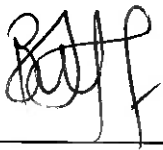


SOUTH AFRICAN CIVIL AVIATION AUTHORITY

CIVIL AVIATION ACT, 2009 (ACT NO. 13 OF 2009)

AMENDMENT OF SA-CATS 3 of 2026

The Director of Civil Aviation has, in terms of section 163 (1) of the Civil Aviation Act, 2009 (Act No. 13 of 2009) amended South African Civil Aviation Technical Standards as reflected in the Schedule hereto. The Technical Standards as contained in the Schedule shall come into operation on the date of publication.



Poppy Khoza

Director of Civil Aviation

Date: 01 SEP 2026

GENERAL EXPLANATORY NOTE:

[] Words in bold type in square brackets indicate omissions from existing technical standards.

_____ Words underlined with a solid line indicate insertions in existing technical standards.

SCHEDULE

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1. Amendment of SA-CATS 66
 - (a) Insertion of Technical Standard 66.01.12
2. Insertion of SA-CATS 106
 - (a) Insertion of Document SA-CATS 106
3. Amendment of SA-CATS 139
 - (a) Insertion of Document SA-CATS 139
4. Amendment of SA-CATS 140
 - (a) Insertion of section 25 in TS 140.01.3
5. Amendment of SA-CATS 148
 - (a) Insertion of TS 148.02.15
6. Amendment of SA-CATS 173
 - (a) Insertion of TS 173.04.1
 - (b) Insertion of TS 173.04.2
 - (c) Insertion of TS 173.04.3
 - (d) Insertion of TS 173.04.4
7. Amendment of SA-CATS 177
 - (a) Substitution of TS177.01.3
 - (b) Substitution of TS 177.03.1

AMENDMENT OF SA-CATS 66

1. Document SA-CATS 66 is hereby amended by the insertion after Technical Standard 66.01.11 of the following Technical Standard:

“66.01.12 Re-designation as Engineering Designated Examiner (EDE)

- (1) An application for re-designation as EDE shall be accompanied by:
 - (a) copy of AME licence with an AME instructor endorsement;
 - (b) copy of the previous or current EDE designation endorsement or certificate;
 - (c) copy of identity document or passport;
 - (d) copy of the annual oversight EDE report;
 - (e) signed code of conduct;
 - (f) attendance proof of EDE annual conference or seminar attendance;
 - (g) proof of payment; and
 - (h) skills test report performed by the EDE if there was a skills test conducted within the previous 12 months”.

INSERTION OF SA-CATS 106

2. Insertion after Document SA-CATS 105 of the following Document:

“DOCUMENT SA-CATS 106: CERTIFICATION FOR PARAGLIDER AND HANG-GLIDER

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- 106.04.9 Instructor conversion
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SUBPART 1: HANG-GLIDER AND PARAGLIDER CERTIFICATE

106.01.8 Logging of flight time and endorsements

- 1 A logbook shall be kept digitally or in hard copy, and shall comprise at least the following information:
 - (a) flight number;
 - (b) flight date;
 - (c) flight duration;
 - (d) total flight time;
 - (e) site name;
 - (f) paraglider, powered parachute or hang-glider flown;
 - (g) solo or tandem;
 - (h) power or non-power; and
 - (i) undercarriage wheeled.
- 2 All flying attributes and skills deemed necessary shall be endorsed in the pilot logbook on completion of the requirements in terms of Part 106 and the applicable syllabi.
- 3 All training provided by an instructor shall be documented in an instructor logbook detailing the following information:

- (a) flight number;
 - (b) flight date;
 - (c) flight duration;
 - (d) total flight time;
 - (e) site name;
 - (f) paraglider, powered parachute or hang-glider flown;
 - (g) solo or tandem;
 - (h) power or non-power;
 - (i) undercarriage wheeled;
 - (j) exercise or skill practiced or completed;
 - (k) theory or practical lesson;
 - (l) learner name; and
 - (m) learner membership number.
- 4 A duplicate version of a logbook shall be provided to a learner for confirmation of completion of the exercises and applicable syllabi.
- 5 Endorsements shall be documented and signed off in the learner or pilot logbook by an appropriately rated instructor confirming the requirements have been successfully completed as applicable.

106.01.10 Recognition and validation of foreign licence, certificate or authorisation by appropriate authority of another State

- (1) An applicant for the recognition and validation of a foreign licence, certificate or authorisation issued by an appropriate authority of another State shall provide logbook summary consisting of at least the following information:
- (a) Title of licence or certificate held.
 - (b) Category of licence (Paraglider or Hang-glider).

- (c) Level of the licence or certificate.
 - (d) Total solo flight time and number of flights.
 - (e) Total tandem flight time and number of flights, if applicable.
 - (f) Total flight time.
 - (g) Total number of flights.
 - (h) Any other flight time summary as applicable to the rating or endorsement being sought.
- (2) Where the logbook summary in subsection (1) is provided in a hardcopy format, the copy shall be certified and dated as true and correct by an applicant.
- (3) Should an applicant not be required to maintain a logbook for the purpose by an appropriate authority of another State, an applicant shall provide a sworn statement as confirmation of flight time and number of flights flown.

106.01.11 Register of foreign pilot recognition certificate

1. An application for issuance of a foreign validation shall be accompanied by:

- (a) the appropriate application form;
- (b) a summary of an applicant logbook including the last page as provided in this Document SA-CATS; and
- (c) provision of an international pilot's proficiency card and copy of current licence certificate, rating or authorisation, from their appropriate authority.

106.01.14 Privileges and limitations of learner

- (1) A learner shall not undergo a solo cross-country flight unless such a learner has successfully completed applicable training as prescribed in appendix A to E.

106.01.15 Requirements for pilot certificate

- (1) Training for a pilot certificate shall consist of theoretical knowledge instruction, practical instruction training, theoretical knowledge examinations and a competency check as applicable.
- (2) Training for a pilot certificate in the hang glider category shall be as prescribed in
 - (i) Technical Standard 106.02.1.
 - (ii) Appendices A to E.
- (3) Training for a pilot certificate in the paraglider category shall be as prescribed in
 - (i) Technical Standard 106.03.1.
 - (ii) Appendices A to E.

106.01.16 Maintenance of competency

- (1) The required training and theoretical knowledge examinations for a certificate shall be completed as prescribed in appendices A to E as applicable.
- (2) An applicant for the renewal of competency as applicable shall complete the applicable competency check demonstrating the required skills detailed on the competency check form as required to a satisfactory level.
- (3) The competency check form referred to in subsection (2) shall be signed by an appropriately rated instructor appointed by an approved Aviation Recreation Organisation.

106.02.1 Hang-glider endorsement requirements

1. Requirements for novice endorsement

- (1) An applicant for a novice endorsement shall—
 - (a) complete a theoretical and practical instruction training course as prescribed in this Document SA-CATS, appendices A to E;

- (b) pass the novice endorsement written theoretical knowledge examination with a pass mark of at least 85%;
- (c) complete at least 5 flights of at least 60 seconds duration each;
- (d) demonstrate a thorough pre-flight check;
- (e) demonstrate a good take-off in zero to light wind not exceeding 5km per hour;
- (f) demonstrate good take-off and landing technique;
- (g) complete a controlled turn in both directions;
- (h) show the ability to fly at the correct flying speed;
- (i) execute 5 controlled landings in a designated area; and
- (j) orally explain knowledge of reserve parachute deployment.

2. Requirements for a Hang-glider A Endorsement

- (1) An applicant for a Hang-glider A Endorsement shall–
 - (a) complete theoretical and practical requirements as prescribed in this Document SA-CATS, appendices A to E;
 - (b) pass the Hang-glider A endorsement written theoretical knowledge examination with a pass mark of at least 85%;
 - (c) display good judgment in the assessment of flying conditions;
 - (d) complete at least 25 solo flights of at least 60 seconds duration each, or 15 solo flights with 5 hours flight time;
 - (e) complete flights at two different sites with one undertaken inland;
 - (f) take-off in a wind greater than 24 km per hour;
 - (g) show the ability to fly at the correct flying speed;
 - (h) execute a stall and recovery;

- (i) complete a controlled 360-degree turn in both directions with a predetermined entry and exit without marked slip or slide;
- (j) complete 4 controlled landings within a 50-meter diameter circle;
- (k) complete a flight in conditions which require quick control responses for safe flight;
- (l) demonstrate good take-off and landing technique; and
- (m) have sufficient knowledge of reserve parachute deployment.

3. Requirements for a Hang-glider B Endorsement

- (1) An applicant for a Hang-glider B-Endorsement shall–
 - (a) complete theoretical and practical requirements as prescribed in Document SA-CATS 106, appendices A to E;
 - (b) pass the Hang-glider B endorsement written theoretical knowledge examination with a pass mark of at least 85%;
 - (c) display good judgment in the assessment of flying conditions;
 - (d) completed at least 75 solo flights of at least 60 seconds duration each or 50 flights with 25 hours flight time;
 - (e) have flown at 4 sites, with 2 flights undertaken at different inland sites;
 - (f) complete 5 controlled landings within a 50-meter diameter circle;
 - (g) demonstrate a controlled landing, feet first without the control frame touching the ground;
 - (h) demonstrate a safe and proficient take-off technique with no evidence of a stall;
 - (i) take-off in a wind speed greater than 30 km per hour;
 - (j) complete a figure of 8 manoeuvre around 2 fixed points in a wind with a speed of at least 15 km per hour while showing the ability to correct for drift;

- (k) conduct safe landings in restricted landing areas and land within 100 meters upwind of a 5-meter-high obstacle; and
- (l) execute a stall and recovery.

4. Requirements for a Hang-glider C Endorsement

- (1) An applicant for a Hang-glider C Endorsement shall–
 - (a) complete theoretical and practical requirements as prescribed in Document SA-CATS 106, appendices A to E;
 - (b) pass the Hang-glider C endorsement written theoretical knowledge examination with a pass mark of at least 85%;
 - (c) display good judgement in the assessment of flying conditions;
 - (d) complete at least 150 flights, each of at least 60 seconds duration, or 100 flights with 50 hours flight time;
 - (e) complete 10 flights of at least 30 minutes duration each;
 - (f) complete one flight of one hour;
 - (g) have held a B endorsed hang-glider license for at least six months;
 - (h) demonstrate good general flying with good airmanship;
 - (i) display a safe and proficient take-off and landing technique;
 - (j) have completed at least two out of ridge lift cross-country flights with an accumulated total distance of at least 100km with all flights being longer than 10km;
 - (k) be tested on applicable radio procedures; and
 - (l) have completed satisfactory navigation of an applicable airspace.

5. Requirements for tandem endorsement

- (1) An applicant for a tandem endorsement shall –

- (a) complete a theoretical and practical instruction training course as prescribed in this Document SA-CATS 106, appendices A to E;
- (b) pass the tandem endorsement written theoretical knowledge examination with a pass mark of at least 85%;
- (c) have completed at least 300 solo flights of at least 60 seconds duration;
- (d) have completed a minimum of 150 hours of total solo flight time;
- (e) be familiar with the hang-gliding tandem requirements and have completed the applicable training in accordance with the syllabus as prescribed in this Document SA-CATS.
- (f) complete at least 10 tandem flights, of which –
 - (i) the first three flights must be with a tandem endorsed hang-glider instructor as a passenger;
 - (ii) five flights as a PIC;
 - (iii) a total of at least three hours flight time; and
 - (iv) all 10 flights must be observed or supervised by a tandem endorsed Grade A or B rated hang-glider instructor; and
- (g) Provide a letter of recommendation from an ARO approved in terms of Part 149.

Note: For all tandem flights conducted above 450ft AGL tandem reserves are compulsory.

6. Requirements for Hill Endorsement

- (1) An applicant for a Hill Endorsement shall–
 - (a) have attended at least two full days of foot launch training with a hang-glider instructor; and
 - (b) complete at least 10 training hill foot launched flights and must include ground skimming.

7. Requirements for Winch Tow Endorsement

- (1) An applicant for a Winch Tow Endorsement shall–
- (a) complete a minimum of five Tow flights to at least 300ft AGL supervised by a tow rated instructor;
 - (b) complete at least one tow flight in moderate thermic conditions;
 - (c) complete an inspection and lay out of the towing system used;
 - (d) be familiar with all signals used for communication between a pilot, launch marshal and tow vehicle;
 - (e) be able to accurately describe general towing procedures;
 - (f) be able to accurately describe the most likely emergency situations and associated recovery actions; and
 - (g) understand the differences between foot launch and dolly or platform launch techniques.

8. Requirements for Wheeled Endorsement

- (1) An applicant for a wheeled endorsement shall –
- (a) complete at least five successful launches with a hang-glider with wheeled undercarriage;
 - (b) demonstrate an understanding and control of higher approach speed due to greater wing loading;
 - (c) demonstrate a correctly timed flare on landing; and
 - (d) complete at least 5 successful landings utilising the wheeled undercarriage with control.

9. Requirements for Powered Endorsement

- (1) An applicant for a Powered Endorsement shall–

- (a) complete theoretical and practical requirements as prescribed in this Document SA-CATS, appendices A to E;
 - (b) pass the A endorsement and powered hang-glider theoretical knowledge examination with at least 85%;
 - (c) complete a minimum of 10 flights of at least 60 seconds duration each with a minimum total of three hours flight time;
 - (d) complete at least one cross country flight with an out landing and re-launch;
 - (e) demonstrate a thorough pre-flight check;
 - (f) demonstrate the ability to maintain constant climb under power;
 - (g) demonstrate the ability to maintain straight and level flight under power;
 - (h) demonstrate a controlled 360-degree turn in both directions with a pre-determined entry and exit without marked slip or slide while under power;
 - (i) complete 4 controlled landings within a 50-meter diameter circle;
 - (j) demonstrate flight in conditions which require quick control responses for safe flight; and
 - (k) have knowledge of reserve parachute deployment pertaining to a powered hang-glider.
- (2) An applicant who holds or has held a Weight Shift Controlled Microlight (WCM) pilot licence may be credited with the cross-country requirement in subsection (1)(d) at the discretion of the instructor.

10. Requirements for Aero Tow Endorsement

- (1) An applicant for an Aero tow Endorsement shall–
- (a) complete a minimum of eight aero tow flights to at least 1000ft AGL, of which four flights must be supervised by an instructor with an aero tow endorsement, and of which four flights must be conducted in moderate thermic conditions; and
 - (b) an applicant trained on aero tow only, for a novice endorsement shall –

- (i) complete a minimum of 10 aero tows as passenger with an instructor with a tandem aero tow endorsement; and
- (ii) complete a minimum of 10 solo aero tows under direct supervision of an instructor with a tandem aero tow endorsement.

Note: It is recommended that a hang-glider pilot with the A endorsement completes at least one tandem aero tow for familiarization purposes and be supervised by an instructor with an aero tow endorsement.

11. Requirements for Display Endorsement

(1) An applicant for a Display Endorsement shall present and demonstrate their proposed sequence or manoeuvres as required by an approved organisation to a nominated instructor and shall comply with the following:

(a) for the hang-glider aerobatic display endorsement, an applicant shall have —

- (i) a minimum of three years of flying experience;
- (ii) a minimum of 600 flights or 1200 flights for advanced aerobatics;
- (iii) a minimum of 300 hours or 600 hours for advanced aerobatics;
- (iv) held a hang-gliding B endorsement or higher for at least 12 months;
- (v) completed three successful prior deployments if conducting a Balloon Drop;
- (vi) completed 40 winch launches, if winching;
- (vii) a satisfactory safety record; and
- (viii) Provide a letter of recommendation from an ARO approved in terms of Part 149.

(b) for the hang-glider standard display endorsement, an applicant shall have —

- (i) a minimum of two years flying experience;
- (ii) a minimum of 100 flights;
- (iii) a minimum of 100 hours;
- (iv) held a hang-glider A endorsement or higher for a period not less than one year preceding the application for the display endorsement;

(v) completed 20 winch launches, if winching;

(vi) Provide a letter of recommendation from an ARO approved in terms of Part 149.

106.02.3 Hang-glider Conversions

- (1) A holder of a hang-glider category rating converting to a paraglider category rating, shall comply with the training requirements prescribed in this Document SA-CATS, applicable appendices A-E.
- (2) A holder of a hang-glider category rating who is an applicant for a conversion to a paraglider category rating, shall complete the theoretical examination prescribed in Document SA-CATS 106.
- (3) The Director may require a paraglider instructor to provide written recommendations for crediting of theoretical examinations referred to in subregulation (2), by providing documentary proof of having passed theoretical examinations referred to in subregulation (2).
- (4) The Director shall require a paraglider instructor to make an evaluation on an applicant's practical skills and provide a written recommendation for the crediting of theoretical knowledge instruction, theoretical knowledge examinations and practical requirements.
- (5) The Director may require additional information supporting the crediting of flight time or theoretical examinations.

