BY ORDER OF THE
SECRETARY OF THE AIR FORCE

AIR FORCE MANUAL 11-246,
VOLUME 2

30 JULY 2024

Flying Operations

AIRCRAFT DEMONSTRATIONS (SAILPLANES)

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available on the e-Publishing website at **www.e-publishing.af.mil** for downloading.

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: 19 AF/A3V

Certified by: AF/A3T
(Col Jonathan H. MaGill)

Supersedes: AFMAN11-246V7, 27 March 2020

Pages: 16

This manual implements Department of the Air Force Instruction (DAFI) 11-209, *Participation in Aerial Events,* to provide procedures for Air Force performance of sailplane aircraft demonstrations (demos). This publication applies to all Regular Air Force and federal civilian employees conducting sailplane demonstrations. Except for associate instructor pilot personnel, this publication does not apply to the Air Force Reserve and Air National Guard. This publication does not apply to the United States Space Force. Ensure all records generated as a result of processes prescribed in this publication adhere to Air Force Instruction 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the office of primary responsibility using Department of the Air Force (DAF) Form 847, *Recommendation for Change of Publication*; route DAF Forms 847 from the field through the appropriate functional chain of command. 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 Department of the Air Force Manual (DAFMAN) 90-161, *Publishing Processes and Procedures*, 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 publication office of primary responsibility for non-tiered compliance items. The use of the name or mark of

any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Department of the Air Force.

SUMMARY OF CHANGES

This document has been revised and needs to be completely reviewed. Major changes include updates to office symbols and publications references throughout. Tiering was removed from the Roles and Responsibilities section to conform to DAFMAN 90-161 standards. "Knock-it-off criteria" was added to the list of terms in **Attachment 1**.

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 (FAA) Order 8900.1A, *Flight Standards Information Management System*, Volume 3, Chapter 6, *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).** Wing commanders (or equivalent) will:

2.1.1. Certify demonstration pilots. Certification authority cannot be lower than the wing commander. **Exception:** Demonstration profile 5 does not require a demonstration pilot certification.

2.1.2. Ensure appropriate ground crew are available to recover and ground handle sailplanes at the landing site.

2.2. **Demonstration Pilots.** Demonstration pilots will:

2.2.1. Cancel any demonstration when the assigned performance location compromises safety or exceeds aircraft performance capabilities.

2.2.2. For off-station demonstration sites, accomplish either a practice demonstration or aerial survey prior to the demonstration. Demonstration pilots may delegate this responsibility to another equivalently certified demonstration pilot.

2.2.3. Complete the pre-demonstration briefing using **Attachment 2**.

3. Suggesting Profile Changes.

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

3.2. **Suggesting Profile Changes.** 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. Training and Certification.

4.1. **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)** Air Force Manual (AFMAN) 11-2Sailplane, Volume 1, *Sailplane Aircrew Training,* specifies aerobatic pilot training requirements.

4.2. **Additional Training.** Units may specify additional training requirements before demonstration pilot certification.

5. Sailplane Demonstration Profiles.

5.1. **General.** 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**), the *Aresti System Glider Aerobatic Figures Catalog* (available at: **http://www.arestisystem.com**), and any Major Command-approved aerobatic training program. **Attachment 3** defines the standard sailplane demonstration profiles.

5.2. **Demonstration Profiles.**

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

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

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

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

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

5.2.3.3. 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)**

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

5.2.3.5. 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.

5.2.3.6. This publication describes demonstration profiles designed to fit in an FAA approved airspace. Reference FAA Order 8900.1A, Volume 3, Chapter 6 *Category Aerobatic Box* for description of airspace requirements. 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. Under any circumstance, the pilot will not compromise the minimum show line distances. **(T-2)**

5.2.3.7. The pilot may modify maneuver entries and recoveries. At no point will the pilot 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 (HSP) non-aerobatic maneuvers; however, the pilot will keep the aircraft beyond the show line described for the event. **(T-2)**

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

5.2.5. On-Scene Commander and Aircraft Safety Pilot will both monitor sailplane altitude and direct a maneuver abort or demonstration cancellation based on briefed “knock-it-off” criteria (when required).

