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EBOOK VOLUME 11. MISCELLANEOUS

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**CHAPTER 1. CERTIFICATE OF WAIVER FOR AN AEROBATIC PRACTICE AREA  
OR AN AEROBATIC CONTEST BOX**

**Section 1. Issue a Certificate of Waiver for an Aerobatic Practice Area or an Aerobatic Contest  
Box**

**11.1.1.1. GACA ACTIVITY REPORT (GAR).**

A. 1232 (OP) (Aerobatic Practice Area)

B. 1233 (OP) (Aerobatic Contest Box)

**11.1.1.3. OBJECTIVE.** The objective of this task is to evaluate an applicant for the purpose of establishing an aerobatic practice area and/or an aerobatic contest box. Upon approval of the application, a General Authority of Civil Aviation (GACA) Certificate of Waiver with attached special provisions is issued to the applicant.

**NOTE:** See Volume 4, Chapter 2, Section 2, Waivers and Authorizations for additional guidance on the waiver process.

**11.1.1.5. GENERAL.** Waiver preparation for an aerobatic practice area is discussed in paragraph 11.1.1.7, and for an aerobatic contest box in paragraph 11.1.1.9.

**NOTE:** Aviation Safety Inspectors (Inspectors) and applicants should review the Application Processing Flowchart for an Aerobatic Box in Figure 11.1.1.1.

**NOTE:** The term Inspector in Charge (IIC) will be used for the Inspector tasked with approving the Certificate of Waiver.

**A. Background.** The unique special provisions for evaluating an application and issuing a waiver for aerobatic practice areas or aerobatic contests include the requirements for the application process, the issuance of the waiver, and the surveillance of the activity.

1) A separate set of suggested special provisions may be used for each type of waiver.

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- 2) Waivers are issued for specific activities in the following two airspace areas:
- a) An aerobatic practice area is established for the purpose of practicing aerobatic skills.
  - b) The aerobatic contest box is established for the sole purpose of conducting competitive aerobatic demonstrations in accordance with the rules, procedures, and practices of the International Aerobatic Club (IAC). GACA may elect to recognize the rules, procedures, and practices of the IAC for its use in its issuance of waivers and in its monitoring of aerobatic operations.
- 3) The user of an aerobatic practice area or an aerobatic contest box is not required to hold a Statement of Acrobatic Competency.
- 4) Each activity requires a waiver with attendant special provisions appropriate to the site and the activity.

**B. Regulatory Authority.** The regulatory authority for the issuance of waivers of General Authority of Civil Aviation Regulation (GACAR) Part 91 for aerobatic practice areas and aerobatic contest boxes is based on the authority vested in the GACARs. All airspace waivers must be fully coordinated by GACA SS&AT with Air Traffic Services (ATS) to ensure safety of flight in the Kingdom of Saudi Arabia (KSA) airspace system. Airspace waivers may be issued up to, but may not exceed, 24 calendar-months. Requests for waivers are processed by the Flight Operations Division. The final approval of the waiver is the responsibility of the Manager, Flight Operations Division.

**C. Application.** Applications for a Certificate of Waiver for aerobatic purposes are processed in the following manner.

- 1) *Aerobatic Practice Area.* There are short term and long term practice areas.
  - a) The application form should be submitted 30 days or more prior to the use of the practice area to allow for sufficient processing time.
  - b) Short term aerobatic practice areas:
    - Are associated with airspace for use of less than 10 days in duration

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- Are associated with a special aviation event or aerobatic contest
- c) Long term aerobatic practice areas:
- Are associated with airspace use for periods from 10 days to no more than 24 calendar months in duration
  - IICs may need to consider environmental factors that could affect the proposed use of the airspace as described in the application. IICs should consult their supervisor if they believe that environmental or other factors affecting or of interest to other government agencies might be involved with the proposed activity.

### 2) *Aerobatic Contest Box*. When applying for an aerobatic contest box:

- a) The application form should be submitted 60 days or more prior to the contest to allow for sufficient processing time.
- b) The GACA will process the application for a contest within 30 days of receipt.
- c) Because thorough planning has a direct bearing on the success and safety of an aerobatic contest box, the applicant is encouraged to develop an effective plan that covers all facets of the coordination and use of the contest box. The IIC should assist the waiver applicant by discussing the following:
  - Proper site selection (controlled and uncontrolled aerodromes, or other sites suitable for aerobatics)
  - The size, scope, and location of the contest
  - The category of competitors
  - A plan for spectator control (if appropriate)
  - The preparation of Notices to Airmen (NOTAM)

3) Upon receipt, the application should be reviewed for discrepancies. If discrepancies exist, a meeting with the applicant may be helpful in resolving them.

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**NOTE:** Although not required, applicants may receive assistance with the application documentation for an aerobatic contest box by contacting the IAC. GACA does not require any applicant to be a member of the IAC; but may recognize the IAC's expertise in this area.

**D. Approval.** Waivers are processed and issued using procedures prescribed in Volume 4, Chapter 2, Section 2 of this handbook.

- 1) Waivers for an aerobatic contest box or a box for an aerobatic practice area are approved upon satisfactory review of the application.
- 2) Certificates of Waivers are issued using procedures prescribed in Volume 15, Chapter 14 of this handbook.

**11.1.1.7. AEROBATIC PRACTICE AREAS.** Pilots who wish to practice aerobatic maneuvers that do not meet the requirements of GACAR § 91.417 must obtain a waiver. Such maneuvers will be performed in a designated area referred to as an aerobatic practice area. These areas are not to be considered event or competition sites. The aviation community uses these practice areas to establish and maintain proficiency as well as to enhance competitive skills in aerobatic maneuvers. Aerobatic practice areas are established by the waiver applicant in conjunction with the GACA and may have dimensions of several kilometers in various directions or be as small as a contest box. Inspectors should be receptive to establishing these areas, consistent with safety regulations and in compliance with current guidance found in this handbook and associated publications. It is imperative that the safety of all nonparticipating aircraft be considered when issuing a Certificate of Waiver for an aerobatic practice area.

**A. Waivers.** When a waiver is issued for an aerobatic practice area, it generally includes provisions for:

- 1) Aerobatic flight below 1,500 feet (460 meters) above ground level (AGL).
- 2) Other portions of GACAR § 91.417 may be waived if the proposed operation involves an airway or Class B, C, D, or E airspace designated for an aerodrome.
- 3) Applicants for aerobatic practice areas located directly over or in the immediate vicinity of an aerodrome, although not required, should coordinate the planned activity with aerodrome management. This is in keeping with a "good neighbor" policy and provides a means for addressing potential aviation safety concerns. The GACA will review, verify, and

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evaluate any potential safety concerns and modify the special provisions attached to the Certificate of Waiver accordingly to address these concerns.

4) The applicant is charged with addressing known environmental concerns in their application and IICs (in consultation with their supervisor) are charged with considering environmental issues during their review of the application. This ensures that environmental impacts are considered when deciding where a proposed aerobatic practice area should be located. The waiver applicant should consider coordinating with the residents, landowners, and municipalities where aerobatic flight is planned to be conducted.

### **B. Definitions.**

1) *Aerobatic Flight*. The provisions of GACAR § 91.417 constitute the definition of aerobatic flight.

2) *Special Aviation Event*. A special aviation event include air shows, closed-course air races, certain parachute demonstration jumps, fly ins, balloon meets, and competitions that are conducted before an invited assembly of persons. Aerobatic competitions are not considered to be special aviation events since the public is not invited (See Volume 11, Chapter 2, Issue a Certificate of Waiver or Authorization for a Special Aviation Event).

3) *Inspector in Charge (IIC)*. The Inspector who is assigned the responsibility of processing the waiver application and for conducting ongoing surveillance of the aerobatic practice area.

4) *Responsible Person*. The person named specifically named on the Certificate of Waiver.

5) *Temporary Flight Restriction (TFR)*. A regulatory action issued via the Notices to Airmen (NOTAMs) system to restrict certain aircraft from operating within a defined area, on a temporary basis, to protect persons or property in the air or on the ground. Typical events associated with a TFR are major events or gatherings, natural disasters, air shows, special security areas, and movements of dignitaries.

**C. Scope of Waivers.** Per GACAR § 91.601, a Certificate of Waiver may only be authorized for the rules listed in GACAR § 91.611.

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- 1) Some aerobatic maneuvers may require only a waiver of GACAR § 91.417(e) to permit aerobatic flight at less than 1,500 feet (460 meters) above the surface. Others may require the waiver of speed limitations, minimum safe altitudes, operations in controlled airspace, or specific prohibitions while operating in the vicinity of an aerodrome.
- 2) The following approved sections of GACAR Part 91 that are commonly waived for aerobatic contests and/or aerobatic practice areas: GACAR §§ 91.65, 91.67, 91.125, 91.127, 91.129, 91.131 and 91.417, depending on the location, congestion, and complexity of the area in which aerobatics will take place.
- 3) Waivers of the basic VFR weather minimums specified in GACAR § 91.165 may be considered only in areas where the entire aerobatic maneuvering area is totally within Class B, C and D airspace or a temporary flight restriction.

### **D. Regulations That May Not Be Waived.**

- 1) GACAR § 91.67(a) and (b) may not be waived at any time for an aerobatic practice area.
- 2) GACAR § 91.161 may not be waived for any operations conducted in an aerobatic practice area. However, the IAC holds an exemption for fuel required during flight in VFR conditions. This exemption applies only during the conduct of officially sanctioned aerobatic contests and associated practices.

**E. Air Traffic (ATS) Coordination.** Aerobatic practice areas may be located at controlled or uncontrolled aerodromes or in sparsely populated areas far removed from any persons and/or congested areas. The IIC determines the location of these practice areas through proper coordination with the waiver applicant and the appropriate ATS. Use of the area may be for a short duration, once each year for annual qualification, or for all hours of the day and/or evening. IICs should coordinate with the ATS unit having primary airspace jurisdiction over the proposed practice area. The waiver shall not be signed unless the working file contains documentation of ATS coordination.

**F. Night Operations.** Aerobatic performers who conduct night aviation event operations should practice their routines in realistic conditions before the actual flight at an aviation event. Numerous air show performers of both powered and unpowered aircraft need to practice their routines in areas that offer no obstructions and little or no distractions during the hours of darkness.

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- 1) In order to facilitate practice sessions, IICs should determine if aerobatic practice areas previously approved for daylight operations only are also acceptable for night operations.
- 2) Many performers of night aerobatic maneuvers use some type of flares or pyrotechnic devices to highlight their maneuvers. Other performers use only lights and strobes. In either case, it will be necessary to coordinate and approve all facets of the waiver and any special provisions to ensure safety is not compromised if the operation is conducted at night.

**G. Temporary Aerobatic Practice Areas.** The GACA may be called upon to issue a waiver for establishing a temporary aerobatic practice area. These waivers may be offered to the responsible person of a proposed aviation event or contest at the same time the application for the associated event or contest waiver is submitted. This additional waiver may be prepared for the specific purpose of providing a temporary area in which only aviation event performers or contestants may practice their routines before and during the event or contest. In addition, it will provide a safe and approved area for those performers or contestants who may be from other states or countries and who need to adapt to the weather and altitude conditions intrinsic to the local area. Even though this will be a separate waiver which becomes effective before the event or contest, it must be prepared so as to terminate on the same date and time as the associated waiver.

- 1) Environmental issues are not considered for temporary aerobatic practice areas of ten consecutive days or fewer in duration when associated with a special aviation event or contest.
- 2) Some of the parameters to consider in establishing this temporary practice area are:
  - a) The actual event or contest site may be suitable as a temporary practice area if it is a controlled environment and there will be no conflict with other nonparticipating aircraft. Effective times must be thoroughly coordinated with the pertinent ATS facilities before approval and issuance of the waiver.
  - b) The temporary practice area should be established no more than 50 km from the actual contest or event site.
  - c) All coordination required for establishing a (regular) aerobatic practice area should also be accomplished for preparation of a temporary aerobatic practice area.



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- d) The responsible person must control access to the temporary aerobatic practice area, and only those persons performing in the contest or event should be permitted to use the area.
  - e) The physical parameters of the temporary practice area should be large enough to encompass all of the maneuvers that will be performed in the actual contest or event.
  - f) The responsibility for site selection, coordination, approvals, application, and oversight of the temporary aerobatic practice area rests solely with the event or contest responsible person.
- 3) It is the responsibility of the event or contest responsible person to coordinate the use of these established practice areas. If practice time is not available at the event or contest site, it is incumbent upon the event or contest responsible person to request a temporary aerobatic practice area. The IIC preparing the waiver may suggest that one be established. This would be more common for events than contests.

**H. Special Provisions.** The following are samples of common special provisions that may be used when issuing a Certificate of Waiver for an aerobatic practice area. If additional special provisions are to be added, the concurrence of the Director, Flight Operations Division is required. Material in brackets [ ] indicate where the IIC must insert information specific to the waiver being sought.

- 1) Aerobatic flight shall be confined to the area designated on the pictorial chart (satellite photographs may be substituted for topographic charts) attached to the Certificate of Waiver and defined in special provision 2. A definitive pictorial chart or photograph of the underlying area should be attached to the application and the Certificate of Waiver.
- 2) The aerobatic practice area is further defined as follows: (This item should contain a literal description of the entire practice area, including all delineating boundaries and the altitudes for each specific section of the practice area.)
- 3) No aerobatic maneuvers may be performed over or within 150 meters laterally from any open air assembly of persons or congested area of any municipality, government, province, or settlement.
- 4) No person may operate an aircraft in aerobatic flight when the visibility is less than

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[number] kilometers or a ceiling less than [number] feet.

5) Before commencing aerobatic flight operations, the person(s) authorized to activate and deactivate the aerobatic practice area shall be responsible for advising the appropriate Aerodrome Aeronautical Information Services (AIS) Unit of the activity and requesting that a NOTAM that includes the following information be issued:

- a) The location, dates, and times the aerobatic activity will be in effect.
- b) If appropriate, the runway(s) that will be closed during the aerobatic activities.

6) All Certificates of Waiver granting relief from appropriate sections of GACAR Part 91 must also contain guidance stipulating that the person(s) responsible for activation of the aerobatic practice area provide the appropriate ATS facility with a copy of the Certificate of Waiver at least 48 hours before activation of the NOTAM. For Certificates of Waiver that are issued on a long term basis, additional wording should be included advising the holder to ensure that the appropriate ATS facility keeps the waiver on file for future NOTAM activation.

7) Notification shall be made to the appropriate ATS facility [and telephone number] at least 30 minutes before the beginning of aerobatic activity in the practice area, or, if a letter of agreement exists, notification shall be made as specified in that document. The same appropriate unit shall also be notified at the termination of aerobatic activities.

8) The person(s) authorized to activate and deactivate the aerobatic practice area described in special provision 2 is [name of the person(s) to whom the waiver is issued or the person(s) delegated by the waiver holder].

9) The person named in special provision 8 shall also be responsible for the following:

- Ensuring that all pilots and aircraft operating within the confines of the waived aerobatic practice area are properly certificated
- Briefing each pilot to ensure that all users of the practice area comply with the limitations imposed by the Certificate of Waiver and its attendant special provisions
- Maintaining a log containing the pilot's name, airman certificate number, aircraft

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registration marks, date, and time the aerobatic practice was in use and providing this information to GACA upon request

- 10) When required by ATC, all pilots must monitor [name of ATC facility and frequency assigned] on a continuous basis while operating within the aerobatic practice area.
- 11) All pilots operating within the waived aerobatic practice area shall maintain VFR at all times and shall be responsible for seeing and avoiding all conflicting traffic.
- 12) Aerobatic flight shall be conducted only between the hours of [specific times of use].
- 13) The holder of this Certificate of Waiver or delegated representative is responsible for halting or canceling activity in the aerobatic practice area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this waiver.
- 14) GACA has the authority to cancel the Certificate of Waiver or delay any activities if the safety of persons or property on the ground or in the air is in jeopardy, or if there is a violation of the terms of the waiver.

**11.1.1.9. AEROBATIC CONTEST BOXES.** A general overview of the aerobatic contest box is contained in Figure 11.1.1.2 and depicts the dimensions of the area for powered and unpowered aircraft engaged in competitive aerobatics.

### **A. Definitions.**

- 1) *Aerobatic Contest Box.* A block of airspace 1000 meters long by 1000 meters wide and having an upper limit of 3,500 feet AGL (4,000 feet AGL for gliders). The lower limit of the box is 1,500 feet AGL for Primary and Sportsman Categories, 1,200 feet AGL for Intermediate, 800 feet AGL for Advanced and 328 feet AGL for the Unlimited Category. For Gliders, the lower limit of the box is 1,500 feet AGL for Sportsman Category, 1,200 feet AGL for the Intermediate Category, and 600 feet AGL for the Unlimited Category. The IIC should consider the waived air space requirement for a contest normally to be a 1.5 km x 1.5 km x 1.5 km starting at the surface or may be depicted as a radius around a point. This allows for all categories and provides a buffer zone around the competition box.
- 2) *Chief Judge.* At an aerobatic contest, the person assigned as the primary judge of one or

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more categories of competition. The Chief Judge does not actually judge the competitors, but helps to ensure the safety of competitors within the contest box. The Chief Judge is assisted by numerous other persons located on the ground and/or in the immediate vicinity of the contest box.

3) *Chief Technical Monitor*. Person assigned duties by the contest director to perform a technical inspection of each competing aircraft and its equipment. The Chief Technical Monitor should normally hold a mechanic certificate with airframe and powerplant ratings; however, this position may be filled by the Contest Director with the “best qualified” person available.

4) *Competition Categories*. There are different competition categories for powered aircraft and gliders. These categories are defined by IAC official contest rules.

5) *Contest Director*. At an aerobatic contest, the person who acts as the general manager of the overall event and is responsible for all safety related issues. The Contest Director may delegate specific duties, functions, and authority but must retain complete accountability for the safety of the event. The Contest Director may also be the person who is designated by the GACA to monitor the event. The Contest Director ensures that all participants comply with all rules set forth in the IAC rules book as well as the provisions of the Certificate of Waiver.

6) *Inspector in Charge (IIC)*. The Inspector who is assigned the responsibility for processing the waiver application and for monitoring the aerobatic contest box, as deemed necessary by the Director, Flight Operations Division, to determine compliance with the applicable GACAR sections.

7) *Participant*. Any individual and/or pilot specifically involved with, or participating in, the waived aerobatic activities.

8) *Safety Director*. The person who reports directly to the Contest Director and is responsible for flight and ground safety.

### **B. Scope of Waivers.** The following regulations may not be waived:

1) GACAR § 91.67(a) and (b) may not be waived at any time for an aerobatic contest box.

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2) GACAR § 91.161 may not be waived. However, the IAC stipulates the minimum fuel required during flight in VFR conditions for aerobatic contests and should be considered during review of the application.

**C. ATS Coordination.** An aerobatic contest box may be located at a controlled or uncontrolled aerodrome. The location is determined and approved through proper coordination with the waiver applicant, aerodrome management, the IICs, and appropriate ATS personnel. IICs should coordinate with the ATS unit having primary airspace jurisdiction over the proposed aerobatic contest box. The waiver will not be signed unless the working file contains documentation of ATS coordination.

**D. Special Provisions.** The following special provisions are listed below to provide a sample of common special provisions that should be used (only those which are appropriate) when issuing a waiver for an aerobatic contest box. If additional special provisions are to be added, the IIC must ensure proper coordination with all affected parties. Material in brackets [ ] indicates where the GACA, with the help of the Contest Director or representative, must insert information specific to the waiver being sought.

- 1) The aerobatic competition area that these special provisions pertain to is depicted and described on attachment [attachment number] to this Certificate of Waiver.
- 2) This waiver is not valid if the inflight visibility is less than 5 km or the ceiling, if a ceiling exists, is less than 3,000 feet AGL. Flight operations shall be conducted in accordance with (IAW) GACAR § 91.165.
- 3) The Contest Director is responsible for ensuring that [ATS facility] is notified by telephone at [ATS primary telephone number] or [ATS backup telephone number] at least 30 minutes before operations begin and again when the flight activity has been terminated.
- 4) Before commencing aerobatic flight operations, the Contest Director is responsible for advising the appropriate ATS facility [and telephone number] of the activity and for requesting that a NOTAM that will ensure wide dissemination and include the following information, appropriate to the operation, be issued:
  - a) The location, dates, and times the aerobatic activity will be in effect.
  - b) When appropriate, runway(s) that will be closed during the aerobatic activities.

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(This information must also be included in the traffic advisory to non-participating aircraft.)

c) Allowing touch-and-go landings during the times the NOTAM is in effect must be coordinated and agreed upon by the waiver holder and the aerodrome manager. (This information must also be included in the traffic advisory to non-participating aircraft.)

d) All traffic at [name of aerodrome] will use [specific traffic pattern information] when landing on or taking off from [list runway(s)] while the NOTAM is in effect. (This information must also be included in the traffic advisory.)

5) All Certificates of Waiver granting relief from appropriate sections of GACAR Part 91 must also contain guidance stipulating that the person(s) responsible for activation of the aerobatic contest box provides the controlling ATS unit with a copy of the Certificate of Waiver at least 48 hours before activation of the NOTAM.

6) Aerobatics shall only be conducted between the hours of official sunrise and sunset.

7) Each aircraft operating within the aerobatic contest box must be appropriately equipped to maintain continuous radio reception with the Chief Judge.

8) The holder of the waiver should obtain the permission of the [name of aerodrome] manager to conduct aerobatic activities and, in addition, ensure that the aerodrome management fully understands and will abide by the terms and conditions of the Certificate of Waiver. However, permission of the aerodrome management is not required for the waiver.

9) Aerobatics are limited to those aircraft and pilots who are approved by the holder of the Certificate of Waiver or a designated representative. The Contest Director is responsible for ensuring that:

a) Each aircraft competing in the aerobatic competition has the appropriate documents necessary to show current registration and airworthiness;

b) Each pilot participating in the aerobatic competition is properly certificated and possesses the currency and/or endorsements appropriate to the flight operation being conducted; and

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c) Before any waived aerobic operation, each pilot participating in the aerobic competition receives a briefing from the waiver holder or designated representative. This briefing must include the terms of the waiver, the confines of waived airspace, and any special limitations or procedural considerations contained therein (See Figure 11.1.1.3, Sample Briefing Signature Page)

**NOTE:** See subparagraph 11.1.1.9A 5) above regarding delegation of authority by the Contest Director.

10) A crowd line consisting of a physical barrier and/or adequate policing shall be established at least 150 meters from the aerobic box to confine all spectators within a designated area.

11) When operating within waived airspace, GACAR § 91.67(c) is waived only if unoccupied structures are involved or to allow participating waived aircraft to operate closer than 150 meters to essential personnel, vehicles, or vessels on the ground. All participating aircraft must maintain at least 150 meters from non-essential personnel.

12) Before performing any aerobic sequence, the area must be scanned thoroughly by both the competitor and the Chief Judge. The competitor must not enter and/or initiate any aerobic maneuvers unless the Chief Judge has ensured that the area is free of any conflicting traffic and has advised the pilot that the aerobic contest box is clear.

13) The GACA has the authority to cancel the Certificate of Waiver or delay any events if the safety of persons or property on the ground or in the air is in jeopardy, or if there is a violation of the terms of the waiver.

**E. Additional Special Provisions.** The following special provisions are issued to a waiver holder for an aerobic contest box established at an uncontrolled aerodrome where a runway remains open during competition. These provisions should be copied with as little editing as possible to fit a unique or individual need. The provisions should be used as appropriate to the type of scenario encountered. Any additions or significant changes must have the concurrence of the Director, Flight Operations Division.

1) [Name of aerodrome] will be closed to all traffic when the competitive activity of Advanced and Unlimited Category pilots may create a conflict with continuing non-participant flight operations. (Also include this information in the NOTAM and traffic



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advisory, as required.)

- 2) No touch-and-go landings are permitted while the aerobatic box is in use if the participant in the aerobatic box poses a hazard to touch and go traffic. (Also include this information in the NOTAM and traffic advisory.)
- 3) Aerobatic operations must not be conducted at altitudes lower than 1,200 feet AGL when the aerobatic contest box is located over a runway that is open and that activity may create a conflict with continuing non-participant flight operations.
- 4) The Contest Director, or a person specifically designated by the Contest Director, will continuously monitor the appropriate frequency while the aerobatic box is active. That person will advise any aircraft operating at or near [name of aerodrome] of potential traffic conflicts that may occur while operating in close proximity to the aerobatics box. The person assigned to monitor the appropriate frequency will have direct access to the Chief Judge by radio, telephone, or direct contact. Should there be an actual or potential conflict; the Chief Judge has the final authority to call for a cessation of aerobatics.
- 5) The appropriate frequency shall be manned by a person who has been briefed on the aerobatics activity, special pattern rules, and restrictions. If needed, a scripted version of the advisory will be furnished by the waiver holder in order to provide a standardized advisory to all pilots.

**F. Aerobatic Competition Not Sanctioned by the International Aerobatic Club (IAC).** The following special provision will be issued to a waiver holder conducting an aerobatic competition that is not sanctioned by the IAC, excluding competitive flying displays at aviation events conducted in accordance with a Certificate of Waiver issued under the provisions of Volume 11, Chapter 2, Section 1, Issue a Certificate of Waiver or Authorization for a Special Aviation Event.

- 1) Participants will have in their possession a valid IAC computer-generated score sheet or other document acceptable to the GACA from an aerobatic competition sanctioned by the IAC and completed within the last 24 calendar-months indicating that he/she has successfully competed in the specific competition category he/she intends to compete at this event.
- 2) Except for takeoff and landing, all participants will fly no lower than the minimum



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altitude prescribed for this specific competition category as stated in the IAC official contest rules.

**NOTE:** The minimum altitudes for each competition category are defined in subparagraph 11.1.1.9A 1).

### 11.1.1.11. PREREQUISITES AND COORDINATION REQUIREMENTS.

**A. Prerequisites.** This task requires knowledge of the regulatory requirements of GACAR Part 1, 61 and 91. In addition, the person preparing and coordinating the waiver must be qualified as an IIC (Operations).

**B. Coordination.** This task may require coordination with an ATS unit, other governmental agencies, and the affected communities and/or property owners which underlie or are adjacent to the practice area or aerobatic contest box, as appropriate.

### 11.1.1.13. REFERENCES, FORMS, AND JOB AIDS.

#### A. References:

- GACAR Part 1, 61 and 91

#### B. Forms:

- Certificate of Waiver
- Figure 11.1.1.1, Application Processing Flowchart for an Aerobatic Contest Box
- Figure 11.1.1.2, Aerobatic Contest Box for Airplanes
- Figure 11.1.1.3, Sample Briefing Signature Page
- GACA Activity Report (GAR)

**C. Job Aids.** None.

### 11.1.1.15. PROCEDURES.

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**A. Processing the Application for Waiver for Aerobatic Practice Area or Aerobatic Contest**

**Box.** For an Aerobatic Contest Box, the GACA will complete its evaluation of the application within 30 days of receipt.

- 1) Brief the applicant on the prerequisites of site selection and any coordination that may be appropriate to the area.
- 2) Brief the applicant on the procedures for preparing and submitting the waiver request.
- 3) Open a GAR.
- 4) Upon receipt, the completed application should be reviewed for obvious discrepancies.
- 5) Perform a visit the proposed site, if required, to obtain firsthand knowledge of the operational parameters of the airspace to be used and the underlying terrain. In addition, evaluate the environmental impact the proposed aerobatic activity might have and coordinate with other GACA resources, as appropriate.
- 6) Ensure that all proposals are coordinated with ATS and with any other entity directly affected by the establishment of the aerobatic practice area.
- 7) If the application is disapproved:
  - a) Prepare a letter of disapproval which describes all deficiencies in the application.
  - b) Send this letter along with the original application and accompanying documentation to the applicant.
  - c) Establish a specified date for correction of deficient items and for resubmittal of the application.
- 8) If the application is approved:
  - a) Prepare the Certificate of Waiver and the attendant special provisions.
  - b) Prepare a file that includes, but is not limited to, copies of the following:
    - Certificate of Waiver (signed) and attendant special provisions

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- Summary of any environmental issues or impacts considered during the application review
  - Letter of disapproval of the application, if applicable
  - Documentation of ATS coordination
- c) Send the applicant the originals of the Certificate of Waiver and the attendant special provisions.
- d) Keep copies of all forms with all attachments for the GACA office file.
- e) Make appropriate GAR entries.
- f) Perform briefings and surveillance as appropriate

### **11.1.1.17. TASK OUTCOMES.** Completion of this task results in one of the following:

- Issuance of a Certificate of Waiver with attached special provisions
- Disapproval of an application for a Certificate of Waiver with the reasons for the disapproval noted

### **11.1.1.19. FUTURE ACTIVITIES.**

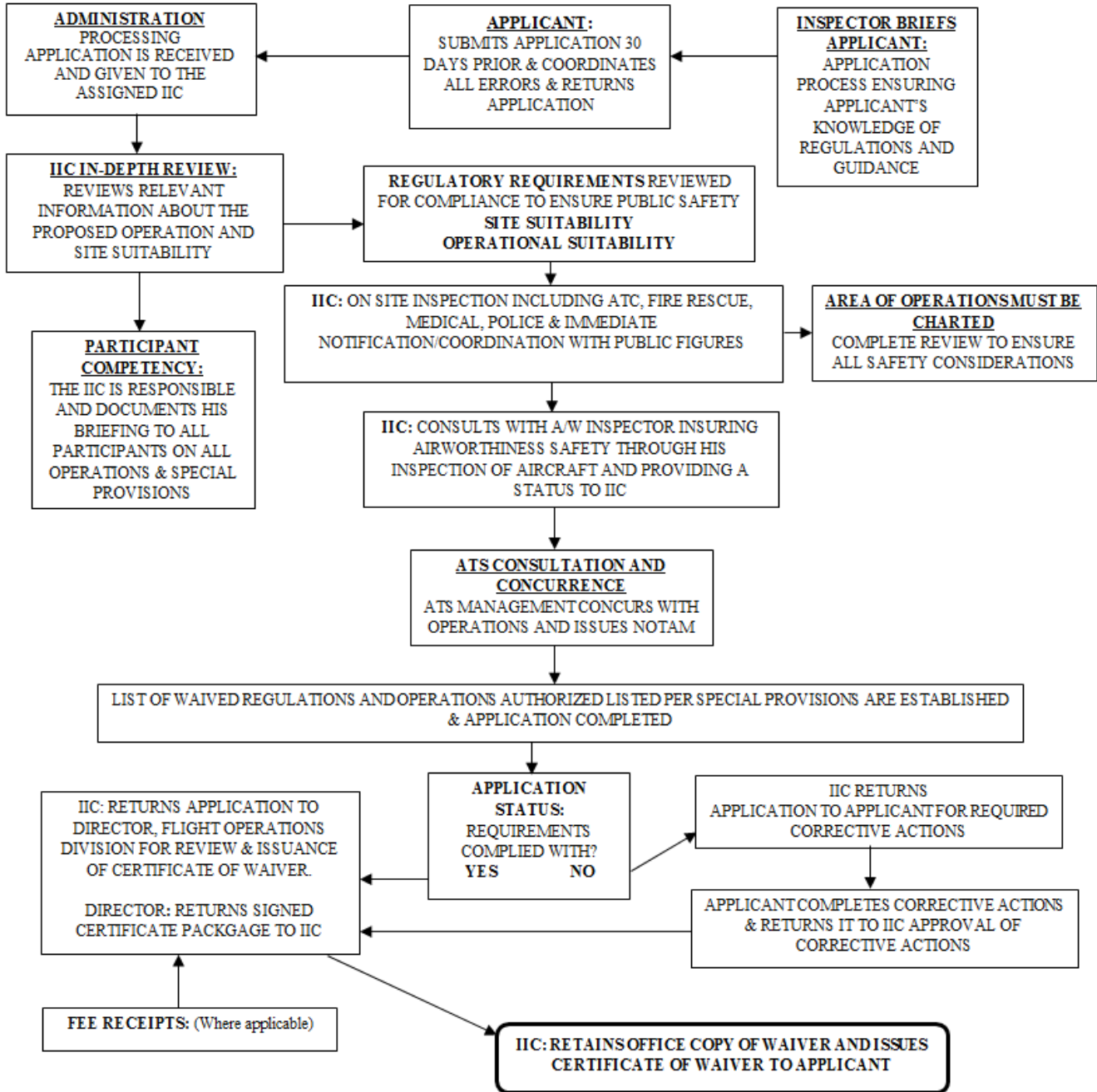
**A. Surveillance.** Surveillance of activities/events conducted in the aerobatic practice area or aerobatic contest box, especially events not sanctioned by IAC, should be performed by an Inspector (Operations).

**B. Cancellation.** The Certificate of Waiver may be cancelled due to noncompliance with the terms and conditions of the waiver and/or with the actions necessary to ensure future compliance.

**C. Application.** Consideration may be taken of a future application for waiver of regulations pertaining to aerobatic maneuvers conducted in an aerobatic practice area and/or aerobatic contest box.