Note: Verify the conversion from paraglider to hang-glider in Part 106.2.3

106.03.1 Paraglider endorsement requirements

1. Requirements for a Paragliding Basic Endorsement

- (1) An applicant for a paragliding basic endorsement must —

- (a) complete a theoretical and practical instruction training as prescribed in this Document SA-CATS, appendices A to E;
- (b) pass the basic endorsement written theoretical knowledge examination with a pass mark of at least 85%;
- (c) submit a copy of an applicable logbook signed by a Grade A or Grade B paragliding instructor confirming that an applicant complied with the requirements of this Technical Standard;
- (d) demonstrate the ability to accurately assess the conditions which allow for a safe launch such as weather, field conditions, or wing weight range and rating;
 - (i) complete a minimum of 35 paragliding flights of which four hours solo flight time;
 - (ii) one solo soaring flight of at least 20 minutes; and
 - (iii) at least two solo flights in light thermic conditions, each lasting at least 10 minutes and shall include consecutive 360 degree turns in both directions.
 - (iv) in the case of a holder of a paraglider certificate with a power endorsement, completes a minimum of –
 - (aa) 10 flights of at least 60 seconds each;
 - (bb) 20 solo flights with height gain of at least 100 meters from the launch site;
 - (cc) at least two solo flights in light thermic conditions, each lasting at least 10 minutes and shall include consecutive 360 degree turns in both directions.
- (e) the initial 35 flights referred to in paragraph (e) may include a maximum of 5 flights of at least 5 minutes on a tandem paraglider as a passenger with a suitably rated instructor;
- (f) complete a flight from at least 2 different mountain sites;
- (g) demonstrate the parachute-landing roll technique;

- (h) demonstrate knowledge of reserve parachute deployment;
- (i) successfully complete the practical flight test including —
 - (i) a demonstration of layout and pre-flight checks, including the five-point check;
 - (ii) a demonstration of unassisted forward and reverse pull-ups or inflations and ground control;
 - (iii) a demonstration of the ability to hold a paraglider inflated directly overhead in sufficient wind;
 - (iv) a minimum of 10 unassisted forward take-offs in wind strengths of 0 – 10 km per hour during which the pilot must demonstrate the ability to run in a straight line while controlling the canopy, without assistance;
 - (v) a demonstration of a minimum of 10 forward and 10 reverse pull-ups and take-off techniques. A pilot must use the cross-brake method or similar, excluding swapping or letting go of the control toggles;
 - (vi) flights demonstrating S-turns or figure 8's;
 - (vii) left and right 90 or 180 degree turns, separate flights permitted;
 - (viii) left and right 360 degree turns, separate flights permitted;
 - (ix) a demonstration of approach for landing set-up and technique;
 - (x) completing at least 3 landings within 50-meter diameter circle;
 - (xi) a demonstration of operating the speed-bar system and understanding the inherent dangers;
 - (xii) a flight with several pilots sharing a ridge;
 - (xiii) a demonstration of the symmetrical wing tip fold or big ears manoeuvre, with and without speedbar, and understanding the inherent dangers; and
 - (xiv) a demonstration of landing with the back risers and understanding the inherent dangers.

Note: A holder of a basic paraglider endorsement automatically holds a hill endorsement unless he or she has only completed the power paraglider endorsement syllabus.

(1) Paraglider Winch trained pilot

- (1) An applicant who has completed more than 50% of the required flights of their Basic endorsement paragliding training syllabus on a winch with an applicable school shall
=
- (a) have flown at least five solo flights from a mountain site of at least 100m height difference over a minimum of two days, which shall include a ridge soaring flight with several other pilots on the ridge, in addition to the winch training;
 - (b) have been thoroughly briefed on the dangers of mountain flying and the accompanying micrometeorology; and
 - (c) have demonstrated good unassisted take-off techniques on the mountain launches.

3. Requirements for a Paragliding intermediate endorsement

- (1) An applicant for a Paragliding intermediate endorsement shall–
- (a) complete theory and practical training as prescribed in this Document SA-CATS, appendices A to E;
 - (b) hold a basic endorsement;
 - (c) complete a minimum of 25 hours flight time including at least 100 flights;
 - (d) complete at least 15 hours of thermic flying;
 - (e) perform at least one asymmetric wing collapse in calm air conditions;
 - (f) perform at least one leading edge wing collapse or front tuck in calm air conditions;
 - (g) complete at least three landings in a 20-meter diameter circle;
 - (h) complete at least five top landings in a 30-meter area;

- (i) complete 3 symmetrical wingtip fold or big ear descents with normal final flare landing in a 30meter diameter circle;
- (j) demonstrate wing inflation to overhead position and deflation of wing on landing in strong wind conditions;
- (k) have sufficient knowledge of the inherent dangers of cross country flying and out landings; and
- (l) submit a completed checklist signed by the instructor by an approved Aviation Recreational Organisation.

4. Requirements for a Paragliding Sport Endorsement

- (1) An applicant for a Paragliding Sport endorsement shall–
 - (a) complete theoretical and practical training as prescribed in this Document SA-CATS, appendices A to E;
 - (b) pass the Sport endorsement written theoretical knowledge examination with a pass mark of at least 85%;
 - (c) submit a completed checklist of all requirements;
 - (d) have logged a minimum of 50 hours;
 - (e) have completed a total of 200 solo flights, of which 50 flights must be in thermic conditions;
 - (f) have completed at least one cross country flight of no less of 20 km;
 - (g) have demonstrated the ability to accurately assess conditions which allow for the safe launch such as weather, field conditions, or wing weight range and rating;
 - (h) have thorough theoretical knowledge of the following –
 - (i) the performance limitations of the paraglider model in use
 - (ii) cliff launches
 - (iii) steep turns or spirals;

(iv) stalls; and

(v) spins.

(i) have knowledge of and be able to demonstrate –

(i) good layout and pre-flight checks;

(ii) unassisted ground control in all conditions;

(iii) good reverse launch technique and take-off in soarable winds;

(iv) top landing;

(v) flights in light thermic conditions, each lasting at least 10 minutes and shall include consecutive 360 degree turns in both directions;

(vi) complete 3 accurate landings in a 10-meter diameter circle; and

(vii) shall have flown at least 6 different sites.

(j) provide a certificate from an approved DTO confirming that the following has been completed:

(i) the manoeuvres documented on the sport endorsement application form under the supervision of a grade A or B instructor, detailing flights and dates with the required sign off or;

(ii) an air safety course accepted by an approved ARO or an “sécurité internationalé de vol libre” course.

5. Requirements for Paragliding Tandem Endorsement

(1) An applicant for a paragliding tandem endorsement shall complete the following:

(a) a theoretical and practical instruction training course in accordance with the applicable syllabus prescribed in this Document SA-CATS, appendices A to E.

(b) pass the tandem endorsement written theoretical knowledge examination with a pass mark of at least 85%;

(c) complete a minimum of 300 solo flights;

(d) complete at least 150 hours solo flight time;

- (e) have a satisfactory safety record for an initial application;
- (f) complete at least a minimum of 40 flights in a tandem paraglider;
- (g) the first two flights of the required initial 10 tandem flights shall be flown with a tandem and Grade B endorsed paragliding Instructor or higher that holds a Grade C TFI endorsement where the applicant is the passenger.
- (h) For the remaining eight flights referred to in paragraph (g), an applicant shall be the PIC of which one flight shall be with a different instructor with at least a Grade C TFI endorsement.
- (i) complete at least a further 10 Flights as PIC with a tandem endorsed pilot;
- (j) request a paragliding Tandem Flight Authority upon completion of the minimum flights in a tandem paraglider referred to in paragraph (f) from an approved Aviation Recreational Organisation and submit the applicable medical certificate as prescribed in Document SA-CATS 67;
- (k) upon receipt of the Tandem Flight Authority, complete at least 20 flights as PIC with a current paraglider pilot holding at least a basic endorsement;
- (l) have flown with at least two different weighted tandem endorsed pilots as passengers with a weight difference of at least 20kg;
- (m) complete a minimum of 3 hours as a PIC and must have flown from at least three different sites;
- (n) a winch trained tandem pilot must complete at least five flights, of which one shall be as a passenger with a Tandem Rated Instructor from a mountain site with at least 200-meter height difference;
- (o) submit documentation with a final sign-off by an initial instructor of a tandem endorsement course;
- (p) have demonstrated ground handling competency with passengers;
- (q) have demonstrated an unassisted forward launch in a wind speed of less than five km per hour wind and one zero wind landing;
- (r) have demonstrated a forward launch in a wind speed of at least 15 km per hour which may be assisted;
- (s) have demonstrated a reverse launch in a wind speed of at least 12 km per hour;
- (t) have demonstrated pendulum control;

- (u) have demonstrated a symmetrical wing tip fold manoeuvre or big ears;
- (v) have completed at least two 30-minute flights in thermic conditions flown at a site between 09h00 and 13h00 GMT;
- (w) have completed a minimum of five mountain launches of which at least two with an instructor acting as a passenger;
- (x) have flown as close as possible to the minimum and maximum weight range of the wing by taking different weighted passengers in order to experience different wing loadings;
- (y) have logged at least three hours as a PIC;
- (z) have completed a minimum of three successful landings in a 15-meter diameter circle; and
 - (aa) have landed unassisted, in a wind speed of at least 20 km per hour, with pilot and passenger staying on their feet while dropping the wing.

6. Requirements for a Paragliding Powered Endorsement

- (1) An applicant for a powered paragliding endorsement shall –
 - (a) complete theoretical and practical instruction training course as prescribed in this Document SA-CATS, appendices A to E;
 - (b) pass the paragliding and powered paragliding theoretical knowledge examination with a result of at least 85%;
 - (c) understand the basic operation of a motor including at least two ways to stop the engine and pre-flight run-up checks;
 - (d) demonstrate a method of establishing proper connection to a wing with cleared lines and risers prior to inflation of a wing;
 - (e) complete a minimum of 35 flights in accordance with the applicable powered endorsement syllabus;
 - (f) have completed a minimum of four hours flight time on a powered paraglider, or three hours if it is a conversion from any paragliding endorsement;

- (g) have completed three forward inflations and launches with a visual check;
- (h) completed a minimum of three controlled reverse inflations of the wing with proper surge dampening followed by launch and complete a minimum of two minutes of controlled wing-kiting overhead the pilot in a steady wind;
- (i) complete five smooth power-on landings into the wind within 5 meters of a target;
- (j) completed five smooth power-off landings into the wind within 10 meters of a target;
- (k) complete at 90,180 and 360 degree turns; and
- (l) in the case of the addition of a power endorsement, a holder of a paraglider certificate shall complete a minimum of 10 flights under power.

7. Requirements for a Paraglider Powered Sport Endorsement

- (1) An applicant for a paraglider Powered Sport endorsement shall comply with the following additional requirements:
 - (a) complete a theoretical and practical instruction training course as prescribed in this Document SA-CATS, appendices A to E
 - (b) complete at least 80 flights on a powered paraglider in addition to the paraglider pilot credits;
 - (c) completed at least 40 hours on a powered paraglider in addition to the paraglider pilot credits;
 - (d) demonstrated use of a speed bar;
 - (e) demonstrated use of a steering system;
 - (f) demonstrated advance turning;
 - (g) demonstrated engine energy management;
 - (h) demonstrated low level flying below 10 meters AGL;
 - (i) completed a spot landing with the engine-off within a 10-meter diameter circle;

- (j) completed a spot landing, with the engine-on within 5 meters from a defined line or within 10-meter diameter circle; and
- (k) completed a 50 km cross-country triangular flight.

8. Requirements for tandem endorsement power paraglider and power parachute

- (1) An applicant for a tandem endorsement powered paraglider or power parachute shall–
 - (a) hold a power paragliding endorsement;
 - (b) complete theoretical and practical instruction training course as prescribed in appendices A to E;
 - (c) pass the tandem endorsement written theoretical knowledge examination with a pass mark of at least 85%
 - (d) have completed at least 150 powered paraglider or powered parachute flights after the initial issue of the applicable endorsement;
 - (e) have completed at least 10 flights with an appropriately rated B grade Tandem endorsed instructor or higher with at least one flight conducted as the passenger;
 - (f) demonstrate the ability to accurately assess conditions which allow for safe launch (weather, field conditions, wing weight range and rating, etc.);
 - (g) complete at least one flight of at least 30 minutes at an inland site above 1200m ASL and one flight of at least 30 minutes at sea level;
 - (h) have flown as a PIC with two tandem rated pilots of differing weights; and
 - (i) complete the manoeuvres as provided on the applicable application forms

9. Requirements for Paraglider Hill Endorsement

- (1) The following requirements must be met for a paragliding hill endorsement:

- (a) take-off from a hill or mountain site under the supervision of a hill endorsed instructor;
- (b) complete at least five successful hill launches and landings; and
- (c) demonstrate knowledge of hill flying, associated dangers and ridge rules.

Note: A holder of a basic paraglider endorsement automatically holds a hill endorsement unless he or she has only completed the power paraglider endorsement syllabus.

10. Requirements for Winch Tow Endorsement

- (1) The following requirements shall be met for a winch tow endorsement:
 - (a) fly from a winch site under the supervision of a winch endorsed instructor;
 - (b) demonstrate the winch release technique;
 - (c) demonstrate landing with the winch line still attached;
 - (d) demonstrate knowledge of emergency procedures whilst winching;
 - (e) complete at least five successful winch launches, release and landings; and
 - (f) demonstrate sufficient skill of following the winch vehicle if on tow or line following if with a static winch.

11. Requirements for a Paraglider Display Endorsement

- (1) An applicant for a paraglider display endorsement must have –
 - (a) presented and demonstrated a proposed sequence or manoeuvres as required by an approved ARO to a nominated instructor and comply with the following:
 - (i) for an aerobatic display endorsement:
 - (aa) a minimum of three years flying experience;

(bb) completed a minimum of 600 flights or 1200 flights for advanced aerobatics;

(cc) completed a minimum of 300 hours flight time or 600 hours flight time for advanced aerobatics;

(dd) held a sport endorsement or higher for at least one year;

(ee) have completed an approved organisations recognised sécurité internationalé de vol libre Course;

(ff) completed six successful prior deployments for a Deployment Bag exit

(gg) completed three successful prior deployments for a Balloon Rollover;

(hh) completed 40 tow launches, if winching;

(ii) have a satisfactory safety record; and

(jj) have an applicable display approval.

(b) Standard display endorsement paragliding an applicant shall have:

(i) a minimum of two years flying experience;

(ii) completed a minimum of 100 flights;

(iii) completed a minimum of 100 hours flight time;

(iv) held an intermediate paragliding endorsement or higher for at least one year;

(v) completed 20 tow launches, if winching;

(vi) submit a satisfactory safety record recommendation from an ARO.; and;

(vii) been issued with an approval from an approved ARO.

106.03.3 Paraglider Conversion

- (1) A holder of a paraglider category rating converting to a hang-glider category rating, shall comply with the theoretical knowledge instruction, theoretical knowledge examinations and practical training prescribed in this Document SA-CATS, applicable appendices A-E.
- (2) A holder of a paraglider category rating who is an applicant for a conversion to a hang-glider category rating, shall complete the theoretical examinations prescribed in this Document SA-CATS.
- (3) An applicant may be credited for theoretical knowledge, theoretical knowledge examinations and practical training requirements at the written recommendation of a hang-gliding instructor.
- (4) The Director may require a hang-glider instructor to provide written by providing documentary proof of the applicant having passed theoretical examinations referred to in subsection (2).
- (5) The Director shall require a hang-glider instructor to make an evaluation on an applicant's practical skills and provide a written recommendation for the crediting of practical requirements.
- (6) The Director may require additional information supporting the crediting of flight time or theoretical examinations.

Note: Verify the conversion from paraglider to hang-glider in Part 106.02.3

1. Paraglider conversion from Powered endorsement to Basic, Intermediate, Sport or Hill Endorsement.

- (1) A holder of a paraglider certificate with only a power paraglider endorsement and if trained solely on a powered paraglider, wishes to convert to any other paraglider endorsement shall –
 - (a) demonstrate the ability to assess conditions which allow for safe launch in circumstances influenced by aircraft performance limitations, operational and environmental conditions;

- (b) demonstrate the ability to conduct a suitable pre-flight check of equipment and paraglider prior to flight;
- (c) demonstrate the ability to control the paraglider;
- (d) demonstrate three successful forward launches and three successful reverse launches;
- (e) demonstrate ridge soaring and adherence to ridge rules;
- (f) complete a minimum of at least 2 solo flights in light thermic conditions each lasting, at least 10 minutes and shall include consecutive 360 degree turns in both directions.
- (g) demonstrate five successful landings with control and deflation;
- (h) demonstrate successful use of symmetrical wing tip folds or big ears with descent to landing; and
- (i) complete a minimum of 10 flights.

2. Paratrike, wheeled undercarriage and Powered Parachute conversions

- (1) An applicant for paraglider wheeled undercarriage endorsement and powered parachute endorsement conversions undertaken on a wheeled undercarriage from first flight without undertaking the foot launched power requirements, shall first complete the paraglider basic endorsement requirements and demonstrate the following: as applicable –
 - a) the ability to conduct a pre-flight inspection on the wheeled undercarriage and canopy prior to flight based on core elements relating to the motor and undercarriage connection, canopy layout, avoiding wheel or line entanglements;
 - b) the ability to centre the canopy overhead using primarily break toggle input and minimal nose wheel steering;
 - c) appropriate use of power to maintain canopy pressurization during launch;
 - d) a minimum of five successful zero wind launches;
 - e) understanding and control of higher approach speed due to greater wing loading;

f) a correctly timed flare on landing; or

g) a minimum of five successful landings with canopy control and deflation;

Note: Tandem flights are only allowed after a tandem endorsement has been obtained as prescribed in the tandem syllabus contained in Document SA-CATS 106.

3. Conversion from Paragliding Basic Endorsement, Intermediate Endorsement or Sport Endorsement to a Power Paragliding Basic or Sport Endorsement

(1) For a conversion from a paraglider basic, intermediate or sport endorsement to a power paragliding basic or sport endorsement, an applicant may be credited up to 50% credit of the flight time hours accrued on a paraglider and shall –

(a) pass the applicable powered paraglider, powered parachute or powered paratrike theoretical knowledge examinations with a pass mark of at least 85%;

(b) complete a minimum of 10 flights;

(c) complete a minimum of two hours flight time on a powered paraglider; and

(d) complete the training on the differences in flight requirements not conducted for basic, intermediate or Sport endorsement.

