



**SOUTH AFRICAN POWER FLYING ASSOCIATION**

## **SPEED RALLY NAVIGATION CHALLENGE**

### **RULES AND REGULATIONS**

Revision 8  
January 2022



**AERO CLUB  
SOUTH AFRICA**

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## Amendments

Date	Revision	Change
3 Oct 2018	1	Document Created
18 Nov 2018	2	<p>3.5 – added altitude to TP photos</p> <p>3.10 – changed upper alt limit from 600 to 1000 ft and apply to all TP's</p> <p>4.1 – Altitude penalty points changed to 1000 ft and 1500 ft for 30 sec &amp; 60 sec penalties</p> <p>4.1 – Turn point penalties, separated 1 nm inside turn to 30 secs, and beyond 1nm to 360 secs</p> <p>2.11. Added portable device scrutineering paragraph</p>
19 Dec 2018	3	7.6 Added scoring result categories and ranking
3 Aug 2019	4	<p>3.5 Photos – altitude reference of the photos updated to reflect minimum altitude to cross CP.</p> <p>3.12 Airfield arrival procedures – will include additional post arrival turn-points specific to airfield that will be briefed.</p> <p>4.1 Penalties, added penalty of 60 sec for missing the outside of a CP by 3 nm, added 30 sec for being below 200 ft &amp; above 1000 ft at CPs, removed 60 sec penalty for being outside 45 deg angle from outside 3nm the CP. Added Exclusion &lt;200 ft over the FP.</p> <p>7.2 Gap between aircraft reduced to between 8 – 15 seconds</p>
1 Sep 2019	5	<p>2.7 – Update to limit competitors</p> <p>2.9 – Nonrefundable payment fees, and payment time period</p> <p>3.1 – Length of flight increased by 20 nm to be between 130 &amp; 150 nm</p> <p>3.4 – Other supporting maps may be provided</p> <p>3.12 – Added wording on airfield crossing altitude</p> <p>6.4 – Added time for test flight aircraft to be present for test flights</p> <p>6.6 – Throttle Stop &amp; on-board camera monitoring wording added</p> <p>7.7 – Added Season &amp; Scoring Championship</p>
25 Jan 2020	6	<p>4.1 – added a 10 m margin on turn-point &amp; added penalty on exceeding 1.5% 3D speed</p> <p>5.10 – Added auto-pilot non-use, GPS blanking &amp; onus on competitor to ensure compliance by means of utilizing on-board cameras.</p> <p>7.6 – Scoring mechanism updated to reflect accuracy with normalized distances, both accuracy &amp; handicap results are scored for each competitor and a combined score.</p>

14 March 2020	7	<p>2.11 – Changed Sealing or disabling of aircraft systems will be done at the discretion of Avionic technical experts and the aircraft owner</p> <p>3.1 – changed max distance to 138 nm</p> <p>4.1 – changed penalty on exceeding 1.75% 3D speed</p> <p>4.1 – Added Autopilot use of heading accuracy of 3Deg penalty – 360s</p> <p>5.10 – updated blanking/disablement of GPS / Autopilots to be done if agreed to by competitor, if not desired or possible, in-cockpit go-pro footage to be provided by the competitor for review by officials should there be a query. Allowance of GPS track made good devices allowable.</p>
30 Jan 2022	8	<p>3.13 – Headings in degrees magnetic added, heading references to the nearest 5 degrees.</p> <p>4.3 – Added pull-up /push down penalty at TP</p> <p>5.1 – Added 180 knot 3D Speed Limit</p> <p>5.5 – Added Transponder</p> <p>5.10 – Added (moving map)</p> <p>7.6 – Added the wording that a combination score for handicap &amp; accuracy will be based on a % mechanism.</p> <p>7.7 – Changed the Season events from 6 to 4, and Season participation to 3 as minimum participation, and if season events are less than 4, the overall result will be assessed up to the events concluded. The championship outcome will consider best overall team, and best team against handicap &amp; best team in Navigation Accuracy.</p>

## 1 AIMS FOR FUN FLYING

The sport of Fun Flying is aimed to improve fundamental flying skills to enable a team (Fun Fly Crew) to navigate and handle their aircraft under Visual Meteorological Conditions (VMC) as independent of technical subsystems as possible. Thus Fun Flying enhances flying safety. This competition is designed as an introduction to Rally and Precision competitions and does not replace these as either National or International events.