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**Figure 11.1.1.1. Application Processing Flowchart for an Aerobatic Contest Box**

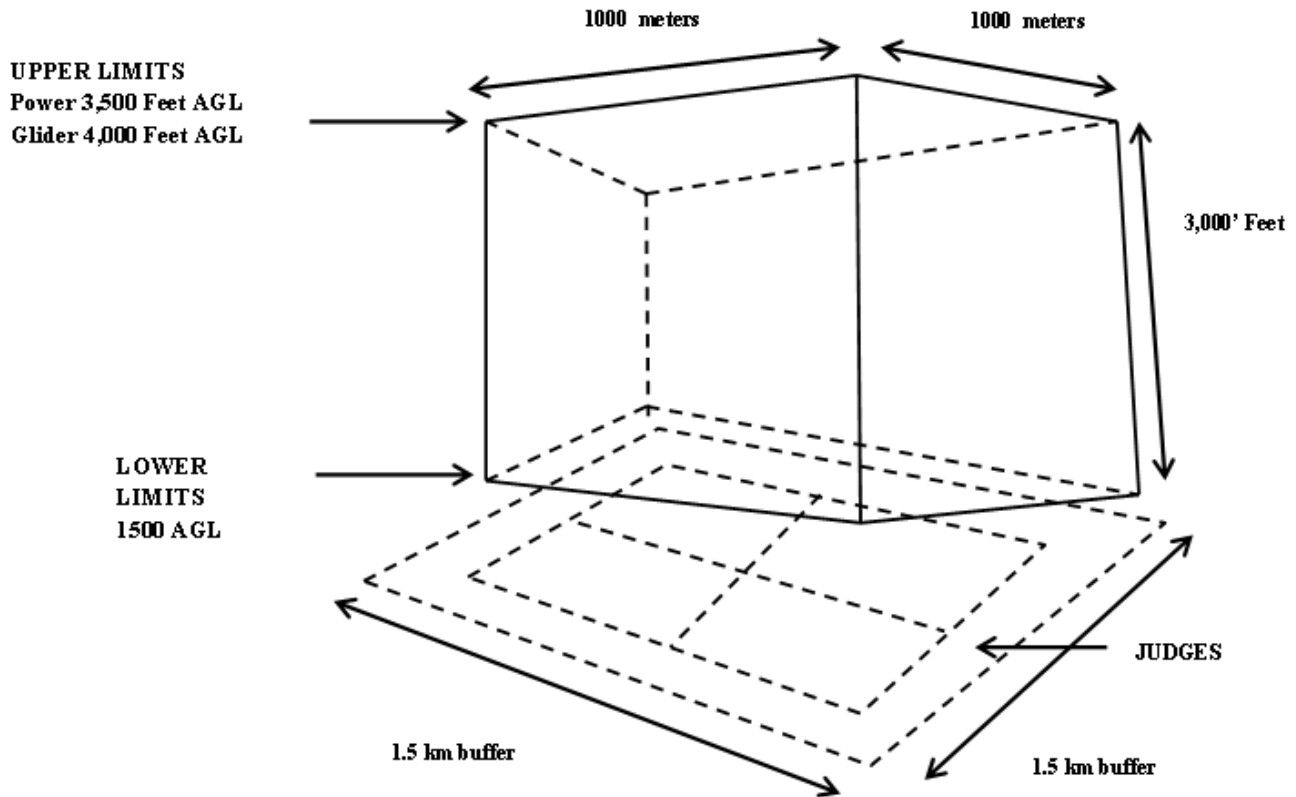


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Figure 11.1.1.2. Aerobatic Contest Box for Airplanes





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### CHAPTER 2. CERTIFICATE OF WAIVER OR AUTHORIZATION FOR A SPECIAL AVIATION EVENT

#### Section 1. Issue a Certificate of Waiver or Authorization for a Special Aviation Event

##### 11.2.1.1. GACA ACTIVITY REPORT (GAR).

A. 1220 (OP) (Certificate of Authorization)

B. 1230 (OP) (Certificate of Waiver)

**11.2.1.3. OBJECTIVE.** Under General Authority of Civil Aviation Regulation (GACAR) § 91.431 no person may conduct a special aviation event unless the event is specifically authorized by the President. This section's task is to determine whether to issue a Certificate of Authorization for a special aviation event. Additionally, this section addresses actions associated with Certificates of Waiver that may also be required for the special aviation event. Completion of this task results in the issuance of a certificate to the applicant or the disapproval of their application. Certificates of Waiver may only be issued for a waiver for those items listed in GACAR § 91.611.

##### 11.2.1.5. GENERAL.

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

1) *Aerobatic Box.* The airspace at an airshow where participating aircraft are authorized to perform aerobatic maneuvers appropriate to their waiver. This box begins at the appropriate category I/II/III show line (Figure 11.2.1.2).

2) *Aerobatic Flight.* Aerobatic flight is where the pitch attitude exceeds 60 degrees above or below the horizon and/or the angle of bank exceeds 75 degrees in reference to the horizon for all aircraft when conducting the event in accordance with a certificate of waiver. The definition for aerobatic flight in GACAR Part 1 does not apply. Therefore, always waive the portion of GACAR Part 1 that defines aerobatic flight.

3) *Air Boss.* The individual who has the primary responsibility for air show operations on

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the active taxiways, runways, and the surrounding air show demonstration area.

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

5) *Air Show Demonstration Area*. The total airspace (lateral and vertical limits) identified by a GACA authorization, Temporary Flight Restriction (TFR), or the Notices to Airmen (NOTAMs) issued for an air show.

6) *Altimeter Setting*. Many performers and jump aircraft may wish to set their altimeters to zero while on the ground to measure height above ground during their performance. This may require a waiver of GACAR § 91.71. The Inspector-In-Charge (IIC) should waive GACAR § 91.71 for any event where aircraft involved in that event are departing from a runway at that location. This does not require the affected aircraft to set their altimeter(s) to zero but gives the pilot the option to do so.

7) *Approved Maneuver*. A GACA approved maneuver or a series of maneuvers. These may include flight over the designated spectator area(s) below 1,000 feet (305 meters) above ground level (AGL), higher speeds for military airplanes, or a maneuver that may involve energy directed at the spectator area that meets safety criteria.

8) *Special Aviation Event*. A special aviation event includes air shows, closed course air races, parachute demonstration jumps, balloon meets, and fly-ins conducted before an invited assembly of persons, for which the GACA issues a Certificate of Authorization (and maybe a Certificate of Waiver as well).

**NOTE:** This chapter does not address or include aerobatic competitions (see Volume 11, Chapter 1, Section 1, Issue a Certificate of Waiver for an Aerobatic Practice Area or an Aerobatic Contest Box).

9) *Aircraft Show Line Categories*. Show line categories, speeds, and distances are shown in Table 11.2.1.1 below. These speeds are only for determining assignment to a show line, not maximum performing speeds. The following criteria are the basis for the minimum distances in Table 11.2.1.1 below:

- a) For reciprocating-powered airplanes, knots indicated airspeed (KIAS) in straight and level flight at 75 percent power at standard temperature and pressure (15°C/sea



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level) and maximum certified takeoff mass.

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

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

**Table 11.2.1.1. Example of Airplane Show Line Category**

<b>AIRPLANE SHOW LINE CATEGORY</b>	<b>AIRCRAFT CHARACTERISTICS*</b>	<b>STANDARD SHOW LINE DISTANCE FROM THE SPECTATOR AREA</b>
I	More than 245 knots	450 m
II	More than 156 knots but 245 knots or less	300 m
III (Single reciprocating engine and BD-5J)	156 knots or less or no more than 1000 kg (2,250 pounds) maximum takeoff mass	150 m
* These are not operating limitations		

**NOTE:** See Table 11.2.1.2 for all aircraft categories.

10) *Certificate of Authorization.* An official document issued by the GACA to permit certain activities that require GACA approval, but that does not waive any regulations. (See Volume 4, Chapter 2, Section 2).

11) *Certificate of Waiver.* An official document issued by the GACA that authorizes certain operations of aircraft to deviate from a regulation, but under conditions that ensure an equivalent level of safety. GACAR § 91.611 lists the sections of GACAR Part 91 that may be waived. (See Volume 4, Chapter 2, Section 2)

12) *Control Point.* A specified location where the event organizer, a designated representative, or an air boss manages the aviation event. The control point must have a

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communication system with the capability necessary to control the aviation event.

13) *Corner Markers*. An easily identifiable marker or landmark from the air, 150 meters or more right and left of primary spectator area along the crowd line from the primary spectator area to provide flybys and performers a 150 meter reference for proper separation from spectators (see Figure 11.2.1.2, Figure 11.2.1.6 through 11.2.1.14 and Figure 11.2.1.18).

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

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

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

16) *Essential Personnel*. Individuals authorized to access the flying display area during an aerobatic performance. (See subparagraph 11.2.1.7C.)

17) *Event Organizer*. The person or organization responsible for the application, preparation, and conduct of the special aviation event.

18) *Flyby*. A non-aerobatic pass or a series of non-aerobatic passes, performed by one or more aircraft, before an invited assembly of persons at an aviation event. (See paragraph 11.2.1.13J)

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

20) *Formation Flying*. When an aircraft is flown solely with reference to another aircraft and within 500 feet (150 meters) of the referenced aircraft. Air racing and simulated dog-fighting are not considered formation flying.

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

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- 22) *Inspector-In-Charge (IIC)*. The aviation safety inspector (Inspector) (Operations) who is assigned primary GACA responsibility for the special aviation event. (See subparagraph 11.2.1.5D.)
- 23) *Military Jet Demonstration Teams*. Sanctioned Military jet demonstration teams, such as the USAF Thunderbirds, the U.S. Navy Blue Angels, and the Canadian Forces Snowbirds, etc.
- 24) *Military Single-Ship Demonstration Teams*. A sanctioned military demonstration team that consists of single aircraft conducting flybys or aerobatic demonstrations of current military fighter aircraft.
- 25) *Official Photographers*. Photographers designated by the responsible person as essential personnel to be in designated areas of the aerobatic box during performances (see subparagraph 11.2.1.9C).
- 26) *Participant*. Any individual specifically involved with, or directly participating in, the authorized aviation event.
- 27) *Primary Spectator Area*. The main area designated by the event organizer for spectator use. The crowd line creates its boundary and has well defined lateral limits (ends). This is the area from which the public is directed to view the event. There may be more than one primary spectator area.
- 28) *Responsible Person*. A person designated by the event organizer to be responsible for all aspects and special provisions of the authorizations and waivers. This person must be acceptable to the GACA as being knowledgeable concerning the terms and provisions of the certificate of authorization/waiver for this aviation event. The responsible person will be responsible to the GACA for the safe conduct of the event.
- 29) *Secondary Spectator Area(s)*. Any area, not designated as a primary spectator area, where people have a natural tendency to gather to observe the event. This includes, but is not limited to, private property or property not under control of the event organizer, public roads, and private access roads.
- 30) *Show Center*. A visible reference point that denotes the center of the flying display area.

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31) *Show Line*. A line on the surface of the ground or water, marked to be clearly visible to pilots from the air, intended to enhance pilot orientation during the performance. The show line provides the performer with a clear visual reference to the minimum safety distance applicable to the category of the maneuvering aircraft being flown (see subparagraphs 11.2.1.13A and C through F.)

**B. Regulatory Authority.** The GACA has the authority to grant or deny authorizations for special aviation events under GACAR § 91.431 and waivers of the regulations listed in GACAR § 91.611 for aviation events.

1) *Scope of Waivers.*

a) Waivers of GACAR sections and the attendant special provisions may vary in scope depending on the regulations that an applicant requests to be waived and may vary depending upon the type of aviation event and the location. Some events require nothing more than waiving GACAR § 91.417(e) to permit aerobatic flight at less than 1,500 feet (460 meters) above the surface. Other events that consist of flybys and static displays may only require waiving sections of GACAR Part 91 for aircraft speed limitations, minimum safe altitudes, or limitations while operating in the vicinity of aerodromes or within Class B, C, D, or E airspace.

b) Waivers of the basic visual flight rules (VFR) weather minimums specified in GACAR § 91.165 may be considered in areas where the entire event can be conducted with Air Traffic Service (ATS) providing separation between participating aircraft and nonparticipating aircraft. This means that the entire air show display area for the affected aircraft must be within Class C, or Class D airspace.

2) GACAR § 91.611 establishes a list of rules subject to waivers. Some of the subsections of the mentioned sections may or may not need to be waived. For example, see note below on GACAR § 91.67. There should be a corresponding special provision that gives the conditions that must be followed for each section and/or subsection to be waived to maintain an equivalent level of safety. Another example would be GACAR § 91.65. Aircraft speed may be waived but that waiver of airspeed would have a limitation on maximum airspeed, and the limitations on where that waiver is valid would be in the special provisions attached to the waiver.

**NOTE:** GACAR § 91.167(a) should not be waived for air show demonstration purposes.

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GACAR § 91.167(b) and (c) may be waived only when the conditions stated herein are met.

**C. Program Coordinators.** Depending on the level of air show activity within the KSA, the GACA may choose to designate a focal point for air show coordination. An air show coordinator would be responsible for overall program monitoring and for coordination of all information and communications between the military, other KSA agencies, and the public with respect to air shows within the KSA. An air show coordinator would function in an advisory capacity to the GACA senior management, and to the IIC, who makes the onsite evaluation and is responsible for technical determinations as to the issuance or denial of a request for authorization/waiver.

- 1) The IIC should elevate any issues requiring clarification or that may be of national interest, such as military demonstration team participation, to the Office Manager.
- 2) An air show coordinator (if designated) makes recommendations regarding policy changes. When policy change is not required, provides clarification back to the IIC.
  - a) Local supplements to aviation event policy are not permitted.
  - b) The IIC should report the initiation of any investigation of non-compliance to the Office Manager, and should coordinate the necessary response with the Office Manager as early as possible in the investigation.
  - c) All accidents or incidents occurring at an aviation event should be reported immediately to the Office Manager.

**D. Inspector in Charge (IIC).** To enable the GACA to more effectively manage the special aviation event the Director, Flight Operations Division may assign an IIC to process an application for an authorization/ waiver for an aviation event. The IIC oversees or personally conducts the following activities:

- Site feasibility study
- Participation in the pre-event evaluation meeting
- Evaluation of the application for authorization/waiver
- Recommendation for issuance or denial

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- Prepares a list of Special Provisions appropriate for the event in compliance with current GACA handbook guidance
- Surveillance of the aviation event

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

**F. Qualified Inspector Not Available.** If the GACA does not have an Inspector who meets the above qualifications, the Director, Flight Operations Division should select an Inspector who is best qualified to perform the tasks of an IIC. After the Director, Flight Operations Division identifies an available IIC, he should work out the arrangements necessary to accomplish the task and provide OJT if an Inspector is available.

**G. Surveillance of an Aviation Event.** Surveillance of an aviation event is the responsibility of the Inspector (IIC). Preferably, the Inspector (IIC) who processed the application for the authorization and any waivers should monitor the event. Consider additional resources for high profile events or large aviation events. Any event not monitored by an Inspector (IIC) must be coordinated with the Director, Flight Operations Division well in advance, and the outcome documented in GAR. (See Volume 12, Chapter 15, Section 8, Aviation Event Surveillance (Operations))

**H. Surveillance of an Aviation Event—Inspector Resources Not Available.** It is always preferred to have a monitor at each event, although in rare circumstances it may not be possible. The Director, Flight Operations Division and the IIC should consider the following as part of their decision making and risk assessing process:

- What is the size of the event? Length, number of air show acts and static display, number of spectators
- Has there been a history of problems with the management of the event?

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

### 11.2.1.7. APPLICATION FOR A CERTIFICATE OF WAIVER OR AUTHORIZATION.

**A. Application for a Certificate of Waiver or Authorization.** An Inspector who reviews relevant information about the proposed operation, site suitability, and processes authorization and waiver applications for aviation events should use the guidance found in Volume 4, Chapter 2, Section 2.

**NOTE:** Inspectors and applicants should review the Application Processing Flowchart for an Airshow in Figure 11.2.1.1.



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- 1) Submit applications for authorizations and waivers for air shows or air races at least 90 days before the date of the event. Only after the event organizer has met all requirements, approval or denial of the application should be completed within 30 days of receipt by the GACA.
- 2) Submit applications for authorizations for parachute jumps made over or into a congested area or open-air assembly of people at least 10 working days before an event. Completion of an application's approval or denial must be done within 5 working days of receipt by the GACA.
- 3) Temporary Flight Restrictions (TFR) are requested in accordance with GACAR § 91.149. TFRs should be requested about the same time the application for event authorization is made and will be processed in accordance with the procedures established in subparagraph 11.2.1.7E4).
- 4) The completion and submission of the application and all supporting documents are solely the applicant's responsibility.
- 5) The applicant must attach current maps, charts, diagrams, or other data appropriate to the activities and locations to the application(s) for an aviation event or authorization for a parachute jump.
- 6) For most events, the supporting data must address the following major areas:
  - a) Diagrams and descriptions of spectator areas which restrict the public from:
    - The flight areas
    - The active runways
    - The taxi and run-up areas
    - Other active areas, such as emergency or police helipads, parachute landing areas, pyrotechnic areas, etc.
  - b) Supporting documents should describe the methods that are used to ensure security of areas outside of the designated spectator area, especially the area under the aerobatic



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maneuvering area.

7) Except for official military pilots, each pilot flying a civil aircraft must have the proper certification and rating for the aircraft to be flown. In addition, each civilian pilot who performs aerobatics must possess a Statement of Aerobatic Competency (see subparagraph 11.2.1.9A), including foreign civil airmen.

a) Non-airmen participants, such as parachutists, can be accepted on the basis of a credential issued by organizations with qualifications acceptable to the GACA. The GACA does not require certification of operators of ultralight vehicles, wing walkers or trapeze occupants, ribbon-cut personnel, drivers of ground vehicles for a car-to-plane transfer, and other non-airmen participants.

b) Except for official military aircraft, each aircraft flown in an aerial demonstration must be properly certificated and have documentation in accordance with the procedures established in subparagraph 11.2.1.9F indicating current inspections, Airworthiness Directives (AD) and time limitations are appropriate for the aircraft to be in an airworthy condition.

**B. Assisting the Event Organizer with the Application.** Federal Aviation Administration (FAA) Advisory Circular (AC) 91-45 (as amended), Waivers: Aviation Events, and FAA AC 105-2 (as amended), Sport Parachute Jumping, provide most information necessary to plan and conduct a safe event.

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

- Type of event
- Effects of air show on adjacent communities and facilities

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

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

**C. Completion of the Application.** If the event cannot take place in compliance with the regulations, a waiver is required. If parachuting will be conducted over a congested area or into an open-air assembly of persons, an authorization is required. The application for a waiver or authorization (see Volume 4, Chapter 2, Section 2) is the proper process that should be submitted by an applicant to the GACA. See section 11.2.1 35 for assistance in completing the application for waiver or authorization.

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

- 1) Inspectors should encourage event organizers to apply for a temporary practice area for

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an associated air show as part of that air show authorization request, if one is desired. This should provide participating performers with a convenient and safe area in which to practice their aerobatic performances.

- 2) Although this may be a separate waiver, which becomes effective as much as 7 days immediately before the event, it should terminate on or before the same date and time as the event authorization/waiver.
- 3) The actual air show site may be suitable as a temporary practice area if it is a controlled environment and there will be no conflict with other nonparticipating aircraft. The effective times must be thoroughly coordinated with the pertinent ATS units before approval and issuance of the authorization/waiver.
- 4) The temporary practice area should be established no more than 30 or 45 kilometers from the actual air show site.
- 5) The responsibility for site selection, coordination, approvals, application, and oversight of the temporary aerobatic practice area rests solely with the air show event organizer.

### **E. Coordination Requirements.**

- 1) *Air Traffic Service (ATS) Coordination.* Any request for an authorization for an aviation event or fly-over not as part of an aviation event requires coordination with the appropriate ATS unit. Any special conditions considered necessary by ATS should be made a part of the certificate of waiver in the special provisions.
- 2) *Special UHF/VHF Frequency Requests.* Requests for special ultrahigh frequency (UHF)/very high frequency (VHF) frequencies for air show usage should be made by the sponsor or responsible person to the ATS unit having jurisdiction over the airspace where the air show will take place.
- 3) *Aerodromes.* Any event organizer who requests an authorization for a special aviation event on an aerodrome certificated in accordance with GACAR Part 139 must coordinate with the Aerodrome Manager and receive approval for the event ground operations plan from the Director, Aerodrome Safety Division before issuance of the Certificate of Waiver.
  - a) Encouraging event organizers to include aerodrome management in the coordination

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will greatly facilitate the process. The ground operations plan includes the necessary changes that must be addressed for security. The respective Aerodrome Manager is responsible for ensuring any necessary changes to the security plan are coordinated with the GACA security before approval. The Aerodrome Manager's approval of the ground operations plan is generally separate and distinct from the review and approval of the overall air show layout (primary spectator area, show line(s), takeoff/landing runway, etc.) that is the responsibility of the GACA.

b) Any limitations or special provisions considered necessary by the respective Aerodrome Manager should be made a part of the certificate of authorization/waiver.

4) *Temporary Flight Restriction (TFR)*. A TFR is an area designated to enhance the protection of persons and property on the surface or in the air, to maintain air safety and efficiency, or to prevent the unsafe congestion of aircraft in the vicinity of an aviation event. The responsible person or air boss must request a TFR, not GACA personnel. The procedures for requesting a TFR can be found in GACAR § 91.149.

a) Aerial demonstrations contained entirely within a Class B, C, or D airspace area should not request the issuance of a TFR under GACAR § 91.149.

b) Requirements for issuance of a TFR NOTAM in accordance with GACAR § 91.149:

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

c) When issued, a TFR should reflect the dates, times, and lateral and vertical limits of the air show display area for the aerial demonstration for which a certificate of authorization has been issued.

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

- The controlling ATS unit or air boss (if authorized by ATS) grants approval
- The air boss has coordinated the procedure with the IIC
- The TFR NOTAM specifies the frequency to contact ATS for approval

2. Cancellation of an aviation event and TFR NOTAM must be coordinated. The responsible person or air boss must coordinate cancellation with the controlling ATS unit and the IIC. The procedures can be either pre-coordinated or established at the time of cancellation.

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

6) *Waiver of GACAR § 91.165 Requirements for VFR*.

a) GACAR § 91.165 authorizing operations “clear of clouds” is waived under the following circumstances:

1. Aerial demonstrations are conducted entirely within Class C or D airspace where ATS communication is maintained (Class B is normally clear of clouds); or
2. Aerial demonstrations that are conducted within the boundaries of a TFR issued for that event and ATS communication is maintained.

b) Aerial demonstrations conducted at night must comply with all of GACAR § 91.165.

### **11.2.1.9. PARTICIPANT AND AIRCRAFT ELIGIBILITY.**

#### **A. Aerobatic Competency Documentation.**

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1) All civil pilots who perform aerobatic maneuvers in any aircraft where the pitch angle or bank angle exceeds 90 degrees must possess a valid statement of aerobatic competency acceptable to the GACA. This can be issued by another national aviation authority.

2) All civil pilots who perform maneuvers in excess of 60 degrees but not more than 90 degrees of pitch, and/or more than 75 degrees but not more than 90 degrees of bank that do not meet the requirements in subparagraph A1), must have a logbook endorsement or a competency letter issued within the past 24 calendar-months after complying with the following:

a) Have successfully completed a flight and ground review by an Inspector (Operations), by the International Council of Airshows (ICAS), or by an Experimental Aircraft Association (EAA) aerobatic competency examiner possessing GACA authorization to administer this test in that particular airplane or rotorcraft.

b) The endorsement or letter states that the pilot may fly maneuvers up to 90 degrees of pitch and/or 90 degrees of bank in reference to the horizon (see Figure 11.2.1.22). The endorsement is limited to the altitude demonstrated but not less than 200 feet (61 meters) AGL. The testing standards for this endorsement are as follows:

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

2. For 90 degrees of pitch up, the applicant must demonstrate a pitch up to 90 degrees from the horizon starting at the lowest altitude authorized; but never less than 200 feet (60 meters) AGL. This pitch up should terminate at a predetermined airspeed or altitude as determined by the examiner.

3. For a 90 degrees of pitch down, the applicant must demonstrate a pitch down to 90 degrees and recover at a predetermined altitude; but never lower than 200 feet (60 meters) AGL.

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

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

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pass.

b. Realign 180 degrees for the next pass.

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

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

6. The applicant may only be endorsed for the altitude demonstrated but not less than 200 feet (60 meters) AGL

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

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

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

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

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

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

c) A qualified person who is required to operate aircraft systems during normal or



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emergency conditions in flight.

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

- 2) Each pilot must be current and have the proper qualifications for the specific make and model of a civil aircraft.
- 3) Each pilot must hold a statement of aerobatic competency or aerobatic endorsement when occupying a seat of an aircraft with functional dual controls for all three axes in which aerobatic flight is conducted.
- 4) Each pilot-in-command (PIC) must hold a non-aerobatic formation credential when occupying a seat of an aircraft that has functional dual controls for all three axes when in a formation flight and aerobatic flight is not conducted.

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

- 1) Have a safety briefing including ingress and egress from the aerobatic box.
- 2) Wear high visibility clothing that will easily identify them as essential personnel when in the box.
- 3) Official photographers may not exceed the number agreed upon by the responsible person and the IIC to be in the specified areas at one time.

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

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

- 1) The members of the aerobatic team must have performed together in 10 aerobatic performances over the preceding 12 months.



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2) When the team members have flown less than 10 aerobatic performances in the past 12 months, the team must be able to document 30 aerobatic practice sessions or combination of 30 practice sessions and air show performances as a team over the preceding 12 months in the performing aircraft type.

3) All persons conducting formation aerobatics must have demonstrated or substantiated their skills and have the formation aerobatics notation placed on their statement of aerobatic competency.

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

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

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

**F. Aircraft Eligibility.** To be eligible to participate in an aviation event, an aircraft must be in an airworthy condition. The aviation event's named responsible person is responsible for ensuring that the participating aircraft have the required documentation to show the aircraft is in airworthy condition. To ensure that the aircraft participating in an aviation event are airworthy, an IIC or his representative should examine the general condition of the aircraft and required aircraft documents, and determine if the aircraft has met the specified inspections.

**11.2.1.11. AIR SHOW AIRSPACE REQUIREMENTS.** The Certificate of Authorization issued to an event organizer specifies a geographic area, both lateral and vertical, where air show demonstrations are authorized. This area could be quite large (e.g., 10 nautical mile (NM) (18.5km) radius of an aerodrome from the surface up to 18,000 feet (5,485 meters) mean sea level (MSL), or rather small (e.g., 2 NM (3.2km) radius up to 3,000 feet (915 meters) MSL), depending on the type of air show demonstration planned. In determining where aerobatics may be performed within the

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geographic area specified in the waiver, the event organizer selects a site that should accommodate all the specific types of air show demonstrations without detracting from safety or creating a hazard to any non-participants or spectators. It is imperative that all areas adjacent to the air show site containing homes, factories, major highways, traveled thoroughfares, or any occupied vessel, vehicle, or structure be carefully evaluated before making a final decision for site selection. You must identify the following applicable items for an air show:

- Air show demonstration area
- Show lines
- Flying Display Area
- 500 feet (150 meters) corner markers
- Restrictions to ingress/egress routes (noise sensitive areas, obstructions, etc.)
- Designated spectator areas

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

**A. Show Lines.** For aerobatic and other flight demonstrations, an aerobatic box and show lines must be established at prescribed minimum distances from the designated spectator areas. The appropriate performers must be able to easily identify these lines. See Table 11.2.1.2, Minimum Show Line Distance From Spectator Areas, Congested Areas and Occupied Buildings by Aircraft Category, for further guidance.

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

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

- 1) Establish show lines prior to establishing the spectator area. If possible, the distance from a crowd line to the closest shoulder of an active runway should be at least 500 feet

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(150 meters). This should allow demonstration teams to make formation takeoffs, performers to use the entire runway for ribbon cuts, etc. It is permissible to use a crowd line that is 500 feet (150 meters) from the centerline of the runway in use but requires Category I airplanes to make single ship centerline takeoffs and Category III airplane aerobatics to remain beyond the centerline, not allowing them to use the centerline for alignment during their performances.

- 2) Use prominent features such as runway shoulders or centerlines, tree lines, parked vehicles, boats for events over water or other geographical features to establish the show lines.
- 3) Prescribed minimums may not be altered to accommodate obstacles that are hazards to performers (antennas, windsocks, tall trees, hangars, etc.).
- 4) All show lines must be clearly discernible, to ensure that pilots have adequate visual references throughout their performance.
- 5) Show lines for events held at night must be lighted in a manner that ensures the lines are clearly visible and identifiable by the participating pilots.
- 6) For military demonstration teams, both the Category I and Category III show lines must be discernible at least 2 miles (3 km) from show center at an altitude of 200 feet (60 meters); the Category I show line should be clearly visible from the highest altitude required by the applicable team.
- 7) Any turbine engine powered airplane for which bona fide performance data acceptable to the GACA is not available should be required to perform on the Category I show line.

**D. Category I Show Lines.** The minimum distance from the spectator area to the show line for Category I aircraft is 1,500 feet (450 meters) or greater (Figures 11.2.1.6 and 11.2.1.7).

- 1) Aerobatic maneuvers for Category I airplanes remain centered on the Category I show line and parallel to the crowd line while in the flying display area. This includes single or multiple airplane maneuvers (Figure 11.2.1.8).
- 2) If the only well-defined show line is closer than 1,500 feet (450 meters) to a spectator area and if it is not possible to move the spectator area, the distance between the Category I

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show line and the primary spectator area may be reduced from 1,500 feet (450 meters) to a minimum of 1,200 feet (365 meters). This reduction is authorized solely in the interest of flight safety because a well-defined show line is essential for pilot orientation. Place all artificial show lines at 1,500 feet (450 meters).

- 3) When there is a reduction in the distance from the show line to the primary spectator area, a similar reduction must not be permitted for the secondary spectator area side of the show.
- 4) In no case shall there be less than 2,700 feet (820 meters) between the primary and the secondary spectator areas.
- 5) The reduction should be determined by first considering the secondary spectator area side of the show line.

**E. Category II Show Lines.** The minimum distance from the spectator area to the show line for Category II aircraft is 1,000 feet (300 meters) or greater. (Figure 11.2.1.9)

- 1) Aerobatic maneuvers for Category II airplanes remain no closer than the Category II show line and parallel to the crowd line while in the flying display area unless the aerobatic box is large enough to contain any aerobatic maneuver. This includes single or multiple airplane maneuvers (Figure 11.2.1.10).
- 2) If the only well-defined show line is closer than 1,000 feet (300 meters) to a spectator area and if it is not possible to move the spectator area, the distance between the Category II show line and the primary spectator area may be reduced from 1,000 feet (300 meters) to a minimum of 800 feet (240 meters). This reduction is authorized solely in the interest of flight safety because a well-defined show line is essential for pilot orientation.
- 3) When there is a reduction in the distance from the show line to the primary spectator area, a similar reduction shall not be permitted for the secondary spectator area side of the show line.
- 4) In no case should there be less than 1,800 feet (550 meters) between the primary and the secondary spectator areas.
- 5) Determine the reduction by first considering the secondary spectator area side of the

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show line.

### **F. Category III Show Lines.**

1) The Category III show line should not be closer than 500 feet (150 meters) from the primary or secondary spectator areas.

a) If there is less than 1,000 feet (300 meters) between the primary and any secondary spectator areas, the site cannot be considered for an air show authorization.

b) The width of the flying display area:

1. If there are less than 1,000 feet (300 meters) between the primary and any secondary spectator areas, the site cannot be considered for an air show authorization. The width of the aerobatic box must be large enough to contain the aircraft maneuvers and still ensure the safety distances for the spectators. When the flying display is only 1,000 feet (300 meters) between the spectator areas, a single aircraft must fly centered on the 500 feet (150 meters) show line when in the display area. No lateral or turning maneuvers are performed in that area and the aircraft must fly past the spectator areas and make a non-aerobatic turn to re-enter the aerobatic display area (Figure 11.2.1.11).

2. For multi-aircraft demonstrations, the flying display area must be wide enough to contain all maneuvers and/or all aircraft where no aircraft or maneuver is closer than 500 feet (150 meters) from a spectator area (Figures 11.2.1.13 and 11.2.1.14).

3. For single aircraft performing lateral and/or turning maneuvers, the flying display area must be wide enough to contain all maneuvers where the aircraft or maneuver is closer than 500 feet (150 meters) from a spectator area (Figure 11.2.1.12).

2) The 500-foot (150 meters) show line may also be used for flybys. In this case, clearly delineate the Category III show line for high performance aircraft.

3) For flybys and ingress/egress routes, place corner markers on the ground to clearly identify the 500-foot (150 meters) lateral separation from the primary spectator area and that marker must be visible from 500 feet (150 meters) above ground level (AGL) at 200 knots

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(Figure 11.2.1.18).