4. Conversion from Tandem Paraglider to Tandem Powered Paraglider, Powered Paratrike or Powered Parachute Trike

(1) An applicant may receive full credit for all hours logged on a paraglider and shall –

(a) have completed training for a solo powered paraglider endorsement;

(b) complete a minimum of 10 flights;

(c) complete a minimum of two hours airtime on a powered paraglider;

(d) complete and pass the Powered Paraglider or Powered Paratrike Examination with a pass mark of at least 85%;

- (e) complete differences training not covered under a tandem paraglider endorsement; and
- (f) complete and pass any specific examination for powered tandem paraglider, powered paratrike or powered parachute.

5. Conversion from a powered paraglider, powered paratrike or powered parachute with wheeled undercarriage to paraglider basic, intermediate or sport endorsement

- (1) An applicant may receive 50% credit for hours logged on a powered paraglider or powered paratrike and shall–
 - (a) complete a minimum of 10 flights;
 - (b) complete a minimum of two hours airtime on a paraglider;
 - (c) complete and pass the applicable Paraglider examination with a pass mark of at least 85%; and
 - (d) complete differences training not conducted under a powered paraglider, powered paratrike or powered parachute endorsement.

6. Conversion of Tandem Endorsed pilots from Powered Paragliding to Non-powered Tandem Endorsement

- (1) For the conversion from a tandem power paraglider endorsement to a non-powered paraglider tandem endorsement, an applicant shall –
 - (a) complete all applicable theoretical knowledge examinations for endorsements with a pass mark of at least 85%; and
 - (b) complete differences training not conducted in the applicable non-powered in the endorsement syllabus.

106.04.1 Requirements for paraglider assistant flight instructor endorsement

(1) The following requirements shall be met for an assistant instructor endorsement:

- (a) register as an assistant instructor with an DTO approved by the Director;
- (b) submit a letter from an DTO requesting that a pilot be registered with an DTO as an assistant instructor; and
- (c) complete an assistant instructor induction training as prescribed in this Document SA-CATS, appendices A to E.

106.4.2 Requirements for paraglider tandem flight instructor rating

(1) An applicant for a paraglider tandem flight instructor rating shall meet the following requirements:

- (a) launch from a minimum of five different sites on a tandem paraglider;
- (b) complete a cross-country flight of at least 25km on a tandem paraglider;
- (c) complete a minimum of 20 tandem flights during the preceding six months of the application referred to in subsection (1);
- (d) submit a certificate in first aid for an initial application;
- (e) submit the applicable form completed and signed by a Grade A or B flight instructor who holds a tandem flight instructor rating;
- (f) complete the following exercises to a satisfactory level of competency:
 - (i) pendulum control;
 - (ii) at least a 50% asymmetric collapse with trimmers off, if applicable;
 - (iii) front collapse with trimmers off, if applicable;
 - (iv) demonstrate knowledge in performing a B line stall;
 - (v) point of spin;
 - (vi) point of stall;
 - (vii) symmetrical wing tip fold landing or big ears;
 - (viii) butterfly landing;

- (ix) demonstrate a controlled spiral with descent rate at least eight meters per second with controlled exit to straight and level flight; and
- (x) demonstrate a minimum of two consecutive 360 degree turns within 20 seconds with accurate on-heading exit.

106.4.3 Requirements for paraglider Grade B flight instructor rating

- (1) An applicant must meet the following requirements for a paraglider Grade B instructor rating:
 - (a) have held an assistant instructor endorsement for at least six months preceding the application;
 - (b) pass an instructor endorsement theoretical knowledge examination with a pass mark of at least 85%
 - (c) complete a theoretical and practical training course in accordance with the applicable syllabus prescribed in this Document SA-CATS, appendices A to E;
 - (d) submit a first aid certificate for an initial application; and
 - (e) submit a satisfactory safety record recommendation from an Aviation Recreational Organisation.

106.4.4 Requirements for paraglider Grade A flight instructor rating

- (1) An applicant for a paraglider grade A instructor rating shall meet the following requirements:
 - (a) hold a paraglider tandem flight instructor rating;
 - (b) assist in presenting at least two instructor training courses at an DTO approved by the Director;
 - (c) submit a satisfactory safety record recommendation from an ARO; and

- (d) have practical experience gained by attending an approved applicable DTO instructor training course;

106.4.5 Requirements for hang-glider assistant flight instructor endorsement

- (1) An applicant for a hang-glider assistant instructor endorsement shall –
 - (a) register as an assistant instructor with an DTO approved by the Director;
 - (b) complete an assistant instructor induction training as prescribed in this Document SA-CATS, appendices A to E.
 - (c) Be acquainted with the United States Hang-Gliding and Paragliding Association (USHPA) manual and current South African Hang-gliding instructor manual; and
 - (d) submit a satisfactory safety record recommendation from an ARO.

106.4.6 Requirements for hang-glider Grade C flight instructor rating

- (1) An applicant for a Grade C instructor rating shall–
 - (a) complete a theoretical and practical training course in accordance with the applicable syllabus as prescribed in this Document SA-CATS, appendices A to E;
 - (b) pass the instructor theoretical knowledge examinations with a pass mark of at least 85%;
 - (c) have completed a minimum of 200 solo flights;
 - (d) have completed a minimum of 100 hours flight time;
 - (e) have held a C hang-glider endorsement for at least 12 months preceding an application for such endorsement;
 - (f) submit a first aid certificate for an initial application;
 - (g) be acquainted with the United States Hang-Gliding and Paragliding Association (USHPA) manual and current South African Hang-gliding instructor manual;
 - (h) submit a satisfactory safety record recommendation from an approved Aviation Recreational Organisation;

- (i) hold an assistant hang-glider instructor endorsement;
- (j) complete the ab-initio training for at least one student under the supervision of a hang-glider Grade B or A instructor;
- (k) be active as an assistant instructor for a minimum period of 10 days; and
- (l) satisfy any other requirements prescribed by the approved Aviation Recreational Organisation or applicable authority.

Note: It is recommended that an assistant instructor spends additional time with a different approved DTO to minimise safety risk.

106.4.7 Requirements for hang-glider Grade A and B flight instructor rating

- (1) An applicant for a Grade B Instructor rating shall–
 - (a) have held a Grade C instructor rating for at least one year preceding an application for such rating;
 - (b) have completed at least two hang-glider training courses acting as an instructor which must be signed off by at least a Grade A or B rated hang-glider instructor;
 - (c) pass the current theory tests for all applicable licenses, ratings and endorsements;
 - (d) submit a written recommendation for display proper attitude, airmanship, responsibility, approachability, and practical instructor potential from an approved Aviation Recreational Organisation;
 - (e) apply knowledge of applicable requirements relating to hang-gliding and paragliding;
 - (f) submit a satisfactory safety record recommendation from an approved Aviation Recreational Organisation; and

- (a) satisfy any other standards required by the approved Aviation Recreational Organisation or applicable authority.
- (2) An applicant for a Grade A Instructor rating shall–
 - (a) have held a Grade B hang-glider instructor rating for a minimum of five years;
 - (b) have completed the training for at least 30 ab-initio students towards a novice hang-glider endorsement;
 - (c) submit a satisfactory safety record recommendation from an Aviation Recreational Organisation;
 - (d) apply knowledge of applicable requirements relating to hang-gliding and paragliding; and
 - (e) have presented at least one instructor seminar under the supervision of a hang-glider grade A instructor as prescribed in this Document SA-CATS, appendices A to E.

106.4.9 Instructor Conversion

- (1) For the conversion of an instructor to another category rating, the Director may require an applicant to provide written recommendations from an instructor to be submitted with a proof of completion of a theoretical examination and practical training for consideration for the crediting thereof.

3 Conversions between Paraglider Instructor and Powered Paraglider, Paratrike or Powered Parachute Instructor

- (1) An applicant may receive 50% credit for hours logged as an instructor and must complete –
 - (a) difference's training;
 - (b) applicable endorsements requirements for endorsements not held; and

- (c) examinations for endorsements not held with a result of at least 85%.

APPENDIX A – PRACTICAL PARAGLIDING AND HANG -GLIDING EXERCISES

	Only practical requirement for the specific endorsement shall be conducted – many exercises can be completed simultaneously or in one flight	
PRACTICAL EXERCISES		
EXERCISE	ITEM DESCRIPTION	HG&PG
	<i>Note: only apply applicable elements for non-powered</i>	
EXERCISE 1		✓
	Familiarisation with the aircraft	
	characteristics of the HG PG or powered version thereof	
	systems	
	check lists, drills, controls	
EXERCISE 1E		✓
	Emergency drills	
	action in the event of fire on the ground and in the air	
	electrical system fire	
	escape drills, location and use of emergency equipment and exits	
EXERCISE 2		✓
	Preparation for and action after flight	
	equipment required, maps, etc.	
	external checks	
	internal checks	
	harness, seat adjustments	
	starting and warm up checks	
	power checks	
	running down system checks and switching off the engine	
	parking, security, and picketing (example tie downs)	
EXERCISE 3		✓
	Air experience	
	Flight exercise	
	introduce student to Aircraft Type Specific flight	
EXERCISE 4		✓
	Effects of controls	
	primary effects when laterally level and when banked	
	secondary effects	
	effects of:	
	airspeed	

	power	
	trimming controls	
	other controls, as applicable	
	operation of:	
	mixture control	
	airmanship	
EXERCISE 5		✓
	Taxiing	
	pre-taxi launch checks	
	starting, control of speed and stopping, including Taxi	
	engine handling	
	control of direction and turning	
	turning in confined spaces	
	effects of wind and use of flying controls, including wheel balancing	
	effects of ground surface	
	marshalling signals	
	instrument checks	
	airmanship	
	Ground handling / skimming flights / tethered flights / winching / power / engine prep (HG & PG)	
EXERCISE 5E		✓
	Emergencies	
	Brake and steering failure	
	Taxi Emergencies	
	Engine Emergencies	
EXERCISE 6		✓
	Straight and level	
	at normal cruising power, attaining and maintaining straight and level flight	
	flight at critically high airspeeds	
	demonstration of inherent stability, including recovering from PIO (Pilot Induced Oscillations)	
	altitude gliding and transition's, loose formation, gaggle (HG & PG flying in close proximity))	
	control in pitch, including use of trim	
	lateral level, direction and balance, trim	
EXERCISE 7		✓
	Climbing	
	entry, maintaining the normal and max rate climb, levelling off	
	levelling off at selected altitudes	
	maximum angle of climb	
EXERCISE 8		✓
	Descending	

	entry, maintaining and levelling off	
	levelling off at selected altitudes	
	glide, powered and cruise descent (including effect of power and airspeed)	
	use of instruments for precision flight	
EXERCISE 9		✓
	Turning	
	entry and maintaining medium level turns	
	resuming straight flight	
	faults in the turn – (in correct pitch, bank, balance), corrections (HG & PG)	
	climbing turns	
	descending turns	
EXERCISE 10A		✓
	Slow flight	
	safety checks	
	introduction to slow flight	
	application of full power with correct altitude and balance to achieve normal climb speed	
	Airspeed recognition / trim speed (HG & PG)	
	airmanship	
EXERCISE 10B		✓
	Stalling	
	airmanship	
	safety checks	
	symptoms	
	recognition	
	B line stall, Full stall and recovery without power and with power	
	recovery when a wing drops/ asymmetric/ front tuck	
	approach to stall in the approach and in the landing configurations, with and without power,	
	recovery at the incipient stage	
EXERCISE 11		✓
	Spin avoidance	
	airmanship	
	safety checks	
	stalling and recovery	
	Descending and Thermal Turns (HG & PG)	

EXERCISE 12		✓
	Take-off and climb to downwind position	
	pre-take-off checks	
	into wind take-off	
	safeguarding the nosewheel	
	crosswind take-off	
	crosswind	
	drills during and after take-off	
	short take-off and soft field procedure/techniques including performance calculations	
	noise abatement procedures	
	Launch, take-off, flare action (HG & PG)	
	Aerotow take off and climb to release (HG & PG)	
	Winch launches take off and climb to release (HG & PG)	
EXERCISE 13		✓
	Circuit, approach and landing	
	circuit procedures, downwind, base leg	
	powered approach and landing	
	safeguarding the nosewheel	
	effect of wind on approach and touchdown speeds	
	crosswind approach and landing	
	glide approach and landing	
	short landing and soft field procedures/techniques	
	wheel landing (tail wheel aeroplanes/gyroplanes)	
	missed approach/go around	
EXERCISE 12/13E		✓
	Emergencies	
	abandoned take-off	
	engine failure after take-off	
	engine shutdown and restarting in flight	
	Missed landing/go-around	
	missed approach	
EXERCISE 14		✓
	First solo	
	instructor's briefing, observation of flight and de-briefing	
	procedures for leaving and re-joining the circuit	
	the local area, restrictions, map reading	
EXERCISE 15		✓
	Advanced turning	
	steep turns (45°), level and descending	
	stalling in the turn and recovery	
	recoveries from unusual altitudes, including spiral dives	

EXERCISE 16		✓
	Forced landing without power	
	out or forced landing procedure, Big ears (symmetric wing tuck)	
	choice of landing area, provision for change of plan	
	gliding distance	
	descent plan	
	key positions	
	engine cooling	
	engine failure checks	
	use of radio	
	base leg	
	final approach (figure 8, S approach or aircraft approach)	
	landing	
	Forced landing with Power	
	actions after landing	
EXERCISE 17A		✓
	Low level flying	
	Safety considerations	
	Selection of the appropriate speed and configuration	
	Awareness of the danger factors and their recognition	
	Transition to low level flight	
	Control of speed and height	
	Following ground contours and line features	
	Ridge Soaring	
EXERCISE 17B		✓
	Precautionary landing	
	occasions necessitating	
	in-flight conditions	
	landing area selection	
	normal aerodrome	
	disused aerodrome	
	ordinary field	
	circuit and approach	
	actions after landing	
EXERCISE 18A		✓
	Navigation	
	Flight planning	
	weather forecast and actuals	
	map selection and preparation	
	choice of route	
	controlled airspace	

	danger, prohibited and restricted areas	
	safety altitudes	
	calculations	
	magnetic heading(s) and time(s) en-route	
	fuel consumption	
	mass and performance	
	flight information	
	NOTAMS etc.	
	radio frequencies	
	Departure	
	altimeter settings	
	maintenance of altitude and heading	
	log keeping	
	use of radio and variometer	
	minimum weather conditions for continuation of flight	
	in-flight decisions	
	lost procedure	
	entering the traffic pattern	
	circuit procedures	
	refuelling	
EXERCISE 18B		✓
	Navigation problems at lower levels and in reduced visibility	
	actions prior to descending	
	hazards (e.g., obstacles, and terrain)	
	effects of wind and turbulence (rotor, wind shadow)	
	vertical situational awareness (avoidance of controlled flight into terrain)	
	avoidance of noise sensitive areas	
	joining the circuit	
EXERCISE 18C		✓
	Navigation with GPS	

APPENDIX B –PILOT ENDORSEMENT THEORETICAL SYLLABI

Only theoretical requirements for the specific endorsement shall be conducted – not all elements documented are required for each endorsement. Instructors may provide lectures and training of these syllabi in an order and fashion that suits their school and environment. The applicable ARO produces a training manual that may be used as a guide or directly for ab initio training.

