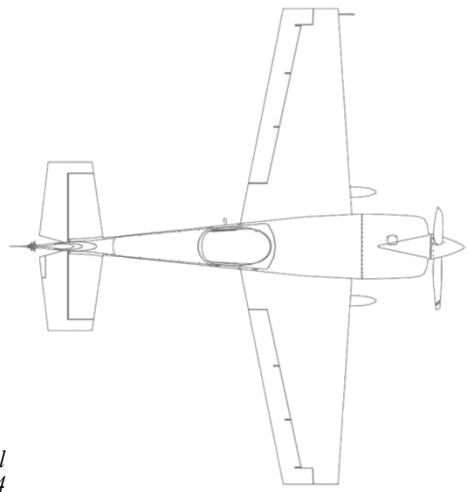
FAI Sporting Code

Fédération Aéronautique Internationale

Section 6

Regulations for the Conduct of International Aerobatic Events



Part 1
Powered Aircraft

Maison du Sport International
Av. de Rhodanie 54
CH-1007 Lausanne
(Switzerland)
Tél. +41 (0)21 345 1070
Fax +41 (0)21 345 1077
E-Mail: sec@fai.org
Web: www.fai.org

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FEDERATION AERONAUTIQUE INTERNATIONALE
MSI - Avenue de Rhodanie 54 – CH-1007 Lausanne – Switzerland

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1 FAI Statutes, ... Chapter 1, ...para. 1.6
2 FAI Sporting Code, Gen. Section, ... Chapter 4, ...para 4.1.2
3 FAI Statutes, ... Chapter 1, ...para 1.8.1
4 FAI Statutes, ... Chapter 2, ...para 2.1.1; 2.4.2; 2.5.2 and 2.7.2
5 FAI By-Laws, ... Chapter 1, ...para 1.2.1
6 FAI Statutes, ... Chapter 2, ...para 2.4.2.2.5
7 FAI By-Laws, ... Chapter 1, ...paras 1.2.2 to 1.2.5
8 FAI Statutes, ... Chapter 5, ...paras 5.1.1, 5.2, 5.2.3 and 5.2.3.3
9 FAI Sporting Code, Gen. Section, ... Chapter 4, ...para 4.1.5
10 FAI Sporting Code, Gen. Section, ... Chapter 2, ...para 2.2.
11 FAI Statutes, ... Chapter 5, ...para 5.2.3.3.7
12 FAI Statutes, ... Chapter 6, ...para 6.1.2.1.3

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GLOSSARY

Discipline ..... Aerobatics
Contest Scope ..... World, Continental, Other International Competitions
Class ..... Power
Category ..... Unlimited, Advanced, Intermediate

1. GENERAL RULES FOR INTERNATIONAL AEROBATIC EVENTS

1.1. Aims of Aerobatic Championships

1.1.1.1. To establish the champions and the winners in the various programmes.

1.1.1.2. To establish the overall champions and the overall winners.

1.1.1.3. To establish the champion teams and team winners.

1.1.1.4. To promote the sporting skill of aerobatic pilots of FAI members and arrange competitive contests between aerobatic pilots of FAI members, and to allow aerobatic pilots the maximum opportunity to demonstrate within the scope of the general rules their ability in competition with others.

1.1.1.5. To promote and popularise aerobatics and to develop and foster friendly relations between aerobatic pilots of different countries.

1.1.1.6. In pursuance of these aims:

a) Fairness and equal treatment shall be ensured by all stakeholders in all CIVA activities and contests, from registration to final results.

b) In case of dispute over the interpretation and application of these rules, and any other regulations for the conduct of aerobatic championships and competitions, a competitor shall be entitled to the benefit of reasonable doubt.

1.2. General Regulations

1.2.1. Contest Scopes

1.2.1.1. World Championships

a) World Championships will be held every two (2) years and should last five (5) to seven (7) days from opening to closing ceremonies.

b) A National Airsport Control (NAC), or other legal entity[1], which has applied to be host and Organiser will be entrusted with the organisation of World Championships pending approval by CIVA.

c) The Organiser will provide conditions for entry and participation for any NAC on equal rights basis and will carry out the World Championships on the basis of the decisions and rules of the FAI.

d) Each NAC will be notified by the Organiser, not later than six (6) months before the beginning of the championships, of any general organisational conditions such as time, place, travel and visa formalities, entry forms, entry deadline, etc.

e) CIVA shall decide at the meeting which precedes a World Championships which FAI language(s) shall be used as the working language(s) both orally and in writing for all purposes for the duration of the championships.

[1] For the sake of wording simplification, in the rest of this document the wording “Organising NAC” may refer to a NAC, another type of FAI member as appropriate, or another entrusted entity. Likewise, for participating countries, the wording “NAC” may refer either to the NAC or to the relevant FAI member if not a NAC.

1.2.1.2. Continental Championships

a) Continental Championships may be held in years when there are no World Championships and should last five (5) to seven (7) days from opening to closing ceremonies.

b) The championships shall be open to all NACs in an 'Open' format. Eligibility for the 'Open' awards is unrestricted, while eligibility for the Continental awards (Continental champion title, FAI & CIVA Continental medals and diplomas) is restricted to NACs of that Continent.

c) In other respects, rule 1.2.1.1 applies.

d) Except where otherwise stated in Sporting Code, the rules and regulations of World Championships should apply.

1.2.1.3. Other International Competitions

a) The Organiser will be a National FAI member.

b) International contests must be made known to the FAI for inclusion in the calendar of international events by October of the year preceding the contest.

c) Any NAC may be invited to participate in an international contest.

d) Each participating NAC will be notified by the organising FAI member not later than three (3) months before the beginning of the contest of any general organisational details and of details specifically relevant to the contest.

1.2.2. Contest Categories

1.2.2.1. All flights carried out by competitors must be made solo; this applies to competition flights and training flights.

1.2.2.2. Contest categories are:

a) Unlimited ("U")

b) Advanced ("A")

c) Intermediate ("I")

1.2.3. Aircraft Restrictions

1.2.3.1. World and Continental Championships are open to piston-engine and electric powered aircraft only.

1.2.3.2. All competing aircraft must meet the performance characteristics required for the kind of flight they will be undertaking.

1.2.4. Competitors Eligibility Restrictions

1.2.4.1. A competitor who achieves an aggregate score of 60% or more in the programmes he/she flew (excluding the Final Freestyle Programme) at a World or Continental Unlimited aerobatic championship for powered aircraft, may subsequently participate in a World or Continental Advanced championship only in an Hors Concours capacity during that calendar year and the following two calendar years, subject to acceptance by the organiser as per 1.2.6.4.

1.2.4.2. A competitor who has previously completed at least one Programme in a World or Continental aerobatic championship for powered aircraft in the Unlimited or Advanced category at any time, may subsequently participate in an Intermediate category power

championship only in an Hors Concours capacity, subject to acceptance by the organiser as per 1.2.6.4.

1.2.5. Minimum Number of Competitors

1.2.5.1. World Aerobatic Championships, or the Open format of Continental Aerobatic Championships, will be held or recognised as such if there are at least fifteen (15) competitors from at least five (5) countries.

1.2.5.2. Continental Aerobatic Championships will be held or recognised as such if there are at least fifteen (15) competitors from at least five (5) countries of that Continent.

1.2.6. Competitors and Team Composition

1.2.6.1. World Championships

a) "U"

i) Every NAC shall notify the Organiser of a World Championships, not less than two (2) months before it is due to start, of the number of competing pilots to be entered from their countries up to a maximum of twelve (12). If the resulting total number exceeds eighty (80) competitors, the Organiser shall have the right, without reference to CIVA, to reduce the maximum number of pilots per country down to no less than eight (8), and in this event shall at once notify NACs accordingly.

ii) Solo entries are allowed and will be accepted from NACs unable to send the minimum number of three (3) competitors required for the team competition.

iii) In the event that fewer than four (4) teams comprised of three (3) or more pilots compete, the number of pilots required to constitute a team will be reduced to two (2). The requirements of paragraph 1.2.5.1 still apply.

iv) No later than at registration, NACs shall advise the Organiser of the names of those pilots competing in Programmes 1 to 4 who should also be considered for entry into Programme 5.

v) In addition to those pilots notified above, each NAC may nominate one additional pilot to compete in Programme 5 only. Any pilot thus nominated must have gained a medal in a previous FAI First Category Unlimited Power Aerobatic contest in the previous five (5) years. The deadlines for notification of entry and fee payment for this additional pilot, plus the amount of the entry fee, will be as for the others, but the pilot will not be required to arrive at the contest site until, at latest, the day before Programme 5 is scheduled to be flown. No training flights will be allowed for Programme 5 after the contest has started.

vi) After the normal entry closing date, the Organiser shall provide the names and countries of these additional pilots to the President of the International Jury. The qualification of these pilots to fly this Freestyle programme will be subject to review by the International Jury. If a pilot is rejected, notification will be sent to the relevant NAC at least two (2) weeks before the start of the Championships.

b) "A" and “I”

i) NACs shall notify the Organiser of a World Championships, not less than two (2) months before it is due to start, of the number of competing pilots to be entered from their NAC up to a maximum of eight (8). The Organiser shall have the right, without reference to CIVA, to reduce this maximum number of pilots of each nation from

eight 8) to six (6) competitors. In this event the Organiser shall at once notify NACs accordingly.

ii) Solo entries are allowed from NACs.

iii) In the event that fewer than four (4) teams comprised of three (3) or more pilots compete, the number of pilots required to constitute a team will be reduced to two (2). The requirements of paragraph 1.2.5.2 still apply.

c) The team of each NAC may include the following officials: one (1) chief delegate, one (1) team manager, one (1) chief trainer, trainers, doctors, interpreters, mechanics etc.

d) Every competitor must be a member of his or her NAC and must be in possession of a valid FAI Sporting Licence.

e) Every official must be a member of his or her NAC.

f) The admission of observers depends on the facilities available and is subject to agreement with the organising NAC.

1.2.6.2. Continental Championships

The composition of teams and the number of members of a team will be fixed by the organising NAC.

a) "U"

For Continental Championships, the number of competitors of each NAC shall be no more than twelve (12).

b) “A” and “I”

For Continental Championships, the number of competitors of each NAC shall be no more than eight (8).

c) Every competitor must be a member of his or her NAC and must be in possession of a valid FAI Sporting Licence.

d) Every official must be a member of his or her NAC.

1.2.6.3. Non-NAC Entries

a) The Organiser is also obliged to accept entries from competitors in possession of a valid FAI Sporting Licence issued by FAI, as described in paragraph 3.3.2. of Sporting Code, General Section.

1.2.6.4. Hors-Concours Entries

a) At its discretion, the Organiser may accept further entries submitted by NACs for pilots subject to eligibility restrictions (see 1.2.4). These entrants will be classified as “*Hors Concours (H/C)*”. They will pay normal entry fees, be subject to the normal entry deadlines for the contest and be treated as other competitors. In the event of time constraints, however, they can expect to be shifted in the order of flight or deleted from the flight programmes altogether at the discretion of the International Jury. H/C pilots’ results will be located in all listings as their score dictates but with the rank not awarded. They will not appear in the final results submitted to FAI and will not be ranked or eligible for any awards or medals.

b) H/C pilots shall possess a current FAI Sporting Licence.

1.2.6.5. Replacements of competitors at Championships will be left to the discretion of the International Jury, but no such replacement will in any case be permitted less than 12 hours before the commencement of the first competition flight.

1.2.7. Aircraft Documentation

1.2.7.1. A valid aerobatic certificate of airworthiness or equivalent document issued by the competent aviation authority of the aircraft's state of registration must be produced to the Organiser for every contest aircraft.

1.2.7.2. Aircraft will not be admitted to the contest unless the appropriate documentation has been submitted to the Organiser.

1.2.8. Air Safety

1.2.8.1. All competitors must observe and adhere to the regulations currently in force in the Organiser's country for air safety as well as the special regulations in force at the contest aerodrome, starting from the arrival at the championship site of the competitor to his/her departure after the championship, including but not limited to training and official training flights. To facilitate this, the Organiser must ensure that an English translation of applicable rules, issued by the Aviation or Customs Authorities of the host country, is available in advance in an event bulletin or on the competition website, and that the relevant safety organisation and systems are in place to enable compliance. Team managers and team coaches make sure that all competitors are briefed on safety in general and on the specific regulations mentioned in this paragraph.

1.2.8.2. Any violation of the safety regulations in force may at any time render the offender liable to exclusion from the contest. No responsibility will be undertaken by the Organiser for any such violation by competitors or others.

1.2.8.3. To enable the pilot to watch over his or her own safety, an accelerometer must be installed in each competing aircraft.

1.2.8.4. The Chief Judge may exclude a pilot who is not flying safely or whose flying might reasonably be judged to be the imminent cause of an unsafe situation.

1.2.9. Insurance

1.2.9.1. The Organiser will provide a promoter's liability insurance of an adequate sum against third party risks for the duration of the contest covering functional test flights, training and competition flights, in accordance with the legal requirements of the country in which the championships or competition is held.

1.2.9.2. All competitors must produce evidence of adequate third-party insurance valid for the duration of the contest and valid in the Organiser's country. The Organiser should specify in local regulations the amount of insurance cover regarded as adequate.

1.2.10. Internal Communications

1.2.10.1. The Organiser of World and Continental Championships must establish an efficient radio communication between the contest officials (Contest Director, Chief Judge, Flight Director, Chairman of the Technical Commission, and International Jury) and supervise the running of the contest and the contest rules.

1.2.10.2. Reliability of radio communication between the contest officials is a safety-critical requirement requiring a professional standard of equipment. Domestic walkie-talkie models are not adequate for this duty.

1.3. Contest Bodies

1.3.1. The International Jury

1.3.1.1. Responsibilities of the International Jury

The International Jury is the supreme arbitration body of international aerobatic events. The activities of the International Jury will be organised systematically by the President of the International Jury from the opening of the contest. The President of the International Jury should allot duties to each of the members of the jury every day. Those duties include:

a) Interpreting the general rules, the judging rules and the general regulations of the contests.

b) Meetings:

i) Attending the meetings of the International Board of Judges (dealing with familiarisation, evaluation, checking the marking sheets).

ii) If required, holding daily evaluation meetings (after the daily contest programme has been completed).

iii) Final meeting of the International Jury. Evaluation of the activities of the International Jury and of the development of the contest and a preliminary assessment of the experience gained during the contest.

c) Supervision:

i) Selecting two (2) Warm-Up pilots several months prior to the event, based on applications to be sent by NACs to the President of the International Jury before a deadline to be announced for each event.

ii) Providing the CIVA “Declaration of Ethical Behaviour” sheet to the Chief Judge, who will sign it and require all other members of the Board of Judges to enter their name, signature and date to warrant their compliance with the requirements of this declaration before competition flights commence. The International Jury will retain this signed sheet among their official records for the event.

iii) Supervising the activities of the Chief Judge and the Board of Judges. This is to include preparation of the judging analysis for all judges. During judging, members of the International Jury must not remain in the vicinity of the International Judges.

iv) Checking the operation of the electronic positioning device (if in use) and supervising the official recording boundary infringements.

v) Overseeing the administration of the contest and ensuring that the Organiser of international contests meets the requirements as stipulated in the checklist provided to the Organiser for such events.

vi) Supervising the briefings and the drawing of lots.

vii) Supervising the activities of the Scoring Office.

viii) Supervising the activities of the meteorological centre.

ix) Supervising the activities of the Technical Commission.

x) Checking the publication of contest results; making visits to the pilots' camp to gather or give information.

xi) Checking the availability and accuracy of medals and trophies at the beginning of the competition.

xii) Controlling the Unknown Programmes in accordance with Sporting Code; including supervision, composition, and explanation, as appropriate.

d) Mediation:

i) Dealing with protests from competitors: discussion of protests, if necessary, in cooperation with the Chief Judge, the Flight Director, the Chairman of the Technical Commission, and the Contest Director. Taking down on record the proceedings in meetings or activities where decisions are sought (e.g. a note of comments, resolutions, etc). The International Jury will publish the results of all protests and decisions. The meetings of the International Jury must not impede the progress of the contest.

ii) Explanatory discussions with chief delegates and team managers to explain measures taken by the Jury; interpretation of the Sporting Code of the FAI and all regulations. This should be done after completion of the daily competition programme or before the beginning of competition flying (i.e. in any case without impeding the progress of the contest).

1.3.1.2. Organiser's Responsibility

a) The Organiser of international aerobatic events must provide the necessary material and technical conditions, and the required number of staff, in order to enable the International Jury to carry out its functions.

1.3.1.3. Appointment

a) The International Jury at World and Continental Championships will be appointed by the FAI Aerobatics Commission (CIVA) and will consist of a President, who will supervise its activities, and at least two (2) members with adequate reserves, who must be members of different NACs. The Chief Judge shall be an advisory member of the International Jury, and the Contest Director shall be adviser to it. Only members of the CIVA Bureau, Delegates and Alternate Delegates to CIVA, and persons selected by the CIVA Bureau for this purpose, are eligible to serve as Jury President.

b) At World and Continental Championships, three (3) members of the International Jury must be physically present on site for the whole event duration (from General Briefing to Award Ceremony).

1.3.1.4. Three (3) members of the International Jury must be available to hear appeals or protests submitted by competitors.

1.3.1.5. Any decision taken by the International Jury by majority vote is final.

1.3.1.6. The International Jury may temporarily vary any rules approved by the International Aerobatics Commission (CIVA) during a contest under the following circumstances:

a) There is an absolute majority within the International Jury, when conducting a vote to introduce a temporary variation to the regulations, and

b) There is a two-thirds majority amongst the participating teams' Chief Delegates, when conducting a vote to introduce a temporary variation to the regulations.

1.3.1.7. In the event that the rules of the Sporting Code are not adhered to at a World Championship, or if the International Jury is not provided with sufficient information to perform their duties in

accordance with the rules, the International Jury may stop the contest until matters are remedied.

a) If remedial action is not taken, the International Jury has the power to declare that the requirements of a World Championship have not been fulfilled in accordance with the rules. If this latter action is taken, the International Jury shall prepare a full report for submission to the next meeting of CIVA at which their decision shall either be endorsed or reversed.

1.3.2. Board of Judges

Judging during World and Continental Aerobatic Championships will be carried out by an International Board of Judges in compliance with the following rules.

1.3.2.1. Composition of the Board of Judges

At World and Continental Championships, the Board of Judges will be composed of:

a) The Chief Judge,

b) Two (2) or more Assistants to the Chief Judge to be chosen by the Chief Judge to provide the administrative services described in 4.1.1.2.,

c) International Judges (each with an assistant) for marking the quality of aerobatic manoeuvres and positioning:

i) For Unlimited and Advanced categories: a minimum of seven (7) and a maximum of ten (10) International Judges.

ii) For Intermediate categories: a minimum of five (5) and a maximum of seven (7) International Judges.

d) If applicable, Officials for operating the electronic tracking system and for recording the infringements of the prescribed performance zone (see 4.2).

1.3.2.2. The Chief Judge

a) For World and Continental Championships, the Chief Judge will be selected and appointed by CIVA. He/she may not be a citizen of the Organiser's country (exceptions to this must first have been accepted by CIVA).

b) The Chief Judge must be an International Judge listed in the FAI official record and must have previous experience of serving as Chief Judge at an international aerobatic event (or a major national competition) run under FAI rules.

1.3.2.3. Representation on the Board of Judges

a) At World and Continental Championships, judges will be invited to apply for selection, irrespective of their nationality, based on their previous RI performance data as recorded in the CIVA Judges Performance Database (JPD). New judge applications for those without International RI performance data can be made by NACs or individuals but must be accompanied by current RI data produced by the FPS scoring system at a National Competition (not necessarily in their own country). These applications must be made by the deadline published by CIVA in the year in which the Championships are to be held.

b) Judges are subsequently selected in accordance with procedures established by CIVA. The selection process includes a ranking of judges by the RIs in the JPD from past Championships.

c) The number of nations represented in the judging panel shall be at least that of the minimum panel size (i.e. at least seven (7) nations in Unlimited/Advanced and at least five (5) nations in Intermediate). When the panel exceeds the minimum size, a maximum of two (2) judges per NAC may be appointed.

d) The contest Organiser shall provide accommodation, food and local transport for the judges and their assistants, with no entry fees, when a full panel is supported by CIVA and the Organiser. The Organiser shall take into consideration the travel schedules of judges and officials when making allowance for their hotel accommodation, ensuring that their arrival is in time to attend the compulsory judges briefing. The Organiser must allow for an additional night's hotel accommodation if needed.

e) If the Organiser's bid supports less than the maximum, then judges and assistants not included in the minimum panel selected by CIVA may individually or through their NAC offer to self-fund, in which case the Organiser – pending approval by the Judging Committee – shall accept them at a preferential rate determined to cover only the same accommodation, food and transportation costs as those for the judges selected for the minimum panel.

f) Final selection will be ratified by the Bureau of CIVA.

g) If any judge(s) are not available and cannot complete their functions and the minimum number of judges are not present, the International Jury will use its discretion in filling the available slot(s).

1.3.2.4. Qualification of Judges

a) All International Judges selected for the Championships must have been approved by the FAI Aerobatics Commission (CIVA) of FAI and listed in the FAI official document to that effect. A judge may not be deleted from the International Judges list who has valid and acceptable JPD data listed in the previous five (5) years. Should a Judge, who has existing acceptable JPD or who is new applicant, not be supported by their NAC, he/she will be listed in the International Judges List, in an International Section. Their Nationality will be shown in brackets after their name.

b) To be a current FAI judge at FAI aerobatic championships, an FAI International Judge must additionally fulfil the following currency requirements:

i) In the year in which the championship is held or during the previous calendar year, the judge must have either judged at a national or international aerobatic championship.

ii) Before the championship is held, all judges and assistants must also attend and satisfactorily complete a judging review session presented by the Chief Judge.

iii) The Chief Judge will ensure that the judge is in possession of current regulations with appropriate translation if necessary.

c) All Judges who wish to be represented on the Board of Judges must have a qualified Assistant, who must also be approved by the Judging Committee and verified by the CIVA Bureau. Any changes in Assistant will require approval prior to the commencement of a contest or a programme by either the Judging Committee or the International Jury as appropriate. Without such approval the Judge will be excluded.

1.3.2.5. Timekeepers and Evaluators

a) The Chief Judge and his assistant will record the timing of flights. Ideally an evaluator checking paperwork will be appointed.

1.3.2.6. Position of Judges

a) The judges (under 1.3.2.1.c) will be posted by the Chief Judge at positions appropriate for observing the competitors, the positions of the judges being at least fifteen (15) m apart.

b) The distance of the positions of the judges from the box edge will be a minimum of 150 m and a maximum of 250 m. The average distance of the board of judges from the adjacent box edge for all planned positions will be published by the Organiser in an event bulletin or on the contest website shortly after those positions are defined.

1.3.2.7. Role of Judges

a) The International Judges appointed for marking the quality of the manoeuvres will mark the manoeuvres and infringements of the lower and upper height limits, interruptions and insertions in compliance with the judging rules (see 4.1, 4.1.7 and 4.4).

1.3.2.8. Judges' Assistants

a) The assistant(s) has (have) the following tasks:

i) Telling the judge prior to the performance the sequence of the figures, details of the various figures, and any other special features.

ii) Recording the mark given by the judge for each figure and writing down into the marking sheet any remarks concerning the rating. Any amendment of record must be signed by the judge.

iii) Giving general assistance.

1.3.3. Contest Management

1.3.3.1. The Contest Director will be responsible for the regular and orderly performance of the contest. The Contest Director is responsible to the International Jury for the efficient administration of the contest.

1.3.3.2. The contest management will be composed of:

a) The Contest Director,

b) The Flight Director,

c) The Chief Judge,

d) The Chairman of the Technical Commission.

1.3.3.3. While the Chief Judge is appointed by a CIVA election process, the individuals nominated to fill the other three roles must be approved by CIVA.

1.3.4. Technical Commission

1.3.4.1. The Organiser shall appoint a suitably experienced Licensed Aircraft Engineer to be the Head of the Technical Commission. Up to two (2) other members of the commission will be selected by the International Jury from suitably qualified technicians attending the event as official team members.

1.3.4.2. The Technical Commission is responsible to the International Jury for the inspection of competing aircraft and of aircraft documentation; for certifying compliance with the airworthiness regulations of aircraft after inspection; for a qualified and objective inspection in case of defects of the technical equipment; and for finding the causes of defects which have occurred during the competition flights. The Technical Commission will advise and inform the International Jury on any points of technical importance.

1.4. Administrative Arrangements

1.4.1. Entries

1.4.1.1. Entries (including for H/C pilots) may be submitted by NACs authorized representatives only, with the exception of FAI applicants from countries without a NAC.

1.4.1.2. The official entry forms must be completed correctly and submitted to the organising NAC not later than requested by the Organiser.

1.4.1.3. Every NAC must be notified of the address of the organising NAC not later than six (6) months for World and Continental Championships, or three (3) months for Intermediate competitions, prior to the beginning of the event (see 1.2.1.1, 1.2.1.2 or 1.2.1.3).

1.4.2. Entry Fees

1.4.2.1. Every NAC sending a team or solo pilot or officials to World or Continental Championships must pay an entry fee for each member of the official team, solo competitors and officials to the organising NAC. Judges and Warm-up pilots are exempt from entry fees.

1.4.2.2. Entry fees will be fixed by CIVA on agreement with the Organiser.

1.4.2.3. The Organiser will notify NACs of the date of payment and of the receiving agency.

1.4.2.4. Entry fees will be refunded if the Championships do not take place.

1.4.3. Practice

1.4.3.1. The Organiser shall ensure that in the seven days prior to the event, all teams/pilots are given fair and free access to practice on the contest site (depending on site availability) – i.e. no preferential treatment / discrimination shall take place, and in this period no additional fees for use of the airfield or hangars shall be charged. To be considered, teams wishing to practice on the competition site shall give notice to the Organiser by a deadline to be announced in the event bulletins.

1.4.4. Accommodation, Food, Medical Services

1.4.4.1. The Organiser will provide adequate accommodation and food for the duration of the event (from dinner on the day of the General Briefing as per 1.4.9.2, to breakfast on the day after the awards ceremony) to all members of official teams, solo competitors, officials and other assistants for whom entry fees have been paid, on the understanding that no extra charges will be imposed for these services. In addition, airfield charges will be covered for those persons for whom entry fees have been paid.

1.4.4.2. The Organiser may also choose to exclude the costs for accommodation and food from the entry fees. In any event, they will give assistance with room reservation and will ensure that adequate food supply will be available at or near the airfield.

1.4.4.3. The Organiser will be responsible for adequate medical services being available to all official participants.

1.4.5. Fuel and Oil

1.4.5.1. Aircraft fuel and oil will be provided by the Organiser for functional test flights and contest flights without imposing extra charge.

1.4.6. Technical Services

1.4.6.1. The Organiser will provide technical assistance and hangarage for competing aircraft, if required.

1.4.7. Interpreters

1.4.7.1. Interpreters, working with the International Jury and the Board of Judges, will be provided by the Organiser, if necessary.

1.4.8. Warm-Up Pilots

1.4.8.1. The International Jury shall be responsible for selecting, several months prior to the event, at least two (2) in U or A, or at least one (1) in I, suitably qualified, non-competing Warm-Up pilots whose sole duty throughout the duration of the event will be to carry out Box Demarcation and/or Demonstration Sequence Flights as specified in this document or required by the Chief Judge or the International Jury.

1.4.8.2. The International Jury shall ensure that experience and capabilities of pilots selected for this duty match the demands of the task. Thus, a suitable Warm-Up pilot must have appropriate and current aerobatic experience in the category specified, be able to provide or secure the use of a suitable aeroplane which he/she is qualified and eligible to fly, and be ready and available to fly at any time throughout the duration of the event. The International Jury will only consider applications fulfilling those requirements.

1.4.8.3. Applications may carry options on final name to cater for cases where national team members are selected late. In such case the application shall mention all names of potential applicants, and all pilots in the application shall fulfil the requirements in paragraph 1.4.8.2 above, otherwise the whole application will be rejected.

1.4.8.4. The type of aeroplane to be flown by each Warm-Up pilot should be those in typical use at the event, able to perform in skilled hands at the highest level. If possible, it is useful to have two (2) significantly different aeroplane types for Warm-Up duties at a championship, to demonstrate to the Panel of Judges the different characteristics of each in tackling demonstration sequences.

1.4.8.5. Provided that pilot qualification and suitability are compliant to requirements in paragraph 1.4.8.2 above, at least one (1) of the two Warm-Up pilots will be selected in priority, by the International Jury, from applications from the organising NAC.

1.4.8.6. In case of unanticipated unavailability of a selected Warm-Up pilot, the International Jury has full flexibility to select a substitute in the best interest of CIVA.

1.4.9. General Briefing and Judging Meetings

1.4.9.1. Procedures for competitors to enter the Performance Zone must pass a safety review by the International Jury.

1.4.9.2. In the evening prior to the first day of competition flights, there will be a briefing by the Organiser for Chief Delegates or Team Managers, members of the International Jury and Judges, on flight conditions, the contest programmes, and any other problems which might arise over the interpretation of the rules. This General Briefing will take place concurrently with the drawing of lots described in 3.2.

1.4.9.3. For familiarisation with and a standardised interpretation of the judging rules the Chief Judge will hold one (1) or more seminars with the Judges – at least one (1) of which with Team Managers or other team representatives present. The Chief Judge will give guidance to the Judges as to the current Judging Criteria and rules for judging, on which he should conduct `question and answer' sessions, and will carry out at least one judging test for which a non-competing pilot shall be available. Throughout the duration of the contest the Chief Judge will hold routine evaluation meetings with the Judges.

1.5. Final Regulations

1.5.1. Interpretation

1.5.1.1. International aerobatic events will be carried out in compliance with Sporting Code and local regulations of the Organiser.

1.5.1.2. Any differences arising during an event will be dealt with by reference to the above rules. For the interpretation of the text at championships, a standard version written in one of the official FAI languages (English, French, Russian, Spanish) shall be taken as the authority. CIVA will select one of the FAI languages as the basis for interpretation.

1.5.2. Competitors' Pledge

1.5.2.1. All competitors undertake, by signing the entry form, to comply with the General Section and Section 6 of the Sporting Code of the FAI and any local regulations made under rule 1.5.3.1.

1.5.3. Supplementary Rules

1.5.3.1. The Organiser will, within the scope of the Sporting Code and the approval by CIVA, prepare such local regulations or specialized details as are relevant and necessary for clarification of organisational problems and duly distribute them to all FAI NACs (see 1.2.1.1, 1.2.1.2, 1.2.1.3 and 1.2.8.1).

1.5.3.2. The technical and organisational preparations of World or Continental Championships will be checked by CIVA regarding their compliance with the general rules before the beginning of the event.

a) The Organiser shall publish in the agreed FAI language(s) and send to the NACs which have indicated a preliminary intention to participate, not less than six (6) months prior to the World or Continental Championships:

i) The local regulations containing only local operating procedures and administrative details including details of the aerodrome at which the Championships will be held.

ii) An English translation of applicable rules, issued by the Aviation or Customs Authorities of the host country.