### **G. Takeoff and Landing Distances from Spectators.**

1) As listed in Table 11.2.1.3, an aircraft's performance characteristics should determine the minimum distance required between the spectator area and the takeoff/landing surface. The guidance pertaining to aircraft operations applies to all aircraft operating at an aviation event while the authorization/waiver is in effect. These same safety distances are recommended to be applied starting when spectators are allowed into the show site until all spectators have left the show site.

2) *Takeoffs and Landings—Aerobatic Maneuvers Conducted.* When the takeoff runway is separated from the primary or secondary spectator areas by less than 500 feet (150 meters) for Category III, 1,000 feet (300 meters) for Category II, and 1,500 feet (450 meters) for Category I aircraft:

- a) Aerobatics are not permitted over spectator areas or congested areas.
- b) An aerobatic maneuver may be performed after takeoff when the aircraft has turned away from the spectator area and crossed the appropriate show line. (See Figures 11.2.1.14 and 11.2.1.15 for Category III aircraft example.)

3) *Rotorcraft Operations.* As listed in Table 11.2.1.3, all rotorcraft must take off and land at a minimum distance of 500 feet (150 meters) from the spectator area during an aviation event and rotorcraft should not pass over spectator areas at any time, except as provided in subparagraphs 11.2.1.13H and 11.2.1.13I below, during the departure and arrival. Rotorcraft must start up and shut down at a minimum distance of 200 feet (60 meters) from the crowd and hover taxi in ground effect or ground taxi at a maximum ground speed of 20 knots ground speed between the takeoff/landing areas and the startup/shutdown area.

4) *Aircraft Towing.* Conduct glider, hang glider, and para-glider towing (airplane/automobile) at a minimum distance of 200 feet (60 meters) from the crowd.

### **H. Flight over Primary Spectator Area.**

1) *Civilian and Military Aircraft.* Flight over the primary spectator area is permitted when at or above 1,000 feet (300 meters) above the spectators.

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2) *Military Jet Demonstration Teams*. When authorized by the GACA, military demonstration teams are permitted to fly at a minimum altitude of 500 feet (150 meters) over the primary spectator area if:

- a) Flight is non-maneuvering and straight and level or wings level in a normal climb.
- b) The direction of flight is in one direction only—back to front or front to back.

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

- 1) Minimum altitude must be no lower than 500 feet (150 meters) above the spectators; and,
- 2) Until the aircraft reaches an altitude of 500 feet (150 meters), flight will be non-maneuvering and wings level in a normal climb.

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

- 1) No abrupt maneuvers between the corner markers may be performed along the 500 feet (150 meters) show line by Category I or II airplanes.
- 2) Conduct a flyby along show lines at a minimum horizontal distance of not less than 500 feet (150 meters) from primary spectator areas, secondary spectator areas, congested areas, or occupied buildings; and in accordance with the following conditions:
  - a) By Category I or II airplanes—no lower than 100 feet (30 meters) AGL when less than 1,000 feet (300 meters) from a designated spectator area, unless the pilot possesses a current surface level SAC card for the make and model of airplane being flown.
  - b) By all airplanes—using a bank angle of no more than 75 degrees, a pitch angle of no more than 60 degrees, and a maximum indicated airspeed of no more than 300 knots, regardless of the show line category.
  - c) By formation flights, no lower than 200 feet (60 meters) AGL, using a bank angle of



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no more than 60 degrees, a pitch angle of no more than 45 degrees and a maximum indicated airspeed of no more than 250 knots, regardless of the show line category.

3) Corner markers must be highly visible landmarks or contrasting markers easily visible from 200 feet (60 meters) AGL at 200 KIAS that identify the crowd line 500-foot (150 meter) lateral separation (corner) points left and right of the primary spectator area (see Figure 11.2.1.18).

**NOTE:** Per GACAR § 91.65(e), if the minimum safe airspeed for any particular operation is greater than the maximum speed required by GACAR § 91.65(a thru d), the aircraft may be operated at that speed.

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

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

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

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

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

b) High energy maneuvers such as minimum radius turns (maximum of 90 degrees of bank) by single aircraft on the appropriate show line for the aircraft category in accordance with the following (see Figure 11.2.1.19):

1. Category III aircraft - maximum altitude of 250 feet (75 meters).

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2. Category II aircraft - maximum altitude of 300 feet (90 meters).

3. Category I aircraft - maximum altitude of 500 feet (150 meters).

c) Non-aerobatic maneuvers by a single aircraft with an energy vector directed towards the primary spectator area, provided the aircraft remains beyond the appropriate reference line for their show line category ( i.e., 500 feet (150 meters) for Category III; 1,000 feet (300 meters) for Category II, 1,500 feet (450 meters) for Category I) (see Figure 11.2.1.17).

d) Flight over the spectator areas in accordance with subparagraphs 11.2.1.13H and 11.2.1.13I.

e) Repositioning turns in accordance with subparagraph 11.2.1.13L.

3) *Permitted Maneuver - Approval Required.* The following maneuvers are prohibited unless approved in accordance with paragraph 11.2.1.17, GACA Maneuver Packages Approval Process:

a) Aerobatic maneuvers which direct an energy vector toward the primary spectator at any point, other than those described in subparagraph 11.2.1.13L1), which are prohibited.

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

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

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

2. For multiple aircraft.

### **L. Repositioning Turns.**

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

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appropriate category aircraft show line as follows:

a) Civilian performers.

1. Holders of a statement of aerobatic competency card and flying Category III or Category I and Category II ex-military fighters are permitted to perform repositioning turns using a maximum of 120 degrees of bank and 90 degrees of pitch when above 500 feet (150 meters) AGL and not over designated spectator areas or congested areas.

2. Holders of an endorsement for pitch and bank angles up to 90 degrees are permitted to perform repositioning turns to those limits above 500 feet (150 meters) AGL when not over designated spectator areas or congested areas.

b) Military Jet Demonstration Teams and Single Ship Demonstration Teams.

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

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

3. Inverted flight is not authorized below 1,500 feet (450 meters) AGL and not over congested areas or spectator areas.

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

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

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

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c) The turns are conducted in a manner to ensure the aircraft remains beyond the appropriate distance for their show line category (i.e., 500 feet (150 meters) for Category III; 1,000 feet (300 meters) for Category II, 1,500 feet (450 meters) for Category I).

**M. Night, Civil Twilight, and Airborne Pyrotechnic Demonstrations Special Provisions.**

Aerobatic performers may request special provisions in their authorization/waiver to conduct aerial demonstrations at night (after civil twilight). The demonstrations are typically conducted with pyrotechnic devices attached to the wings. Other demonstrations use numerous landing lights, strobe lights, or smoke. Conduct these demonstrations no lower than 500 feet (150 meters) and no higher than 5,000 feet AGL. Jet aircraft performers may request a higher ceiling requirement. Inspectors can accommodate such requests by ensuring that the following are accomplished:

- The pyrotechnic or light installations are appropriately documented in the aircraft's maintenance records
- The requirements in subparagraph 11.2.1.13, N below are met

**N. Night and Twilight Event Special Provisions.** As appropriate, include the applicable special provisions in addition to the special provisions in paragraph 11.2.1.29 of this section for events conducted after local sunset.

- 1) Confine aerobatic demonstrations at night to 1 NM on either side of the show center along a well-defined, lighted show line.
- 2) Confine aerobatic demonstrations to altitudes above 500 feet (150 meters) AGL and below 5,000 feet AGL after official sunset.
- 3) The minimum weather conditions at night require a cloud base no lower than 2,500 feet (750 meters) and 4800 meter visibility. GACAR § 91.165 should not be waived for any flight conducted between sunset and sunrise.
- 4) Aircraft position lights must be operating from sunset to sunrise except while pyrotechnics on the aircraft are illuminated unless GACAR § 91.173 is waived. Waive GACAR § 91.173 only if the flight is conducted totally within Class B, C, D or TFR airspace.

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

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

- 1) Startup and shutdown areas for rotorcraft should be:
  - a) Located at a minimum distance of 200 feet (60 meters) from the crowd or passenger waiting areas.
  - b) Protected by appropriate barriers and/or crowd control to prevent unauthorized persons from entering these areas.
  - c) Located to prevent the rotorcraft from passing over spectators during takeoff or landing.
- 2) Pilots must receive the performer's briefings by the same briefer unless relief is granted by the IIC for a different briefer to give the briefing due to remoteness of rotorcraft operations in reference to the event (attendance at the performer's briefing is highly recommended).
- 3) Refueling procedures for operations conducted during the event hours must be approved by the IIC.

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

**P. Rotorcraft Demonstrations.**

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1) *Rotorcraft Acts Involving External Load Operations.* Air show acts that are considered Class B, C, or D external-load operations will not be conducted over persons on the surface unless those persons are part of the act and must be conducted in accordance with GACAR Part 133 and the provisions of the waiver. Military rotorcraft need not comply with GACAR Part 133; but must comply with the provisions of the Certificate of Authorization/Waiver.

2) Rotorcraft may perform aerobatic maneuvers no closer than 1,000 feet (300 meters) horizontally from designated spectator areas.

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

4) Rotorcraft may not perform non-aerobatic abrupt maneuvers closer than 500 feet (150 meters) horizontally from a spectator area.

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

**Q. Air Carrier Aircraft Demonstrations.** Flight demonstrations may be conducted at an air show under the provisions of the aviation event authorization by any certificated air carrier with a large aircraft listed on their certificate. When an air carrier operating this large aircraft requests a special provision for an aviation event to conduct a flight demonstration at an air show, the IIC should require the following:

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

2) A waiver provision should be developed with the following limitations and included in the Special Provisions portion of the aviation event authorization/waiver:

- Minimum altitude—200 feet (60 meters) AGL

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- Maximum bank—30 degrees
- Maximum speed—300 knots
- Minimum speed— $V_{ref}$  for the configuration and mass of the aircraft, or as required for the go-around sequence on touch-and-go landings should be permitted only when the carrier has addressed the crew procedures, the runway requirements, and the abort procedure in sufficient detail.

3) Coordination with the air carrier's assigned Inspector is necessary before approval by the IIC.

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

**R. Ultralight Vehicle Demonstrations.** An ultralight vehicle is only a single place vehicle and must meet the applicability of GACAR Part 103 and operate as an ultralight vehicle under GACAR Part 103.

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

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

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



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

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

**T. Wing Walking and Specialty/Trapeze Acts.** Wing walking acts may be approved when the performers have safely demonstrated the act in an aerobatic competency evaluation. GACAR § 91.49 may need to be waived for stunt persons only. All rotorcraft trapeze acts must comply with the applicable requirements of GACAR Part 133 concerning rotorcraft external load combination Class B or D operations. Avoid over-flight of the designated spectator areas for these acts.

**U. Ground-Based Pyrotechnics.** As appropriate, include the pyrotechnics special provisions and checklist (see Figure 11.2.1.24) for events that use ground-based pyrotechnics, if the ground-based pyrotechnics will be installed and/or detonated anywhere on the aerodrome surface.

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

- 1) Motorized and non-motorized gliders fall into the Category III aircraft group. Category III aerobatic box and performance distances apply.
- 2) Unless obstructions are present that would make it unsafe, a taxiway takeoff should be permitted with a minimum distance of 200 feet (60 meters) from the primary spectator area (see Figure 11.2.1.3). This distance may be reduced to 150 feet (45 meters) if the takeoff path is at an angle of at least 10 degrees away from the spectators.
- 3) Landings may be approved on the taxiway used for the takeoff as long as there are no obstructions or adverse wind conditions that would create a hazard to the spectators. If the landing approach requires a low altitude turn over the spectators, landing on a taxiway is not permitted. After landing, the aircraft must come to a full stop at least 50 feet (15 meters) from spectators.

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**W. Agricultural Aircraft Demonstration.** In addition to the applicable air show special provisions, include the appropriate agricultural aircraft special provisions for events that have agricultural aircraft aerobatic demonstrations.

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

1) *All Civil and Military Aircraft.* For flight over congested (built-up) areas adjacent to flying display areas:

a) GACAR § 91.67(a) should not be waived for aerial demonstration purposes. GACAR § 91.67(a) requires that all pilots must always operate an aircraft at an altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface, except when necessary for takeoff or landing; and

b) Aerobatic maneuvers are prohibited.

2) *All Civil and Military Aircraft (Except for Sanctioned Military Demonstration Teams).* For flight over congested (built-up) areas adjacent to the flying display area:

a) Minimum Altitude. At least 1,000 feet (300 meters) above the highest obstacle within a radius of 500 feet (150 meters) from the aircraft.

b) Ingress from Adjacent Congested Areas (Built-up Areas) to Flying Display Area. Aircraft entering a flying display area from over a congested (built-up) area are permitted to leave the minimum altitude specified above in subparagraph “a” above) to complete a smooth transition to the performance altitude on the flight line; however, the angle of descent should not be lower than a normal approach for that aircraft type (i.e., steeper than normal approaches are permitted).

c) Egress from Flying Display Areas to Adjacent Congested (Built-up) Areas. Aircraft exiting a flying display area to a congested (built-up) area should climb at a rate consistent with the safe operation or best pitch attitude for that aircraft type. If extended flight over the built-up area is expected, compliance with the minimum altitude specified above in subparagraph “a” above) is required (see Figure 11.2.1.21).

**Y. Compensation at Air Shows.**

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- 1) To receive any type of compensation (fuel, oil, lodging, rental cars, etc.), for flight activities at an air show, an airman must have a valid commercial pilot certificate. The aircraft must be certificated for operations that allow compensation or hire. Additionally, if passengers or property are carried for compensation or hire, the aircraft must be certificated to allow for those types of operations.
- 2) In accordance with GACAR § 91.421, all experimental aircraft are prohibited from conducting operations for compensation or hire while carrying passengers and/or property operations. Experimental aircraft may be authorized to be operated for compensation or hire without any passengers or property on board.
- 3) IICs should conduct an investigation when they become aware of any performers who may only hold a private pilot certificate and appear to be receiving compensation while performing or giving rides.
- 4) Additionally, all Inspectors conducting surveillance should be vigilant in monitoring activities that involve passenger rides at an aviation event. They should conduct an investigation when they become aware of operations conducted in an aircraft or by a pilot who may be operating contrary to regulations.

### 11.2.1.15. MILITARY PERFORMANCES.

**A. General.** The guidelines in this paragraph apply to military aircraft, military pilots, and parachute teams specifically designated to perform military missions.

- 1) The military aircraft, pilots, and teams must be sanctioned by their respective state military command.
- 2) Single ship military demonstration teams are not exempt from any regulation or policy that is used in issuing an authorization/ waiver unless specifically stated in their GACA-accepted command guidance. Fly these aircraft in accordance with these guidance documents (see paragraph 11.2.1.15C below).
- 3) The GACA does not issue any blanket special approvals, authorizations, waivers, or blanket exemptions that would pertain to all military air show performances. The sanctioned teams normally have maneuver packages that are approved each year and pertain only to the team for whom it was approved.

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- 4) Forward any outside complaints received by the GACA as a result of the aerial demonstration to the designated military representative for disposition.
- 5) Action against any military team or performer for non-compliance should be conducted according to current GACA policy, (see guidance found in Volume 13). When action for non-compliance is contemplated, the IIC must notify the Director, Flight Operations Division prior to taking any action.
- 6) All accidents and incidents must be reported to the Director, Flight Operations Division by the IIC.

**B. Sanctioned Military Jet Demonstration Teams.** This title pertains only to the military aircraft, pilots, and teams sanctioned by their respective country's military commands.

- 1) A sanctioned military jet demonstration team should provide the GACA with a command-approved maneuvers packages for GACA acceptance. See paragraph 11.2.1.17 for the acceptance process.
- 2) These teams normally conduct pre-show meetings with the air show event organizer and the GACA. These meetings must occur in sufficient time before the proposed air show to allow the GACA to approve the proposed maneuvers package. Participation in these meetings is mandatory for the assigned IIC. It is incumbent upon the event organizer to notify the GACA in ample time to send a representative to the meeting. The IIC should notify the Director, Flight Operations Division of the meeting. It is imperative to review site suitability in detail with the event organizer and military jet demonstration team representative at this meeting. This should include, but is not limited to, the placement of the aerobatic box and impact on the nonparticipating public on the surface under this box, review of proposed ingress/egress routes that require GACA approval and any impact on scheduled operations.
- 3) Coordinate any change to a GACA maneuvers package or the addition or removal of a pilot authorized to fly under the prescribed maneuvers package with the IIC as soon as possible. These changes are not authorized until accepted by the GACA.
- 4) Military jet demonstration teams and military Single ship Demonstration teams may conduct an arrival demonstration. This normally consists of several passes for visual familiarity with existing landmarks and maneuvers practice using these landmarks.

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Coordinate details of the arrival demonstration in advance.

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

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

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

a) They are authorized to fly non-aerobatic at 500 feet (150 meters) above obstacles and/or occupied buildings when within 3 NM (5.6 km) of show center.

b) The opposing solos are permitted to descend below 500 feet (150 meters) AGL in the transition area over occupied buildings in a wings level shallow descent to arrive at 200 feet (60 meters) AGL before reaching 1 NM (1.85 km) from show center.

c) On a case-by-case basis, where it is deemed a safe transition to the next maneuver, the IIC should grant a waiver to the sanctioned military jet demonstration teams permitting them to fly as low as 200 feet (60 meters) above the highest obstacle within a 500-foot (150 meter) horizontal radius along specified ingress/egress routes within 3 NM (5.6 km) from show center, provided the following conditions are met:

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

2. The results of a completed onsite survey conducted during the previous 6

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months by a representative of the military demonstration team.

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

4. Depict ingress/egress routes on a 1:24,000 scale map (or its equivalent) indicating the minimum altitudes requested, the 150 meter lateral distance of the end of the primary spectator area, and any other secondary open-air assemblies of persons.

d) Flight is never authorized below 500 feet AGL:

1. Over occupied buildings outside of the transition area.

2. Within 150 meters laterally of open-air assemblies of persons.

3. Aerobatic flight is not permitted outside of the aerobatic box (except as authorized as stated above).

### **C. Sanctioned Military Single Ship Demonstration Teams—Military Single-Ship**

**Demonstrations.** Military single ship demonstration teams are specialized teams that are sanctioned to demonstrate the capabilities of one particular aircraft; (e.g., the USAF A-10, F-15, F-16, and F-22 single ship demonstration teams); the USN F-18 single ship demonstration teams; and Canada's DND single ship demonstration teams. The applicable branch of the military must develop guidance and/or maneuver packages, which define the aerobatic routine to be performed at aviation events (see paragraph 11.2.1.17).

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

### **E. Military Parachuting Demonstration Teams.**

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1) *Sanctioned Military Parachuting Teams.* Sanctioned military parachute demonstration teams are considered to have met the highest level of parachuting competence. The team members need not be listed on an application for a Certificate of Authorization or Certificate of Waiver. The sponsor or responsible person may make the application for a sanctioned team.

2) *Non-Sanctioned Military Parachuting Teams.* Non-sanctioned military teams are not performing any demonstrations for their respective country's military services; therefore, they must meet all the same requirements as any civilian team.

**F. Military Participation.** The respective country's military service may require the event organizer, or a designated representative, to complete a request for their military flight demonstration team to perform in an air show event. An example of such request for a United States military demonstration team can be viewed at website: <http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd2535.pdf> (DD Form 2535, Request for Military Aerial Support). The event organizer or representative must forward the form to the GACA. The event organizer must allow for a 30-day review period. The GACA completes Section IV, GACA Coordination (Airspace Coordination). Classify the proposed site requiring an authorization/waiver as satisfactory, conditional-satisfactory, or unsatisfactory during an Inspector-conducted site feasibility study.

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

1) As a reference, generally the standard aerobatic box for the USN Blue Angels and USAF Thunderbirds is 12,000 feet by 3,000 feet (3,658m by 915m). The Canadian Snowbirds usually request 8,000 feet by 3,000 feet (2,440m by 915m). For a single ship demonstration team, the standard aerobatic box is normally 6,000 feet by 3,000 feet (1,829m by 915m). The support manuals and some maneuvers packages should indicate the size of the required airspace.



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2) Military Flybys (Other than an Aviation Event). Requests for a flyover or flyby at civic events, funerals, etc., are submitted to the GACA for coordination. Other than sanctioned jet demonstration teams, the flybys should be accomplished at 1,000 feet (300 meters) above the highest obstacle within 2,000 feet (600 meters) (horizontal) from the flight path.

a) If no regulations are being waived:

1. No site evaluation is necessary.
2. Contact the ATS facility with jurisdiction for the air space being used for coordination.

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

1. If the speed requested is above those authorized in GACAR § 91.65.
2. If one of the sanctioned military jet demonstration teams is requesting a flyover below 1,000 feet (300 meters) above the highest obstacle 2,000 feet (600 meters) either side of their flight path as required in GACAR § 91.67.
3. If a waiver of GACAR § 91.67 is issued to one of the sanctioned military jet teams, the follow conditions must be met:
  - a. A site suitability must be conducted including ingress and egress routes.
  - b. Flight below 500 feet (150 meters) above the highest obstacle 1,000 feet (300 meters) either side of the intended flight path is not authorized.
  - c. Only shallow turns, climbs and descents are authorized below 1,000 feet (300 meters) AGL.
4. In addition the following coordination requirements must be met:
  - a. Conduct a briefing between the PIC and the Inspector before the flyby.
  - b. Compliance with all other rules of GACAR Part 91 is required.

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### 11.2.1.17. GACA Maneuvers Packages Acceptance Process.

**A. Foreign Military Flight Demonstration Teams.** Foreign sanctioned military flight demonstration teams, single-ship demonstration teams, and mixed military and civilian formation demonstrations who conduct public performances require GACA acceptance of their command-approved maneuvers package or accepted aerial demonstration guidance.

**B. Civilian Performers.** Civilian performers requesting approval for one or more maneuvers described in subparagraph 11.2.1.13K), or relief from one or more requirements listed in this chapter require GACA acceptance and must make an application as follows:

1) The applicant must submit a written application to include (applicants that are applying for relief from a requirement and not an approval of a maneuver need only comply with a) and b) below and send request to the GACA):

- a) A copy of the performers statement of aerobatic competency
- b) A detailed description of the maneuver(s) requiring approval or relief.
- c) A pictorial display (e.g., ribbon drawing) of the maneuver(s) including the sequence in which the maneuver(s) will be flown.
- d) The entry and exit airspeed and altitude for the requested maneuver.
- e) The airspace required to complete the maneuver(s) requiring approval to include lateral, horizontal and vertical distances.
- f) A computation of turn radius, scatter radius and safety radius from the closest points to the primary spectator area of the maneuver(s) needing approval using the formulas listed in subparagraph 11.2.1.21 noting the airspeed, altitude and G forces used in the computations.
- g) An evaluation from an ICAS or an aerobatic competency evaluator acceptable to the GACA verifying the following.

1. The maneuver has been demonstrated.

2. It can be performed competently with regularity.

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3. It has been demonstrated by the applicant to be within the airspace described in 4 above.

4. It does not meet the definition of a Prohibited Maneuver as described in subparagraph 11.2.1.13K1).

2) Upon completion, the aerobatic competency examiner should forward the application and evaluation results to the GACA IIC.

3) Upon receipt, the IIC should review the application and documentation. Within 15 working days of receipt, the IIC should forward the application package with comments to the Director, Flight Operations Division.

4) The Director, Flight Operations Division should notify the IIC and the applicant of the results within 30 days of receiving the application package.

**C. Evaluation Process.** An evaluation is required to assure an equivalent level of safety for spectators in case of an incident involving the aircraft. The Director, Flight Operations Division and the IIC should decide what the appropriate evaluation requires. This should depend on the requested maneuver(s) and completeness of the application. The review may include, but is not limited to, a safety committee of subject matter experts as determined by the GACA.

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

a) Aerobatic maneuvers which direct an energy vector toward the primary spectator at any point, other than those described in subparagraph 11.2.1.13K1), which are prohibited.

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

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

1. For single aircraft that exceed the requirements of subparagraph 11.2.1.13K(2)(b) above.

2. For multiple aircraft.

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2) Below is an outline of GACA acceptance process:

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

1. A complete copy of their maneuvers package must be furnished to the IIC.
2. The maneuvers package (electronic format is required) should consist of profiles that must contain the following:
  - A ribbon pictorial (or equivalent) of all maneuvers in the performance
  - Minimum and maximum operating altitudes
  - Distances from the designated spectator area
  - Relationship of the aircraft to the show line
3. Minimum weather requirements for the performance and profiles for a high and low show if that option is available.
4. The size and dimensions of the following airspace required to conduct the performance: flying display area, aerobatic box, and ingress/egress routes.
5. A proposed date for a private demonstration/review by the IIC.

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

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

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conduct flight demonstrations in the KSA

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

- A team roster, including the address, telephone number, fax number and e-mail address of the point of contact (POC)
- If foreign, a list of the aircraft used in the demonstration and a description of how they intend to conduct flight demonstrations in the KSA
- If requesting an approval for a maneuver not meeting the description in subparagraph 11.2.1.13K2) (acceptable maneuvers) then submit an application in accordance with subparagraph 11.2.1.17B above

d) *Final acceptance of approved maneuvers.* The IIC should coordinate any necessary changes with the applicant. Changes shall also be coordinated with Director, Flight Operations Division.

**11.2.1.19. PARACHUTE DEMONSTRATIONS.** Although many air show activities may require waivers, parachuting or skydiving demonstration jumps do not. As provided in GACAR Part 105, some of these jumps require a Certificate of Authorization.

**A. Parachutists Not Associated with a GACA Recognized Parachute Association.**

Parachutists who are not members of a parachute association recognized by the GACA and who wish to participate in a demonstration or exhibition jump over or into a congested area must present satisfactory evidence of the experience, knowledge, and skill equivalent to that required by a parachuting organization such as the U.S. Parachute Association (USPA). Questions concerning parachute riggers, airworthiness, engineering, and safety questions regarding the jump and landing area should be referred to the IIC.

- 1) If the applicant is unable to provide adequate information about the event or jumper's qualifications, the Inspector may require a demonstration jump (not over a congested area) before issuing an authorization.
- 2) Airborne demonstrations, other than those performed by military parachute

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demonstration teams, must have an approval letter from the GACA containing the conditions for these demonstrations if the equipment, opening altitude and jump experience do not meet the requirements found in this paragraph.

**B. Safety.** GACAR Part 103 states rules designed to protect the general public and other users of the national airspace from sport parachuting activities.

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

**C. Authorization.** GACAR Part 105 includes rules applicable to jumps over or into congested areas or open-air assemblies of persons. Any jump over or into a congested area or into an open-air assembly of persons requires an authorization. GACAR § 105.27(b) lists the information required when applying for an authorization.

- 1) The drift-over provision of GACAR Part 105 permits a jumper to exit an aircraft over areas other than a congested area and, with a fully deployed parachute, drift over a congested area or open-air assembly of persons, and then land in an open area. Under these circumstances, an authorization is not required. However, the drift-over provision does not permit any jump that results in a landing into a congested area or open-air assembly of persons unless the parachutists have obtained an authorization.
- 2) Inspectors (Operations) reviewing applications to jump into congested areas or controlled airspace should look for any indication that these jumps involve special stunts or more participants than permitted by the aircraft type certificate. When in doubt, coordinate with an Inspector (Airworthiness).

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

- 1) Open field and Level I landing areas require currency equivalent to a USPA class C or D license (or equivalent), a minimum of 200 jumps, of which 50 jumps were within the last 12

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months to include 5 jumps within the previous 60 days on the same make and model canopy to be used for the demonstration.

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

3) The GACA recognizes the following criteria as an example of meeting its requirements. USPA issues the PRO rating with an expiration date that coincides with the expiration date of the holder's USPA membership. USPA members are renewed on the basis of continued demonstration of the original certification requirements. USPA original certification requirements are memberships in USPA, a USPA class D license, and the accomplishment of 10 successive jumps into a 10-meter (30 feet) diameter target area in accordance with the following:

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

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

1) *Open Field.*

a) A minimum-sized area that should accommodate a landing area no less than 500,000 square feet (46,450 square meters)(e.g., approximately 750 by 750 feet (215m by 215m), or an area with the sum total that equals or exceeds 500,000 square feet) (46,450 square meters).

b) Allows a jumper to drift over the spectators with sufficient altitude (250 feet) (75 meters) so as to not create a hazard to persons or property on the ground.

c) Should accommodate landing no closer than 100 feet (30 meters) from spectators.



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### 2) *Level I Landing Area.*

- a) An open area that should accommodate a landing area no smaller than 250,000 square feet (23,225 square meters) (e.g., approximately 500 by 500 feet) (150m by 150m).
- b) Permits jumpers to land no closer than 50 feet (15 meters) from the spectators and to pass over the spectators no lower than 250 feet (75 meters), including the canopy and all external paraphernalia.
- c) Many open field athletic areas and aerodrome operational areas constitute Level I landing areas.

### 3) *Level II Landing Area.*

- a) An open area that should accommodate a rectangular, square, oval or round shaped landing area of approximately 5,000 square feet (465 square meters) for no more than four jumpers, with at least 50 feet (15 meters) in width. An additional 800 square feet (75 square meters) (minimum for each additional jumper over four for any jumper landing within 30 seconds of the last of any four jumpers).
- b) Permits jumpers to land no closer than 15 feet (4.5 meters) from the spectators and to pass over the spectators no lower than 50 feet (15 meters) including the canopy and all external paraphernalia.
- c) Soccer pitches with bleachers, walls, or buildings in excess of 50 feet (15 meters) in height on two or more sides above the landing surface, are defined as stadiums and constitute Level II landing areas.

4) Stadium. A Level II landing area smaller than a standard soccer pitch and bounded on two or more sides by bleachers, walls, or buildings in excess of 50 feet (15 meters) high.

### 5) Other Landing Area Considerations.

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

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to avoid creating a hazard to persons and property on the ground), and that has no other safety concerns would likely not require an authorization as required by GACAR Part 105.

b) Any parachute jumping demonstration planned in conjunction with a public aviation event will require a Certificate of Authorization with appropriate special provisions as required by GACAR Part 105 even if the landing area exceeds the maximum dimensions for a Level I area. A parachute jumping demonstration planned in conjunction with a public aviation event is one that takes place any time after the first spectator arrives for the event that day.

### **F. Tandem Jump Demonstrations.**

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

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

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

### **11.2.1.21. AIR RACES.**

**A. Cross-country Air Races.** Cross-country air races are normally proficiency type races and do not require authorizations/waivers other than for altitude and speed at checkpoints along the route. This may require some coordination with the ATS unit that services that airspace. See Volume 11, Chapter 3, Section 1, Issue a Certificate of Waiver for GACAR § 91.67(b) and/or (c) (Minimum Safe Altitudes: General) for assistance and guidance in issuing a waiver for GACAR § 91.67. Airspeed may be waived in accordance with this section similar to military flybys described in subparagraph 11.2.1.15G2.

**B. Closed-course Air Races.** Due to the complexity of the two types of closed-course pylon air racing courses (e.g., Reno type and Red Bull type), all air racing courses must be submitted to

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the GACA for approval before an authorization/ waiver can be issued by the GACA. The formulas found in subparagraphs 11.2.1.21G and H should help the applicant design the racecourse for submission.

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

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

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

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- 1) Determine whether the air race course has prior GACA approval.
- 2) Determine if the participants have the proper qualifications by holding a current air race pilot authorization for the class in which they are participating.
- 3) Obtain statements from the organization regarding the air racing currency of each airman.
- 4) Determine whether the organization has established safety operating rules.
- 5) Inform the Director, Flight Operations Division upon receipt of an air race application.

**D. Air Racing Organizations.** If the GACA determines that an air race organization has a credible program, policies, and procedures for determining air racing pilot competence, that organization may be given authorization to issue race pilot certificates. These organizations are normally referenced by class, such as the following:

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

**E. Typical Racecourses.** A diagram of a typical air race site is shown in Figure 11.2.1.25. A diagram of a typical unlimited racecourse is shown in Figure 11.2.1.26. Two examples of suitable air race site diagrams are shown in Figure 11.2.1.27. The following paragraphs discuss the method of determining the various distances used.

**F. Racecourse Design.** A satisfactory pylon air racecourse design involves the shape of the course and its relationship to the area around the course, especially the spectator areas. Both of these factors depend upon the maximum speed of the racing aircraft and the maximum “g” loading

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(acceleration forces) that the aircraft are expected to encounter when flying the racecourse in a normal manner. The maximum height at which the aircraft are expected to fly during the race is also a factor.

### **G. Racecourse Speeds.**

1) The following are typical speeds for each racing class:

- Formula V: 139 knots
- Sport Biplane: 182 knots
- AT-6/SNJ: 195 knots
- International Formula One: 217 knots
- Sport Class: 260 knots

2) Unlimited and jet classes: 391 knots and higher.

3) As additional classes become active, they may be added to this list with appropriate speeds specified.

