



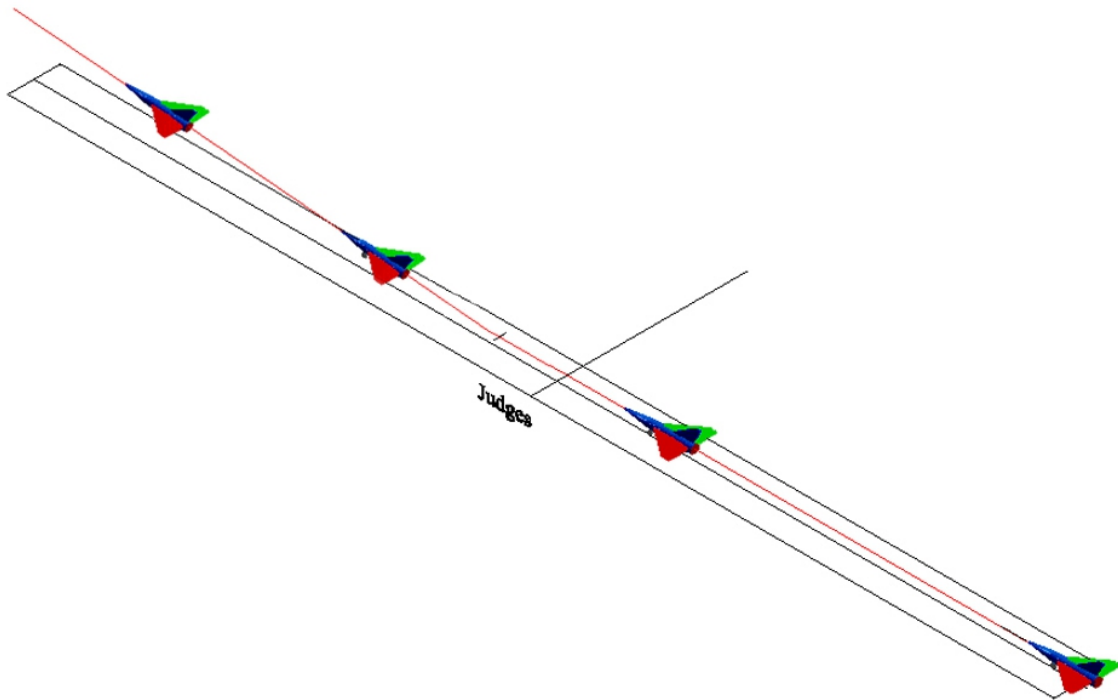
IJMC Scale Jet Classes

2018

ATTACHMENT NO. 1 TO THE RULEBOOK:
DIAGRAMS & FULL DETAILS OF ALL MANOEUVRES

Mandatory manoeuvre (all types)

- (a) **Take-off** - The model shall take-off from the ground **after the judge's centreline** and climb away on a constant heading and climb angle for a duration of minimum five seconds. During this time the landing gear sequence has to be initiated.

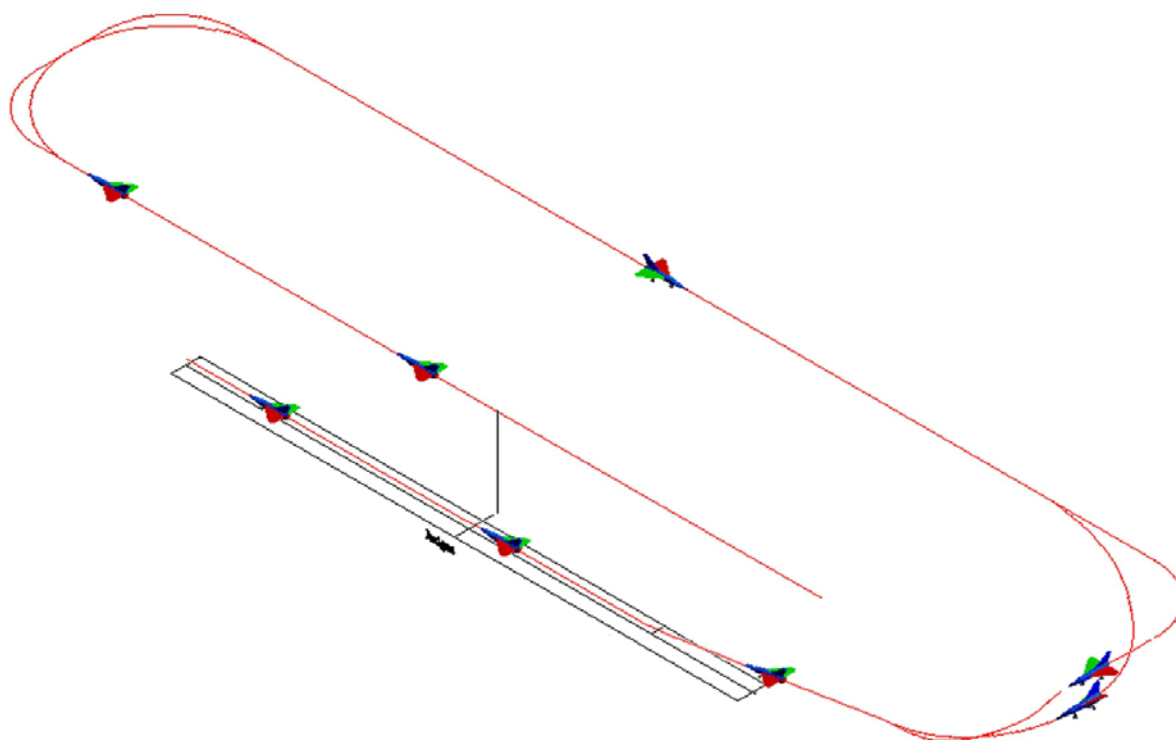


Errors:

- Model is touched after calling "now" (zero marks)
- Model veers off runway direction on take-off
- Take-off distance is not in keeping with the prototype
- Speed unrealistic or acceleration too rapid
- Lift-off not smooth
- Climb rate incorrect (too steep or too shallow)
- Nose attitude during climb not in keeping with the prototype
- Flaps not used if applicable
- Landing gear sequence not initiated if applicable
- Climb-out track not the same as the track of the take-off run
- Climb out too short

Mandatory manoeuvre (all types)

- (b) **Circuit, Approach and Landing** - The model shall commence upwind and execute a circuit and landing approach in the manner of the prototype, and land on the runway **before the judge's centreline**. When the model has come to a stop, the manoeuvre is complete (and flying time stops). *Taxi back will not be judged*. Retractable landing gear (where fitted) is to be extended during the downwind leg of the circuit, and flaps, spoilers, speed brakes etc., are to be extended as per the full-size prototype.



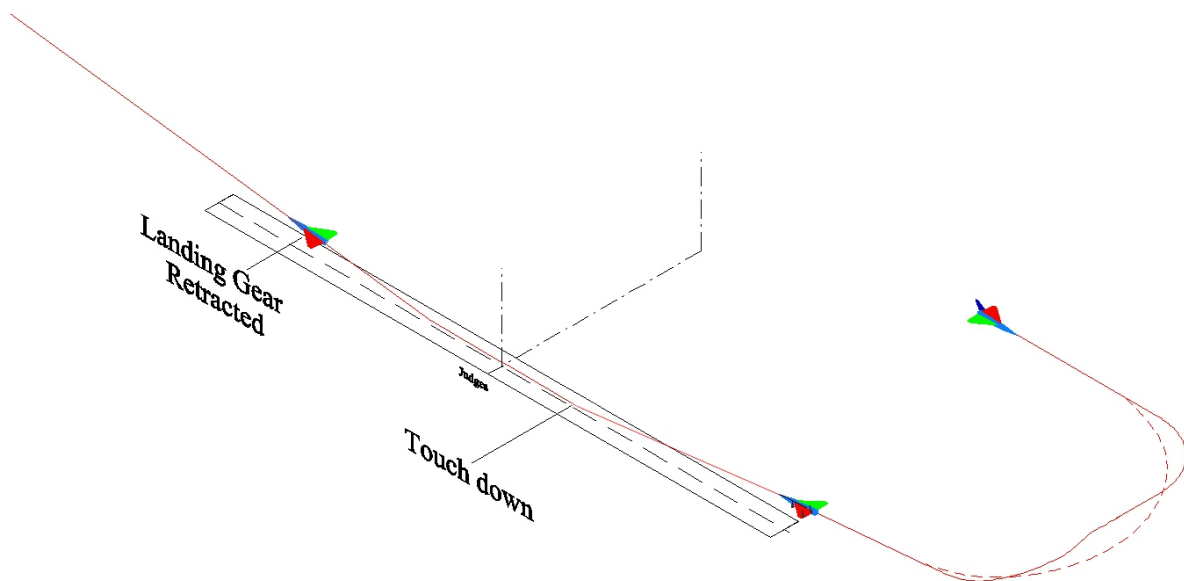
Errors:

- *Manoeuvre does not commence parallel to the runway (on the upwind leg)*
- *Circuit is not centred on the judges line*
- *Downwind track not parallel to runway axis*
- *Landing gear not extended on downwind leg*
- *Altitude changed before appropriate descent point*
- *Descent not smooth and continuous*
- *Model does not adopt a landing attitude appropriate to subject type*
- *Model bounces on touch down*
- *Model does not come to a gradual and smooth stop after landing*
- *Model touches wing tip on the ground during landing*
- *One gear leg collapses after touch down = 20% penalty (same if one gear not extended during approach)*
- *Two or all gear legs collapse after touch down = 50% penalty (same if two or all gear legs not extended during approach)*
- *Landing run not straight*

Note: All landings ending with the model on its back will be regarded as a crash landing and scored zero.

Optional Manoeuvre Group 1

- (11) **Touch and Go (all types) (revised 2012)** - The model shall commence at end of downwind leg and execute 180° base & final turn to landing approach in the manner of the prototype, and land on the runway **before the judge's centreline**. The model then accelerates and, after a short distance, takes off again, followed by a climb on a constant heading and climb angle of approx. 5 seconds, during which time the landing gear sequence is initiated. Retractable landing gear (where fitted), flaps, spoilers, speed brakes etc., are to be extended as per the full-size prototype.

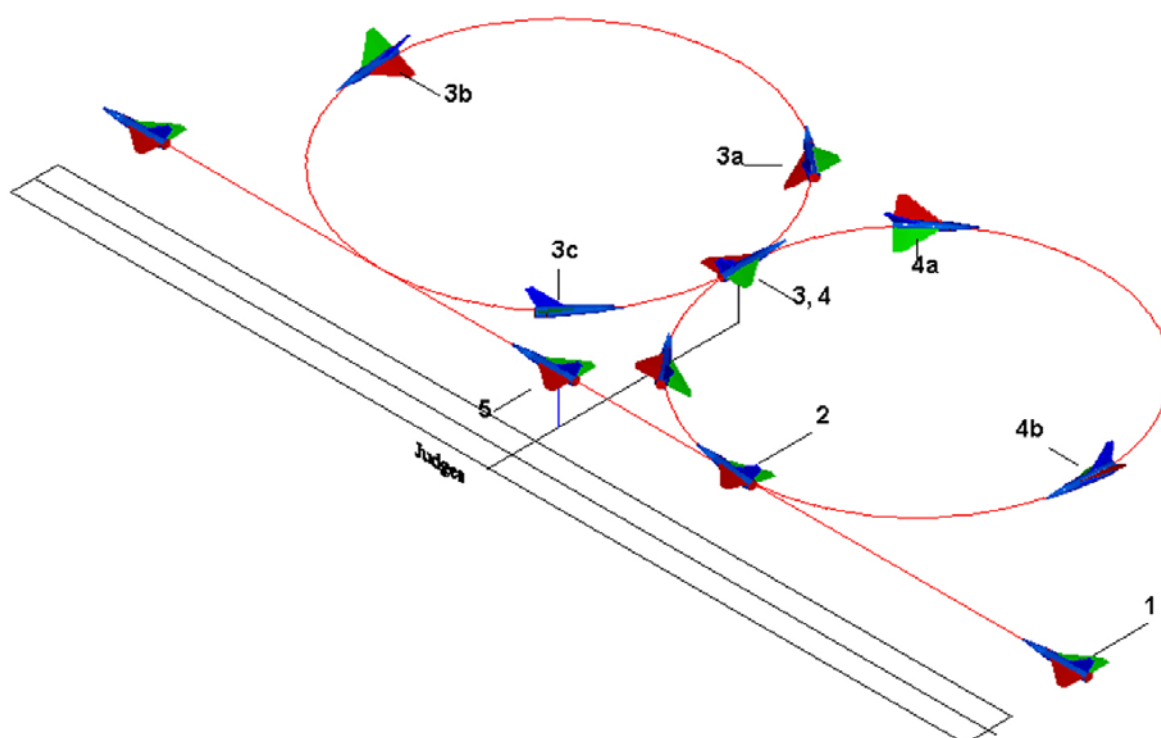


Errors:

- Landing gear not extended in a manner appropriate to the full-size prototype
- Descent not smooth and continuous
- Speed too high during descent
- Model does not adopt landing attitude appropriate to the prototype
- Model bounces on touch down
- Model veers off runway direction on ground roll
- Ground roll too short / too rapid acceleration
- Lift-off not smooth
- Nose attitude during climb not in keeping with the prototype
- Flaps not used if applicable
- Landing gear sequence not initiated if applicable
- Climb-out track not the same as for take-off run
- Climb out too short

Optional Manoeuvre Group 1

- (12) **Horizontal Figure of Eight (non aerobatic only)** - The model approaches in straight and level flight (1), then makes (2) a one-quarter circle turn in a direction away from the judges, followed (3) by a 360 degree circle turn (3a, 3b, 3c) in the opposite direction. This is followed (4) by a three-quarter-circle turn (4a, 4b) in the same direction as the first turn, completing a figure-of-eight, parallel to the runway centreline and at a constant altitude. The manoeuvre ends (5) on the same altitude and heading as the start, and should be centred on the judges' centreline.

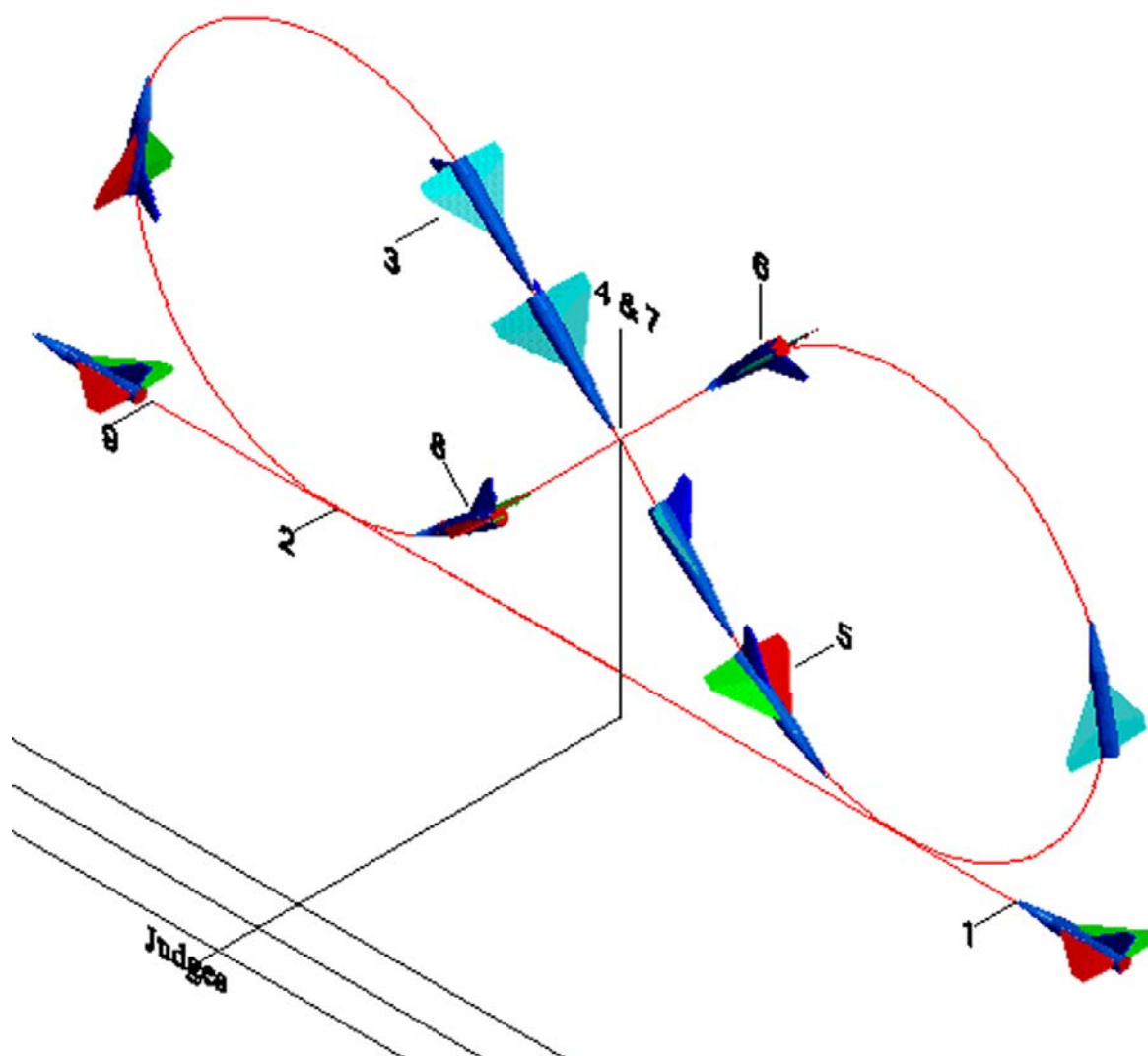


Errors:

- Entry into first circle not at right angles to original flight path
- Circles are of unequal size
- Circles misshapen
- Constant height not maintained
- Intersection not centred on judges position
- Entry and exit path not parallel with judges line
- Overall size of manoeuvre not realistic for prototype
- Model flight path not smooth and steady
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 1

- (13) **Cuban Eight (aerobatic only)** - The model approaches parallel to the runway (1). After passing the judges' centreline, the model pulls up (2) into approximately 5/8th's of an inside loop and continues heading downward (3) at 45 degrees, inverted. The model performs a half roll on the 45-degree downline on the judges' centreline; followed (5) by another approximately 3/4 inside loop to 45 degrees inverted (6). The model then executes a half-roll to normal flight (7) on the judges' centreline, and then recovers (8) to straight and level flight (9) on the same track, heading and altitude as the start.

