National Defence / Défense nationale

A-CR-CCP-242/PT-005

TRAINING MANUAL

# AIR CADET GLIDING PROGRAM MANUAL

(ENGLISH)

**(Supersedes A-CR-CCP-242/PT-005 dated 2004-02-01)**

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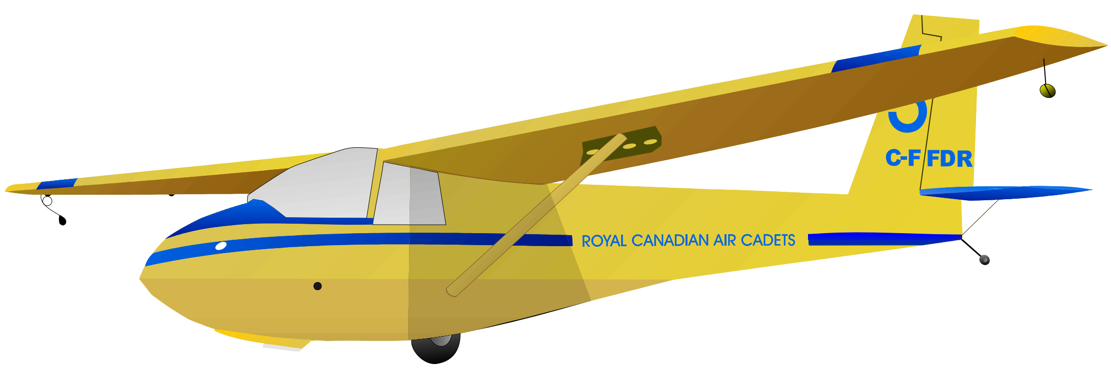


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## LIST OF EFFECTIVE PAGES

Insert latest changed pages and dispose of superseded pages in accordance with applicable orders.

**NOTE**

The portion of the text affected by the latest change is indicated by a black vertical line in the margin of the page. Changes to illustrations are indicated by miniature pointing hands or black vertical lines.

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**Contact Officer: ACGP SET Flt Cdr, CFS**

## FOREWORD

1. A-CR-CCP-242/PT-005, Air Cadet Gliding Program Manual, is issued on authority of the Chief of the Defence Staff.

2. This publication is effective on receipt and supersedes all previous editions and amendments, which are to be withdrawn and destroyed.

3. Suggestions for amendments shall be forwarded through Regional Headquarters to Central Flying School, attention: ACGP SET Flt Cdr, info National Defence Headquarters, Attention D Cdts.

**RECORD OF CHANGES**

| Identification of Change | | Date Entered | Signature |
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| **Change Number** | **Date** | | |
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# CHAPTER 1 - AIR STANDARDS

## SECTION 1 - GENERAL

### INTRODUCTION

1. The purpose of the Air Cadet Gliding Program (ACGP) is to provide practical aviation experiences to Royal Canadian Air Cadets. The program, which comprises several gliding activities, uses the Schweizer 2-33 or the 2-33A glider (hereinafter referred to as the 2-33). Gliders are launched by three methods: winch, auto or air tow.

### PROGRAM OVERVIEW

2. The ACGP is a year-round program, comprising approximately 55 000 glider flights per year. The chronological activities of the ACGP on an annual basis are as follows:

a. a Spring Familiarization (Famil) Flying program at various locations across Canada in proximity to local Royal Canadian Air Cadet Squadrons (March to June). See Section 6 for details;

b. a Summer Glider Pilot Training program for 320 air cadets annually in accordance with Transport Canada (TC) Glider Pilot Licence standards. Where the Regional Gliding School (RGS) is collocated with a summer Air Cadet Camp, famil and demonstration (demo) flying may also be provided to air cadets attending other summer camp courses (June to August);

c. a Fall Famil Flying program as per the spring program (August to December); and

d. a special Winter Maintenance, Structural Inspection and Repair Program (SIRP) for the gliders and tow aircraft that results in a regularly scheduled structural confirmation and/or rebuild of each glider and tow aircraft.

**NOTE**

Normal aircraft inspection, maintenance and snag recovery activities are conducted throughout the spring, summer and fall flying programs.

### RESPONSIBILITIES AND RELATIONSHIPS

3. The ACGP is a partnership between the Department of National Defence (DND) and the Air Cadet League of Canada (ACL) and is governed by a renewable Contract for Goods and Services. Gliders and tow aircraft utilized in the ACGP are owned by the various Provincial Committees of the ACL, are civilian-registered in accordance with Canadian Aviation Regulations (CARs) and are fully insured (hull and liability) by the ACL.

4. At the request of the ACL, DND exercises operational and technical control of the ACGP in accordance with TC policies, directives and regulations augmented by policies, directives, standards and procedures promulgated by DND. In recognition of this partnership, TC has granted legal custody and control of the aircraft to DND, while allowing the aircraft to maintain civilian registry.

5. The ACGP is a national program operated in accordance with policies, directives, standards and instructions promulgated by D Cdts and Air Force Training (AF Trg). DCdts has delegated responsibility for administration of the program to the National Cadet Air Operations Officer (NCA Ops O/DCdts 4-6). Commander 1 Canadian Air Division (1 Cdn Air Div) is the OAA and has delegated ACGP operational airworthiness to AF Trg. With respect to operations and training, a Standards and Evaluation Team (SET) is established at the Central Flying School (CFS), which provides ACGP oversight and reports to AF Trg through Cmdt CFS. The ACGP SET Flight Commander is designated the National Evaluation Team Leader. With respect to the technical airworthiness aspects of the program, such as aircraft maintenance, repair, modification and inspection, a cell within the DAEPM (TH) has been appointed as the National Technical Authority for the ACGP (DGAEPM (TH) 8). DAEPM (TH) personnel assigned to the National Technical Authority cell are functionally responsible to DGAEM, but administratively controlled by D Cdts as D Cdts 5-5.

6. The ACGP is executed by the various Regional Cadet Support Units. Regional Cadet Air Operations Officers (RCA Ops O) or equivalent are responsible for the conduct of the ACGP within each region in accordance with TC regulations, and in accordance with DND National operational, training and maintenance policies, standards and instructions.

7. Annually, D Cdts/ACGP SET and DAEPM (TH) each conduct a conference to discuss, review and amend as required ACGP National policies, standards, and instructions. This successful method of promoting the effectiveness and safety of the ACGP is directly related to the discussions and decisions of the members of the conferences: the NCA Ops O/ACGP SET Flt Cdr (co-chairs) and DAEPM (TH) 8 (chairperson), the RCA Ops Os, the Regional Gliding Engineering Officers (RG Eng Os), the ACL and the Director Flight Safety (DFS).

**APPLICATION OF NATIONAL DIRECTION**

8. All flying and associated ground activities shall be conducted in accordance with the applicable CARs, A-CR-CCP-242/PT-005, Air Cadet Gliding Program Manual, policies, directives, Standard Operating Procedures (SOPs) and instructions as approved by the OAA and National Technical Authority maintenance and repair directives.

**REGIONAL FLYING ORDERS**

9. Regional Flying Orders shall be produced by the RCA Ops O and distributed to the RGS, all gliding sites, appropriate flight safety officers (FSOs), ACGP SET and D Cdts.

10. Regional Flying Orders shall complement and supplement National operational, training and technical policies, orders, directives and instructions detailed in paragraph 8. These orders may be more restrictive but shall not contravene national direction.

11. Annually, Regional Flying Orders shall be read and signed by all personnel engaged in ACGP activities. By signing, personnel shall signify understanding and compliance.

12. Regional Flying Orders shall include, as a minimum, the following information:

a. ACGP regional, provincial, zone, area, centre and gliding site organizations, as required;

b. Terms of Reference for personnel filling the key positions detailed in the regional organizations, e.g. RCA Ops O or equivalent, RG Eng O, Provincial Gliding Officer, Zone/Area/Centre Commanders, RGS and Gliding Site Commanders and Unit Flight Safety Officers (UFSOs), as required;

c. RGS and gliding site orders and directives, including but not limited to:

(1) command and control, including flight authorization and flight recording procedures;

(2) airfield layout, including emergency landing areas (diagram and/or photograph);

(3) traffic patterns, (diagram and/or photograph);

(4) tow patterns, including release points (diagram and/or photograph);

(5) flying training areas, including emergency landing areas (diagram and/or photograph);

(6) air traffic control procedures (ground and air); and

(7) emergency response procedures;

d. National, regional and local SOPs; and

e. Flight Safety Program;

**PILOT TRAINING RECORD**

13. A Pilot Training Record shall be maintained by the RCA Ops O for each tow aircraft pilot, glider pilot, winch operator, auto launch driver and auto launch observer. The record shall include the items that follow; however, the RCA Ops O may impose additional requirements in order to satisfy regional/local conditions:

a. an index itemizing the record contents;

b. TC licence(s) and rating(s);

c. Medical Certificate

c. ACGP qualification(s);

d. results of training courses;

e. results of proficiency examinations;

f. results of currency, proficiency and upgrade flights; and

g. pilot-in-command (PIC) time on type(s), and total time.

**PILOT INFORMATION FILE**

14. In order to promote proficiency, currency and flight safety, the RCA Ops O shall maintain a Pilot Information File (PIF) system at the RGS and all regional gliding sites.

15. The PIF shall contain supplementary operational, training, maintenance, flight safety and regulatory directives and information which impact on the safe and effective execution of the ACGP and which are not available in published directives. A PIF should be relatively temporary in nature and ideally be replaced within one year by a permanent order in the appropriate publication. PIFs shall be reviewed on an annual basis and those items of a recurring nature should be re-issued for the following year.

# SECTION 2

# FLIGHT SAFETY

## GENERAL

1. The Canadian Forces (CF) is responsible for the establishment and implementation of Flight Safety policy for the ACGP in accordance with A-GA-135-001/AA-001, A-GA-135-001/AA-002 and A-GA-135-002/AA-001. Specifically, ACGP Flight Safety policy is established by the Chief of the Air Staff/DFS and implemented by the Region Commander. DFS will initiate Flight Safety Investigations (FSIs) for accidents and selected incidents in accordance with the severity or the potential for severity of the occurrence. The RCA Ops O shall ensure that all regional ACGP supervisory and flight safety personnel fully understand ACGP Flight Safety procedures.

## DFS, FLIGHT SAFETY OFFICER SUPPORT

2. DFS provides advice and assistance directly to D Cdts.

3. In order to assist the regions in the implementation of Flight Safety policy, the Chief of the Air Staff (CAS) has assigned regular force Flight Safety Officers (FSOs) to each of the Regional Commanders.

4. Additionally, on an annual basis in response to the ACGP spring familiarization, fall familiarization and RGS locations and schedules, CAS will align FSOs with proximate gliding sites. Subsequently, the RCA Ops O shall advise D Cdts and the assigned FSOs as soon as possible of the location and schedule of all regional ACGP activities.

## BASIC FLIGHT SAFETY COURSE (BFSC)

5. The RCA Ops O shall complete the BFSC as soon as possible after assuming the position of RCA Ops O. Two vacancies are normally provided to ACGP personnel on each BFSC. D Cdts will advise the RCA Ops O of the availability of these training slots and the RCA Ops O will select appropriate personnel to attend.

## ADVANCED FLIGHT SAFETY COURSE

6. There is no requirement for a RCA Ops O to attend the Advanced Flight Safety Course. However, should there be vacancies available, consideration will be given to placing a RCA Ops O on a course.

**NOTE**

The assignment of a FSO to the RGS and each of the spring and fall gliding sites is mandatory.

## SECTION 3

## PERSONNEL QUALIFICATION STANDARDS

### AUTHORIZED PERSONNEL

1. The following personnel who meet the prescribed TC and ACGP licence, medical, qualification and rating prerequisites and standards may operate ACGP gliders, tow aircraft and/or launch equipment and may perform associated supervisory and/or instructional duties with the approval of the RCA Ops O or equivalent:

a. Air Cadets;

b. Cadet Instructor Cadre personnel;

c. Civilian Instructors directly involved in instructing cadets; and

d. Regular or Reserve Force personnel.

### PARTICIPATION BY PERSONNEL (CATO 52-05)

2. Regular Force and Primary Reserve personnel who wish to voluntarily participate in the ACGP must obtain authorization from their Commanding Officers (COs) in order to ensure that their participation is deemed to be on duty. Otherwise, an investigation into an accident resulting in injury or death may not conclude that any disability or death arose out of, or was directly connected with military service.

3. Supplementary Reserve personnel may also be authorized to participate in the ACGP and are considered to be on duty for the period outlined in their CF 899, Reserve Force Route Letter. Supplementary Reserve personnel without a CF 899 who wish to volunteer their services must comply with the instructions detailed in CATO 23-07, Volunteer Liability – Cadet Activities.

4. A list of authorized and qualified military personnel participating in the ACGP shall be maintained by the RCA Ops O.

### QUALIFICATION UPGRADING

5. Qualification upgrading may be approved by the RCA Ops O providing that the necessary licence, rating and experience prerequisites have first been met. The RCA Ops O shall only grant the qualification after review and confirmation of the applicable Pilot Training Record documentation (see Section 1, paragraph 13). RCA Ops Os may delegate granting authority to regionally designated personnel for qualifications, with the following exceptions: Glider Instructor Standards and Check Pilots, Glider Instructor Pilot, Glider Pilot (Double Tow), Glider Maintenance Pilot and all Tow Pilot qualifications. Waivers to qualification prerequisites will be granted only in exceptional circumstances. Requests for waivers shall be forwarded to the ACGP SET prior to NCA Ops O approval.

### QUALIFICATION STANDARDS - EXPLANATION

6. Generally, the qualifications listed in the following paragraphs are hierarchical in nature. For example, a Tow Aircraft Standards Pilot is also qualified as a Tow Aircraft Check Pilot and a Tow Pilot. Conversely, a Tow Aircraft Check Pilot is also qualified as a Tow Pilot but **not** as a Tow Aircraft Standards Pilot. To the greatest extent possible, upgrade, currency and proficiency checks shall be completed by a qualified pilot holding at least one qualification level higher than the person being checked.

**NOTE**

Qualifications that are not hierarchical in nature are the unique qualifications for Tow Aircraft Maintenance Pilot, Tow Aircraft Pilot, Glider Maintenance Pilot, Double Tow and cross-country qualifications in all aircraft.

**QUALIFICATION STANDARDS – TOW AIRCRAFT PILOTS**

7. The following are applicable:

a. **Qualification Title – Tow Aircraft Standards Pilot**.

b. **Duties.** When so designated by the RCA Ops O, a Tow Aircraft Standards Pilot is authorized:

(1) to conduct conversion to type;

(2) to conduct towing conversion;

(3) to conduct Tow Aircraft Check Pilot upgrade; and

(4) to conduct Tow Aircraft Standards Pilot upgrade.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Private Pilot, Commercial (Aeroplane) or ATR (Aeroplane) Licence;

**NOTE**

If a pilot undergoing conversion, proficiency and/or currency checks in accordance with the standards and procedures detailed in this document is not current in accordance with TC regulations, then the Tow Aircraft Standards Pilot conducting the checks must hold a Commercial or higher licence valid for aeroplanes. If the Standards Pilot holds a Private Pilot Licence, the candidate shall record the time in the "Remarks" column of the logbook. This time cannot be credited towards total time or for the purpose of licence upgrade.

(2) have acquired not less than 600 hours PIC of which not less than 300 hours PIC shall have been acquired on the tow aircraft type for which the qualification will be authorized;

(3) have successfully completed the Tow Aircraft Conversion Course (see Chapter 5) and the Instructional Technique portion of the Glider Instructor Course (see Chapter 4); and

(4) have successfully demonstrated, from the rear seat of the tow aircraft, a Proficiency Level 4 in performing sequences detailed in the Tow Pilot Flight Test Report (see Chapter 5, Annex A). Such demos shall include not less than 10 take-offs and landings of which at least 5 must be conducted in crosswind conditions.

**NOTES**

1. If the pilot has previously held a CF Qualified Flying Instructor (QFI) or Instructor Pilot (IP) rating, or a TC Class III Instructor rating, then the PIC time on the tow aircraft type may be reduced to 50 hours.

2. If the pilot has previously held a CF QFI or an IP rating, or a TC Instructor rating, then the Instructional Technique training detailed previously in paragraph 7.c. (3) may be waived.

8. The following are applicable:

a. **Qualification Title – Tow Aircraft Check Pilot**.

b. **Duties.** When so designated by the RCA Ops O, a Tow Aircraft Check Pilot is authorized to conduct annual tow aircraft proficiency and currency checks and towing proficiency and currency checks.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Private Pilot Licence, Commercial (Aeroplane) or ATR (Aeroplane) Licence;

**NOTE**

If a pilot undergoing proficiency and/or currency checks in accordance with the standards and procedures detailed in this document is not current in accordance with TC regulations, then the Tow Aircraft Check Pilot conducting the checks must hold a Commercial or higher licence valid for aeroplanes. If the Check Pilot holds a Private Pilot Licence, the candidate shall record the time in the “Remarks” column of the logbook. This time cannot be credited towards total time or for the purpose of licence upgrade.

(2) have acquired not less than 400 hours PIC of which not less than 200 hours PIC shall be on the tow aircraft type for which the qualification will be authorized, providing that the pilot has been employed as a qualified tow pilot during the Spring and Fall Glider Famil Programs and/or the RGS Program within the previous 12 months, and has participated in the previously mentioned programs as a qualified tow pilot for three years;

(3) have successfully completed the Tow Aircraft Conversion Course (see Chapter 5) and the Instructional Technique portion of the Glider Instructor Course (see Chapter 4); and

(4) have successfully demonstrated, from the rear seat of the tow aircraft, a Proficiency Level 4 in performing the sequences detailed in the Tow Pilot Flight Test Report (see Figure 5-1-2 on page 5-1-5). Such demos shall include not less than 10 take-offs and landings, of which at least 5 must be conducted in crosswind conditions.

**NOTES**

1. If the pilot has previously held a CF QFI or IP rating, or a TC Class III Instructor rating, then the PIC time on the tow aircraft type may be reduced to 50 hours.

2. If the pilot has previously held a CF QFI or IP rating, or a TC Instructor rating, then the Instructional Technique training detailed previously in subparagraph 8.c.(3) may be waived.

9. The following are applicable:

a. **Qualification Title – Tow Aircraft Maintenance Pilot**.

b. **Duties.** When designated **in writing** by the RCA Ops O, a Tow Aircraft Maintenance Pilot is authorized to conduct maintenance test flights.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Private Pilot, Commercial (Aeroplane), or ATR (Aeroplane) Licence;

(2) have successfully completed the Tow Aircraft Conversion Course (see Chapter 5); and

(3) have acquired not less than 100 hours PIC on the tow aircraft type for which the maintenance test flying is required.

10. The following are applicable:

a. **<u>Qualification Title – Tow Pilot (Double Tow)</u>.**

b. **Duties.** When designated **in writing** by the RCA Ops O, a Tow Pilot (Double Tow) is authorized to conduct towing operations with two gliders under tow.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Private Pilot, Commercial (Aeroplane), or ATR (Aeroplane) Licence;

(2) have successfully completed the Tow Aircraft Conversion Course (see Chapter 5);

(3) have acquired not less than 50 hours PIC on the tow aircraft type; and

(4) shall successfully demonstrate Proficiency Level 3 on at least two double air tow missions under the direct supervision of a Tow Aircraft Standards Pilot or Check Pilot qualified for double tow operations.

11. The following are applicable:

a. **<u>Qualification Title – Tow Pilot</u>**

b. **Duties.** When so designated by the RCA Ops O, a Tow Pilot is authorized:

(1) to conduct local towing operations in support of glider famil programs and/or RGS training;

(2) to conduct air cadet famil and demo flights (see Section 6, paragraphs 3 to 7 for restrictions during towing operations); and

(3) to conduct tow aircraft cross-country operations provided that there are no gliders under tow.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Private Pilot, Commercial (Aeroplane), or ATR (Aeroplane) Licence;

(2) have acquired not less than 100 hours PIC time on aeroplanes if the course is to be conducted on the Bellanca Scout, or not less than 150 hours PIC time on aeroplanes if the course is to be conducted on the L-19/C305 aircraft;

(3) have successfully completed the Tow Aircraft Conversion Course (see Chapter 5); and

(4) shall meet Transport Canada recency requirements and shall have flown, as a minimum, 5 hours PIC on aeroplanes in the preceding 12 months.

**NOTE**

The RCA Ops O may extend the tow qualification and duties to include cross-country operations provided that, in addition to the prerequisites stated previously, the pilot:

a. has acquired not less than 25 hours PIC on the tow aircraft type; and

b. has successfully demonstrated PL 3 on at least one cross-country under the direct supervision of a Tow Standards Pilot or Check Pilot qualified for cross country operations.

**QUALIFICATION STANDARDS – GLIDER PILOTS**

12. The following are applicable:

a. **Qualification Title – Glider Instructor Standards Pilot**.

b. **Duties.** When so designated by the RCA Ops O, a Glider Instructor Standards Pilot is authorized:

(1) to conduct training for the purpose of upgrading pilots to a TC Flight Instructor Rating (Gliders);

(2) to conduct Glider Check Pilot upgrade; and

(3) to conduct Glider Instructor Standards Pilot upgrade.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Flight Instructor Rating (Gliders);

(2) be a graduate of the ACGP Glider Instructor Course (see Chapter 4); and

(3) have been successfully employed as a RGS Glider Instructor for at least three years and shall have acquired not less than 75 instructional hours in gliders.

**NOTE**

If the pilot has previously held a CF QFI or IP rating, or a TC Instructor rating, and the pilot has been successfully employed as a RGS glider instructor for at least one year, the instructional hours in gliders may be reduced to 25 hours.

13. The following are applicable:

a. **Qualification Title – Glider Check Pilot.**

b. **Duties.** When so designated by the RCA Ops O, a Glider Check Pilot is authorized:

(1) to conduct rear seat glider famil training and upgrades for glider pilots selected to carry out famil flights with passengers in either the front or rear seat;

(2) to conduct front seat glider famil training and upgrades for glider pilots selected to carry out famil flights with passengers in the rear seat only;

(3) to conduct annual glider proficiency checks; and

(4) to conduct glider currency checks as required.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Flight Instructor Rating (Gliders);

(2) be a graduate of the ACGP Glider Instructor Course (see Chapter 4); and

(3) have been successfully employed as a RGS Glider Instructor for at least one year and shall have acquired not less than 25 instructional hours in gliders.

**NOTES**

1. If the pilot does not meet the course and/or employment requisites detailed in subparagraphs 13.c. (2) and/or 13.c. (3), then the qualification may be granted, provided that the pilot has been successfully employed in the Spring and Fall Famil Programs for at least three years and has acquired not less than 50 hours PIC in gliders;

2. As per Note 1, except that if the pilot has previously held a CF QFI or IP rating, or a TC Class III Instructor rating, the qualification may be granted, provided that the pilot has been successfully employed in the Spring and Fall Famil Programs for at least one year.

14. The following are applicable:

a. **Qualification Title – Glider Maintenance Pilot**

b. **Duties.** When designated in writing by the RCA Ops O, a Glider Maintenance Pilot is authorized to conduct maintenance test flights.

c. **Prerequisites**. The pilot shall:

(1) hold a valid Canadian Flight Instructor Rating (Gliders);

(2) be a graduate of the ACGP Glider Instructor Course (see Chapter 4); and

(3) have been successfully employed as a RGS Glider Instructor for at least one year and shall have acquired not less than 25 instructional hours in gliders.

15. The following are applicable:

a. **Qualification Title – Glider Instructor Pilot**.

b. **Duties.** When so designated by the RCA Ops O, a Glider Instructor Pilot is authorized:

(1) to conduct glider pilot training; and

(2) to conduct air cadet demo flights.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Flight Instructor Rating (Gliders); and

(2) be a graduate of the ACGP Glider Instructor Course (see Chapter 4).

16. The following are applicable:

a. **Qualification Title – Glider Pilot (Double Tow)**.

b. **Duties.** When designated **in writing** by the RCA Ops O, a Glider Pilot (Double Tow) is authorized to conduct towing operations with two gliders under tow.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Glider Pilot Licence;

(2) have acquired not less than 20 hours PIC in gliders;

(3) have completed at least five single cross-country air tow missions; and

(4) successfully demonstrate Proficiency Level 3 on at least two double air tow missions under the direct supervision of a Glider Standards Pilot or Check Pilot qualified for double tow operations.

17. The following are applicable:

a. **<u>Qualification Title – Glider Pilot (Cross-Country)</u>**.

b. **Duties.** When designated by the RCA Ops O, a Glider Pilot is authorized to conduct cross-country air tow operations.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Glider Pilot Licence;

(2) have acquired not less than 10 hours PIC in gliders; and

(3) have successfully demonstrated PL 3 on at least one cross country tow under the direct supervision of a Glider Standards Pilot or Check Pilot qualified for cross country operations.

**NOTE**

1. If the pilot holds a valid Canadian Private Pilot Licence or higher, or has successfully completed flying training to CF "Wings" standard, then the 10 hours PIC in gliders may be waived.

2. A cross-country flight is defined as one requiring a study of the route to be flown. The study should include such items as weather, emergency landing sites etc. As well, the flight should consist of different departure and arrival airports, enroute climbs and descents and be of at least one hour duration.

18. The following are applicable:

a. **<u>Qualification Title – Glider Familiarization Pilot (Rear Seat)</u>**.

b. **Duties.** When so designated by the RCA Ops O, a Glider Famil Pilot (Rear Seat) is authorized to conduct glider famil flights from either the front or rear seat of the glider.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Glider Pilot Licence;

(2) have acquired:

(a) not less than 15 hours PIC, including not less than 100 flights in gliders, or

(b) not less than 10 hours PIC, including not less than 200 flights in gliders; and

(4) have successfully demonstrated the ability to brief the passenger on the characteristics and limitations of the glider and the flying sequences authorized to be performed during the famil flight, and have successfully demonstrated the ability to consistently perform the take-off, tow, release circuit and landing to a PL 4.

19. The following are applicable:

a. **<u>Qualification Title – Glider Familiarization Pilot (Front Seat)</u>**.

b. **Duties.** When so designated by the RCA Ops O, a Glider Famil Pilot (Front Seat) is authorized to conduct glider famil flights only from the front seat of the glider.

c. **Prerequisites.** The pilot shall:

(1) hold a valid Canadian Glider Pilot Licence and shall have 10 hours PIC in gliders;

(2) have successfully demonstrated the ability to brief the passenger on the characteristics and limitations of the glider and the flying sequences authorized to be performed during the famil flight, and have successfully demonstrated the ability to consistently perform the take-off, tow, release circuit and landing to a PL 4.

(3) have flown at least three solo flights utilizing the same launch method as that intended for the passenger carrying flight.

**NOTE**

If the pilot holds a valid Canadian Private Pilot Licence or higher, or has successfully completed flying training to CF "Wings" standard, then the 10 hours PIC in gliders may be waived.

20. The following are applicable:

a. **<u>Qualification Title – Basic Glider Pilot</u>**.

b. **Duties.** When so designated by the RCA Ops O, a Basic Glider Pilot is authorized to fly as PIC. Passengers are prohibited.

c. **Prerequisite.** The pilot shall:

(1) hold a valid TC Glider Pilot Licence; and

(2) be a graduate of the ACGP Glider Scholarship Course, the Soaring Pilot Conversion Course to ACGP Pilot or the Power Pilot Conversion to Glider Pilot Course.

**QUALIFICATION STANDARDS – LAUNCH CONTROL OFFICER**

21. The following are applicable:

a. **<u>Qualification Title – Launch Control Officer (LCO)</u>**.

b. **Authorization.** The RCA Ops O shall be the granting authority for an LCO qualification.

c. **Duties.** Under the direction of the RGS Flight Commander/Gliding Site Commander, the LCO shall:

(1) direct and ensure the safe and efficient operation of all gliding and gliding support activities on the airfield, and shall specifically co-ordinate and control the launches and all ground movements of gliders and tow planes, the recovery of tow planes and monitor the recovery of gliders.

(2) during flying operations, remain at the normal LCO place of duty on the airfield/gliding site until officially relieved by the Flight Commander/Gliding Site Commander or the follow-on LCO; and

(3) ensure that a comprehensive hand-over briefing is provided to the follow-on LCO to include, as a minimum, the planned operation, the air and ground situation and all flight safety considerations.

d. **Prerequisites.** The LCO shall:

(1) have the following:

(a) a Glider Instructor Rating, or

(b) a Tow Pilot qualification, or

(c) a Glider Famil Pilot qualification provided that the candidate has acquired not less than 20 hours PIC in gliders, including not less than 125 flights; or the candidate has acquired not less than 10 hours PIC in gliders including not less than 200 flights (mandatory for a RGS LCO); and

(2) have successfully completed the LCO Qualification Course (see Chapter 4).

**QUALIFICATION STANDARDS – WINCH LAUNCH PERSONNEL**

22. The following are applicable:

a. <u>**Qualification Title – Winch Launch Instructor**</u>.

b. **Duties.** When so designated by the RCA Ops O, a Winch Launch Instructor is authorized to conduct winch launch training.

c. **Prerequisites.** The Winch Launch Instructor shall:

(1) hold or shall have held a valid Canadian Glider or Private Pilot Licence or higher; and

(2) have been employed as a winch operator for at least one year and shall have satisfactorily completed at least 250 launches.

23. The following are applicable:

a. <u>**Qualification Title – Winch Launch Operator**</u>.

b. **Duties.** When so designated by the RCA Ops O, a Winch Launch Operator is authorized to conduct winch launches.

c. **Prerequisites.** The Winch Launch Operator shall:

(1) hold or shall have held a valid Canadian Glider or Private Pilot Licence or higher; and

(2) have successfully completed a course of instruction as follows:

(a) a briefing on winch launch procedures including normal and emergency SOPs, normal and emergency signals and local flying orders,

(b) the observation of a minimum of 10 winch launches conducted by a Winch Launch Instructor,

(c) the successful completion of a minimum of 10 winch launches under the direct supervision of a Winch Launch Instructor,

(d) practical application of emergency procedures including at least two simulated emergencies, and

(e) instruction and practical experience on associated equipment and rope/cable splicing, including a certification to carry out and authorize daily inspections (DIs).

24. The following are applicable:

a. **<u>Qualification Title – Winch Cable Retrieve Driver</u>**.

b. **Duties.** When so designated by the RCA Ops O, a Winch Cable Retrieve Driver is authorized to drive the retrieve vehicle during winch operations to retrieve the cable from the winch for launch.

c. **Prerequisites.** The Retrieve Driver shall:

(1) hold a valid Driver's Licence(s)/Operator's Permit(s) for the vehicle being used; and

(2) have successfully completed a course of instruction as follows:

(a) a briefing on retrieve procedures including normal and emergency SOPs, normal and emergency signals and local gliding site/aerodrome operating procedures,

(b) the observation of a minimum of three retrieves conducted by a qualified Retrieve Driver,

(c) the successful completion of a minimum of three retrieves under the direct supervision of a qualified Retrieve Driver, and

(d) instruction and practical experience on associated equipment and rope/cable splicing including a certification to carry out and authorize DIs.

**QUALIFICATION STANDARDS – AUTO LAUNCH PERSONNEL**

25. The following are applicable:

a. **<u>Qualification Title – Auto Launch Instructor</u>**.

b. **Duties.** When so designated by the RCA Ops O, an Auto Launch Instructor is authorized to conduct auto launch training for Auto Launch Drivers and Auto Launch Observers.

c. **Prerequisites.** The Auto Launch Instructor shall:

(1) hold or shall have held a valid Canadian Glider or Private Pilot Licence or higher; and

(2) have been employed as an Auto Launch Driver and Observer for at least one year and shall have satisfactorily completed at least 250 launches.

26. The following are applicable:

a. **<u>Qualification Title – Auto Launch Observer</u>**.

b. **Duties.** When so designated by the RCA Ops O, an Auto Launch Observer is authorized to conduct auto launches, acting as the vehicle control and safety officer and directing the actions of the driver.

c. **Prerequisites.** The Auto Launch Observer shall:

(1) hold or shall have held a valid Canadian Glider or Private Pilot Licence or higher; and

(2) have successfully completed a course of instruction as follows:

(a) a briefing on auto launch procedures, including normal and emergency SOPs, normal and emergency signals and local flying orders,

(b) the observation of a minimum of 10 auto launches conducted by an Auto Launch Instructor operating as the observer,

(c) the successful completion of a minimum of 10 auto launches under the direct supervision of an Auto Launch Instructor,

(d) practical application of emergency procedures including at least two simulated emergencies, and

(e) demonstration of the ability to safely and effectively direct the actions of the driver of the auto launch vehicle.

**NOTE**

Only one of the auto launch crew (driver or observer) may be under instruction in a vehicle engaged in auto launches.

27. The following are applicable:

a. **Qualification Title – Auto Launch Driver**.

b. **Duties.** When so designated by the RCA Ops O, an Auto Launch Driver is authorized to drive the launch vehicle during auto launch operations.

c. **Prerequisites.** The Auto Launch Driver shall:

(1) hold a valid Driver's Licence(s)/Operator's Permit(s) for the vehicle being used; and

(2) have successfully completed a course of instruction as follows:

(a) a briefing on auto launch procedures, including normal and emergency SOPs, normal and emergency signals and local flying orders,

(b) the observation of a minimum of 10 auto launches conducted by an Auto Launch Instructor operating the vehicle,

(c) the successful completion of a minimum of 10 auto launches under the direct supervision of an Auto Launch Instructor,

(d) practical application of emergency procedures including at least two simulated emergencies, and

(e) instruction and practical experience on associated equipment and rope/cable splicing, including a certification to carry out and authorize DIs.

**NOTE**

Only one of the auto launch crew (driver or observer) may be under instruction in a vehicle engaged in auto launches

## SECTION 4

## AEROMEDICAL, PROFICIENCY AND CURRENCY STANDARDS

### PHYSIOLOGICAL RESTRICTIONS

1. **Drugs.** ACGP personnel shall follow TC guidelines contained in CARS and the TC AIM for prescription and over-the-counter (OTC ) drug use. Given the remote locations of some gliding sites and the lack of timely availability of civil aviation medical examiners (CAMEs) or CF flight surgeons, additional guidelines for pilots and supervisors are provided in the following paragraphs.

2. Restrictions to flying are based on the medication and the condition being treated. The risk of acute incapacitation, decreased performance and the effects of the illness must be considered from a flying perspective. Clearly, a CAME or flight surgeon is in the best position to assess any situation that may require flying restrictions, however, students or staff may report for flying duties while undergoing periodic or prolonged treatment from a civilian doctor (MD) or specialist. Assuming individuals have not experienced side-effects during the initial period of treatment, the following medications are approved for use without flying restrictions:

a. INH for TB converters;

b. Hydrochlorthiazide/Dyazide for hypertension;

c. ACE inhibitors/ARBs;

d. Allopurinol for hyperuricemia;

e. Oral contraceptives;

f. Tetracyclines/other antibiotics at low dosage for acne (NOT Minocycline);

g. Sodium cromoglycate preparations - inhaled, or topical nasal or ophthalmic;

h. Topical or inhaled steroid preparations (ie. Flonase);

i. Antacids (ie. Maalox, Mylanta)/sucralfate/Proton pump inhibitors;

j. Epinephrine drops for glaucoma;

k. Thyroid replacement hormone ;

l. Antimalarial prophylaxis (chloroquine; doxycycline);

m. Loratidine (Claritin), fexofenadine (Allegra);

n. Transdermal nicotine for smoking cessation;

o. Imodium;

p. Lipid-lowering agents (Cholestyramine);

q. Fluvastatin, pravastatin, simvistatin, atorvostatin;

r. Fenofibrate (Lipid Supra); and

s. Acyclovir/famcyclovir/valacyclovir for recurrent HSV.

3. For simple analgesia (e.g. relief of musculoskeletal aches, headache, etc.) the use of acetaminophen (Tylenol) is allowed during flying duty. The use of ASA (Aspirin) and non-steroidal anti-inflammatory drugs (NSAIDS) during flying duty is not allowed unless cleared by a CAME/flight surgeon. The common cold will be a frequent occurence during ACGP operations and individuals should see an MD, as a minimum, to determine their fitness to fly. If individuals take cough and cold medications, prescription or OTC and particularly those containing cough suppressants, decongestants and/or antihistamines, they shall not fly until at least 48 hours have passed since discontinuing treatment or they have been cleared by a CAME/flight surgeon.

4. Other common medications and herbal agents that are prohibited unless cleared for use by a CAME or flight surgeon include, but are not limited to:

a. Clemastine (Tavist) and cetirizine (Reactine);

b. Muscle relaxants (e.g. Flexeril);

c. Sedatives/hypnotics;

d. Anti-motion sickness drugs;

e. Anti-depressants;

f. Systemic steroids (anabolic steroids are not permitted at any time);

g. Isotretinoin (Accutane) for acne treatment;

h. Creatinine;

i. St. John's Wort;

j. Ephedrine-containing compounds; and

k. Valerian.

5. **Alcohol.** ACGP pilots involved in flying operations shall not consume any alcoholic beverages for at least the period of 12 hours immediately prior to flight, and in no case, less than 8 hours before reporting for duty.

6. **Blood Donations.** Pilots engaged in flying duties can donate blood, providing that no flying activities take place until 72 hours after the blood donation.

7. **Hypoglycaemia.** Personnel engaged in supervisory/flying duties shall maintain proper nutritional habits, i.e., personnel shall consume a breakfast, lunch, dinner, and snacks and liquids as required.

8. **Smoking.** Smoking is **prohibited** in ACGP aircraft or equipment. Smoking is also prohibited within 50 feet of tow aircraft, gliders, hangars, fuel storage or refuelling areas. Smoking is permitted only in designated areas.

**EMPLOYMENT RESTRICTIONS**

9. **Duty.** Duty Day commences when an individual reports for duty and ceases when they are released from duty (this includes mission and weather briefings, maintenance and other delays or any other work directly related to flying in that Duty Day). The normal Duty Day should not exceed 12 hours. In any case, it will not exceed 14 hours.

10. **Duty Hours.** The following times should normally be the maximum times for ACGP personnel:

a. Maximum continuous cockpit time is normally two hours but not to exceed two and a half hours, except cross-country ferry flights which may exceed two and a half hours;

b. A maximum of five hours instructional/day and maximum of eight hours can be flown if instruction is combined with any other flying. Students on the Basic Glider Course shall fly a maximum of six flights per day, except that CFIs may authorize up to eight flights in a day based on student fatigue level; and

c. Aircrew shall not fly (any combination of civilian or military flying) more than

(1) 120 hours in any consecutive thirty-day period;

(2) 300 hours in any consecutive ninety-day period; or

(3) 1,000 hours in any consecutive twelve-month period.

8. **Rest.** Crew Rest (CR) is defined as that time provided for physiological rest to recover from flying duties or provided for rest prior to standby duties. CR begins when an individual is released from duty. Periods of rest acquired during the Crew Duty Day shall not be considered rest for the purposes of either extending the computed length of the Duty Day or reducing the length of the CR period. CR should be a minimum of 12 hours. Following duty days exceeding 12 hours, a minimum of 14 hours CR should be attained. RGS CO's and Gliding Site Commanders may declare a reduced CR period provided that at least eight hours of uninterrupted rest is assured. Regardless, it remains the PIC's responsibility to ensure that adequate CR is attained. In addition, PIC's may declare unscheduled CR whenever they consider fatigue could jeopardize the safety of the flight. When unscheduled CRs are declared, PIC's shall report the circumstances to the CO/Site Commander**.** Pilots shall have a minimum rest period of 30 minutes after each two hours of cockpit time. During the rest period, pilots shall not engage in flying related activities, including ground operations.

**MEDICAL STANDARD – TC LICENCES**

11. All ACGP pilots shall possess a current Medical Certificate valid for the TC licence(s) and/or rating(s) held by the pilot.

**FIRST AID QUALIFICATION REQUIREMENT**

12. At least one member of the supervisory staff present during ACGP operations should be in possession of a St. John's Ambulance Emergency First Aid qualification.

**PROFICIENCY STANDARDS**

13. An annual proficiency check program consisting of ground school lectures/briefings, written examinations and flight checks, applicable to the aircraft type and pilot qualifications, shall be administered under the direction of the RCA Ops O.

14. Ground Lectures/Briefings shall include:

a. A-CR-CCP-242/PT-005, Air Standards and SOPs, and Aircraft Descriptions and Operating Instructions (both normal and emergency), with special emphasis on Tow Aircraft Upset Phenomenon (both glider and tow aircraft pilots) and Ground Loop Phenomenon (tow pilots), as follows:

(1) discussion of Ground Loop Phenomenon shall include a detailed review of Chapter 2, Section 9, paragraphs 11 to 21 and viewing of the US Army L-19 Training Video; and

(2) review/study of Ground Loops shall also be a mandatory item during the pre-RGS work-up phase and the Tow Aircraft Conversion Course.

b. Regional and local flying orders and SOPS, as follows;

(1) regional SOPs shall address cross-country towing requirements with respect to proficiency, currency, operations, flight planning and notification procedures, and weather criteria (considering en route topography, and climatic and seasonal conditions); and

(2) local SOPs shall address RGS and Famil Site operational and flight safety requirements with respect to weather/crosswind criteria (considering local topography, and climatic and seasonal conditions).

c. Review of Personnel Cause Factors (refer to the CF Flight Safety Manual and From The Ground Up, General Airmanship/Human Factors). Such review shall include Human Interaction, Physical and/or Physiological, Psychological (Behavioural), Pathological (Medical) and Pharmacological (Drugs).

15. Examinations, produced by the RCA Ops O and revised annually, shall be administered as follows:

a. Every pilot shall write an open book examination applicable to the aircraft type, which is to include questions on the following subject matter:

(1) flying orders and SOPs;

(2) aircraft and aircraft systems operations;

(3) normal operating procedures; and

(4) aircraft operating data.

b. Every pilot shall write a closed book examination applicable to the aircraft type, which is to include questions on the following subject matter:

(1) aircraft emergency operating procedures; and

(2) tow emergency procedures.

c. The pass mark for both examinations shall be 85 per cent corrected to 100 per cent in a face-to-face debriefing by a qualified Tow Check Pilot or Glider Check Pilot.

16. Proficiency check flights shall be conducted as follows:

a. Subsequent to the successful completion of the written examinations, every pilot shall successfully demonstrate the ability to perform the sequences that follow, subject to launch altitude limitations, aircraft operating restrictions/prohibitions and the pilot's qualifications:

(1) ground handling;

(2) crosswind take–offs and landings;

(3) air tow, winch and/or auto launch;

(4) slow flight;

(5) steep turns and spirals;

(6) stalls and spins;

(7) aircraft emergency operating procedures; and

(8) tow emergency procedures, including at least one simulated rope/cable break.

(9) in the case of tow pilots, a minimum of one air tow

**NOTE**

For tow pilots, the aircraft handling portion of the proficiency check program shall be successfully completed before progressing to the towing proficiency check. Upon successful completion of the aircraft handling portion of the proficiency check program the tow pilot may act as pilot-in-command with the exception of towing operations. Tow Aircraft Check and Standards Pilots are exempt from the tow proficiency portion of the Annual Proficiency Program.

b. Proficiency flight checks shall include a pre-flight face-to-face briefing by the applicable Check Pilot conducting the proficiency check, detailing the flight requirements, and shall include a post-flight face-to-face debriefing detailing the results of the proficiency check.

**NOTE**

Glider sequences not demonstrated because of launch altitude limitations shall be fully discussed in a face-to-face briefing and shall be completed within the calendar year.

c. The following annexes shall be used as a basis for developing regionally produced flight-check cards:

(1) Chapter 3, Annex A, Student Glider Pilot Progress Card/Flight Test Report; and

(2) Chapter 5, Tow Pilot Flight Test Report (pg 5-1-5 fig 5-1-2).

d. The completed flight check card(s) are filed in the individuals PTR for a period of two years.

17. **Additional Proficiency Requirements** – **Standards Pilots, Check Pilots and Glider Instructors.** For every pilot who holds a qualification to conduct training, conversion, qualification upgrading and/or proficiency and currency checks, the proficiency check shall also include a demonstration of ability to:

a. brief a sequence applicable to the aircraft type as detailed in Chapter 3 or 5;

b. identify improper or incorrect techniques and procedures; and

c. identify corrective action and determine appropriate remedial action.

**NOTE**

First-year instructor pilots (graduates of the Glider Instructor Course immediately preceding the RGS) shall satisfactorily complete a confirmatory flight check(s) at an appropriate time during the conduct of the RGS. Such flight checks shall assess handling proficiency from the rear seat and instructional ability.

18. Glider Instructors, Glider Check Pilots, Glider Instructor Standards Pilots shall demonstrate a Proficiency Level 4. Refer to paragraphs 18 to 22 for Proficiency Level (PL) definitions. Additionally, for Glider Instructors, refer to Chapter 4, Figure 4-1-6 for Proficiency Level (PL) definitions. The instructor Phase II Card/Flight Test card (pg 4-1-25) is to be complete and retained on the individual's PTR for a period of two years. Only the applicable parts have to be completed. Tow Aircraft Check Pilots and Tow Aircraft Standards Pilots shall demonstrate a Proficiency Level 4 from both the front and rear seats.

19. All other pilots shall demonstrate a Proficiency Level 3 with the exception of Glider Familiarization pilots (front and rear seat) who must demonstrate a Proficiency Level 4 for Take-off, Tow, Release, Circuit and Landing.

**PROFICIENCY LEVEL DEFINITIONS**

20. **Level 1. The Student** was not capable of completing the task. Trainee required verbal and/or physical assistance to avoid making major errors. Further instruction is required.

21. **Level 2. The Student** completed the task but required verbal and/or minor physical assistance to avoid making major errors. Further practice is required.

22. **Level 3. The Student** completed the task, making only minor errors. Trainee required minimal verbal cues to analyze and/or correct errors.

23. **Level 4. The Student** completed the task without assistance, making only minor errors. Trainee was able to self-analyze and correct errors.

24. **Level 5. The Student** completed the task without assistance and without error.

**CURRENCY STANDARDS**

25. To remain current, a pilot shall fly, as a minimum, the following sequences:

a. for glider pilots, regardless of qualification, a launch (aero, winch or auto), a circuit and a landing; and

b. for tow pilots, regardless of qualification, a take-off, final approach and landing is required to maintain currency on the tow aircraft type.

**NOTE**

Sequences shall be flown as pilot "at the controls" (ie. physically flying the aircraft), regardless of type of flight or PIC.

26. Notwithstanding the following ACGP requirements, pilots shall meet Transport Canada currency minimums.

27. **60 to 180 Days.** A pilot shall not be authorized to fly as PIC of a particular type of aircraft if the pilot has not flown as PIC for at least 60 and up to 180 days in that type of aircraft until the following requisites have been met:

a. the pilot has completed at least one review mission with a qualified Check Pilot or Standards Pilot (depending on the qualification/rating under review);

b. the recurrency program includes a complete review of all critical emergencies;

c. the pilot has been flight-checked by a qualified Check Pilot or Standards Pilot (depending on the qualification/rating being checked) and has achieved the required Flying Level. Refer to paragraphs 16 and 17 for required Proficiency Levels; and

d. in the case of Glider Standards Pilots, their currency is extended to up to 180 days and for Glider Check Pilots, their currency is extended up to 90 days. Tow Standards and Check Pilots' currency is also extended to 90 days and this currency shall be independently maintained from both the front and rear seat. Currency must be maintained in accordance with CARS 401.05 (2).

**NOTE**

The review mission and flight check may be combined into one mission if the candidate clearly demonstrates that they can achieve the required proficiency level.

28. **181 to 365 Days.** A pilot shall not be authorized to fly as PIC of a particular type of aircraft if the pilot has not flown as PIC for at least 181 and up to 365 days in that type of aircraft until the following requisites have been met:

a. the pilot has successfully written an open book handling examination and a closed book emergency procedures examination, applicable to the aircraft type(s). The pass mark for both examinations shall be 85 per cent corrected to 100 per cent in a face-to-face debriefing;

b. the pilot has completed at least one review mission with a qualified Check Pilot or Standards Pilot (depending on the qualification/rating under review);

c. the recurrency program includes a complete review of critical emergencies; and

d. the pilot has been flight-checked by a qualified Check Pilot or Standards Pilot (depending on the qualification/rating being checked) and has achieved the required Flying and/or Instructional Proficiency Level. Refer to paragraphs 16 and 17 for required Proficiency Levels.

**NOTE**

Only in the case of tow pilots, the review mission and the flight check may be combined into one mission if the candidate clearly demonstrates that they can achieve the required proficiency level.

29. **366 Days and over.** A pilot shall not be authorized to fly as PIC of a particular type of aircraft if the pilot has not flown as PIC for at least 366 days, unless the pilot has completed a refresher course consisting of ground school briefings, air lessons and examinations. Such a refresher course shall include, as a minimum, the recurrency requirements for pilots who have not flown for 181 to 365 days. Successful completion of this requirement shall be on a proficiency basis as determined by the designated qualified Tow Aircraft or Glider Check Pilot and approved by the RCA Ops O.

30. The RCA Ops O shall ensure that tow aircraft pilot and glider pilot log books are monitored to confirm that pilots are maintaining both proficiency and currency.

**NOTE**

If the RCA Ops O, the deputy, or a check/standards pilots as designated by the RCA Ops O are unable to maintain flying currency during the winter maintenance period, the NCA Ops O shall be advised and shall determine the necessary procedures to regain flying currency prior to the commencement of the spring proficiency program.

31. **Continuation Flying.** On a regular basis during the course of regular flying duties, ACGP glider and tow aircraft pilots shall practice all normal and emergency procedures applicable to their type of aircraft.

32. **Cross-Country Pilot Currency (Double Tow).** Tow aircraft and glider pilots holding cross-country (double tow) qualifications shall not be authorized to fly as PIC on cross-country double air tow missions unless they have flown at least one double tow mission within the previous 365 days. Currency will be regained subsequent to a flight check on a cross-country double air tow mission in the local area by a glider or tow aircraft check pilot, as applicable, qualified and current on cross-country double tow operations and achievement of a Proficiency Level 4 rating.