4) The maximum “g” loading for a race aircraft flying the course in a normal manner has been set at 3.5 “g’s.” In actual racing, where maneuvering and turbulence is encountered, momentary “g” loadings in excess of this figure can be expected.

5) The speed and “g” loadings permit the calculation of the minimum radius turn that should be permitted in the design of the racecourse. The formula for the turn radius for a given “g” loading and speed is shown below. (Using a value of 3.5 for “g,” the minimum turn radius is shown for each racing class below.)

### **Minimum Turn Radius Formula**

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

$R$  = Minimum turn radius (feet)

$V$  = Aircraft speed in ft/sec or

$V$  = knots  $\times 1.689$

32.2 = Acceleration force of gravity (ft/sec<sup>2</sup>)

$g$  = "g" force in turn

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

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

1) The raceway width may vary from 150 feet to 500 feet (45 m to 150 m) in the various racing classes so that the aircraft may pass one another. The critical requirement is that no racing aircraft is permitted to cross over the show line during the race.

2) The minimum turn radius, the maximum turn angle, and the raceway width define the limits of a satisfactory race course. The race course relationship to the spectator areas or other populated area must also be defined. All racing classes require a distance of 500 feet (150 meters) between the primary spectator area and the show line.

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

a) The theoretical straight-line distance to a point on the ground that the debris may follow (ignoring air resistance) depends upon aircraft speed and altitude. This distance is the scatter distance. A maximum racing altitude of 250 feet (75 meters) is acceptable

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for aircraft weighing in excess of 1,000 lbs (presently, the AT-6/SNJ and the Unlimited Class). A maximum racing altitude of 150 feet (45 meters) is acceptable for aircraft weighing 1,000 lbs. or less (presently the International Formula One, Sport Biplane, and Formula V classes). The scatter distance formula for each racing class is shown below.

**Scatter Distance Formula**

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

$S$  = Scatter distance (feet)

$V$  = Aircraft speed in ft/sec

( $V$  = knots  $\times$  1.689)

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

32.2 = Acceleration of gravity (ft/sec<sup>2</sup>)

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

**Scatter Radius Formula**

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

$S_r$  = Scatter radius (feet)

$R$  = Turn radius (feet)

$S$  = Scatter distance (feet)

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



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define the safety radius.

Safety Radius Formula

**Safety Radius Formula**

$$Sfr = R + 15 \times (Sr - R)$$

$Sfr$  = Safetyradius(feet)

$Sr$  = Scatterradius(feet)

$R$  = Turn radius(feet)

- 4) The critical turn with respect to the safety radius is the turn that enters the portion of the race closest to the spectators. The safety area is constructed as follows:
- Bisect the course change angle for the critical turn;
  - Mark off the minimum turn radius for the class of aircraft racing, as shown in Figure 11.2.1.16, from the pylon position to a point on the angle bisector; and
  - Draw an arc, whose radius is the safety radius, from the point described in subparagraph 11.2.1.21H3)c) above. No spectators can be within this arc (Figure 11.2.1.25).
- 5) In some cases, it may be expedient to design the race course around the spectator area. While spectator area-to-show line distances are unchanged, the safety zone is now outside the spectator area and is no longer a factor. Roads to this kind of a race course layout must be completely closed off to the spectator area during the race.
- 6) Race courses are normally flown in a counterclockwise direction (left turns). Problem sites may require flying the course in a clockwise direction (right turns). Other modifications of the race course, such as changing the angular relationship of the spectator line to move the crowd away from a turn pylon, or lengthening the race course to move the turn pylon away from the crowd, may also be necessary.

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### 11.2.1.23. BALLOON MEETS AND COMPETITIONS.

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

**B. Balloon Operations.** Flight competitions by manned balloons often involve operations at horizontal and vertical distances less than those required by GACAR § 91.67(b) and (c). Operations at these altitudes are necessary to take advantage of varying wind conditions at different altitudes that are the balloonist's only means of directional control. These operations are acceptable when appropriate limitations are developed to ensure public safety and the safety of the participants.

**C. Public Safety.** Ballooning has grown significantly in recent years, and competitive tasks are often refined and standardized. The GACA's concern is that every effort is made to ensure public safety. The intent of GACAR § 91.67 should never be compromised when issuing authorizations/waivers and developing special provisions.

1) Target areas must be under the control of event officials. The use of portable bull horns or public address systems provides an adequate means for crowd control, or for directing balloonists away from the target area in an emergency. Balloon landings are not normally permitted closer than 1,500 feet (450 meters) from the target or goal, although event officials may allow a reduction of this distance to 500 feet (150 meters) for safety considerations. Only balloon recovery ground support crew members and authorized event officials can be present at the landing site.

2) The relatively slow speed of balloons allows spectators to move from harm more easily than at an air show where fast moving aircraft are performing. Accordingly, the designated spectator area can be minimized to a 200-foot (60 meter) radius away from the designated balloon goal/target. The IIC should ensure that the sponsors assure spectators remain clear of the goal/target area during balloon meets or competitions.

**D. Balloon Competition Event Authorizations/Waivers.** To be found eligible for a waiver of GACAR § 91.67(b) and (c), the applicant must prepare and maintain an organized manned balloon competition manual that has been found acceptable by the GACA. The contents of the manual are the basis for issuance of the waiver. The applicant and the participants must comply

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with the balloon manual contents and requirements. No operations can be conducted under a waiver except while in VFR conditions during the period from sunrise to sunset, as specified in GACAR § 91.165.

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

2) A waiver of GACAR § 91.67(b) and (c) for organized balloon competitions can be issued based on submission of an application containing the proposed operations and contents of the organized manned balloon competition manual. (See subparagraph 11.2.1.23E below.)

3) GACAR § 91.67(b) and (c) should be waived only to the extent necessary to accommodate the event while allowing an acceptable level of safety. Evaluation of the site by the IIC determines the actual separation distances for a specific event; however, the following minimum distances and special provisions must be observed.

a) GACAR § 91.67(b) may be waived to allow flight over a congested area at an altitude of no less than 500 feet (150 meters) above the highest obstacle within a 500-foot (150 meter) horizontal radius of the balloon. This section of the regulation may only be waived within a specified maximum distance from designated launch sites and/or target areas. This designated area should be determined by the event organizer and the GACA IIC. This area must also be clearly delineated in the event organizer's manual before the event. (A scaled map, drawing, and/or aerial photographs should be in the event organizer's manual before the event.) The designated area should be the minimum area necessary to accommodate the event, and the area should be consistent with the event organizer's ability to control operations. A waiver of GACAR § 91.67(b) should not be issued if the target area is so small that a normal descent (200 to 300 feet per minute) (61m to 92m per minute) cannot be made.

b) GACAR § 91.67(b) may be waived to allow flight above, but not less than 75 feet (20 meters) from, any open-air assembly of persons (designated spectator area) under the direct control of the event organizer.

c) GACAR § 91.67(c) may be waived to allow flight over open water or sparsely

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populated areas, no closer than 200 feet (60 meters) horizontally to any person, vessel, vehicle, or structure.

**E. Organized Manned Balloon Competition Manual.** The following is a list of the minimum required topics that must be addressed in the competition manual for a balloon event. Other information may also be included (see Figure 11.2.1.28).

1) Responsibilities and Procedures:

- Duties of personnel
- Registration and airworthiness determinations
- Pilot qualifications
- Pilot/crew member briefing responsibilities
- Copy of letter(s) of agreement
- Event flight crew member qualifications, experience, and maximum numbers onboard each balloon for each type of event

2) Ground Operations:

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

3) Flight operations:

- Areas of operations
- Types of operations

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- Altitudes
- Weather requirements
- Communications requirements
- ATS coordination

4) The organized manned balloon competition manual must incorporate GACAR § 91.67(b) and (c) limitations as appropriate to the event in a form and manner acceptable to the GACA and the event organizer. The event organizer should describe in the manual as clearly as possible the manner of operations that are needed to comply with the event authorization/waiver.

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

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

- Flight director (event director)
- Person responsible for establishing and maintaining crowd control
- Event organizers GACA liaison (normally the IIC)
- Persons responsible for obtaining weather data and conducting the pre-event pilot and event flight crew member briefings

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

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**H. Balloon Event Flight Crew Members.** Only pilot and event flight crew members, as described in the organized manned balloon competition manual, may be carried onboard any balloon operating under the authorization/waiver issued to the event organizer.

- 1) Event flight crew members should be restricted to the minimum number required for the type of event as specified in the organized manned balloon competition manual. Event flight crew members should be kept to a minimum for competitive events.
- 2) All event flight crew members must have received appropriate training concerning their duties relative to the event, and must attend the event pilot and flight crew member briefing before each event. These crew members must sign a statement that they were briefed and that they are designated event flight crew members for the purpose of the specific event for which the authorization/waiver was granted.
- 3) The PIC of each balloon is responsible for obtaining the signed statements on a form furnished by the event organizer. The PIC should maintain this form during the event and return it to the event organizer and make it available to the GACA IIC upon request.
- 4) Balloon event flight crew members are differentiated from ground support launch and recovery crew members.

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

**J. Types of Competitive Tasks.** Competitive tasks are exercises in navigation using changes in wind direction. The winner of a task is the balloonist who can best take advantage of changes in wind direction by ascending and descending. Event organizers generally engage launch directors to control staggered launch times and ensure safety for multiple launches. The following are some typical balloon competitive tasks, based on information provided by the BFA. See Figure 11.2.1.28 for detailed descriptions of the tasks.

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- Pilot declared goal
- Judge declared goal
- Multiple judge declared goal
- Elbow
- Hare and hound
- Convergent navigational task
- Fly on task
- Gordon Bennett memorial
- Watership down
- Key grab

### **11.2.1.25. EVENT MANAGEMENT.**

#### **A. Management Organization.**

- 1) The event organizer of a special aviation event may be an individual, a group of individuals, or an organization that may designate a responsible person to act on all matters pertaining to a GACA issued Certificate of Authorization and/or Waiver.
- 2) The responsible person of a special aviation event has the overall responsibility for the conduct of the air show in a safe manner and in accordance with the conditions contained in the authorization and waivers issued for the air show.
- 3) The IIC should work closely with the responsible person to develop normal and emergency plans, briefings, and checklists.

**B. Briefing (See Figure 11.2.1.29).** The importance of the participant briefing to the safe and successful conduct of a special aviation event cannot be overemphasized. At a safety briefing review all aspects of the flying, ground, and emergency procedures of the proposed air show.



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Conduct the briefing in such a way that each of the performers and air show personnel in charge of the air, ground, and emergency operations leaves the briefing with a clear understanding of their responsibilities and procedures to be followed in normal or emergency situations that may occur during the course of the aviation event.

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

- a) Conduct a briefing before the beginning of an aviation event on each day of the event. A night show briefing can be incorporated into this briefing if all parties are present.
- b) Carry out a briefing in an area as free of noise and other distractions as possible, and you must limit attendance to flight crews, appropriate flight crew support staff, parachutists, ground performers such as pyrotechnic teams, public announcers, and other key event personnel as determined by the air boss and/or IIC.
- c) Verify each participant's attendance at a briefing by roll call or otherwise, and a record retained for submission to the IIC, if requested.
- d) Performers who are not briefed are not permitted to participate in the aviation event covered in the briefing.
- e) For team performances, only the team leader is required; however, a delegate may represent the team leader, provided the person is a pilot member of the team.
- f) For an aircraft that is to be launched from a remote airfield, the briefing may be given to the aircraft's pilot by telephone.
- g) The briefing is conducted at a time as close to the performance time as practicable.

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

- a) Key aviation event personnel (to include essential and event organizer personnel) are introduced and the means of communication with them is described.
- b) Weather—the briefing should be given by a meteorologist if one is available, but may be given by a flight specialist or experienced pilot. The briefing need only cover aspects of the weather that are significant to the conduct of the aviation event such as

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the altimeter setting, cloud cover or ceiling, visibility, winds and temperature, density altitude, and other weather data forecast for the period of the event. If a low ceiling program (marginal weather) has been approved, the weather minima and a “low show” program must be briefed. If GACAR § 91.165 (cloud clearance) is waived, this must be briefed.

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

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

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

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

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

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

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- i) Pyrotechnic briefing, in accordance with subparagraph 11.2.1.13U. The pyrotechnic briefing card must be used by the shooter in command (Figure 11.2.1.24).
- j) Identification and location of all participating aircraft equipped with operable ejection seats, jettisoned fuel tanks, or ballistic parachute systems.
- k) Time check—to ensure all participants are using the same time for air show coordination.
- l) The flight operations director or other person responsible for flight operations ensures that each performer understands the applicable special provisions with respect to individual low-level provisions contained in the authorization/ waiver issued for the air show.
- m) Circling the Jumpers- All key personnel involved with circling the jumpers must complete the briefing described in Figure 11.2.1.30.
- n) Any other subjects as necessary.

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

### 11.2.1.27. WEATHER CONDITIONS.

#### A. Day.

- 1) Flight demonstrations should not be conducted unless the ceiling is at least 1,500 feet (450 meters), and the visibility is at least 3 statute miles (4.8 km) at the time of the demonstration.
- 2) Except for GACA approved military performers, aerobatic maneuvers conducted by Category III aircraft during flight demonstrations should not be conducted unless the

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ceiling is at least 1,500 feet (450 meters), and the visibility is at least 3 statute miles (4.8 km) at the time of the demonstration.

3) The GACA IIC may adjust the minimum ceiling and visibility requirements at his discretion, but no less than 1,000 feet (300 meters) and 3 statute miles (4.8 km) if:

a) Except for the GACA approved military performers, aerobatic maneuvers are conducted by Category III aircraft only within an operations area having a diameter of no more than 2 statute miles (3.2 km); and

b) To the surface as a result of the reduced weather conditions.

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

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

6) Flight demonstrations may be conducted “clear of cloud” when the requirements are met to waive cloud clearance requirements in GACAR § 91.165.

**B. Night.** The minimum weather conditions at night require a cloud base no lower than 2,500 feet (750 meters) and 3 statute miles (4.8 km) visibility.

**C. Military.** Military participants must comply with minimum weather requirements established in their command-approved maneuvers package, as approved by the GACA, except when the minimum weather requirements are less restrictive than the policy established in this handbook.

**11.2.1.29. SPECIAL PROVISIONS.** Special provisions are conditions, requirements, or limitations necessary to protect nonparticipating persons, property on the surface, and other users of the airspace. Each authorization/waiver must include special provisions as determined by the GACA.

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

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supersede aircraft airworthiness operating limitations.

**B. Ensuring Safety.** The special provisions ensure that the event can be conducted without an adverse effect on safety. Waivers contain special provisions to ensure an equivalent level of safety with the rules that are waived, thus protecting the nonparticipating public and nonparticipating air traffic.

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

- 1) Special provisions may pertain to associated protective measures and control requirements that may not be specifically covered by the regulations. In addition, it may be necessary to increase one regulatory minimum in order to authorize a safe deviation from another. For example, in order to permit aerobatic flight in Class D airspace, it might be necessary to increase the minimum visibility requirement to 5 NM (9.3 km) or some other appropriate value.
- 2) Type the provisions with as little editorial change as possible onto the Certificate of Authorization/Waiver or on attached pages.

### 11.2.1.31. PREREQUISITES AND COORDINATION REQUIREMENTS.

**A. Prerequisites.** This task requires knowledge of regulatory requirements in GACAR Part 91 and in GACA policies as well as qualification as an Inspector (Operations).

- 1) The Inspector assigned this task is also responsible for the surveillance of the special aviation event (see Volume 12, Chapter 15, Section 8).
- 2) The Inspector assigned this task and the subsequent surveillance should have completed on-the-job training (OJT) and participated in issuing a certificate of authorization/waiver and the surveillance of a previous special aviation event with an Inspector qualified in this task.
- 3) For a special aviation event at which a GACA approved military demonstration team performs, the Inspector should have satisfactorily completed OJT (including participation

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in the feasibility study, the pre-event evaluation meeting, authorization/waiver preparation, and air show surveillance) at an event that includes a military demonstration aerobatic team.

**B. Coordination.** This task requires prior coordination with the appropriate Air Traffic Service (ATS), aerodrome management and the Airworthiness Division.

### 11.2.1.33. REFERENCES, FORMS, AND JOB AIDS.

#### A. References:

- GACAR Part 1, 61, 91, 103, 105, 133 and 139
- FAA AC 91-45 (as amended), Waivers: Aviation Events
- FAA AC 103-7 (as amended), The Ultralight Vehicle
- FAA AC 105-2, Sport Parachute Jumping

#### B. Forms:

- Certificate of Waiver
- Certificate of Authorization
- Statement of Acrobatic Competency
- GACA Activity Report (GAR)

#### C. Job Aids:

- Numerous Figures and Tables

### 11.2.1.35. GENERAL PROCEDURES.

**A. Determine if a Certificate of Authorization or Waiver Is Required.** All special aviation events must be authorized. If the event cannot take place in compliance with the regulations, a waiver is also required. If parachuting will be conducted over a congested area or into an

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open-air assembly of persons, an authorization is required for this activity as well.

- 1) If a waiver or authorization is not required, no further action is required with this task.
- 2) If a waiver or authorization is required, brief the applicant on preparing the application.

**B. GAR.** Open the GAR.

**C. Brief Applicant.**

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

**D. Evaluate Application.** Upon receipt of the application, review it for obvious discrepancies. If discrepancies exist, arrange a meeting with the applicant to resolve the issues to mutual satisfaction. Use the information provided by the applicant to review all pertinent information and supporting documentation for the proposed aviation event.

1) *Name of Organization and Responsible Person.* An organization does not sponsor every air show. An individual may sponsor an event. If the applicant represents an organization, the organization's name should appear. The name of the individual and his position or authority to represent the organization (i.e., the responsible person) should appear below the organization name. A responsible person is one who has demonstrated to the GACA knowledge concerning the terms and provisions of the certificate of waiver for this aviation event. The responsible person will be responsible to the GACA for the safe conduct of the event.

2) *Permanent Mailing Address.* Ensure that the applicant indicates the permanent mailing address of the organization.

3) *Section and Number To Be Waived.* Ensure that the applicant has listed all sections of the regulations to be waived. GACAR § 91.611 may be referenced for a list of rules subject to waiver. Ensure that the applicable rules to be waived are requested. An application for a parachuting operation should state that an authorization is requested in accordance with GACAR Part 105.



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4) *Description of Proposed Operation.* Determine if the applicant has correctly indicated the type of aviation event. It may be sufficient for the applicant to use the terms air show, parachute demonstration jump, or air race to describe the events. However, it would be helpful for the applicant to fill in as detailed a description as possible if the event is an air show or air race. For example, if known, the category of aircraft to be flown should be entered in addition to the make and model.

5) *Area of Operation.* Ensure that the applicant has listed the specific locations and the lateral and vertical limits of the aerial demonstrations. The applicant should describe the air show demonstration area as a rectangular, cubic, or cylindrical cell of airspace; and the aerobatic box as a cube or rectangle bounded by a runway or other definable geographical reference, a lateral point, and up to a particular altitude above ground level. This can be over land or water. Additionally:

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

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

- The location and marking of the show lines
- The locations of the boundaries of the air show demonstration area
- The locations of the boundaries of the flying display area and/or aerobatic box
- The locations and types of corner markers if flybys are anticipated
- The location of the primary spectator area and the types of barriers used, including gates
- The locations of the emergency vehicles and medical facilities

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- The locations of the emergency access surface routes to and from the event site
- The locations of the aircraft movement areas
- The location of the parachuting landing area
- The locations of the static display aircraft parking areas
- The locations of the air show aircraft parking areas
- The locations of the fly-in aircraft parking areas
- The locations of the refueling areas
- The locations of the helipads
- The location of the air show control point
- The locations of the pyrotechnic areas

c) Applicants should note if supplemental information is attached.

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

6) *Beginning Date and Hour and Ending Date and Hour.* Check for a beginning date and time, and an ending date and time for the special aviation event. Also, Inspectors can eliminate the need for the applicant to resubmit applications for an additional authorization/waiver by advising applicants to list alternative dates on the initial application. This avoids confusion and reduces the number of applications that must be submitted by the event organizer.

7) *Aircraft and Pilots.* Check for aircraft make and model, pilot names, certificate numbers and ratings, and full home addresses. A notation stating the show line category must be annotated with each make and model of aircraft. Ensure that parachutist names, license class, and addresses are included. The initial application does not need to list specific

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performers/aircraft. The application may be accepted with a notation in Item 8 that a list will be provided at a later, specified date and time. The list, once submitted, should include all performers and aircraft (civilian and military) and parachute teams (civilian and military). Notations stating the show line category should be annotated for each make and model aircraft. Once the list has been supplied, it may be amended by the responsible person and resubmitted to the IIC for approval. Performers added on the day of the event must show proof of appropriate qualifications that the aircraft is airworthy, and a determination must be made that the performance can be conducted at that show site.

8) *Event Organizer*. Ensure that the applicant has indicated the event organizer (organization or individual) of the special aviation event and the event organizer's address. The event organizer of an air show may be an individual, a group of individuals, or an organization. The event organizer of an air show may appoint a responsible person that has the overall responsibility for the conduct of the air show in a safe manner and in accordance with the conditions contained in the Certificate of Authorization/Waiver issued for the air show. The event organizer may delegate to other persons the authority to organize and control particular aspects of the event. At a small event, one person may be able to coordinate more than one activity, while at a large event; a committee of persons delegated by the appropriate authority may be needed to control an activity.

9) *Policing*. Ensure that the applicant has described provisions for policing the event. The applicant should specify if a written formal plan has been provided to the IIC. This may be accepted with a statement "A crowd control plan will be furnished on [applicant enters a specific date and time]" or "crowd control plan N/R" (if approved by IIC). Although there is no specific requirement for the use of uniformed police or security guards, GACA must coordinate security issues with KSA and the GACA security resources. The need for policing depends upon several factors that must be discussed with the applicant to ensure adequate crowd control. However, it is highly recommended that uniform clothing be worn (high visibility T-shirts, hats, etc.) by individuals performing crowd control or other official duties. Additionally:

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

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b) With respect to crowd control, it is the event organizer's responsibility to ensure that all reasonable efforts are made to confine spectators to the spectator areas, ensure that sterile areas are evacuated and remain sterile, and to present a plan to the IIC in sufficient detail that specifies how this will be accomplished and who is responsible to police the aviation event.

10) *Emergency Facilities*. Ensure that the applicant has indicated all emergency items that will be available at the time and place of the event. Emergency facilities often cause problems for event organizers. As previously noted, the application serves as an all-purpose form and contains items that may or may not be appropriate to emergency facilities. Some applications may be erroneously denied because the boxes for physician, ambulance, and fire truck are left blank. Encourage every air show event organizer to provide emergency medical service even though this service may not be utilized. Many event organizers prefer to have the local fire department's emergency rescue squad, paramedics, or emergency medical technicians at their show rather than a physician.

**NOTE:** For balloon events, consult the guidelines for emergency procedures listed in paragraph 11.2.1.25.

11) *Air Traffic Service*. Ensure that the applicant has described the method of controlling air traffic, to include the arrival and departure of aircraft. Also, ensure the applicant has coordinated with the appropriate GACA ATS unit and has requested a TFR in accordance with GACAR § 91.149, as applicable. The application should indicate whether a TFR has been requested from ATS. This item should also contain a description of a method for controlling air traffic and potential alternative communication methods. Specifically, the applicant should provide at least the following in the application:

- a) Although every aircraft in the event may be equipped with a two-way radio, a visual ground-to-air emergency signal must be provided and described in the application.
- b) If a scheduled operator serves an aerodrome that is the site of an aviation event, arrangements must be made for the arrival and departure of such aircraft. It is usually adequate to schedule a break in the activities to allow for scheduled arrivals and departures. The event organizer should complete prior coordination with the operator and ATS.

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c) Request for a Temporary Flight Restriction (TFR), as authorized under GACAR § 91.149, if applicable. Add a notation if a TFR request has been initiated.

d) List ATS units, frequencies, and contacts.

12) *Schedule of Events*. Ensure that the applicant has listed the dates and times for all events. The GACA must see a proposed schedule of events to finalize its evaluation of the application. The application should contain at least a general description of the types of events and their approximate sequence in the show. The application may be accepted with a notation in Item 16 that a final schedule of events will be provided at a later, specified date and time.

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

b) Any demonstration or act added to the air show schedule requires notification to the GACA and should be submitted at the earliest opportunity (see subparagraph 11.2.1.7C6, item 8). Cancellation of an air show demonstration or act does not require advance notice, unless it has a significant impact on the event (e.g., cancellation of a military demonstration team would require notification, as would the cancellation of the entire event).

13) *Certification*. Ensure that the applicant has signed and dated the application.

**E. Determine if Application Is Complete.**

1) *Application Incomplete or Inaccurate*. If the application is incomplete or inaccurate, return the application to the applicant.

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

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

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- 1) Review, if applicable, previous Certificates of Waiver or Authorization issued for special aviation events or parachuting respectively, at the same location.
- 2) Coordinate the use of controlled airspace with the appropriate ATS unit as soon as possible. Include any limitations or special conditions considered necessary by the ATS as part of the Certificate of Authorization/Waiver.
- 3) Using the list of participating aircraft, verify that GACA Airworthiness documents have been completed.
- 4) Using the list of participating aircraft and Table 11.2.1.2, determine the required show line distance.
- 5) Accompanied by the applicant, conduct an onsite visit to sites used for the first time and to sites unfamiliar to the Inspector.
  - a) Clarify or confirm information submitted with the application.
  - b) Verify the distances and the location of the show and reference lines.
- 6) Verify that a NOTAM has/will be issued and is appropriate.
  - a) A copy of the published or proposed NOTAM should be attached to the authorization/waiver.
  - b) Brief the NOTAM at each pre-show briefing for all participants.

**G. Review Waiver Requests for GACAR § 91.67.** Determine if a waiver of GACAR § 91.67 is appropriate.

- 1) Waive GACAR § 91.67(b) and (c) only if the pilot will still be in compliance with GACAR § 91.67(a).
- 2) Waive GACAR § 91.67(b) and (c) only for non-aerobatic flight, while temporarily exiting or returning to the operating area.
- 3) Waive GACAR § 91.67(c) only if unoccupied structures are involved, or to allow

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participating personnel, vehicles, or vessels to be positioned closer than 500 feet (150 meters) from the performing aircraft.

- 4) Waive GACAR § 91.67(b) and (c) for flight over structures, roads, vehicles, or vessels under the following conditions for GACA recognized military teams:
- a) When the show line is generally aligned with a runway at an active aerodrome.
  - b) When ingress and egress transition of the operating area coincides with established approach or departure paths used for the designated runway.
  - c) When aerobatic flight will not be conducted over any nonparticipating persons.
  - d) When non-aerobatic flight over nonparticipating persons is not closer than 500 feet (150 meters) but may be as low as 200 feet (60 meters) above unoccupied obstacles less than 500 feet (150 meters) laterally from ingress/egress route while flying within 3 NM from the show center.
- 5) Consult with the Manager, Flight Operations Division as necessary.

### **H. Process Application.**

- 1) *Authorization/Waiver Disapproval.* If the entire operation cannot be approved, return the application to the applicant.
- 2) *Authorization/Waiver Approval.* If the entire operation can be approved, complete the Certificate of Waiver and/or Authorization and develop the special provisions.
- 3) *Develop Special Provisions List.* Develop the list of special provisions appropriate to the aviation event using the information submitted with the application and suggested special provisions for air shows contained in Figure 11.2.1.31.

**I. Issue Certificate of Waiver and/or Authorization.** Complete the Certificate or Authorization or Certificate of Waiver. Chapters 13 and 14 of Volume 15 has furthers details on issuing these documents.

- 1) *Distribute the Certificates as follows:*



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- a) Place a copy in the Office file.
- b) Send a copy to all affected ATS units.
- c) Return the signed original to the applicant.

**J. GAR.** Complete the GAR.

**11.2.1.37. ADDITIONAL PROCEDURES FOR MILITARY APPLICANTS.** In addition to the procedures in paragraph 11.2.1.35, conduct the following procedures for military applicants.

**A. Determine if a Feasibility Study is Required.** A feasibility study may be required when an authorization/ waiver is required for a military demonstration at a special aviation event.

**B. Conduct Feasibility Study.**

- 1) If an onsite inspection is required, review the documents submitted with the request for GACA completion of a required military form. The documents that must be submitted by the event organizer are:
  - a) Templates of the proposed maneuvers overlay for the proposed site (the maneuvers package for the current year should be used to evaluate the site);
  - b) A current map for the area, or current aerial photographs of the required airspace for the event, as necessary, to conduct the feasibility study.
- 2) The Inspector should determine the following for an aerial demonstration:
  - a) Whether the operating area is large enough to contain the aerobatic maneuvers;
  - b) Whether proposed egress and ingress routes adversely impact safety; and
  - c) Whether a waiver of GACAR § 91.67(b) and (c) is necessary.
- 3) The Inspector should determine for a military flyby:
  - a) Whether the operating area is appropriate to conduct a flyby at 1,000 feet (300 meters) above the highest obstacle, and 2,000 feet (600 meters) laterally of an

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obstruction;

b) Whether the flyby can be conducted in accordance with GACAR Part 91 without a waiver.

