

5.1. CLASS F3A - AEROBATIC POWER MODEL AIRCRAFT

5.1.1. Definition of a Radio Controlled Aerobatic Power Model Aircraft

A model aircraft, but not a helicopter, which is aerodynamically manoeuvred by control surface(s) in attitude, direction, and altitude by a pilot on the ground using radio control.

5.1.2. General Characteristics of Radio Controlled Aerobatic Power Models:

Maximum overall span	2000mm
Maximum overall length	2000mm
Maximum total weight, with batteries	5000g

A tolerance of 1% will be allowed for possible inconsistencies in measurement instruments for size, weight, and voltage unless otherwise stated.

Propulsion device limitations: Any suitable propulsion device may be utilised. Propulsion devices that are not permitted are those requiring solid expendable propellants, gaseous fuels (at room temperature and atmospheric pressure), or liquefied gaseous fuels. Electric powered model aircraft are limited to a maximum of 42.56 volts for the propulsion circuit, measured off load, and prior to flight while the competitor is in the ready box.

Paragraph B.3.1.a) of Section 4B (Builder of Model aircraft) is not applicable to class F3A.

The maximum sound/noise level of the model aircraft and its propulsion device, shall be 94 dB(A) measured at 3m from the centre line of the model aircraft with the model aircraft placed on the ground over concrete, macadam, grass, or bare earth at the flight line.

The tolerance of the sound/noise level measurement is the specified tolerance of the manufacturer of the measuring instrument.

With the propulsion device running at full power, the measurement will be taken 90 degrees on the righthand side, with the nose of the model aircraft pointing into the wind. The Class 1 SLM (Sound Level Meter) microphone shall be placed on a stand 30cm above the ground in line with the propulsion device Other than the helper restraining the model aircraft, and the sound steward, no persons or sound/noise reflecting or sound absorbing objects shall be nearer than 3m to the model aircraft or the microphone.

The sound/noise measurement shall be made immediately prior to each flight. The sound test area must be located in a position that does not create a safety hazard to officials and other competitors.

The flight time will be interrupted while the sound/noise test at the flying site is being made. The competitor shall not be delayed more than 30 seconds for this sound test.

In the event of a model aircraft failing the sound/noise test, no indication of the result or the reading shall be given to the competitor, or his team, or the judges, and both the transmitter and the model aircraft shall be impounded by the flight line official immediately following the flight. No modification or adjustment to the model aircraft shall be permitted (other than refuelling or battery recharging). The competitor and his equipment shall remain under supervision of the flight line director. The model aircraft shall be re-tested within 30 minutes by a second noise steward using a second Sound Level Meter, and in the event that the model aircraft fails the re-test, the score for the preceding flight shall be zero. The score for the flight may be tabulated but not made public until the result of the re-test is communicated to the tabulators.

Radio equipment shall be of the open loop type (ie no electronic feedback from the model aircraft to the ground). Auto-pilot control utilising inertia, gravity or any type of terrestrial reference is prohibited. Automatic control sequencing (pre-programming) or automatic control timing devices are prohibited.

Example: Permitted:

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

Not permitted:

1. Snap roll buttons with automatic timing mode.
2. Pre-programming devices to automatically perform a series of commands.
3. Auto-pilots or gyros for automatic wing levelling or other stabilisation of the model aircraft.
4. Propeller pitch change with automatic timing mode.
5. Any type of voice recognition system.
6. Conditions, switches, throttle curves, or any other mechanical or electronic device that will prevent or limit maximum power or rpm of the propulsion device during the sound/noise test.
7. Any type of learning function involving manoeuvre to manoeuvre or flight to flight analysis.