This overall aim for Fun Flying is achieved by:

- emphasizing the ability to navigate a given route using basic equipment
- emphasizing the ability to follow a precise track

## 2 GENERAL RULES

- 2.1. Official competition time will be local time or UTC. A master clock, showing GPS time, will be available for competitors to set their timing.
- 2.2. The use of electronic aids and/or autopilot is at the discretion of the organizer. If not allowed, all unauthorized devices will be sealed or taken into custody during the flight by the organizer. The organiser may at discretion run more than one event class.
- 2.3. The competition will be held in VFR conditions as defined by ICAO.
- 2.4. The competition may be postponed, modified in its course (part or complete), partially or completely cancelled due to weather conditions or any force majeure at the discretion of the Competition Director.
- 2.5. The Pilot in Command must be a member of the South African Power Flying Association, hold a valid National, Private Pilot's licence, or higher licence.
- 2.6. For handicapping purposes, aircraft with two or more seats will have two crewmembers taken into account for the calculation of racing trim. In the event that more than two crewmembers are carried, the Handicap Committee will still only take two crewmembers into account for the calculation of racing trim.
- 2.7. The maximum number of aircraft allowed to participate in the competition is at the discretion of the Competition Director, ultimately limited to 50 as per the requirements of AIC 19.1
- 2.8. It is a condition of entry and of participation in the event that all crew are present at all briefings.
- 2.9. Entry fees will be published prior the event, a no show will not be refundable. Payments to be made 2 weeks prior the event.
- 2.10. The Competition Director will be appointed by the South African Power Flying Association and is responsible for the organisation of the event. The Competition Director will adjudicate any appeals related to handicaps and applied penalties. Protests will be heard by the Competition Director and a suitable team made up of experienced Competitors.
- 2.11. Scrutineering will be carried out and portable devices to be sealed in a sealable bag, aircraft to be scrutineered for contraband. Sealing or disabling of aircraft systems will be done at the discretion of Avionic technical experts and the aircraft owner.

### 3 COMPETITION DETAILS

- 3.1. Each flight will have a length between 130 nm and 138 nm and minimum of 8 legs and a maximum of 10 legs. It will be a handicap event.
- 3.2. Before flight, a list of starting sequence and times will be published.
- 3.3. Between a minimum of 20 minutes and a maximum of 60 minutes before take-off a competition envelope, containing all information and instructions for the execution of the flight, will be handed over to the crew.
- 3.4. Each crew will be provided with charts, not necessarily aeronautical, with a scale of 1:250 000. Other supporting maps may be provided at the Competition Director's discretion.
- 3.5. Crews will be provided with sheets of checkpoint photographs that will show the turnpoint feature taken in the line of flight at around 1000 ft in altitude taken at around 1 nm from the turn point in Google Earth format. The turn-point photos will also show the minimum altitude to cross the turnpoint feature.
- 3.6. For this level of competition a map will be given to each crew with the Start Point (SP), Check Points (CP), Finish Point (FP) and Route with magnetic headings per route leg printed on the map. The Competition airfield will also be clearly marked. The SP will be a line across the runway.
- 3.7. All CP's will be exact points on the ground and on the map. CP's must be visible from at least 1.5 NM on inbound track. There will be major CP's and minor CPs, major CPs are those that are the primary turnpoints in the region of 90 degrees, and minor CPs are those that are secondary turnpoints emulating a kink or chicane in the route.
- 3.8. All CP's are to be flown around the outside, cutting corners will attract time penalties.
- 3.9. GPS time will be used during the competition. Times (hh:mm:ss), may be given in local time or UTC time. The take-off time will be taken at a clearly announced T/O time gate.
- 3.10. Heights and altitudes crossing CPs or finish lines will be detailed in briefings, but will not be below 200 feet AGL and not above 1000 feet AGL. CPs in this case are all the TPs (primary) turn points, and the minor (secondary) turnpoints.
- 3.11. Once an aircraft has passed the designated point a sharp lookout must be kept before turning onto the new heading. Altitude must be changed gradually - NO PULL-UPS.
- 3.12. Aircraft passing the finish line, shall, unless specifically given a procedural change during the briefing, continue on the same heading and at the same altitude for a distance of at least one (1) nautical mile before ANY change in heading or altitude. Specific airfield arrival procedures will be briefed, with additional Turn-points defined and expected airfield crossing altitude.
- 3.13. Unless otherwise stated all distances will be in Nautical Miles, speeds in Knots, heights in Feet AGL, altitude in Feet AMSL, and winds (except take-off winds) in Degrees True, headings in degrees magnetic. All coefficients and percentage data will be rounded to the first decimal place with figures from 0,5 to 0,9 rounded up and figures from 0,1 to 0,4 rounded down. Headings will be given to the nearest 5 Degrees.