**LOG BOOK CERTIFICATION – QUALIFICATION AND PROFICIENCY**

33. Certification of annual proficiency, currency and upgraded qualification(s) shall be entered on the current page of the pilot's logbook using the following format:

| | |
|---|---|
| Aircraft Type | |
| Proficiency/Currency/Upgrade Check Date | |
| Qualification Achieved | |
| Supervisor Signature/Appointment/Licence Number | |

34. The logbook times are to be certified as correct annually.

**GLIDER INSTRUCTOR REFRESHER TRAINING**

35. Prior to instructing at any of the Regional Gliding Schools, returning instructors must undergo instructor refresher training as follows:

| FLIGHT NUMBER | AIR LESSON | ALTITUDE |
|---|---|---|
| 1 | Proficiency * | 3000 feet |
| 2 | Launch Emergency | 300-500 feet |
| 3 | AL9 | 2500 feet |
| 4 | AL10 | 2500 feet |
| 5 | AL13 * | 3000 feet |
| * Required for Standards Refresher | | |

Figure 1-4-1 Refresher Training Syllabus

36. **Proficiency Flying** – Instructors must meet a PL4 on all flying exercises. A minimum of one proficiency flight is required to demonstrate this proficiency. Additional flights can be added at the discretion of the CFI. In addition, at least one simulated Launch Emergency (rope break) will be flown.

37. **Instructional Technique** – Instructors must demonstrate a PL4 for instructional technique prior to completing the Refresher Training. The Air Lessons outlined in the Refresher Syllabus shall be flown until this proficiency requirement is met. As a minimum, Air Lessons 9, 10 and 13 must be flown. During Flight Number 3, take off, air tow, circuit and landing must also be taught in addition to Air Lesson 9. The instructor must also demonstrate a modified circuit (low circuit entry) during Air Lesson 13. Additional flights can be added at the discretion of the CFI. An Air Lesson Progress Card (Figure 4-1-4) shall be completed for each flight.

**NOTE**

Previously qualified Standards Instructors are only required to fly a minimum of one proficiency flight and Air Lesson 13.

38. **Academic Training** – Instructors must attend formal classroom lectures from the Instructor Course Instructor Development syllabus as follows:

a. **Lecture 6 -** Performance Levels, Overall Flight Ratings and Grading Errors;

b. **Lecture 7 -** Progress Books/Progress Cards / Student Activity Records / Record Keeping; and

c. **Lecture 8 -** Unsatisfactory Course Progress and Course Failures.

**NOTE**

Previously qualified Standards Instructors are not required to attend the lecture portion of the Refresher Training.

39. **Pre-Flight Brief** – Instructors must deliver one Pre-Flight Brief to PL4. This brief will be evaluated on a Pre-Flight Briefing Progress Card (Figure 4-1-5).

## SECTION 5

## SUPPLEMENTARY STANDARDS

### AEROBATICS

1. Aerobatics are **prohibited** in ACGP aircraft. With regards to ACGP aircraft, aerobatics are defined as manoeuvres in which an aircraft exceeds 30 degrees pitch angle, nose up or nose down, or exceeds 60 degrees angle of bank. Aerobatics also encompass manoeuvres intentionally performed by an aircraft involving an abrupt change in altitude, an abnormal attitude, or an abnormal variation in speed or flight path. Manoeuvres that fall outside the definition of aerobatics include incipient spins, spins, stalls, spiral dives, and auto or winch launches. Tow aircraft unusual attitude training shall be carried out with a check/standards pilot onboard and is only authorized for training purposes up to +/- 45 degrees of pitch and 90 degrees of bank.

### FORMATION FLYING

2. Close formation flying in ACGP aircraft is **prohibited**.

3. Loose or en route formation to perform specific tasks, such as cross-country towing, equipment transport, or public relations photos may be authorized by the RCA Ops O or the delegated authority.

4. Loose or en route formation is defined as:

   a. **Lateral Separation.** Not less than 300 feet; and

   b. **Longitudinal Separation.** Not less than 2 000 feet.

5. When loose or en route formation is authorized, the following procedure shall be followed:

   a. authorization shall be obtained from the RCA Ops O or the delegated authority;

   b. a flight leader shall be designated;

   c. a pre-flight briefing shall be conducted covering pertinent information regarding the specific flight including weather, radio frequencies, route and emergency procedures; and

   d. only echelon formations may be flown.

### AIR DEMOS

6. RCA Ops Os may approve participation in air shows, air demos, etc. after consultation with and the concurrence of the appropriate Provincial Committee of the ACL. Details of approved participation shall be forwarded to NDHQ/NCA Ops O at least 15 working days prior to the event.

### PUBLIC RELATIONS FLIGHTS

7. Public relations/photo flights in ACGP aircraft during towing operations may be approved by the RCA Ops O.

8. Passengers shall be fully briefed on all aspects of the flight, including normal and emergency operating procedures. Special care must be taken to ensure that passengers are fully aware of the inherent danger of loose articles inside the confines of the cockpit, e.g. hand-held radios, cameras, etc., especially with respect to interference with aircraft controls.

9. Qualified ACGP personnel shall strap-in passengers for all public relations/photo flights in ACGP gliders or tow aircraft.

**RELEASE FOR FLIGHT AFTER ABNORMAL OCCURRENCE OR DAMAGE**

10. Any aircraft that has been subject to an abnormal occurrence, as defined in Standard 625, Appendix G, Canadian Aviation Regulations (CARs), or that has sustained damage must be inspected to retain its Certificate of Airworthiness.

11. TC has granted legal custody of the ACGP aircraft to DND. Additionally, in accordance with the DND/ACL MOA, DND has assumed operational and technical control of the ACGP aircraft at the request of the ACL.

12. Although CARs authorizes a licensed pilot, who is the operator of an aircraft, to carry out an inspection, DND, in accordance with its delegated authority and in the interest of Flight Safety, has restricted that authority such that only a TC licensed AME shall be allowed to determine the airworthiness and serviceability of an ACGP aircraft that has been subjected to an abnormal occurrence or damage.

13. Therefore, whenever an ACGP glider or tow aircraft has been subjected to an abnormal occurrence or has sustained damage during air or ground operations (regardless of the nature of the occurrence or the degree of the perceived damage), the Regional Gliding Engineering Officer or the Regional Gliding Engineering Officer's on-site delegate (providing the delegate has the required TC qualifications) has the sole authority to release the aircraft for flight.

**CREDITING OF TIME**

14. The ACGP shall comply with the following definitions in regards to the logging of time. Air time is the period of time commencing when the airplane leaves the supporting surface and terminating when it touches the supporting surface at the next point of landing. Flight time is defined as the time beginning from engine start for the purpose of flight until the engine is shut down. With respect to gliders and glider pilots, flight time shall be equal to air time.

15. ACGP glider pilots shall comply with the following directives regarding the logging of time:

a. For each sortie, flight time may only be logged in one column of the logbook.

b. Flight time shall be logged by the glider instructor acting as PIC in the instructor (INSTR) column for the following purposes:

(1) ab-initio training;

(2) currency, proficiency and upgrade flights;

(3) all glider conversion courses mandated by this manual;

(4) glider instructor course;

(5) glider instructor refresher training; and

(6) demo flights

c. When receiving instruction as referred to in para 15b, flight time shall be entered in the dual column (DUAL).

d. In all other instances, the designated pilot in command shall log flight time in the pilot column (PILOT).

16. ACGP tow aircraft pilots shall comply with the following directives regarding the logging of time:

a. When undergoing conversion, currency, proficiency or upgrade training while flying with a qualified Tow Aircraft Check or Standards Pilot who is the holder of a commercial or higher license which is valid for airplanes, the tow aircraft pilot shall log flight time in the dual column.

b. When undergoing conversion, currency, proficiency or upgrade training while flying with a qualified Tow Aircraft Check or Standards Pilot who is the holder of a private pilot license which is valid for airplanes, the tow aircraft pilot shall record flight time in the remarks column. This time cannot be credited towards total time for the purpose of license upgrade.

c. In all other instances, the designated PIC shall log the flight time in the PIC column.

# SECTION 6

# FAMIL, DEMO AND INSTRUCTIONAL FLYING IN ACGP TOW AIRCRAFT AND GLIDERS

## AIM

1. The aim of famil, demo and instructional flying in ACGP gliders and tow aircraft is to encourage and foster in the air cadets an interest in aviation. A building block approach, which is detailed in the paragraphs that follow, is used to accomplish this aim.

## PRE-FLIGHT BRIEFINGS

2. Before flight in ACGP aircraft, the air cadet shall receive a detailed briefing covering flight safety, the type of aircraft, the purpose and detail of the flight and emergency procedures.

## FAMILIARIZATION FLYING

3. Famil flights are the first building block and cater primarily to the young air cadet inexperienced in aviation. Famil flights are benign flights in either gliders or tow aircraft, executed to imbue the air cadet with the joy of flight and a desire to experience aviation in more depth

4. Famil flights in tow aircraft during towing operations may be authorized <u>only under the following conditions</u>:

   a. the activity is approved by the RCA Ops O (or equivalent);

   b. The PICs of the glider and the tow aircraft are designated in writing by the RCA Ops O;

   c. no training is being conducted in the glider and the glider pilot is at least a Glider Famil Pilot (Front Seat);

   d. the tow aircraft pilot has a minimum of 500 hours PIC with 200 hours PIC in an ACGP tow aircraft; and

   e. the air cadet is escorted to and from the tow aircraft and strapped-in by a qualified pilot who shall confirm that two-way communication has been established between the air cadet in the rear seat and the tow aircraft pilot.

## DEMO FLYING

5. Demo flights are the next building block in an air cadet's aviation progression, encompassing more complicated manoeuvres such as steep turns, stalls, spins and spiral dives that allow air cadets to experience in more depth, or to put into practice, aviation information or practical experience received during formal aviation studies. Demo flights, conducted in either gliders or tow aircraft, are for experienced air cadets, identified by aviation qualification or course of study, as follows:

   a. an air cadet attendee/graduate of the Introduction to Aviation Course;

   b. an air cadet attending the ACGP Glider Pilot Course or the TC Private Pilot Course;

   c. an air cadet who has achieved a TC Glider and/or Private Pilot Licence; and

   d. a senior cadet who has experienced glider flying several times and demonstrates an interest in more complicated manoeuvres.

6. Demo flights in tow aircraft are authorized provided the following conditions are first satisfied:

   a. approval by the RCA Ops O (or equivalent);

b. the air cadet passengers hold the qualifications detailed in paragraph 5;

c. the glider pilot holds an current instructor rating in accordance with TC regulations; and

d. the tow aircraft pilot has a minimum of 500 hours PIC with 200 hours PIC on the tow aircraft type.

7. Demo flights in gliders shall only be conducted by current ACGP glider instructors.

**INSTRUCTIONAL FLYING**

8. The third building block is flying training in ACGP gliders, conducted at one of the five RGSs over a six-week summer period. The course comprises approximately nine hours of flying training (49 flights – 29 dual and 20 solo). The detailed syllabus and standards are contained in Chapter 3, Glider Pilot Course.

# SECTION 7

# INSPECTIONS, EVALUATIONS, SURVEYS AND EXERCISES

## NATIONAL INSPECTIONS AND EVALUATIONS (Operations and Training)

1. A National Operations and Training Inspection and Evaluation Program is in place to assess each regional ACGP operation. The National program cycle will be repeated on a two to three year basis.

2. The purpose of the Operations and Training Inspection and Evaluation program will be to review regional procedures and activities with respect to the direction, policies, standards and SOPs as detailed in A-CR-CCP-242/PT-005, and to propose recommendations for the improvement of the efficiency, effectiveness and safety of the operation.

3. The ACGP SET, augmented by current tow aircraft and glider check pilots provided by the regions shall conduct the Flying Training Evaluations (FTE).

4. The evaluation will normally be conducted during the summer cadet flying training period in accordance with the ACGP National Evaluation Checklist, Annex B. Prior to each evaluation, the Director of Cadets will issue an evaluation instruction covering the administrative details with respect to Funding, Transportation, Accommodation and additional team requirements.

5. Regions will receive a verbal debriefing at the conclusion of the evaluation with respect to both findings and recommendations. A formal written report will follow that will provide for both regional and national comments. At the completion of the staffing process, the report will detail follow-up action requirements at the regional and/or national level. Information copies of the completed report will be sent to the other regions and to all assigned FSOs.

## NATIONAL INSPECTIONS AND EVALUATIONS (Technical)

6. On a biannual basis, DAEPM (TH) 8, the National Technical Authority, will conduct a technical audit at each regional ACGP maintenance and repair facility.

7. The purpose of the audit is to confirm that the necessary resources are available and that the aircraft and gliding equipment are being maintained in compliance with applicable regulations, standards and orders.

## NATIONAL STAFF ASSISTANCE VISITS

8. Annually, normally during the pre-solo flying training phase the National Cadet Air Operations Officer, and DAEPM (TH) 8 (National Technical Authority), will visit those RGSs not undergoing an Evaluation. Although not part of a formal SAV, ACGP SET personnel will attend all or part of RGS Instructor training and work-up phase for proficiency and the maintenance of qualifications. This flying will also be done at an RGS not undergoing an Evaluation that year.

9. The purpose of the visit will be to review RGS resources, facilities and organization and the flying and ground training activities (with respect to the direction, policies, standards and SOPs detailed in A-CR-CCP-242/PT-005), and to provide assistance, as required and requested, that will enable the RGS to conduct the scheduled training effectively, efficiently and safely.

## REGIONAL GLIDING SITE AND RGS OPERATIONAL INSPECTIONS

10. Prior to the commencement of flying at the regionally approved spring and fall famil sites, and the RGS, the RCA Ops O shall ensure that a thorough operational inspection of each location has been carried out. In order to ensure that complete and consistent inspections are effected, the RCA Ops O shall produce a Gliding Site Inspection Check-list that covers, as a minimum, the following:

a. the necessary liaison with, and authorization from, gliding site/airport authorities/owners;

b. a physical inspection of operating areas such as parking and tie-down locations, and ground manoeuvre, take-off and landing areas with respect to obstructions, aircraft operating limitations and general safety considerations;

c. a review, confirmation and/or update of local flying orders and SOPs, including normal operating procedures, emergency glider landing areas and operating restrictions with respect to local topographical and/or climatic conditions; and

d. a review, confirmation and/or update of local Crash Response Orders including liaison with local emergency response organizations.

11. The RCA Ops O shall ensure that the follow-up action taken on each observation is recorded in writing. Safety observations shall be actioned prior to flying taking place. Copy(s) of the Regional Gliding Site(s) inspection are to be filed and retained by the RCA Ops O for a period of two years.

**NOTE**

Crash Response Orders shall be developed in accordance with A-GA-135-001/AA-001, Flight Safety for the Canadian Forces, Chapter 7, Planning and Response Procedures.

**GLIDING SITE AND RGS FLIGHT SAFETY SURVEYS**

12. Each gliding site and RGS shall undergo an initial Flight Safety Survey during the first year of operation and every two years thereafter.

13. Prior to the commencement of the spring famil program, the RCA Ops O shall advise the FSOs designated by the CAS of the yearly schedule of flying activities at all the various locations, identifying which locations will require a Flight Safety Survey. Should the regular force FSO support not be available, the RCA Ops O shall assign the survey duty to a regional member of the ACGP who is a successful graduate of the Basic Flight Safety Course.

14. When the annual ACGP flying activities have been terminated at the end of the fall famil program, the RCA Ops O shall advise CAS/DFS and D Cdts/NCA Ops O which locations did not receive the scheduled Flight Safety Survey, in order to ensure that those particular locations receive a Flight Safety Survey priority for the following year.

15. When necessary, the RCA Ops O shall provide a Flight Safety-trained and qualified Tow Aircraft or Glider Pilot to assist the FSO in the conduct of the survey.

16. The Flight Safety Survey shall be conducted during normal flying operations in order to effectively assess the gliding site/RGS Flight Safety program in accordance with the ACGP Flight Safety Survey Guide, Annex A.

17. RCA Ops O shall co-ordinate distribution of the Flight Safety Surveys in accordance with the Distribution List detailed in Annex A.

18. The RCA Ops O shall ensure that the follow-up action taken on each "UNSATISFACTORY" assessment is recorded in writing. Unsatisfactory assessments directly affecting the safety of the flying operations shall be corrected prior to flying taking place.

**PRACTICE EMERGENCY RESPONSE EXERCISE**

19. Annually, the RCA Ops O shall ensure that a practice emergency response exercise is carried out at the RGS and all regional gliding sites in order to validate or amend, as necessary, established procedures.

## ANNEX A

## ACGP FLIGHT SAFETY SURVEY GUIDE

1. The following Assessment Codes apply:

   a. S = Satisfactory

   b. D = Satisfactory with Debriefing

   c. U = Unsatisfactory

| ACCIDENT PREVENTION PROGRAM | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 1. **Flight safety publications:**<br>~ incident/accident reports<br>~ magazines<br>~ posters<br>~ flashers<br>~ memoranda<br>~ bulletins<br>~ distribution<br>~ method of display | | | | |
| 2. **Flight safety films and video tape recordings.** | | | | |
| 3. **Flight safety briefings:**<br>~ frequency<br>~ seasonal<br>~ effectiveness | | | | |
| 4. **Standard Operating Procedures (SOPs):**<br>~ display<br>~ current/adequate<br>~ read and signed | | | | |
| 5. **Publications and amendments:**<br>~ availability | | | | |
| 6. **Facilities display:**<br>~ airfield layout<br>~ location | | | | |
| 7. **Marshalling signals in accordance with SOPs:**<br>~ compliance with orders<br>~ poster display | | | | |
| 8. **Radio procedures:**<br>~ standardization | | | | |

| ACCIDENT PREVENTION PROGRAM (continued) | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 9. **Aircrew:**<br>˜ qualifications | | | | |
| 10. **Aircrew:**<br>˜ proficiency | | | | |
| 11. **Aircrew:**<br>˜ currency | | | | |
| 12. **Operations:**<br>˜ launch control<br>˜ scheduling<br>˜ duty time limitations<br>˜ flying time limitations | | | | |
| 13. **Check-lists and publications for aircraft and equipment:**<br>˜ availability<br>˜ usage of pre-take-off and landing check-lists<br>˜ aircraft owner's manual | | | | |
| 14. **Aircraft handover:**<br>˜ check-list handover<br>˜ location | | | | |

| GLIDER OPERATIONS – GENERAL | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 1. **Checkouts:**<br>˜ thorough<br>˜ realistic<br>˜ simulated rope breaks<br>˜ in accordance with SOPS | | | | |
| 2. **Medical:**<br>˜ valid<br>˜ restrictions<br>˜ hazards posed by colds, etc<br>˜ procedures to ensure that aircrew cannot fly while medically unfit | | | | |
| 3. **Publications:**<br>˜ disseminated on time (Aeronautical Information Publication [AIP])<br>˜ VFR Supplement<br>˜ amendments distributed | | | | |
| 4. **Briefings:**<br>˜ location<br>˜ requirements to attend<br>˜ number per day<br>˜ special requirements<br>˜ current weather<br>˜ ops conditions<br>˜ emergency procedures | | | | |
| 5. **Launch Control Officer (LCO):**<br>˜ qualifications<br>˜ responsibilities | | | | |
| 6. **Launch personnel:**<br>˜ duties understood<br>– adherence to SOPs | | | | |

| **GLIDER OPERATIONS – GENERAL (continued)** | | | | |
|---|---|---|---|---|
| 7. **Weather/wind limitations:**<br>˜ daylight VFR only<br>˜ 90 crosswind limits:<br>2-33 8 knots/10 mph<br>Scout 15 knots/17 mph<br>L-19 10 knots/11 mph<br>NOTE<br>15 kts/17 mph for Stds/Check pilot conducting training only, see Ch 2 Sec 2 para 3)<br>˜ gusts not greater than 10 knots or 12 mph | | | | |
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 8. **Glider movements:**<br>˜ supervision<br>˜ sufficient personnel<br>˜ by hand when backwards<br>˜ by vehicle when forward | | | | |
| 9. **Glider parking in accordance with SOPs:**<br>˜ distance between gliders<br>˜ alignment and direction<br>˜ parked configuration<br>˜ spoilers extended<br>˜ low wing into wind<br>˜ tie-down in accordance with SOPs | | | | |
| 10. **Vehicular traffic:**<br>˜ control of movement | | | | |
| 11. **Spectators:**<br>˜ supervision | | | | |
| 12. **Pilot log books:**<br>˜ maintained and up to date<br>˜ log book certification for proficiency and qualifications | | | | |

| GLIDER OPERATIONS – EMERGENCY PROCEDURES | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 1. **Occurrence response plan:**<br>˜ effectiveness<br>˜ warning system<br>˜ transport to site<br>˜ photographer/camera<br>˜ personnel knowledgeable of plan | | | | |
| 2. **Grid maps:**<br>˜ available and current<br>˜ understood by drivers | | | | |
| 3. **Crash alarm system.** | | | | |
| 4. **Vehicles to crash site:**<br>˜ rules governing vehicle movement<br>˜ control of vehicles by tower<br>˜ markings<br>˜ current weather<br>˜ ops conditions<br>˜ emergency procedures | | | | |
| 5. **Crash responsibilities:**<br>˜ recovery of wreckage<br>˜ wreckage guards<br>˜ wreckage schematic<br>˜ crash trailer and crash site equipment | | | | |
| 6. **Notification to:**<br>˜ local fire fighters<br>˜ local police/RCMP<br>˜ CF Flight Safety personnel | | | | |
| 7. **Availability of ambulance:**<br>˜ response time<br>˜ capability | | | | |
| 8. **Fire extinguishers:**<br>˜ spot checks in hangars, flight line, aircraft and winch<br>˜ up to date<br>˜ knowledge of use | | | | |
| 9. **Emergency procedures:**<br>˜ knowledge and practice<br>˜ take-off abort<br>˜ emergency release<br>˜ non-release<br>˜ rope/cable breaks<br>˜ off-field landing | | | | |

| AIR SERVICES | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 1. **Bird strike:**<br>˜ records, i.e. CF 218 | | | | |
| 2. **Airfield condition:**<br>˜ ramps, taxiways, runways, lighting, approaches, over-run areas, in-field areas<br>˜ method of disseminating previously discussed information to users | | | | |
| 3. **Weather services:**<br>˜ access to current and forecast conditions<br>˜ information displayed<br>˜ information updated, i.e. use of PIREPs | | | | |
| 4. **Control tower:**<br>˜ communications with all glider operations<br>˜ local glider procedures<br>˜ visibility of entire glider ops and traffic patterns<br>˜ tower control of gliders and tow aircraft<br>˜ tower control of vehicles on airfield | | | | |

| MAINTENANCE AND SERVICING | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 1. **Relationship with FSOs:**<br>˜ mutual exchanges of information | | | | |
| 2. **Flight Safety publications:**<br>˜ poster displays<br>˜ "Safety Comment" forms availability and use<br>˜ aircraft accident summaries | | | | |
| 3. **Use of intake duct plugs:**<br>˜ tow planes | | | | |
| 4. **Foreign object damage (FOD) program:**<br>˜ airfield inspections<br>˜ no loose equipment in cockpits | | | | |
| 5. **Flight testing:**<br>˜ approved personnel<br>˜ check-lists used | | | | |
| 6. **Maintenance administration:**<br>˜ equipment inspections<br>˜ snags recorded<br>˜ aircraft technical logs up to date<br>˜ corrective action on snags<br>˜ storage conditions<br>˜ cleanliness of aircraft and hangar. | | | | |

**SAFETY SYSTEMS**

| Items to be checked | S | D | U | Findings |
|---|---|---|---|---|
| 1. **Life support equipment:**<br>˜ proper type<br>˜ well maintained<br>˜ storage<br>˜ inspections valid | | | | |
| 2. **Personnel-issue in accordance with Scale of Issue:**<br>˜ users fitted and briefed on equipment care and handling procedures for overdue equipment. | | | | |
| 3. **Emergency Locator Transmitter (ELT):**<br>˜ availability<br>˜ usage | | | | |
| 4. **Crash response: ****<br>˜ equipment **<br>˜ availability<br>˜ usage | | | | |

** Crash response equipment shall include the following items (refer to Chapter 2, Section 2, paragraph 16):

a. first aid kit;

b. disposable camera;

c. rescue knife (harness cutter);

d. two fire extinguishers;

e. a vehicle capable of transporting equipment and personnel to within proximity of the crash site;

f. crash axe;

g. fire-fighter’s combination tool; and

h. two wool blankets.

**NOTE**

If an airport crash response system is available, then the mandatory equipment list may be reduced to items a, b, c, d, and e.

| TRAINING | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 1. **Supervisor training:**<br>˜ frequency | | | | |
| 2. **Local surveys:**<br>˜ regular and systematic<br>˜ adequacy of corrective action<br>˜ use of FSO resources | | | | |
| 3. **Glider school lectures in accordance with directives:**<br>˜ lesson plans<br>˜ adequacy<br>˜ according to syllabus<br>˜ training aids | | | | |

| AIR TOW LAUNCH PROCEDURES | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 1. **Air tow launch crew:**<br>˜ number of crew three (3) minimum<br>˜ briefed on operation<br>˜ understand duties | | | | |
| 2. **Position of signallers:**<br>˜ wingman<br>˜ tow aircraft signaller 45 degrees ahead of aircraft, 50' away from takeoff path, facing wingman and aircraft | | | | |
| 3. **Tow rope attachment procedure:**<br>˜ only when glider ready<br>˜ ropes in accordance with SOPs<br>˜ condition of rope checked | | | | |
| 4. **Pre-takeoff checks:**<br>˜ back release and forward release checked at start of daily operations<br>˜ in accordance with check-list | | | | |
| 5. **Signals:**<br>˜ verbal and hand signals<br>˜ usage in accordance with SOPs<br>˜ clear and understood | | | | |
| 6. **Tow aircraft handling procedure:**<br>˜ take-off and climb in accordance with SOPs<br>˜ 15 to 20 degrees of bank<br>˜ release descending left turn<br>˜ rope drop in designated area<br>˜ landing clearance of trailing tow rope | | | | |

| WINCH LAUNCH PROCEDURES | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 1. **Winch launch crew:**<br>˜ number crew (four minimum)<br>˜ briefed on operation<br>˜ understand duties<br>˜ certified winch operators | | | | |
| 2. **Winch cable and attachment:**<br>˜ conditions checked<br>˜ only when glider ready<br>˜ multiple winches; correct cable installed<br>˜ downwind glider launched first | | | | |
| 3. **Winch launch signalling:**<br>˜ adequate signals used<br>˜ easily seen by crews<br>˜ correct usage | | | | |
| 4. **Signals:**<br>˜ mechanical<br>˜ verbal and hand signals<br>˜ clear and understood<br>˜ usage in accordance with SOPs | | | | |
| 5. **Takeoff and climb:**<br>˜ technique<br>˜ initial climb shallow<br>˜ Safety Altitude: 200 feet AGL<br>˜ Safety Speed: 50 mph<br>˜ maximum climb speed 69 mph | | | | |
| 6. **Climb control procedure:**<br>˜ yaw to reduce power<br>˜ release if too slow | | | | |
| 7. **Cable break procedure:**<br>˜ glider in flying attitude<br>˜ non-release signals and procedure | | | | |
| 8. **Cable retrieving:**<br>˜ signals<br>˜ originated by winch ops<br>˜ maximum speed of 15 mph to lay or retrieve cable | | | | |

| AUTO LAUNCH PROCEDURES | | | | |
|---|---|---|---|---|
| **Items to be checked** | **S** | **D** | **U** | **Findings** |
| 1. **Auto launch crew:**<br>˜ number of crew (four minimum)<br>˜ briefed on operation<br>˜ understand duties<br>˜ certified vehicle driver and observer | | | | |
| 2. **Auto tow cable and equip:**<br>˜ in accordance with SOPs | | | | |
| 3. **Cable attachment:**<br>˜ only when glider ready | | | | |
| 4. **Auto tow launch:**<br>˜ from runway or hard surface | | | | |
| 5. **Position of signallers:**<br>˜ launch vehicle observer in place | | | | |
| 6. **Signals:**<br>˜ verbal and hand signals<br>˜ clear and understood<br>˜ usage in accordance with SOPs | | | | |
| 7. **Take-off and climb:**<br>˜ technique<br>˜ initial climb shallow<br>˜ Safety Altitude: 200 feet AGL<br>˜ Safety Speed: 50 mph<br>˜ maximum climb speed 69 mph | | | | |
| 8. **Climb control procedure:**<br>˜ yaw to reduce power<br>˜ release if too slow | | | | |
| 9. **Cable break procedure:**<br>˜ glider in flying attitude<br>˜ non-release signals and procedure | | | | |
| 10. **Cable retrieving:**<br>˜ parachute not dragged | | | | |

**FLIGHT SAFETY SURVEY DISTRIBUTION LIST (**to be co-ordinated by the RCA Ops O)

1. Region Cadet Support Unit (RCSU) Commanding Officer (CO).
2. RCA Ops O.
3. Assigned FSO.
4. NDHQ/DCdts 4˜6.
5. CAS/DFS 2-6.
6. ACGP SET
7. 1 CAD/DFSO

# ANNEX B

## AIR CADET GLIDING PROGRAM
## NATIONAL EVALUATION CHECKLIST

### PART A - INTRODUCTION

1. States the purpose of the evaluation.

2. Should the Evaluation Team be directed to place emphasis on a particular part of the evaluation, that direction will be recorded here.

### PART B - STATUS OF PREVIOUS RECOMMENDATIONS

1. Review recommendations of previous evaluations with action addressee(s) (national and/or regional) to ensure that action has been taken.

2. Formal confirmation of action taken to be provided to the Evaluation Team.

3. Problems/concerns noted by the Evaluation Team or raised by the region.

### PART C - ORGANIZATION and MANNING

1. Review of organization charts, span of control and manning status. Have organization/manning shortfalls been identified to the regional/national authority. What action is outstanding?

2. Assess staff workload.

3. Are pilots with the required qualifications strategically located within the region?

4. Problems/concerns noted by the Evaluation Team or raised by the region.

### PART D - PUBLICATIONS

1. Review for currency and compliance:

   a. ACGP Manual (Ref: 242, Chapter 1, Section 1);

   b. Region/Zone/Centre/Site Flying Orders (Ref: 242, Chap 1, Section 1);

   c. Pilot Information File (Ref: 242, Chapter 1, Air Standards, Section 1); and

   d. Aircraft Checklists. Manual of Flying Training Tow Aircraft – Scout/L-19

2. Is there a publication system in effect that addresses?

   a. control and distribution;

   b. amendment mechanism; and

   c. bilingualism (where applicable).

3. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART E - LOG BOOKS**

1. Number of log books examined.

2. Check for proper certification. (Ref: 242, Chapter 1, Section 4)

3. Are flights being properly recorded?

4. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART F - PILOT TRAINING RECORD/QUALIFICATIONS**

1. Are Pilot Training Records maintained as directed? (Ref: 242, Chapter 1, Section 1)

2. Crosscheck Pilot Training Records and log-books against qualification standards to ensure that personnel are qualified to hold their assigned positions. (Ref: 242, Chapter 1, Section 3)

3. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART G - ANNUAL PROFICIENCY CHECK PROGRAM**

1. Review annual proficiency program carried out prior to the commencement of the Spring Familiarization Program at all levels (region, province, zone, site, etc.) for completeness.
   (Ref: 242, Chapter 1, Section 4).

2. Are examinations being written and de-briefed as directed?
   (Ref: 242, Chapter 1, Section 4)

3. Are check flights being carried out as directed?
   (Ref: 242, Chapter 1, Section 4)

4. Are the examination results and flight check results properly documented? (Flight Test Cards, Log Books, Training Records, etc.)

5. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART H - STANDARDS**

1. Is there a Standards Officer at the RGS or the gliding site(s). Is the position a dedicated or shared position? Is there a conflict of interest between the shared positions?

2. Is the position filled by a qualified individual?

3. How does the position fit into the chain of command? Is there a conflict of interest?

4. What indoctrination/monitoring procedures are used with new instructors and familiarization pilots?

5. How are ground school and flight line instructors monitored? What information is gathered?
   Who is the OPI(s)? What is the follow-up procedure?

6. How are the student records monitored? By whom? What is the feedback procedure?

7. Is there effective liaison between Standards/Flight line/Ground School?

8. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART I - STAFF/STUDENT EVALUATION FLIGHTS**

1. Number of flights conducted by Evaluation Team:

    a. instructor:

    b. student:

    c. tow pilot:

    d. other:

2. Results of flights (observations and recommendations on individual flights will be made if necessary and presented to the Flt Comd/CFI/RCA Ops O).

3. What is the overall quality of briefings, flights and debriefings?

4. Is the Progress Book properly constructed and maintained IAW direction contained in the 242 (Ref: 242, Chapter 3, Section 1)

5. Are Progress Cards completed properly? Are Proficiency Levels, Overall Flight Rating and Instructor's Comments being applied?
(Ref: 242, Chapter 3, Section 1)

6. Is there effective liaison between the CFI, the Flt Comd’s and the instructors? Is the chain of command respected? What mechanism(s) is (are) used to ensure effective review of student progress?

7. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART J - OPERATIONS**

1. Are glider launch and recovery procedures properly carried out IAW applicable orders (air tow, winch/auto launch)? (Ref: 242, Chapter 2, AOIs and SOPs);

2. Are sufficient qualified support personnel available for the type of launch being carried out?

3. Is effective, proactive supervision being administered by the CFI, Flt Comd/Gliding Site Comd?

4. Is the Launch Control Officer qualified, knowledgeable and exercising firm control?

5. Is the daily operations briefing complete, covering all aspects of the day's operation (weather, operations, emergencies)? (Ref: 242, Chapter 2, Section 2)

6. Is the weather closely monitored? Is wind speed and direction directly available (control tower, FSS, anemometer, etc.)?

7. Are bad weather activities planned in advance for students and staff? and

8. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART K - GROUND SCHOOL**

1. Are sufficient qualified instructors available?

2. Do lesson plans comply with the 242? (Ref 242, Chapter 3, Section 4)

3. How are the instructors monitored (how often, examination of lesson plans, etc.)?

4. Review documentation (student records, exam results, course critiques).

5. Are the classrooms adequate (size, temperature, furniture, chalk boards).

6. Are the required audio-visual aids available and in satisfactory condition? Are there any problems obtaining training aids and maintaining their serviceability?

7. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART L - GLIDER SITE/RGS INSPECTIONS**

1. Are inspections carried out as directed? (Ref: 242, Chapter 1, Section 7)

2. Is the inspection checklist adequate?

3. Have written follow-up procedures been established to confirm that inspection deficiencies have been corrected?

4. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART M - MAINTENANCE**

1. Are there sufficient aircraft resources and support equipment to meet the requirements of the spring and fall familiarization programs and the RGS?

2. Is there effective liaison and coordination between operations and maintenance staffs concerning the availability of tow aircraft, gliders and support equipment to meet the short and long term goals of the flying program?

3. Is there effective liaison between the engineering staff and the national technical authority?

4. Are equipment unserviceabilities recorded as directed?

5. Are test flight cards available and used for tow aircraft and gliders?

6. Are maintenance test flights properly authorized and designated?
(Ref: 242, Chapter 1, Section 3)

7. Is base support adequate?

8. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART N - FLIGHT SAFETY PROGRAM**

1. Is there a FS survey schedule published for the calendar year?

2. Is WFSO support adequate? Are these resources sufficient to carry out the scheduled surveys? If not, what regional alternatives have been established to ensure the timely and objective completion of the survey requirements? (Ref 242, Chapter 1, Section 2)

3. Are the FS surveys conducted as directed (format, distribution, etc.)? (Ref 242, Chapter 1, Section 7)

4. Have written follow-up procedures been established to ensure that deficiencies identified in the survey have been corrected?

5. Are the FS programs at the region, RGS and gliding sites proactive, aggressive and effective (committee, briefings, posters, etc.)?

6. Are there sufficient FS-qualified personnel at the region, RGS and gliding sites?

7. Are there sufficient FSO training slots available to meet the region requirements?

8. Are Practice Emergency Response exercises carried out as directed? (Ref: 242, Chapter 1, Section 7)

9. Are Practice Emergency Response checklists available and are the responsible supervisors fully knowledgeable with their use? Are the checklists dated with respect to currency? How often are the checklists reviewed and updated?

10. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART O - BASE SUPPORT**

1. Evaluators to include a general statement on the overall support provided by the host base(s).

2. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART P – LEAGUE SUPPORT**

1. Evaluators to include a general statement on the overall support provided by the Provincial League(s).

2. Problems/concerns noted by the Evaluation Team or raised by the region.

**PART Q - TEAM LEADER'S COMMENTS**

1. General statement on the overall evaluation results.

2. Remarks concerning the leadership and supervision provided at the various organization levels, e.g. proactive, reactive, positive, negative, etc:

   a. Gliding Sites: RCA Ops O, Gliding Site Comd’s, LCOs; and

   b. RGS: RCA Ops O, RGS CO, CFI, Flt Comd’s, LCOs.

3. Remarks concerning the effectiveness of the familiarization and/or instructional staff with respect to knowledge of orders and directives, flying ability, airmanship, instructional technique (as applicable) and flight safety.

4. Highlight serious deficiencies.

5. Make additional observations and recommendations as required.

# CHAPTER 2

# AIRCRAFT OPERATING INSTRUCTIONS AND STANDARD OPERATING PROCEDURES

**NOTE**

ACGP aircraft and equipment shall be inspected, maintained and operated in accordance with the manufacturers' operating instructions, TC Directives and Regulations, standards and procedures detailed in this manual, and Supplementary Regional Orders and Procedures.

## SECTION 1

## SCHWEIZER 2-33 GLIDER

### INTRODUCTION

1. A limited description of the Schweizer 2-33 and some basic procedures involving assembly and pre-flight inspection are provided in the paragraphs that follow. The 2-33 Sailplane manual produced by Schweizer Aircraft Corporation is the legal controlling document that must be carried on board the aircraft during flight. The information contained in this section is adapted from that manual.

### GENERAL DESCRIPTION

2. The 2-33 is a conventional two-place tandem intermediate training glider manufactured by Schweizer Aircraft Corporation, Elmira, New York. Its construction is all metal with a fabric cover on the fuselage and tail surfaces. It has a one-piece canopy for increased visibility. The wings are tapered in the outboard section and have spoilers/dive brakes incorporated.

3. **Overall dimensions and characteristics**. The following are applicable:

| | |
|---|---|
| Length | 25 feet 9 inches |
| Span | 51 feet 0 inches. |
| Height | 9 feet 3-1/2 inches |
| Wing Area | 219.48 square feet |
| Aspect Ratio | 11.85:1 |
| Basic Weight | 600 lb [1] |

**Note**: **1**. Some ACGP gliders may be heavier due to equipment additions.

### FLIGHT CONTROLS

4. **Tow Release Knob.** The following are applicable:

   a. **Front.** Located at centre bottom of instrument panel.

   b. **Rear.** Located at top left of front seat back.

   c. **Operation.** To release, pull red knob out fully.

5. **Spoiler and Brake Lever.** The following are applicable:

   a. **Front.** Located on the left side of cockpit below the level of the instrument panel.

b. **Rear.** Located at centre of left side of cockpit.

c. **Operation.** Push forward and down to unlock, and pull straight back to desired position. The wheel brake is actuated when the spoiler handle is brought fully to the rear within the last 1/2-inch of its travel. The rearward pressure applied on the spoiler handle controls the degree of braking. The following apply:

(1) When flying with dive brakes extended, the stall speed of the 2-33 is 36 mph solo and 40 mph dual. It is unsafe, however, to make an approach with dive brakes open in the speed range of 36 to 43 mph, as the rate of descent is so great that a proper flare-out for landing cannot be made.

(2) Beginning with 2-33 Serial No. 500, a new main landing wheel, including a hydraulic brake installation, is provided, superseding the mechanical brake. The hydraulic brake is rigged so that it is actuated only at the extreme aft position of the dive brake/wheel brake control handle. The main wheel is a split-rim type incorporating a Cleveland Model 30-63D hydraulic brake. This is a disc-type brake, actuated by a Gerdes Products A049-3P master cylinder located adjacent to the control bellcrank on the left hand side, aft of the rear seat.

6. **Control Column.** Front and rear controls are conventional in design and are mounted on a single torque tube (see Figure 2-1-1).

7. **Rudder pedals.** The following are applicable:

a. **Front.** The conventional left and right toe pedals are located forward of the floor board and are adjustable.

b. **Rear.** The conventional left and right pedals, located on either side of the front seat, are not adjustable.

8. **Trim Lever.** One of three types of trim control is provided in the front cockpit, depending on the year of manufacture of the glider:

a. a bungee-type control mounted on the left cockpit wall below the spoiler handle; or

b. a bungee-type control mounted on the floor in front of the control column; or

c. a ratchet-type control mounted on the base of the control column.

9. **Instruments.** Flight instruments are mounted on the instrument panel in the front cockpit and shall consist of, as a minimum, an altimeter, ASI, VSI and magnetic compass.

10. **Optimum Flying Speeds.** The following are applicable:

| | |
|---|---|
| Best Gliding Speed Dual (23:1) | 50 mph |
| Best Gliding Speed Solo (23:1) | 45 mph |
| Minimum Sinking Speed Dual (3.1 feet per second) | 42 mph |
| Minimum Sinking Speed Solo (2.6 feet per second) | 38 mph |

11. **Flight Limitations.** The following operating limits are critical to safe flight and must be adhered to by all ACGP glider pilots. The following is provided by the manufacturer for the 2-33 at 1,040 lb gross weight:

| | |
|---|---|
| Dive (never exceed, brakes open or closed) | 98 mph |
| Air tow (never exceed) | 98 mph |
| Begin manoeuvring with caution | 65 mph |
| Spoilers extended (never exceed speed) | 98 mph |
| Auto and winch tow (never exceed speed) | 69 mph |

**NOTES ON FLIGHT LIMITATIONS**

1. Over 65 mph, the pilot must manoeuvre with caution. Although the maximum load factor of 4.67 should never be exceeded, the pilot can do so inadvertently with abrupt manoeuvres. Speeds between 65 mph and the 98 mph shall be treated as a cautionary range and manoeuvring within this range should be reduced to a minimum as velocity increases.
2. A safety factor of 1.5 is required for certification giving an ultimate load factor of 7.0 to allow for material variations and inadvertent atmospheric conditions. Because of its light wing loading, the 2-33 can develop very high loads if speed limitations are not rigidly observed.

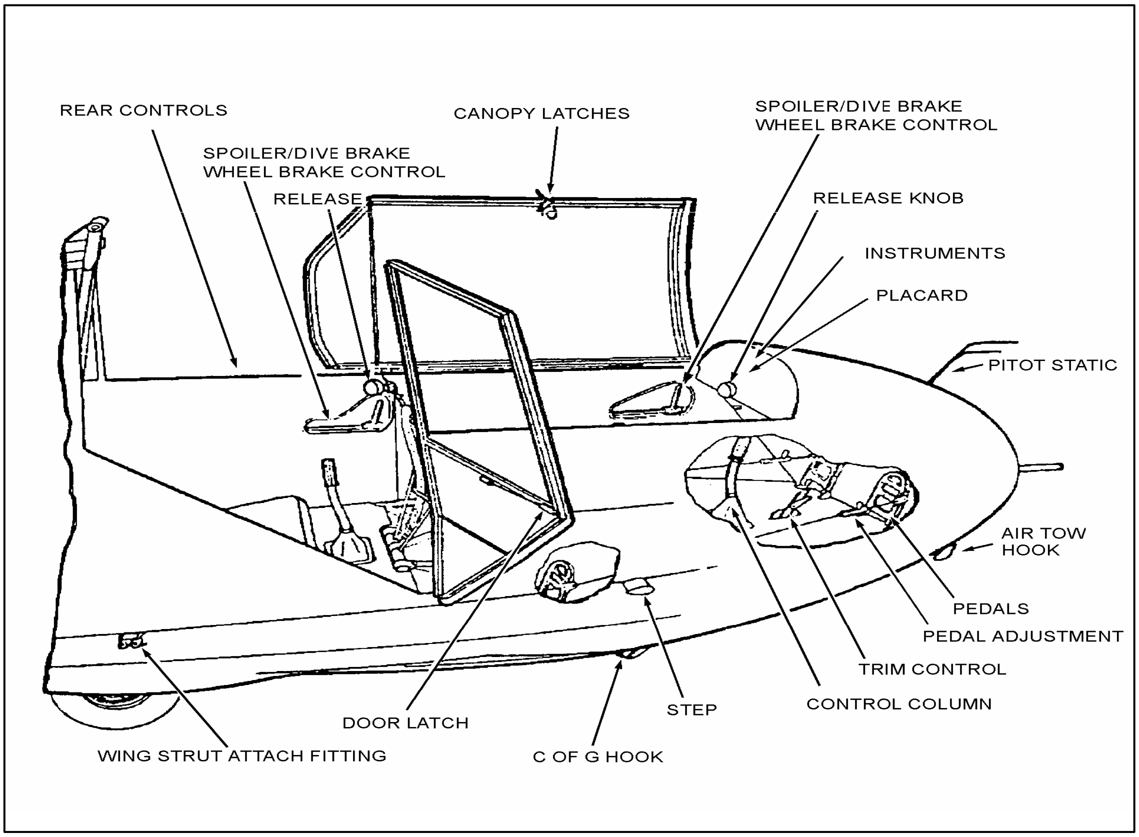



Figure 2-1-1 2-33 Cockpit and Controls

12. **Winch/Auto Launches** – **Use of C of G and Forward Tow Hooks.** Winch or auto launches may be executed using either the forward or the C of G tow hook, although using the C of G tow hook will result in a higher launch altitude. There is no tendency to oscillate with either method.

13. **Stalls.** Stalls are very gentle and always straight ahead with no tendency to fall off to either direction, unless the glider is in a forward slip, in which case it may drop toward the trailing wing. Buffeting usually occurs before the stall. Buffet may not be present if moisture is accumulating on the wing surfaces and the glider may develop a high sink rate with little or no other indications of a stalled condition. The following are applicable:

**WARNING**

Due to various differences in the 2-33, these gliders may stall as much as 5 mph faster than the placard speeds. Stall speeds in precipitation may be 2-4 mph higher due to aerodynamic degradation of wing surfaces and increased position error of the pitot-static system.

| | |
|---|---|
| Stall Speed Solo | 34 mph |
| Stall Speed Dual | 38 mph |
| Stall Speed Solo (with dive brakes open) | 36 mph |
| Stall Speed Dual (with dive brakes open) | 40 mph |

14. **Spins.** The 2-33 will spin depending on the weight of pilots and equipment, etc. Care should be taken to avoid stalls and spins at low altitude by using extra speed.

**WEIGHT, BALANCE AND PLACARDS**

15. **Weight and Balance.** The glider must be operated within the maximum limit of gross weight, and it must be balanced within the forward C of G limit and the rearward C of G limit. The weight and empty C of G of each glider is determined at manufacture or on subsequent reweighing, and this information must then be used to calculate the operational weight and balance. A 19 pound removable ballast will be needed by some pilots to keep the C of G within approved limits. An Excel program has been developed to determine the C of G envelope of each 2-33. See Annex E for a manual example of weight and balance calculations for any 2-33.

16. **Loading Graph**. Each 2-33 shall have a Loading Graph (see representative example in Figure 2-1-2 below, stored in an easily visible area of either cockpit, which will allow the pilot to easily determine the correct loading, solo or dual, with or without ballast. Proper loading must be confirmed by the pilot before each flight.

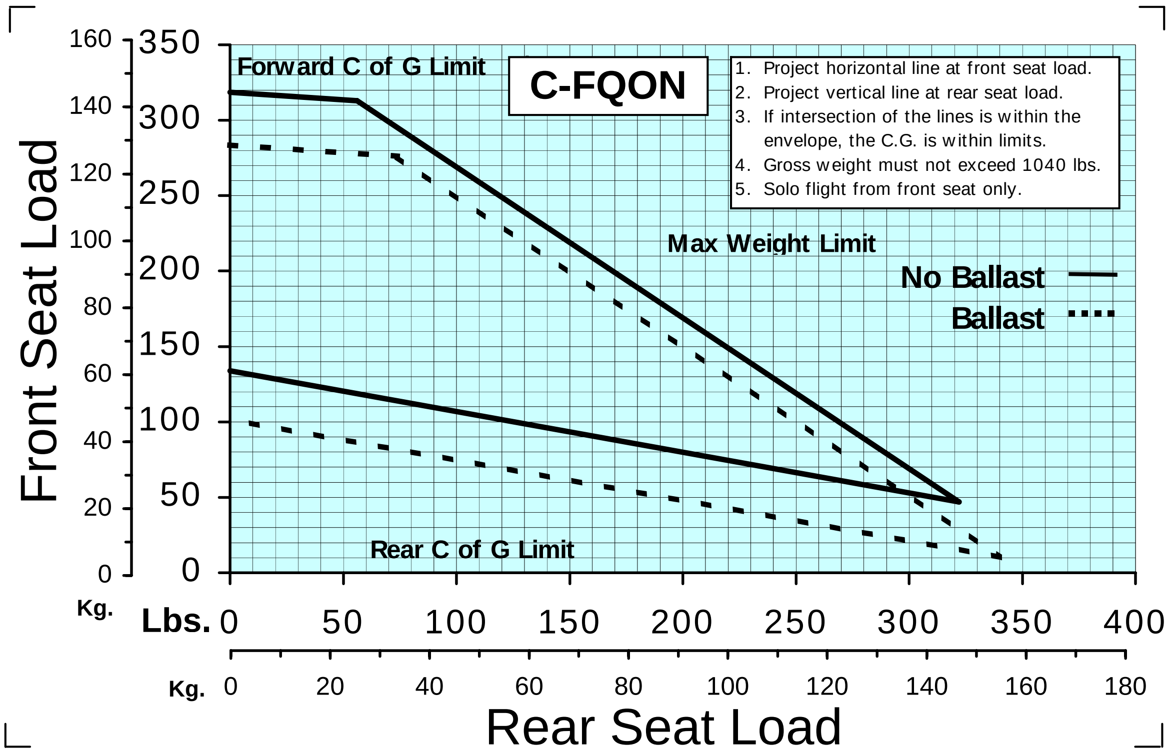



Figure 2-1-2 2-33 Loading Graph

17. **Placards.** Placard weights are also installed in the cockpit of the 2-33. See the following example for details:

| | |
|---|---|
| Maximum weight aft pilot/220 lb forward | 150 lb |
| Minimum weight aft pilot/100 lb forward | 120 lb |
| Minimum weight forward pilot solo | 134 lb |

a. **Maximum Weight Aft Pilot/220 Forward** – **150**. If the front seat pilot weighs 220 lb, then the maximum weight of the rear passenger cannot be more than 150 lb, since the maximum useable load for this glider is 370 lb (220 plus 150). Adherence to this placard is essential to ensure that the useable maximum weight of the glider is not exceeded.

b. **Minimum Weight Aft Pilot/100 Forward** – **120**. If the front seat pilot weighs 100 lb, then the minimum weight of the rear passenger cannot be less than 120 lb, in order to properly balance the glider. Adherence to this placard is essential to ensure that the aft C of G is maintained within the approved limit.

c. **Minimum Weight Forward Pilot, Solo** – **134**. Adherence to this placard is essential to ensure that the C of G is maintained within approved limits for solo flight. Ballast weight must be added if the weight of the pilot is less than the placard minimum.

