



Jet Formation

TOP GUN - Europe Master

Competition Rules

Introduction

Jet Formation Competition (JFC) is open to all formation teams worldwide, flying any type of maneuvers' with sport or scale Radio Controlled Aerobatic Jet Model Aircraft.

Definition of a Radio Controlled Aerobatic Jet Model Aircraft

A model aircraft, but not a helicopter, which uses turbine jet(s), turbo prop jet(s) or ducted fan(s) as the propulsion source(s) and which is aerodynamically maneuvered by control surface(s) in attitude, direction, and altitude by a pilot on the ground using radio control.

- Variable thrust direction of the propulsion device(s) is permitted.
- Turbo prop model aircrafts are permitted (Tucano, PC21, Siai Marchetti SF260, etc).

1 - General Regulations

1.1 Competitors

- All Competitors must be member of WJA (World Jet Association).
- Every Jet Formation Team must have two (2) pilots and two (2) Jet Model Aircrafts.
- Every Jet Formation Team must have a NAME.
- A minimum of 3 teams are required to start the competition.
- There is no limit of Team number per each country.
- Pilots are allowed to enter the competition in more than one team, but flying different Jet Model Aircrafts.
- Every competitor of TOP GUN Europe Master (any class) has the right to take part at the individual freestyle round, with any type of sport or scale Radio Controlled Aerobatic Jet Model Aircraft

1.2 General Characteristics of a R/C Aerobatic Jet Model Aircraft

The R/C Aerobatic Jet Model Aircraft shall use as a propulsion device turbo jet/s or ducted fan/s. Ducted fans may use turbo jet engines or electric motors as a power source. Rocket or pulse jet engines may NOT be used.

Maximum overall wingspan: no restrictions

Maximum overall length: no restrictions

Maximum take-off weight with fuel (or with battery if EDF): no restrictions *

Maximum thrust of turbine: no restrictions*

Electric Motors power source max. no load voltage 72 volts *

Noise limits: no restrictions*

* limits for the competition area of the event must be followed and must be submitted to the competitors (for example: Italy and Germany have a maximum take-off weight 25 Kg)

The propulsion device(s) must automatically shut-off (EDF) or fully idle (turbo jet) at the moment an R/C signal failure occurs.

1.3 Radio Equipment

Radio equipment shall be of the open loop type.

Permitted:

1. Control rate devices that are manually switched by the pilot.
2. Any type of button or lever, switch, or dial control that is initiated or activated and terminated by the competitor.
3. Manually operated switches or programmable options to couple and mix control functions.

4. The use of electronic stability augmentation devices or gyros with or without speed related automatic gain control derived from a GPS signal.
5. The transmission of information from the model aircraft to the pilot on the ground.

Not permitted:

1. Snap roll buttons with automatic timing mode.
2. Pre-programming devices to automatically perform a series of commands, except for landing gear function.
3. Automatic flight path guidance.
4. Any type of voice recognition system.
5. Any type of learning function involving maneuver to maneuver or flight to flight analysis.

1.4 Definition and Number of Helpers

One Team Manager (the caller) per team is permitted during the flight. Two helpers may be present and assist during the starting of the motor(s). One person, either a helper, or the team manager, may place the model aircrafts for take-off and retrieve the model aircraft following the landing. In exceptional circumstances, another helper may join the competitor and caller/helper during the flight, but only to hold a sun-shield as protection from direct sunlight. These protection devices must not interfere with the judges' vision of the maneuvers.

2 - The competition

2.1 Number of Flights

Each Jet formation Team have to fly two (2) preliminary rounds, plus the final flight.

Competitors have the right to the same number flights. Only completed rounds will be counted. Only when all competitors in the preliminary and final rounds, have had the opportunity to complete the same number of rounds, can the results of the rain-interrupted (or other delay) competition be determined.

2.2 Definition of an Attempt

There is an attempt when the competitor/Team is given permission to start.

If the propulsion device fails after the model aircraft becomes airborne, the attempt will be deemed complete.

2.3 Number of Attempts

Each competitor/Team is entitled to one attempt for each official flight.

Note: An attempt can be repeated at the contest director's discretion only when any unforeseen reason beyond the control of the competitor, causes the model aircraft to fail to start (if there is radio interference or other technical problem).