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

**C. Complete GACA Sections of Military Request Forms (if applicable).**

**D. Pre-Event Evaluation Meeting.** Attend the pre-event evaluation meeting. At this meeting, the Inspector should discuss the following:

- Proposed special provisions of the Certificate of Authorization or Waiver
- Provisions of the applicable military forms
- The onsite evaluation
- Conditional-satisfactory requirements
- Safety concerns unique to the site
- Past events, if appropriate
- Review of request for a waiver to GACAR § 91.67(b) or (c) and submitted supporting documents, and
- Proposed egress and ingress routes and requests for flight along those routes below 500 feet (150 meters) AGL that require GACA approval

**11.2.1.39. TASK COMPLETION.** Completion of this task results in one of the following:

- Issuance of a Certificate of Authorization/Waiver (Special Aviation Event)
- Issuance of a Certificate of Authorization (certain parachute jumps or demonstrations)
- Denial of an application for a Certificate of Waiver or Authorization

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**11.2.1.41. FUTURE ACTIVITIES.**

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

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Table 11.2.1.2. Minimum Show Line Distance From Spectator Areas, Congested Areas and Occupied Buildings by Aircraft Category

Minimum Show Line Distance from Spectator Areas, Congested Areas and Occupied Buildings	Aircraft Category or Aircraft Type	Demonstration Maneuvers Authorized
450 meters	Category I Aircraft	Aerobatic maneuvers
300 meters	Category II Aircraft	Aerobatic maneuvers
300 meters	Rotorcraft	Aerobatic maneuvers
150 meters	Category III Aircraft	Aerobatic maneuvers and Flybys
150 meters	Gliders, Hang Gliders, powered paragliders	Aerobatic maneuvers and Flybys
150 meters	Ultra-light vehicles and Weight-shift control aircraft	Aerobatic maneuvers and Flybys
150 meters	Rotorcraft	Non-aerobatic maneuvers
150 meters	Category I Aircraft	Flybys
150 meters	Category II Aircraft	Flybys
150 meters	BD-5J Microjet	Aerobatic maneuvers
30 meters	Powered Parachute Aircraft, Ultralights (paragliders and powered paragliders)	Non-aerobatic maneuvers
<p>The minimum distances in this table are based upon the following criteria:</p> <p>a) For reciprocating engine powered airplanes—true airspeed in straight and level flight at 75 percent power at standard temperature and pressure (15°C/sea level) and maximum certified takeoff mass.</p> <p>b) For turbine engine powered airplanes (does not include the BD-5J Microjet),—85 percent of the maximum continuous powered straight and level flight true airspeed at standard temperature, pressure (15°C/sea level), and maximum certified takeoff mass.</p> <p><b>NOTE:</b> The speeds in paragraphs (a) and (b) above are used for determining assignment to a show line, not the maximum performing speed of the aircraft. See subparagraph 11.2.1.5A10) for Category.</p>		

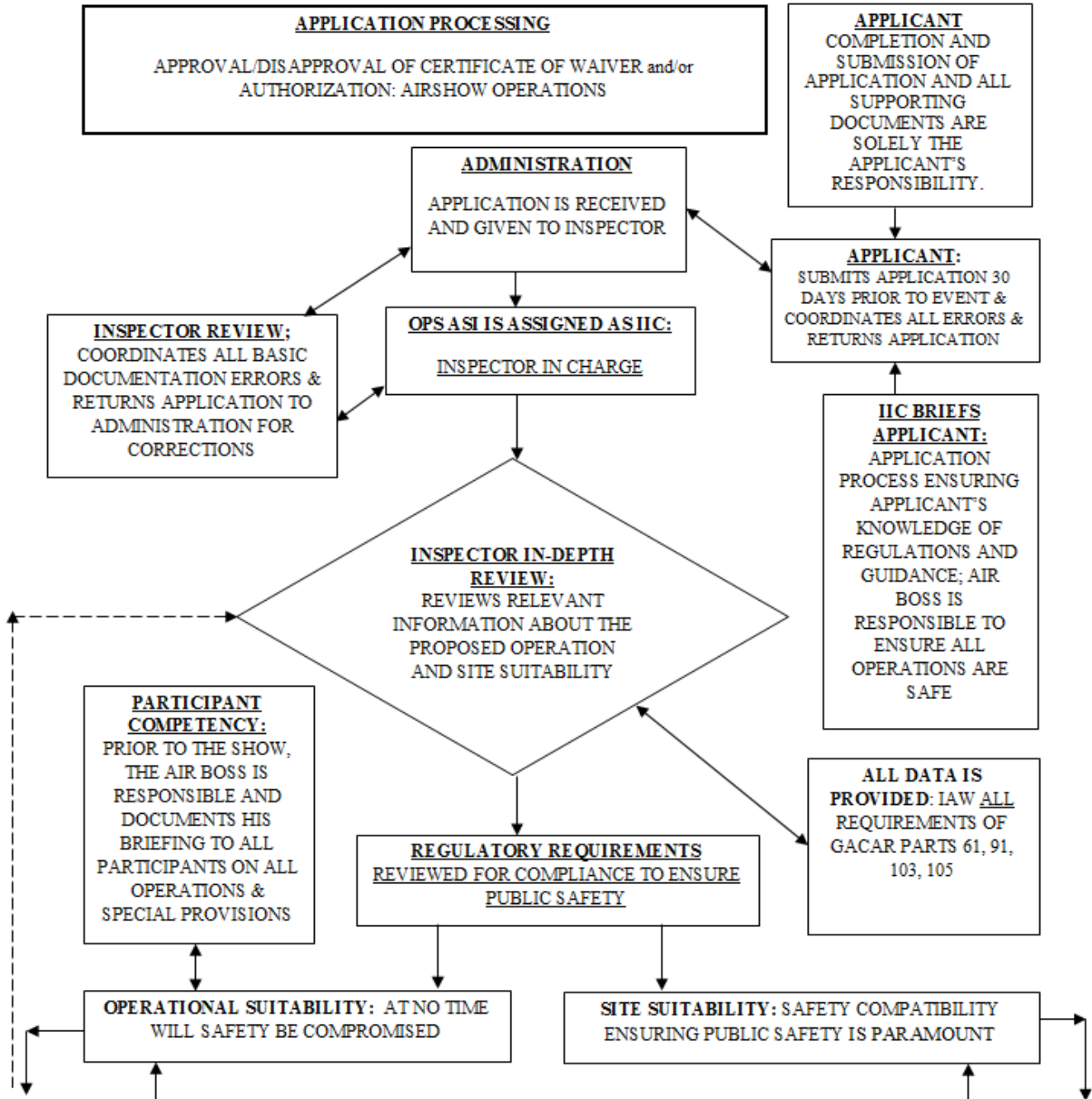
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**Table 11.2.1.3. Minimum Distance between Spectator Areas, Built up Areas or Occupied Buildings and Take off/landing Surface**

<b>Minimum Distance between Spectator Areas, Built-up areas or Occupied Buildings and Take-off/Landing Surface</b>	<b>Aircraft Performance Characteristics</b>
30 meters	Powered Parachute Aircraft
60 meters	(1) Airplanes, gyroplanes, and weight-shift control aircraft with reference speed for final approach ( $V_{ref}$ ) of 60 kts or less and a certificated takeoff mass of 1000 kg (2500 lbs.) or less, including ultralights (airplanes, gyroplanes, and weight-shift control) (See Figure 11.2.1.3)
60 meters	(2) Gliders, powered and unpowered paragliders, and hang gliders (See Figure 11.2.1.3)
60 meters	(3) Helicopters—engine start and shutdown and hover taxi in ground effect (See Figure 11.2.1.19)
90 meters	Airplanes and gyroplanes with $V_{ref}$ of more than 60 kts but less than 100 kts and certificated takeoff mass of 22670 Kg (50,000 lbs.) or less (See Figure 11.2.1.4)
150 meters	(1) Airplanes and gyroplanes with $V_{ref}$ in excess of 100 kts (See Figure 11.2.1.5)
150 meters	(2) Airplanes and gyroplanes with a certificated takeoff mass in excess of 22670 kg (50,000 lbs.) (See Figure 11.2.1.5)
150 meters	(3) Airplanes and rotorcraft conducting excessive, non-aerobatic maneuvers on takeoff or landing (comedy acts) (See Figure 11.2.1.5)
150 meters	(4) Rotorcraft—take-off and landing (See Figure 11.2.1.19)
The minimum distances in this table for:	
a) Formation takeoff/landing operations, should be measured to the closest runway edge.	
b) Single aircraft operations conducted on the centerline may be measured to the runway centerline.	

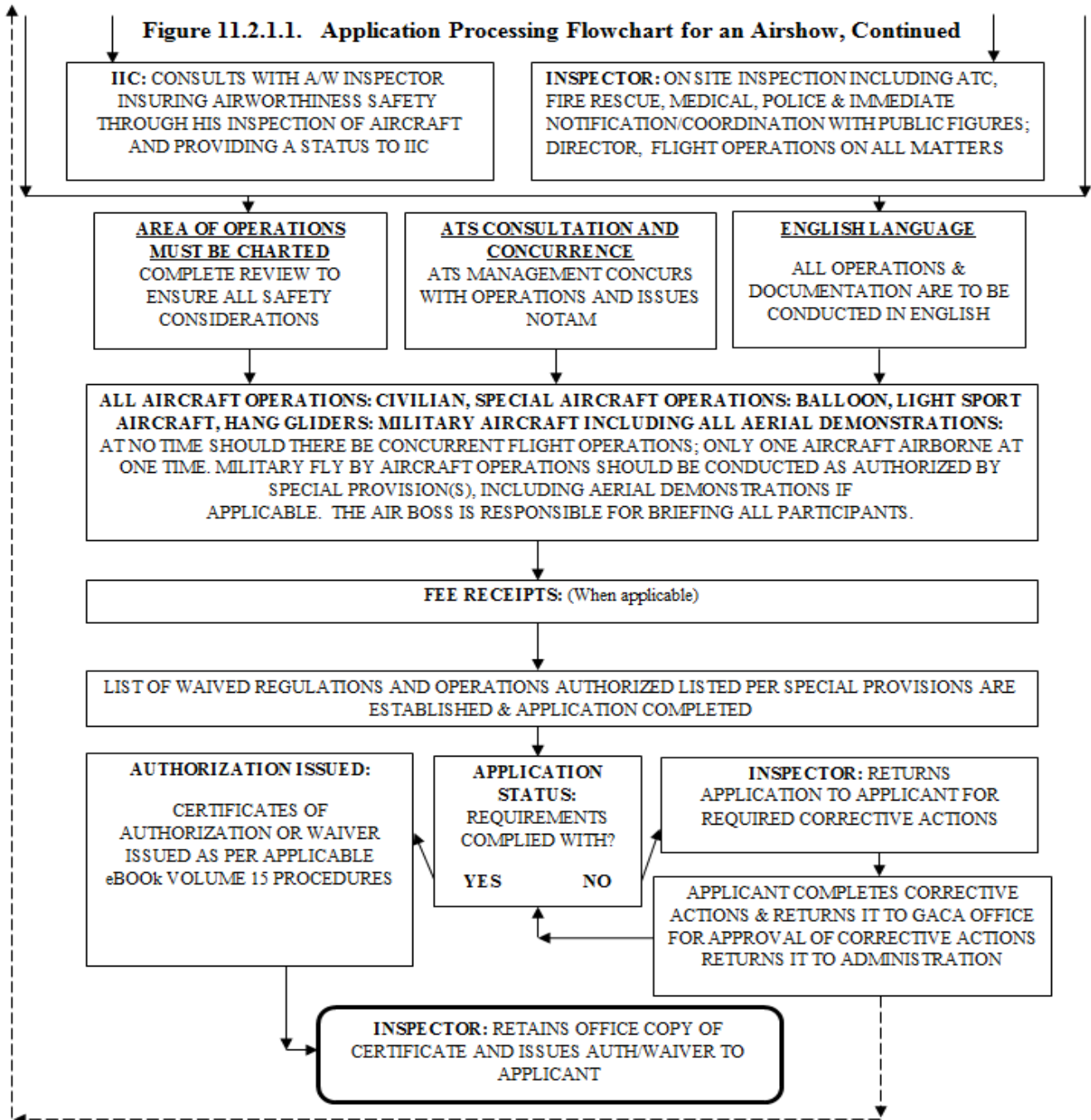
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**Figure 11.2.1.1. Application Processing Flowchart for an Airshow**





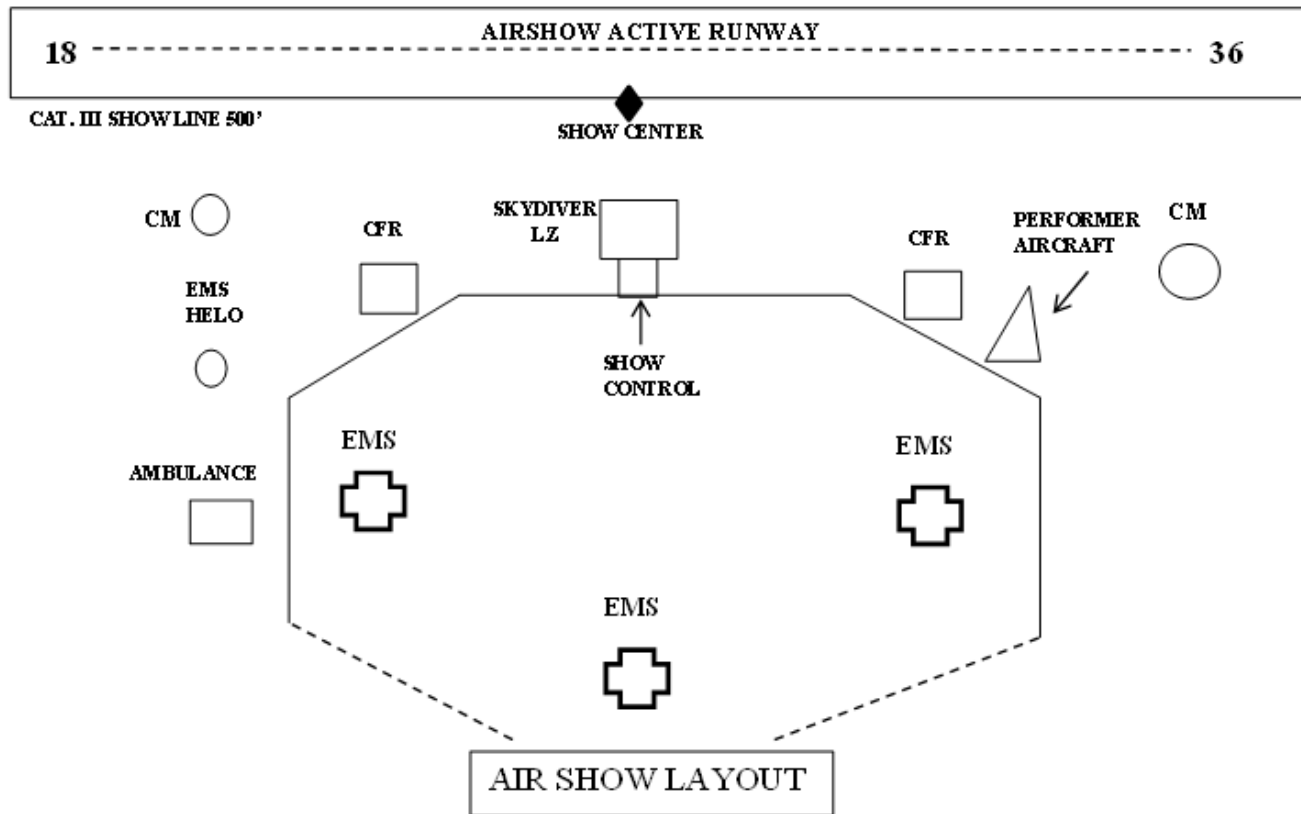
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Figure 11.2.1.2. Example of an Air Show Layout



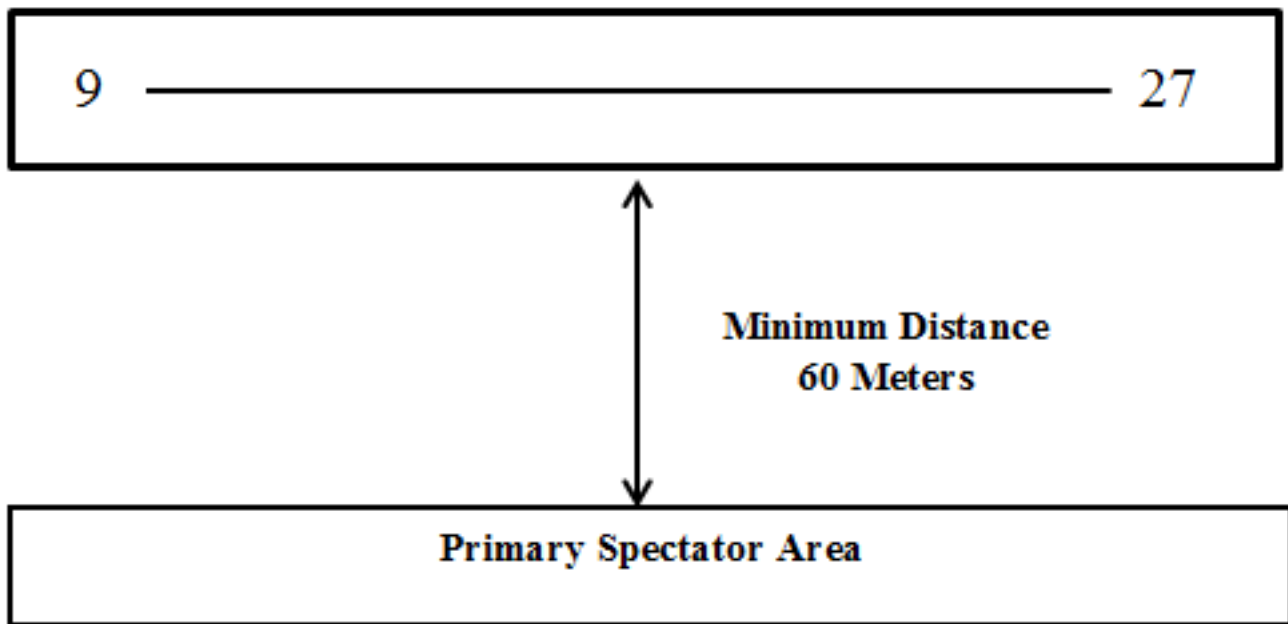
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**Figure 11.2.1.3. Minimum Separation Distance (200 Feet/60 Meters) Between Runway or Takeoff Area and the Primary Spectator Area**

Minimum Separation Distance Between Runway or Take-Off Area and the Primary Spectator Area for airplanes, gyroplanes, and weight-shift control aircraft with a  $V_{ref}$  of 60 kts or less and a maximum certified mass of 1140 kg (2,500 lbs) or less, ultralights (airplanes, gyroplanes, and weight-shift control), gliders, powered and unpowered paragliders and hang gliders.



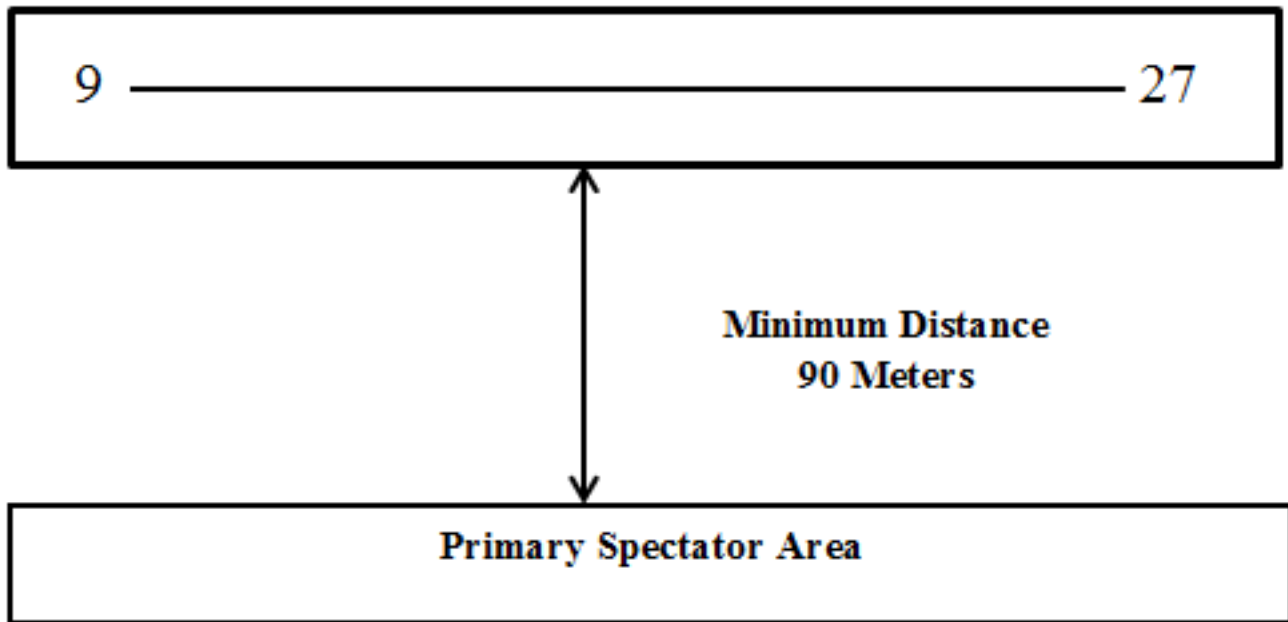
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**Figure 11.2.1.4. Minimum Separation Distance (300 Feet/90 Meters) Between Runway or Takeoff Area and the Primary Spectator Area**

Minimum Separation Distance Between Runway or Take-Off Area and the Primary Spectator Area for Airplanes and Gyroplanes with a Vref of more than 60 kts but less than 100 kts and maximum certificated mass of 22730 kg (50,000 lbs.) or less.



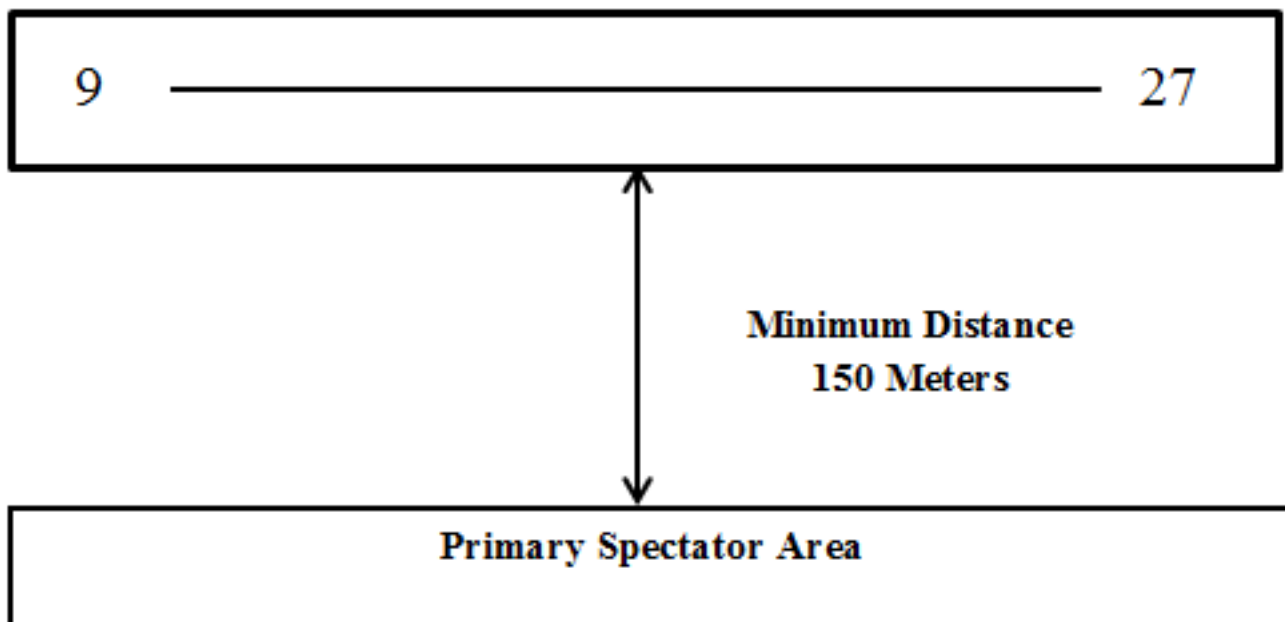
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**Figure 11.2.1.5. Minimum Separation Distance 150 Meters Between Runway or Takeoff Area and the Primary Spectator Area**

Minimum Separation Distance Between Runway or Take-Off Area and the Primary Spectator Area for Airplanes with Vref in excess of 100 kts, Airplanes and Gyroplanes with a maximum certificated mass in excess of 22,730 kg (50,000 lbs.) and Airplanes and Helicopters conducting excessive, non-aerobatic maneuvering on take-off and landing (comedy acts).



**NOTE:** The minimum distances illustrated in this diagram for:

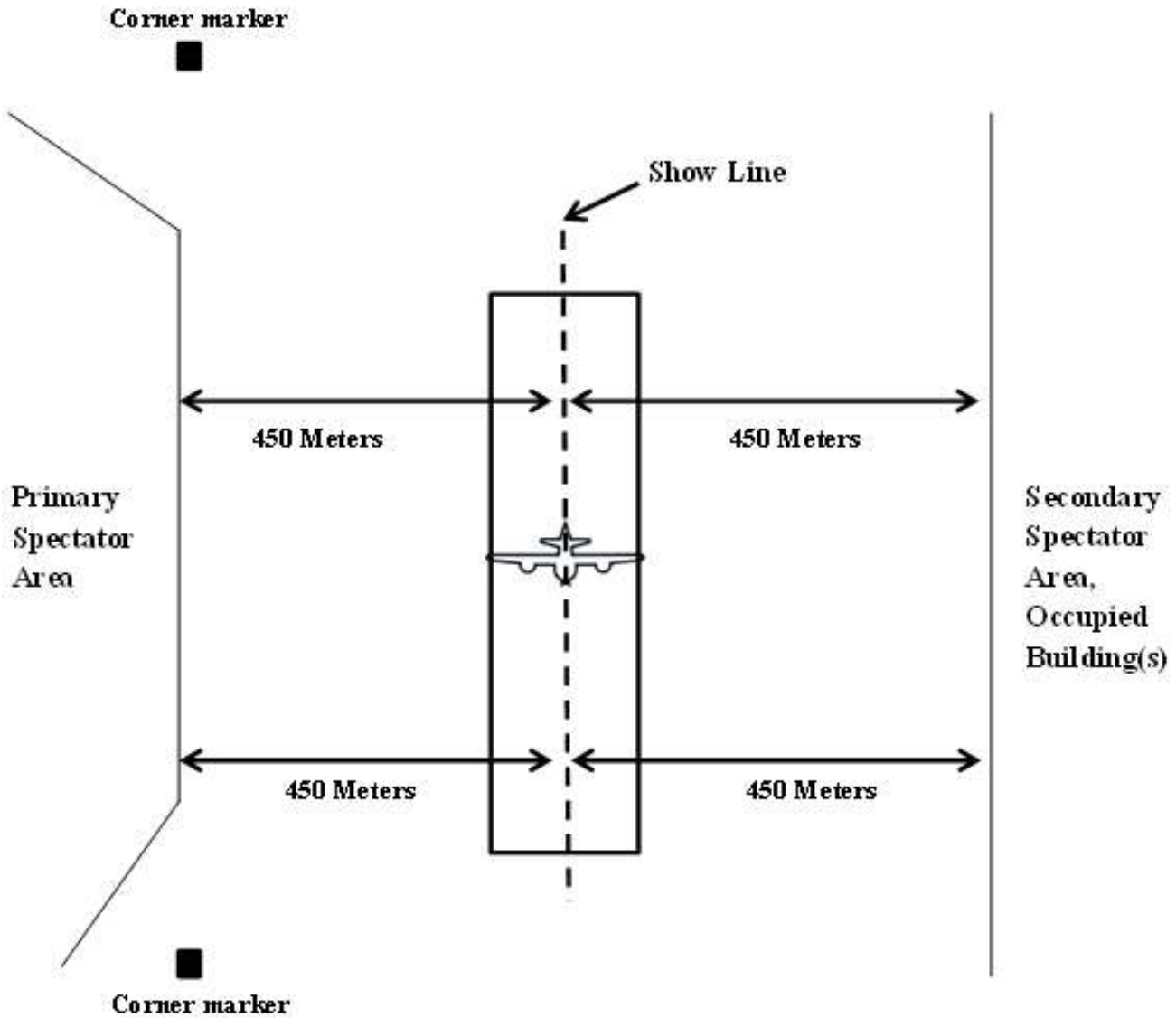
- a) Single aircraft operations conducted on the centerline are to be measured to the runway centerline.
- b) Formation takeoff/landing operations are to be measured to the runway edge.

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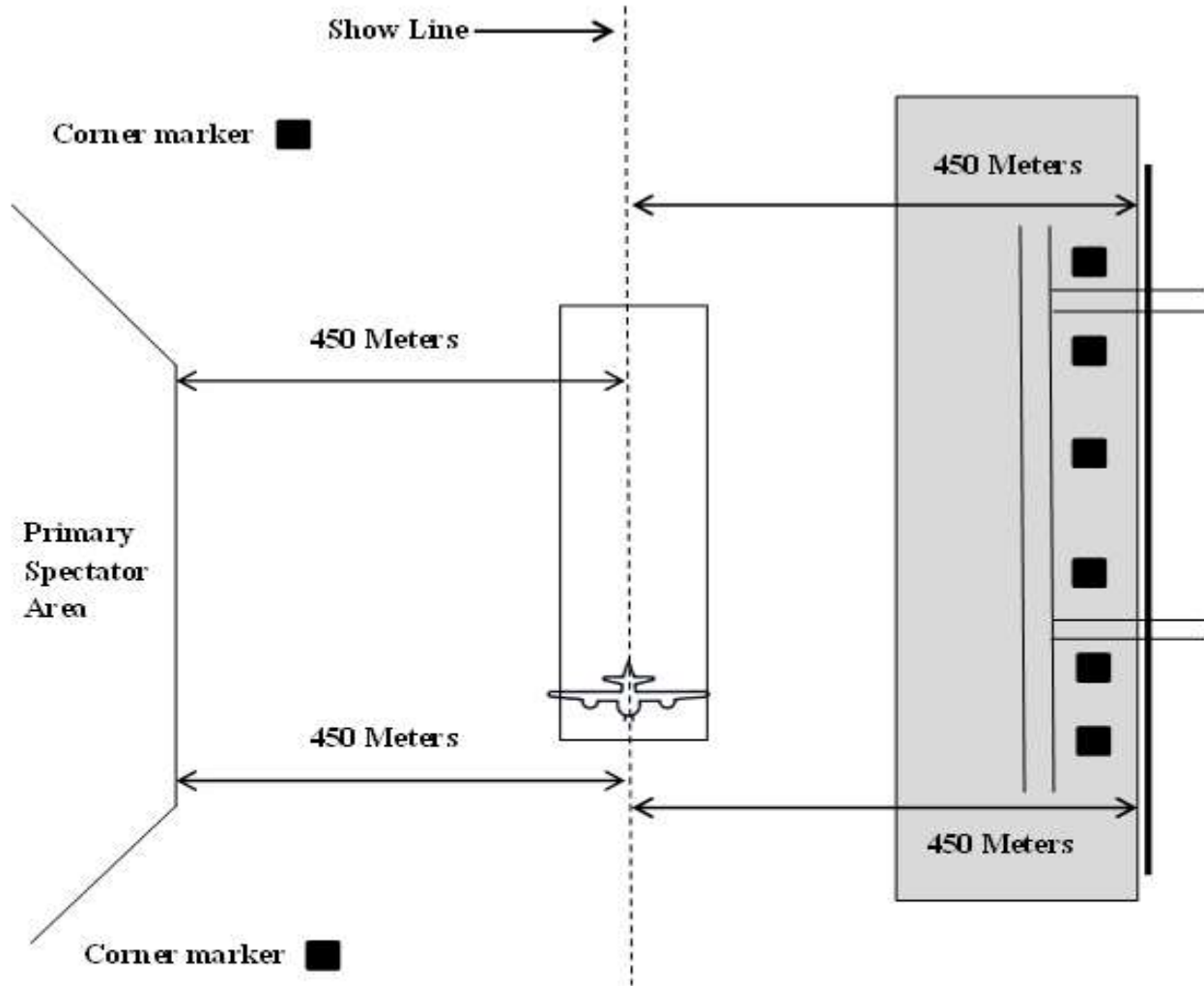
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Figure 11.2.1.6. Minimum Distance from Spectators for Category I



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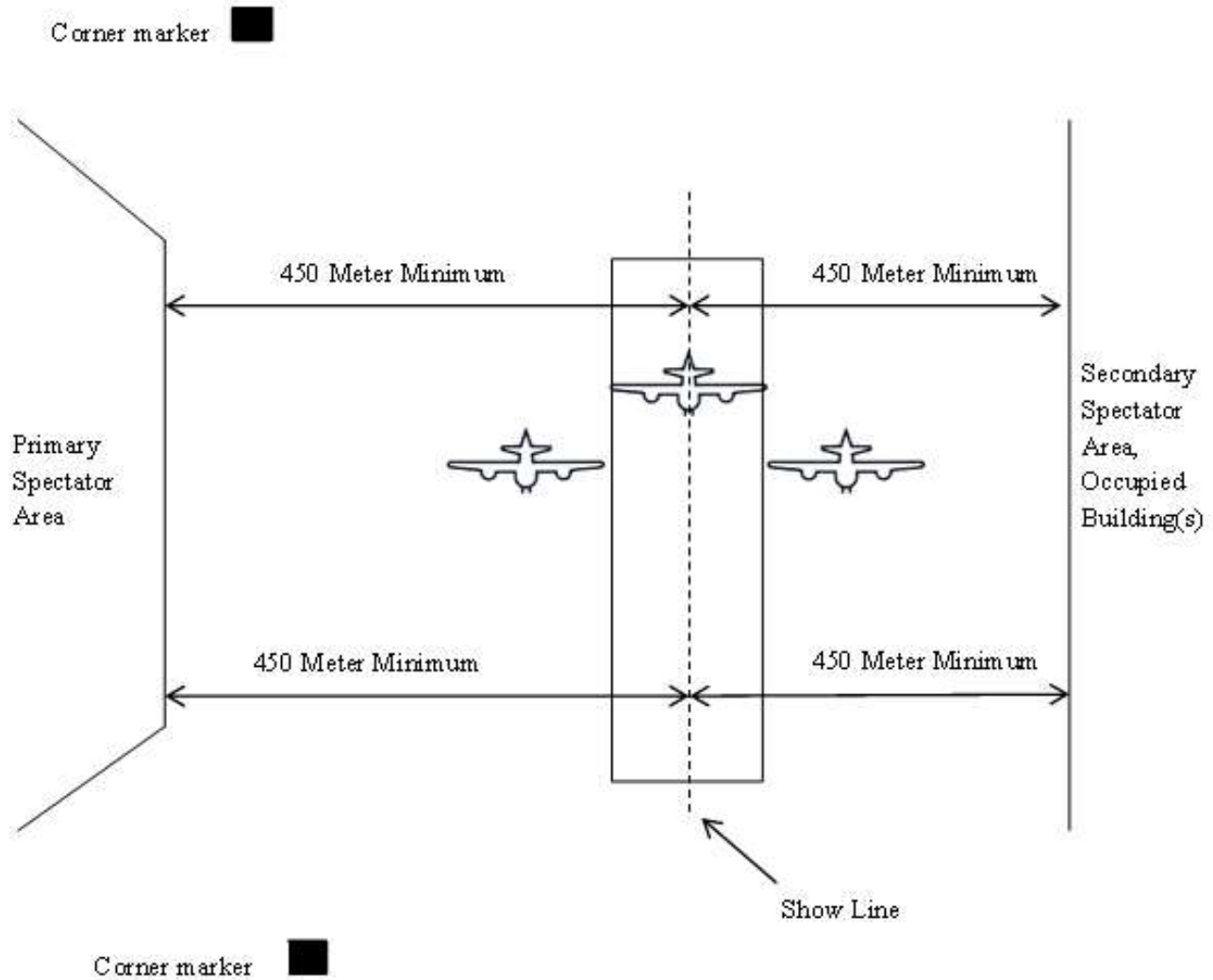
**Figure 11.2.1.7. Site Layout with Flying Display Area Less Than 450 Meters from Show Line**



**Note:** In the example depicted above, the buildings and the roads lie within the flying display area less than 450 Meters from the show line. For this site layout to be approved, *all* buildings must be vacated and road access denied to the highlighted area.

