



AUSTRALIAN AEROBATIC CLUB

# AAC REGULATIONS

March 2010



# AAC REGULATIONS

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## **INTRODUCTION**

The Australian Aerobatic Club (AAC) is responsible for the administration of the sport of aerobatics in Australia. It acts through the Australian Sport Aviation Confederation Incorporated, which is in turn responsible to the Federation Aeronautique Internationale (FAI). The FAI is the international organisation, which is responsible for the regulation of aviation sports worldwide. The governing commission of the FAI, which regulates sport aerobatics, in particular is called the Commission Internationale de Voltige Aerienne or CIVA. Australia sends one delegate with full voting rights to the annual CIVA meeting.

In the interests of maintaining international standards in the sport of aerobatics, the AAC contest rules are based broadly on CIVA rules. For Entry, Graduate, Sportsman and Intermediate competitors these Regulations provide all the relevant information. For the International Categories (Unlimited, Advanced and Yak-52), competitors should primarily refer to the FAI Sporting Code Section 6, "Regulations for the Conduct of International Aerobatic Events, Part 1 - Powered Aircraft". Local variations to the FAI Sporting Code for Australian competitions are noted throughout the text. Copies of the full CIVA Regulations are available on our Website via the CIVA link.

AAC Regulations are amended from time to time to reflect changes in CIVA and FAI Regulations. These Regulations are to be used at all competitions held in the name of the AAC.

Paul Bennet  
President  
Australian Aerobatic Club

# **AAC REGULATIONS**

## **LIABILITY**

1. The AAC, its officers, agents, servants, employees and/or membership shall not be liable for any acts or omissions of an individual Chapter holding a contest (or its officials, directors, agents, servants or employees), and any contest (or related activities) shall be conducted solely at the risk of the sponsoring Chapter.
2. All Chapter contest activities must be insured as may be prescribed from time to time by the AAC, or in the absence of such prescription, to insure against all reasonable and probable liability, which may result from said activities, as, otherwise provided herein.
3. As a condition of any permit by the AAC for a Chapter contest, and in consideration of the granting thereof, the sponsoring Chapter and/or its officers, directors, agents, servants, employees (or their administrators, heirs or assigns) agree to forever hold harmless and defend the AAC and/or its officers, directors, agents, servants or employees from any and all liability of any nature, whether due to negligence or intention, act or omission.

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# AAC REGULATIONS

## AMENDMENT RECORD

Keep this record up to date in the front of your Manual. The updated Manual is available on the AAC Web Site [www.aerobicsaustralia.com.au](http://www.aerobicsaustralia.com.au) or contact the Secretary on [secretary@aerobicsaustralia.com.au](mailto:secretary@aerobicsaustralia.com.au).

<u>Amendment</u>	<u>Date Inserted</u>
1	December 1999
2	March 2002
3	September 2002
4	February 2003
5	January 2004
6	September 2004
7	February 2005
8	April 2005
9	February 2006
10	June 2006
11	February 2007
12	February 2008
13	February 2009
14	December 2009
15	March 2010

# **AAC REGULATIONS**

## **CHAPTER 1**

### **CONTEST JOB DESCRIPTIONS**

#### **1.1. CONTEST DIRECTOR**

SAFETY will at all times be the primary consideration of the Contest Director who is the general manager of the event and is responsible for: -

- a) Conducting the contest in accordance with AAC, FAI and CIVVA Regulations.
- b) Appointing Contest Officials.
- c) Obtaining relative (CASA) approval to hold the contest if required and having a NOTAM issued to cover the event and practice days before.
- d) Obtaining weather forecasts.
- e) Securing insurance of the contest, including naming of AAC.
- f) Co-ordinating with sponsors, airport and CASA officials.
- g) Designation of landing and take-off areas for competition aircraft.
- h) Selecting a discrete frequency for use by competing pilots during official practice and competition.
- i) Supervision of the Radio Operator(s) in conjunction with the Chief Judge
- j) Designation and marking of the Aerobatic Zone.
- k) The set-up of the public address system, if required
- l) Conducting the pilot briefing.
- m) Liaise with Chief Judge to ensure Unknown Sequences are prepared.
- n) Receiving protests.
- o) Certification of final scores.
- p) Posting of scores.
- q) Presentation of Awards and or prize money.
- r) Any other duties as directed by the National Committee.

The Contest Director will be:-

- ◆ A current member of the AAC.
- ◆ Member of and assist in appointment of the Contest Jury.
- ◆ A member of the Technical Committee.

The Contest Director may:-

- ◆ Withdraw any contestant for reasons of safety.
- ◆ Exclude any contestant for unsportsmanlike conduct.

#### **1.2 CONTEST SECRETARY**

Will report directly to the Contest Director and is responsible for:-

- a) Issuing of Competition Entry Forms and all competition information details.
- b) Provide Judging Forms A, B & C for all flights (except the Free Programme), Line and Deadlines Sheets.
- c) Provide Registration and Order of Flight sheets for the Registrar
- d) Ensure clipboards and all relative stationery are available at the contest site.
- e) Liaise with Chief Judge regarding Unknowns to ensure adequate copies of Judges Forms A, B & C.

#### **1.3 CONTEST JURY**

The Contest Jury will consist of the Contest Director, Chief Judge and up to three additional members who are appointed by the Contest Director and Chief Judge.

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The Contest Director and Chief Judge will appoint alternate jurors when necessary to replace a juror involved in a protest or when a juror is unable to serve for whatever reason (including a conflict of interest).

The Contest Jury is the arbitration body of aerobatic events and will be responsible for:-

- a) Interpreting the general rules, the judging rules and the general regulations of the contest.
- b) Dealing with protests from contestants and judges.
- c) Approving modifications to Unknown sequences for the purpose of maintaining safety.

Decisions made by the Contest Jury are final and not subject to change or further protest.

The Contest Jury will be responsible for determining the into wind direction of flight of all aerobatic programmes.

### 1.4 CHIEF JUDGE

After SAFETY, the Chief Judge's primary concern should be the accurate and fair judging of the competition flights and is responsible for:-

- a) The preparation of Unknown Sequences as required
- b) Supervising Judges, Assistant Judges, Recorders, Line Judges, Timers, Starter, the Score Operators and Deadline Judge.
- c) Supervision of the Radio Operator(s) in conjunction with the Contest Director
- d) Advising the competition pilot of any possible conflict by transmitting the words "Break, Break, Break" on the discrete frequency.
- e) Appointing substitutes with the concurrence of the Contest Director for any officials who are unable to perform their duties.
- f) Approving substitution of aircraft.
- g) Authorising changes in the order of competition flights.
- h) Conducting a briefing for all Judges, Assistants, Line and Deadline Judges.
- i) Debriefing all Judges and Assistants.
- j) Certification of final scores.
- k) Ascertain any zero scores and height penalties for each flight.
- l) **Acting as the Judge, in deciding any zero scores, for manoeuvres started behind the Panel of Judges**
- m) **Acting as judge ( as determined by the contest jury),**

Refer to Appendix 2 Code of Practice for the Chief Judge and Board of Judges at Aerobatic Championships

The Chief Judge will be:-

- a) A National Judge; however, in the absence of a National Judge the Contest Director shall appoint the most experienced State Judge as the Chief Judge.
- b) A current member of the AAC.
- c) A member of, and assist in the appointment of the Contest Jury.
- d) A member of the Technical Committee.

The Chief Judge may:-

- a) **Perform the duties of a regular Judge, if it is deemed by the contest jury that the inclusion of the Chief Judge's scores would enhance the performance of the Judging Panel.**
- b) Withdraw any Judge for reasons of incompetency.
- c) Withdraw any contestant for reasons of safety
- d) Exclude any person for unsportsmanlike conduct.

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### 1.5 SAFETY DIRECTOR

Will report directly to the Contest Director and is responsible for:-

- a) Flight Safety - assisted by the Chief Judge and Technical Committee.
  - i. Ensure all aircraft flown by competitors during official practice and contest are fitted with a serviceable radio.
- b) Ground Safety - assisted by the Starter.
  - i. Flight Line control.
  - ii. Crowd control
  - iii. Parking of competition and transient aircraft.

### 1.6 MEDICAL DIRECTOR

The Medical Director will work in conjunction with the Safety Director concerning:

- a) Acquisition of and placement of emergency equipment.
- b) Securing of medical attention, i.e. doctor, ambulance, etc., if required.
- c) Provision for access and exit of emergency vehicles.

### 1.7 TECHNICAL COMMITTEE

Each contest will have a Technical Committee, which will consist of the Contest Director, the Chief Judge and other members appointed by the Contest Director. Whenever possible a LAME should be included in the Technical Committee.

In the event of an interruption of a flight due to an alleged mechanical problem, the Technical Committee will investigate the malfunction and determine whether or not it was a failure beyond the control of the competitor. The Technical Committee will report the findings to the Contest Jury.

### 1.8 REGISTRAR

The Registrar will be responsible to the Contest Director for: -

- a) Completion and acceptance of all current AAC Entry Forms including the Free Sequence (Forms A, B and C), if applicable by each contestant, that has certified by National Judge.
- b) Acceptance of entry fees.
- c) Preparation of a list of all contestants by category.
- d) Ensuring that each contestant is a current member of an AAC State Chapter and National Club, and has a current FAI Sporting Licence, pilot's licence, a Current Medical, Bi-ennial Flight Review and appropriate Low Level Permission aerobatic endorsement and spin (inverted & upright) endorsements as appropriate.
- e) Ensuring that the aircraft to be flown has a Certificate of Registration, a Certificate of Airworthiness, and a current valid maintenance release, together with a current Public Liability Insurance cover of a minimum of \$5,000,000.00.
- f) Issuing as many copies of the sequence of flights for each category programme as may be required.
- g) Drawing for order of flight.

Registration will not be deemed complete until the competitors Free Sequence together with the Judges Certification is submitted.

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### **1.9 STARTER**

SAFETY will at all time be the primary consideration of the Starter, who is responsible to the Chief Judge for the orderly release of all flights, reports of mechanical difficulties and for compliance with safety regulations by each contestant. The Starter will ascertain that each contestant's seat belts are securely fastened prior to release and will brief the pilot as to the into-wind direction of flight.

### **1.10 ASSISTANT SAFETY DIRECTOR**

The Assistant Safety Director will be appointed by the Contest Director and is responsible for manning the base radio and keeping a listening watch on the C.T.A.F. and discrete frequency. This role incorporates acting in a ground advisory capacity for all traffic. He/she will be responsible for warning the Chief Judge of any possible conflict

### **1.11 JUDGES**

Judges will be selected from the current AAC List of Qualified Aerobatic Judges by the Contest Director and Chief Judge and will be under the direct supervision of the Chief Judge. Judges will be responsible for all aspects of grading contest flights and the performance of the Assistant Judges and Recorders assigned to them. All Judges are required to attend the Judges' Briefing at the beginning of the contest and a debriefing at the end of each section of contest flights. A contestant may be a Judge or other official only if the contestant can attend each and every briefing and debriefing session. Relatives of competitors may not judge or assist in categories wherein their relatives are competing, unless otherwise approved by the Contest Jury. The AAC List of Qualified Aerobatic Judges is attached as Appendix 6.

The judge will be a current financial member.

Refer to Appendix 2 Code of Practice for the Chief Judge and Board of Judges at Aerobatic Championships

### **1.12 ASSISTANT JUDGES**

One Assistant Judge is assigned to each Judge. The Assistant is responsible for assisting the Judge to determine the proper sequence of the figures, into-wind direction of flight and other duties deemed necessary by the judge.

### **1.13 RECORDERS**

One Recorder is assigned to each judge to record all grades, positioning marks and such comments as time permits on the competitor's Form A. The Recorder maintains possession of the clipboard with Forms A, B and C in the proper order of flight.

### **1.14 LINE AND DEADLINE JUDGES**

Line and Deadline judges are assigned and located to record each infringement of the Aerobatic Box and designated deadline. They will be briefed by the Chief Judge.

Line Judges will be stationed at each corner of the performance zone so as to view all four boundaries of the aerobatic zone. If only two Line Judges are available, they will be located on two diagonally opposed corners.

A visual sighting device, a minimum of two stakes, which are lined up parallel with the Line of the aerobatic zone, will be used to determine each infringement of the limits of the aerobatic zone by each

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## CHAPTER 1

contestant. In all categories except Entry and Graduate, the Line Judge should note each manoeuvre flown outside the aerobatic zone during the infringement. After each **session** of flights, line infringement score sheets will be turned in to the Chief Judge.

Use of Line Judges and Deadline **Judges** is desirable at AAC Contests as is their attendance at all Judges' briefing and debriefing sessions. However, the Contest Jury may **preclude their use due to logistic considerations**.

### **1.15 TIMER**

The Timer will be responsible for the accurate timing of all flights if required. A record will be maintained by the Timer of all official flight times.

### **1.16 SCORING SYSTEM MANAGER**

Scoring System Manager will be responsible to the Chief Judge and the Contest Director for the prompt and accurate computations of all scores of competition flights.

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## CHAPTER 2

### CONTEST QUALIFICATIONS

#### 2.1 PILOTS

Competition pilots must possess, as a minimum, a current PPL (A) or higher licence, an aerobatic endorsement together with a CASA low-level permission applicable to the category in which they are competing.

They must be current members of the AAC and possess a current FAI Sporting Licence.

All pilots competing in Unlimited, Advanced or Intermediate must have completed and passed the AAC Judges' Home Study Course.

All pilots who have not flown in prior competition may be required to demonstrate their proficiency prior to being allowed entry.

#### 2.2 SAFETY PILOTS

The competitor will be the sole occupant of the aircraft during competition flights except in Entry, Graduate and Sportsman. The Safety Pilot should be a member of the AAC with the following qualifications CASA Delegate, an A.T.O, or Instructor, or holding the appropriate Low Level Permission. In all cases the Safety Pilot and the use of same is subject to the approval of the Contest Jury.

#### 2.3 ENTRANCE REQUIREMENTS

Compliance with Commonwealth of Australia C.A.O.'s and C.A.R.'s is required for participation in AAC contests. Possession of certain aircraft and pilot documentation is required before participation in AAC contests will be permitted. All required documents must be current and will be checked by the Registrar at the contest site. Photocopies of documents will be accepted.

Documents required to be produced at the contest are: -

- a) Certificate of Registration.
- b) Certificate of Airworthiness.
- c) Maintenance Release.
- d) Certificate of Insurance showing public liability and property damage in the amount of \$5,000,000 single limit minimum.
- e) A current Pilot's Licence.
- f) A current Medical Certificate.
- g) A Bi-ennial Flight Review.
- h) Aerobatic endorsement per CAO 40.1, the minimum aerobatic endorsements required are loop, barrel roll, slow roll, stall turn, roll off the top and spin (inverted & upright) as appropriate.
- i) Low Level Permission appropriate to the competition level being flown
- j) AAC Membership card.
- k) FAI Sporting Licence

Failure to satisfy the Registrar of possession of these documents will result in immediate disqualification and will prevent participation in the contest.

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## CHAPTER 2

### 2.4 JUDGES

A List of Qualified Aerobatic Judges will be kept by the AAC. Judges and Assistant Judges must meet all the standards outlined below and they must be current members of the AAC.

Appointments to this list will be made by the AAC National Committee.

Judges who are guilty of considerable misjudgement, prejudice etc, will be reported to the National Committee by the Chief Judge. In case of repeated failure, the National Committee may drop a Judge's classification or remove their name entirely from the list of Qualified Aerobatic Judges.

In order to be included on the AAC List of Qualified Aerobatic Judges, the following qualifications and experience is required: -

#### 2.4.1 National Judges

- a) Must have completed the current AAC Judges' Home Study Re-currency Course.
- b) Must be a current State Judge.
- c) Must have judged at least two AAC contests within the previous 18 months.
- d) Must be recommended by at least one current National Judge under whom they have served.
- e) Must be approved by the AAC National Committee.
- f) Must maintain their Judge's Log Sheet to enable confirmation of their currency.

#### 2.4.2 State Judges

- a) Must have completed the current AAC Judges' Home Study Course.
- b) Must have assisted at two AAC contests, OR have judged at four club flying critique sessions under the supervision of a current State or National Judge.
- c) Be recommended by two current National or State Judges under whom they have served.
- d) Must maintain the Judge's Log Sheet to enable confirmation of their currency.

#### 2.4.3 Assistant Judges

These Judges are not required to be chosen from the list of Qualified Aerobatic Judges. However, they should have: -

- a) Completed the current AAC Judges' Home Study Course OR,
- b) Had previous competition aerobatic experience.

#### 2.4.4 Recorders

Recorders are not required to be chosen from the list of Qualified Aerobatic Judges. However, they should have: -

- a) Completed the current AAC Judges' Home Study Course OR,
- b) Had previous competition aerobatic experience.

#### 2.4.5 Line and Deadline Judges

These Judges are not required to be chosen from the list of Qualified Aerobatic Judges. However these Judges must be able to interpret Forms B and C.

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## CHAPTER 3

### ADMINISTRATION OF THE CONTEST

#### 3.1 AIRSPACE APPROVAL

It may be necessary to obtain CASA approval to hold the contest. The need, or otherwise, for CASA approval should be ascertained well in advance of the contest date and the appropriate action taken. This is the responsibility of the Contest Director.

#### 3.2 INSURANCE

All aerobatic contests approved or conducted by the AAC must be covered by air display liability insurance, including State competitions.

The Australian Aerobatic Club (National Body) must be included in the insurance policy as a named Insured.

#### 3.3 SELECTION OF JUDGES

The use of five (5) Judges is standard for all contests. However, a minimum of three (3) Judges may be used when five (5) currently qualified Judges are not available. Line Judges will be chosen by the Chief Judge. (unless waived at the discretion of the Contest Jury). The Chief Judge may ONLY perform the duties of a regular Judge **deemed necessary by the contest jury**.

#### 3.4 SUPPLEMENTARY RULES

The Contest Jury may issue Supplementary Rules to cover contests.

#### 3.5 NUMBER OF CONTESTANTS PER AIRCRAFT

The maximum number of pilots that may be entered in a contest per competition aircraft may be limited by the Supplementary Rules issued by the Contest Jury.

#### 3.6 ENTRY AND OTHER FORMS

An entrant in an aerobatic contest will be required to complete the following current forms from the AAC and submit them to the Contest Registrar not later than the time specified and at the place the Contest Director shall designate. All entrants undertake, by signing the Application for Entry, compliance with the regulations and procedures in this manual as revised.

- a) Application for Entry and the Entry Fee.
- b) "Hold Harmless" Waiver and agreement.
- c) Free programme score sheets and sequence sheets.

Free programme score sheets must be submitted in Microsoft Visio using Aresti software format and emailed to the nominated official) to be completed as follows: -

Form A - (Judges Score Sheet) will show symbols, catalogue reference numbers and coefficients.

Form B - (Flow Chart) will show the continuous sequence of the programme, as it would be flown with the wind blowing from right to left.

Form C - (Flow Chart) will show the continuous sequence of the programme as it would be flown with the wind blowing from left to right.

Forms B & C must carry the correct symbol for the wind into-wind direction and a red line indicating the position of the Optional Break.

Note: Originals that have certified by National Judge must be supplied during registration.

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The forms will include the conventional symbols, catalogue numbers and coefficients only. No account will be taken of any other writing or notations.

It will be the duty of the contestant to have their Free Programme checked by a National Judge, prior to the contest. The Judge will check the catalogue reference numbers on form 'A' of each competitor with the symbols on forms 'B' and 'C', taking the reference numbers in the Aresti System (Condensed) as the base criteria for deciding compliance with the versatility rules. The Judge checking the Free Programme will sign and date the Free Programme sheets when completed. Any contestant who arrives at a contest without their Free Programme checked may be refused entry. The Chief Judge will check that the Free Programmes have been certified by a Judge. See Chapter 5, Free Programmes.

Registration will not be deemed complete until the competitors Free Sequence together with the Judges Certification is submitted.

Should a competitor disagree with a decision of the Contest Officials concerning their Free Programme, the matter may be put before the Contest Jury under the procedures in this manual under "Protests".

The final responsibility for the correctness and compatibility of forms A, B and C lies with the competitor.

The Contest Officials will be responsible for ensuring that the names of the competitors will not appear on Forms A, B and C.

A copy of all competitors' free programmes (Form B only) will be posted prior to the start of this programme.

### **3.7 ENTRY FEES**

The amount of the entry fee will be determined by the National or State Committee (as applicable).