5.3. **Demonstration Weather.** The pilot will ensure each demonstration complies with the following weather requirements:

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

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

ADRIAN L. SPAIN, Lt Gen, USAF
Deputy Chief of Staff, Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

DAFI 11-209, *Participation in Aerial Events,* 20 May 2021

DAFMAN 90-161, *Publishing Processes and Procedures,* 18 October 2023

AFI 33-322, *Records Management and Information Governance,* 23 March 2020

AFMAN 11-2Sailplane Volume 1, *Sailplane Aircrew Training*, 19 February 2020

Federal Aviation Administration Order 8900.1A, *Flight Standards Information Management,* 27 October 2022

System, Volume 3, *General Technical Administration*

Aresti System Glider Aerobatic Figures Catalog

International Aerobatic Club Official Contest Rule Book

Adopted Forms

DAF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

AGL—above ground level

Demo—demonstration

FAA—Federal Aviation Administration

HSP—high-speed pass

IAW—in accordance with

IFG—in-flight guide

KIAS—knots indicated airspeed

Terms

Aerial Control Team—Certified team (such as an airboss) responsible for the safe execution of an aerial event.

Airboss—Civilian team certified by FAA hired by the airshow event coordinator to run all aspects and control major airshows.

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.

Knock-it-off Criteria—Any reason, as determined by the pilot, airboss, or chief judge, to terminate or forego a performance element due to safety of flight or where doubt or confusion exists during maneuvering which might put the aircrew, aircraft or airshow attendees at risk.

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.

Safety Pilot—A pilot not flying responsible for the safe execution of the aerobatic demonstration within airspeed and G-limits and FAA defined boundaries and parameters.

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 (in addition to Sailplane in-flight guide (IFG) guidance):

A2.1.1. Aerial control team/airboss brief.

A2.1.2. Time hack.

A2.1.3. Call signs and tail numbers.

A2.1.4. Weather and status (takeoff, enroute, recovery, landing, alternates).

A2.1.5. Notice to airmen review.

A2.1.6. Mission overview.

A2.1.7. Demonstration area and show layout. (review site survey data, if applicable).

A2.1.8. Go/no-go (currencies, duties not including flying, flight crew information file, and read files).

A2.1.9. Flight authorization and approval.

A2.1.10. Spare procedures.

A2.1.11. Operations Supervisor brief / dispatch.

A2.2. Takeoff, Aerotow, Departure IAW Sailplane IFG:

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.

A2.3.6. Knock-it-off situations.

A2.4. Arrival IAW Sailplane IFG:

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.