**SPIRALLING IN THERMALS**

18. **Stall and Buffeting Speeds.** To remain aloft or gain altitude in a thermal, it is necessary to spiral. The average thermal diameter is quite small requiring a fairly steep bank. Although this is general practice, it is not necessary in areas where large diameter thermals are found. The best flying speed in any thermal at any degree of bank is 1 or 2 mph above the buffet before the stall as the example that follows illustrates:

**WARNING**

Due to various differences in the 2-33, these gliders may stall as much as 5 mph faster than the placard speeds.

| | SOLO | DUAL |
|---|---|---|
| Stalling speed (level flight) | 34 mph | 38 mph |
| Stalling speed (30 degree bank) | 36.5 mph | 41 mph |
| Buffeting speed | 34 to 37 mph | 39 to 42 mph |
| Spiralling speed | 39 mph | 43 mph |

19. The minimum sink and stalling speeds are directly proportional to the angle of bank. Sometimes it is necessary to bank steeply and sacrifice slow speed and low sink to remain within the limits of the thermal. This is especially true in strong, small diameter thermals.

**SLIPPING**

20. The 2-33 can be slipped both while moving forward and while turning. A slipping turn is done in a normal manner, but due to limited rudder area, the forward slip must be done with a little low wing and full rudder. The airspeed shall be a minimum of 50 mph solo and 55 mph dual to ensure controllability and to prevent inadvertent spin entry as the result of a stall.

**ERECTION PROCEDURE FOR THE 2-33**

21. Considering that the glider may be dis-assembled and assembled rather frequently, the number of bolted attachments is kept to a minimum. However, all of the attachment fittings may be made with the appropriate AN bolts, nuts and cotter pins specified in the maintenance manual. The LS-1 safety pin is an acceptable alternate for the No. 1 and 2 commercial safety pins.

22. **Removal from Open Air Trailer.** The erection of the 2-33A glider is accomplished beginning with the removal from the trailer

a. Position trailer into the wind or place trailer in a protected area. Remove trailer from towing vehicle and block the trailer wheels.

b. Block and stabilize the trailer in a nose down attitude.

c. Remove the wing-to-trailer tie-downs.

d. Support the wing to prevent twisting and remove the wing to trailer upper attachment pin.

e. Remove the wing to trailer lower attachment pin.

**NOTE**

The RH wing is mounted on the trailer left hand and the LH wing is mounted on trailer right side

**CAUTION**

Raise wing high enough to prevent the wing from striking the trailer saddles and fenders

f. Remove the wing from the trailer and place the wing on ground protection.

g. Repeat 2c through 2f for the other wing.

h. Support the glider fuselage. Remove the glider rear wheel bracket to trailer attachment.

i. Block and stabilize the trailer in a nose up position.

**CAUTION**

To prevent damage to the glider fuselage, maintain clearance between the fuselage and the trailer stabilizer mount uprights.

j. Remove the fuselage to trailer front tie-downs and **carefully** roll the glider back out of the trailer wheel well and off the trailer.

23. **Aircraft Assembly.** Wing and strut attachment AN bolts with a minimum grip length of 1-13/16 inches must be MPI inspected prior to use. Affected bolts will have a green dye applied indicating the inspection has been completed. Some aircraft fuselage rear wing fittings and wing attachment fittings with worn holes may have been reworked to accept an AN7 bolt. If an AN 7 bolt is required, the wing root area will be stencilled to indicate the proper attachment hardware.

a. Position the glider upright. Attach the left and right wing struts to the fuselage with AN7 (7/16-inch) bolts, washers, nuts and safety pins.

b. Lift and place LH wing in position and attach to the fuselage with an AN7 bolt in the front fitting and an AN6 bolt in the rear fitting. Install spacers on the nut side. Install the nut finger tight so the spacer can still be rotated by hand. Install safety pin.

c. The wing tip outrigger wheel is installed by inserting the ferrule on the spring assembly into a hole in the lower side of the wing. Secure in place using an AN36A bolt, with a washer under the head.

d. Raise LH strut and attach to the wing strut fitting with AN7 bolt with washer under head and nut. Install the nut and safety pin.

e. Attach aileron push-rod to bellcrank to the fuselage bellcrank using an AN393-25 clevis pin and safety pin.

**NOTE**

While aligning the RH swing into position, with both wing dive brakes closed, check that the dive brake torque tube fittings (bolt and slot) are properly positioned to mesh

f. Repeat paragraphs 23.a. through 2d for the RH wing installation.

g. Attach the fuselage dive brake push tube to the LH wing torque tube bellcrank. Use an AN393-21 clevis pin and secure with safety pin.

h. Re-check each wing for proper installation and safety.

i. Install the wing gap cover. The Plexiglas assembly is put in place between the wing leading edges and secured with the aerolock studs. The back gap cover assembly is then hooked over the wing trailing edges, and the pierced strap is inserted in the link-up mechanism and tightened with a screwdriver. Connect the radio antenna. Install the head protector and wing root liners.

24. **Installation of Stabilizer and Elevator.**

a. With the horizontal stabilizer strut attachment fittings on the bottom, place assembled elevator and stabilizer into position. Secure the horizontal stabilizer front and rear spar fittings to the fuselage with AN4 bolts, AN960-416L washers, and AN365428 nuts.
b. Place the stabilizer struts in position and secure each with AN7 bolts, an AN960-10 washer, an AN310 nut and safety pin.

d. Connect elevator push-rod to elevator horn with an AN4-6 bolt, AN310-4 nut, AN960-416 washer and a safety pin.

25. **Post Assembly Inspection.** A post assembly inspection shall be performed to ensure the aircraft has been assembled properly and that:

a. the aircraft was assembled in compliance with the maintenance instructions;
b. all controls move freely and in the correct direction with no binding or lost motion;

c. all control components are properly safetied;

d. both dive brakes open equally, and the wheel brake activates at the end of the control travel; and

e. ailerons are neutral in conjunction with the control column position. Rudder is in neutral in conjunction with the rudder pedals

26. **Post Assembly Independent Inspection.**

a. Complete and sign GLIDER FINAL ASSEMBLY CHECK-LIST.

**NOTE**

**Ensure that two entries are made in the journey log**. Suggested entries as follows:

"Aircraft assembled in compliance with the 2-33A parts and maintenance manual section A"
(Signature)

"Flight controls checked for correct assembly, locking and sense of operation"
(Signature)

**These signatures do not have to done by an AME but by persons duly qualified for elementary work and independent checks by the RCA Ops O or RG Eng O,**

## PRE-FLIGHT INSPECTION

27. Inspect for condition, operation and security of attachments and any signs of failure (see Figure 2-1-3):

a. **Cockpit/Interior Fuselage:**

(1) Check canopy for condition, cleanliness; check canopy attachment points and latch.

(2) Check instruments, radio, ballast and battery.

(3) Check release mechanism, front and rear.

(4) Check control column and rudder pedals for security and wear.

(5) Check trim lever for freedom of movement and effectiveness.

(6) Check rear door hinge, catches and rear window attachment points.

(7) Check control cables and pulleys for security and wear.

(8) Check wing pins for position and wing bolts for wear.

(9) Check brake and spoiler connections for security.

(10) Check interior of fuselage for signs of wear.

(11) Check for proper seat and back cushions and spacers.

b. **Right Wing/Fuselage:**

(1) Check wing strut bolts for security.

(2) Check out-rigger wheels for security and wear.

(3) Check spoiler/dive brake hinges and connections for security and wear.
(4) Check aileron hinges, attachment points and pushrods for security.

(5) Check condition of wing.

(6) Check that canopy fairing on upper wing surface is flush and secure.

(7) Check right fuselage fabric for wear.

c. **Tail Assembly:**

(1) Check right inspection port covers for security.

(2) Check rudder cable connection for security.

(3) Check all hinges and bolts on tail assembly for security.

(4) Check pushrod attachment to elevator horn for security.

(5) Check horizontal stabilizer struts and stabilizer attachment to fuselage for security.

(6) Check tail wheel assembly for freedom of movement and security.

d. **Left Wing/Fuselage:**

(1) Check wing strut bolts for security.

(2) Check out-rigger wheels for security and wear.

(3) Check spoiler/dive brake hinges and connections for security and wear.

(4) Check aileron hinges, attachment points and pushrods for security.

(5) Check condition of wing.

(6) Check that canopy fairing on upper wing surface is flush and secure.

(7) Check left fuselage fabric for wear.

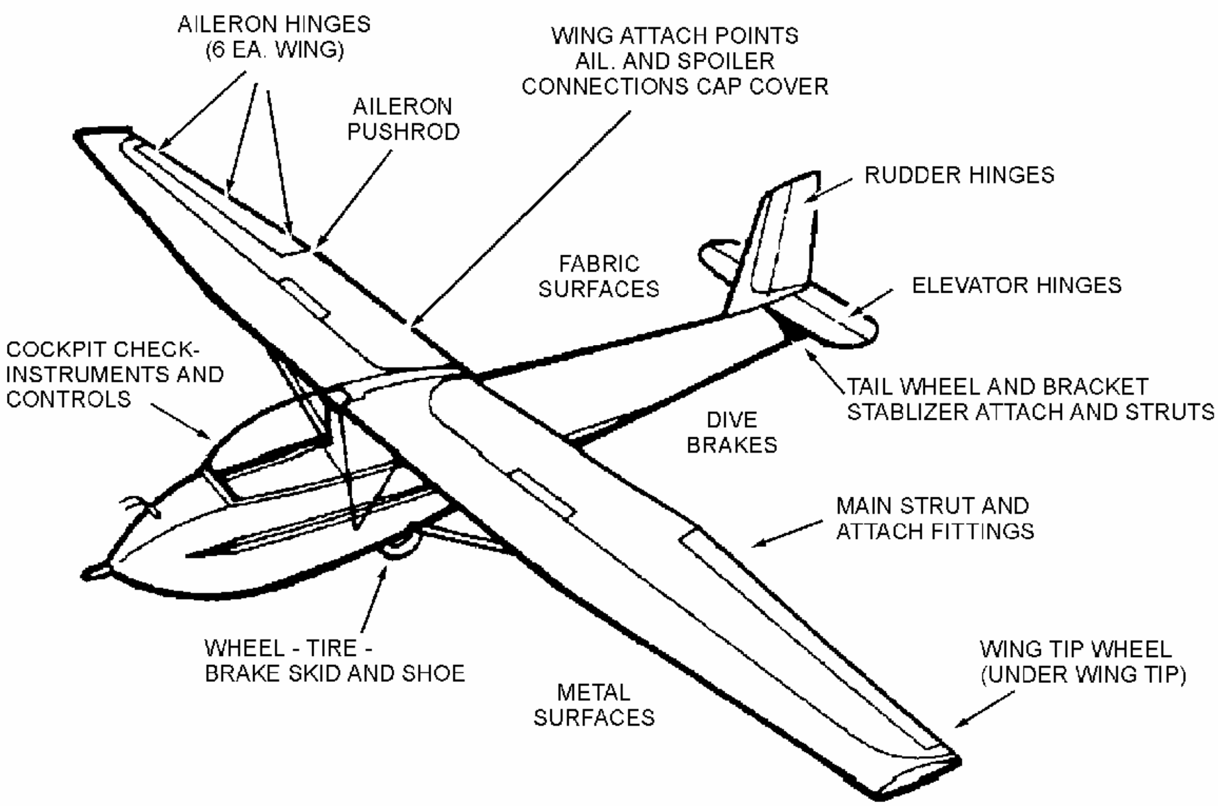
e. **Nose/Wheel Area:**

(1) Check skid and skid plate for security and wear.

(2) Check wheel, tire (25-30 psi) and brake.

(3) Check pitot tubes and static vent for obstructions. **Do not blow into the pitot tube.**

Figure 2-1-3 2-33 Pre-flight Inspection



## SECTION 2

## GLIDING OPERATIONS GENERAL SOPs

### OPERATIONS BRIEFING

1. A briefing guide shall be produced for, and be used by, every gliding site prior to daily flying operations. Personnel shall be briefed on all aspects of the operation such as weather forecast/report, weather limitations, NOTAMS, launch and recovery procedures, circuit pattern, crew responsibilities, emergency procedures, emergency landing areas (both on and off the airfield) and crash response.

### WEATHER LIMITATIONS

2. ACGP flying operations shall be conducted in daylight VFR conditions. The RCA Ops O, providing the pilot is night rated and the aircraft is properly equipped in accordance with TC regulations, may authorize tow aircraft night flying under VFR conditions.

3. **Tow Aircraft Crosswind Limitations.** The crosswind limitation for tow aircraft operations in the Scout is 15 knots (17 mph) at 90 degrees. The crosswind limitation for the L-19/C305 is 10 knots (11 mph). The crosswind limit may be increased to15 knots (17 mph) during Tow Pilot Conversion, proficiency, and currency training with a qualified Tow Aircraft Standards or Check pilot.

4. **2-33 Crosswind Limitations**. Gliding operations may be conducted in surface wind conditions not exceeding 25 knots (28 mph) headwind, 8 knots (10 mph) 90 degrees crosswind or a maximum tailwind component of 5 knots (6 mph). Site supervisors shall be in possession of a hand-held anemometer or equivalent. Operations may be based on hand-held anemometer readings, particularly where ATS reports are inadequate or field site readings may provide a more accurate inidication of winds in the launch/touchdown zones. Site supervisors must exercise sound judgement when ATS reports, if available, differ significantly from wind readings taken on the field. The crosswind component chart that follows indicates surface wind limitations for gliding operations for various crosswind conditions.

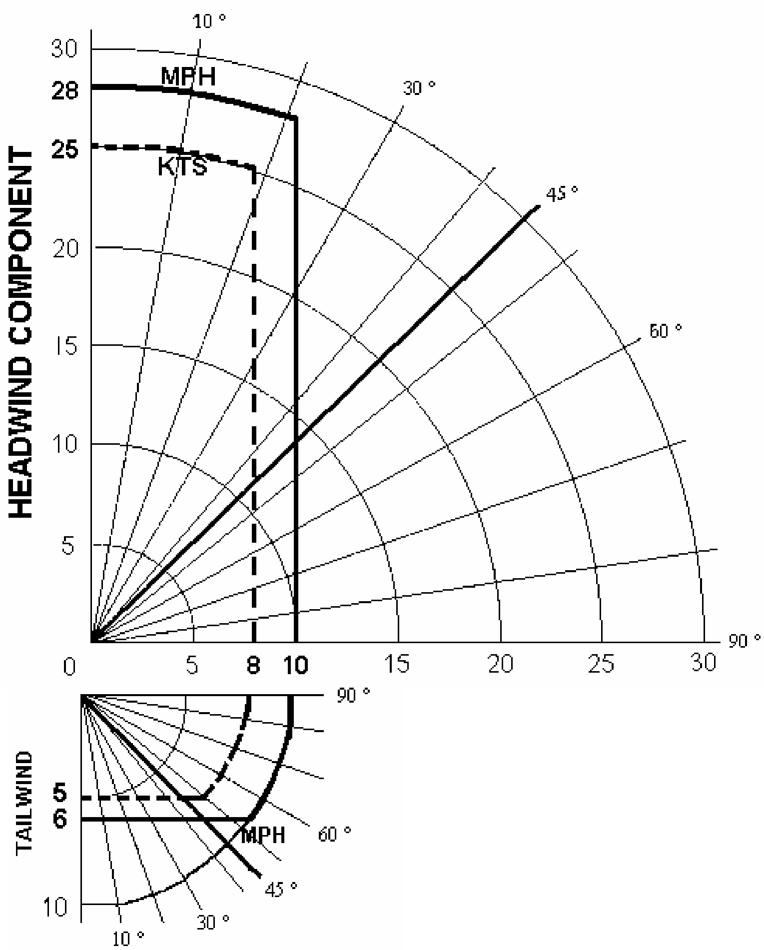



Figure 2-2-1 Crosswind Limitations

5. Wind gusts are a hazard due to the light weight and relatively slow stalling speed of the gliders. The maximum permissible gust differential is 10 knots or 12 mph.

6. A gust condition exists when both of the following conditions exist. Firstly, the main gust peak is 15 knots or greater and secondly the peak gust speed is at least 5 knots higher than the two minute average speed. Additionally, gust conditions normally include rapid and repeated changes in wind direction.

7. The fundamental relationship between wind conditions and the safety of gliding operations is well demonstrated. In addition to crosswind limitations, the wind speed, direction, gustiness, local terrain, and the associated mechanical turbulence shall be considered in conjunction with the experience level of the glider pilots when making a decision on whether or not to conduct gliding operations.

**DAILY INSPECTIONS**

8. DI's shall be carried out on tow aircraft, gliders, launch vehicles and winches prior to the commencement of flying operations. The DIs shall be certified on the appropriate forms by either an aircraft maintenance engineer, a qualified pilot, a student qualified to carry out DIs, or a vehicle operator qualified on the equipment being used.

9. Annex B details the Glider Daily Inspection.

10. Tow ropes, launch cables, and drogue chutes shall be thoroughly inspected on a daily basis. Frequent rope and cable inspections shall be made throughout the day when conditions for rapid wear are present. Glider pilots shall inspect the tow line weak link and ring assembly prior to each launch.

11. Pilots qualified on the aircraft being utilized shall perform a daily pre-flight inspection prior to the commencement of gliding operations.

**LAUNCH CONTROL OFFICER (LCO)**

12. An LCO shall be on duty at gliding sites whenever ACGP glider activities are taking place. Refer to Chapter 1, Section 3, paragraph 21.

**COMMUNICATION EQUIPMENT AND PROCEDURES**

13. The LCO, gliders and tow aircraft shall be equipped with serviceable two-way VHF radios, operating on a common frequency.

14. ACGP personnel shall hold restricted radio-telephone operator's certificates endorsed for aeronautical radios.

**CLOTHING, SURVIVAL AND CRASH RESCUE EQUIPMENT**

15. **Clothing and Survival Equipment.** ACGP personnel shall wear protective headgear for protection against the sun, glare and dehydration. Additionally, ACGP personnel shall wear flight clothing in accordance with Scale of Issue CFS 8, D08-113. When extensive over-water flight is anticipated, a Mae West shall be worn. Finally, appropriate survival items shall be carried during cross-country flights over sparsely populated or inhospitable terrain with respect to actual and forecast weather conditions.

16. **Crash Rescue Equipment.** To facilitate its use, the following mandatory equipment shall be positioned in close proximity to the launch site and the LCO:

a. first aid kit;

b. disposable camera;

c. rescue knife (harness cutter);

d. two fire extinguishers;

e. a vehicle capable of transporting equipment and personnel to within proximity of the crash site;

f. crash axe;

g. fire fighter's combination tool; and

h. two wool blankets.

**NOTE**

If an airport crash response system is available, then the mandatory equipment may be reduced to items a, b, c, d, and e.

**RELEASE HOOK CHECK**

17. A release hook check shall be performed as part of the pre-take-off check prior to the first flight of the day.

**LIMITED PRE-FLIGHT INSPECTION (WALK-AROUND)**

18. Prior to strapping into a glider, including after a crew change, all glider pilots will perform a limited pre-flight inspection (walk-around). The walk-around will include an inspection of the following items:

a. Wing leading edges; **Mise en forme :** Puces et numéros

b. Wheels and skid; **Mise en forme :** Puces et numéros

c. Elevator pushrod assembly (including bolts); and **Mis en forme**

**Mise en forme :** Puces et numéros

d. Pitot/static assembly. **Mise en forme :** Puces et numéros

**Mis en forme**

**PRE-TAKE-OFF CHECK**

19. All tow pilots and glider pilots shall complete a pre-take-off check prior to launch. The pre-take-off check shall be completed as prescribed in the aircraft operator's manual in the case of tow aircraft, and as indicated for gliders in the paragraphs that follow. The glider pre-take-off check shall be performed verbally and by touch prior to each launch. Any interruption shall require re-initiation of the check. Check the following:

a. **(B)allast.** Weight limitations and ballast.

b. **(C)ontrols.** Controls functional; rudder pedals adjusted.

c. **(I)nstruments.** Instruments checked; radio and altimeter set.

d. **(S)poilers.** Operation, then close and lock.

e. **(T)rim.** Trim set for takeoff. Trim shall be set full forward for aero tow and winch. Trim shall be set full aft for auto tow.

f. **(R)elease.** Operation and security.

g. **(S)traps.** Straps secure front and back seat.

h. **(C)anopy/Door.** Canopy, rear window and door closed and locked. Confirm security of canopy latch by touch.

**ALTIMETER SETTING**

20. The altimeter may be set to zero except for cross countries when it will be set in accordance with the procedure defined in the TC AIP.

**PRE-RELEASE CHECK**

21. The following check shall be completed prior to releasing the glider from the tow aircraft:

a. **(A)rea.** Ensure glider is approaching the pre-briefed release point.

b. **(A)ltitude.** Ensure glider is at or is approaching the pre-briefed altitude.

c. **(A)ttitude/Position.** Ensure glider is in the proper attitude, i.e. wings level/high tow.

d. **(T)raffic.** Check for conflicting traffic in the practice area, especially at the release point.

**PRE-STALL, SPIN, SPIRAL CHECK**

22. The following ASCOT check shall be completed before executing either stall, spin or spiral dive exercises:

a. **(A)ltitude.** Ensure entry altitude will permit recovery by the required altitudes that follow.

b. **(S)traps.** Straps secure front and back.

c. **(C)anopy.** Canopy , rear window and door closed and locked. Confirm security of canopy latch by touch.

d. **(O)bjects.** Ensure no loose objects.

e. **(T)raffic/Terrain.** Check for conflicting traffic and ensure clear of built-up areas.

**STALL, SPIN, SPIRAL, FORWARD SLIP RECOVERY ALTITUDES**

23. Recovery altitudes are as follows:

a. stalls shall be recovered above 1 500 feet AGL;

b. spirals shall be recovered above 1 500 feet AGL; and

c. incipient and full spins shall be recovered above 2 000 feet AGL.

d. forward slipping and slipping turns shall not be continued below 250 feet AGL except in an emergency.

**GLIDER CIRCUIT**

24. Circuit procedures in the ACGP shall be based on an ideal circuit consisting of the Initial Point, Downwind, Base Turn, Base Leg, Final Turn, Final Approach and Landing (Figure 2-2-2).

**PRE-LANDING CHECK**

25. The "SWARTSC" pre-landing check shall be completed prior to reaching a point abeam the touch-down point:

a. **(S)poilers.** Check operation and position.

b. **(W)ind.** Assess wind speed and direction.

c. **(A)irspeed.** Fly downwind at 50 mph IAS. Calculate the approach speed (50 mph plus wind speed, including any gust factor. See note).

d. **(R)adio.** Call **Downwind/Base**, as required.

e. **(T)rim/Traffic.** Set trim as required, and check for conflicting traffic.

f. **(S)traps.** Check front and back seat harness security.

g. **(C)anopy.** Canopy, rear window and door closed. Confirm security of canopy latch by touch.

**NOTE**

The reported wind speed, including any gusts, must be added to 50 mph for base and final approach to a maximum FAS of 65 mph (ie. if the wind speed is any value of 15 mph or greater, the maximum FAS is still 65 mph).

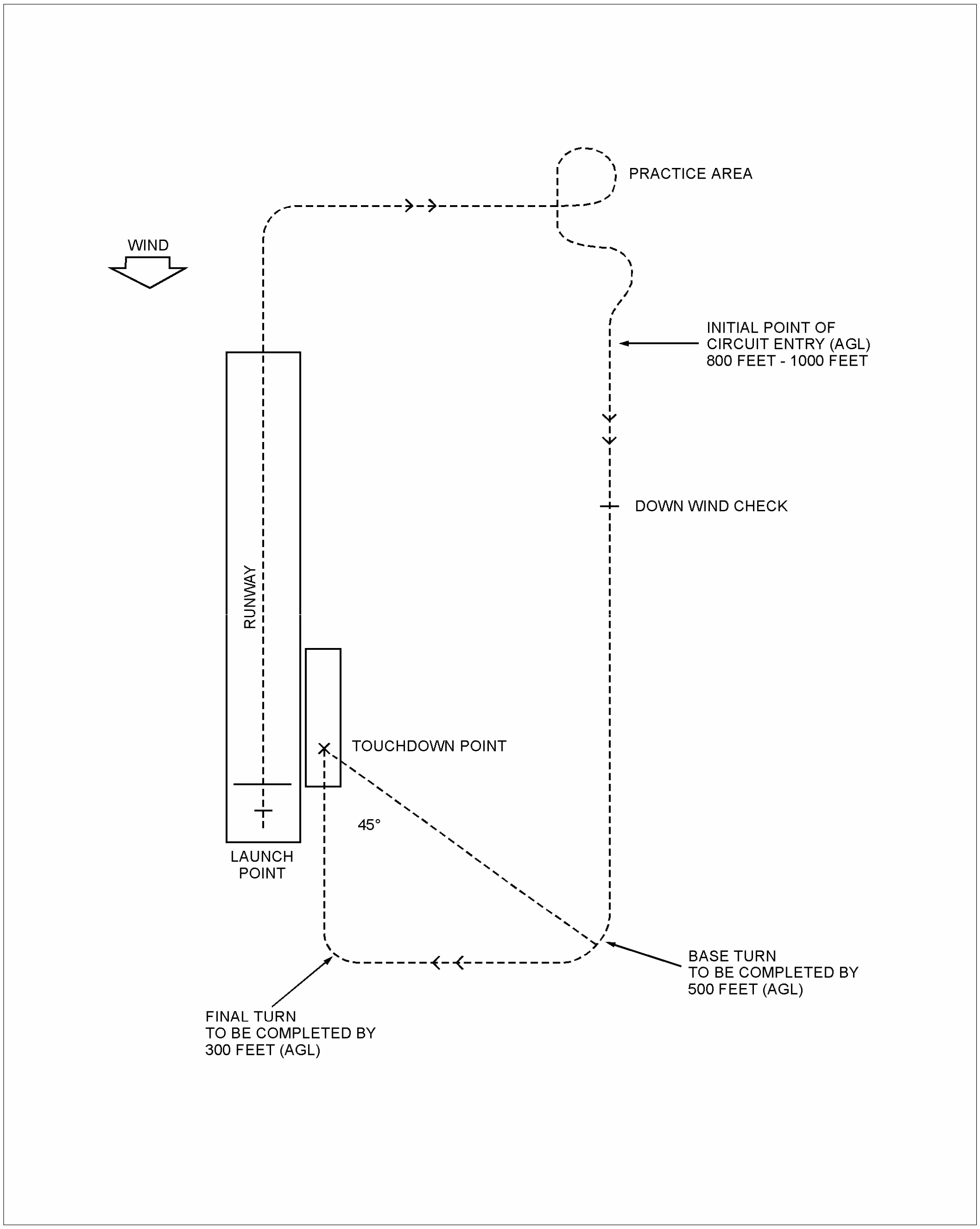



Figure 2-2-2 Example of a Right Hand Circuit

**PENETRATION APPROACHES**

26. A penetration approach is defined as an attempt to increase gliding distance, for whatever reason, by placing the glider in ground effect at a high energy state. The following edited excerpt from an article in Soaring Magazine (Feb 90) clearly identifies the futility of the procedure:

> Is diving into ground effect worth it? **No!** The high aspect ratio of gliders keeps induced drag small, therefore making any drag reduction due to ground effect small as well. Additionally, any drag reduction is significant only when the wing is just a few feet above the ground a condition hard to fly consistently or safely, especially in a high-wing glider. **UNLESS THE PILOT FLIES THE PROFILE PERFECTLY AND THE TERRAIN CONDITIONS ARE IDEAL, GLIDING DISTANCE WILL BE LOST**. Therefore, in order to maximize glide distance, fly L/D max airspeed adjusted for wind and hold that airspeed until the flare/round-out.

**WARNING**

**PENETRATION APPROACHES (DIVING INTO GROUND EFFECT TO ATTEMPT TO STRETCH GLIDING DISTANCE) ARE PROHIBITED.**

**GLIDER GROUND MOVEMENTS**

27. Glider ground movements shall be exercised with caution, with respect to personnel safety considerations and adequate clearance between the glider and obstacles.

**WARNING**

**IN HIGH WIND CONDITIONS, A QUALIFIED GLIDER PILOT SHALL BE STRAPPED IN THE COCKPIT OF EACH PARKED GLIDER THAT IS NOT TIED DOWN AND EACH GLIDER UNDER GROUND TOW.**

a. **By Hand.** When moving gliders by hand, the preferred direction shall be backwards with the pushing force applied to the struts. Personnel shall be positioned at a wing tip and at the tail plane for lifting and steering. Both wing tips shall be manned to ensure clearance when manoeuvring around or near other aircraft or into/out of hangars. Forward movement of gliders is acceptable when the rotation of the glider through 180 degrees is unnecessary or inappropriate. In this case personnel shall man the wing tips and nose to monitor clearance and provide steering and braking as necessary.

b. **By Vehicle Rope Tow.** The minimum length of rope between a tow vehicle and glider shall be 30 feet. Personnel shall be positioned at the nose and each wing tip to ensure clearance, steering, and braking.

c. **By Tow Bar.** When moving gliders with a Tow Bar, steering and breaking is provided by the Tow Bar. Normally only one person is required at a wing tip to maintain wings level. When manoeuvring around other aircrafts or into/out of hangars, personnel shall be positioned at each wing tip to ensure proper clearance.

**GLIDER AND TOW AIRCRAFT TIE-DOWN**

28. A 2-33 facing into the wind may be subjected to lift forces as shown in the table that follows:

| WIND | LIFT | NET LIFT |
|---|---|---|
| 30 mph | 750 lb | 250 lb |
| 40 mph | 1 300 lb | 800 lb |
| 50 mph | 2 000 lb | 1 500 lb |
| 60 mph | 2 900 lb | 2 400 lb |
| 70 mph | 3 950 lb | 3 450 lb |

29. **Representative Glider Tie-Down Methods.** See Figures 2-2-3, 2-2-4 and the text that follows.

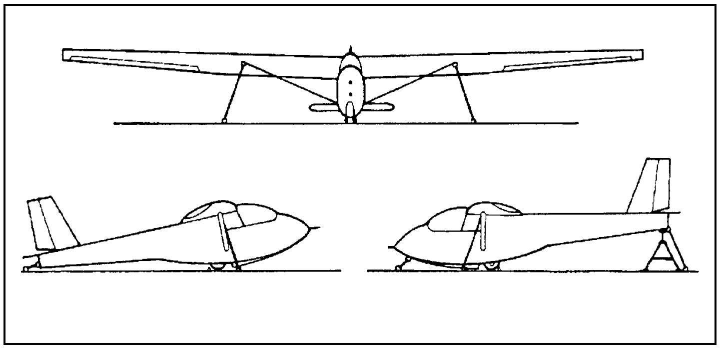


Figure 2-2-3 Glider Tie-Downs

30. To ensure sufficient clearance is provided between parked aircraft, a minimum of 15 feet should be maintained between glider wing tips (see Figure 2-2-4). This will permit ease of movement of aircraft into and out of tie-down areas without risk of wing tip contact. The clearance also provides some protection in the case of an adjacent aircraft partially breaking loose from its tie-down.

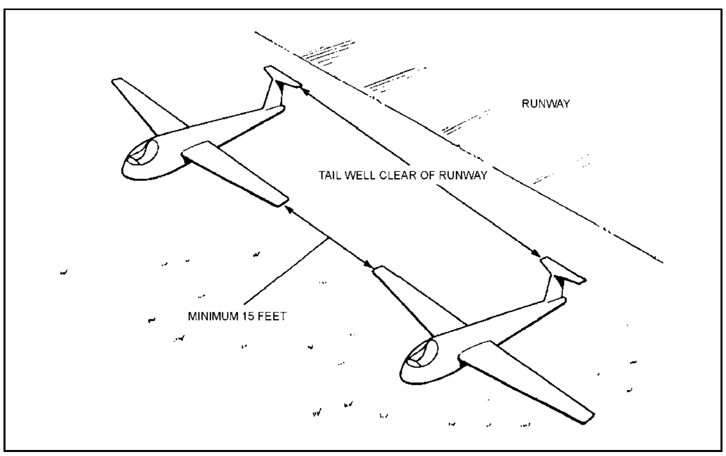



Figure 2-2-4 Tie-Down Clearances

31. Considering the various locations with respect to both local soil and wind conditions from which both ACGP training and famil flights take place, for the purpose of glider and tow aircraft tie-down standards, all locations where either gliders or tow aircraft are left unattended are deemed to represent a high wind hazard.

32. Tie-down procedures are as follows:

a. **Permanent Tie-Downs.** Permanent tie-downs for both gliders and tow aircraft shall be used at all unsheltered RGS locations and as many famil sites as deemed practical by the RCA Ops O, such that:

(1) the glider tail shall be supported on a stand to reduce the angle of attack as much as possible;

(2) at least one tie-down to a ground anchor shall be provided at each wing, the tail and the nose (glider only) such that the angle between the tie-down rope and the vertical is at least 30 degrees. In lieu of the nose tie-down, two ground anchors may be provided at the tail, each on opposite sides of the longitudinal axis;

(3) individual ground anchors, either provided or constructed, shall be capable of withstanding an upward vertical force at least equal to the average tensile strength of the tie-down rope;

(4) the nominal tie-down rope shall be a 10 mm polypropylene monofilament rope, with an average minimum strength of 2 700 lb. The RCA Ops O may authorize ropes of equivalent average minimum tensile strength;

(5) all tie-down ropes shall be replaced annually and when their condition dictates and minimum strength is suspect;

(6) glider/tow aircraft controls and control surfaces shall be positively locked to prevent inadvertent movement during unattended periods; and

(7) glider spoilers/dive brakes shall be positively locked in the open position or, alternately, an approved spoiler device shall be installed to reduce the effects of wind-generated lift during unattended periods.

b. **Temporary Tie-Downs.** If permanent tie-downs are neither available nor practical to construct, the following standard shall be met:

(1) Steel "tent-peg" style tie-down anchors shall be used. They shall be at least 42 inches in length and at least 1/2-inch in diameter and constructed so that a smooth, circular attachment point is available for the tie-down rope.

(2) Tie-down anchors shall be provided as follows:

(a) Nose one (glider only);

(b) Each wing two;

(c) Tail two; and

(d) All tie down anchors shall be angled away from the glider/tow aircraft attachment point.

(3) The tie-down rope angle (angle from the glider/tow aircraft attachment point to the tie-down anchor) shall be at least 30 degrees from the vertical.

(4) The use of portable tail stands is recommended.

(5) Standards established in subparagraph 31.a. for permanent tie-downs with respect to glider and tow aircraft controls and control surfaces and glider spoilers/dive brakes shall be observed.

## SECTION 3

## TOW RINGS, ROPES, CABLES

### TOW RINGS

1. Schweizer Aircraft Company tow rings part number 1A-214-3, NSN 5365-21-896-7418 shall be the only approved rings for the tow rope and weak link assemblies. Locally constructed tow rings are **prohibited.**

### ROPES AND WEAK LINKS

2. Ultraviolet-stabilized monofilament polypropylene air tow and auto launch ropes and weak links are the standard for the ACGP. Ropes and weak links shall be frequently inspected to assess sun and abrasion damage.

3. **Air Tow Rope.** The following are applicable:

   a. **Size.** The tow rope for missions utilizing air tow shall be part number 301023556, NSN 4020-21-911-8030, an 8 mm rope with a certified breaking strength not greater than twice the maximum certified operating weight of the glider.

   b. **Length.** The minimum length of an air tow rope shall be 200 feet. The risk of tow aircraft upset increases as rope length is decreased (see Section 9, Tow Aircraft Emergency Procedures). Rope longer than 200 feet reduces the risk of upset and is well suited for air tow training. However, the length of tow rope may need to be restricted to 200 feet due to the take-off distance available and/or approach obstacles.

4. **Air Tow Weak Link.** The weak link for air tow shall be a knot in the rope at the glider end approximately 18 inches from the glider tow hook such that the certified breaking strength of the knot shall be not less than 80 per cent of the maximum certified operating weight of the glider and not more than 1200 lb.

**NOTE**

> The knot forming the weak link should be protected to prevent rapid wear and strength reduction due to dragging on landing, and shall be designed and applied to allow easy access and inspection.

5. **Auto Launch Rope.** The following are applicable:

   a. **Size.** The tow rope standard for all missions utilizing auto launch shall be part number 301323552, NSN 4020-21-912-1593, 10 mm rope which has a minimum breaking strength of 2800 pounds.

   b. **Length.** The length of rope used depends on the length of runway and the desired launch height. Normally, the launch should provide sufficient altitude for the glider to execute some turns before joining the circuit. Although a 360-degree pattern may be accomplished with less altitude, an 800 foot launch should be the minimum. Auto tow launch heights can be made to altitudes as high as 1 500 feet if wind conditions and runway/rope lengths are suitable.

6. **Auto Launch Weak Link.** The weak link standard is an 8 mm polypropylene rope with a certified breaking strength of not greater than twice the maximum certified operating weight of the glider, The weak link shall be constructed of 8mm rope, part number 301023556, NSN 4020-21-911. The assembled weak kink shall be 18 inches long, spliced or looped into the glider end of the tow rope:

   a. **Splice.** The weak link is spliced directly into the tow rope. Replacement of worn or damaged weak links or tow rings requires the cutting of the tow rope above the splice and the splicing of a new weak link into the tow rope. This procedure is time-consuming and results in the shortening of the tow rope; or

b. **Loop.** The glider end of the tow rope is spliced back into itself forming a loop. The weak link is spliced back into itself also forming a loop. The loops are then looped together. The worn or damaged weak link or tow ring is simply replaced by cutting the weak link and replacing it with a prefabricated one. Replacement is quick and the tow rope length remains constant.

**CABLE, SWIVEL, DROGUE CHUTE AND WEAK LINKS**

7. **Winch Launch Cable.** The following are applicable:

a. **Type.** 1/8-inch armour-plated steel twist cable NATO Stock Number (NSN) 4010-21-813-6632. This cable is rated at 2160 lbs tensile strength with a maximum 2500 lbs tensile strength when the cable is new.

b. **Splices.** Use copper nico-press sleeves that are often found on aircraft controls. Each sleeve is swagged in three places as per manufacture instructions with a special action nico-press tool made for this purpose. Three sleeves each spaced not closer than 4 inches apart to provide cable flexibility shall be used to repair kinked, twisted or broken cable. Also, slipping apart of the splice is prevented if the cable is twisted between nico-press sleeves.

c. **Attachment to Drum.** Drill a 5/32-inch hole in the drum and pass the cable through. Cut off a 1/2-inch length of cable and pair this with the end of the cable through a sleeve and swage (see Figure 2-3-1). It is essential to take a rat-tail file and generously ease the sharp corner of the 5/32-inch hole before threading the wire. Arrange the cable length so that there are never less than 20 turns on the drum to avoid excessive stress where the cable passes through the hole. A better anchor consists of a small block with a tangentially drilled hole welded to the drum.

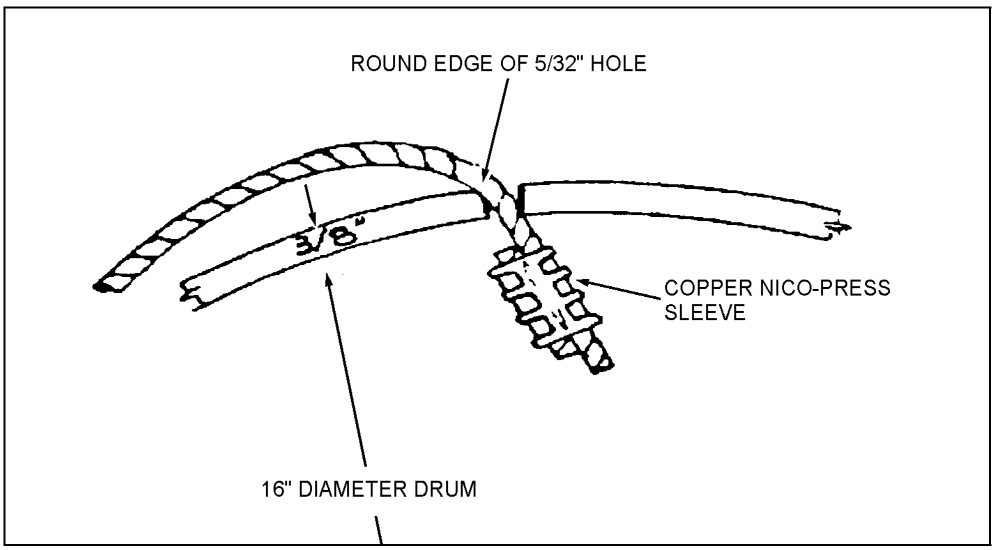



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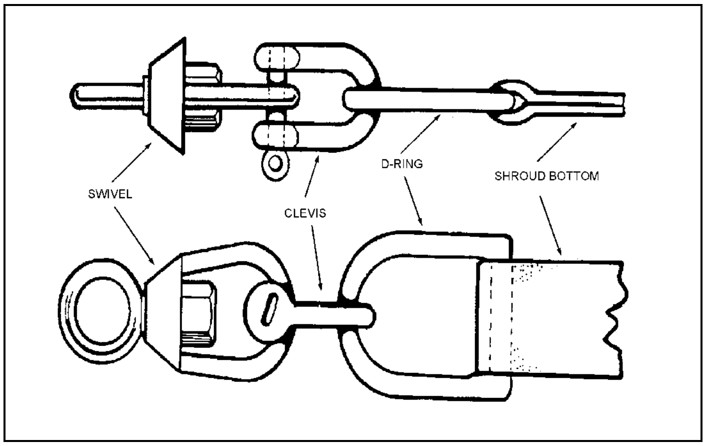
Figure 2-3-1 Detail of Drum Attachment

8. **Winch Launch Weak Link.** (Figure 2-3-3, detail B) The weak link standard is an 8 mm polypropylene rope with a certified breaking strength of not greater than twice the maximum certified operating weight of the glider. This weak link shall be constructed of 8 mm rope, part number 301023556, NSN 4020-21-911-8030. The assembled length of the weak link shall not be less than six feet (183 cm) to ensure the chute clears the nose of the glider. One Schweizer tow ring part number 1A-214-3, NSN 5365-21-896-7418 is to be spliced in at one end for glider hook up and a loop spliced in at the opposing end for the attachment to the chute D ring. The weak link must be installed between the glider hook up and the chute D ring to prevent over stressing the glider during the launch phase.

9. **Winch Launch Swivel.** A swivel is connected immediately ahead of the chute. The swivel is intended to allow any twist in the wire to be dissipated when the load is applied. A snap swivel is easy to attach and detach (see Figure 2-3-2).




2
Figure 2-3-2 Snap Swivel

10. **Drogue Chute.** The drogue chute (Figure 2-3-3) prevents the launch cable from free falling when the glider releases and allows the winch operator to draw it in under control as it descends. A chute that opens up to approximately 5 feet in diameter should be suitable. Too large a chute would be hazardous on take-off should the winch stall or slow down allowing the chute to open and obscure the glider pilot's vision.

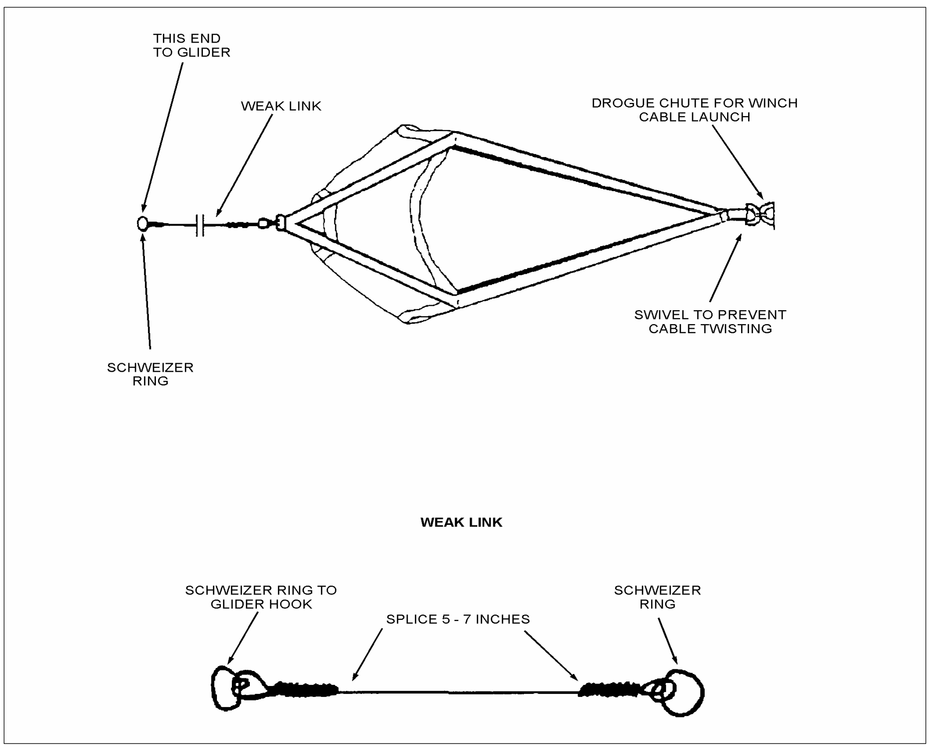



Figure 2-3-3 Drogue Chute Connection to Winch/Auto Cable

# SECTION 4

# AIR TOW PROCEDURES

## AIR TOW LAUNCH PERSONNEL AND EQUIPMENT

1. The ground personnel required for air tow launching of gliders shall normally consist of an LCO, a hook-up person, a wing person and a tow aircraft signaller. Additional personnel such as a tail person and retrieve crew may be used where appropriate. In the case of any aircraft taking off, all personnel and support equipment positioned forward of the nose of that aircraft must be at least 50 feet away from its nearest wingtip. This does not apply to permanent or semi-permanent runway and taxiway markers, fire extinguishers or ground crew handling the glider attached to the short rope in a double-tow launch.

## POSITION OF SIGNALLERS

2. **Hook-up Person.** After hook-up, the Hook-Up Person shall be positioned outboard of the Wing Person, in full view of the pilot in order to receive from the pilot and pass on to the Tow Aircraft Signaller the launch signals. The Hook-Up Person shall also scan the take-off area and landing area(s) to ensure they are clear for take-off.

3. **Wing Person.** The wing person shall be positioned at the into-wind glider wing tip, holding it with one hand, and shall be ready to raise the wing to the level position when so directed.

**NOTE**

> The duties of the Hook-Up Person and the Wing Person may be combined provided that the launch signals can be easily and clearly passed to the Tow Aircraft Signaller without jeopardizing the safety of the launch; and, provided that in the event of an immediate requirement to abort, the Wing Person immediately lowers or drops the wing in order to provide abort direction to the Tow Aircraft Signaller.

4. **Tow Aircraft Signaller.** The tow aircraft signaller relays launch signals to the tow pilot. **The signaller shall be positioned ahead of the tow aircraft on line 45 degrees and at least 50 feet to one side of the take-off path.** If required, the signaller shall marshall the tow aircraft to the take-off position, attach the tow rope and check the security of the hook-up. Therefore, tow aircraft signallers shall be completely knowledgeable of aircraft marshalling signals.

## AIR TOW LAUNCH SIGNALS

5. The following signals shall be used for the purpose of controlling the air tow launch of gliders in the ACGP:

   a. **"Ready For Hook-up".** This instruction is given verbally by the pilot after the pre-flight check has been completed and the pilot has inspected the state of the weak link, rope and ring (the tow rope and ring shall be presented to the glider pilot for inspection prior to each launch). On receiving the "ready for hook-up" command, the hook-up person prepares to attach the ring to the forward (air) tow hook.

**NOTE**

> The tow rope shall not be attached to the glider until the occupants are properly secured, the canopy and door are closed and locked, and the PIC has given the "ready for hook-up" instruction.

   b. **"Open".** This instruction is given by the hook-up person requesting the pilot to open the release mechanism. The pilot repeats the instruction and opens the release mechanism, holding it open until directed by the hook-up person to close the release.

   c. **"Close".** The hook-up person gives this instruction to the pilot who repeats the instruction and slowly closes the release mechanism.

d. **"Secure on Air Tow".** After checking the attached rope for security, the hook-up person relays this information to the pilot by verbally confirming the connection to the appropriate launch hook.

e. **"Clear" or "Clear Above and Behind".** This advisory is issued under the authority of the LCO. This signal indicates to the glider pilot that the LCO, while monitoring such factors as the wind speed and direction, radio transmissions, and visually checking the airfield surface and surrounding airspace for conflicting traffic, has found conditions suitable for launch. This advisory does not relieve the glider or tow pilot of the responsibility of obtaining, where appropriate, clearances from ATC, or to continue monitoring the launch environment for potential conflicts and to abort as necessary.

f. **"Wings Level".** The glider pilot instructs the wing person to raise the wing by showing the thumb up with the left hand and by calling out the command. A glider with wings level at the launch site indicates to all personnel that a launch is about to commence.

g. **"Take up Slack".** The glider pilot issues this command to the wing person/hook-up person verbally and by showing the left hand thumb and forefinger. The wing person/hook-up person then proceeds to hand signal the tow aircraft signaller to have the tow pilot slowly commence taking up the slack in the rope. The signal consists of movement of the arm in front of the body in a sweeping motion of 180 degree arc below the waist (see Figure 2-4-1).

