

BULLET BACKGROUND PAPER
ON
CY24 USAFA GLIDER DEMO TEAM TG-16A/TG-17A MANEUVERS PACKAGE ADDENDUM
TO
AFMAN 11-246, VOL 7

1. General. The purpose of this Bullet Background Paper is to discuss the USAF TG-16A and TG-17A Glider Demonstration profiles to be flown by the USAF Academy Glider Demonstration Team (USAFAGDT) at Open Houses and Air Shows in CY24. The TG-16 and TG-17 Glider Maneuvers Package is contained in AFMAN 11-246, Vol7, *Aircraft Demonstrations (Sailplanes)*, dated 27 Mar 20. Additional information required by FAA 8900.1, Vol 3, Ch 6, Sec 1-3, is contained below.

- a. TG-16A or TG-17A Glider aerobatic demonstrations will always be flown as a single ship.
- b. Depiction of topside vs. underside of aircraft:



- c. The size and dimensions of the airspace required to conduct the performance:
 - Runway requirements: 2,300 ft length minimum takeoff length required
 - Aerobatic box: Can be flown IAW AFMAN 11-246, Vol 7, para 5.3.6 or can expand all the way to the ends of the FAA approved aerobatic area (runway end to runway end).
 - Ingress/egress routes: Glider will hold on tow next to the demonstration box, release off tow and enter the box when approved by the Air Boss. Glider will always hold downwind and enter flying towards upwind of the box. Glider will complete the routine in the box, and fly a pass down to 500 ft AGL over the runway with a pull-up to a downwind opposite the crowd.
- d. Distances from the designated primary and secondary spectator areas: Depend on where the primary and secondary spectator areas are for each airshow. Cat III crowd line will be flown, no closer.
- e. Category III show line for flybys: yes, IAW FAA 8900.1 CHG 694, Vol 3, Ch 6, Sec 1
- f. Relationship of the aircraft to the show line and corner markers: Glider will always remain behind the Cat III show line. Corner markers are Not Applicable since the glider will never fly banana pass behind the crowd.

- g. Applicable show line category for aircraft: Category III IAW FAA 8900.1 CHG 694, Vol 3, Ch 6, Sec 1
- h. To clarify AFMAN 11-246, Vol 7, Para 5.3.6., some of the profiles are designed to fit in a 3,300 feet long by 3,300 feet wide box, but do not need to be flown in that box size. Maneuvers may be cut out but never added to fit inside of an applicable box. The standard size Airshow box required for a demo should be a Category 2 box for these routines, but may be paired down to a Category 3 box. Cat III crowd lines will be adhered to based on aircraft type.
- i. Identification of Energy Toward the Crowd (ETC): See f above. Energy will never be directed towards the crowd.
- j. Minimum weather requirements for the performance and profiles for a high and low show if that option is available: IAW AFMAN 11-246, Vol 7, para 5.4.
- k. A contingency plan for reduced number of aircraft due to reduction in aircraft or crew, to include:
 - Minimum number of aircraft authorized for performance: One. This is a single-ship demonstration.
 - Training profile requirements: The same profile flown during the practice will be flown for the actual demonstration.
 - Any revised profiles: Routines as Depicted in AFMAN 11-246, Vol 7, Attachment 3 may be reversed in direction based on upwind.
- l. Equivalent ribbon cut pictorials of all maneuvers in the performance are included in AFMAN 11-246, Vol 7, Attachment 3.
 - Overhead pictorial is not available.
 - View of the routine is from the perspective of the crowd.
 - Each maneuver starts with a dot and ends with a line.
 - A solid black line is when the aircraft is upright.
 - A dotted red line is when the aircraft is inverted.
 - Arrows indicate ½ rolls if they are on one side of a line unless otherwise depicted. Arrows on both sides of a line are full rolls.
 - Triangles indicate spins. Red triangles are inverted spins.
- m. Minimum and maximum operating altitudes: Aerobatics may be flown down to 1,500 ft AGL. Pass over the Cat III show line may be flown down to 500 ft AGL. Top of the aerobatic routine is normally 5,000 ft AGL.
- n. The military orders/instruction/guidance describing the requirements for training and the conduct of the operation; and designation of the team member authorized to represent the team at the Participants Safety Briefing.
- o. A list of the aircraft used in the demonstration and a description on how to conduct flight demonstrations in the United States (e.g., support manual).
- p. Accident/incident procedures, to include contact information for the public affairs office for media coordination. Establish a requirement to immediately notify the FAA inspector-in-charge (IIC) of the assigned military IIC for accidents/incidents and determine what resources the FAA will need, to include

any data, witness reports, or other information. The military team's accident/incident procedures must be incorporated into the aviation event's emergency response plan (ERP).