1.5.3.3. Should the Organiser wish to request a waiver on any of the applicable rules in this document (FAI Sporting Code Section 6, Part 1) before the opening of the Championships, they shall submit a waiver application to the CIVA Bureau with sufficient notice. The CIVA Bureau will then decide to grant or dismiss the waiver based on the submitted elements. Only an explicit positive answer from the CIVA Bureau will determine a waiver has been granted. In such case any waived rule shall be announced in the event bulletin and sent without delay to the NACs which have indicated an intention to participate.

2. PROGRAMMES OF WORLD AND CONTINENTAL CHAMPIONSHIPS

2.1. Flight Programmes Schedule

At World and Continental Championships, the following competition flights will be scheduled:

2.1.1. Flight Programmes list

Programme 1: The Free Known Programme
Programme 2: The First Free Unknown Programme
Programme 3: The Second Free Unknown Programme
Programme 4: The Third Free Unknown Programme
Programme 5: The Final Freestyle Programme (Unlimited only)

2.1.2. General regulations on flight programmes schedule

2.1.2.1. After the Free Known Programme (Programme 1), no pilot shall continue in the competition unless the pilot is, in the judgement of the International Jury and Board of Judges, capable of safely flying the remaining programmes. Any pilot disqualified under this rule will be so informed by the International Jury before the start of Programme 2.

2.1.2.2. For Programme 4, if there may be insufficient time to complete the championships due to weather problems or unforeseen circumstances, the International Jury is authorised to introduce a cut of the competitors. In this case the number of competitors qualified for Programme 4 shall be at least 50% of the total number of competitors still in the running, based on the combined standings before Programme 4. If, subsequently, time is available for more flights, the International Jury may add competitors from the cut group to Programme 4 in the order of their ranking from the combined results before Programme 4, highest first. All flights made in Programme 4 through this mechanism will be considered valid in the final results for the contest.

2.1.2.3. The decision on the number of competitors who will fly the Final Freestyle Programme will be made by the International Jury in consultation with the Organiser, but will be not less than ten (10) pilots, nor, usually, more than twenty (20). Priority in selection will be given to those pilots entered by NACs for this programme only. The Jury shall then select at least nine (9) pilots, in their order of ranking in the programmes so far completed. In this part of the selection process, no more than three (3) pilots will be selected from any one NAC.

2.1.2.4. In Unlimited, Programme 5 shall have priority over Programme 4. Thus, if weather forecasts indicate that all programmes may not be completed before the end of the contest period, the Organiser, in consultation with the International Jury, shall direct that Programme 5 be flown before Programme 4.

2.2. Programme 1 – The Free Known Programme

2.2.1.1. Sequences for the Free Known Programme will be composed of figures or combinations of figures (a combination being taken as one figure) selected from the Aresti System (Condensed) as follows:

a) Five (5) figures from a Known ‘master set’ selected at the CIVA plenary each year for each category, used in any order and at any position in the sequence with their start direction into-wind, down-wind or cross-wind in either direction as desired, with their design unchanged;

b) Plus five (5) Free figures that each competitor must add, in order to design a sequence of ten (10) figures that satisfies regulations below.

2.2.1.2. The selected Known 'master set' 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.

2.2.1.3. The selected Known 'master set' must be such as to enable design of sequences that satisfy the non-repetition requirement in 2.2.1.7 and versatility requirements in 2.2.1.8.

2.2.1.4. The total difficulty coefficient of all figures of Free Known sequences shall not exceed the limits given in the table below.

	Known set Minimum Total K	Known set Maximum Total K	Sequence Maximum Total K
Unlimited	225	245	450
Advanced	160	175	320
Intermediate	100	110	200

2.2.1.5. The start and finish of Programme 1 must be carried out in normal or inverted level flight. Competitors may begin and finish their programme at any height between the upper and lower limits given in Rule 3.8.1.1.

2.2.1.6. 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 Aresti System (Condensed) as currently amended by CIVA. The numbers and coefficients in the Aresti System (Condensed) will be taken as definitive.

2.2.1.7. In a given sequence, a catalogue reference number may be used only once.

2.2.1.8. Versatility

In order to achieve versatility in the design of Programme 1, it is a mandatory requirement that sequences include the following figures. Sequences not including these figures will not be accepted:

<table>
<tr><th>Family</th><th>Intermediate</th><th>Advanced</th><th>Unlimited</th></tr>
<tr><td>1</td><td>Not Required</td><td colspan="2">At least one figure</td></tr>
<tr><td>2</td><td colspan="2">At least one from either 2.1.2 to 2.1.3, or 2.2.2 to 2.2.7, or 2.3.2 to 2.3.6, or 2.4.2 to 2.4.8</td><td>At least one from either 2.2.3 to 2.2.7, or 2.3.2 to 2.3.6, or 2.4.2 to 2.4.8</td></tr>
<tr><td>5</td><td colspan="3">At least one figure</td></tr>
<tr><td>6</td><td colspan="2">Not required</td><td>At least one figure</td></tr>
<tr><td>7</td><td colspan="3">At least one figure</td></tr>
<tr><td>8</td><td colspan="3">At least one figure</td></tr>
<tr><td>9.1 to 9.8</td><td colspan="2">At least one from each sub-family</td><td>Not specified</td></tr>
<tr><td>9.9 & 9.10</td><td>At least one</td><td>At least two, no sub-family specified</td><td>At least two from each sub-family</td></tr>
<tr><td>9.11 & 9.12</td><td colspan="3">At least one figure from either</td></tr>
<tr><td>Opposite Rolls</td><td colspan="3">At least one instance with elements from Families 9.1 to 9.10</td></tr>
</table>

2.2.1.9. Sequence Submission

a) As directed in the event bulletin or at the latest by the time of registration on site, each competitor must submit a computer file for the programme to the Contest Director, for verification of compliance with the relevant Rules. Hard copies alone, or hand drawings will not be accepted. The computer file must contain completed pages for the five Forms described below, in a format declared acceptable by the Bureau of CIVA[1]. It is the competitor's responsibility to ensure the software used has been updated to comply with the Aresti System (Condensed) and Section 6, Part 1, regulations as currently amended by CIVA. If any pilot submits their Free Known sequence after the registration deadline, they will not be allowed to take part in Programme 1.

b) Form 'A' will show all symbols, catalogue reference numbers and difficulty coefficients.

c) Form 'B' will show the continuous sequence of the programme as it would be flown with the wind blowing from right to left, plus a table listing the Figure Numbers, their Catalogue Numbers and coefficients. Form B will also show identification of the five (5) compulsory Known figures with the same designation (A-E) as in the official 'master set'.

d) Form 'C' will show the continuous sequence of the programme as it would be flown with the wind blowing from left to right.

e) Form 'R' will combine in one page Forms A and B.

f) Form 'L' will combine in one page Forms A and C.

g) Forms B, C, R and L must carry the correct symbol for the wind direction.

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

2.2.1.10. Checking

a) It shall be the duty of the Contest Officials to check each competitor's sequence validity:

i) correct use of the Known 'master set', non-repetition and versatility requirements;

ii) catalogue reference numbers and difficulty coefficients on Form A (respectively R and L) with respect to the symbols on Forms B and C (respectively R and L), taking the reference numbers in the Aresti System (Condensed) as the basic criteria for deciding compliance with the Rules of this section.

b) The final responsibility for the correctness and compatibility of Forms A, B, C, R, L lies with the competitor. Any inaccuracies in the drawing of symbols or in the quoting of coefficients, or the discovery of any cases of repetition of figures, will be referred to the competitor's Team Manager so that the forms may be corrected and resubmitted.

c) The Contest Officials referred to in this rule are those of the Organiser.

[1] Currently the only format declared acceptable by the Bureau of CIVA is .seq from OpenAero.

d) In order to avoid possible alteration and resubmission of forms during the contest, NACs may, if they wish, submit their computer files to the Organiser for checking not more than one (1) month before the beginning of the contest.

e) The Organiser shall ensure that Forms A, B, C, R and L are signed by each competitor at time of registration. The Organiser will provide hard copies to each competitor for signature, and those signed hard copies will be the ones used by the Organiser for reproduction according to 2.2.1.13.

2.2.1.11. Should a competitor disagree with a decision of the Contest Officials concerning his or her Programme 1, a complaint may be put to the International Jury before flying commences in Programme 1. The approved programmes of all competitors will be published before the start of Programme 1, in sufficient time for complaints and protests to be made. Once the flying of Programme 1 has started, no complaints of any kind will be accepted by the International Jury on any aspect of the composition of a competitor's programme.

2.2.1.12. Each judge will communicate to the Chief Judge which of both Form types (A/B/C or R/L) he/she wants to use. The Chief Judge shall then give the consolidated Form type list to the Organiser for sorting out the judging line paperwork. This requirement is valid for all Programmes where such Forms are used.

2.2.1.13. The Organiser will be responsible for reproducing a sufficient number of copies of competitors' programmes to meet the requirements of the contest. One (1) set of copies of Programme 1 (Forms B and C only) shall be provided to each Team (and to each Judge, see 4.1.2.4) prior to the start of this programme. The relevant set (A/B/C or R/L) shall be delivered to each judge for scoring operations according to 2.2.1.12.

2.2.1.14. The Organiser will be responsible for ensuring that the names of the competitors will not appear on Forms A, B and C (respectively R and L) that are given to the judges.

2.2.1.15. Notwithstanding paragraph 2.2.1.10.b), the judges shall only take into account what is actually shown on the relevant Form B or Form C (respectively Form R or L), depending on the official wind direction. The figures drawn on this Form, their orientation with reference to wind and box axes, shall be definitive. Corrections may be made to Forms B, C, R, L, via the Contest Organisation, and presented to the Chief Judge at any time prior to the flight commencing.

2.3. Programmes 2, 3 & 4 - The Free Unknown Programmes

2.3.1.1. For the Free Unknown Programmes, figures will be chosen from Appendix A. A maximum of ten (10) figures may be submitted. A representative of every NAC which has at least one (1) pilot competing (except as *Hors Concours*) may submit one (1) figure, unless there are more than ten (10) NACs participating. In this case, the procedure to determine which NACs will submit figures will be as in paragraph 2.3.1.2. Repetition of any manoeuvre with the same catalogue number is not allowed within any one programme. Repetition of a complete figure from Programme 2 is not allowed in Programme 3, and repetition of a complete figure from Programmes 2 and 3 is not allowed in Programme 4. The intent of this regulation is that sequences for Programmes 2, 3 and 4 will be different.

Category	Programme	Figure Minimum K	Figure Maximum K
Intermediate	2	12	20
	3	12	25
	4	12	30
	2	15	30

Category	Programme	Figure Minimum K	Figure Maximum K
Advanced	3	15	35
	4	15	40
Unlimited	2	22	No limit
	3	22	No limit
	4	22	No limit

2.3.1.2. If there are pilots competing from more than ten (10) NACs, a group of ten (10) such NACs will be selected to nominate figures for each Unknown Programme. This procedure will be applied separately for Programmes 2, 3 and 4. In this rule, in a), b) and c), NACs are meant worldwide, or from the Continent in case of Continental Aerobatic Championships.

a) The first priority to be selected for this group will be those NACs that have at least three (3) pilots.

b) The second priority to be selected for this group will be those NACs that have two (2) pilots.

c) The third priority to be selected for this group will be all other NACs that have one (1) pilot.

d) In the case of Continental Aerobatic Championships, the fourth priority to be selected for this group will be all other NACs from other Continents that have at least one (1) pilot.

e) The International Jury, guided by this system of priorities, shall draw lots as necessary to determine which NACs shall choose figures and in which order.

f) Priority to be in the group does not imply priority in the order of selecting figures.

2.3.1.3. If there are pilots from fewer than ten (10) NACs participating, their representatives will still select only one (1) figure each. The remaining figures will be selected by the International Jury. These figures must cover Families not already represented (if any). Repetition of Catalogue numbers is not allowed throughout the nominated figures.

2.3.1.4. Sequences for Programmes 2, 3 or 4 are to be composed using the ten (10) officially approved figures submitted by the National Teams, and additional figures from the Aresti System (Condensed) as currently amended by CIVA, solely to aid in composition. These additional figures may contain repetitions despite rule 2.3.1.1.

a) In the nomination of figures there will be a limit on the number of figures selected from the following:

<table>
<tr><th>Family</th><th>Intermediate</th><th>Advanced</th><th>Unlimited</th></tr>
<tr><td>1.1.6 – 1.1.11</td><td colspan="2"></td><td>Max. of two from columns 3 and 4</td></tr>
<tr><td>1.2.3, 1.2.4</td><td colspan="2">Max. of one only from columns 3 and 4</td><td></td></tr>
<tr><td>7.8.1 to 7.8.8</td><td>None</td><td>Max. of one</td><td></td></tr>
<tr><td>8.4.1 to 8.4.4, 8.4.15 to 8.4.18, 8.5.1, 8.5.2, 8.6.1, 8.6.2</td><td colspan="2"></td><td>A maximum of two from columns 3 and 4</td></tr>
</table>

Family	Intermediate	Advanced	Unlimited
9.9	Min. 1, Max. 2.	Min. 2, Max. 4.	A maximum of four*
9.10	None		A maximum of four*
			* Total of Families 9.9 and 9.10 not to exceed eight, at least two of which must be vertically climbing
9.11 & 9.12	A maximum of one figure		

b) There will not be more than one (1) flick roll (Family 9.9 or 9.10) per figure, except in Unlimited where two (2) flick rolls per figure will be permitted in up to two (2) figures.

c) At least one (1) additional figure, up to a maximum of four (4), must be included in each sequence. The K-factors for these additional figure(s) shall be modified so that they share equally an aggregate of 24K. (note: Additional figures are referred to as “linking figures” in Appendix A and in the Sporting Code document “International Aerobatic Events: Statistical Method for Processing Scores”, nevertheless they are allowed to be placed anywhere in the sequence, including as first or last figure).

d) Sequences will consist of no more than fourteen (14) figures.

e) In sequence composition, figures may be used starting from one or the other axis. Nevertheless, figures with their entry and exit on the same axis must maintain their construction unchanged, i.e. with the exit flight path in the entry direction or with the direction of flight reversed as originally drawn.

2.3.1.5. The contest Organiser shall provide copies of the list of figures to all competing NACs, and each NAC may submit to the International Jury a maximum of two (2) sequences, composed of these figures, for each Programme. The contest Organiser will determine the deadline for submitting proposed sequences. Computer files must be submitted and must contain complete pages of all five Forms: A, B, C, R and L. Acceptable file formats and responsibility of submitting NACs in terms of up-to-date software are as described in rule 2.2.1.9.a).

2.3.1.6. Publication and Selection of Free Unknown Programmes

a) All proposed sequences received by the deadline must be checked, and corrected, if necessary, by the International Jury.

b) The International Jury shall publish all sequences received from the NACs not later than twenty four (24) hours before the start of the Programme.

c) At least twelve (12) hours before the commencement of each Programme, each competitor will notify the Organiser which of the proposed sequences he/she will fly.

d) Prior to the flight order and paperwork being issued to the judging line, Team Managers or individual competitors as appropriate, shall verify the correctness of the allocation of selected sequence per pilot; this verification shall be recorded by the Organiser.

e) At least one (1) hour before the start of each Programme, the Organiser shall provide each NAC with a list of the Free Unknowns chosen by each competing pilot.

2.3.1.7. Training for the Unknown Programmes is not permitted. Competitors violating this regulation will be disqualified.

2.4. Programme 5 - The Final Freestyle Programme (Unlimited only)

2.4.1.1. Programme 5 will be the last programme flown in the competition (except as provided for in 2.1.2.4). This programme is flown without reference to the Aresti System (Condensed); aerobatic manoeuvring in this programme is entirely at the discretion of the competitor.

2.4.1.2. Depending on the public areas relative to the performance zone, the Organiser – with agreement by the International Jury – must implement a safety deadline, the infringement of which would lead to immediate disqualification from the Final Freestyle Programme. Specific procedures in such case (e.g. radio call from the Chief Judge) will be explained in the briefing for this Programme.

2.4.1.3. The start and finish of Programme 5 may be in normal or inverted flight on a horizontal, ascending or descending path, which must not deviate from the horizontal by more than 45 degrees. Competitors may begin or finish their sequence at any height above the lower limit given in Rule 3.8.1.1.

2.4.1.4. There will be no submission of forms containing the sequence of figures to the Contest Director.

2.4.1.5. Smoke may be used at the option of each individual competitor. In case of failure of the smoke system, the competitor will not be entitled to a reflight.

2.4.1.6. Music may be used at the option of each individual competitor.

a) Competitors may submit an audio track to the organisers, to be played during their performance to the judging panel and over the public address system. This must be provided at least twelve (12) hours before the scheduled flight time in .mp3 or .mp4 format, preferably on a USB memory stick or alternatively by email. The organisers will check the file and certify its acceptance.

b) The default time for starting playback of the audio track will be on the third wing rock at the commencement of the performance. Alternatively, the competitor may instruct the organiser in writing when playback of the audio track should commence, if necessary triggered by a command on the radio from the pilot.

c) The organiser must arrange for the audio track to be transmitted to the pilot during the performance and ensure that the set-up still allows the Chief Judge to cease the music and transmit safety messages at any time.

d) In case the audio track fails to be played to the judges or to the pilot for a reason not attributed to the competitor or his/her team, the competitor will be entitled to a reflight, subject to approval by the International Jury.

2.5. Time Between Programmes

2.5.1.1. No competitor will fly more than one (1) programme per day.

2.5.1.2. Rule 2.5.1.1 above is subject to the International Jury deciding on exceptions in case the Organiser determines that applying this rule would put at risk completion of a valid contest. In such a case, the Organiser must allow sufficient time between programmes such that no competitor shall be required to fly a Free Unknown Programme less than six (6) hours, or a Freestyle Programme less than four (4) hours, after landing from his/her previous programme.

3. OPERATIONS OF WORLD AND CONTINENTAL AEROBATIC CHAMPIONSHIPS

3.1. Daily Briefing

3.1.1.1. Before the beginning of competition flying, on each competition day, a briefing will be held for competitors, officials, judges and the International Jury on organisational matters concerning the competition day, on meteorological conditions, etc. The briefing should last no longer than thirty (30) minutes.

3.2. Sequence of Flights (Drawing of Lots)

3.2.1.1. The sequences of flights for Programmes 1-4 will be determined in the evening prior to the first day of competition flights, concurrently with the General Briefing described in 1.4.9.2.

3.2.1.2. The initial sequence of flights for Programme 1 will be determined by drawing of lots.

a) The Organiser shall, with sufficient notice, submit the set-up of the drawing of lots (items to be drawn, position and clarity of the hidden numbers on items, etc) to the International Jury for approval.

b) Prior to the drawing of lots, the Organiser shall give the approved items ready for the drawing of lots (i.e. with the number on each item, which will not be visible when drawing the lots) to the International Jury, together with any material needed as approved under a) above.

c) The International Jury will then set up the items for the drawing of lots, appropriately shuffled to ensure that there is a random draw.

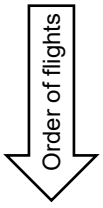
d) Each competitor will draw his or her own lot in front of attendees during the briefing, under supervision of the International Jury. If a competitor is not present to draw his or her own lot, a member of that competitor's team may do so.

3.2.1.3. The sequence of flights for Programme 1 may then be adjusted by the International Jury if two closely drawn pilots are to fly the same aircraft.

3.2.1.4. The adjusted sequence of flights for Programme 1 will then be split into four (4) sections (A, B, C and D) as equally sized as possible. In case the total number of competitors is not a multiple of 4, the section(s) with one more competitor than section D will be section A, then section B, and then section C if necessary.

3.2.1.5. The list of competitors within a given section remains fixed for Programmes 1-4 (except for Programme 4 in case 3.2.1.9 applies).

3.2.1.6. The sequence of sections will follow a varying scheme as follows:



Prog 1	Prog 2	Prog 3	Prog 4
Section A	Section B	Section C	Section D
Section B	Section C	Section D	Section A
Section C	Section D	Section A	Section B
Section D	Section A	Section B	Section C

3.2.1.7. For each Programme (2 to 4), the initial sequence of flights within each section will be subject to a drawing of lots under the same procedure as in 3.2.1.2.

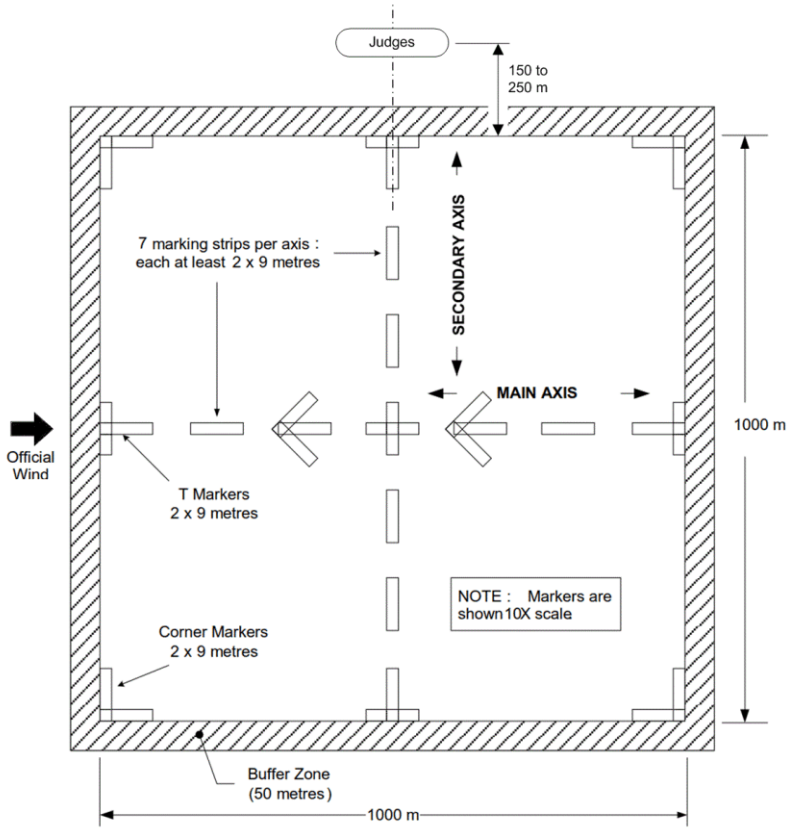
3.2.1.8. The sequence of flights for each Programme (2 to 4) may then be adjusted by the International Jury as for Programme 1 (3.2.1.3), considering the whole sequence regardless of sections.

3.2.1.9. In case a cut is necessary in Programme 4 as per 2.1.2.2, the section concept is maintained, with competitors not making the cut removed from the sequence of flights prior to any application of 3.2.1.8. Changes to the sequence of flights according to 3.2.1.8 are then done as the last step to produce the Programme 4 adjusted sequence of flights.

3.2.1.10. In the course of the contest, the sequence of flights may be altered by the International Jury if special circumstances require. In any case, there must be a minimum of two (2) flights or fifteen (15) minutes between engine shut off and the next start-up on the same aeroplane. If this time period causes a gap in the continuity of flying, the Starter shall inform the Chief Judge accordingly.

3.3. Performance Zone

3.3.1.1. Programmes will be flown with reference to the longitudinal and lateral axes marked on the ground. The performance zone (box) must be a clearly and distinctly marked area of 1000 x 1000 m, the central point of which will be the intersection of the axes, as shown in the diagram. The zone must be located adjacent to a suitable emergency landing area; details of this (as well as the average distance of the board of judges from the adjacent box edge for all planned positions, as per 1.3.2.6.b) will be provided by the Organiser in an event bulletin.



3.3.1.2. The longitudinal (main) and the lateral (secondary) axes shall both be marked by seven (7) contrasting marking strips. Only one axis system must be visible at a time. The size of these markers must be at least 2 x 9 m, 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 and also must be at least 2 x 9 m in size. Two arrows will be placed near the central point of the main axis. They indicate the specified direction of the main axis pointing into the Official Wind. The International Jury will determine any change of the Official Wind Direction (hence main axis) as may be necessary, and ensure that the Organiser amends the orientation of the direction arrows accordingly (see 3.7.1.2).

3.3.1.3. The markers must be visible from any height within the performance zone. The colour of the marking strips must be in distinct contrast to the ground and other airfield markings, which should be removed if possible.

3.3.1.4. Aerial pictures of the box, taken along both axes, must be distributed to the International Jury and competing Teams to determine the correctness of the box geometry and to facilitate familiarization with the physical references.

3.4. Warm-Up Flights

3.4.1.1. The Organiser will ensure that the first two flights (or in I, the first flight) of each competition day and each programme, will be by Warm-Up pilots. The Contest Director, with the concurrence of the Chief Judge, may delete the second Warm-Up flight.

3.4.1.2. Prior to each flight the Warm-Up pilot(s) on duty should seek instruction from either the Chief Judge or a member of the International Jury regarding the demands of the flight itself. This will normally commence with either a full or partial demarcation of the box axes and boundaries at either or both of the minimum and/or the disqualification heights, as specified in 3.4.1.3, followed by normal execution of the typical competition flight of the selected sequence. The Chief Judge may also request some specific deliberate ‘errors’ to be included in the flight, for the purpose of exploring the attention and discrimination of the panel of judges.

3.4.1.3. Box demonstration procedure:

a) Prior to the commencement of contest flying each day, the Chief Judge shall brief and direct one of the Warm-Up pilots (or another, non-competing pilot for that purpose) to demonstrate:

i) the 'low' and 'disqualification' heights around the performance zone (in case there is no precision height measuring device available);

ii) the box boundaries.

b) This demonstration will normally comprise:

i) flight along the four boundary lines, rocking the wing above the corners and the centre points;

ii) flight along the two main axes, rocking the wing above the 'T's and the centre marker.

c) If applicable the Chief Judge should clearly announce to all judges the 'low' or 'disqualification' height being flown.

d) The Chief Judge should draw attention to the appearance of the demonstrating aeroplane with particular reference to:

i) its proximity to the ground, to assist later assessments of low flying (in case there is no precision height measuring device available);

ii) indications of the box boundaries with respect to notable local / surrounding features, to provide a sound basis for assessment of the positioning mark.

3.4.1.4. Each sequence flown by a Warm-Up pilot will normally be immediately followed by a judging line review and conference at which the Chief Judge will assess and discuss the marks and downgrades recorded by each judging team and their reasoning where appropriate. The contest Flight Director should assume that such a review may be expected to take not less than fifteen (15) minutes.

3.4.1.5. The International Jury and the Chief Judge should monitor each Warm-Up flight to ensure that any perceived shortcomings or potential improvements are quickly reviewed, and all pertinent instructions are brought to the attention of the pilot concerned.

3.4.1.6. Though the appointed Warm-Up pilots may be closely associated with National Teams competing at the event, knowledge gained by them during the execution of the Warm-Up flights shall be freely and without favour imparted to any Teams and competitors on request, and thus not restricted nor limited in any way.

3.5. Video/Audio Devices

3.5.1.1. Video cameras may be mounted in/on competition aircraft at the discretion of the pilot.

3.5.1.2. Radio sets are required and must be able to be tuned to the "Safety Frequency". No other communication devices are permitted and will either be removed from the competing aircraft or rendered inoperative and sealed by the Technical Commission.

3.5.1.3. Receiving any kind of information addressed to the competitor from anyone other than the Chief Judge or Air Traffic Control will render the competitor liable to disqualification from the contest.

3.5.1.4. Radios, set to the "Safety Frequency", are only for communication from the Chief Judge to the competing pilot for box control purposes and to serve urgent flight safety matters.

3.5.1.5. Failure of a competitor's radio after arrival at the contest site will not be grounds for disqualification. The contest Organiser will arrange other means for the safe and orderly dispatch of these pilots.

3.5.1.6. The "Safety Frequency" will be selected by the Organiser and given to the competitor together with the competition papers. The "Safety Frequency" will be monitored during all competition flights and possibly recorded.

3.5.1.7. Once each pilot is airborne, he/she is not allowed to enter the Performance Zone before two-way communication is established with the Chief Judge. The Chief Judge will call the competitor on the safety frequency, saying: “Number x, radio check” – or, in case of a Free Unknown Programme, “Number x, radio check and confirm sequence X”. If the pilot does not receive this call, after a reasonable time and visually checking that no other aircraft is flying in the Performance Zone, he/she should call the Chief Judge on the safety frequency and state, “Number x, radio check.” The Chief Judge must respond to this call if he hears it. If two-way communication is not established, the pilot must land immediately. The situation will then be treated as in the case of any other technical defect, in accordance with section 3.11.

3.5.1.8. The standard phraseology in the event that the time limit is exceeded will be the Chief Judge saying “Time, time, time”. The standard phraseology in the event that a break is required for safety reasons will be the Chief Judge saying “Break, break, break”. If the Chief Judge subsequently requires the pilot to land immediately, he shall say "Land, land, land". The Chief Judge or his representative may address the competitor in matters concerned with safety of the competition flight as circumstances may require. A pilot who fails to comply with any of these instructions from the Chief Judge shall be liable to disqualification from that Programme.

3.6. Meteorological Conditions

3.6.1. Daylight

3.6.1.1. Flights will be carried out between the hours of sunrise and sunset at the place of competition.

3.6.2. Minima

3.6.2.1. The minimum height of the cloud base must be 50 m above the maximum height determined for each competition flight. For the Unlimited Final Freestyle Programme, the minimum height of the cloud base must be 800 m.

3.6.2.2. The minimum prevailing flight visibility, determined with reference to ground features from the midpoint of the contest area at the maximum height for the competition flight, must be five (5) km.

3.6.2.3. The maximum permissible average wind speed components are:

Altitude	Direction	Maximum permissible
Surface	Any	12 m/s
	Crosswind (reference runway)	6 m/s
	Tailwind (reference runway)	3 m/s
300 m and 600 m	Headwind (reference box main axis)	12 m/s
	Crosswind (reference box main axis)	8 m/s
	Tailwind (reference box main axis)	3 m/s

3.6.2.4. In case the following conditions are fulfilled:

a) The main axis component of the wind at 300 m or 600 m exceeds twelve (12) m/s, or is close to the twelve (12) m/s limit so that normal flight operations are expected to be significantly disturbed, at the discretion of the International Jury,

b) and there is a distinct risk that the contest cannot be validated under the standard wind main axis component limit rule (see above), at the discretion of the International Jury,

then the International Jury may decide to extend the wind main axis component limit at 300 m and 600 m to fourteen (14) m/sec (with the cross-axis component limit unchanged) with the following conditions:

c) Boundary judging is cancelled for the entire Programme (including for pilots having already flown under standard conditions).

d) A twenty (20)-minute notice is given when changing from the “12 m/sec mode” to the “14 m/sec mode” and vice versa.