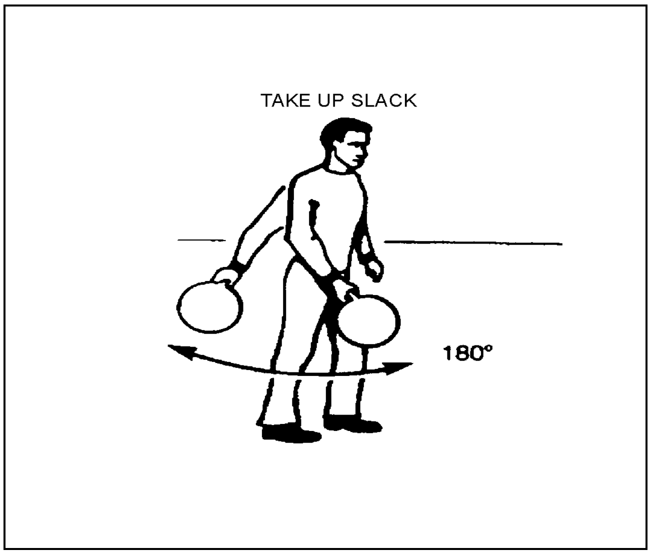



Figure 2-4-1 "Take Up Slack" Signal

**NOTE**

The "take up slack" hand signal is **<u>never</u>** used to marshal a tow aircraft forward. Only the "move ahead" aircraft marshalling hand signal shall be used.

h. **"All Out".** The glider pilot issues this command to the wing person/hook-up person verbally and by showing the thumb and two fingers on the left hand. The wing person/hook-up person then proceeds to hand signal the tow aircraft signaller to have the tow pilot advance power for take-off. The signal consists of movement of the arm in a continuous 360 degree circular motion in front of the body (see Figure 2-4-2).

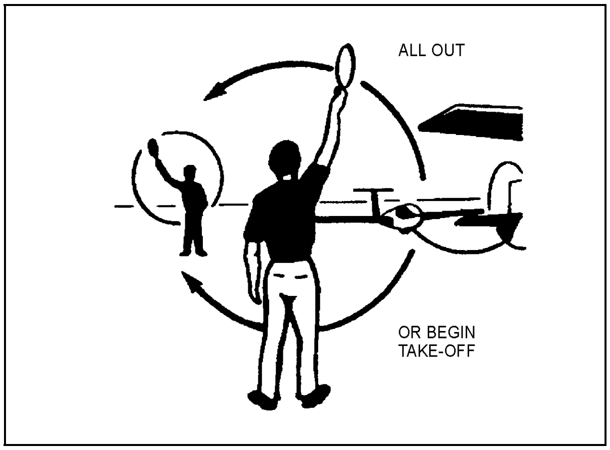



Figure 2-4-2 "All Out" Signal

i. **"Stop".** This command is given in a loud voice to stop a launch sequence. This signal can be given by anyone at the launch site and shall be immediately relayed by the wing person/hook-up person and tow aircraft signaller both verbally and visually.

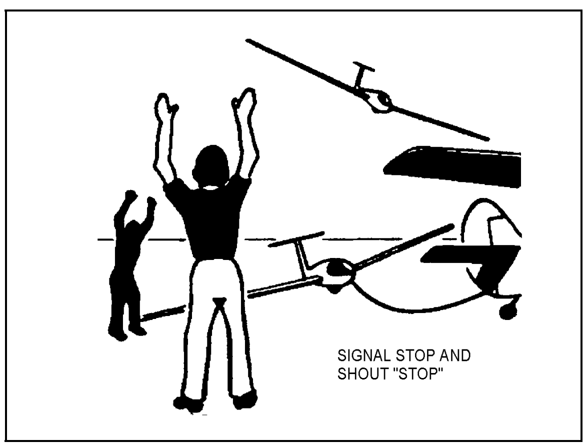



Figure 2-4-3 "Stop" Signal

**NOTE**

The stop signal, consisting of open palms with the arms held high, shall always be used with a verbal command (see Figure 2-4-3). Both the tow aircraft pilot and the glider pilot shall immediately release the rope to prevent an inadvertent launch.

**AIR TOW SPEEDS AND POSITIONS**

6. **Tow Speeds.** Normal air tow speeds shall be 65 to 70 mph. During transits, airspeeds may be increased to 90 mph IAS for the 2-33. If turbulence is encountered during transits, airspeed should be immediately reduced.

7. **Tow Positions ̃ Description.** The two air tow positions in common use are referred to as "high tow" and "low tow". For the high tow or "normal" position, the glider is flown above the tow aircraft's wake and maintains approximately the same altitude as the tow aircraft i.e., the tow aircraft fuselage or wing appears on the horizon. For the low tow position, the glider is flown below the wake of the tow aircraft, which places the glider approximately 30 feet below the level of the tow aircraft.

8. **Tow Positions ̃ Use.** The high tow (or normal position) shall be flown during routine air tow launches, with the low tow position reserved for use during training missions and when descending on tow either to change altitude, to recover a glider under tow, or during cross-country flights. See Figure 2-4-4 for an illustration of the tow positions, and refer to paragraph 12 regarding descent procedures for an explanation on the utility of the low tow position.

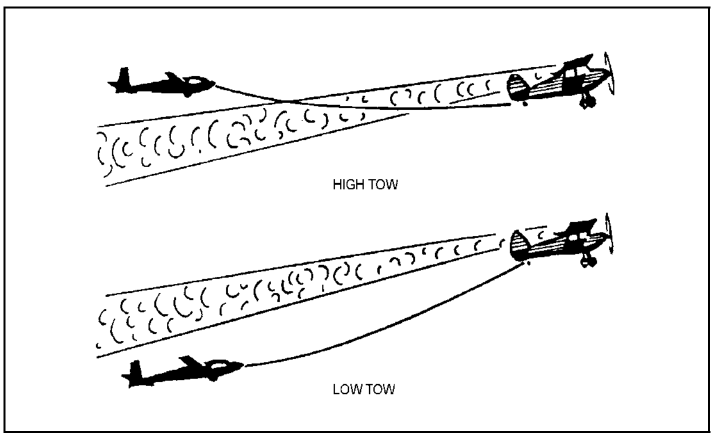



Figure 2-4-4 Tow Positions

**SLACK ROPE PROCEDURE**

9. **Description.** A slack tow rope during air tow is often created unintentionally and poses significant hazards for the glider pilot. A change in speed of either the glider or tow aircraft that allows them to come closer together will result in a slack tow rope. Ways in which slack rope may be created are identified in the following subparagraphs:

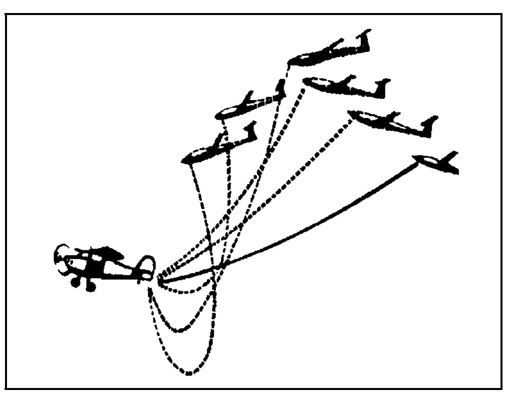


Figure 2-4-5 Slack Rope Formation

a. Climbing the glider above the normal tow position and then attempting to descend back to the proper position is a manoeuvre often flown by student pilots in the early stages of training (Figure 2-4-5). The climb, followed by the sudden descent, provides the glider with excess speed and results in a slack tow rope.

b. If a glider over-banks during a turn and moves rapidly to the inside, the fixed length of the rope will cause it to accelerate forward relative to the tow aircraft. The typical reaction of the student pilot is to overcorrect in the turn back toward the correct position. With extra speed at the glider, the result of the change in direction is slack in the tow rope (Figure 2-4-6).

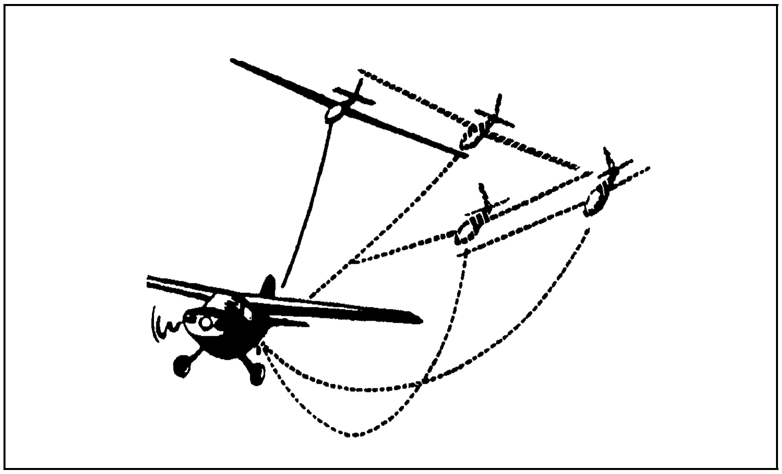


Figure 2-4-6 Slack During Turn

c. During a descent the tow aircraft may not gain as much speed as the glider on tow. This can lead to a steady increase in tow rope slack as the glide angle is increased (Figure 2-4-7).

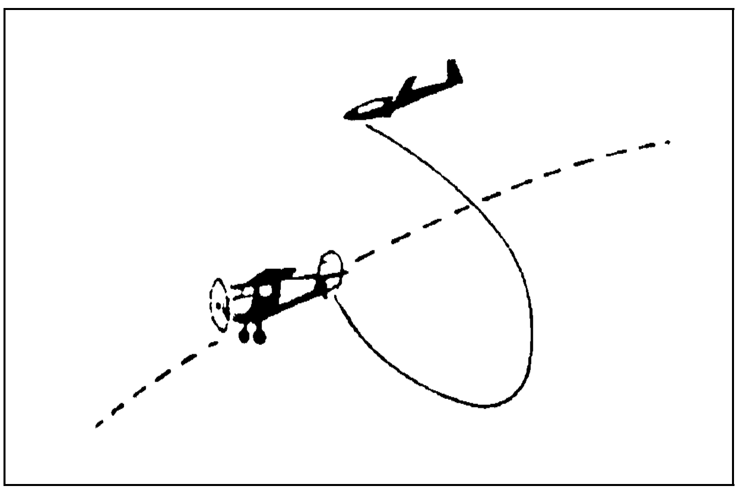


Figure 2-4-7 Slack During Descent

10. **Hazards.** The hazards of a slack tow rope include entanglement, an inadvertent back release, a rope break, or damage to the canopy from a released tow rope and ring. Excessive slack is particularly hazardous due to the possibility of entanglement with weaker structures of the glider. Excessive slack combined with light back release tension can also produce an unexpected release at low altitude or during a cross-country tow. Rope breaks commonly occur when slack in the tow rope is followed by acceleration of the tow aircraft (Figure 2-4-8).

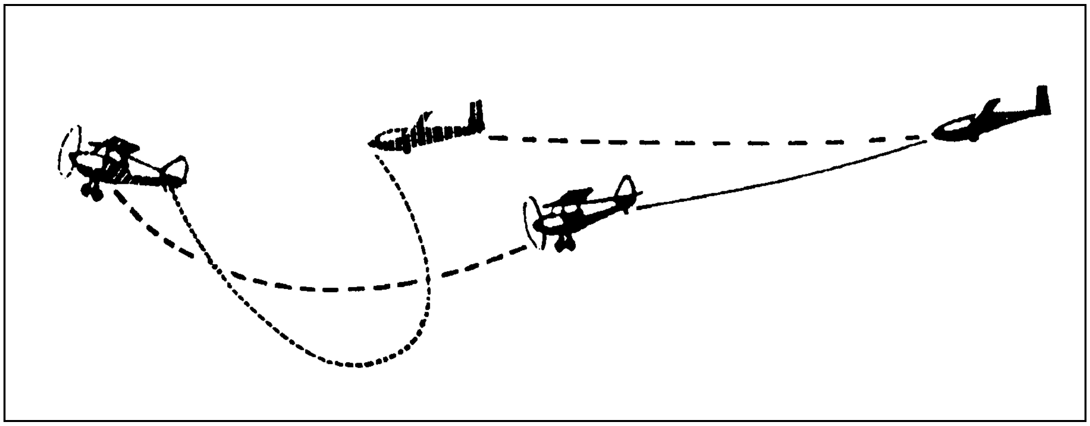


Figure 2-4-8 Possibility of Cable Break/Back Release

11. **Corrective Procedures.** The degree to which the slack rope occurs determines the urgency with which the pilot must react. The slack rope procedure for a climb or descent shall be executed as follows:

a. For slack rope occurring during a climb:

(1) take immediate corrective action to stop the increase in slack by yawing away from the loop (Figure 2-4-9);

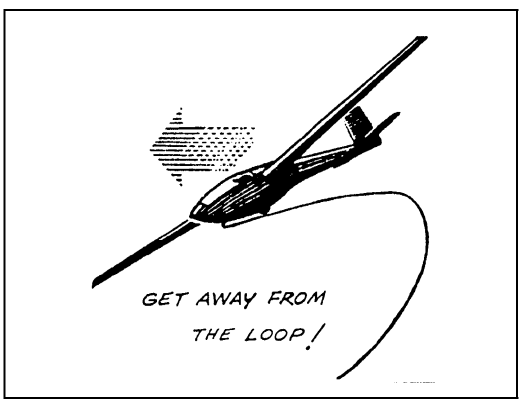



Figure 2-4-9 Slack Rope

(2) discontinue the yaw once the slack stops increasing and **STAY AWAY FROM THE LOOP**; and

(3) maintain the same bank attitude as the tow aircraft and use slight nose down attitude to equalize the glider speed with the tow aircraft as it accelerates under climb power.

b. For slack rope occurring during a descent:

(1) take immediate corrective action to stop the increase in slack by yawing away from the loop;

(2) discontinue the yaw once the slack stops increasing and **STAY AWAY FROM THE LOOP**; and

(3) transition to the low tow position and deploy sufficient spoilers to maintain a taut rope.

**DESCENT ON AIR TOW PROCEDURE**

12. Descent during air tow is rarely employed but may be required to descend under ATC control, descend to maintain clearance from cloud, or descend during the recovery of a glider under tow. The following demonstrated technique eliminates the problems associated with slack rope which occur during a descent in the "normal" tow position:

a. gradually move the glider to the low tow position, i.e., below the slipstream; and

b. deploy sufficient spoilers to maintain a taut rope.

**AIR TOW RELEASE PROCEDURE**

13. The following release procedure provides positive separation and minimizes damage to the glider release housing:

a. Prior to reaching the release point, the glider pilot shall conduct the Pre-Release Check in accordance with Section 2, paragraph 20.

b. Responsibility for release rests with the glider pilot. However, regional SOPs may allow the tow pilot to initiate the release by verbally and/or visually signalling the glider pilot. **IN THIS CASE, THE VISUAL SIGNAL MUST BE SUCH THAT IT CANNOT BE MISINTERPRETED AS AN EMERGENCY SIGNAL.** In either case, the tow pilot shall not commence a post-release, descending left turn until visually confirming that the glider has released.

c. At release, the glider pilot shall pull the release knob, hold it open momentarily (approximately 1 to 2 seconds), repeat the procedure, visually confirm separation from the tow rope, and then execute a gentle climbing turn to the right (Figure 2-4-10).

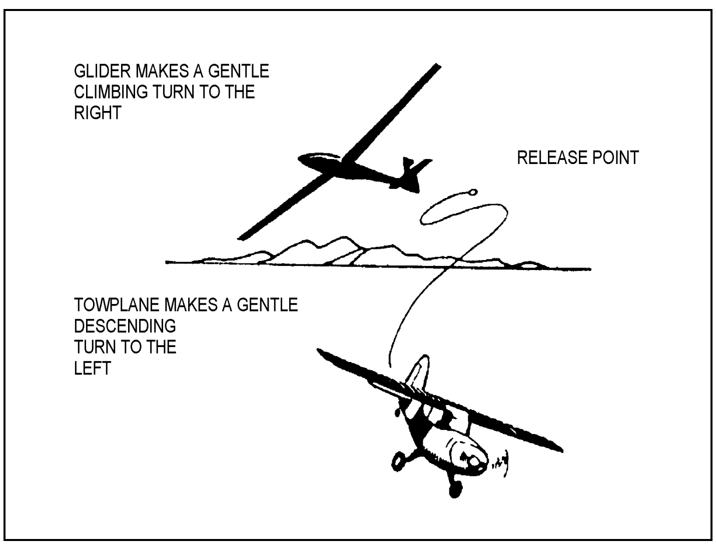



Figure 2-4-10 Separation Procedure

**CROSS-COUNTRY AIR TOW PROCEDURES**

14. Cross-country air tows, whether single or double, shall be executed with particular attention due to the increased risk of an off-field landing in the event of an inadvertent release.

15. The need to maintain both horizontal and vertical clearance from cloud is especially important when cross-country towing is being conducted. Inadvertent penetration of even the smallest cloud formation may necessitate the glider releasing in unforgiving circumstances. Misjudged attempts to out-climb clouds or descend below clouds, cloud penetration due to poor visibility, and reduced turn performance while towing all contribute to unintentional flight into cloud.

16. An inadvertent back release during a cross-country tow may also occur. A descending tow aircraft with a glider under tow may produce substantial slack in the tow rope. A loop in the tow rope and the resulting aerodynamic drag on the loop may result in pressure sufficient to produce a back release.

17. The following SOPs shall be observed:

a. A detailed pre-flight briefing is mandatory and shall include, but is not limited to the following:

(1) departure, en route and destination weather and winds;

(2) visual signals in the event of radio failure;

(3) glider(s) positioning during the various stages of flight;

(4) emergency procedures, especially initial reactions for take-off abort and premature releases below 500 feet AGL; and

(5) destination arrival, release and landing procedures.

b. Route selection shall optimize the availability of glider emergency landing areas.

c. Turbulence due to strong winds and unstable conditions makes air tow very difficult to fly and increases glider pilot fatigue. Therefore, en route winds in excess of 20 knots shall be avoided, particularly if the air is also unstable.

d. Unless a climb over, or descent under, clouds can be completed 1 mile before the cloud formation and unless that climb or descent can achieve at least a minimum of a 500 feet vertical separation from the cloud, tow pilots shall alter course right or left to avoid the cloud horizontally by at least 2 000 feet.

e. Tow pilots should limit the rate of descent to 200 fpm when towing gliders. When a steeper descent is required, the glider pilot shall descend to the low tow position and deploy sufficient spoilers to maintain a taut rope

f. Appropriate survival items shall be carried during cross-country flights over sparsely populated or inhospitable terrain with respect to actual and forecast weather conditions.

g. To reduce pilot fatigue, all cross-country air tows over two hours in duration shall normally have two qualified pilots per glider.

**NOTE**

When two glider pilots are used on cross-country air tows, survival items will require pre-planning rationalization because of reduced or nil space availability in the glider.

## SECTION 5

## WINCH LAUNCH PROCEDURES

### WINCH INSPECTION AND SERVICING

1. Every owner of a winch shall keep a logbook record. The logbook record will document maintenance, modifications and inspections. A logbook is also recommended to document maintenance, modifications and inspections of the truck.

2. The winch shall be inspected prior to each day's operation using the appropriate winch inspection report

   a. **Winch Movement and Daily Inspection.**

| WINCH MOVEMENT AND DAILY INSPECTION | | | |
|---|---|---|---|
| **WINCH ENGINE INSPECTION** | | | |
| Fuel | | Fan and Fan Belt – Condition | |
| Battery – Levels, Condition | | Engine and Transmission Mounts | |
| Radiator – Level | | Drive-line – Condition | |
| **TRUCK ENGINE INSPECTION (If Applicable)** | | | |
| Fuel | | Transmission – Level (Automatic) | |
| Oil – Level, Leaks | | Fan and Fan Belt – Condition | |
| Radiator - Level | | Tires – Condition, Inflation | |
| Battery – Levels, Condition | | | |
| **WINCH EQUIPMENT AND SPARES** | | | |
| Tools | | Chocks | |
| Fire Extinguisher | | Grounding Strap and Rod | |
| First Aid Kit | | Spare Oil, Coolant, etc. | |
| Kit - Nico Press Tool, Sleeves and Instructions | | Chute – Condition | |
| Cable Cutter | | Weak Links / Rope | |
| Radio | | Lights – Operational | |
| **WINCH MOVEMENT** | | | |
| Cable and Chute - Secured | | Jack Stands – Up ( if equipped ) | |
| Guillotine Secured | | Chocks – Out | |
| Drum – in Park | | Winch Ignition – Off | |
| Drum Cover – On | | Fuel Cap – Secured | |
| **WINCH PREPARATION** | | | |
| Truck – In Gear, Emergency Brakes On | | Cable – Free | |
| Wheel Chocks - Secure | | Drum and Guard – visual alignment, loose welds, compression stress, cracks and distortion | |
| Grounding Rod – In | | Drum Bolts – Secure | |
| Guillotine – Armed | | Rollers and Head – Freedom of movement, wear, alignment and security | |
| **RECORD HOUR METER START TIME:** | | | |
| **WINCH START CHECKS (ALLOW WARM-UP)** | | | |
| All gauges operational, in normal range | | Transmission Fluid – Level | (     ) |
| **CABLE INSPECTION** | | | |
| Condition - Splices, Kinks, etc. | | Clevis, elongation and cracks, freedom of movement | |
| SIGNATURE OF OPERATOR:______________________________ DATE:________________ | | | |

Figure 2-5-1. Winch Movement/Arrival Checklist

b. **100 Hour.** A designated person appointed by the RCA Ops O shall inspect the winch unit. The winch unit shall be inspected in accordance with the 100 hour inspection report. All inspections and work performed shall be noted in the winch logbook.

| **WINCH – 100 HOUR** | |
|---|---|
| | |
| a. Oil Change | |
| b. New Oil Filter | |
| c. Transmission fluid – condition, cleanliness. Change if required. | |
| d. Differential – Check fluid level. | |
| e. Brakes – Fluid level and condition, leaks. | |
| f. Battery – electrolyte levels, cleanliness and charge. | |
| g. Fan Belt – Tension and condition. | |
| h. Radiator– inspect for leaks, condition and fluid strength. Hoses for condition and security. | |
| i. Exhaust – Check for cracks and condition | |
| j. Fan and Shroud – condition and security | |
| k. Air Filter – Check and replace as necessary | |
| l. Light Lubricant | |
| (1) Throttle Linkage | |
| (2) Transmission Linkage | |
| (3) Brake Lever | |
| (4) Guillotine | |
| (5) Rollers and Head | |
| m. Grease drive shaft “U” joints | |
| n. Light and Beacon – Functional and Secure | |
| o. Instruments – Functional, secure and operating within limits | |
| SIGNATURE: DATE: | |

Figure 2-5-2. 100 Hour Inspection Check-list

**NOTE**: The above report shall be held on file with the winch logbook.

c. In conjunction with the 100 hour inspection report an annual inspection shall be completed after the active training season has ceased and prior to storage. The annual inspection shall confirm that the engine is within factory specifications and the drive train, chassis, electrical and instrumentation is in good repair. A designated person appointed by the RCA Ops O shall inspect the winch unit. All inspections and work performed shall be noted in the winch logbook.

**WINCH OPERATION**

2. Because a variety of winches are employed in the ACGP, operating procedures presented in the following paragraphs are general in nature. Refer to the manufacturer's operating handbook for detailed information and direction, if applicable.

3. After completion of the pre-operation inspection, a typical single drum winch launch operation will proceed as follows:

a. **Starting Up.** The engine should be started with the shift in "Park" or “Neutral” and the brake "On". Engine instruments should be checked for normal operation. The engine must be thoroughly warmed up before a winch launch is attempted.

b. **Taking Up Slack.** On receiving the "take up slack" signal from the launch point, the operator should:

(1) check the circuit for any conflict with approaching or departing air traffic, ground vehicles and area is clear of bystanders. A winch launch shall be postponed until all traffic and bystanders are clear of the launch area. Winch cable breaks may cause catastrophic injury and/or damage to personnel and aircraft;

(2) with the brake on, shift to drive; and

(3) at idling speed or with very little power applied, the brake should be released sufficiently to allow a very slow take up of slack until the cable becomes taut.

c. **All Out.** When the "all out" signal is received, the brake should be released and power applied until the proper launch airspeed is obtained. The power should be adjusted throughout the launch to maintain the proper airspeed or tension for the wind conditions present.

d. **Signals.** During the launch, the glider pilot may find the launch airspeed excessive and signal the reduction to the winch operator by yawing from side-to-side as described under SOPs. The winch operator should carefully reduce power to bring the glider back into its proper speed range. In the event that the glider airspeed drops below safe launch airspeed, the glider will release.

e. **Release.** As the glider reaches the top of the launch, the power should be reduced to signal the glider pilot to release. After the release occurs, the power is again applied to take up slack and draw the chute away from the glider while keeping the chute inflated. The cable is drawn in under power until the cable is assured to land in an appropriate area of the airfield. As the chute approaches the ground, the power may be reduced to allow the chute to slow, with brakes applied as it touches the ground.

f. **Retrieve.** The winch should be shifted to neutral and the brake set to the recommended position for the retrieve. If a backlash or trouble develops during the retrieve, the stop signal should be given. In emergencies, the brake can be applied to stop the cable from spooling off the drum. When the retrieve is complete, the drum and cable should be checked for loose loops or fouling which should be corrected prior to attempting the next launch. A baton, light or radio can be used to give various control signals to the retrieve vehicle:

(1) **"Stop".** Hold the baton steady overhead, send a steady light or use radio to indicate stop.

(2) **"Proceed Slowly".** Baton waived underhand, send a slowly flashing light or use radio to proceed slowly.

(3) **"Proceed Normally".** Baton waived overhead, send a rapidly flashing light or use radio to proceed normally.

**WINCH SAFETY**

4. Winch operations need to be conducted with particular care due to the potentially dangerous nature of the steel cable that moves at high speed and tension during a launch.

5. Considering that cable breaks are inevitable in a winch launch operation and that the stored energy in a cable under tension is great, a broken cable may come whipping back in a highly dangerous manner. Therefore, the winch driver must be protected by strong steel mesh, 1/4-inch safety glass, or Perspex to protect against flying armour plating chips or flying cable. No one shall be permitted to stand close to or remain outside of the protective winch cab when a launch is in progress.

6. In the event of a cable break that leaves the drogue chute attached to the glider, the section of cable still connected to the winch will spring towards the winch as it falls rapidly to the ground (without the drogue chute to provide any resistance). As a consequence, a normal powered recovery of the cable onto the spool is not possible without having the cable being dragged across the ground at high speed. In some environments, this rapidly moving cable can pose a serious hazard to personnel or equipment on the ground, especially if a crosswind has moved the cable off the normal winch launch path. Therefore, the winch operator must cut power and allow the cable to free fall to the ground so as not to endanger personnel or property.

7. The winch operator must also be prepared for the unlikely event of a release failure. If the glider pilot is unable to release and is unsuccessful in producing a back release, the winch operator must activate the guillotine to cut the cable at the winch. If for any reason this is not possible, in some winch configurations an axe may be used to sever the cable.

8. In the event that the initial portion of the winch launch has been mishandled in any way, the winch operator must abort the launch sequence. The need for this precaution arises from the situation in which slack has been taken up too quickly resulting in the glider being jerked forward due to the spring tension that develops in the cable. Just as the glider springs forward and overruns the cable, the winch operator could be acting on the "all out" signal. Proceeding with the "all out" could have disastrous results if the cable or chute becomes entangled with any part of the glider such as the tail. **The launch site shall direct any restart following an aborted launch.**

9. The levelling of the glider wings is an indication to the winch operator that a launch sequence may be directed to commence shortly. Conversely, if the winch operator sees a wing go down even though the "take up slack" or "all-out" signal has been received, the winch operator shall abort the launch.

**WINCH LAUNCH PERSONNEL**

10. The ground personnel required for a winch launch operation shall normally consist of an LCO, a hook-up person/signaller, a wing person, a tail person, a cable retrieve vehicle crew and a winch operator. Additional personnel such as a dedicated winch signaller, or glider retrievers may be used where appropriate.

**POSITION OF LAUNCH CREW**

11. The **wing person** shall be positioned at the into-wind glider wing tip, holding it with one hand, ready to raise the wing to the level position. The wing person shall wait for the appropriate signals or a command from the glider pilot while observing the take-off area to ensure the area is clear for take-off. A **tail person** is required to hold down the tail prior to launch.

12. When using signal bats, radio or light signals, the **signaller** shall watch the pilot of the glider for the appropriate launch signals.

**WINCH LAUNCH SIGNALLING DEVICES**

13. Launch control signals from the launch site to the winch operator may be accomplished by using the following devices:

a. an Aldis lamp;

b. signal bats, approximately 18 inches in diameter, painted yellow or fluorescent, with handles attached;

c. spotlight, vehicle headlights; or

d. radio communications.

14. The Aldis lamp is the most effective signalling device due to its ability to send light signals over long distances. When an Aldis lamp or headlight is used, the dots and dashes must be long enough to allow the bulb to light up clearly for the dot pulses so that a distinctive difference between the two signals exist. A definite difference in rhythm in light spacing also helps to make the signals easier to read.

15. An amber rotating light affixed to the top of the winch and activated by the ignition switch shall be used to confirm to the launch site that the winch operator has started the winch engine.

**WINCH LAUNCH SIGNALS**

16. The following signals shall be used for the purpose of controlling the winch launch of gliders in the ACGP:

a. **"Ready For Hook-up".** The pilot gives this instruction after the pre-flight check has been completed and the pilot or the hook-up person has checked the condition of the cable, weak link and ring. On receiving the "ready for hook-up" command, the hook-up person prepares to attach the ring to the winch tow hook.

**CAUTION**

The winch cable shall not be attached to the glider until the occupants are properly secured, the canopy, rear window and door is closed and locked, and the PIC has given the "Ready for hook-up" instruction. This practice will ensure that the PIC is prepared to abort from the moment the winch cable is attached, in the event of an inadvertent launch.

b. **"Open".** This instruction is given by the hook-up person requesting the pilot to open the release mechanism. The pilot repeats the instruction and opens the release mechanism until directed by the hook-up person to close the release.

c. **"Close".** The hook-up person gives this instruction to the pilot who repeats the instruction and slowly closes the release mechanism.

d. **"Secure on Winch Launch".** After checking the attached cable for security, the hook-up person relays this information to the pilot by verbally confirming the connection to the winch launch (C of G) hook.

e. **"Clear" or "Clear Above and Behind".** This advisory is issued under the authority of the LCO. This signal indicates to the glider pilot that the LCO, while monitoring such factors as the wind speed and direction, radio transmissions, and visually checking the airfield surface and surrounding airspace for conflicting traffic, has found conditions suitable for launch. This advisory does not relieve the pilot of the responsibility to obtain, where appropriate, clearances from ATC, or to continue monitoring the launch environment for potential conflicts and abort as necessary.

f. **"Wings Level".** The glider pilot instructs the wing person to raise the wing by showing the thumb up with the left hand and by calling out the command. A glider with wings level at the launch site indicates to all personnel that a winch launch is about to commence.

g. **"Take Up Slack".** The glider pilot issues this command to the signaller verbally and by showing the left hand thumb and forefinger. The signaller then proceeds to signal the winch to commence taking up the slack. The "take up slack" signal can be given in a number of ways. Waving a brightly coloured bat in the underhand arc, slow flashing of headlights, or radio transmissions are standard methods of indicating "take up slack" to the winch operator.

h. **"All Out".** The glider pilot issues this command to the signaller verbally and by showing the thumb and two fingers on the left hand. The signaller then proceeds to signal the winch operator to advance power for take-off. The "all out" signal can be given in a number of ways. Waving a brightly coloured bat 180 degrees in an overhand arc, rapid flashing of headlights, or radio transmissions are standard methods of indicating "all out" to the winch operator.

i. **"Stop".** This command may be issued by anyone at the launch site to stop a launch sequence. The hand signal (see Figure 2-4-3) is also be used in conjunction with the verbal command, and is directed at the glider pilot, wing person and launch signaller. The glider pilot shall immediately release the cable to prevent an inadvertent launch, and the wing person shall place the wing tip back on the ground. The stop signal shall be immediately relayed to the winch operator by the following methods:

(1) holding the signal bat motionless straight above the head;

(2) sending a continuous white light to the winch via headlights or an Aldis lamp; or

(3) transmitting "**Stop, Stop, Stop**" via radio communication.

**TAKE-OFF AND CLIMB**

17. As minimum flying speed is obtained, the pilot shall apply slight back pressure to become airborne, remaining in a shallow climb angle until safe climbing speed is reached.

18. The nose shall be raised progressively to the best climb angle only after it is safe to do so. The increase in attitude shall be smooth with the maximum climb attitude achieved only after passing through 200 feet AGL and while maintaining an airspeed of at least 50 mph (see Figure 2-5-3).

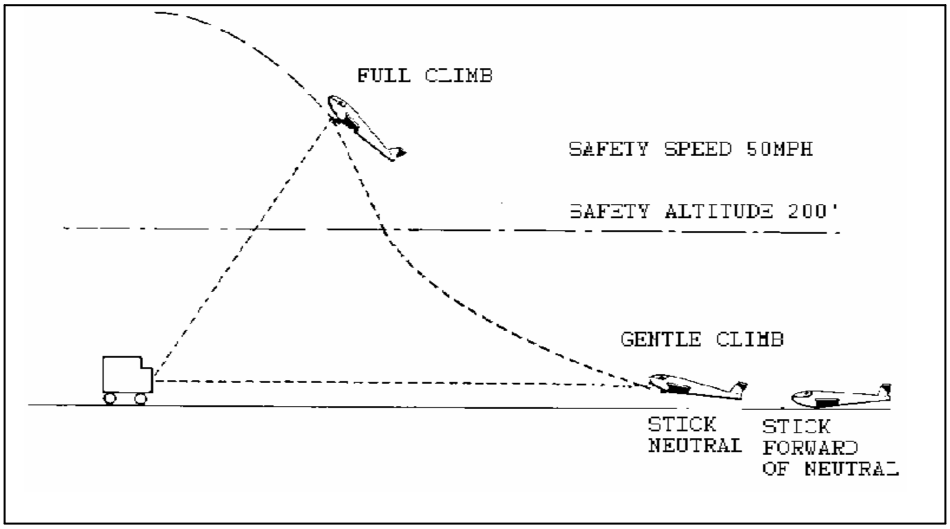



Figure 2-5-3. Controlled Climb Angle

**CLIMB CONTROL SIGNAL**

19. In the event that a reduction in the climb speed is necessary, the glider pilot shall reduce the climb angle to prevent exceeding the placard speed, and yaw the glider from side to side to signal the winch operator to reduce power (see Figure 2-5-4).

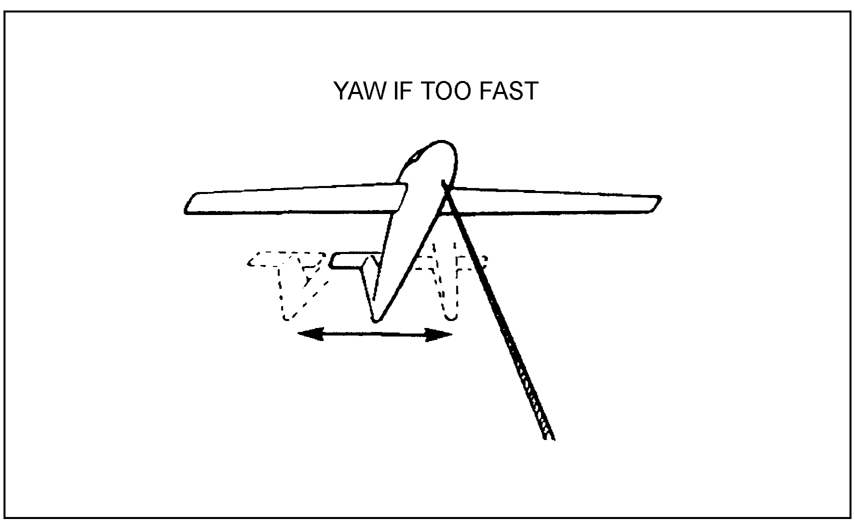



Figure 2-5-4. Too Fast Signal

20. If the airspeed falls below the Safety Airspeed of 50 mph or exceeds the Placard Speed of 69 mph, the pilot shall abort the launch by releasing the glider.

**NOTES ON WINCH/AUTO LAUNCH**

21. The following description of winch/auto launching provides a number of guidelines for safely executing a winch/auto launch. The standard operating procedures for winch/auto launch in conjunction with the techniques outlined in the paragraphs that follow provide the basic knowledge with which candidates converting to winch/auto launch should be familiar.

a. **Take-off.** The control column should be held slightly forward until the glider is moving along the ground and accelerating smoothly. The following are applicable:

(1) **Winch Take-off.** The acceleration is significantly greater during the initial stage of a winch launch than that experienced during an air tow or auto launch take-off. Because of the rapid acceleration, the use of a tail person to hold the tail down is necessary (with rapid acceleration, the tail may bang heavily on the ground if the tail is not being held down). Flying speed is normally achieved very quickly at which point the control column should gradually be moved rearward.

(2) **Auto Launch Take-off.** The initial acceleration during an auto launch is similar but less abrupt than that experienced during a winch launch. Because of the initial acceleration, a tail person is employed to hold the tail down. As flying speed is achieved, the control column should gradually be moved rearward.

b. In the early stages of the launch, particularly on calm days, large lateral movements of the control column may be necessary to pick up a dropped wing. As flying speed is quickly reached, the controls become effective and normal movement is sufficient. The glider will be kept straight by the pull of the cable/rope and little or no rudder will be needed until climb attitude is reached. The glider will run on its main wheel and leave the ground when a safe speed is reached. The glider should not be pulled off the ground by coarse pitch inputs by the pilot.

c. **Initial Climb (below the Safety Altitude of 200 feet AGL).** The glider should not be held down to fly level with the ground; rather, a relatively shallow climb angle should be initially established and gradually increased as the glider gains altitude during the initial stages of the climb prior to reaching the Safety Altitude. For safety reasons, as detailed below, the initial part of the climb must be shallow:

(1) After a proper climb speed is obtained, the pilot should continue a shallow climb (15-20 deg) until an altitude of 50 feet is reached, somewhat steeper (30 deg) until 200 feet is reached and then on a full climb (45-50 deg). A glider climbing steeply in the early stages of the launch will impose an excessive load on the launching gear and may prevent the winch engine from developing full power or the launch vehicle from accelerating properly.

(2) Should any part of the launching gear fail at this time (excessive load will increase the risk) a nose high attitude, coupled with low airspeed, may result in a stall from which recovery may be impossible.

d. **Full Climb (above the Safety Altitude of 200 feet AGL**). The following are applicable:

(1) Only after passing through the Safety Altitude of 200 feet AGL and only if the Safety Speed of 50 mph has been achieved should the maximum climb angle be established, i.e. control column fully aft. During the climb the airspeed should be maintained at approximately 25 mph above the stall speed, i.e. 60 mph.

(2) If the airspeed continues to increase after the maximum climb angle has been established, the climb angle shall be immediately reduced (i.e. reduce the pitch angle by lowering the nose) to prevent over-stressing the glider. The airspeed should be then stabilized at a safe speed.

(a) If this procedure is unsuccessful **but** the airspeed is still within acceptable limits, the glider should be yawed from side to side to direct the winch/auto operator to reduce power.

(b) If this procedure is unsuccessful **and** the airspeed exceeds or will probably exceed the launch limit of 69 mph, the launch shall be immediately aborted (glider released). The pilot should be prepared to counter an abrupt nose-up moment. A landing shall then be carried out as specified in the emergency procedures for winch/auto launching.

(3) If the airspeed falls below the safe climbing speed of approximately 50 mph or continues to decrease, the launch shall be immediately aborted (glider released) and a landing carried out as specified in the emergency procedures for winch/auto launching.

e. **Top of Climb.** As the climb angle is reduced near the top of the climb, there may be a tendency for the glider to porpoise if back pressure is held on the control column. If this pressure is relaxed slightly, the porpoising should cease. Near the very top of the launch, the nose of the glider will be pulled down toward the horizon. This is an indication to the pilot to take the load off the cable/rope before operating the release handle. Normally, the winch/auto operator will reduce the power when the glider reaches the top of the launch. This reduction in power can be clearly felt in the glider, and the pilot should release after lowering the nose slightly to take the tension off the cable/rope.

f. **Launching in a Crosswind.** The following are applicable:

(1) Drift will probably not be constant throughout the climb because of the wind gradient. To eliminate drift, the glider is essentially rotated about its vertical axis slightly, into the wind. A slight pressure on the upwind rudder pedal will prevent the cable/rope from pulling the glider straight again and causing the glider to drift downwind. When correcting for drift in the climb, the impression is that the into-wind wing is low. However, the wing is simply trailing as a result of the rotation around the vertical axis.

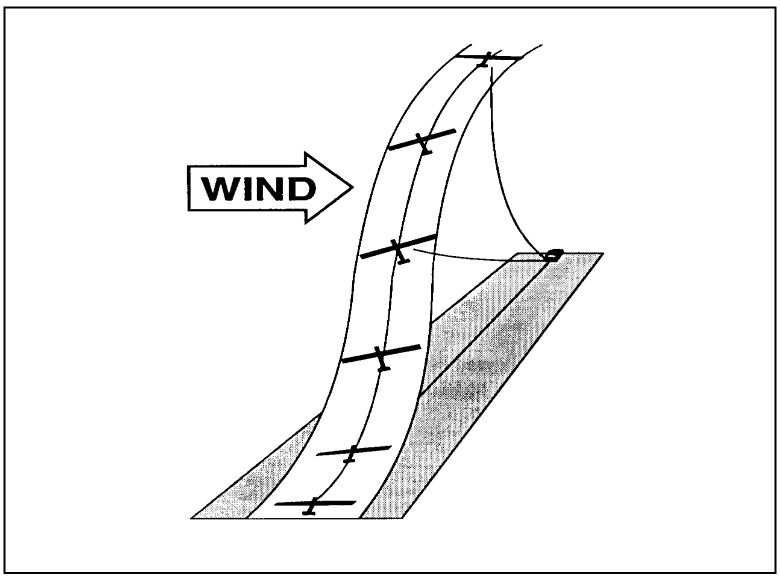



Figure 2-5-5. Winch/Auto Launch in a Crosswind

(2) Plan to release the cable/rope upwind of the launch area so that the wind drift will not cause it to fall in an unwanted position.

**COMMON FAULTS ON WINCH/AUTO LAUNCHES**

| No. | Fault | Correction |
|---|---|---|
| 1 | Wing drops to ground during take-off run. Usually caused by wing person's clumsiness; particularly dangerous in long grass. | If wing cannot be picked up with full opposite aileron before it touches the ground, the cable must be released immediately. Otherwise the glider may swing violently toward the down wing. |
| 2 | Tendency to swing off-course during ground run. | Use plenty of rudder, but centralize it as soon as the glider is back on line. |
| 3 | Ballooning on take-off. | Maintain forward pressure on control column. |
| 4 | Pitching movements (porpoising) on climb. | Too much back pressure on the control column. |
| 5 | Speed too slow. | Abort launch. |
| 6 | Speed too high (approaching 69 mph). | Ease control column forward to reduce airspeed and give too fast signal or release, as required. |

Figure 2-5-6 Common Faults on Winch/Auto Launches

## SECTION 6

## AUTO LAUNCH PROCEDURES

### AUTO LAUNCH VEHICLE

1. A suitably powered vehicle equipped with a proper tow hook and release system is critical to the safe conduct of an auto launch operation. A 1/2-ton truck with automatic transmission is preferred because of power and visibility considerations. Full size automobiles may be heavy enough to get good traction, but in most cases weights in the trunk will improve traction. The same technique may be applied to pick-up trucks to improve traction.

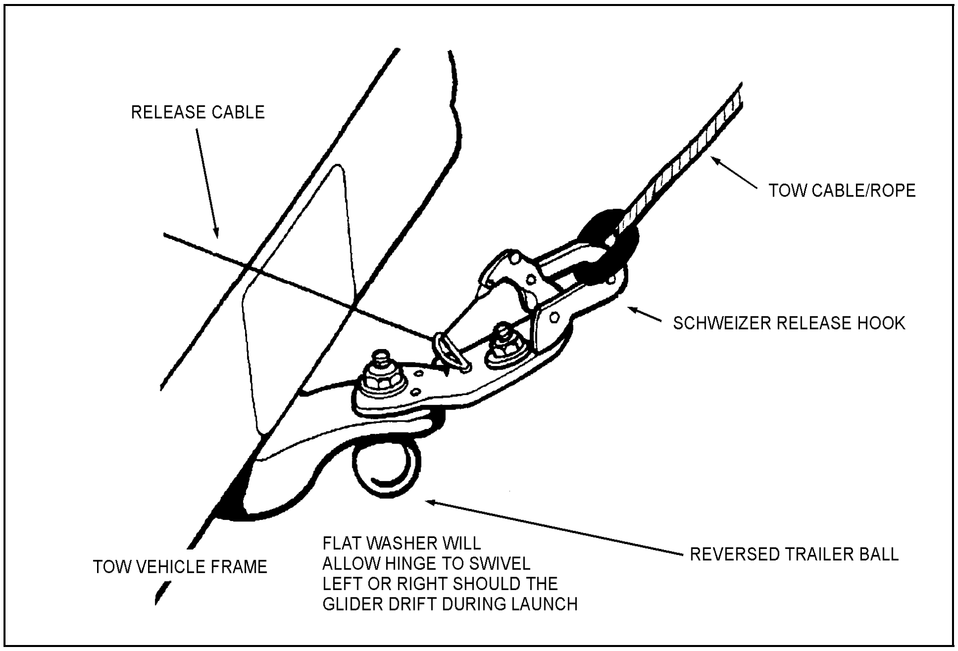



Figure 2-6-1 Typical Auto Tow Hitch Assembly

### GENERAL NOTES ON AUTO LAUNCH

2. A daily inspection of the tow vehicle shall be carried out prior to the commencement of auto launch operations. Emphasis shall be placed on careful inspection of the tow hook assembly. A confirmatory release check of the release mechanism is mandatory.

3. The vehicle driver is always accompanied by an observer who relays launch signals to the driver from the start of the launch to the release. The qualifications of individuals performing these duties are defined in Chapter 1.

4. As the glider becomes airborne, the observer carefully monitors the progress of the launch and informs the driver of any need to decrease speed. The observer confirms the release, or in the event of a release failure at the glider, releases the tow rope at the vehicle tow hook.

**NOTE**

On the first flight of the day, when conditions are unknown, downwind launches to position gliders for operations on the active runway are prohibited. Positioning of gliders in this instance shall be by ground movement.

5. **Calculating Auto Tow Launch Speeds.** The following are applicable:

a. subtract the surface wind from the placard speed (69 mph);
b. subtract an additional 5 mph as safety factor;
c. after the glider is in safe climb, reduce by 10 mph; and
d. subtract the surface wind again to accommodate wind gradient.

6. During an auto launch, the driver must adjust the vehicle speed to achieve the gliders best climbing airspeed. To tow at the optimum speed requires skill and judgment. Because of the wind gradient and the curvilinear flight path of the glider, the ground speed registered on the vehicle speedometer will not directly provide the airspeed of the glider. If the vehicle's speed is insufficient, the glider will be unable to climb and may be forced to release. If the speed is too high, the glider is liable to be over-stressed if the cable/rope does not break first.

7. The auto launch driver and observer must always be alert and react smoothly to the glider pilot's signals. After a few launches, the driver will become familiar with the vehicle speeds required under the prevailing conditions to provide the proper glider airspeeds.

8. After the glider releases, the vehicle stops to one side of the runway in order to provide a clear runway for the glider pilot. When all is clear, the vehicle crew drags the rope back to the launch point. Regional Flying Orders shall direct the procedures for returning the rope to the launch site.

9. Careful inspection of the towing rope shall be conducted on a regular basis. Kinks, weak spots or knots shall be immediately corrected.

**AUTO LAUNCH PERSONNEL**

10. The ground personnel required for an auto launch operation shall normally consist of an LCO, a hook-up person/signaller, a wing person, a tail person and a launch vehicle crew. Additional personnel, such as a dedicated signaller or glider retrievers, may be used where appropriate.

**POSITION OF LAUNCH CREW**

11. **Wing Person.** The wing person shall be positioned at the into-wind glider wing tip. The wing person shall hold it with one hand and be ready to raise the wing to the level position. The wing person shall wait for the signals or a command from the glider pilot while observing the take-off area to ensure the area is clear for take-off.

12. **Signaller.** After attaching the tow rope to the glider, the hook-up person shall also act as the signaller. When using signal bats, the signaller will stand beside the wing person and watch the glider pilot for the appropriate launch signals.

13. **Auto Launch Observer and Signals.** An observer will be located inside the launch vehicle while observing the signaller and the glider. During the launch, the observer shall relay any control signals from the signaller or pilot to the driver, and shall report the progress of the glider to the driver, as follows:

a. "Wings Level";

b. "Take up Slack";

c. "All Out";

d. "Glider Airborne";

e. "Rope Airborne";

f. "Glider in Full Climb";

g. "Glider on Top"; and

h. "Glider Released".

14. The observer shall also monitor the progress of the rope retrieve and effect the release when required.

**AUTO LAUNCH SIGNALS**

15. The following signals shall be used for the purpose of controlling the auto launch sequence:

a. **"Ready For Hook-up".** The pilot gives this instruction after the pre-flight check has been completed and the pilot has inspected the state of the weak link, cable/rope, and ring (the tow rope and ring shall be presented to the glider pilot for inspection prior to each launch). On receiving the "ready for hook-up" command, the hook-up person prepares to attach the ring to the appropriate tow hook.

**NOTE**

The launch cable/rope shall not be attached to the glider until the occupants are properly secured, the canopy, rear window and door is closed and locked, and the PIC has given the "ready for hook-up" instruction.

b. **"Open".** This instruction is given by the hook-up person requesting the pilot to open the release mechanism. The pilot repeats the instruction and opens the release mechanism.

c. **"Close".** The hook-up person gives this instruction to the pilot who repeats the instruction and slowly closes the release mechanism.

d. **"Secure on Auto Launch".** After checking the attached rope/cable for security, the hook-up person advises the pilot by verbally confirming the connection to the auto launch (C of G) hook.

e. **"Clear" or "Clear Above and Behind".** This advisory is issued under the authority of the LCO. This signal indicates to the glider pilot that the LCO, while monitoring such factors as the wind speed and gusts, radio transmissions, and visually checking the airfield surface and surrounding airspace for conflicting traffic, has found conditions suitable for launch. This advisory does not relieve the glider pilot or vehicle crew of the responsibility of obtaining, where appropriate, clearances from ATC, or of continuing to monitor the launch environment for potential conflicts and to abort as necessary.

f. **"Wings Level".** The glider pilot instructs the wing person to raise the wing by showing the thumb up with the left hand and by calling out the command. A glider with wings level at the launch site indicates to all personnel that an auto launch is about to commence.

g. **"Take up Slack".** The glider pilot issues this command to the signaller verbally and by showing the left hand forefinger. The signaller then proceeds to signal the auto launch observer to commence taking up the slack. The "take up slack" signal can be given in a number of ways. Waving a brightly coloured bat in a 180 degree underhand arc, the slow flashing of headlights, or radio transmissions are standard methods of indicating "take up slack" to the auto launch observer.

h. **"All Out".** The glider pilot issues this command to the signaller verbally and by showing two fingers on the left hand. The signaller then proceeds to signal the "all out" to the auto launch observer. This signal can be given in a number of ways. Waving a brightly coloured bat in a 180 degree overhand arc, the rapid flashing of headlights, or radio transmissions are standard methods of indicating "all out" to the auto launch observer.

i. **"Stop, Stop, Stop".** This command is given in a loud voice to stop a launch sequence. The hand signal (see Figure 2-4-3) is also to be used in conjunction with the verbal command, and is directed at the glider pilot, wing person and launch signaller. The glider pilot shall immediately release the rope/cable to prevent an inadvertent launch, and the wing person shall place the wing tip back on the ground. The signal to stop can be given by anyone at the launch site, and shall be immediately relayed to the auto launch observer by the following methods:

(1) holding the signal bat motionless straight above the head;

(2) sending a continuous white light to the launch vehicle via headlights or an Aldis lamp; or

(3) transmitting "Stop, Stop, Stop" via radio communication.