### **3.8 REFUSAL OF ENTRY**

Any contestant may be refused participation in a contest in which the contestant or their aircraft does not meet the standards required. The decision to refuse entry may be made by the Contest Director.

Contestants arriving late regardless of reason will be refused entry unless they arrive in time to complete registration, technical inspection, be briefed and on the line ready to fly before the commencement of the first flight of their category.

### **3.9 WITHDRAWAL OF ENTRY**

Contestants may withdraw from a contest any time prior to the entry deadline date and time. In case of withdrawal, the entry fee will be returned to the contestant.

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### 3.10 TROPHIES AND AWARDS

Awards will be given to category winners under the following guidelines: -

Category	Number of Contestants	Number of Awards
All six	2	1 <sup>st</sup> & 2 <sup>nd</sup> Place
	3 or more	1 <sup>st</sup> , 2 <sup>nd</sup> & 3 <sup>rd</sup> Place

At AAC National Contests, awards will be given to the first three finishers in each category. Entry Category will not be flown at the National Championships.

FAI members of other countries may be invited to compete, but not for the title of Australian Champion in any category.

At AAC National Contests:

- ◆ **Australian Champion Trophy**  
The highest placing Australian Unlimited Competitor will be awarded the Philips Cup Australian Champion Trophy. The winner will retain the perpetual trophy for one (1) year.
- ◆ **Australian Aerobatic Club Highest Percentage Overall Trophy**  
The competitor who achieves the highest percentage overall will be awarded the Australian Aerobatic Club Highest Percentage Overall Trophy. The winner will retain the perpetual trophy for one (1) year.
- ◆ **Highest Placing First Time Sportsman Competitor**  
A trophy will be awarded to the highest placing first time Sportsman Competitor. The winner will retain the perpetual trophy for one (1) year.
- ◆ **Team Trophy**  
Team points will be awarded for each grade as follows:  
1<sup>st</sup> place    3 pts  
2<sup>nd</sup> place    2 pts  
3<sup>rd</sup> place    1 pts  
  
The State Chapter with the highest aggregate points will be awarded the team trophy. In the event of a tie, those chapters next highest placing contestants scores will be used.
- ◆ **Tom Moon Four Minute Free Trophy**  
The competitor who wins the Unlimited Four Minute Free will be award the Tom Moon Trophy. The winner will retain the perpetual trophy for one (1) year.
- ◆ **The Australian Aerobatic Club (Year) Aerobatic Champion** will be awarded a perpetual trophy in the years when no Unlimited competition is held. This trophy will be awarded to the highest placing Advanced Pilot.

### 3.11 PRIZE MONEY

Prize money will be awarded at the discretion of Contest Officials.

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## **CHAPTER 3**

### **3.12 CANCELLATION OR POSTPONEMENT OF THE CONTEST**

No contest will be cancelled or postponed unless: -

- a) There is time to notify all contestants at least three (3) days in advance of the contest date.
- b) Weather conditions do not permit the safe conduct of the contest.
- c) Due to circumstances beyond the control of the Contest Director.

### **3.13 POSTING OF SCORES**

The Contest Director will be responsible for the posting of official scores as promptly as possible. The ACRO Aerobic Contest Results Organiser software in Raw Score Mode will be used.

### **3.14 CONTEST RECORDS**

Score sheets will be made available to contestants immediately after the Contest Director has posted official scores for the programme flown.

### **3.15 CERTIFICATION OF FINAL SCORES**

The Contest Director and Chief Judge will review the computation of all scores. Following this review, the Contest Director and Chief Judge will certify the scores as final by affixing their signatures to same.

### **3.16 PROTESTS**

Individual pilots and judges are eligible to file protests. The following procedure will be used when lodging protests: -

- a) Protests must be submitted to the Contest Jury on the AAC Protest Form.
- b) Protests must be accompanied by a fee of \$150.00 per protest, which will be returnable, if the protest is upheld.
- c) Protests must be lodged not later than two (2) hours after the occurrence, decision or publication of results, which causes the protest to be made. Non-working hours, as defined in Supplementary Rules for the Championship or Competition, will not be counted. Every protest must refer to the rule or rules to which it relates.
- d) The hearing of the protest will be conducted as follows: -
  - i. All protests will be dealt with by the Contest Jury. Decisions taken by the Contest Jury are final and must not be changed later.
  - ii. The hearing will be conducted as soon as possible after the receipt of the protest.
  - iii. The protester can be present while the hearing is being conducted and may call witnesses but will be excluded when the Contest Jury is considering its verdict.
  - iv. Witnesses may be called.

# AAC REGULATIONS

## CHAPTER 3

### 3.17 PRACTICE/TRAINING FLIGHTS

**Individual registration must be completed prior to undertaking Official Practice**

#### Unlimited and Advanced

Refer FAI Section 6 – Programme Q.

#### Intermediate, Sportsman, Graduate & Entry

- a) All competitors will be allowed one training flight for familiarisation with the local conditions over the performance zone. Each training flight will be 10 minutes in the box. Training flights are subject to the same safety regulations as contest flights, and they are to be on a schedule determined by the Contest Director.
- b) The acceptable meteorological conditions for practice flights may be below the minima for competition flights and are specified in Chapter 4 paragraph 4.11.
- c) The contest will be deemed to have started at the beginning of the briefing prior to official practice.
- d) No other practice flights will be allowed once the contest has begun. The rule may be waived by the Contest Jury under special circumstances at their discretion.

# **AAC REGULATIONS**

## **CHAPTER 4**

### **CONTEST REGULATIONS AND PROCEDURES**

#### **4.1 PUBLIC ADDRESS SYSTEM**

May be permitted by the Contest Jury with the following restrictions:-

- a) The PA system should not be audible at the judging position.
- b) No derogatory remarks about contestants, crews or officials will be allowed.

#### **4.2 FLIGHT LINE CREWS**

Each contestant will be responsible for the conduct of his or her flight line crew. Only those persons authorised by the Contest Director will be eligible to serve on the flight line crew. Any misconduct may result in their expulsion from the flight line.

#### **4.3 REASONS FOR DISQUALIFICATION**

All contestants must comply with the Civil Aviation Act, CAR, CASR's, CAO's & AIPs. Any violation of these Orders and Regulations will render the offender liable to disqualification from the contest.

A contestant will be disqualified if it is determined by the Contest Jury, Judges or the Technical Committee that the contestant has violated any of the following regulations: -

- a) No pilot may fly without a complete pilot briefing.
- b) Technical Devices - the use of technical devices for the purpose of coaching during a competition flight is prohibited.
- c) Smoke Systems - the use of smoke systems during competition flight is prohibited, except for the 4 Minute Free Style programme.
- d) Mechanical Condition - operation of a competition aircraft with a known mechanical defect that renders the aircraft un-airworthy.
- e) Aircraft Limitations - performing a manoeuvre, which is prohibited for that aircraft type.
- f) Reckless Flying - any violation of traffic patterns, unscheduled aerobatic manoeuvres, or operation of an aircraft in an unsafe manner or in such a manner that would create an unsafe situation or cast an image of recklessness on the AAC. The contestant will not be allowed any subsequent flying except for the removal of their aircraft from the contest location.
- g) Alcohol - no alcohol beverage may be consumed by any person associated with the contest in any capacity during the period of practice and competition flying and must abide by the Civil Aviation Safety Regulations 1998, subsection 99.010
- h) Scuba Diving - contestants must not participate in scuba diving within a 24-hour period prior to participation in a contest.
- i) Medical - sudden unpredictable deterioration in physical condition, which renders further aerobatic flight unsafe, will require immediate cessation of that flight. Preventable physical incapacitation will be grounds for disqualification for that flight.

In the event of temporary incapacitation before the start of a flight, the pilot will notify the Starter. Medical evaluation must be performed by the Medical Director before the Contest Jury considers the possibility of subsequent or make up flight.

The Contest Jury will rely heavily upon the Medical Director's opinion (which may be supplemented by consultation with appropriate physician consultant(s) of their choice).

# AAC REGULATIONS

## CHAPTER 4

The Contest Jury will have final authority to decide upon “make up” or “resumption of contest” flights.

- j) Drugs - Contestants will not be permitted to compete if they are under treatment with any drugs which are not permitted to be taken under C.A.R. Part 6 (Medical) Schedule 1 Part 1.
- k) Unauthorised presence on the Judging Line.
- l) Fraudulent entry, misconduct, harassment or intimidation of officials.
- m) Practising of any unknown manoeuvre by any contestant; however, this does not preclude the flying of any normal competition sequence.
- n) Unauthorised entry into the Aerobatic Box.
- o) Alteration of Free Programme after the Judge’s Certification of the Sequence without obtaining recertification.

### 4.4 ETHICS

Abuse of any contest official or other contestant is grounds for disqualification from the contest.

Bribery or attempted bribery of any contest official or other contestant or acceptance of a bribe is grounds for disqualification from the contest.

Unsporting Behaviour. Cheating or unsporting behaviour, including deliberate attempts to deceive or mislead officials, wilful interference with other competitors, falsification of documents, use of forbidden equipment or prohibited drugs, violations of airspace, or repeated serious infringements of rules should, as a guide, result in disqualification from the sporting event

### 4.5. SEQUENCE OF FLIGHTS

#### Unlimited and Advanced

The sequence of competition flights for Programme Q and 4 will be determined by lot to be arranged by the Contest Director. Each competitor will draw his or her own lot.

In Programmes 1, 2, and 3, the official combined standings from the previous programme(s) will be used, in reverse order, to determine the order of flight except for the top 10 pilots. The top 10 pilots will draw for order of flight for each programme.

#### Intermediate, Sportsman, Graduate and Entry

The sequence of competition flights will be determined by lot to be arranged by the Contest Director. Each competitor will draw his or her own lot.

The sequence of flights may be altered by the Contest Jury if special circumstances require.

### 4.6 PILOT BRIEFING

This briefing is mandatory for all contest officials and contestants. Notification of time and place will be given in advance. The briefing will be conducted by the Contest Director and will include:-

- a) Roll call and order of flight. (Pilots must answer roll call in person). Missing roll call will incur penalties for each briefing as follows:-

Graduate & Entry	10 penalty points
Sportsman	25 penalty points
Intermediate	50 penalty points
Advanced	75 penalty points
Unlimited	100 penalty points

# AAC REGULATIONS

## CHAPTER 4

- b) Introduction of Judges, Starter and Contest Officials.
- c) Introduction of CASA Officials (if present).
- d) Weather forecast and winds aloft.
- e) Into-wind direction of flight.
- f) Description of Aerobatic Zone, Safety Manoeuvres and deadlines.
- g) Safety rules and minimum altitudes.
- h) Starting procedure.
- i) Holding area.
- j) Procedures re control of entry of contestant to the aerobatic zone.
- k) It is recommended that, when possible, a “warm up” flight for the judges and contestants be flown in Known and Unknown programmes by a pilot who is a non-competing pilot. Such pilot shall fly the low altitude line(s).
- l) Sufficient review of any manoeuvres deemed necessary to assure complete understanding by all contestants and judges.
- m) Personnel permitted on the Judging Line.
- n) It is the individual pilots responsibility to bring to the attention of the meeting any procedure or rule, in which they are unsure of the interpretation or instruction. *Lack of knowledge is not to be use as subsequent excuse.*

### 4.7 JUDGES BRIEFING

This briefing is mandatory for the following personnel - Judges, Assistant Judges, Recorders, Timers, Line and Deadline Judges. It will be conducted by the Chief Judge and shall include:

- a) Position duties.
- b) Judges review of the following items:
  - i. Range of scores.
  - ii. Questions about scoring of individual manoeuvres.
  - iii. Criteria for scoring individual manoeuvres.
  - iv. Criteria for scoring positioning.
  - v. Stress the Deadline.
  - vi. Low altitude limits.
  - vii. Other items deemed necessary.
  - viii. Location and time of debriefing following each competition flight, if required.

### 4.8 STARTING

A competition pilot must be at their aircraft, at the nominated starting position ready for flight a minimum of two (2) competitors prior to their order of flight number. The starter will check that lap belts and shoulder harness are secure and will then brief the pilot as to the into-wind direction of flight and frequencies to be used as a final reminder. Then after receiving starting orders, the contestant will start, then taxi when cleared, for departure to the competition area. Failure of the contestant to observe proper starting procedures or to comply with the Starter's orders may subject him/her to disqualification.

All pilots will give normal taxi radio calls on the appropriate frequency and normal radio calls on rejoining the circuit. During official practice and competition, all pilots will listen out on the discrete frequency chosen by the Contest Director.

Once airborne, before entering the Performance Zone and having ensured that the box is clear, a pilot may call the Chief Judge on the safety frequency, saying: “Competitor Number x, radio check”. The Chief Judge must respond to this call if he hears it. If he/she hears no response, the pilot may elect to land as in the case of any other technical defect, in accordance with section 4.9.2.

# AAC REGULATIONS

## CHAPTER 4

### MECHANICAL DEFECTS

#### 4.9.1

- a) In the event of a competing aircraft becoming unserviceable before the start of a flight, the Contest Jury may, on the recommendation of the Technical Committee, permit the competitor to use another aircraft or the same aircraft following the rectification of the defect.
- b) In the event that a test flight is required and the competitor does not allow a non-competing pilot to fly his/her aircraft for test purposes, a special authorisation will be given to the competitor to fly this test flight under the following conditions:
  - i. The flight will consist of a maximum of three aerobatic figures.
  - ii. The figures will be recommended by the Technical Committee and approved by the Contest Jury.
  - iv. The flight will be conducted in the Aerobatic Zone and observed by a member of the Contest Jury.
  - v. If the competitor violates these conditions he/she will be disqualified.

#### 4.9.2

- a) When a competitor has a mechanical defect in flight and decides to land, he/she will be required to taxi (if able) to a designated secure area that is protected from spectators. This area will be off limits to everyone except the competitor, the Technical Committee and the Contest Jury. An engineer will be permitted to enter the area with the concurrence of the Contest Jury. The competitor will be required to remain in his/her aircraft until the arrival of a member of the Contest Jury who will release him/her and subsequently permit the aircraft to be worked on and inspected.
- b) In the event of a competitor breaking off his or her competition flight in case of technical damage which is beyond the pilot's control after take-off, he or she may be allowed to repeat the flight provided that evidence of the damage can be furnished to the Technical Committee within two hours after landing. For finding the damage only, the following persons will be permitted to work on the aircraft: the competitor and the mechanic named by the competitor, plus members of the Technical Committee and the Contest Jury. When the cause of the damage has been found, the damage will be repaired by the mechanic of the aircraft and other experts, as recommended by the Technical Committee.

#### 4.9.3

Any damage will be counted as such provided it is a break or deformation found on the aircraft or engine or their component parts without use of any special device except a magnifying glass.

#### 4.9.4

The following defects will not be counted:

- a) Incorrect adjustment.
- b) Technical trouble caused by dirt if attributed to negligence of the competitor. Note: if it can be ascertained by the Technical Committee that contaminated fuel or oil was supplied by the organisers, the penalising rule does not apply.
- c) Insufficient or missing safety devices causing a change of settings during the flight.

In cases a) or c) (with the exception of the Note in b)), the competitor will not be permitted to repeat his or her flight.

#### 4.9.5

# **AAC REGULATIONS**

## **CHAPTER 4**

The Contest Jury must, not later than five hours from the landing of the competitor concerned, decide whether or not a repetition flight will be approved. In case of doubt on the basis of the statement by the Technical Committee, the Contest Jury shall decide in favour of the competitor.

### **4.9.6**

In order to avoid any delay in the progress of the contest, the flight will be repeated at the first available opportunity closest to the original flight order even if this is prior to the decision of the Jury.

### **4.9.7**

The sequence of repetition flights is determined by the sequence of interruptions of competition flights.

### **4.9.8**

A competitor making a repetition flight must re-fly the entire programme. Judging and scoring will be continued from the figure during which the technical problem occurred in the interrupted programme.

## **4.10. RECALL SIGNALS**

The discrete radio frequency will be used to recall a competitor if necessary during a flight.

The standard phraseology in the event that a break is required for safety reasons will be the Chief Judge saying "Break, break, break" and no other.

## **4.11 METEOROLOGICAL CONDITIONS**

Weather conditions for aerobatic flight are covered by CASA Visual Meteorological Conditions for visual flight operations. Therefore, contests held under AAC rules must comply with these minimum cloud clearance, ceiling and visibility requirements. However, ideal weather will not necessarily prevail on the contest day.

### **4.11.1**

Flights will be carried out between the hours of sunrise and sunset at the place of competition. These times may be extended by the Contest Jury, if required, to a maximum of 15 minutes either side of official BOD and EOD, i.e. BOD plus 15 minutes and EOD minus 15 minutes. If the visibility deteriorates within the stated time limits the Chief Judge will discontinue competition flights. The Contest Jury will decide upon the finish of the competition.

### **4.11.2**

The minimum height of the cloud base must be 50 metres above the maximum height determined for each competition flight. The minimum prevailing flight visibility, determined with reference to ground features from the midpoint of the area at the maximum height for the competition flight, must be 5 kilometres. The maximum permissible average wind speed at the surface is 12 m/sec (~23kts). At 500m the maximum permissible average headwind component is 12 m/sec (~23kts). Maximum crosswind components, in relation to the main axis, are 6 m/sec (~12kts) at the surface and 8 m/sec (~16kts) at 500m. Maximum tail wind component at the surface and 500m is 3 m/sec (~6kts). Competition flight will not take place in precipitation.

The decision with regard to the into-wind direction of flight shall take into account the predominant direction of the actual winds. Flying at the start of each day, and each flight programme, shall commence into the actual wind.

In circumstances where intermittent low cloud is passing through the Performance Zone, followed by clear patches of weather, the Contest Director in conjunction with both the Jury and the Chief Judge, may waive the time limit for the completion of the programme, thus allowing a competitor to orbit if so desired, until the Zone is clear.

# AAC REGULATIONS

## CHAPTER 4

### 4.11.3

If the meteorological conditions do not meet the requirements or if the visibility decreases below 5km, the Chief Judge after consultation with the Contest Jury will discontinue competition flights. Such decision may be taken:

- a) If the information from the aerodrome weather service was obtained by balloon ascent.
- b) If there is information available from competitors who have just finished or discontinued a flight owing to weather conditions which, in the opinion of the pilot, were outside the prescribed limits.
- c) If the visibility is judged independently by members of the Contest Jury, the Chief Judge or the competitors to be below the minimum laid down.

In such cases the members of the Contest Jury should immediately use an aircraft, to be made available for this specific purpose, and arrange for a weather reconnaissance flight in order to observe the horizontal visibility and cloud height.

If the cloud is at least 800 m above aerodrome level, the Contest Jury may relax the visibility and wind limitations stated above in the interests of completing the first three competition programmes before the end of the period.

### 4.11.4

A competitor may discontinue his or her sequence in level flight at the end of a figure if, in his or her opinion, the weather conditions do not comply with the competition rules, i.e.,

- a) If for the first four programmes the horizontal visibility deteriorates to less than 5km, or if the cloud height in the performance zone is lower than the prescribed height or if precipitation becomes apparent the competitor may discontinue his or her flight before the beginning of the programme or during the programme. In this case, members of the Contest Jury should immediately use their test aircraft in order to check the weather conditions in the performance area and to reach a decision on the possible repetition of the competition flight. This applies to Programmes Q, 1, 2 and 3.
- b) If the wind exceeds the limits specified in 4.11.2 during a flight and the competitor is not able to observe such changes and he or she completes the flight (i.e. if the competitor made his or her flight under conditions which were disadvantageous as compared with other competitors), this competitor is entitled to repeat the flight, except in Programmes 2 and 3 for Unlimited and Advanced and Programme 3 for Intermediate.
- c) The marking for the repetition for a competitor will be continued from that figure immediately following the break.
- d) If a competitor discontinues his or her flight without sufficient reason, no repetition flight will be allowed.

# AAC REGULATIONS

## CHAPTER 4

### 4.11.5

- a) If during the performance of Programmes Q, 1, 2 or 3 the height of the cloud base is less than the maximum height laid down for the particular programme, the Contest Jury may allow flights to be made in two parts, the competitor being allowed to readjust height without penalty to commence the second part.
- b) If the cloud base subsequently rises to the minimum cloud base pilots may no longer interrupt their flights without penalty; with due warning, i.e. at least 10 minutes in advance, pilots will be advised by the Contest Director or his/her staff, following advice to him from the Contest Jury, when they are to fly without interruption.
- c) When an interruption occurs along the Y-axis, the competitor must resume his or her flight in the same direction of flight.