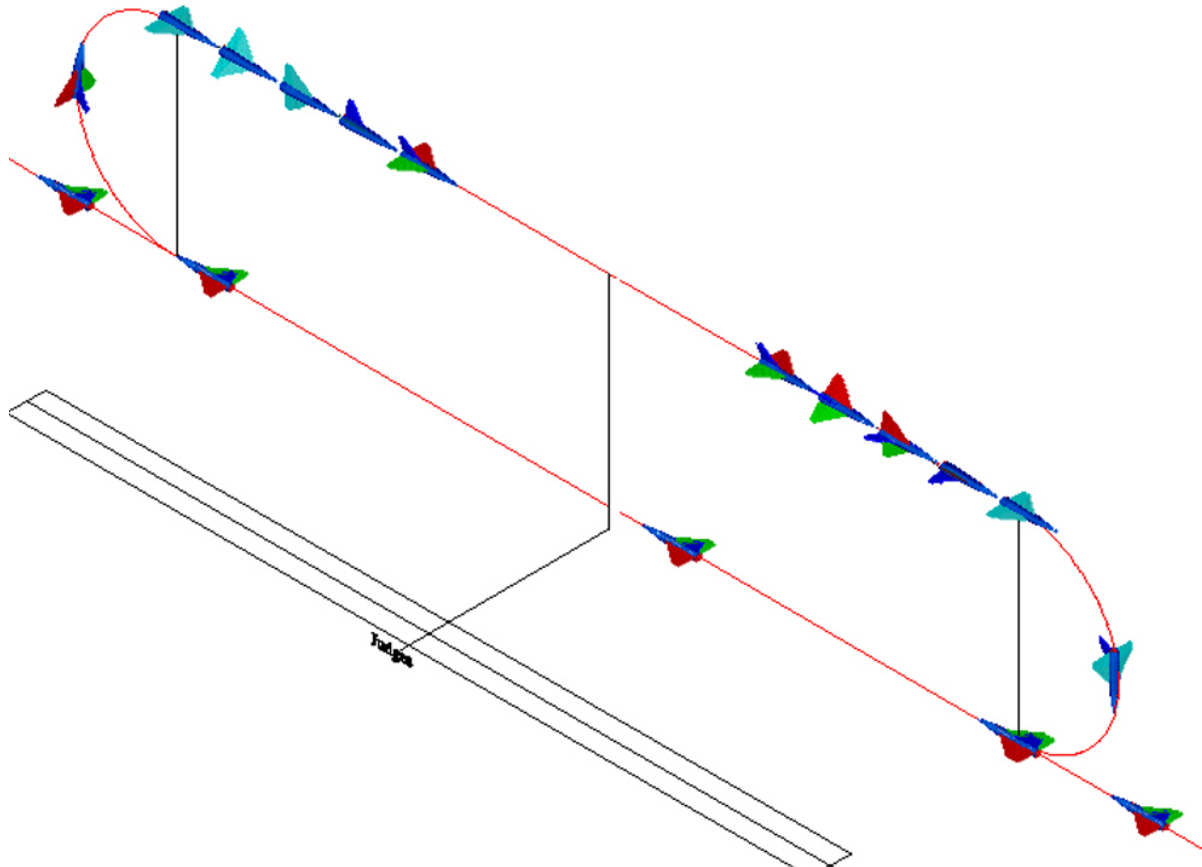


Errors:

- Manoeuvre not performed in a constant vertical plane that is parallel with the judges line
- Loops are not in keeping with the prototype
- Loops are not the same size
- Half rolls are not centred on judges position
- 45 degree descent path not achieved
- Model does not exit manoeuvre at same height as entry
- Model does not resume straight and level flight on same track as entry
- Inappropriate use of throttle
- Size and speed of loops not in manner of prototype
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 1

- (14) **Combination Immelman/Split-S (aerobatic only)** - This manoeuvre is a combination of an Immelman and a Split-S. The model approaches in straight and level flight, and approximately 75 metres after it has passed the judges centreline it pulls up into a half inside loop, and then immediately executes a half roll to normal attitude. After straight and level flight of approx. 150 metres, the model performs a half roll to inverted, and then a half inside loop downward to recover into level flight on the same heading and altitude as the start.

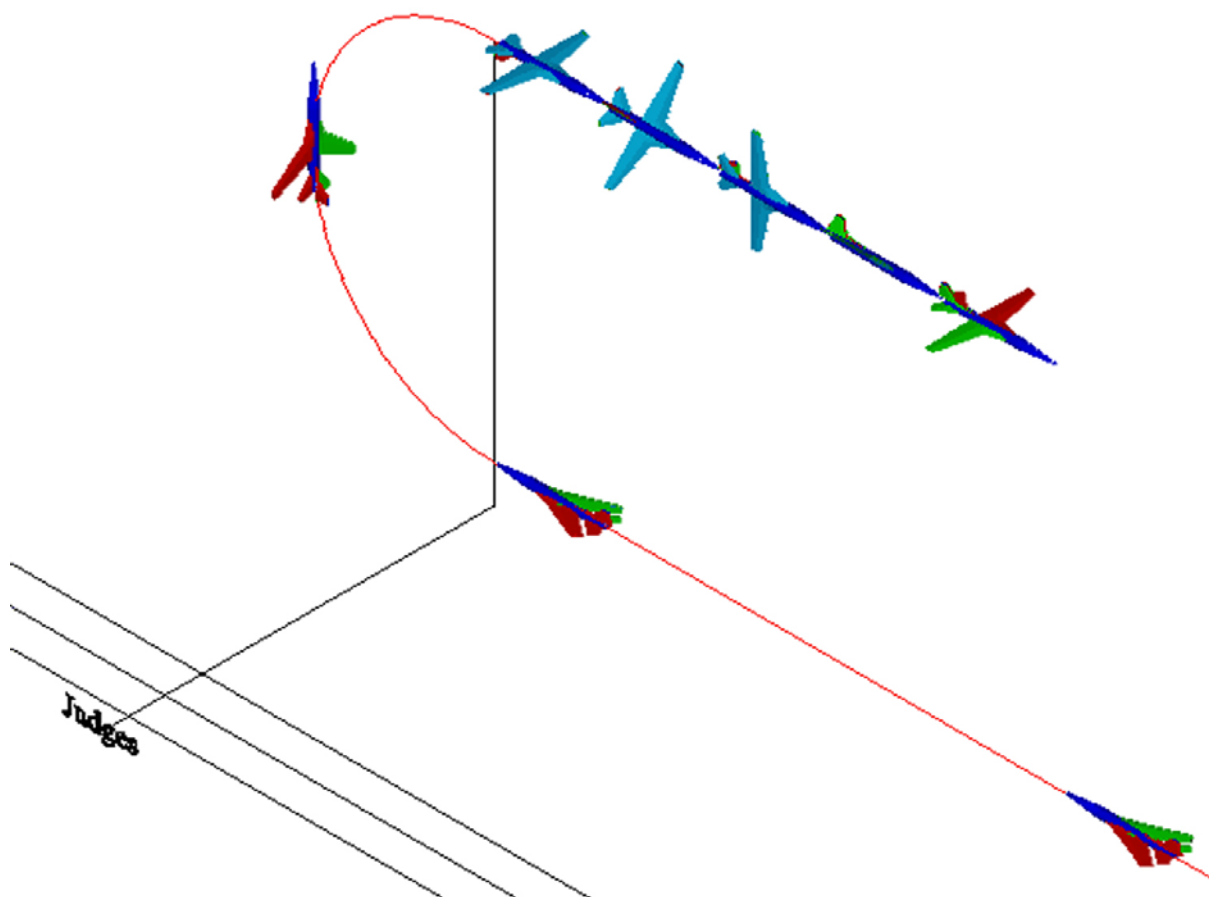


Errors:

- Track of the half loops not in a vertical plane
- Half loops are not accurately semicircular
- First roll starts too late, second roll starts too early
- Excessive height loss in the rolls
- The size of both half loops not equal
- Track veers during the rolls
- Model does not resume straight and level flight on the same track as the entry
- Manoeuvre not flown parallel with judges line
- Size of manoeuvre and speed not in manner of the prototype
- Manoeuvre too far away, too close, too high or too low
- Manoeuvre not centred on judges position

Optional Manoeuvre Group 1

- (15) **Immelman – Variable Geometry wing (aerobatic only)** - The model commences the manoeuvre parallel to the runway with wings swept back and performs a half inside loop upwards, starting at the judges centreline. During the half loop the wings are to be swept forward. On completion of the half loop the aircraft then executes a half roll at the top to resume normal level flight, on a reciprocal track to that at the start. **Note: this option is only available for aerobatic models equipped with Variable Geometry wings.**

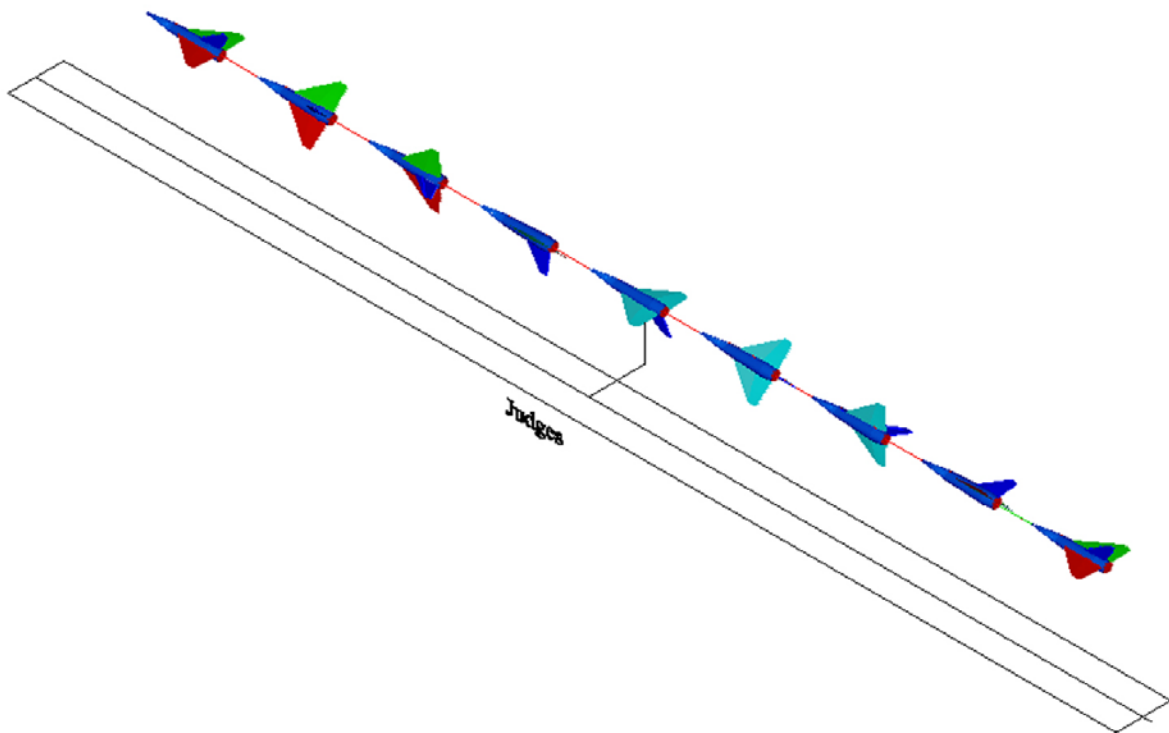


Errors:

- Half loop is not semi-circular
- Plane of the half loop not vertical or on line
- Half loop not centred on judges position
- Half loop is not in keeping with the prototype
- Inappropriate use of throttle
- Model inverted for too long or too short a time
- Roll starts too early or too late
- Excessive height loss in the roll
- Track veers during the roll
- Model does not resume straight and level flight on the opposite track to entry
- Manoeuvre not flown parallel with judges line
- Size and speed of manoeuvre not in the manner of the prototype
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 2

- (21) **Slow roll (aerobatic only)** - The model approaches in straight and level flight, parallel to the runway, and rolls slowly at a constant rate through one complete roll and resumes straight and level flight on the same heading and altitude, taking between 3 and 5 seconds to execute the slow roll. This manoeuvre should be performed horizontally. Contestant to nominate combat or airshow style.

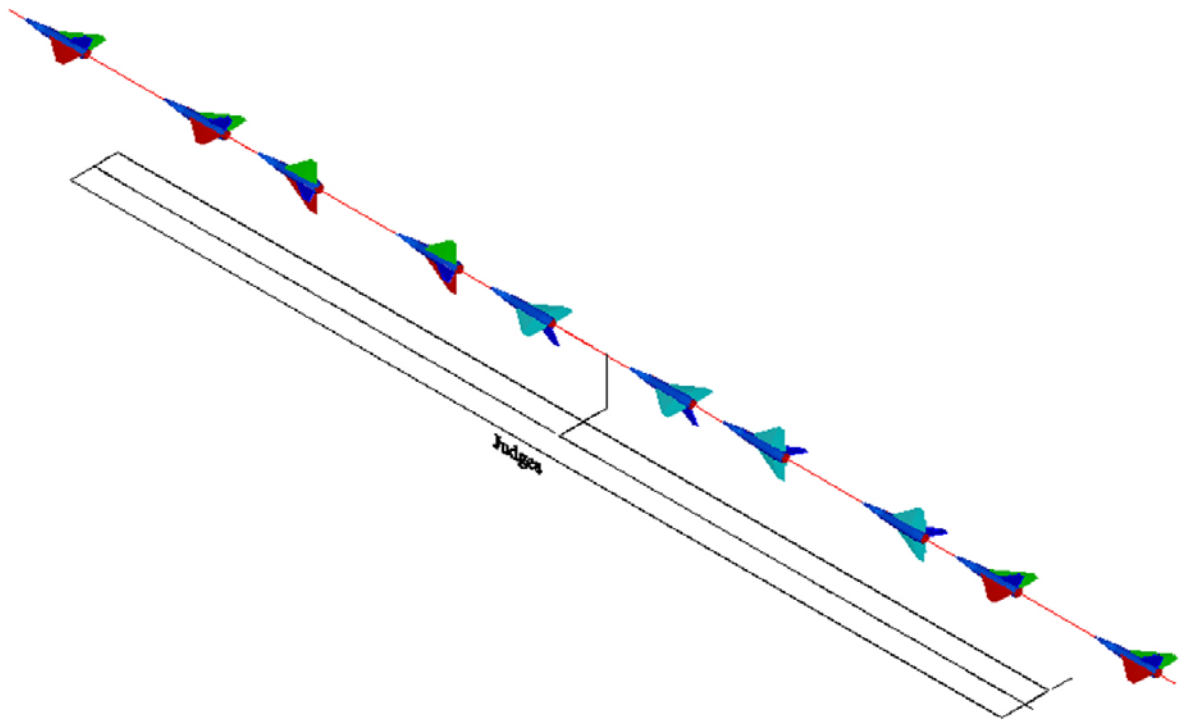


Errors:

- Rate of roll not constant
- Style of roll not typical of the prototype
- Roll not centred on judges position
- Entry and exit at different heights or speeds
- Entry, and exit tracks and line of roll not parallel with judges line
- Model does not resume straight and level flight on same track and heading as entry
- Style of roll not nominated
- Roll rate too fast
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 2

- (22) **4-Point Roll (aerobatic only)** - The model approaches in straight and level flight, parallel to the runway, and rolls at a constant rate through four complete quarter rotations, hesitating at each of three equally spaced intervals, and resumes straight and level flight on the same heading and altitude. This manoeuvre should be performed horizontally.

