

**BY ORDER OF THE  
SECRETARY OF THE AIR FORCE**

**AIR FORCE MANUAL 11-246,  
VOLUME 7**



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***Flying Operations***

***AIRCRAFT DEMONSTRATIONS  
(SAILPLANES)***

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This manual implements Air Force Instruction (AFI) 11-209, *Participation in Aerial Events*, to provide procedures for Air Force performance of sailplane aircraft demonstrations. This publication applies to all Regular Air Force and federal civilian employees conducting sailplane demonstrations. With the exception of associate instructor pilot personnel, this publication does not apply to the Air Force Reserve and Air National Guard. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*. This publication may be supplemented at any level, but field units below the Major Command-level must route supplements to the applicable Major Command Standardization and Evaluation office for coordination prior to certification and approval. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the requestor's commander for non-tiered compliance items.

## ***SUMMARY OF CHANGES***

This document has been substantially revised and needs to be completely reviewed. Major changes include replacing the categories of Sportsman and Intermediate with new categories known as Level 2 and Level 3. This revision also converts the publication from AFI to Air Force Manual, eliminates duplicate information and updates the tier waiver authorities.

### **1. Introduction.**

1.1. This publication provides specific maneuvers, sequences, and parameters governing the execution of sailplane aerial demonstrations. In this publication, consider all sailplanes the same type aircraft.

1.2. Federal Aviation Administration Order 8900.1, *Flight Standards Information Management System*, Volume 3, *General Technical Administration*, provides additional guidance when the Federal Aviation Administration issues a certificate of waiver or authorization for an aviation event.

### **2. Roles and Responsibilities.**

#### **2.1. Wing Commanders (or equivalent) will:**

2.1.1. Certify demonstration pilots. **(T-3)**. Wing Commanders will not delegate this responsibility. **(T-2)**. **Exception:** Demonstration profile 5 does not require a demonstration pilot certification.

2.1.2. Provide an appropriate ground crew to recover and ground handle sailplanes at the landing site. **(T-3)**.

#### **2.2. Demonstration Pilots will:**

2.2.1. Cancel any demonstration when the assigned performance location compromises safety or exceeds aircraft performance capabilities. **(T-3)**.

2.2.2. For off-station demonstration sites, accomplish either a practice demonstration or aerial survey prior to the demonstration. **(T-3)**. Demonstration pilots may only delegate this responsibility to another certified demonstration pilot. **(T-2)**.

2.2.3. Complete the pre-demonstration briefing using **Attachment 2**. **(T-3)**.

### **3. Suggesting Profile Changes:**

3.1. Unit commanders may not authorize profile changes for actual demonstrations. **(T-2)**.

3.2. Units will submit suggested profile changes or additional profiles in the same format as the profiles in **Attachment 3**. **(T-3)**. Wing commanders may authorize certified demonstration pilots to practice and evaluate proposed profile changes prior to submitting a change proposal.

**4. Demonstration Pilot Training and Certification.** Units will train and certify demonstration pilots as Level 2 and Level 3 aerobatic pilots before wing commander (or equivalent) certification as demonstration pilots. **(T-2)**. AFMAN 11-2Sailplane, Volume 1, *Sailplane Aircrew Training*, specifies aerobatic pilot training requirements. Units may specify additional training requirements before demonstration pilot certification.

**5. Demonstration Profiles.** **Attachment 3** defines the standard sailplane demonstration profiles. This publication derives sailplane demonstration maneuvers from the International Aerobatic Club official contest rules (available for International Aerobatic Club members at <https://www.iac.org/download-contest-rules> and the *Aresti System Glider Aerobatic Figures Catalog* available at: <http://www.arestisystem.com>, or a Major Command-approved aerobatic training program.

5.1. The demonstration profiles in **Attachment 3** require either Level 2 or Level 3-certified demonstration pilots, as indicated. **(T-2).**

5.2. Each profile includes approved maneuvers and the sequence in which the demonstration pilot performs them.

5.3. Pilots will not alter approved demonstration profiles unless necessary due to safety or weather considerations, except as follows:

5.3.1. Pilots will maintain final glide distance to an appropriate landing site. **(T-2).**

5.3.2. Pilots may adjust minimum altitudes upwards based on current atmospheric conditions to maintain final glide distance.