3.6.2.5. Competition flight will not take place in precipitation.

3.6.2.6. In all categories, subject to review by the International Jury, the maximum density altitude, measured at the surface for sequences to be flown without a permitted break is 3,000 feet.

3.6.3. Weather Information

3.6.3.1. The Contest Director must provide the competitors, the Chief Judge, the Board of Judges and the International Jury with half-hourly information on weather conditions and, at shorter intervals, on wind speed and direction at 300 m and 600 m height if required due to meteorological developments. In addition, the Contest Director must provide the Official Wind Direction, as determined by the International Jury, to the competitors at the beginning of each contest day and anytime that Official Wind Direction is changed.

3.6.3.2. The wind speed and direction must be measured on the site of the competition, or in the immediate vicinity (less than five (5) nautical miles). The wind speed and direction must be measured either:

a) by a qualified weather station crew using the appropriate tools: radar or balloon ascent.

b) or with a drone, using equipment, operations and software as specified in a separate document approved by the CIVA Bureau.

c) or with an aircraft using a GPS, according to the method described below in 3.6.3.3.

3.6.3.3. Method for measurement of wind speed and direction by airborne GPS:

a) Wind velocity shall be measured at 300 m and 600 m height using the procedure described below.

b) Any GPS device either permanently fixed or hand held may be used, provided it is designed for speeds up to at least 150 km/h.

c) Flight procedure:

i) Choose an airspeed appropriate for the aircraft and the weather conditions. The pilot must be able to maintain a horizontal flight path at this speed.

ii) Fly track true north and maintain the chosen airspeed as accurately as possible. Read and record the groundspeed indicated on the GPS device (Vn). Repeat this procedure for true tracks south, west and east. Record the ground speeds Vs, Vw and Ve for those directions. The easiest way to get these data is to fly a rectangle.

iii) Repeat this procedure for both required heights.

d) Calculation of wind speed and direction: (V = ground speed measured by GPS, W = wind speed)

i) Determination of the north-south wind component: If Wns = 0 then the wind direction is 090° or 270°.

$$Wns = \frac{|Vn - Vs|}{2}$$

ii) Determination of the east-west wind component: If Wew = 0 then the wind direction is 360° or 180°.

$$Wew = \frac{|Ve - Vw|}{2}$$

iii) Total wind speed:

$$W = \sqrt{W^2 ns + W^2 ew}$$

iv) Wind direction: If the wind direction is not one of the cardinal points from i) or ii) the table below should be used.

N/S component	E/W component	Wind Direction WD
Vs > Vn	**Ve > Vw**	$WD = 270° + \arctan\left[\frac{Vns}{Vew}\right]$
Vs > Vn	**Ve < Vw**	$WD = \arctan\left[\frac{Vew}{Vns}\right]$
Vs < Vn	**Ve > Vw**	$WD = 180° + \arctan\left[\frac{Vew}{Vns}\right]$
Vs < Vn	**Ve < Vw**	$WD = 90° + \arctan\left[\frac{Vns}{Vew}\right]$

3.6.3.4. The weather bulletin with information on actual wind speed and direction, along with the Official Wind Direction as determined by the International Jury in accordance with 3.7.1.2, will be published for the competitors' use on a board at the flight line, as well as at a convenient location for all competitors, by the Contest Director. The bulletin must include the time of any change in the Official Wind Direction, wind speed, or direction, as well as the time of the bulletin's publication. The Team Managers are responsible for passing these data on to their teams. Under stable weather conditions adequately meeting the above conditions, half-hourly

information is not required. The International Jury will decide upon the necessity of providing this information.

3.6.4. Adverse Weather

3.6.4.1. If the meteorological conditions do not meet the requirements of 3.6.2, the Chief Judge after consultation with the International Jury will discontinue competition flights. Such decision may be taken:

a) if the information in the bulletin from the aerodrome weather service was obtained in accordance with 3.6.3.2.

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 conditions are judged independently by members of the International Jury, the Chief Judge or the competitors to be outside the prescribed limits.

3.6.4.2. In such cases the members of the International 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.

3.6.4.3. After an interruption for the wind exceeding the limit above, flying shall not be resumed until the wind speed has stabilized at or below the limits for thirty (30) minutes.

3.6.4.4. 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 International 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.

3.6.4.5. If the cloud is at least 850 m above aerodrome level, and if a majority of Chief Delegates agree, the International 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 contest period.

3.6.4.6. If in his or her opinion the weather conditions do not comply with the competition rules, a competitor may discontinue his or her flight before starting the sequence or, during the programme, in level flight at the end of a figure i.e.:

a) If during any programme the horizontal visibility deteriorates to less than five (5) km.

b) If the cloud height in the performance zone is lower than the height in the following table.

Category	Break if lower than:	No flying if lower than:
Unlimited	1050 m	850 m
Advanced	1150 m	850m
Intermediate	1250 m	950 m

c) If precipitation becomes apparent. In this case, members of the International 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 1 to 4.

d) If the wind exceeds the limits specified in 3.6.2: if a competitor during a flight 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 to 4.

e) The marking for the repetition flight for a competitor will be continued from the figure immediately following the break.

f) If a competitor discontinues his or her flight without sufficient reason, no repetition flight will be allowed.

3.6.5. Permitted Breaks

3.6.5.1. The International Jury may allow flights to be made in two (2) parts, during the performance of all Programmes other than the Final Freestyle, if the height of the cloud base is between the heights given in the table at paragraph 3.6.4.6.b) or if the relevant density altitude exceeds that stated in paragraph 3.6.2.6.The competitor is then allowed to adjust his height and location without penalty to commence the second part.

3.6.5.2. The pilot may choose where to take this break without stating so in advance, and such break need not be marked on Forms B or C (respectively R or L). However, second or subsequent breaks will be penalized in accordance with paragraph 4.3.8. When an interruption occurs along the secondary axis, the competitor must resume his or her flight in the same direction of flight.

3.6.5.3. If the cloud base subsequently rises to the higher figure in the table, pilots may no longer interrupt their flight without penalty. Pilots will be advised by the Contest Director (or his staff), with a minimum of a 10-minute warning, following advice to him from the International Jury, when they are to fly with/without interruption should the weather conditions change.

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

3.6.6. Penalised Breaks

3.6.6.1. In the event that a pilot interrupts the sequence after a figure is flown incorrectly, with completion on the wrong heading or in the wrong attitude, the break will always be penalised. Following a penalised break, a subsequent interruption may be considered a permitted break according to paragraph 3.6.5 if it is taken after a correctly flown figure.

3.6.6.2. After a penalized interruption, there is no obligation for the pilot to resume the sequence in a direction determined by the flight before the interruption.

3.7. Conduct of Competition Flights

3.7.1.1. Competition flights will be made separately in the sequence determined according to Rule 3.2. No competitor may fly competition Programmes in another order than listed in 2.1.1.

3.7.1.2. The Official Wind Direction for Programmes 1, 2, 3 and 4 shall be determined by the International Jury. No flight shall be required to commence within a period of thirty (30) minutes after determination or change of the Official Wind Direction is published.

a) The International Jury shall determine the Official Wind Direction taking into account the reported actual wind direction and speed at 300 m and 600 m, and the forecast trend. The Official Wind Direction at the start of each day, and each flight programme, shall be aligned with the performance zone axis closest to the above assessment.

b) The International Jury shall provide the Official Wind Direction to the Chief Judge and Contest Director before the start of each contest day and any time it is determined that the Official Wind Direction must be changed.

3.7.1.3. In the event that the Contest Director, in consultation with the International Jury, determines that the runway direction (QFU) should be changed although the official wind remains unchanged, the Chief Judge, the International Jury, Starter, Radio Operator and the concerned next competing pilots will be informed immediately. The next competitor will be instructed to not enter the runway under any circumstances. Once all airborne championship aircraft have landed and have vacated the runway, and the Chief Judge has given his/her approval, the next competitor may be instructed to take off.

3.7.1.4. There will be, if required, a 30-minute break after every two hours of competition flying for the Board of Judges to have a rest.

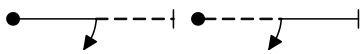
3.8. Height Limitations

3.8.1.1. The following height limitations have been determined for all contest flights:

Category	Upper	Lower	Disqualification
Unlimited	1000 m	100 m	50 m
Advanced	1100 m	200 m	100 m
Intermediate	1200 m	200 m	100 m

3.9. Safety, Warm-Up and Practice Manoeuvres

3.9.1.1. Before the wing-rocking at the start of each competition flight it is mandatory that pilots perform at least two (2) half-rolls with a stop at the inverted position (1.1.1.3 & 9.1.3.2; 1.1.1.4 & 9.1.3.2), plus at least one (1) of the practice figures specified in 3.9.1.4. These figures are flown to check the aircraft's inverted fuel and oil systems are operable, that there are no loose articles in the aircraft and to ensure that the pilot's safety harness is properly secured. In addition, it is recommended that pilots perform the safety manoeuvres specified in 3.9.1.2 and 3.9.1.3, and up to two (2) more practice figures as specified in 3.9.1.4.



a) The pilot may perform any number of these half-roll figures (1.1.1.3 & 9.1.3.2; 1.1.1.4 & 9.1.3.2), separately or continuously, before the wing rocking signalling the start of the competition sequence.

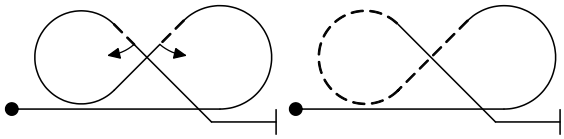
3.9.1.2. As additional safety checks, the pilot may perform push/pull stick inputs (in any order and any number, in erect or inverted flight) to create instant g-load and hence check harness and absence of loose articles in the aircraft.

3.9.1.3. In addition, the pilot may perform any number of turns (erect or inverted, but not rolling turns) as warm up manoeuvres, separately or in continuous turns. These warm-up manoeuvres are flown to help prepare the pilot for the upcoming g-loadings and to help reduce the risk of g-induced Loss of Consciousness (g-LOC).

3.9.1.4. The pilot may perform up to three practice figures. These figures are optional and may be flown in any order. They provide additional preparation for g-loadings and allow the pilot to assess the wind direction and drift in the performance zone. Allowed practice figures are:

a) 2-line stall turns (all figures in family 5.2), without rotations;

b) Humpty bumps starting vertical up (all figures in family 8.4, rows 1 to 4, columns 1 and 2), without rotations;



c) Horizontal 8's as follows: 7.8.4.1 with two half rolls only; 7.8.1.1. without rotations

3.9.1.5. These safety, warm up and practice figures may be flown before the commencement of all the Programmes.

3.9.1.6. All safety, warm up and practice figures must be flown inside the performance zone.

3.9.1.7. Prior to the actual performance of Programme 1, in addition to safety, warm-up and practice figures according to 3.9.1.1 - 3.9.1.4, competitors will be permitted to fly, once, practice figures from their Programme 1 sequence, starting from figure one (1) of their sequence, consecutively up to the first five (5) figures.

3.9.1.8. Violations of safety, warm-up and practice manoeuvres will be penalized in accordance with paragraph 4.3.2.

3.10. Duration of Flight and Signalling Start and Finish

3.10.1. Time Limits

3.10.1.1. Programmes 1 to 4 will have a time limit of twelve (12) minutes in all categories from the moment the aircraft is cleared to enter the box by the Chief Judge / timers.

3.10.1.2. When the time limit is reached the Chief Judge will clearly inform the pilot by means of the radio.

3.10.1.3. In the event that a pilot takes a permitted weather break, the timing will be stopped on the third wing rock at the start of the break and re-started on the third wing rock signalling the beginning of the second part of the broken sequence.

3.10.1.4. In Programme 5 ("U" only) there is a time window of between 3 minutes 30 seconds and four (4) minutes in which to complete the programme, without penalty, after signalling the start of the sequence.

3.10.1.5. The Chief Judge shall indicate by call or signal the time during which the Judges must watch and mark a programme.

3.10.1.6. If for some reason a general recall is necessary, this will be indicated to competitors and Judges by a red pyrotechnic. A recall is, except in dangerous situations, allowed only up to the beginning of a programme.

3.10.2. Signalling

3.10.2.1. A competitor must signal the start and finish of each programme, and any interruption, by distinctly rocking the wing three (3) times by more than 45 degrees. For timing purposes, the programme is deemed to start on the return of the wings to level after the third wing rock; and is deemed to finish on their return to level after the third of the final wing rocks.

3.10.2.2. The aircraft may start and/or finish the wing rocks either inside or outside the aerobatic zone. They may be in normal or inverted flight, on any flight path angle. The flight path angle may change between the wing rocks. The return of wings to 'level' therefore does not necessarily refer to the aircraft being 'in level flight'.

3.10.2.3. If the first figure in a programme or the first figure after an interruption begins in inverted flight, the authorized starting procedure is either:

a) a half roll prior to the first wing rock, and all wing rocks performed in inverted flight;

b) a vertical line established from flight in a direction parallel to the starting axis, with the exit in inverted flight; in this case the wing rocks may be performed partly or totally on the vertical line, or after levelling-off in inverted flight.

3.10.2.4. 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.

3.10.2.5. Violations of signalling procedures, determined by simple majority of judges, will be penalized in accordance with paragraph 4.3.3.

3.11. Danger of Collision

3.11.1.1. In case of danger of collision with a bird or conflicting air traffic:

a) If the pilot has to delay the commencement of the competition flight, the delay directly linked to such hazard is a "reasonable cause" and therefore will not trigger any missed slot penalty (described in 4.3.1).

b) If the pilot has to interrupt the competition flight and land, the case should be treated in the same manner as if a mechanical defect (paragraph 3.12) had taken place.

c) If the pilot has to orbit to avoid any such hazard, the Chief Judge will allow additional time if required.

3.12. Mechanical Issues

3.12.1. Defects on the Ground

3.12.1.1. In the event of a competing aircraft becoming unserviceable before the start of a flight, the International Jury may, on the recommendation of the Technical Commission, permit the competitor to use another aircraft or the same aircraft following the removal of the defect.

3.12.1.2. In the event that a test flight is required, and the competitor does not allow a non-competing pilot to fly his aircraft for test purposes, a special authorization will be given to the competitor to fly this test flight under the following conditions:

a) that the flight will consist of a maximum of three (3) aerobatic figures;

b) that these figures will be recommended by the Technical Commission and approved by the International Jury;

c) if the competitor violates these conditions he will be disqualified.

3.12.2. Defects in Flight

3.12.2.1. 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 and other team members. This area will be off limits to everyone except the competitor, the Technical Commission and the International Jury. An engineer from the competitor's team will be permitted to enter the area with the concurrence of the Jury. The competitor will be

required to remain in his aircraft until the arrival of a member of the International Jury who will release him and subsequently permit the aircraft to be worked on and inspected.

3.12.2.2. 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 Commission within two (2) 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 Commission (except the one belonging to the pilot's NAC if any) and the International 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 Commission.

3.12.2.3. 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.

3.12.2.4. The following defects will not be counted:

a) incorrect adjustment;

b) technical trouble caused by dirt if attributed to negligence of the competitor or his/her team. Note: if it can be ascertained by the Technical Commission that contaminated fuel or oil was supplied by the Organiser, the penalizing rule does not apply;

c) insufficient or missing safety devices causing a change of settings during the flight.

3.12.2.5. In cases (a) to (c) above (with the exception of the Note in (b)), subject to jury assessment, the competitor will receive a penalty equal to the Low penalty for the category (I, A, U) and will be permitted to re-fly the programme in accordance with paragraph 3.12.2.9.

3.12.2.6. The International Jury must, not later than five (5) 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 Commission, the International Jury shall decide in favour of the competitor.

3.12.2.7. 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 International Jury.

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

3.12.2.9. 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.

3.13. Change of Aircraft by a Competitor

3.13.1.1. A contest aircraft may on the recommendation of the technical commission, and with the permission of the International Jury, be replaced at any time by another contest aircraft.

3.13.1.2. If due to a technical reason a pilot has to fly a different aeroplane, he/she shall be allowed to make the following figures in addition to normal safety manoeuvres, in order to become accustomed to the substitute:

Intermediate	Advanced	Unlimited
Horizontal 4-point roll, 9.4.3.4. Horizontal positive flick roll, 9.9.3.4. Stall turn 5.2.1.1	Horizontal 4-point roll, 9.4.3.4. Horizontal positive flick roll, 9.9.3.4. Stall turn with half roll, 5.2.1.1. + 9.1.1.2.	Horizontal 4-point roll, 9.4.3.4. Horizontal positive flick roll, 9.9.3.4. Horizontal negative flick roll, 9.10.3.4 (bracketed by two half rolls 9.1.3.2). Stall turn with roll, 5.2.1.1. + 9.1.1.4.

3.14. Protests

3.14.1.1. Protests will be accepted from individual competitors and teams only. All protests must be submitted to the President of the International Jury in writing, either directly or through the Contest Director, with a deposit, 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 local regulations for the specific championships or competitions will not be counted. Every protest must refer to the rule or rules to which it relates. The amount of the deposit shall be stated in the local regulations for the championships or competition. It should not exceed US$100.

3.14.1.2. All protests will be dealt with in compliance with the FAI General Section of the Sporting Code, Chapter 6. They will be dealt with by the International Jury, in cooperation with the Chief Judge if his assistance is required and his duties permit. Decisions taken by the International Jury are final and must not be changed later.

3.14.1.3. The deposit will be returned if the protest is upheld.

4. EVALUATION OF COMPETITION FLIGHTS

4.1. Evaluation Of The Performance

4.1.1. Chief Judge

4.1.1.1. The Chief Judge's primary concern should be the accurate and fair judging of the competition flights, including the monitoring of flights for Hard Zero (HZ) marks and penalties. He should place his expertise at the disposal of the Board of Judges, and coordinate and guide their work.

4.1.1.2. The Chief Judge oversees administrative matters (correctness of paperwork, recording of penalties, etc.) but must be provided with two (2) or more Chief Judge Assistants under his/her supervision who will perform at least the following tasks along with other duties as requested:

a) calling the manoeuvres and recording the notes of the Chief Judge, to whatever extent he requires;

b) processing and expediting the flow of paperwork;

c) handling all other radio communications. One of his assistants should assist in monitoring the zero (0.0 and HZ) marks (see 4.4.1.12) and penalties awarded by the Judges after each flight.

4.1.1.3. It is essential that the Chief Judge follows each flight, with emphasis on recording Hard Zero (HZ), 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 judges' 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.

4.1.1.4. Checking the duration of flight will be the duty of the Chief Judge and his assistants.

4.1.1.5. The Chief Judge will hold routine evaluation meetings with the Judges during the contest (see 1.4.9.3). He should ensure that rules in Chapter 3.14.1.4 are understood and operate smoothly, and establish a good working relationship between teams of Judges and Assistants, Timekeepers, and other helpers.

4.1.1.6. The Chief Judge is responsible for ensuring that there is enough time between flights for the judging to be unhurried: he/she should control (by radio) the flow from one contestant to the next.

4.1.1.7. The following recordings and corresponding penalty points will be carried out under the responsibility and control of the Chief Judge:

a) programme interruptions,

b) insertions,

c) infringements of the lower and upper height limits,

d) infringement of proper signalling in Programme 5 (Unlimited), as per 4.3.4.3.

4.1.1.8. At the end of each flight, the Chief Judge should ascertain whether any of the Judges has recorded a Hard Zero (HZ) mark, or any of the penalties mentioned in 4.1.1.7 above. This will be done by perusal of the score sheets collected from the judges, prior to entry into the scoring system.

4.1.1.9. When all Form A's (respectively Form R's or L's) have been submitted to the Chief Judge for a flight and a difference of opinion occurs with regards to a Hard Zero (HZ) mark, insertion penalty or interruption penalty:

a) the Chief Judge shall call for a discussion in the judging area by the International Judges;

b) such discussions shall not interfere with the subsequent flights;

c) the official video may be used in these discussions to help determine matters of fact, but not of perception;

d) a judge may request a viewing of the video during a discussion if he/she deems it necessary. This request will always be honoured;

e) all Form A's (respectively Form R's or L's) shall be retained by the Chief Judge until the final decision is made.

4.1.2. Judges

4.1.2.1. CIVA Judges and Assistants, on being selected for duty on an International Judging Panel, must at all times act with true impartiality and treat all competitors on an equitable basis including during breaks in the competition.

a) All Judges and Assistants are required to sign the CIVA declaration of ethical behaviour when registering at the event (see also 1.3.1.1.c)ii)).

b) Any indication that a Judge or Assistant is acting contrary to the required manner and/or is seen to be colluding with a third party in matters that could affect their impartiality may lead to expulsion from the judging line, subject to review and confirmation of such a directive by the International Jury.

4.1.2.2. Each programme of World and Continental Championships will be marked by the Judges using a standardised system: see Appendix B and also 4.1.7 and 4.4 below.

4.1.2.3. The marks given by a Judge to a pilot of his/her own country shall be included.

4.1.2.4. All Judges should study copies of all contestants' Free Known and Free Unknown Programmes, provided by the Organiser, before flying of the programme is started.

4.1.2.5. 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. The judge himself must sign off any changes on the score sheet. Once entered into the scoring system, the scoring sheet comes under the jurisdiction of the International Jury.

4.1.2.6. The preliminary flights by non-competing pilots (see 3.3) 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.

4.1.2.7. It is strongly recommended that the Judges record remarks on the score sheets.

4.1.2.8. In case of a vote among the Judges on the question of penalization, all judges shall vote irrespective of nationality.

4.1.2.9. Where the majority decision of the Panel of Judges is required, in a case of disagreement about the penalisation of the flight of a competitor, the Chief Judge shall have a casting vote in the event of a tie.

4.1.3. Recording of Interruptions, Insertions, Height Infringements and other Violations

4.1.3.1. Each judge must record programme interruptions, insertions, infringements of the lower and upper height limits (unless a precision height measuring device is available), as well as violations of safety manoeuvres or signalling procedures, 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/her assistant will then enter the appropriate penalty based on simple majority (except for disqualification, see 4.1.3.2 below). In case of a 50/50 split, the Chief Judge may call a conference or cast his vote as appropriate.

4.1.3.2. Disqualification (for the current programme) for infringements of the disqualification height limit (3.8.1.1), by which air safety is endangered, shall be decided by a two-third majority vote of the Board of Judges, even when there is a precision height measuring device available.

4.1.4. Marks for Figures

4.1.4.1. The Judges will independently assess the quality of each figure, and its components as performed in the sequences for Programmes 1, 2, 3 and 4, marking with numbers from zero (0.0) to ten (10), in intervals of half (0.5) point. A Hard Zero (HZ) mark will be awarded if the figure is incorrect or missing, in accordance with Section 4.4. For Programme 5 the assessment will be in accordance with 4.1.6.1.

4.1.4.2. When marking the quality of the performance of individual figures, the Judges have to consider the following general principles:

a) For Programmes 1, 2, 3 and 4, accordance of the figure flown and direction of flight, with the pre-stated figure in the original sequence;

b) the distinctly recognizable start and finish of each figure with a horizontal line;

c) 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;

d) Marking Criteria set out in Appendix B;

e) 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;

f) that inverted figures are judged by the same criteria as upright figures.

4.1.4.3. 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 4.3.5.2.a)) if the next figure is actually performed inside the 50 m boundary of the performance zone

4.1.4.4. If a judge misses seeing a figure, or any part of a figure such that a mark cannot be given with full confidence, the Judge will give a mark of “Average” or “A” to that figure.

a) When determining the Ranking Index (RI) for each judge, "A" marks will be replaced by a numeric average of the other judges (non-"A") marks (with HZ’s evaluated as numeric zeros), rounded to the nearest half-point. If the numeric average decimal part is exactly 0.25 or 0.75, the numeric average will be rounded upwards.

4.1.5. Marking of Flight Positioning and Symmetry

4.1.5.1. Positioning refers to the 3D placement of each figure relative to the performance zone and to the judges. A position mark will be given by each Judge.

4.1.5.2. A column headed “Pos” on the Form A (respectively R, L) marks sheet shall be used to record the positions of figures that are not optimally placed, as they are flown.

4.1.5.3. Depending on the aircraft’s height and the nature of the figures, there is an optimum X and Y axis position for each figure where the requirements of the sequence are satisfied, and any geometric errors will be clear to the judge and therefore easy to assess. This position may be central or toward the right or left within the performance zone, and nearer to or further from the judge as dictated by the design of the sequence and the height and performance of the aircraft.

4.1.5.4. The position of a figure is somewhat or considerably “non-optimal” when it adversely affects the judge’s ability to assess it, is poorly positioned when considered within the design of the sequence, or its position dictates that subsequent figures will not be flown at optimal positions and may therefore be difficult to assess. Otherwise, the position shall be considered satisfactory, and no position downgrade is required.

4.1.5.5. 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 positioned laterally and at an appropriate distance from the judges within the performance zone. The judge’s positioning marks will take into account any imbalance between non-optimally positioned figures to reflect the left-to-right symmetry of the sequence flown by the competitor.

4.1.5.6. For each figure the judge shall add a reference in the “Pos” column describing the position of the figure if this is observed to have been non-optimal. The shape and size of the figure and the location of any manoeuvres within it shall be compared to the optimum position of the whole figure when considered within the design of the sequence. Where the position of a figure is somewhat or considerably non-optimal because it is too much to the left or the right or too near or too far away, the following annotations (or their local / national equivalent) shall be used:

Figure position:	The ‘Pos’ annotation: Somewhat non-optimal	Considerably non-optimal
Left of the optimum position:	**“L”**	**“LL”**
Right of the optimum position:	**“R”**	**“RR”**
Too near to the judge:	**“N”**	**“NN”**
Too far from the judge:	**“F”**	**“FF”**

4.1.5.7. At the end of the sequence the annotations in the “Pos” column shall be used by each judge to determine a sequence positioning downgrade based primarily on these recorded observations. Each single letter is taken as equivalent to a half mark and each double letter equivalent to a full mark downgrade. For example, the figure “Pos” annotations L, R, N, FF, LL and R would combine as a downgrade of 4.0 points. The Judge is entitled to revise his final positioning mark up or down by a maximum of one (1) point if he considers there were other relevant factors which should be taken into account to reduce or increase the downgrade.

4.1.5.8. The K factor for positioning marks in Programmes 1, 2, 3 and 4 will be as follows:

a) Unlimited: 40K

b) Advanced & Intermediate: 30K

4.1.6. Marking of Programme 5

Criteria	K-factor
Artistic Impression	160
Technical Control	160
Positioning	80
Total	**400**

4.1.6.1. Programme 5 (Unlimited Final Freestyle Programme) will be marked under five “Judging Areas” detailed in Appendix B.11, gathered under three headings as in the table below. A mark of up to 10 in increments of 0.5 will be awarded to each of the five Judging Areas.

4.1.6.2. Programme 5 is judged on a comparative basis. For that purpose, each judge shall set its own average mark standard -- taking into account that near maximum or minimum scores on the first flights would restrict future comparisons for superior or inferior flights.

4.1.6.3. As marking sheets for each competitor are collected immediately after each performance (see 4.5.2.1), Judges may utilise a Final Freestyle Summary Sheet to keep a personal record of the marks they award to each competitor in each judging area, to assist them in maintaining a balanced comparative view of all performances throughout the programme.

4.1.7. Calculation of Scores

The calculation of scores for a competitor's programme will be as follows:

4.1.7.1. For each figure, the raw score is calculated by multiplying the coefficient (K) of the figure by the mark given by the judge.

4.1.7.2. The marks given by a Judge are processed according to the Sporting Code document “International Aerobatic Events: Statistical Method for Processing Scores”, with the final scores being determined for a programme as a whole. The CIVA-approved software programme must be used and obtained from the President of CIVA.

4.1.7.3. It shall be a duty of the Organiser to arrange for the publication of the competition results in accordance with Rule 4.1.7.1. The marking sheets must be made available to the competitors, Chief Delegates, Team Managers, and Contest Officials for information and/or checking before the start of the subsequent programme.

4.1.7.4. A copy of the files generated by the CIVA-approved Computer Scoring System must be available to any official or Team Manager upon request. The media used for that copy will be supplied by the requester and has to be compatible with the computer being used by the contest Organiser. A complete copy of all the files must be sent to the President of CIVA after the contest is finished.

4.2. Boundary Judging

4.2.1.1. The recording of infringements of the performance zone defined in 3.3 may be carried out only with a CIVA-approved electronic tracking system.

4.2.1.2. If a CIVA-approved electronic tracking system can be used, Boundary judging is mandatory at World Championships, except in the Final Freestyle Programme (Unlimited) for which boundary judging is not applicable.

4.2.1.3. Boundary judging, although recommended, is not mandatory for Continental Championships.

4.2.1.4. If an electronic tracking system is used, the position of the aircraft will be tracked by the instrument and performance zone boundary infringements (including the 50 m buffer zone according to 4.3.6.2) recorded. A member of the International Jury or a neutral person assigned by the International Jury must be present at the recording station to monitor the operation of the system.

4.2.1.5. A record of boundary infringements will be kept and will be made available to competitors.

4.3. Penalties Deductible From Total (Averaged) Scores

4.3.1. Missed Slot

4.3.1.1. A penalty of 250 points (200 points in A and I) will be awarded to a pilot who, without reasonable cause, is not ready when his/her slot time arrives or causes an unreasonable delay between the time of the slot and the start of his/her flight.

4.3.2. Violations of Safety Manoeuvres

4.3.2.1. A penalty of 30 points (all categories) will be given for each and every figure flown outside the box or other than the prescribed manoeuvres set out in Rule 3.9.

4.3.3. Violations of Signalling Procedures

4.3.3.1. A penalty of 30 points (all categories) will be given in case of violation of signalling procedures set out in Rule 3.10.2.

4.3.4. Time Limits for the Programmes

4.3.4.1. Any figure of Programme 1-4 with the first element (roll or pitch) started after the time limit will be set to CHZ by the Chief Judge, and Judges should, where necessary, revise their marks to HZ for these figures.

4.3.4.2. Any deviation, shorter or longer, from the time allowed for Programme 5 will incur 10 penalty points for each second or fractional part of a second of deviation.

4.3.4.3. Failure of a competitor to observe precisely Rule 3.10.2 in Programme 5 (signalling start and finish) will result in a penalty of 150 points.

4.3.5. Infringement of Height Limits

4.3.5.1. Unlimited

a) For every obvious and visually recognised descent below the lower height limit (see 3.8.1.1) during the performance of Programmes 1, 2, 3, 4 and 5, the competitor will be given 250 penalty points.

b) In Programmes 1, 2, 3 and 4, 250 penalty points will be given for each figure flown completely below the lower height limit.

c) For every climb above the upper height limit (see 3.8.1.1) in Programmes 1, 2, 3 and 4, 50 penalty points will be given.

d) A competitor flying lower than the disqualification height (see 3.8.1.1) will be disqualified (from the current programme) for causing a dangerous situation.