<u>HG Theory Subjects</u>	<u>PG Theory Subjects</u>
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	<u>Human performance limitations:</u>		<u>Human performance limitations:</u>
1)	<u>Introduction</u>	1)	<u>Introduction</u>
2)	<u>Hypoxia</u>	2)	<u>Hypoxia</u>
3)	<u>Hyperventilation</u>	3)	<u>Hyperventilation</u>
4)	<u>Air sickness</u>	4)	<u>Air sickness</u>
5)	<u>Epilepsy</u>	5)	<u>Epilepsy</u>
6)	<u>Alcohol and drugs</u>	6)	<u>Alcohol and drugs</u>
7)	<u>Disorientation</u>	7)	<u>Disorientation</u>
8)	<u>Management of stress</u>	8)	<u>Management of stress</u>
9)	<u>The ego factor</u>	9)	<u>The ego factor</u>
10)	<u>Intermediate syndrome</u>	10)	<u>Intermediate syndrome</u>
	<u>Novice Endorsement:</u>		<u>Basic Endorsement:</u>
1)	<u>General Knowledge</u>	1)	<u>General Knowledge</u>
2)	<u>Basic air law</u>	2)	<u>Basic air law</u>
3)	<u>Basic meteorology</u>	3)	<u>Basic meteorology</u>
4)	<u>Flight and control</u>	4)	<u>Flight and control</u>
5)	<u>Hang-glider design and equipment</u>	5)	<u>Paraglider design and equipment</u>
6)	<u>Airflow</u>	6)	<u>Airflow</u>
7)	<u>Airmanship</u>	7)	<u>Airmanship</u>
	<u>Class A Endorsement</u>		
1)	<u>Meteorology</u>		
2)	<u>Airflow</u>		
3)	<u>Glider design and Hang-glider Structure</u>		
4)	<u>Flying skills and airmanship</u>		
5)	<u>General Knowledge and Air Law</u>		
6)	<u>Aerodynamics</u>		
7)	<u>Human Performance and medical</u>		
8)	<u>Navigation and Airspace</u>		
	<u>Class B Endorsement:</u>		<u>Intermediate Endorsement</u>
1)	<u>Meteorology and micro-meteorology</u>	1)	<u>Meteorology and micro-meteorology</u>

2)	<u>Equipment and flying skills</u>	2)	<u>Equipment and flying skills</u>
3)	<u>Hang-glider Design, Structure and Aerodynamics</u>	3)	<u>Paraglider Design, Structure and Aerodynamics</u>
4)	<u>Airmanship</u>	4)	<u>Airmanship</u>
5)	<u>Human Performance and medical</u>	5)	<u>Human Performance and medical</u>
6)	<u>Airspace and air law</u>	6)	<u>Airspace and air law</u>
7)	<u>Navigation and Airspace</u>	7)	<u>Navigation and Airspace</u>
	<u>Class C Endorsement</u>		<u>Sport Endorsement</u>
1)	<u>General and South Africa legal aspects</u>	1)	<u>General and South Africa legal aspects</u>
2)	<u>Air law</u>	2)	<u>Air law</u>
3)	<u>Navigation and Airspace</u>	3)	<u>Navigation and Airspace</u>
4)	<u>Flying skills</u>	4)	<u>Flying skills</u>
5)	<u>Medical aspects of flying</u>	5)	<u>Medical aspects of flying</u>
6)	<u>Meteorology (Including advanced micro meteorology)</u>	6)	<u>Meteorology (Including advanced micro meteorology)</u>
7)	<u>Aero dynamics</u>	7)	<u>Aero dynamics</u>
8)	<u>Hang-glider design</u>	8)	<u>Paraglider design</u>
9)	<u>Human Performance and medical</u>	9)	<u>Human Performance and medical</u>
	<u>Tandem Endorsement</u>		<u>Tandem Endorsement</u>
1)	<u>Passenger Care:</u>	1)	<u>Passenger Care:</u>
2)	<u>Harness and comfort</u>	2)	<u>Harness and comfort</u>
3)	<u>Briefing</u>	3)	<u>Briefing</u>
4)	<u>Differences</u>	4)	<u>Differences</u>
	<u>Powered Endorsement</u>		<u>Powered Endorsement</u>
1)	<u>Engines – general</u>	1)	<u>Engines – general</u>
2)	<u>Ignition systems</u>	2)	<u>Ignition systems</u>
3)	<u>Carburetion and Fuel system</u>	3)	<u>Carburetion and Fuel system</u>
4)	<u>Fuel</u>	4)	<u>Fuel</u>
5)	<u>Electrical system</u>	5)	<u>Electrical system</u>
6)	<u>Propeller</u>	6)	<u>Propeller</u>
7)	<u>Undercarriages</u>	7)	<u>Undercarriages</u>

	<u>Instruments:</u>		<u>Instruments:</u>
1)	<u>Altimeter</u>	1)	<u>Altimeter</u>
2)	<u>Variometer, visual and audio</u>	2)	<u>Variometer, visual and audio</u>
3)	<u>GPS</u>	3)	<u>GPS</u>
4)	<u>Engine instruments</u>	4)	<u>Engine instruments</u>
5)	<u>Pressure altitude, density altitude</u>	5)	<u>Pressure altitude, density altitude</u>

APPENDIX C – CATEGORY SYLLABUS ELEMENTS

	<u>All elements of these syllabi as applicable to the certificate or endorsement to be issued shall be covered in the training however the order and manner provided to the learner shall be at the discretion of the instructor</u>		
	<u>PARAGLIDER</u>		<u>HANG-GLIDER:</u>
	GENERAL KNOWLEDGE		GENERAL KNOWLEDGE
1)	Regulatory overview	1)	Regulatory overview
2)	Record keeping	2)	Record keeping
3)	Accidents and incidents	3)	Accidents and incidents
4)	License and endorsement structure	4)	License and endorsement structure
5)	Peer supervision sign-off systems/Observers	5)	Peer supervision sign-off systems/Observers
6)	Personal flying logbook	6)	Personal flying logbook
	<u>AIR LAW</u>		<u>AIR LAW</u>
1)	Introduction to relevant CARs	1)	Introduction to relevant CARs
2)	The need for flight patterns/right of way rules	2)	The need for flight patterns/right of way rules
3)	Right of way rules/principles	3)	Right of way rules/principles
4)	Situational awareness	4)	Situational awareness
5)	Site establishment and registration	5)	Site establishment and registration
6)	Ridge soaring etiquette	6)	Ridge soaring etiquette
7)	Thermalling etiquette	7)	Thermalling etiquette
8)	Airspace classification	8)	Airspace classification
9)	General flight rules	9)	General flight rules
10)	Visual flight rules	10)	Visual flight rules
11)	Incident/accident reporting	11)	Incident/accident reporting
	<u>BASIC METEOROLOGY</u>		<u>BASIC METEOROLOGY</u>

1)	Macro-meteorology overview	1)	Macro-meteorology overview
2)	Micro-meteorology overview	2)	Micro-meteorology overview
3)	Pressure, Density and Temperature	3)	Pressure, Density and Temperature
4)	Pressure and Wind	4)	Pressure and Wind
5)	Cloud Formation	5)	Cloud Formation
6)	Fog, Mist and Haze	6)	Fog, Mist and Haze
7)	Air Masses	7)	Air Masses
8)	Fronts	8)	Fronts
9)	Thunderstorms	9)	Thunderstorms
10)	Wind direction, strength, and topography	10)	Wind direction, strength, and topography
11)	Three primary causes of turbulence	11)	Three primary causes of turbulence
12)	Wind shadow and wind gradient	12)	Wind shadow and wind gradient
13)	Flight over Mountainous Areas	13)	Flight over Mountainous Areas
14)	Weather Analysis and Forecasting	14)	Weather Analysis and Forecasting
15)	Weather Information for Flight Planning	15)	Weather Information for Flight Planning
FLIGHT CONTROL		FLIGHT CONTROL	
1)	Wind speed and associated risks	1)	Wind speed and associated risks
2)	Strong wind precautions	2)	Strong wind precautions
3)	Stall recognition and recovery	3)	Stall recognition and recovery
4)	Wind speed, Airspeed, and groundspeed judgment	4)	Wind speed, Airspeed, and groundspeed judgment
5)	Polar curves, glide ratio, sink rate, wing loading	5)	Polar curves, glide ratio, sink rate, wing loading
6)	Speed to fly	6)	Speed to fly
7)	The effects of wing loading on handling and performance	7)	The effects of wing loading on handling and performance
AERODYNAMICS		AERODYNAMICS	
1)	Three axis of flight – pitch, roll and yaw	1)	Three axis of flight – pitch, roll and yaw
2)	Definitions: Angle of attack, anhedral, dihedral, washout, sweepback, camber, reflex.	2)	Definitions: Angle of attack, anhedral, dihedral, washout, sweepback, camber, reflex.
3)	Stability features in pitch, roll, yaw	3)	Stability features in pitch, roll, yaw
4)	Airflow over wing and resultant forces (lift vector, resultant lift, drag, gravity and direction of flight	4)	Airflow over wing and resultant forces (lift vector, resultant lift, drag, gravity and direction of flight
5)	Aerofoils	5)	Aerofoils
6)	Thrust, Prop Torque effect	6)	Thrust, Prop Torque effect
PARAGLIDER DESIGN AND EQUIPMENT		HANG-GLIDER DESIGN AND EQUIPMENT	
1)	Harness types (pod, cocoon, stirrup,)	1)	Harness types (knee-hangers, pod, cocoon, stirrup, supine and sup prone)
2)	Disassembly and inspection of paraglider	2)	Rogallo wing hazards
3)	Tip steering	3)	Modern hang-glider features – washout battens, sprogs, flutter sticks, variable billow/geometry, carbon fibre tubing
4)	Motors	4)	Disassembly and inspection of hang-glider
5)	Wear and tear considerations	5)	Motors
		6)	Wear and tear considerations

	PRE-FLIGHT CHECK PRINCIPLES		PRE-FLIGHT CHECK PRINCIPLES
1)	Glider, harness, helmet, weather, and pilot,	1)	Glider, harness, helmet, weather and pilot, the 3 H's and the 5 LC's.
2)	Effects of wing loading and hang point adjustments	2)	Effects of wing loading and hang point adjustments
3)	Pre- and in-flight checks	3)	Pre- and in-flight checks
4)	Reserve deployment	4)	Reserve deployment
	AIRFLOW		AIRFLOW
1)	Terrain and wind – The shape of the hill/mountain - rotor, compression, venturi, gradient, and wind shadow.	1)	Terrain and wind – The shape of the hill/mountain - rotor, compression, venturi, gradient, and wind shadow.
2)	Determinants of ridge lift	2)	Determinants of ridge lift
3)	Important safety considerations and precautions – identifying safe and danger areas for launch, in flight and landing	3)	Important safety considerations and precautions – identifying safe and danger areas for launch, in flight and landing
	AIRMANSHIP		AIRMANSHIP
1)	Contributing factors (knowledge, skill, experience, and pilot attitude - flying is more about attitude than altitude)	1)	Contributing factors (knowledge, skill, experience, and pilot attitude - flying is more about attitude than altitude)
	PRINCIPLES OF FLIGHT		PRINCIPLES OF FLIGHT
1)	Thermalling: Introduction to thermals Thermalling techniques. Rules in a thermal and right of way. Structure of a thermal and effects of prevailing wind and lapse rate.	1)	Thermalling: Introduction to thermals Thermalling techniques. Rules in a thermal and right of way. Structure of a thermal and effects of prevailing wind and lapse rate.
2)	Ridge Soaring: Introduction to ridge lift Lift and pressure bands. Ridge Rules and right of way.	2)	Ridge Soaring: Introduction to ridge lift Lift and pressure bands. Ridge Rules and right of way.
3)	Cross Country flight: Introduction to cross country flying	3)	Cross Country flight: Introduction to cross country flying
4)	Out landings and recovery.	4)	Out landings and recovery.
5)	Flight planning.	5)	Flight planning.
	Air safety Course (SIV)		
1)	Theory for the specific manoeuvre		
2)	Emergencies		

APPENDIX D – INSTRUCTOR SYLLABUS

	<u>All elements of this syllabus as applicable to the Instructor Rating to be issued shall be covered in the training, however the order and manner provided to the applicant shall be at the discretion of the instructor</u>		
	<u>HG Instructor Rating:</u>		<u>PG Instructor Rating</u>
	<u>Human performance limitations:</u>		<u>Human performance limitations:</u>
1)	<u>Introduction</u>	1)	<u>Introduction</u>
2)	<u>Hypoxia</u>	2)	<u>Hypoxia</u>
3)	<u>Hyperventilation</u>	3)	<u>Hyperventilation</u>
4)	<u>Air sickness</u>	4)	<u>Air sickness</u>
5)	<u>Epilepsy</u>	5)	<u>Epilepsy</u>
6)	<u>Vertigo</u>	6)	<u>Vertigo</u>
7)	<u>Disorientation</u>	7)	<u>Disorientation</u>
8)	<u>Anxiety</u>	8)	<u>Anxiety</u>
9)	<u>Fear</u>	9)	<u>Fear</u>
10)	<u>Psychological factors</u>	10)	<u>Psychological factors</u>
11)	<u>Shyness</u>	11)	<u>Shyness</u>
12)	<u>Management of stress</u>	12)	<u>Management of stress</u>
13)	<u>Fatigue</u>	13)	<u>Fatigue</u>
14)	<u>Drugs and alcohol</u>	14)	<u>Drugs and alcohol</u>
15)	<u>The authority & ego factor</u>	15)	<u>The authority & ego factor</u>
16)	<u>Intermediate syndrome</u>	16)	<u>Intermediate syndrome</u>
17)	<u>Primacy</u>	17)	<u>Primacy</u>
18)	<u>Other sports</u>	18)	<u>Other sports</u>
19)	<u>Previous injury</u>	19)	<u>Previous injury</u>
	<u>General Instructing Fundamentals</u>		<u>General Instructing Fundamentals</u>
1)	<u>Qualities of an instructor</u>	1)	<u>Qualities of an instructor</u>
2)	<u>Principles of learning</u>	2)	<u>Principles of learning</u>
3)	<u>The teaching process</u>	3)	<u>The teaching process</u>
4)	<u>Principles of teaching the sport of hang-gliding</u>	4)	<u>Principles of teaching the sport of paragliding</u>
5)	<u>Responsibilities of a Complete Instructor</u>	5)	<u>Responsibilities of a Complete Instructor</u>
6)	<u>Site selection</u>	6)	<u>Site selection</u>

7)	<u>Weather conditions suitable for training</u>	7)	<u>Weather conditions suitable for training</u>
8)	<u>Equipment</u>	8)	<u>Equipment</u>
9)	<u>Risk management</u>	9)	<u>Risk management</u>
10)	<u>Inability to follow directives</u>	10)	<u>Inability to follow directives</u>
11)	<u>Age and Sex related considerations</u>	11)	<u>Age and Sex related considerations</u>
12)	<u>Licensing, the observer and sign-off system</u>	12)	<u>Licensing, the observer and sign-off system</u>
13)	<u>Endorsement and License structure</u>	13)	<u>Endorsement and License structure</u>
14)	<u>Endorsement and License issuing procedure</u>	14)	<u>Endorsement and License issuing procedure</u>
	<u>Grade C – hang-gliding</u>		<u>Grade C – paragliding TFI</u>
1)	<u>General Knowledge and Air Law</u>	1)	<u>General Knowledge and Air Law</u>
2)	<u>Hang-glider Structure and Aerodynamics</u>	2)	<u>Paraglider Structure and Aerodynamics</u>
3)	<u>Navigation and Airspace</u>	3)	<u>Navigation and Airspace</u>
4)	<u>Flying Skills and Airmanship</u>	4)	<u>Flying Skills and Airmanship</u>
5)	<u>Meteorology and Airflow</u>	5)	<u>Meteorology and Airflow</u>
6)	<u>Human factors and medical</u>	6)	<u>Human factors and medical</u>
7)	<u>Training methods</u>	7)	<u>Training methods</u>
	<u>Grade B - Hang Gliding;</u>		<u>Grade B – Paragliding;</u>
	<u>No additional theoretical training required for this endorsement; it is purely based on acquired experience.</u>	1)	<u>General Knowledge and Air Law</u>
		2)	<u>Paraglider Structure and Aerodynamics</u>
		3)	<u>Navigation and Airspace</u>
		4)	<u>Flying Skills and Airmanship</u>
		5)	<u>Meteorology and Airflow</u>
		6)	<u>Human Performance and medical</u>
		7)	<u>Training Methods/ launch methods</u>
		8)	<u>Proper attitude appropriate for the endorsement</u>
	<u>Grade A - Hang Gliding (Instructors Instructor)</u>		<u>Grade A– Paragliding (Instructors Instructor)</u>
1)	<u>ATO/ DTO regulations</u>	1)	<u>ATO/ DTO regulations</u>

<u>2)</u>	<u>Building Block training methodology</u>	<u>2)</u>	<u>Building Block training methodology</u>
<u>3)</u>	<u>Primacy</u>	<u>3)</u>	<u>Primacy</u>
<u>4)</u>	<u>Syllabi</u>	<u>4)</u>	<u>Syllabi</u>
<u>5)</u>	<u>Documentation</u>	<u>5)</u>	<u>Documentation</u>
<u>6)</u>	<u>Practical training</u>	<u>6)</u>	<u>Practical training</u>

APPENDIX E – ITEMISED ELEMENTS OF SYLLABUS

<u>Guidance for Theoretical knowledge areas that should be covered in training as applicable to the commensurate endorsement Note: If the theory has been completed at a lower endorsement in the theory training a refresher is conducted on the elements applicable</u> <u>As a minimum the areas marked with an X for the applicable endorsement shall be covered in the instruction provided</u>			<u>Novice/Basic</u>	<u>A</u>	<u>Intermediate /B</u>	<u>Sport /C</u>	<u>Tandem</u>	<u>TFI</u>
	<u>Physics and Mechanics</u>							
<u>1</u>	<u>Speed, velocity, force</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>2</u>	<u>Pressure – Bernoulli's Principle</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>3</u>	<u>Motion of body along a curved path</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>4</u>	<u>Aerofoil, lift and drag</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>5</u>	<u>Air resistance and air density</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>6</u>	<u>Aerofoil shapes</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>7</u>	<u>Lift and drag – Angle of attack, Pitch and airspeed</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>8</u>	<u>Distribution of lift, Centre of pressure</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>9</u>	<u>Drag – Induced, parasite – Form, skin, interference</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>10</u>	<u>Lift/drag ratio and aspect ratio</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>11</u>	<u>Wake turbulence</u>		<u>x</u>	-	-	<u>x</u>	-	-

	<u>Equilibrium</u>						
<u>1</u>	<u>The four forces: Lift, weight, gravity and drag</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>2</u>	<u>Centre of gravity (C of G) position</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>3</u>	<u>The balance of the four forces: Straight and level</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>4</u>	<u>Climbing</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>5</u>	<u>Descending</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>Stability</u>						
<u>1</u>	<u>Positive, neutral, negative</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>2</u>	<u>Lateral and directional stability</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>3</u>	<u>Longitudinal stability</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>4</u>	<u>Pitch Yaw Roll</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>5</u>	<u>Effects of power and the prop</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>Paraglider or Hang-glider Performance</u>						
<u>1</u>	<u>Polar curves</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>2</u>	<u>Effect of temperature, altitude, density, moisture etc.</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>3</u>	<u>Range and endurance</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>4</u>	<u>Climbing performance</u>	<u>x</u>	-	-	<u>x</u>	-	-

<u>5</u>	<u>Rate of climb</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>6</u>	<u>Angle of climb</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>7</u>	<u>best glide</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>8</u>	<u>best rate of climb</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>9</u>	<u>Take-off and landing performance</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>10</u>	<u>Take-off run available</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>11</u>	<u>Take-off distance available</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>12</u>	<u>Landing distance available</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>13</u>	<u>Take-off and initial climb - performance</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>14</u>	<u>Effect of –</u>		<u>x</u>	-	-	<u>x</u>	-	-
-	<u>a</u>	<u>wind, wind gradient and wind shear</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>b</u>	<u>weight</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>c</u>	<u>pressure, altitude, temperature, and air density</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>d</u>	<u>ground surface and gradient</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>e</u>	<u>Approach and landing – performance</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>d</u>	<u>turbulence and gusts</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>e</u>	<u>ground effect</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>d</u>	<u>Rotor</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>e</u>	<u>Wind-shadow</u>	<u>x</u>	-	-	<u>x</u>	-	-