5.3.3. If the pilot does not meet the entry conditions for any maneuver, the pilot will execute a wings-level pass and reattempt the maneuver entry or transition to the next maneuver. **(T-2).**

5.3.4. Pilots will not make up for maneuvers not accomplished in the prescribed sequence. **(T-2).**

5.3.5. This publication describes demonstration sequences so the pilot performs each maneuver in the same direction with respect to the wind. As a result, the pilot may orient the demonstration in any of four directions, depending on the wind and the crowd line, without considering it a profile change.

5.3.6. This publication describes demonstration profiles designed to fit in a minimum aerobatic box of dimensions 3,300 feet long by 3,300 feet wide by 4,500 feet tall. Pilots may increase the height of the aerobatic box to accommodate all maneuvers in the profile. Pilots may also increase the lateral boundaries of the box for specific demonstrations; however, the pilot may not compromise the minimum show line distances. **(T-2).**

5.3.7. The pilot may modify maneuver entries and recoveries; however, the pilot will not point the energy vector at the primary spectator area. **(T-2).** **Exception:** The pilot may direct the energy vector towards the primary spectator area during positioning and high-speed pass non-aerobatic maneuvers; however, the pilot will keep the aircraft beyond the show line described for the event. **(T-2).**

5.4. The pilot will ensure each demonstration complies with the following weather requirements:

5.4.1. The minimum weather for a demonstration is a ceiling at least 3,500 feet above ground level, 5 miles of visibility, and a discernible horizon. **(T-2).**

5.4.2. The minimum weather for a high-speed pass is a ceiling at least 1,500 feet above ground level and 3 miles of visibility. **(T-2).**

5.5. Pilots will not perform aerobatics below to their certified aerobatic altitude, or below the airspace approved for aerobatics, whichever is higher. **(T-2)**.

MARK D. KELLY, Lt Gen, USAF  
Deputy Chief of Staff, Operations

## Attachment 1

## GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

**References**

AFPD 11-2, *Aircrew Operations*, 31 January 2019

AFI 11-209, *Participation in Aerial Events*, 22 May 2018

AFMAN 11-2SailplaneV1, *Sailplane Aircrew Training*, 18 February 2020

AFI 33-360, *Publications and Forms Management*, 1 December 2015

AFMAN 33-363, *Management of Records*, 1 March 2008

Federal Aviation Administration Order 8900.1, *Flight Standards Information Management System*, Volume 3, *General Technical Administration* (<http://fsims.faa.gov/>)

*Aresti System Glider Aerobatic Figures Catalog* (<http://www.arestisystem.com>)

*International Aerobatic Club Official Contest Rule Book* (<https://www.iac.org/download-contest-rules>)

**Adopted Forms**

AF Form 847, *Recommendation for Change of Publication*

**Abbreviations and Acronyms**

AGL—Above Ground Level

KIAS—Knots Indicated Airspeed

**Terms**

**Aerotow**—A sailplane takeoff and climb process where a powered aircraft tows the sailplane through the air.

**Crowd Line**—A physical barrier or a line marked on the ground, which, with added policing, serves as a restraining line. The event host places the crowd line a specified distance from the show line. The barrier must prevent spectators or other nonparticipants from encroaching upon the show line.

**Demonstration pilot**—A pilot trained and certified to perform aerial demonstrations.

**Demonstration profile**—A description of the approved maneuvers and the sequence in which the pilot performs them during an aerial demonstration.

**High-speed pass**—A flyover maneuver designed to position a sailplane in front of the crowd to facilitate taking photographs.

**International Aerobatic Club**—Civilian organization that acts as the governing body in concurrence with the Federal Aviation Administration to establish rules and procedures for powered and non-powered aerobatics.

**Level 2 Aerobatic Maneuvers**—Aerobatic maneuvers flown in International Aerobatic Club competitions within the Level 2 competitive category.

**Level 3 Aerobatic Maneuvers**—Aerobatic maneuvers flown in International Aerobatic Club competitions within the Level 3 competitive category.

**Show Line**—A prominent, readily visible ground reference such as a river, runway, taxiway, canal, breakwater, road, or any straight line that enhances pilot orientation during aerobatic routines.