Note: Even though an interruption may be allowed without penalty by the Contest Jury, there is no obligation for pilots to interrupt their flight.

### 4.12 DIRECTION OF FLIGHT

The into-wind direction of flight for the start of the Compulsory Programmes shall be determined by the Contest Jury. The Contest Jury shall also determine the alignment of the main axis for the Free Programme but the competitor may choose to start his or her first figure along either axis in either direction, provided he or she shows clearly on the drawings of his or her programme the direction to be chosen. No flight shall be required to take place less than 30 minutes after the into-wind direction of flight is determined or subsequently changed.

### 4.13 SIGNALLING START AND END OF SEQUENCE

#### 4.13.1

A competitor must signal the start and finish of each programme, and any interruption, by distinctly dipping the wing three (3) times immediately one after the other by more than 45°. For timing purposes the programme is deemed to start on the return of the wings to level after the third wing dip; and is deemed to finish on their return to level after the third of the final wing dips.

The aircraft may start and/or finish the wing dips either inside or outside the aerobatic zone. They may be in normal or inverted flight or a horizontal, climbing or descending path.

If the first figure in a programme begins in inverted flight, all wing dips must be performed in inverted flight. The competitor may change his flight attitude from normal to inverted only by a half roll prior to the first wing dip. The return of wings to 'level' therefore does not necessarily refer to the aircraft being 'in level flight'. Failure to comply will result in a penalty of 30 points.

A horizontal flight path is required at the start of the first figure. This horizontal may be started inside the aerobatic zone or, provided that it is clearly seen to continue inside, it may be started outside the zone.

#### 4.13.2

Refer 5.6

Failure of a competitor in Programme 4 – The Final Freestyle Programme to observe precisely the signalling start and finish rules in Programme 4 will result in a penalty of 150 points.

# AAC REGULATIONS

## CHAPTER 4

### 4.14 TIME LIMITATIONS

- a) A time limit of 15 minutes will apply for Entry, Graduate, Sportsman and Intermediate Programmes. This will deem to start when the competitor is called into the Performance Zone by the Chief Judge. The end of the 15 minute time limit will be clearly announced by the Chief Judge to the pilots by means of radio. There will be no penalty for exceeding the time limit, but figures flown after that time will not be scored.
- b) Unlimited and Advanced: Refer FAI Section 6, paragraph 4.2.6.1, sub-paras a) and b).
- c) In Programme 4 there is a time window of between 3 minutes 30 seconds and four minutes in which to complete the programme, without penalty, after signalling the start of the sequence. Any deviation, shorter or longer, from the time allowed for Programme 4 will incur 10 penalty points for each second or fractional part of a second of deviation.
- d) The Chief Judge shall indicate by call or signal the time during which the Judges must watch and mark a programme.
- e) The standard phraseology in the event that the time limit is exceeded will be the Chief Judge saying “Time, time, time” and no other.

### 4.15 HEIGHT LIMITATIONS

<b>Category</b>	<b>Upper Limit</b>	<b>Lower Limit</b>
Entry	3500 feet	1500 feet
Graduate	3500 feet	1500 feet
Sportsman	3500 feet	1500 feet
Intermediate	3500 feet	1200 feet
Advanced	1100m	CIVA Sporting Code 6 4.2.4.1
Unlimited	1000m	CIVA Sporting Code 6 4.2.4.1

Sportsman, Graduate and Entry competitors must have either a 1500ft low-level permission, fly with a safety pilot OR fly the sequence not below 3000ft.AGL.

# AAC REGULATIONS

## CHAPTER 4

### 4.16 INFRINGEMENTS OF ALTITUDE LIMITS, BOUNDARIES, DEADLINE, INTERRUPTIONS

	Graduate &Entry	Sportsman	Intermediate	Advanced Civa Sporting Code 6 4.2.4.1	Unlimited Civa Sporting Code 6 4.2.4.1
High Altitude Infringement	5	10	20		
Low Altitude Infringement 1-200 feet	100	100	100		
Low Altitude Infringement More than 200 feet	0 entire programme	0 entire programme	0 entire programme		
Line Infringement	Nil	5	10		
Deadline Infringement	Any manoeuvre or part there of flown behind the contest deadline will be given a zero				
Programme Interruption/Insertion	10	20	35		

\* For every obvious and visually recognised infringement of the lower height limit during the performance the competitor will be given 100/200/250 penalty points. An additional 100/200/250 penalty points will be given for each additional figure flown partly or completely below the lower height limit. **Any manoeuvre that involves more than one infringement of the lower limit, will incur a penalty for each infringement.**

Penalties assessed for infringement of altitude limits, to be sustained, require that a simple majority of the Judges indicate on the score sheet the individual manoeuvre on which the infringement occurred and the extent of any low infringements, i.e. below 200ft. In case the required simple majority could not rise from a vote within the Board of Judges, the Chief Judge shall have a casting vote. An infringement of the lower disqualification level must be agreed by **a Simple Majority** of the Judges. **For Advanced and Unlimited under CIVA Rules, a two-thirds majority is always required for the penalty of disqualification.**

#### Line Infringements:

Line judges will note each infringement of the zone by more than 50 metres. The Graduate and Entry Categories are not subject to boundary infringements.

A single infringement is considered to have occurred if the fuselage of the aircraft is seen by the Line Judges to have crossed the line being observed, even if this occurs more than once in a single figure.

When four corner judging positions are being utilized, then both judges must confirm that the a/c concerned has infringed the boundary concerned **for the penalty** to be carried/upheld.

For each infringement of the performance zone by more than 50 metres in the direction of the x-axis and/or y-axis a pilot will be given a line infringement. If any portion of the first manoeuvre is performed outside the aerobatic zone, the competitor will incur a Line infringement.

A mark of "O" will be given for any figure started behind the Chief Judge.

# AAC REGULATIONS

## CHAPTER 4

### Programme Interruption:

A competitor will be given penalty points if he or she interrupts his or her programme:

- a) by dipping the wing three (3) times immediate one after the other;
- b) in order to make a change of attitude or direction between two figures (more than 90°);
- c) in order to lose or regain height;

Following a programme interruption, the competitor must restart his or her programme with the figure

- a) immediately preceding the point of interruption;
- b) in which the interruption occurred;
- c) immediately following the point of interruption

In no case shall a figure that has already received a score (even if zero) prior to a programme interruption be re-scored.

Should the competitor restart his or her programme at any point other than provided for, the competitor will be given additional penalty points in accordance with the appropriate tariff.

The addition of a figure to a sequence will also result in penalty points, but all subsequent figures correctly flown will be marked. For example, if the additional figure flown is a repeat of the previous figure, the score for the original figure must be retained, even if zero. Under no circumstances should a competitor be allowed to gain an advantage due to this additional figure.

### **4.17 THE AEROBATIC PERFORMANCE ZONE**

The programme will be flown with reference to the longitudinal (X) and lateral (Y) directional axes. The Performance Zone will be a clearly and distinctly marked area of 1000 x 1000metres whose central point will be the intersection of the axes.

The longitudinal (main) and the lateral (secondary) axes shall both be marked by 7 contrasting marking strips. The size of these markers must be at least 2 x 9 metres, with the longer side aligned with the direction of the axis. The ends of the axes and the four corners of the box must be clearly marked. On the main axis and near the centre point an arrow will be placed, pointing into the official wind as determined by the Contest Jury.

The colour of the marking strips must be in distinct contrast to the ground and other airfield markings, which latter should be removed if possible.

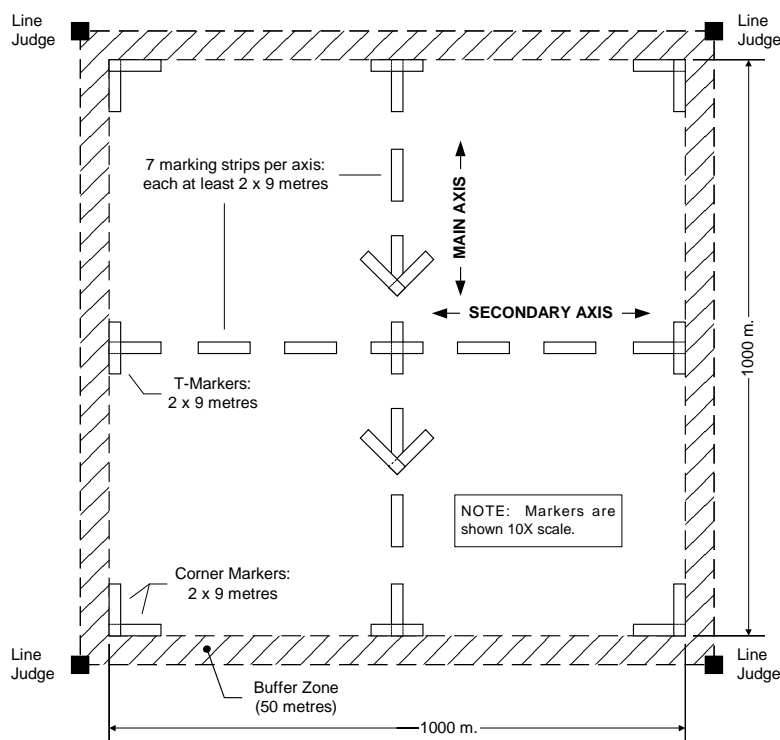
The Judges will be located approximately 750 metres from this intersection on an extension of the Y axis. The Chief Judge and Radio Operator shall be located directly behind the Panel of Judges. The contest deadline normally will be a minimum of 250 metres from the Line of the Zone; however, there is no maximum. Line Judges are so stationed that there is a 50 metre buffer zone before Line infringement penalties are noted.

When a contest is held without an aerobatic box having been laid out, the X axis will correspond to a suitable ground feature, such as a runway or road of approximately 1000 metres length. The Judges will sit on a line parallel to this feature as close to the midline as possible but at least 600 metres away.

The positioning score will be downgraded by the Judges for manoeuvres performed outside the performance zone. The rules applying to a CASA Deadline will still apply and a deadline judge may be appointed. No Line judges will be used.

# AAC REGULATIONS

## CHAPTER 4



### 4.18 INFRINGEMENT OF CONTEST DEADLINES

A contest deadline may be designated by the Contest Director in co-ordination with the Chief Judge. This deadline will normally be 250 metres from the edge of the buffer zone of the Aerobatic Zone.

As a condition of their approval for the contest to be held, CASA may require a deadline between the aerobatic zone and possible spectator areas. This CASA deadline may not necessarily be the same as the contest deadline.

Any manoeuvres flown behind the contest deadline will be given a zero. Applicable boundary infringements will be applied.

### 4.19 CONTESTANTS PER CATEGORY

There must be a minimum of two contestants in a category to declare a category champion and for the contest to rank as a State or National Contest in that category. Contestants will not be allowed to enter more than one category in any one contest. This does not mean that contestants cannot enter a different category at another contest. They may enter any category they wish and are qualified to fly.

### 4.20 PERSONNEL ON THE JUDGING LINE

The following personnel only are permitted on the judging line except by permission of the Chief Judge: Judges, Assistant Judges, Timers, Line Judge Co-ordinator, Contest Director, Starter or their representative. Score Runners and no more than two runners to bring food and drink. Contestants found on the judging line without permission may be disqualified.

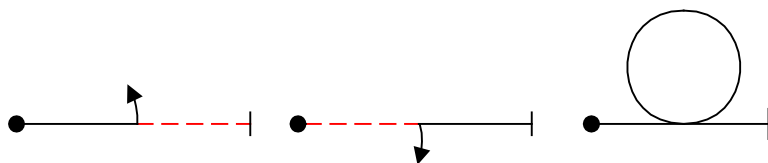
# AAC REGULATIONS

## CHAPTER 4

### 4.21 OPTIONAL SAFETY MANOEUVRES

Before the wing dipping at the start of competition flight in all programmes, it is recommended that all pilots perform safety manoeuvres as follows. These figures are optional but, if flown, may only be flown once, in any order, and continuously on the same axis. They must be flown inside the performance zone.

#### Entry, Graduate, Sportsman and Intermediate Categories



#### Advanced and Unlimited Categories

Refer. FAI Sporting Code, Section 6 para.4.3.1.2

A penalty of 30 points will be given for each and every figure flown outside the box and other than the prescribed manoeuvres.

# AAC REGULATIONS

## CHAPTER 5

### THE FLIGHT PROGRAMMES

#### 5.1 THE COMPETITION FLIGHTS

Each contestant will be required to perform the following competition flights, flown in the order shown.

**Entry Level will not be flown at the National Championships.**

Category	Programme	Flights
Graduate & Entry	1	Known Compulsory Programme
	2	Known Compulsory Programme
Sportsman	1	Known Compulsory Programme
	2	Free Programme (or repetition of Known Compulsory Programme)
Intermediate	1	Known Compulsory Programme
	2	Free Programme
	3	Unknown Compulsory Programme
Advanced	Q	Known Compulsory Programme
	1	Free Programme
	2	First Unknown Compulsory Programme
	3	Second Unknown Compulsory Programme
Unlimited	Q	Known Compulsory Programme
	1	Free Programme
	2	First Unknown Compulsory Programme
	3	Second Unknown Compulsory Programme

#### **Programme 4 - The Final Freestyle Programme (Unlimited)**

This programme is a separate competition and the scores will not count toward the overall Unlimited Champion. This program is only open to the competing Unlimited pilots.

Refer. FAI Sporting Code, Section 6, para. 4.3.5 for rules for the conduct of Programme 4.

In the event of an incomplete contest because of weather or for some other unforeseen reason, each category will be considered complete based on any flights finished in their entirety.

#### 5.2 QUALIFICATION FLIGHTS

Entry, Graduate, Sportsman and Intermediate:

Programme 1 will be a qualification flight. Contestants must be able to fly 75% or more of these manoeuvres. Contestants who cannot or do not complete 75% or more of the required manoeuvres

# AAC REGULATIONS

## CHAPTER 5

will be disqualified from that category. This is not to be interpreted to mean that a contestant receiving “0”s for wrong direction of flight will be disqualified.

Additionally, if in the opinion of the Contest Jury and Board of Judges, a pilot demonstrates an inability to satisfactorily control their aircraft, he/she will be disqualified from that category.

### Unlimited and Advanced:

Refer to CIVA Sporting Code Section 6

### **5.3 ENTRY, GRADUATE, SPORTSMAN AND INTERMEDIATE - PROGRAMME**

#### **1**

#### **ADVANCED AND UNLIMITED – PROGRAMME Q**

#### **THE KNOWN COMPULSORY PROGRAMME**

The Known Compulsory Programmes will be composed of figures in normal and inverted flight performed consecutively and continuously observing the prescribed sequence of the flights.

The programme must be such as to enable competitors to fly all figures safely in the aircraft available to them, provided that the aircraft meet the requirements of normal technical standards. The figures will be selected from the Aresti System (Condensed), as amended.

### Programme Q

Refer to CIVA Sporting Code Section 6

### **5.4 SPORTSMAN AND INTERMEDIATE - PROGRAMME 2**

#### **ADVANCED AND UNLIMITED - PROGRAMME 1**

#### **THE FREE PROGRAMME**

The Free Programmes may be composed using a maximum number of figures or combination of figures and/or a maximum “K”, depending on category. A combination will be taken as one figure. All figures must be taken from the Aresti System (Condensed).

The Sportsman competitor has the option of re-flying the Known in lieu of a Free.

<u>Category</u>	<u>Maximum No. of Figures or Combination Figures</u>	<u>Maximum “K” Factor</u>
Sportsman	12	Same as current compulsory
Intermediate	15	220
Advanced	Refer. FAI Sporting Code, Section 6, para. 4.3.3	
Unlimited	Refer. FAI Sporting Code, Section 6, para. 4.3.3	

# AAC REGULATIONS

## CHAPTER 5

The start and finish of The Free Programme must be carried out in normal or inverted level flight.

Any figure or combination of figures, which is identified in the Aresti System (Condensed), may be selected to compose the Free Programme.

Any figure or combination of figures, which is selected, must bear the Catalogue reference number(s) and the difficulty coefficient(s) (K) stated in the Catalogue. The numbers and coefficients in the Aresti System (Condensed) will be taken as definitive.

The character and composition of basic figures must not be changed when combining other figures with them.

The direction of rotation of rolls is not prescribed.

However:

- a) When rolls are in continuous rotation, the tips of the symbols are to be linked by a small line.
- b) In un-linked rolls performed in the same direction, no line links the symbols but the tips must be drawn pointing in the same direction.
- c) In opposite rolls the tips of the symbols are to be drawn pointing in opposite directions.

Un-linked rolls in the same direction must be of different types. The two types of rolls are defined as follows:

- i. Aileron rolls (slow rolls and hesitation rolls).
- ii. Flick rolls (positive and negative).

### Advanced and Unlimited

Refer. FAI Sporting Code, Section 6, para. 4.3.3.

### Sportsman and Intermediate

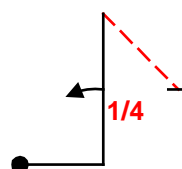
Repetition of catalogue reference numbers is allowed from Families 1. and 9. for these categories only, providing that there is no repetition of the combination figure used.

For example:- this will allow the competitor to use both:

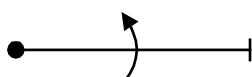


1.7.1.

and

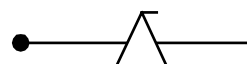


1.7.1. + 9.1.1.1. OR



1.1.1. + 9.1.3.4.

and



1.1.1. + 9.9.3.4.

to compose the Free sequence.

# AAC REGULATIONS

## CHAPTER 5

### VERSATILITY

In order to achieve versatility in the Free programme, it is mandatory that a competitor includes the following:-

#### Sportsman Category

At least one figure from	Family 1.
At least one figure from	Family 2.1. - 2.2.
At least one figure from	Family 7.
At least one figure from	Family 8.
At least one figure from	Family 9.1. - 9.4.
Only one figure from	Family 9.11 or 9.12

#### Intermediate Category

At least one figure from	Family 1.
At least one figure from	Family 2.1. - 2.2.
At least one figure from	Family 5.
At least one figure from	Family 7.
At least one figure from	Family 8.
At least one figure from	Family 9.1.
At least one figure from	Family 9.2. - 9.8.
At least one figure from	Family 9.9. - 9.10.
Only one figure from	Family 9.11 or 9.12

#### Advanced Category

Refer. FAI Sporting Code, Section 6, para. 4.3.3.6.

#### Unlimited Category

Refer. FAI Sporting Code, Section 6, para. 4.3.3.6.

Programmes not including these figures will not be accepted.

A pilot MUST have the Free sequence checked and signed by a National or State Judge, as applicable, before submitting his/her entry form to ensure compliance with the relevant rules.

Registration will not be deemed complete until the competitors Free Sequence together with the Judges Certification is submitted.

Once the flying of the programme has started, no protest of any kind will be accepted by the Contest Jury on any aspect of the composition of a contestant's programme.

### **5.5 INTERMEDIATE - PROGRAMME 3 THE UNKNOWN COMPULSORY PROGRAMME**

#### **ADVANCED AND UNLIMITED – PROGRAMME 2 THE FIRST UNKNOWN COMPULSORY PROGRAMME**

#### **ADVANCED AND UNLIMITED – PROGRAMME 3 THE SECOND UNKNOWN COMPULSORY PROGRAMME**

The Unknown Compulsory programme will be given to the contestants not less than 18 hours before the time at which the programme is to be flown. All manoeuvres for the Intermediate Unknown programme will be selected from Appendix 2 of this manual.

# AAC REGULATIONS

## CHAPTER 5

For the Unlimited and Advanced Unknown programmes refer to the FAI Sporting Code, Section 6, para. 4.3.4.

Repetition of any manoeuvre with the same catalogue number is not allowed within any one programme

The Unknown Compulsory programme will be made up as follows:-

<u>Category</u>	<u>Number of Manoeuvres</u>		<u>Approx K Factor</u>
	<u>Minimum</u>	<u>Maximum</u>	
Intermediate	6	12	135K
Advanced/Unlimited	Refer. FAI Sporting Code, Section 6, para. 4.3.4.1.		

Versatility Requirements for UNLIMITED and ADVANCED Unknowns, Refer. FAI Sporting Code, Section 6, para. 4.3.4.4.