	<u>Principles of flight</u>						
	<u>Flying controls</u>		<u>x</u>	-	-	<u>x</u>	-
<u>1</u>	<u>The three axes: Vertical, Lateral, Longitudinal Yaw, Pitch, Roll</u>		<u>x</u>	-	-	<u>x</u>	-
<u>2</u>	<u>Operation and function of leading edge, Brakes, big ears, Cravat, line, tip steering</u>		<u>x</u>	-	-	<u>x</u>	-
<u>3</u>	<u>Principles and purpose of mass and aerodynamic balance, Wing loading</u>		<u>x</u>	-	-	<u>x</u>	-
<u>4</u>	<u>Operation and purpose of trimming controls if applicable</u>		<u>x</u>	-	-	<u>x</u>	-
<u>5</u>	<u>Operation and function of Speed-bar</u>		<u>x</u>	-	-	<u>x</u>	-
<u>6</u>	<u>Operation and function of the trimmers</u>		<u>x</u>	-	-	<u>x</u>	-
<u>7</u>	<u>Operation and adjustment of harness and effect</u>		<u>x</u>	-	-	<u>x</u>	-
<u>8</u>	<u>Turning</u>		<u>x</u>	-	-	<u>x</u>	-
<u>9</u>	<u>Methods of Turning</u>		<u>x</u>	-	-	<u>x</u>	-
<u>10</u>	<u>The forces in the turn</u>		<u>x</u>	-	-	<u>x</u>	-
<u>11</u>	<u>Compensation for loss of lift</u>		<u>x</u>	-	-	<u>x</u>	-
	<u>Weight and C of G</u>						
<u>1</u>	<u>Limitations on Paraglider or hang-glider weight and effects</u>		<u>x</u>	-	-	<u>x</u>	-
<u>2</u>	<u>Limitations in relation to Paraglider balance</u>		<u>x</u>	-	-	<u>x</u>	-

3	<u>Weight and centre of gravity</u>	<u>x</u>	-	-	<u>x</u>	-	-
							-
	<u>The Spin</u>						
1	<u>Causes of a spin</u>	<u>x</u>	-	-	<u>x</u>	-	-
2	<u>Rotation, Effect on harness and risers</u>	<u>x</u>	-	-	<u>x</u>	-	-
3	<u>Effect of the C of G on spinning characteristics</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>The Stall</u>						
1	<u>Airflow separation</u>	<u>x</u>	-	-	<u>x</u>	-	-
2	<u>Stalling angle – Relationship to airspeed</u>	<u>x</u>	-	-	<u>x</u>	-	-
3	<u>Wing loading</u>	<u>x</u>	-	-	<u>x</u>	-	-
4	<u>Wing loading increase with bank angle increase</u>	<u>x</u>	-	-	<u>x</u>	-	-
5	<u>High-speed stall</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>Flying Performance</u>						
1	<u>Use of brakes</u>	<u>x</u>	-	-	<u>x</u>	-	-
2	<u>take-off and initial climb performance</u>	<u>x</u>	-	-	<u>x</u>	-	-
3	<u>Approach and landing stable approach</u>	<u>x</u>	-	-	<u>x</u>	-	-
4	<u>Cross control</u>	<u>x</u>	-	-	<u>x</u>	-	-
5	<u>Side slipping</u>	<u>x</u>	-	-	<u>x</u>	-	-

<u>6</u>	<u>Stability</u>	-	<u>x</u>	-	-	<u>x</u>	-	-
<u>7</u>	<u>Relationship of C of G to control in pitch</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>8</u>	<u>Harness or undercarriage setup</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>9</u>	<u>Wing loading, projected wing area and manoeuvres</u>		<u>x</u>	-	-	<u>x</u>	-	-
-	<u>a</u>	<u>Definition of wing loading and projected wing area</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>b</u>	<u>Effect on stalling speed</u>	<u>x</u>	-	-	<u>x</u>	-	-
-	<u>c</u>	<u>In-flight precautions</u>	<u>x</u>	-	-	<u>x</u>	-	-
								-
	<u>Air Law and regulations</u>							
<u>1</u>	<u>Applicable acts, regulations, and other documents</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>2</u>	<u>Structure and function of ANR's, CAR's, CAT's, AIP's, Notams, AIC's and AIP supplements.</u>		-	-	-	<u>x</u>	-	-
<u>3</u>	<u>Classification of Paraglider or Hang-glider</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>4</u>	<u>Paraglider or hang-glider documentation</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>5</u>	<u>Paraglider or hang-glider equipment</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>6</u>	<u>Paraglider or hang-glider radio equipment</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>7</u>	<u>Paraglider or hang-glider weight schedule</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>8</u>	<u>Documents and records to be maintained and produced on request</u>		<u>x</u>	-	-	<u>x</u>	-	-
<u>9</u>	<u>Offences in relating to documents and records</u>		<u>x</u>	-	-	<u>x</u>	-	-

<u>10</u>	<u>Airworthiness aspects</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>11</u>	<u>Licensing or certification and endorsements</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>12</u>	<u>Personal flying logbook and instructor's logbook</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>13</u>	<u>Airspace classification</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>14</u>	<u>General flight rules</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>15</u>	<u>Visual flight rules and Visual metrological Conditions</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>16</u>	<u>Special flight rules</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>17</u>	<u>Flight operations</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>18</u>	<u>General provisions</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>19</u>	<u>Air traffic services</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>20</u>	<u>Air-proximity reporting procedures</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>21</u>	<u>Incident/accident reporting</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>22</u>	<u>International operations and foreign pilots</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>23</u>	<u>Operation of Non-type certified Paraglider or hang-glider and powered and wheeled version there of</u>	<u>x</u>	-	-	<u>x</u>	-	-
<u>24</u>	<u>Proclaimed nature reserves</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>Loose Formation/ Gaggles Flying/Display/ Aerobatic</u>						
<u>1</u>	<u>Law and regs</u>	-	-	-	<u>x</u>	-	-
<u>2</u>	<u>Procedures and hazards</u>	-	-	-	<u>x</u>	-	-

	<u>Aviation Meteorology</u>							
1	<u>THE ATMOSPHERE</u>							
	<u>a</u>	<u>Composition and structure</u>	x	-	x	x	-	-
	<u>b</u>	<u>Vertical divisions</u>	x	-	x	x	-	-
2	<u>PRESSURE, DENSITY AND TEMPERATURE</u>							
	<u>a</u>	<u>Barometric pressure, isobars</u>	-	-	x	x	-	-
	<u>b</u>	<u>Changes of pressure, density, and temperature with altitude</u>	-	-	x	x	-	-
	<u>c</u>	<u>Solar and terrestrial energy radiation, temperature</u>	-	-	x	x	-	-
	<u>d</u>	<u>Lapse rate</u>	-	-	x	x	-	-
	<u>e</u>	<u>Stability and instability</u>	-	-	x	x	-	-
	<u>f</u>	<u>Effects of radiation, advection subsidence and convergence</u>	-	-	x	x	-	-
3	<u>HUMIDITY AND PRECIPITATION</u>							
	<u>a</u>	<u>Water vapour in the atmosphere</u>	x	-	x	x	-	-
	<u>b</u>	<u>Dew point and relative humidity</u>	x	-	x	x	-	-
4	<u>PRESSURE AND WIND</u>							
	<u>a</u>	<u>High- and low-pressure areas</u>	x	-	x	x	-	-
	<u>b</u>	<u>Gradient wind</u>	x	-	x	x	-	-

	<u>c</u>	<u>Vertical and horizontal motion</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>d</u>	<u>Effect of wind gradient and wind shear on take-off and landing</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>e</u>	<u>Relationship between isobars and wind</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>f</u>	<u>Turbulence and Wind gusts</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>g</u>	<u>Local winds, land and sea breezes, berg winds, valley winds and visual wind speed guides</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
<u>5</u>	<u>CLOUD FORMATION</u>							
	<u>a</u>	<u>Cloud types</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>b</u>	<u>Convection clouds</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>c</u>	<u>Orographic clouds</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>d</u>	<u>Stratiform and cumulus clouds</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
<u>6</u>	<u>VISIBILITY</u>							
	<u>a</u>	<u>Fog, mist, and haze</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>b</u>	<u>Radiation, advection, frontal</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>c</u>	<u>Formation and dispersal</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>d</u>	<u>Reduction of visibility due to mist, snow, smoke, dust and sand</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>e</u>	<u>Hazards of flight due to low visibility.</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-

		<u>horizontal and vertical</u>						
<u>7</u>	<u>AIRMASSES</u>							
	<u>a</u>	<u>Weather associated with pressure systems</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
<u>8</u>	<u>FRONTS</u>							
	<u>a</u>	<u>Formation of cold and warm fronts</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>b</u>	<u>Associated clouds and weather, cold front</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
<u>9</u>	<u>THUNDERSTORMS</u>							
	<u>a</u>	<u>Formation – air masses, frontal, orographic</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>b</u>	<u>Conditions required</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>c</u>	<u>Development process</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>d</u>	<u>Recognition of favourable conditions for formation</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>e</u>	<u>Hazards</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>f</u>	<u>Effects of lightning and severe turbulence</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>g</u>	<u>Avoidance of flight in the vicinity of thunderstorms</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
<u>10</u>	<u>FLIGHT OVER MOUNTAINOUS AREAS</u>							
	<u>a</u>	<u>Hazards</u>	-	<u>x</u>	<u>x</u>	<u>x</u>	-	-

	<u>b</u>	<u>Influence of terrain on atmospheric processes</u>	-	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>c</u>	<u>Mountain waves, wind shear, turbulence, vertical movement, rotor effects</u>	-	<u>x</u>	<u>x</u>	<u>x</u>	-	-
11	<u>CLIMATOLOGY</u>							
	<u>a</u>	<u>General world circulation</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>b</u>	<u>South African summer patterns</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>c</u>	<u>South African winter patterns</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
	<u>d</u>	<u>Berg winds</u>	<u>x</u>	-	<u>x</u>	<u>x</u>	-	-
12	<u>ALTIMETRY</u>							
	<u>a</u>	<u>Operational aspects of pressure settings for variometers</u>	-	-	-	<u>x</u>	<u>x</u>	-
	<u>b</u>	<u>Pressure altitude, density altitude</u>	-	-	-	<u>x</u>	<u>x</u>	-
	<u>c</u>	<u>Height, altitude, flight level</u>	-	-	-	<u>x</u>	<u>x</u>	-
13	<u>THE METEOROLOGICAL ORGANISATION</u>							
	<u>a</u>	<u>SAWS and other Forecasting services</u>	<u>x</u>	-	-	<u>x</u>	<u>x</u>	-
14	<u>WEATHER ANALYSIS AND FORECASTING</u>							
	<u>a</u>	<u>Weather charts, symbols, signs</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>b</u>	<u>Significant weather charts</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>c</u>	<u>Prognostic charts for general aviation</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-

15	<u>WEATHER INFORMATION FOR FLIGHT PLANNING</u>							
	<u>a</u>	<u>Reports and forecasts for departure, en route, and destination</u>	<u>x</u>	-	-	<u>x</u>	<u>x</u>	-
	<u>b</u>	<u>Interpretation of coded information METAR, TAF</u>	<u>x</u>	-	-	<u>x</u>	<u>x</u>	-
	<u>c</u>	<u>Availability of ground reports for surface wind, wind shear, visibility</u>	<u>x</u>	-	-	<u>x</u>	<u>x</u>	-
16	<u>METEOROLOGICAL BROADCASTS FOR AVIATION</u>							
	<u>a</u>	<u>ATIS, SIGMET</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
17	<u>MICRO-METEOROLOGY</u>		<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>a</u>	<u>Rotors</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>b</u>	<u>Venturi's</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>c</u>	<u>Katabatic and Anabatic winds</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>d</u>	<u>Thermal activity and thermal triggers.</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>e</u>	<u>Dust devils</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>f</u>	<u>The immediate environment.</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>g</u>	<u>Wind indicators</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>h</u>	<u>Cloud indicators</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	-	-
	<u>Paraglider Wing, Harnesses and Instruments</u>							

<u>1</u>	<u>PARAGLIDER /HANG-GLIDER -HARNESS and undercarriage etc</u>							
	<u>a</u>	<u>Structure</u>	<u>x</u>	-	-	-	-	-
	<u>b</u>	<u>Materials</u>	<u>x</u>	-	-	-	-	-
	<u>c</u>	<u>Wear and tear considerations/maintenance</u>	<u>x</u>	-	-	-	-	-
	<u>d</u>	<u>Repairs</u>	<u>x</u>	-	-	-	-	-
	<u>e</u>	<u>Wing and harness or undercarriage assessment</u>	<u>x</u>	-	-	-	-	-
	<u>f</u>	<u>UV</u>	<u>x</u>	-	-	-	-	-
	<u>g</u>	<u>Turbulence</u>	<u>x</u>	-	-	-	-	-
	<u>h</u>	<u>Hard and/ or drag landings</u>	<u>x</u>	-	-	-	-	-
	<u>i</u>	<u>Connectors and reserves</u>	<u>x</u>	-	-	-	-	-
	<u>j</u>	<u>Cleaning</u>	<u>x</u>	-	-	-	-	-
<u>2</u>	<u>INSTRUMENTS</u>							
	<u>a</u>	<u>Airspeed indicator</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>b</u>	<u>Altimeter / variometer</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>c</u>	<u>Radio</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>d</u>	<u>Magnetic compass /</u>	<u>x</u>	-	-	<u>x</u>	-	-

	<u>General Navigation</u>							
1	<u>FORM OF THE EARTH</u>		<u>x</u>	-	-	<u>x</u>	-	-
	<u>a</u>	<u>Axis, poles</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>b</u>	<u>Meridians of longitude</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>c</u>	<u>Parallels of latitude</u>	<u>x</u>	-	-	<u>x</u>	-	-
2	<u>DIRECTION</u>							
	<u>a</u>	<u>True north</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>b</u>	<u>Earth's magnetic field, variation – annual change</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>c</u>	<u>Magnetic north</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>d</u>	<u>Magnetic influences</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>e</u>	<u>Compass deviation</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>f</u>	<u>Turning, acceleration errors</u>	<u>x</u>	-	-	<u>x</u>	-	-
	<u>g</u>	<u>Avoiding magnetic interference with the compass/ Precautions when carrying magnetic objects</u>	<u>x</u>	-	-	<u>x</u>	-	-
3	<u>DISTANCE AND SPEED</u>							
-	<u>a</u>	<u>Nautical mile, statute mile, kilometre</u>	<u>x</u>	-	-	<u>x</u>	-	-

<u>4</u>	<u>AERONAUTICAL MAPS AND CHARTS (TOPOGRAPHICAL)</u>							
	<u>a</u>	<u>Projections and their properties</u>	-	-	-	<u>x</u>	-	-
	<u>b</u>	<u>Scale</u>	-	-	-	<u>x</u>	-	-
	<u>c</u>	<u>1:250 000 and 1:500 000 aviation navigation charts</u>	-	-	-	<u>x</u>	-	-
	<u>d</u>	<u>Main properties</u>	-	-	-	<u>x</u>	-	-
	<u>e</u>	<u>Depiction of height</u>	-	-	-	<u>x</u>	-	-
	<u>f</u>	<u>Topography</u>	-	-	-	<u>x</u>	-	-
	<u>g</u>	<u>Relief</u>	-	-	-	<u>x</u>	-	-
	<u>h</u>	<u>Cultural features</u>	-	-	-	<u>x</u>	-	-
	<u>i</u>	<u>Aeronautical symbols</u>	-	-	-	<u>x</u>	-	-
	<u>j</u>	<u>Aeronautical information</u>	-	-	-	<u>x</u>	-	-
	<u>k</u>	<u>Line features</u>	-	-	-	<u>x</u>	-	-
<u>5</u>	<u>CHARTS IN PRACTICAL NAVIGATION</u>							
	<u>a</u>	<u>Plotting positions</u>	-	-	-	<u>x</u>	-	-
	<u>b</u>	<u>Latitude and longitude</u>	-	-	-	<u>x</u>	-	-
	<u>c</u>	<u>Bearing and distance</u>	-	-	-	<u>x</u>	-	-
	<u>d</u>	<u>Measurement of tracks and distances</u>	-	-	-	<u>x</u>	-	-

	<u>e</u>	<u>Conversion of units</u>	-	-	-	<u>x</u>	-	-
6	<u>PRINCIPLES OF NAVIGATION</u>							
	<u>a</u>	<u>Track, true and magnetic</u>	-	-	-	<u>x</u>	-	-
	<u>b</u>	<u>Wind velocity, heading and ground speed</u>	-	-	-	<u>x</u>	-	-
	<u>c</u>	<u>Drift, wind correction angle</u>	-	-	-	<u>x</u>	-	-
	<u>d</u>	<u>ETA</u>	-	-	-	<u>x</u>	-	-
	<u>e</u>	<u>Dead reckoning, position</u>	-	-	-	<u>x</u>	-	-
7	<u>FLIGHT PLANNING</u>							
	<u>a</u>	<u>Selection of charts</u>	-	-	-	<u>x</u>	-	-
	<u>b</u>	<u>Route and aerodrome weather forecasts and reports</u>	-	-	-	<u>x</u>	-	-
	<u>c</u>	<u>Assessing the weather situation</u>	-	-	-	<u>x</u>	-	-
	<u>d</u>	<u>Plotting the route</u>	-	-	-	<u>x</u>	-	-
	<u>e</u>	<u>Considerations of controlled airspace, airspace restrictions, danger areas, etc.</u>	-	-	-	<u>x</u>	-	-
	<u>f</u>	<u>Use of AIP and NOTAM</u>	-	-	-	<u>x</u>	-	-
	<u>g</u>	<u>Safe altitude(s)</u>	-	-	-	<u>x</u>	-	-