5.1.3. Definition and Number of Helpers

A helper may be a Team Manager, another competitor, or an officially registered supporter. Each competitor is permitted one helper (usually the caller) during the flight. Two helpers may be present and assist during the starting of the motor(s). One person, either a helper, or the team manager, or the caller, may place the model aircraft for take-off and retrieve the model aircraft following the landing. In exceptional circumstances, another helper may join the competitor and caller/helper during the flight, but only to hold a sun-shield as protection from direct sunlight. These protection devices must not interfere with the judges' vision of the manoeuvres. Physically disabled competitors requiring an additional helper and/or caller or other assistance, must request permission with full details, with their entry, from the organiser of a championship. This additional assistance must be provided by the competitor, must not give him an unfair advantage over other competitors, and must not unduly delay or interfere with the running of the competition. Except for communication between the caller and the competitor, no other performance-enhancing communication with helpers is permitted during the flight.

5.1.4. Number of Flights

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

5.1.5. Definition of an Attempt

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

If the propulsion device stops after the take-off has begun, the attempt will be deemed complete.

5.1.6. Number of Attempts

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

Note: An attempt can be repeated at the contest director's discretion only when any unforeseen reason beyond the control of the competitor, causes the model aircraft to fail to start (eg there is radio interference). Similarly, in a flight that is interrupted by any circumstance beyond the control of the competitor, the competitor is entitled to a reflight, with the entire schedule being flown and judged, but only the affected manoeuvre and the unscored manoeuvres that follow will be tabulated. This reflight should take place within 30 minutes of the first flight, in front of the same set of judges, or be the first flight after the judges' break, or, if it involves a protest, as soon as the FAI Jury has deliberated and communicated the outcome of the protest to the contest director. The result of the reflight will be final.

5.1.7. **Definition of an Official Flight**

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

5.1.8. **Marking**

Each manoeuvre may be awarded marks, in whole numbers, between 10 and 0 by each of the judges during the flight. During tabulation, these marks are multiplied by a coefficient (K-Factor) which varies with the difficulty of the manoeuvre, usually from one to five.

Any manoeuvre not completed, or flown out of sequence with the stated manoeuvre on the judge's score sheet, shall be scored zero (0). Zero scores need not be unanimous, except in cases where an entirely wrong manoeuvre was performed. Judges must confer after the flight in these cases, bringing it to the attention of the flight line director/contest director on site.

Manoeuvres must be performed where they can be seen clearly by the judges. If a judge, for some reason beyond the control of the competitor, is not able to follow the model aircraft through the entire manoeuvre, he may set the "Not Observed" (N.O.) mark. In this case, the scoring tabulators will, as the judge's mark for that particular manoeuvre, enter the average of the numerical marks given by the other judges, rounded to the nearest whole number.

Centre manoeuvres should be performed in the centre of the manoeuvring area while turn around manoeuvres should not extend past a line 60 degrees left and right of centre. Vertical height should not exceed 60 degrees. Also, manoeuvres should be performed along a line of flight approximately 150m in front of the competitor's position. Infractions of this rule will be cause for downgrading by each judge individually and in proportion to the degree of infraction. Exceptions to this rule are for the rolling circle manoeuvres which, of necessity, may deviate from the 150m line of flight.

The manoeuvring area shall be clearly marked with white (or contrasting colour to the background) vertical poles, approximately 100mm in diameter and approximately 4m high, placed on centre and 60 degrees each side of centre on a line 150m in front of the competitor's position. Flags, streamers, or boards of contrasting colour to the background, should be mounted on the poles to improve visibility. White (or contrasting) lines, originating at the competitor's position and extending outward at least 50m, shall also be used to mark the centre and extreme limits (60 degrees left and right of centre) of the manoeuvring zone. Audible and visual signals to indicate violations of the manoeuvring zone must not be used.

The judges shall be seated not more than 10m, and not less than 7m behind the competitor's position (the apex of the 60 degree lines) and within an area described by the extension of the 60 degree lines to the rear of the competitor. The judges must be seated abreast, usually separated by 2m, with scribes or score secretaries separating them. The judges' line is also the zero line, and any part of a manoeuvre performed behind this line, will result in a zero score for that manoeuvre.