**Attachment 2****PRE-DEMONSTRATION BRIEFING GUIDE****A2.1. General:**

- A2.1.1. Time hack.
- A2.1.2. Call signs and tail numbers.
- A2.1.3. Weather and status (takeoff, enroute, recovery, landing, alternates).
- A2.1.4. Notice to airmen review.
- A2.1.5. Mission overview.
- A2.1.6. Demonstration area and show layout. (Review site survey data, if applicable.)
- A2.1.7. Go/no-go (currencies, duties not including flying, flight crew information file, and read files).
- A2.1.8. Flight authorization and approval.
- A2.1.9. Spare procedures.

**A2.2. Takeoff, Aerotow, Departure:**

- A2.2.1. Tow hookup.
- A2.2.2. Takeoff and abort procedures.
- A2.2.3. Departure direction and holding.
- A2.2.4. Release procedures and altitude.

**A2.3. Demonstration Profile:**

- A2.3.1. Profile start parameters.
- A2.3.2. Profile maneuver parameters.
- A2.3.3. Minimum maneuver and recovery altitudes.
- A2.3.4. Maneuver aborts and repositions.
- A2.3.5. Mandatory radio calls.

**A2.4. Arrival:**

- A2.4.1. Traffic entry.
- A2.4.2. Pattern and landing.

**A2.5. Abnormal Procedures:**

- A2.5.1. Abort procedures.
- A2.5.2. Bailout or forced landing.
- A2.5.3. Weather transition plan.
- A2.5.4. Emergencies.

A2.5.5. Aerial Control Team termination procedures.

**A2.6. Debrief.**



### Attachment 3

#### DEMONSTRATION PROFILES

**A3.1. Demonstration Profile 1 – Level 3 Category.** Figure A3.1 depicts Demonstration Profile 1 for Level 3 Category. The profile includes the following maneuvers in sequence:

A3.1.1. Half roll to inverted.

A3.1.2. 30 degree inverted upline.

A3.1.3. 1 ¼ turn Inverted Spin.

A3.1.4. Hammerhead.

A3.1.5. Pull to vertical up, ¼ roll to ¾ P-Loop.

A3.1.6. Half Cuban.

A3.1.7. Cloverleaf with a 1/4 turn on the up line, 2 seconds on inverted Y-Axis and a 1/4 turn on the down line.

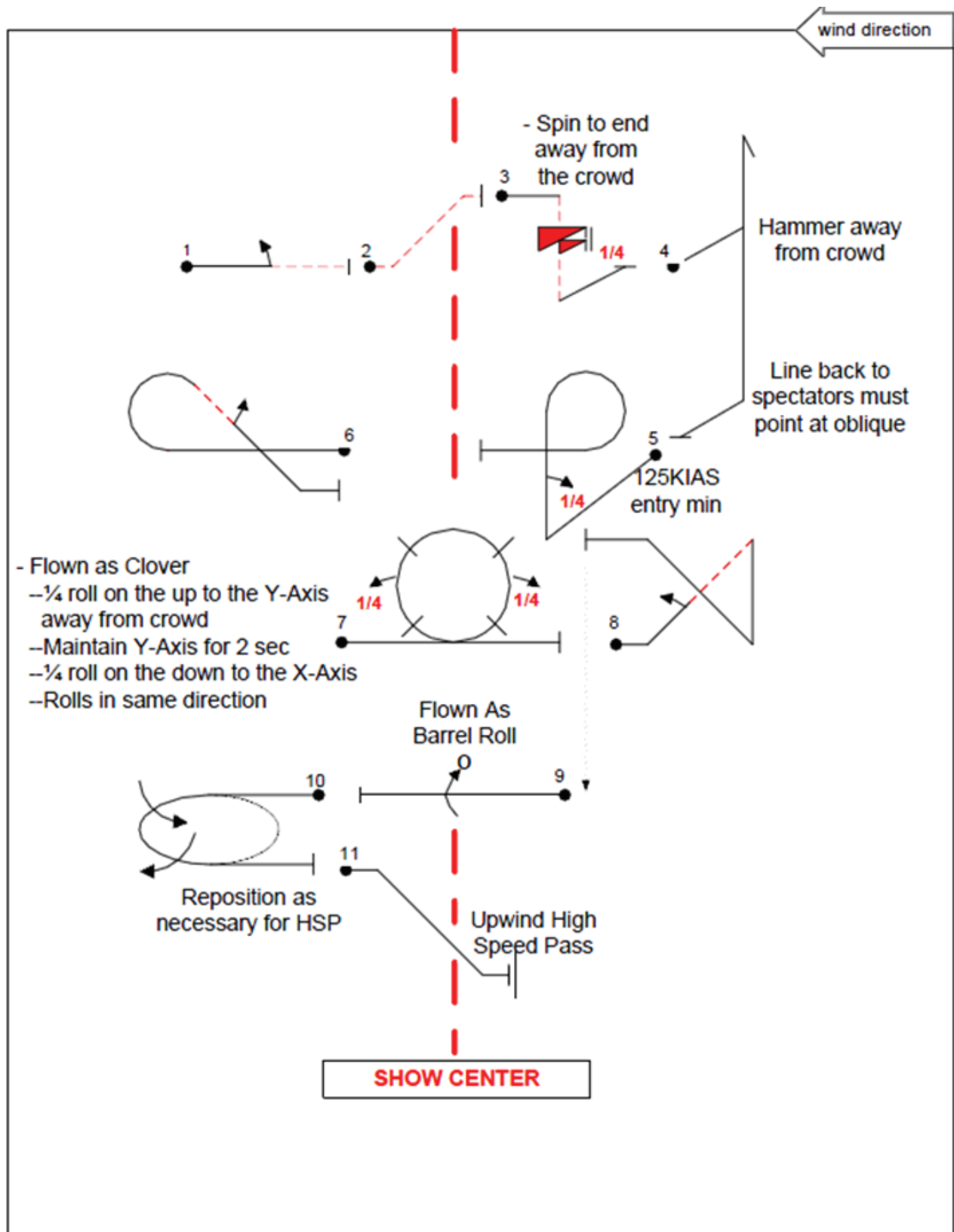
A3.1.8. Bow Tie.