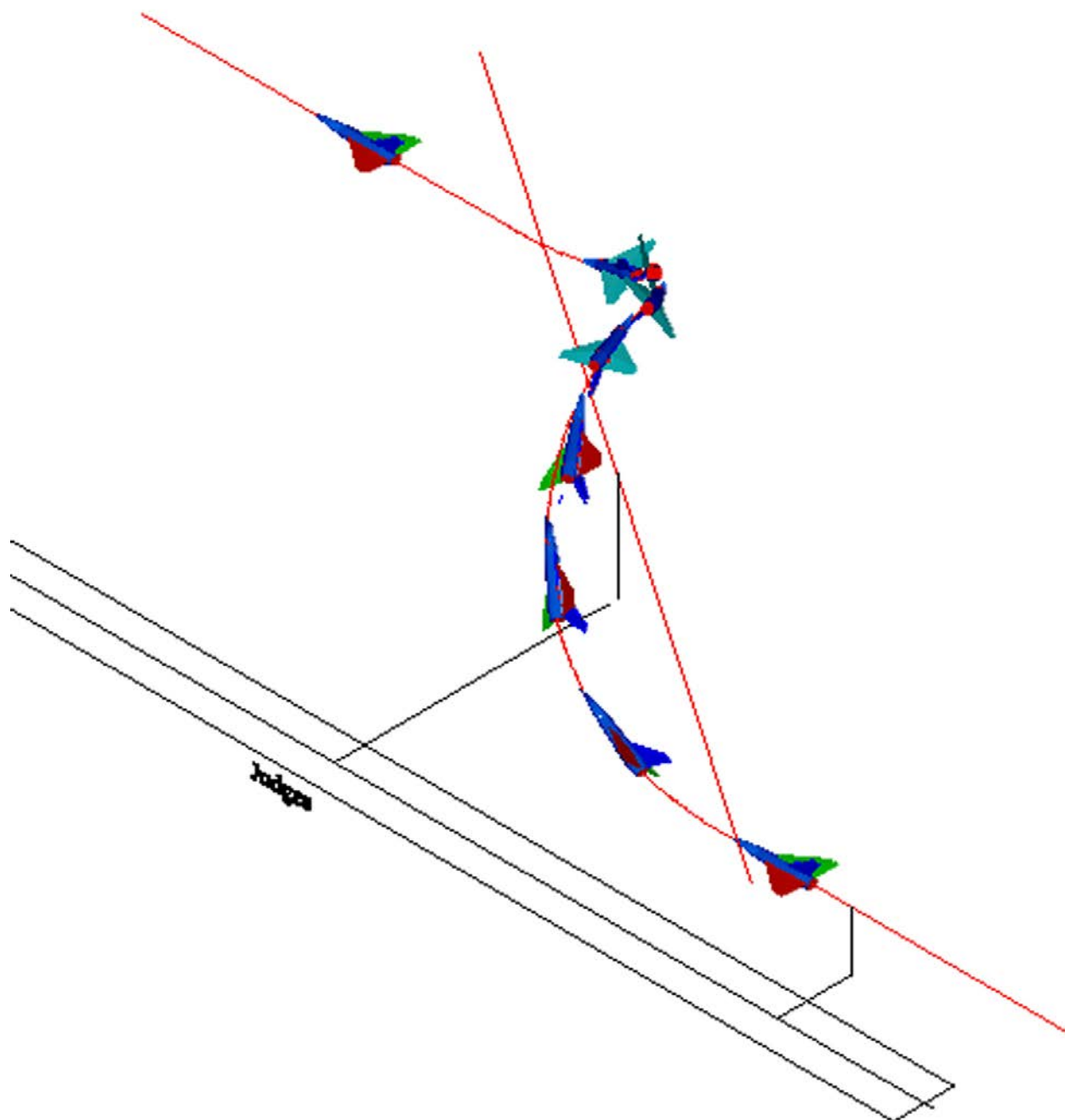


Errors:

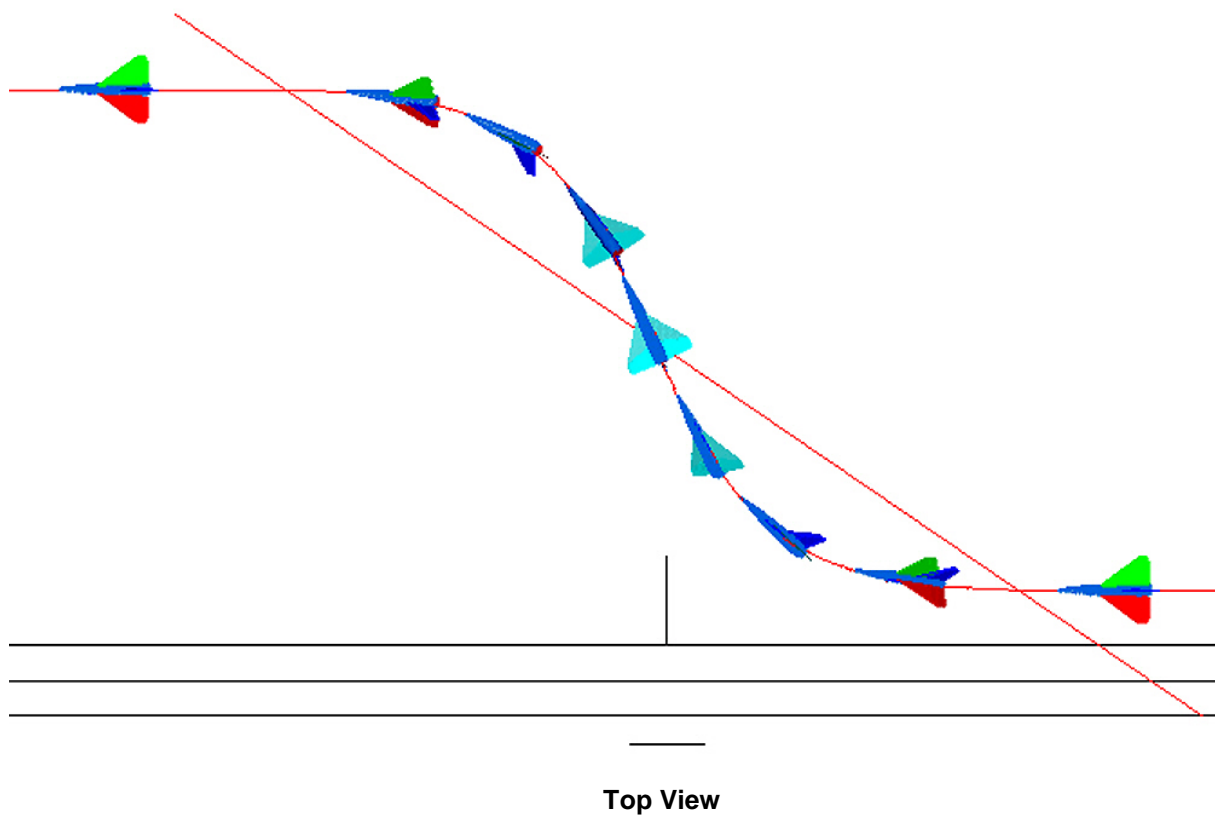
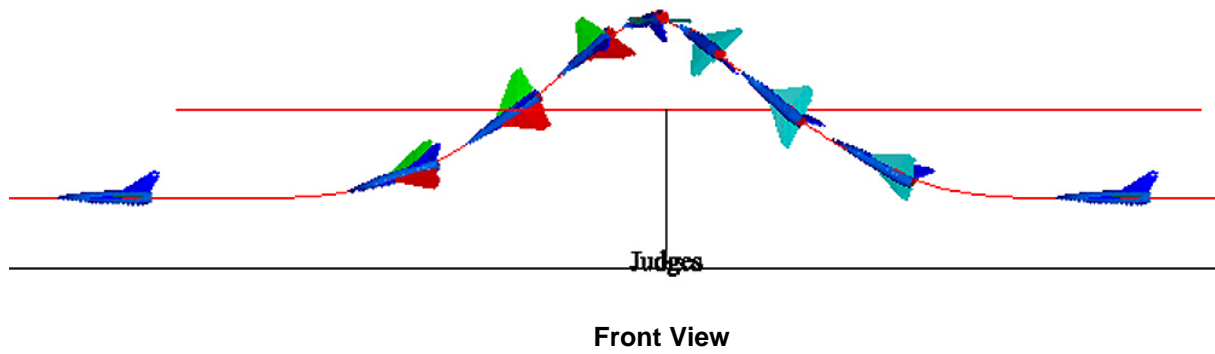
- Rate of roll not constant
- Style of roll not typical of the prototype
- Roll not centred on judges position
- Entry and exit at different heights or speeds
- Entry, and exit tracks and line of roll not parallel with judges line
- Model does not resume straight and level flight on same track as entry
- Style of roll not nominated
- One or more of the quarter rolls deviate from 90 degrees
- Intervals between each part of roll different
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 2

- (23) **Positive 'G' Roll (aerobatic only)** - This is a special form of the normal roll. The model approaches in level flight and parallel to the runway, and performs a 360 degree roll away from the judges while simultaneously pitching up, describing a gentle helical flight-path, and resumes level flight, again parallel to the runway but further away than on the entry track.



Isometric View
(front and top views on next page)

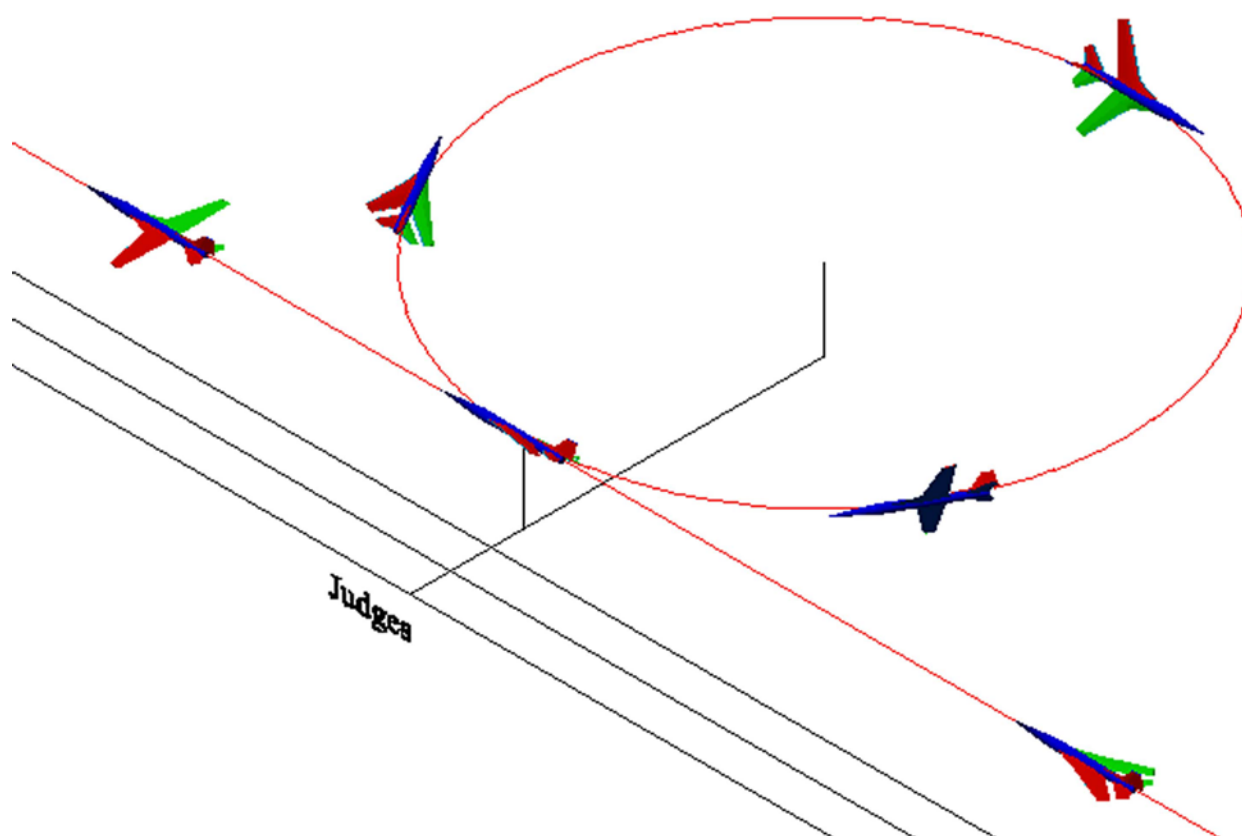


Errors:

- *Rate of roll not constant*
- *Rate of pitch not constant*
- *Style of roll not typical of the prototype*
- *Roll not centred on judges position*
- *Entry and exit at different heights or speeds*
- *Entry and exit tracks not parallel to each other*
- *Attitude at entry is not the same as attitude at exit*
- *Manoeuvre too far away, too close, too high or too low*

Optional Manoeuvre Group 2

- (24) **360 degree Wing-extending Turn – Variable Geometry wing (aerobatic only)** - The model approaches in straight and level flight with wings swept back, and enters a 360 degree circle, commencing by turning away from the judges on the centreline. The model adopts a rate of bank appropriate to the wing configuration and a constant altitude. At any time while executing the 360-degree circle the wings are extended and the model decelerates to recover to straight and level flight on the same heading and altitude as the start. The rate of turn should be in keeping with the prototype, and is intended to demonstrate the transition from high-speed swept-wing configuration to a lower speed un-swept configuration. **Note: this option is only available for aerobatic models equipped with Variable Geometry wings.**

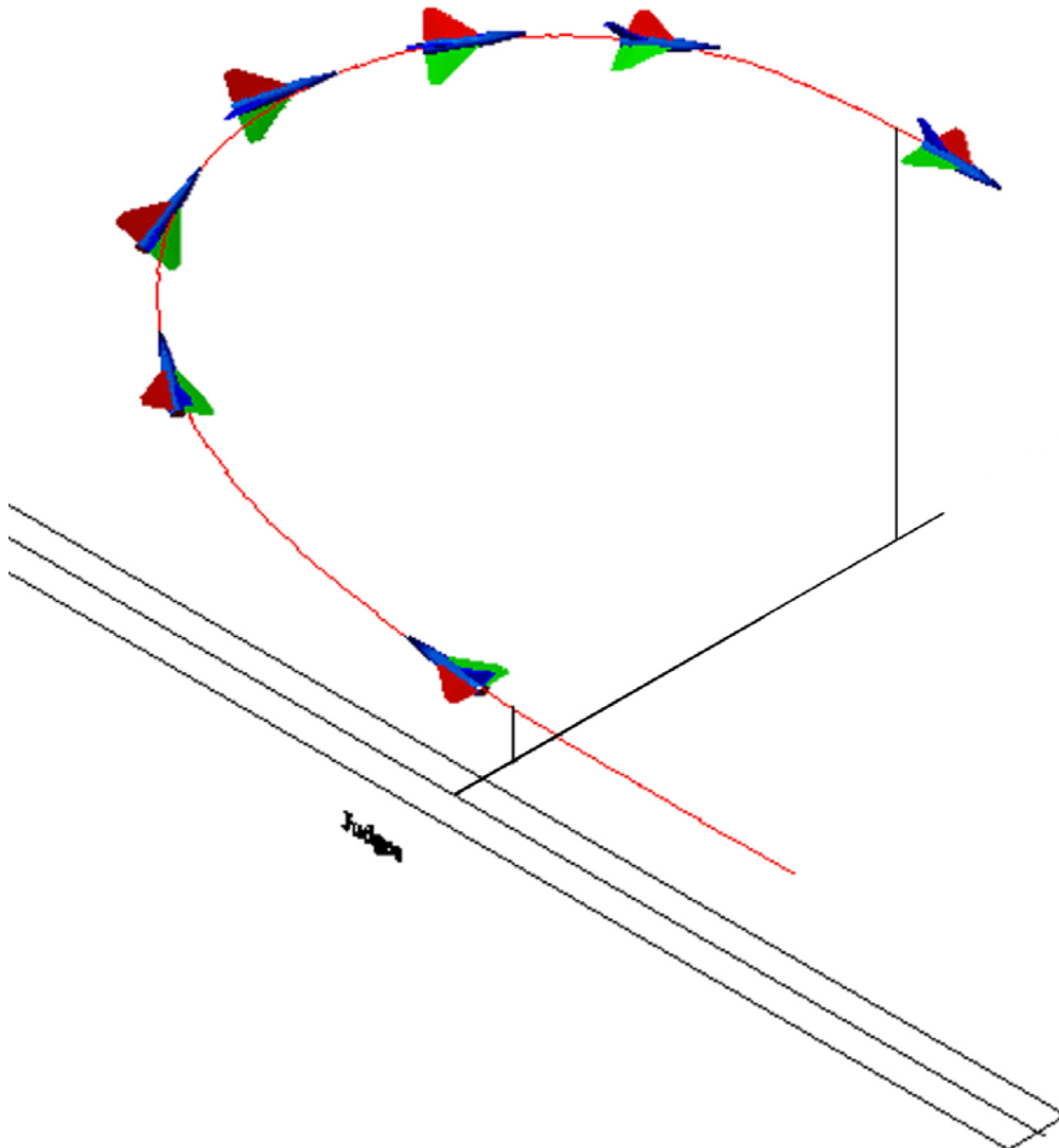


Errors:

- Circle not centred on judges position
- Constant height not maintained
- Entry and exit path not parallel with judges line
- Overall size of manoeuvre not realistic for prototype
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 2

- (25) **Chandelle (non aerobatic option only)** - From straight and level flight the model passes the judges' centreline, and performs a 180 degree turn in a direction away from the judges. During the first 90 degrees of the turn the model simultaneously climbs and rolls into the turn. During the second 90 degrees of the turn the model will continue climbing (gradually lowering the nose) and rolling away from the turn. At the end of the manoeuvre the model attains Standard Attitude.