4.3.5.2. Advanced and Intermediate

a) For every obvious and visually recognised descent below the lower height limit (see 3.8.1.1) during the performance of any Programme, the competitor will be given 200 penalty points.

b) 200 penalty points will be given for each figure flown completely below the lower height limit.

c) For every climb above the upper height limit (see 3.8.1.1), 30 penalty points will be given.

d) A competitor flying lower than the disqualification height (see 3.8.1.1) will be disqualified (from the current programme) for causing a dangerous situation.

4.3.6. Infringements of the Performance Zone

4.3.6.1. Definitions

a) When an electronic tracking system is operated, an infringement is considered to have occurred if the position of the aircraft is indicated by the system as crossing the limits defined in Rule 4.3.6.2, even if this occurs more than once in a single figure.

4.3.6.2. For each infringement of the performance zone in Programmes 1, 2, 3 and 4 by more than 50 metres in the direction of the main axis and/or the secondary axis a pilot will be given penalty points in accordance with the table below.

Zone Infringement	Unlimited	Advanced or Intermediate
Penalty point tariff	30	20

4.3.6.3. Thereafter, for every figure started beyond 50 metres outside the performance zone, further penalty points will be given, in accordance with the same table.

4.3.7. Flight Regulations and Dangerous Flying

4.3.7.1. Competitors found guilty of violating flight regulations and/or causing a dangerous situation will, on the recommendation of the International Jury, be disqualified by the Contest Director. The Chief Judge may, with the agreement of two-thirds (2/3) of the Board of Judges, exclude a pilot who is not flying safely or could cause an unsafe situation. This would apply from take-off to touchdown (see also 1.2.8.4).

4.3.8. Interruption of a Programme or Insertion of Figures

4.3.8.1. A competitor will be given penalty points, in accordance with the appropriate tariff, if he or she interrupts his or her programme by rocking the wings three (3) times one after the other, in accordance with 3.10.2.

4.3.8.2. 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 (0.0 or HZ)) prior to a programme interruption as in 4.3.8.1 be rescored.

4.3.8.3. Should the competitor restart his or her programme at any point other than provided for in 4.3.8.2, the competitor will be given additional penalty points in accordance with the appropriate tariff.

4.3.8.4. The insertion 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 inserted figure flown is a repeat of the previous figure, the score for the original figure must be retained, even if zero (0.0 or HZ). Under no circumstances should a competitor be allowed to gain an advantage due to this inserted figure.

Interruption or Insertion	Unlimited	Advanced	Intermediate
Penalty point tariff	100	80	50

4.4. Penalties & Devaluations Applicable To Figures In Programmes 1, 2, 3 and 4

It is assumed by a Judge that a contestant is going to fly a perfect figure, therefore he/she starts with the mark of ten (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 B.

4.4.1. Downgrades

4.4.1.1. The absence of a distinct horizontal start or finish to a figure will reduce the mark by one (1) point in each case for each figure affected.

4.4.1.2. At the initiation or completion of every figure and at comparable moments within the figure, each deviation from a wings level, horizontal flight path with the aircraft longitudinal axis parallel to the relevant box axis, in accordance with paragraph B.6.1.1, will attract a reduction of half (0.5) point per 2.5 degrees of deviation, one (1) point per five (5) degrees of deviation.

4.4.1.3. As there is no “free” space between figures (4.1.4.3) any reduction applied in accordance with 4.4.1.2 must also apply as an error at the start of the subsequent figure.

4.4.1.4. 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 one (1) point per five (5) degrees of deviation.

4.4.1.5. Over-rotating a roll and rolling the wings back again must be penalised by one (1) point per five (5) degrees of over-rotation, even if the correct geometry is resumed afterwards, and no matter how quickly the correction is made. The same provisions apply 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.

4.4.1.6. If within a figure two or more lines have to be of the same length, the basis for judging is the first line flown. Any observed variation must be penalised by reducing the marks in accordance with paragraph B.8.1.5.

4.4.1.7. A tail slide that does not move backwards by the required amount must be penalized by four (4) points.

4.4.1.8. Slow rolls flown in combination with a turn (family 2) or loop (family 7.4.1 – 7.4.2) must be smoothly continuous: i.e. there must not be any change in the rate of roll from beginning to end.

4.4.1.9. When an excessively long line is shown between a looping segment and adjacent roll, or roll and adjacent looping segment, the mark must be penalized by four (4) points.

4.4.1.10. Marking criteria for combinations of rolls with turns and loops will include the even integration of the rolls within the figure. Specific downgrades for rolling turns are noted in paragraph B.9.3., while specific downgrades for turns in loops are noted in paragraph B.9.10.3.

4.4.1.11. If the total of downgrades in this section leads to a value lower than the score of (0.5), a numerical zero (0.0) will be given to the figure.

4.4.1.12. When awarding any kind of zero mark (i.e. numerical 0.0 or HZ), judges must state the reason why the figure was graded zero.

4.4.2. Hard Zero

4.4.2.1. A mark of Hard Zero (HZ) must be awarded if the Judge considers that the figure is incorrectly flown in respect of a geometrical error, as listed below, that is clearly verifiable as a matter of fact. A mark of Hard Zero (HZ) will be awarded to a figure if:

a) any figure is flown which does not conform to the drawing held by the judges for marking purposes (Form 'B', 'C', 'L' or 'R').

Note - when a figure is inserted to a sequence Rule 4.3.8.4 applies;

b) when rolls are superimposed on a turn (Rule 4.4.1.10), the roll is finished but 90º or more of the turn still remains to be flown;

c) when rolls are superimposed on a turn (Rule 4.4.1.10), the turn is finished but 90° or more of roll still remains to be flown;

d) when rolls are superimposed on a loop (Rule 4.4.1.10), the roll is finished but 90º or more of the apex still remains to be flown, or the apex is finished but 90°or more of the roll remains to be flown (the apex being the symmetric top or bottom arc defined by the start of the roll);

e) any deviation from the prescribed direction (Rules 4.4.1.2 and 4.4.1.3) reaches 90º;

f) any other single deviation in geometry/flight path/attitude/rotation (Rule 4.4.1) reaches 90º;

g) the pre-stated figure or any part of it is omitted;

h) 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 Chief Judge should instruct unsighted judges to revise their mark from Hard Zero (HZ) to Average (A);

i) a rolling turn included a flick roll.

j) the visible line between a roll and a part loop in Family 7.2 and Families listed in B.9.8.4 is greater than 2R.

4.4.2.2. If figures subsequent to the Hard Zero mark are correct and are flown in the correct direction, they shall be marked in the normal way.

4.4.2.3. During a repetition flight (paragraphs 3.6.4.6.e) or 3.12.2.9) 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 mark awarded for that figure during the first flight will be reduced to an Hard Zero (HZ).

4.4.3. Alignment on Hard Zero

4.4.3.1. The awarding of Confirmed Hard Zero marks is determined by the Chief Judge. When all Form A's (respectively Form R's or L's) have been submitted to the Chief Judge for a flight and difficulties occur in interpreting the correct application of the Hard Zero (HZ) mark, the procedure specified in 4.1.1.9 will be used.

4.4.3.2. Case of Hard Zeros Given by The Majority of Judges:

a) The score sheets go to the scorer unchanged, the Chief Judge having checked the Confirmed Hard Zero (CHZ) box on the score sheet, unless a conference to confirm the facts is demanded by any judge(s). The computer system changes the minority scores to Hard Zero (HZ) and determines the judges' HZI points as per the Sporting Code document "International Aerobatic Events: Statistical Method for Processing Scores" para.8.4.

4.4.3.3. Case of Hard Zeros Given By 50% or less of the Judges:

a) The Chief Judge first determines by means of conferencing whether the Hard Zero is correct or not. If correct, the Chief Judge will check the Confirmed Hard Zero (CHZ) box on the score sheet; if not he will leave it blank.

b) If the judges conference does not reach a consensus but the Chief Judge is convinced that there is substantial evidence on the video for a Hard Zero (HZ), the Chief Judge shall check the Confirmed Hard Zero (CHZ) box.

c) The judges must not change their score sheets as a result of the discussion. The score sheets will then go to the scoring office and the computer system will then change the incorrect marks and determine judges' HZI points as per the Sporting Code document "International Aerobatic Events: Statistical Method for Processing Scores" para.8.4.

4.4.3.4. Case of Hard Zeros (HZs) referred to or determined by the International Jury:

a) The Chief Judge may on occasions, where there is a mixture of scores and Hard Zeros (HZs) for a figure, not be able to determine the validity of the Hard Zero (HZ) score(s), due to uncertainty in the Regulations (e.g. paperwork errors). In such instances the Chief Judge shall tick the Confirmed Hard Zero (CHZ) box and then refer the matter to the International Jury for clarification and a decision.

b) Where the International Jury determines the Hard Zero (HZ) mark is correct, those judges who had given numerical marks will have their marks changed to Hard Zero (HZ) by the President of the International Jury, without prejudice to their Ranking Index.

c) Where the International Jury determines the Hard Zero (HZ) mark is incorrect, the Hard Zero (HZ) confirmation will be reversed and those judges who have given Hard Zeros (HZs) will have their marks changed to an average by the President of the International Jury, without prejudice to their Ranking Index.

4.4.3.5. When a Judge's Hard Zero (HZ) vote is over-ruled, upward correction of a Hard Zero (HZ) will be to a Fitted Value determined by the scoring software.

4.4.4. Mix of Zeros

4.4.4.1. The CIVA results calculation software will handle a mix of Hard Zero (HZ) or Average (A) marks. In order for this to function correctly, the Chief Judge, if necessary after a conference as described in paragraph 4.4.3, must fill the Confirmed Hard Zero (CHZ) field on the judging sheets if a Hard Zero (HZ) was in fact flown. If review shows the figure to have been correct, the Confirmed Hard Zero (CHZ) box must be left open.

4.4.4.2. If during this process the Chief Judge establishes that there is a mix of Hard and Numerical Zeros for the same error, i.e. it is only the extent of the error above 45 degrees that cannot be established, and these combined Zeros are in the majority for this error, the Chief Judge shall instruct those judges with the Numerical Zeros (NZs) to change their score sheets to Hard Zeros (HZs) and sign the sheets accordingly. The Chief Judge will then fill the Confirmed Hard Zero (CHZ) field. Consequently, no judge will in this instance have a point added to his Hard Zero Anomaly count (see also the Sporting Code document "International Aerobatic Events: Statistical Method for Processing Scores").

4.4.4.3. Should a judge consider that a figure started behind the judges, the judge shall mark the figure regardless, but add the comment, "Behind" in the Remarks section of the Form A (respectively Form R or L). At the end of each flight, the Chief Judge shall determine by a simple majority (with the Chief Judge casting a vote as required), if the figure in question was

started behind the judges. If the majority holds that the figure was started behind the judges, each judge shall change his/her mark to Hard Zero (HZ) and all Form A's (respectively Form R's or L's) shall be countersigned by the Chief Judge. If the figure is deemed by the majority to have been flown in front of the Judges, the original marks shall be handled as with any other figure.

4.5. Judging Administration

4.5.1. Paperwork

4.5.1.1. All paperwork supplied to the Board of Judges except that specifically prepared for use by the Chief Judge and the video operator should have all references to the pilots' identity removed.

4.5.2. Collection of Marking Sheets

4.5.2.1. Immediately after a competitor has completed a competition flight and the judges have finished their marking, the marking sheets will be collected for perusal at the Chief Judge's workstation. Once any required actions are taken (conference, penalties added, indexes checked etc.) the marking sheets will be forwarded for entry into the scoring system. The individual judges themselves must sign off any changes to their marking sheets.

4.5.2.2. Once the marking sheets have left the Chief Judge's workstation, they come under the supervision and jurisdiction of the International Jury.

4.5.3. Publication of Results

4.5.3.1. The total results for each competitor in each of the competition flights shall be available to the competitors, in the agreed working language(s), prior to the start of the subsequent programme. The current results of each programme will be published on an information board to indicate the placing of the competitors. The final evaluation and placing will be found and announced after checking by the International Jury, not later than the following day.

4.5.4. Public Announcements

4.5.4.1. Prior to the take-off for and during the performance of a programme, details concerning the competitor concerned may be published by any means (radio commentary, etc.).

4.5.5. Official Video Recording

4.5.5.1. An official video recording from the Judges' position must be made of every individual competition flight in a World or Continental Aerobatic Championship. The official recording must be available to the International Jury to assist their decision on any protests regarding the evaluation of a competition flight. The recording shall not be available to competitors or Team Officials at a World or Continental Aerobatic Championship, except in conjunction with the International Jury's decisions on protests and with their agreement. During each competitor's flight, the video recording may be streamed for public viewing.

4.5.5.2. The official recording shall also be available to the Chief Judge and the Board of Judges to assist their discussions on matters of fact.

4.5.5.3. The Organiser must provide quality equipment with qualified operators to ensure useful information is provided to the judges and International Jury for their decisions.

4.5.6. Confidentiality

4.5.6.1. The judges are advised to keep activities of the Board of Judges and of the International Jury strictly confidential.

4.5.7. Judges' Performance Evaluation

4.5.7.1. Judges' evaluation by flight programme will be conducted by the International Jury using the software programme approved by CIVA (see the Sporting Code document "International Aerobatic Events: Statistical Method for Processing Scores", chapter 8). The Chief Judge will receive in print format a complete analysis of all Judges from the International Jury after each programme is completed.

4.5.7.2. Individual judging analysis for each judge will be posted online following the conclusion of each programme. The Chief Judge should make himself/herself available for discussion with individual judges to facilitate their review of this material.

4.5.7.3. The judging analysis of the whole contest including the Chief Judge's complete analysis of all judges will be made available after the competition has been completed.

4.5.8. Reprimand and Disqualification of Judges

4.5.8.1. The reprimands and/or the disqualification of judges by the International Jury shall be administered in compliance with the appropriate Sporting Code.

4.5.8.2. The International Jury, in conjunction with the Chief Judge, shall have the authority to disqualify any International Judge from the championship after the completion of any programme if that judge's Ranking Index deteriorates significantly from those established in previous programmes, or if it determines that the judge is continuously biased or not competent. This decision will be final and cannot be protested or appealed.

4.5.8.3. In case of a disqualification of a judge, the marking which was the reason for the disqualification will not be counted for the programme in question. CIVA will decide upon the further use of the disqualified judge on the recommendation of the International Jury.

4.5.8.4. On the basis of judging data, which have to be available promptly, it is the duty of the International Jury to monitor the performance of the judges.

4.5.9. Substitute Judge

4.5.9.1. If a substitute International Judge is appointed under 1.3.2.3.g) above, he/she shall only take his place on the Board of Judges at the start of the subsequent programme, and the marks of the departed judge for the programme he/she did not complete will be deleted.

5. AWARDS

5.1. Titles Definition

5.1.1.1. Overall Champion: The competitor who gains the highest total number of combined points in Programmes 1 to 4 (provided at least Programmes 1 and 2 are completed), regardless of gender.

5.1.1.2. Champion Team: The team with the highest total number of combined points in Programmes 1 to 4 (provided at least Programmes 1 and 2 are completed), taking into account the three highest individual scores in that team, regardless of gender (or the two highest individual scores in that team in the event that fewer than 4 teams comprised of 3 or more pilots compete, see 1.2.6.1.a)iii) and 1.2.6.1.b)iii)).

5.1.1.3. Overall Junior Winner: The Junior competitor who gains the highest total number of combined points in Programmes 1 to 4 (provided at least Programmes 1 and 2 are completed), regardless of gender. Junior competitors are defined as competitors reaching 26 years of age no earlier than 1 January of the year of the championship, according to their official ID or passport.

5.1.1.4. Overall Rookie Winner: The newcomer competitor who gains the highest total number of combined points in Programmes 1 to 4 (provided at least Programmes 1 and 2 are completed), regardless of gender, provided at least three newcomers participate in the competition. Newcomers are defined as competitors who have never participated before in a Category 1 CIVA championship of that category or higher.

5.1.1.5. Champion in the Final Freestyle Programme: The competitor who gains the highest number of points in Programme 5, regardless of gender.

5.2. Applicability of Titles per Category

5.2.1.1. Champion Titles are applicable according to the following table (provided that at least Programmes 1 and 2 are completed).

	Unlimited	Advanced	Intermediate
Overall Champion	Yes	Yes	Yes
Overall Junior Winner	Yes	Yes	Yes
Overall Rookie Winner	Yes	Yes	No
Champion Team	Yes	Yes	Yes
Champion Final Freestyle	Yes	n.a.	n.a.

5.3. Generalities

5.3.1.1. The Organiser is recommended to give awards at World and Continental Championships to the Chief Judge, the Panel of Judges, the Chief of the Scoring Office and all the specialists in the computing room.

5.4. Open Format of Continental Championships

5.4.1.1. For the Open format of Continental Championships, any competitor or Team from any Continent, who would have received awards according to 5.5.3, 5.6.2 or 5.7.2, if all competitors had been from that Continent, will receive equivalent awards (FAI & CIVA medals, FAI diplomas, Open trophies if existing), with addition of the word ‘Open’ in the championship title, e.g. ‘European Open Aerobatic Championships’. No title of “Champion”

will be awarded in this format. Instead, “Winner” titles will be awarded, e.g. ‘Winner of the European Open Advanced Aerobatic Championships’.

a) By exception, competitors or Teams from the Continent who already receive awards as part of the Continental Championship awards according to 5.5.3, 5.6.2 or 5.7.2, will not receive additional Open awards for the same ranking categories (regardless of the rank itself).

5.5. Unlimited Contests

5.5.1. World Championships

5.5.1.1. Titles, Awards and Trophies will be given according to the following table.

Titles	FAI medals	CIVA medals	Trophies	FAI Diplomas
Overall World Unlimited Champion	Gold 64mm		Jose L. Aresti Cup *donated by Colonel Jose L. Aresti*	Yes (a)
Second place	Silver 64mm			Yes (a)
Third place	Bronze 64mm			Yes (a)
Overall Junior Winner		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
Overall Rookie Winner (c)		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
World Unlimited Team Champion (b)	Gold x4 (c) 64mm + 3x 50mm		Petr N. Nesterov Cup *donated by the USSR*	Yes x4 (c)
Second place (b)	Silver x4 (c) 64mm + 3x 50mm			Yes x4 (c)
Third place (b)	Bronze x4 (c) 64mm + 3x 50mm			Yes x4 (c)
Top placing Team from the Southern hemisphere			Southern Cross Trophy *donated by the South African Aero Club*	
Winner each Individual Programme 1 to 4		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
Winner Unknown Programmes (combined results of Programmes 2 to 4)			Eric Müller Trophy *donated by the Swiss Aerobatic Association*	
World Unlimited Champion Final Freestyle		Gold	Manfred Strössenreuther Trophy *donated by the South African Aerobatic Club*	Yes
Second place		Silver		Yes
Third place		Bronze		Yes

a) FAI Diplomas will be awarded to the ten highest scoring competitors overall.

b) One medal each for the Team Manager (64mm) and the three (or two in case 1.2.6.1.a)iii) is into force) highest-scoring pilots (50mm), plus FAI diplomas.

c) Awarded provided at least three newcomers (as defined in 5.1.1.3) participate in the competition.

5.5.2. World Air Games

5.5.2.1. Medals and Diplomas awarded at the World Air Games will be identical to World Championships.

5.5.3. Continental Championships

5.5.3.1. Titles, Awards and Trophies will be given according to the following table.

Titles	FAI medals	CIVA medals	Trophies	FAI Diplomas
Overall [Continental] Unlimited Champion	Gold 64mm		Europe: Manfred Strössenreuther Trophy *donated by the Federal Republic of Germany*	Yes (a)
Second place	Silver 64mm			Yes (a)
Third place	Bronze 64mm			Yes (a)
Overall Junior Winner		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
Overall Rookie Winner (c)		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
[Continental] Unlimited Team Champion (b)	Gold x4 (c) 64mm + 3x 50mm		Europe: Darius and Girėnas Trophy *donated by the Lithuanian Aeroclub*	Yes x4 (c)
Second place (b)	Silver x4 (c) 64mm + 3x 50mm			Yes x4 (c)
Third place (b)	Bronze x4 (c) 64mm + 3x 50mm			Yes x4 (c)
Winner each Individual Programme 1 to 5		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes

a) FAI Diplomas will be awarded to the ten highest scoring competitors overall.

b) One medal each for the Team Manager (64mm) and the three (or two in case 1.2.6.1.a)iii) is into force) highest-scoring pilots (50mm), plus FAI diplomas.

c) Awarded provided at least three newcomers (as defined in 5.1.1.3) participate in the competition.

5.6. Advanced Contests

5.6.1. World Championships

5.6.1.1. Titles, Awards and Trophies will be given according to the following table.

Titles	FAI medals	CIVA medals	Trophies	FAI Diplomas
World Advanced Champion	Gold 64mm		Peter Celliers Trophy	Yes (a)
Second place	Silver 64mm			Yes (a)
Third place	Bronze 64mm			Yes (a)
Overall Junior Winner		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
Overall Rookie Winner (c)		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
World Advanced Team Champion	Gold x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Second place	Silver x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Third place	Bronze x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Winner each Individual Programme 1 to 4		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes

a) FAI Diplomas will be awarded to the ten highest scoring competitors overall.

b) One medal each for the Team Manager (64mm) and the three (or two in case 1.2.6.1.b)iii) is into force) highest-scoring pilots (50mm), plus FAI diplomas.

c) Awarded provided at least three newcomers (as defined in 5.1.1.3) participate in the competition.

5.6.2. Continental Championships

5.6.2.1. Titles, Awards and Trophies will be given according to the following table.

Titles	FAI medals	CIVA medals	Trophies	FAI Diplomas
[Continental] Advanced Champion	Gold 64mm		Europe: Ivan Tuček Trophy *donated by the Czech Aeroclub*	Yes (a)
Second place	Silver 64mm			Yes (a)
Third place	Bronze 64mm			Yes (a)
Overall Junior Winner		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
Overall Rookie Winner (c)		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
[Continental] Advanced Team Champion	Gold x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Second place	Silver x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Third place	Bronze x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Winner each Individual Programme 1 to 4		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes

a) FAI Diplomas will be awarded to the ten highest scoring competitors overall.

b) One medal each for the Team Manager (64mm) and the three (or two in case 1.2.6.1.b)iii) is into force) highest-scoring pilots (50mm), plus FAI diplomas.

c) Awarded provided at least three newcomers (as defined in 5.1.1.3) participate in the competition.

5.7. Intermediate Contests

5.7.1. World Championships

5.7.1.1. Titles, Awards and Trophies will be given according to the following table.

Titles	FAI medals	CIVA medals	Trophies	FAI Diplomas
World Intermediate Champion	Gold 64mm		Glen Dell Trophy *donated by the Glen Dell Family Trust and Sport Aerobatic Club of South Africa*	Yes (a)
Second place	Silver 64mm			Yes (a)
Third place	Bronze 64mm			Yes (a)
Overall Junior Winner		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
World Intermediate Team Champion	Gold x4 (b) 64mm + 3x 50mm		Team Trophy *donated by the Sport Aerobatic Club of South Africa*	Yes x4 (b)
Second place	Silver x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Third place	Bronze x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Winner each Individual Programme 1 to 4		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes

a) FAI Diplomas will be awarded to the ten highest scoring competitors overall.

b) One medal each for the Team Manager (64mm) and the three (or two in case 1.2.6.1.b)iii) is into force) highest-scoring pilots (50mm), plus FAI diplomas.

5.7.2. Continental Championships

5.7.2.1. Titles, Awards and Trophies will be given according to the following table.

Titles	FAI medals	CIVA medals	Trophies	FAI Diplomas
[Continental] Intermediate Champion	Gold 64mm			Yes
Second place	Silver 64mm			Yes
Third place	Bronze 64mm			Yes
Overall Junior Winner		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes
[Continental] Team Champion	Gold x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Second place	Silver x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Third place	Bronze x4 (b) 64mm + 3x 50mm			Yes x4 (b)
Winner each Individual Programme 1 to 4		Gold		Yes
Second place		Silver		Yes
Third place		Bronze		Yes

a) FAI Diplomas will be awarded to the ten highest scoring competitors overall.

b) One medal each for the Team Manager (64mm) and the three (or two in case 1.2.6.1.b)iii) is into force) highest-scoring pilots (50mm), plus FAI diplomas.

Appendices

A. APPENDIX A: LIST OF FIGURES FOR PROGRAMMES 2, 3 AND 4

This appendix illustrates those figures that may be nominated for the compilation of unknown programmes at each type of contest.

A.1. Colour Coding

A.1.1. Intermediate

A.1.1.1. Intermediate figures are shown throughout in blue and are marked with a blue [Y] symbol. Textual comments relating to Intermediate figures are also in blue.

A.1.2. Advanced

A.1.2.1. In Advanced contests, all the Intermediate figures may be flown (unless otherwise noted in the text), plus those shown in red and marked with a red [A] symbol. Textual comments relating to Advanced figures are also in red.

A.1.3. Unlimited

A.1.3.1. In Unlimited contests, all the Intermediate and Advanced figures may be flown, plus those shown in black. Unlimited figures are not marked with a symbol. Textual comments relating to Unlimited figures are also in black.

A.2. Roll, Flick and Spin Combination

A.2.1. Intermediate and Advanced

A.2.1.1. Unlinked and opposite rolls are permitted only on straight horizontal lines, with a maximum of 10 stops.

A.2.1.2. No roll element, neither aileron nor flick roll, may be added after a spin.

A.2.2. Unlimited

A.2.2.1. Unlinked and opposite rolls are permitted on straight horizontal lines, with a maximum of ten (10) stops.

A.2.2.2. On vertical and 45° lines, opposite aileron rolls may be added as long as neither the total extent of rotation nor the number of stops exceed the limits shown in the table below.

Line Direction	Total Rotation	Stops
Vertical Up	450°	4
45° Up	540°	4
45° Down	540°	3
Vertical Down	360°	3

A.2.2.3. Combinations of aileron roll first, and then flick roll, may be added in Families 1, 7 and 8 on 45° up lines. The combined extent of rotation shall not exceed 540° with not more than four (4) stops.

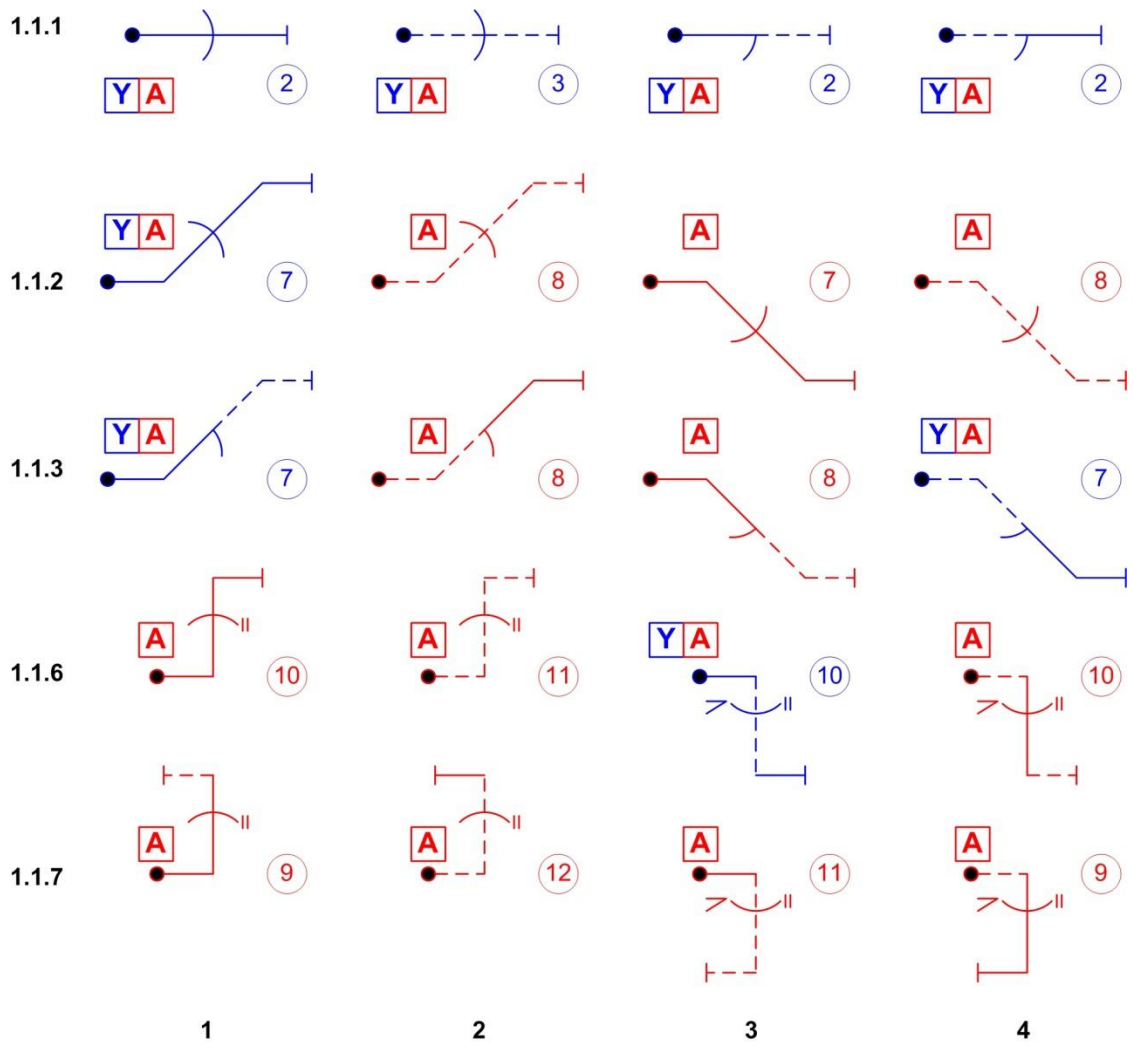
A.2.2.4. Combinations of flick roll first and then aileron rolls, may be added in Families 1, 7 and 8 on 45° down lines. The combined extent of rotation shall not exceed 540° with not more than three (3) stops.

A.2.2.5. An aileron or flick roll element may be added after a spin.

A.2.3. All Categories

A.2.3.1. Any of the figures illustrated with a 360° optional roll sign may be performed without that roll.