**TAKE-OFF AND CLIMB**

16. As minimum flying speed is obtained, the glider pilot shall apply slight back pressure to become airborne but remain in a shallow climb angle until a safe climbing speed is reached.

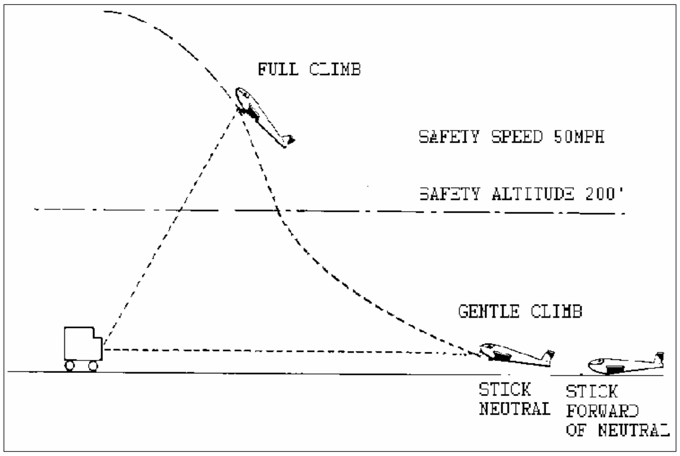



Figure 2-6-2 Controlled Climb Angle

17. The nose shall be raised progressively to the best climb angle only after it is safe to do so. The increase in attitude shall be smooth with the maximum climb attitude achieved only after passing through 200 feet AGL while maintaining an airspeed of at least 50 mph (Figure 2-6-2). See notes on winch/auto launch on page 2-5-8, para 22.

**CLIMB CONTROL SIGNAL**

18. In the event that a reduction in the climb speed during an auto launch is necessary, the glider pilot shall reduce the climb angle to prevent exceeding the placard speed, and shall yaw the glider from side to side to signal the auto launch observer to reduce speed (see Figure 2-6-3).

19. If the airspeed falls below the Safety Airspeed of 50 mph or exceeds the Placard Speed of 69 mph, the pilot shall abort the launch by releasing the glider.

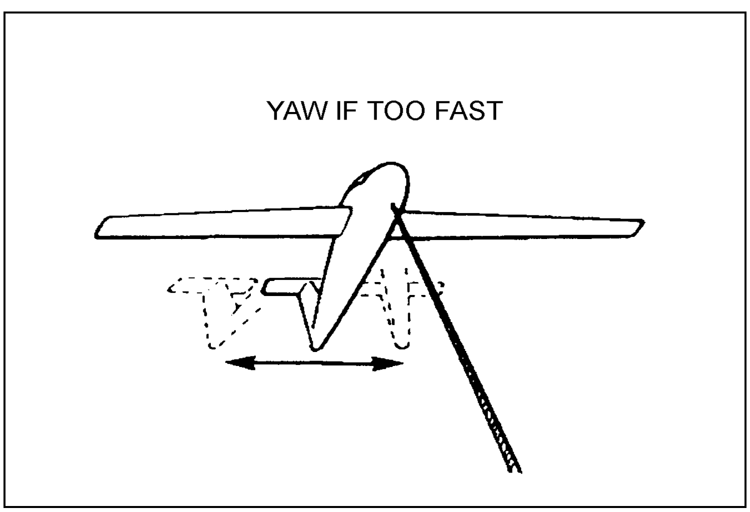



Figure 2-6-3 Too Fast Signal

# SECTION 7

# GLIDER EMERGENCY PROCEDURES

## GENERAL

1. The occasional emergency situation is inevitable. Through instruction and practice, pilots will become familiar with the procedures that will minimize the dangers inherent to gliding.

2. In the Air Cadet Gliding Program, specific procedures for emergencies in each phase of the flight are detailed. Regardless of the particular situation, the pilot should prioritize their actions by first flying the glider safely, heading towards a safe landing area and communicating their intentions, time permitting. This can be summarized by the saying, "aviate, navigate, communicate".

3. For rope/cable break emergencies, the altitude, wind conditions, runway length, aircraft attitude, airspeed and position relative to the runway are critical factors to consider in determining the correct response to a premature release.

4. A common error associated with rope/cable breaks is the perceived necessity to return to the launch site. Due to the dangers associated with low level turns, pilots shall make every effort to be established on the final approach by 300 feet AGL.

## CANOPY OPEN IN FLIGHT

5. An inadvertent opening of the canopy in flight is not a critical emergency. The following is applicable:

a. continue to safely fly the aircraft;

b. assess your situation, considering the phase of flight, position and altitude; and

c. If able, close the canopy. If unable to close the canopy, plan for sufficient altitude and airspeed to compensate for the increased drag when returning for landing.

## GROUND ABORT

6. Any glider launch shall be aborted whenever anyone detects a potential flight safety hazard. The "Stop, Stop, Stop" verbal and visual signal shall be given.

## AIR TOW EMERGENCIES

7. **Air Tow Launch Ground Abort.** Both the tow pilot and the glider pilot shall immediately release the tow rope. Immediately following release of the tow rope, the glider pilot shall attempt safe separation from the tow rope and the tow aircraft while maintaining positive control of the glider. In those situations where the glider has obtained sufficient speed to overtake or pass a decelerating tow aircraft, the glider shall be manoeuvred to the right. The tow aircraft pilot must therefore anticipate that the glider may pass on pilot's right and take appropriate avoidance action to the left.

8. **Summary.** The following are applicable:

a. **Air Tow Launch**. Both the tow aircraft and glider release the tow rope.

b. **Subsequent Actions**. Control the glider/tow aircraft to establish safe separation from the other aircraft and the tow rope.

**DEPLOYED SPOILERS DURING AIR TOW**

9. In the event that a glider pilot has inadvertently left the spoilers deployed during take-off, the tow pilot may not be able to maintain a climb or even level flight. If time and height preclude contacting or signalling the glider pilot, the glider may be released by the tow pilot without warning.

10. The following actions shall be taken by the aircrew in responding to deployed spoilers during air tow:

a. the tow pilot shall immediately advise the glider pilot verbally by radio and visually by moving the rudder rapidly from side to side;

b. the glider pilot shall immediately close the spoilers; and

c. when a glider is unexpectedly released during air tow, the immediate reaction of the glider pilot shall be to fly the aircraft, confirming that spoilers are closed.

**PREMATURE RELEASE (SINGLE AIR TOW)**

11. In the case of a premature release, the following is applicable:

a. In the event of a rope break, the glider pilot shall simultaneously fly the aircraft, activate the release **twice**, and select a suitable landing area.

b. Similarly, when a tow aircraft gives the release signal, the glider pilot shall immediately release, establish safe separation and select a suitable landing area. See Figure 2-7-1.

c. Following an early release or rope break during air tow, the tow aircraft should fly straight ahead or, if turning, should roll out and fly straight away from the glider. Tow aircraft recovery should follow normal procedures for the runway in use.

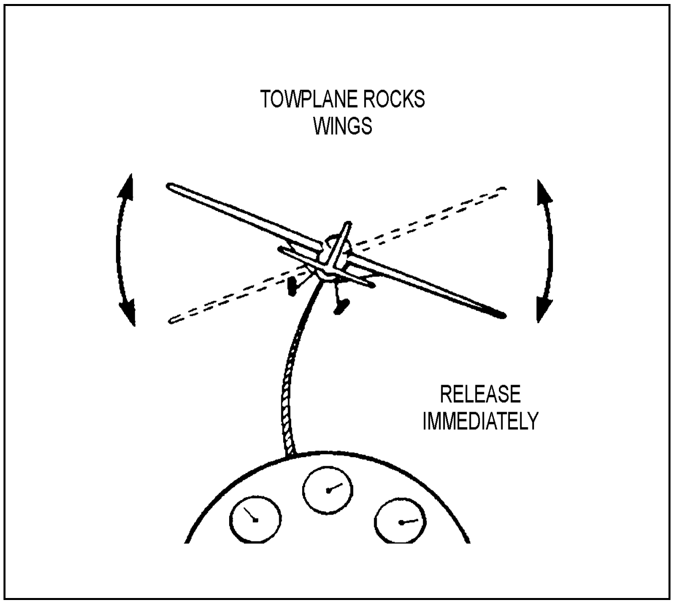


Figure 2-7-1 Towplane Signaling Release

12. When a downwind landing is flown, the following is applicable:

a. Several factors determine the effectiveness and safety of a downwind landing. High wind speeds (greater than 15 knots) make a downwind landing increasingly challenging. Due to the excessive ground speed produced, and the possibility of over-running the landing area, downwind landings may not be the best course of action. Airspeed shall be maintained at 50 mph on an approach to a downwind landing.

b. High winds and associated mechanical turbulence also make control of a glider difficult as it slows after touch-down. The tendency to weathercock may be uncontrollable and result in a ground loop. Pilots should always choose landing areas clear of personnel or equipment when landing under these conditions.

13. **Launch Failure at or Below 200 Feet AGL.** The following are applicable:

a. the glider pilot should attempt to land straight ahead making minor deviations to avoid obstacles. See Figure 2-7-2;

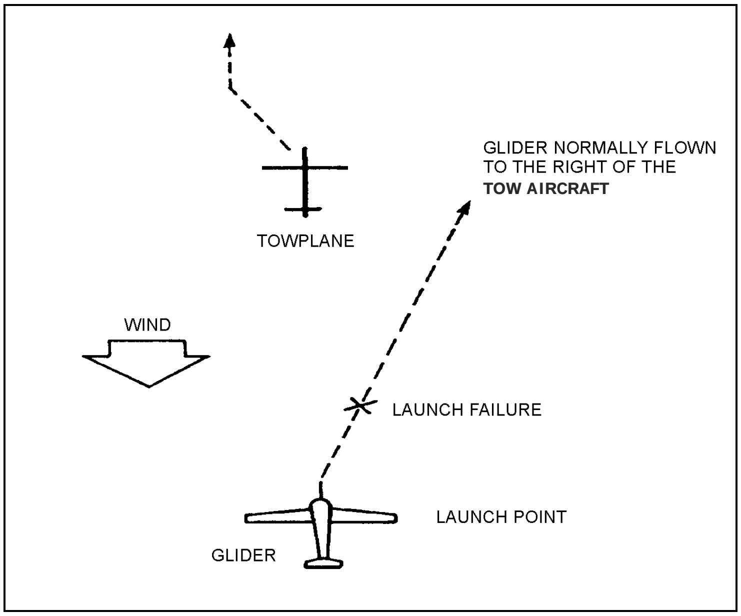



Figure 2-7-2 Launch Failure Below 200 Feet AGL

b. if the tow aircraft lands straight ahead, the glider shall be manoeuvred to its right;

c. if a straight ahead landing is not possible, turns up to 90 degrees may be executed at altitudes above 100 feet AGL. Altitude and the runway remaining are critical factors to consider when making the decision to turn.

14. **Launch Failure Between 200 Feet and 500 Feet AGL.** Select the best option from the following:

a. straight ahead landing;

b. downwind landing; and

c. crosswind or alternate runway landing.

**NOTE:**

If sufficient runway is available, the glider pilot should attempt to land straight ahead.

15. **Launch Failure Above 500 Feet AGL.** Select the best option from the following:

a. modified circuit (see Fig. 2-7-4);

b. crosswind or alternate runway;

c. downwind landing; and

d. straight ahead landing.

## RELEASE FAILURE (SINGLE AIR TOW)

16. **Glider Cannot Release.** In the event that the glider release mechanism fails to release the tow rope, the glider pilot shall proceed as follows:

a. The glider pilot shall notify the tow pilot of the release malfunction by radio, and prepare for the tow pilot to affect the release by climbing approximately 20 feet higher than the normal high tow position.

b. If radio communication is unsuccessful, the glider shall be flown out to the **left and level with the tow aircraft** so as to be in a position to be easily viewed by the tow pilot. Once this position has been achieved, the glider wings shall be briskly banked back and forth to indicate to the tow pilot the failure to release. See Fig. 2-7-3.

c. Once the radio message or visual signal is received by the tow pilot, the glider should be flown above the normal high tow position and shall be towed to an altitude and position from which a recovery of the glider trailing a tow rope can be made without difficulty. On reaching a suitable position, the tow pilot shall release the tow rope and confirm separation.

d. For the final approach, the glider pilot shall maintain an altitude high enough to allow the trailing tow rope to clear all obstacles and personnel.

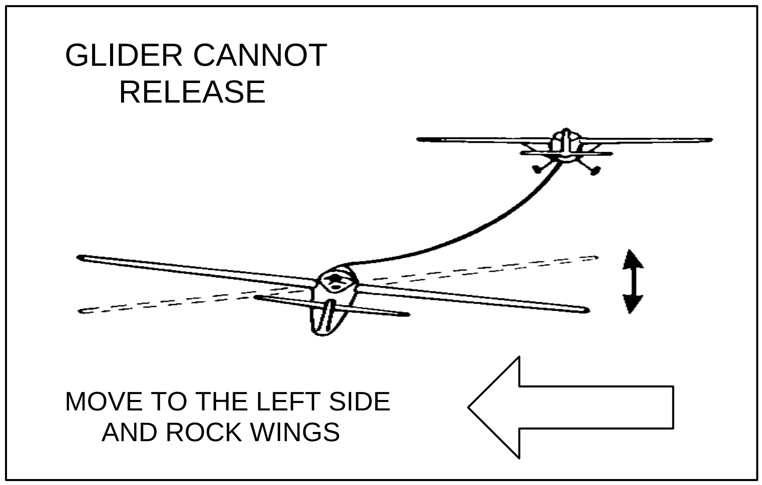



Figure 2-7-3 Glider Cannot Release

17. **Glider and Tow Aircraft Cannot Release.** In the event that neither the tow aircraft nor the glider can release, the following procedures shall be used to recover a glider under tow:

a. When the glider pilot realizes or is advised that the tow aircraft is also unable to release, the glider pilot shall descend to the low tow position and deploy full spoilers. The spoilers should be left fully deployed for the recovery and the glider pilot shall maintain the low tow position throughout the approach and landing.

b. The tow pilot shall modify the circuit to lengthen the final approach and to land long so that the glider does not get below a normal glide path. For tow aircraft, between 10 to 20 degrees of flap, an indicated airspeed of 60 mph, and approximately 500 fpm rate of descent should be used throughout the recovery.

c. After landing, the tow aircraft should slow quickly because of the glider skid contact and braking. During roll out, the tow aircraft should move gradually to the left hand side of the runway to allow the glider to pass on the right, if necessary. Alternately, the tow pilot should monitor the glider throughout the landing phase and be prepared to use some power after touchdown to maintain separation from the glider, if necessary.

## GLIDER RELEASE FAILURE (WINCH OR AUTO LAUNCH)

18. In the event that the glider pilot is unable to release the rope or cable during a winch or auto launch, the following actions shall be taken by the pilot and the launch operator:

a. the pilot shall over-fly the winch or auto launch vehicle and attempt to generate a back release; and

b. the winch operator shall use the winch guillotine or axe, and the auto launch observer shall activate the release at the launch vehicle.

**WINCH/AUTO LAUNCH GROUND ABORT**

19. **Winch/Auto Launch Ground Abort**. If there is any possibility that the glider may overrun the winch cable/auto launch rope on an aborted winch or auto launch, the pilot shall immediately release and manoeuvre the glider to the right so as to provide separation from the rope/cable. This procedure will safely clear the glider (specifically the tail wheel) from the auto tow rope or winch cable and drogue chute. If the auto or winch did not immediately react to the "Stop" signal, the rope/cable may still be moving with enough momentum to snag the glider causing glider damage and personal injury.

a. **Winch or Auto Launch**. The glider releases the winch cable/auto rope.

b. **Subsequent Actions**. Control the glide to establish safe separation from the cable.

**PREMATURE RELEASE WINCH/AUTO LAUNCH**

20. The following are applicable:

a. In the event of a cable/rope break, the immediate corrective action is to lower the nose of the glider to the normal gliding attitude. The glider pilot shall then activate the release **twice**, and select a suitable landing area.

b. Similarly, when the winch or auto launch vehicle loses power, the glider pilot shall immediately activate the release **twice** and simultaneously lower the nose of the glider to the normal gliding attitude, and select a suitable landing area.

**NOTE:**

The nose high attitude and rapidly decreasing airspeed that exists immediately after a cable/rope break is quickly followed by an initially high rate of descent as the aircraft recovers normal flying speed.

21. **Launch Failure at or Below 400 Feet AGL.** The following are applicable:

a. the glider pilot should attempt to land straight ahead making minor deviations to avoid obstacles, including the drogue chute, winch, cable.

**NOTE:**

During auto tow operations, when the glider is above 300 feet and the climb angle is shallower than normal, causing the position of the glider to be farther upwind than normal, turns up to 180 degrees may be executed, providing that sufficient runway is available.

22. **Launch Failure Above 400 Feet AGL.** The following are applicable:

a. In the event of a rope/cable break or premature release above 400 feet AGL, the glider pilot has several options available, and needs to consider various factors in determining the correct response. The position, altitude, wind speed and runway layout determine which of the following alternatives are appropriate:

(1) If sufficient runway remains, a straight ahead landing shall be conducted.

(2) If insufficient runway or space is available for a straight ahead landing, then a modified circuit with an abbreviated downwind leg, followed by an into-wind landing or crosswind landing may be conducted.

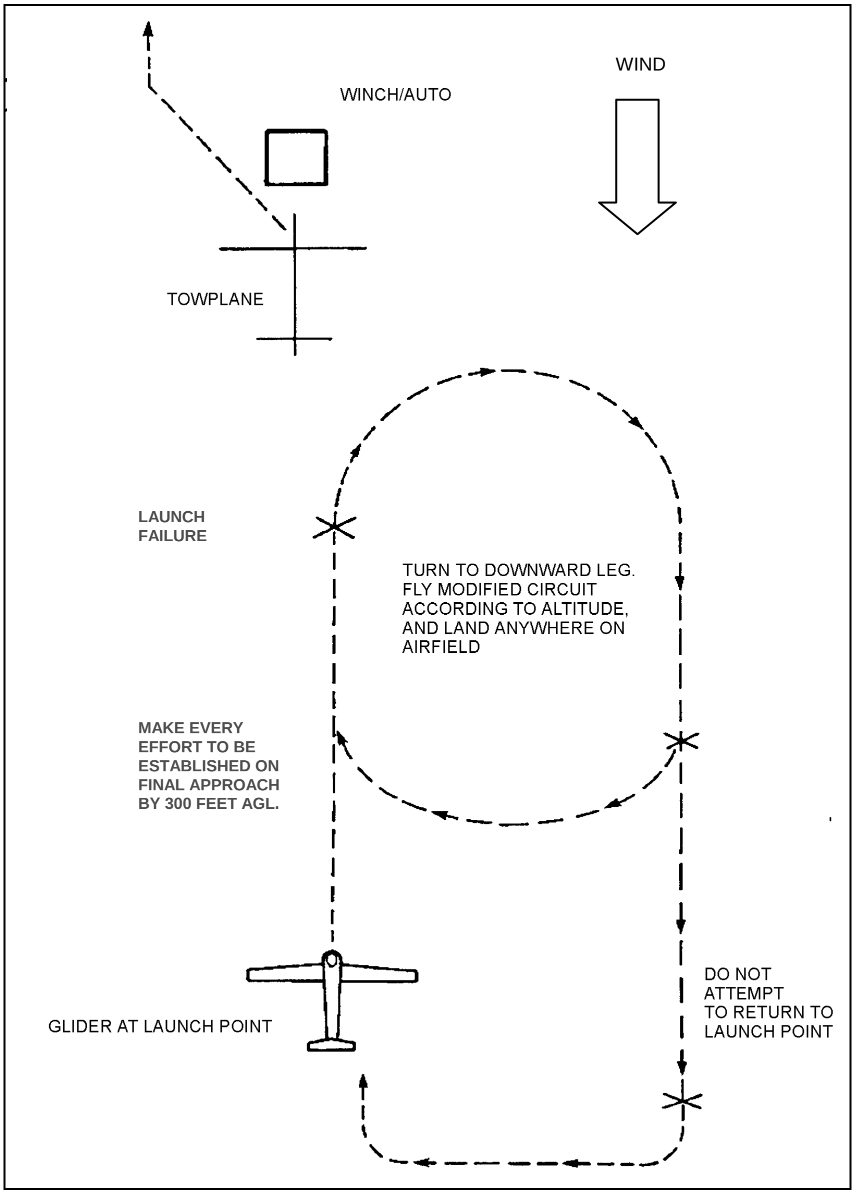



Figure 2-7-4 Modified Circuit

23. In winch/auto tow operations, downwind landings are discouraged because they are often difficult to execute properly, due to the position of the glider only partway up the runway during the majority of the launches. The runway available for downwind landing is often limited and requires the glider pilot to eliminate substantial altitude in order to prevent over-running the landing area.

**OFF-FIELD LANDING PROCEDURE**

24. Unintentional off-field landings rarely occur if constant attention is paid to the altitude and position of the glider in relation to the point of intended landing. This is especially important while manoeuvring in the circuit during periods of high winds or thermal activity. Lack of attention or carelessness usually is the reason pilots find themselves too far downwind from the touch-down point or too low to safely make the field. In the event that modification to the circuit pattern is insufficient to ensure a safe landing at the intended landing area, therefore making an off-field landing necessary, the following procedures apply:

a. Alternate landing areas in close proximity to the normal landing area shall be identified, inspected and briefed prior to flight.

b. The decision to land should always be made while sufficient altitude remains to fly a standard pattern. On cross-country flights, the experienced glider pilot always keeps a good landing field within range. Keeping the glider within the 45 degree vertical reference to the field, with allowances made for wind direction, surface condition, height of cover and obstacles will ensure a safe recovery.

c. The choice of a field should be made while ample altitude is available. The glider pilot should never wait until the last moment to select a field and be forced to make a straight-in approach. On cross-country flights, the tow pilot should help the glider pilot in selecting a suitable field by making low approaches.

d. Fields with newly harvested crops offer the best surface. Un-harvested crops such as high grain, corn or sunflower should be avoided due to the increased risk of aircraft damage.

e. If the site chosen contains rolling terrain, the landing should be made uphill to aid braking action even if slightly out of wind.

f. Once the off-field landing has been successfully completed, the pilot should remain with the glider, indicate the "all's well" to the circling tow aircraft and attempt to contact the launch site by radio.

## SECTION 8

## TOW AIRCRAFT OPERATIONS

### INTRODUCTION

1. The Bellanca Scout, L-19 and Wilga aircraft are used for glider towing. ACGP personnel in the conduct of the ACGP shall use the procedures and references detailed in this section for the operation of tow aircraft.

### REFERENCES

2. In addition to the instructions and procedures detailed in this chapter, the following references shall be used:
   a. Manufacturer's aircraft operating handbooks;
   b. A-CR-CCP-242/PT-005, Chapter 1, Air Standards and Chapter 5, Tow Aircraft Conversion Course; and
   c. Regional SOPs and Flying Orders.

### NORMAL OPERATIONS

3. The tow aircraft manufacturers' handbooks detail normal and emergency operating procedures. Tow pilots shall refer to these documents, reproduced by the regions as required, for a description of aircraft systems and procedures relating to aircraft performance and engine handling, emergency procedures for occurrences such as engine or electrical system failures, inspection and maintenance procedures, etc.

### TOW AIR CRAFT CROSSWIND LIMITATIONS

4. The crosswind limitation for tow aircraft operations in the Scout is 15 knots (17 mph) at 90 degrees. The crosswind limitation for the L-19/C305 is 10 knots (11 mph). The crosswind limit may be increased to15 knots (17 mph) during Tow Pilot Conversion, proficiency, and currency training with a qualified Tow Aircraft Standards or Check pilot.

### AIR TOW RELEASE PROCEDURE

5. Tow aircraft and glider separation is as follows (see Section 4, para 13 for further info):

   a. Responsibility for release rests with the glider pilot. However, regional SOPs may allow the tow pilot to initiate the release by verbally and/or visually signalling the glider pilot. **IN THIS CASE, THE VISUAL SIGNAL MUST BE SUCH THAT IT CANNOT BE MISINTERPRETED AS AN EMERGENCY SIGNAL.** In either case, the tow pilot shall not commence a post-release, descending left turn until visually confirming that the glider has released.

   b. At release, the glider pilot shall pull the release knob, hold it open momentarily (approximately 1 to 2 seconds), repeat the procedure, visually confirm separation from the tow rope, and then execute a gentle climbing turn to the right (Figure 2-8-1).

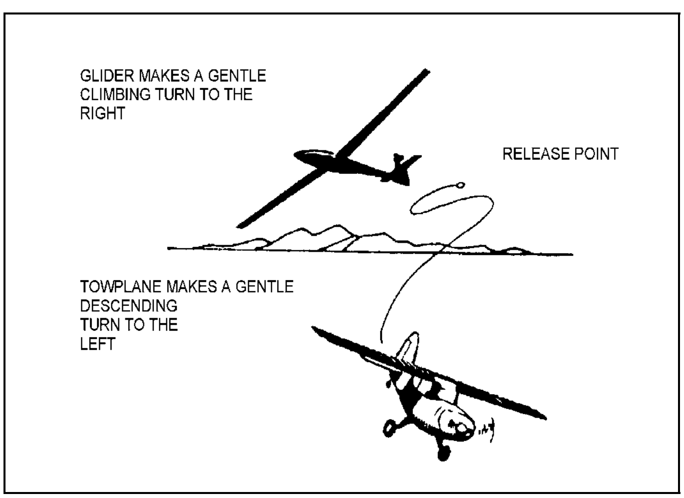



Figure 2-8-1 Separation Procedure

**TOW AIRCRAFT LANDING PROCEDURES**

6. **Final Approach and Landing.** The following are applicable:

a. **Final Approach.** To allow for an adequate clearance between the trailing tow rope and approach path obstacles, a slightly steeper than normal power-on approach shall be carried out.

b. **Landing.** The following apply:

(1) For all ACGP tow aircraft operations, the normal landing method will be a three-point landing as opposed to a wheel landing (main wheels only at touchdown), for the following reasons:

(a) reduced possibility of a swing which could lead to a ground loop;

(b) elimination of aircraft attitude changes after touchdown and attendant gyroscopic complications;

(c) reduced ground roll;

(d) improved post-touchdown directional control because the steerable tail wheel operation is immediately available; and

(e) consistency in approach/landing planning regardless of landing area conditions (soft, hard, rough, wet, etc).

(2) However, when maximum aileron control is required because of gusty crosswind conditions, a tail-low wheel landing may be accomplished. The following procedure is recommended:

(a) flapless, or a very low flap setting;

(b) maintain tail-low attitude during touchdown phase to minimize attitude change during post-touchdown deceleration and to minimize gyro effect;

(c) use the lowest practical threshold speed considering both the aircraft configuration and weight, and both the crosswind and gust conditions;

(d) use the lowest practical power setting;

(e) reduce power to idle prior to touchdown; and

(f) be prepared to correct for a potential swing as the tail is lowered.

**NOTE**

A gust condition exists when both of the following conditions exist. Firstly, the main gust peak is 15 knots or greater and secondly the peak gust speed is at least 5 knots higher than the two minute average speed. Additionally, gust conditions normally include rapid and repeated changes in wind direction.

(3) Under normal conditions, before wheel brakes are applied, ensure that all wheels are firmly on the ground, positive directional control is confirmed and the control column is fully aft.

**SOLO FLIGHT IN TOW AIRCRAFT**

7. Solo flight shall only be conducted with the rear control column removed.

## SECTION 9

## TOW AIRCRAFT EMERGENCY PROCEDURES

### GROUND ABORT and PREMATURE RELEASE (SINGLE AIR TOW)

1. See Section 7, paras 1 to 4 (Ground Abort) and Section 7, para 7 (Premature Release).

### ENGINE FAILURE WHILE TOWING

2. In the event of a complete engine failure while towing a glider, the following procedure shall be followed:

   a. Time permitting, the tow pilot shall either signal the glider to release (Figure 2-9-1) or release the glider immediately, set the attitude for best glide, and complete the emergency procedure appropriate for the type of aircraft flown.

   b. Because towing operations present an increased risk of cylinder head cracking, the tow pilot should be prepared to handle situations where an engine suddenly looses significant power and is accompanied by excessive vibration:

      (1) In most cases the normal engine failure procedure is appropriate. However, if possible, tow pilots should consider their altitude, position and the experience of the glider pilot in their decision to release the glider.

      (2) If reduced tow aircraft engine performance does not inhibit safe flight, the tow pilot should consider towing the glider to a position ensuring a safe recovery for both tow aircraft and glider.

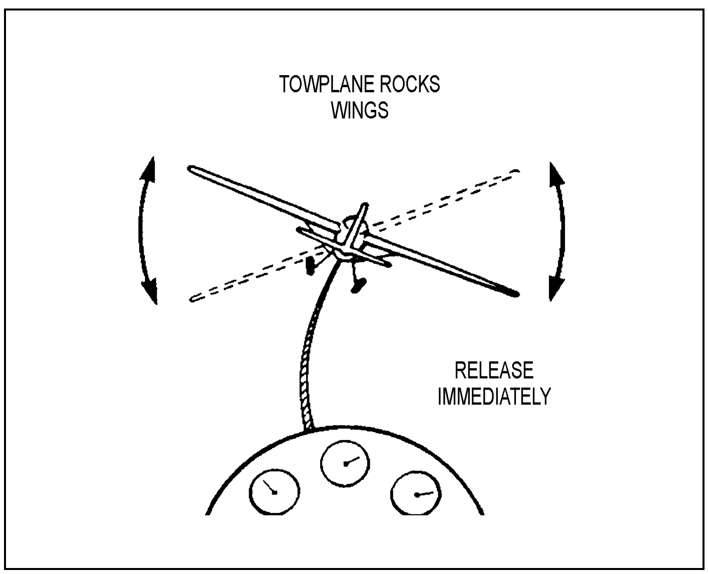



Figure 2-9-1 Towplane Signaling Release

### POOR CLIMB PERFORMANCE DURING AIR TOW

3. Several factors could lead to poor climb performance during air towing. Assuming that time permits, the tow pilot shall check the glider configuration after checking the tow aircraft engine and systems.

4. If engine performance is normal and flaps are set properly, the glider configuration may be the cause of the problem. In the event that a glider pilot has inadvertently left the spoilers deployed during take-off, the tow pilot will

likely have serious difficulty in maintaining a climb or indeed level flight. If the tow pilot does not have time and height available to signal the pilot, the glider may have to be jettisoned without delay.

5. The following actions shall be taken by the tow pilot in responding to deployed spoilers during air tow:

a. If time and altitude permit, the tow pilot shall signal the glider pilot by vigorously moving the rudder from side to side. This visual signal is the quickest way to advise the glider pilot that the spoilers are deployed. If time is available, the tow pilot shall follow up with an advisory radio call to advise the glider pilot of the problem.

b. If spoilers are not retracted and the tow pilot is able to continue with the air tow, a climb to a position and altitude shall be made from which a safe recovery of the glider is possible.

**RELEASE FAILURE (SINGLE TOW)**

6. See paragraphs 12 and 13 of this chapter, and Section 7.

**TOW AIRCRAFT UPSET**

7. Tow aircraft upset is caused by the rapid movement of a glider on tow to an excessively high position, and can be accompanied by glider movement well to the right or left of the normal tow centre line. If a glider climbs on tow, it also increases its airspeed because it flies around the arc of the circle whose centre is the tow aircraft. Increased airspeed makes the glider climb even faster, and the result is a sling shot effect. The elapsed time in such an occurrence, from normal tow to an uncontrollable situation, is as little as 3 seconds. The vertical and horizontal forces generated at the tail of the tow aircraft can cause a severe pitching motion resulting in the complete elimination of lift through the creation of a negative angle of attack or an angle of attack exceeding the stalling angle. A simultaneous horizontal force can produce a yaw sufficient to place the tow aircraft in a spin.

8. Altitude may not be sufficient to recover from the tow aircraft upset and subsequent spin, especially if the upset occurs below 1 500 AGL.

9. The risk of tow aircraft upset is particularly acute if tow ropes significantly shorter than 200 feet are being used. For example, momentary loss of control by a glider pilot attempting to close a canopy that has opened or a rapid, over-controlled attempted recovery from a low position can easily lead to a position well above the height of the tow aircraft. With a short tow rope, the vertical component of the load vector at the tow aircraft's tail increases rapidly as the glider moves out of position.

10. Tow pilots should be conscious of the circumstances that can create difficulty for the inexperienced glider pilot. A student glider pilot often gets low on tow in the early part of the climb. The factors that contribute to this, apart from a lack of anticipation by the glider pilot, include a poorly controlled transition by the tow pilot from the level accelerating phase into the climb and the effect of the wind gradient. Following lift off, a rapid climb by the tow pilot could cause an inexperienced glider pilot to make an excessive correction from a low tow position and lead to tow aircraft upset.

11. Tow pilots should be alert to the potential of tow aircraft upset and take corrective action as required. When a glider on tow rapidly diverges to an excessively high or low tow position sufficient to produce overpowering forces on the tail, the tow pilot shall jettison the glider.

**GROUND LOOPS**

12. Tow pilots must have an extensive working knowledge of the ground loop phenomenon as it applies to **conventional gear aircraft** (tail draggers). The purpose of this requirement is not to produce aerodynamicists or physicists but rather to produce competent pilots, because in the final analysis, the pilot causes the overwhelming majority of ground loops.

13. A **Swing** is defined as an undesirable but controllable turn during the ground operation of an aircraft; whereas, a **Ground Loop** is defined as a violent uncontrollable turn resulting from failure to correct (or overcorrecting) a swing.

14. It follows, therefore, that a Ground Loop can be prevented as long as the pilot maintains directional control by countering a Swing in both a timely and correct manner.

15. **Causes of a Swing.** A swing may be caused by one of the following:

a. **Environmental Factors.** The following environmental factors may cause a **swing**:

(1) touching down while crabbing into wind;

(2) touching down while the aircraft is drifting sideways;

(3) a crosswind acting on the fuselage and rudder, causing an aircraft to weathercock into the wind;

(4) allowing the upwind wing to rise, which combined with weather cocking effects, causes a swing into wind;

(5) failing to properly control a wheel landing in gusty crosswind conditions in that when the tail settles onto the runway, heading control changes from the rudder to the tail wheel and during the transition period, a swing can develop; and

(6) incorrect recovery action for drift after a bounce has the same effect as landing with drift.

b. **Aerodynamic Factors.** The following aerodynamic factors may cause a **swing**:

(1) **Engine Torque.** The clockwise rotation of the propeller (seen from the cockpit) induces a swing to the left of increasing magnitude as the power increases.

(2) **Asymmetric Thrust.** In a tail-down attitude, the down-going propeller blade meets the air at a greater angle of attack than the up-going blade resulting in greater lift produced by the downgoing blade, causing a tendency for the aircraft to swing to the left.

(3) **Precession.** Because the spinning propeller acts like a gyroscope, as the tail lifts during take-off, a force is imposed that reacts through 90 degrees, causing a swing to the left.

(4) **Slipstream.** The corkscrew motion of the airflow from the propeller travels around the fuselage, impacting the tail on the left side, thereby causing a swing to the left.

16. **Swings on Take-off.** The following are applicable:

a. All of the aerodynamic forces involved during take-off in conventional gear aircraft combine to produce a strong tendency for the aircraft to swing to the left. The most obvious and dramatic is the precession effect as the tail is raised during the take-off acceleration. However, torque and slipstream effects are minimized as the aircraft accelerates because of the offset vertical stabilizer. Additionally, asymmetric thrust is reduced to zero as the aircraft reaches level flight attitude prior to lift-off.

b. Because the effectiveness of the flight controls continues to increase as speed increases, environmentally or aerodynamically-induced swings are normally easily controlled during take-off.

17. **Landing.** The following are applicable:

a. **Swings and Aerodynamic Factors.** Swings on take-off induced by aerodynamic factors (torque, asymmetric thrust, precession and slipstream) are minimized during landing because of reduced engine power requirements. Consequently, these aerodynamic-induced swings normally can be easily corrected by timely and proper control application.

b. **Swings and Environmental Factors.** Swings caused by environmental factors are not so easily dismissed. As indicated airspeed decreases, aerodynamic control effectiveness also decreases (aileron, rudder and elevator) and consequently, progressively larger control inputs are necessary to counter an environmentally-induced swing. As control effectiveness further decreases, brakes and power must be used to stop the swing.

c. **Swings and Ground Speed.** The greater the ground speed, the more pronounced will be the swing. Two major factors affect ground speed:

(1) **Wind.** For example, considering a touchdown speed of 40 mph, the difference between landing in a 5 mph headwind and a 5 mph tailwind is a 30 per cent increase in ground speed.

(2) **Density Altitude.** For example, consider a 40 mph TAS at SL and 15 degrees Celsius; at 2 000 feet ASL and 30 degrees Celsius, the TAS would be 43 mph. A combination of this increase and that due to the tailwind, as detailed previously, produces almost a 40 per cent increase in ground speed.

(3) **Conclusion.** As detailed in the text that follows, ground speed dramatically affects the inertial force of an aircraft and, consequently the severity of a swing.

18. **Inertia, Momentum and Centre of Mass.** The following are applicable:

a. Inertia, as defined by Newton, is the tendency of a mass to remain in a state of rest or constant speed in a straight line unless acted upon by an unbalanced force. For example, a car moving into a flat icy curve will tend to continue in a straight line off the side of the road. Therefore, if the mass is moving, the inertial force will resist any change to both its direction and velocity. Additionally, the greater the mass, the greater the inertial force, the greater the resistance to change. Further, the inertial force of the mass will increase dramatically as the velocity of the mass increases. Using the example of the aircraft landing at 2 000 feet ASL and 30 degrees Celsius in a 5 mph tailwind as compared to the same aircraft landing at SL and 15 degrees Celsius in a 5 mph headwind, the relatively small increase in ground speed of 13 mph almost doubles the inertial force.

b. The specific point through which the inertial force acts is defined as the Centre of Mass. For both the L-19 and the Scout, the Centre of Mass can be considered the same as the C of G. This location, above the ground and behind the main wheels, provides the catalyst which, in the absence of corrective action by the pilot, transforms a swing into a ground loop.

c. If the pilot allows a swing to progress, the longitudinal axis of the aircraft will increasingly diverge from the vector of the Centre of Mass. The wheels will be attempting to go in one direction, while the Centre of Mass is attempting to continue in its original direction. As this angle between the direction of the wheels and the direction of the Centre of Mass increases, so does the inevitability of the total loss of directional control, especially when the direction of the Centre of Mass moves beyond the wheels towards the tail of the aircraft. In other words, the wheels lose effectiveness in controlling direction and an abrupt ground loop skid will occur as inertia continues to drive the Centre of Mass along its original vector.

d. Additionally, because the Centre of Mass is located above the ground, centripetal force will cause the aircraft to lean to the outside of a swing. Eventually, in a classic ground loop, as all directional control is lost, a high probability exists that the outside wing will contact the ground. If the coefficient of friction between the tire and the surface is high, the inertial force could also collapse the outside landing gear. If the coefficient of friction is low, the aircraft may only slide.

19. **Preventing the Ground Loop.** The following are applicable:

a. **The easiest and simplest way to prevent a ground loop is to never allow a swing to develop.** Therefore, after touchdown, the aircraft must be kept straight by immediate and correct reaction to every directional change, regardless if the swing is assumed or perceived to be minor. Every swing, regardless of magnitude, must be responded to before there is an inch of displacement between the longitudinal axis and the inertial force vector. In other words, directional control response must be immediate, positive and correct.

b. Ground loops do not always happen on the runway. Many ground loops have occurred during taxi because the pilot started an intentional turn at too high a speed. Considering the high density altitude tail-wind example, the controls may feel light, there may be little feedback from the controls, and the pilot may incorrectly assume that the aircraft is moving slower than it actually is. The pilot starts what is considered a normal turn and immediately a vicious ground loop results. The combination of mass, inertia and momentum wins again because the pilot misidentified the relative velocity, thereby creating a high rate of turn. The only solution is to fly the aircraft from engine start until the aircraft has come to a complete stop with the engine off.

20. **Countering Swings with Available Controls.** The following are applicable:

a. **Rudder.** During the post-landing phase as the aircraft is decelerating to taxi speed, rudder deflection may be aerodynamically effective in countering a tendency for the aircraft to swing.

b. **Aileron.** As long as aileron control is effective, aileron into a swing, while not a cure for a swing, will assist in preventing a lean to the outside of the swing. Note, however, that it may also cause the aircraft to turn toward the swing direction.

c. **Elevator.** Full back-stick elevator acts to hold the tail down thereby increasing the effectiveness of tail wheel steering. Additionally, with flaps up, full back-stick elevator may assist in keeping the full weight of the aircraft on the ground, thereby increasing the effectiveness of the wheel brakes.

d. **Tail Wheel Steering.** As airflow past the vertical stabilizer reduces during deceleration, the rudder becomes ineffective and directional control must be transferred to tail wheel steering. Care must be taken to avoid tail wheel angles that will result in the free-castering of the tail wheel. The pilot must be cognizant of approaching those limits and be prepared to use brakes and/or power.

e. **Brakes.** Brakes should be used whenever necessary to counter a swing and to realign the longitudinal axis with the inertial vector.

f. **Power.** The following apply:

(1) **Application.** Power is perhaps the least considered, but one of the most effective controls the pilot has to negate a swing. Power can restore aerodynamic effectiveness. However, power is not a cure-all. Use it, but do not abuse it. Advance the throttle, if necessary, to a fairly high power setting, holding in full rudder and full back-stick. When the swing shows signs of stopping, reduce power.

(2) **Conclusion.** Use as much power as required to maintain or regain directional control, early and without hesitation. Leave it on only as long as necessary to correct the swing. If there is room to stop, do so straight ahead.

●●●●●●●●
● **CAUTION** ●
●●●●●●●●

There is a temptation to leave full power on and go-around. Many have tried it, usually to their grief. There is a distinct difference in going around in order to recover from a bad landing and going around to recover from a directional control problem. A go-around recovery from a bad landing is good advice because at touchdown, the aircraft has speed relatively close to that required for take-off; full power will put the aircraft in a flying state almost immediately. However, the ground loop scenario may be entirely different. Because the speed could be well below that required to get airborne, a go-around effectively becomes a take-off, with its attendant time, distance and aircraft control requirements. The worst reaction is to apply power and **force** the aircraft airborne into ground effect. When ground effect is lost, the aircraft will stall.

21. **Summary.** The following are applicable:

a. Use all available controls to keep the aircraft straight (rudder, aileron and full back-stick) after landing, and during deceleration and taxi. The following apply:

(1) approach any turns on the ground with caution;

(2) be prepared to apply brakes; and

(3) be prepared to apply power.

b. If a swing starts, respond **immediately** with rudder and aileron.

c. If the swing continues, use brake **immediately**.

d. If the swing continues, use power **immediately**.

**NOTE**

Application of controls, brakes and power must occur very rapidly, and will probably occur simultaneously as the severity of the swing increases.

e. Reduce power as soon as the swing is eliminated.

22. The majority of ground loops are caused by the pilot. With skill and knowledge, a pilot should be capable of successfully countering directional control problems. Remember the following:

a. A **Swing** is an undesirable but **controllable** turn during the ground operation of an aircraft.

b. A **Ground Loop** is a violent **uncontrollable** turn resulting from overcorrecting or failing to correct a swing.

## SECTION 10

## DOUBLE AIR TOWS (TWO GLIDERS) NORMAL AND EMERGENCY PROCEDURES

### AUTHORITY (DOUBLE AIR TOW)

1. Double air tows (two gliders) shall only be authorized by the RCA Ops O. Only personnel with a current double tow qualification, designated in writing by the RCA Ops O, may act as PIC for double air tows. Refer to Chapter 1, Air Standards.

2. Double tows are approved for L-19 aircraft. Double tows using Bellanca Scout aircraft are prohibited.

### CONSIDERATIONS (DOUBLE AIR TOW)

3. Double air tows shall be used only when the advantage outweighs that of a single tow in terms of both flight safety and efficiency, (e.g. one double tow over mountains versus two single tows; personnel availability; tow aircraft availability; etc.).

4. Compared to single glider tows, double air tows present additional challenges to the crews of both tow aircraft and gliders, especially considering that overcontrolling or harsh corrective action by one aircraft will invariably cause problems for the other formation members. The result could be a chain of actions and reactions that may increase in severity such that an emergency release is the only viable and safe course of action remaining.

5. Other considerations that must be taken into account are as follows:

  a. take-off and climb performance will be reduced; and

  b. fuel and oil consumption will be increased.

### SOPs (DOUBLE AIR TOW – NORMAL OPERATIONS)

6. SOPs for double air tows are as follows:

  a. the tow aircraft shall line up on the runway centre line approximately 400 feet from the button;

  b. the glider on the long rope (minimum 400 feet) shall line up on the downwind side of the tow aircraft, one glider wing span from the runway centre line;

  c. the glider on the short rope (minimum 200 feet) shall line up on the upwind side of the tow aircraft, one-half glider wing span from the runway centre line;

**NOTE**

The line-up configuration detailed in the previous subparagraphs ensures approximately one-half wing span separation between the wing tip of the short rope glider and the long rope and equal angle-off for both tow ropes (approximately 7 degrees);

  d. at the tow aircraft, the short rope ring shall be placed on top of the long rope ring;

  e. after hook-up is completed, the gliders shall be pushed back to take up the remaining slack in the tow ropes;

  f. care must be taken to maintain the correct lateral spacing. The visual reference for the correct position of the gliders is to place the tow aircraft fin on the opposite side wing root;

g. the glider pilots must ensure that the correct positions are maintained throughout the take-off and initial climb. This will ensure that asymmetric towing loads on the tow aircraft are minimized, thereby allowing for normal tow aircraft directional control;

h. the short rope glider shall employ a hook-up person/signaller and a wing person;

i. the long rope glider shall employ a hook-up person and a wing person;

j. a tow aircraft signaller shall be employed;

k. the LCO shall ensure that both gliders are ready for take-off before authorizing the signaller at the short rope glider to initiate the "all-out";

l. the tow aircraft must accelerate straight down the runway centre line, immediately adjusting for any directional deviation, however small, using tail wheel steering, rudder and/or brakes to aggressively regain and maintain the centre line;

**NOTE**

Should the tow aircraft be unable to maintain or immediately regain the runway centre line, the take-off shall be aborted.

m. during take-off, both gliders must maintain the correct visual reference to the tow aircraft thereby ensuring equal angular tow rope displacement from the tow aircraft, while following the tow aircraft through any minor deviations;

n. the glider on the short rope should become airborne first, establishing a slightly higher than normal vertical position (approximately 6 to 9 feet) while maintaining the correct lateral position;

o. the glider on the long rope should maintain the ground roll until the glider on the short rope becomes airborne, then establish a slightly lower than normal vertical position (approximately 2 to 5 feet) while maintaining the correct lateral position;

p. as the tow aircraft becomes airborne, the entire formation should weathercock into the wind with the gliders maintaining the correct vertical and lateral positioning with respect to the tow aircraft;

q. once airborne, the gliders can maintain a “V” formation with the same angular position as described for the take-off, or transition to the line astern position described below. While in “V” formation, both gliders shall remain above the slipstream, the glider on the short rope slightly higher than the glider on the long rope;

r. prior to releasing, the tow aircraft shall signal (visually and /or by radio) for the gliders to assume the line astern position;

s. the glider on the long rope shall ensure that the move to the line astern position is synchronized with the movement of the glider on the short rope;

t. the line astern position is defined as follows:

    (1) the glider on the short rope maintains a high tow position, and

    (2) the glider on the long rope maintains a low tow position;

u. upon arrival at the release location, the glider on the short rope shall release first and shall perform an immediate gentle climbing turn to the right. The glider on the long rope will then assume the high tow position, releasing in the same manner approximately 10 to 15 seconds after the glider on the short rope;

v. after release, the long rope glider is responsible for ensuring safe separation from the short rope glider;

w. upon confirmation that both gliders have released and established safe separation to the right of the tow aircraft, the tow aircraft may commence a standard post-release descending left hand turn;

x. the gliders and the tow aircraft shall ensure safe separation from each other during approach and landing. Prepared, hard runway surfaces shall only be used for landing unless grass areas, free from all obstacles, have been previously certified as safe landing areas for the formation.

**TAKE-OFF ABORT (DOUBLE AIR TOW)**

7. An abort is mandatory under the following conditions:

a. the tow aircraft cannot maintain or regain the runway centre line any time during the take-off ground roll; or

b. either of the gliders under tow cannot maintain position such that the asymmetric tow loads cause the tow aircraft to deviate from the runway centre line and prevent the tow aircraft from regaining the runway centre line.

8. If the tow aircraft initiates the abort, the following procedures apply:

a. The tow aircraft shall:

(1) immediately release the gliders;

(2) if required, regain directional control and regain the runway centre line;

(3) call "Abort" on the radio;

(4) stop or continue with the take-off, depending on the runway remaining, tow aircraft controllability and serviceability, airspeed, etc.

b. The gliders shall, upon seeing/hearing the tow aircraft abort:

(1) immediately release the tow ropes; and

(2) land/manoeuvre to the left and right of the tow aircraft, respectively, avoiding obstacles.