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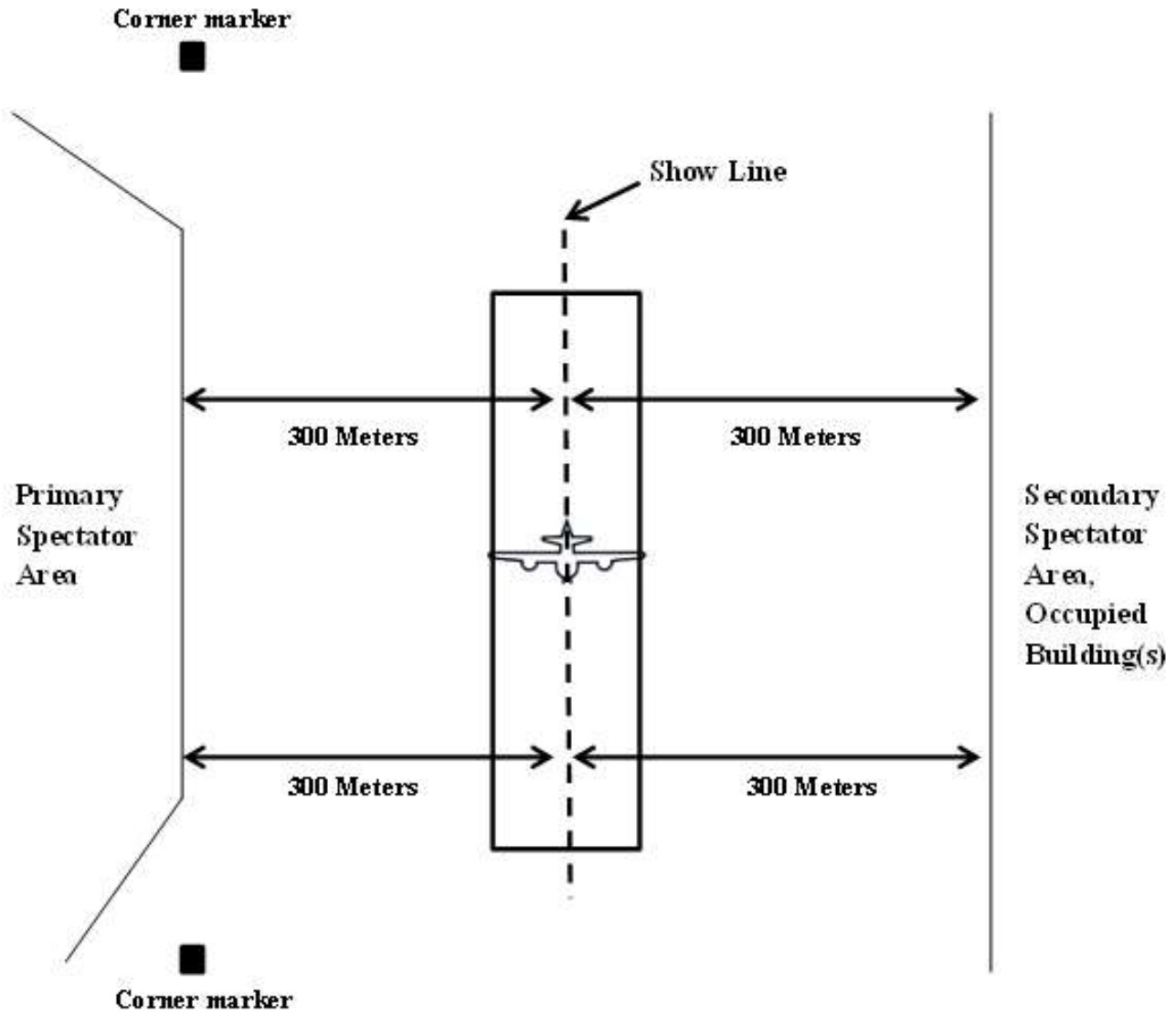
Figure 11.2.1.8. Example of Category I Aircraft Formation on Show Line





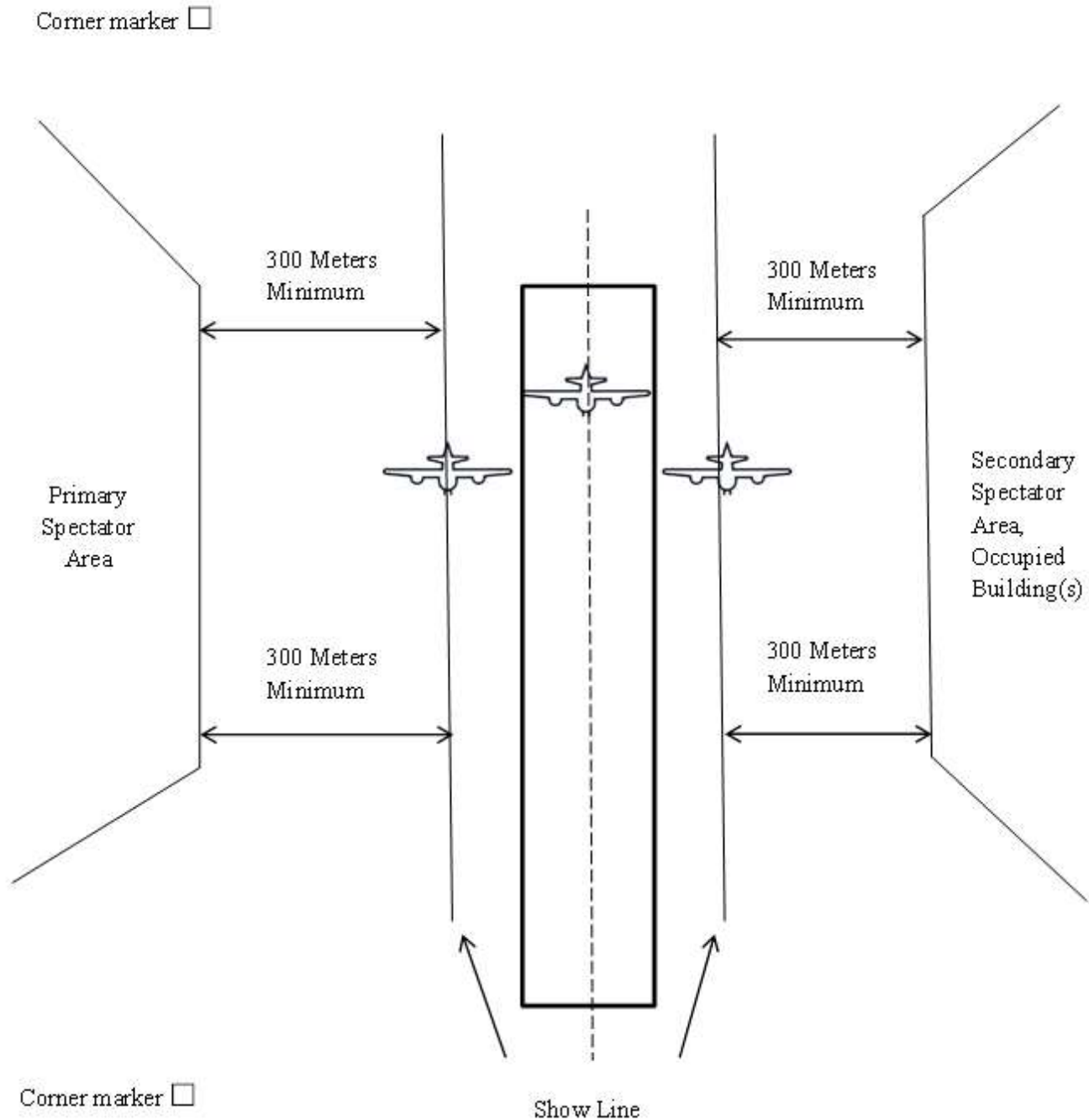
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Figure 11.2.1.9. Minimum Distance from Spectators for Category II Aircraft



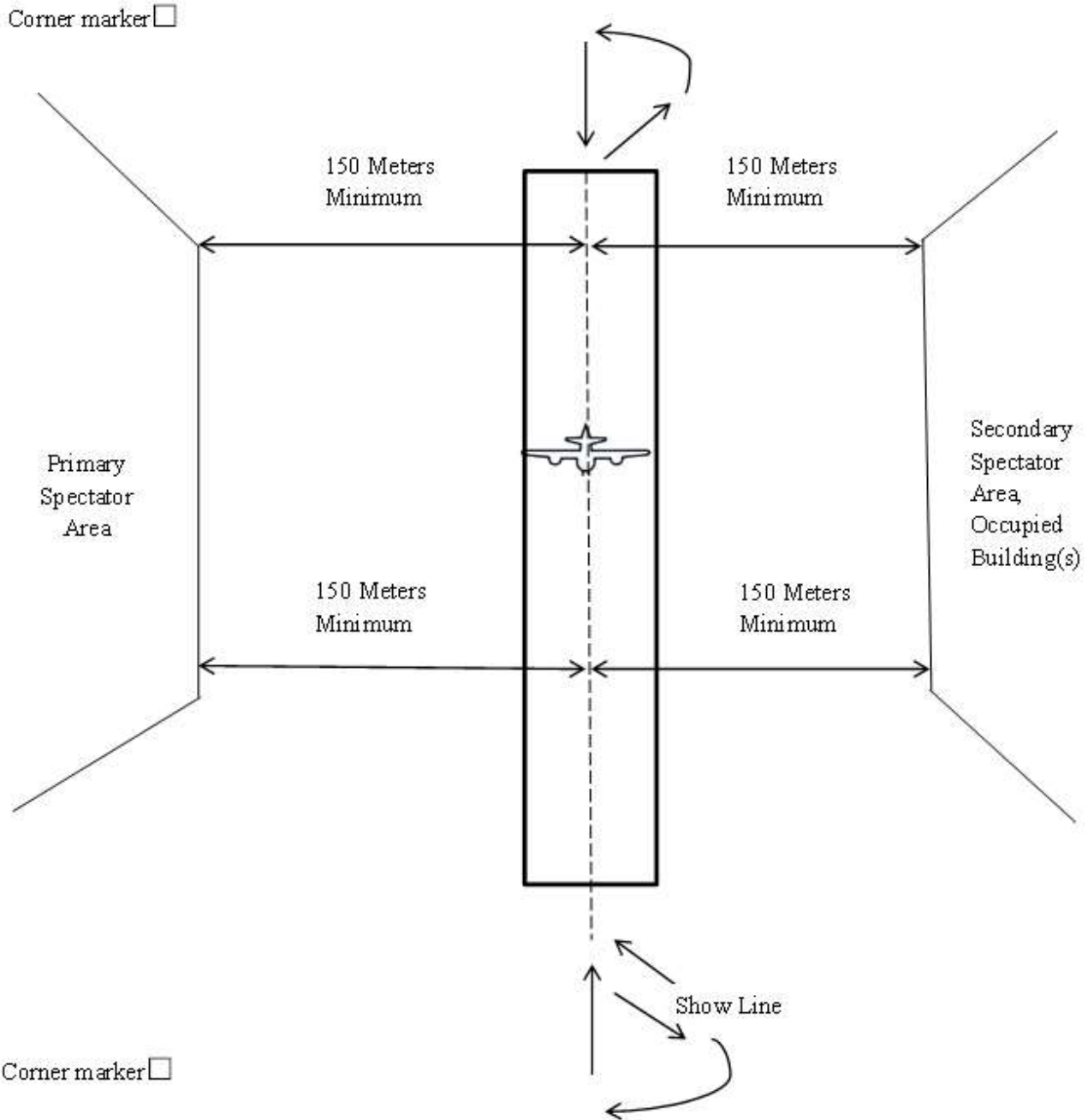
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Figure 11.2.1.10. Example of Category II Aircraft Formation on Show Line



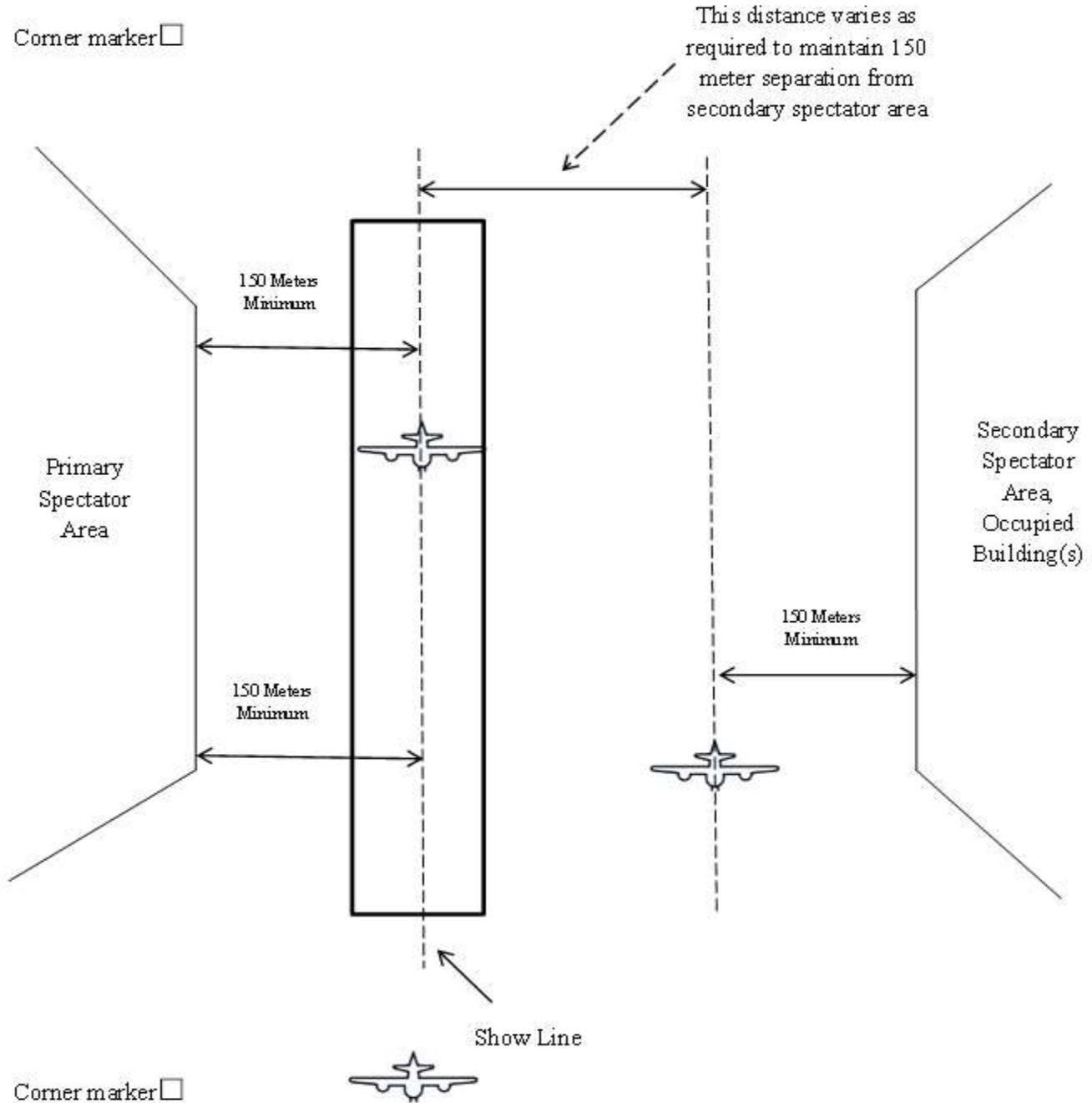
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Figure 11.2.1.11. Single Category III Aircraft in Minimum Width Flying Display



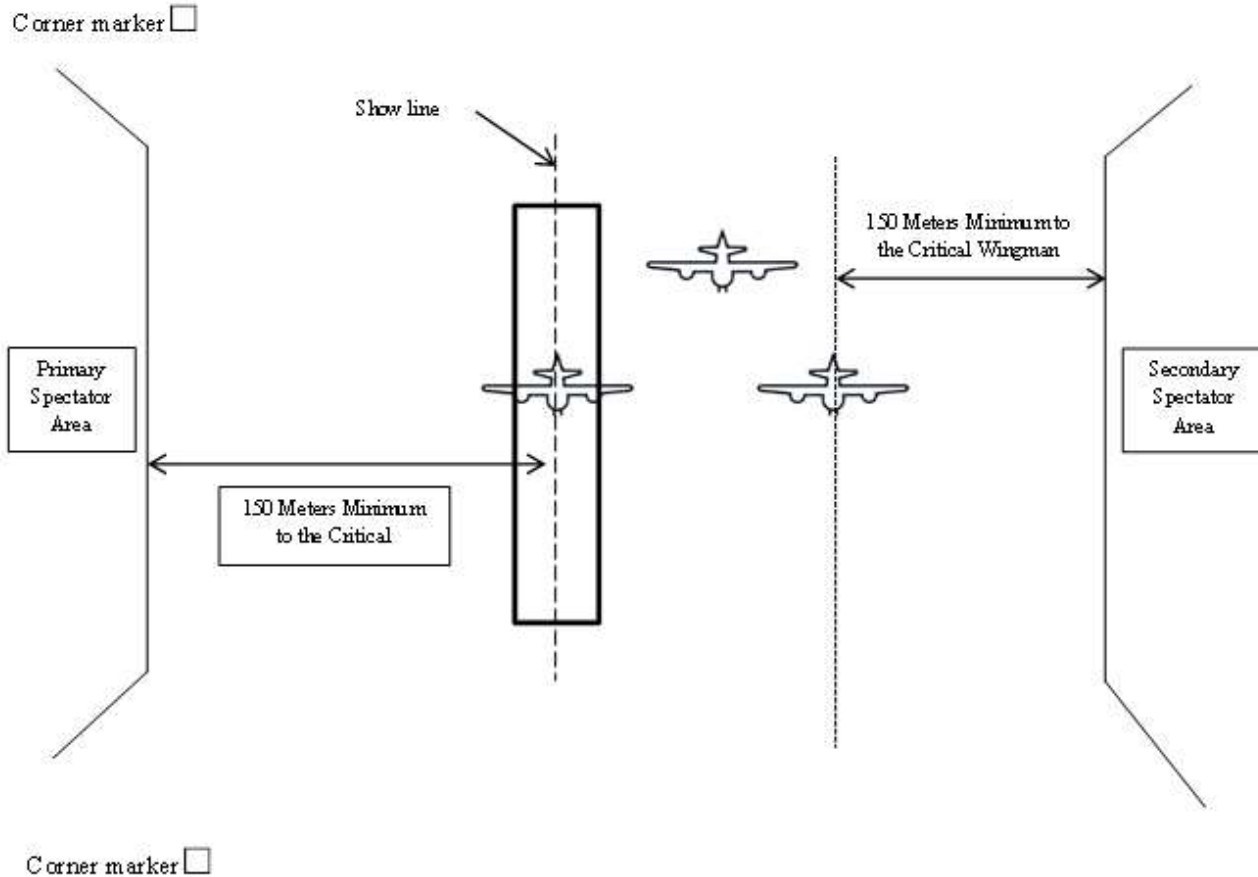
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**Figure 11.2.1.12. Minimum Width of a Flying Display Area for Category III Aircraft Performing Lateral and/or Turning Maneuvers**



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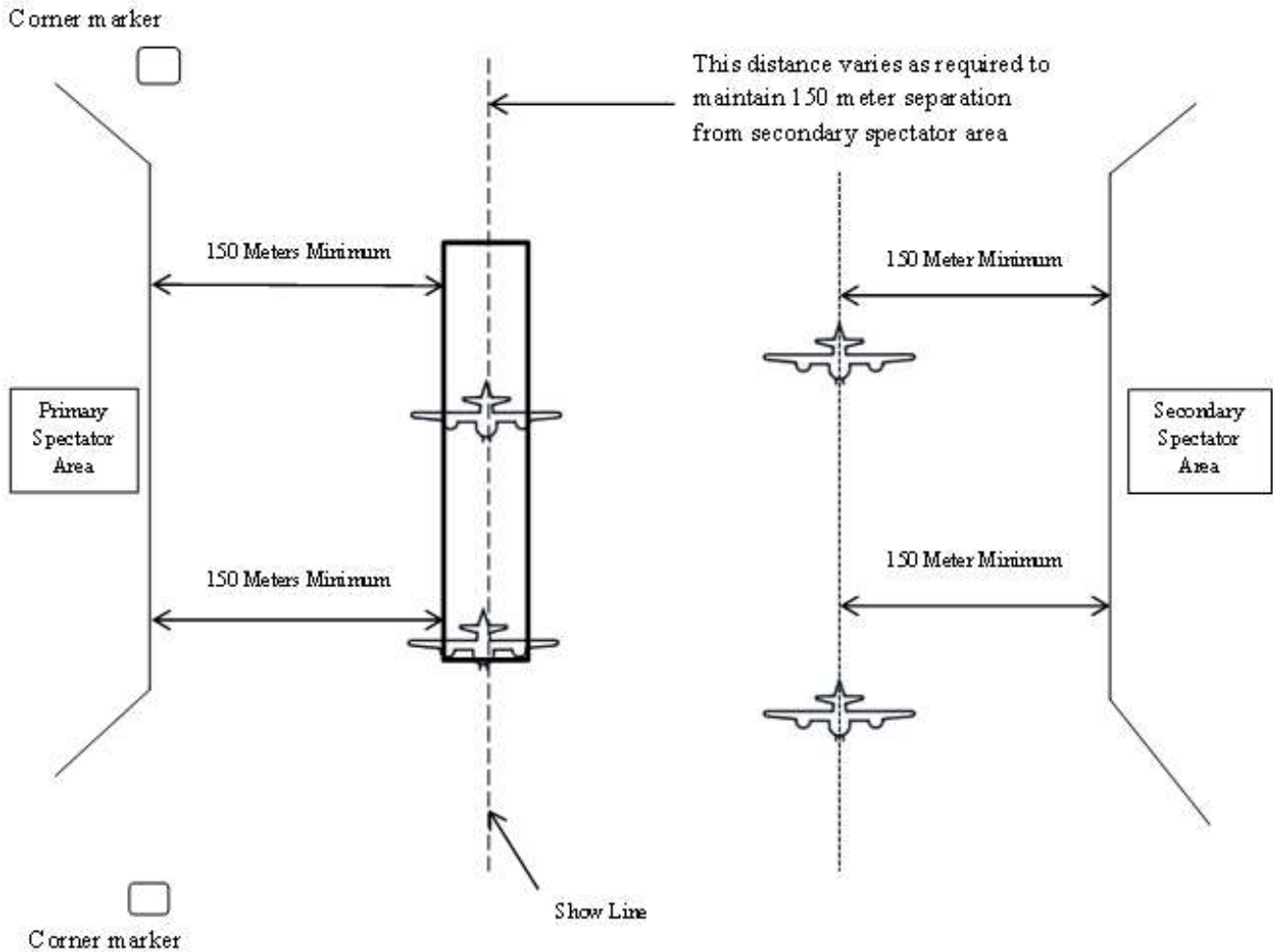
**Figure 11.2.1.13. Minimum Width of a Flying Display Area for Category III Aircraft in Formation Flight**



**NOTE:** The diagram above depicts a situation where minimal distance between the Primary Spectator Area and Secondary Spectator Area is available. In this situation, the formation lead must adjust his track to ensure that the center of the critical aircraft closest to the primary spectator is no closer than the 150 Meter show line. In this situation, minimum distance required between the primary spectator area and the secondary spectator is greater than 300 Meters to ensure the center of the critical aircraft closest to the secondary spectator area is no closer than 150 Meters to the secondary spectator area. At air show sites that have Cat II and I aircraft performing aerobatic maneuvers, there is normally ample space available.

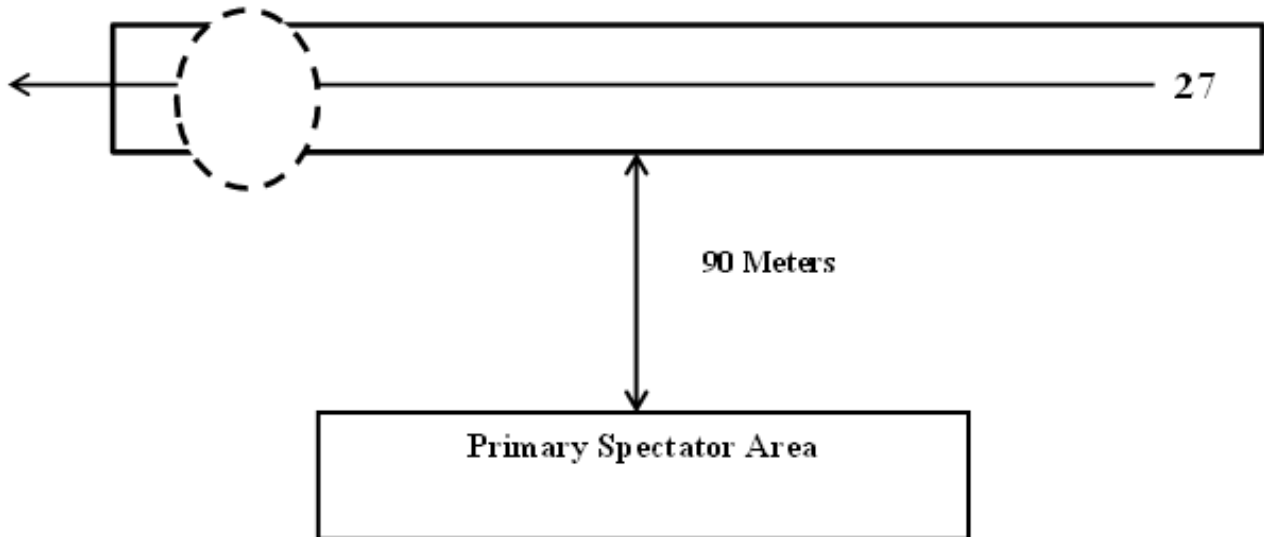
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**Figure 11.2.1.14. Example of the Minimum Width of a Flying Display Area for Multiple Category II Aircraft Performing Lateral and/or Turning Maneuvers**



**NOTE:** This diagram depicts more than one Cat III aircraft performing together in a flying display area, e.g. a squirrel cage.

**Figure 11.2.1.15. Aerobatic Maneuvers Performed After Aircraft Beyond Spectator Area**



In the example depicted in the above diagram, the runway or take-off area for the Cat III Aircraft is less than 150 meters from the primary spectator area, thus aerobatic maneuvers may not be performed after take-off until the aircraft is beyond the end of the spectator area.

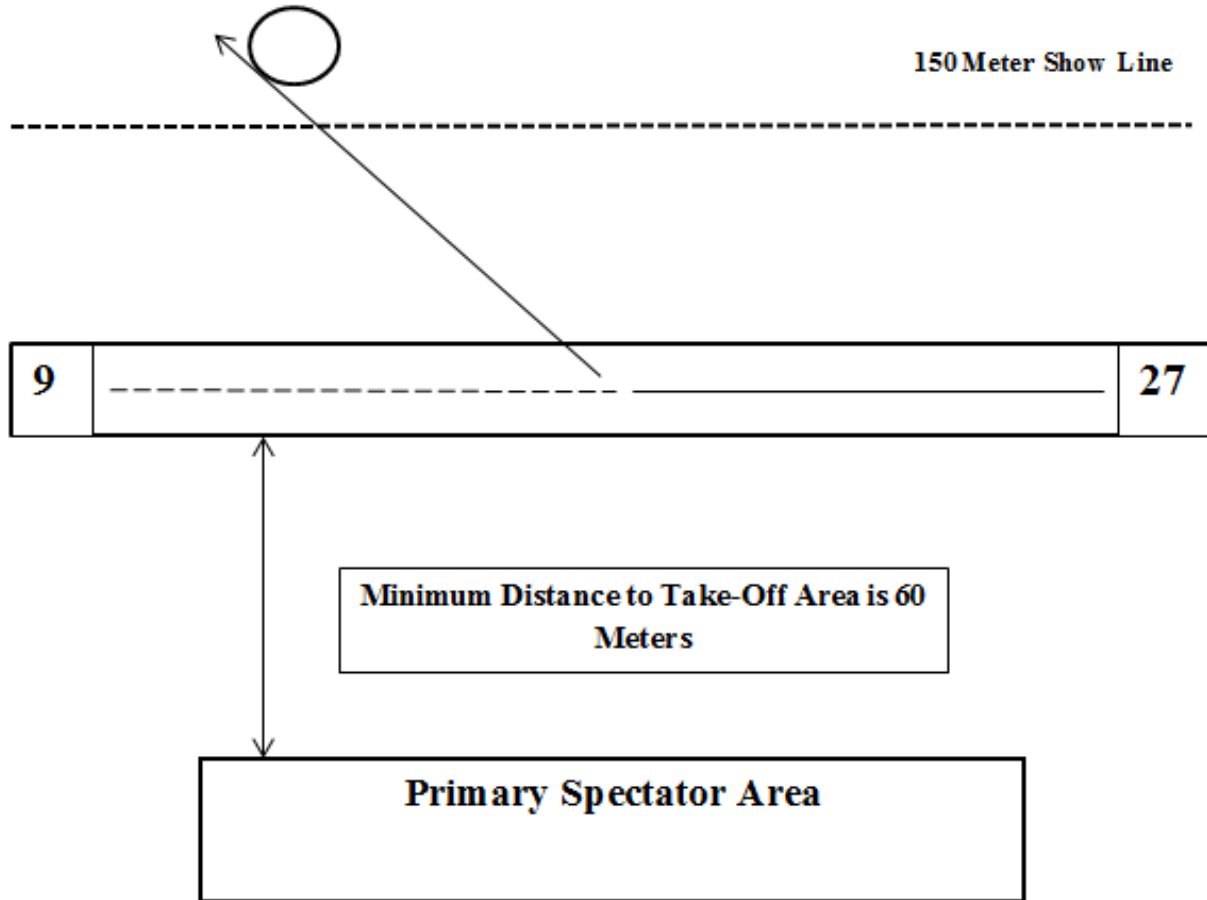


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**Figure 11.2.1.16. Aerobatic Maneuvers Performed After Turn Away Performed**



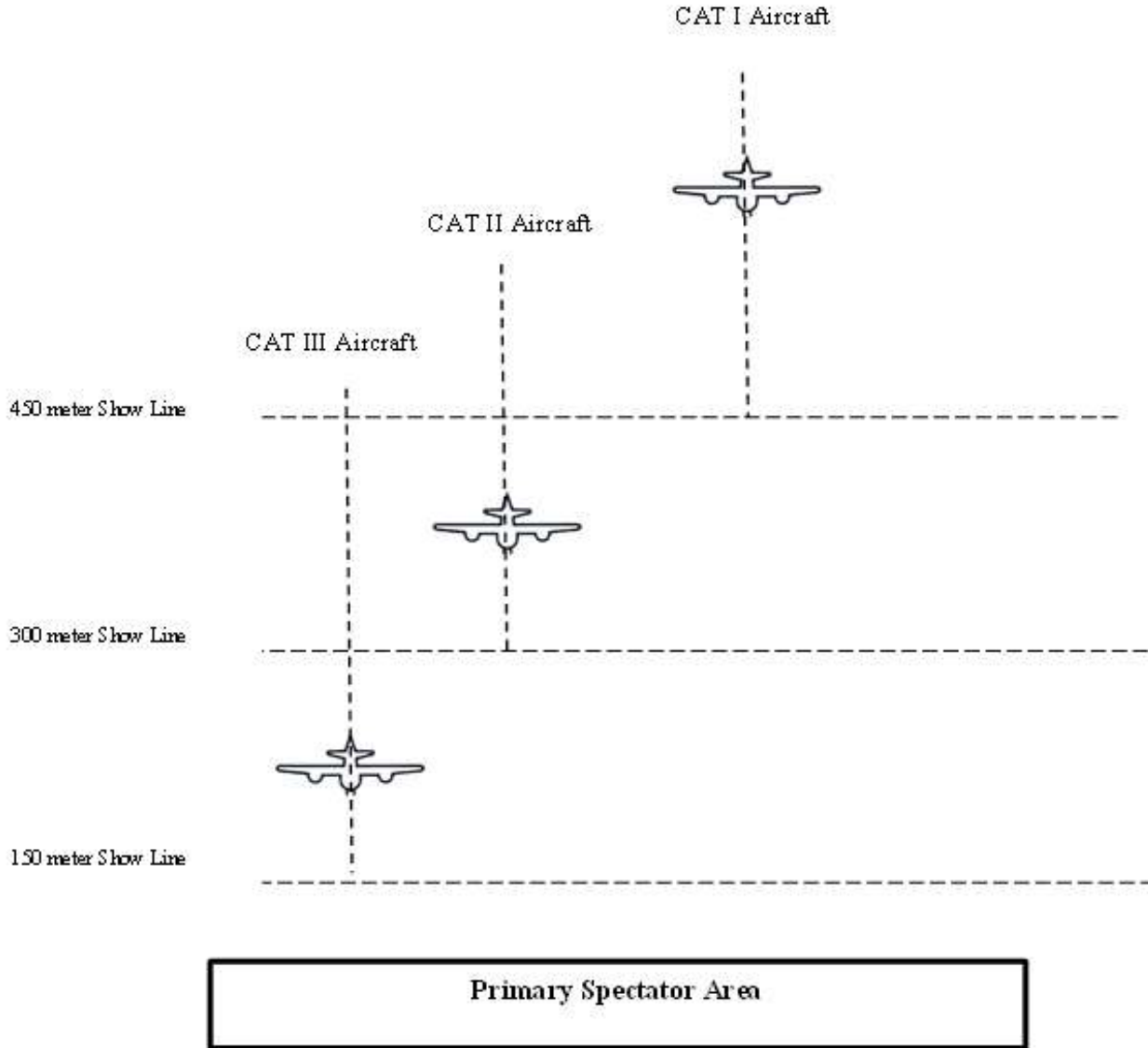
In the example depicted in the above diagram, the runway/take-off area for the CAT III aircraft is less than 150 meters from the primary spectator area, thus, aerobatic maneuvers may be performed after take-off when a “turn away” is carried out as shown above and once the aircraft has reached the 150 meter show line.