### 5.6 PROGRAMME 4 - THE FINAL FREESTYLE PROGRAMME

Refer FAI Sporting Code, Section 6, para. 4.3.5.

In addition, the programme shall last between 3 minutes 30 seconds and four minutes.

### 5.7 POSITIONING COEFFICIENTS

The following coefficients (K factors) will apply to Positioning for all flights in each category:-

Graduate & Entry	2K
Sportsman	4K
Intermediate	6K

As there is no penalty for a programme interruption in the Graduate and Entry Categories, the positioning score for Graduate and Entry Categories should incur a 1point deduction for each interruption made.

The K factor accorded to positioning marks for Advanced and Unlimited will depend on whether infringements of the performance zone are being recorded and, if so, whether by Line Judges or an electronic instrument. Refer. FAI Sporting Code, Section 6, para. 5.1.4.5.

If an electronic, radar or radio-controlled tracking instrument is operated, the observance of the performance zone and of the positions of the individual figures are recorded.

For conventional marking of positioning, the positioning mark will be given by the Board of Judges. At the discretion of the organiser, infringements of the performance zone may be recorded by Line Judges.

The competitors should try to perform their programmes within the confines of the performance zone and in symmetry about the secondary axis. Depending on the aircraft's height and on the nature of the figure being flown, there is also an optimum range from the judges for the placement of each figure. At

## **AAC REGULATIONS**

### **CHAPTER 5**

this range, the geometrical errors in the figure, and the precise nature of the figure, are both clear and easy to assess.

When Line Judges are not used, it is particularly important for each judge to consider the precise placement of each figure against the ideal and also in relation to the limits of the performance zone. The highest marks will be given if the central point of a competition flight is above the secondary axis, and if each figure is optimally placed inside the performance zone. A more complete explanation of the principles of the judging of positioning is given at the end of Appendix 1.

# AAC REGULATIONS

## CHAPTER 6

### SCORING

#### 6.1. MARKS FOR FIGURES

- 6.1.1. The Judges will independently assess the quality of each figure and its components as performed in the sequences for Programmes Q, 1, 2 and 3, marking with numbers from 0 to 10, in intervals of 0.5; for Programme 4 the assessment will be in accordance with 6.3. A zero mark will be awarded if the figure is incorrect or missing.
- 6.1.2. The scores will be calculated by multiplying the coefficient (K) for each figure by the mark given to each.
- 6.1.3. When marking the quality of the performance of individual figures, the Judges have to consider the following general principles:
- a) the geometry of the figures (including shape, radii, angles, plane of flight, direction of flight), which must be in compliance with the prescribed characteristics;
  - b) the precision of the performance, for which there are Marking Criteria set out in Appendix 1;
  - c) the distinctly recognizable start and finish of each figure with a horizontal line;
  - d) for Programmes Q, 1, 2 and 3 note also that the figure flown must be in accordance with the pre-stated figure in the original sequence;
  - e) that in judging a figure, which comprises a combination of manoeuvres, the marking criteria of its various components continue to apply, but the combined manoeuvres are to be taken as a unit;
  - f) that the length of lines and the size of radii caused by the flying characteristics of an aircraft are not to be taken into account in the marking;
  - g) that inverted figures are judged by the same criteria as upright figures.
- 6.1.4. Once horizontal flight path is established at the end of a figure in a sequence, the beginning of the next figure is considered to have occurred. This rule is not to be interpreted to mean that a competitor will incur penalty points for performance zone infringements (see 4.1.6) if the next figure is actually performed inside the 50 m boundary of the performance zone.
- 6.1.5. If a judge misses seeing a figure, or any part of a figure such that a grade cannot be given with full confidence, the Judge will give a mark of "Average" or "A" to that figure.

#### 6.2 PENALTIES AND DEVALUATIONS APPLICABLE TO MARKS FOR FIGURES IN PROGRAMMES Q, 1, 2, AND 3

It is assumed by a Judge that a contestant is going to fly a perfect figure, therefore he/she starts with the grade of 10 and proceeds to downgrade this mark (a) by fixed values as prescribed herein, and (b) by further values in conformity with the Judging Criteria in Appendix 1.

- 6.2.1 The absence of a distinct horizontal start or finish to a figure will reduce the mark by 1 point in each case for each figure affected.
- 6.2.2 At the completion of a figure, each deviation from the correct direction of flight-path will attract a reduction of 0.5 points per 2.5° of deviation, 1 point per 5° of deviation.
- 6.2.3 As there is no "free" space between figures any reduction applied in accordance with 6.2.2 must also apply as an error at the start of the subsequent figure.
- 6.2.4 Downgrades
- a) All deviations from the correct geometry (plane of flight, direction of flight, angle of bank), and for deviations from the proper flight path or the proper attitude (as appropriate), the mark will be reduced by 1 point per 5° deviation.

# AAC REGULATIONS

## CHAPTER 6

- b) Over-rotating a roll and rolling the wings back again must be penalised by 1 point per 5° of over-rotation, even if the correct geometry is resumed afterwards, and no matter how quickly the correction is made. The same provision applies when, at the end of a loop or part-loop, the aircraft's nose is pitched beyond the desired line and then brought back again.
- c) If within a figure two or more lines must be of the same length, an observed variation is penalised by reducing the grade in the following manner:
  - (i) A visible variation - 1 point deduction;
  - (ii) if the lengths vary by 1:2 - 2 point deduction
  - (iii) and so forth up to a 3 point deduction.
  - (iv) No line before or after roll, 4 point deduction.
- b) The basis for judging line length is the first line flown. The absence of one of these lines before OR after a roll has to be penalised by 1 additional point.
- c) If there are no lines before AND after the roll, the total penalty is two (2) points only.

6.2.5 Slow rolls flown in combination with a turn (Family 2.3 - 2.20) or loop (Family 7.5 – 7.6) must be smoothly continuous: i.e. there must not be any change in the rate of roll from beginning to end. If the competitor stops the roll, there will be a reduction of the mark by 2 points for each stoppage. If there is any recognisable variation of the angular velocity about the longitudinal axis, there will be a reduction of the mark by 1.

6.2.6 Marking criteria for combinations of rolls with turns and loops will include the even integration of the rolls within the figure. If the total pre-stated number of rolls is completed before the appropriate point in the figure, the mark will be reduced by 1 point for every 5° of the remaining segment of the turn or loop.

6.2.7 Any turn of more than 45° to correct heading between figures will incur an interruption penalty.

6.2.8.1 A grade of zero will be given to a figure if, by majority decision of the judges,

- a) Any figure is flown which does not conform to the drawing held by the judges for marking purposes (Form 'B' or 'C'). Note – when a figure is added to a sequence a programme interruption penalty will be applied (refer page 21).
- b) The remaining segment of the turn or loop exceeds 45°.
- c) Any deviation from the prescribed direction exceeds 45°.
- d) Any other single deviation in geometry/flight-path/attitude/rotation exceeds 45°.
- e) The pre-stated figure or any part of it is omitted.
- f) Any part of the figure was not visible as it was flown in or behind cloud. If the figure was visible to a majority of judges, then the average of their grades may be given by the unsighted judges.

However, if figures subsequent to the zero mark are correct and are flown in the correct direction, they shall be marked in the normal way.

6.2.8.2 A grade of zero will be given to a figure that is started behind the judges. The Chief Judge shall decide if any manoeuvre has started behind the Panel of Judges

6.2.9 During a repetition flight the figures before the break must all be flown correctly. If a competitor omits or flies such a figure incorrectly, so as to gain an unfair advantage, the

# **AAC REGULATIONS**

## **CHAPTER 6**

grade awarded for that figure during the first flight will be reduced to zero.

- 6.2.10 When difficulties occur in interpreting the correct application of a zero mark, the Chief Judge may call for a discussion on the spot by the Judges. Such discussions shall not interfere with the subsequent flights. Form A shall be retained until the final decision is made at the next possible break.

### **6.3 CALCULATION OF SCORES**

The rating of a pilot's performance for a given flight is an amount of points arising from two separate sources:

- a) Quality evaluation of flown figures or flight positioning with a score given by judges observing the flight, on a scale ranging from 0 to 10.
- b) Penalties arising from height or time infringements and/or interruptions of the program sequence and other disciplinary actions.

Infringements as outlined in Chapter 4 will be marked on the Chief Judge's score sheet only. The Judges' score sheets will be combined with the Chief Judge's score sheets and sent to the Contest Scoring Computer Office. The scores will be computed and the contestant's final score for the flight will be the average score of all the Judges less any penalty points assessed.

The Acro Aerobatic Contest results Organiser software is approved and recommended in Raw Score Mode is approved and recommended for all competitions.

The Judge's score sheets will be made available for the contestant's inspection but will remain in the possession of the Contest Director.

### **6.4. JUDGING THE FINAL FREESTYLE PROGRAMME**

After Programme 4, the Chief Judge will hold a mandatory meeting of all judges. The marks of all judges will be compared to establish a judging standard for the programme.

Judges will keep all the marking sheets until all competitors have completed the programme. Should the completion of all flights in Programme 4 be interrupted, all judges marking sheets shall be collected and secured by the Chief Judge until flying resumes.

Programme 4 (Final Freestyle Programme) will be marked under 3 headings as per the FAI Sporting Code, Section 6, para. 5.1.5.

Refer to Appendix 1 for the full judging criteria.

# **AAC REGULATIONS**

## **A FINAL WORD**

In conclusion, remember that you, as a Judge, are expected to grade only against one standard, and that is perfection. The performance of the aircraft or the difficulty in performing a manoeuvre (on the basis of your personal experience) in any given type of aircraft is not to be considered in formulating your grade. Do not be afraid to find fault with a contestant's flying, regardless of their name or reputation. As a Judge, this is your job.

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## CRITERIA FOR JUDGING AEROBATIC FIGURES

## A. PREFACE

The following is an expansion and clarification of the general principles for grading aerobatic figures stated in CIVA Regulation 2.1.2. The final grade awarded to a figure has many facets, but the first and most important component in any grade is the geometry of the figure as compared to the true horizon and Aerobatic Box axis. Geometry is derived from two distinctly different entities: flight path and attitude.

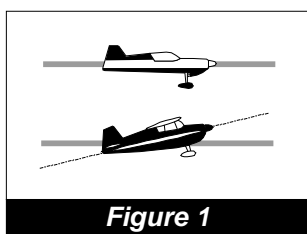
## B. DEFINITIONS

There are some words and phrases, which are used consistently throughout the text in a very precise sense, and it is as well to define at the start the sense in which each is used:

Angle of attack	The angle at which the wings of an aeroplane meet the relative airflow.
Angle of incidence	The angle at which the wing is attached to the aeroplane.
Figure	Each individual component of a sequence, which may comprise one or more manoeuvres in combination; it starts and ends with a horizontal line.
Manoeuvre	Any one of the basic aerobatic movements, which may be combined to make a figure (e.g. an avalanche is one figure consisting of two manoeuvres -- loop and flick roll).
Score/Mark/Point	<b>Marks</b> are assigned (from 0 to 10) by judges, and may be devalued by various <b>point</b> values. The <b>score</b> is calculated by multiplying the judges' marks by the coefficients (K factors) and adding the products.

## C. FLIGHT PATH AND ATTITUDE

## Flight Path

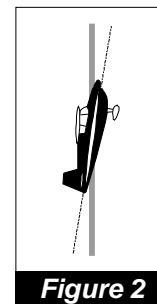


Think of the airplane condensed into a single dot and watch the path this dot takes through the sky. This is the flight path, or track, of the aircraft's center of gravity. Judging the flight path consists of comparing the observed path with fixed references such as the horizon or the X and Y axis of the Aerobatic Box.

(Figure 1)

## Vertical Attitude

Judging vertical lines is based on the attitude of the aircraft and not its flight path. When an aircraft's flight path, in a zero wind condition, is exactly 90 degrees to the horizon, the wings are being held at the correct angle to produce no lift. The aircraft's attitude while in this condition (zero lift) defines the proper judging criterion for vertical attitude. This is called the zero-lift axis.



(a) When this zero-lift axis is vertical, the longitudinal axis of some aircraft may not appear to be vertical. (Figure2) The Judge must determine the proper vertical attitude for each aircraft type

### CRITERIA FOR JUDGING AEROBATIC FIGURES

according to its zero-lift axis. The best opportunity to make this determination is to observe practice flights and note the different aircrafts' vertical attitudes, both up and down.

(b) An aid for judging the perfect vertical (zero-lift) attitude is to observe vertical rolls. During a truly vertical roll, the aircraft's wings will constantly be parallel to the horizon, something which is especially noticeable after 90 degrees of roll.

(c) Be aware that aircraft types whose zero-lift axis does not pass through the tail will make a spiral with the tail during a perfect vertical roll. From the Judges' perspective, this spiral will look as if the tail is shifting off-axis from the zero-lift axis flight path.

When there is a wind of any kind, the observed flight path will be offset from perpendicular to the horizon by some degree. This wind effect must be completely ignored by the Judge, who must only evaluate the accuracy of the vertical attitude. (Figure 3)

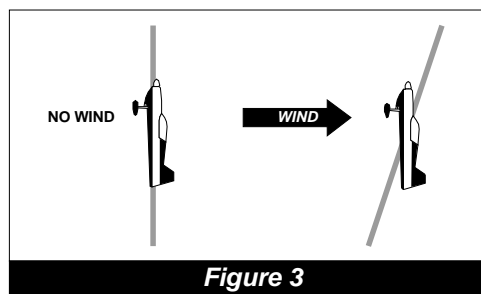


Figure 3

#### The 45 Degree Attitude

This is the vertical attitude plus or minus 45 degrees. In view of the difficulty in judging 45 degree lines accurately, scoring deductions should be applied with care. When flown into the wind, a perfect 45 degree line will appear to be steep while the opposite is true when flown downwind. (Fig 4) As with the vertical attitude, this wind effect must be completely ignored by the Judge who must only evaluate the accuracy of the 45 degree attitude. The prescribed deduction is one (1) point per five (5) degrees of deviation from the correct geometry (0.5 points per 2.5 degrees).

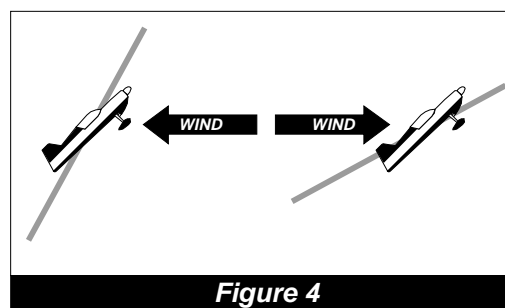


Figure 4

#### D. GRADING

All transitions from one plane of flight to another should have a reasonable and constant radius. The size of that radius is not a grading criteria and higher grades are not to be given to "square, high-G" corners.

It should be assumed that a competitor is going to fly a perfect figure, so a Judge starts with a grade of 10. As the figure is performed, the Judge then begins to find faults (if any) with what he or she sees, and starts downgrading as the figure progresses. This system of grading is required by the rules as opposed to waiting until the figure is finished and assigning a grade based on overall impression. The latter causes the judging to be erratic and inconsistent.

#### Summary

Remember, it is the Judge's job to find fault: be a nit-picker. On the other hand, give a grade of 10 if you see a perfect figure - but if you are really being critical you won't see too many. Don't get in a rut. Guard against confining your grades in too narrow a range. If you watch carefully and grade consistently, you will find yourself giving an occasional 2, 3, or 4 on some sloppy figures that are not quite bad enough for a zero. You will also be giving an occasional 9 or 10 for the superlative figure with which you can find little or no fault. Take care not to grade on an overall impression of a flight. Be ready to award a low grade for a poor figure even if you have been grading other figures flown by that competitor with 8's and 9's.

### CRITERIA FOR JUDGING AEROBATIC FIGURES

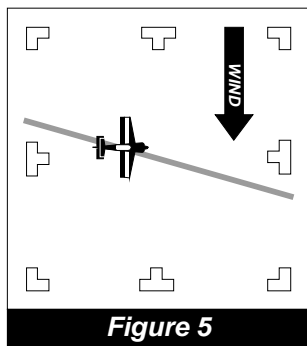
On the other hand, when you see a competitor barely getting through the figures and you have been giving 4's and 5's don't be afraid to award a 9 for the almost perfect 90 degree turn that you just saw.

Finally, and most importantly, only grade what you see. If you can't see anything wrong with a figure, don't deduct any points, even if you think there must be something wrong. Always give the competitor the benefit of the doubt.

#### E. WIND CORRECTION

There are two kinds of wind correction: correction for figure geometry (shape) and correction for Aerobic Box positioning.

The competitor is required to make the shape of all loops and part-loops within a figure perfectly round as seen by the judge on the ground. Wind correction is required for loops and part-loops within figures so that the aircraft's flight path describes a constant radius circle or part circle. Remember, the Judge grades for the roundness of the flight path. Any deviation from perfect roundness must result in a reduction of the score for that figure.



**Figure 5**

The competitor is also required to keep the aircraft within the Aerobic Box. This becomes more of a problem when a wind is blowing at an angle to the X axis. (Figure 5) The primary method of dealing with cross-box drift is to include a "wind corrector" figure in the sequence. A wind corrector is a figure which places the aircraft onto the Y axis. Because the Y axis is non-directional, the competitor can turn onto the Y axis in the direction which will allow an upwind position change before flying a subsequent figure which returns the aircraft to the X axis.

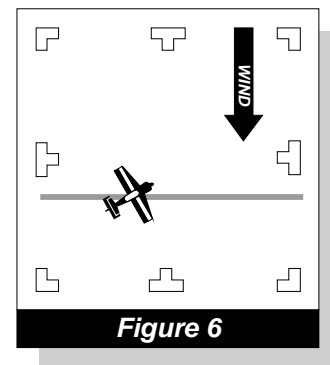
A well designed Free Program will always include at least one, and preferably more, wind corrector figures.

Not every Known Compulsory or Unknown Program contains sufficient (or any) wind corrector figures, however, in this case, it is up to the competitor to keep the aircraft within the Aerobic Box without benefit of a specific Y axis figure to accomplish it.

A common approach is to crab into the wind as done in navigational flight. (see Figure 6) Crabbing means that the aircraft's heading is at an angle to the competition axis (X or Y). The downside to this approach is that if this heading angle can be detected by the Judge, a deduction of one (1) point per five (5) degrees will be given.

It is possible for the competitor to correct for wind in such a manner that the attitude remains absolutely true to the correct geometry of the figure but the flight path has a sideways component. It goes beyond the scope of this document to provide a tutorial on how this may be accomplished, but what is clear is that if any yaw (heading) deviation or bank angle is visible to the Judge, the score must be reduced at the rate of one (1) point for every five (5) degrees of deviation detected.

Please note, however: even if it is plainly evident that the aircraft has moved laterally within the Aerobic Box, if the method of that movement cannot be detected by the Judge, no deduction for such correction must be made.



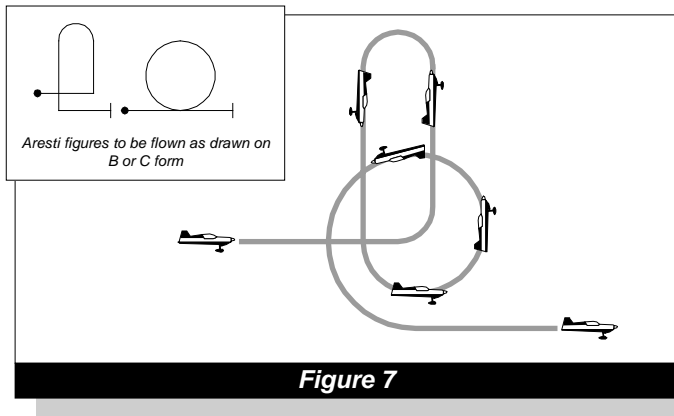
**Figure 6**

CRITERIA FOR JUDGING AEROBATIC FIGURES

F. THE TWO BASIC COMPONENTS OF AEROBATIC CONSTRUCTION: LINES AND LOOPS

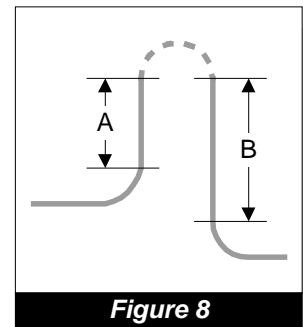
Lines

All lines are judged in relation to the true horizon and the Aerobatic Box's axis. Horizontal lines are judged on flight path, not attitude. Different aircraft at different airspeeds will employ different attitudes to maintain a horizontal flight path. (Fig1) While maintaining a horizontal flight path, the aircraft's heading must remain parallel to the X or Y axis. The deduction for deviation in either axis is one (1) point per five (5) degrees from the correct geometry.