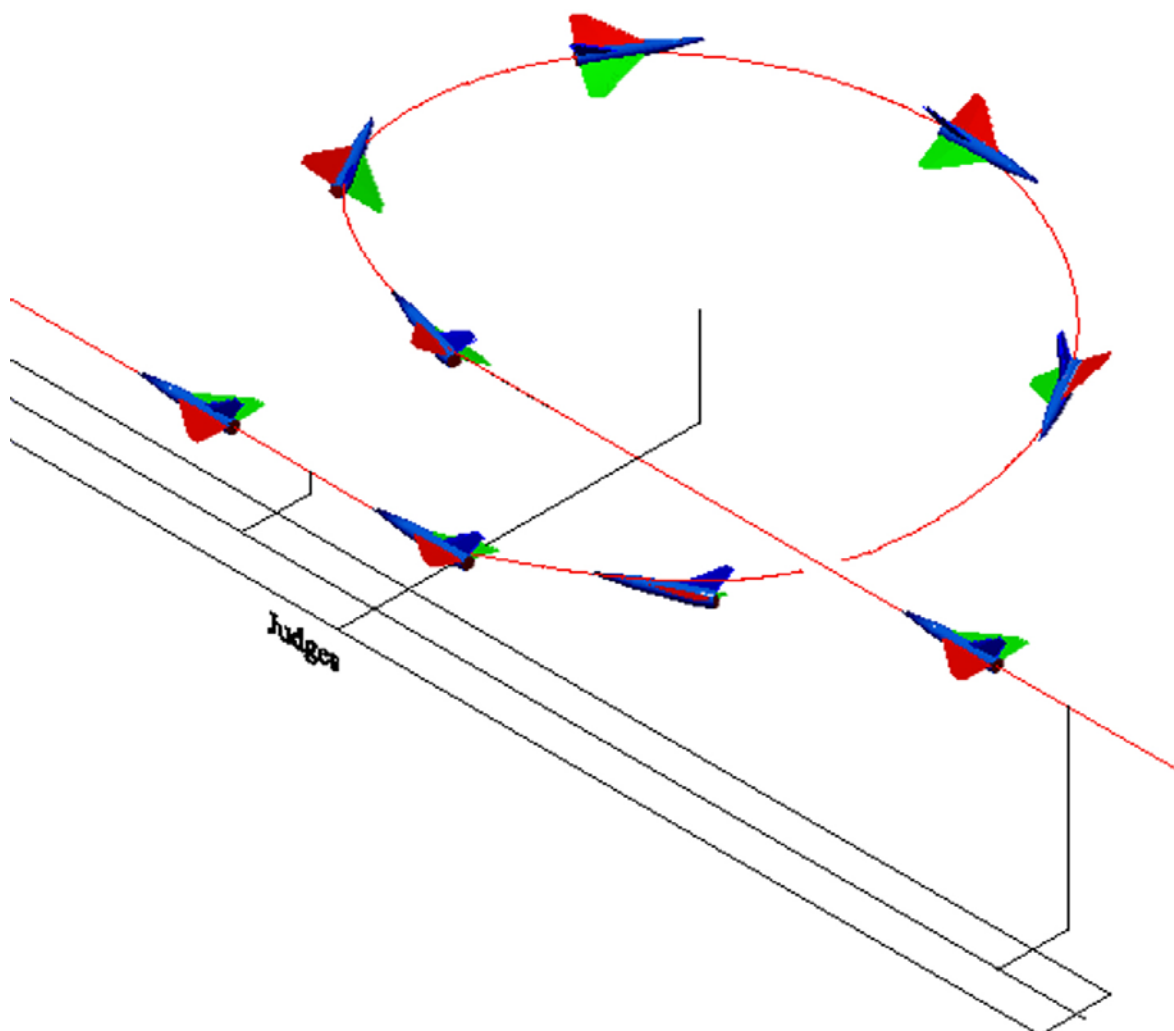


Errors:

- Approach and departure not parallel to runway heading
- Approach and departure not horizontal
- Climb rate not constant
- Turn rate not constant
- Turn not 180 degrees
- Manoeuvre too far away or too close
- Manoeuvre does not start and finish on the judges centreline

Optional Manoeuvre Group 2

- (26) **360 degree descending circle (all types)** - Commencing from straight and level flight, the model performs a gentle 360 degree descending circle, in a direction away from the judges, at a constant low throttle setting. The manoeuvre terminates at a maximum height of 5 metres, resuming straight and level flight on the same path.

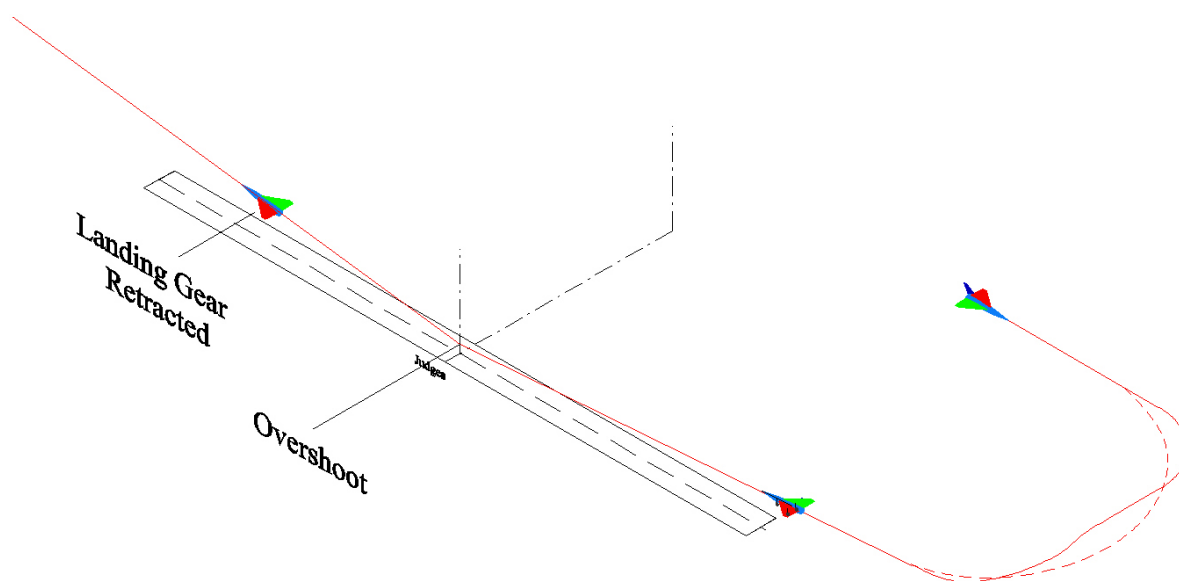


Errors:

- Rate of descent not constant
- Descent too steep
- Throttle setting not constant or low enough
- Circle misshapen
- No significant loss of height
- Model does not descend to 5 metres or below
- Circle not centred on judges' position
- Entry and exit paths not parallel with the judges' line
- Start and finish not called in straight and level flight
- Too far away, too close.

Optional Manoeuvre Group 3

- (31) **Overshoot (all types) (revised 2012)** - The model shall commence at end of downwind leg and execute 180° base & final turn to, descending smoothly at reduced power and speed and, in front of the judges at a height of approx. 3 metres, aborts the landing and applies full power. The model climbs on a constant track, heading and climb angle for approx. 5 seconds, during which time the landing gear sequence has to be initiated. Retractable landing gear (where fitted), flaps, spoilers, speed brakes etc., are to be extended as per the full-size prototype.

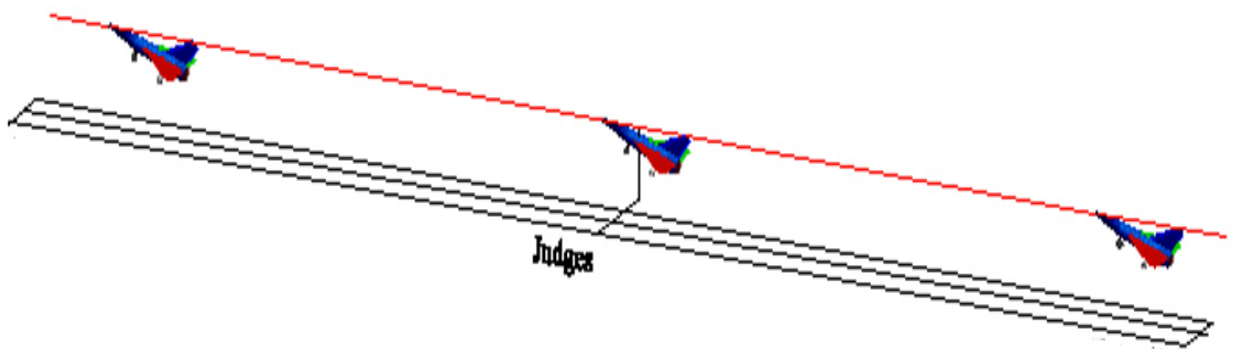


Errors:

- Landing gear not extended in a manner appropriate to the full-size prototype
- Altitude changed before appropriate descent point
- Descent not smooth and continuous
- Speed too high during descent
- Model does not adopt landing attitude appropriate to the prototype
- Abort of landing more than 3m above ground
- Climb rate incorrect (too steep or too shallow)
- Nose attitude during climb not in keeping with the prototype
- Flaps not used if applicable
- Landing gear sequence not initiated if applicable
- Climb-out track not the same as for final track
- Climb out too short

Optional Manoeuvre Group 3

- (32) **Slow Flight in “dirty” configuration (all types)** - The model approaches straight and level, parallel and close to the runway at a height of between 10 and 15 metres in a “dirty” configuration, i.e. with the landing gear already extended. Also flaps, airbrake(s) and/or spoiler(s) must be extended (if applicable). The model will fly at just above landing speed, and continues for a minimum duration of 10 seconds, centred on the judges' centreline.



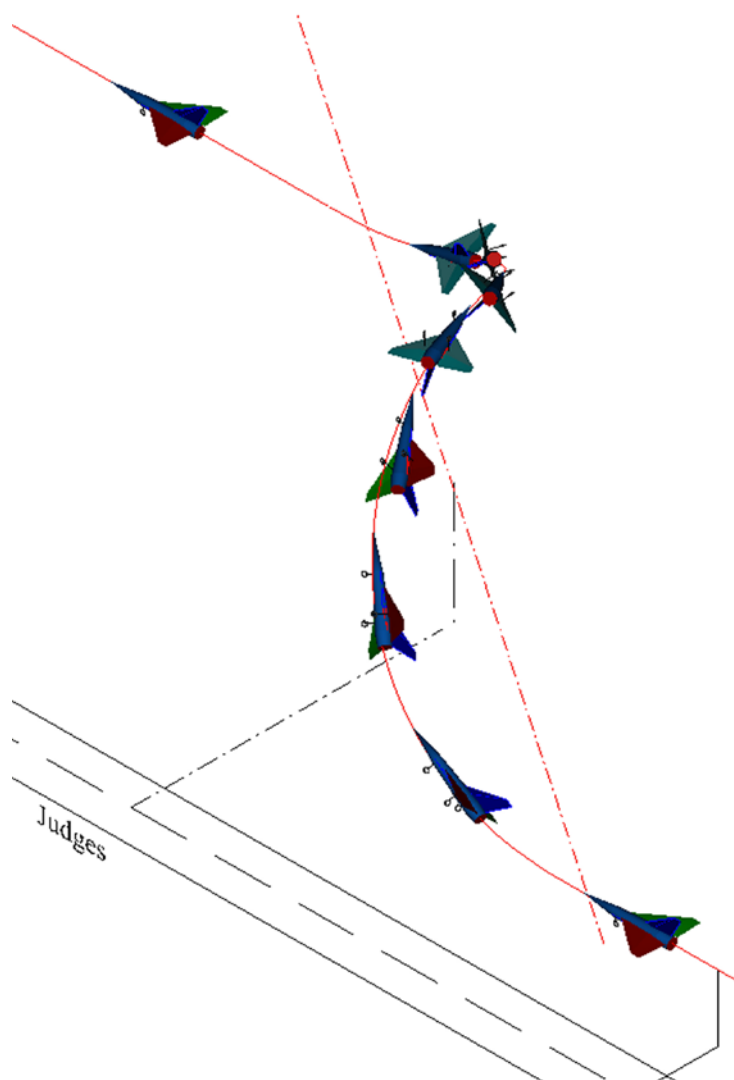
Errors:

- Landing gear not extended
- Flaps, airbrake(s) and/or spoiler(s) not extended if applicable
- Model does not fly a straight course
- Model gains or loses height
- Model track not parallel to the runway centreline
- Manoeuvre not centred on judges position
- Manoeuvre not flown parallel with judges line
- Manoeuvre too short in time
- Model's flight not smooth and steady
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 3

- (33) **Positive 'G' Roll with landing gear extended (aerobatic only)** - This is essentially identical to the Positive 'G' roll (manoeuvre 23), only it is executed at a **moderate speed with the landing gear extended**. The model approaches in level flight and parallel to the runway and performs a 360 degree roll away from the judges while simultaneously pitching up, describing a gentle helical flight-path, and resumes level flight, again parallel to the runway but further away than on the entry track.

Note: see also side and top view diagrams of manoeuvre 23 to further clarify the flightpath

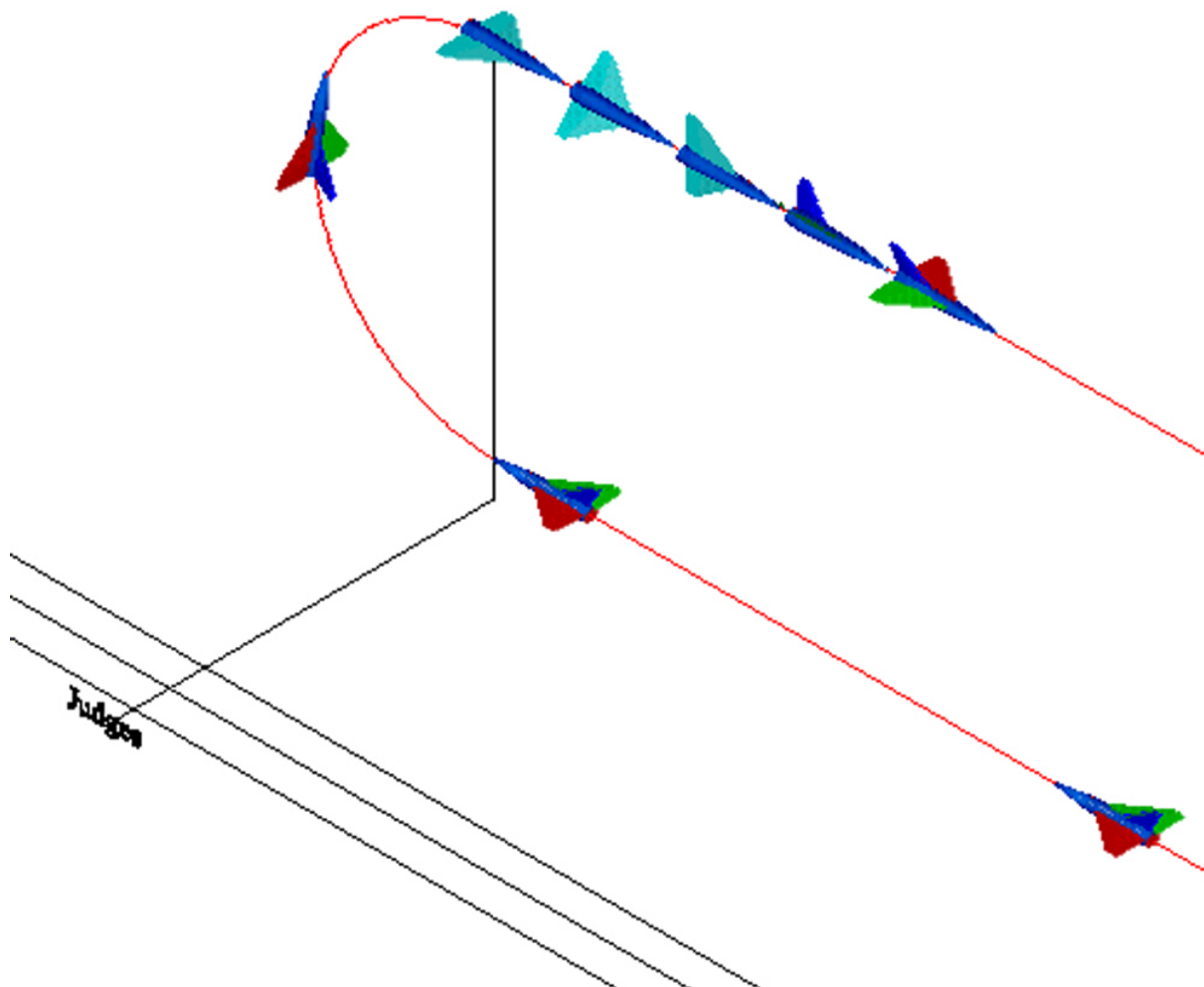


Errors:

- Landing gear not extended prior to start of manoeuvre
- Rate of roll not constant
- Rate of pitch not constant
- Style of roll not typical of the prototype
- Speed with landing gear extended too high or not typical of prototype
- Roll not centred on judges position
- Entry and exit at different heights or speeds
- Entry and exit tracks not parallel to each other
- Attitude at entry is not the same as attitude at exit
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 4

- (41) **Immelman Turn (aerobatic only)** - The model commences the manoeuvre parallel to the runway and performs a half inside loop upwards, starting at the judges centreline, and then immediately executes a half roll at the top to resume normal level flight, on a reciprocal track to that at the start.