	<u>h</u>	<u>Alternate landings</u>	-	-	-	<u>x</u>	-	-
	<u>i</u>	<u>Communications</u>	-	-	-	<u>x</u>	-	-
8	<u>PRACTICAL NAVIGATION</u>							
	<u>a</u>	<u>Compass headings and deviation</u>	-	-	-	<u>x</u>	-	-
	<u>b</u>	<u>Organisation of in-flight workload</u>	-	-	-	<u>x</u>	-	-
	<u>c</u>	<u>Departure procedure</u>	-	-	-	<u>x</u>	-	-
	<u>d</u>	<u>Maintenance of heading and altitude if flying under power</u>	-	-	-	<u>x</u>	-	-
	<u>e</u>	<u>Use of visual observations</u>	-	-	-	<u>x</u>	-	-
	<u>f</u>	<u>Establishing position, checkpoints</u>	-	-	-	<u>x</u>	-	-
	<u>g</u>	<u>Revisions to heading and ETA</u>	-	-	-	<u>x</u>	-	-
	<u>h</u>	<u>Flight following</u>	-	-	-	<u>x</u>	-	-
9	<u>GLOBAL POSITIONING SYSTEM (GPS)</u>							
	<u>a</u>	<u>Limitations</u>	-	-	-	<u>x</u>	-	-
	<u>b</u>	<u>Application</u>	-	-	-	<u>x</u>	-	-
	<u>c</u>	<u>Principles</u>	-	-	-	<u>x</u>	-	-
	<u>d</u>	<u>Presentation and interpretation</u>	-	-	-	<u>x</u>	-	-
	<u>e</u>	<u>Coverage</u>	-	-	-	<u>x</u>	-	-

	<u>f</u>	<u>Errors and accuracy</u>	-	-	-	<u>x</u>	-	-
	<u>g</u>	<u>Factors affecting reliability and accuracy</u>	-	-	-	<u>x</u>	-	-
	<u>h</u>	<u>Legalities</u>	-	-	-	<u>x</u>	-	-
10	<u>HUMAN PERFORMANCE LIMITATIONS AND PASSENGER CARE</u>							
	<u>a</u>	<u>Introduction</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>b</u>	<u>Oxygen</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>c</u>	<u>Hypoxia</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>d</u>	<u>Hyperventilation</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>e</u>	<u>Barotraumas</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>f</u>	<u>Common ailments</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>g</u>	<u>Decompression</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>h</u>	<u>Air sickness</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>i</u>	<u>Hearing</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>j</u>	<u>Sight</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>k</u>	<u>Toxic hazards</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>l</u>	<u>Blood pressure</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>m</u>	<u>Epilepsy</u>	<u>x</u>	-	-	-	<u>x</u>	-

	<u>n</u>	<u>Alcohol and drugs</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>o</u>	<u>Knowledge and the senses</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>p</u>	<u>Disorientation</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>q</u>	<u>Avoiding the air proximity</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>r</u>	<u>Stress</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>s</u>	<u>Management of stress</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>u</u>	<u>Emotional factors</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>v</u>	<u>Social psychology</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>w</u>	<u>The Ego Factor</u>	<u>x</u>	-	-	-	<u>x</u>	-
	<u>x</u>	<u>Intermediate syndrome</u>	<u>x</u>	-	-	-	<u>x</u>	-
11	<u>(11) Passenger Care</u>							
	<u>a</u>	<u>Embarking / Disembarking (Clip In)</u>	-	-	-	-	<u>x</u>	-
	<u>b</u>	<u>Harness straps and comfort</u>	-	-	-	-	<u>x</u>	-
	<u>c</u>	<u>Briefing</u>	-	-	-	-	<u>x</u>	-
	<u>d</u>	<u>Open harness flying</u>	-	-	-	-	<u>x</u>	-
	<u>e</u>	<u>Clothing, long hair, helmet, and security</u>	-	-	-	-	<u>x</u>	-
	<u>f</u>	<u>Cameras and loose articles</u>	-	-	-	-	<u>x</u>	-
	<u>g</u>	<u>Human performance limitation as</u>	-	-	-	-	<u>x</u>	-

		<u>applicable to your passenger</u>						
<u>h</u>		<u>Eye-contact, body contact and communication</u>	-	-	-	-	<u>x</u>	-
<u>i</u>		<u>Air law as applicable to passengers</u>	-	-	-	-	<u>x</u>	-
<u>j</u>		<u>Passenger seat and flying control access</u>	-	-	-	-	<u>x</u>	-
<u>k</u>		<u>Signing of indemnities</u>	-	-	-	-	<u>x</u>	-

AMENDMENT OF SA-CATS 140

3. Document SA-CATS 140 is hereby amended by the insertion Technical Standard 140.01.3 after section 24 of the following section:

“25. Peer support programme

1.1 Principles of peer support programme

(1) Access to a peer support programme shall-

- (a) be used as a primary early warning system that provides peer-based support when the existing coping mechanisms for a license-holder or safety sensitive employee become inadequate to deal with work-related and personal stressors;
- (b) enable self-declaration or referral in case of a decrease in the license-holder's medical fitness in accordance with Document SA-CATS 67; and
- (c) allow an aviation licence-holder or safety sensitive employee to receive temporary relief from aviation-related duties and, when appropriate, be referred for professional support through an established peer support network.

1.2 Confidentiality and protection of data

- (a) The protection of personal and confidential data shall be a precondition for an effective peer support programme, in accordance with applicable legislation and the conditions of an approved SMS.
- (b) Personal data of any licence-holder or safety sensitive employee utilising a peer support programme shall be handled in a confidential, non-stigmatising, and safe environment to ensure a culture of mutual trust and cooperation is maintained.
- (c) Aggregated trend or statistical related data may be presented by the peer support programme in a manner that is anonymous for the purpose of safety

management only, so as not to compromise the voluntary participation in, and confidentiality of such a programme.

- (d) Notwithstanding the above, an operator or ATS provider who employs an external service provider for a peer support programme shall have an agreement stipulating detailed procedures on how to proceed in the case of an aviation-related safety concern.

1.3 Elements of proactive and non-punitive peer support programme

- (1) A peer support programme shall contain, as a minimum, the following elements:
 - (a) representative licence-holder or safety sensitive employee peers trained to fulfil the role of peer volunteers;
 - (b) procedures to address education of licence-holder or safety sensitive employees regarding self-awareness and facilitation of self-referral;
 - (c) training and supervision of a peer volunteer shall be provided by appropriate personnel, including mental health professionals with relevant knowledge of a peer support process and safety critical environments, the aviation environment, and where applicable, appropriate e-learning platforms;
 - (d) monitoring of the efficiency of the programme;
 - (e) monitoring and support for a licence-holder or safety sensitive employee returning to work once assessment of fitness for duty is completed;
 - (f) a supportive role in managing the risks resulting from fear of loss of licence;
 - (g) a referral process to a mental health professional with an understanding of a peer support programme, with experience in the aviation domain;
 - (h) an escalation protocol for a peer volunteer or health professional in a clearly defined case related to medical conditions or serious safety concerns.
 - (i) inclusion in a peer support programme in an air service operator, maintenance organisation or ATS provider's Safety Policy; to facilitate the

appropriate level of trust to ensure an effective peer support service which encourages self-declaration from license-holder and safety sensitive employees.

- (2) A peer support programme may provide anonymous and aggregated trend-based data for purposes of integration with an air service operator or ATS provider's SMS programme.
- (3) Aggregated data shall be collected timeously within the programme and if required, reported within stipulated timelines.
- (4) Aggregated data forming a trend of less than 3% occurrence is not considered significant and therefore not reported to ensure confidentiality is maintained.
- (5) Peer support interventions may exempt a person from a declaration requirement that they have received mental health services, unless such professional services extend beyond or are delivered outside the interventions afforded under the Peer Support Programme.

1.4 Facilitation of trust in peer support programme

- (1) Trust shall be facilitated by-
 - (a) establishing a platform for multi-stakeholder participation and partnership in the governance process. Participation includes operational management, trained and experienced peer volunteers, health professionals preferably with aviation experience and licence-holder representative organisations, and where appropriate, nominated representatives of the Authority;
 - (b) a process for the design, implementation and operation of a peer support programme;

- (c) a formal agreement between operational management and peer support governance structures identifying the procedures for the reporting, use, protection and confidentiality of data;
- (d) clear and unambiguous provisions on data protection;
- (e) a non-punitive air service operator policy that also covers a peer support programme;
- (f) peer support programme managed either from within an air service operator or under the authority of a separate and qualified independent organisation.
- (g) an air service operator, ATS provider and peer support programme provider ensuring that such a programme establishes and maintains clearly defined boundaries necessary to facilitate the appropriate level of trust to ensure effective peer support service which encourages self-declaration from a licence-holder;
- (h) management's demonstrated commitment to promote a proactive safety culture through validation of peer support and in ensuring ease of access into a peer support programme;
- (i) careful selection and involvement of person with appropriate aviation and other expertise when supporting and advising a licence-holder;
- (j) a well-structured system to protect the confidentiality of personal data;
- (k) implementing an effective communication system, awareness and educational process that promotes the benefits of and encourages use of a peer support programme, including its positive impacts, obtaining support without fear of negative consequences and management of safety and health risks resulting from fear and stigmatisation; and
- (l) a peer support programme shall be incorporated into an air service operator's or ATS provider's policies on positive safety culture and in accordance with Document SA-CATS 140.

1.5 Training and awareness

- (1) An air service operator or ATS provider management shall receive induction training in a peer support programme.
- (2) Peer volunteers, as well as other staff involved within a peer support programme, shall receive initial and refresher training related to their role and function which shall include the following:
 - (a) Initial training including the following as a minimum:
 - (i) the policies and procedures governing the peer support programme;
 - (ii) practically orientated basic training in psychological first aid,
 - (iii) offering supportive listening conversations,
 - (iv) addressing aviation-related trauma and substance abuse; and
 - (v) referral and confidentiality procedures.
 - (b) refresher training on peer support skills and supervision as a pre-requisite to remaining in a peer support programme.
- (3) Health professionals involved with a peer support programme shall be made aware of their role and function, the referral processes and return to duty procedures.
- (4) Mental health professionals involved in a peer support programme shall be trained on the following:
 - (a) pilot, cabin crew and ATS medical licensing requirements; as applicable;
 - (b) psychological first aid;
 - (c) legal requirements regarding applicable data protection requirements; and
 - (d) cases where information shall be disclosed due to an immediate and evident safety threat and in the interest of public safety, and the process for such disclosure.

(5) When promoting the benefits of a peer support programme, an air service operator or ATS provider shall provide induction training to licence-holder and safety sensitive employee who shall inform the following:

- (a) the validity and effectiveness of a peer support programme;
- (b) awareness of job stressors and life stressors and the impact on well-being, mental health, fatigue and related risks;
- (c) coping strategies;
- (d) potential effects of psychoactive substance use and related disorders;
- (e) medication use that is prescribed or over-the-counter medication to ensure the safe exercise of the privileges of the licence whilst taking medication;
- (f) early recognition of risk factors and symptoms that may impair the performance of a licence-holder; and
- (g) principal and availability of peer support, including data protection and confidentiality.

1.6 Additional elements contributing to a peer support programme

(1) The following must be established when implementing a peer support programme:

- (a) establishment and verification of operational and data protection procedures; and
- (b) procedures for the selection and training of dedicated and experienced peer support staff who are familiar with the sensitivity of safety-critical operations.

1.7 CONTRACTING A PEER SUPPORT PROGRAMME TO A THIRD PARTY

An air service operator or ATS provider may contract the establishment of a peer support programme to a third party in accordance with provisions as provided in this Document SA CATS 140.

1.8 Obligation to seek aviation medical advice in case of a decrease in medical fitness

- (a) A peer's involvement in a peer support programme can be beneficial due to similar professional backgrounds between a peer and a person seeking support. A mental health professional shall support the peer when required, in circumstances where intervention is required to prevent endangering safety.
- (b) Utilising a peer support programme does not remove the licence-holder or safety sensitive employee obligation to seek aero-medical advice in case of a decrease in medical fitness in accordance with Document SA-CATS 67". "

AMENDMENT OF SA-CATS 148

- 4. Document SA-CATS 148 is hereby amended by the insertion after Technical Standard 148.02.5 of the following Technical Standard:

"148.02.15 DRUG AND SUBSTANCE ABUSE MANAGEMENT PLAN

- (1) A holder of an approval shall ensure that the DASAMP provided in Regulation 148.02.15 includes the following elements:
 - (a) the DASAMP shall contain a drug and substance abuse policy which shall detail the aim, purpose, organisational values and the legal requirements for the approved manufacturing organisations and the personnel who are required to be covered.
 - (b) The management of the DASAMP is the responsibility of all employees

from senior management to frontline staff. The plan shall extend to all SSAE contractors and subcontractors performing safety sensitive aviation activities for the organization.

- (c) The details of each DASAMP contact particulars shall be included as part of the reporting requirements and may also be updated in the Manual of Procedure (MOP) if the contact particulars change between reporting periods.
 - (i) The DASAMP shall be in line with the relevant labour and health legislation.
 - (ii) DASAMP organisations shall review the DASAMP at least every 5 years.
- (2) An Individual who is both a SSAE employees and DASAMP supervisor is required to complete training for both roles. The DASAMP Education Program is required to be undertaken prior to commencement of SSAE and thereafter, re-current training should be carried out every 3 years.
- (3) An SSAE and DASAMP supervisor shall be provided with awareness on the manufacturing organisation's policy on alcohol and other drug use, testing, support and assistance services and information about potential risks to aviation safety from alcohol and other drug use in the form of an education programme, which shall include an awareness training on—
 - (a) the manufacturing organisations drug and substance abuse management policy.
 - (b) patterns of alcohol and other drug consumption;
 - (c) workplace factors, effects and the impact of alcohol and drugs;
 - (d) problematic use of alcohol and other drug abuse prevention and management strategies;

- (e) alcohol and other drug related harm;
- (f) dealing with alcohol and drug abuse affected employees and the testing process;
- (g) identifying resources to assist in dealing with alcohol and other drug abuse issues in the workplace; and
- (h) a manufacturing organisation may run face to face activities, include information in an induction booklet and provide continuous reinforcement through brochures or other education resources. Communication shall be on a medium that all employees have access to and understand”.

AMENDMENT OF SA-CATS 173

5. Document SA-CATS 173 is hereby amended by the insertion after Subpart 3 of the following Subpart:

“SUBPART 4: FLIGHT VALIDATION ORGANISATION (CATEGORY C)

173.04.1 Operations Manual

1. Information to be contained in operations manual

- (1) The information referred to in Regulation 173.04.1(1)(b), which must be contained in the operations manual of an applicant, must include—
 - (a) a description of an applicant’s organisational structure and a statement setting out the functions that the flight validation organisation performs, or proposes to perform in terms of Part 173;
 - (b) a list of the services that an applicant provides, or proposes to provide;

- (c) a statement, for each service, that identifies the location where the service is provided, or proposed to be provided;
- (d) a description of the arrangements made or proposed to be made by an applicant to ensure that it has, and will continue to receive, the information necessary for providing the service;
- (e) a statement detailing any agreement entered into by an applicant in relation to the provision of flight validation services provided by another party;
- (f) a copy of the document that sets out the applicant's SMS;
- (g) a description of an applicant's training and checking programme;
- (h) a description of the procedures to be used to ensure that flight validations are completed in accordance with the conventions contained in this Subpart;
- (i) a description of the management structure established, or proposed to be established, by an applicant and a statement of the duties and responsibilities of all positions within the organisational structure;
- (j) a description of the arrangements made or proposed to be made by an applicant to ensure that it has, and shall continue to receive, the information necessary for providing the service;
- (k) a description of an applicant's record-keeping system;
- (l) a description of the processes and documentation used to present to staff the relevant standards, regulations and procedures, and any of the validation pilot's site-specific instructions for the provision of flight validation services;
- (m) a description of the procedures to be used to ensure that all applicable equipment, including software, is operated in accordance with the manufacturer's operating instructions and manuals; and

- (n) a description of the procedures to be followed to ensure that all operational staff are familiar with any operational changes that have been issued since they last performed operational duties.

173.04.2 PERSONNEL REQUIREMENTS

1. Requirements for flight validation pilot

- (1) In accordance with regulation 173.04.2(1)(a), a flight validation pilot shall have a duty to ensure that any flight validation covered by the approval is performed as prescribed in TGM for flight procedure design and cartography.
- (2) The minimum requirements to be met for qualification as a flight validation pilot as provided by Regulation 173.04.2(2), are the following:
- (a) pilot licence with an instrument rating;
 - (b) completion of an approved training programme as provided in Regulation 173.01.7(9);
 - (c) completion of in-service training in instrument flight validation as detailed in the designer's operations manual; and
 - (d) a qualified flight validation pilot shall, in the preceding 18 months, have flight validated at least one procedure per applicable rating.
- (3) The minimum requirements for qualification as supervisory personnel as provided by regulation 173.04.2(3), are the following:
- (a) the qualification and experience requirements of a flight validation pilot; and
 - (b) completion of 24 flight validations as a flight validation pilot.