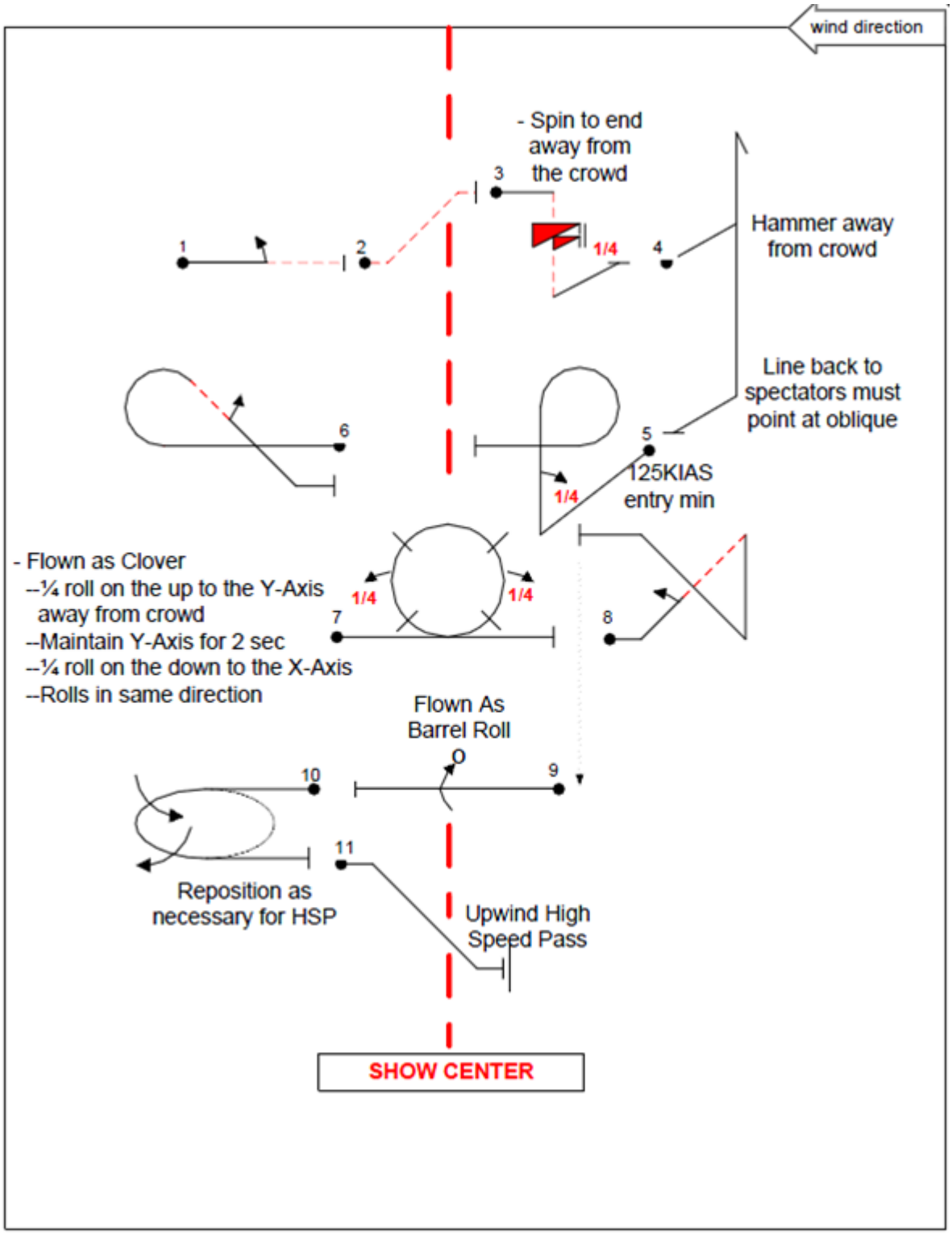
A3.1.8. Bow tie.

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 "SNAP DEMO" – 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 ½ snap to upright.

A3.2.3. Full positive snap developing into a 1 ¼ turn upright spin.

A3.2.4. Wheels-up tail slide.

A3.2.5. Positive snap on 60-degree upline into a tumble.

A3.2.6. Pull-pull-pull humpty with a 3/4 snap on the down line.

A3.2.7. 90-degree outside rolling turn.

A3.2.8. Reverse cuban.