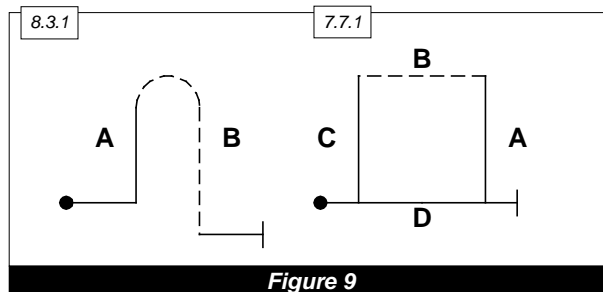
(a) All figures begin and end on definite horizontal lines, and both must be present in order to earn a good grade. A competitor who rushes from one figure to another without showing this horizontal and well-recognizable line will be downgraded by one (1) point for each missing line in each figure affected. Therefore, leaving out the line between two figures will downgrade the preceding figure by one (1) point and the following figure by one (1) point. (Figure 7)

(b) All lines that occur inside a figure have a beginning and an end which define their length. They are preceded and followed by part-loops. (Figure 8)



(c) With the exception of Family 3 figures and some figures in Family 7, the criterion for the length of lines within a figure states that they do not have to be of equal length. Therefore, it is imperative that the judges become familiar with the specific criterion for the length of lines for each figure. For example, the length of the lines in a "Humpty-bump" do not need to be equal, but all four lines in a "Square loop" must be of equal length. (Figure 9)

(d) Whenever any kind of roll is placed on an interior line (except when any type of roll follows a spin), the lengths of the two parts of the line before and after the roll must be equal. Judges should take care to judge the symmetry of the length of lines in a figure using only the length of the lines and not by elapsed time taken to fly each segment. This difference in length versus elapsed time is most noticeable in figures where rolls are placed on up-lines. As the aircraft loses airspeed, the time it takes to fly a line after the roll will be greater than the time required to fly the line of the same length before the roll.



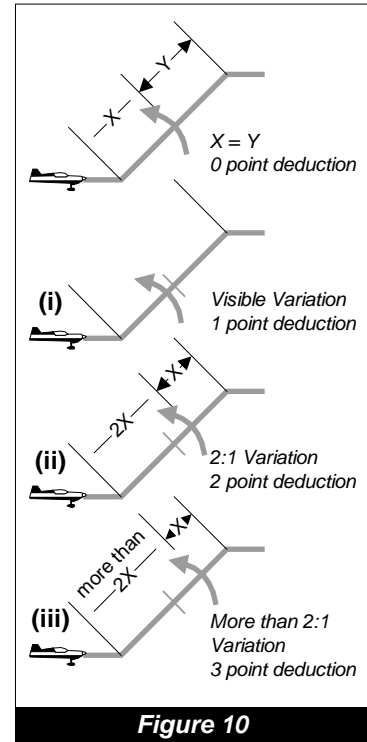
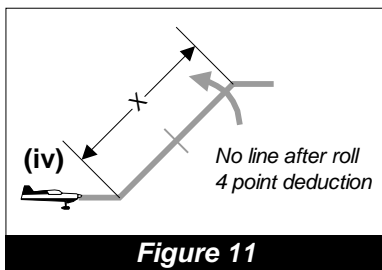
CRITERIA FOR JUDGING AEROBATIC FIGURES

(e) If within a figure two or more lines must be of the same length, an observed variation is penalised by reducing the grade in the following manner: (Figures 10 & 11)

- (i) a visible variation - 1 point deduction;
- (ii) if the lengths vary by 1:2 - 2 point deduction
- (iii) and so forth up to a 3 point deduction.
- (iv) No line before or no line after the roll, a 4 point deduction.

The basis for judging line length is the first line flown. The absence of one of these lines before OR after a roll has to be penalised by 1 additional point. If there are no lines before AND after the roll, the total penalty is two (2) points only.

*Example: The competitor is to fly a 45 degree up-line with a full roll on the line. However, the airplane is returned to level flight immediately after the roll. The deduction is 4 points: 3 points are deducted because the lines are of vastly different length and another 1 point is deducted because of the absence of one of the lines.*



(f) All 90 degree and 45 degree lines are preceded by the execution of a part-loop. Since we have in this part-loop a significant angle-of-attack, the aircraft's attitude in the part-loop will differ from its flight path. Therefore, when the aircraft's attitude reaches the desired line after transitioning from the part-loop, this difference between attitude and flight path will be carried on and will be the same as the angle-of-attack. For this reason, the only criterion for judging in that moment of reaching the desired line is to be the attitude of the aircraft and not it's flight path. It would then be very illogical suddenly to change the criterion of judgement from the visible and straight line of attitude to the unrecognizable and curved line of flight path. Therefore, the judging of 90 degree and 45 degree lines can only be based on attitude, not flight path.

**Loops and Part Loops**

The loop is a figure from Family 7, but part-loops are integral to every other family so it is necessary to discuss the loop before going on to the other families.

(a) A loop must have, by definition, a constant radius. It starts and ends in a well-defined line which, for a complete loop, will be horizontal. For a part-loop, however, such lines may be in any other plane of flight and will be defined by the aircraft's attitude. As the speed changes during execution of a loop or part-loop, the angular velocity around the aircraft's lateral axis also has to change in order to keep the radius constant. When the speed decreases, for example, to half its initial rate, the angular velocity, to keep the same radius, will be reduced by half --this is a fact of physics. Thus, the angular velocity can be an aid for the Judge to gauge the radius -- especially when the angular velocity in the higher part-loop is seen to be faster, as this is a clear indication that the radius is smaller. This aid becomes more important when two part-loops are separated by a line between.

CRITERIA FOR JUDGING AEROBATIC FIGURES

(b) The part-loops of any one figure should all have the same radius, except in Family 1 figures and where indicated in Family 8.1 thru 8.28 and 8.49 thru 8.56. For example, a figure starts on a horizontal line, with a quarter loop next, followed by a vertical line and then another quarter loop. The quarter-loop at the top of the vertical line (Family 1 figure) need not have the same size radius as the quarter-loop at the bottom. However, the top radius must not be a "corner" or very sharp angle. It must have a smooth, distinct and constant radius.

ARESTI SYSTEM (CONDENSED) FAMILIES

Lines and Angles

Family 1.1 to 1.11 has been fully covered in the preceding section. Note that the figures in Family 1.12 to 1.39 are NOT performed as drawn in the Catalogue. (Figure 12) In each of these figures there are three (four in 1.28 - 1.39) looping components: a one-eighth loop, a three-eighths loop and a quarter loop. Rolls may be performed on the 45 degree line and/or the 90 degree line, with the part-lines before and after the roll being of equal length. The initial horizontal line and the line at the end of the figure may be flown at different altitudes.

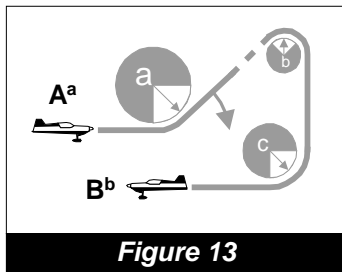
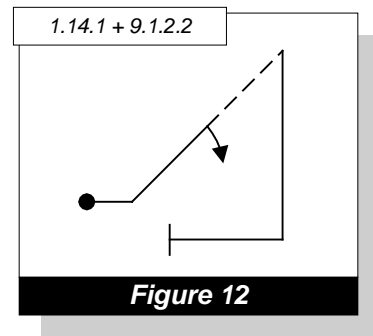
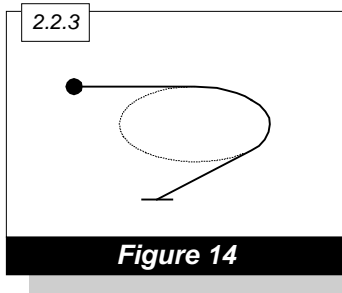


Figure 13 shows Family 1.12-1.19 as flown. Radii a, b, and c may all be different and entrance altitude "A" can be different from exit altitude "B".

FAMILY 2 - Turns and Rolling Turns

Family 2.1 - 2.2 Turns

Competition turns (Figure 14) are not to be confused with standard coordinated turns. In aerobatic competition, a turn is divided into three parts: 1) establishing the bank using a roll on heading; 2) the turn itself; and 3) a roll back to straight and level flight on heading.



First, the roll to establish the bank. This must be a roll of between 60 and 90 degrees, it must be performed on the entry heading, and the aircraft must maintain a constant horizontal line.

Once the roll is completed and the angle of bank is established, the competitor immediately performs the turn. The turn must maintain the established angle of bank throughout. The aircraft must also maintain horizontal flight. The rate of turn is constant throughout and is NOT wind corrected. Therefore, in wind, a 360 degree turn will not appear as a perfect circle.

As soon as the aircraft is on the exit heading, the competitor performs another roll at a rate equal to the entry roll. Again the aircraft must maintain a constant horizontal line.

## CRITERIA FOR JUDGING AEROBATIC FIGURES

Downgrades:

1. The angle of bank established by the initial rolling manoeuvre must be at least 60 degrees. Anything less is a one (1) point deduction for every five (5) degrees.
2. The angle of bank, once established, must remain constant. Any deviation is a one (1) point deduction for every five (5) degrees of deviation.
3. The rate of roll must be the same for the entry and exit rolls of this figure. Any deviation is a one (1) point deduction.
4. The aircraft must maintain a constant altitude throughout the figure. Any variation would be either one (1) point for every five (5) degrees of change or 1 point for every 100 feet.
5. The rate of turn must remain constant. Any change would be not more than one (1) point deduction for each change. Note that the rate of turn may appear to change in a strong wind, when it really isn't changing. The Judge must always keep the wind in mind and give the pilot the benefit of the doubt if there is any question.
6. The aircraft must begin and end on the prescribed heading. Any deviation is a one (1) point deduction for every five (5) degrees of deviation.

**Family 2.3 - 2.20 - Rolling Turns**

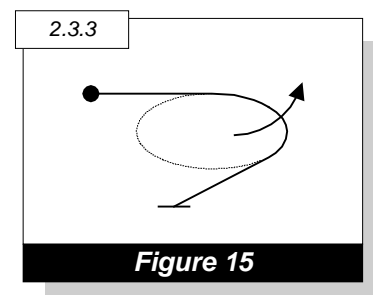
The rolling turn is a figure that combines a turn of a prescribed amount with a roll or rolls integrated throughout the turn.

These rolls may be in the same direction as the turn and are called "rolls in" or "rolls to the inside". They can be rolls in the opposite direction of the turn and are called "rolls out" or "rolls to the outside". Or there can be rolls alternating in and out.

When we say that the rolls are integrated, we are saying that in addition to there being constant rate of turn throughout the figure, there is also a constant rate of roll throughout. Naturally, the one exception to this constant roll rate is the pause when reversing roll directions.

To help visualize the execution of this figure and facilitate a way for the Judge to determine a constant roll rate, let's look at an aircraft performing a 360 degree rolling turn with 4 rolls to the inside from upright (Family 2.10.1). First, on the prescribed entry heading, the pilot executes a turn and simultaneously initiates a roll in the same direction as the turn. The judge will expect the aircraft to be inverted at 45, 135, 225, and 315 degrees and to be upright at 90, 180, 270 and 360 degrees. At these interim headings, the Judge will NOT downgrade using the one (1) point for five (5) degrees rule but will judge changes in the rate of roll, changes in rate of turn and changes in altitude (see downgrades below). At the end of the figure the aircraft must be wings level and on the prescribed heading.

When a rolling turn is performed with rolls alternating directions, the aircraft must change direction of roll at a wings level attitude. The position of the aircraft in the turn is still only used as an aid to determine if the pilot is varying the rate of roll or turn.

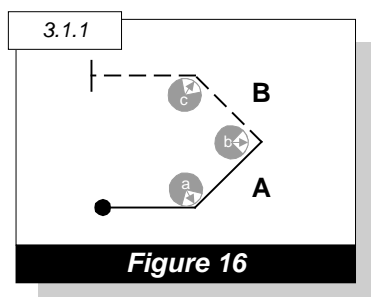


## CRITERIA FOR JUDGING AEROBATIC FIGURES

Downgrades:

1. Performing more or fewer rolls than the catalog description calls for results in the figure being zeroed.
2. All rolls in a rolling turn are slow rolls. If a flick roll is performed, the figure is zeroed.
3. Each stoppage of the rate of roll is a deduction of no more than two (2) points.
4. Each variation in the rate of roll is no more than a one (1) point deduction.
5. Each stoppage in the rate of turn is a deduction of no more than two (2) points.
6. Each variation in the rate of turn is no more than a one (1) point deduction.
7. Variations in altitude are deducted using either (1) point for every five (5) degrees or 100 feet of altitude.
8. One (1) point for every five (5) degrees that the aircraft is not in level flight when reversing roll direction.
9. One (1) point for every five (5) degrees of roll remaining when the aircraft has reached its exit heading.
10. One (1) point for every five (5) degrees of turn remaining when the aircraft has completed its last roll.

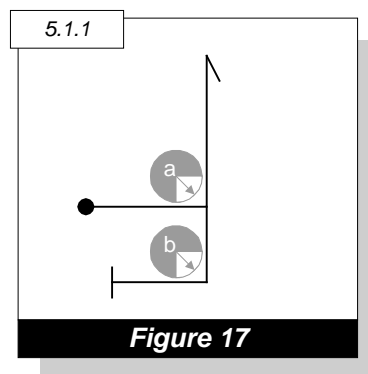
### Family 3 - Combinations of Lines



The transition from level flight to 45 degree lines should be at a constant and reasonable 1/8 looping radius. All lines within the figure should be equal in length. The 45 degree transitions in Family 3.1 should have a constant and reasonable radius and not (as drawn) a sharp corner.(Figure 16)

### Family 5 - Stall Turns

Stall Turns, also referred to as Hammerheads, are some of the most graceful figures in the catalog. In its most basic form (Figure 17), the figure begins when the aircraft leaves horizontal flight and flies a quarter loop to establish a vertical climb. At the top of the vertical line, the aircraft pivots and establishes a vertical descent, with the figure ending as the aircraft is returned to horizontal flight

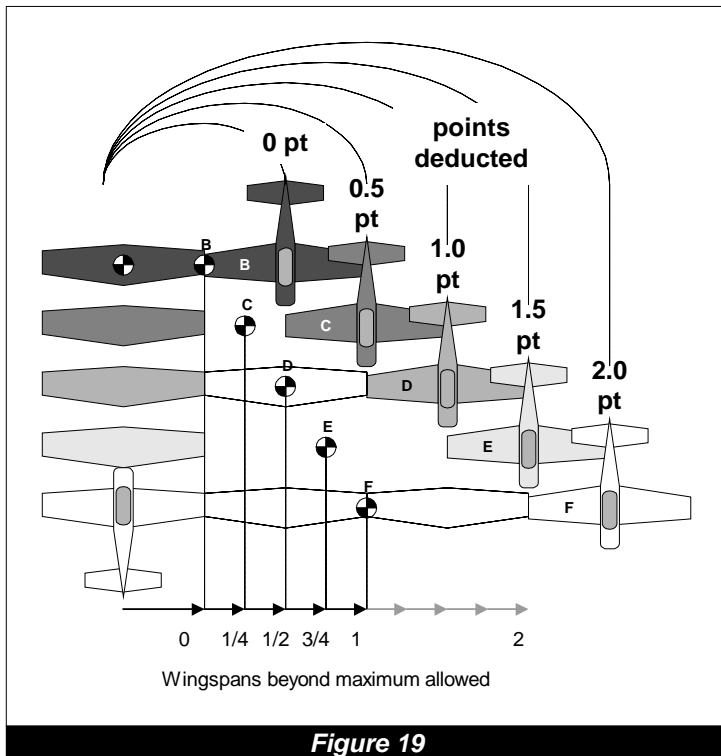
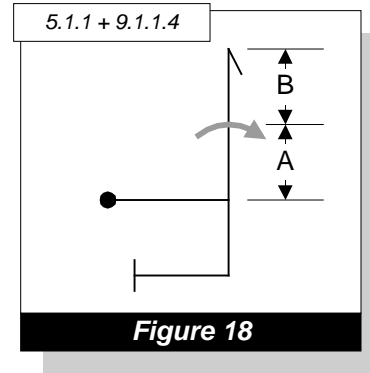


The judging criteria are:

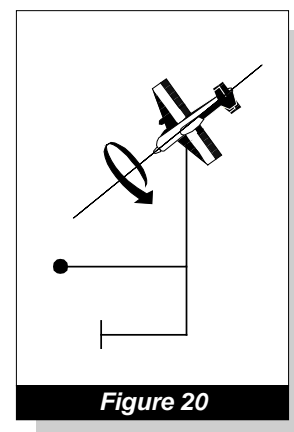
1. The entry and exit quarter loop radii must be equal. (Figure 17)
2. The vertical lines, both up and down, must be flown on the zero-lift axis. (see Figure 2)

CRITERIA FOR JUDGING AEROBATIC FIGURES

3. Any deviation from vertical, either up or down, will result in a deduction of one (1) point per five (5) degrees from the zero lift axis.
4. Any added roll(s) must be in the vertical climb or vertical descent and positioned so that the lines before and after the roll are of equal length (Figure 18). For deductions see figure 10.
5. The length of the vertical up and down lines need not be equal. As such, the altitude of the horizontal lines at the start and finish of the Stall Turn may be different.
6. During the vertical climb or vertical descent, the wings must remain parallel to the horizon. There will be a one (1) point deduction per five (5) degrees of deviation of the vertical (yaw) axis from horizontal. This deviation is often referred to as "dropping a wing".
7. As the aircraft nears the point where it would stop climbing, it must pivot in a plane parallel to vertical. Ideally, the aircraft pivots around its center of gravity. To avoid a deduction, the aircraft must pivot around an axis point which cannot not be farther away from its center of gravity than its wingtips (1/2 wingspan, Pivot Point Range from A to B, Figure 19). The downgrade for this deviation (often referred to as "flying over the top") is one (1) point per half wingspan that the point of rotation exceeds the maximum allowed (Pivot Point B, Figure 19).
8. The rate at which the aircraft pivots around its vertical axis is not a judging criterion.
9. The wings must remain in the vertical geometric plane throughout the turnaround, and the aircraft's attitude before and after the turnaround must be absolutely vertical, with no pitch or roll. If there is movement around the role axis often referred to as "torquing" (Figure 20), there is a deduction of one (1) point for each five (5) degrees off axis.



*"Torquing" is rotation about the longitudinal axis during turnaround.*



## CRITERIA FOR JUDGING AEROBATIC FIGURES

## Family 6 - Tailslides

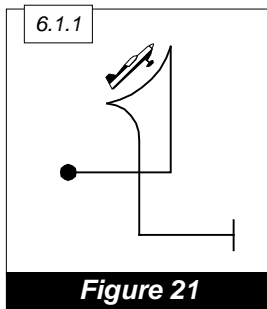


Figure 21

All the criteria of the Stall Turn apply to this figure except, of course, for the manoeuvre at the top of the vertical climb. At the point when the aircraft stops, it must slide backwards by at least a half fuselage length. If there is no slide of at least this length, the grade is zero (0). The aircraft must slide in the vertical plane and not with the nose inclined towards the horizon. A slide of this type must be downgraded by the formula of one (1) point for every five (5) degrees of inclination.

Following the slide backwards, the aircraft must then tip over and fall through to a diving position. Often the nose will swing back or "pendulum" past the vertical after falling through. The figure is not to be downgraded for this, nor downgraded if it does not happen. It is a function of the length of the slide and the type of aircraft, and is not to be considered in grading the figure.

There are two types of tailslides: canopy-up (also called "wheels-down") and canopy-down (also called "wheels up"). The canopy-up tailslide is depicted in the Aresti diagram with a curved solid line at the top of the tailslide symbol. (Figure 21) The canopy-down tailslide is depicted in the Aresti diagram with a curved dashed line at the top of the tailslide symbol. (Figure 22)

This figure must be watched carefully, as the aircraft can fall the wrong way (which is graded a zero) with the correct direction of flight and the proper aircraft attitude still maintained. Wings should stay level with the horizon throughout and not drop during the slide or the fall through. Watch for the aircraft torquing off the correct plane of flight, which must be downgraded.