## 4 PENALTIES

- 4.1. Penalties that may be applied will include either be time added to the competitor or, in the worst case, exclusion. The prescribed penalties are;

Turning inside a turn-point at up to 1 nm (with 10 m margin)	- 60 seconds
Turning inside a turn-point at more than a 1 nm	- 360 seconds
Turning outside a turn-point at more than 3 nm	- 60 seconds
Approaching a turn-point opposing the 3nm 45 degree cone	- 360 seconds
Exceeding set 3D speed by nominal 1.75%	- 360 seconds
Use of Auto Pilot showing a 3 deg heading accuracy	- 360 seconds
Turning too high/low over a turning point	
<200 feet at Finish Point	- Exclusion
<100 feet	- Exclusion
100-200 feet	- 30 seconds
1000-1500 feet	- 30 seconds
1501-2000 feet	- 120 seconds
>2000 feet	- 360 seconds

- 4.2. Minimum time penalty given will be 30 seconds per infringement. Maximum time penalty will be 360 seconds per infringement.
- 4.3. Any activity/ flying that is deemed to be dangerous, (ie pull ups, aerobatic manoeuvres, diving inside on turns etc...), and a risk to the competitor himself, other competitors or anyone else, may lead to the exclusion. A pull up, push down manoeuvre of more than 200 ft at a distance of 0.5 nm from each side of the Turn-point will attract a 360 second penalty.
- 4.4. A Competitor may be excluded for any unsporting or dangerous behaviour, deliberate attempts to deceive or mislead officials, wilful interference with other competitors, verbal abuse of any official or other competitor, falsification of documents, violations of airspace, or any infringements of the rules, regulations or supplementary regulations.

## 5 AIRCRAFT

- 5.1. Aircraft eligible for the competition are piston engine aircraft and propeller turbine engine aircraft at the discretion of the organiser. The event is for Standard Production, as well as Amateur built aircraft. A maximum 3D speed of 180 knots will be allowed.
- 5.2. A modified aircraft is any aircraft with any modification, (i.e...engine blueprinting, propeller changes ..) or accessories (i.e...Speed kits, gap seals ...), which may have been carried out.
- These modifications and accessories must be approved by Civil Aviation Authorities, must not hinder or limit the normal operation of the aircraft.
  - Modification, or changes to any modifications/accessories, must be brought to the attention of the organisers
- 5.3. The minimum allowable declared competition airspeed is 70 kts.
- 5.4. Aircraft must have an endurance equal to maximum stage length at competition speed, plus 10 % and additionally a VFR fuel reserve to meet the legal requirements.