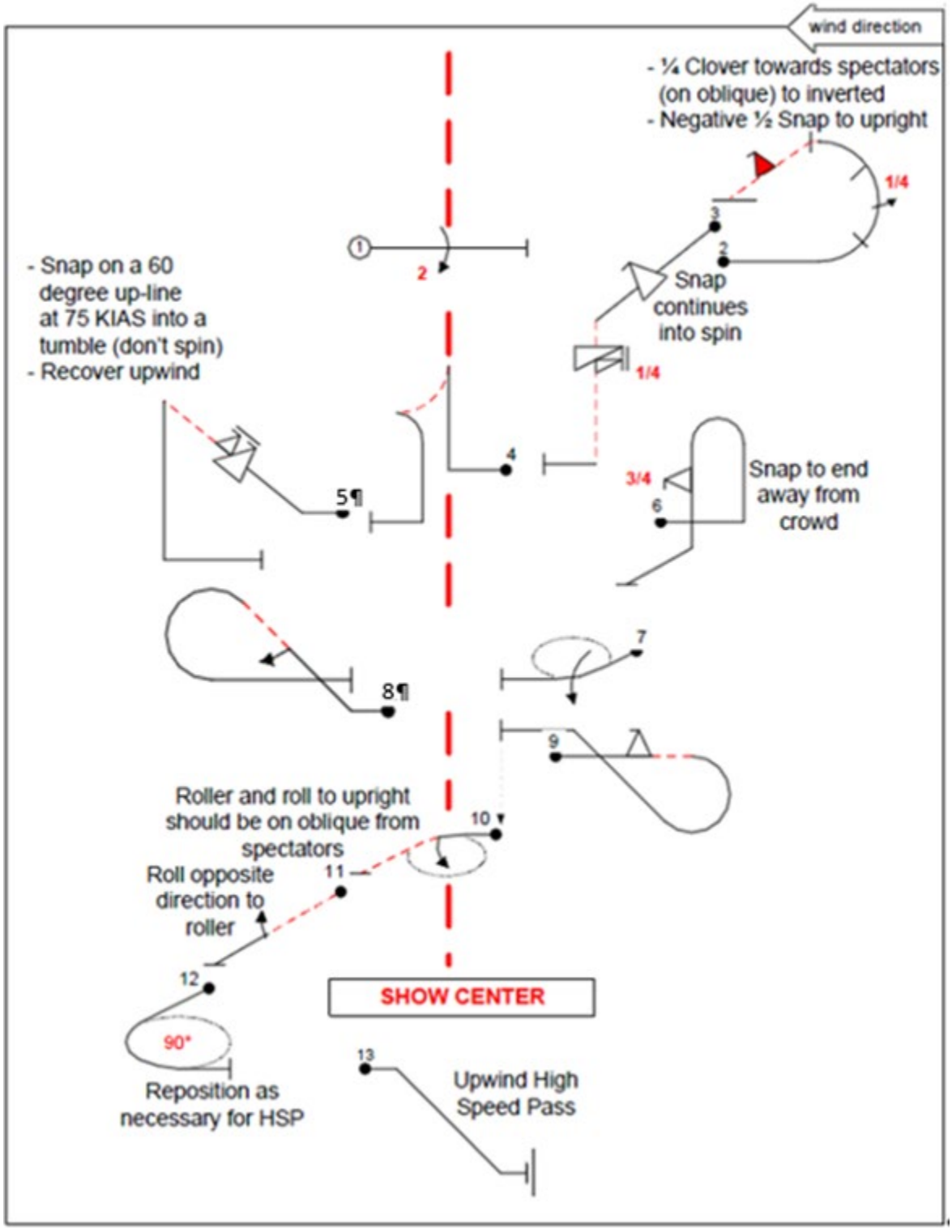
A3.2.9. Half snap to split-S to 30-degree upline.

A3.2.10. 90-degree inside rolling turn (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 "SNAP DEMO" – 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.