A3.1.9. Barrel Roll.

A3.1.10. 180-degree inside/outside rolling turn.

A3.1.11. Repositioning as necessary to High-speed Pass.

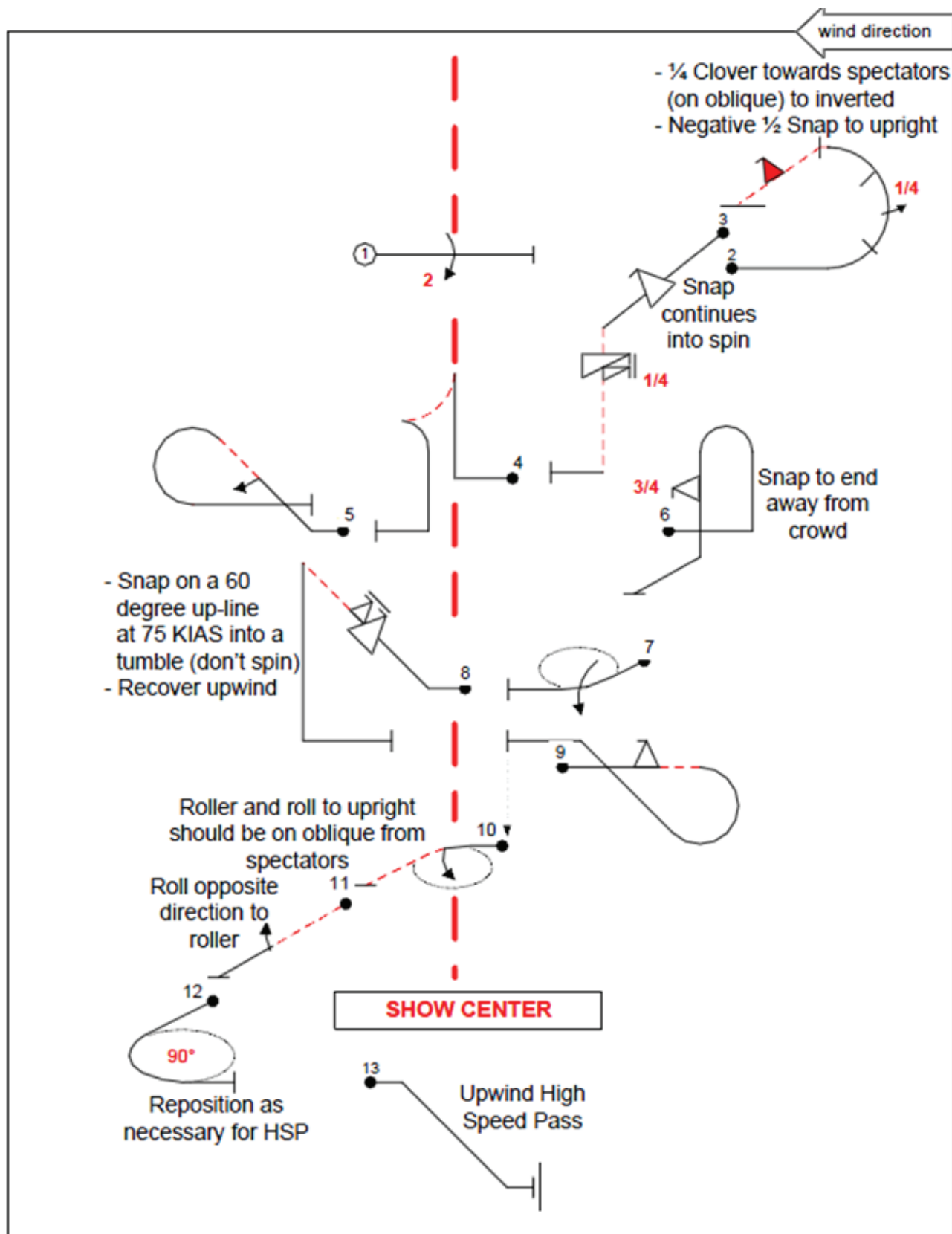
Figure A3.1. Demonstration Profile 1 – Level 3 Category.