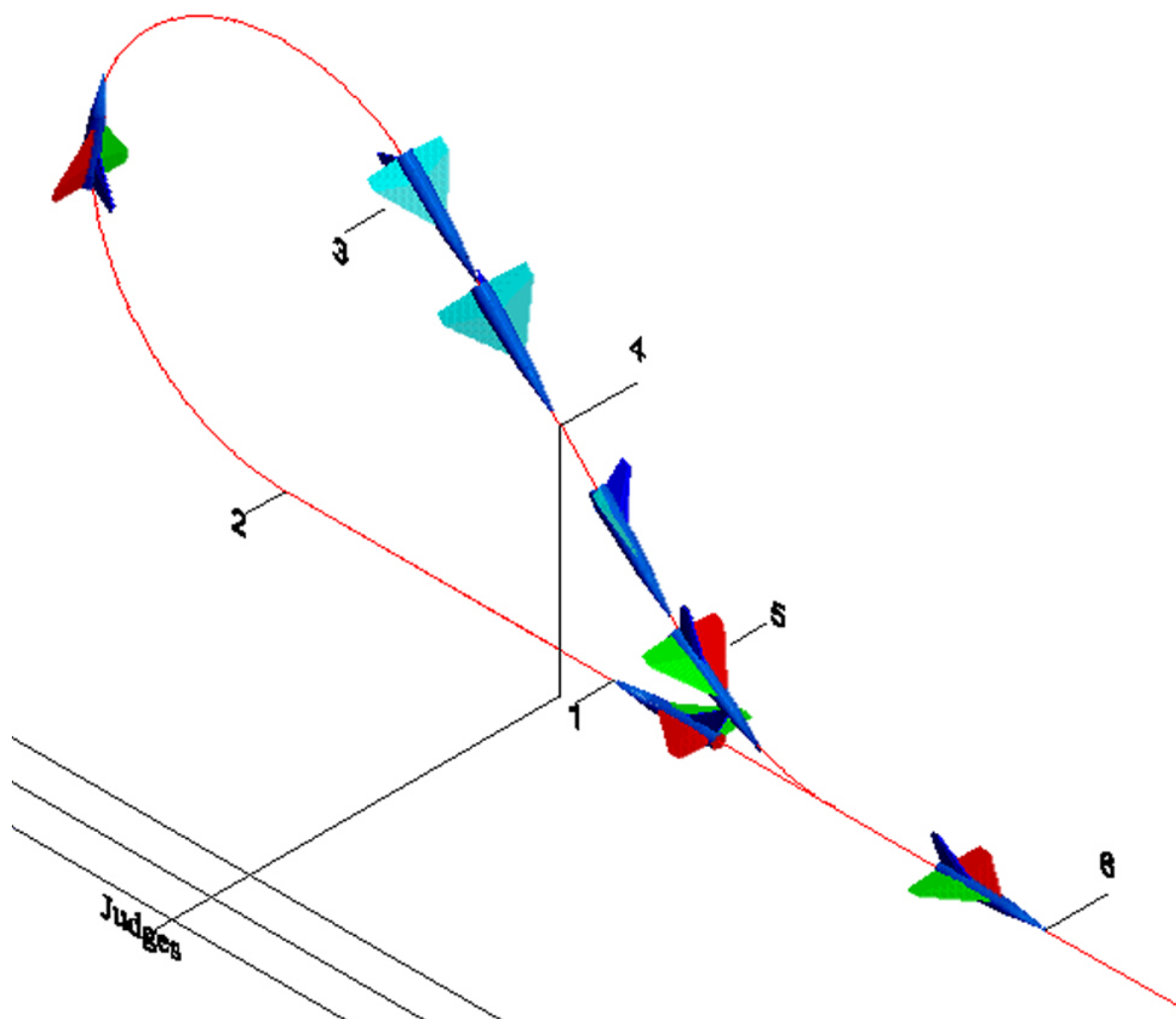


Errors:

- Plane of the half loop not vertical or on line
- Half loop not centred on judges position
- Half loop is not in keeping with the prototype
- Inappropriate use of throttle
- Roll out not immediate on completion of half loop
- Excessive height loss in the roll
- Track veers during the roll
- Model does not resume straight and level flight on the opposite track to entry
- Manoeuvre not flown parallel with judges line
- Size and speed of manoeuvre not in the manner of the prototype
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 4

- (42) **Half Cuban Eight (aerobatic only)** - The model approaches (1) parallel to the runway, straight and level, and after passing the judges' centreline, the model pulls up (2) into approximately 5/8th's of an inside loop and continues heading downward (3) at 45 degrees, inverted. The 45 degree inverted flight is held until a half roll (4) is performed in front of the judges, followed by a pull out (5) into straight and level flight (6) which is to be at the same height as original entry.

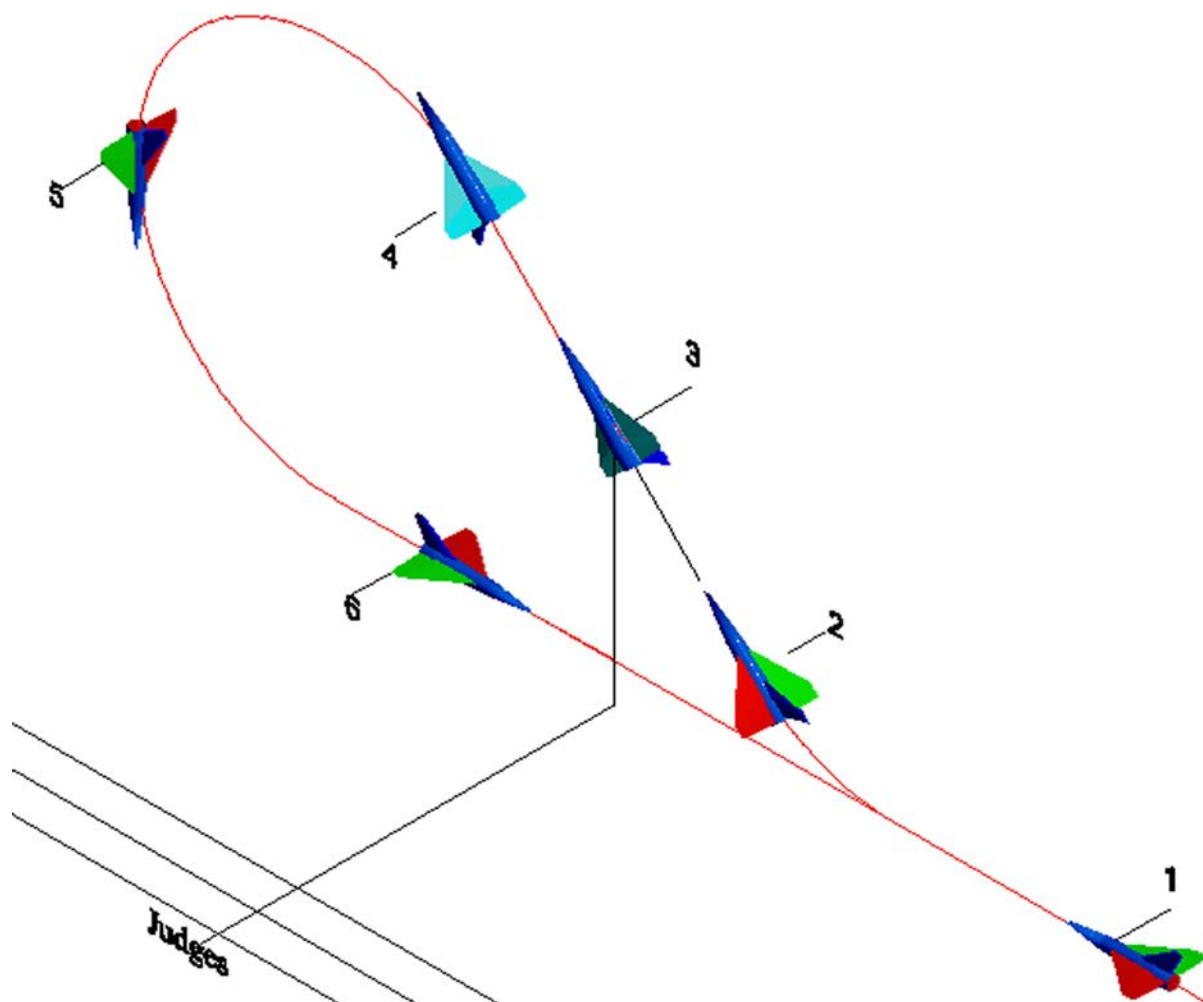


Errors:

- Manoeuvre not performed in a vertical plane that is parallel with the judges line
- Loop portion of the manoeuvre is not circular
- Half roll is not centred on judges position
- 45 degree descent path not achieved
- Model does not exit manoeuvre at same height as entry
- Inappropriate use of throttle
- Size and speed of manoeuvre not in the manner of the prototype
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 4

- (43) **Half Reverse Cuban Eight (aerobatic only)** - The model approaches (1) parallel to the runway, straight and level, and pulls up (2) to a 45 degree upline, performs a half roll (3) in front of the judges then pulls (4) through 5/8th's of an inside loop (5) to resume straight and level flight (6) at the entry height on a reciprocal track.

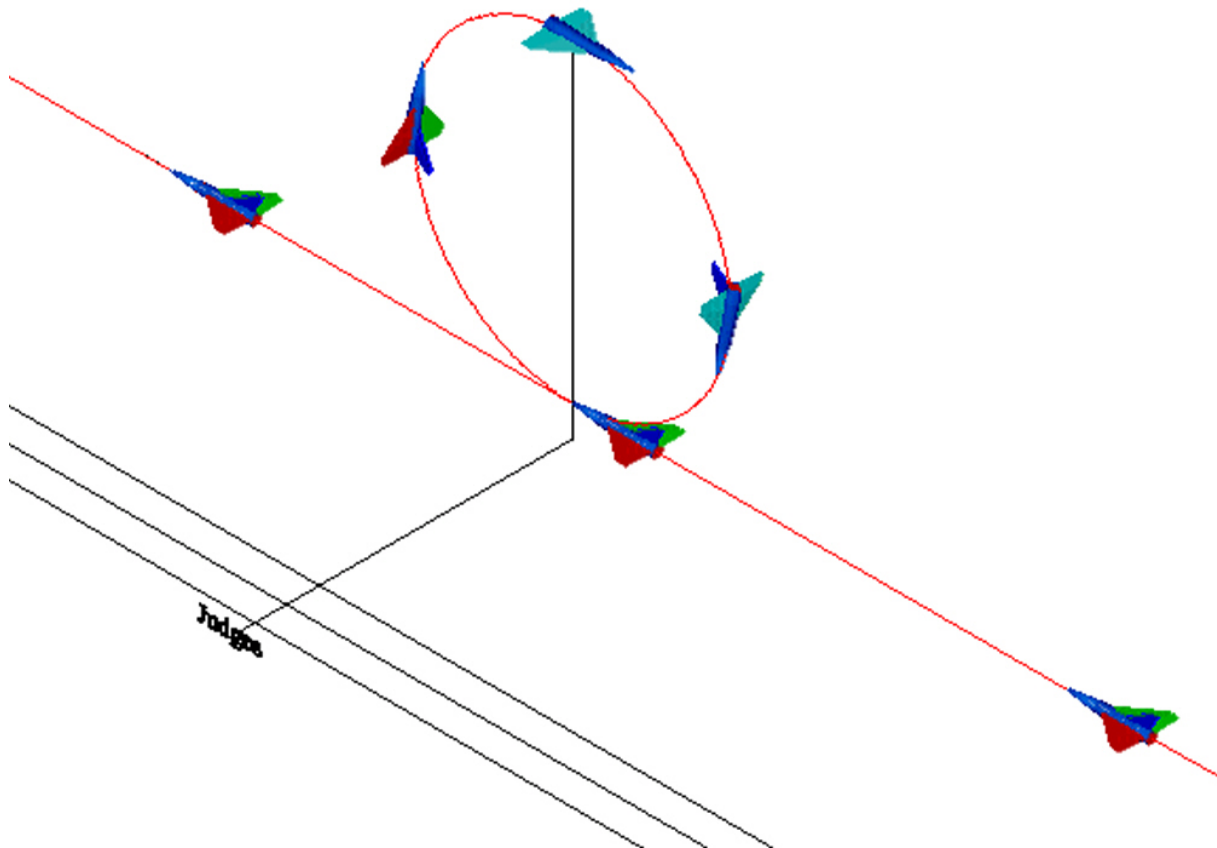


Errors:

- *Manoeuvre not performed in a vertical plane that is parallel with the judges line*
- *Loop portion of the manoeuvre is not circular*
- *Half roll is not centred on judges position*
- *45 degree descent ascent path not achieved*
- *Model does not exit manoeuvre at same height as entry*
- *Inappropriate use of throttle*
- *Size and speed of manoeuvre not in the manner of the prototype*
- *Manoeuvre too far away, too close, too high or too low*

Optional Manoeuvre Group 4

- (44) **One Inside Loop (aerobatic only)** - From straight and level flight, parallel to the runway, the model executes a 360 degree circle in a vertical plane, and resumes level flight at the same altitude, and on the same track and heading as it started.

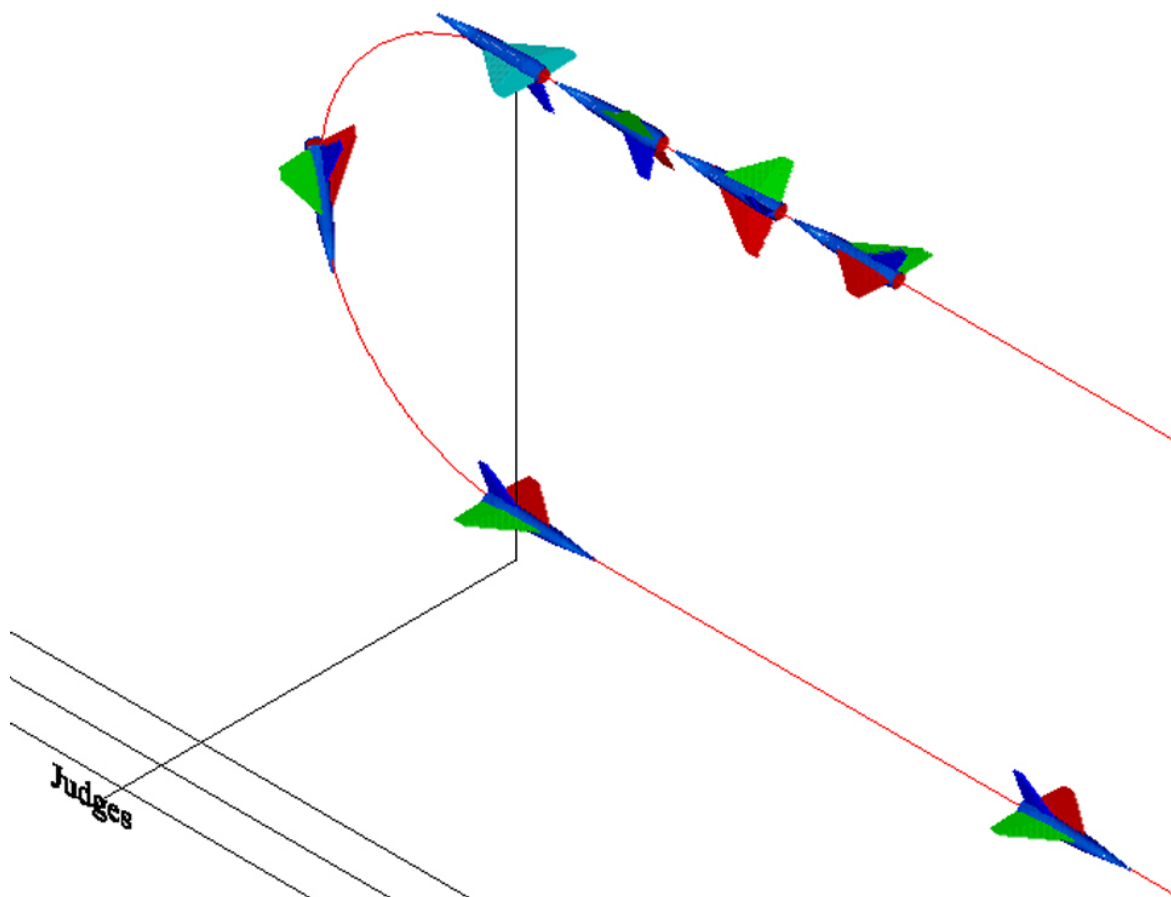


Errors:

- *Plane of loop not vertical*
- *Loop not in keeping with the prototype*
- *Inappropriate use of throttle*
- *Size and speed of manoeuvre not in the manner of the prototype*
- *Manoeuvre not centred on the judges position*
- *Model does not resume straight and level flight on the same track and height as entry*
- *Manoeuvre not flown parallel with the judges line*
- *Manoeuvre too far away, too close, too high or too low*

Optional Manoeuvre Group 4

- (45) **Split “S” (aerobatic only)** - The model commences the manoeuvre parallel to the runway, performs a half roll to arrive in the inverted position at the judges' centreline, and then immediately a half inside loop downwards, and resumes normal level flight on a reciprocal track to that at the start.