- 5.5. All aircraft must be fitted with a serviceable communication radio & transponder.
- 5.6. Each aircraft involved in the competition (competition aircraft and support aircraft) must be insured against 3rd party liability claims. A certificate of insurance in English shall be made available to the Organizer on request.
- 5.7. Aircraft will be parked in the open in the sequence as designated by the Competition Director.
- 5.8. The Technical Officer of the Handicap Committee has the right to have any aircraft inspected or test flown and can assign competition parameters (speeds) to the aircraft which are not listed in the aircraft's manuals. This will include the removal of any external devices, or removal of components to reduce the aircraft mass. Each entrant will provide a copy of the performance schedule of the aircraft on request.
- 5.9. Each aircraft will carry all documents required by the Civil Aviation Regulations and amendments which are in force at the time.
- 5.10. This is a no use GPS (moving map) and auto-pilot event, blanking will be done at the discretion of the owner and an Avionics expert who can provide a blanking service, it is required that competitors fly and navigate by map reference only. This remains the responsibility of the competitor, measures such as in-cockpit go-pro are to be used to govern compliance if blanking/disablement of affected systems are not done or possible, event results will be reviewed. Track made good devices are approved for heading reference only.
- 5.11. All fuel tanks, must be filled before the start of the event and may be checked by Competition Officials before take-off. This requirement will also apply to test flights for handicapping purposes. The tanks to be filled are those that form part of achieving the POH MTOM. Auxiliary or extended range tanks are exempt if filling them exceeds MTOM in a standard aircraft flight configuration.
- 5.12. Event/Race Number & Sponsor decals are optional. The Competition Director reserves the right to allocate numbers. Requests for special or specific numbers will be entertained if possible, provided the number requested has not already been allocated.

## **6 TEST FLIGHTS**

- 6.1. The Competition Director may require any aircraft to be test flown. The total cost of the test flight, including fuel, oil or aircraft time, etc; will be borne by the competitor with no recourse to the Organisers.
- 6.2. The Competitor may also request a test flight.
- 6.3. The Test Flight will be conducted under supervision of an Official with a total of two persons on board in terms of the rules on such course or method as decided on by the Competition Director. All fuel tanks will be full (as per 5.11) and all luggage compartments etc. will be empty.
- 6.4. All aircraft to be test flown are to be at the airfield the day prior the event by no later than 10 am.



- 6.5. The Test Flight will be performed using an FAI/GAC approved GPS logger and as briefed by the Official in charge of test flying.
- 6.6. The test flight will be flown over the course at FULL THROTTLE in all directions. A throttle limiting stop can be fitted at the discretion of the pilot, and sealed by the competition director or his delegate (official). For aircraft requiring off full throttle/full pitch performance setting, test flight to be flown at the nominated setting, to be confirmed with in-cockpit mounted camera that will be made available for after flight review validation.

## **7 FORMAT AND FINAL RESULT**

- 7.1. The Scoring/Handicap Committee will publish a list of all participating aircraft with their respective handicap speeds and a list of take-off times.
- 7.2. Start times will be calculated using the course distance and aircraft speed to enable all aircraft to finish at the nominated finish time within a safety margin of between 8 - 15 seconds from each other.
- 7.3. The aircraft final position will then be determined by their position on crossing the finish line against their handicap speed and after considering any time penalties or exclusions applied, also the final position may vary from line finish due to a staged start for spacing.
- 7.4. Each aircraft will be handicapped by the Scoring/Handicap Committee who will take into account some or all of the following:
  - Aircraft Manufacturer's Specifications;
  - Event Trim and All Up Weight;
  - Previous Event Performance of type and specific aircraft;
  - Flight Test Results.
  - The course layout, distance and altitude
- 7.5. The Handicap Committee may, with competitors present alter or revise any published handicap speed with motivation, or request a post event flight test flight to re-confirm a baseline speed.
- 7.6. The scoring results will consist of two categories:
  - a. Performance against handicap speed, and;
  - b. Navigation accuracy result – this result normalised against aircraft speed
  - c. The position sequence will rank the no penalties placings first, then in increasing penalties as the follow-on.
  - d. Ranking will be made against handicap speed and accuracy as well as a combination score based on a % performance scoring mechanism.
- 7.7. The Speed Rally fixtures will be organised as an annual season/series of 4 events. An overall leader board scoring system will be maintained by the organiser on the Speed Rally Website to determine a series score. The series score will be based on a count of an arithmetic positional score per event.

A series championship will consider 3 event results to count, worst results or no-participation will be discarded. Should the series be curtailed to less than 4 events, the championship will count to the series participation up to the event completed for the Season. The championship outcome will consider best overall team, and best team against handicap & best team in Navigation Accuracy.