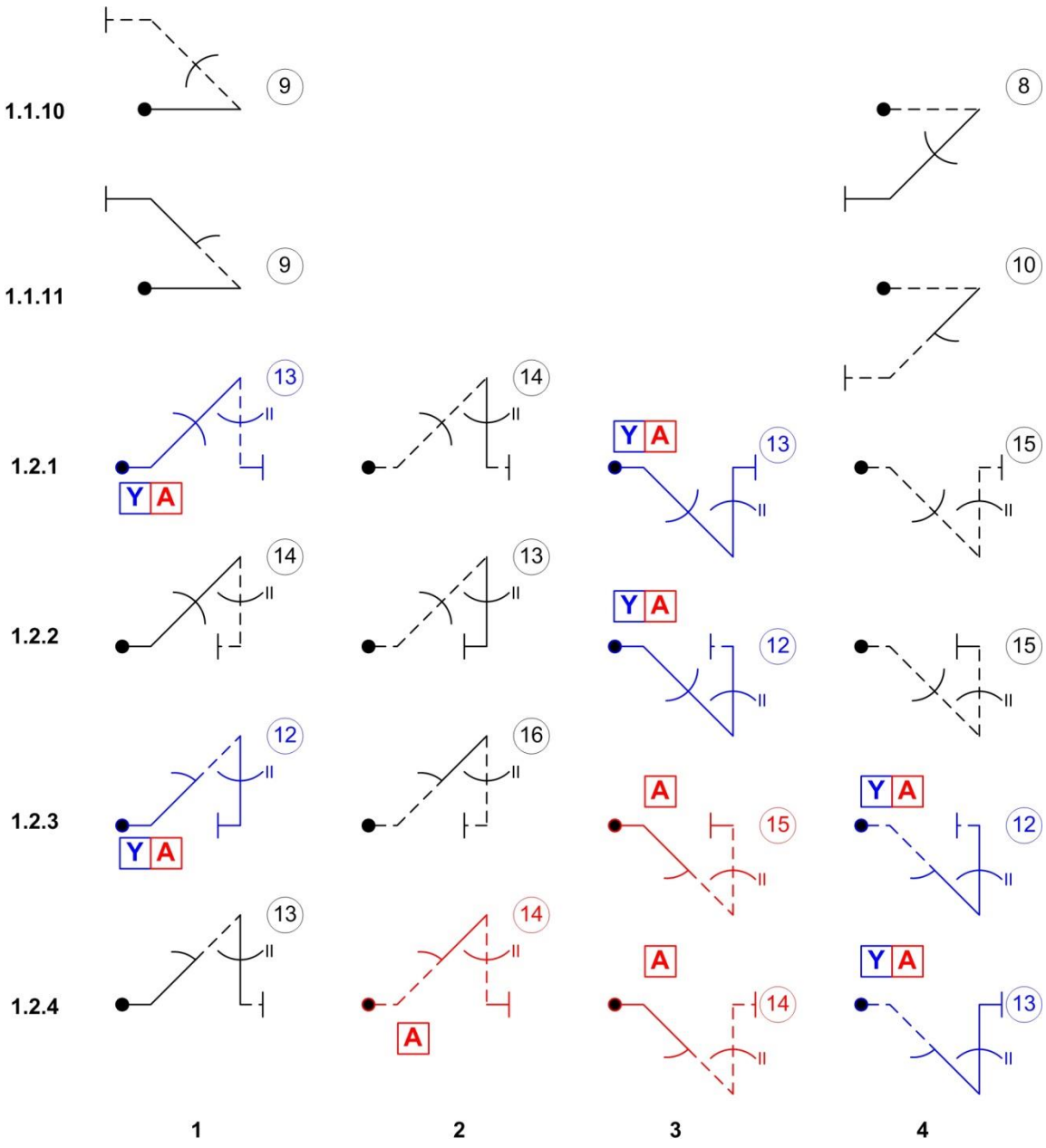
A.3. Family 1.1.1 To 1.1.7



A.3.1.1. Intermediate: Figure 1.1.6.3: Spin only.

A.3.1.2. Unlimited: Family 1.1.1 used for linking figures only.

A.4. Family 1.1.10 To 1.2.4

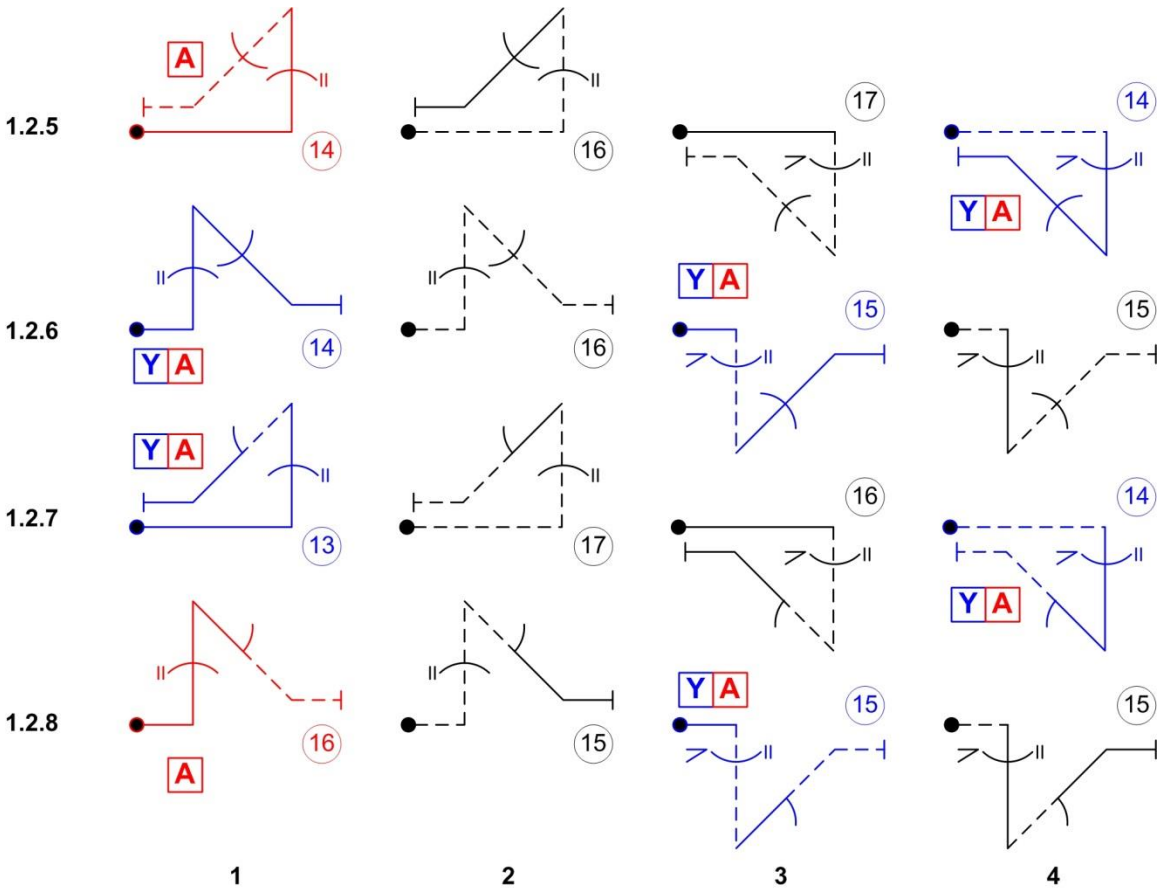


A.4.1.1. Unlimited: No combination of aileron roll and flick roll (ref A.2.2.3) permitted on the 45° up line of Figures 1.1.10.1 and 1.1.11.1.

A.4.1.2. Unlimited: No unlinked and opposite rolls (ref A.2.2.2), nor combinations of flick roll and aileron roll (ref A.2.2.4), permitted on the 45° down line of Figures 1.1.10.4 and 1.1.11.4

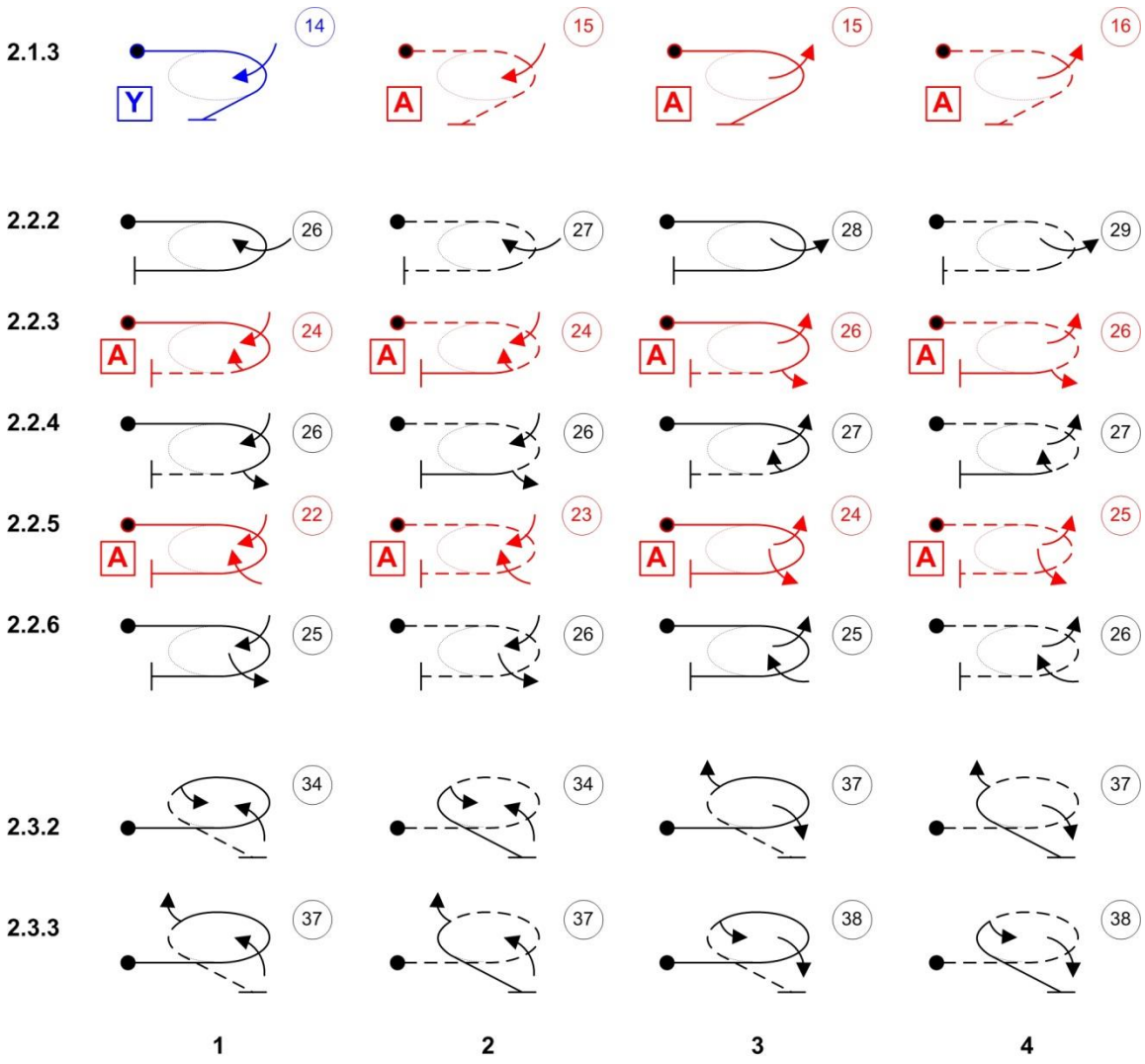
A.4.1.3. Intermediate: Figures 1.2.1.x to 1.2.4.x: No vertical roll elements.

A.5. Family 1.2.5 To 1.2.8



A.5.1.1. Intermediate: Columns 3 and 4: No vertical rolling elements. Column 3: Spin only.

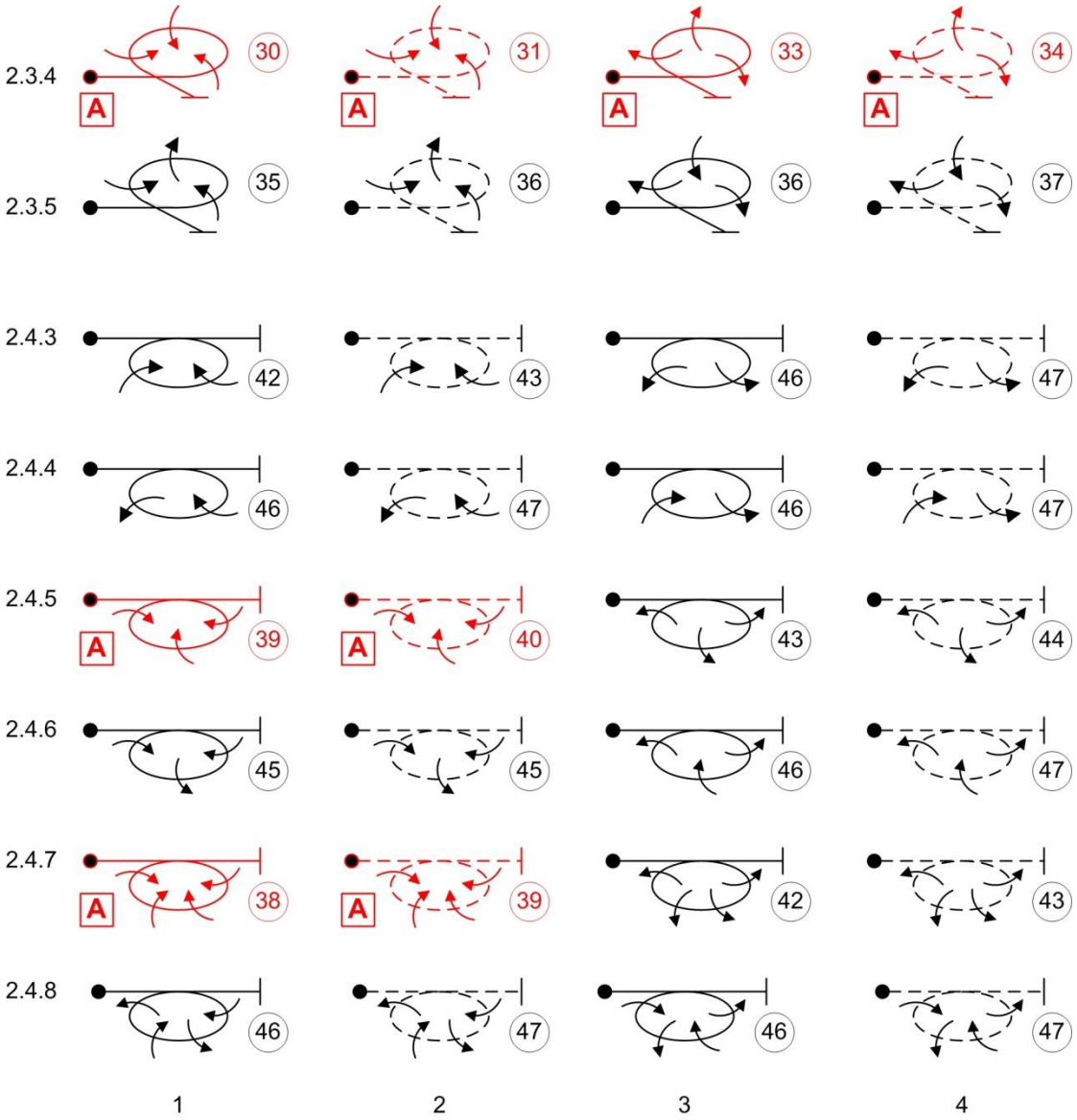
A.6. Family 2.1.3 To 2.3.3



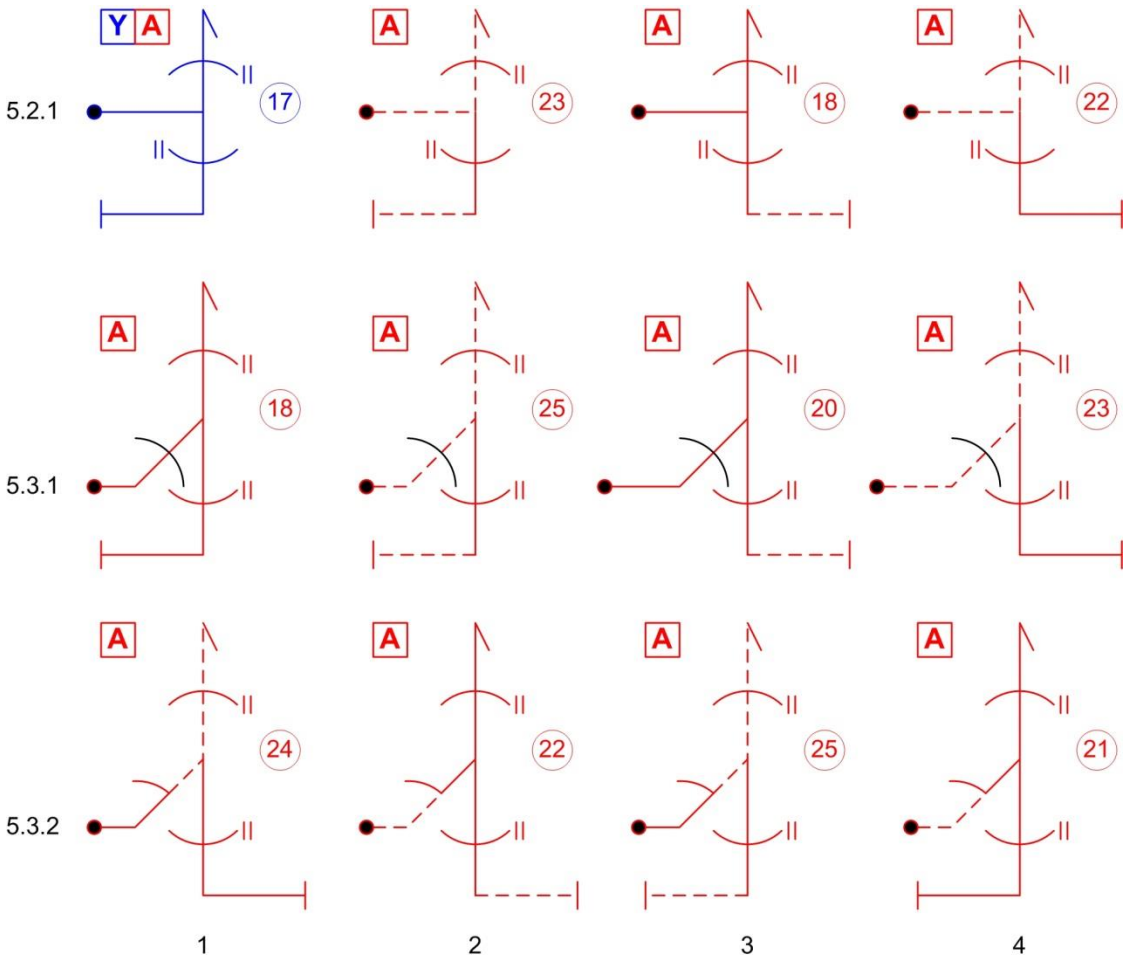
A.6.1.1. Figure 2.1.3.1 : Only for Intermediate (according to minimum K requirement in rule 2.3.1.1).

A.6.1.2. Figures 2.1.3.2 to 2.1.3.4 : Not for Unlimited (according to minimum K requirement in rule 2.3.1.1).

A.7. Family 2.3.4 To 2.4.8



A.8. Family 5 Stall Turns

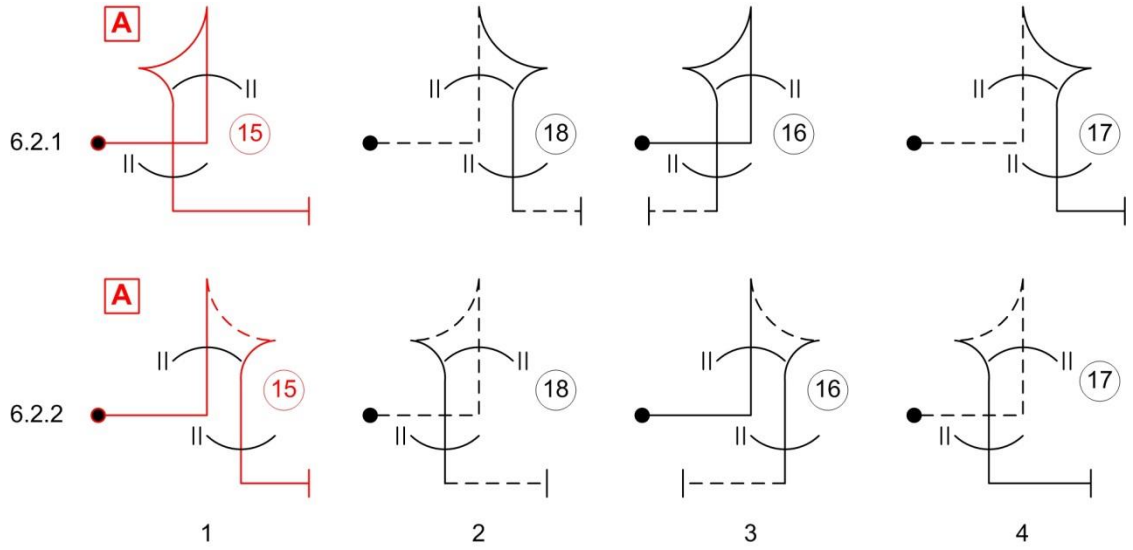


A.8.1.1. All categories: In Family 5, No flick rolls permitted on ascending vertical or 45° lines, except in Family 5.2.1.

A.8.1.2. Advanced: on all 45° lines, rotations limited to 9.1.2.2 or 9.4.2.2; and on ascending vertical lines in Families 5.3.1 and 5.3.2, rotations limited to 9.1.1.1.

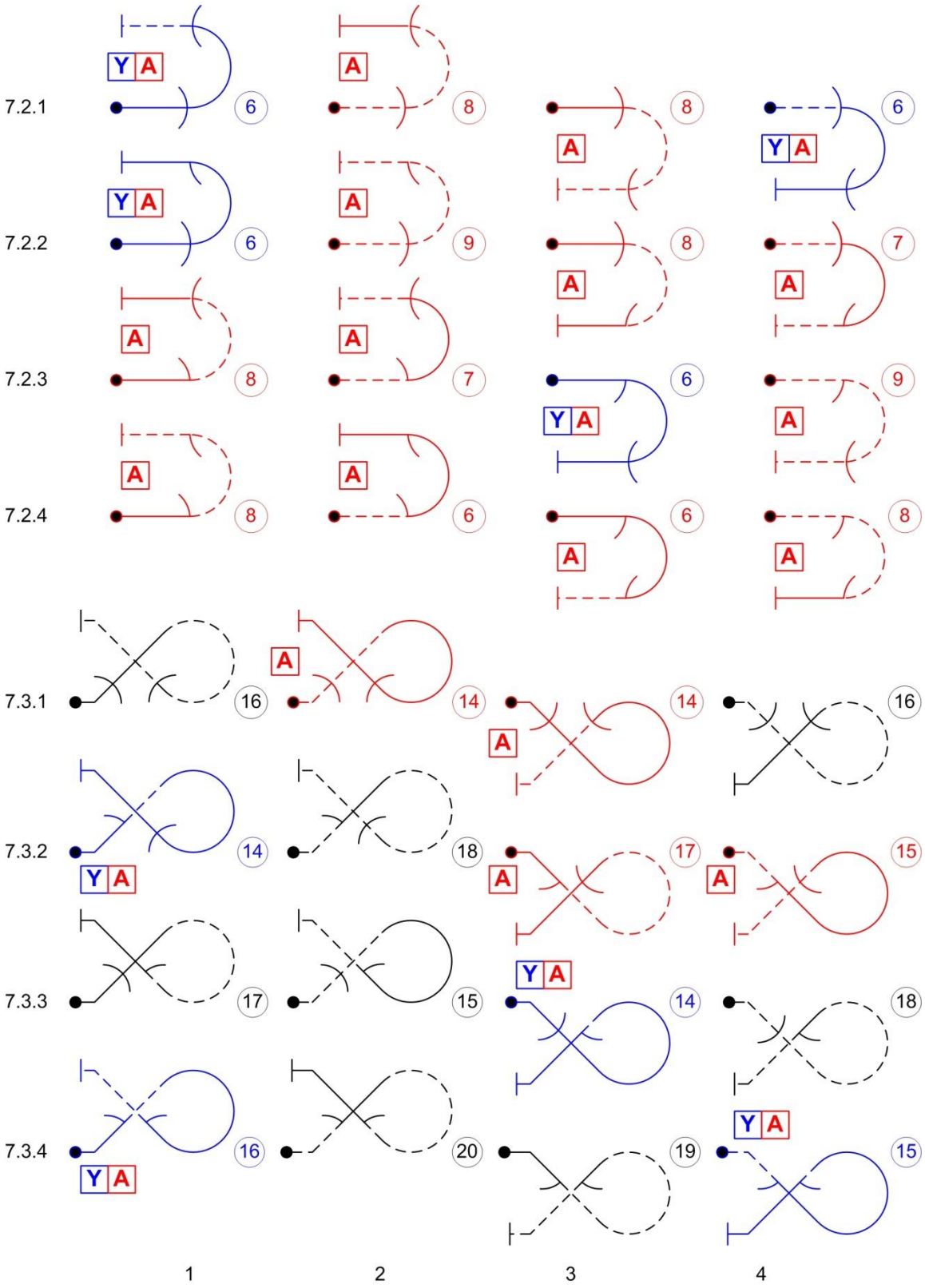
A.8.1.3. Unlimited: Combined total for all aileron roll elements on either or both the 45° and vertical up lines in Families 5.3.1 and 5.3.2 not to exceed 450° of rotation and 4 stops.

A.9. Family 6 Tail Slides



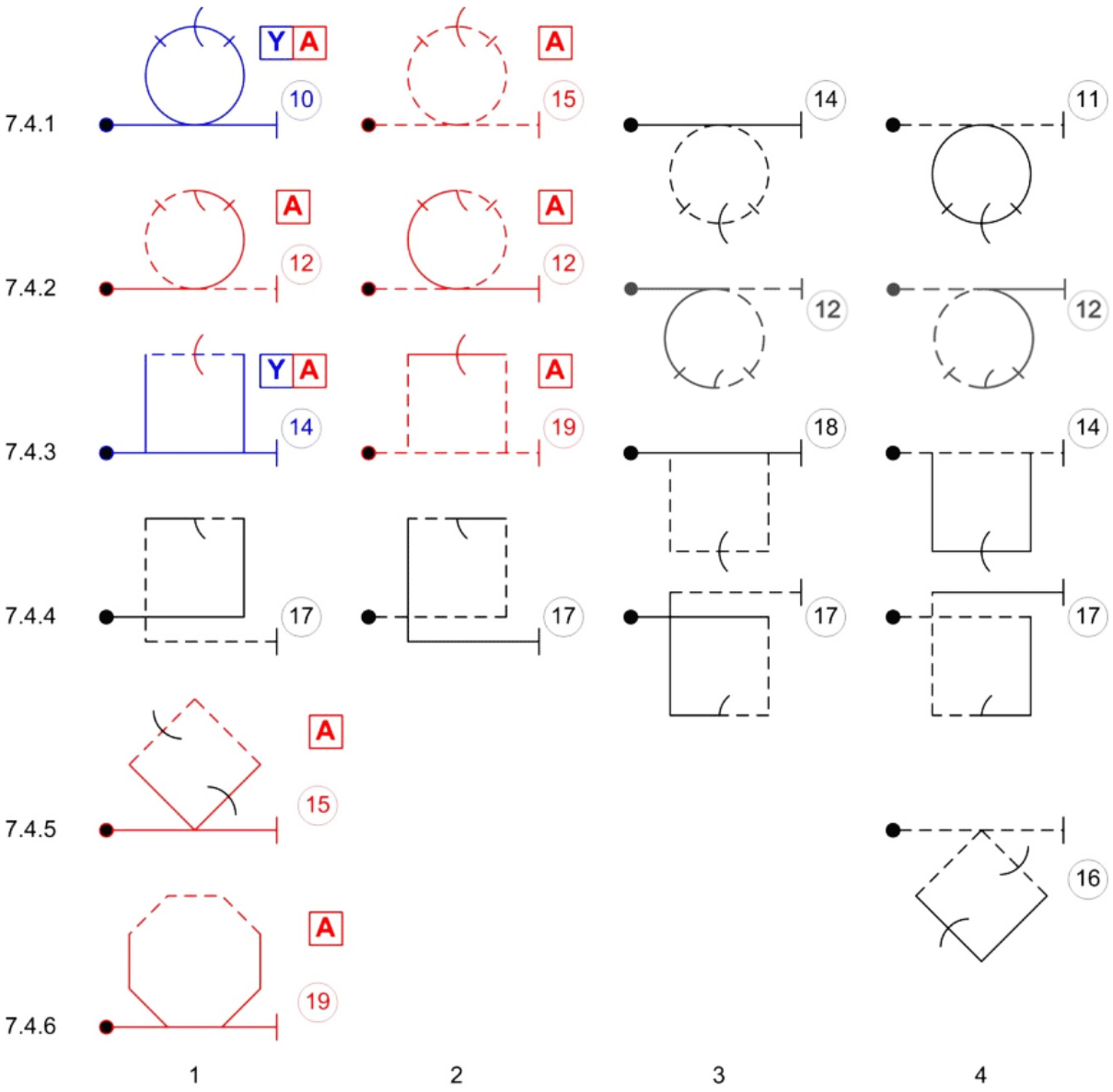
A.9.1.1. Advanced: No rolls permitted on the upward line. On the downward line 9.1.5.1, 9.1.5.2 or 9.1.5.3 are permitted.

A.10. Family 7.2.1 To 7.3.4



A.10.1.1. All Categories: No flick rolls permitted on the horizontal entry lines of figures in columns 1 and 2, nor on the horizontal exit lines of figures in columns 3 and 4, of 7.2.1 to 7.2.4.

A.11. Family 7.4.1 To 7.4.6



A.11.1.1. Advanced and Intermediate: Maximum 360° roll on 7.4.1.1. Only 9.1.3.4. allowed in 7.4.1.2.