At the conclusion of the flight, each judge must independently consider if the in-flight sound level of the model aircraft is too loud. If a majority of the judges consider the in-flight sound level of the model aircraft to be too loud, then the flight score will be penalised by 10 points for each counting judge on that panel during the flight. If, during a flight, the sound level of the model aircraft increases perceptibly as a result of an equipment malfunction, or of a condition initiated by the competitor, the flight line director may request a sound re-test. If an equipment malfunction during the flight (such as mechanical failure of the exhaust/muffler system) causes excessive noise, the flight line director may request the competitor to land his model aircraft, and scoring will cease from the point of malfunction.

If a model aircraft is, in the opinion of the judges, unsafe or being flown in an unsafe manner, they may bring this to the attention of the flight line director, who may instruct the pilot to land.

The individual manoeuvre scores given by each judge for each competitor must be made public at the end of each round of competition. The team manager must be afforded the opportunity to check that the scores on each judge's score sheet correspond to the tabulated scores (to avoid data capture errors). The score board must be located in a prominent position at the flight line, in full view of the competitors and the public.

All preliminary flight results before the completion of a round must be ranked alphabetically, or by country, or by contestant number, but not in order of performance or placing.

5.1.9. **Classification**

For World and Continental Championships, each competitor will have four preliminary (Schedule P) flights, with the best three normalised scores counting to determine the preliminary ranking. All scores, preliminary, semi-final and final, will be normalised to 1000 points as described below. The top one third, but not more than 30 competitors, will then have two additional semi-final flights flying the known finals schedule. The total of the best three preliminary flights (normalised again to 1000 points) will count as one score along with the two semi-finals scores to provide three scores, the best two to count for semifinals classification.

The top ten competitors of the semi-finals of a World or Continental Championship where there was an entry of more than 40 competitors, will then have four additional flights to determine the individual winner. For a World or Continental Championship with less than 40 competitors, the top five competitors will advance to the finals. Two final flights will be the current known finals schedule (F) and two will be unknown schedules (two different schedules, UK1 and UK2) (see 5.5). The known and unknown schedules must be flown in alternating sequence, starting with the known finals schedule (F). The best score from the known schedule will be combined with the best score from the unknown schedules for final classification. In the case of a tie the semi-final score will be used to decide the higher classification.

The team classification is established at the end of the competition (after the finals) by adding the numerical final placing of the three team members of each nation. Teams are ranked from the lowest numerical scores to the highest, with complete three-competitor teams, ahead of two-competitor teams, which in turn are ranked ahead of one-competitor teams. In the case of a tie, the best individual placing decides the team ranking.

For World and Continental Championships, the scores for all rounds, preliminary, semi-finals and finals, will be computed using the Tarasov-Bauer-Long (TBL) statistical averaging scoring system. Only computer tabulation systems containing the TBL algorithm and judge analysis programs that have been approved by the CIAM Bureau can be used at World and Continental Championships.

All scores for each round, preliminary, semi-final and finals, will then be normalised as follows. When all competitors have flown in front of a particular group of judges (ie a round) the highest score shall be awarded 1000 points. The remaining scores for that group of judges are then normalised to a percentage of the 1000 points in the ratio of actual score over winner's score.

$$\text{Points}_x = \frac{S_x}{S_w} \times 1000$$

Points_x = points awarded to competitor X

S_x = score of competitor X

S_w = score of winner of round

Note 1: Final and semi-final flights to determine the individual winner are usually only required for World and Continental Championships. For open international events, national championships, and domestic competitions, the total of the three best preliminary flights may be used to determine the individual winner and team placing. Further flights of Schedule F may be planned, depending on local conditions and time available.

Organisers of Open International and National events may schedule more, or less, than four preliminary rounds/flights, depending on local conditions and time available. In such cases, at least one round/flight should always be able to be discarded to determine the final results. In the event of adverse weather conditions where no further flying is possible, the preliminary classification may be determined as follows:

One round/flight completed by each competitor: round/flight to count
Two rounds/flights completed by each competitor: best round/flight to count
Three rounds/flights completed by each competitor: best two rounds/flights to count
Four rounds/flights completed by each competitor: best three rounds/flights to count.