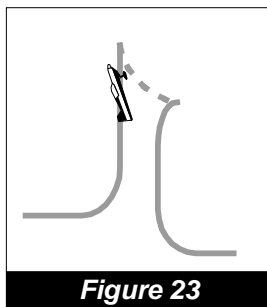


Figure 23

Also watch for "cheating" on the vertical line up in the direction of the slide just prior to sliding. (Figure 23) Any "cheating" on the up-line will most likely carry over into the backwards slide as well. The slide backwards must also be perfectly vertical, a second deduction would be taken if this deviation from vertical is visible.

The entry quarter loop and the exit quarter loop must both have the same radii. The altitude of the entry and exit horizontal lines need not be the same and the figure must not be downgraded if they are different.

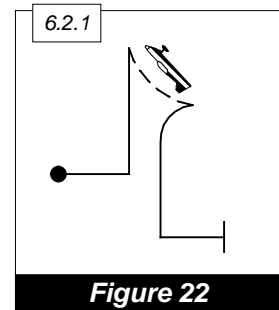


Figure 22

When rolls are combined with Family 6 figures, there must be an equal length of line before and after the roll(s). In the vertical downline, the aircraft must attain a vertical attitude and establish a downline before starting the roll(s).

In summary, the aircraft should make a smooth and steady transition up to vertical flight, the wings should stay level in relation to the horizon, and the aircraft should come to a complete stop in this attitude. After sliding backward at least one half fuselage length, it should fall through in the appropriate direction without dropping a wing or the nose moving off axis, and recover on the same plane as that of entry. After completion of this, it should again project the 90 degree down line before transitioning into horizontal flight with a quarter loop of radius equal to the entry quarter loop.

## Family 7 - Loops, Vertical S's, and Figure 8's

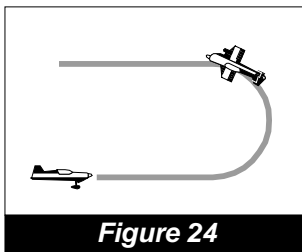
The size of a loop is not a grading criteria. It will vary according to the flight characteristics of the aircraft. A large loop is not graded any higher or lower than a small loop. But any variation to the radius will downgrade these figures.

## CRITERIA FOR JUDGING AEROBATIC FIGURES

**Family 7.1 - 7.4 - Half-Loops with Rolls**

The half-loops in this sub-family must be of a constant radius and wind-corrected to appear as a perfect half circle (see full loops discussion below).

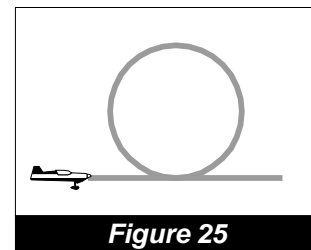
When a half-loop is preceded by a roll or rolls, the half-loop follows immediately after the rolls without any visible line. Drawing a line requires a downgrade of at least two (2) points depending on the length of the line drawn. Should the half-loop begin before the roll is completed, the Judge must downgrade the figure one (1) point for every five (5) degrees of half-loop flown on which the roll was performed.

**Figure 24**

The half-loop followed by a roll is also flown with no line between the half-loop and roll. Again, drawing a line requires a downgrade of at least two points depending on the length of the line drawn. Should the roll begin before the half-loop is completed, the Judge must downgrade the figure one (1) point for every five (5) degrees of half-loop on which the roll was performed. (Figure 24)

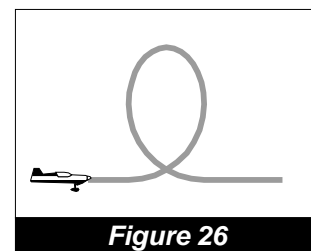
**Family 7.5 - 7.6 - Full Loops**

All full loops must appear perfectly round to the Judge. This means that they must be wind corrected to have a constant radius. This wind correction is only with regards to the roundness of the loop and not for the effect of any crosswind on the figure. Therefore, no deduction is given if the finish point is displaced relative to the start point in a direction perpendicular to the plane of the loop. Full loops must also begin and end at the same altitude or they will be downgraded. (Figure 25)

**Figure 25**

Loops must be flown with no visible crabbing and wings must be level at all times. The one (1) point for every five (5) degrees rule holds for both these cases.

If there is a roll or rolls at the apex of the loop, it must be centered in the loop and flown on the arc of the loop itself. Flying the roll on a line at the apex of the loop is at least a two (2) point downgrade. If the roll is not centered, it must be downgraded one (1) point for every five (5) degrees of the arc that it is off center.

**Figure 26**

To better quantify deductions for irregularity of the radius of looping figures, the Judge divides the loop into quadrants. Any variation in the radius from one quadrant to the next can be downgraded a fixed number of points depending on the magnitude of the variation. The goal of each Judge is to develop a reproducible method to judge all loops with the same criteria.

CRITERIA FOR JUDGING AEROBATIC FIGURES

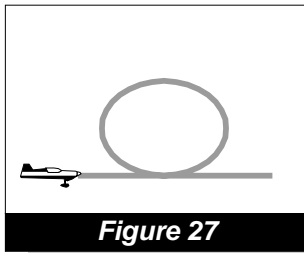


Figure 27

In judging loops, a common error is for the vertical diameter of the loop to be larger than the horizontal diameter. This is often called an "egg" shaped loop. (Figure 26) Less common are loops with a horizontal diameter greater than the vertical. This is also called an egg-shaped loop. (Figure 27)

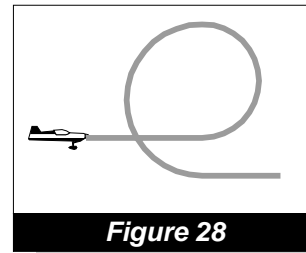


Figure 28

Another common error is in varying the radius of the final quadrant performing an "e" shaped loop. (Figure 28)

Whatever method is used, standard downgrades should be applied for each of these errors. Additional downgrades should be applied based on the magnitude of variation.

Family 7.7 - 7.10 - Square, Diamond and Octagon Loops

Square, Diamond and Octagon loops are flown as hesitation loops with lines of equal length and partial loops with equal radii. All horizontal lines are judged on flight path and vertical and diagonal lines are judged based on aircraft attitude. As such, except in a windless condition, the judge should never expect to see these figures closed. They will always be driven by the wind. Square and Octagon loops are not considered complete until the last horizontal line is drawn equal to the length of the first line of the figure. (Figure 29)

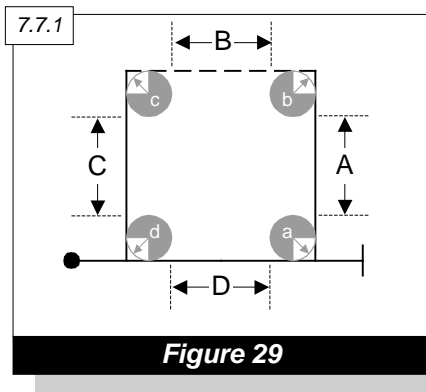


Figure 29

*Radii  $a = b = c = d$   
Line Length  $A = B = C = D$   
Figure is not complete until  $D = A$*

Where rolls are flown on the Square or Diamond loops, they must be centered on the line.

Aids for judging all hesitation loops are that a good performance will contain changes of angular velocity in all the partial loops, and variations of time taken to draw the length of each interior line, which also varies according to the aircraft's speed. The rhythm of all these partial loops is a help for judging. A frequently seen error in hesitation loops is for the aircraft to overshoot the partial loop and then have to bring the nose back to correct the attitude. This must be downgraded by one (1) point for every five (5) degrees.

Family 7.11 - 7.12 - Vertical S's

These figures are accomplished with two joined half-loops flown in opposite directions. (Figure 30) Look for both half-loops to be the same size and perfectly round. The half-loops should be a continuous looping figure when there is no roll between the half-loops. When a roll is performed between the half-loops, there is no line before or after the roll. However, the roll is flown on a horizontal line which begins as soon as the first half-loop is finished. As soon as the roll is finished, the next half-loop must begin immediately. Adding a line at either of

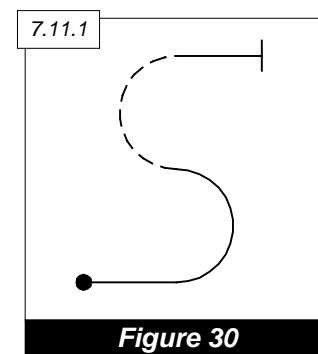
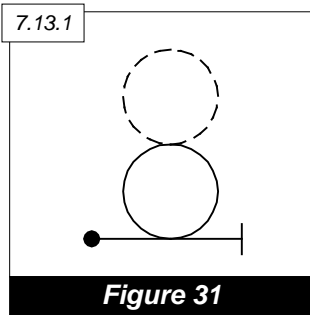


Figure 30

CRITERIA FOR JUDGING AEROBATIC FIGURES

these points is at least a two (2) point deduction depending on the length of the line.



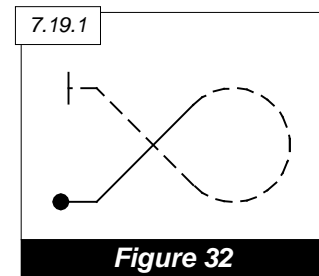
Family 7.13 - 7.18 - Vertical 8's

These figures are performed by flying two loops, one above the other. Sub-family 7.13-7.16 is composed of two loops, both above or both below the entry altitude. Sub-family 7.17 - 7.18 is composed of one loop above and one loop below the entry altitude. In either case the entry and exit altitudes must be the same.

These figures may be combined with various types of half rolls. When a roll is performed between the loops, there is no line before or after the roll. However the roll is flown on a horizontal line which begins as soon as the first loop is finished. As soon as the roll is finished, the next loop must begin immediately. Adding a line at either of these points is at least a two (2) points deduction depending on the length of the line. These figures are to be graded using the same criteria as full loops. Additionally, both loops must be of the same size. Unless there is a roll between the loops, they must be directly above one another. (Figure 31)

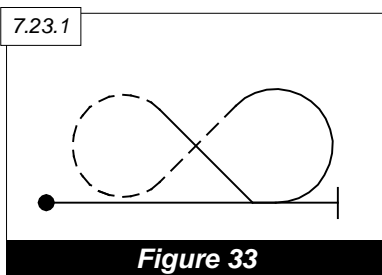
Family 7.19 - 7.22 - Partial 8's

Sometimes referred to as "Goldfish", the entry, <sup>3</sup>/<sub>4</sub> loop, and exit radii in these figures do not have to be identical. The entry and exit lines are judged with reference to the 45 degree attitude, not flight path. Any rolls on the 45 degree lines must be centered on that line. It is not required that the lengths of the 45 degree lines bear any strict relation to the diameter of the three quarter loop. That is, the entry and exit altitudes need not correspond to the altitude limits of the loop. (Figure 32)



Family 7.23 - 7.30 - Horizontal 8's

Both loops must be the same size and the lines between the loops flown at exactly 45 degrees attitude. This means that only if there is no wind will they intersect at the exact midpoint of the 8. If there are rolls of any variety, they will only occur on the 45 degree lines and be positioned so that the lines before and after the roll are of equal length. For deductions see figure 10.



The start and finish of the figure and the bottoms (or tops if the figure is reversed) of the two loops must be at the same altitude. However, if there are multiple rolls flown on the last 45 degree line, that line may project above or below the looping portions and exit at a different altitude than the entry altitude of the figure.

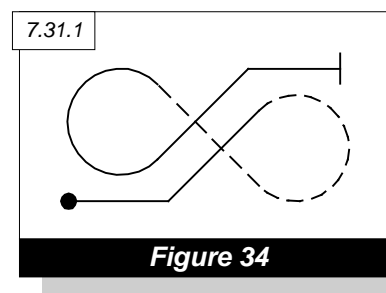
The radius of the part-loop between 45 degree and horizontal need not equal the radii of the loops of the Horizontal 8 itself. A common fault is to fly these part-loops as drawn in the catalog symbol, which means with a corner. This must be downgraded. (Figure 33) The entry, <sup>3</sup>/<sub>4</sub> loop, and exit radii in these figures do not have to be identical.

**CRITERIA FOR JUDGING AEROBATIC FIGURES**

**Family 7.31 - 7.38 - Combination 8's**

Besides possessing the unique characteristic of containing three 45° lines on which rolls may potentially be placed, these sub-families should be judged as 7.23 to 7.30 but with the addition of an extra 45° line.

Radii of the entry/exit 1/8 loops and the two 3/4 loops do not have to be equal. The two 3/4 loops must have the same diameter and occur at the same altitude. Any rolls placed on any 45° line must be centered. The horizontal entry/exit lines must coincide with the top and bottom of the loops, except when the first or last 45° lines contain multiple linked, unlinked or opposite rolls, when they may be extended (not shortened) above or below the extreme of the 3/4 looping segments. Shortening of a line, as in Figure 34, should be penalized by up to 2 points.

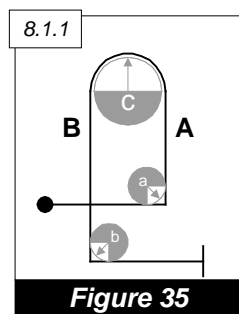


**Figure 34**

**Family 8 - Combinations of Lines, Loops and Rolls**

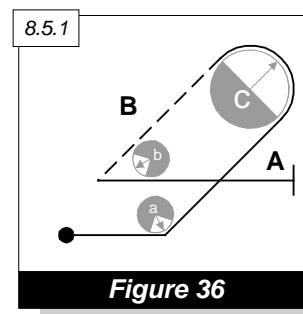
Although some of the figures in this Family appear to be exotic, there are no new judging criteria for these figures. These figures are combinations of horizontal, vertical and 45 degree lines as well as partial loops of varying degrees. The judging criteria for these lines and loops are unchanged. What is left to discuss are the judging criteria for the combinations of these lines and loops.

**Family 8.1 - 8.28 - Humpty Bumps**



**Figure 35**

These figures, whether vertical or performed with 45 degree lines, are judged as combination of lines and loops. For all these figures, the radii of the first and last partial loop must be equal. However, the half loop in the middle of the figure can be of a different radius. These half loops must still have a constant radius from the time they depart the vertical or 45 degree line. This requires a change in angular velocity during the half loop.

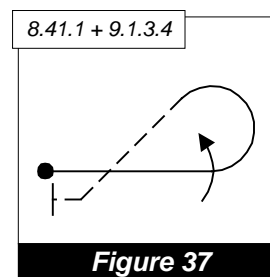


**Figure 36**

The lines in these figures may be of different lengths, and therefore the entry and exit altitudes of these figures can be different. Rolls on any of these lines must be centered.

**Family 8.29 - 8.48, 8.51 - 8.54;  
Reverse Half Cubans, 3/4 Loops, Half Cubans etc**

In these figures, all partial loops must have the same radii. The rolls on vertical and 45 degree lines must be centered. Horizontal rolls immediately preceding or following looping segments have the same criteria as in Families 7.1 to 7.4. Angles drawn in the Catalogue, such as in Figure 37, are to be flown as partial loops.



**Figure 37**

CRITERIA FOR JUDGING AEROBATIC FIGURES

Family 8.49, 8.50, 8.55 & 8.56 - Multiple Looping Combinations

When 1/4, 1/2 and 3/4 loops join each other in these sub-families, their radii must be equal and there is no line between the loops (Figure 38). A line drawn would be a minimum two (2) point deduction depending on the length of the line. The only exception is the 1/4 loop that returns the aircraft to horizontal flight, which should have a reasonable radius, but need not match the other looping radii

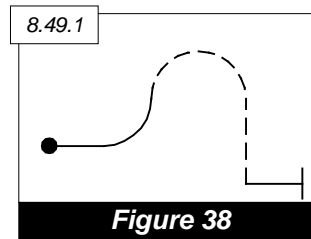


Figure 38

Family 8.57 - 8.72 - Teardrops

In these figures, all partial loops must have the same radii. The rolls on vertical and 45 degree lines must be centered. Angles are to be flown as partial loops. In the case of this figure, a 1/8 outside loop is flown followed by an inverted 45 degree line up with an optional 360 degree roll. Then an outside 5/8 loop is flown and a vertical line down on which there may be another 360 degree roll. Finally a quarter loop is flown, bringing the aircraft back to upright horizontal flight. (Figure 39)

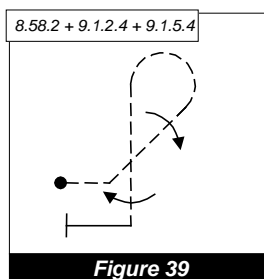


Figure 39

Family 9 - Rolls and Spins

Rolls may be performed on horizontal, 45 degree or 90 degree lines; on complete loops; between part-loops; between part-loops and lines; and following spin elements.

They may be 1/4, 1/2, 3/4 or a full 360 degrees in their rotation, up to two consecutive full rolls. Additionally, slow rolls may be flown in combination with turns as prescribed in Family 2 (Rolling Turns).

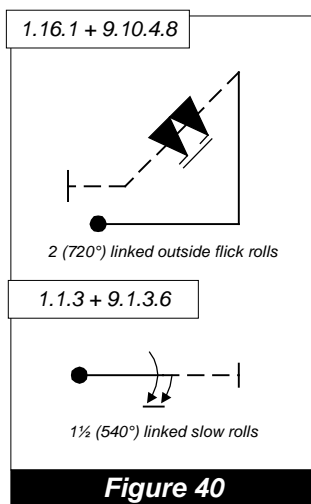


Figure 40

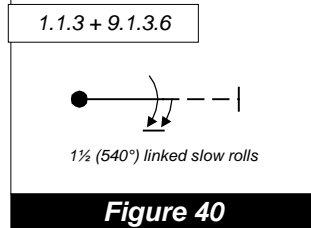


Figure 40

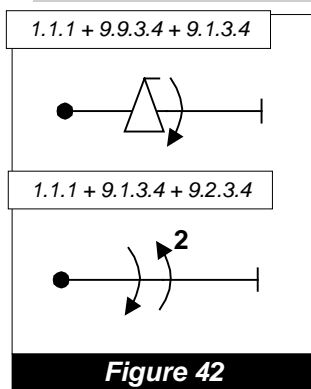


Figure 42

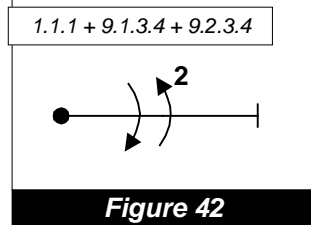


Figure 42

In all cases, the same criteria apply: the rate of roll must be constant throughout the roll(s). The aircraft should continue to project, during the rolling portion, the prescribed plane and direction of flight.

Multiple rolls may be linked, unlinked, or opposite.

(1) When rolls are in continuous rotation, the tips of the symbols are linked by a small line. When flying linked rolls there is no pause between them. (Figure 40)

(2) Unlinked rolls must be of different types, the two types being defined as follows:

- (i) Aileron rolls (slow rolls and hesitation rolls)
- (ii) Flick rolls (positive and negative)

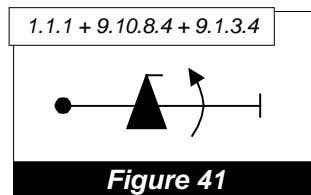


Figure 41

No line links the symbols, though their tips are drawn pointing in the same direction (i.e., on the same side of the line). They must have a brief but perceptible pause between them and they are to be flown in the same direction of rotation. (Figure 41)

(3) Opposite rolls may be either of the same or different type. In opposite rolls, the tips of the symbols are drawn on opposite sides of the

**CRITERIA FOR JUDGING AEROBATIC FIGURES**

line, indicating they are to be flown in opposite directions of rotation. The pilot may elect to fly the first roll in either direction, but the second roll must be opposite direction to the first. Opposite rolls, including those in rolling turns, should be flown as one continuous manoeuvre - the brief check between opposite rotations should be minimal. (Figure 42) If the two rolls are of the same type, they must be flown in opposite directions if they are not linked.

(4) Either aileron or flick rolls may follow spin elements (Family 9.11 or 9.12). When a spin and a roll are combined on the same vertical downline they will always be unlinked; may be flown in either the same or opposite direction, as shown by the position of the tips of the symbols on the Form B or C; and the combination may not exceed two rotational elements. (For example, it would be illegal to combine two opposite direction aileron rolls with a spin element.)