9. If a glider initiates the abort, the following procedures apply:

a. the glider initiating the abort should attempt to coordinate a simultaneous release with the other glider using the radio if possible;

b. if time/conditions prevent this pre-planned action, the remaining glider, upon seeing/hearing the other glider abort, shall immediately release;

c. both gliders shall land/manoeuvre to the left and right of the tow aircraft, respectively, avoiding obstacles; and

d. the tow aircraft shall manoeuvre to the centre line and stop or continue with the take-off, depending on the runway remaining; tow aircraft controllability and serviceability; airspeed; etc.

**PREMATURE RELEASE (DOUBLE AIR TOW)**

10. Premature release procedures during double tows should be handled as for single tows with the following additional considerations:

a. **Glider on Short Rope Released.** Immediate climbing right turn away from the glider on the long rope to ensure separation. To prevent fouling with the long rope glider, the short rope glider shall not release its tow rope until at least 90 degrees of the turn have been completed.

b. **Glider on Long Rope Released.** The released glider (long rope) shall carry out normal procedures as for a single glider premature release. The unreleased glider (short rope) shall maintain high tow position to avoid being fouled by the other tow rope.

c. **Both Gliders Released.** Glider on short rope must initiate an immediate climbing turn away from the gilder on the long rope to ensure separation. Glider on the long rope must take appropriate separation action to avoid the other glider and its tow rope.

**RELEASE FAILURE (DOUBLE AIR TOW)**

11. Release failures during double tows should be handled as for single tows with the following additional considerations:

a. **Glider on Short Rope Cannot Release.** Glider on long rope will release from low tow position prior to the tow aircraft releasing both tow ropes.

b. **Glider on Long Rope Cannot Release.** After the glider on the short rope releases, the glider on the long rope shall assume the high tow position. The tow aircraft shall then release both tow ropes.

c. **Both Gliders Cannot Release.** Both gliders shall assume the "V" tow position. The tow aircraft shall then release the tow ropes.

d. **Both Gliders and Tow Aircraft Cannot Release.** As per single tow release failure for both glider and tow aircraft, except that on approach and landing, the gliders assume positions to the left and right of the tow aircraft, respectively. The tow aircraft shall land and roll out on the runway centre line.

## ANNEX A

## GLIDER FINAL ASSEMBLY CHECKLIST

1. A final check shall be carried out after a full assembly. This check should be performed by more than one person to ensure that all assembly points are double-checked. **A standard pre-flight inspection shall also be completed prior to the test flight.**

| | |
|---|---|
| **1. WINGS** | |
| a. Surfaces checked | |
| b. Strut attachment bolts, washers, nuts and safety pins: | |
| (1) Fuselage (LH & RH) – hardware installed | |
| (2) Wings (LH & RH) - hardware installed | |
| (3) Aileron locks (LH & RH) - removed | |
| **2. SPAR BOLTS, SPACERS, NUTS & PINS** | |
| a. Forward Spar (LH & RH) – hardware installed | |
| b. Rear Spar (LH & RH) – hardware installed | |
| c. Spacers – installed under nuts & can be rotated by hand | |
| **3. SPOILER CONTROL** | |
| a. Pin and safety pin – hardware installed | |
| **4. AILERON CONTROLS** | |
| a. Pins & safety pins (LH & RH) - hardware installed | |
| **5. ELEVATOR CONTROL** | |
| a. Push rod, bolt, nut and safety pin – hardware installed | |
| **6. TAIL SECTION – HORIZONTAL STABILIZER** | |
| a. Horizontal stabilizer & strut attachment bolts, washers, nuts and safety pins: | |
| (1) Horizontal stabilizer attachment – hardware installed | |
| (2) Struts - fuselage attachment (LH & RH) – hardware installed | |
| (3) Struts - horizontal stabilizer attachment (LH & RH) – hardware installed | |
| **7. LOG BOOK ENTRIES (2) COMPLETED** | |
| a. Aircraft assembled in compliance with the 2-33A parts and maintenance manual section A | |
| b. Flight controls checked for correct assembly, locking and sense of operation *(must be an independent check)* | |

**GLIDER REGISTRATION:** **DATE:**

**NAME & SIGNATURE:**

**PLACE DOCUMENT IN THE AIRCRAFT LOGBOOK WHEN COMPLETED**

## ANNEX B

## GLIDER DAILY INSPECTION

The daily inspection shall be completed before the gliders first flight of the day.

**Registration:** ____________________________ **Date:** ____________________________

| **Documentation / Cockpit** | **Check Off** |
|---|---|
| 1. **Journey Log:** ensure time remaining to complete flights before next scheduled inspection & check for snags | ( ) |
| 2. **Battery:** in & secure, wires away from the feet area | ( ) |
| 3. **Radio Check:** transmit & receive | ( ) |
| 4. **Canopy:** attachment points, canopy condition, cleanliness (use plastic cleaner or soap & water, **do not use glass cleaner**) | ( ) |
| 5. **Front Release Knob:** tension, cable free, operation | ( ) |
| 6. **Instruments:** condition & security, gently check air hose connections behind dash (if desired check alt against field elevation) | ( ) |
| 7. **Ballast:** bracket secure, pin installed if removable ballast installed | ( ) |
| 8. **Rudder Pedals:** springs attached, rudder cables attached, freedom of movement | ( ) |
| 9. **Control Column & Trim:** freedom of movement | ( ) |
| 10. **Spoilers & Brake Control:** freedom of movement, wheel brake operation | ( ) |
| 11. **Publications Pouch:** installed (**do not check contents daily**, C of A, C of Reg., C. of G. graph, handbook, exemption) | ( ) |
| 12. **Front Seat Belt:** condition | ( ) |
| 13. **Rear Door & Rear Windows:** condition, security of latches, attachment points | ( ) |
| 14. **Rear Release Knob:** spring tension | ( ) |
| 15. **Rear Rudder Pedals:** freedom of movement, cables free | ( ) |
| 16. **Rear Control Column:** freedom of movement | ( ) |
| 17. **Rear Seat Belt:** condition, secure rear seat harness if not in use | ( ) |
| 18. **Forward Wing Attachment Bolts & Safety Pins:** in & safetied (2) (or can be checked from inspection windows) | ( ) |
| 19. **Spoiler Disconnect:** pin (1) in & safetied, visual for security | ( ) |
| 20. **Aileron Disconnect:** pins (2) in & safetied, visual for security | ( ) |
| 21. **Control Cables:** security & wear | ( ) |
| 22. **Rear Fuselage Interior:** condition | ( ) |
| **Forward Fuselage** | |
| 23. **Main Wheel & Tire:** condition, wear, inflation | ( ) |
| 24. **Skid & Skid Plates:** condition, lower skid wear plate not worn through | ( ) |
| 25. **Tow Hook:** wear, hook condition, proper engagement (see reverse side), winch hook wired or taped up if not in use | ( ) |
| 26. **Nose Cone:** condition | ( ) |
| 27. **Pitot/Static:** condition, no obstructions | ( ) |
| **Left Wing** | |
| 28. **Wing Strut:** condition | ( ) |
| 29. **Wing Strut Bolts:** in, castle nuts on & safetied, washers as required | ( ) |
| 30. **Dive Brake:** hinges, connections for security & wear | ( ) |
| 31. **Wing Skin:** condition | ( ) |
| 32. **Outrigger Wheel & Spring:** condition & wear | ( ) |
| 33. **Ailerons & Pushrods:** condition, movement & security | ( ) |
| 34. **Spoilers:** condition, movement, security, check spring assembly | ( ) |

**Rear Fuselage**

35. **Centre Section Fairing:** condition, fasteners secure ( )
36. **Wing Attachment Bolts & Safety Pins:** in & safetied (4), washers, spacers & castle nuts on (flashlight required for fwd bolts) ( )
37. **Fabric:** condition, all inspection covers installed ( )

**Empennage**

38. **Vertical Stabilizer:** condition, security to fuselage ( )
39. **Horizontal Stabilizer:** condition, security ( )
40. **Horizontal Stabilizer Lift Struts:** attachment & safetied ( )
41. **Tail Wheel Assembly:** condition, attachment, security, wheel wear, wheel rotates, wheel secure ( )
42. **Rudder & Elevator:** condition, movement, security ( )
43. **Rudder Cable & Elevator Push Rod:** condition, security ( )
44. **Inspection Plate Cover:** secure ( )

**Right Wing**

45. **Spoilers:** condition, movement, security, check spring assembly ( )
46. **Ailerons & Pushrods:** condition, movement & security ( )
47. **Outrigger Wheel & Spring:** condition & wear ( )
48. **Wing Skin:** condition ( )
49. **Dive Brake:** hinges, connections for security & wear ( )
50. **Wing Strut:** condition ( )
51. **Wing Strut Bolts:** in, castle nuts on & safetied, washers as required ( )

Enter all major & minor unserviceabilities in journey log defect column.

**Signature:** ______________________________ **Licence No:** ____________________________

**Note:** This inspection sheet should be reproduced locally on a 8 ½” by 14” sheet.

## ANNEX C

## GLIDER TRAILERING CHECKLIST

| | | | |
|---|---|---|---|
| **1.** | **FUSELAGE:** | | |
| | a. | Centre aligned | ( ) |
| | b. | Wing pins secured | ( ) |
| | c. | Turnbuckles secured | ( ) |
| | d. | Safety pins installed | ( ) |
| **2.** | **TAIL:** | | |
| | a. | Centre aligned | ( ) |
| | b. | Secure through D-Ring | ( ) |
| | c. | Secure horizontal stabilizer to trailer | ( ) |
| **3.** | **COCKPIT:** | | |
| | a. | Control stick secured | ( ) |
| | b. | Canopy secured | ( ) |
| | c. | Pitot tube covered | ( ) |
| 4. | Struts secure | | ( ) |
| **5.** | **WINGS:** | | |
| | a. | Small bolt top fitting | ( ) |
| | b. | Shoulder of bolts up | ( ) |
| | c. | Bolts (two per wing) | |
| | | (1) Left wing bolts installed | ( ) |
| | | (2) Right wing bolts installed | ( ) |
| | | (3) Safety pins installed (4) | ( ) |
| | d. | Fuselage and Wing Surface clearance | ( ) |
| | e. | Wing root openings covered | ( ) |
| **6.** | **AILERON LOCKS SECURED** | | ( ) |
| **7.** | **RUDDER LOCK SECURED** | | ( ) |
| **8.** | **D-TUBES COVERED** | | ( ) |
| **9.** | **TRAILER:** | | |
| | a. | Hitch safety pin | ( ) |
| | b. | Safety chain secured | ( ) |
| | c. | Lights | |
| | | (1) signal | ( ) |
| | | (2) brake | ( ) |
| | | (3) park | ( ) |

**GLIDER REGISTRATION:** **DATE:**

**SIGNATURE:**

## ANNEX D

## ACGP AIRCRAFT TIE-DOWN CHECKLIST

| | |
|---|---|
| 1. Tie-Down Post/Soil security/composition | ( ) |
| 2. Nose secured (if applicable) | ( ) |
| 3. Wings Secured: | ( ) |
| a. Low wing into prevailing wind | ( ) |
| b. Left Wing secured | ( ) |
| c. Right Wing secured | ( ) |
| 4. Tail Stand installed as appropriate | ( ) |
| 5. Tail secured | ( ) |
| 6. Controls secured by seat harness: | ( ) |
| a. Aileron Locks installed | ( ) |
| b. Rudder Lock installed | ( ) |
| 7. Canopy/doors secured | ( ) |
| 8. Pitot Head covered | ( ) |
| 9. Spoilers open and locked or approved spoiler device installed | ( ) |
| 10. Canopy Cover installed | ( ) |

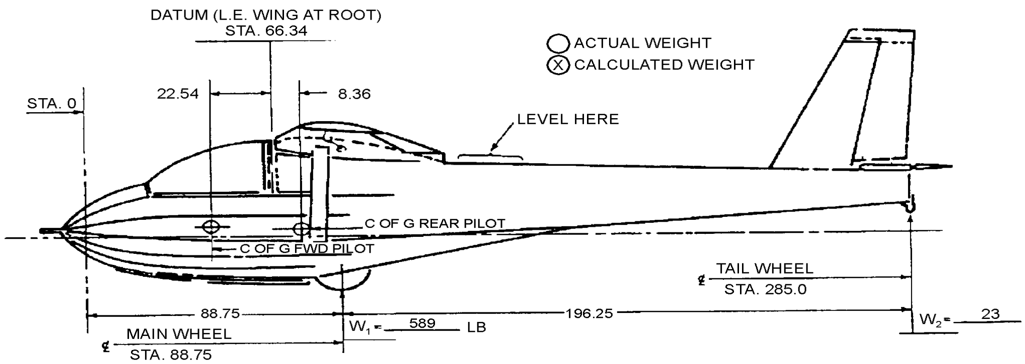
**SIGNATURE:** **DATE:**

**COMMENTS:**

# ANNEX E

## 2-33 WEIGHT AND BALANCE CALCULATIONS

WEIGHT AND BALANCE, MODEL NO. SGS 2-33A SER. NO. 369 REG. NO. N-33969 DATE FEBRUARY 27. 1975




EMPTY WEIGHT = $W_1 + W_2$ = 589 + 23 = 612 LB

EMPTY C OF G (STA) = $\frac{W_2 \times 196.25}{W_1 + W_2} + 88.75 = \frac{23 \times 196.25}{612} + 88.75$ = STA 96.12

SHIP AS WEIGHED INCLUDES EQUIPMENT LISTED ON 1-4427-3

**NOTES**

1. SEE GLIDER DATA SHEET NO. G2EA.
2. FORWARD PILOT C OF G AT STA. 43.80.
3. REAR PILOT C OF G AT STA. 74.70.

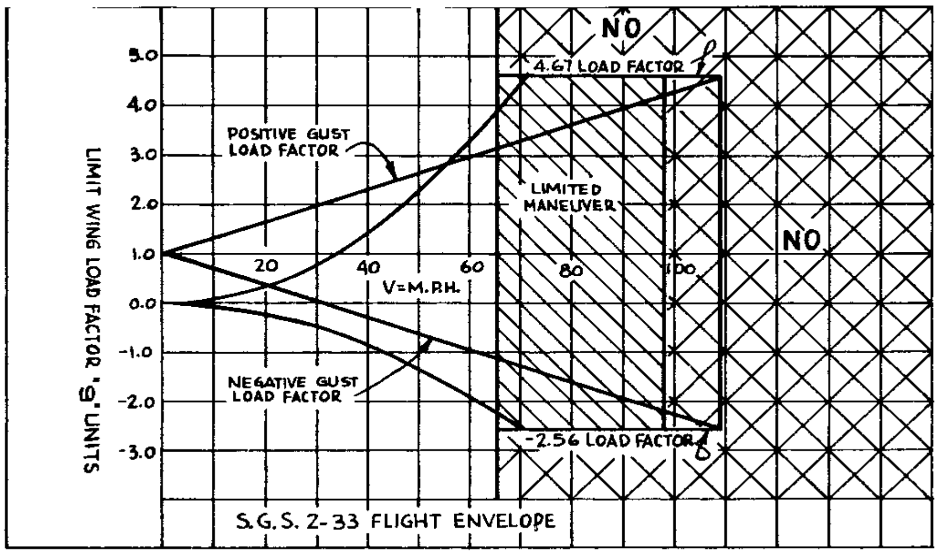
| EXAMPLE GLIDER SERIAL No. 369 | | | |
|---|---|---|---|
| **ITEM** | **WEIGHT** | **ARM** | **MOMENT** |
| Glider empty weight and C of G | 612 | 96.12 | 58,825 |
| Front pilot weight | 170 | 43.80 | 7,446 |
| Rear pilot weight | 150 | 74.70 | 11,205 |
| Ballast, if used | 0 | 14.75 | 0 |
| | | **TOTAL MOMENT** | **77,476** |
| **TOTAL WEIGHT** | **932** | | |
| | | | |
| Total moment / Total weight | = 77,476 / 932 | = 83.13 | = Actual flying C of G |
| | | | |
| This C of G is between the limits of Station 78.20 and 86.10 and the gross weight is less than 1,040 lb.<br><br>Therefore, this glider has a proper flight weight and a balanced loading. | | | |

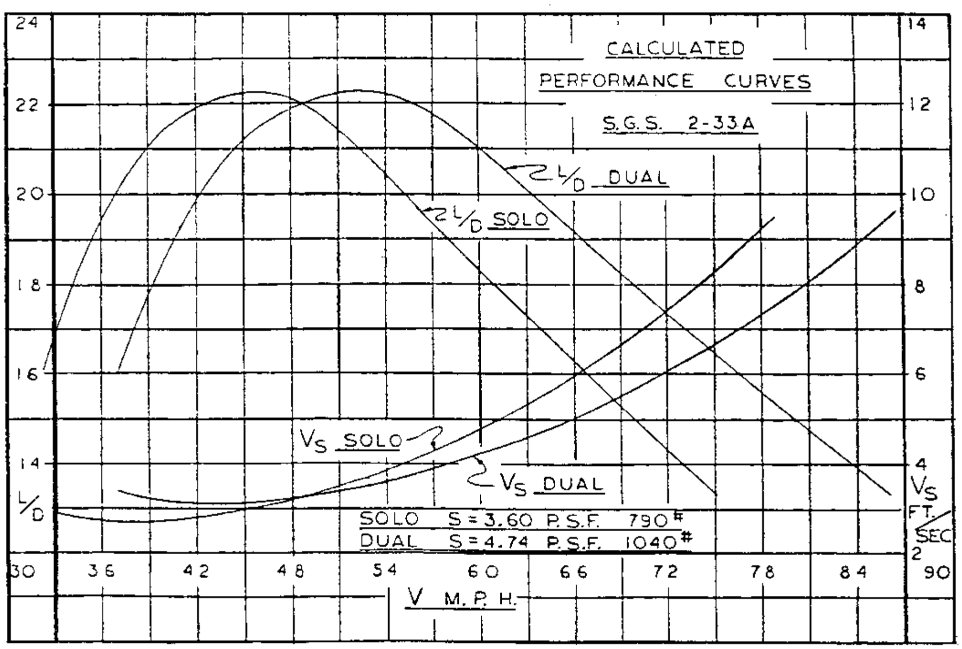
| MY GLIDER SERIAL No.: | | | |
|---|---|---|---|
| **ITEM** | **WEIGHT** | **ARM** | **MOMENT** |
| Glider empty weight and C of G | | | |
| Front pilot weight | | 43.80 | |
| Rear pilot weight | | 74.70 | |
| Ballast, if used | | 14.75 | |
| | | **TOTAL MOMENT** | |
| **TOTAL WEIGHT** | | | |
| | | | |
| Total moment / Total weight | = | = | = Actual flying C of G |
| | | | |
| Is the C of G within limits?<br><br>Is the total weight less than 1,040 lb. | | | |

Note: Removable ballast if used is 19 pounds.

**ANNEX F**

**2-33 FLIGHT ENVELOPE AND PERFORMANCE CURVES**



# CHAPTER 3

# GLIDER PILOT COURSE TRAINING PLAN

## SECTION 1

## FLYING TRAINING

### GENERAL

1. The Glider Pilot Course contains a series of air and ground lessons designed to train student pilots with no previous flying experience to the TC Glider Pilot Licence standards and the Glider Pilot Course Qualification Standard.

2. Air Cadets attending the course must be in possession of a TC Student Pilot Permit in accordance with procedures detailed in Canadian Aviation Regulations (CARs). A Medical Category 4 is acceptable provided that a TC Medical Examiner, following a normal aviation medical, has assigned the category.

3. **2-33 Height and Weight Limitations.** The Schweizer 2-33 gliders used in the course impose certain physical limitations with respect to the weight and size of the pilot. Therefore, the student pilot's size must promote comfortable positioning in the cockpit with good visibility in all directions as well as being able to effect full movement control. Candidates arriving at the RGS who exceed these limitations will be subject to RTU action. The following limitations shall be applied:

| **Limitations** | Maximum | | Minimum | |
|---|---|---|---|---|
| Weight | 200 lb | 90.72 kg | 90 lb | 40.82 kg |
| Height | 6 ft 3 in | 190.5 cm | 4 ft 6 in | 137.16 cm |

### FLIGHT SAFETY

4. As for all ACGP activities, Flight Safety is the guiding principle for the Glider Pilot Course. A proactive Flight Safety Program is an essential component of the course, contributing to a safe and effective flying training operation, and assisting the students to develop the required skills in airmanship, decision making, aircraft handling and the procedural aspects of aviation.

### FLYING SYLLABUS

5. The flying syllabus, comprising 27 dual instruction, one EC, one PC, and 20 solo flights, is detailed in Figures 3-2-1 and 3-2-2. Flights shall be conducted in the order stated in the syllabus. Exceptions to this direction, which may be approved by the CFI, are flights that require certain weather conditions, such as winds creating illusions due to drift, and the Launch Emergency Flights (AL20 to AL22).

### PROGRESS BOOKS

6. Regions shall use the standardized National Progress Book detailed in Annex A of this chapter. Student progress books shall be held at the RGS for a period of 3 years.

### SOLO FLIGHTS – BRIEFING, MONITORING AND DEBRIEFING

7. All student solo flights shall be preceded by a thorough briefing by the instructor. As a minimum, the briefing shall cover the following: the limits of the mission; a review of the sequences to be flown; a review of circuit procedures (especially existing and forecast weather/wind conditions and circuit modification procedures); and a review of appropriate emergencies the student may encounter (especially rope break procedures and alternate and emergency landing areas).

8. All solo flights shall be individually monitored by a qualified glider instructor for the entire duration of the flight. A radio shall be available for the use of instructors monitoring solo students. Instructors shall position themselves in close proximity to a radio that can be used to contact the student if needed.

9. At the conclusion of every solo flight, the instructor shall review the flight with the student, paying particular attention to the student's concerns and questions.

**PERFORMANCE ASSESSMENT – GENERAL**

10. A student's performance must be measured in relation to the QS and not to the performance of other students.

11. Evaluation for the Emergency PO shall only be for the reactions pertaining to the emergency itself.

**PROFICIENCY LEVELS (PLs) – EXPLANATION AND DEFINITIONS**

12. Successive flights have progressively more challenging objectives and, therefore, the student must achieve an increasing level of proficiency on flying exercises as detailed in Annex A, Card 7 "Proficiency Level Standards". For example, the standard for landing is PL 1 on AL 6, PL 2 on AL15 and PL 3 on AL 23.

13. The following Proficiency Level (PL) definitions are applicable:

a. **Level 1.** **The Student** was not capable of completing the task. Trainee required verbal and/or physical assistance to avoid making major errors. Further instruction is required

b. **Level 2**. **The Student** completed the task but required verbal and/or minor physical assistance to avoid making major errors. Further practice is required

c. **Level 3.** **The Student** completed the task, making only minor errors. Trainee required minimal verbal cues to analyze and/or correct errors.

d. **Level 4.** **The Student** completed the task without assistance, making only minor errors. Trainee was able to self-analyze and correct errors.

e. **Level 5.** **The Student** completed the task without assistance and without error.

**MAJOR AND MINOR ERRORS – EXPLANATION AND DEFINITIONS**

14. The assignment of a valid Proficiency Level is dependant upon a thorough understanding of the terms "major error" and "minor error".

15. The following definitions are applicable:

a. A **Major Error** is an error that significantly detracts from the ideal and/or jeopardizes the safety or successful completion of the task.

b. A **Minor Error** is an error that detracts from the ideal but does not jeopardizes the successful completion of the task

**OVERALL FLIGHT RATING (OFR) – EXPLANATION AND DEFINITIONS**

16. The Instructor will rate each flight from an **overall** flight perspective based on the PL achieved by the student glider pilot on each exercise or sequence.

17. Following the rating of individual tasks using the 1-5 proficiency level scale, the candidate's overall performance of the trip shall be assessed by the instructor as follows:

Standard Exceeded - The student performed the majority of the tasks to a level higher than required by the TP, and easily performed the remaining tasks to the level required by the TP.

Achieved Standard - The student performed all tasks to the level required by the TP.

Achieved Standard with Difficulty - The student experienced difficulty achieving the minimum levels required by the TP.

Marginal - The student was unable to achieve the level required by the TP on one task.

Unsatisfactory - Candidate's overall performance did not meet the level required by the TP. Failure to achieve the required standard on two tasks will constitute an Unsatisfactory rating.

**NOTES**

(1) Every effort shall be made to correct performance deficiencies as soon as possible. In addition:

A marginal flight assessment cannot be given after AL22.

The trip immediately following a marginal or unsatisfactory (ED) trip may not be rated as marginal.

The trip immediately preceding a flight test may not be rated as marginal.

No Enabling or Performance Checks may be rated as marginal.

(2) Those items which are commented upon in any assessment, and which refer to airmanship or HPMA (CRM) related activities, shall be directly related to, and supported by an observed task.

**UNSATISFACTORY PROGRESS**

18. All Unsatisfactory Course Progress will be handled in accordance with 1 CAD Orders 5-212.

19. Unsatisfactory Course Progress includes:

a. any failed EC;

b. a Failed Transport Canada Exam; or

c. any UNSAT Trip, excluding Review Flights.

20. The first time a student demonstrates unsatisfactory course progress in the flying phase, the flight commander will conduct an Initial Review (IR) and may grant one Extra Dual (ED). For the second and third instances of unsatisfactory progress in the flying phase, the CFI will convene an Independent Review Board (IRB) which may grant one additional ED per UNSAT trip. The fourth instance of unsatisfactory progress in the flying phase constitutes a Course Failure, which requires a Progress Review Board (PRB).

**EXTRA DUAL FLIGHTS (ADDITIONAL INSTRUCTIONAL)**

21. Extra duals may be authorized for students who fail to achieve the required standard. Extra duals shall be graded as either SAT or UNSAT. The authorizing signature and appointment must be present on the Extra Dual Card (Red) prior to flight.

**COURSE FAILURE**

22. Course failure is deemed as:

a. Four UNSAT trips during the course (including EC's and PC's);

b. Failure of a retest on the PC;

c. Failure of any four ground school ECs, including re-writes; or

d. Failure of a Transport Canada Exam re-write.

23. Once a student's progress has constituted a course failure, a PRB will be convened as per 1 CAD Orders 5-212, and recommendations made to the RCA Ops O.

**REVIEW FLIGHTS**

24. Under extraordinary situations, such as student sickness, extended poor weather, etc., resulting in prolonged non-flying activity longer than 4 days, the CFI may approve a "Review Flight" in order for the student to regain previously demonstrated proficiency. For a prolonged period of non-flying activity longer than nine days, the CFI may approve up to two Review Flights.

25. To ensure that students do not fly solo in unfamiliar conditions and/or situations (which could present a flight safety hazard) the CFI, or in his or her absence the Flight Commander, may also approve one Review Flight per instance.

26. Individual sequences will be rated on the Proficiency Level to the standard of the preceding mission and the Overall Flight Rating must be graded SAT or UNSAT. In the case of an UNSAT Review Flight, an ED will be required to regain the standard.

27. Under no circumstances shall Review Flights be used as a result of below standard performance. Extra Duals are specifically mandated for this situation.

28. The authorizing signature and appointment must be present on the Review Flight Card (Green) prior to flight.

**FINAL FLIGHT TEST – TIMING**

29. The Final Flight Test should be conducted after all solos have been flown, however, it may be conducted at any time after the Pre Test mission AL28 has been flown.

## SECTION 2

## FLIGHT/AIR LESSON - SYNOPSIS

| PRE-SOLO | | | | | |
|---|---|---|---|---|---|
| **Flt No.** | **Exercise** | **Release (Feet AGL)** | **Time (Approximate)** | | **Total** |
| | | | **Dual** | **Solo** | |
| AL1 | Familiarization Flight | 2 000 | :12 | | 0:12 |
| AL2 | Attitudes and Movements | 2 000 | :12 | | 0:24 |
| AL3 | Attitudes and Movements | 2 000 | :12 | | 0:36 |
| AL4 | Air Tow, Straight Glide and Medium Turns | 2 000 | :12 | | 0:48 |
| AL5 | Take Off, Flight Management, Secondary Effect of Controls and Circuit Procedures | 2 000 | :12 | | 1:00 |
| AL6 | Gentle Tums, Approach and Landing | 2 000 | :12 | | 1:12 |
| AL7 | Basic Stalls | 2 500 | :15 | | 1:27 |
| AL8 | Air Tow Positions and Stalls | 2 500 | :15 | | 1:42 |
| AL9 | Steep Turns and Stalls in Turns | 2 500 | :15 | | 1:57 |
| AL10 | Slipping | 2 500 | :12 | | 2:09 |
| AL11 | Slipping Turns | 2 000 | :12 | | 2:21 |
| AL12 | Incipient Spins and Drift Illusions | 3 000 | :18 | | 2:39 |
| AL13 | Spins and Spirals | 3 000 | :18 | | 2:57 |
| AL14 | Flight Management | 1 500 | :10 | | 3:07 |
| AL15 | Circuit Modification (High) | 1 500 | :10 | | 3:17 |
| AL16 | Circuit Modification (High) | 2 500 | :15 | | 3:32 |
| AL17 | Circuit Modification (Low) | 1 500 | :10 | | 3:42 |
| AL18 | Circuit Modification (Low) | 1 500 | :10 | | 3:52 |
| AL19 | Upgrade | 2 500 | :15 | | 4:07 |
| AL20 | Launch Emergency, Modified Circuit | 800 | :05 | | 4:12 |
| AL21 | Launch Emergency, Downwind Landing | 400-600 | :04 | | 4:16 |
| AL22 | Launch Emergency | A/R | :04 | | 4:20 |
| AL23 | **General Progress Check** | 3 000 | :18 | | 4:38 |
| AL24 | **SOLO FLIGHT CHECK** | 2 500 | :15 | | 4:53 |

Figure 3-2-1 Pre-Solo Flying Syllabus

| POST-SOLO | | | | | |
|---|---|---|---|---|---|
| **Flt No.** | **Exercise** | **Release (Feet AGL)** | **Time (Approximate)** | | **Total** |
| | | | **Dual** | **Solo** | |
| S1 | First Solo: Gentle and Medium Turns | 2 000 | | :12 | 5:02 |
| AL25 | **Post-Solo Progress Check** | 1 500 | :10 | | 5:12 |
| S2 | Second Solo: Medium Turns | 1 500 | | :10 | 5:22 |
| S3 | Third Solo: Medium Turns | 1 500 | | :10 | 5:32 |
| S4 | Fourth Solo: Medium Turns | 1 500 | | :10 | 5:42 |
| S5 | Fifth Solo: Steep Turns | 1 500 | | :10 | 5:52 |
| AL26 | **Progress Check** | 2 000 | :12 | | 6:04 |
| S6 | Sixth Solo: Steep Turns | 1 500 | | :10 | 6:14 |
| S7 | Seventh Solo: Steep Turns | 1 500 | | :10 | 6:24 |
| S8 | Eighth Solo: Gentle Stalls | 2 000 | | :12 | 6:36 |
| S9 | Ninth Solo: Medium Stalls | 2 000 | | :12 | 6:48 |
| S10 | Tenth Solo: Spoiler Open Entry Stalls | 2 000 | | :12 | 7:00 |
| AL27 | **Comprehensive Progress Check** | 2 500 | :15 | | 7:15 |
| S11 | Eleventh Solo: Crosswind Operations | 1 500 | | :10 | 7:25 |
| S12 | Twelfth Solo: Crosswind Operations | 1 500 | | :10 | 7:35 |
| S13 | Thirteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 7:45 |
| S14 | Fourteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 7:55 |
| S15 | Fifteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 8:05 |
| AL28 | **Pre Flight Test Comprehensive Progress Check** | 3 000 | :18 | | 8:23 |
| S16 | Sixteenth Solo: Slipping | 1 500 | | :10 | 8:33 |
| S17 | Seventeenth Solo: Slipping | 1 500 | | :10 | 8:43 |
| S18 | Eighteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 8:53 |
| S19 | Nineteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 9:03 |
| S20 | Twentieth Solo: Medium & Steep Turns | 1 500 | | :10 | 9:13 |
| AL29 | **FINAL FLIGHT TEST** | 2 500 | :15 | | 9:28 |
| Total Flights: 49 (consisting of 29 Dual and 20 Solo) | | | 6:00 | 3:28 | 9:28 |

Figure 3-2-2  Post-Solo Flying Syllabus

# SECTION 3

## AIR LESSONS/FLIGHTS – DETAILS

## AIR LESSON 1 – FAMIL FLIGHT (AL1 – 2 000 FEET)

### AIM

1. This may be the student's first ride in a glider. The ride is intended to familiarize the student with the glider, local procedures and the flying area.

### OBJECTIVE

2. At the conclusion of this trip, the student should have been exposed to the following items:

| Demo Work | Level |
|---|---|
| a. 2-33 cockpit | NA |
| b. Airfield lay-out | NA |
| c. Local flying area | NA |
| d. Safety factors | NA |

### MOTIVATION

3. The student should enjoy the flight while becoming familiar with the local area, launch site procedures, and cockpit procedures.

### REFERENCES

4. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 1 and 2;

b. RGS Flying Orders;

c. Chapter 2, Section 1, Schweizer 2-33 Glider AOI; and

d. Glider Checklists.

**TIPS TO INSTRUCTORS**

1. This lesson should take the form of an introduction to flying and a famil trip. Do not attempt to instruct on this trip, except for running over details of the straps, canopy and other items necessary for the safety of the glider and occupants.

2. Point out the local flying area and the prominent features and landmarks. Show your student the airfield layout, the circuit – initial point (IP), downwind, base turn, base leg, final turn, final approach and landing. Explain your decisions and actions during the final approach and landing.

3. Encourage the students to look around frequently and to regard themselves as part of the aircraft. The development of good look-out habits starts with the first trip.

4. Treat the student and glider gently during this first trip. Watch for signs of apprehension or sickness.

5. Outline the course to your student, explaining what is expected in the way of preparation for each trip. Encourage questions regarding any facet of training.

**BRIEFING OUTLINE**

5. **Glider Ground Handling.** The following are applicable to glider ground handling:

   a. daily inspection;

   b. pre-take-off checks;

   c. hook-up signals; and

   d. airfield layout.

6. **Glider Air Handling.** The following are applicable to glider air handling:

   a. Launch signals;

   b. checks;

   c. release technique; and

   d. transfer of aircraft control.

7. **Local Flying Area.** The following are applicable to the local flying area:

   a. look-out (ground and air); and

   b. clock elevation system.

**SUMMARY**

8. Stress safety and look-out.

9. Encourage questions. Stress the importance of the student understanding the briefing before you start the air exercise.

10. Question the student on the presentation:

   a. What is the pre-take-off check? and

   b. What is the procedure for relinquishing and retaking control (transfer of aircraft control)?

**AIR LESSON OUTLINE**

11. **Ground.** The following are required:

   a. Demonstrate all the pre-flight actions;

   b. Have the student strap in; assist as required and ensure that positioning is correct and comfortable;

   c. Practice transfer of control; and

   d. Do pre-take-off check and commands.

12. **Air.** The following are required:

   a. Demonstrate the launch signals, the take-off and air tow;

   b. Show the student the practice area, pointing out landmarks. Assist the student in developing an orientation with the local area;

   c. Demonstrate the clock elevation system; have the student report aircraft;

d. Demonstrate aircraft stability and the basic attitudes of flight; and

e. Fly the circuit and land describing the separate components of the circuit (IP, downwind, base turn, base leg, final turn, final approach and landing).

**LINK**

13. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link this lesson to student's previous flying experience.

**POST-FLIGHT REVIEW**

14. The following are required:

a. Obtain the student's overall impression of the trip. Stress that checks and emergency procedures must be learned quickly and accurately. Start your student on self-analysis;

b. Give the reading assignment and stress that the material must be known in preparation for the next trip; and

c. It is understood that several air lessons may be taught in a row without a significant break. Instructors must ensure that major errors and key points are debriefed after each air lesson, even if the debriefing is abbreviated and/or conducted while still in the cockpit. These post-flight debriefs should be amalgamated into a thorough review as soon as possible after the last in a series of back-to-back instructional flights.

15. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Sections 1, 2 and 3.

## AIR LESSON 2 – ATTITUDES AND MOVEMENTS (AL2 – 2 000 FEET)

### AIM

1. This is the first mission with the student at the controls. On this trip the student will be introduced to the primary use of the controls and the various flight attitudes of the glider.

### OBJECTIVE

2. At the conclusion of this trip, the student must demonstrate the following PLs:

| New Work | Level |
|---|---|
| a. Pre-Flight | 1 |
| b. Ground Handling | 1 |
| c. Airmanship | 1 |
| d. Attitudes and Movements | N/A |

### MOTIVATION

3. A sound fundamental knowledge of checks, established procedures and effects of controls is a prerequisite to safe flight and more advanced manoeuvres.

### REFERENCES

4. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Section 3;

b. RGS Flying Orders;

c. Chapter 2, Section 1, Schweizer 2-33 Glider AOI; and

d. Glider Checklists.

**TIPS TO INSTRUCTORS**

1. Continue to stress look-out and safety during all dual trips as well as awareness of glider position within the designated practice area.

2. Explain the meaning of **horizon reference** and **instrument crosscheck**. Emphasize that the glider attitude and not the instruments is the primary reference.

3. Ensure that the student is seated correctly and is in the proper position. Ensure that the student knows the correct number of spacers required and how to adjust the rudder pedals so that they are in the same relative position on each trip.

4. Let the student fly as much as possible but maintain hands near controls at all times to provide assistance when necessary.

5. When demonstrating the effects of spoilers, use high and low speeds to show the marked difference in effectiveness.

6. For the effects of controls exercise, strive to provide the student with a good introduction. The student's feet should be placed comfortably on the rudder pedals with the heels on the floor. The control column should be held lightly with the wrist free to flex.

7. Continually challenge your student if the student is progressing well, by giving more difficult handling manoeuvres.

8. You should verbally test your student on rope break procedures on each flight to keep the student thinking throughout the air tow what to do if the rope breaks.

**BRIEFING OUTLINE**

5. **Pre-Flight Activities**

    a. Weather and Operations Brief;

    b. DI Checklist; and

    c. Aircraft Logs.

6. **Airmanship.** Define and explain scope:

    a. common sense, situational awareness, air picture, planning;

    b. adherence to SOPs, National/regional/local orders; and

    c. wind assessment, look-out, etc.

7. **Use of Check-lists/Radio.** The following are applicable to the use of check-lists/radio:

    a. Checks (to be memorized before solo):

        (1) pre-release;

        (2) pre-take-off;

        (3) pre-landing; and

        (4) pre-stall/spin.

    b. Emergency procedures.

    c. radio procedures (receive/transmit [R/T].

8. **Ground Handling.** The following are applicable:

    a. Pre-flight inspection (walk around);

    b. pre-take-off check (BCISTRSC);

    c. hook-up procedures.

9. **Release/Flight Attitudes.** The following are applicable to release/flight attitudes:

    a. pre-release check and release procedure;

    b. wings level glide attitude;

    c. nose-up attitude;

    d. nose-down attitude; and

    e. banked attitude.

10. **Primary Effects of Controls.** The following are the primary effects of controls:

    a. elevators/pitch;

    b. ailerons/roll; and

    c. rudders/yaw.

    e. effects of controls:

        (1) control responses and effectiveness;

        (2) effect of speed; and

(3) use of trim and use of spoilers.

11. **Emergency Scenario.** While on departure at 200 feet AGL, the rope breaks. What are your actions?

**LINK**

12. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Attitudes and movements are the building blocks for all other manoeuvres. Successfully learning the attitudes and movements is like building a strong foundation for a house. If a weak foundation is build, the house will fall down.

**SUMMARY**

13. Encourage the student's questions.

14. Ask the following confirmatory questions to the student:

a. Describe the hook-up signals and the indications you are looking for during each step.

b. What are the launch signals?

c. What are the following speeds:

(1) best L/D, dual; and

(2) minimum sink, dual.

d. What attitude and trim changes will be evident when increasing airspeed from 50 mph to 65 mph?

**AIR LESSON OUTLINE**

15. Student performs pre-flight inspection (walk around) under supervision.

16. Ensure the student is strapped in correctly.

17. Review the operation and function of the cockpit controls.

18. Student performs the pre-take-off check.

19. Student verifies the rope's condition and initiates hook-up.

20. Student gives launch signals.

21. Demonstrate the take-off and the air tow with the student following through.

22. Student calls out the pre-release check, the instructor demonstrates the release procedure and directs the student to activate the release.

23. Demonstrate and let the student practice the effects of controls: roll, pitch and yaw.

24. Demonstrate and allow the student to practice the effects of spoilers.

25. Demonstrate the circuit: IP entry, downwind (including downwind check), base turn, base leg, final turn, final approach and landing.

**POST-FLIGHT REVIEW**

26. Review the air lesson in detail and make sure the student fully understands all the debriefing points and the proper techniques/procedures.

27. **Reading Assignment.** The following are applicable:

a. Chapter 6, ACGP Manual of Glider Flying Training, Section 3; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

## AIR LESSON 3 – ATTITUDES AND MOVEMENTS (AL3 – 2 000 FEET)

**AIM**

1. To review and perfect the student's understanding of attitudes and movements.

**OBJECTIVE**

2. At the conclusion of this trip, the student must demonstrate the following PLs:

| **Demo** | **Level** |
|---|---|
| a. Air Tow | N/A |
| **Upgrade** | **Level** |
| a. Ground Handling | 2 |
| b. Attitudes and Movements | N/A |

**MOTIVATION**

3. A strong base knowledge of aircraft movements and different flight attitudes is necessary before moving on to more complex manoeuvres.

**REFERENCES**

4. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Section 3;

b. RGS Flying Orders;

c. Chapter 2, Section 1, Schweizer 2-33 Glider AOI; and

d. Check-lists.

**TIPS TO INSTRUCTORS**

1. Continue to stress look-out and safety during all dual trips as well as an awareness of the glider's position within the designated practice area.

2. Climb. Ensure your student understands VSI instrument lag. Ensure the student can determine the presence of lift or sink from the reading on the VSI during straight glide.

3. Teach your student proper radio procedures and terminology and encourage your student to use the radio on all subsequent flights.

**BRIEFING OUTLINE**

5. **Emergency Procedures Review.**

6. **Review Glider Ground Operation.** Ground handling including all checks:

a. daily inspection;

b. pre-take-off; and

c. hook-up signals.

7. **Review Glider Air Operation Including All Checks.** Review the following:

   a. launch signals;

   b. pre-release check and release procedure;

   c. effects of controls:

      (1) control responses and effectiveness;

      (2) effect of speed;

      (3) use of trim; and

      (4) use of spoilers.

8. **Review Flight Attitudes.** Review the following:

   a. wings level glide attitude;

   b. nose-up attitude;

   c. nose-down attitude; and

   d. banked attitude.

9. **Review Primary Effects of Controls.** Review the following:

   a. elevators/pitch;

   b. ailerons/roll; and

   c. rudders/yaw.

10. **Emergency Scenario.** While on air tow at 600 feet AGL, the rope breaks. What are your actions?

**LINK**

11. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

   a. This lesson builds upon the skills learned in air lesson 2.

**SUMMARY**

12. Encourage the student's questions.

13. Ask the following confirmatory questions to the student:

   a. Describe the pre-landing check and what is required for each step.

   b. What is the pre-release check? and

   c. What are the following speeds:

      (1) stall speed, dual; and

      (2) stall speed with spoilers, dual.

   d. What attitude and trim changes will be evident when decreasing airspeed from 65 mph to 45 mph?

**AIR LESSON OUTLINE**

14. Review the operation and function of the cockpit controls.

15. Student performs all ground handling. **You must upgrade ground handling.**

16. Student verifies the rope's condition and initiates hook-up.

17. Student gives -the launch signals.

18. Demonstrate the take-off and the air tow with the student following through.

19. Student calls out the pre-release check, the instructor demonstrates the release procedure and directs the student to activate the release.

20. Review the basic flight attitudes.

21. The student practices the effects of controls and the use of controls to achieve desired attitudes.

22. Demonstrate the effects of spoilers.

23. Demonstrate circuit joining procedure; fly the circuit and land.

24. The student performs the pre-landing check and radio call.

**POST-FLIGHT REVIEW**

25. Review the air lesson in detail and make sure the student fully understands all the debriefing points and the proper techniques/procedures.

26. **Reading Assignment.** The following are applicable:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Section 3; and

   b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

## AIR LESSON 4 – AIR TOW, STRAIGHT GLIDE AND MEDIUM TURNS (AL4 – 2 000 FEET)

**AIM**

1. The aim of this mission is to teach straight glide, medium turns and air tow. Note that straight glide is defined as "wings level, constant airspeed".

**OBJECTIVE**

2. At the conclusion of this trip, the student must demonstrate the following PLs:

| **Demo** | | **Level** |
|---|---|---|
| a. | Take-off | N/A |
| b. | Flight Management | N/A |
| c. | Circuit and Landing | N/A |
| **New Work** | | **Level** |
| d. | Air tow | 1 |
| e. | Straight glide | 1 |
| f. | Medium turns | 1 |
| g. | Emergency (verbal) | 1 |
| **Upgrade** | | **Level** |
| h. | Ground Handling | 3 |

**MOTIVATION**

3. Skill in maintaining directional control of the glider and executing medium turns will provide the student with confidence and the ability to advance to more complex tasks such as the air tow and the circuit.

4. Air tow is difficult to master. Therefore, early introduction allows for the greatest amount of practice.

**REFERENCES**

5. The following references apply for this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Section 3; and

   b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Continue to stress look-out and orientation to the airfield.

2. Although the student will be probably be slow, allow the student to do the pre-take-off, pre-release and pre-landing checks; supervise closely and correct when necessary. Insist on proper R/T.

3. During air tow training, taking control and returning it to the student will occur many times over the first 10 to 15 flights. However, a prepared student who is allowed to fly air tow as much as possible, will increase in confidence and skill, quickly and safely.

4. Do not allow the student to fly outside of safe air tow limits. Ensure your student understands the extreme danger of tow aircraft upset.

5. When demonstrating and practising straight glide. Fly directly up-wind and downwind so that drift is not present.

6. Insist on accurate heading control during student practice by ensuring that the student keeps the wings level in straight glide.

7. Stress look-out and attitude flying in turns. Have the student roll out on specific external references.

8. Demonstrate flight management in order to complete exercises at or close to the IP.

9. The detailed briefing on the circuit is given in AL5. The briefing in this lesson is intended to be short, concise and used as an introduction.

**BRIEFING OUTLINE**

6. Take-off. The following are applicable:

   a. technique;

   b. position;

   c. emergency procedures; and

   d. common errors:

      (1) nose too high on initial roll;

      (2) drift; and

      (3) climbing too slowly.

7. **Air Tow.** The following are applicable to air tow:

   a. tow positions and transitions;

   c. turns;

   d. attitude and direction;

   d. slack rope procedures; and

   e. visual tow signals.

8. **Release**. The following are applicable to release:

   a. release procedures and profile.

9. **Straight Glide.** The following are applicable to straight glide:

a. coordinated flight at 50 mph:

(1) external references;

(2) instrument references, including yaw string; and

(3) trim.

b. uncoordinated flight: bank and yaw, slip and skid; and

c. common errors:

(1) poor look-out;

(2) wings not level; and

(3) relying too much on airspeed indicator.

10. **Changing Airspeed.** The following are applicable to changing airspeed:

a. attitude change;

b. ASI lag;

c. effect on trim; and

d. common errors:

(1) not adjusting trim for new airspeed; and

(2) focusing on ASI vice horizon.

11. **Turning.** The following are applicable to turning:

a. types (gentle, medium, steep);

b. aerodynamic principles;

c. use of controls:

(1) function of controls in turn,

(2) entry;

(3) maintaining the turn; and

(4) recovery to straight glide.

d. external references;

e. look-out; and

f. common errors:

(1) poor lookout;

(2) not releasing enough back pressure during roll-out; and

(3) chasing ASI vice using good outside reference.

12. **Flight Management.** Introduce the basic concepts of flight management.

13. **Circuit.** The following are applicable to the circuit:

a. the purpose; and

b. the components:

(1) IP;

(2) downwind;

(3) base turn;

(4) base leg;

(5) final turn;

(6) final approach; and

(7) landing.

14. **Final Approach Speed Calculation.**

15. **Emergency Scenario.** While on air tow at approximately 800 feet AGL, the tow plane descends rapidly and then rocks its wings vigorously. What are your actions?

**LINK**

16. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link the control inputs used for air tow to the primary effects of controls with emphasis on the need for reduced inputs because of speed.

b. Link straight glide to the wings level glide attitude.

c. Link medium turns to the banked attitude.

**SUMMARY**

17. Encourage your student's questions.

18. Ask the following confirmatory questions to the student:

a. Briefly describe the procedures used in a turn.

b. What is the purpose of the circuit?

c. How is the speed for final approach calculated? and

d. What is the ideal position for high air tow?

**AIR LESSON**

19. The student does pre-take-off check and hook-up signals. **<u>You must upgrade ground handling</u>.**

20. The student gives the launch signals. The instructor demonstrates the take-off with the student following through.

21. The student flies the air tow under close supervision.

22. Student releases.

23. Demonstrate and allow student to practice straight glide and airspeed changes.

24. Demonstrate and let the student try medium turns.

25. Demonstrate the proper use of altitude and area when returning to the circuit IP.

26. Demonstrate all components of the circuit.

27. Student completes the pre-landing check while the instructor flies the glider.

**POST-FLIGHT REVIEW**

28. Review the presentation and air exercise in detail.

29. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Sections 3 and 4.

## AIR LESSON 5 – TAKE-OFF, FLIGHT MANAGEMENT, SECONDARY EFFECTS OF CONTROLS AND CIRCUIT PROCEDURES (AL5 – 2 000 FEET)

**AIM**

1. The student has seen the take-off and circuit several times already and this mission will formally introduce the take-off, flight management and circuit, as well as demonstrate the secondary effects of controls.

**OBJECTIVE**

2. At the conclusion of this lesson, the student must demonstrate the following PLs:

**Demo Work**

a. Approach and Landing

| **New Work** | | | **Level** |
|---|---|---|---|
| a. | Take-Off | | 1 |
| b. | Flight Management | | 1 |
| c. | Circuit Work: | | |
| | (1) | Downwind | 1 |
| | (2) | Base Turn | 1 |
| | (3) | Base Leg | 1 |
| | (3) | Final Turn | 1 |
| d. | Circuit Modification | | 1 |

**MOTIVATION**

3. An understanding of the further effects of controls enables the student to better coordinate the aircraft in level flight and turns.

4. The early introduction and repetitive exposure to the take-off and the circuit will assist the student in quickly developing proficiency in circuit flying.