Note 2: The TBL score tabulation system can only be applied for events with at least 10 competitors and 5 judges. For those smaller events that are not scored with the TBL system, the high and low scores for each manoeuvre will be discarded if four or more judges are used.

5.1.10. Judging

For World Championships the organiser must appoint four panels of five judges each (a total of twenty judges). The judges must be of different nationalities and must be selected from a current list of FAI International Judges. Those selected must reflect the approximate geographical distribution of teams participating in the previous World Championship with the final list approved by the CIAM Bureau. At least one third, but not more than two thirds of the judges must not have judged at the previous World Championships. Judge assignment to the four panels will be by random draw.

The invited judges for a World or Continental Championship, must have had a reasonable amount of F3A judging experience of both current P and F schedules, and must submit a résumé of his/her judging experience to the organiser during the nomination process. The organiser must in turn submit the résumés to the CIAM Bureau along with the judges list for approval.

For the semi-final rounds of a World Championship the judges will be arranged in two groups of ten judges. Assignment to the two groups will be by random draw.

For a World Championship with fewer than 72 competitors, and for a Continental Championship with 40 or more competitors, the organiser must appoint two panels of five judges each (a total of ten judges). The judges must be of different nationalities and must be selected from a current list of FAI International Judges. Judge assignment to the two panels will be by random draw.

For Continental Championships with fewer than 30 competitors, the organiser must appoint a single panel of five judges, with the same selection criteria as above.

For World Championships with fewer than 72 competitors, and for a Continental Championships with 30 or more entries, two panels of five judges may be used for the preliminary and semi-final rounds, and one panel of ten judges may be used for the final rounds. For a Continental Championship with fewer than 40 competitors, one panel of five judges may be used for preliminary, semi-final, and final rounds.

For international events where the TBL statistical averaging scoring system is not used, the high and low scores for each manoeuvre may be discarded, but only where four or more judges are used.

For the final rounds of a World Championship with 72 or more competitors, the twenty judges will be arranged in three groups, a left hand group of five judges to judge only the left turn-around manoeuvres, a centre group of ten judges to judge only the centre manoeuvres and a right hand group of five judges to judge only the right turn-around manoeuvres. Judge assignments to the three groups will be by random draw for rounds one and two (one known and one unknown round) with a second draw for rounds three and four, except a judge will not serve in the same group as in the previous draw. For each competitor, the score from the three groups (following TBL computation) will be combined for a total score for the flight.

Before every World Championship, there shall be a briefing for the judges, followed by training flights by non-competitors. Also, warm-up flights for the judges should be flown by non-competitors before the first official preliminary flight each day. For the semi-finals the highest placing non-semi-finalists and for the finals the highest placing two non-finalists should be awarded the honour of performing the warm-up flights. Warm-up flights should be judged but under no circumstances should they be tabulated. Any deviations from the above procedures must be stated in advance by the organisers and must have prior approval of the CIAM or the CIAM Bureau.

5.1.11. Organisation for Radio Controlled Aerobatics Contests

For transmitter and frequency control see Section 4B, paragraph B.11.

The draw for flight order will be done for each flight line, so that frequencies are separated with two competitors in between. Team members will not be drawn to fly directly after each other. Team members on separate flight lines will be separated by at least two competitors. Competitor identification numbers will only be assigned after this flight order draw, by pilot group, and in numerical ascending order.

For flights two, three and four of the preliminary rounds the flight order will start $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ down the flight order respectively. Organisers must take care to avoid a flight draw which will cause competitors to fly at approximately the same time each day.

The flight order for the first semi-finals round will also be by random draw. The second semi-finals flight will start $\frac{1}{2}$ down the semi-finals flight order.

The flight order for the first round of the finals will be established by a random draw as above.

The flight order for flights two, three and four will start $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ down the finals flight order.

During the flight the competitor must stay in the proximity of the judges and under the supervision of the Flight Line Director. Competitors must be called by a flight line official at least five minutes before they are required to occupy the starting area.