**Family 9.1 - Slow Rolls**

The penalty for varying the rate of roll is one (1) point per variation. Any stoppage in the slow roll that could result in its being considered a hesitation roll, would zero (0) the figure.

The finish of the roll must be as crisp and precise as possible. Coming to a slow finish in fact represents a change in the rate of roll and should be penalized accordingly.

The wings must stop precisely after the desired degree of rotation and not go past the stop point and then return. A deduction of one (1) point for each five (5) degrees of over/under rotation.

**Family 9.2 - 9.8 - Hesitation Rolls**

For hesitation rolls, the second digit in the catalog number indicates the number of points: Family 9.2 is 2-point rolls; Family 9.4 is 4-point rolls; and Family 9.8 is 8-point rolls.

These rolls are judged on the same criteria as the slow roll, only the aircraft stops rotation during the roll for a pre-stated number of times, i.e., 2, 4 or 8. The rate of the roll and the rhythm of the hesitations must be constant throughout with the aircraft projecting the pre-stated plane and direction of flight.

The pauses will be of identical duration and the degree of rotation correct between each pause: 180 degrees, 90 degrees, or 45 degrees. Each pause of a hesitation roll must be clearly recognizable in every case, but it is especially important that in poor visibility or at high altitude, the competitor pauses long enough to make them recognizable to the Judges. If a pause is not recognizable, the figure is graded a zero (0).

**Family 9.9 - Positive Flick Rolls**

Flick rolls represent one of the greatest challenges to judges. This is primarily due to two factors: (1) the "flicking" characteristics of different types of aircraft are unique; and (2), flick rolls are a high energy manoeuvre that occurs very quickly. Flicks happen so fast, in fact, that it is virtually impossible for a judge to determine the exact order in which events occur, especially at the beginning of the flick. There are no criteria, therefore, for seeing nose and wing movement initiated at the same time as with the other autorotation family, Spins.

## CRITERIA FOR JUDGING AEROBATIC FIGURES

The judge must see two things to determine that a flick roll has occurred. The nose must depart the flight path and autorotation must be initiated. If the judge does not observe both events, the figure must be given a zero (0).

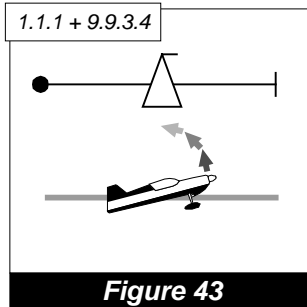


Figure 43

For a positive flick roll, the nose must move away clearly and unambiguously from the wheels. (Figure 43) This puts the aircraft's wings near the critical angle-of-attack. If the nose moves in the wrong direction, a zero is given. Either shortly after the nose moves, or simultaneously with the nose movement, the aircraft must be seen to yaw around its normal axis, thus initiating a stall of one wing and subsequent autorotation. If any movement about the longitudinal (roll) axis is observed before the autorotation starts, the figure is downgraded one (1) point per five (5) degrees of roll.

Throughout the flick roll, the main axis of the flick roll's rotation must be in the correct plane and direction of flight. However, the type of motion (angle-of-attack and angular velocity) displayed around the main axis of autorotation differs between aircraft types (much as each type of aircraft has different spin characteristics). If the character of the flick roll changes during the figure, the figure is downgraded (see Family 9.1) A changing rate of rotation or the nose moving more onto the flight path (like a slow roll) is the most often observed change in character. But for all aircraft types, the criteria for stopping the flick roll is the same: the attitude before starting the flick roll and in the instant of stopping it must be identical and must correspond to the geometry of the basic figure on which the flick roll is performed.

Flick rolls must be observed very carefully to ensure that the competitor is not "aileroning" the aircraft around its longitudinal axis. Aerobatic aircraft with very high rates of roll can occasionally fool a judge in the execution of flick rolls. The movement of the aircraft's nose departing the flight path prior to autorotation is a good clue to the proper execution of a flick roll. As always, the competitor is given the benefit of the doubt, but if a judge is certain that a proper flick roll has not been executed, a zero (0) is given. Another common error is for the aircraft to autorotate, but to not stay in autorotation until the end of the figure. In this case, a deduction of one (1) point for each five (5) degrees of rotation remaining when the autorotation stops must be made. If autorotation ends with more than 45 degrees of rotation remaining, even if the roll is completed with aileron, the flick roll is zero.(0)

## Family 9.10 - Negative Flick Rolls

For negative flick rolls, all criteria stated for positive flick rolls apply except, of course, that the aircraft is in a negative rather than positive angle-of-attack during autorotation. Therefore, in a negative flick roll the nose of the aircraft will move toward the wheels as it departs the line of the aircraft's flight path. (Figure 44) This direction of motion must be observed very carefully, since it is the defining characteristic that differentiates a negative flick roll from a positive flick roll. As with positive flick rolls, if the nose does not move in the correct direction, it is not a negative flick roll and the figure must be given a zero (0).

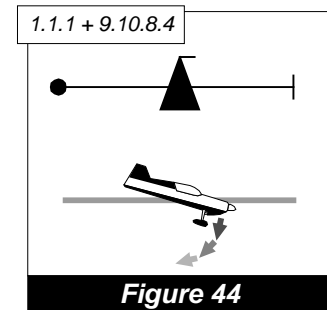
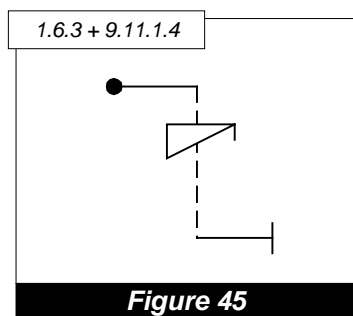


Figure 44

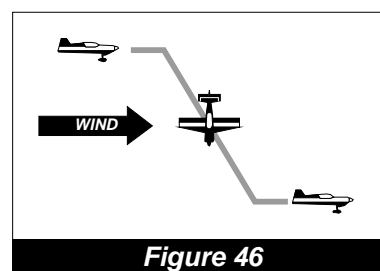
## CRITERIA FOR JUDGING AEROBATIC FIGURES

## Family 9.11 and 9.12 - Spins



All spins begin and end with horizontal flight. In order to spin, the aircraft must be completely stalled in horizontal, level flight from a clearly visible horizontal line before the stall. When the aircraft stalls, the center of gravity will drop from wings-level horizontal flight. It should be noted that an aircraft has forward inertia

as the aircraft decelerates through stall speed.



This appearance is more pronounced when the figure is performed downwind, and is enhanced when performed into the wind. This change in appearance is not a grading criteria. (Figure 46)

When the aircraft stalls, the nose will fall and at the same time the wing tip will drop in the direction of the spin. Failure to achieve this should be considered a "forced entry" and downgraded one (1) point per five (5) degrees of deviation.

After completion of the prescribed number of turns, the aircraft must stop rotating precisely on the pre-stated heading, then a 90 degree down, wings-level attitude must be seen. Grading criteria for the basic figure being flown then resumes. If a roll follows a spin, there should be a brief, but perceptible pause (similar to unlinked rolls) between the spin and the roll. Because there is no vertical line before the spin, there is no criteria to center either a spin element alone or a spin-roll combination on the vertical downline. Be alert for early stopping of the stalled autorotation followed by "aileroning" to the pre-stated heading. In this case, a deduction of one (1) point for every five (5) degrees of "aileroning" must be applied. For example, in a one-turn spin the autorotation is observed to stop after 345 degrees of rotation and the ailerons are used to complete the rotation. The highest score this spin could receive is a 7.0.

No account is to be taken of the pitch attitude of the aircraft during autorotation, as some aircraft spin in a nearly vertical pitch attitude while others spin quite flat in conventional spins. Speed of rotation is not a judging criterion.

If the aircraft never stalls, it is apparent that it cannot spin, and a zero (0) must be given. You will see "simulated" spins where barrel rolls or flick rolls are offered as spin entries. In both cases, the flight path will not be downward. In all of these cases, the figure will be zeroed.

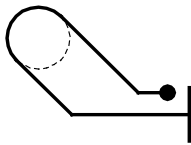
In all spins the grading criteria are:

1. A clean breaking stall in horizontal flight.
2. Fully-stalled autorotation.
3. Stopping on pre-stated heading.
4. Vertical down, wings-level attitude after stopping on heading.
6. A constant, reasonable quarter-loop radius back the horizontal flight.

## CRITERIA FOR JUDGING AEROBATIC FIGURES

**Family 10 - The Wingover**

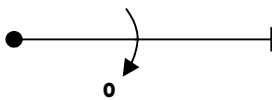
This manoeuvre has been introduced and intended for the Entry Category only.



The wingover requires a 180° turn placed at the apex of 45° climbing and descending sections. The bank angle at the apex should be 90° with the fuselage axis horizontal. The normal one (1) point off per five (5) degree of error applies. Variations and stops of the turn rate are penalized by 1 and 2 points off respectively. The K factor for a wingover is 8.

**Family 11 – The Barrel Roll**

This manoeuvre has been introduced and is intended for the Entry Category only.



The Barrel Roll is performed around an imaginary point on the horizon 20 degrees off the axis. The manoeuvre is flown with positive 'G' throughout so the nose of the aircraft will describe a perfect circle around this point on the horizon. When viewed from the ground, the aircraft appears to describe a corkscrew effect in the horizontal plane. The Judges will be looking for:

1. Rate of roll should blend evenly with the circle described by the nose.
2. Initially, the nose should rise simultaneously with the change of heading and beginning of the roll.
3. At 90 degrees roll point the fuselage angle should be 20 degrees above the horizon, a 20 degree left or right of the original heading depending on direction of roll.
4. The highest altitude should occur at the 180 degree roll point, at which time the heading should be 40 degrees off original heading.
5. At 270 degrees roll point, the fuselage angle should be 20 degrees below the horizon and heading should have reduced back to 20 degrees from the heading prior to the start.
6. The manoeuvre is ended when original heading, altitude and zero bank is attained. At that point the aircraft will have displaced horizontally from the geographic starting point by approximately 100 to 200 metres in the direction of roll.

The K factor for the barrel roll is 15.

**CRITERIA FOR JUDGING AEROBATIC FIGURES****POSITIONING**

Positioning is scored in one of two ways: mechanically, by means of a tracking device; or by the individual judges.

Positioning refers to the placement of the figures in relation to the boundaries of the performance zone. Additionally, positioning relates to the placement of each figure at its optimum range from the judges, taking into account the height of the aircraft and the nature of the individual figure being flown. Lastly, positioning also refers to the symmetrical placement of the sequence, as a whole, to the left and right of the judges' position.

**Performance Zone Boundaries**

When Line Judges are used at a contest, infringements of the performance zone will be directly penalised and judges need pay less attention to such infringements when considering a grade for positioning. When Line Judges are not used, however, a much higher K factor is applied to the positioning score and judges must make additional reductions to the grades given when a pilot flies figures in a position that is clearly outside the confines of the performance zone.

In this latter case, the K factor is specifically chosen so that one less mark for the positioning grade equates to two figures being flown outside the performance zone. Thus, if a judge considers in these circumstances that four figures have been flown outside the zone, a deduction of 2 marks should be made from the positioning grade, in addition to any deductions made under the terms of the following paragraphs.

**Optimal Placement of Figures**

Even though figures are flown within the performance zone, judges must still consider their positioning in relation to an optimum position where clarity of execution and geometry are at their greatest. This optimum position will vary depending on the aircraft's height and the nature of the figure.

Consistently accurate flying is best assessed when the elevation of the judge's sight line from the horizontal is reasonably constant. This means that when an aircraft is at the greatest height, it should be also at its furthest distance away from the judging position along the secondary axis. Consequently, when an aircraft is low, then it should be closer to the judges to give the same viewing perspective.

In even the best positioned sequence, however, some variations in the judge's sight line elevation are inevitable. These different viewing angles also affect the optimum position for figures of different kinds. For example, looping shapes and 45-degree climbing or descending lines are much easier to judge accurately if the sight angle in relation to the horizon is small. Conversely, such figures are difficult to assess if flown high up and close to the front of the performance zone.

Further, such fine points as the accuracy of hesitations in an 8-point roll are much easier to judge when the figure is close to the judges and fairly low, rather than over a kilometre away at the rear of the performance zone – let alone outside it.

Consideration of all the parameters in the few short paragraphs of this section will enable a judge to make a clear decision about any figure that is clearly flown in other than its optimum position. Judging of the particular figure will be difficult, and such bad presentation should be reflected in the positioning grade for the sequence. It would be appropriate to deduct between 0.5 and 1 mark for any such misplaced figure, depending on the severity of the difficulty incurred.

**Sequence Symmetry**

The previous sections have considered figures placed outside the performance zone and figures flown too close to, or too far away from, the judging position. The last consideration in assessing the positioning grade for the sequence is its symmetry about the secondary axis. Particularly in conditions of a strong headwind, or perhaps a slight but legal tailwind, some pilots might have difficulty in placing the sequence symmetrically about the secondary axis.

**CRITERIA FOR JUDGING AEROBATIC FIGURES**

In a sequence of 12 figures, for example, 6 figures flown upwind and 6 downwind of the centre would present an ideal flight. A less even balance, perhaps 4 and 8, would represent a lower level of skill and would attract a further deduction of one mark from the positioning grade. Further imbalance than this, 3 to 9, or 2 to 10, should progressively attract greater downgrading of the positioning grade.

**Summary**

The judge's final decision on a grade for positioning is not a simple one. It must take in to account deductions for asymmetry of the sequence, non-optimal placement of individual figures and, in the case where Line Judges are not used, figures clearly flown outside the performance zone. Whilst a particularly well designed and positioned sequence might still merit a grade of 8.5 or so, a badly flown sequence could well deserve a very low grade from 0 to perhaps 2 or 3.

This extra burden placed on the judging panel deserves as much consideration as the grading of individual figures if the differences between good and bad flights are to be fairly assessed.

**CRITERIA FOR JUDGING AEROBATIC FIGURES****THE FINAL FREESTYLE PROGRAMME Unlimited Only)**

The Final Freestyle Programme will be judged under three main headings. A grade of up to 10 marks, in increments of 0.5 will be given under each of the ten sub-headings.

**Technical Merit (160K)**

The Technical Merit of a flight shall be assessed by its fulfillment of the following objectives.

**Use of Many Different Areas of the Flight Envelope – 40K**

The pilot is expected to make full use of many different areas of the flight envelope of the aircraft. This means flying at the full range of air speeds and accelerations permitted. The time available should be divided between high speed, high G manoeuvres and slower flight periods. Both positive and negative parts of the envelope should be used, in reference to both speed and G. The flight should include the demonstration of controlled flight beyond the stall boundary by use of auto-rotation or other high-alpha manoeuvres. The judge will deduct points if any of these areas are noticeably under-utilised.

**Exploitation of Aerodynamic Controls and Gyroscopic Forces – 40K**

The pilot is expected to show movement of the aircraft about all axis using both conventional aerodynamic controls and also using propeller-generated gyroscopic forces. Higher marks 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 attract lower scores.

**The Clarity of the Execution of Individual Manoeuvre Elements – 40K**

It should be clear to the judges that the manoeuvres flown were, in fact, intended and fully under the pilot's control. Higher marks will be given under this heading when individual manoeuvre elements are started and finished on obviously precise headings and in well-defined attitudes. When, for example, gyroscopic manoeuvres are allowed to decay into imprecise, poorly defined auto-rotation, judges should consider deducting marks for poor execution. Marks should also be deducted if it appears that the pilot has relinquished control of the aircraft for short periods.

**The Combination of Manoeuvre Elements in a Wide Variety of Figures Flown on Different Axis and Flightpaths – 40K**

Many different figures should be completed in the time available. These should include manoeuvre elements of many different kinds and should use many different flight paths and axis. Lower marks should be given to a pilot who used only one or two principal axis of flight. However, the use of additional axis must be clear and precise, not giving the appearance of being used by chance. Marks should also be deducted if any particular manoeuvre 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 (160K)****The Pleasing and Continuous Flow of Figures – 40K**

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 manoeuvre should then begin without any prolonged period of inactivity caused by the need to reposition the aircraft or re-orientate the pilot. Marks will be deducted for any obvious period of level flight, or inactivity, required between figures.

**CRITERIA FOR JUDGING AEROBATIC FIGURES****Contrasting Periods of Dynamic and Graceful Manoeuvres – 40K**

In a musical symphony, the listener's mood may be changed by contrasting fast and slow movements. Similarly, in a Freestyle sequence, the audience should be treated to a flight that causes different reactions. While some manoeuvres 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 programme for showing such differences of mood and pace. Marks should be deducted in this category for a flight that shows no such distinctions.

**Presenting Individual Figures in Their Best Orientation – 40K**

Figures can give different impressions when seen from different viewpoints. For example, a climbing inverted flat spin (*eventail*) 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.

**Placing Individual Figures in Their Optimum Position – 40K**

Each figure has an optimum position from which it should be 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 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 positioned.

**Positioning (80K)****Symmetry – 40K**

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 centre of the performance zone. Marks should be deducted if, by design or by the influence of the wind, a pilot's programme is noticeably biased to left or right. The greater the degree of asymmetry, the greater should be the deduction.

**The Performance Zone – 40K**

Even though a flight might be symmetrical, it may also be spread too far to either side, so that some manoeuvre elements are flown outside the performance zone. Figures may also be flown on the direct line of vision but very distant. Any part of the flight that is flown so far away that it appears to be outside the zone should be penalized at a rate of 0.5 of a mark for each apparent excursion.

# AAC REGULATIONS

## APPENDIX 2

### CODE OF PRACTICE FOR THE CHIEF JUDGE AND BOARD OF JUDGES AT AEROBATIC CHAMPIONSHIPS

#### Chief Judge

1. The Chief Judge's primary concern, after safety, should be the accurate and fair judging of the competition flights, including the monitoring of flights for zero marks and penalties. He should place his expertise at the disposal of the Board of Judges, and coordinate and guide their work.
2. The Chief Judge oversees administrative matters (correctness of paperwork, recording of penalties, etc.) and should be provided with a small group of special assistants who will perform at least the following tasks under his supervision:
  - (i) Calling the manoeuvres and recording the notes of the Chief Judge, to whatever extent he requires;
  - (ii) Processing and expediting the flow of paperwork;
  - (iii) Receiving and recording the calls of the Line Judges;
  - (iv) Handling all other radio communications.One of his assistants should assist in monitoring the zero marks and penalties awarded by the Judges after each flight.
3. It is essential that the Chief Judge follows each flight, with emphasis on recording zeroes, interruptions, insertions and height penalties. Such infringements and comments should be recorded, as an *aide-memoire*, on a score sheet, which should be retained for reference prior to the judge's scoresheets being submitted to the workstation. The official recording of penalties will be on the appropriate section of the score sheet reserved for the use of the Chief Judge and entered prior to submission to the scoring system.
4. The Chief Judge should hold seminars with the Judges. He should give guidance to the Judges as to the current Judging Criteria and rules for judging, on which he should conduct 'question and answer' sessions.
5. The Chief Judge will hold other routine evaluation meetings with the Judges during the contest and before it begins he must hold practice sessions on the judging line during the contestants' training flights. He should ensure that the Code of Practice is understood and operates smoothly, and establish a good working relationship between teams of Judges and Assistants, Timekeepers, and other helpers.
6. The Chief Judge is responsible for ensuring that there is enough time between flights for the judging to be unhurried: he should control (by radio) the flow from one contestant to the next.
7. At the end of each flight, the Chief Judge should ascertain whether any of the Judges has recorded a zero mark, height penalty, interruption penalty or insertion penalty. This will be done by perusal of the score sheets collected from the judges, prior to entry into the scoring system.
8. In the event of a difference of opinion between the Judges concerning a zero mark, insertion penalty or interruption penalty, the Chief Judge will call a judging conference as soon as possible to resolve differences.
9. The awarding of a zero mark is determined by majority, with the Chief Judge having a casting vote if required. It should be noted that when a Judge's vote is overruled, upward correction of a zero must be to the average of the grades given by the judges.

## AAC REGULATIONS

### APPENDIX 2

- 10 Height, Interruption and Insertion Penalties. Each judge must record such infringements on their score sheet. Where there are no such infringements the words "No Penalties" or "NP" should be entered in the remarks box, thus giving a positive indication in either instance. The Chief Judge or his assistant will then enter the appropriate penalty based on the majority result. In the case of a 50/50 split the Chief Judge may call a conference or cast his vote as appropriate.
11. The awarding of penalties for infringements of upper and lower height limitations is decided by majority vote of the judges. In the case the required simple majority could not rise from a vote within the Board of Judges, the Chief Judge shall have the casting vote. A two-thirds majority is always required for the penalty of disqualification for **Advanced and Unlimited under CIVA Rules**
12. The Chief Judge must record when a competitor has exceeded the time limit for a programme. This should not be brought to the judges' attention whilst the flight is in progress, but immediately after the flight has ended and the scores brought to zero as appropriate.  
  