- q. The Pilot-In-Command must be FAA demonstration certified. Passengers will not be flown during demonstrations. An additional safety pilot certified as an instructor in the airframe flown is required as an additional crewmember. Only required crewmembers may be on board during aerial demonstrations.
- r. 30 days are recommended between the last routine practice and the actual demonstration versus 45 days required in FAA 8900.1.
- s. Entry and exit airspeed:

• **Demonstration Profile 1 – Level 3 Category.**

| Maneuver | Entry Airspeed (KIAS) | Exit Airspeed (KIAS) |
|---|-----------------------|----------------------|
| Half roll to inverted | 105 ±5 | 105 ±5 |
| 30 degree inverted upline | 105 ±5 | 50 ±5 |
| 1 ¼ turn Inverted Spin | 50 ±5 | 105 ±5 |
| Hammerhead | 120 ±10 | 105 ±5 |
| Pull to vertical up, ¼ roll to ¾ P-Loop | 125 +5/-0 | 105 ±5 |
| Half Cuban | 105 ±5 | 105 ±5 |
| Cloverleaf with a 1/4 turn on the up line and a 1/4 turn on the down line | 105 ±5 | 105 ±5 |
| Bow Tie | 120±5 | 80±5 |
| Barrel Roll | 105 ±5 | 105 ±5 |
| 180-degree inside/outside rolling turn | 95±5 | 95±5 |

• **Demonstration Profile 2 – Level 3 Category**

| Maneuver | Entry Airspeed (KIAS) | Exit Airspeed (KIAS) |
|---|-----------------------|----------------------|
| Two-point roll | 105 ±5 | 105 ±5 |
| One quarter cloverleaf with a turn on the up line to a negative ½ snap to upright | 105 ±5 | 50 ±5 |
| Full positive snap developing into a 1 ¼ turn upright spin | 75±5 | 105 ±5 |
| Wheels-up tail slide | 105 ±5 | 105 ±5 |
| Reverse Cuban | 120±5 | 105 ±5 |
| Pull-pull-pull humpty with a 3/4 snap on the down line | 105 ±5 | 105 ±5 |
| 90 degree Outside Rolling Turn | 95±5 | 95±5 |
| Positive Snap on 60-degree upline into a tumble | 75±5 | 105 ±5 |
| Half Snap to Split-S to 30-degree upline | 105 ±5 | 50 ±5 |
| 90 degree inside Rolling Turn (1/2 roll to inverted) | 95±5 | 95±5 |
| Half roll from inverted to upright | 105 ±5 | 105 ±5 |

- **Demonstration Profile 1 – Level 2 Category**

| Maneuver | Entry Airspeed (KIAS) | Exit Airspeed (KIAS) |
|--|-----------------------|----------------------|
| Pull-push-pull humpty | 105 ±5 | 105 ±5 |
| Goldfish | 120±5 | 80±5 |
| One-turn spin | Approx. 40 (Stall) | 105 ±5 |
| Laydown Humpty | 120±5 | 105 ±5 |
| Loop | 105 ±5 | 105 ±5 |
| One-fourth cloverleaf with a turn on the up line | 105 ±5 | 105 ±5 |
| Hammerhead | 120 ±10 | 105 ±5 |
| One-fourth cloverleaf with a turn on the down line | 105 ±5 | 105 ±5 |
| Barrel roll | 105 ±5 | 105 ±5 |
| Split-S | 90±10 | 105 ±5 |

- **Demonstration Profile 2 – Level 2 Category**

| Maneuver | Entry Airspeed (KIAS) | Exit Airspeed (KIAS) |
|--|-----------------------|----------------------|
| Cuban 8 | 105 ±5 | 105 ±5 |
| Immelmann | 120±5 | 105 ±5 |
| Down Sharks Tooth | 55 ±5 | Approx. 75 |
| One-turn upright spin | Approx. 40 (Stall) | 105 ±5 |
| One-fourth cloverleaf with a turn on the up line | 105 ±5 | 105 ±5 |
| One-fourth cloverleaf with a turn on the down line | 105 ±5 | 105 ±5 |
| One-fourth cloverleaf with a turn on the up line | 105 ±5 | 105 ±5 |
| One-fourth cloverleaf with a turn on the down line | 105 ±5 | 105 ±5 |
| Barrel roll | 105 ±5 | 105 ±5 |
| 70 degree Stall Turn | 120 ±10 | 105 ±5 |
| Reverse shark's tooth | 120±5 | 105 ±5 |

- **High Speed Pass Profile:** AFMAN 11-246, Vol 7, Attachment 3

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