5. Flight management is an essential skill to ensure a safe recovery of the glider.

**REFERENCE**

6. Chapter 6, ACGP Manual of Glider Flying Training, Sections 3 and 4.

**TIPS TO INSTRUCTORS**

1. Emphasize need for larger control inputs during initial ground roll.

2. Stress the importance of keeping low on the tow plane.

3. Stress attitude flying, look-out and orientation to the airfield.

4. Give a clear explanation of the use of the yaw string during the further effects portion.

5. Although you briefed the student on the circuit in the previous lesson, now is the time for amplification and reiteration. You should expect a great deal of student participation in this briefing.

6. Stress look-out in the pattern and make sure the student informs you of any traffic.

7. A thorough explanation of the day's winds and their effect is required prior to flight time. A discussion of other wind conditions can be done during this briefing.

8. The student must be taught to recognize the proper site picture during the final turn. When established on final approach, point out visual cues to assist the student from getting high/low on final.

9. Emphasize the importance of flying an accurate ground track in the circuit by using the runway as the primary reference.

**BRIEFING OUTLINE**

7. **Take-Off.** The following are applicable to take-off:

   a. environmental considerations (eg. wind);

   b. launch signals;

   c. crosswind technique;

   d. attitude and direction during ground-roll;

   e. lift-off;

   f. control and position before and after tow plane lift-off;

   g. emergency procedures;

   h. common errors:

      (1) nose too high on initial roll;

      (2) drift; and

      (3) climbing too slow.

8. **Flight Management.** Proper manoeuvring to stay within area boundaries and ensure safe recovery of the glider.

   a. managing altitude in relation to IP;

   b. effects of winds aloft; and

   c. traffic awareness.

9. **Secondary Effects of Controls.** Secondary effect of the ailerons and the rudder.

10. **Circuit.** The following are applicable to the circuit:

a. the purpose;

b. the ideal (nil wind) circuit;

c. wind considerations;

d. crabbing technique; and

e. airspeed adjustments for wind conditions.

11. **Circuit Modification.** The following are applicable :

a. circuit modification options for minor corrections (track changes and judicious spoiler use)

12. **Emergency Scenario.** Across from the touch down point, you are at 650 feet AGL. What are your actions?

**LINK**

13. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link take-off to air tow;

b. Link secondary effects to take-off (use of rudder to help keep wings level at low speed);

c. Link secondary effects to slipping;

d. Link the circuit to turns and straight glide; and

e. Link flight management to previous flights, citing specific examples.

**SUMMARY**

14. Encourage your student's questions.

15. Ask the following confirmatory questions to the student:

a. What are the minimum circuit altitudes?

b. What is the secondary effect of roll? Of yaw? and

c. What type of turn is normally used in the circuit?

**AIR LESSON OUTLINE**

16. Student completes the pre-take-off check, hook-up and launch signals . Assist only if required.

17. The student gives the launch signals and does the take-off, under close supervision.

18. The student flies the air tow, performs release and release profile.

19. Demonstrate secondary effects of controls.

20. Let student practice medium turns.

21. Student joins and flies circuit with assistance. Student completes pre-landing check. Instructor demonstrates the approach and landing, also demonstrating over/undershoot approach references.

**POST-FLIGHT REVIEW**

22. Review the air exercise in detail and encourage your student's questions. Start having students to analyze their own performances.

23. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Section 4.

## AIR LESSON 6 – GENTLE TURNS, APPROACH AND LANDING (AL6 – 2 000 FEET)

### AIM

1. The aim of this lesson is to introduce another type of turn, and the approach and landing phase of the circuit.

### OBJECTIVE

2. At the conclusion of this lesson, the student must demonstrate the following PLs:

| New Work | Level |
|---|---|
| a. Gentle Turn | 2 |
| b. Circuit Work: | |
| (1) Approach | 1 |
| (2) Landing | 1 |
| **Upgrade** | **Level** |
| c. Straight Glide | 2 |
| d. Medium Turn | 2 |

### MOTIVATION

3. The gentle turn is a basic manoeuvre used to change direction.

4. A good landing starts with a good final approach.

### REFERENCES

5. The following references apply for this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Section 4; and

   b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. The instructor should not be discouraged if there is little improvement during the first few circuit lessons. Student difficulties may include:

   a. how to judge when to initiate the turn to base leg;

   b. how to judge when to initiate the turn to final;

   c. how to judge whether the glider is overshooting or undershooting;

   d. when to round-out;

   e. how to complete the touchdown (hold-off); and

   f. how to keep straight during the ground roll.

2. Stay close to the controls during landings in case you must take immediate control to avoid a hazardous situation from developing.

3. The point at which descent is checked during the landing is sometimes difficult for students to judge. Suggestions include:

   a. the ground seems to be coming up rapidly;

   b. the whole area of the ground seems to expand;

   c. the touchdown point seems to approach rapidly; and

   d. becoming conscious of sudden movement of the ground.

4. The student must be taught to look ahead and slightly to the sides of the aircraft, and not to fixate on any one feature.

5. Since poor landings are often the result of a poor final approach, you must ensure that the student maintains the calculated final approach speed and compensates for any crosswind.

6. Ensure that the student understands the necessity to fly the glider to a full stop.

**BRIEFING OUTLINE**

6. **Review.** Review as necessary.

7. **Gentle Turns.** The following are applicable to gentle turns:

   a. angle of bank;

   b. look-out;

   c. visual references; and

   d. use of rudder.

8. **Final Turn.** The following are applicable to the final turn:

   a. position of final turn;

b. wind considerations;

c. angle of bank;

d. where to look-out; and

e. dangers of cross-controlling (skidding turn).

9. **Final Approach.** The following are applicable to the final approach:

a. aiming point;

b. final approach speed;

c. maintaining centreline;

d. use of spoilers; and

e. crosswind techniques.

10. **Landing.** The following are applicable to the landing:

a. round out;

b. hold-off;

c. touchdown;

d. ground roll;

e. maintaining centreline; and

f. common errors:

(1) misjudging round-out (ballooning and bouncing);

(2) not maintaining final approach speed to round-out; and

(3) landing in crabbed configuration.

11. **Emergency Scenario.** While on base leg you notice a significant descent rate. What are your actions?

**SUMMARY**

12. Encourage your student's questions.

13. Ask the following confirmatory questions to the student:

a. What are your actions in the event of ballooning on landing?

b. What is the normal angle of bank for a gentle turn?

c. How is directional control maintained on the roll-out? and

d. What is the probable cause of a pilot rounding out too high/too low during a landing?

**AIR LESSON OUTLINE**

14. Student completes ground handling.

15. Student performs take-off, air tow and release.

16. Demonstrate and let the student practice gentle turns.

17. Let the student practice straight glide and medium turns. **<u>You must upgrade straight glide and medium turns</u>.**

18. Student joins and flies the circuit, approach and landing.

**LINK**

19. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link gentle turns to medium turns; and

b. Link approach and landing to attitudes and movements.

**POST-FLIGHT REVIEW**

20. Debrief the manoeuvres flown and encourage students to analyze their errors. Make sure students understand the proper techniques and procedures.

21. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 and 5.

## AIR LESSON 7 – BASIC STALLS (AL7 – 2 500 FEET)

**AIM**

1. To show the 2-33 stall symptoms and the proper stall recovery procedure.

**OBJECTIVE**

2. At the conclusion of this flight, the student must demonstrate the following PLs:

| New Work | Level |
|---|---|
| a. Stall | 2 |

| Upgrade | Level |
|---|---|
| a. Circuit Work | |
| (1) Downwind | 2 |
| (2) Base Turn | 2 |
| (3) Base Leg | 2 |
| (4) Final Turn | 2 |

**MOTIVATION**

3. In the event of a stall close to the ground, the student must show instant recognition and carry out prompt recovery to minimize altitude loss.

**REFERENCES**

4. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 and 5; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Recognition and prevention of a stall is the key to the exercise. Impress upon your student that recovery from a stall must be initiated as soon as there is any symptom of an approaching stall, unless you specifically direct otherwise. Explain that the recovery is the same as for a fully developed stall, except that the glider usually recovers as soon as you move the control column forward. Fully developed stalls are practised to familiarize your student with all of the symptoms of the stall and to allow practice in recovering from them.

2. Emphasize clearing turns with good look-out above, around, and especially below the glider before practising stalls.

3. The majority of students will have some apprehension towards this exercise. Make sure that you explain that there is nothing dangerous about practising stalls. However, to judge your student's reaction, make your first demo a gentle stall.

**BRIEFING OUTLINE**

5. **Review.** Review as necessary.

6. **Basic Stall.** The following are applicable to the basic stall:

   a. theory;

   b. pre-stall spin check (ASCOT);

   c. look-out;

   d. entry;

   e. symptoms of approaching stall;

   f. characteristics of the stall;

   g. negative ‘g’ sensations;

   h. recovery;

   i. effects of spoilers;

   j. variations of the basic stall:

      (1) gentle – entry from a near nose level attitude;

      (2) medium, - entry from a nose up attitude to a maximum of 30°; and

      (3) turning.

   k. common errors:

      (1) releasing too much back pressure;

      (2) releasing back pressure too late;

      (3) use of ailerons instead of rudder for wing drop; and

      (4) poor look-out.

7. **Safety Factors.** The following are safety factors:

   a. minimum recovery altitude; and

   b. decreased manoeuvrability.

8. **Emergency Scenario.** While on the initial take-off roll you feel a sudden loss of acceleration and the tow plane starts to move to the left. What are your immediate actions?

**SUMMARY**

9. Encourage your student's questions.

10. Ask the following confirmatory questions to the student:

    a. Describe the symptoms of an approaching stall; and

    b. What are the steps in a stall recovery?

**AIR LESSON OUTLINE**

11. Student does the pre-take-off check and launch signals.

12. Student does take-off. .

13. Student performs ASCOT check and clearing turns.

14. Demonstrate and let student practice medium and gentle stalls.

15. Let student practice medium and gentle turns.

16. Let student join and fly the circuit. Assist where required. **<u>You must upgrade circuit work</u>.**

**LINK**

17. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

    a. Link stalls to attitudes and movements; and

    b. Link stalls to secondary effects.

**POST-FLIGHT REVIEW**

18. Debrief all the manoeuvres flown in detail and encourage students to analyze their own performance. Ensure the students understand the proper techniques/procedures.

19. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Section 5.

**AIR LESSON 8 – AIR TOW POSITIONS AND STALLS (AL8 – 2 500 FEET)**

**AIM**

1. The aim of this lesson is to introduce air tow positions and practice gentle and medium stalls.

**OBJECTIVE**

2. At the conclusion of this lesson, the student must demonstrate the following PL:

| New Work | Level |
|---|---|
| a. Tow Positions | NA |

**MOTIVATION**

3. Practicing stalls allows students to better recognize stall symptoms to avoid a stall; and recover safely should a stall occur. Additionally, practicing stalls demonstrates the lower end of the airspeed envelope of the glider.

4. Flying the air tow positions introduces the student to the harmless effects of slipstream turbulence and demonstrates the envelope in which the glider must be flown while on air tow.

**REFERENCES**

5. Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 and 5.

**TIPS TO INSTRUCTORS**

1. You should review the effects of wind (especially crosswind) in the circuit, the final approach and landing. Additionally, make sure that you discuss the day's winds and how it will affect the flight.

2. Ensure that your student understands the difference between slipstream turbulence and rough air.

3. It is recommended, at this stage, that the student verbalizes lookout in order for you to know where the student is looking for traffic.

**BRIEFING OUTLINE**

6. **Review All Weak Area Sequences.**

7. **Air Tow Positions.** The following are applicable to air tow positions:

a. high tow position;

b. low tow position;

c. high left tow position (for signalling release failure); and

d. transiting methods.

8. **Review Stalls.** Emphasize closing of spoilers if open.

9. **Emergency Scenario.** You are abeam the landing area in the circuit at 1 100 feet AGL. What are your actions?

## SUMMARY

10. Encourage your student's questions.

11. Ask the following confirmatory questions to the student:

    a. Briefly describe the correct procedure for a take-off with a left crosswind;

    b. Briefly describe your actions in the circuit to counteract a 90 degree crosswind. Describe your landing technique in a crosswind; and

    c. Briefly describe one method of transiting to the low air tow position.

## AIR LESSON OUTLINE

12. The student performs the take-off and air tow.

13. Demonstrate air tow positions and transiting methods.

14. Student practices gentle stalls. Demonstrate and let student practice stalls with open spoiler entry.

15. Student practices medium and gentle turns.

16. Student joins and flies the circuit.

## LINK

17. Tailor link to the individual student. Be creative to encourage each student’s understanding. At a minimum, include the following:

    a. Link air tow positions to previous air tow experiences; and
    b. Link air tow transiting methods with the secondary effects of controls, noting the negative effects.

## POST-FLIGHT REVIEW

18. Have the student discuss and analyze errors. Explain the proper corrections in detail.

19. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Section 5.

## AIR LESSON 9 – STEEP TURNS AND STALLS IN TURNS (AL9 – 2 500 FEET)

### AIM

1. The aim of this mission is to introduce the steep turn and to demonstrate stalls in turns.

### OBJECTIVE

2. At the conclusion of this lesson, the student must demonstrate the following PLs:

| Demo Work | Level |
|---|---|
| a. Turning Stall | NA |
| **New Work** | **Level** |
| b. Steep Turn | 2 |
| **Upgrade** | **Level** |
| c. Straight Glide | 3 |

### MOTIVATION

3. Steep turns are a means of turning quickly in a small radius and may be needed in emergency situations to avoid other aircraft. Also during soaring missions, the steep turn is used to spiral within thermals.

4. The student must be knowledgeable of the stalling speed increase in a turn as the bank is increased.

### REFERENCES

5. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Section 5; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Emphasize the need for increased back pressure in the steep turn.

2. Note that at the point of stall in a steep turn the nose will not drop but the buffet should be obvious.

3. Direct the student's attention to the ASI when you feel the buffet. Your student should note the increase in stall speed.

4. The student should be able to manage airspace and set-up for the IP with minimal assistance.

### BRIEFING OUTLINE

6. **Review.** Review the following:

a. concentrate on any weak sequences; and

b. continue to stress wind effect in the circuit, especially during the final approach and the landing phases.

7. **Steep Turns.** The following are applicable to steep turns:

   a. use of controls;

   b. airspeed;

   c. external references;

   d. look-out; and

   e. common errors:

      (1) poor look-out;

      (2) nose too high/low;

      (3) too much bank; and

      (4) not releasing enough back pressure on roll-out.

8. **Review Stalling and Increased Stall Speeds in Turns.**

9. **Emergency Procedures.** Emergency procedures for the following shall be examined:

   a. glider release failure; and

   b. glider and tow plane release failure.

10. **Emergency Scenario.** While on air tow at approximately 400 feet AGL on a rough day, a large loop develops in the rope. What are your actions?

**SUMMARY**

11. Encourage your student's questions.

12. Ask the following confirmatory questions to the student:

   a. Methods to counteracting a crosswind on approach and landing;

   b. Describe the effect of G-loading on stall speed; and

   c. Describe the procedure for non-release of the glider.

**AIR LESSON OUTLINE**

13. The student does ground handling.

14. The student does the take-off, air tow and release.

15. Student practices straight glide. **<u>You must upgrade straight glide</u>.**

16. Demonstrate the increased stalling speed in the steep turn.

17. Demonstrate and let the student practice steep turns.

18. The student flies the circuit.

**LINK**

19. Tailor link to the individual student. Be creative to encourage each student’s understanding. At a minimum, include the following:

   a. Link steep turns to medium turns; and

   b. Link stalls in turns to stalls.

**POST-FLIGHT REVIEW**

20. Have the students analyze their mistakes. Critique any errors that may have been missed or not recognized.

21. **Reading Assignment. Chapter 6,** ACGP Manual of Glider Flying Training, Section 6.

## AIR LESSON 10 – SLIPPING (AL10 – 2 500 FEET)

**AIM**

1. The aim of this lesson is to learn the technique of slipping to increase rate of descent or counteract a crosswind.

**OBJECTIVE**

2. At the conclusion of this lesson plan, the student must demonstrate the following PLs:

| New Work | Level |
|---|---|
| a. Slipping | 2 |

| Upgrade | Level |
|---|---|
| a. Airmanship | 2 |

**MOTIVATION**

3. The forward slip is an effective manoeuvre to increase the rate of descent of the glider without increasing the forward speed.

4. The side-slip is an effective manoeuvre to counteract drift caused by crosswind on final approach.

**REFERENCES**

5. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Section 6; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Ensure your student understands the difference between a forward slip and a side-slip, and the specific use for each.

2. Except during an emergency, forward slipping, for the purpose of increasing the rate of descent, shall not be continued below 250 feet AGL.

3. When practising slipping, line the glider up with a section line so the student can practice tracking in a straight line.

**BRIEFING OUTLINE**

6. **Slipping.** The following are applicable to slipping:

a. forward slipping and side-slipping;

b. difference in entry for the two types;

c. airspeeds and altitudes; and

d. common errors:

(1) not enough bank on entry;

(2) too much bank;

(3) poor airspeed control; and

(4) uncoordinated recovery.

7. **Airmanship.** Review definition and scope in terms of:

a. common sense, situational awareness, air picture, planning;

b. adherence to SOPs, National/regional/local orders;

c. wind assessment, look-out, etc.

8. **Emergency Scenario.** While on base leg, you are unable to open the spoilers. What are your actions?

**SUMMARY**

9. Encourage your student's questions.

10. Ask the following confirmatory questions to the student:

a. Describe two slipping methods and their primary uses;

b. What is the ideal airspeed for a forward slip? and

c. What is the minimum altitude for a forward slip?

**AIR LESSON OUTLINE**

11. The student does all the ground handling.

12. The student does take-off, air tow and release.

13. Demonstrate and let the student practice both types of slipping.

14. The student joins and flies the circuit.

15. **<u>You must upgrade airmanship</u>.**

**LINK**

16. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link slipping to secondary effects

**POST-FLIGHT REVIEW**

17. Debrief all the manoeuvres encouraging your students to analyze their own errors. Make sure your student clearly understands the proper techniques/procedures.

18. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Section 6.

## AIR LESSON 11 – SLIPPING TURNS (AL11 – 2 000 FEET)

**AIM**

1. The purpose of this air lesson is to introduce slipping turns.

**OBJECTIVE**

2. At the conclusion of this lesson the student must demonstrate the following PLs:

| New Work | Level |
|---|---|
| a. Slipping Turns | 2 |

**MOTIVATION**

3. Slipping turns are a useful method to lose altitude while turning. More altitude can be lost in a slipping turn than in a forward slip.

**REFERENCES**

4. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 3 and 6; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**BRIEFING OUTLINE**

5. **Slipping Turns.** The following are applicable to slipping:

a. minimum airspeed;

b. minimum altitude;

c. entry;

d. higher angle of bank; and

e. recovery.

6. **Emergency Scenario.** You misjudge your circuit and turn final at 1 000 feet AGL with a 5 knot headwind. What are your actions?

**SUMMARY**

7. Encourage your student's questions.

8. Ask the following confirmatory question to the student: Describe a situation where you would use a slipping turn.

**AIR LESSON OUTLINE**

9. Student completes take-off and air tow.

10. Demonstrate and let student practice slipping turns.

11. The student completes the circuit, approach and landing.

**LINK**

12. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

   a. Link slipping turns to forward slips; and

   b. Link slipping turns to medium turns.

**POST-FLIGHT REVIEW**

13. Have the students analyze their own mistakes with your assistance. Critique any errors that may have been missed or not recognized.

14. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Section 6.

## AIR LESSON 12 – INCIPIENT SPINS AND DRIFT ILLUSIONS (AL12 – 3 000 FEET)

### AIM

1. To introduce the incipient spin recovery.

2. To demonstrate the illusions created by drift.

### OBJECTIVE

3. By the end of this lesson the student must demonstrate the following PLs:

| **New Work** | **Level** |
|---|---|
| a. Incipient Spin Recovery | 2 |
| **Upgrade** | **Level** |
| b. Pre-Flight | 2 |

### MOTIVATION

4. In all aircraft, it is essential that the symptoms leading to a spin are recognized and that prompt action is taken to avoid entering it.

5. If a spin has been entered, it is important that the pilot recognizes the spin and initiate prompt recovery action.

6. Illusions created by drift can cause the pilot to apply improper control inputs that can be critical when operating close to the ground.

### REFERENCES

7. The following references apply for this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 and 6; and

   b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Most students approach spins with some apprehension. Try to alleviate this by explaining and then demonstrating how easy it is to recover at any stage of a spin.

2. When teaching spin recovery, emphasize proper control inputs. Discuss the minimum recovery altitude laid down by TC.

3. Discuss the straight ahead and the skidding turn entries to a spin. Explain the dangers of the skidding turn on to final.

4. Ensure your student has a thorough understanding of the problems drift illusions can cause.

5. Illusions created by drift can be demonstrated during any subsequent mission as conditions dictate.

**BRIEFING OUTLINE**

8. **Spins.** The following are applicable to the incipient spin:

   a. aerodynamic requirements;

   b. symptoms;

   c. recovery from incipient stage; and

   d. recovery from full spin.

9. **Incipient Spins.** The following are applicable:

   a. ASCOT check;

   b. entry;

   c. recovery criteria; and

   d. common errors:

      (1) moving stick too far forward on recovery; and

      (2) not centralizing the rudders.

10. **Illusions Created by Drift.** Discuss the illusions created by drift in the following situations:

    a. turning out of wind;

    b. turning in to wind; and

    c. flying upwind vs. downwind.

. **Emergency Scenario.** You have not been able to lose altitude in the circuit due to strong lift. Upon turning on to final you are still at 1 000 feet AGL. What are your actions?

**SUMMARY**

11. Encourage the student's questions.

12. Ask the following confirmatory questions to the student:

    a. When should a spin recovery be initiated?

    b. What is the minimum recovery altitude for an incipient spin? and

    c. Briefly describe the spin recovery procedure.

**AIR LESSON OUTLINE**

13. Verbally confirm student’s knowledge of pre-flight actions including:

    a. daily inspections;

    b. weather and ops briefs;

    c. journey logs; and

    d. airfield setup. **<u>You must upgrade pre-flight actions.</u>**

14. The student performs take off, air tow and release.

15. The student performs the ASCOT check and clearing turns.

16. The instructor demonstrates and the student practices incipient spin recovery.

17. The student joins and flies the circuit.

18. The instructor points out any illusions created by drift on turn to final. This can be done on any subsequent lesson as conditions dictate.

19. The student flies the final approach and lands.

**LINK**

20. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link spins to stalls; and

b. Link illusions created by drift to co-ordination

**POST-FLIGHT REVIEW**

21. Debrief the manoeuvres flown and encourage the students to analyze their errors. Make sure the student understands the proper techniques and procedures.

22. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Section 6.

## AIR LESSON 13 – SPINS AND SPIRALS (AL13 – 3 000 FEET)

### AIM

1. The purpose of this air lesson is to further develop techniques necessary for safe take-off, improve the air tow and to demonstrate a fully developed spin and the proper recovery.

2. To introduce spiral dive recovery.

### OBJECTIVE

3. By the end of the lesson, the student must demonstrate the following PLs:

| **New Work** | | **Level** |
|---|---|---|
| a. | Full Spin | Demo |
| b. | Spiral dive recovery | 2 |
| **Upgrade** | | **Level** |
| c. | Take-Off | 2 |
| d. | Air Tow | 2 |
| e. | Release | 2 |
| f. | Gentle Turn | 3 |

### MOTIVATION

4. A pilot must know the difference between a spin and a spiral in order to apply the correct recovery technique immediately and accurately.

### REFERENCES

5. Chapter 6, ACGP Manual of Glider Flying Training, Section 6.

> **TIPS TO INSTRUCTORS**
>
> 1. Compare the symptoms of the spiral dive to those of the spin and ensure that the student can recognize the difference between them. When discussing the spiral dive, stress the need to unload "G" prior to commencing the roll-out in order to avoid overstressing the aircraft.
>
> 2. Start the steep turn for a spiral dive entry from a low airspeed. This technique will allow more time and revolutions before recovery is initiated without gaining excessive airspeeds or losing excessive altitude.

### BRIEFING OUTLINE

6. **Spins.** The following are applicable to spins:

a. incipient vs. full spin recovery;

b. ASCOT check;

c. entry; and

d. recovery criteria.

7. **Spiral Dive.** The following are applicable to a spiral dive:

   a. differences from spin;

   b. recovery; and

   c. common errors:

      (1) not unloading "G" before rolling wings level; and

      (2) allowing too much speed to develop before recovery.

8. **Emergency Scenario.** You attempt to release from the tow plane but the rope does not fall away. What are your actions?

**SUMMARY**

9. Encourage your student's questions.

10. Ask the following confirmatory questions to the student:

    a. Briefly describe the differences between a spin and a spiral dive; and

    b. What is the minimum recovery altitude for a full spin?

**AIR LESSON OUTLINE**

11. The student does the take-off, air tow and release. **<u>You must upgrade take-off, air tow and release</u>.**

12. The student does the ASCOT check.

13. The instructor demonstrates a full spin.

14. The instructor demonstrates and the student practices spiral dive recovery.

15. The student practices gentle turns and any other sequences that altitude permits. **<u>You must upgrade gentle turns</u>.**

16. The student flies the circuit and lands.

**LINK**

17. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

    a. Link full spins to incipient spins; and

    b. Link spiral dives to steep turns.

**POST-FLIGHT REVIEW**

18. Debrief all the manoeuvres encouraging your students to analyze their own errors. Make sure your students clearly understand the proper techniques/procedures.

19. **Reading Assignment.** The following are applicable:

    a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 3, 4 and 5; and

    b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

## AIR LESSON 14 – FLIGHT MANAGEMENT (AL14 – 1 500 FEET)

### AIM

1. The aim of this lesson is to improve flight management and proficiency on previously taught material.

### OBJECTIVE

2. By the end of the lesson, the student must demonstrate the following PLs:

| **Upgrade** | **Level** |
|---|---|
| a. Flight Management | 2 |

### MOTIVATION

3. Proper flight management is essential for a safe return to circuit.

### REFERENCES

4. The following references apply for this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 1 to 6; and

   b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

### BRIEFING OUTLINE

5. **Review.** Review any weak sequences from the last trip.

6. **Discussion.** Discuss the importance for situational awareness in the practice area due to limited altitude.

7. **Emergency Scenario.** While on air tow at 900 feet AGL, the tow plane waggles its wings vigorously. What are your immediate and subsequent actions?

### SUMMARY

8. Encourage your student's questions.

9. Ask the following confirmatory questions to the student:

   a. What is the reason for an increased airspeed in a steep turn? and

   b. In no-wind conditions, how far could you glide from 400 feet AGL?

### AIR LESSON OUTLINE

10. The student does all ground handling.

11. The student does the take-off, air tow and release.

12. Let student practice air work as required and set up for the circuit, emphasizing flight management. **<u>You must upgrade flight management.</u>**

13. The student flies the circuit and lands.

**LINK**

14. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

    a. Link flight management to previous flights, citing examples.

**POST-FLIGHT REVIEW**

15. Debrief all the manoeuvres encouraging your students to analyze their own errors.

16. **Reading Assignment.** The following are applicable:

    a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 1 to 6; and

    b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**AIR LESSON 15 – CIRCUIT MODIFICATION (HIGH) (AL15 – 1 500 FEET)**

**AIM**

1. To respond to high circuit entry by employing circuit modification techniques.

**OBJECTIVE**

2. At the conclusion of this Air Lesson, the student must demonstrate the following PLs:

| Upgrade | Level |
|---|---|
| a. Approach | 2 |
| b. Landing | 2 |
| c. Circuit Modification | 2 |

**MOTIVATION**

3. Circuit modification practice helps the student become proficient in flight management, developing circuit judgement and thereby allowing for correct excess altitude adjustment.

**REFERENCES**

4. Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 and 6.

**TIPS TO INSTRUCTORS**

1. Enter the circuit 150 to 200 feet high. Use circuit modification techniques vice spoilers and forward slipping. This gives the student needed practice in circuit modification.

2. If you must use the spoilers and/or forward slipping, stress to the student that once altitude is lost it cannot be regained. Therefore, judicious use of spoilers and slips is critical. Poor judgement will lead to a dramatic requirement for circuit modification.

**BRIEFING OUTLINE**

5. **Circuit Modification (High).** The following are applicable to circuit modification (high):

a. downwind modifications;

b. base modifications; and

c. use of spoilers/slipping.

6. **Emergency Scenario.** While on air tow at 450 feet AGL, your canopy opens. What are your actions?

**SUMMARY**

7. Encourage your student's questions.

8. Ask the following confirmatory questions to the student:

   a. Briefly describe the use of slipping in the circuit; and

   b. Describe your actions when you are 200 feet high abeam the touchdown point.

**AIR LESSON OUTLINE**

9. The student does all ground handling.

10. The student does the take-off, air tow and release.

11. Let the student practice upper air sequences.

12. The student joins the circuit 150 to 200 feet high and the instructor assists the student in modifying the circuit. <u>**You must upgrade circuit modification.**</u>

13. The student completes the final approach and landing. <u>**You must upgrade the approach and landing phases of the circuit.**</u>

**LINK**

14. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

   a. Link to previous circuit flying

**POST-FLIGHT REVIEW**

15. Debrief the students on all manoeuvres flown and analyze their errors. Make suggestions on how performance can be improved.

16. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 to 6.

## AIR LESSON 16 – CIRCUIT MODIFICATION (HIGH) (AL16 – 2 500 FEET)

**AIM**

1. To respond to spoilers stuck closed by employing circuit modification techniques and slipping.

2. To review upper air work.

**OBJECTIVE**

3. At the conclusion of this Air Lesson, the student must demonstrate the following PLs:

| Upgrade | Level |
|---|---|
| a. Stalls | 3 |

**MOTIVATION**

4. The student must learn to react properly to stuck spoilers using circuit modification techniques.

**REFERENCES**

5. Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 and 6.

**BRIEFING OUTLINE**

6. **Review.** Review as required:

   a. upper air sequences including incipient spins, spirals, stalls and steep turns;

   b. slipping;

   c. circuit;

   d. wind effect; and

   e. emergencies.

7. **Spoilers Stuck Closed.** The following are applicable:

   a. downwind modifications;

   b. base modifications; and

   c. use of slipping.

8. **Emergency Scenario.** While on air tow at 500 feet AGL, the tow plane rocks its wings. What are your actions?

**SUMMARY**

9. Encourage your student's questions.

10. Ask the following confirmatory questions to the student:

   a. Briefly describe the use of slipping in the circuit; and

   b. Describe your actions when you are 200 feet high on base.

**AIR LESSON OUTLINE**

11. The student does all ground handling.

12. The student does the take-off, air tow and release.

13. Let the student practice upper air sequences. **<u>You must upgrade stalls.</u>**

14. The student flies a circuit simulating spoilers stuck closed.

15. The student completes the final approach and landing.

**LINK**

16. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

   a. Link to previous circuit flying

**POST-FLIGHT REVIEW**

17. Debrief the students on all manoeuvres flown and analyze their errors. Make suggestions on how performance can be improved.

18. **Reading Assignment.** Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 to 6.

## AIR LESSON 17 – CIRCUIT MODIFICATION (LOW) (AL 17 – 1 500 FEET)

**AIM**

1. To respond to low altitude circuit entry by employing circuit modification techniques.

**OBJECTIVE**

2. The objective of this flight is to practice circuit modification techniques required to correct for a low circuit entry.

**MOTIVATION**

3. Circuit modification practice helps the student become proficient in flight management, developing circuit judgement and thereby allowing the pilot to correct for lower than normal altitudes and excessive sink rates.

**REFERENCES**

4. Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 and 5.

**BRIEFING OUTLINE**

5. **Circuit Modification (Low).** The following are applicable to circuit modification (low):

   a. downwind modifications;

   b. base modifications;

   c. high sink scenario; and

   d. **Safety Factors.** Minimum altitudes must be observed throughout this air lesson.

6. **Emergency Scenario.** While on initial ground roll for take-off you notice a knot half-way along the towrope. What are your immediate actions?

**SUMMARY**

7. Encourage your student's questions.

8. Ask the following confirmatory questions to the student:

   a. Describe your modified circuit if you find yourself low; and

   b. Describe your modified circuit if you find heavy sink on downwind.

**AIR LESSON OUTLINE**

9. The student does the ground handling, take-off, air tow and release.

312. 10. Let the student practice upper air work.

11. The student joins the circuit 100 feet low.

12. With the instructor's assistance, the student applies circuit modification techniques and lands.

**LINK**

13. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

   a. Link to previous circuit flying

**POST-FLIGHT REVIEW**

14. Debrief the students on all manoeuvres and have them analyze their own errors. Make suggestions on how performance can be improved.

15. **Reading Assignment.** The following are applicable:

a. Chapter 6, ACGP Manual of Glider Flying Training, Section 3; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

## AIR LESSON 18 – CIRCUIT MODIFICATION (LOW) (AL18 – 1500 FEET)

### AIM

1. To respond to spoiler stuck open by employing circuit modification techniques.

2. To review slipping.

### OBJECTIVE

3. At the conclusion of this Air Lesson, the student must demonstrate the following PL:

| Upgrade | Level |
|---|---|
| a. Medium Turns | 3 |

### MOTIVATION

4. The student must be prepared to correctly react to a spoiler stuck open failure.

### REFERENCES

5. Chapter 6, ACGP Manual of Glider Flying Training, Sections 4 and 5.

### BRIEFING OUTLINE

6. **Review.** Review as required turns and slipping.

7. **Safety Factors.** The following safety factors shall be observed:

   a. minimum altitudes; and

   b. return of spoiler control to student.

8. **Emergency Scenario.** When flying in the area, you realize that you will not make the airfield. What are your actions?

### SUMMARY

9. Encourage your student's questions.

10. Ask the following confirmatory question to the student: Describe your modified circuit if you find heavy sink on downwind.

### AIR LESSON OUTLINE

11. The student does the ground handling, take-off and air tow.

12. At the release altitude, the tow plane will rock its wings to initiate the release.

13. Let the student practice medium turns. **<u>You must upgrade medium turns.</u>**

14. The student joins the circuit.

15. With the instructor's assistance, the student applies circuit modification techniques for spoilers stuck open.

16. The student lands.

**LINK**

17. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link to previous circuit flying

**POST-FLIGHT REVIEW**

18. Debrief the students on all manoeuvres and have them analyze their own errors. Make suggestions on how performance can be improved.

19. **Reading Assignment.** The following are applicable:

a. Chapter 6, ACGP Manual of Glider Flying Training, Section 3; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

## AIR LESSON 19 – UPGRADE (AL19 – 2 500 FEET)

**AIM**

1. The aim of this lesson is to practice flight manoeuvres as required and to continue developing circuit judgements.

**OBJECTIVE**

2. At the conclusion of this flight the student must demonstrate the following PL:

| Upgrade | Level |
|---|---|
| a. Take-off | 3 |
| b. Air tow | 3 |
| c. Release | 3 |
| d. Steep turn | 3 |
| e. Downwind | 3 |
| f. Base Turn | 3 |
| g. Base Leg | 3 |

**MOTIVATION**

3. Practice of upper air work and the circuit are essential to obtain the desired proficiency for solo flight. This is the last flight for practicing upper air work prior to AL23.

**REFERENCES**

4. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 1 to 6; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Ensure that the spin and spiral dive exercises are practiced during this flight. Concentrate on any weak sequences.

2. Use this review flight to concentrate on flight management and circuit judgement..

**BRIEFING OUTLINE**

5. **Review.** Review upper air sequences, and any weak sequences from the last trip.

6. **Emergency Scenario.** While practicing in the area, you realize that you are too low to make it back to the aerodrome. What are your actions?

**SUMMARY**

7. Encourage your student's questions

8. Ask the following confirmatory questions to the student:

a. What is the stall speed, dual, of the 2-33? and

b. How do the spin and spiral recoveries differ?

**AIR LESSON OULINE**

9. The student does all ground handling.

10. The student performs the take-off, air tow and release. **You must upgrade take-off, air tow and release.**

11. Let student practice upper air work and set up the circuit. **You must upgrade steep turns**.

12. The student flies the circuit and lands. **You must upgrade downwind, base turn and base leg.**

**LINK**

14. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link to previous flights, discussing specific manoeuvres

**POST-FLIGHT REVIEW**

13. Debrief all the manoeuvres encouraging your student to analyze their own errors.

14. **Reading Assignment.** The following are applicable:

a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 1 to 6; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**AIR LESSON 20 – LAUNCH EMERGENCY, MODIFIED CIRCUIT (AL20 – 800 FEET)**

**AIM**

1. The aim of this lesson is to develop quick, effective and safe reactions to a launch failure above 500 feet AGL and to fly a modified circuit in order to complete an into-wind landing.

**OBJECTIVE**

2. At the conclusion of this flight the student must demonstrate the following PLs:

| Upgrade | Level |
|---|---|
| a. Circuit Modification | 3 |
| b. Emergencies | 2 |

**MOTIVATION**

3. The response to an emergency must be immediate and correct.

**REFERENCES**

4. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Section 3; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Stress that **<u>time</u>** is the most important factor. Common sense must dictate a pilot's action and what checks can be completed in the time available.

2. You must be extremely vigilant of your altitude above ground level throughout this entire exercise and your distance from your intended landing area. If you are too far away at 800 feet AGL to return to the aerodrome, **<u>Don't pull the release</u>**.

3. Ensure your student understands the altitude/distance problems.

4. Ensure that the LCO and the tow pilot are informed prior to conducting any rope-break simulations.

5. The student must be evaluated on both Emergencies and Circuit Modification on this flight.

**BRIEFING OUTLINE**

5. **Review.** Review as required:

a. take-off;

b. crosswind take-off; and

c. rope break procedures:

(1) above 500 feet;

(2) 200 to 500 feet;

(3) below 200 feet;

(4) on the roll; and

(5) wind effects/considerations including gliding distances.

6. **Rope Break Exercise.** The following are applicable to a rope break exercise:

a. immediate actions;

b. modified circuits;

c. wind effect (use actual winds);

d. airspeeds; and

e. safety considerations:

(1) turn coordination,

(2) point of no return, and

(3) alternate landing areas as pre-briefed in the daily operations briefing.

7. **Emergency Scenario.** While conducting rope break exercises, you find yourself too low to make it back to the landing point. What are your actions?

**SUMMARY**

8. Encourage your student's questions.

9. Ask the following confirmatory questions to the student:

a. What is the procedure for a rope break at 800 feet AGL?

b. How far will a 2-33 glide from 400 feet AGL in no-wind conditions? and

c. If the canopy opens during air tow, what are your actions?

**AIR LESSON OUTLINE**

10. The student performs the take-off and air tow.

11. The instructor pulls release at 800 feet AGL, if safe. **You must upgrade emergencies.**

12. The student flies a modified circuit and lands. **You must upgrade circuit modification.**

**LINK**

13. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link to low circuit modification flights

b. Link to verbal emergencies discussed on previous lessons

**POST-FLIGHT REVIEW**

14. Debrief the students on all the manoeuvres flown and analyze their errors. Make suggestions on how performance can be improved.

15. **Reading Assignment.** The following are applicable:

a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 3 and 4; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**AIR LESSON 21 – LAUNCH EMERGENCY – DOWNWIND LANDING (AL 21 – 400-600 FEET)**

**AIM**

1. The aim is to develop the student's ability to react quickly, effectively and safely to a launch failure between 400 and 600 feet AGL.

**OBJECTIVE**

2. To have the student experience a second simulated rope break and recovery to the airfield at a lower altitude.

**MOTIVATION**

3. The response to an emergency must be immediate and correct.

**REFERENCES**

4. The following references apply for this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 3 and 4; and

   b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Stress that **<u>time</u>** is the most important factor. Common sense must dictate a pilot's action and what checks can be completed in the time available.

2. You must be extremely vigilant of your altitude above ground level throughout this entire exercise and your distance from your intended landing area. If you are too far away at any altitude to return to the aerodrome, **<u>Don't pull the release</u>**.

3. Ensure your student understands downwind landing problems and techniques.

4. Ensure that the LCO and the tow pilot are informed prior to conducting any rope-break simulations.

**BRIEFING OUTLINE**

5. **Review.** Review as required:

   a. take-off (including crosswind take-off); and

   b. rope break procedures:

      (1) above 500 feet;

      (2) 200 to 500 feet;

      (3) below 200 feet;

      (4) on the roll; and

      (5) wind effect considerations including gliding distances.

6. **Rope Break Exercise.** The following are applicable to a rope break exercise:

   a. immediate actions;

   b. downwind approach and landing;

c. wind effect (use actual wind);

d. airspeeds; and

e. safety considerations:

(1) turn coordination;

(2) point of no return; and

(3) possible alternate landing areas as pre-briefed in the daily operations briefing.

7. **Emergency Scenario.** On air tow you notice that your rate of climb is slow. You see the tow plane's rudder wiggle vigorously back and forth. What are your immediate actions?

**SUMMARY**

8. Encourage your student's questions.

9. Ask the following confirmatory questions to the student:

a. Why would you choose to land downwind? and

b. Explain the effect of wind direction and speed on your decision on where to land.

**AIR LESSON OUTLINE**

10. The student performs the take-off and air tow.

11. The instructor pulls release at 400 to 600 feet AGL, if safe.

12. The student flies and performs a downwind landing.

**LINK**

13. Tailor link to the individual student. Be creative to encourage each student’s understanding. At a minimum, include the following:

a. Link to low circuit modification flights;

b. Link to previous launch emergency; and

c. Link to verbal emergencies discussed on previous lessons.

**POST-FLIGHT REVIEW**

14. Debrief the students on all manoeuvres flown and have them analyze their own errors. Make suggestions on how performance can be improved.

15. **Reading Assignment.** The following are applicable:

a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 3 and 4; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

## AIR LESSON 22 – LAUNCH EMERGENCY

**AIM**

1. The aim of this mission is to develop quick, effective and safe reactions to a launch failure, so as to accomplish a safe recovery.

**OBJECTIVE**

2. To have the student experience a third simulated rope break and recovery to the airfield developing the skill to safely handle any take-off rope break scenario as a solo student. The student shall achieve the following PLs:

| **Upgrade** | **Level** |
|---|---|
| a. Emergencies | 3 |
| b. Airmanship | 3 |

**MOTIVATION**

3. The response to an emergency must be immediate and correct.

**REFERENCES**

4. The following references apply for this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 3 and 4; and

   b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Stress that **TIME** is the most important factor. Common sense must dictate a pilot's action and what checks can be completed in the time available.

2. You must be extremely vigilant of your altitude above ground level throughout this entire exercise and your distance from your intended landing area. If you are too far away at any altitude to return to the aerodrome, **<u>Don't pull the release</u>**.

3. If applicable, ensure your student understands the problems that can be encountered during a downwind landing, especially the higher than normal ground speed during approach and the effects of a tail wind during landing.

4. Inform the LCO and the tow pilot prior to conducting any rope-break simulations.

**BRIEFING OUTLINE**

5. **Review.** Review as required:

   a. take-off (including crosswind take-off);

   b. rope break procedures:

      (1) above 500 feet;

      (2) 200 to 500 feet;

(3) below 200 feet;

(4) on the roll; and

(5) wind effects/considerations including gliding distances.

6. **Airmanship.** Review definition and scope in terms of:

a. common sense, situational awareness, air picture, planning;

b. b. adherence to SOPs, National/regional/local orders;

c. wind assessment, look-out, etc.

7. **Rope Break Exercise.** The following are applicable to a rope break exercise:

a. immediate actions;

b. downwind approach and landing;

c. cross runway landing;

d. modified circuit;

e. straight ahead landing;

c. wind effect (use actual wind);

d. airspeeds; and

e. safety considerations:

(1) turn coordination;

(2) point of no return; and

(3) possible alternate landing areas as pre-briefed in the daily operations briefing.

8. **Emergency Scenario.** While on tow, you lose sight of the tow plane. What are your actions?

**LINK**

9. Tailor link to the individual student. Be creative to encourage each student's understanding. At a minimum, include the following:

a. Link to low circuit modification flights;

b. Link to previous launch emergency; and

c. Link to verbal emergencies discussed on previous lessons.

**SUMMARY**

10. Encourage your student's questions.

11. Ask the following confirmatory questions to the student:

    a. What airspeed is used for downwind landings?

b. What is the maximum tailwind component for normal operations?

**AIR LESSON OUTLINE**

12. The student performs the take-off and air tow.

13. Any of the following can be performed for this flight:

    a. Modified circuit;

    b. Cross runway landing;

    c. Downwind landing;

    d. Straight ahead landing.

14. The instructor pulls release at an appropriate, safe altitude for the chosen exercise. The student performs the appropriate action and lands. **<u>You must upgrade emergencies</u>.**

15. **<u>You must upgrade airmanship</u>.**

**POST-FLIGHT REVIEW**

16. Debrief the students on all manoeuvres flown and have students analyze their own errors. Suggest how to improve performance.

17. **Reading Assignment.** The following are applicable:

    a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 1 to 6;

    b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI; and

    c. Review Progress Book.

## AIR LESSON 23 – GENERAL PROGRESS CHECK (AL23 – 3 000 FEET)

**AIM**

1. The aim of this mission is to review all the sequences that will be tested on the solo check.

**OBJECTIVE**

2. At the conclusion of this trip, the student must have demonstrated the following PLs:

| Upgrade | | | Level |
|---|---|---|---|
| a. | Pre-flight | | 3 |
| b. | Spiral Dive Recovery | | 3 |
| c. | Slipping | | 3 |
| d. | Slipping Turns | | 3 |
| e. | Incipient Spin Recovery | | 3 |
| f. | Circuit Work: | | |
| | (3) | Final Turn | 3 |
| | (4) | Final Approach | 3 |
| | (5) | Landing | 3 |
| g. | Flight Management | | 3 |

**MOTIVATION**

3. This is the last dual mission with enough altitude to review the upper airwork before the solo check. It provides the additional opportunity to refine some of the techniques learned so far. By now the student should be feeling more comfortable with the glider and it is essential that the students demonstrate their ability to perform these basic manoeuvres before authorization is given for solo flight.

**REFERENCES**

4. The following references apply for this lesson:

a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 1 to 6; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Question the student to determine retention of the sequences taught during the previous 19 dual missions.

2. If possible, fly the same profile that can be expected on the solo check.

3. Continue to stress self-analysis. Being able to self-analyze is important before the student goes solo.

4. The student must have achieved PL 3 (Solo Standard) on all the objectives of the previous instructional flights including this review flight, before proceeding to the Pre-Solo Flight Check. At the conclusion of this review flight, discuss your student's progress with your Flight Commander or CFI who will decide whether to proceed with the Solo Check or to give an Extra Dual.

**BRIEFING OUTLINE**

5. **Review.** Review as required:

   a. upper air work including stalls, incipient spins and spirals;

   b. circuit (including modification procedures), final approach and landing;

   c. wind effect;

   d. local procedures including R/T; and

   e. emergencies.

6. **Emergency Scenario.** While checking the rope for hook-up you notice that the rope around the ring is quite frayed. What are your actions?

**SUMMARY**

7. Encourage your student's questions.

8. Ask the following confirmatory questions to the student:

   a. You are high halfway on downwind. How do you modify the circuit to land in the proper place?

   b. What is the spin recovery procedure? and

   c. Will diving into ground effect (penetration approach) increase gliding distance? Explain.

**AIR LESSON OUTLINE**

9. The student does the take-off and air tow.

10. The student practices to improve incipient spin recovery; spiral dive recovery; and stalls and recovery.

11. The student practices to improve slipping.

12. The student flies the circuit without assistance.

13. the student completes the approach and landing.

14. **<u>You must upgrade pre-flight, incipient spin recovery, spiral dive recovery, stalls, slipping, flight management, approach and landing</u>.**

**LINK**

13. Tailor link to the individual student. Be creative to encourage each student’s understanding. At a minimum, include the following:

   a. Link to previous air lessons, discussing specific manoeuvres.

**POST-FLIGHT REVIEW**

15. Debrief the students on all manoeuvres flown and have the students analyze their own errors. Make suggestions on how performance can be improved. Advise the student whether the next flight will be the formal Pre-Solo Flight Check or additional instruction/review.

16. **Reading Assignment.** The following are applicable:

a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 1 to 6;

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

c. Local Flying Orders; and

d. Review of Progress Book.

## AIR LESSON 24 – SOLO FLIGHT CHECK (2 500 FEET)

**AIM**

1. To confirm that the student is competent in all sequences that have been taught and is safe for solo in the glider.

**OBJECTIVE**

2. The student must demonstrate, as a minimum, PL 3 on all manoeuvres.

**MOTIVATION**

3. To demonstrate to the instructor and peers that the student has performed to the standard required to be entrusted with the care of an ACGP glider.

4. To enjoy the sense of freedom, confidence and responsibility commensurate with being in control of a glider.

**REFERENCES**

5. The following references apply for this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Sections 1 to 6;

   b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

   c. Previous Air Lessons.

**TIPS TO INSTRUCTORS**

1. **Progress Book.** Check to ensure that the student has been taught and has achieved a PL 3 on all sequences.

2. **Airmanship.** Look-out should be proficient. Checks and emergency procedures must be correct and understood by the student.

3. **Take-Off and Tow.** The student should be able to maintain direction on the runway, fly the glider off safely and use the correct air tow technique.

4. **Stalls.** The student must demonstrate the ability to recognize an impending stall. You must also ensure that the student understands that correct recovery procedures must be initiated before the stall and/or incipient spin develops fully. The student must be capable of doing so with a minimum loss of altitude.

5. **Flight Management.** The student should return the glider to the IP at the correct altitude without prompting.

6. **Circuit.** Track, altitude, airspeed and bank control should be reasonably accurate.

7. **Approach.** The student should demonstrate good airspeed control during the final turn and approach and recognize overshoot and undershoot trends, taking appropriate corrective action to maintain the proper glide path.

8. **Landing.** The student should be proficient in safely recovering the glider and must be able to recover from a bad landing. The glider must be under positive control throughout the after-landing roll.

9. **Confidence.** The student should be able to meet difficulties with assurance and not panic when confronted with unusual situations. The student should demonstrate initiative, making timely and safe corrections.

**BRIEFING OUTLINE**

6. Ensure the student is able to analyze and correct errors in the circuit, especially the final approach and landing phases. Question the student on the recognition of, and corrective action for, selected emergencies.

7. Brief the student on the air exercise.

**SUMMARY**

8. Encourage and answer the student's questions.

**AIR LESSON OUTLINE**

9. The student does all the ground handling, take-off and air tow.

10. The student is responsible for flight management.

11. Air work is conducted as per the briefing and is normally cued by the Check Pilot.

12. The student flies the circuit through to the landing.

**POST-FLIGHT REVIEW**

13. Include the student's instructor in the debriefing. Review all areas where difficulties were encountered. Advise the Flt Comd and instructor of your decision regarding solo status as soon as the debriefing is complete.