He should also confirm which figures should receive a zero because they were started behind the judges. This should also be dealt with immediately after the flight and the scores brought to zero as appropriate.
13. The Chief Judge, assisted by the timekeepers, has the responsibility for the awarding of penalties for improper wing rocking.
14. After the warm-up flight(s) in Programme 4, the Chief Judge will hold a mandatory meeting of all judges. The marks of the judges will be compared to establish a judging standard for the programme.

#### The Judges

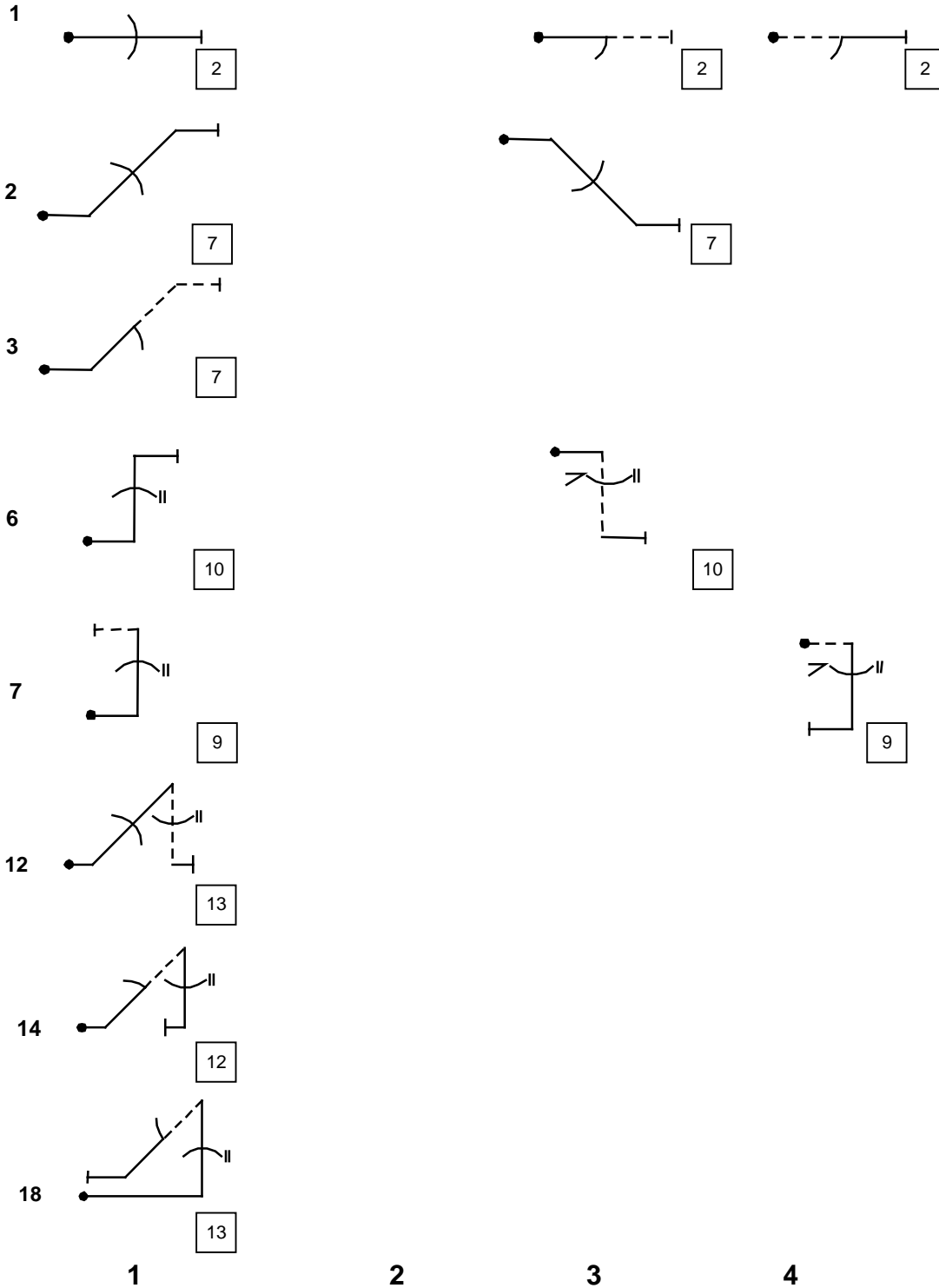
1. It is required that all Judges use an experienced Judge's Assistant together with a recorder if available
2. All Judges should obtain and study copies of all contestants' Free Programme before flying of the programme is started.
3. A Judge may only *reconsider* his marks so long as his score sheet is still in his possession or if asked to do so at the request of the Chief Judge. Once entered into the scoring system, the scoring sheet comes under the jurisdiction of the Contest Jury. The judge must sign off any changes on the score sheet.
4. The preliminary flights by non-competing pilots will be marked exactly as if they were competitors; bearing in mind that the purpose of these flights is so that the first competing pilot who follows them shall not be penalized by receiving an unduly low 'anchor' mark.
5. It is strongly recommended that the Judges record remarks on the score sheets.
6. Judges shall not keep or make reference to a flight order sheet, or communicate to third parties by means of cell phone, radio, etc whilst on the judging line or during breaks/lunches. Failure to adhere to this instruction may lead to expulsion from the judging line.

# AAC REGULATIONS

## APPENDIX 3

### LIST OF FIGURES FOR INTERMEDIATE UNKNOWN

#### 1. LINES & ANGLES

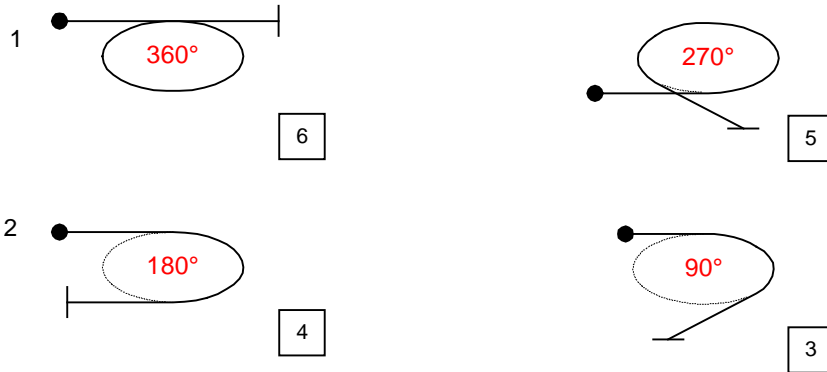


Any of the above figures illustrated with a 360° optional roll sign may be performed without that roll.

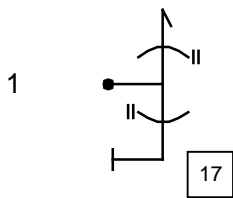
# AAC REGULATIONS

## APPENDIX 3

### 2. TURNS AND ROLLING TURNS



### 5. STALL TURNS



Rolls of 90° may be added on the upward or downward vertical lines. The figures may also be flown without rolls.

1

2

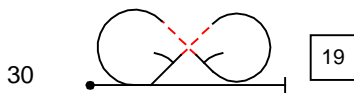
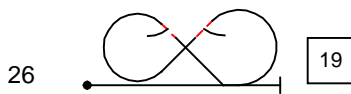
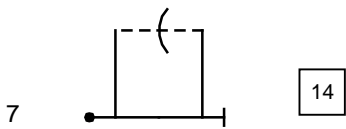
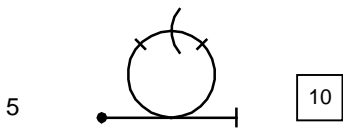
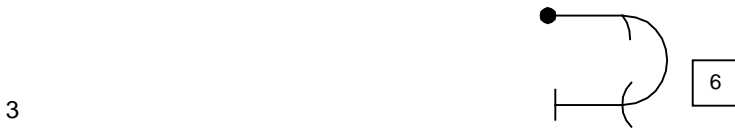
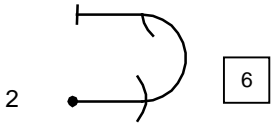
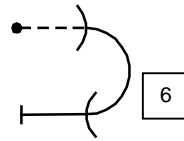
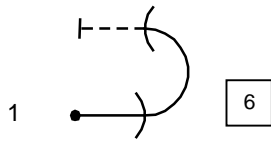
3

4

# AAC REGULATIONS

## APPENDIX 3

### 7. LOOPS AND EIGHTS



1

2

3

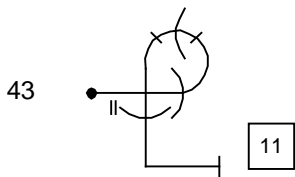
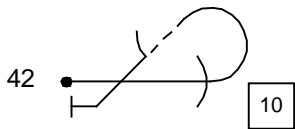
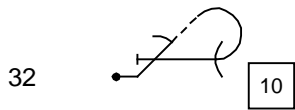
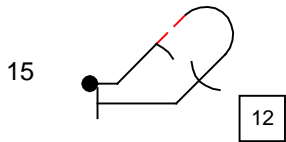
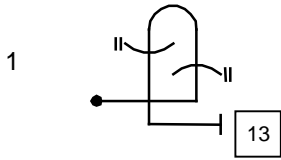
4

The tops of loops in Families 7.5 and 7.6 are not considered horizontal lines and cannot support opposite or unlinked roles.

# AAC REGULATIONS

## APPENDIX 3

### 8. COMBINATIONS OF LINES, ANGLES AND LOOPS



1

2

3

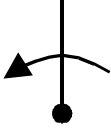

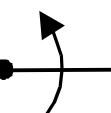


4

Any of the above figures illustrated with a 360° optional roll sign may be performed without that roll

# AAC REGULATIONS

## APPENDIX 3

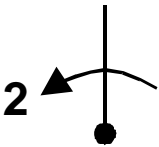
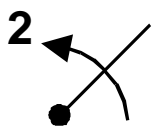
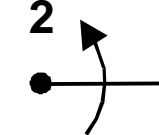
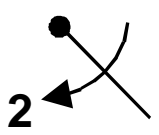
### 9. ROLLS AND SPINS

<b>9.1</b>		$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	<b>1</b>	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	<b>2</b>
<b>1</b>		6							
<b>2</b>			6		10				
<b>3</b>			4		8		10		
<b>4</b>			4		8				
<b>5</b>		2	4						
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>

# AAC REGULATIONS

## APPENDIX 3

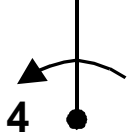
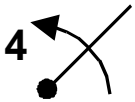
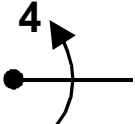

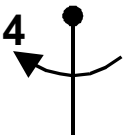
### 9.2 2-POINT ROLLS

9.2					1		1½		2
1									
2									
3					9				
4					9				
		1	2	3	4	5	6	7	8

# AAC REGULATIONS

## APPENDIX 3

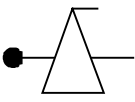
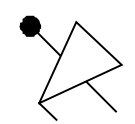
### 9.4 4-POINT ROLLS

9.4			$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
1									
2			7						
3			5		11				
4			5						
5									
		1	2	3	4	5	6	7	8






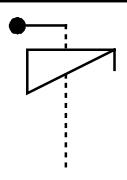
# AAC REGULATIONS

## APPENDIX 3

### 9.9 POSITIVE FLICK ROLLS

9.9			$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
3					11				
4					11				
		1	2	3	4	5	6	7	8

### 9.11 POSITIVE SPINS

9.11								
				1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
1		Upright Entry Line		5	4	3		
				4	5	6	7	8

**Unlimited and Advanced**  
**List of Figures for Programmes 2 and 3**

Refer to FAI Sporting Code  
Section 6

Regulations for the Conduct of International Aerobatic Events

Part 1

Powered Aircraft

Chapter 9

(Available on [www.fai.org/aerobatics/documents](http://www.fai.org/aerobatics/documents))

# AAC REGULATIONS

## APPENDIX 5

### LIST OF QUALIFIED JUDGES

CHAPTER	NATIONAL	STATE
<b>Queensland</b>		
	*Beard Malcolm	Tudge Clive
	Bent Ian	Sneyd Russell
	*Cook Liz	
	Hart Laura	
	Hart Steve	
	Hearne Tracy	
	Hudson Stephen	
	Scilini Brendan	
	Scilini Merryn	
	Walther Markus	
	Williamson Peter	
<b>New South Wales</b>		
	Appleton Colin	
	Bell Russell	
	Bennet Paul	
	Hall Matt	
	Graham Glenn	
	Lamy Laurent	
	Lowy David	
	*Moon Roxarne	
	Percy Glen	
	Piper Grant	
	Sharpe John	
	Unicomb Philip	
	Wiltshire Richard	
<b>Victoria</b>		
	Andronicu Paul	
	Cameron Don	
	Clemence David	
	Close Ian	
	Connellan Richard	Gloster Alf
	Edwards Eddie	
	Hanby Guy	
	Litjens Hans	
	McConnell Greg	
	Pilkington David	

\* International Judges

**AUSTRALIAN AEROBATIC CLUB**

**JUDGES LOG SHEET**

NAME \_\_\_\_\_

STATE \_\_\_\_\_

<b>DATE OF EVENT</b>	<b>EVENT</b>	<b>LEVEL JUDGED</b>	<b>PILOT NUMBERS</b>	<b>CATEGORY</b>	<b>ENDORSEMENT</b>

**APPENDIX 6**

**AAC REGULATIONS**

# AAC REGULATIONS

## APPENDIX 7

### PROCEDURE AND CRITERIA FOR AUSTRALIAN TEAM SELECTION

#### 1. AIM

The aim of these procedures and criteria is to select pilots and officials for the World, Advanced and YakWac Championships.

#### 2. SELECTION PANEL

Members of the National Committee of the Australian Aerobatic Club will form the selection panel. The Panel shall consist of a minimum of 5 and no more than 8 persons. If a member of the National Committee is applying for a position on the Team that member shall not form part of the Panel. It is preferable that the Panel consist of members who have first-hand knowledge of the demands of world championships.

#### 3. SELECTION CRITERIA

##### 3.1 Pilots

A pilot wishing to be considered by the Selection Panel should advise the National Committee in writing prior to the start of the National Aerobatic Championships.

The following selection criteria will apply:

- a) A pilot who has consistently demonstrated the performance of safe aerobatic flight, good sportsmanship, and who is in good standing with the Australian Aerobatic Club.
- b) A pilot who has consistently gained more than 70% of possible points in the last two major championships in which he or she has competed whether those championships be State or National.
- c) A pilot who has gained first, second or third place in the preceding Australian Aerobatic Championships  
or
- d) A pilot who has received a Special Invitation to compete with the Team from the Selection Panel. These pilots will be required to complete a qualification flight in front of at least two members of the Selection Panel.

Once the Panel has advised selection the pilot must confirm in writing to the National Committee his/her acceptance of the team place within 2 weeks of the advice. This acceptance must include their agreement to act as an integral part of the Team and to participate fully as Team members before and during the relevant championship. Pilots will be expected to wear Team uniforms as dictated by the National Committee.

Pilots must deposit their entry fee relative to the competition they will be competing at with the National Body at time of confirmation. Once the entry fee has been transferred to the Contest Organisers no refund will be available unless agreed to by the Contest Organisers.

##### 4.1 Other Team Positions

The Selection Panel will also consider nominations for other official Team positions:

- Chief Delegate
- Team Manager
- Trainer
- Doctor
- Mechanic

Members wishing to nominate for other team positions must forward their CV to the National

## **AAC REGULATIONS**

### **APPENDIX 7**

Committee prior to the National Championships.

Once the Panel has advised selection the team member must confirm in writing to the National Committee his/her acceptance of the team place within 2 weeks of the advice. This acceptance must include their agreement to act as an integral part of the Team and to participate fully as Team members before and during the relevant championship. Pilots will be expected to wear Team uniforms as dictated by the National Committee.

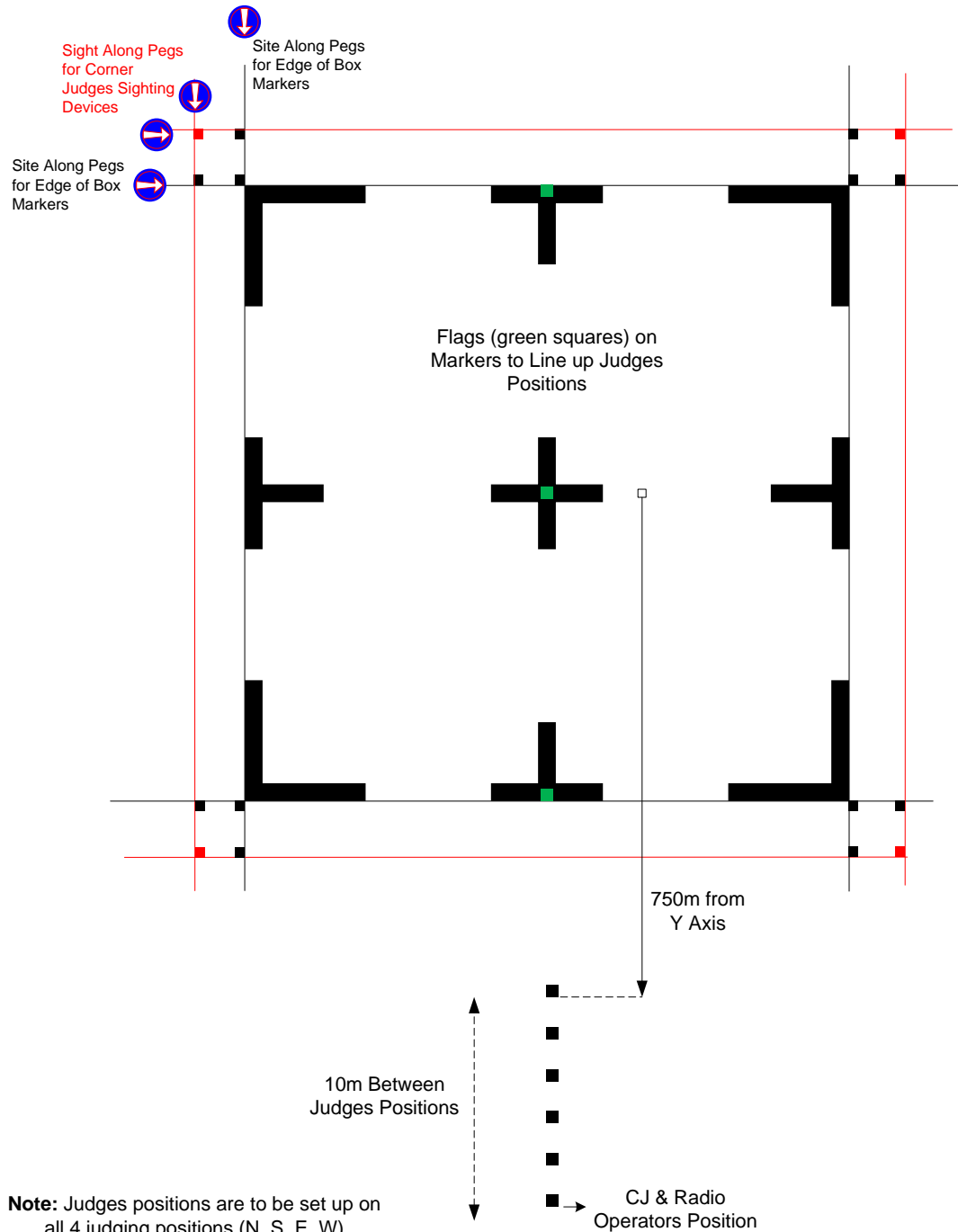
Team Members must deposit their entry fee relative to the competition they will be attending with the National Body at time of confirmation. Once the entry fee has been transferred to the Contest Organisers no refund will be available unless agreed to by the Contest Organisers.

# AAC REGULATIONS

## APPENDIX 8

### How to Set Up Box Markers Corner Judges Sighting Devices

Example is 1 corner of 4 to be done



**Note:** Judges positions are to be set up on all 4 judging positions (N, S, E, W) At Parkes due to position of sun AM/PM