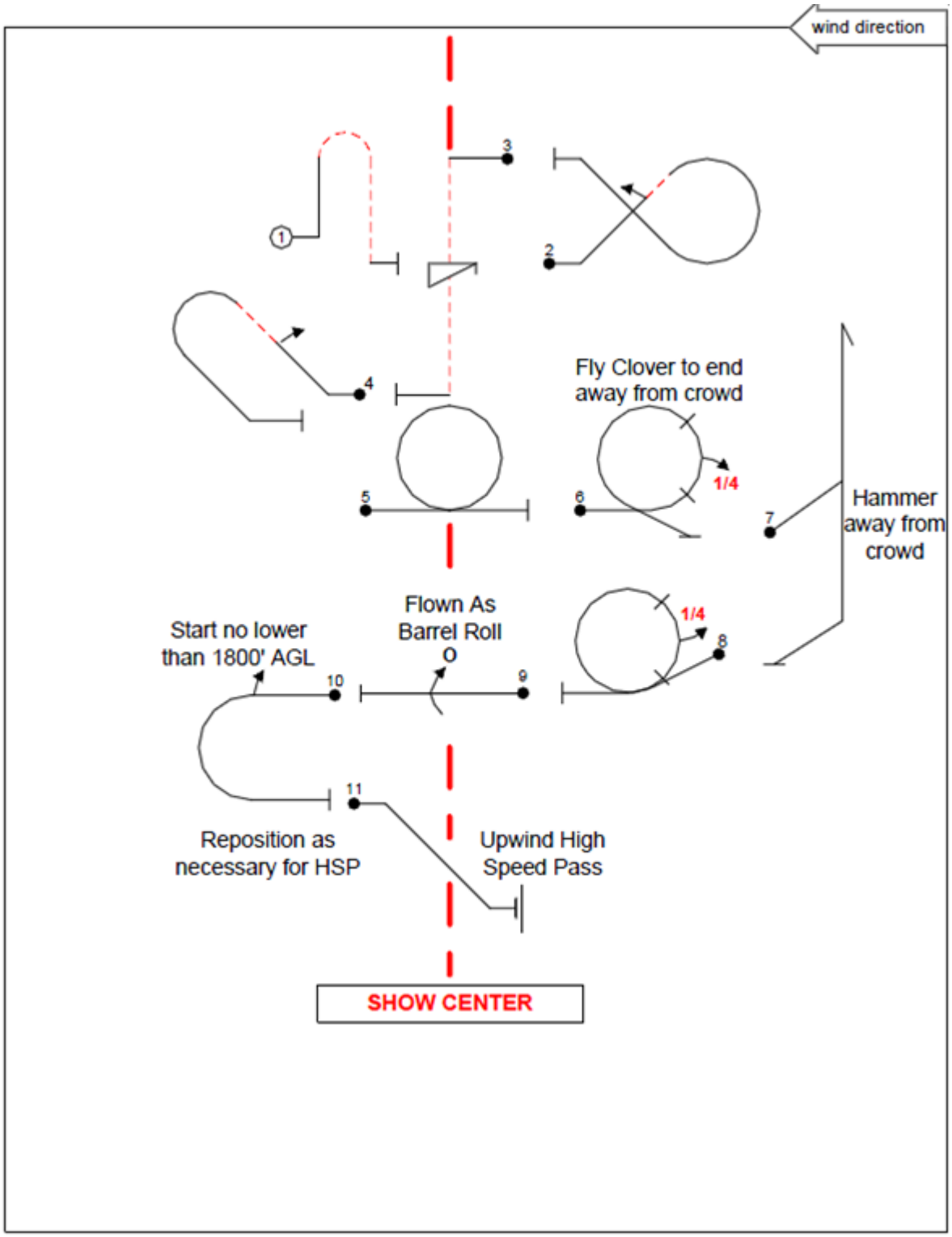
A3.3.8. One-fourth cloverleaf with a turn on the down line.

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.