2. Procedure for Assessing and Maintaining Competency

- (1) In accordance with regulation 173.04.2(5), the procedure for initially assessing, and maintaining the competence of those personnel involved in flight validation activities covered by the approval shall be as prescribed in the TGM for flight procedure design and cartography

173.04.3 PRIVILEGES

- (1) Flight simulation is applicable in all cases where—
- (a) Continuous Climb Operations/Continuous Descent Operations procedures are introduced;
 - (b) Required Navigational Performance Authorisation Required procedures are developed; and
 - (c) airspace containment of procedures is to be proven.
- (2) Flight validation is applicable in all cases where—
- (a) procedures are being introduced at an aerodrome for the first time;
 - (b) procedures contain deviations from design criteria;
 - (c) the accuracy of data used in the design process needs to be verified;
 - (d) helicopter Point in Space procedures are developed; and
 - (e) RNP AR procedures are developed.

173.04.4 DUTIES OF APPROVAL HOLDER

- (1) A holder of a flight validation shall—
- (a) validate each instrument flight procedure in accordance with the conditions prescribed in the TGM for flight procedure design and cartography.
 - (b) the instrument flight procedure package provided shall contain the following minimum data in an acceptable format to conduct a validation;

- (i) an instrument flight procedure summary;
- (ii) proposed instrument procedure chart or depiction of sufficient detail to safely navigate and identify significant terrain, obstacles and obstructions;
- (iii) proposed ARINC 424 path terminators for PBN procedures only;
- (iv) list of relevant obstacles, identification and description of controlling obstacles and obstacles otherwise influencing the design of the procedure, waypoint fix latitude or longitude, procedural tracks or course, distances and altitudes;
- (v) airport infrastructure information, such as visual aids Approach Lighting System, Visual Approach Slope Indicator;
- (vi) information on aerodrome obstacle limitation or safeguarding processes applied;
- (vii) any special local operational procedure such as noise abatement, non-standard traffic patterns, lighting activation;
- (viii) detailed listing of deviations from design criteria and proposed mitigation;
- (ix) for a non-standard instrument flight procedure: training, operational or specific equipment requirements;
- (x) appropriate validation checklist and report forms;
- (xi) ground validation report;
- (xii) flight inspection report where applicable; and
- (xiii) flight validation report”.

AMENDMENT OF SA-CATS 177

6. Document SA-CATS 177 is hereby amended by:
 - (a) the substitution for Technical Standard 177.01.3 of the following Technical Standard:

“(1) Operational requirements for charts

Preparation of specific Charts

All aeronautical charts shall be designed in accordance with the following operational requirements governing the presentation of essential information on each type of chart that has been formulated in accordance with the following:

- (a) each type of chart must provide information relevant to the function of the chart;
- (b) each type of chart must provide information appropriate to the phase of flight, to ensure the safe and expeditious operation of the aircraft;
- (c) the presentation of information must be accurate, free from distortion and clutter, unambiguous, and readable under all normal operating conditions;
- (d) Colours or tints and type size must be such that the chart can be easily read and interpreted by the pilot in varying conditions of natural and artificial light;
- (e) The information must be in a form which enables the pilot to acquire it in a reasonable time consistent with the information and must be in a form which enables a pilot to acquire it in a reasonable time;
- (f) The presentation of information provided on each type of chart must permit a smooth transition from chart to chart as appropriate to the phase of flight;
- (g) the charts shall be True North orientated; and

- (h) the basic sheet size of the charts should be 210 × 148 mm (8.27 × 5.82 in) which is the A5 size developed by the International Standards Organization.

(2) Titles

The title of a chart or chart series prepared in accordance with the specifications contained in this Subpart and intended to satisfy the function of the chart shall be that of the relevant chapter heading as modified by the application of any Standard contained therein, except that such title shall not include the word "ICAO" unless the chart conforms with all Standards specified in this subpart and any specified for the particular chart.

(3) Miscellaneous information

- (a) The marginal note layout shall be as provided in Appendix 1, except as otherwise specified for a particular chart.

- (b) The following information shall be shown on the face of each chart unless otherwise stated in the specification of the chart concerned:

(i) designation or title of the chart series;

(ii) name and reference of the sheet; and

(iii) on each margin an indication of the adjoining sheet (when applicable).

Note.— The title may be abbreviated.

- (c) A legend of the symbols and abbreviations used shall be provided. The legend shall be on the face or reverse of each chart except that, where it is impracticable for reasons of space, a legend may be published separately.

- (a) The name and adequate address of the producing agency shall be shown in the margin of the chart except that, where the chart is published as part of an aeronautical document, this information may be placed in the front of that document.

(4) Symbols

- (a) Symbols used shall conform to those shown in Appendix 2 — ICAO Chart Symbols, except that where it is desired to show on an aeronautical chart special features or items of importance to civil aviation for which no ICAO symbol is at present provided, any appropriate symbol may be chosen for this purpose, provided that it does not cause confusion with any existing ICAO chart symbol or impair the legibility of the chart.
- (b) To represent ground-based navigation aids, intersections and waypoints, the same basic symbol shall be used on all charts on which they appear, regardless of chart purpose.
- (c) The symbol used for significant points shall be based on a hierarchy of symbols and selected in the following order:
- (i) ground-based navigation aid;
 - (ii) intersection; and
 - (iii) waypoint symbol shall be used only when a particular significant point does not exist as either a ground-based navigation aid or an intersection.
- (d) Symbols shall be shown in the manner specified in 2.4.2, 2.4.3 Appendix 2 — ICAO Chart Symbols, symbol number 121.

Note.— The size and prominence of symbols and the thickness and spacing of lines may be varied according to the scale and functions of the chart, with due regard to the importance of the information they convey.

(5) Units of measure

- (a) Distances shall be derived as geodesic distances.
- (b) Distances shall be expressed in either kilometres or nautical miles or both, provided the units are differentiated.
- (c) Altitudes, elevations and heights shall be expressed in either metres or feet or both, provided the units are differentiated.
- (d) Linear dimensions on aerodromes and short distances shall be expressed in metres.
- (e) The order of resolution of distances, dimensions, elevations and heights shall be as specified for a particular chart.
- (f) The units of measurement used to express distances, altitudes, elevations and heights shall be conspicuously stated on the face of each chart.
- (g) Conversion scales such as kilometres to nautical miles, metres to feet shall be provided on each chart on which distances, elevations or altitudes are shown. The conversion scales shall be placed on the face of each chart.

(6) Scale and projection

- (a) For charts of large areas, the name and basic parameters and scale of the projection shall be indicated.
- (b) For charts of small areas, a linear scale only shall be indicated.

(7) Date of validity of aeronautical information

The date of validity of aeronautical information shall be indicated on the face of each chart.

(8) Spelling of geographical names

- (a) The symbols of the Roman alphabet shall be used for all writing.
- (b) The names of places and geographical features in countries which officially use varieties of the Roman alphabet shall be accepted in their official spelling, including the accents and diacritical marks used in the respective alphabets.
- (c) Where a geographical term such as “cape”, “point”, “gulf”, or “river” is abbreviated on any particular chart, that word shall be spelt out in full in the language used by the publishing agency, in respect of the most important example of each type. Punctuation marks shall not be used in abbreviations within the body of a chart.
- (d) Recommendation— In areas where Romanized names have not been officially produced or adopted, and outside the territory of Contracting States, names should be transliterated from the non-Roman alphabet form by the system generally used by the producing agency.

(9) Abbreviations

- (a) Abbreviations shall be used on aeronautical charts whenever they are appropriate.
- (b) Where applicable, abbreviations shall be selected from Part 1.

(10) Political boundaries

- (a) International boundaries shall be shown but may be interrupted if data to the use of the chart would be obscured.

- (b) Where the territory of more than one State appears on a chart, the names identifying the countries shall be indicated.

Note.— In the case of a dependent territory, the name of the sovereign State may be added in brackets.

(11) Colours

Colours used on charts shall conform to Appendix 3 — Colour Guide.

(12) Relief

- (a) Relief, where shown, shall be portrayed in a manner that will satisfy the chart users' need for the following:

- (i) orientation and identification;
- (ii) safe terrain clearance;
- (iii) clarity of aeronautical information when shown; and
- (iv) planning.

Note.— Relief is usually portrayed by combinations of contours, hypsometric tints, spot elevations and hill shading, the choice of the method being affected by the nature and scale of the chart and its intended use.

- (b) Where relief is shown by hypsometric tints, the tints used shall be based on those shown in the Hypsometric Tint Guide in the TGM for Flight Procedure Design and Cartography.
- (c) Where spot elevations are used, they shall be shown for selected critical points. The value of spot elevations of doubtful accuracy shall be followed by the sign.

(13) Prohibited, restricted and dangerous areas

When prohibited, restricted or dangerous areas are shown, the reference or other identification shall be included, except that the nationality letters may be omitted.

(14) Air traffic services airspace

- (a) When ATS airspace is shown on a chart, the class of airspace, the type, name or call sign, the vertical limits and the radio frequency to be used, shall be indicated and the horizontal limits depicted in accordance with Document SA-CATS 177, Appendix 2 — ICAO Chart Symbols.
- (b) On charts used for visual flight, those parts of the ATS Airspace Classes table in Document SA-CATS 177, Appendix 4 applicable to the airspace depicted on the chart shall be on the face or reverse of each chart.

(15) Magnetic variation

- (a) True North and magnetic variation shall be indicated. The order of resolution of magnetic variation shall be specified for a particular chart.
- (b) When magnetic variation is shown on a chart, the values shown shall be those for the year nearest to the date of publication that is divisible by 5, such as 1980 or 1985. In exceptional cases where the current value would be more than one degree different, after applying the calculation for annual change, an interim date and value shall be quoted.
- (c) For instrument procedure charts, the publication of a magnetic variation change shall be completed within a maximum of six AIRAC cycles.

- (d) In large terminal areas with multiple aerodromes, a single rounded value of magnetic variation shall be applied so that the procedures that service multiple aerodromes use a single, common variation value.

Note.— The date and the annual change may be shown.

(16) Typography

Note.— Samples of type suitable for use on aeronautical charts are included in Document SA-CATS 177, Appendices 3 and 4.

(17) Aeronautical data

- (a) A contracting State shall take all necessary measures to introduce a properly organized quality system containing procedures, processes and resources necessary to implement quality management at each function stage, as provided in Part 175. The execution of such quality management shall be made demonstrable for each function stage when required.
- (b) In addition to the measures referred to in paragraph (a), a contracting State shall ensure that established procedures exist in order that aeronautical data, at any moment, is traceable to its origin to allow any data anomalies or errors detected during the production or maintenance phases or in the operational use, to be corrected.
- (c) The chart resolution of aeronautical data shall be as prescribed for a particular chart.
- (d) The integrity of aeronautical data shall be maintained throughout the data process from origination to distribution to the next intended user.
- (e) Digital data error detection techniques shall be used during the transmission or storage of aeronautical data and digital data sets.

(18) Common reference system

(a) Horizontal reference system

- (i) WGS-84 shall be used as the horizontal or geodetic reference system. Published aeronautical geographical coordinates indicating latitude and longitude shall be expressed in terms of the WGS-84 geodetic reference datum.
- (ii) Geographical coordinates which have been transformed into WGS-84 coordinates, but whose accuracy of original fieldwork does not meet the requirements as provided in Part 139, Subpart 7 for Aeronautical Survey.
- (iii) The chart resolution of geographical coordinates shall be that specified for a particular chart series.

Note 1.— Specifications concerning the determination and reporting for accuracy of fieldwork and data integrity of WGS-84-related aeronautical coordinates for geographical positions established by ATS are given in Part 139, Subpart 7 for Aeronautical Survey.

(b) Vertical reference system

- (i) MSL datum, which gives the relationship of gravity-related height or elevation to a surface known as the geoid, shall be used as the vertical reference system.

Note 1.— The geoid globally most closely approximates MSL is defined as the equipotential surface in the gravity field of the Earth that coincides with the undisturbed MSL extended continuously through the continents.

Note 2.— Gravity-related heights or elevations are also referred to as orthometric heights while distances of points above the ellipsoid are referred to as ellipsoidal heights.

- (ii) In addition to the elevations referenced to MSL, for the specific surveyed ground positions, geoid undulation referenced to the WGS-84 ellipsoid for those positions shall also be published as specified for a particular chart.

Note 1.— Specifications concerning the determination and reporting of accuracy of field work and data integrity for elevation and geoid undulation at specific positions at an aerodrome or heliport are provided in Part 139, Subpart 7 for Aeronautical Survey.

Note 2.— Specifications concerning the accuracy and integrity classification of elevation and geoid undulation at specific positions at an aerodrome or heliport are provided in Part 139, Subpart 7 for Aeronautical Survey.

- (iii) The chart resolution of elevation and geoid undulation shall be that specified for a particular chart series.

Note.— Specifications concerning the chart resolution of elevation and geoid undulation are provided in Part 139, Subpart 7 for Aeronautical Survey.

(c) Temporal reference system

- (i) The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system.
- (ii) When a different temporal reference system is used for charting, this shall be indicated in GEN 2.1.2 of the AIP.

(19) Frequency of revision

(1). Period between revisions:

<i>Type of Chart</i>	<i>Approximate period between revisions</i>	<i>Remarks</i>
1. Aerodrome Obstacle Chart (Types A, B)	When accumulation of hand amendments justifies	
2. Precision Approach Terrain Chart	When any significant change in terrain profile occurs	
3. Enroute Chart	28 days (AIRAC cycle)	Congested areas
	Multiples of 12 weeks (AIRAC cycle)	Uncongested areas
4. Standard Departure Chart — Instrument (SID) Standard Arrival Chart — Instrument (STAR)	When a significant change occurs but not more often than 4 weeks	

<i>Type of Chart</i>	<i>Approximate period between revisions</i>	<i>Remarks</i>
5. Instrument Approach Chart	When a significant change in procedure occurs	
6. Visual Approach Chart	When accumulation of hand amendments justifies	
7. Aerodrome/Heliport Chart Aerodrome Ground Movement Chart Aerodrome Parking/Docking Chart	When accumulation of hand amendments justifies	
8. World Aeronautical Chart 1:1 000 000 Aeronautical Chart 1:500 000 Aeronautical Navigation Small Scale	Base — 4 years Aeronautical Information — 1 – 2 years	In congested areas the aeronautical information may be revised more frequently. Note also 16.9.1 and 17.9.1 of Annex 4
9. Plotting Chart	Significant change in aeronautical information	

Note.— Significant changes are those which need to be taken into account in aircraft operations.

(20) Types of aeronautical charts

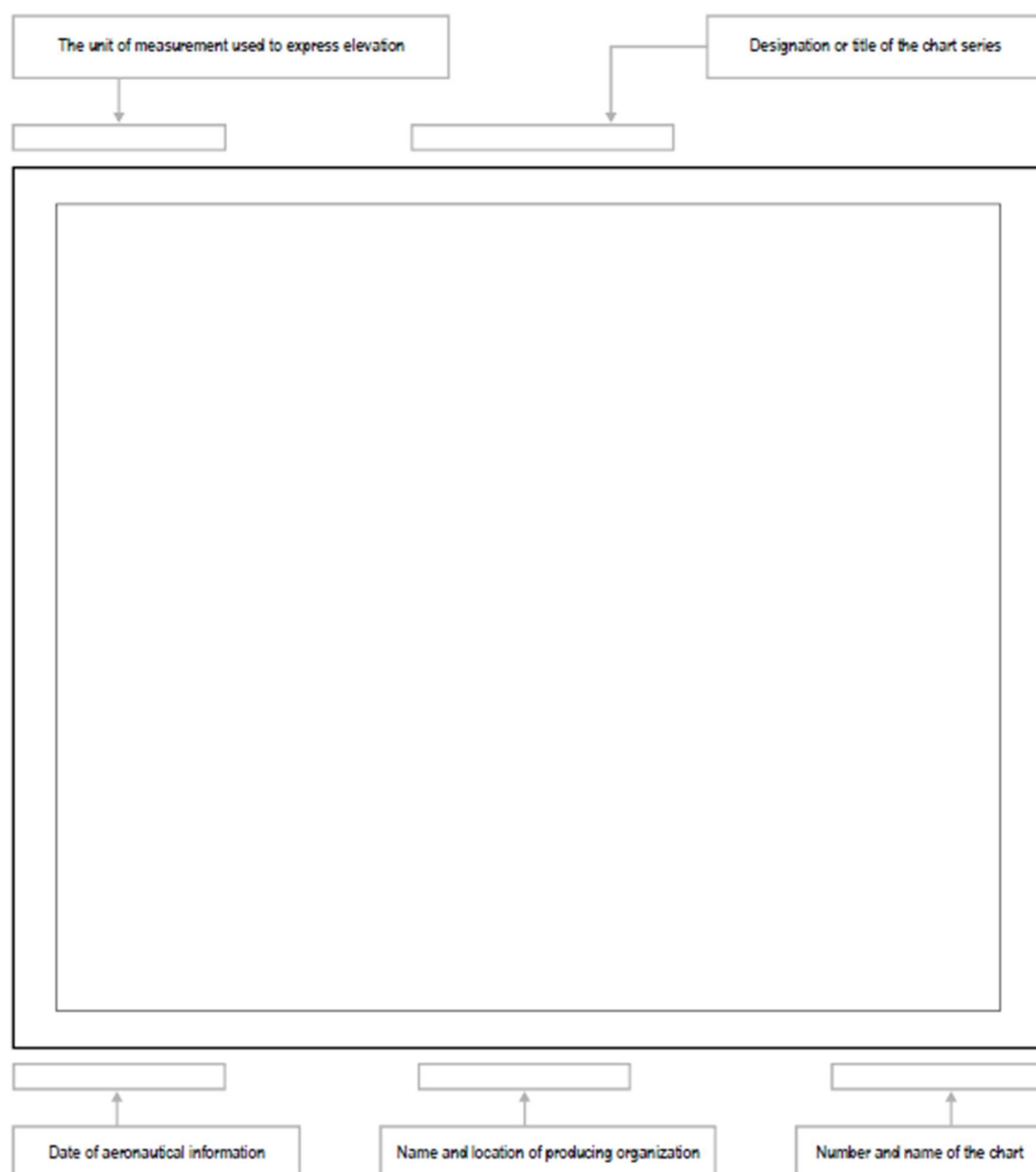
- (a) Aerodrome Obstacle Chart — ICAO Type A
- (b) Aerodrome Obstacle Chart — ICAO Type B
- (c) Precision Approach Terrain Chart - ICAO
- (d) Enroute Chart — ICAO
- (e) Instrument Approach Chart — ICAO
- (f) Aerodrome/Heliport Chart — ICAO