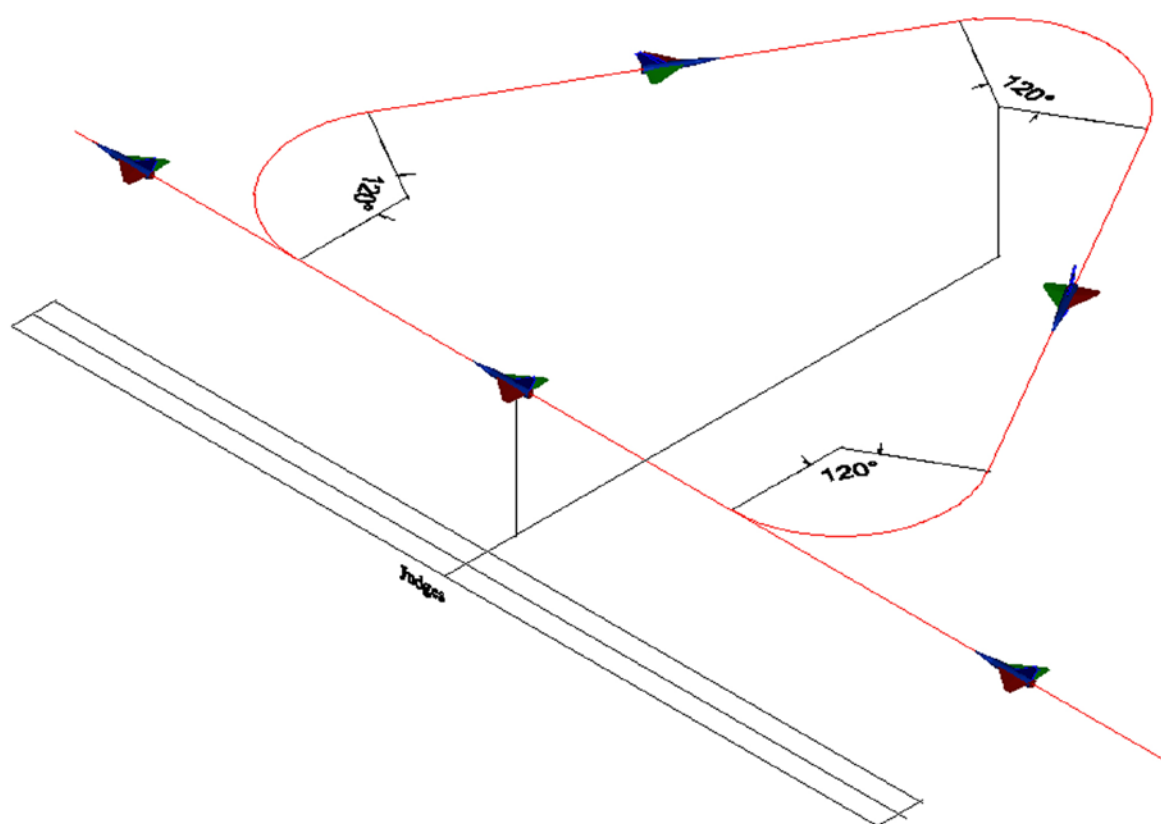


Errors:

- Roll starts too early or too late
- Track veers during half roll
- Excessive height loss in the roll
- Model inverted for too long before commencing half loop
- Inappropriate use of throttle
- Plane of the half loop not vertical or on line
- Half loop not centred on judges position
- Half loop is not in keeping with the prototype
- Model does not resume straight and level flight on the opposite track to entry
- Manoeuvre not flown parallel with judges line
- Size of manoeuvre and speed not in manner of the prototype
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 4

- (46) **Flight in Triangular Circuit (non aerobatic option only)** - The model approaches in straight and level flight, parallel to the runway and approximately 100 metres after passing the judges centreline, turns through 120 degrees (away from the judges). It then flies straight and level for approximately 200 metres, turns 120 degrees in the same direction as before, then continues straight and level for a further 200 metres approximately. It then makes another 120 degree turn in the same direction as before, and flies straight and level (parallel to the runway), completing an equilateral triangle, recovering with the model at the same altitude and heading as entry.

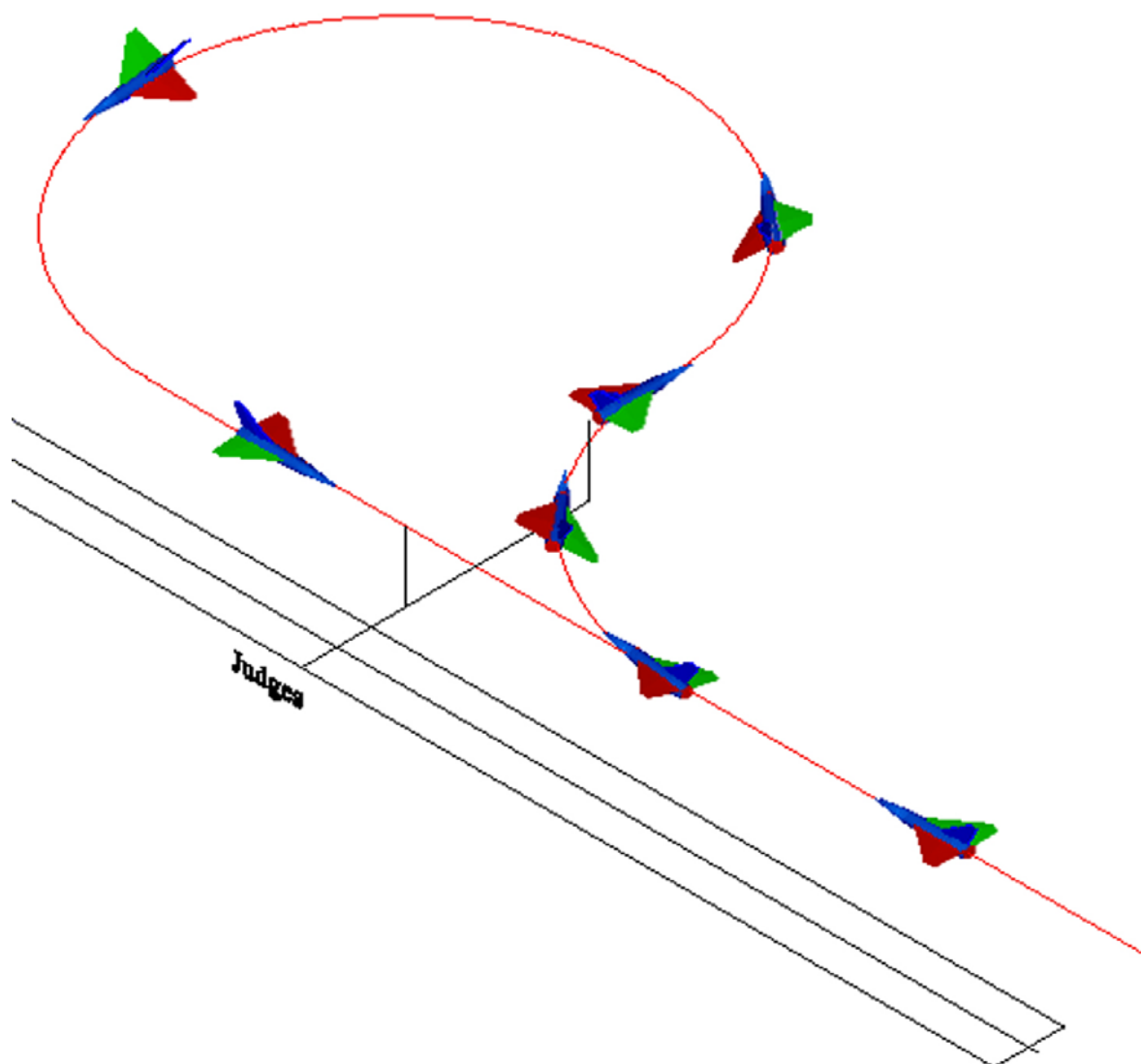


Errors:

- Model changes height
- Rate of turn at corners not constant
- Angular differences between the 3 corners
- Sides of triangle are not straight
- Sides of triangle are not equal in length
- Sides of triangle are too short
- Correction for drift not properly made
- Triangle not centred on judges position
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 4

- (47) **Procedure Turn (non aerobatic option only)** - The model approaches parallel to the runway in straight and level flight, then makes a one-quarter circle turn in a direction away from the judges, followed by a 270 degree turn in the opposite direction. The manoeuvre ends on the same altitude and on a reciprocal heading to the start. The transition from the one-quarter circle turn to the 270-degree turn should be centred on the judges' centreline.

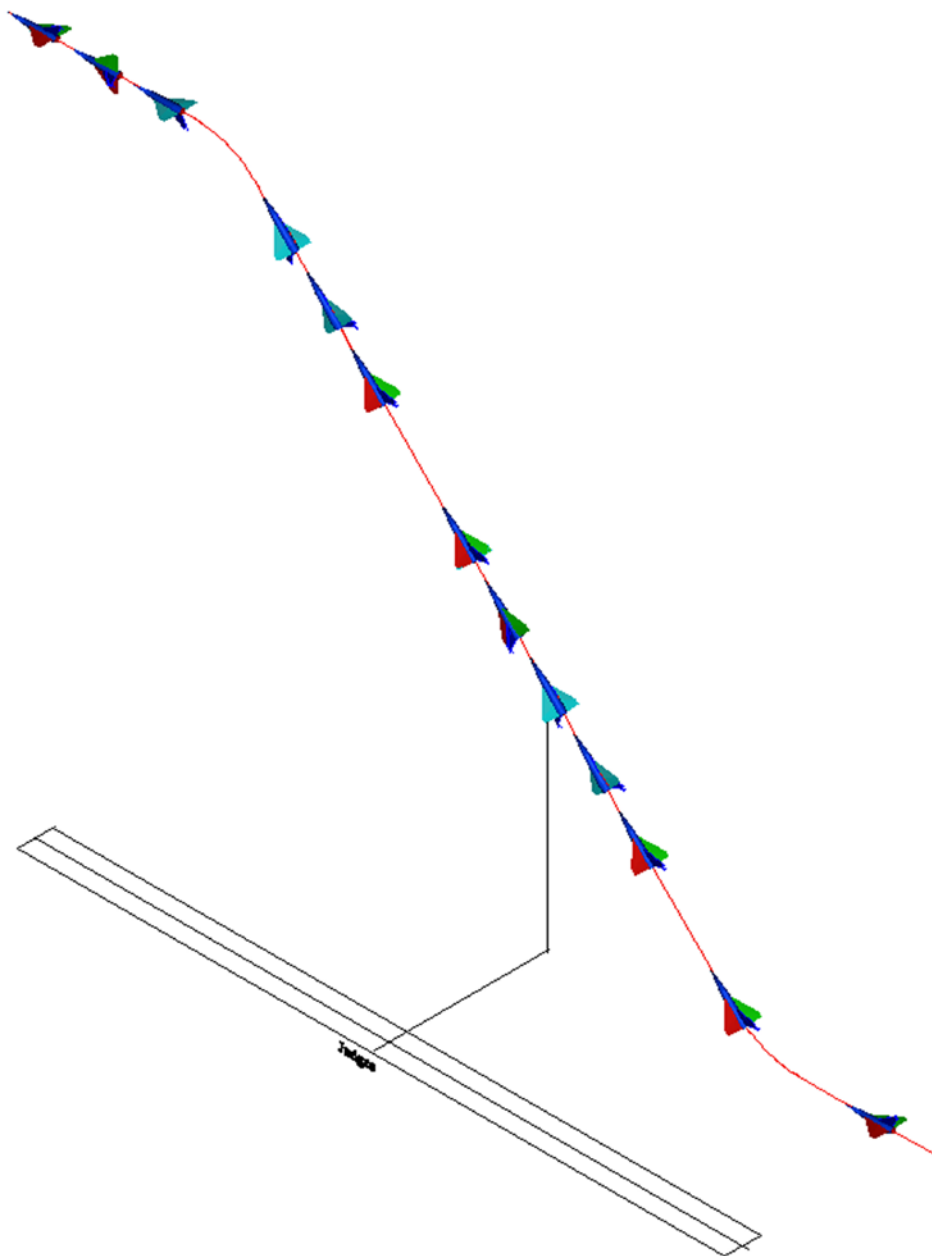


Errors:

- *Entry into the 270 degree turn not at right angles to original flight path*
- *270 degree turn not at a constant radius*
- *Constant height not maintained*
- *Transition not centred on judges position*
- *Entry and exit path not parallel with judges line*
- *Overall size of manoeuvre not realistic for prototype*
- *Model flight path not smooth and steady*
- *Manoeuvre too far away, too close, too high or too low*

Optional Manoeuvre Group 5

- (51) **Victory Roll (with rolling exit) (aerobatic only)** - The model commences parallel to the runway, in level flight, and before reaching the judges' centreline it pulls up to a climbing flight path of approx. 45 degrees for 2-3 seconds, followed by a complete 360 degrees roll on the judges centreline. After another 2-3 seconds the model makes a half roll to inverted, pulls to resume level flight followed by a half roll to upright attitude and the same track and heading as entry.

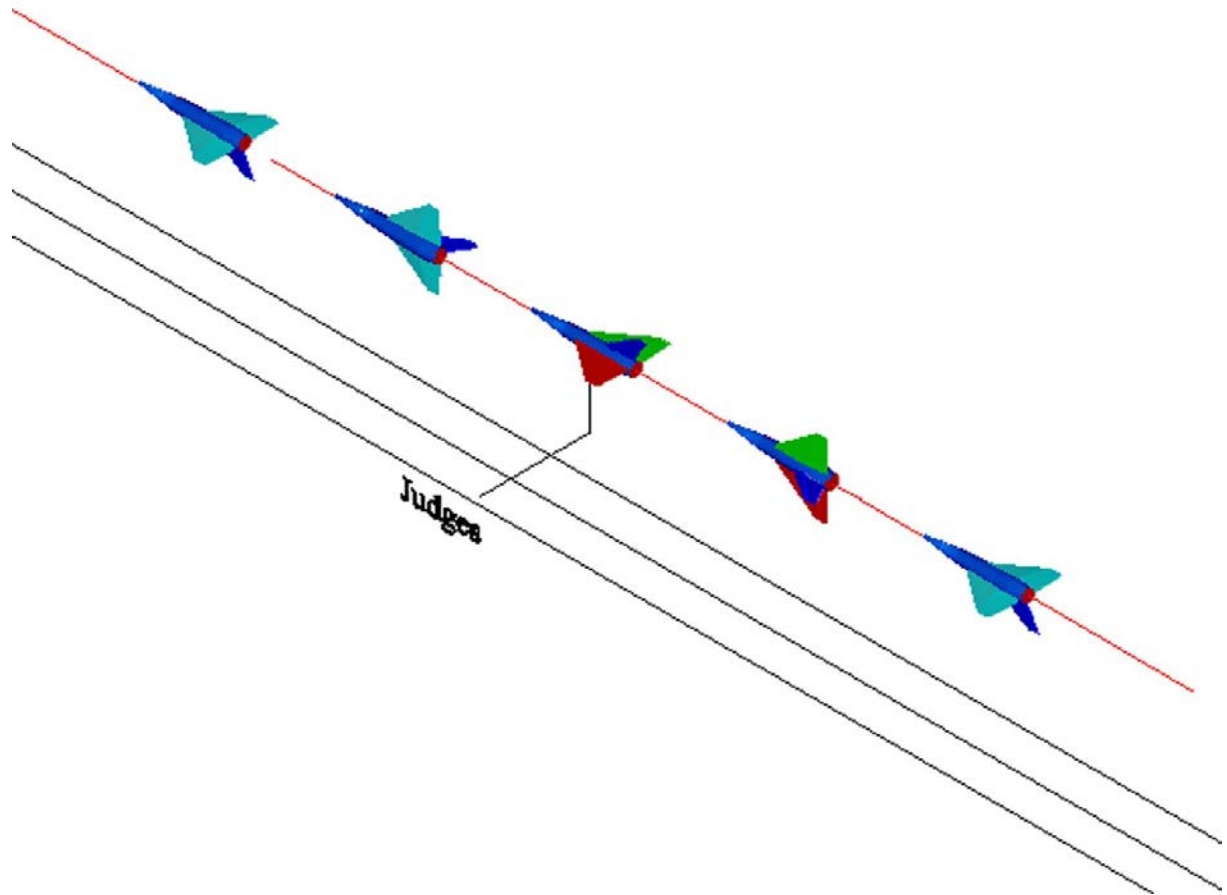


Errors:

- *Manoeuvre not performed in a constant vertical plane that is parallel with the judges line*
- *Climb angle not constant*
- *Roll rate too high*
- *45 degree climb path not achieved*
- *Model rolls by more or by less than 360 degrees*
- *360 degree roll not centred on judges position*
- *Exit not as described*
- *Manoeuvre too far away, too close, too high or too low*

Optional Manoeuvre Group 5

- (52) **Inverted Normal Axial Horizontal Roll (aerobatic only)** - From inverted straight and level flight parallel to the runway, the model rolls at a constant rate through one complete rotation, and resumes inverted straight and level flight on the same heading.