Similarly, in a flight that is interrupted by any circumstance beyond the control of the competitor, the competitor is entitled to a re-flight, with the entire schedule being flown and judged, but only the affected maneuver and the unscored maneuvers that follow will be tabulated.

2.4 Definition of an Official Flight

There is an official flight when an attempt is made whatever the result.

2.5 Marking

- a) Each judge has to assess maneuvers and any other relevant action of the competitor/Team individually and independently from the other judges.
- b) Each maneuver may be awarded marks by each of the judges during the flight. Every maneuver starts with the mark of 10 points and will be downgraded for each defect during the execution of the maneuver in one(1) point steps, depending on the severity of the defect.
- c) The judges shall be seated not more than 10m, and not less than 7m behind the competitor's position (the apex of the 75 degree lines) and within an area described by the extension of the 75 degree lines to the rear of the competitor. The judges must be seated abreast, usually separated by 2m, with scribes or score secretaries separating them.
- d) If a model aircraft is, in the opinion of the judges, unsafe or being flown in an unsafe or inappropriate manner, they may bring this to the attention of the flight line director, who may instruct the pilot to land.
- e) The individual maneuver scores given by each judge for each competitor must be made public at the end of each flight of competition.

2.6 Classification TOP GUN - Europe Master

- a) Each Jet formation Team will have two (2) preliminary flights, the sum of the two (2) scores (normalized scores to 1000 points) to determine the preliminary ranking.
- b) The top five (5) of the classified Jet formation Teams will enter the finals.
- c) The finalists will fly one (1) final flight.
- d) The final ranking of the finalists will be determined by the sum of the preliminary flight normalized scores and the final flight score, normalized to 1000 points.

2.7 Judging

For each competition there must be a minimum of three (3), and a maximum of five (5) judges, plus one timer.

To avoid errant judging, it is recommended that training flights be performed, before the beginning of official flying. These training flights are judged and tabulated according to the regulations, but the results are not made public.

2.8 Organization of Contests

Only spread spectrum radio control systems are allowed.

The order of the first flight will be done by a draw.

For flights two, three and four of the preliminary rounds the flight order will start 1/3, and 2/3 down the flight order respectively.

Competitors must be called by a flight line official at least five (5) minutes before they are required to occupy the starting area.

The competitor and his helper(s) then occupy the starting area so that a radio check can be performed to verify the correct functioning of the radio control equipment.

For electric powered models, the electric power circuit(s) must not be physically connected, before the starting time is begun and must be physically disconnected immediately after landing.

The competitor may not start his model aircraft unless he has been instructed by a flight line official to do so.

During the flight, the pilots and helper/caller must stay in the designated position in front of the judges and under the supervision of the flight line director.

3 - The Round

3.1 Official Flight Round

The official flight round have to be flow with SMOKE and MUSIC.

Every official flight round must include as first the mandatory maneuvers and some free maneuvers, more than one (1), before the Formation landing.

The mandatory maneuvers:

- 1) Formation take-off
- 2) Low level formation flyby (at maximum 10 m altitude or lower)
- 3) Formation Looping
- 4) Crossover knife-edge flight from opposite ends (at maximum 20 m altitude or lower)

5) Free Formation maneuvers *

6) Formation Landing

3.1.1 Flight maneuvers order

The sequence of the mandatory maneuvers must be respected. If a maneuver is missed or flown out of order the score will be downgraded according to the severity of the omission.

3.1.2 Definition of the free part in the official flight round

* The Free Formation maneuvers must be performed by each Jet Formation Team:

- must be more than one (1): two, three, four, etc... (only limit is the max flight time !)
- the maneuver's list must not be declared in advance
- the flying order of these maneuvers is free and every round can be different

3.1.3 Music – performing rights

Each Jet Formation Team will select their own music for their flight rounds and will accept all responsibility with regards to obtaining permission from composers to use their music for public displays.

3.1.4 Music - operation

Teams are required to supply their musical accompaniment either live or on suitable media for their official flight rounds on CD or USB pen.

If the music does not start or fails during the flight for reasons outside the Jet Formation Team responsibility, the chief Judge will permit a re-flight.