If the frequency is clear the competitor or his team manager will be allowed to collect the transmitter from the transmitter pound. The competitor and his helper(s) then occupy the starting area so that a radio check can be performed to verify the correct functioning of the radio control equipment. If there is a frequency conflict, the competitor must be allowed a maximum of one minute for a radio check before the start of the 3 minute starting time.

The time keeper will audibly notify the competitor when the minute is finished and immediately start timing the 3-minutes starting time. Electronic timing displays must be able to be interrupted for the sound/noise test.

A competitor is allowed eight (8) minutes for each flight. The timing of a flight starts when the contest director, or timekeeper, gives an instruction to the competitor to start. The timing device/clock will be interrupted when the competitor is ready to take the sound measurement.

Helpers who place the model aircraft, must ensure that the model aircraft is placed in the correct position, as instructed by the officials. When the contest director/sound steward is satisfied that he has obtained a reading from the SLM, he will indicate this to the competitor, and the timing device will be re-activated to continue the timing process.

Before the timing device/clock reaches the 3-minute mark, the model aircraft must show a deliberate forward movement for the take-off (throttle advanced). If the model aircraft does not roll forward deliberately before/at the 3-minute-mark, the contest director/time keeper will advise the competitor and helper that the flight may not proceed. The flight shall score zero points. Under normal circumstances, the clock/timing device continues to run, and when reaching the 8-minute mark, the contest director/time keeper will advise the competitor, helper, and the judges, and judging/scoring will stop at that point. The clock will be stopped when the wheels of the model aircraft touch the ground for landing, as proof to the competitor of the recorded time.

No penalty is assigned to the competitor if the expiry of the 8-minute timing period occurs after the last manoeuvre, but before the landing. Thus, the wheels of the model aircraft may touch the ground after the 8-minute mark, with no penalty to the competitor.

The competitor may not start his model aircraft unless he has been instructed by a flight line official to do so. Deliberate starts at the flight line during official flying to check the propulsion device will be subject to disqualification from that round. No public address or commentary should be made during flights.

During the flight, the competitor, and his helper/caller (if required) must stay in the designated position in front of the judges, at the convergence of the ground markings, and under the supervision of the flight line director. The competitor must wear or display his identification/start number.

5.1.12. Execution of Manoeuvres

The manoeuvres must be executed during an uninterrupted flight in the order in which they are listed on the score sheets. The competitor may make only one attempt at each scored manoeuvre during the flight.

The competitor has eight minutes to complete the flight; timing to start when the flight line official gives the signal to the competitor to start his model aircraft and ending when the model aircraft first touches the runway after completing the flight.

The model aircraft must take-off and land unassisted, that is, no hand launched flights. If any part of the model aircraft is jettisoned during the flight, scoring will cease at that point and the competitor must be instructed by the flight line director to immediately land his model aircraft. Usually, the judges will be able to determine when a part has been jettisoned from the model aircraft. They should bring this to the attention of the flight line director on site.

Scoring will cease with the expiry of the eight minute time limit, except for the in-flight sound assessment, which is done after the flight is completed, irrespective of the time.

5.1.13. Schedule of Manoeuvres

For 2010-2011, Schedule P-11 will be flown in the preliminaries. Schedule F-11 will be flown in the semifinals, as well as in the finals, alternating with unknown schedules.

PRELIMINARY SCHEDULE P-11**K-Factor**

Take-off sequence (not judged, not scored)