- (g) The Standard Departure Chart — Instrument (SID) — ICAO
- (h) The Standard Arrival Chart — Instrument (STAR) — ICAO
- (i) The Visual Approach Chart — ICAO
- (j) The Aircraft Parking/Docking Chart — ICAO
- (k) The Aerodrome Ground Movement Chart — ICAO
- (l) The ATC Surveillance Minimum Altitude Chart — ICAO
- (m) WAC – 1:1 000 000 - ICAO
- (n) WAC – 1:500 000 - ICAO
- (o) Area Chart – ICAO
- (p) Plotting Chart – ICAO
- (q) Aeronautical Navigation Chart – ICAO Small scale
- (r) Aerodrome Terrain and Obstacle Chart (Electronic) - ICAO
- (s) Electronic Aeronautical Chart display – ICAO

2. Staffing [Personnel] requirement

APPENDIX 1

APPENDIX 1. MARGINAL NOTE LAYOUT



APPENDIX 2

Appendix 2

Annex 4 — Aeronautical Charts

TOPOGRAPHY

1	Contours		8	Gravel		12	Highest elevation on chart	Alternative 17456
2	Approximate contours		9	Levee or esker	Alternative	13	Spot elevation	.6397 .6975
3	Relief shown by hachures		10	Unusual land features appropriately labelled	Many Small Islands Rock Outcrop Active volcano	14	Spot elevation (if doubtful accuracy)	.6379
4	Bluff, cliff or escarpment		11	Mountain pass		15	Coniferous trees	
5	Lava flow					16	Other trees	
6	Sand dunes					17	Palms	
7	Sand area							
18	Areas not surveyed for contour information or relief data incomplete						Caution	

HYDROGRAPHY

19	Shore line (reliable)		30	Abandoned canal Note.— Dry canal having landmark value.		38	Reservoir	
20	Shore line (unreliable)		31	Lakes (perennial)		39	Dry lake bed	Alternative
21	Tidal flats		32	Lakes (non-perennial)	Alternative	40	Wish	Alternative
22	Coral reefs and ledges		33	Salt lake		41	Shoals	
23	Large river (perennial)		34	Salt pans (evaporator)		42	Glaciers and ice caps	
24	Small river (perennial)		35	Swamp		43	Danger line (2 m or one fathom line)	
25	Rivers and streams (non-perennial)	Alternative	36	Rice field	Alternative	44	Charted isolated rock	
26	Rivers and streams (unsurveyed)		37	Spring, well or water hole	perennial intermittent	45	Rock awash	
27	Rapids					46	Unusual water features appropriately labelled	
28	Falls							
29	Canal							

APP 2-15

19/11/09

CULTURE

BUILT-UP AREAS

47	City or large town	
48	Town	
49	Village	
50	Buildings	

HIGHWAYS AND ROADS

57	Dual highway	
58	Primary road	
59	Secondary road	
60	Trail	
61	Road bridge	
62	Road tunnel	

MISCELLANEOUS (Cont.)

69	Pipeline	
70	Oil or gas field	
71	Tank farms	
72	Nuclear power station	
73	Coast guard station	
74	Lookout tower	
75	Mine	
76	Forest ranger station	
77	Race track or stadium	
78	Ruins	
79	Fort	
80	Church	
81	Mosque	
82	Pagoda	
83	Temple	

RAILROADS

51	Railroad (single track)	
52	Railroad (two or more tracks)	
53	Railroad (under construction)	
54	Railroad bridge	
55	Railroad tunnel	
56	Railroad station	

MISCELLANEOUS

63	Boundaries (international)	
64	Outer boundaries	
65	Fence	
66	Telegraph or telephone line (when a landmark)	
67	Dam	
68	Ferry	

AERODROMES

84	Civil	Land	
85	Civil	Water	
86	Military	Land	
87	Military	Water	
88	Joint civil and military	Land	
89	Joint civil and military	Water	
90	Emergency aerodrome or aerodrome with no facilities		
91	Abandoned or closed aerodrome		
92	Sheltered anchorage		
93	Aerodrome for use on charts on which aerodrome classification is not required e.g. Enroute Charts		
94	Helipoint		
	Note — Aerodromes for the exclusive use of helicopters		

95 Note — Where required by the function of the chart, the runway pattern of the aerodrome may be shown in lieu of the aerodrome symbol, for example:



AERODROMES (Cont.)
AERODROME DATA IN ABBREVIATED FORM WHICH MAY BE
IN ASSOCIATION WITH AERODROME SYMBOLS
 (Reference: 16.9.2.2 and 17.9.2.2)

96	Elevation given in the units of measurement (metres or feet) selected for use on the chart 357 L H 95 Minimum lighting - obstacles, boundary or runway lights and lighted wind indicator or landing direction indicator Name of aerodrome LIVINGSTONE Note:— A dash (-) is to be inserted where L or H do not apply. Length of longest runway in hundreds of metres or feet (whichever unit is selected for use on the chart) 95 Runway hard surfaced, normally all weather
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AERODROME SYMBOLS FOR APPROACH CHARTS

97	Aerodromes affecting the traffic pattern on the aerodrome on which the procedure is based		98 The aerodrome on which the procedure is based	
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RADIO NAVIGATION AIDS*

99	Basic radio navigation aid symbol Note.— This symbol may be used with or without a box to enclose the data.			107	Collocated VOR and TACAN radio navigation aids	VORTAC			
100	Non-directional radio beacon	NDB		108	Instrument landing system	ILS	PLAN VIEW		
101	VHF omnidirectional radio range	VOR					Electronic		
102	Distance measuring equipment	DME					FRONT COURSE		
103	Collocated VOR and DME radio navigation aids	VOR/DME					BACK COURSE		
104	DME distance	Distance in kilometres (nautical miles) to DME → 15 km → KAY Identification of radio navigation aid		109	Radio marker beacon		PROFILE		
105	VOR radial	Radial bearing from, and identification of, VOR R 090 KAY					Electronic		
106	UHF tactical air navigation aid	TACAN					GLIDE PATH		
							Elliptical		
							Beacon Shape		
Note.— Marker beacon may be shown by outline, or stipple, or both.									
110	Compass rose To be oriented on the chart in accordance with the alignment of the station (normally Magnetic North)			Compass rose to be used as appropriate in combination with the following symbols:					
								VOR	
								VOR/DME	
								TACAN	
								VORTAC	
Note.— Additional points of compass may be added as required.									

*Note.— Guidance material on the presentation of radio navigation aid data is given in the Aeronautical Chart Manual (Doc 8697).

AIR TRAFFIC SERVICES

111	Flight information region	FR		117	Air defence identification zone	ADIZ	
112	Aerodrome traffic zone	ATZ		118	Advisory route	ADR	
113	Control area Airway Controlled route	CTA AWY		119	Visual flight path		
114	Uncontrolled route			120	Scale break (on ATS route)		
115	Advisory airspace	ADA					
116	Control zone	CTR					

Significant Point Functionality

		Significant point depiction for conventional navigation		Significant point depiction for area navigation				
121	Basic Symbols with functionality	REPORTING FLY-BY/FLY-OVER	On request (NA)	Compulsory (NA)	On request fly-by	Compulsory fly-by	On request fly-over	Compulsory fly-over
		VFR reporting point						
		Intersection INT						
		VORTAC						
		TACAN						
		VOR						
		VOR/DME						
		NDB						
		Waypoint WPT	Not used	Not used				

For details on use and meaning of these symbols, refer to paragraph 2.4

122	Change-over point To be superimposed on the appropriate route symbol at right angles to the route	COP		123	ATS/MET reporting point	MRP	Compulsory 	On request 	124	Final approach fix	FAF	
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AIR TRAFFIC SERVICES (cont.)

125	Altitudes/flight levels	Altitude/flight level "window"	17 000 10 000	FL 220 10 000
		"At or above" altitude/flight level	7 000	FL 70
		"At or below" altitude/flight level	5 000	FL 50
		"Mandatory" altitude/flight level	3 000	FL 30
		"Recommended" procedure altitude/flight level	5 000	FL 50
		"Expected" altitude	Expect 5 000	Expect FL 50

Note: — For use only on SID and STAR charts. Not intended for depiction of minimum obstacle clearance altitude.

AIRSPACE CLASSIFICATIONS

126	Airspace classifications		Aeronautical data in abbreviated form to be used in association with airspace classification symbols: 127 Alternative TMA DONLON 119.1 C 200m AGL - FL 245 Type Name or call sign Radio frequency(ies) Airspace classification Vertical limits C TMA DONLON FL 245 200m AGL 119.1

AIRSPACE RESTRICTIONS

128	Restricted airspace (prohibited, restricted or danger area)		Common boundary of two areas	
129	International boundary closed to passage of aircraft except through air corridor			

Note: — The angle and density of rulings may be varied according to scale and the size, shape and orientation of the area.

OBSTACLES

130	Obstacle		134	Exceptionally high obstacle (optional symbol)	
131	Lighted obstacle		135	Exceptionally high obstacle — lighted (optional symbol)	
132	Group obstacles		Note: — For obstacles having a height of the order of 300 m (1 000 ft) above terrain.		
133	Lighted group obstacles		136	Elevation of top (italics) 52 (15)	Height above specified datum (upright type in parentheses)

MISCELLANEOUS

137	Prominent transmission line		140	Wind turbine — unlighted and lighted	
138	Isonomic line or isogonals		141	Wind turbines — minor group and group in major area, lighted	
139	Ocean station vessel (normal position)				

VISUAL AIDS

142	Marine light		Note 1: Marine alternating lights are red and white unless otherwise indicated. Marine lights are white unless colours are stated. Note 2: Characteristics are to be indicated as follows:		
		Alt B F	Alternating Blue Fixed	Fl G Gp	Flashing Green Group
			Electronic	Occ R SEC	Occulting Red Sector
143	Aeronautical ground light			sec (U) W	Second Unswitched White
144	Lightship				

SYMBOLS FOR AERODROME/HELIPORT CHARTS

145	Hard surface runway		154	Point light	
146	Pierced steel plank or steel mesh runway		155	Obstacle light	
147	Unpaved runway		156	Landing direction indicator (lighted)	
148	Stopway	SWY	157	Landing direction indicator (unlighted)	
149	Taxiways and parking areas		158	Stop bar	
150	Helicopter alighting area on an aerodrome		159	Runway-holding position	Pattern A Pattern B
151	Aerodrome reference point	ARP	Note: For application, see Annex 14, Volume I, 5.2.10.		
152	VOR check-point		160	Intermediate holding position	
153	Runway visual range (RVR) observation site		Note: For application, see Annex 14, Volume I, 5.2.11.		
			161	Hot spot	
			Note: Hot spot location to be circled.		

SYMBOLS FOR AERODROME OBSTACLE CHARTS - TYPE A, B AND C

		Plan	Profile			Plan	Profile
162	Tree or shrub		Identification number	167	Terrain penetrating obstacle plane		
163	Pole, tower, spire, antenna, etc.			168	Escarpment		
164	Building or large structure			169	Stopway	SWY	
165	Railroad			170	Cleanway	OWY	
166	Transmission line or overhead cable						

ADDITIONAL SYMBOLS FOR USE ON PAPER AND ELECTRONIC CHARTS

PLAN VIEW		Electronic
171	Minimum sector altitude <i>Note.— This symbol may be modified to reflect particular sector shapes.</i>	NSA
172	Terminal arrival altitude <i>Note.— This symbol may be modified to reflect particular TAA shapes.</i>	TAA
173	Holding pattern	
174	Missed approach track	
PROFILE		
175	Runway	
176	Radio navigation aid (type of aid and its use in the procedure to be annotated on top of the symbol)	
177	Radio marker beacon (type of beacon to be annotated on top of the symbol)	
178	Collocated radio navigation aid and marker beacon (type of aid to be annotated on top of the symbol)	
179	DME fix (distance from DME and the fix use in the procedure to be annotated on top of the symbol)	
180	Collocated DME fix and marker beacon (distance from DME and the type of beacon to be annotated on top of the symbol)	

APPENDIX 3

APPENDIX 3. COLOUR GUIDE

(Ref. 2.11.1)

CHART SYMBOLS

Culture, except highways and roads; outlines of large cities, grids and graticules; spot elevations, danger lines and off-shore rocks; names and lettering except for aeronautical and hydrographic features		BLACK	
Built-up areas of cities		BLACK Stipple	
Highways and roads	Optional colours	BLACK Half-tone	
		RED	
Built-up areas for cities (alternative to black stipple)		YELLOW	
Contours and topographic features: Items 1 through 10 of Appendix 2 Hydrographic features: Items 39 through 41 of Appendix 2		BROWN	
Shore lines, drainage, rivers, lakes, bathymetric contours and other hydrographic features including their names or description		BLUE	
Open water areas		BLUE Half-tone	
Salt lakes and salt pans		BLUE Stipple	
Large non-perennial rivers and non-perennial lakes		BLUE Stipple	
Aeronautical data, except for Enroute and Area Charts — ICAO, where different colours may be required. Both contours may be used on the same sheet but where only one colour is used, dark blue is preferred	Optional colours	MAGENTA	
		DARK BLUE	

CHART SYMBOLS (Cont.)

Woods		GREEN	
Areas which have not been surveyed for contour information or relief data are incomplete	Optional colours	GOLDEN BUFF	
		WHITE	

HYPSONETRIC TINTS

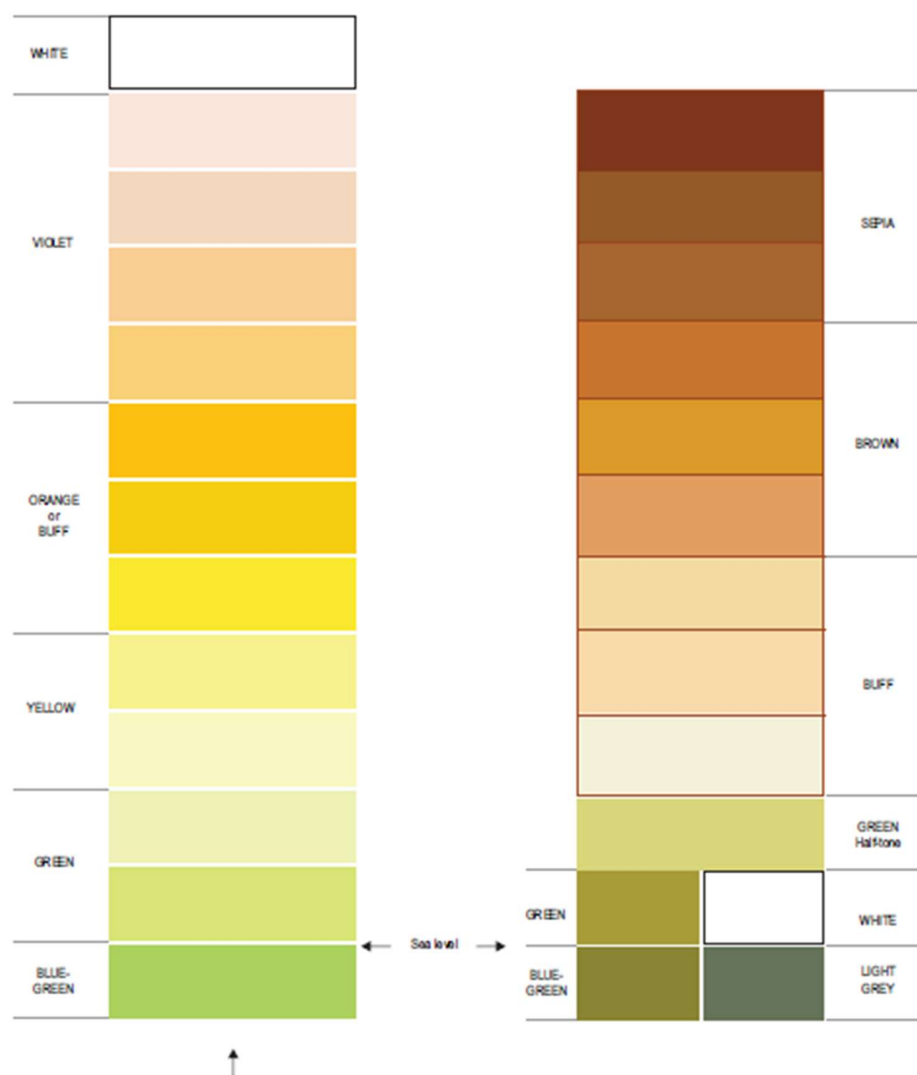
	WHITE	Tint for extreme elevations		SEPIA	
	MOLET				
	ORANGE or BUFF	Tint for higher range elevations		BROWN	
	YELLOW	Tint for middle range elevations		BUFF	
	GREEN	Tint for lower range elevations	Optional colours	GREEN	
				WHITE	
	BLUE-GREEN	Tint for areas below sea level	Optional colours	BLUE-GREEN	
				LIGHT GREY	

Note.—Basic tints are identical to those specified for the International Map of the World.

APPENDIX 4

APPENDIX 4. HYPSONOMETRIC TINT GUIDE

(Alternative systems, reference 2.12.2)



Note 1.— These tints are identical to those specified for the International Map of the World.

Note 2.— Elevations have not been associated with tints of either system in order to allow for flexibility in their selection.