**A3.2. Demonstration Profile 2 – Level 3 Category.** Figure A3.2 depicts Demonstration Profile 2 for Level 3 Category. The profile includes the following maneuvers in sequence:

- A3.2.1. Two-point roll.
- A3.2.2. One quarter cloverleaf with a turn on the up line to a negative  $\frac{1}{2}$  snap to upright.
- A3.2.3. Full positive snap developing into a  $1\frac{1}{4}$  turn upright spin.
- A3.2.4. Wheels-up tail slide.
- A3.2.5. Reverse Cuban.
- A3.2.6. Pull-pull-pull humpty with a  $\frac{3}{4}$  snap on the down line.
- A3.2.7. 90 degree-Outside Rolling Turn.
- A3.2.8. Positive Snap on 60-degree upline into a tumble.
- A3.2.9. Half Snap to Split-S to 30-degree upline.
- A3.2.10. 90 degree inside Rolling Turn ( $\frac{1}{2}$  roll to inverted).
- A3.2.11. Half roll from inverted to upright.
- A3.2.12. Repositioning turn as necessary to High Speed Pass.

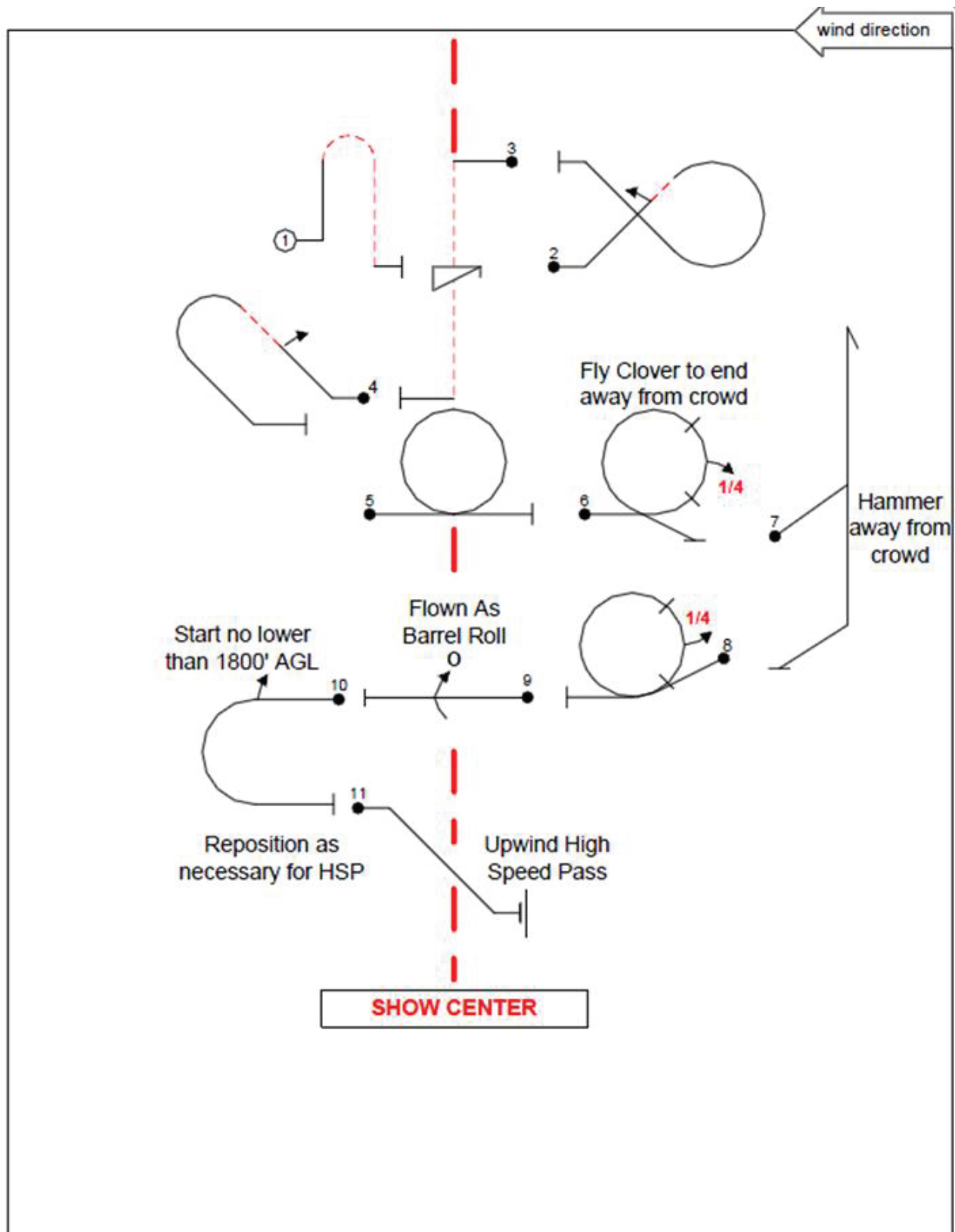
Figure A3.2. Demonstration Profile 2 – Level 3 Category.



**A3.3. Demonstration Profile 1 – Level 2 Category.** Figure A3.3 depicts Demonstration Profile 1 for Level 2 Category. The profile includes the following maneuvers in sequence:

- A3.3.1. Pull-push-pull humpty.
- A3.3.2. Goldfish.
- A3.3.3. One-turn spin.
- A3.3.4. Laydown Humpty.
- A3.3.5. Loop.
- A3.3.6. One-fourth cloverleaf with a turn on the up line.
- A3.3.7. Hammerhead.
- A3.3.8. One-fourth cloverleaf with a turn on the down line.
- A3.3.9. Barrel roll.
- A3.3.10. Split-S.
- A3.3.11. Repositioning as necessary to High-speed pass.

Figure A3.3. Demonstration Profile 1 – Level 2 Category.



**A3.4. Demonstration Profile 2 – Level 2 Category.** Figure A3.4 depicts Demonstration Profile 2 for Level 2 Category. The profile includes the following maneuvers in sequence:

A3.4.1. Cuban 8.

A3.4.2. Immelmann.

A3.4.3. Down Sharks Tooth.

A3.4.4. One-turn upright spin.

A3.4.5. Four quarter cloverleaves – two with turns on the upline and two with turns on the downline.