1. Figure M: $\frac{3}{4}$ -pt roll up, $\frac{1}{4}$ roll down, $\frac{1}{2}$ outside loop, integrated $\frac{1}{2}$ roll, $\frac{1}{4}$ roll up, $\frac{3}{4}$ roll down	5
2. Half reverse cuban 8, $\frac{2}{4}$ -pt roll up.....	3
3. Two slow rolls in opposite direction	3
4. Half square loop, full snap roll up, inverted exit	4
5. 4-pt roll on 45 degrees down, inverted exit	3
6. Push-push-pull humpty bump, $\frac{1}{2}$ roll up, $\frac{2}{4}$ -pt roll down.....	3
7. Loop, with 8-pt roll integrated over top 180 degrees	5
8. Half square loop on corner, $\frac{2}{4}$ -pt rolls, inverted exit	3
9. Reverse cuban 8, $\frac{4}{8}$ -pt roll and $\frac{2}{4}$ -pt roll in 45 degree downlines, inverted exit	4
10. Half loop with $\frac{1}{2}$ roll, inverted entry and exit	2
11. Reverse 8-pt roll ($\frac{4}{8}$ -pt rolls in opposite direction), inverted exit	5
12. Stall turn, $\frac{2}{4}$ -pt roll up, full roll down.....	3
13. Double immelmann, $\frac{2}{4}$ -pt roll and full roll, inverted exit	4
14. Figure 9, full roll up.....	2
15. Opposite knife-edge	5
16. Figure 8, full outside loop, $\frac{1}{2}$ loop on top, inverted exit.	2
17. 2 $\frac{1}{4}$ inverted spins in opposite directions, $\frac{1}{2}$ roll exit	4

Landing (not judged, not scored)

ANNEX 5A

F3A - RADIO CONTROLLED AEROBATIC MODEL AIRCRAFT DESCRIPTION OF MANOEUVRES

5A.1.13 The flight path of a model aircraft is used to judge the shape of all manoeuvres, and manoeuvres must start and finish with straight and level upright or inverted flight of recognisable distance. Centre manoeuvres must start and finish on the same heading, while turn-around manoeuvres must finish on a heading 180 degrees to entry. When appropriate, entry and exit of centre manoeuvres must be at the same altitude, unless specified otherwise. Positioning adjustments in altitude are allowed in turn-around manoeuvres.

All manoeuvres which have more than one loop or parts of loops must have the loops and parts of loops the same diameter/radius and in the case of consecutive loops, in the same place. Similarly, all manoeuvres that have more than one continuous roll must have the same roll rate. All manoeuvres that have more than one point roll, must have the same roll rate, and the points must be of equal duration. Where there is a combination of continuous rolls and point rolls within a manoeuvre, the roll rate for the point rolls does not necessarily have to be the same as the roll rate for the continuous rolls. All consecutive rolls (continuous and/or point rolls, or a combination) on a horizontal line must be at the same altitude and heading.

All manoeuvres with rolls, part rolls, point rolls, or snap-rolls, or combinations of same, must have lines of equal length before and after the rolls or combinations, except when specified otherwise. Barrels rolls and axial rolls instead of specified snap rolls must be downgraded severely (more than 5 points). Snaprolls may be positive or negative. Spiral dives instead of specified spins must be scored zero. Snap-roll entries to spins must be scored zero. Wing-overs (two wing-spans or more radius of pivot) instead of stall turns must be scored zero.

Any violation of the above will be reason for downgrading. This is in addition to the downgrades for deviations from the manoeuvre descriptions and the judging notes in Annex 5A, the Judges Guide Annex 5B and any official sub-committee-approved judge training material. Note that these lists are not allinclusive.

Take-off and landing procedures are not judged and are not scored. The direction of landing may be different from that of the take-off.

PRELIMINARY SCHEDULE P-11 (from January 2010)

P-11.01 Figure M, $\frac{3}{4}$ -pt. roll up, $\frac{1}{4}$ roll down, $\frac{1}{2}$ outside loop with integrated $\frac{1}{2}$ roll, $\frac{1}{4}$ roll up, $\frac{3}{4}$ roll down: From upright, pull to a vertical upline and perform a $\frac{3}{4}$ -pt. roll, followed by a stall turn. On the vertical downline, perform a $\frac{1}{4}$ roll. Push through a half outside loop with a fully integrated half roll. On the vertical upline, perform a $\frac{1}{4}$ roll up, followed by a stall turn. On the vertical downline, perform a $\frac{3}{4}$ roll, and pull to exit upright.

P-11.02 Half reverse cuban 8, with $\frac{2}{4}$ -pt. roll up. Pull to a 45 degree upline and perform two points of a fourpoint roll. Pull through $\frac{5}{8}$ of an inside loop to exit upright.