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**Figure 11.2.1.17. Non-aerobatic Maneuvers by a Single Aircraft with an Energy Vector Directed Towards the Primary Spectator Area**



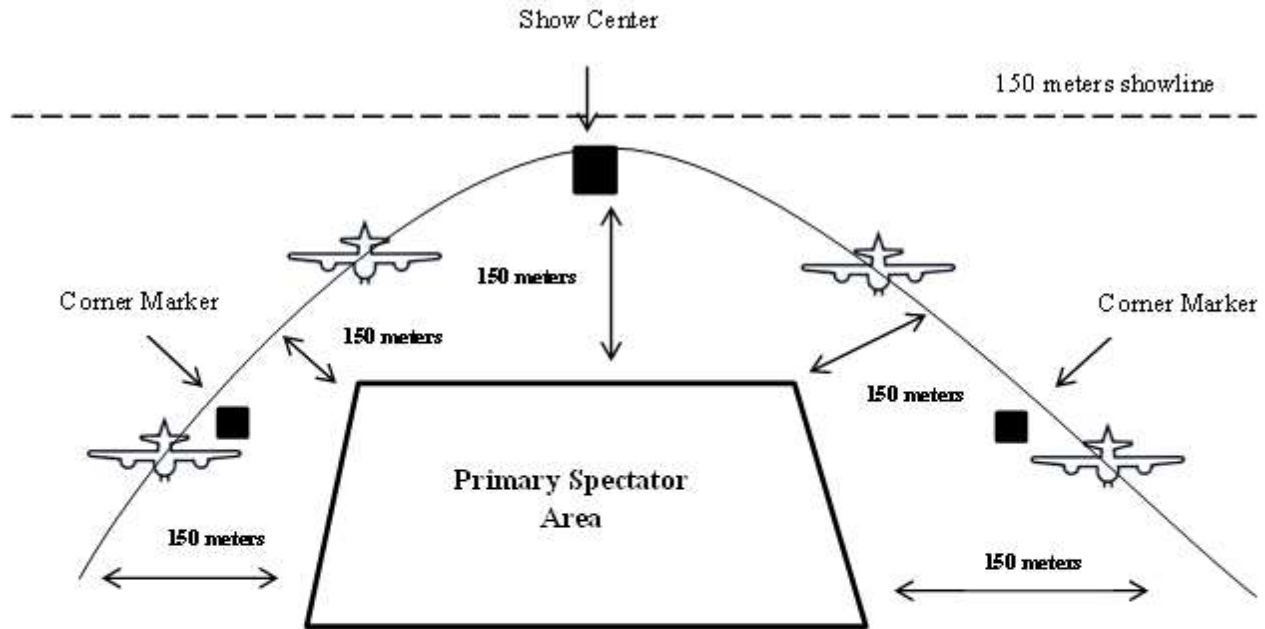
In the above diagram, as an example, in order to have all energy directed away from the primary spectator area, a CAT I aircraft flying at 350kts. And using a 75 degree bank would have to initiate the turn a minimum of 900 meters prior to the 150 meters show line

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Figure 11.2.1.18. Typical Arc in Review or Banana Pass



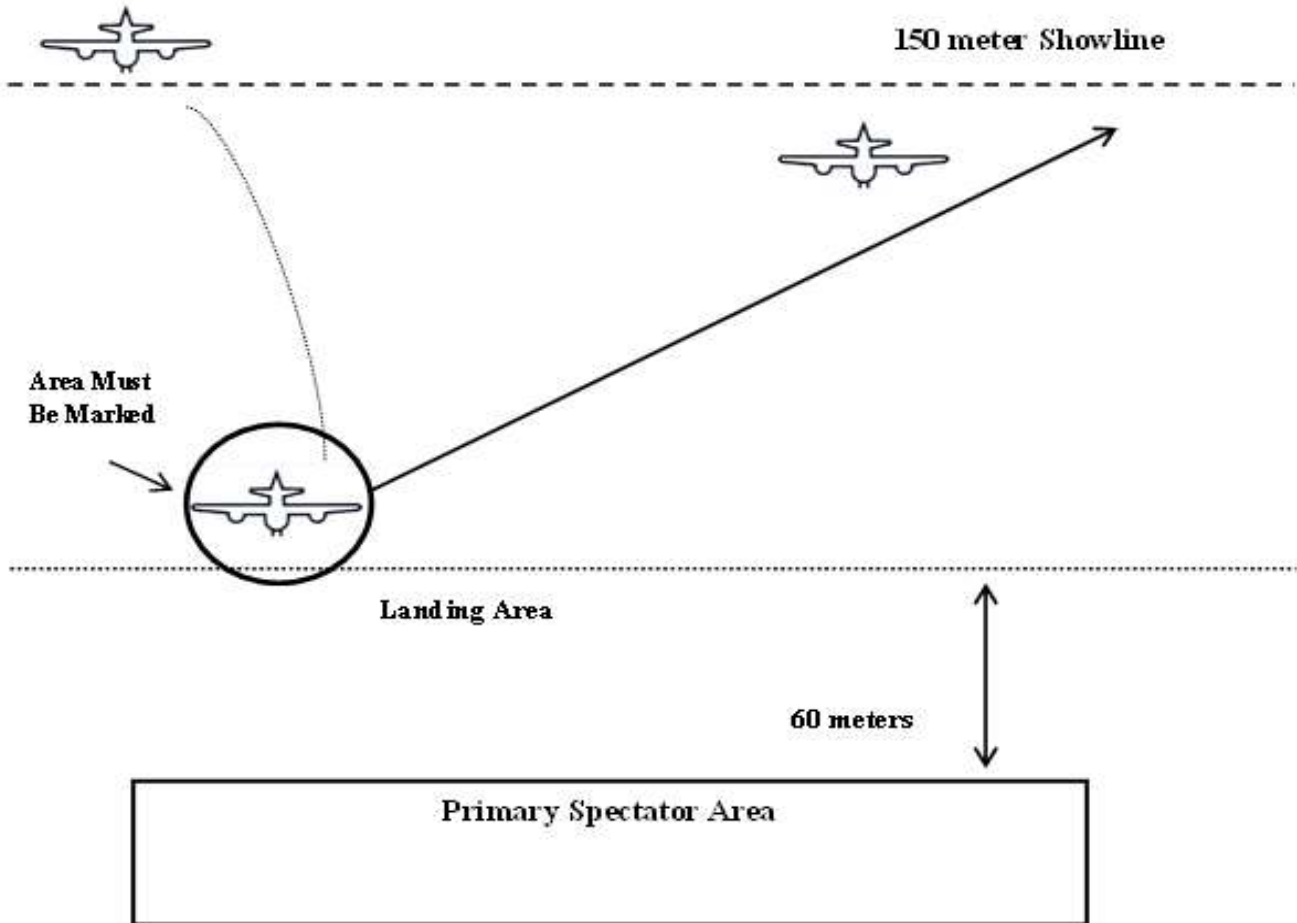
NOTE: Minimum distances of 150 meters must be maintained from spectator areas. Clearly marked showcenter and corner markers will help performers maintain minimum distances.

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Figure 11.2.1.19. Rotorcraft Takeoff and Landing Areas



(a) Helicopters may, following the completion of a landing or coming to a stable hover, no closer than 150 meters from spectators, hover taxi to a clearly marked landing area, no closer than 60 meters from a spectator enclosure.

(b) Hover Taxi means helicopter movement conducted above the surface and in ground effect at airspeeds less than 20 knots.

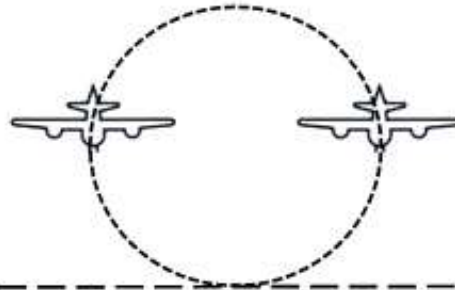
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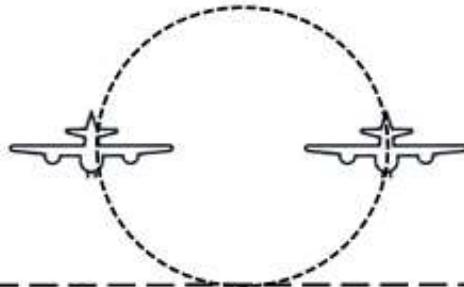
**Figure 11.2.1.20. Maneuvers Toward the Primary Spectator Area 360 Degree Turns Using Bank Angles of Less Than 90 Degrees**

Category I aircraft – single aircraft, maximum bank angle of 90 degrees, maximum altitude of 500 feet AGL



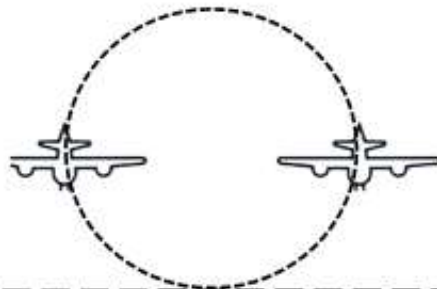
450 Meter Show Line

Category II aircraft – single aircraft, maximum bank angle of 90 degrees, and maximum altitude of 300 feet AGL



300 Meter Show Line

Category III aircraft – single aircraft, maximum bank angle of 90 degrees, maximum altitude of 250 feet AGL; and Gliders



150 Meter Show Line

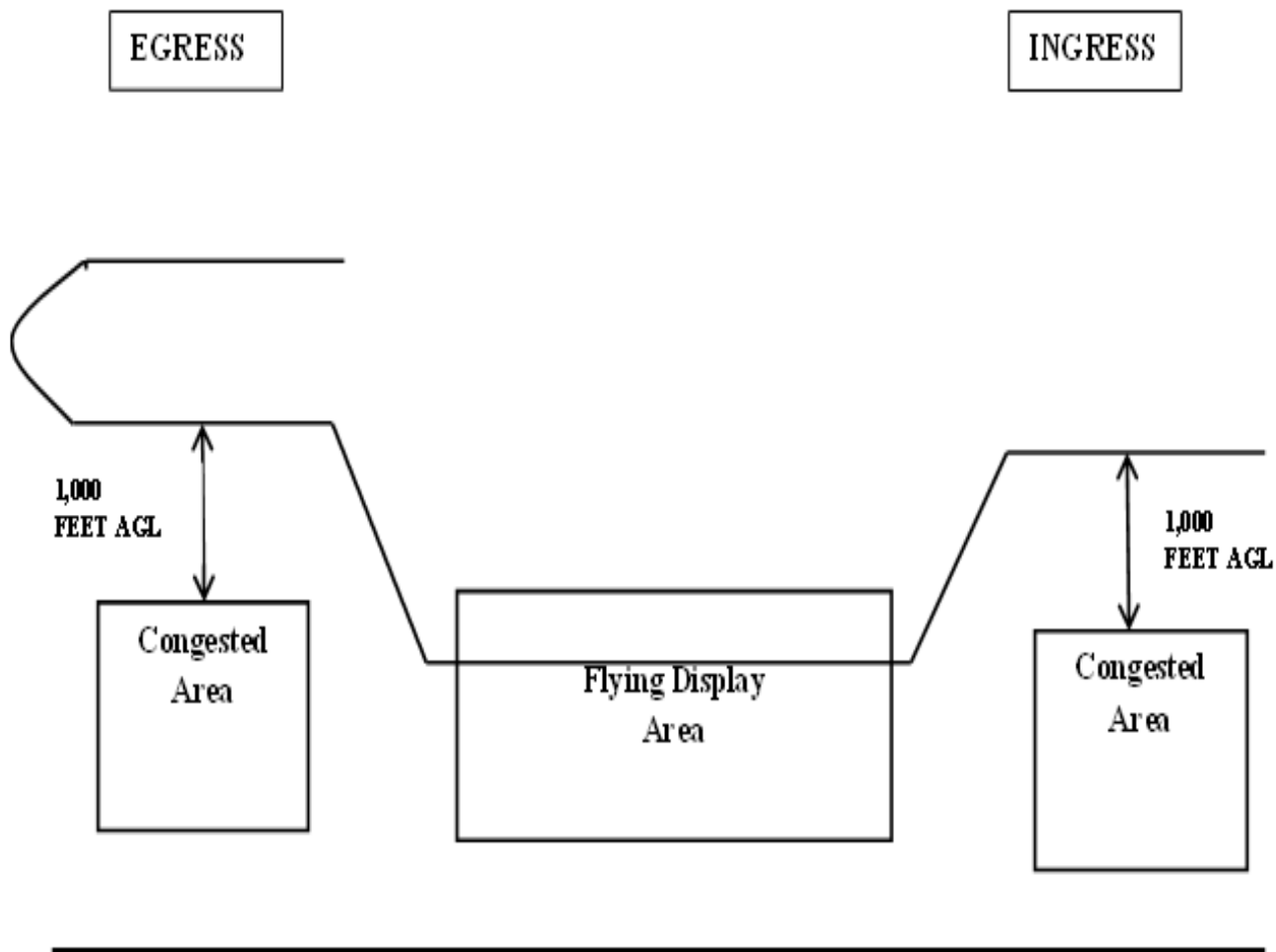
**Primary Spectator Area**

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Figure 11.2.1.21. Aircraft Approach and Exit to and from a Flying Display Area Bordered by Congested Areas



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**Figure 11.2.1.22. Sample Endorsement for Increased Angle of Pitch and Bank**

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

This endorsement may be entered in the logbook or issued in the form of a letter. This endorsement may only be made by a GACA Inspector (Operations), or by a GACA-approved endorser, such as an ICAS aerobatic competence examiner, or a designated pilot examiner authorized to administer a practical flight test in this make and model of airplane.

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**Figure 11.2.1.28. Example of a Balloon Competition Manual**

**BALLOON COMPETITION MANUAL**

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

**Table of Contents**

I. Purpose.

II. Responsibilities and Procedures.

- a) Duties of Personnel.
- b) Registration and Airworthiness Determination.
- c) Pilot and Event Flight Crew Members.
- d) Pilot/Crew Briefing Responsibilities.
- e) Letter of Agreement.
- f) Event Documentation.

III. Ground Operations.

- a) Clear Areas.
- b) Spectator Areas.
- c) Crowd Control Requirements.
- d) Landowner Relations/Notification.

IV. Flight Operations.

- a) Areas of Operations.



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- b) Types of Operations.
- c) Altitudes.
- d) Weather Requirements.
- e) Communications Requirements.
- f) Air Traffic Coordination.

**Section I. Purpose.**

This manual is submitted as a part of an application for a waiver of GACAR § 91.67(b) and (c), by the [insert name of organization] for the [insert name of event] Balloon Race. Specifically, the waiver should allow officially registered balloons to operate at an altitude of no less than [insert number] feet/meters above the highest obstacle within a [insert number] foot/meter radius of the balloon en route to the target within a [insert number] nautical mile/kilometer (or other specified distance) radius of the designated launch field or goal. It should also allow for officially registered balloons to operate at [insert number] feet/meters AGL over spectators and to set goals and/or targets at a minimum distance of [insert number] feet/meters from physical barriers provided for spectator control.

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

**Section II. Responsibilities and Procedures.**

- a) Duties of Personnel.
  - o Event Director—[insert name]
  - o Operations Director—[insert name]
  - o The GACA Liaison—[insert name]
  - o Weather Officer—[insert name]
  - o Safety Officer—[insert name]

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### b) Registration and Airworthiness Determination.

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

### c) Pilot and Event Flight Crew members.

Each pilot must hold the appropriate pilot certificate (Private or Commercial) with Lighter than Air Category and Free Balloon Class Rating. Each pilot must show evidence of current Flight Review (GACAR § 61.17) and must also show evidence of currency per GACAR § 61.17. Minimum hours as PIC per the organizers specified time must also be shown.

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

### d) Pilot Crew Briefing Procedures.

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

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

### e) Letter of Agreement.

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

### f) Event Documentation.

All relevant registration files, task data sheets, pilot registration information etc., should be maintained by the organizer at least [insert number] days after the event and made available to the

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GACA Monitor upon request. Competition maps and task sheets should be made available to the GACA Monitor at the time of the pilot briefing.

**Section III. Ground Operations.**

a) Clear Areas.

Clear areas are established at each target site. These areas are kept clear of spectators and are usually fenced. [Insert type of officials] will police any area (such as the target area on the main launch field) to keep unauthorized persons out. In the Minimum Altitude Diagram (see Section 4 c), this is referred to as the “Target Area.”

b) Spectator Areas.

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

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

c) Crowd Control Requirements.

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

d) Landowner Relations/Notification.

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

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Zone (PZ).

### **Section IV. Flight Operations.**

#### a) Area of Operation.

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

#### b) Types of Operations.

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

The tasks will include:

##### 1) *Pilot Declared Goal.*

Each pilot will fly from a launch area and will attempt to drop a marker close to a goal selected by him. Pilots define goals by description and map reference. The goals are declared in writing and given to a timekeeper. Each pilot flies from the designated launch area and attempts to drop a marker close to the selected goal. The result is the distance from the declared goal to the observed mark. The shortest distance wins. The landing after dropping the marker cannot be less than 450 meters from the declared goal.

##### 2) *Judge Declared Goal.*

Each pilot flies from the designated launch area and attempts to drop a marker as close as possible to a goal set by the officials. The result is the distance from the declared goal to the observed mark. The shortest distance wins. The landing after dropping the marker cannot be less than 450 meters from the declared goal.

##### 3) *Multiple Judge Declared Goal.*

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Each pilot flies from the launch area and chooses one of a number of goals set by the officials. The pilot attempts to drop a marker near the goal chosen. The result is the distance from the observed mark to the nearest goal. The shortest distance wins. The landing after dropping the marker cannot be less than 450 meters from the selected goal.

### 4) *Hare and Hound.*

A hare balloon will fly from the launch area and each pilot should attempt to fly near the final landing place of the hare and drop the marker. In the West, this may be referred to as the “Road Runner Race.” The lead balloon, “the hare,” takes off several minutes before the rest of the balloons and drops a marker at a designated point. The hare balloon deflates and is removed from the landing area. The marker dropped by the hare balloon becomes the target for the later balloons, “the hounds.” The hounds try to drop markers as close as possible to the hare balloon’s target. After dropping the marker from the hound balloon, landing is at the pilot’s discretion but cannot be less than 450 meters from the target.

### 5) *Fly In Task.*

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

### 6) *Fly On Task.*

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

### 7) *Gordon Bennett Memorial.*

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

### 8) *Max Distance—Minimum Distance.*

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

### 9) *Elbow (ELBO).*

Each pilot flies from the launch area and attempts to achieve the greatest change of flight direction

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during the flight with the least angle of divergence. A 180-degree change in direction with a zero angle of divergence is best. Two concentric circles, specific distances apart, surround the launch point. The pilot drops two markers. The first marker must be dropped between the inner and outer circle. The second marker must be dropped within the outer circle. The second marker cannot be less than 1,500 meters from the first marker. Landing after dropping the marker is at the pilot's discretion.

### 10) *Convergent Navigational Task (CNT).*

Officials establish a goal, but pilots find their own launch areas for the attempt to reach the goal. The boundary of the launch area declared by the pilot is the physical boundary of a field or a circle with a 90 meter radius from the inflation point, whichever is less. The officials place a target at the goal 30 minutes before the launch period. The pilot launches from a selected site, attempts to navigate to the target, and drops a marker. The result is the distance from the target to the marker. The shortest distance wins. The landing after dropping the marker is at the pilot's discretion but cannot be less than 450 meters from the target.

### 11) *Watership Down.*

This is a two-part task. Pilots find their own launch sites and fly to a target established by the officials. At a specified time before the launch, a hare balloon takes off adjacent to the target and drops a marker at a designated point. This marker becomes the second target. The hare balloon deflates, and the envelope remains flattened on the ground to serve as a guide to the second target area. Each competing pilot drops a marker as close as possible to the first target, which was the launch site of the hare balloon. Pilots then fly-on to drop a second marker as close as possible to the target marker placed by the hare balloon.

### 12) *Key Grab.*

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

The area around the pole must be completely clear of spectators and under the control of the event officials. Event organizers should have portable bull horns or a public address system to control the crowd movements or to direct the balloonist away from the target area in an emergency. If these precautions are observed, a waiver of GACAR § 91.67(c) can be issued to allow operations closer

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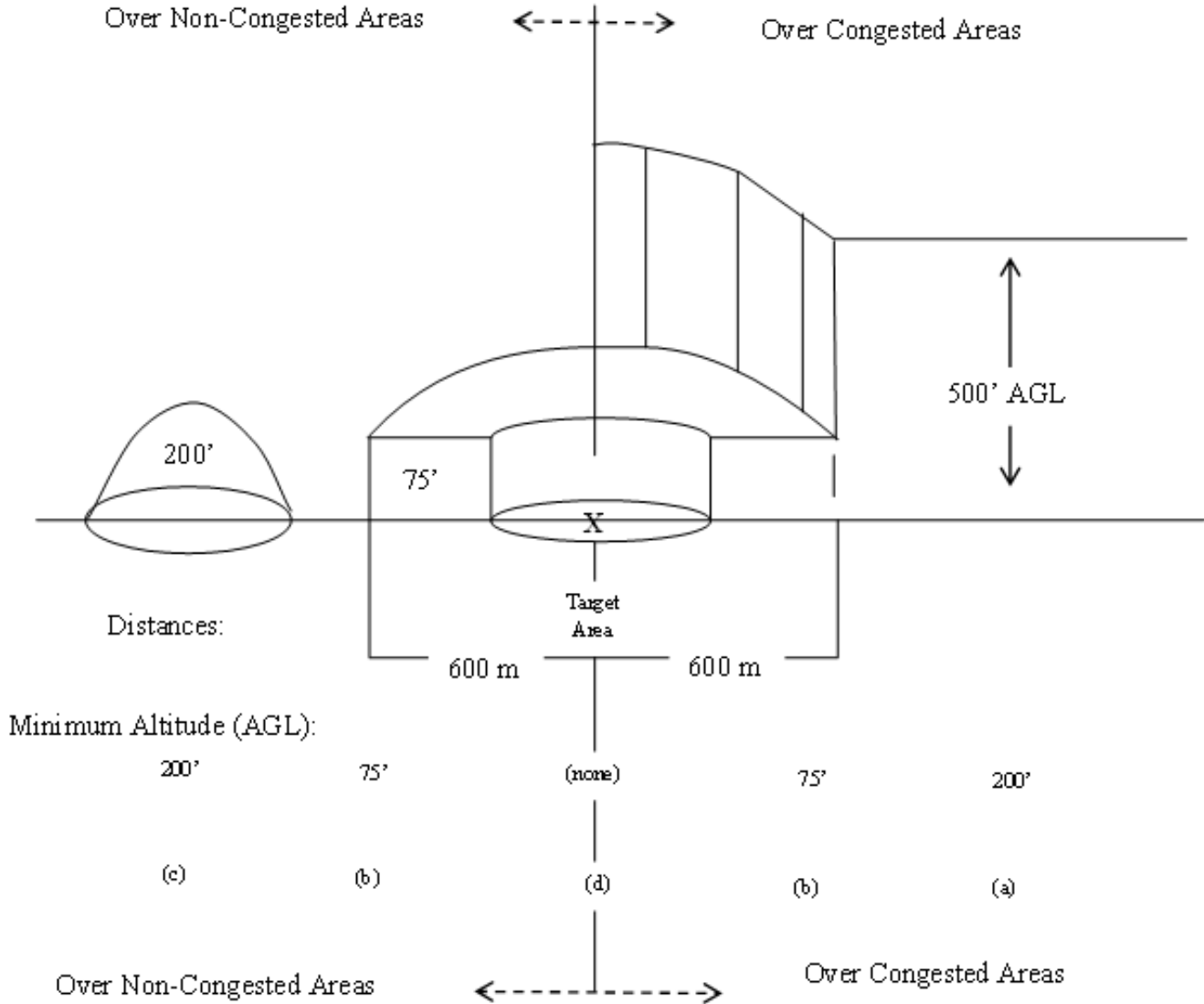
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than 150 meters to the crowd.

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

c) Minimum Altitude Diagram.

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d) Altitudes.

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



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

e) Weather Requirements.

Flight operations should be conducted during the period from published sunrise to sunset, with the visual flight rules (VFR) and weather conditions as specified in GACAR § 91.165. Maximum demonstrated surface winds must be [insert number] or less.

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

f) Communications Requirements.

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

g) Air Traffic Coordination.

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

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

**ATTACHMENTS:**

- Sectional of Area
- List of Pilot Entries
- Schedule of Events

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- Statement of Responsibility
- Competition Rules

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**Figure 11.2.1.29. Preshow Briefing Guide**

**AVIATION EVENT PRESHOW BRIEFING GUIDE**

WHO SHOULD ATTEND:

ALL PERFORMERS:

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

KEY OPS/SUPPORT PERSONNEL:

- Air Boss
- Air Traffic Service
- Fire Chief/CRS
- Rotorcraft Emergency Medical Services (REMS)
- Smoke Oil/Refueling Chief
- Aircraft Marshalls Chief

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- Maintenance Chief
- Crowd Control Chief
- The GACA IIC(or assigned) MONITOR:

WEATHER BRIEFER:

AIR SHOW DIRECTOR/EVENT SPONSOR:

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

WHO SHOULD NOT ATTEND:

- Pets
- Individual Sponsors
- Media Representatives
- Spouses
- Children
- Relatives/Friends
- Anyone not directly associated with the performance

BRIEFING:

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

INTRODUCE KEY OFFICIALS:

TIME HACK:

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

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REVIEW NOTAM(S)/TFR:

REVIEW WAIVER AND SPECIAL PROVISIONS:

REVIEW AREA MAP:

Hold Points/Turn Directions Altitudes

Noise Abatement Procedures

Sensitive Areas

Special Use Airspace

Remote Recovery Aerodromes

Obstructions

Controlled/Emergency Bail Out/Ditching Procedures

AERODROME STATUS:

Airspace

Runways In Use

Facilities

Arresting Cables

Traffic Patterns

AIR SHOW LAYOUT:

Sequence of acts and their cues for positioning

Show Lines

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Spectator Areas (Primary/Secondary)

Ground Based Pyro

Hazards

Aircraft Parking

Taxi Routes

Crash Rescue Runway Watch Locations

Unique Local Items/Conditions

### **Figure 11.2.1.30. Circling the Jumpers Briefing**

An endorsement of “Circling the Jumpers” on a statement of aerobatic competency is no longer required for the circling aircraft pilots.

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

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

If at any time the air boss determines that the circling the jumpers is not proceeding as briefed, the air

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boss must give a “Knock It OFF” to the circling aircraft. Upon receiving a “Knock It Off” the circling aircraft will make a cautious turn away from the jumpers and go to the previously determined holding area and wait for instructions from the air boss.

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### Figure 11.2.1.31. Common Special Provisions for an Airshow

**SPECIAL PROVISIONS:** Special provisions are conditions, requirements, or limitations necessary to protect non-participating persons and property on the surface and other users of the KSA airspace system. Each Certificate of Waiver or Authorization must include special provisions as determined by the GACA to ensure an acceptable level of safety.

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

**Ensuring Safety.** The special provisions ensure that the event can be conducted without an adverse effect on safety. Every waiver or authorization must contain special provisions to ensure an equivalent level of safety for the non-participating public and non-participating air traffic.

**Use of Special Provisions:** Some events require extensive and highly detailed special provisions, whereas the special provisions for other events can be less detailed. In addition to variation among events, local conditions may have a significant impact on the necessary special provisions. Ensure that all special provisions issued are appropriate for the event.

1. Special provisions may pertain to associated protective measures and control requirements that may not be specifically covered by the regulations. In addition, it may be necessary to increase one regulatory minimum in order to authorize safe deviation from another.
2. The special provisions should be typed with as little editorial change as possible onto the Certificate of Waiver or Authorization form or on attached pages. Numbers and language can be inserted or changed to suit each event only when necessary and appropriate. Editorial comments enclosed in square brackets, [ ], should not be included on the certificate.

**COMMON SPECIAL PROVISIONS.** Only the appropriate special provisions should be included on a Certificate of Waiver or a Certificate of Authorization. Failure to comply with any standard or special provision is a violation of the terms of this Certificate of Waiver or Certificate of Authorization and justification for cancellation of this Certificate. Such action may also constitute non-compliance with pertinent sections of the GACARs.



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1. The GACA has the authority to cancel or delay any or all acts or events if the safety of persons or property on the ground or in the air is in jeopardy, or there is non-compliance with the terms of the waiver or authorization.

2. The responsible person will ensure that notification is made to the [Insert AIS name] Aeronautical Information Service (AIS) of the date, time, place, areas, altitudes, nature of the activity, and duration of the operation and request that a Notice to Airmen (NOTAM) be issued. Such notice must be accomplished by providing the controlling AIS with a copy of the Certificate of Waiver or Authorization, if requested, at least 48 hours before the event and no more than 72 hours before the event.

**NOTE:** Do not include if a Temporary Flight Restriction (TFR) NOTAM is issued by Air Traffic Service (ATS) for the special aviation event.

3. The responsible person named in Item 2 on the waiver or authorization application must 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 or authorization before beginning the activities. No person may participate in any event listed on the Waiver or Authorization unless that person has signed a statement stating that they have received a briefing on the provisions of the Waiver or Authorization. Teams may be represented by a participating performer of that team.

4. All civil aircraft and pilots participating in the demonstration must be available for GACA inspection at time and place agreed upon by the responsible person and the GACA Inspector In Charge (IIC).

5. For civil aircraft, only required flight crew members by type design, safety pilots, or those persons required to participate in the demonstration (wing walkers, stunt persons, actors integral to the performance, and those conducting safety related functions) will be carried on any aircraft engaged in demonstrations authorized by this waiver or authorization.

6. All civil pilots who perform aerobatics must possess:

a. A valid Statement of Acrobatic Competency issued by GACA or a GACA-approved authority. All limitations on the form will be adhered to including altitude restriction for the entire performance.

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- b. Performers that execute maneuvers more 75 degrees of bank but no more than 90 degrees and/or pitch attitudes more than 60 degrees but no more than 90 degrees of bank only require a logbook endorsement or competency letter from a qualified evaluator.
- c. Documentation of performing or practicing their performance(s) within the previous 15 days.
7. Pilots who wish to conduct non-aerobatic formation flight in waived airspace must possess a valid industry formation training and evaluation credential acceptable to the GACA.
8. Persons or aircraft not appearing on the waiver or authorization application and subsequently added to the Certificate of Waiver or Authorization may not participate without specific approval by the Responsible person or air boss. The Responsible person or air boss will notify the GACA IIC by the most expeditious means of any change made.
9. No demonstrations may be authorized or scheduled when a suspension of aerodrome traffic or diversion of other aircraft traffic would cause a hardship to schedule operations.
10. Civilian flying performers who do not hold a valid Statement of Acrobatic Competency with a Level 1 altitude authorization may conduct non-aerobatic fly-bys:
- a. No closer than the 150 meters show line.
  - b. Ingress/egress must be no closer than 150 meters laterally to the ends of the primary spectator area.
  - c. No lower than 30 meters AGL when operating a jet or turbojet airplane within 300 meters of a designated spectator area unless the pilot is in possession of a current Surface Level 1 Statement of Aerobatic Competency for that airplane.
11. For the purpose of this event, the definition of aerobatic flight contained in GACAR Part 1 is waived.
12. The following aircraft attitudes will be considered aerobatic flight:
- a. For all solo aircraft: when the pitch angle exceeds a positive or negative 60° angle from the horizon, and/or when the bank angle exceeds 75°.

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b. For formation flights: when the pitch angle exceeds a positive or negative 45° angle from the horizon, and/or when the bank diverges from level flight in excess of 60°.

13. Repositioning Turns.

a. All military pilots and civilian holders of a statement of aerobatic competency card are permitted to perform repositioning turns using a maximum of 120 degrees of bank and 90 degrees of pitch when above 500 feet AGL and not over designated spectator areas or congested areas.