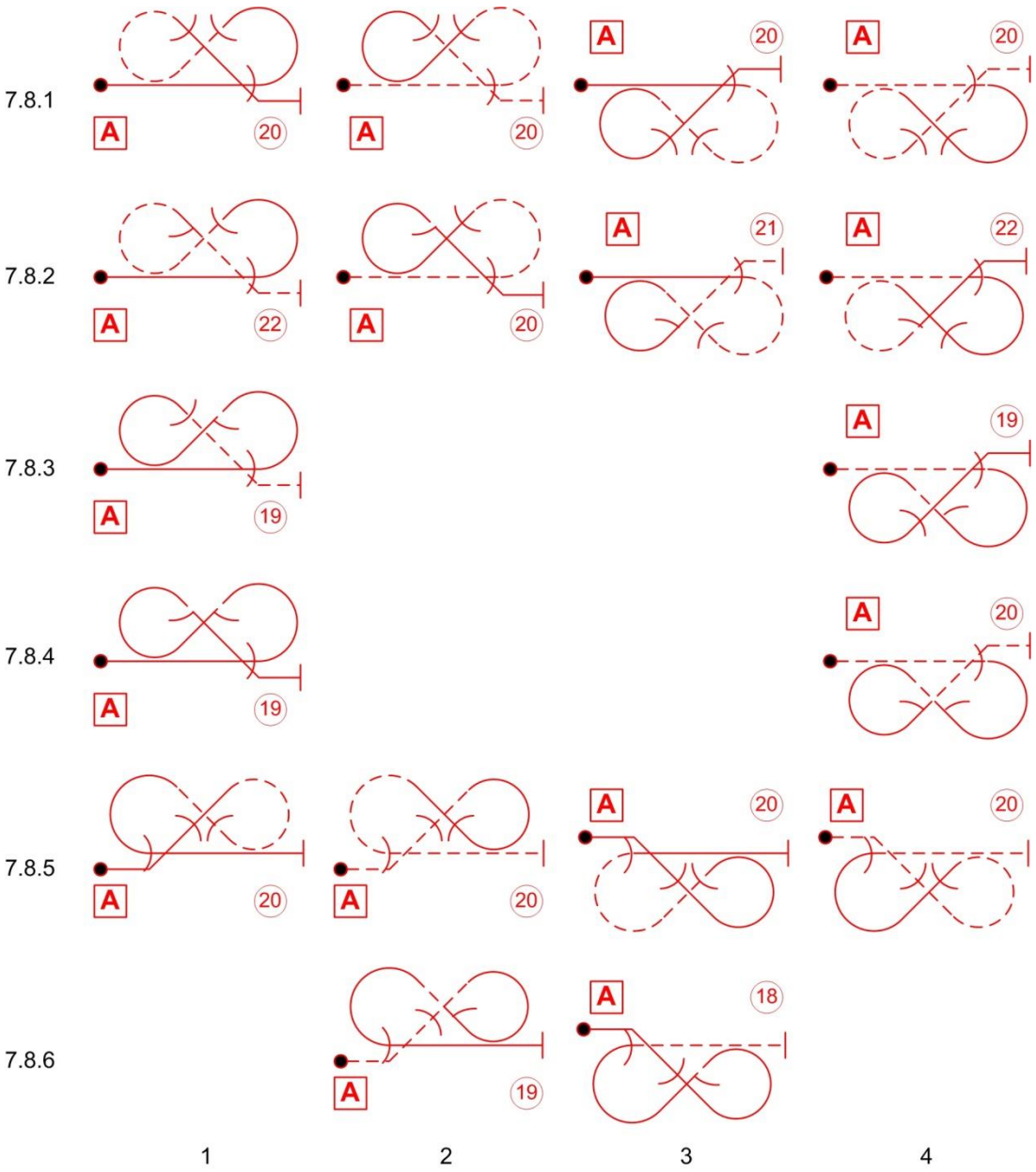
A.11.1.2. Advanced: No unlinked and opposite rolls permitted on 7.4.3.1 or 7.4.3.2. No rolls permitted on 7.4.5.1. Intermediate: No roll on 7.4.3.1.

A.11.1.3. Unlimited: No flick rolls permitted in Figures in columns 3 and 4 of 7.4.1 to 7.4.4, nor on the lower lines of any Figure in 7.4.5.

A.11.1.4. Unlimited: No unlinked and opposite rolls (ref A.2.2.2), nor combinations of flick roll and aileron roll (ref A.2.2.4), permitted on the 45° down lines of any Figure in 7.4.5.

A.11.1.5. Unlimited: Eight-point rolls (9.8.3.4) not permitted on 7.4.1.3 or 7.4.1.4.

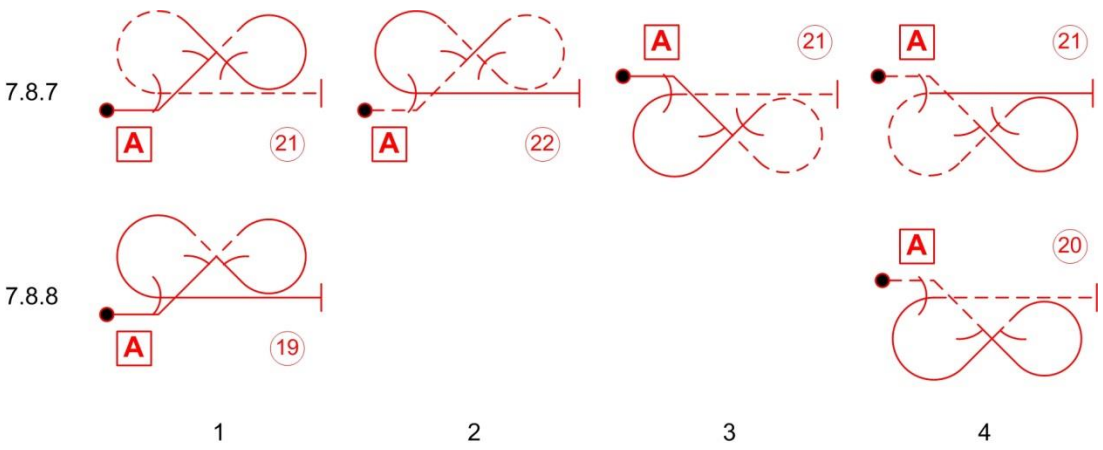
A.12. Family 7.8.1 To 7.8.6



A.12.1.1. All Categories: No flick rolls permitted on the horizontal entry lines of figures in columns 1 and 2, of 7.8.1 to 7.8.4.

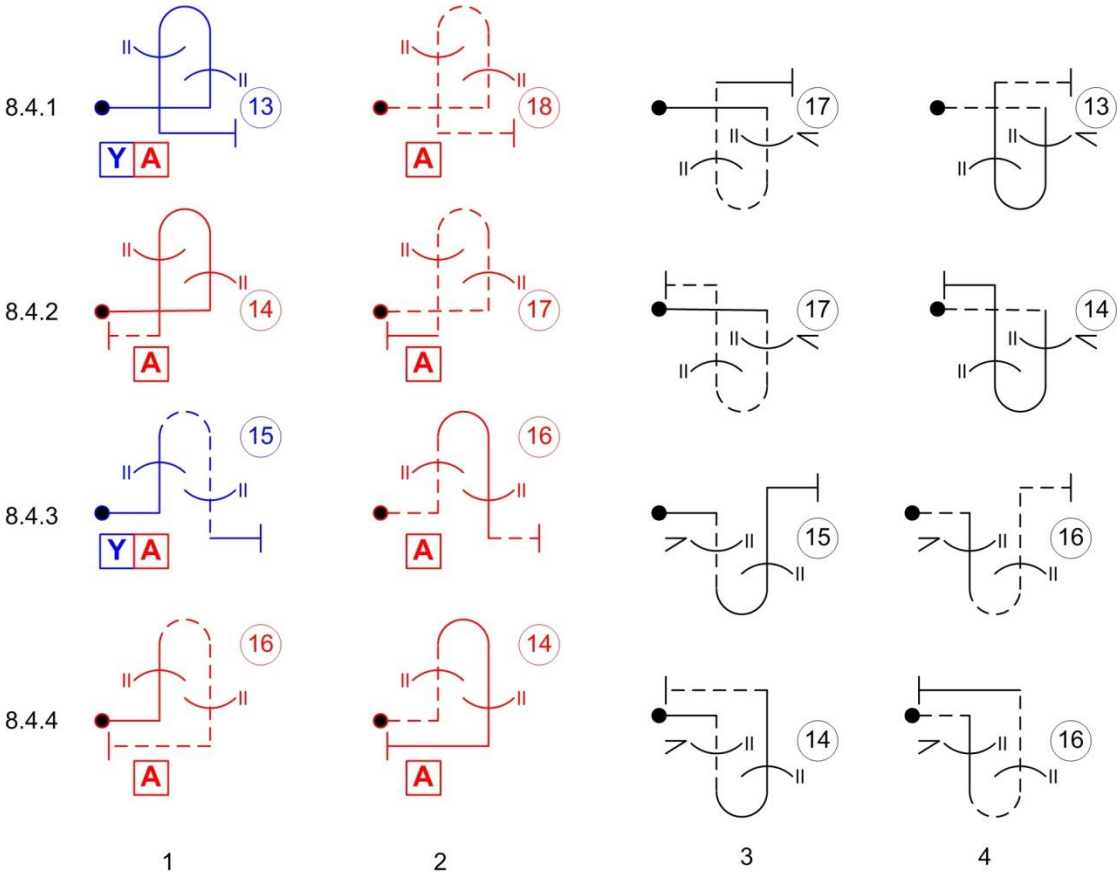
A.12.1.2. All Categories: No flick rolls permitted on the horizontal exit lines of figures in columns 1 and 2, of 7.8.5 and 7.8.6.

A.13. Family 7.8.7 To 7.8.8

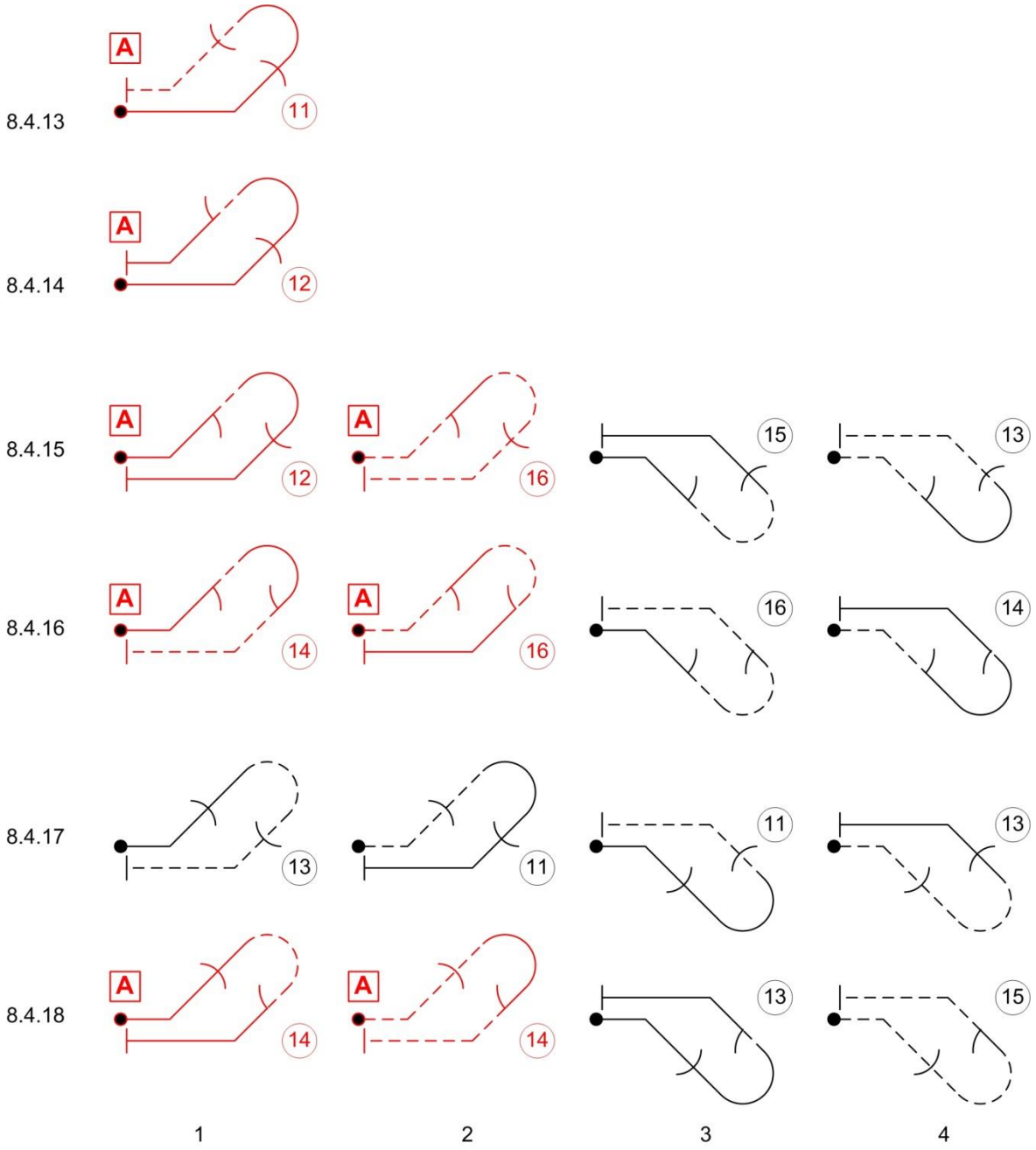


A.13.1.1. All Categories. No flick rolls permitted on the horizontal exit lines of figures in columns 1 and 2, of 7.8.7 and 7.8.8.

A.14. Family 8.4.1 To 8.4.4



A.15. Family 8.4.13 To 8.4.18

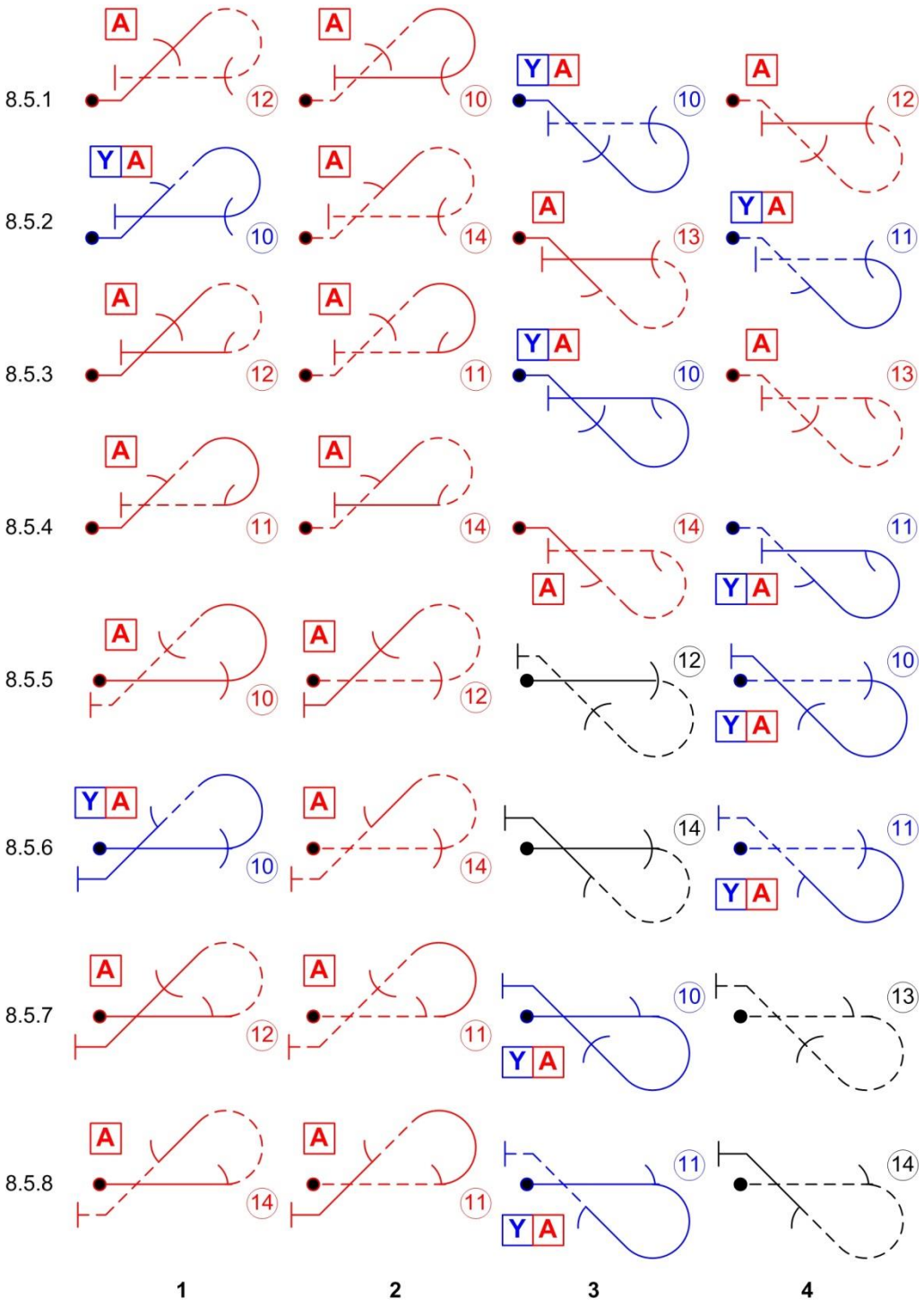


A.15.1.1. Advanced: No flick roll permitted on 8.4.13.1 or 8.4.14.1.

A.15.1.2. Advanced: No flick roll permitted on the 45° down line of 8.4.15 to 8.4.18.

A.15.1.3. Unlimited: No unlinked and opposite rolls (ref A.2.2.2), nor combinations of flick roll and aileron roll (ref A.2.2.4), permitted on the 45° down line of 8.4.15 to 8.4.18.

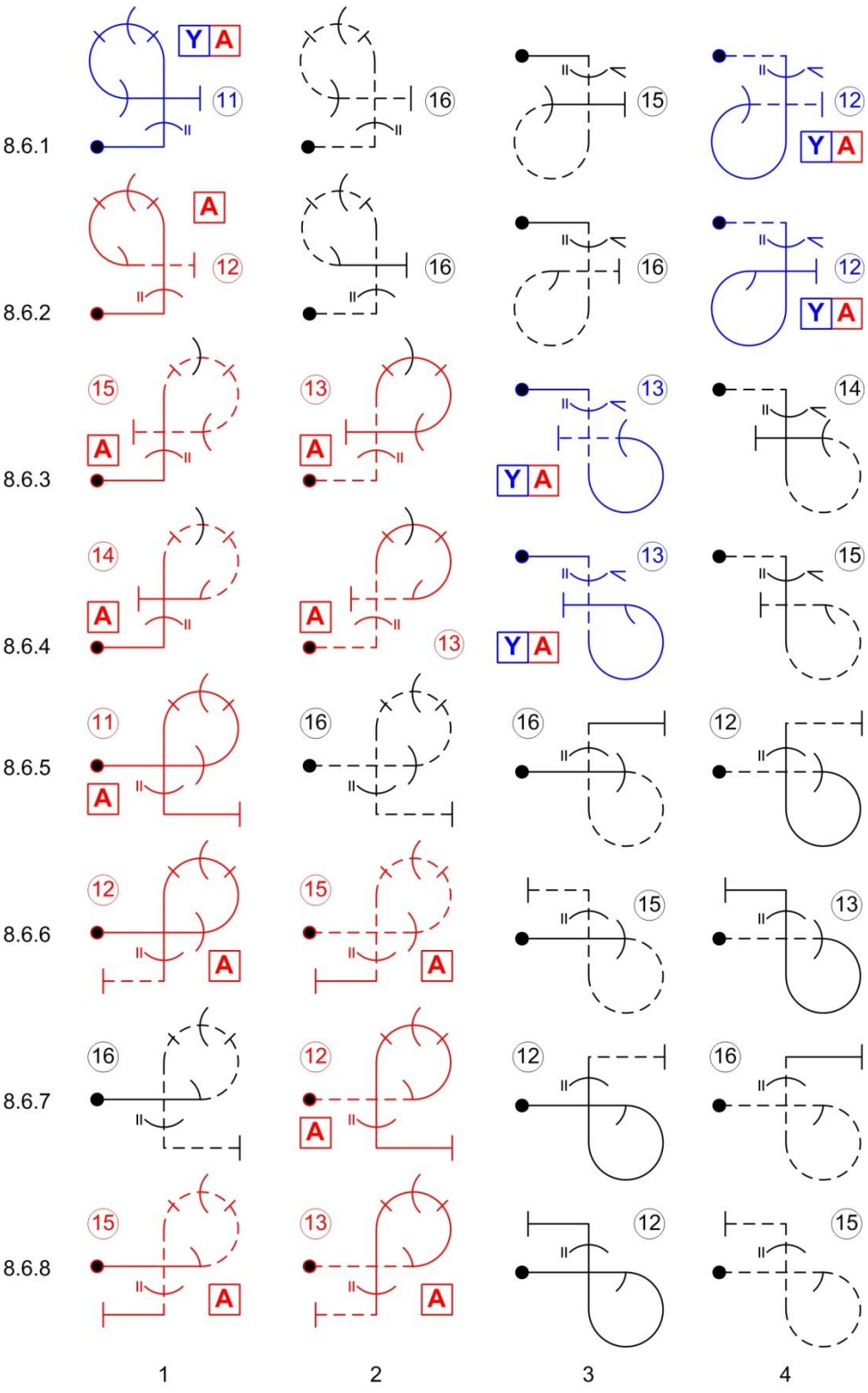
A.16. Family 8.5.1 To 8.5.8



A.16.1.1. Advanced: 9.2.4.4 not allowed on 45° line of 8.5.1.4 and 8.5.3.4.

A.16.1.2. All Categories: No flick rolls on horizontal entry / exit lines of any figure from columns 1 or 2.

A.17. Family 8.6.1 To 8.6.8



A.17.1.1. Intermediate: No vertical rolls; spin only on 8.6.3.3 and 8.6.4.3.

A.17.1.2. Advanced and Intermediate: From 8.6.1 to 8.6.4: No rolls in tops of ¾ looping segments in columns 1 and 2.

A.17.1.3. Advanced: From 8.6.1 to 8.6.4: Not more than ½ vertical roll up in column 1; no vertical roll up in column 2.

A.17.1.4. Unlimited: From 8.6.1 to 8.6.4: Flick rolls not permitted on the top of figures in columns 1 and 2 when preceded by a vertical roll exceeding 3 stops or more than 360 degrees of rotation.

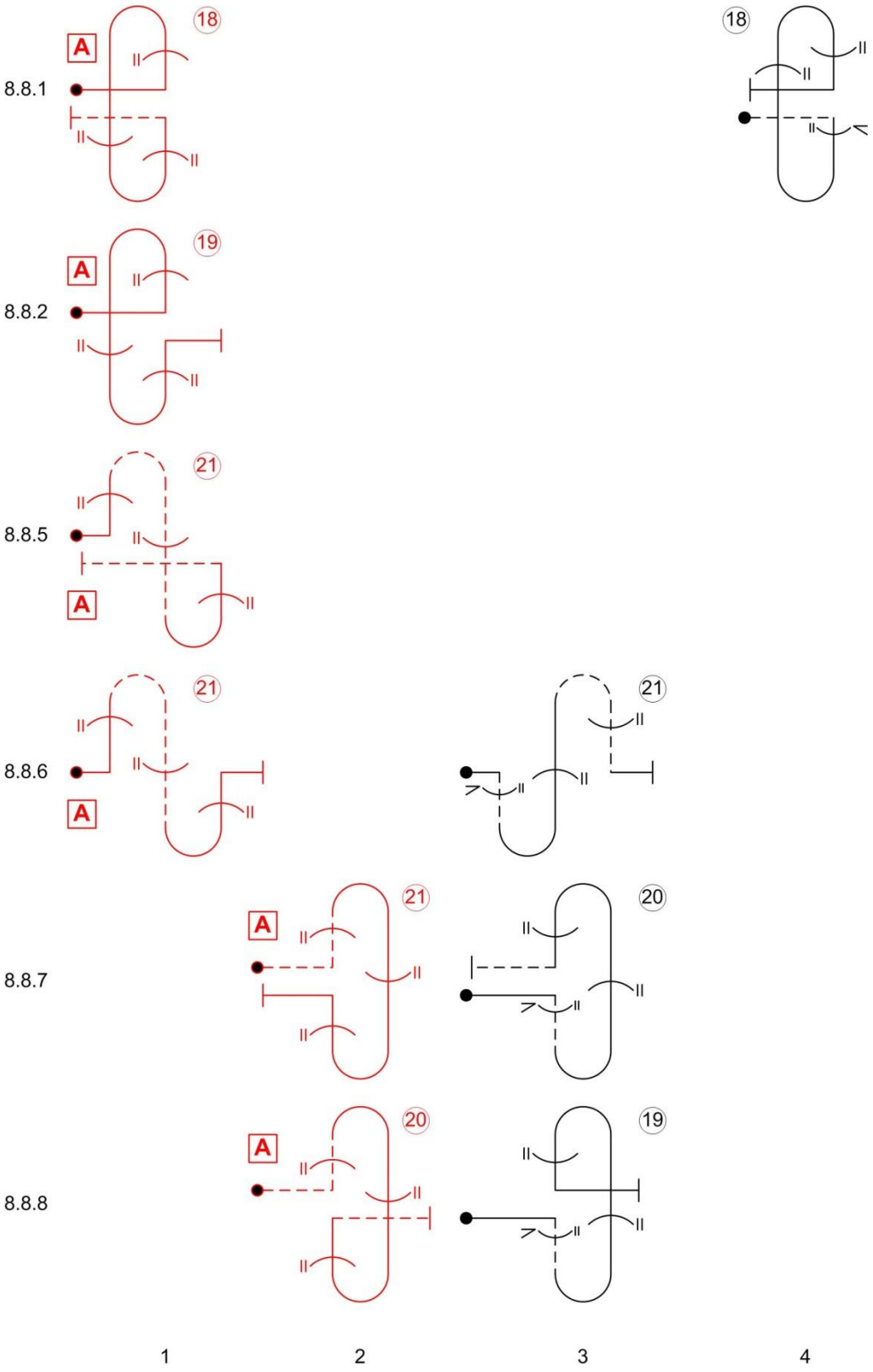
A.17.1.5. Advanced: From 8.6.5 to 8.6.8: No flick rolls on vertical down lines after a roll in the loop.

A.17.1.6. All Categories: No flick rolls on horizontal entry / exit lines of any figure from columns 1 or 2.

A.17.1.7. Unlimited: From 8.6.5 to 8.6.8: No flick rolls on vertical down lines after a hesitation roll in the loop.

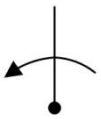
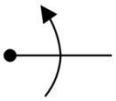
A.17.1.8. Advanced: From 8.6.5 to 8.6.8: Maximum 360° rotation at top of ¾ loop in columns 1 and 2.

A.18. Family 8.8



A.18.1.1. All categories: In Family 8.8, a maximum of one Family 9 element allowed on any vertical line.

A.19. Family 9.1, Continuous Rolls

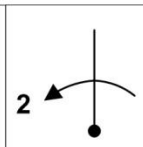
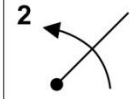
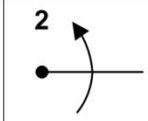
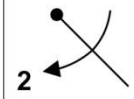
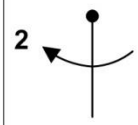
		¼	½	¾	1	1¼	1½	1¾	2
1		6 Y A	8 Y A	10 A	12	14			
2		4	6 Y A	8	10 Y A	11	12		
3		2 Y A	4 Y A	6 A	8 Y A	9	10 Y A	11	12 A
4		2	4 Y A	6	8 A		10		
5		2 Y A	4 A	6 A	8				
		1	2	3	4	5	6	7	8

A.19.1.1. Advanced:

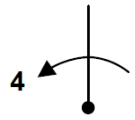
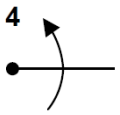
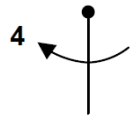
a) No level fly-off after 9.1.1.3.

b) No negative recovery after 9.1.5.3.

A.20. Family 9.2, Two-Point Rolls

					1		1½		2
1					13				
2					11 Y A		14		
3					9 Y A		12 Y A		15 A
4					9 A		12		
5					9				
		1	2	3	4	5	6	7	8

A.21. Family 9.4, Four-Point Rolls

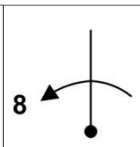
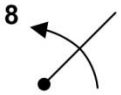
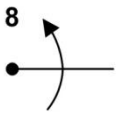
			½	¾	1		1½		2
1			9 A	12	15				
2			7 Y A	10	13 Y A				
3			5 Y A	8 A	11 Y A				
4			5 Y A	8	11				
5			5 A	8					
		1	2	3	4	5	6	7	8

A.21.1.1. Advanced:

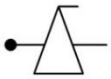
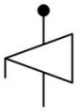
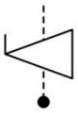
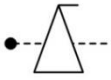
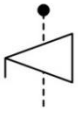
a) No level fly-off after 9.4.1.2.

b) No inverted recovery after 9.4.5.2.

A.22. Family 9.8, Eight-Point Rolls

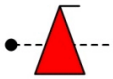
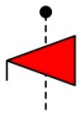
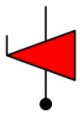
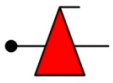
		¼	½		1		1½		2
1		7 Y A	11						
2		5	9 Y A						
3		3 Y A	7 Y A		15 A				
4		3	7						
5		3 Y A	7						
		1	2	3	4	5	6	7	8

A.23. Family 9.9, Positive Flick Rolls

			½	¾	1	1¼	1½	1¾	2
1			15	15	15				
2			13 Y A	13	13 A				
3			11 Y A	11	11 Y A		14 A		
4			11 A	11	11 A		14		
5			11 A	11 A	11				
6			17	17	17				
7			15	15	15				
8			13	13	13				
9			13	13	13				
10			13 A	13	13				
		1	2	3	4	5	6	7	8

A.23.1.1. ¾ positive flick rolls on non-vertical lines not permitted at any attitude when initiation or stop of the flick roll is to be performed with use of downward movement of rudder (lower pedal).

A.24. Family 9.10, Negative Flick Rolls

			½	¾	1	1¼	1½	1¾	2
1			17	17	17				
2			15	15	15				
3			13	13	13		16		
4			13	13	13				
5			13	13	13				
6			19	19	19				
7			17	17	17				
8			15	15	15				
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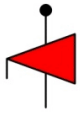
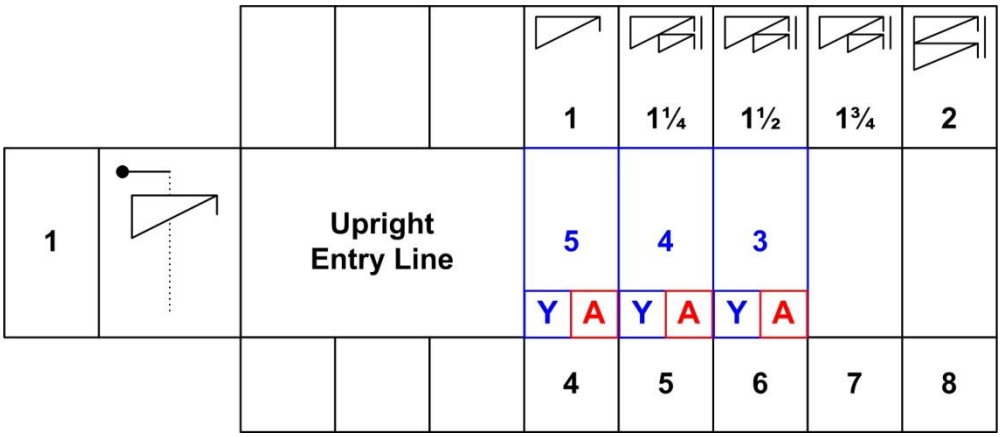
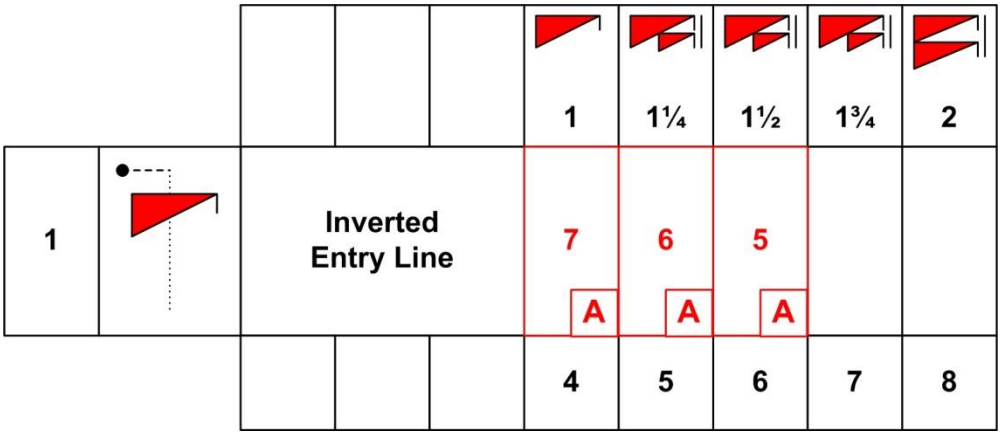
10			15	15	15				
		1	2	3	4	5	6	7	8

A.24.1.1. ¾ negative flick rolls on non-vertical lines not permitted at any attitude when initiation or stop of the flick roll is to be performed with use of downward movement of rudder (lower pedal).

