

# 2004 Tucson Aerobatic Shootout

## Four-Minute Free Score Sheet

Competitor: \_\_\_\_\_

Judge: \_\_\_\_\_

Round: \_\_\_\_\_

<b>TECHNICAL MERIT [ 90 K ]</b>		K	Grade
1.	Complete Use of the Flight Envelope Utilizing the Exploitation of Aerodynamic and Gyroscopic Forces	20	
2.	Execution of Individual Maneuvers	40	
3.	Wide variety and Versatility of Different Figures Flown on Different Axes and Flight paths	30	
<b>ARTISTIC IMPRESSION [ 90 K ]</b>			
4.	Pleasing and Continuous Flow of Figures with Contrasting periods of Dynamic and Graceful Maneuvers including Choreography	50	
5.	Presentation of Individual and Combinations of Figures in Their Best Orientation and Optimal Position	40	
<b>POSITIONING [ 20 K ]</b>			
6.	Symmetry of the Presentation Utilizing the Performance Zone to Maximize the Audience and Judges Perception, Reception, and Viewing of the Program	20	
<b>TOTAL K [ 200 K ]</b>			

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## Four-Minute Free Judging Criteria

### **TECHNICAL MERIT [ 90 K ]**

#### Complete Use of the Flight Envelope Utilizing the Exploitation of Aerodynamic and Gyroscopic Forces [ 20K ]

The pilot is expected to make full use of the flight envelope of the aircraft. This means flying the full range of airspeeds and accelerations permitted. Program time should be divided between high and low speeds, high and low G maneuvers, and both positively and negatively G loaded flight segments. The flight should include the demonstration of controlled flight beyond the stall boundary by use of autorotation or other high angle of attack maneuvers. The judge will deduct points if any of these areas are noticeably under utilized. The pilot is expected to show movement of the aircraft about all axes using both conventional aerodynamic controls and propeller-generated gyroscopic forces. Higher grades will be given to pilots able to make use of all these effects through a wide range of aircraft attitudes and flight paths. Repeated use of any such forces in the same or similar attitudes should result in lower scores.

#### Execution of Individual Maneuvers [ 40K ]

It should be clear that the maneuvers flown were, in fact, intended and fully under the pilot's control. Higher marks will be given for this objective when individual maneuver elements are started and finished on obviously precise headings and in well-defined attitudes. When, for example, gyroscopic maneuvers are allowed to decay into imprecise, poorly defined autorotation, marks should be deducted for poor execution, Marks should also be deducted if it appears that the pilot has relinquished control of the aircraft at any time.

#### Wide Variety of Figures Flown on Different Axes and Flight Paths [ 30K ]

Many different figures should be completed in the time available. These should include maneuver elements of many different kinds and should use many different flight paths and axes. Lower marks should be given to a pilot who used only one or two principal axes of flight. However, the use of additional axes within the performance zone must be clear and precise, not giving the appearance of being used by chance. Marks should also be deducted if any particular maneuver element is over-used or continues for an excessive period of time. For example, higher marks would be given in the event of a two-turn flat spin followed by something else, than to a multi-turn spin that simply took up more time.

## **ARTISTIC IMPRESSION [ 90 K ]**

### **Pleasant and Continuous Flow of Figures with Contrasting periods of Dynamic and Graceful Maneuvers [ 50K ]**

In a precisely flown sequence, the completion of a figure will be well described when movement about an axis ceases and a particular attitude is briefly held. The start of the next figure or maneuver should then begin without any prolonged period of inactivity caused by the need to reposition the aircraft or reorient the pilot. Marks will be deducted for any obvious period of level flight, or inactivity, required between figures. In a musical symphony, the listener's mood may be changed by contrasting fast and slow movements. Similarly, in a 4-minute Free Program, the judge should be treated to a flight that causes different reactions. While some maneuvers involve very high speeds, sudden attitude changes and rapid rotations, others involve slower speeds or more gentle transitions. Higher marks will be given to a pilot who finds time in his program for showing such differences of mood and pace. Marks should be deducted in this category for a flight that shows no such distinctions. Higher marks should be given for choreography with the music to enhance the flight, and the flight choreographed to enhance and present visual impressions where both the music and aircraft are flowing together with each other and acting as a unified entity to display a harmonious presentation.

### **Presentation of Individual and Combinations of Figures in Their Best Orientation and Optimal Position [ 40K ]**

Figures can give different impressions when seen from different viewpoints. For example, a climbing inverted flat spin looks most impressive when the top surface of the aircraft can be seen. A loop flown in a plane inclined at 45 degrees to the vertical is best appreciated when it is flown on the Y-axis. Marks should therefore be deducted if the judge is not shown a figure in its best orientation.

Each figure has an optimum from which it is best viewed. For example, a loop flown overhead does not give the same pleasing geometry as one flown further distant. Similarly, a figure flown near the upper height limit will cause discomfort when flown at the near edge of the performance zone; a low-level horizontal figure is better seen from close by than far away. Higher marks will therefore be given when individual figures are optimally placed, while judges should deduct marks when it appears that a figure is not well placed or positioned.

## **POSITIONING [ 20 K ]**

### **Symmetry of the Presentation Utilizing the Performance Zone to Maximize the Audience and Judges Perception, Reception, and Viewing of the Program [ 20 K ]**

Highest marks will be given when the sequence as a whole is balanced evenly to the left and right of the judges' direct line of vision towards the center of the performance zone. Marks should be deducted if, by design or by the influence of the wind, a pilot's program is noticeably biased to left or right. The greater the degree of asymmetry, the greater should be the deduction. Even though a flight might be symmetrical, it may also be spread too far to either side, so that some maneuver elements are flown outside the performance zone, thus making them difficult to see and interpret. Figures may also be flown on the direct line of vision but very distant. Any part of the flight that is flown at such distances should be penalized for each excursion. The entire program should be positioned so as to maximize both the audience and judges perception and reception of the flight as a whole.