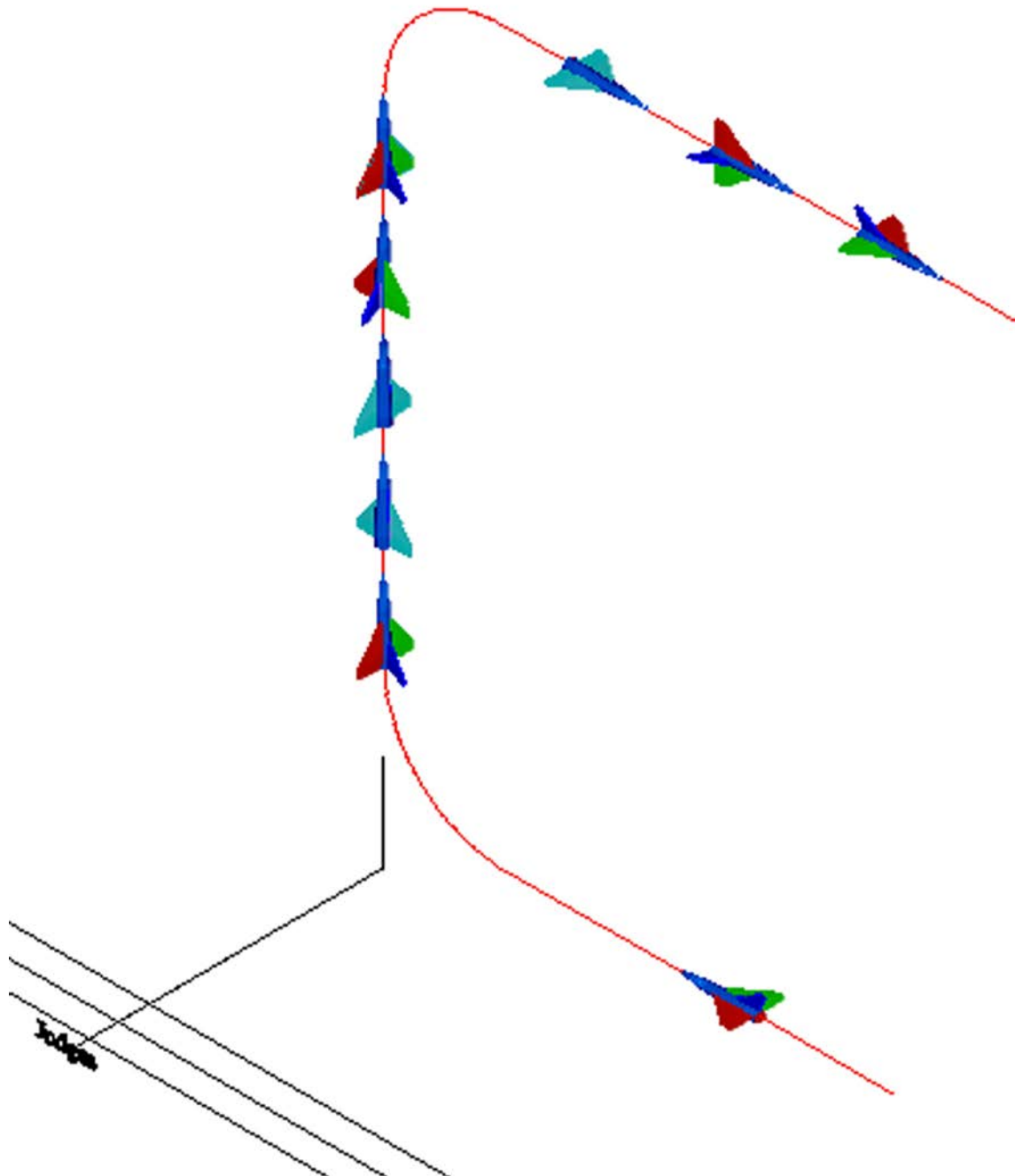


Errors:

- Model not inverted at start of manoeuvre
- Rate of roll not constant
- Style not typical of the prototype
- Roll not centred on judges position
- Entry and exit at different heights or speeds
- Entry and exit tracks and line of roll not parallel with judges line
- Model does not resume inverted straight and level flight on same track as entry
- Roll not horizontal
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 5

- (53) **Normal Vertical Roll (aerobatic only)** - From straight and level flight the model performs a 90 degree pull up to vertical, rolls at a constant rate through one complete 360 degree rotation, and recovers with positive G pull to level flight inverted then a half-roll to upright attitude. The vertical part of the manoeuvre should be on the judges centreline.

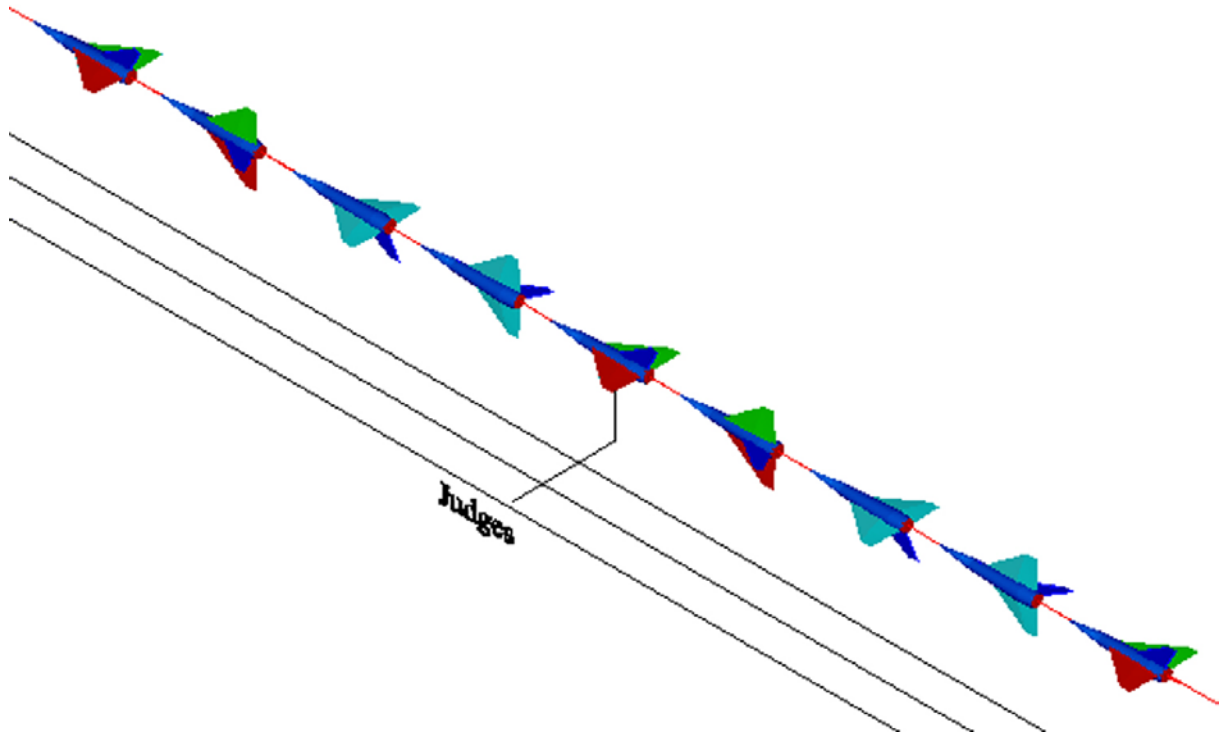


Errors:

- *Rate of roll not constant*
- *Style of roll not typical of the prototype*
- *Vertical Roll not centred on judges position*
- *Vertical Roll more or less than 360 degrees*
- *Roll not vertical*
- *Manoeuvre too far away, too close, too high or too low*

Optional Manoeuvre Group 5

- (54) **Two (consecutive) Axial Horizontal Rolls in the same direction (aerobatic only)** - From straight and level flight, parallel to the runway, the model rolls at a constant rate through two complete consecutive rotations, and resumes straight and level flight on the same heading.

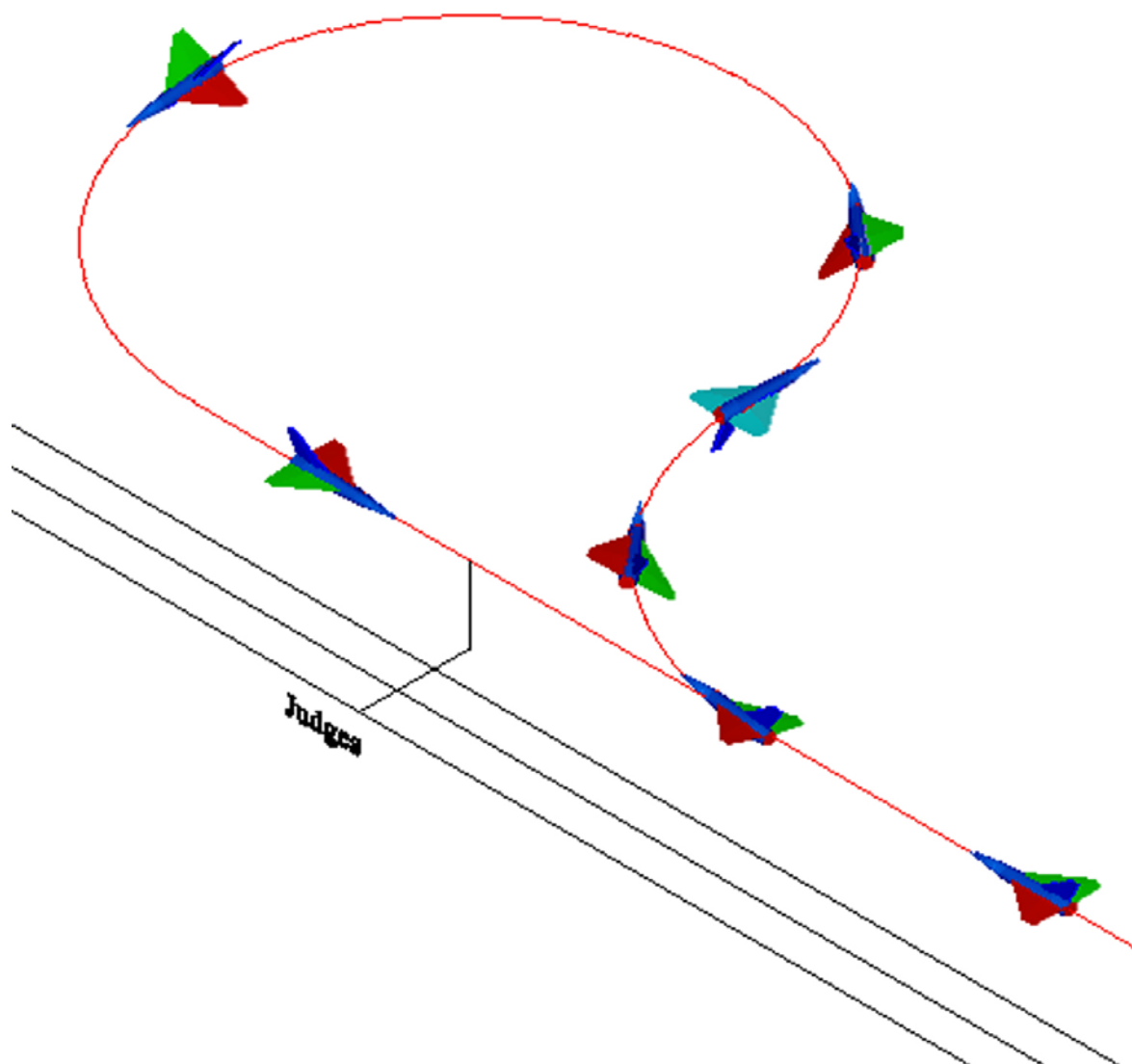


Errors:

- Rate of roll not constant
- Style of roll not typical of the prototype
- Rolls not centred on judges position
- Entry and exit at different heights or speeds
- Entry and exit tracks and line of rolls not parallel with judges line
- Model does not resume straight and level flight on same track as entry
- Rolls not horizontal
- Manoeuvre too far away, too close, too high or too low
- Hesitation between first and second roll

Optional Manoeuvre Group 5

- (55) **Derry Procedure Turn (aerobatic only)** - The model approaches in straight and level flight, then makes a one-quarter circle turn in a direction away from the judges. Toward the end of this quarter circle turn the model rolls in the direction of the turn, to be inverted at the end of the turn. The model continues to roll to enter a 270 degree circle turn in the opposite direction. The model will stop rolling when upright and banked in the direction of the turn. The manoeuvre ends on the same altitude and on a reciprocal heading to the start. The transition from the one-quarter circle turn to the 270 degree turn should be centred on the judges' centreline.

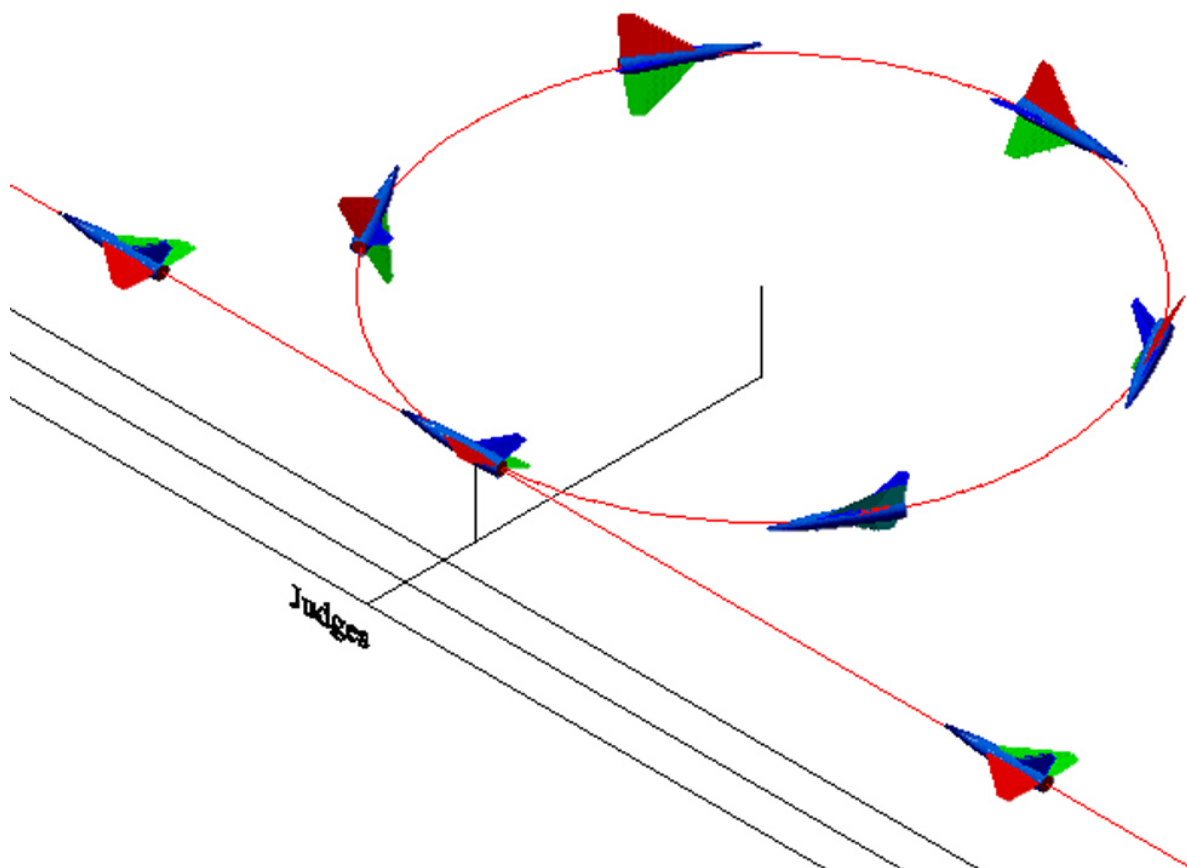


Errors:

- Entry into the 270 degree turn not at right angles to original flight path
- 270 degree turn not at a constant radius
- Constant height not maintained
- Transition not centred on judges position
- Entry and exit path not parallel with judges line
- Overall size of manoeuvre not realistic for prototype
- Model flight path not smooth and steady
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 5

- (56) **360 degree Horizontal Circle (non aerobatic option only)** - The model approaches in straight and level flight, and executes a 360 degree circle, commencing by turning away from the judges on the centreline. The model adopts a constant rate of bank (between 20 and 30 degrees) and a constant altitude, recovering to straight and level flight on the same heading and altitude as the start. The rate of turn should be in keeping with the prototype, and is intended to demonstrate a high rate-of-turn of non-aerobatic models.

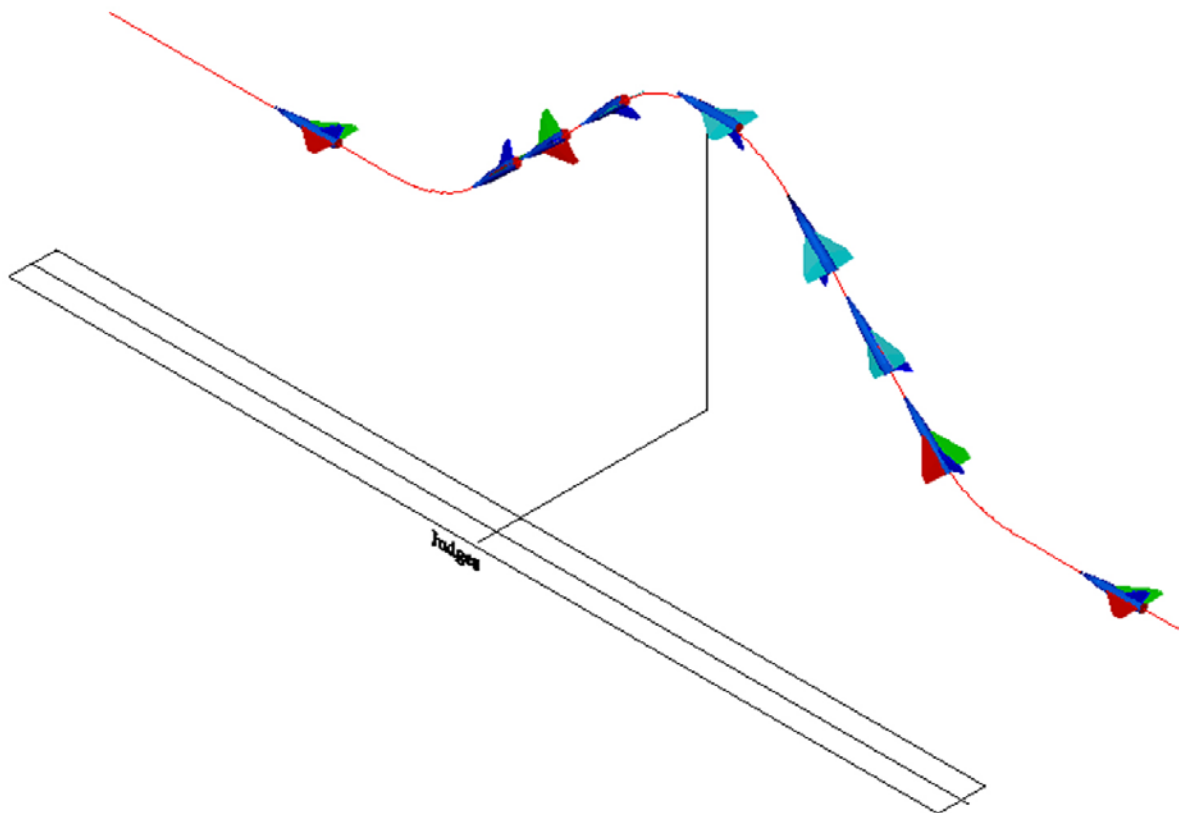


Errors:

- Circle not centred on judges position
- Speed not constant or too low
- Constant height not maintained
- Entry and exit path not parallel with judges line
- Overall size of manoeuvre not realistic for prototype
- Bank angle changes during circle
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 6

- (61) **Cobra Roll (aerobatic only)** - The model starts in straight and level flight, pulls up into a 45 degree climb and executes a half roll to inverted. It then completes a 1/4 inside loop into a 45-degree dive, executes a half roll to normal attitude, and recovers to level flight at the same altitude and heading as the start. The highest point of the 1/4 inside loop should be on the judges' centreline.