A.25. Family 9.11, Upright Spins



A.26. Family 9.12, Inverted Spins



B. APPENDIX B: CRITERIA FOR JUDGING AEROBATIC FIGURES

B.1. Preface

B.1.1.1. The following is an expansion and clarification of the general principles for grading aerobatic figures stated in Rule 4.1.4. The final mark awarded to a figure has many facets, but the first and most important component in any mark is the geometry of the figure as compared to the true horizon and Aerobatic Box axes. Geometry is derived from two distinctly different entities: flight path and attitude.

B.2. 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:

B.2.1. Angle of Attack

B.2.1.1. The angle at which the wings of an aeroplane meet the relative airflow.

B.2.2. Angle of incidence

B.2.2.1. The angle at which the wing is attached to the aeroplane.

B.2.3. Figure

B.2.3.1. Each individual component of a sequence, which may comprise one or more manoeuvres in combination; it starts and ends with a horizontal line.

B.2.4. Manoeuvre

B.2.4.1. 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).

B.2.5. Score/Mark/Point

B.2.5.1. Marks are assigned (from 0 to 10) by judges and may be devalued by various point values. The score is calculated by multiplying the judges' marks by the coefficients (K factors) and adding the products.

B.3. Flight Path And Attitude

B.3.1. Flight Path

B.3.1.1. Think of the aircraft 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 centre of gravity. Judging the flight path or the track over the ground consists of comparing the observed path with fixed references such as the horizon or the main and secondary axes of the Aerobatic Box. (Figure 1)

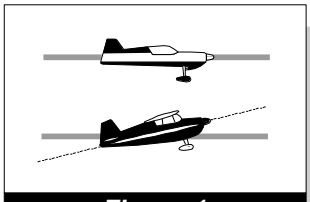


Figure 1

B.3.2. Vertical Attitude

B.3.2.1. 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 according to its zero-lift axis.

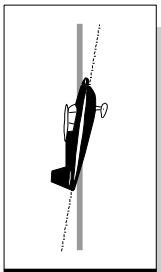


Figure 2

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.

B.3.2.2. 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)

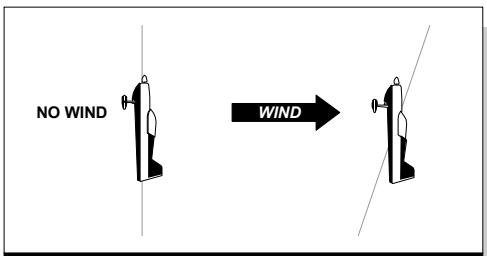


Figure 3

B.3.3. The 45 Degree Attitude

B.3.3.1. This is the vertical attitude plus or minus 45 degrees. In view of the difficulty in judging 45 degrees lines accurately, scoring deductions should be applied with care. When flown into the wind, a perfect 45 degrees line will appear to be steep while the opposite is true when flown downwind. (Figure 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 degrees 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).

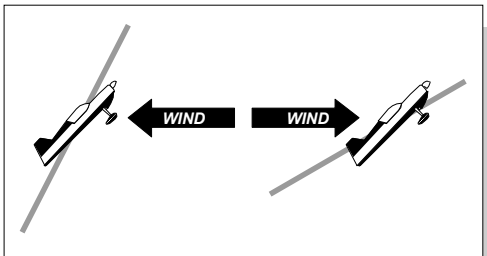


Figure 4

B.4. Grading

B.4.1.1. 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 criterion and higher marks are not to be given to "square, high-G" corners.

B.4.1.2. It should be assumed that a competitor is going to fly a perfect figure, so a Judge starts with a mark of ten (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 mark based on overall impression. The latter causes the judging to be erratic and inconsistent.

B.4.1.3. Should a competitor fly a figure at a location, inside or outside the performance zone, such that the accuracy of the flight path or attitude cannot reasonably be determined, a downgrade of two (2) points should be applied for each element of the figure that cannot be properly assessed.

B.5. Summary

B.5.1.1. Remember, it is the Judge's job to find fault: be a nit-picker. On the other hand, give a mark 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 marks in too narrow a range. If you watch carefully and mark 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 mark on an overall impression of a flight. Be ready to award a low mark for a poor figure even if you have been grading other figures flown by that competitor with 8's and 9's.

B.5.1.2. 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.

B.5.1.3. Finally, and most importantly, only mark 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.

B.6. Box Axes

B.6.1.1. Except in the Final Freestyle Programme, at the entry and exit of every figure the aircraft longitudinal axis must be exactly aligned with either the main or secondary axis of the Aerobatic Box. Any angular deviations visible to the judge must be downgraded by one (1) point per five (5) degrees.

B.6.1.2. Main axis directionality:

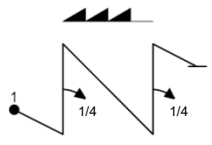
a) The main axis is parallel to the official wind. Any figure with entry and/or exit lines aligned on the main axis must be flown with such entry and/or exit lines as drawn on sequence Forms B or C (respectively R or L), into or away from the official wind, otherwise the figure will be marked Hard Zero (HZ).

b) Except for figures from Families 5 and 6: any line element within a figure, either straight, looping or turning, drawn on the main axis, must be flown in the direction drawn on sequence Forms B or C (respectively R or L), into or away from the official wind, otherwise the figure will be marked Hard Zero (HZ) (Figure 5).

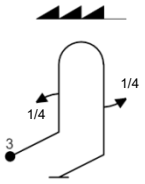
B.6.1.3. The secondary axis is non-directional, i.e. the pilot is free to choose direction on the secondary axis when transiting from the main to the secondary axis.

B.6.1.4. Any figure with both entry and exit lines aligned on the secondary axis must be drawn with parallel entry and exit lines.

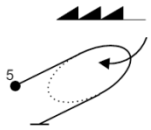
B.6.1.5. Any figure with both entry and exit lines aligned on the secondary axis must be flown with the exit direction relative to the entry direction as drawn on sequence Forms B or C (respectively R or L), i.e. in the same or the opposite direction, otherwise the figure will be marked Hard Zero (HZ) (Figure 5).



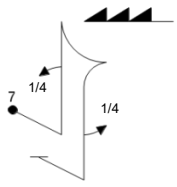
- 45° down: into wind
- Exit direction: same as entry



- Top half-loop: into wind
- Exit direction: opposite to entry



- Turn: into wind



- Tail slide can be started with canopy facing wind or opposite
- Exit direction: opposite to entry

Figure 5

B.7. Wind Correction

B.7.1.1. There are two kinds of wind correction: correction for figure geometry (shape) and correction for Aerobatic Box positioning.

B.7.1.2. 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 marks for the roundness of the flight path. Any deviation from perfect roundness must result in a reduction of the score for that figure.

B.7.1.3. The competitor is also required to keep the aircraft within the Aerobatic Box. This becomes more of a problem when a wind is blowing at an angle to the X axis. (Figure 6) 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.

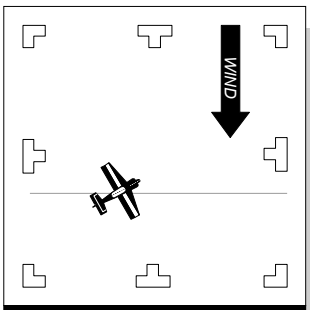


Figure 6

B.7.1.4. A well-designed sequence will include at least one, and preferably more, wind corrector figures. Not every sequence contains sufficient (or any) wind corrector figures, however, in this case, it is up to the competitor to keep the aircraft within the Aerobatic Box without benefit of a specific Y axis figure to accomplish it.

B.7.1.5. A common flight mode is to crab into the wind as is done in navigational flight. (see Figure 6) Crabbing means that the aircraft's longitudinal axis is at an angle to the track over the ground. The downside to this approach is that if the aircraft longitudinal axis is detected by the Judge to be at an angle to the competition axis (main or secondary), a deduction of one (1) point per five (5) degrees will be given.

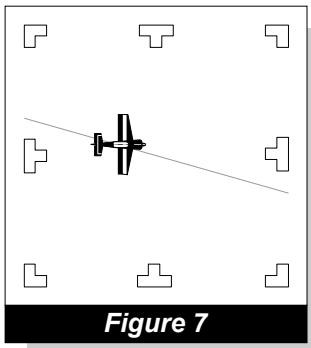


Figure 7

B.7.1.6. It is possible for the competitor to correct for wind in such a manner that the aircraft longitudinal axis remains true to the correct geometry of the figure, but the flight path has a modified sideways component. Even if it is plainly evident that the aircraft has moved laterally within the Aerobatic Box, if there is no deviation in the aircraft longitudinal axis or bank angle visible to the Judge then no deduction shall be made (see Figure 7).

B.8. The Two Basic Components of Aerobatic Construction: Lines and Loops

B.8.1. Lines

B.8.1.1. All lines are judged in relation to the true horizon and the Aerobatic Box axes. Horizontal lines in the vertical plane are judged on flight path, not attitude. Different aircraft at different airspeeds will employ different attitudes to maintain a horizontal flight path. (Figure 1) While maintaining a horizontal flight path, the aircraft's longitudinal axis must remain parallel to the main or secondary axis. The deduction for deviation in either axis is one (1) point per five (5) degrees from the correct geometry.

B.8.1.2. All figures begin and end on definite horizontal lines, and both must be present in order to earn a good mark. 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 8)

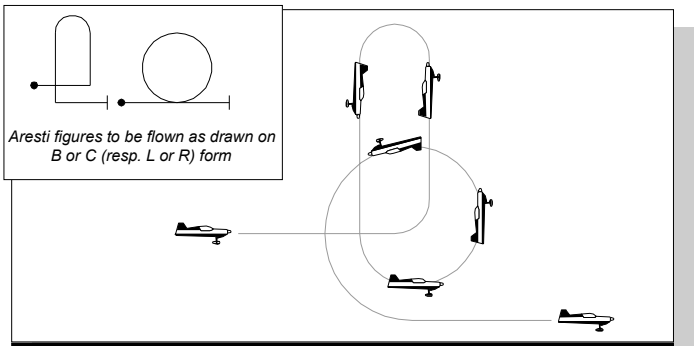


Figure 8

B.8.1.3. 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 9) 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. However, the corresponding attitude of vertical and 45 degrees lines must be maintained long enough to allow judges to observe the angle and determine any deviations from the prescribed attitude. Varying the attitude whilst flying a vertical or 45 degrees line must be downgraded by at least one (1) point per line. The same applies to deviations from a horizontal flightpath when judging horizontal lines. It is imperative that the judges become familiar with the specific criterion for the length of lines for each figure. For example, the lines in a "Humpty-bump" do not need to be of equal length, but all four lines in a "Square loop" must be of equal length. (Figure 10)

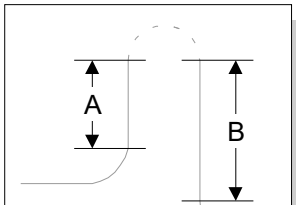


Figure 9

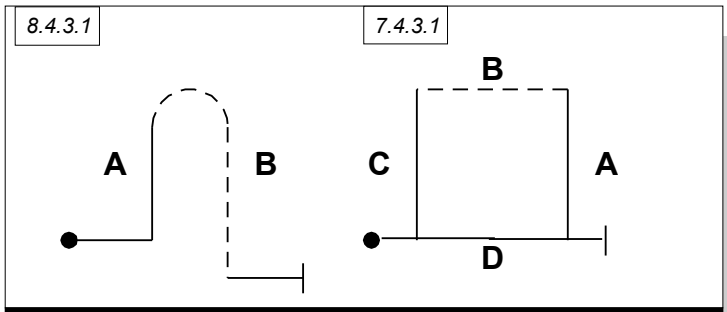


Figure 10

B.8.1.4. 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.

B.8.1.5. If within a figure two or more lines must be of the same length, the basis for judging line length is the first line flown. An observed variation is penalised by reducing the mark in the following manner: (Figures 11 & 12)

a) a visible variation – one (1) point deduction

b) if the lengths vary by 1:2 – two (2) points deduction

c) and so forth up to a three (3) points deduction

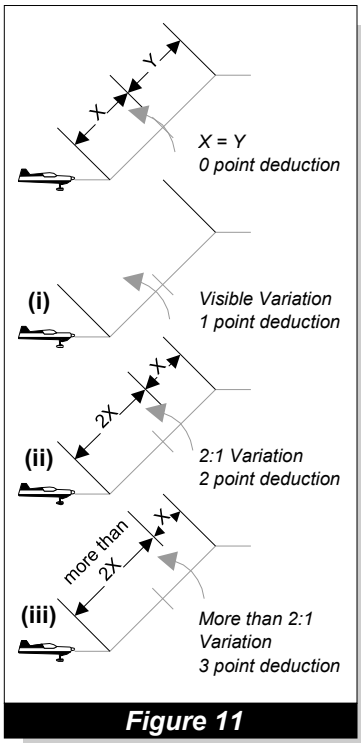


Figure 11

d) No line before OR after roll – four (4) points deduction

e) No line before AND after roll – two (2)points deduction only

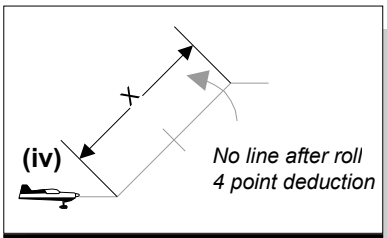


Figure 12

B.8.1.6. All 90 degree and 45 degrees 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 its 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 degrees lines can only be based on attitude, not flight path.

B.8.2. Loops and Part Loops

B.8.2.1. The loop is a figure from Family 7, but part-loops are integral to every other family so it is necessary to define some key elements before considering 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. 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.

b) Part-loops are depicted either as round elements or as ‘corner’ angles. It should be noted that any ‘corner’ angle drawn in the pictograms, such as in Figure 13, is always to be flown as a part-loop and must have a smooth, distinct and constant radius.

c) For any one figure having several internal part-loops depicted as round elements, all such part-loops shall have the same radius – with exception for all of Family 8.8 figures (double humpty bumps) for which the radius of the second part loop is not required to match the radius of the first one.

d) The radius of any part-loop depicted as a corner angle is not required to match the radius of any other part-loop in the same figure – with exception for all of Family 3 (combinations of lines) and Family 7.4 (whole loops) figures, which must keep a regular geometrical shape and therefore require all part-loops to have the same radius.

B.9. Aresti System (Condensed) Families

B.9.1. Family 1 - Lines and Angles

B.9.1.1. Family 1.1 has been fully covered in the preceding section. Note that the figures in Family 1.2 and 1.3 are NOT performed as drawn in the Catalogue. (Figure 13)

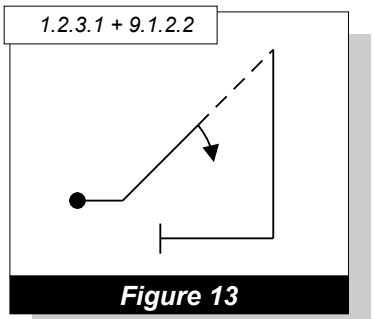


Figure 13

B.9.1.2. In each of these figures there are three (four in Family 1.3) looping components: e.g. a one-eighth loop, a three-eighths loop and a quarter loop. Rolls may be performed on the 45 degrees line and/or the 90 degrees 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.

B.9.1.3. Figure 14 shows Family 1.2.1 to 1.2.8 as flown. Radii a, b, and c may all be different and entrance altitude “A” can be different from exit altitude “B”.

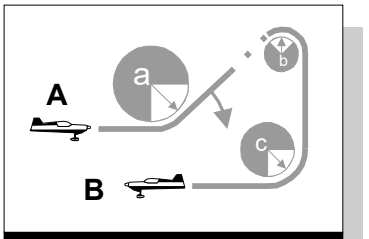


Figure 14

B.9.2. Family 2.1.1, 2.2.1, 2.3.1, 2.4.1 - Turns

B.9.2.1. Competition turns (Figure 15) are not to be confused with standard coordinated turns. In aerobatic competition, a turn is divided into three parts:

a) establishing the bank using a roll on heading;

b) the turn itself; and

c) a roll back to straight and level flight on heading.

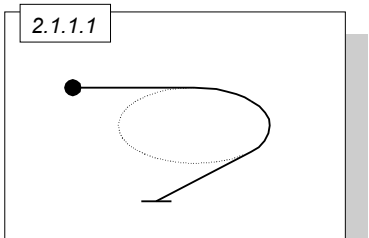


Figure 15

B.9.2.2. 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.

B.9.2.3. 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 degrees turn will not appear as a perfect circle.

B.9.2.4. 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.

B.9.2.5. Downgrades:

a) 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.

b) The angle of bank, once established, must remain constant. Any deviation is a one (1) point deduction for every five (5) degrees of deviation.

c) 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.

d) 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 one (1) point for every 100 feet.

e) The rate of turn must remain constant. Any change would be no more than a 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.

f) 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.

B.9.3. Family 2 Other Figures - Rolling Turns

B.9.3.1. The rolling turn (Figure 16) combines a level turn of a prescribed amount with a roll or rolls evenly integrated throughout the turn. The term “evenly integrated” means that from start to finish the figure should display a constant rate of turn combined with a constant rate of roll.

B.9.3.2. As seen from the ground, rolls in the same direction as the turn are referred to as “rolls in” or "rolling inwards". Rolls in the opposite direction to the turn are described as “rolls out” or "rolling outwards".

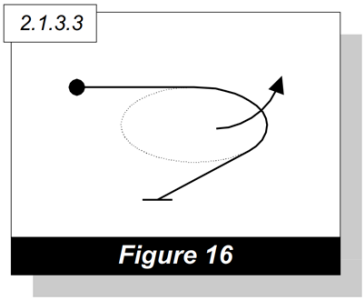


Figure 16

B.9.3.3. Between the start and end of a rolling turn one or more intermediate points occur when the aircraft wings are momentarily either vertical or horizontal.

Examples are shown Figure 17.

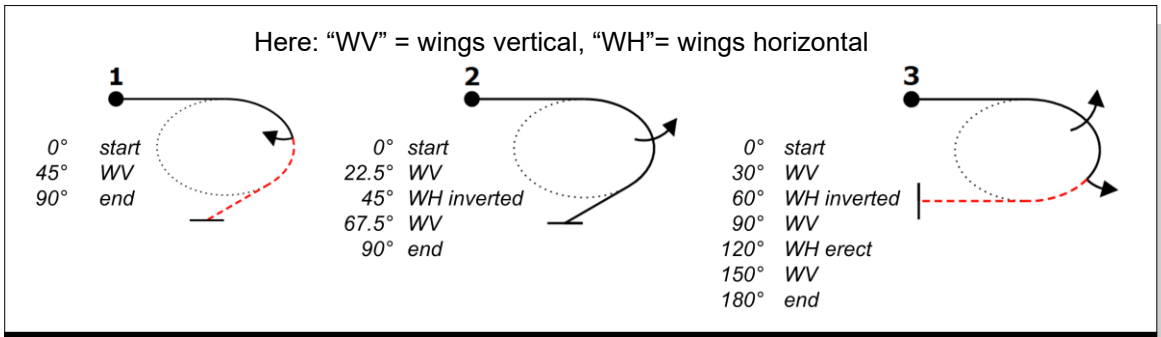


Figure 17

B.9.3.4. When a rolling turn has rolls of alternating directions, the aircraft must change the direction of roll with the wings level. At this point the roll should reverse direction with only a short pause; a longer pause must be downgraded.

B.9.3.5. For example, imagine an aircraft performing a 180 degrees rolling turn with 1 roll inwards and one roll outwards from upright (Aresti 2.2.6.1):

a) The figure starts in horizontal flight with the wings level and the aircraft longitudinal axis aligned with the prescribed box axis.

b) The pilot simultaneously initiates the turn and commences the roll in the same direction as the turn.

c) The judge should expect the aircraft wings to be vertical or horizontal at precisely each intermediate point in the turn.

d) Throughout the figure the judge should note any detectable variations in the rate of roll, the rate of turn and the horizontal flight path.

e) The roll direction should be reversed from inwards to outwards with only a short pause when the turn angle reaches 90 degrees. The rate of roll before and after the reversal should remain constant.

f) The turn is not wind corrected and for this reason may not follow a circular flight path.

g) The figure ends when the aircraft longitudinal axis reaches alignment with the prescribed box axis, with the flight path horizontal at the moment the wings become level.

B.9.3.6. Downgrades:

a) The aircraft must commence the figure with the wings level, in horizontal flight and with the longitudinal axis aligned with the correct box axis. Errors are deducted using one (1) point for every five (5) degrees.

b) Each variation from the required horizontal flight path is deducted using one (1) point for every five (5) degrees upwards or downwards.

c) Each variation in the rate of turn is no more than a one (1) point deduction. Each stoppage of the rate of turn is a deduction of two (2) points.

d) Each variation in the rate of roll is no more than a one (1) point deduction. Each stoppage of the rate of roll is a deduction of two (2) points.

e) At a roll direction reversal there must be only a short pause, with the wings level. A longer pause is no more than a one (1) point deduction. Errors in the roll angle from wings level are deducted using one (1) point for every five (5) degrees.

f) Each time the wings are vertical or horizontal, a deviation between the aircraft axis and the correct amount of turn at this point is a deduction of no more than one (1) point.

g) All rolls in a rolling turn are aileron or slow rolls. If a flick roll is performed, the figure is graded Hard Zero (HZ).

h) Performing more or fewer rolls than the catalogue stipulates or incorrectly rolling either inwards or outwards must be graded Hard Zero (HZ).

i) The figure is completed when the aircraft stops rolling, or its longitudinal axis reaches the prescribed box axis. Errors when the exit point is reached are penalised as follows:

   i) Where the turn angle is less or more than required and/or the flight path is above or below horizontal the deduction is one (1) point per five (5) degrees.

   ii) Where continued rolling is seen to bring the wings level after the turn is completed the following deduction should be applied:
   - Per five (5) degrees of roll executed: one (1) point
   - 90 degree or more of roll executed: Hard Zero (HZ).

B.9.4. Family 3 - Combinations of Lines

B.9.4.1. The transition from level flight to 45 degrees lines should be at a constant and reasonable 1/8 looping radius. All lines within the figure should be equal in length. All part-loops in Family 3 shall have the same radius (in Figure 18, radii a).

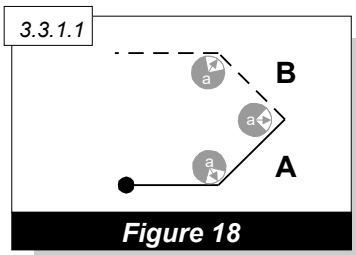


Figure 18

B.9.5. Family 5 - Stall Turns

B.9.5.1. In its most basic form (Figure 19), the stall turn 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.

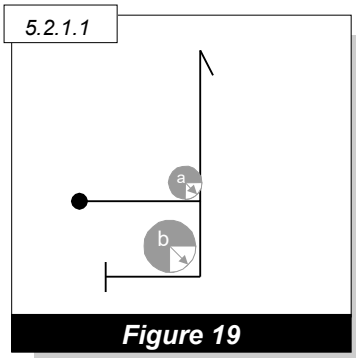


Figure 19

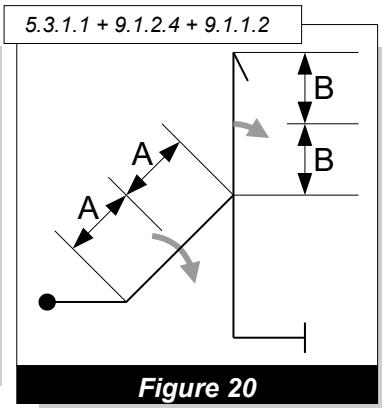


Figure 20

B.9.5.2. The judging criteria are:

a) Vertical and 45 degrees attitudes must comply with Appendix B.3. Any deviation will result in a deduction of one (1) point per (5) degrees of error.

b) Any rolls must be centred on their underlying lines (Figure 20). For deductions see B.8.1.5.

c) The lines may all be of different lengths.

d) 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 "dragging a wing".

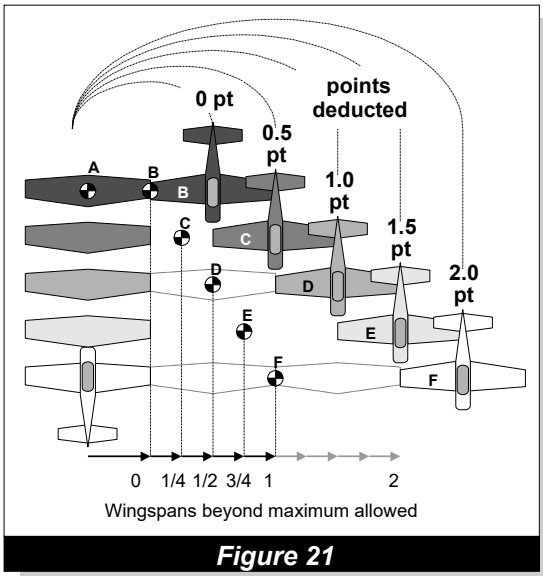


Figure 21

e) 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 centre of gravity. To avoid a deduction, the aircraft must pivot around an axis point which cannot not be farther away from its centre of gravity than its wingtips (1/2 wingspan, Pivot Point Range from A to B, Figure 21). 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 21).

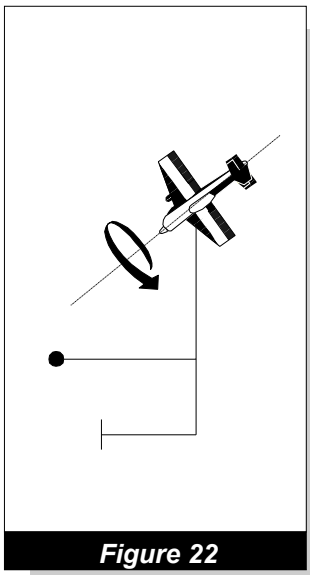


Figure 22

f) The rate at which the aircraft pivots around its vertical axis is not a judging criterion.

g) 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 roll axis, often referred to as "torquing" (Figure 22), there is a deduction of one (1) point for each five (5) degrees off axis.

B.9.6. Family 6 - Tail slides

B.9.6.1. All the criteria of the Hammerhead 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 mark is downgraded by four (4) points. 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.

B.9.6.2. 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.

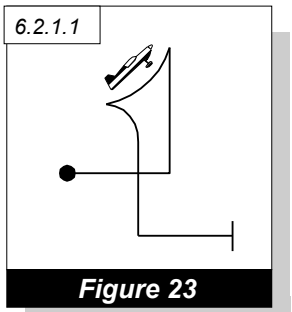


Figure 23

B.9.6.3. There are two types of tail slides: wheels-down (also called "canopy-up") and wheels up (also called "canopy-down"). The wheels-down tail slide is depicted in the Aresti diagram with a curved solid line at the top of the tail slide symbol. (Figure 23) The wheels-up tail slide is depicted in the Aresti diagram with a curved dashed line at the top of the tail slide symbol. (Figure 24)

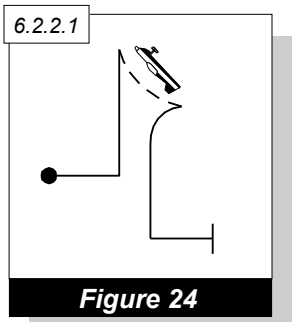


Figure 24

B.9.6.4. This figure must be watched carefully, as the aircraft can fall the wrong way, which is marked a Hard Zero (HZ), 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. Also watch for "cheating" on the vertical line up in the direction of the slide just prior to sliding (Figure 25). Any "cheating" on the up line will most likely carry over into the backwards slide as well. Because the slide backwards must also be perfectly vertical, a second deduction would be taken if this deviation from vertical is visible. 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.

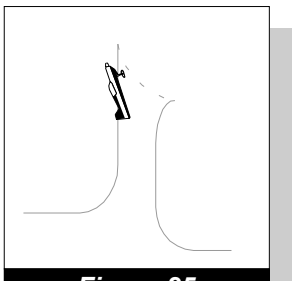


Figure 25

B.9.6.5. 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 down line, the aircraft must attain a vertical attitude and establish a down line before starting the roll(s).

B.9.6.6. 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 degrees down line before transitioning into horizontal flight with a quarter loop of reasonable and constant radius.

B.9.7. Family 7 - Loops, S's, and Eights

B.9.7.1. The size of a loop is not a grading criterion. It will vary according to the flight characteristics of the aircraft. A large loop is not marked any higher or lower than a small loop. But any variation to the radius will downgrade these figures.

B.9.8. Family 7.2 - Half-Loops With Rolls

B.9.8.1. 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).