3.2 Starting Time

All teams will be given a 10 minutes warning before the start of their flight.

3.3 Flying Time

Every competitor/Team is allowed **eight (8) minutes of flying time for each flight round.**

The team will then be instructed to start their flight, the timing of which will commence when the team leader calls "Start or Take –off" or when the first model begins the take-off run.

No points will be awarded for any maneuvers not completed at the end of the time allowed.

Choreography points will be awarded in proportion to the amount of the flight maneuvers completed.

3.4 Pyrotechnics

The use of fireworks/pyrotechnics on the ground is not allowed.

Functions of the model, such as fireworks/pyrotechnics and flares, may be used during the flight and must be operated only by the pilot from his transmitter.

3.5 Safety Issues

Safety Line: If there is a cross-wind causing persons to be endangered by a competitor's model, or the Safety Line, established jointly by the Contest Director and Flight Line Controller, is crossed under any circumstances, scoring will cease and all pilots of the team involved will be instructed by the Flight Line Controller to land their models immediately.

High Risk Maneuvers: High energy turns, "split" and "crossover" maneuvers flown towards the crowd closer than 50 meters from the crowd line are banned. If any team is considered by the Flight Line Controller to be in breach of this regulation, scoring will cease and all the team pilots will be instructed by the Flight Line Controller to land their models immediately.

If one of the two flying model touch the ground during the flight round or any part unintentionally separates from the aircraft during flight round, the scoring stops and the Jet Formation Team must land immediately. In this case the re-flight is not allowed.

The loss of one the two flying model means the end of the round, scoring stops and the other model aircraft must land immediately. In this case the re-flight is not allowed.

3.6 Protests

All protests must be made in writing, and handed to the Contest Director. No protests may be submitted later than 30 minutes of the round.

4 - Judging Criteria

4.1 Flight Maneuvers

All maneuvers must be flown parallel and close, but beyond the far side of the runway.

During the flight each mandatory maneuvers will be judged with a note from 1 to 10 by each judge considering the following criteria:

Precision of demonstration: maneuvers must be performed in a centered position and at a height which will allow them to be seen clearly by the judges.

Close Formation: judges will award more points for the closeness of the aircraft in formation.

4.2 mandatory maneuvers description

1) Formation Take-off - (K factor 1)

The formation shall take off, fly in a straight line from take off and at a constant rate of climb and start landing gear retraction.

2) Low level formation flyby - (K factor 1)

The formation shall make a low fly-by, for duration of 5 - 10 seconds, at maximum 10 m altitude or lower

3) Formation Looping - (K factor 2)

From straight and level flight, the formation executes a 360° circle in a vertical plane, and resumes level flight at the same altitude and on the same track and heading as it started.

4) Crossover knife-edge flight from opposite ends - (K factor 3)

Two models from each formation team shall make a low fly-by from opposite directions. The crossing point the models shall be centered on the judges' position.

5) Free Formation maneuvers *- (K factor 4)

More maneuvers and more complexity/difficulty deserve more points. All presented maneuvers shall be centered on the judges' position.

6) Approach and Landing - (K factor 2)

The formation will make a landing approach in the manner of the prototype, and land/touching ground on the runway at the same time. Retractable undercarriage need to be extended and flaps, spoilers, speed brakes, parachute, if available can be used.

4.3 Additional Scores

At the end of every flight, judges will judge with a note from 1 to 10 the whole flight performance considering the following criteria too:

Synchronism of demonstration - (K factor 2)

The judges will award points for the synchronism of figures, selection of the manoeuvres, change of formation and the harmony of the tempo and mood music to the style of the flying.

Special effects - (K factor 1)

During all rounds the judges will award points for the use of smoke, lights, and special effects with music.

Choreography - (K factor 1)

The judges will reward flight speed, smoothness, accuracy and harmony with music throughout the whole flight. (Non-scale manoeuvres flown by scale aircraft will not be penalized)

4.4 Normalization of Flight Scores

After each flight round is completed, the points are normalized to 1000 as follow:

$$P_x = (S_x / S_w) \times 1000$$

Px: score awarded by judges

Sx: score of competitor X

Sw: top score (winner)