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

14. A control point must be established where the certificate holder or representative must direct the demonstration. This person must be continuously available to the GACA and is the person designated as responsible for the overall safety of the event.

15. A show line (man-made or natural) clearly visible to the performers/pilots must be provided to assist them in compliance with the approved distances from the spectator area(s). The show line will include a clearly visible show center marker and corner markers that are 150 meters beyond the spectator areas along the crowd line to provide reference to pilots entering or leaving the flying display area.

16. Except when authorized during takeoff or landing, aircraft that operate at speeds of 156 knots or less and certain other Category III aircraft may perform no closer than 150 meters horizontally from the spectator area[s]. Any single reciprocating-engine airplane with a maximum certificated takeoff mass of no more than 1000 kg (2,250 lbs.) is also a Category III aircraft.

**NOTE:** The dimensions of the aerobatic area for Category III aircraft may vary. It only needs to be large enough to provide sufficient space for Cat III performers to complete their aerobatic maneuvers within it. The only requirement that may not be altered is that the minimum distance from each side of this aerobatic area to the primary and secondary spectator areas respectively may not be less than 150 meters at any time.

17. Except when authorized during takeoff or landing, aircraft that operate at speeds of more than

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156 knots but 245 knots or less must perform aerobatic maneuvers no closer than 300 meters horizontally from a single spectator area. If two spectator areas are used, the show lines may be no less than 240 meters from one spectator area and no less than 300 meters from any other designated spectator area.

**NOTE:** The dimensions of the aerobatic area may vary. The aerobatic area only needs to be large enough to provide sufficient space for Cat II performers to complete their aerobatic maneuvers within it. The only requirement is that the minimum distance from each side of this aerobatic area to the primary and secondary spectator areas respectively may normally not be less than 300 meters. This distance may be reduced only on one side only of the Cat II aerobatic area to no less than 240 meters from either the primary or secondary spectator areas in accordance with the guidance provided in Table 11.2.1.2.

18. Except when authorized during takeoff or landing, aircraft that operate at speeds of more than 245 knots must perform aerobatic maneuvers no closer than 450 meters horizontally from a single spectator area. If two spectator areas are used, the show line may be no less than 365 meters from one of the designated spectator areas, and no less than 450 meters from any other designated spectator area. Single Cat I airplanes or the center of formation flights of Cat I airplanes must be centered on this show line (See Table 11.2.1.2).

**NOTE:** For reciprocating engine powered airplanes, these distances are predicated on true airspeed in straight and level flight at 75 percent power at standard temperature and pressure (15°C/sea level) and maximum certificated takeoff mass. For turbine engine powered airplanes, the distances are based on 85 percent of the maximum continuous powered straight and level flight true airspeed at standard temperature, pressure, and maximum certificated gross mass. Any turbine engine powered airplane for which valid performance data acceptable to the GACA is not available will be required to perform on or beyond the Category I show line.

19. Supersonic and/or trans-sonic speeds are prohibited. (GACAR § 91.507)

**NOTE:** This special provision should only be included if an aircraft scheduled in the event is capable of operating at supersonic and trans-sonic speed.

20. Adequate communication capability (electronic and visual) must be provided to maintain a safe operation, to control spectators, and to advise participants that the aerial demonstration has been halted or canceled.

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21. A crowd line consisting of a physical barrier and/or adequate policing must be provided to confine the spectators to designated areas. The spectator areas must have well defined lateral boundaries.

22. The demonstration must be halted for any reason that is in the interest of safety. It must also be halted when unauthorized aircraft enter the air show operations area, or when unauthorized persons or vehicles enter the area underlying the aerobatic maneuvering area. Only the minimum number of authorized persons necessary to support operations will be authorized in the operating areas. The holder of the Certificate of Authorization or Waiver assumes responsibility for persons who enter the operations area.

23. Aircraft engines must not be started and aircraft must not be taxied in designated spectator areas or static display areas unless adequate measures are taken to protect the spectators. Areas where engines and propellers will be turning must be at least 100 feet (30 meters) from the spectator area and areas where rotors are turning must be at least 200 feet (60 meters) from the spectator area. Areas where engines and propellers are turning that are protected by a physical barrier or guarded by wing-walkers, Marshalls, and crowd control monitors that will prevent entry by unauthorized personnel, must be at least 15 meters from the spectator area (see Table 11.2.1.3).

24. Flight demonstrations must not be conducted unless the ceiling is at least 1500 feet, and the visibility is at least 3 statute miles (5 km) at the time of the demonstration unless the IIC reduces the ceiling limitation to 1,000 feet AGL. If GACAR § 91.165 is waived, the cloud separation may be reduced to "Clear of Clouds" by the IIC. No other reductions in weather requirements must be made.

25. Aircraft maneuvers may not direct energy toward primary spectator areas. Certain related maneuvers and procedures, however, may be authorized as outlined below:

a. Non-aerobatic maneuvers where the aircraft is pointed at the primary spectator area are permitted as long as the aircraft is beyond the appropriate show line for category ( i.e. 150 meters for CAT III; 300 meters for CAT II, and 365 to 450 meters for CAT I) without energy towards the crowd considerations.

b. Aerobatic maneuvers conducted inside the aerobatic box that in the event of a catastrophic failure a part of the aircraft would contact the surface at or inside the primary

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spectator area between the corner markers are prohibited.

c. Aerobatic maneuvers that do not fit the description in 25(a) or 25(b) above require GACA approval.

d. Maneuvers on an oblique line that pass 150, 300, or 450 meters to either side of a spectator area as appropriate to the category of aircraft being flown during oblique aerobatic maneuvers.

26. For GACA-recognized or sanctioned military flight demonstration teams, approved maneuvers include level or climbing (normal rate) non-aerobatic flight over any spectator no less than 500 feet above the highest point in the primary spectator areas. All other performers must be at or above 1000 feet above the highest point in the primary spectator areas.

27. Any maneuver or speed approved by the GACA in the maneuvers package or contained in the GACA-accepted military order are permitted, if performed as approved. However, GACA may approve flight below 500 feet AGL over occupied buildings in the transition areas depicted in their maneuvers package for sanctioned military jet teams. Low altitude ingress and egress routes below 500 feet AGL other than the transition area require GACA IIC approval.

28. An arrival demonstration is not authorized unless an advance member of the military flight demonstration team has been briefed on the show line and pertinent special provisions of the waiver. This information must be relayed to the team leader before the arrival demonstration.

29. The following facilities must be provided and readily available at the demonstration site. [List the emergency and medical equipment or personnel that the sponsor and the IIC have agreed are needed, and include an emergency plan]

30. To alert non-participating aircraft, a closed field signal in the form of a large “X,” which is readily visible from 3,000 feet AGL, must be displayed on a prominent part of the aerodrome when the aerial demonstration is in progress. [This closed field signal is necessary at most uncontrolled aerodromes; but is usually not required at aerodromes which have an ATS control tower. Ensure the X is placed where it will not be a hazard to aircraft operating on the surface.]

31. The responsible person will ensure that roads and buildings under the specified aerobatic maneuvering area are devoid of vehicular and pedestrian traffic and/or persons.

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32. Spectator areas may not be closer than 150 meters from any takeoff and landing runway when the approach speed ( $V_{ref}$ ) of any aircraft exceeds 100 knots and/or for any aircraft that has a maximum certificated takeoff mass of more than 22,680 kg (50,000 pounds). Aircraft with both an approach speed ( $V_{ref}$ ) of 100 knots or less and a maximum certificated takeoff mass of 22,680 kg (50,000 pounds) or less must be required to use a runway that is at least 90 meters from the spectator area. If ALL aircraft and ultra-lights in an air show have approach speeds of less than 60 knots, and maximum certificated takeoff mass of less than 1,135 kg (2,500 pounds), and there is no excessive maneuvering during takeoff or landing, spectators may be as close as 60 meters to the takeoff or landing runway. The “flying farmer” or similar comedy routines that involve excessive non-aerobatic maneuvering immediately after takeoff or just before landing must also be separated from the spectator area by at least 150 meters. These distances can be measured to the runway centerline for single aircraft operations, in which case the aircraft are expected to operate on the runway centerline. For formation takeoffs/landings, this distance must be measured to the runway edge.

33. Aircraft equipped with operable ejection seats or jettisoned tanks must be identified as such to the event sponsor and on-site crash rescue services.

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

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

35. Upon request of the GACA, civil aircraft pilots must show evidence of performing or

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practicing their performance(s) within the previous 15 days.

**NOTE:** This evidence can be a logbook endorsement, a written statement or by noting this date on the waiver when signing the waiver at the show site. The required practice or performance must be in the aircraft and of the maneuvers that will be performed at this event.



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**CHAPTER 3. CERTIFICATE OF WAIVER FOR GACAR § 91.67(B) AND/OR (C)  
(MINIMUM SAFE ALTITUDES: GENERAL)**

**Section 1. Issue a Certificate of Waiver for GACAR § 91.67(b) and/or (c) (Minimum Safe Altitudes: General)**

**11.3.1.1. GACA ACTIVITY REPORT (GAR).**

**A. 1230 (OP)**

**11.3.1.3. OBJECTIVE.** The objective of this task is to determine whether or not an applicant is eligible for the issuance of a Certificate of Waiver of General Authority of Civil Aviation Regulation (GACAR) § 91.67(b) and/or (c) concerning minimum safe altitudes. Upon approval of the application, a General Authority of Civil Aviation (GACA) Certificate of Waiver, with attached special provisions will be issued to the applicant.

**11.3.1.5. BACKGROUND.**

**A. Definitions.**

- 1) *Congested and Densely Populated Areas.* Refer to Volume 4, Chapter 6, Section 3, Evaluate a Part 133 Congested Area Plan (CAP).
- 2) *Pipeline/Power Line Patrol.* Operation of an aircraft in order to locate leaks or breaks in a pipeline or power line.
- 3) *In the Public Interest.* Operations conducted by, or for, the government of the Kingdom of Saudi Arabia (KSA) for the purpose of conservation, wildlife preservation, pipeline or power line patrols or other special purpose operations.

**B. Authority.** GACAR § 91.611 provides for the issuance of a waiver to GACAR § 91.67(b) and/or (c).

**C. Examples.** Examples of waivers of GACAR § 91.67(b) and/or (c), are pipeline/power line patrol, and low-level thermography flights.

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**D. Regulations That May Not Be Waived.** GACAR § 91.67(a) shall not be waived.

**E. Eligibility.** Operators of standard or restricted category aircraft may apply for a Certificate of Waiver to engage in pipeline/power line patrol operations.

**F. Submission.** Completion and submission of the application is the responsibility of the applicant. A completed application should be submitted to the GACA a minimum of 45 days before the planned operation begins.

**G. Approval or Denial.** Within 30 days of receipt of the application, a Certificate of Waiver or the disapproval of the application must be issued by the GACA.

**H. Expiration Date.** A Certificate of Waiver expires no later than 24 calendar-months from the date of issuance. A Certificate of Waiver may be reissued after the submission of a properly prepared application, and if appropriate, the applicant's previously approved operations manual.

### 11.3.1.7. WAIVER OF GACAR § 91.67(b).

**A. Inspector Considerations.** There are three basic points that an Aviation Safety Inspector (Inspector) should consider before processing a request for a waiver of GACAR § 91.67(b):

- 1) Is the waiver request in the public interest?
- 2) Can the operation be conducted with an equivalent level of safety?
- 3) What special provisions are necessary to ensure this adequate safety margin?

**B. Evaluation of the Application.** The applicant should describe in detail the proposed operation and specify the altitude essential to accomplish the operation. When issuing the waiver, the altitude requested should be an absolute minimum but may not be less than 500 ft (150 m) from persons or property unless necessary to safeguard human life (see paragraph 11.1.4.13, Minimum Safe Distances and Altitudes). Operations involving flights in airspace requiring two-way communication should be coordinated with the appropriate air traffic service (ATS) unit.

**C. Special Provisions.** For clarity, special provision guidelines are divided into single-engine and multiengine operations.

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1) *Single-engine Aircraft*. The minimum altitude permitted in the waiver must comply with GACAR § 91.67(a). This may be accomplished by requiring specific routes and altitudes as necessary to ensure the aircraft could reach a safe landing area in the event of engine failure. If specific routes and altitudes are used, they should be depicted on a chart. The waiver should be limited to day visual flight rules (VFR) operations only.

2) *Multiengine Aircraft*. If the aircraft is operated at weights that allow it to climb with the critical engine inoperative consistent with terrain but not less than 50 feet per minute, specific routes and altitudes are not required. At its discretion, the GACA may waive day and night VFR, as applicable.

### 11.3.1.9. WAIVER OF GACAR § 91.67(c).

**A. Minimum Separation Distance.** Unless it is necessary to safeguard human life or it can be determined to be in the public interest and contributing to the public health, welfare, and safety, the 500 ft (150 m) minimum separation distance from persons on the surface shall not be waived. Issuances of waivers to safeguard human life are discussed in subparagraph 11.3.1.9B below. Issuance of waivers determined to be in the public interest are discussed in subparagraph 11.3.1.9C below.

**B. Waivers Issued To Safeguard Human Life.** For waivers issued to safeguard human life, the applicant should be required to identify a minimum altitude or proximity that permits accomplishment of the operation. The minimum requested should be the absolute minimum permitted. In addition:

1) *Single-engine Aircraft*. These aircraft should be prohibited from flying directly at or over persons on the surface and, when operating in close proximity to persons on the surface, it must always be possible to comply with GACAR § 91.67(a) without excessive maneuvering.

2) *Multiengine Aircraft*. These aircraft should be limited to weights that allow it to climb with the critical engine inoperative consistent with terrain but not less than 50 feet per minute. If this is not possible, the multiengine aircraft should be treated in the same manner as single-engine aircraft.

**C. Waivers Issued in the Public Interest.** Operators determined to act in the public interest, may be authorized to operate closer than 500 ft (150 m), but in no case closer than 200 ft (60 m), to

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persons on the surface. Waivers issued in accordance with this paragraph are limited to operators certificated to operate under GACAR Parts 121, 133 or 135 and require the development of suitable procedures in the certificate holder's Operations Manual.

**D. Special Provisions.** Depending upon the type of operation involved, it may be necessary to prescribe numerous and detailed special provisions. The following are special provisions which should be shown on every waiver, along with any additional provisions considered necessary by the GACA:

- 1) Operations are limited to VFR day only.
- 2) Unless authorized in the Operations Manual, intentional flight at less than 500 ft (150 m) directly over persons on the surface is prohibited. In addition, the aircraft may not be flown along a path that would require excessive maneuvering to avoid persons on the surface in the event of an emergency.
- 3) Unless authorized by in the Operations Manual, the terms of the waiver are limited to within 400m of the authorized route or operating area, except that no community should be overflown below 500 ft (150 m) or at less than 1000 ft (300 m) over the congested areas of a municipality.
- 4) Operations under this waiver are limited to the pilots listed on the Certificate of Waiver or the Operations Manual.
- 5) In the event of an emergency (the known or suspected rupture of a gas pipeline, flood, storm, etc.) requiring immediate action, the waiver holder may use pilot personnel without compliance with either the initial or annual check requirements. However, within 7 days of the time this emergency use is exercised, the waiver holder should notify the GACA that such action was taken.
- 6) Except when necessary to safeguard human life, no operation should be conducted in closer proximity to persons on the surface than authorized by this waiver.

**E. Other Waivers of GACAR § 91.67(c).** A waiver for operations other than for the purpose of safeguarding human life or in the public interest should prohibit flight closer than 500 ft (150 m) of any vessel, vehicle, or building on the surface unless the pilot takes reasonable action to determine that they are not occupied by persons at the time of the operation.

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**F. Operations Manual.** If GACAR § 91.67(c) is to be waived for certificate holders operating under GACAR Parts 121, 133 or 135 because it has been determined to be in the public interest, the applicant must submit a revision to their Operations Manual (OM) to the Principal Operations Inspector (POI) for acceptance. Operating and safety procedures associated with operations below the minimum safe altitudes prescribed by GACAR § 91.67(c) must be incorporated in the OM. Once accepted by the GACA, the OM becomes a part of the special provisions for the Certificate of Waiver. The OM is the standard by which a waiver holder must conduct all operations pursuant to the Certificate of Waiver. The controls, procedures, and conditions set forth in the OM are the primary assurance that persons on the surface will not be jeopardized. This becomes the basis for issuance of the Certificate of Waiver. Therefore, failure to comply with the provisions of the OM may be considered non-compliance with the terms of the waiver and may constitute justification for cancellation of the waiver.

**G. Operations Manual Revisions.** Inspectors should encourage operators to discuss OM revisions with the POI before they are submitted for acceptance. Revisions should not be distributed by the operator until accepted by the GACA and returned to the operator with signature and date. If the revisions are not acceptable, notify the operator in writing within 10 days of receipt of the revisions at the GACA Office.

**11.3.1.11. CONTENTS OF THE OPERATIONS MANUAL.** In addition to the required OM contents as prescribed in GACAR Parts 121, 133 and 135, the OM must include, but is not limited to, the following additional information to support the operations below the minimum safe altitudes prescribed by GACAR § 91.67(c) and addressed under the Certificate of Waiver:

**A. Pilots to be Used.** This section should contain a list of pilots to be used, including their pilot certificate numbers, grade, and class and date of medical.

**B. Aircraft to Be Used.** This section should contain a list of aircraft by make and model.

**C. Area of Operations.** There may be a wide variety of operational needs. Some can be identified as specific patrol routes, whereas others may involve open water or forest areas of an entire state. The following information should be provided, as appropriate.

1) *Specific Routes (Power line/Pipeline Rights of Way).* The manual must contain each route depicted in either cartographic or photographic form. The depiction must identify each community, settlement, stadium, or other common gathering place located within a 400

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m on either side of the route. The depiction should include additional information regarding the location of hazardous power or phone lines or other obstructions requiring altitudes in excess of the minimums prescribed in the waiver.

2) *Large Area Routes*. Manuals developed by operators needing a broad area waiver should clearly describe the land or water areas where the privileges of the waiver are to be exercised. This may be in the form of a provincial map with operational areas depicted or a description of operational areas, i.e., open water areas and sparsely populated areas where wildlife preservation operations are to be conducted. It is especially important that the operator provide pilots with sufficient information to know when the privileges of the waiver apply and when they must be in full compliance with GACAR § 91.67(b) and/or (c).

**D. Flight Operations.** The operations manual should contain a flight operations section covering information necessary to ensure compliance with the waiver and include at least the following:

1) *Weather Conditions*. Operations are limited to VFR.

2) *Operations in Airspace Requiring Two-Way Communication*. The terms of the waiver may not be exercised in airspace requiring two-way communication unless authorization for the flight has been obtained from the appropriate air traffic service unit.

3) *Operations Within 500 Feet (150 m) of Persons*. GACAR § 91.67(c) prohibits operations directly over persons on the surface at less than a 500 ft (150 m) altitude. When operations at less than a 500 ft (150 m) altitude or a 500 ft (150 m) lateral clearance from persons are desired, procedures must be approved by the GACA that include approach and departure paths, emergency procedures to be used, and the pattern and altitude that permits the aircraft, if single-engine, to land in an emergency without endangering persons or property on the surface. Additionally, the aircraft flight path must be such that it does not necessarily pass directly over persons on the surface in the event of an emergency. The trajectory of the aircraft must pass to one side or the other of any persons on the surface.

4) *Entry/Departure Paths*. All normal entry and departure paths to and from the waived flight paths should be charted and available to the pilot.

**E. Pilot Personnel—Minimum Requirements.** The operator should establish and specify the minimum pilot requirements. Minimum requirements should meet or exceed the following:

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- A current commercial pilot certificate with ratings appropriate to the category and; class aircraft to be used under the terms of the waiver
- At least 500 hours as pilot in command (PIC) logged
- A minimum of 100 hours in the category and class of aircraft to be used
- A minimum of 5 hours in the make and model aircraft to be used under the waiver

**F. Initial Checkout.** The manual must provide that each pilot be route qualified and have his logbook endorsed as such by a chief pilot. The endorsement must be made by the chief pilot, although another qualified pilot may give the initial checkout. In addition to route qualification, each pilot must satisfactorily demonstrate knowledge in the following:

- Route familiarization
- Aircraft performance and limitations
- Emergency procedures
- Operations manual
- Terms and conditions of the waiver

**G. Annual Check.** The chief pilot should examine each pilot at least once each 12 calendar months. The examination should consist of an oral and practical test that covers the subject areas for the initial checkout.

**H. Pilot Notices.** The applicant must develop a procedure to notify all pilots of special circumstances such as the avoidance of noise-sensitive areas, changes of operating procedures, etc.

### 11.3.1.13. PREREQUISITES AND COORDINATION REQUIREMENTS.

**A. Prerequisites.** This task requires knowledge of the regulatory requirements of GACAR Part 91, GACA policies, and qualification as an Inspector (Operations).

**B. Coordination.** This task may require coordination with Inspectors from the Airworthiness



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Division or with appropriate Air Traffic Service (ATS) units.

### 11.3.1.15. REFERENCES, FORMS, AND JOB AIDS.

#### A. References:

- GACAR Part 1, 61 and 91

#### B. Forms.

- Certificate of Waiver
- GACA Activity Report (GAR)

#### C. Job Aids.

- Figure 11.3.1.1, Sample Letter of Disapproval of an Application
- Figure 11.3.1.2, Minimum Safe Altitude Waiver and Facility Inspection Job Aid
- Figure 11.3.1.3, Sample Letter of an Unsatisfactory Inspection

### 11.3.1.17. PROCEDURES.

**A. Initial Contact.** Advise the applicant that the completed application must be submitted in duplicate (the original and one copy) to the GACA at least 45 days before planned operations begin. If GACAR § 91.67(c) is to be waived in the public interest advise the applicant that any required amendment to the Operations manual must be prepared and submitted with the completed application.

**B. GACA Activity Report (GAR).** Make appropriate GAR entries.

**C. Review Application.** Review the information provided by the applicant to ensure all pertinent information for the proposed operation is provided.

1) *Name of Organization/Name of Responsible Person.* Ensure that the applicant has indicated the name of the organization or individual applying and the name of a person responsible for matters concerning the application. If the applicant is a representative of an



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organization, the organization's name should appear. The name of the individual and his position or authority to represent the organization (e.g., the "responsible person") should appear.

2) *Permanent Mailing Address*. Ensure that the applicant indicates the permanent mailing address of the organization or individual.

3) *GACAR Sections to be Waived*. Ensure that the applicant has listed all sections of the regulations that need to be waived. In many instances the applicant does not know or is not sure which sections of the regulations are involved. A conference with the applicant before acceptance of the application may be necessary.

4) *Description of Operations*. Ensure that the applicant has indicated the type of operation to be conducted. It is sufficient for the applicant to use the terms "pipeline patrol," "power line patrol," "aerial surveying," "patrolling," or "weather control," to describe the type of operation. However, the applicant should include detailed information on the type of operation.

5) *Area of Operations*. Ensure that the applicant has included a detailed description of any routes near any municipality, government, or province over which operations are conducted. For power line/pipeline operations, the routes must be depicted in cartographic or photographic form. This depiction should include every community, settlement, stadium, or other common gathering place located to either side of the route. The depiction should also include the areas where power lines and phone lines or any other obstructions cross the route.

a) Ensure that the applicant has listed specific locations and altitudes of the proposed operation.

b) Ensure that the area of operation is appropriate for the requested operation.

6) *Time Period*. In instances involving one-time operations where the applicant has not indicated an alternate date, the Inspector should advise the applicant to request alternate dates in order to save time and unnecessary paperwork.

a) Ensure that the applicant has included a beginning date and hour and an ending date and hour for the planned operation.

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b) Ensure that the requested dates do not exceed 24 calendar-months.

7) *Aircraft and Pilots*. Check for aircraft make and model, pilot names, certificate numbers and ratings, and full home addresses. At the time the application for a waiver is submitted, the applicant may not know the names of the pilots or the aircraft to be used in a particular operation.

8) *Certification*. Ensure that the applicant has signed and dated each page of the application.

**D. Process Application.**

1) *If the application has not been completed:*

a) Prepare a letter of disapproval of an application (Figure 11.3.1.1) with a suspense date for submission of a corrected application.

b) Retain a copy of the application for future comparison.

c) Return the application, the operations manual (if appropriate), any supporting documentation, and the letter of disapproval to the applicant.

d) Make the applicable GAR entries.

2) If the application has been completed, continue with the task.

**E. Review the Proposed Operations Manual (if Required).** Review the operations manual to ensure that the manual contains the items discussed in paragraph 11.3.1.11 of this section.

1) If the manual is unsatisfactory:

a) Prepare a letter of non-acceptance with a suspense date for submission of a corrected operations manual.

b) Retain a copy of the manual for future comparison.

c) Return the application, the disapproved operations manual, any supporting

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documentation, and the letter of non-acceptance to the applicant.

- 2) If the manual is satisfactory, prepare a letter of acceptance of the operations manual and update OpSpec A7 as applicable.
- 3) Continue with the task.

### **F. Pre-Inspection Activities.**

- 1) Contact the applicant by telephone and/or letter to set up a date and time to conduct the facility inspection.
- 2) Coordinate with the Airworthiness Division to inspect aircraft and engine logbooks, the aircraft mass and balance to see if it has been revised to reflect current equipment, and any special equipment for proper mount or installation (cameras, gas leak detector devices, device for power line voltage readout, etc.).
- 3) If a restricted category aircraft will be used, coordination with the Airworthiness Engineering Section of the Airworthiness Division may also be needed.

**G. Conduct Facility Inspection.** Use the Minimum Safe Altitude Waiver and Facility Inspection Job Aid (Figure 11.3.1.2) to conduct the facility inspection.

- 1) Check pilot certificate and medicals.
- 2) Check pilot logbooks for the appropriate en route endorsements.
- 3) Ensure that the registration certificate and the airworthiness certificate, as well as a copy of the special operating limitations (restricted category), are on board the aircraft.

### **H. Unsatisfactory Inspection.**

- 1) Brief the operator on the discrepancies found during the inspection.
- 2) Prepare a letter of unsatisfactory inspection (Figure 11.3.1.3). Include in the letter a date for a follow-up inspection that is 15 days from the date of the letter of disapproval.
- 3) Retain a copy of the application to use in the follow-up inspection to ensure that

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discrepancies found in the initial inspection are corrected.

- 4) Return the application, the operations manual, any supporting documentation, and the letter of disapproval to the applicant.
- 5) Make appropriate GAR entries.
- 6) Perform follow-up inspection.

### **I. Satisfactory Inspection.**

- 1) Prepare the Certificate of Waiver.
- 2) Develop any special provisions from paragraph 11.3.1.7 of this section, and any other provisions deemed necessary in the interest of safety.
- 3) If the area of operations indicates that the operator will conduct operations outside the area requested in the application, the following shall be included as a special provision: “Operations outside the area of operations authorized in this waiver may be conducted without obtaining an additional certificate of waiver, provided the operations are coordinated in advance with GACA.”
- 4) Submit the Certificate of Waiver to the Manager, Flight Operations Division for approval.

**J. GACA Office File.** Prepare an office file on the operator that includes, but is not limited to, a copy of the following:

- Certificate of Waiver and any special provisions
- Application
- Letter of disapproval of the application, if applicable
- Letter of non-acceptance of the operations manual, if applicable
- Accepted operations manual

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- Letter indicating an unsatisfactory facility inspection, if applicable
- Completed job aid
- Any other documents of correspondence

**K. Waiver Distribution.**

1) Send the originals of the following documents to the applicant:

- Certificate of Waiver and any special provisions
- The letter of acceptance of the operations manual

2) Retain a copy of the Certificate of Waiver and its associated provisions in the office operator file.

**L. Complete the GAR.**

**11.3.1.19. TASK OUTCOMES.** Completion of this task results in one or more of the following:

- A Certificate of Waiver is issued
- Letter of disapproval of an application
- A completed Minimum Safe Altitude Waiver and Facility Inspection Job Aid
- A letter indicating the non-acceptance of an operations manual
- A letter indicating an unsatisfactory facility inspection
- Letter indicating acceptance of an operations manual

**11.3.1.21. FUTURE ACTIVITIES.**

- Reissue a Certificate of Waiver
- Cancellation of a Certificate of Waiver

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- Review revisions to Operations Manual
- Possible follow-up facility inspection
- Possible non-compliance investigation

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**Figure 11.3.1.1. Sample Letter of Disapproval of an Application**

GACA Letterhead

[Date]

[Applicant's name and address]

Dear [applicant's name]:

This letter is to inform you that the application you submitted on [indicate date] has been disapproved for the reasons listed below:

- [list deficiencies]

Please make the corrections noted and return to the GACA Office within 15 days of receipt of this letter.

If you have any questions or comments, please feel free to contact the GACA at the following telephone number [indicate number].

Sincerely,

[Inspector's signature]

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Figure 11.3.1.2. Minimum Safe Altitude Waiver and Facility Inspection Job Aid

OPERATOR \_\_\_\_\_  
 LOCATION \_\_\_\_\_  
 DATE COMPLETED \_\_\_\_\_

CHECK	S	U	N/A
GACA Office:			
1. Review application, determine if Operations Manual is required.			
2. If not, see a., if yes, see b., below.			
a. Brief applicant on:			
(1) Route map, approach/departure paths for single engine			
(2) Pilot experience requirements for:			
▪ Initial/annual training			
▪ Training records			
▪ Chief pilot duties			
(3) Aircraft category requirements restricted category operating limitations and possible waiver			
(4) Controlled airspace operations			
(5) Pilot notification procedures in the event of special circumstances.			
b. Issue guidance for Operations Manual development			
3. Review Operations Manual:			
a. Minimum altitude			
b. Area of operation depicts settlements, power lines, etc.			
c. Aircraft notification			
d. Aircraft inspection program			
e. List of personnel; experience; ratings; fulfills hours requirements; pilot training program			
f. Flight Operations; VFR: flight under 500 feet AGL; flight in controlled airspace; entry and departure paths; special circumstances			



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g. Procedures to safeguard human life			
h. Manual status; control page, revision page, changes to manual			
i. List of Special Provisions			
4. Determine applicable “standard” special provisions			
5. Base Inspection			
a. Review pilot records/certificates			
(1) Certificate type			
(2) Medical			
(3) Training records			
(4) Route map – ingress/egress routes			
(5) Special equipment			
6. Develop additional special provisions as needed			

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**Figure 11.3.1.3. Sample Letter of an Unsatisfactory Inspection**

GACA Letterhead

[Date]

[Applicant's name and address]

Dear [applicant's name]:

This letter is to inform you that the following discrepancies were found during the facility inspection on [indicate date]:

[List discrepancies]

Please make corrections of the noted discrepancies within 15 days of receipt of this letter. Please notify this office when corrections may be made so that a follow-up inspection can be scheduled. If you have any questions or comments, please feel free to contact me at the following telephone number [indicate number].

Sincerely,

[Inspector's signature]

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**CHAPTER 4. SAFETY PROGRAMS FOR THE PREVENTION OF THE  
PROBLEMATIC USE OF PSYCHOACTIVE SUBSTANCES**

**Section 1. Evaluate Education and Prevention Programs under GACAR Part 7**

**11.4.1.1. GACA ACTIVITY REPORT (GAR).**

A. TBD

**11.4.1.3. OBJECTIVE.** This objective of this task is to evaluate the education and prevention programs for the problematic use of psychoactive substances as required under GACAR Part 7. Programs that meet the requirements of GACAR Part 7 are accepted by the President and the acceptance is recorded in operations specification (OpSpec) A98.

**11.4.1.5. BACKGROUND.** Until such time as more detailed guidance material is developed, aviation safety inspectors (ASI) should consult the ICAO *Manual on Prevention of Problematic Use of Substances in the Aviation Workplace* (Doc. 9654) for further details on the attributes of education and prevention programs that meet the intent of GACAR Part 7.

**11.4.1.7. PREREQUISITES AND COORDINATION REQUIREMENTS.** This content is still to be developed.

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**CHAPTER 5. MODEL AIRCRAFT**

**Section 1. General Information**

**11.5.1.1. GACA ACTIVITY REPORT (GAR).**

A. TBD

**11.5.1.3. OBJECTIVE.** This content is still to be developed.

**11.5.1.5. BACKGROUND.** This content is still to be developed.

**11.5.1.7. PREREQUISITES AND COORDINATION REQUIREMENTS.** This content is still to be developed.

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**CHAPTER 6. UNMANNED AIRCRAFT SYSTEMS**

**Section 1. General Information**

**11.6.1.1. BACKGROUND.** This content is still to be developed.

**11.6.1.3. PREREQUISITES AND COORDINATION REQUIREMENTS.** This content is still to be developed.

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**CHAPTER 7. ARTICLE 83 BIS AGREEMENTS**

**Section 1. General Information**

**11.7.1.1. BACKGROUND.** This content is still to be developed.

**11.7.1.3. PREREQUISITES AND COORDINATION REQUIREMENTS.** This content is still to be developed.