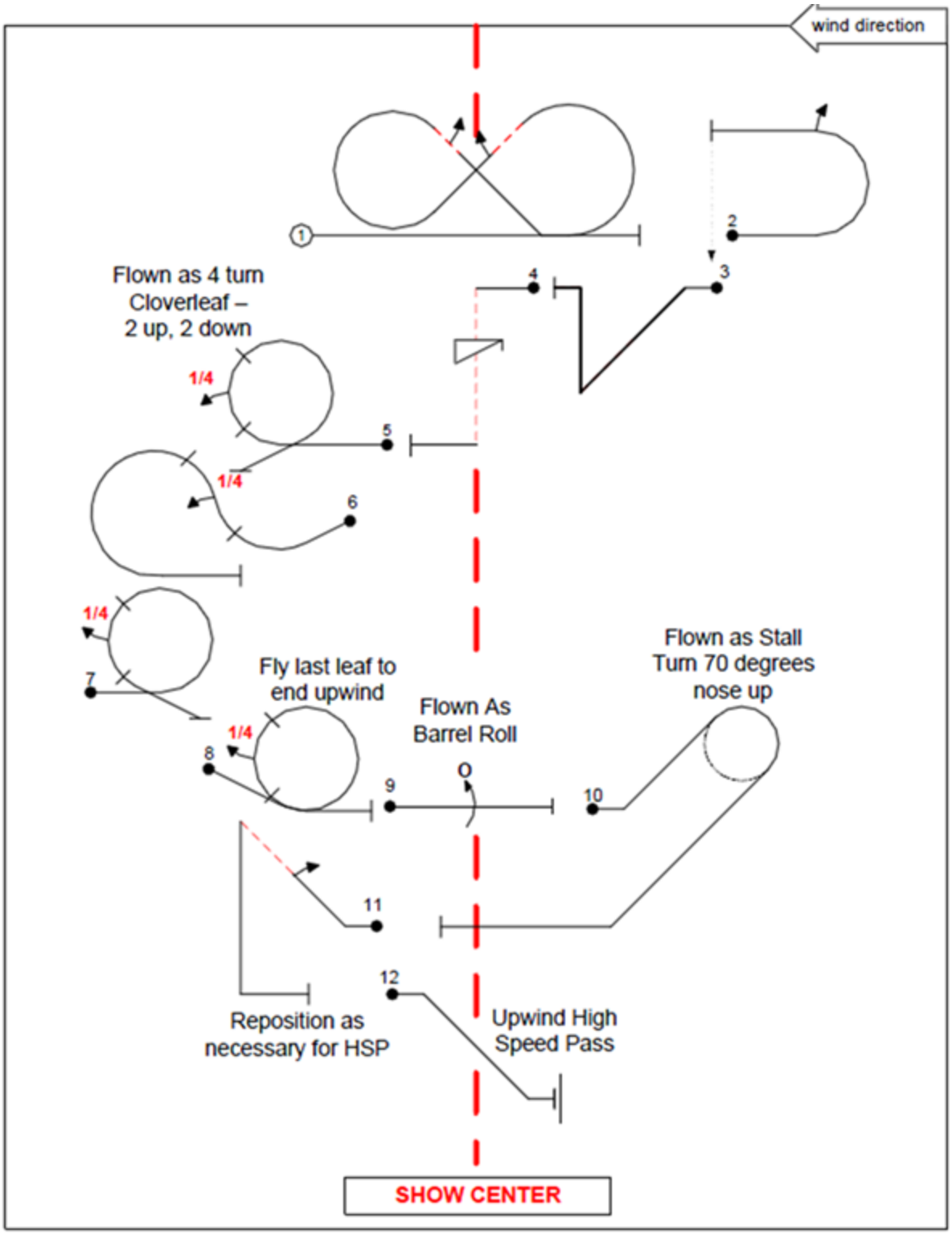
A3.4.6. Barrel roll.

A3.4.7. 70-degree stall turn.

A3.4.8. Reverse sharks 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. The high-speed pass does not require a demonstration certification. The following steps outline procedures to safely execute a high-speed pass:

A3.5.1. Pilots should enter the show at a 45-degree angle approximately ¼ mile from the end of the runway or 1/2 mile from show center.

A3.5.2. To ensure adequate energy to complete the maneuver, pilots should start the pass at least 1,500 feet AGL and fly the pass.

A3.5.3. Complete a descending dive to arrive at show center at or above DAFI 11-209 and AETC supplement altitude requirements and at approximately 120 knots indicated airspeed (KIAS).

A3.5.4. Complete the high-speed pass with a 3 to 4 G pull up and turn away from the crowd no closer than 500 feet to the crowd.

A3.5.5. Exit the high-speed pass on a climbing 45-degree angle opposite of the entry side or maintain direction to a traffic pattern.