P-11.03 Two slow rolls in opposite direction: From upright, perform a slow roll, followed by a slow roll in the opposite direction, to exit upright.

Judging notes:

- The pause between rolls is very brief.

P-11.04 Half square loop, snap roll up, inverted exit: From upright, pull to a vertical upline, perform a snap roll, and pull to exit inverted.

P-11.05 4-pt. roll on 45 degrees down, inverted exit: From inverted, pull to a 45 degree inverted downline, perform a 4-pt. roll, and push to exit inverted.

P-11.06 Push-push-pull humpty bump, ½ roll up, 2/4-pt. roll down: From inverted, push to a vertical Upline and perform a half roll. Push through a half outside loop. On the downline, perform 2 points of a 4-pt. roll, and pull to exit upright.

P-11.07 Loop, with 8-pt. roll integrated over top 180 degrees: From upright, perform an inside loop with a fully integrated 8-pt. roll over the top half of the loop.

Judging notes:

- The 8-pt. roll must be fully integrated on the circular flight path over 180 degrees.

P-11.08 Half square loop on corner, 2/4-pt. rolls, inverted exit: From upright, pull to a 45 degree upline, and perform 2 points of a 4-pt. roll. Push through 90 degrees to a 45 degree upline, perform two points of a 4-pt. roll, and pull to exit inverted.

P-11.09 Reverse cuban 8, 4/8-pt. roll and 2/4-pt. roll in on 45 degree downlines, inverted exit: From inverted, pull to a 45 degree inverted downline, and perform 4 points of an 8-pt. roll. Pull through a ¾ inside loop to a 45 degree inverted downline, perform 2 points of a 4-pt. roll, and pull through 5/8 of an inside loop to exit inverted.

P-11.10 Half loop with ½ roll, inverted exit: From inverted, pull through a half inside loop, followed immediately by a half roll, to exit inverted.

P-11.11 Reverse 8-pt roll (4/8-pt. rolls in opposite direction), inverted exit: From inverted, perform 4 points of an 8-pt roll in one direction, followed by 4 points of an 8-pt. roll in the opposite direction, to exit inverted.

P-11.12 Stall turn, 2/4-pt. roll up, full roll down : From inverted, push to a vertical upline, perform 2 points of a 4-pt. roll, followed by a stall turn. On the vertical downline, perform a roll, and pull to exit upright.

P-11.13 Double immelmann, 2/4-pt. roll and full roll, inverted exit : From upright, pull through a half Inside loop, followed immediately by 2 points of a 4-pt. roll. Push through a half outside loop, followed immediately by a roll, to exit inverted.

Judging notes:

- The 2/4-pt. roll and full roll must follow immediately after the part-loops.
- The length of the upper and lower horizontal line (including rolls) is equal to the diameter of the half loops.

P-11.14 Figure 9, full roll up : From inverted, push to a vertical upline, and perform a roll. Pull through a ¾ inside loop to exit upright.

P-11.15 Opposite knife-edge : From upright, on a horizontal line, perform a ¼ roll to knife-edge. Perform a ½ roll in the opposite direction, to knife-edge, and perform a ¼ roll to exit upright.

Judging notes:

- The knife-edge segments must be of equal length, and must be long enough to demonstrate controlled, sustained knife-edge flight.

P-11.16 Figure 8, full outside loop, ½ loop on top, inverted exit : From upright, push through an outside loop, followed by a half loop, to exit inverted.

P-11.17 Inverted spin of $2\frac{1}{4}$ turns and $2\frac{1}{4}$ turns in the opposite direction, with $\frac{1}{2}$ roll exit :

Perform an inverted spin of $2\frac{1}{4}$ consecutive turns immediately followed by $2\frac{1}{4}$ consecutive turns in the opposite direction. Push through a $\frac{1}{4}$ loop to horizontal, and perform a $\frac{1}{2}$ roll to exit upright.

Judging notes:

- Snap entry, zero points.
- Forced entry, downgrade.
- Turn reversal is immediate.

F3A PRELIMINARY SCHEDULE P-11 (from January 2010)