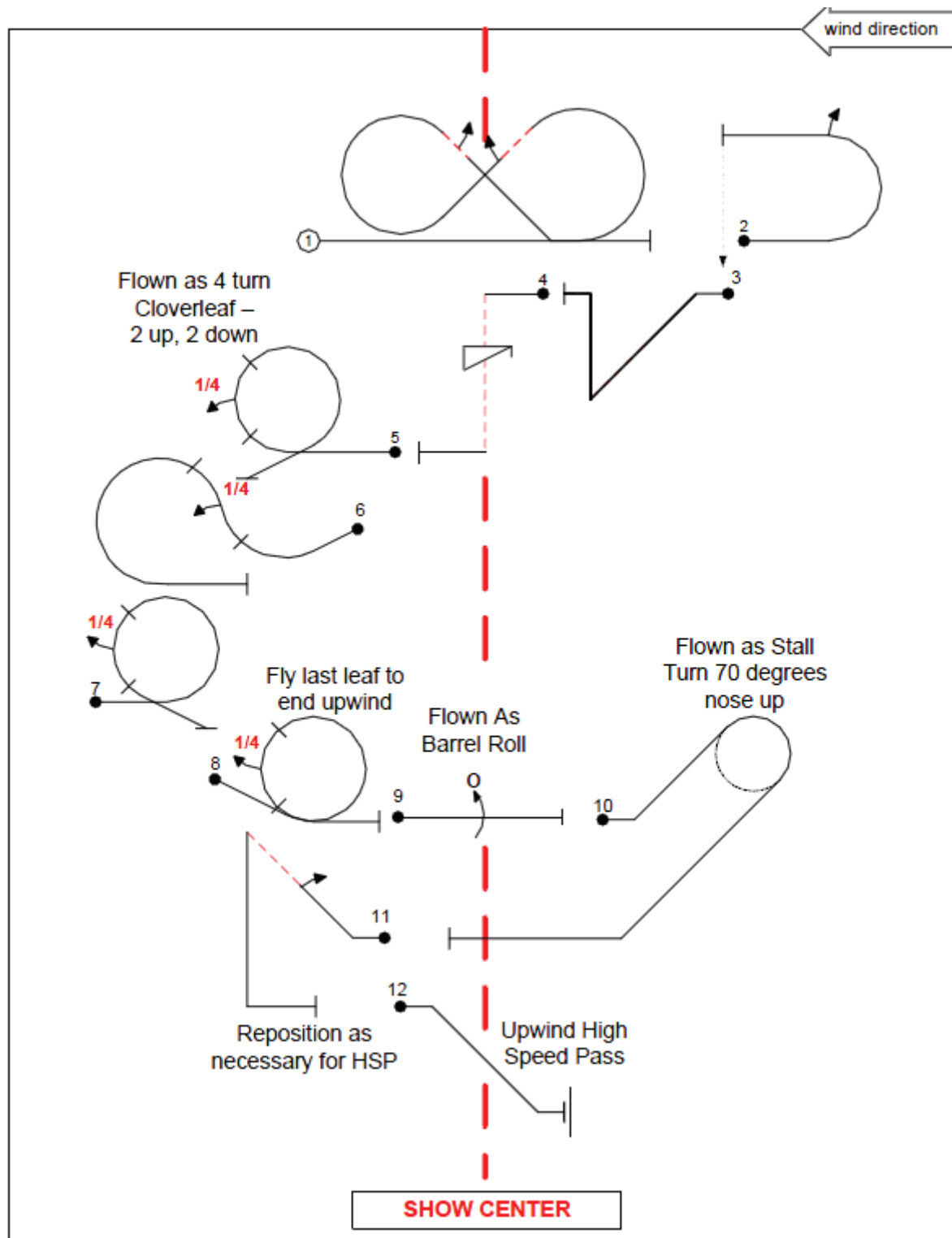
A3.4.6. Barrel roll.

A3.4.7. 70 degree Stall Turn.

A3.4.8. Reverse shark's tooth.

A3.4.9. Repositioning as necessary to High-speed pass

Figure A3.4. Demonstration Profile 2 – Level 2 Category.



**A3.5. High Speed Pass Profile.** Demonstration profile 5 is a high-speed flyover and does not require a demonstration certification. Pilots will:



A3.5.1. Enter the show at a 45-degree angle approximately  $\frac{1}{4}$  mile from the end of the runway or  $\frac{1}{2}$  mile from show center. **(T-3)**.

A3.5.2. Start the pass at least 1,500 feet above ground level and fly the pass. **(T-3)**.

A3.5.3. Complete a descending dive so as to arrive at show center at or above the minimum authorized altitude in accordance with AFI 11-209 or requested waiver altitude (normally 500 foot above ground level), and at approximately 120 knots indicated airspeed. **(T-3)**.

A3.5.4. Complete the flyover with a 3 to 4 G pull up and turn away from the crowd no closer than 500 feet to the crowd. **(T-3)**.

A3.5.5. Exit the flyover on a climbing 45-degree angle opposite of the entry side or maintain direction to a traffic pattern. **(T-3)**.