B.9.8.2. When a half-loop is preceded by a roll or rolls: 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. The half-loop follows immediately after the rolls without any visible line. Drawing a line requires a downgrade of:

a) One (1) point for a short but visible line;

b) Two (2) points for a more obvious line of length up to half the looping radius;

c) Three (3) points for a longer line with length up to the full looping radius;

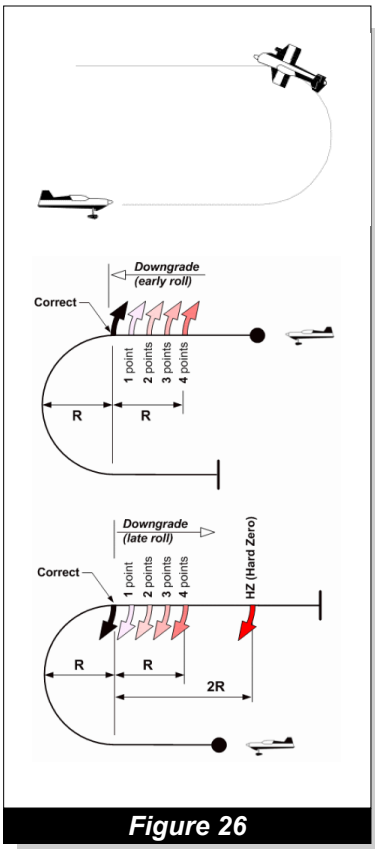


Figure 26

d) Finally, four (4) points when the length of line exceeds the radius of the looping element.

e) <u>If the visible line between wings levelled at the end of the half loop and the roll is started is greater than 2R then the figure must receive a mark of HZ, giving the reason 'Wrong figure, roll element missing (describe missing roll e.g. 2x4). If the roll element is subsequently flown to complete the figure, then this must be penalised as an insertion, as it gains the pilot an advantage by putting them back in the correct place to continue without taking a penalised break.</u>

B.9.8.3. The half-loop followed by a roll is also flown with no line between the half-loop and roll. Again, drawing a line requires same downgrades as described in B.9.8.2. 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 26)

B.9.8.4. The foregoing principles for downgrading unwanted lines between rolls and looping segments must be applied in the same manner when rolls are placed adjacent to looping segments in the following families of figures:

Family 7.4	Reversing whole loops
Family 7.5	Horizontal and vertical S's
Family 7.8	Horizontal and vertical 8's
Family 8.5	Half Cuban eights
Family 8.6	P-loops and reversing P-loops
Family 8.7	Q loops
Family 8.10	Reversing 1¼ loops

B.9.9. Family 7.3 - Three Quarter Loops

B.9.9.1. Sometimes referred to as "Goldfish", none of the part-loops in these figures are required to be of the same size. Entry and exit lines are judged with reference to the 45 degrees attitude, not flight path. Any rolls on the 45 degrees lines must be centred on that line. The lengths of the two 45 degrees lines may be different, and the entry and exit altitudes need not correspond to the altitude limits of the loop. (Figure 27)

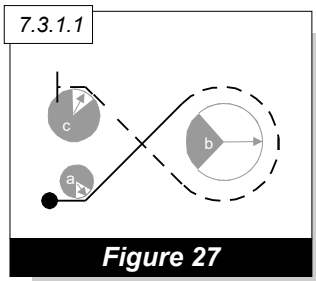


Figure 27

B.9.10. Family 7.4.1 - 7.4.2 - Full Loops

B.9.10.1. 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 28)

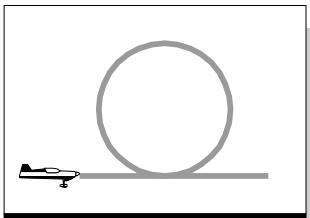


Figure 28

B.9.10.2. 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.

B.9.10.3. If there is a roll or rolls at the apex of the loop, it must be centred 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 centred, it must be downgraded one (1) point for every five (5) degrees of the arc that it is off centred.

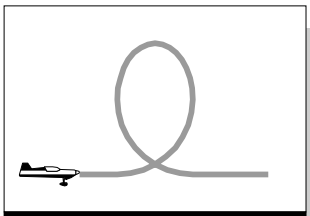


Figure 29

B.9.10.4. To better quantify deductions for irregularity of the radius of looping figures, the Judge divides the loop into quadrants. Any recognizable variation in the radius must be downgraded by a maximum of two (2) points per quadrant depending on the magnitude of the variation.

B.9.10.5. 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 "L" shaped loop. (Figure 29) Less common are loops with a horizontal diameter greater than the vertical. This is called an egg-shaped or pumpkin-shaped loop. (Figure 30) Another common error is in varying the radius of the final quadrant performing an "e" shaped loop. (Figure 31)

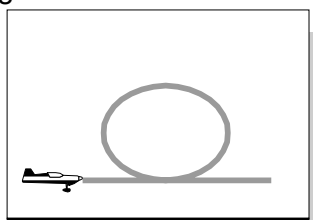


Figure 30

B.9.11. Family 7.4.3 - 7.4.6 - Square, Diamond and Octagonal Loops

B.9.11.1. 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.

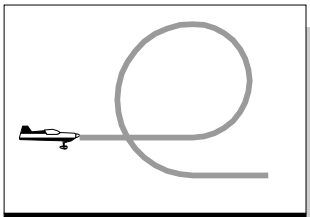


Figure 31

5.7.2.2. In Figure 32:

a) Radii are all equal (a)

b) Line Length A = B = C = D

c) Figure is not complete until D = A

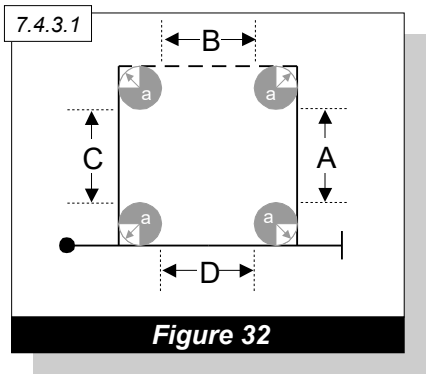


Figure 32

B.9.11.2. Where rolls are flown on the Square or Diamond loops, they must be centred on the line.

B.9.11.3. 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.

B.9.12. Family 7.4.7 - 7.4.14 - Reversing Whole Loops

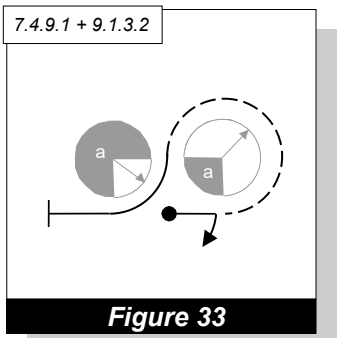


Figure 33

B.9.12.1. A reversing whole loop is a loop in which one quarter changes direction. As in half loops, rolling elements may be added on entry and exit lines (Figure 33).

B.9.12.2. Judging criteria for roundness are the same as for round loops (see B.9.10): the reversing loop must be wind corrected with all partial loops having the same radii; the figure must begin and end at the same altitude.

B.9.12.3. The reversing loop must be a continuous looping figure with no line at the point where the pitch direction changes. Adding a line between the two partial loops is at least a two (2) point deduction depending on the length of the line.

B.9.12.4. Criteria for rolls on entry line and exit line are the same as for half loops (see B.9.8).

B.9.12.5. Criteria for rolls at the apex of the loop are the same as for round loops (see B.9.10).

B.9.13. Family 7.5.1 - 7.5.8 - Horizontal S

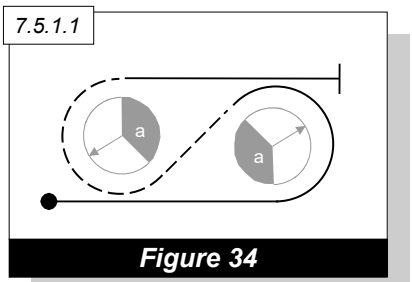


Figure 34

B.9.13.1. Both 5/8 loops must be of the same size (Figure 34) and the line between them flown at exactly 45 degrees attitude. Extremities of the looping segments must be at the same altitude as the entry and exit lines.

B.9.13.2. Criteria for rolls on entry line and exit line are the same as for half loops (see B.9.8).

B.9.13.3. Rolls may be performed on the 45 degrees line, with the part-lines before and after the roll being of equal length.

B.9.14. Family 7.5.9 - 7.5.10 - Vertical S's

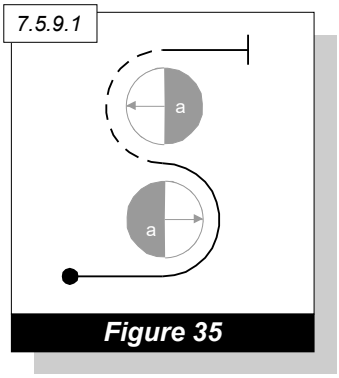


Figure 35

B.9.14.1. These figures are accomplished with two joined half-loops flown in opposite directions. Look for both half-loops to be the same size and perfectly round (Figure 35).

B.9.14.2. When there is no roll between the half-loops (figures 7.5.9.x), the half-loops must be a continuous looping figure. Adding a line at this point is at least a two (2) point deduction depending on the length of the line.

B.9.14.3. When a half-roll is performed between the half-loops (figures 7.5.10.x), there is no line before or after the half-roll. However, the half-roll is flown on a horizontal line which begins as soon as the first half-loop is finished. As soon as the half-roll is finished, the next half-loop must begin immediately.

B.9.14.4. In these figures, criteria for transition between the first half-loop and the half-roll, and for transition between the half-roll and the second half-loop, are the same as for half loops (see B.9.8).

B.9.15. Family 7.8.1 - 7.8.8 - Horizontal 8's

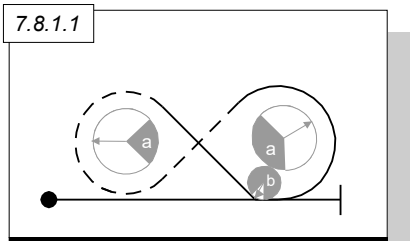


Figure 36

B.9.15.1. The 5/8 and 3/4 loops must have the same radius, but the radius of the 1/8 loop between 45 degrees and horizontal lines is not required to equal the radii of the loops of the Horizontal 8 itself (in Figure 36, radii a and b may be different). A common fault is to fly these part-loops with sharp corners as drawn in the catalogue symbol. This must be downgraded. The lines between the loops shall be 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. Criteria for rolls on the relevant entry or exit line are the same as for half loops (see B.9.8). Rolls may be performed on the 45 degrees lines, with the part-lines before and after the roll being of equal length (for deductions see B.8.1.5).

B.9.15.2. 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 linked, unlinked or opposite rolls flown on the last 45 degrees line, that line may project above or below the looping portions and exit at a different altitude than the entry altitude of the figure.

B.9.16. Family 7.8.9 - 7.8.16 - Horizontal Super 8's

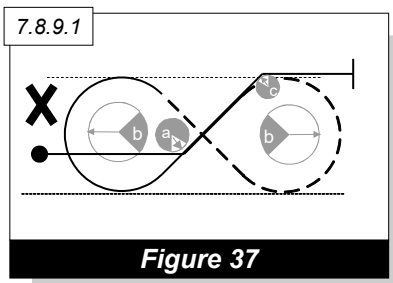


Figure 37

B.9.16.1. Besides possessing the unique characteristic of containing three 45 degrees lines on which rolls may potentially be placed, these sub-families should be judged as 7.8.1 to 7.8.8 but with the addition of an extra 45 degrees line.

B.9.16.2. The two 3/4 loops must have the same radius and occur at the same altitude. The entry and exit 1/8 loops must have a reasonable and constant radius, but are not required to be the same size as either the 3/4 loops or each other (Figure 37). Any rolls placed on any 45 degrees line must be centred. The horizontal entry/exit lines must coincide with the top and bottom of the loops, except when the first or last 45 degrees lines contain multiple linked, unlinked or opposite rolls, when they may be extended (not shortened) above or below the

extreme of the ¾ looping segments. Shortening of a line, as in Figure 37, should be penalised by up to two (2) points.

B.9.17. Family 7.8.17 - 7.8.22 - Vertical 8's

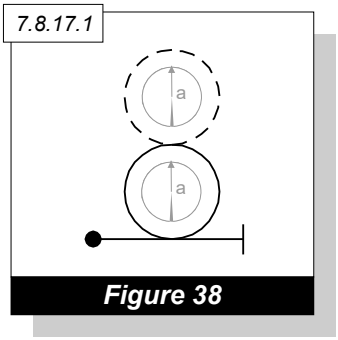


Figure 38

B.9.17.1. These figures are performed by flying two loops, one above the other. Sub-family 7.8.17-7.8.20 is composed of two loops, both above or both below the entry altitude. Sub-family 7.8.21 - 7.8.22 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.

B.9.17.2. 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 marked using the same criteria as full loops. Additionally, both loops must be of the same size (in Figure 38, radii a). Unless there is a roll between the loops, they must be directly above one another.

B.9.18. Family 8 - Combinations of Lines, Loops and Rolls

B.9.18.1. 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 degrees 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.

B.9.19. Family 8.4 - Humpty Bumps

B.9.19.1. These figures, whether vertical or performed with 45 degrees lines, are judged as combination of lines and loops (Figures 39 and 40). In these figures, none of the part-loops are required to have the same radii. These part-loops must still have a constant radius from start to finish. This requires a change in angular velocity during the part-loop.

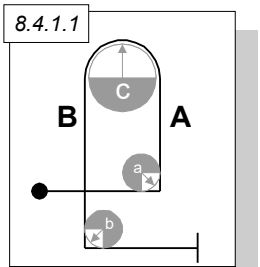


Figure 39

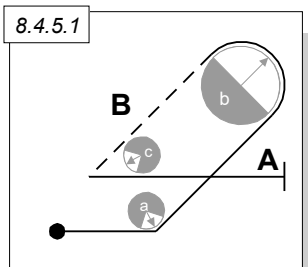


Figure 40

B.9.19.2. 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 centred.

B.9.20. Family 8.5.1 - 8.5.8, 8.6.1 - 8.6.8, 8.7 - Half Cubans, P Loops, Q Loops

B.9.20.1. In these figures, none of the part-loops are required to have the same radii (in Figure 41, radius b may be different from radius a). The rolls on vertical and 45 degrees lines must be centred. Horizontal rolls immediately preceding or following looping segments have the same criteria as in Family 7.2.

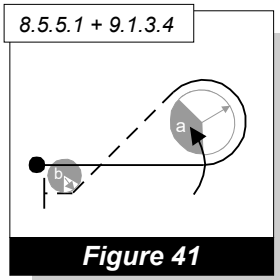


Figure 41

B.9.21. Family 8.5.9 - 8.5.24 - Teardrops

B.9.21.1. In these figures, none of the part-loops are required to have the same radii. The rolls on vertical and 45 degrees lines must be centred. Angles are to be flown as part-loops (Figure 42).

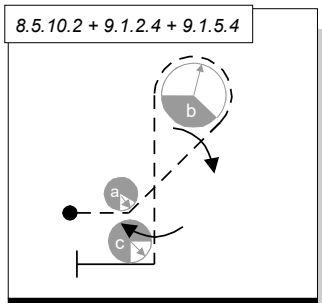


Figure 42

B.9.22. Family 8.6.9 - 8.6.16, 8.10 - Reversing P Loops, Reversing 1¼ Loops

B.9.22.1. When 1/4, 1/2 or 3/4 loops depicted as round elements join each other in these sub-families, their radii must be equal and there is no line between the loops (Figure 43). A line drawn would be a minimum two (2) point deduction depending on the length of the line. The part-loop depicted as a corner angle shall have a reasonable and constant radius, but is not required to have the same radius as the other part-loops.

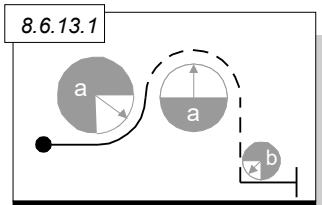


Figure 43

B.9.23. Family 8.8 - Double Humpty Bumps

B.9.23.1. These comprise of three vertical lines and two 180° looping segments (Figure 44).

B.9.23.2. In view of the markedly different speeds possible during the looping segments, none of the radii (a, b, c, d) have to be equal (but each must be internally constant). There is no requirement either for any relation between the vertical lines' length. All other criteria for humpty bumps apply (see B.9.19.2).

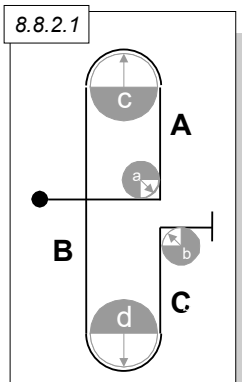


Figure 44

B.9.24. Family 9 - Rolls and Spins

B.9.24.1. Rolls may be performed on horizontal, 45 degree or 90 degrees lines; on complete loops; between part-loops; between part-loops and lines; and following spin elements.

B.9.24.2. 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).

B.9.24.3. 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.

B.9.24.4. Multiple rolls may be linked, unlinked, or opposite.

a) 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 45)

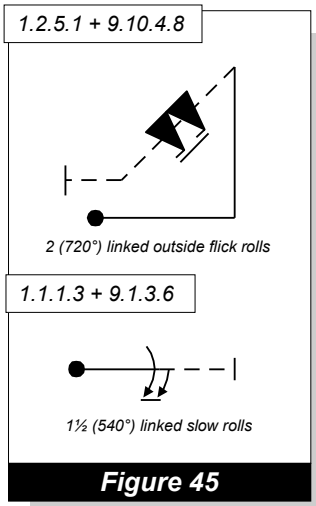


Figure 45

b) 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)

c) With unlinked rolls, 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 46)

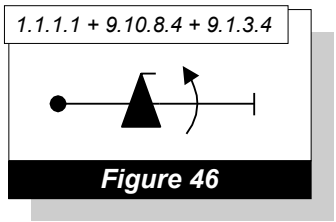


Figure 46

d) 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 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 47) If the two rolls are of the same type, they must be flown in opposite directions if they are not linked.

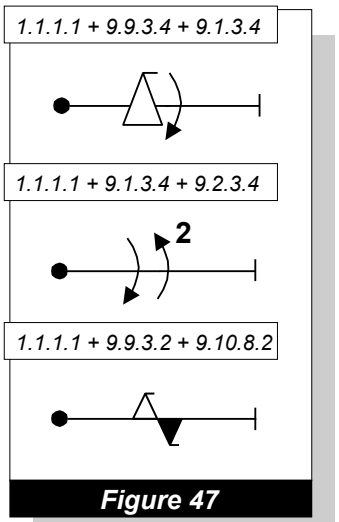


Figure 47

e) 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 down line 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 (respectively R or L); 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.)

B.9.25. Family 9.1 - Slow Rolls

B.9.25.1. 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 Hard Zero (HZ) the figure.

B.9.25.2. 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.

B.9.25.3. The wings must stop precisely after the desired degree of rotation and not go past the stop point and then return. This is referred to as "bumping the point". A deduction of half (0.5) point to one (1) point is given depending on the severity of the "bump".

B.9.26. Family 9.2 - 9.8 - Hesitation Rolls

B.9.26.1. For hesitation rolls, the second digit in the catalogue 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.

B.9.26.2. 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, at regular intervals. The rate of the roll, when not in pause, must be constant throughout with the aircraft projecting the pre-stated plane and direction of flight.

B.9.26.3. The pauses will be of identical duration. 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 height, the competitor pauses long enough to make them recognizable to the Judges. If a pause is not recognizable to a judge, the figure is marked a Hard Zero (HZ).

B.9.26.4. Angular errors at each pause are downgraded by comparison to the expected attitude. For instance, an angular error at an intermediate hesitation stop that is corrected in the next stop, must be downgraded only once; an angular error at an intermediate hesitation stop, followed by the prescribed degrees of rotation (45, 90 or 180 degrees), thus showing a further angular error that is not corrected, must be downgraded twice.

B.9.27. Family 9.9 - Positive Flick Rolls

B.9.27.1. Flick rolls represent one of the greatest challenges to judges, due to two factors: a) the "flicking" characteristics of different types of aircraft can vary considerably; and b), in properly executed flick rolls changes of pitch, yaw and roll rate occur very quickly. Judges must watch particularly carefully to determine the exact order in which events occur, especially at the initiation of the flick.

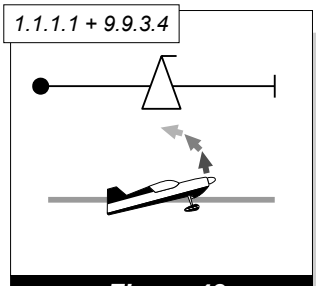


Figure 48

B.9.27.2. The judge must see two things to determine that a flick roll has been correctly initiated: a) the aircraft must display a rapid and clearly visible change of pitch attitude (Figure 48) to put the wing close to the stall, and b) autorotation must be initiated by use of the rudder. Note that when a flick roll is initiated the angle-of-attack may be at or close to zero (e.g. in vertical and 45 degrees lines) or significantly positive or negative if a looping figure is being flown; the pitch change to achieve critical angle-of-attack may thus be less in some circumstances and cannot be fixed. However, if the required pitch change and/or actual autorotation are not clearly seen, the mark must be downgraded by four (4) points.

B.9.27.3. At the start of a positive flick roll, the aircraft must clearly and unambiguously pitch in the nose up / tail down sense, from the pilot’s perspective, to put the wings near the critical angle-of-attack (Figure 48). If the aircraft pitches in the wrong direction, a Hard Zero (HZ) is given. Either shortly after or simultaneously with the pitch change the aircraft must yaw, initiating a stall of one wing and the rapid onset of autorotation. If the judge considers that a proper flick has not been initiated, the mark must be downgraded by four (4) points. Provided the flick initiation criteria are satisfied, any roll that is observed before the autorotation starts must be downgraded by one (1) point per five (5) degrees of roll.

B.9.27.4. Throughout the flick the roll must be driven primarily by the rudder, and autorotation must be seen to continue. This can best be confirmed by the observed conical motion of the fuselage longitudinal axis, the largest displacement being at the tail which is furthest from the C of G. This should not be confused with the spiral motion of a tight barrel roll, wherein the centre of gravity of the aeroplane more noticeably follows a spiral flight path. However, the rate of rotation and the angle, relative to the flight path, of the conical fuselage rotation may vary between aircraft types, much as each type of aircraft has different spin characteristics. For all aircraft types, the criteria for stopping the flick roll are the same: autorotation must stop at the desired extent of roll, followed immediately by adoption of the attitude or flight path that conforms to the requirements of the underlying figure. A non-looping flight path that is displaced parallel to that prior to the flick is normal, and should not be downgraded. Downgrades for errors in the extent of rotation or the following flight path or attitude are penalised at the normal rate of one (1) point per five (5) degrees of error.

B.9.27.5. Flick rolls must be observed very carefully to ensure that the rotation is driven throughout by asymmetry in air flow induced by continued rudder application and that the competitor is not "aileroning" the aircraft around its longitudinal axis and thus without the conical fuselage motion. The movement of the aircraft's nose or tail departing the flight path prior to

autorotation is a good clue to proper initiation of a flick roll, and conical motion of the tail is indicative that autorotation is continuing. A common error is for the aircraft initially to autorotate but to not stay in autorotation until the end of the figure, the roll becoming driven substantially by application of aileron; in this case a deduction of one (1) point for each five (5) degrees of rotation remaining when the autorotation ceases 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 awarded a numerical zero (0.0).

B.9.28. Family 9.10 - Negative Flick Rolls

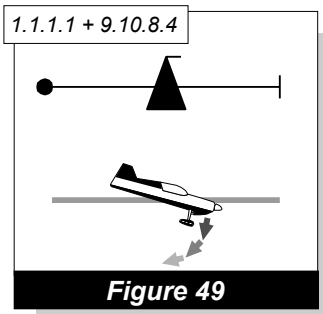


Figure 49

B.9.28.1. For negative flick rolls, all criteria stated for positive flick rolls apply except that the aircraft is in a negative rather than positive angle-of-attack during autorotation. Therefore, in a negative flick roll the nose and tail of the aircraft must initially move in the nose down / tail up sense, from the pilot's perspective, as the angle-of-attack is changed (Figure 49). 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 moves in the wrong direction, it is not a negative flick roll, and the figure must be given a Hard Zero (HZ). In all other respects relating to the characteristics of the rotation and errors to be observed, the criteria are the same as for positive flick rolls.

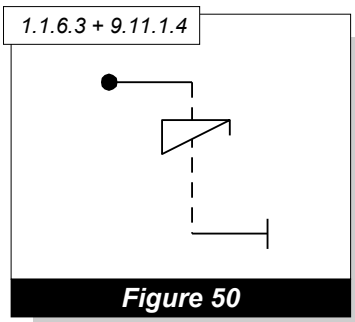


Figure 50

B.9.29. Family 9.11 and 9.12 - Spins

B.9.29.1. All spins start from horizontal flight (Figure 50). 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 centre of gravity will drop from wings-level horizontal flight.

B.9.29.2. It should be noted that an aircraft has forward momentum as the aircraft decelerates through stall speed. This appearance is more visible when the figure is performed downwind and is less visible when performed into the wind. This change in appearance is not a grading criterion. (Figure 51)

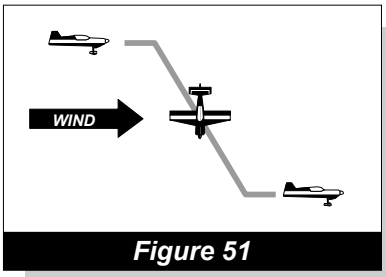


Figure 51

B.9.29.3. 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. During spin entry and in the spin, the flight path is affected by wind. When the spin is entered with a tailwind, the flight path may suggest that the spin entry was "forced". This change in appearance is not a marking criterion.

B.9.29.4. 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 criterion to centre either a spin element alone or a spin-roll combination on the vertical down line. 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.

B.9.29.5. 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 also not a judging criterion.

B.9.29.6. If the aircraft never stalls, it is apparent that it cannot spin, and a downgrade of four (4) points 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 downgraded by four (4) points.

B.9.29.7. In all spins the grading criteria are:

a) A clean breaking stall in horizontal flight.
b) Fully stalled autorotation.
c) Stopping on pre-stated heading.
d) Vertical down, wings-level attitude after stopping on heading.
e) A constant, reasonable quarter-loop radius back the horizontal flight.
f) The direction of a spin shall be determined from the roll component.

B.10. Positioning: Optimal Placement of Figures

B.10.1.1. 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.

B.10.1.2. 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.

B.10.1.3. In even the best positioned sequence, however, some variations in the judges' 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 degrees 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.

B.10.1.4. 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.

B.10.1.5. 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 mark for the sequence. It would be appropriate to deduct between half (0.5) and one (1) point for any such misplaced figure, depending on the severity of the difficulty incurred.

B.11. The Final Freestyle Programme (Unlimited Only)

B.11.1. Generalities

B.11.1.1. The mark awarded to each Judging Area (see below) of every performance represents the judges' personal view of its merit by comparison with corresponding aspects of other competitors' performances. Judges should award the highest marks where the performance is exceptional, and conversely where the quality of execution is without merit or exhibits poor control the mark should be significantly lower or even zero.

B.11.2. Assessment of Artistic Impression (160K)

The Artistic Impression of a flight shall be assessed by its fulfilment of the following objectives:

B.11.2.1. Judging Area #1: Programme design and artistic rendition – 80K

a) A wide-ranging mix of interesting freestyle and traditional or classical manoeuvres is expected, employing a broad variety of flight paths on many axes. Maximum and minimum flight regime speeds should be explored to demonstrate a high level of agility. Dull, uninteresting or apparently unplanned periods should be downgraded. Where possible the use of audio/music and/or smoke to effectively highlight flight paths and figures or individual elements is encouraged.

b) Each aspect of Judging Area #1 has equal importance:

i) Comprehensive variety of freestyle and classical manoeuvring with high dynamic range.

ii) Combinations of traditional elements and fresh or original manoeuvres.

iii) Interesting diversity of flightpaths not restricted to classical main / cross box axes.

iv) Avoidance of dull or boring periods that might indicate lack of planning.

v) Effective and sympathetic use of smoke and / or any accompanying audio track.

B.11.2.2. Judging Area #2: Integration of flight paths and attitudes – 80K

a) Throughout the performance the judge should expect to see smooth and flowing integration of each element. All parts of the performance should integrate pleasingly with the preceding and subsequent parts, individual characteristics being harmoniously linked together. A wide variety of upward, downward and level flight paths and attitudes on many axes using straight and curving lines and vectors should be employed to demonstrate individual features to their best advantage.

b) Each aspect of Judging Area #2 has equal importance:

i) Smooth and flowing execution with good control.

ii) Consecutive periods with different characteristics harmoniously linked.

iii) Use of many vectors and curving flight paths to present individual features.

B.11.3. Assessment of Technical Control (160K)

The level of technical control exhibited during a flight shall be assessed as follows:

B.11.3.1. Judging Area #3: Technical excellence and dynamic range – 80K

a) The purpose of each element throughout the performance should be clear – are the pilot's intentions understandable and successfully accomplished? Thorough exploration should

be made of high and low speed areas of the flight envelope, including forward and backward flight. Any errors and/or corrections should be minimal and should not disturb the presentation, and there should be no obvious moments where control is perceived to be diminished or temporarily lost.

b) Each aspect of Judging Area #3 has equal importance:

i) Clarity of intentions and accuracy of presentation through all flight regimes.

ii) Exploration of fast and slow speed regimes, forward and backward flight.

iii) Freedom from obvious corrections, uncontrolled or unplanned departures.

B.11.3.2. Judging Area #4: Aerodynamic controls and propeller-driven elements – 80K

a) The performance should demonstrate flight using the widest possible range of well controlled positive and negative attitudes or angles of attack. Slow, fast and hesitation rolls should be accurately executed. Variations in the aircraft's three principal axes – yaw, pitch and roll – should be precisely controlled. Normal and unusual flick rolls with a range of differing rotations should be expected. A range of interesting tumbling elements driven principally by well controlled gyroscopic propeller influences should be included.

b) Each aspect of Judging Area #4 has equal importance:

i) Good use of full range of positive and negative angles of attack.

ii) Accurate slow, fast and hesitation rotations, use of yaw, pitch and roll axes.

iii) Wide variety of positive and negative flicks and unusual rotations.

iv) Interesting range of propeller-driven gyroscopic elements and tumbling.

B.11.4. Assessment of Positioning (80K)

The positioning of the aircraft during a performance shall be assessed as follows:

B.11.4.1. Judging Area #5: Use of the performance zone and allowed time to maximum advantage – 80K

a) The full width, height and depth of the performance area should be exploited in a well-balanced manner. Each element and transition should be executed at a height, distance and lateral position and orientation for maximum effect and to enable clear assessment of its features. Any wind effects should be imperceptible or hidden. The competitor should make effective use of the time available to display a wide and interesting range of elements and manoeuvres.

b) Each aspect of Judging Area #5 has equal importance:

i) Imaginative and balanced use of the width, height and depth of the performance area.

ii) High and wide elements not too close, low elements not too distant to assess.

iii) Manoeuvres and transitions positioned and orientated for best impact.

iv) Imperceptible handling of wind effects.

v) Good use of the available time to demonstrate a wide range of manoeuvres.

RECORD OF AMENDMENTS

Version Number	Date Issued
2011-1	1 January 2011
2012-1	1 February 2012
2012-2	9 February 2012
2012-3	12 March 2012
2012-4	20 May 2012
2013-1	10 February 2013
2013-2	5 August 2013
2014-1	20 February 2014
2015-1	07 May 2015
2016-1	20 February 2016
2016-RS1	14 April 2016
2017-1	16 January 2017
2018-1	16 April 2018
2019-1	15 February 2019
2020-1	10 February 2020
2021-1	26 February 2021
2022-1	6 March 2022
2023-1	10 April 2023
2023-2	22 April 2023
2024-1	15 March 2024
2025-1	3 March 2025
2026-1	1 February 2026

Version Number	Date Issued