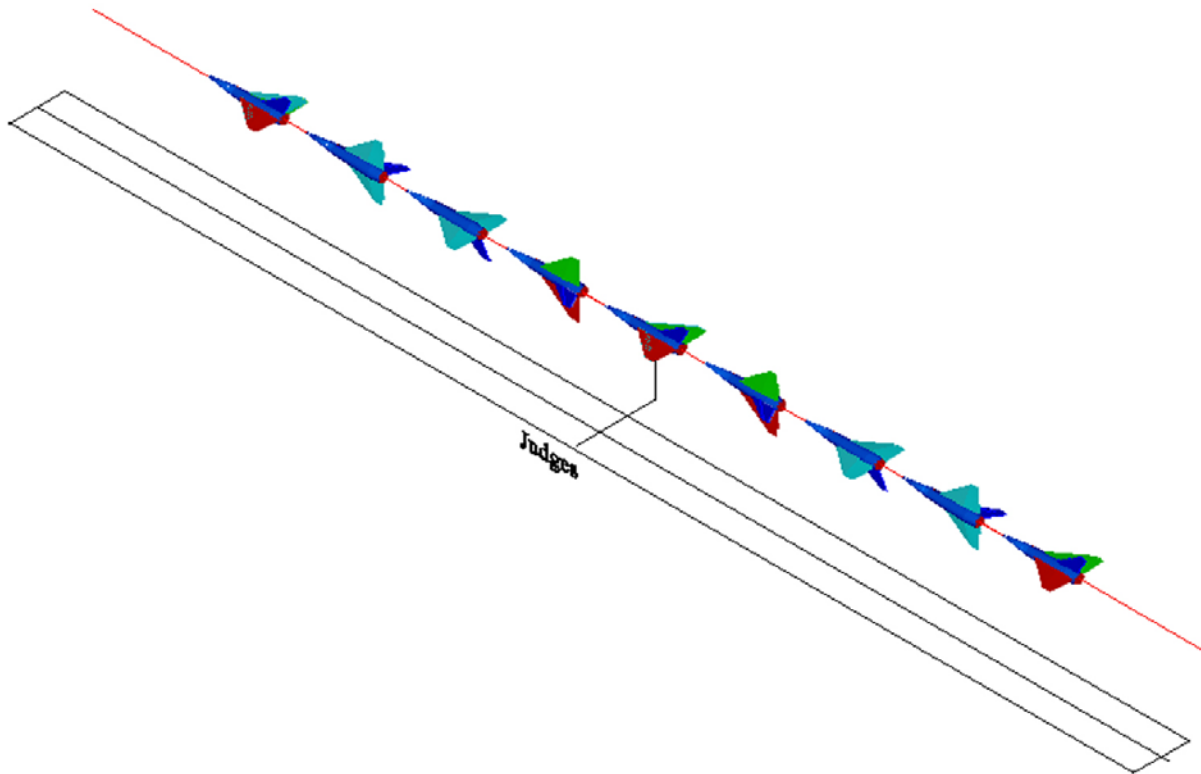


Errors:

- Manoeuvre not performed in a vertical plane that is parallel with the judges line
- Quarter loop is not centred on judges position
- 45° climb and descent paths not achieved
- Half rolls not centred in climb and descent part of figure
- Model does not exit manoeuvre at same height as entry
- Inappropriate use of throttle
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 6

- (62) **Two Axial Horizontal Rolls, one in each direction (aerobatic only)** - From straight flight the model rolls at a constant rate through one complete rotation, immediately followed by a roll at the same constant rate but in the opposite direction, then resumes straight and level flight on the same heading. The model should approach in straight flight, parallel to the runway.

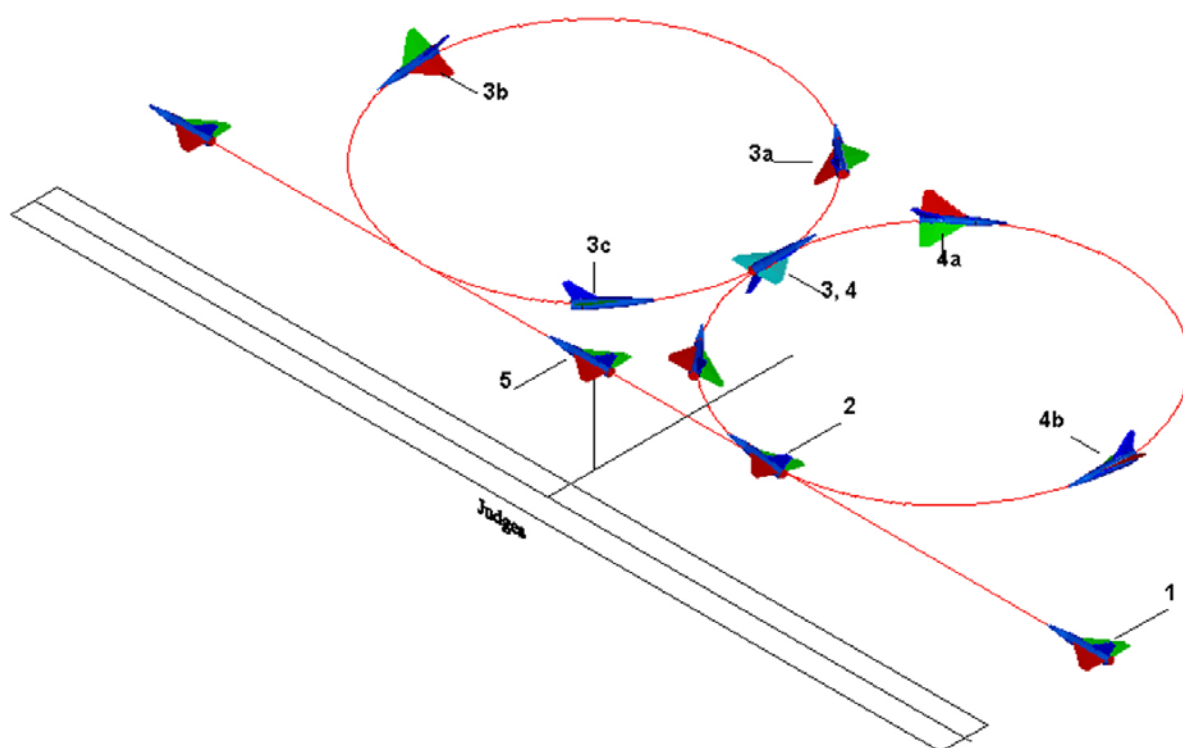


Errors:

- Rate of rolls not constant
- Style of rolls not typical of the prototype
- Rolls not centred on judges position
- Entry and exit at different heights or speeds
- Entry and exit tracks and line of rolls not parallel with judges line
- Model does not resume straight and level flight on same track as entry
- Rolls not horizontal
- Manoeuvre too far away, too close, too high or too low

Optional Manoeuvre Group 6

- (63) **Horizontal Derry Eight (aerobatic only)** - The model approaches (1) in straight and level flight, then makes (2) a one-quarter circle turn in a direction away from the judges. Toward the end of this quarter circle turn the model rolls (3) in the direction of the turn to be inverted at the end of the turn. The model continues to roll to enter a 360 degree circle turn (3a, 3b, 3c) in the opposite direction. The model will stop rolling when upright and banked in the direction of the turn. Toward the end of this 360 degree circle turn the model rolls (4) in the direction of the turn to be inverted at the end of the turn. The model continues to roll to enter a three-quarter-circle turn (4a, 4b) in the same direction as the first turn. The model will stop rolling when upright and banked in the direction of the final turn, completing a figure-of-eight, parallel to the runway centreline and at a constant altitude. The manoeuvre ends (5) on the same altitude and heading as the start, and should be centred on the judges' centreline.

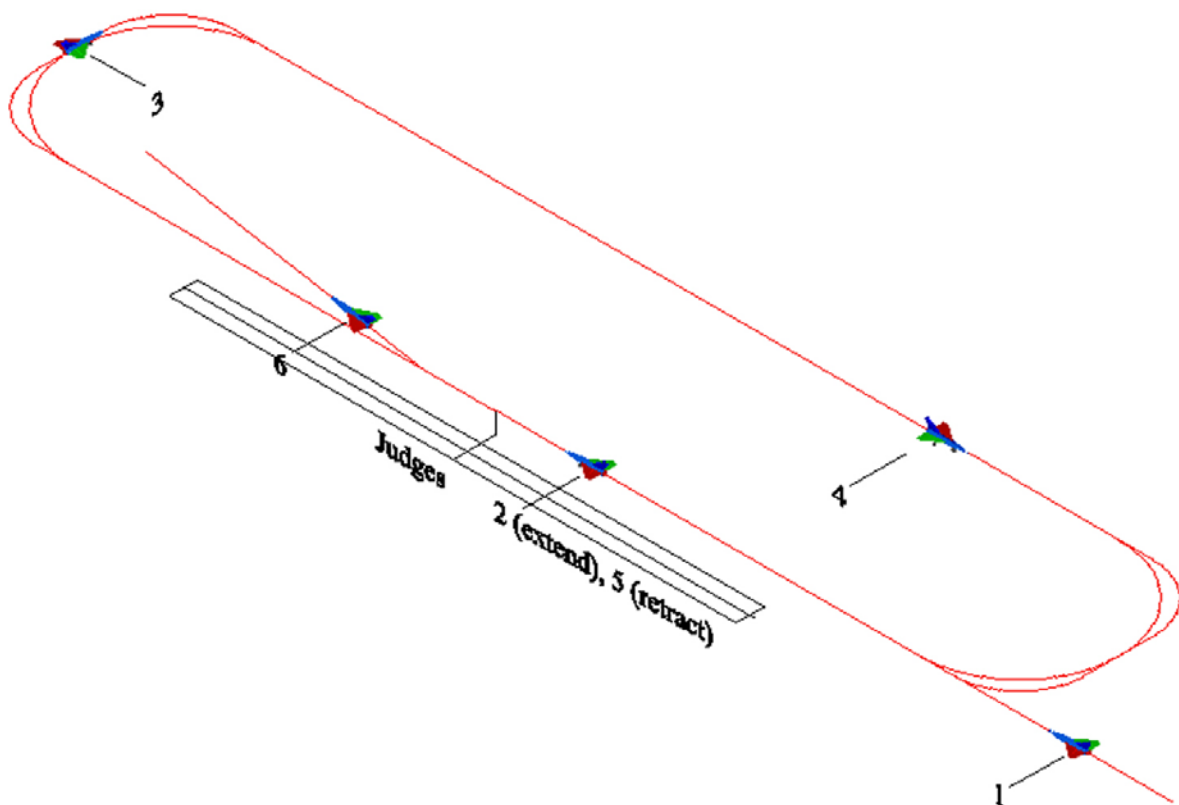


Errors:

- Entry into first circle not at right angles to original flight path
- Circles are of unequal size
- Circles misshapen
- Constant height not maintained
- Intersection not centred on judges position
- Model not inverted when passing through the intersection
- Entry and exit path not parallel with judges line
- Overall size of manoeuvre not realistic for prototype
- Model flight path not smooth and steady
- Manoeuvre too far away, too close, too high or too low
- Inappropriate roll rates

Optional Manoeuvre Group 6

- (64) **Extend and Retract Landing Gear (all types)** - The model approaches (1) parallel to the runway, from downwind, at reduced speed in straight and level flight at an altitude between 10 and 15 metres and the landing gear is lowered (2) in front of the judges. The model then turns away from the judges (3) and completes a circuit at constant height (4), retracting the landing gear when again over the runway (5) in front of the judges. The model climbs away (6) with increased power on a constant track and climb angle for approximately 5 seconds, parallel to the runway.

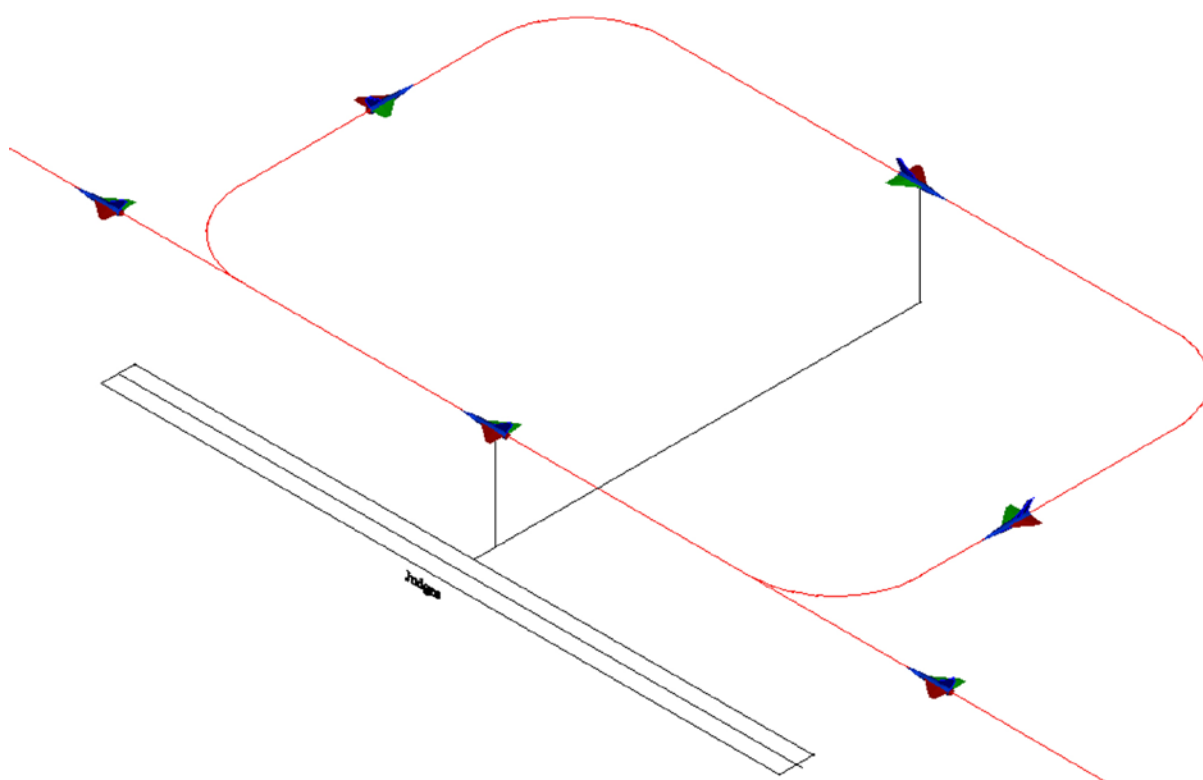


Errors:

- Model speed too high for landing gear extension
- Landing gear not extended or retracted in full view of the judges
- Speed and sequence of extension and retraction not realistic
- Model unstable when landing gear is extended
- Change in attitude with landing gear extended not in keeping with the prototype
- Misshapen circuit or height not constant
- Circuit not centred on judges position
- Entry and exit paths not parallel with judges line
- Entry and exit tracks not the same
- Manoeuvre lacks scale realism (e.g. climb-out)
- Manoeuvre too far away or too close

Optional Manoeuvre Group 6

- (65) **Flight in Rectangular Circuit (non aerobatic option only)** - The model approaches in straight and level flight to a point approximately 150 metres past the judges centreline, turns 90 degrees away from the judges, flies straight and level for approximately 150 metres, then turns 90 degrees in the same direction as before. It then flies straight and level for approximately 300 metres, turns 90 degrees in the same direction as before, then flies straight and level for approximately 150 metres. It makes a final 90 degree turn in the same direction as before, and completes the manoeuvre by resuming straight and level flight on the same heading and at the same altitude as entry. Opposite sides of the rectangle should be of equal length.



Errors:

- *Model changes height*
- *Rate of turn at corners not constant*
- *Angular differences between 4 corners*
- *Sides of rectangular circuit are not straight*
- *Opposite sides of rectangular circuit are not equal in length*
- *Sides of rectangular circuit are too short*
- *Correction for drift not properly made*
- *Rectangular circuit not centred on judges position*
- *Manoeuvre too far away, too close, too high or too low*