## FIRST SOLO FLIGHT: (SOLO 1: GENTLE AND MEDIUM TURNS – 2 000 FEET)

**AIM**

1. To allow the student to experience solo flight.

**OBJECTIVE**

2. The student is to practice co-ordinated gentle and medium turns and flight management.

3. The student is to safely recover the glider using standard circuit procedures.

**MOTIVATION**

4. A successful first solo provides a significant boost to the student pilot's self-confidence, and is the first of the 20 mandatory solo trips of the Course.

**TIPS TO INSTRUCTORS – STUDENT'S FIRST SOLO**

1. The instructor is responsible for ensuring that suitable conditions exist for the student's first solo flight:

   a. **Light Conditions.** Normal daylight must be available for solo flights.

   b. **Weather Conditions.** The first solo flight shall not be considered unless suitable weather conditions exist and are forecast to continue (consider heat, visibility, horizon, weather, turbulence, etc.). For example, a first solo flight must not be attempted when an impending frontal passage could cause a wind shift or when a thunderstorm is in the vicinity. Although a thunderstorm may not pass directly over the airport, it can still cause abrupt wind changes and turbulent conditions over a fairly wide area.

   c. **Traffic Conditions.** At airports where heavy traffic conditions may be encountered at some periods of the day, ensure that the first solo is scheduled for an off-peak period.

   d. **Student Fatigue.** After a lengthy session of dual instruction, the student may be so fatigued that it is inadvisable to conduct the first solo flight, even though the student appears to be performing satisfactorily.

   e. **Strap-in.** Ensure that the student understands the placarded C of G limitations and the requirement, if necessary, for ballast. The instructor shall securely fasten the straps in the rear seat, advise the student about going solo, and advise the tow pilot that a student on the first solo will be towed.

   f. **Advice and Encouragement.** Make sure the student understands that the glider will trim differently with only one pilot, and make sure the student realizes the extra need for keeping a sharp look-out now that the student will be alone. Express confidence in the student's ability and offer words of encouragement as the student prepares for one of the most memorable flights of the course.

   g. **Overconfidence**. Glider instructors shall discuss with the student the dangers of overconfidence during solo missions.

   h. **Student Anxiety**. Glider instructors should strive to treat the first solo as “just another mission”. Overemphasis on this trip may cause unnecessary student anxiety. Instructors should ensure that other students do not congregate around the student about to go solo.

**BRIEFING OUTLINE**

5. **Briefing.** As a minimum, the briefing shall cover the following:

   a. the limits of the air exercise to be flown, emphasizing look-out, flight management and airmanship;

   b. the difference in handling characteristics and trim with one less person in the glider;

   c. **Circuit Procedures.** The following are applicable to circuit procedures:

      (1) joining at the correct position and altitude,

      (2) completing all checks including use of radio,

      (3) turning base and final on the prescribed track, at the appropriate heights and at the correct speeds,

      (4) employing circuit modification techniques as required,

      (5) using the over/under shoot reference approach on final,

      (6) remembering that a lighter glider will tend to "float" longer on round-out and hold-off, and

      (7) concentrating on the touch-down and roll, maintaining wings level and directional control, and keeping the skid off the ground as long as possible; and

   d. specific actions to be taken after a rope break and any other emergency situation that may arise.

**DEBRIEFING**

6. Congratulate the student on a successful first solo.

7. Debrief the students on all manoeuvres flown and have the students analyze their own errors, especially the circuit. Make suggestions on how performance can be improved.

8. Pay particular attention to the student's concerns and questions.

## AIR LESSON 25 – POST-SOLO REVIEW AND PROGRESS CHECK (1 500 FEET)

**AIM**

1. To ensure that the student is maintaining the required standard for further solo practice.

**OBJECTIVE**

2. At the conclusion of this trip the student will have demonstrated the ability to continue further solo practice.

**MOTIVATION**

3. To improve flying skills.

**REFERENCES**

4. The following references apply to this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Chapters 1 to 6; and

   b. RGS Flying Orders.

**TIPS TO INSTRUCTORS**

**POST-SOLO REVIEW/PROGRESS CHECKS**

1. The student must understand that the purpose of dual review flights is to provide flying training continuity and to assist and confirm that not only is the training standard being met, but also that improvement continues to be made. The student must understand that supervision and training do not cease when the solo stage is reached, but rather that supervision and training are a continuous and integral part of every pilot's flying career, regardless of what licences or ratings the pilot may hold.

2. Remind the student that safe flying practices are still the priority during the post-solo stage and that breaches of flying discipline or poor airmanship will not be tolerated.

3. Remind the student that considerable polish and fine-tuning of practical flying skills, decision-making ability and airmanship will be necessary in order to successfully complete the course and become a Glider Pilot licensed by TC. At the same time, considering that the first solo has been successfully completed, ensure that the student understands that you have confidence not only in the student's demonstrated ability but also in the student's capability to continue to improve.

**BRIEFING OUTLINE**

5. **Review.** Review the following:

   a. medium and steep turns;

   b. circuit and circuit modification procedures; and

   c. emergency procedures (question and answer).

6. **Discussion.** Discuss the effects of the prevailing and forecast weather and wind on the circuit.

**SUMMARY**

7. Encourage your student's questions.

**AIR LESSON OUTLINE**

8. The student performs the take-off and air tow.

9. The student practices medium turns.

10. The student flies the circuit and lands.

**POST-FLIGHT REVIEW**

11. Debrief the student on all manoeuvres flown and have the student analyze errors. Make suggestions on how performance can be improved.

**SOLO FLIGHTS 2 TO 5 (SOLOS 2 TO 4: MEDIUM TURNS – 1 500 FEET AND SOLO 5: STEEP TURNS – 1 500 FEET)**

**AIM**

1. For the student to practice various turns and circuit procedures to improve and fine tune flying skills.

**AIR LESSON**

2. The student practices exercises for each of the solo flights as briefed by the instructor.

**TIPS TO INSTRUCTORS ON STUDENT SOLO FLIGHTS**

1. Remind the student that safe flying practices remain the highest priority during solo flights and that any breach of flying discipline or non-compliance with flying orders or poor airmanship will not be tolerated.

2. Remind the student that solo missions are learning opportunities during which flying skills can be improved and fine-tuned, an essential requirement in order to successfully complete the course and earn a Glider Pilot Licence.

3. The pre-flight briefing must be thorough, covering all details of the exercises to be practised, especially circuit work and emergency procedures that may arise as a consequence of the exercises (e.g., if steep turns are to be practised, then review stall, spin and spiral dive recognition and recovery procedures). The pre-flight briefing must also cover prevailing wind and weather conditions, especially their effect on circuit planning and execution. Finally, the instructor should confirm the student's preparedness by asking questions and expecting correct answers.

4. The instructor must monitor the student's solo flight and be prepared to render assistance should problems arise.

5. The post-flight debriefing is critical to the student's continued improvement and confidence. Therefore, the instructor should ask questions concerning all aspects of the flight, offering suggestions on how the student can continue to improve.

6. The instructor must pay particular attention to the student's concerns or questions, watching for signs of over- or under-confidence and taking appropriate action as the situation dictates.

## AIR LESSON 26 – REVIEW AND PROGRESS CHECK (2 000 FEET)

### AIM

1. To determine that the student's skills (glider handling, decision-making and airmanship) continue to improve and to further emphasize and provide guidance in the areas of flight safety, flight management and airmanship.

### OBJECTIVE

2. At the conclusion of this trip the student will have demonstrated the ability to continue further solo practice.

### MOTIVATION

3. To improve flying skills.

### REFERENCES

4. The following references apply to this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Chapters 1 to 6; and

   b. RGS Flying Orders.

**TIPS TO INSTRUCTORS**

**POST-SOLO REVIEW/PROGRESS CHECKS**

1. The student must understand that the purpose of dual review flights is to provide flying training continuity and to assist and confirm that not only is the training standard being met, but also that improvement continues to be made. The student must understand that supervision and training do not cease when the solo stage is reached, but rather that supervision and training are a continuous and integral part of every pilot's flying career, regardless of what licences or ratings the pilot may hold.

2. Remind the student that safe flying practices are still the priority during the post-solo stage and that breaches of flying discipline or poor airmanship will not be tolerated.

3. Remind the student that considerable polish and fine-tuning of practical flying skills, decision-making ability and airmanship will be necessary in order to successfully complete the course and become a Glider Pilot licensed by TC.

### BRIEFING OUTLINE

5. **Review.** Review the following:

   a. steep turns;

   b. stalls: gentle, medium, and turning;

   c. circuit and circuit modification procedures; and

   d. emergency procedures.

6. **Discussion.** Discuss the effects of the prevailing and forecast weather and winds on the circuit.

**SUMMARY**

7. Encourage your student's questions.

**AIR LESSON OUTLINE**

8. The student performs the take-off and air tow.

9. The student practices stalls as directed by the instructor.

10. The student practices medium and steep turns.

11. The student flies the circuit and lands.

**POST-FLIGHT REVIEW**

12. Debrief the student on all manoeuvres flown and have the student analyze the errors. Make suggestions on how performance can be improved.

## SOLO FLIGHTS 6 TO 10 (SOLOS 6 AND 7: STEEP TURNS – 1 500 FEET; SOLO 8: GENTLE STALLS – 2 000 FEET; SOLO 9: MEDIUM STALLS – 2 000 FEET; AND SOLO 10: STALLS WITH OPEN SPOILER ENTRY – 2 000 FEET)

### AIM

1. For the student to practice various turns, various stalls and circuit procedures to improve and fine tune flying skills.

### AIR LESSON

2. The student practices the exercises for each of the solo flights as briefed by the instructor.

**TIPS TO INSTRUCTORS ON STUDENT SOLO FLIGHTS**

1. Remind the student that safe flying practices remain the highest priority during solo flights and that any breach of flying discipline or non-compliance with flying orders or poor airmanship will not be tolerated.

2. Remind the student that solo missions are learning opportunities during which flying skills can be improved and fine-tuned, an essential requirement in order to successfully complete the course and earn a Glider Pilot Licence.

3. The pre-flight briefing must be thorough, covering all details of the exercises to be practised, especially circuit work, and emergency procedures that may arise as a consequence of the exercises (e.g., if steep turns are to be practised, then review stall, spin and spiral dive recognition and recovery procedures). The pre-flight briefing must also cover prevailing wind and weather conditions, especially their effect on circuit planning and execution. Finally, the instructor should confirm the student's preparedness by asking questions and expecting correct answers.

4. The instructor must monitor the student's solo flight and be prepared to render assistance should problems arise.

5. The post-flight debriefing is critical to the student's continued improvement and confidence. Therefore, the instructor should ask questions concerning all aspects of the flight, offering suggestions on how the student can continue to improve.

6. The instructor must pay particular attention to the student's concerns or questions, watching for signs of over- or under-confidence and taking appropriate action as the situation dictates.

## AIR LESSON 27 – COMPREHENSIVE REVIEW AND PROGRESS CHECK (2 500 FEET)

**AIM**

1. To confirm that the student's flying skills (glider handling, decision-making and airmanship) continue to improve and to further emphasize and provide guidance in the areas of flight safety and management.

2. To assess and correct, as necessary, the student's stall and spin entry and recovery procedures.

**OBJECTIVE**

3. At the conclusion of this trip the student will have demonstrated the ability to continue further solo practice.

**MOTIVATION**

4. To improve flying skills.

**REFERENCES**

5. The following references apply to this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Chapters 1 to 6; and

   b. RGS Flying Orders.

**TIPS TO INSTRUCTORS**

**POST-SOLO REVIEW/PROGRESS CHECKS**

1. Students must understand that the purpose of dual review flights is to provide flying training continuity and to assist and confirm that not only is the training standard being met, but also that improvement continues to be made. The student must understand that supervision and training do not cease when the solo stage is reached, but rather that supervision and training are a continuous and integral part of every pilot's flying career, regardless of what licences or ratings the pilot may hold.

2. Remind the student that safe flying practices are still the priority during the post-solo stage and that breaches of flying discipline or poor airmanship will not be tolerated.

3. Remind the student that considerable polish and fine-tuning of practical flying skills, decision making ability and airmanship will be necessary in order to successfully complete the course and become a Glider Pilot licensed by TC.

**BRIEFING OUTLINE**

6. **Review.** Review the following:

   a. spins and spiral dives: recognition, entry, and recovery;

   b. circuit and circuit modification procedures; and

   c. emergency procedures.

7. **Discussion.** Discuss the effects of the prevailing and forecast weather and winds on the circuit.

**SUMMARY**

8. Encourage your student's questions.

**AIR LESSON OUTLINE**

9. The student performs the take-off and air tow.

10. The student practices incipient spin and spiral dive recoveries.

11. The student flies the circuit and lands.

**POST-FLIGHT REVIEW**

12. Debrief the student on all manoeuvres flown and have the student analyze the errors. Make suggestions on how performance can be improved.

**SOLO FLIGHTS 11 TO 15 (SOLOS 11 AND 12: CROSSWIND OPERATIONS – 1 500 FEET; AND SOLOS 13 TO 15: MEDIUM AND STEEP TURNS – 1 500 FEET)**

**AIM**

1. For the student to practice take-off and circuit work in crosswind conditions, and to practice various turns in order to improve and fine tune flying skills.

**AIR LESSON**

2. The student practices the exercises for each of the solo flights as briefed by the instructor.

**TIPS TO INSTRUCTORS ON STUDENT SOLO FLIGHTS**

1. Remind the student that safe flying practices remain the highest priority during solo flights and that any breach of flying discipline or non-compliance with flying orders or poor airmanship will not be tolerated.

2. Remind the student that solo missions are learning opportunities during which flying skills can be improved and fine-tuned, an essential requirement in order to successfully complete the course and earn a Glider Pilot Licence.

3. The pre-flight briefing must be thorough, covering all details of the exercises to be practised, especially circuit work and emergency procedures that may arise as a consequence of the exercises (e.g., if steep turns are to be practised, then review stall, spin and spiral dive recognition and recovery procedures). The pre-flight briefing must also cover prevailing wind and weather conditions, especially their effect on circuit planning and execution. Finally, the instructor should confirm the student's preparedness by asking questions and expecting correct answers.

4. The instructor must monitor the student's solo flight and be prepared to render assistance should problems arise.

5. The post-flight debriefing is critical to the student's continued improvement and confidence. Therefore, the instructor should ask questions concerning all aspects of the flight, offering suggestions on how the student can continue to improve.

6. The instructor must pay particular attention to the student's concerns or questions, watching for signs of over- or under-confidence and taking appropriate action as the situation dictates.

**AIR LESSON 28 – PRE-FLIGHT TEST COMPREHENSIVE REVIEW (3 000 FEET)**

**AIM**

1. To review all sequences under an instructor's supervision in preparation for the flight test.

2. To ensure that all minor problems are corrected.

**OBJECTIVE**

3. At the conclusion of this trip the student should be prepared for the flight test

**MOTIVATION**

4. To demonstrate the skill level required for the Final Flight Test.

**REFERENCES**

5. The following references apply for this lesson:

 a. Chapter 6, ACGP Manual of Glider Flying Training, Chapters 1 to 6; and

 b. RGS Flying Orders.

**TIPS TO INSTRUCTORS**

1. Do not discuss the techniques of the various testing officers. The student should understand that the testing officer is only interested in confirming the skill level of the student, and not in fault finding.

2. Review a Flight Test Card to help the student prepare for the Flight Test.

3. In some cases, the flight test may occur before your student has finished the full sequence of solo flights. Ensure that the student understands that the remaining solo flights must be completed with a high standard of flight discipline and airmanship.

**BRIEFING OUTLINE**

6. **Review the Flight Test Card.**

7. **Review the Typical Flight Test Sequence of Events.**

8. **Student's Individual Responsibility.** Ensure students understand their individual responsibility for:

 a. all checks;

 b. look around; and

 c. flight management.

**SUMMARY**

9. Encourage your student's questions and address all your student's concerns.

**AIR LESSON OUTLINE**

10. The student performs the take-off and air tow.

11. The student performs required flight test sequences, prompted by the instructor.

12. The student flies the circuit and lands.

**POST-FLIGHT REVIEW**

13. Debrief the student on all manoeuvres flown and have the student analyze the errors. Make suggestions on how performance can be improved.

14. Address all your student's concerns. Ensure that your student understands that success on a Flight Test, like any evaluation, is the result of knowledge, skill and confidence.

## SOLO FLIGHTS 16 TO 20 (SOLOS 16 AND 17: SLIPPING – 1 500 FEET AND SOLOS 18 TO 20: TURNS – 1 500 FEET)

### AIM

1. For the student to practice slipping and medium and steep turns as detailed for each solo, and flight management and the circuit in order to improve and fine tune flying skills.

### AIR LESSON

2. The student practices the exercises for each of the solo flights as briefed by the instructor (S16 – forward/side-slips; S17 – turning slips).

**TIPS TO INSTRUCTORS ON STUDENT SOLO FLIGHTS**

1. Remind the student that safe flying practices remain the highest priority during solo flights and that any breach of flying discipline will not be tolerated.

2. Remind the student that solo missions are learning opportunities during which flying skills can be improved and fine-tuned, an essential requirement in order to successfully complete the course and earn a Glider Pilot Licence.

3. The pre-flight briefing must be thorough, covering all details of the exercises to be practiced, especially circuit work and emergency procedures that may arise as a consequence of the exercises (e.g., if steep turns are to be practiced, then review stall, spin and spiral dive recognition and recovery procedures). The pre-flight briefing must also cover prevailing wind and weather conditions, especially their effect on circuit planning and execution. Finally, the instructor should confirm the student's preparedness by asking questions and expecting correct answers.

4. The instructor must monitor the student's solo flight and be prepared to render assistance should problems arise.

5. The post-flight debriefing is critical to the student's continued improvement and confidence. Therefore, the instructor should ask questions concerning all aspects of the flight, offering suggestions on how the student can continue to improve.

6. The instructor must pay particular attention to the student's concerns or questions, watching for signs of over- or under-confidence, and taking appropriate action.

## AIR LESSON 29 – FINAL FLIGHT TEST (2 500 FEET)

### AIM

1. To ensure the student possesses the proficiency and qualifications for a TC Glider Pilot Licence.

### OBJECTIVE

2. At the conclusion of this lesson the student will demonstrate the required proficiency to be awarded the TC Glider Pilot Licence.

### MOTIVATION

3. To demonstrate the skill level required of a licensed Glider Pilot.

### REFERENCES

4. The following references apply for this lesson:

   a. Chapter 6, ACGP Manual of Glider Flying Training, Chapters 1 to 6;

   b. RGS Flying Orders; and

   c. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**TIPS TO INSTRUCTORS**

1. Do not discuss the techniques of the various testing officers. The student should understand that the testing officer is only interested in confirming the skill level of the student, and not in fault finding.

2. Review a Flight Test Card to help the student prepare for the Flight Test.

3. In some cases, the flight test may occur before your student has finished the full sequence of solo flights. Ensure that the student understands that the remaining solo flights must be completed with a high standard of flight discipline and airmanship.

### BRIEFING OUTLINE

5. **Briefing.** A briefing shall be provided on the following:

   a. the sequences to be performed during the flight test; and

   b. the student's responsibilities, including:

      (1) all checks,

      (2) look around; and

      (3) flight management.

### SUMMARY

6. Encourage the student's questions.

**AIR LESSON OUTLINE**

7. The student performs the take-off and air tow.

8. The student performs the required flight test sequences, as directed by the testing officer.

9. The student flies the circuit and lands

**POST-FLIGHT REVIEW**

10. Debrief the student on all manoeuvres flown. Include the student's instructor in the debriefing.

# SECTION 4

# ACADEMIC TRAINING (GROUND SCHOOL)

## LECTURE PROGRAM

1. The academic instruction for the ACGP Glider Pilot Course shall consist of a minimum of 50 hours of formal training. Lecture periods shall be no more than 50 minutes long with a suitable break between consecutive lectures.

2. A full ground training day should consist of a maximum of six formal lecture periods. The remaining periods should be scheduled for supervised study periods, flight safety briefings or administration.

3. A schedule that provides flying training with an academic program on a half day or alternate day basis is preferred. The early introduction of glider handling topics in a classroom setting ensures that the students are familiar with the material prior to their flight training.

4. This section is the training plan for the academic portion (ground training) of this course.

## ACADEMIC SUBJECTS

5. The following is a summary of the required academic training:

| **Performance (Educational) Objective** | **Topic** | **Periods** |
|---|---|---|
| 401 | Understand Air Law | 7 |
| 402 | Glider Procedures | 6 |
| 403 | Understand Navigation | 9 |
| 404 | Understand Radio Theory | 3 |
| 405 | Understand Meteorology | 13 |
| 406 | Understand Theory of Flight | 10 |
| 407 | Flight Operations | 6 |
| 408 | Understand the Principles of Human Factors in Aviation | 3 |
| 409 | Be Aware of Flight Safety | 3 |
| **Total RGS Instructional Periods** | | 60 |

6. The student shall write and pass the following ECs consisting of:

   a. Understand Air Law – pass mark 70% (pre-solo);

   b. Glider Procedures – pass mark 85% (pre-solo);

c. Understand Navigation – pass mark 70%;

d. Understand Radio Theory – pass mark 70%;

e. Understand Meteorology (Theory) – pass mark 70%;

f. Understand Meteorology (Interpretive) – pass mark 70%;

g. Understand Theory of Flight – pass mark 70%;

h. Flight Operations – pass mark 70%;

k. Understand the Principles of Human Factors in Aviation – pass mark – Attend; and

l. Be Aware of Flight Safety – pass mark – Attend.

7. At least 1 sample MOT must be administered in each region. There is no pass mark and this exam is not to be counted as an EC. Failure of this exam will have no bearing on course standing and shall not be applied to unsatisfactory course progress criteria. This mark shall not be recorded on the course reports for students.

8. ECs are nationally standardized and are distributed by CFS/ACGP SET. Procedures for EC failure are outlined in "Chapter 3 – Assessment Details."

9. Throughout this document three classifications are used for level of emphasis to be applied when instructing a specific topic or definition:

a. Briefly discuss/describe – This topic should be given an overview of the concept only;

b. Discuss/Describe/Demonstrate – This topic shall be instructed; and

c. Emphasize – This topic shall be instructed and emphasized, as this topic is most likely examined by Transport Canada.

10. The practical navigation exercise is the exception to 9, where the instructor shall lead the students through the practical exercise.

## PO 401 – UNDERSTAND AIR LAW

Enabling Objective 401.01 – Understand the Canadian Aviation Regulations (CARs)

1. **Performance: Understand the Canadian Aviation Regulations (CARs)**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** Prior to the first solo, the student shall pass a written EC with a minimum pass mark of 70%.

4. **Teaching Points:**

**(1) Lesson 1 (1 period): Basic CARs and Aircraft Registration**

a. Briefly describe the AIP and the CFS and their contents;

b. Define the following applicable terms and emphasize their interpretations for glider flight: aerodrome, aerodrome traffic zone, aeroplane, aircraft, airport, airport traffic, air traffic, ATC clearance, ATC instruction, ATC service, ATC unit, airworthy, apron, ceiling, Certificate of Airworthiness, Certificate of Registration, control area, controlled airport, control zone, day, daylight, flight notification, flight plan, flight time, flight visibility, glider, ground visibility, heading, IFR, landing, manoeuvring area, minister, movement area, night, overtaking aircraft, owner, personnel licence, special VFR flight, taking off, track, VFR, VFR flight, and visibility;

c. Describe aircraft registration in Canada, including mandatory markings; and

d. Describe the requirements for placards within an aircraft registered in Canada including weight and balance.

**(2) Lesson 2 (1 period): Aerodromes, Rules of the Air and VFR Flight**

a. Emphasize the concepts behind runway numbering, runway markings, taxiways, aerodrome markings and aerodrome lighting;

b. Describe light signals sent to aircraft on the ground and in the air;

c. Describe visual ground signals given to aircraft at aerodromes;

d. Describe the rules of the air including minimum height of aircraft and low flight regulations, emphasizing the rules on right of way, dropping of objects from an aircraft, conditions for permissible aerobatics according to Transport Canada and prohibitions regarding the carrying of passengers during aerobatic manoeuvres according to Transport Canada;

e. Redefine VFR, SVFR and night VFR;

f. Describe minimum instrumentation required for VFR flight during the day; and

g. Define the weather minima for VFR flight in all conditions.

**(3) Lesson 3 (1 period): Licensing and Documentation**

a. Describe the minimum requirements for obtaining a glider pilots license;

b. Describe the validity requirements for keeping a glider pilots license, including the license validation certificate and Transport Canada Currency requirements;

c. Emphasize the description of the privileges granted to a holder of a glider pilots license;

d. Describe the documents required to be carried on board an aircraft in flight, including a discussion of exemptions for the ACGP;

e. Describe the aircraft journey and technical logs;

f. Describe the logging of flights by pilots;

g. Describe aircraft airworthiness and the airworthiness certificate;

h. Emphasize the use of flight plans, flight itineraries and flight notifications;

i. Emphasize the description of the pilots responsibilities with respect to flight preparation, loading and pre-flight inspections; and

j. Emphasize the description of the contents of an arrival report.

**(4) Lesson 4 (1 period): Airspace**

a. Emphasize how airspace is defined in Canada, including the various classifications and restrictions on VFR aircraft;

b. Describe the purpose of Air Traffic Control and the duty of ATC in various classifications of airspace;

c. Describe the Canadian Airway Structure and how it is indicated on VNCs;

d. Describe the VFR cruising altitudes; and

e. Describe altimeter setting, including the standard pressure region and the altimeter setting region.

**(5) Lesson 5 (1 period): Procedural CARs**

a. Describe aircraft operating and equipment requirements;

b. Describe the requirements for pilots to report accidents and incidents;

c. Describe the Transportation Safety Board;

d. Describe the requirements for seats, safety belts and harnesses in aircraft;

e. Emphasize the CAR defining oxygen equipment and supply on aircraft;

f. Describe the distress, urgency and safety signals;

g. Describe the CARs pertaining to wake turbulence regulations;

h. Describe the requirements, as per Transport Canada, of license restrictions when donating blood, after compression dives and after using anaesthetics;

i. Describe the signs, symptoms and causes of hypoxia;

j. Emphasize the Transport Canada regulations regarding alcohol consumption and over-the-counter medications; and

k. Emphasize regulations pertaining to aircraft surface contamination on the ground.

5. **Time:** 5 X 50 minute periods – Lecture
1 X 50 minute period – Review
1 X 50 minute period – Written EC

6. **Approach:**

a. Lecture.

7. **References:**

a. A3

b. A12

8. **Training Aids:**

9. **Test Details:**

a. The student shall attain a minimum of 70% on a written EC.

10. **Remarks:**

a. The successful completion of this EO is necessary before the student is allowed to progress to solo status.

b. This subject matter will also be examined as part of the Transport Canada Glider Pilot examination.

## PO 402 – GLIDER PROCEDURES

Enabling Objective 402.01 – Understand Glider Procedures

1. **Performance: Understand Glider Procedures**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** Prior to going solo the student shall pass a written EC with a minimum pass mark of 85%.

4. **Teaching Points:**

**(1) Lesson 1 (1 period): Introduction to the 2-33A and ACGP Operations**

a. Describe the construction type and materials used in the construction of the SGS 2-33A;

b. Define the dimensions, load restrictions, wing area, aspect ratio, basic empty weight and maximum gross weight of the SGS 2-33A;

c. Describe the type, location and use of the primary and ancillary cockpit controls in the SGS 2-33A;

d. Briefly describe the assembly and disassembly procedures of the SGS 2-33A;

e. Describe how to manoeuvre gliders on the ground according to SOPs including towing, turning, signals, field safety, high wind precautions, high wind hazards, prop blast areas and jet blast areas;

f. Describe the purpose of weather and operations briefings;

g. Describe supervisory personnel on the airfield and their responsibilities; and

h. Describe the purpose of pre-flight preparation and inspection of gliders.

**(2) Lesson 2 (1 period): Ground Launch Procedures, In-Flight Checks and the Circuit**

a. Describe the procedure for tying down an aircraft on an airfield including the equipment used;

b. Describe the tow ropes used, including how to handle and inspect the rope, the length minima as per the 242, the maximum tensile strength of the rope, a description of the weak link as well as the minimum and maximum breaking strength of the weak link;

c. Describe the hook-up procedures and signals;

d. Describe the pre-take-off check (BCISTRSC) including how to properly strap into the aircraft;

e. Describe how to interpret weight and balance information including use of the chart;

f. Describe the launch signals, including wings level, take up slack, all out and stop and other signals to include close spoilers and glider unable to release;

g. Describe the pre-release check (AAAT);

h. Describe the pre-spin/spiral check (ASCOT);

i. Describe the ACGP circuit including minima; and

j. Describe the pre-landing check (SWARTSC).

**(3) Lesson 3 (1 period): Air Handling**

a. Briefly describe the launch methods used in the ACGP;

b. With respect to Air Tow, describe take-off, tow, release, slack rope procedures and tow aircraft upset;

c. Define the typical speeds for the 2-33A, including stalling, minimum sink, Best L/D, Manoeuvring Speed, $V_{ne}$ and other speeds not to be exceeded, Slipping speed minima, spiralling speed, and buffeting range;

d. Describe how to calculate gliding distance given altitude, best L/D and wind velocity;

e. Discuss considerations when gliding with respect to upper level winds;

f. Describe wind considerations with respect to approach and landing;

g. Describe how to use a crosswind chart, including the TC chart format;

h. Define the manufacturer's wind limits for the 2-33A, including the headwind, direct crosswind and tailwind limitations; and

i. Define the maximum and minimum cockpit weights, including the use of ballast.

**(4) Lesson 4 (1 period): Emergency Procedures and Local Orders**

a. Describe the ACGP emergency procedures for rope breaks at various altitudes, release failures, double release failure and off-field landings;

b. Describe the ACGP emergency signals given by the tow aircraft, over the radio and by ground personnel, as well as the procedure to be followed;

c. Describe the Transport Canada recommended procedure for a rope break less than 300' (prepare for off-field landing);

d. Describe the purpose of regional and local orders;

e. Discuss regional and school orders;

f. Describe the Pilot Information File (PIF); and

g. Discuss current PIFs.

5. **Time:** 4 X 50 minute periods – Lecture and/or Practical Exercise
1 X 50 minute period – Review
1 X 50 minute period – Written EC

6. **Approach:**

   a. Lecture.

7. **References:**

   a. A1

   b. A4

   c. A15, Chapter 2

8. **Training Aids:**

9. **Test Details:**

   a. The student shall attain a minimum of 85% on a written EC.

10. **Remarks:**

    a. It is imperative that this PO be scheduled and passed in advance of PO 409.

    b. The successful completion of this EO is necessary before the student is allowed to progress to solo status.

    c. This subject material will be assessed as part of the Transport Canada examination.

## PO 403 – UNDERSTAND NAVIGATION

Enabling Objective 403.01 – Understand the Principles of Navigation

1. **Performance: Understand the Principles of Navigation**

2. **Conditions:**

   a. Given:
      (1) Publications;
      (2) Douglas Protractor; and
      (3) Flight Computer.

   b. Denied:
      (1) Assistance.

3. **Standard:** The student shall pass a written EC with a minimum pass mark of 70%.

4. **Teaching Points:**

   **(1) Lesson 1 (1 period): Basic Navigation Concepts**

   a. Describe the Earth as an oblate spheroid, the direction of Earth rotation and the axis of rotation;

   b. Define great circle, rhumb line, true direction, magnetic direction, variation, magnetic dip, isogonic lines, agonic lines, compass direction and deviation;

   c. Emphasize the definition of a Meridian;

   d. Describe the graticule; and

   e. Define the characteristics of parallels of latitude and meridians of longitude, including how to geographically determine co-ordinates.

   **(2) Lesson 2 (2 periods): Aeronautical Charts**

   a. Describe the various measures of distance used in aviation, including the nautical mile, the statute mile and the kilometre;

   b. Describe the various measures of speed used in aviation, including miles per hour and knots;

   c. Demonstrate simple time/speed/distance calculations;

   d. Describe both Cardinal and Quadrantal directions and how to convert between the systems;

   e. Describe how to measure true track on a map;

   f. Describe how to determine variation from a map;

   g. Describe how to compute magnetic and compass heading;

   h. Emphasize the concept of distance measurement on a map including scale;

   i. Emphasize how to identify heights of obstacles above sea level and above ground;

j. Describe the generic properties of maps;

k. Describe the characteristics, properties and uses of a Lambert Conformal Conic Projection with respect to aviation;

l. Describe the characteristics, properties and uses of a Mercator and Transverse Mercator Projection with respect to aviation;

m. Describe how scales and heights are shown on maps;

n. Describe how to find the maximum elevation in an area and on a map; and

o. Emphasize how to interpret other map and topographic symbols, including obstacles.

**(3) Lesson 3 (1 period): Chart Reading**

a. Demonstrate how to use dead reckoning and pilotage to analyze a map, including how to pick relevant route markers;

b. Describe how to use grid references of latitude and longitude to pinpoint locations;

c. Describe how to properly orient a map;

d. Demonstrate how to properly fold a map; and

e. Emphasize all of the information available to a pilot on the legend of a map.

**(4) Lesson 4 (3 periods): Flight Planning**

a. Describe the effect of wind on an aircraft;

b. Redefine the concepts of track, true track, track made good, ground speed, heading, bearing and track error;

c. Describe 10 degree drift lines, including opening and closing angles;

d. Describe the “one-in-sixty” rule and demonstrate how to properly apply it;

e. Demonstrate how to properly plot bearings and tracks on a map; and

f. Lead a flight planning exercise.

5. **Time:** 7 X 50 minute periods – Lecture
1 X 50 minute period – Review
1 X 50 minute period – Written EC

6. **Approach:**

a. Lecture; and

b. Kinaesthetic.

7. **References:**

a. A5

b. A11

8. **Training Aids:**

   a. Douglas Protractor;

   b. Standard ICAO ruler;

   c. Flight Computer;

   d. VFR Navigation Chart; and

   e. VFR Terminal Area Chart.

9. **Test Details:**

   a. The student shall attain a minimum of 70% on a written EC.

10. **Remarks:**

   a. This subject matter will also be examined as part of the Transport Canada Glider Pilot examination.

## PO 404 – UNDERSTAND RADIO THEORY

Enabling Objective 404.01 – Understand Aeronautical Radio Theory and Operating Procedures

1. **Performance: Understand Aeronautical Radio Theory and Operating Procedures**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** The student shall pass a written EC to satisfy the Industry Canada Radiotelephone Operators Restricted Certificate (Aeronautical) standard with a minimum pass mark of 70%.

4. **Teaching Points:**

   **(1) Lesson 1 (1 period): Radio Theory and Phraseology**

   a. Defining wavelength, crest, trough, cycle, frequency (including Hz, kHz and MHz) and amplitude;

   b. Define frequency bands in aviation use (LF, MF, HF, VHF, UHF) including aviation use and limitations of that band;

   c. Define ground waves, sky waves, skip zones and line of sight transmission (limitations);

   d. Describe standard messages, including words, phraseology, numbers, time and the phonetic alphabet; and

   e. Describe priority of communications.

   **(2) Lesson 2 (1 period): Aviation Services and Emergency Procedures**

   a. Describe correct message handling procedures, including call-up, reply, message and acknowledgement using glider related examples and shortening of call sign by ATC;

   b. Describe how to use a radio, including rate, pronunciation, and profanity restrictions;

   c. Describe aspects of emergency radio procedures, including the Distress, Urgency, Security and Medevac call signs, the appropriate frequencies, and how a distress call is performed or relayed;

   d. Briefly describe the services provided by Air Traffic Control, Advisory stations and Flight Service Stations;

   e. Briefly define Direction Finding Assistance; and

   f. Describe radio checks, including correct radio check procedure and the readability scale.

5. **Time:** 2 X 50 minute periods – Lecture
   1 X 50 minute period – Review/Written Test

6. **Approach:**

   a. Lecture.

7. **References:**

   a. A3

   b. A5

   c. A13

8. **Training Aids:**

9. **Test Details:**

   a. The student shall attain a minimum mark of 70% on the written EC.

10. **Remarks:**

   a. This exam will count as the EC for the purposes of this course. The subject matter may form a part of the TC Glider Pilot examination.

## PO 405 – UNDERSTAND METEOROLOGY

Enabling Objective 405.01 – Understand Meteorological Theory

1. **Performance: Understand Meteorological Theory**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** The student shall pass a written Meteorology Theory EC with a minimum pass mark of 70%.

4. **Teaching Points:**

   **(1) Lesson 1 (1 period): The Earth's Atmosphere and Atmospheric Pressure**

   a. Describe the composition and physical properties of the Atmosphere;

   b. Describe the vertical structure of the atmosphere;

   c. Define a standard atmosphere;

   d. Describe the properties of density and pressure;

   e. Describe the atmospheric properties of mobility, expansion and compression;

   f. Define pressure measurements and typical units;

   g. Define sea level pressure;

   h. Describe pressure systems and how they vary;

   i. Describe the effects of changing temperature on pressure;

   j. Define isobars;

   k. Describe horizontal pressure differences; and

   l. Describe low-pressure systems, high-pressure systems, ridges, troughs and cols.

   **(2) Lesson 2 (1 period): Meteorological Aspects of Altimetry and Winds**

   a. Define pressure altitude and density altitude;

   b. Describe altimeter setting;

   c. Describe considerations when flying from high to low and low to high pressure systems;

   d. Define wind and pressure gradient;

   e. Emphasize the concept of low level winds and variation in surface wind, including how topography effects wind;

f. Emphasize the concept of surface friction and how it causes the wind gradient;

g. Describe veering and backing;

h. Emphasize the definition of squalls and gusts as defined by the 'From the Ground Up';

i. Describe the diurnal effects of winds;

j. Describe the forces acting on the atmosphere including deflection caused by the Earth's rotation;

k. Describe land and sea breezes; and

l. Describe anabatic and katabatic winds.

**(3) Lesson 3 (1 period): Temperature and Moisture**

a. Briefly describe the Fahrenheit and Celsius temperature scales;

b. Describe how the atmosphere is heated;

c. Describe how the atmosphere is cooled;

d. Describe the differences in temperature and lift associated with various surfaces;

e. Describe temperature variations with altitude emphasizing the concept of inversion;

f. Define an isothermal layer;

g. Emphasize the concept of relative humidity and dewpoint;

h. Describe changes of states of matter, specifically sublimation and condensation;

i. Describe the types of precipitation; and

j. Define lapse rate, including dry adiabatic and saturated adiabatic lapse rates.

**(4) Lesson 4 (1 period): Clouds, Fog and Lifting Agents**

a. Emphasize the classifications of clouds by height as well as visual recognition;

b. Describe cloud formation and internal structure;

c. Briefly describe the type of precipitation or turbulence generally associated with various types of clouds, as applicable;

d. Describe the various types of fog and how they form; and

e. Describe the physical lifting processes of the atmosphere.

**(5) Lesson 5 (1 period): Air Masses and Stability**

a. Define an air mass;

b. Describe how air masses are classified and how they form;

c. Emphasize the air masses that primarily affect North American weather patterns;

d. Describe how air masses change over time and distance;

e. Relate how air masses determine weather;

f. Describe seasonal and geographic affects of air masses;

g. Briefly reintroduce the concept of lapse rate;

h. Emphasize the relationship between lapse rate and stability;

i. Describe modifications of stability with respect to surface heating and cooling;

j. Emphasize the types of weather associated with stable and unstable air;

k. Reintroduce the concepts of surface heating and cooling with respect to stability;

l. Describe how visibility is affected by stability/instability;

m. Reintroduce the concepts behind air mass lifting processes; and

n. Describe subsidence and convergence.

**(6) Lesson 6 (1 period): Fronts**

a. Define a front;

b. Emphasize the definitions of types of fronts;

c. Describe the structure of warm, cold, stationary and occluded fronts including how they relate to frontal weather;

d. Describe the cross-section and three dimensional aspects of warm and cold fronts, including the average values of the respective slopes;

e. Describe the formation of fronts;

f. Describe how a warm or cold front would be recognized in flight, including cloud trends;

g. Briefly describe typical flight problems associated with fronts, including ceiling, visibility, turbulence and precipitation;

h. Emphasize the frontal weather at a cold front; and

i. Describe the frontal weather of a warm front, a TROWAL and an upper front.

**(7) Lesson 7 (1 period): Meteorological Hazards**

a. Describe types of turbulence, emphasizing convective and mechanical turbulence;

b. Emphasize the concept of wind shear;

c. Describe how thunderstorms are developed;

d. Describe the structure of a thunderstorm;

e. Describe the hazards of a thunderstorm, including turbulence, hail, rain, icing, lightning, gust fronts, downbursts and microbursts;

f. Describe how altimetry is affected by a thunderstorm;

g. Describe flight procedures in the area of thunderstorm including avoidance and direction of flight around a thunderstorm;

h. Describe the classifications of icing;

i. Describe the hazards of in-flight icing, including how accretion occurs;

j. Describe how haze and smoke commonly form and their effect on visibility;

k. Define a squall line; and

l. Describe a tornado.

5. **Time:** 7 X 50 minute periods – Lecture
1 X 50 minute period – Review
1 X 50 minute period – Written Meteorological Theory EC

6. **Approach:**

a. Lecture.

7. **References:**

a. A3

b. A5

c. A7

d. A8

e. A9

f. A10

8. **Training Aids:**

9. **Test Details:**

a. The student shall attain a minimum of 70% on a written EC.

b. This material will be examined separately from PO 405.02.

10. **Remarks:**

a. This subject matter will also be examined as part of the Transport Canada Glider Pilot examination.

## PO 405 – UNDERSTAND METEOROLOGY

Enabling Objective 405.02 – Interpret Meteorological Reports

1. **Performance: Interpret Meteorological Reports**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** The student shall pass a written Meteorology Interpretive EC with a minimum pass mark of 70%.

4. **Teaching Points:**

**(1) Lesson 1 (1 period): METARs and TAFs**

a. Describe the process of issuing a METAR;

b. Emphasize how to decode a METAR;

c. Describe how an AWOS METAR is indicated;

d. Describe the issue period, validity and range of TAFs; and

e. Emphasize how to decode a TAF.

**(2) Lesson 2 (1 period): GFAs and FDs**

a. Describe the issue periods and validity of GFAs;

b. Demonstrate how to interpret GFAs; and

c. Demonstrate how to interpret an FD.

**(3) Lesson 3 (1 period): Meteorological Services and Other Weather Maps**

a. Briefly describe the aviation weather information service (AWIS);

b. Describe the aviation weather briefing service (AWBS);

c. Describe a Flight Service Stations (FSS);

d. Briefly describe the pilot automatic telephone weather answering service (PATWAS);

e. Briefly describe a transcribed weather broadcast (TWB);

f. Briefly describe significant in-flight weather warning messages (SIGMET);

g. Briefly describe other types of weather maps, including the prognostic chart, satellite imagery used for aviation, the volcanic ash report including the symbols used on these weather reports and their issue times; and

h. Describe how this type of information is used with respect to flight planning.

5. **Time:** 3 X 50 minute periods – Lecture
1 X 50 minute period – Written Meteorological Interpretive EC

6. **Approach:**

a. Lecture; and

b. Interpretive Exercise(s).

7. **References:**

a. A3

b. A5

c. A7

d. A8

e. A9

f. A10

8. **Training Aids:**

9. **Test Details:**

a. The student shall attain a minimum of 70% on a written EC.

b. This material will be examined separately from PO 405.01.

10. **Remarks:**

a. This subject matter will also be examined as part of the Transport Canada Glider Pilot examination.

## PO 406 – UNDERSTAND THEORY OF FLIGHT

Enabling Objective 406.01 – Know Airframe Components and Aircraft Systems

1. **Performance: Know Airframe Components and Aircraft Systems**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** The student shall pass a written EC with a minimum pass mark of 70%.

4. **Teaching Points:**

   **(1) Lesson 1 (1 period): Aircraft Components and Aircraft Systems**

      a. Describe the three axes of the aircraft and their related (Cartesian) planes;

      b. Describe the primary effect of each control;

      c. Describe trimming, including how it is performed;

      d. Describe the secondary controls of an aircraft, including spoilers, flaps and dive brakes;

      e. Describe how control surfaces are co-ordinated in proper turns;

      f. Describe static and dynamic balancing and their effect on flutter; and

      g. Describe the various types of aircraft construction.

5. **Time:** 1 X 50 minute period – Lecture

6. **Approach:**

   a. Lecture.

7. **References:**

   a. A5

   b. A6

   c. A15

8. **Training Aids:**

9. **Test Details:**

   a. The student shall attain a minimum of 70% on a written EC.

   b. This material will be examined in conjunction with PO 406.02 and PO 406.03 and will not be examined until all three enabling objectives have been completed.

10. **Remarks:**

a. This subject matter will also be examined as part of the Transport Canada Glider Pilot examination.

## PO 406 – UNDERSTAND THEORY OF FLIGHT

Enabling Objective 406.02 – Understand the Theory of Flight

1. **Performance: Understand the Theory of Flight**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** The student shall pass a written EC with a minimum pass mark of 70%.

4. **Teaching Points:**

**(1) Lesson 1 (1 period): Principles of Flight and Forces Acting on a Glider**

a. Define Bernoulli's Theorem;

b. Describe Newton's three laws as they apply to flight;

c. Define lift;

d. Define drag, including induced, parasite and profile drag;

e. Define angle of attack;

f. Define angle of incidence;

g. Describe the variation of lift and drag with changes in angle of attack;

h. Define the lift/drag ratio;

i. Define the stalling angle, centre of pressure and the effects of increasing the Angle of Attack on the centre of pressure;

j. Emphasize the concept of forces acting on the aircraft during manoeuvres such as turning;

k. Emphasize the concept of thrust as it pertains to gliders;

l. Define weight;

m. Define equilibrium;

n. Define centripetal/centrifugal force; and

o. Briefly describe the concept of aerodynamic couples.

**(2) Lesson 2 (1 period): Aerofoil and Wing Design**

a. Describe the function of airfoils;

b. Describe airflow and pressure distribution about an airfoil;

c. Define relative airflow;

d. Define wing planform;

e. Define area, span, chord, aspect ratio and camber;

f. Define laminar flow;

g. Describe the principle of streamlining;

h. Describe dihedral and anhedral; and

i. Describe the factors relating to total lift and drag of a wing.

**(3) Lesson 3 (1 period): Wing Additions and Load Factor**

a. Define wing loading, dynamic loading, load factor and gust loads;

b. Emphasize how wing spoilers and dive brakes affect the airflow over a wing;

c. Describe how flaps affect the airflow over a wing;

d. Reintroduce the concept of centripetal force and weight;

e. Describe how load factor varies in turns;

f. Emphasize the relationship between weight and load factor to stalling speed of an aircraft; and

g. Describe the structural limitations of an aircraft as it relates to load factor.

**(4) Lesson 4 (1 period): Stability and Weight and Balance**

a. Define stability, including longitudinal, lateral, directional, positive, negative, neutral, inherent and spiral;

b. Describe various methods of achieving stability;

c. Describe the need for Centre of Gravity limits including when they are exceeded fore and aft;

d. Describe normal flight characteristics at both fore and aft centre of gravity limits;

e. Describe stall/spin flight characteristics at both fore and aft centre of gravity limits; and

f. Demonstrate how to perform weight and balance calculations using the ACGP graph and using weight/arm/moment calculations.

**(5) Lesson 5 (1 period): Practical Aerodynamics**

a. Describe aileron drag;

b. Describe the inter-relationship between roll and yaw;

c. Describe the relationship between wing loading and angle of bank with respect to both co-ordinated and uncoordinated flight (load factor);

d. Describe the relationship between stalling airspeed as it relates to angle of bank in co-ordinated flight;

e. Describe gliding for range, gliding for distance, best gliding speed, best angle of climb and best rate of climb;

f. Describe the effect of temperature and density altitude on flight characteristics; and

g. Define the manufacturer's standard with respect to calculating approach airspeed based on stall speed.

5. **Time:** 5 X 50 minute periods – Lecture
1 X 50 minute period – Review

6. **Approach:**

a. Lecture.

7. **References:**

a. A5

b. A6

c. A15, Section 6

8. **Training Aids:**

9. **Test Details:**

a. The student shall attain a minimum of 70% on a written EC.

b. This material will be examined in conjunction with PO 406.01 and PO 406.03 and will not be examined until all three enabling objectives have been completed.

10. **Remarks:**

a. This subject matter will also be examined as part of the Transport Canada Glider Pilot examination.

**PO 406 – UNDERSTAND THEORY OF FLIGHT**

Enabling Objective 406.03 – Know Flight Instruments

1. **Performance: Know Flight Instruments**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** The student shall pass a written EC with a minimum pass mark of 70%.

4. **Teaching Points:**

   **(1) Lesson 1 (1 period): Instruments on the Pitot-Static System**

   a. Describe the Pitot-Static system;

   b. Describe the construction of the airspeed indicator including markings;

   c. Emphasize the concept behind the operation of the Airspeed Indicator including errors;

   d. Define indicated airspeed and true airspeed;

   e. Describe how to convert indicated airspeed to true airspeed;

   f. Describe the principles of operation of a variometer;

   g. Describe the principles of operation of a vertical speed indicator;

   h. Describe lag as it applies to variometers and vertical speed indicators;

   i. Describe an altimeter, its principles of operation and errors;

   j. Describe the construction, principles of operations and errors of a sensitive altimeter;

   k. Describe altimeter setting using a sensitive altimeter;

   l. Describe the effect of a blocked pitot or static line; and

   m. Describe how to create an alternate static source.

   **(2) Lesson 2 (1 period): Other Instruments**

   a. Describe the construction of a magnetic compass;

   b. Describe deviation;

   c. Describe the Earth's magnetic field and how it causes compass errors;

   d. Describe the remaining compass errors including magnetic dip, emphasizing turning and acceleration errors;

e. Describe compass swinging;

f. Emphasize the concept of variation;

g. Describe the principle of operation of a direct reading magnetic compass;

h. Describe how to properly read a magnetic compass;

i. Describe how to check compass heading on the ground and in flight;

j. Describe gyroscopes and the concept of precession; and

k. Describe the construction and principles of operation of a Turn and Slip indicator.

5. **Time:** 2 X 50 minute periods – Lecture
1 X 50 minute period – Written EC of PO 406

6. **Approach:**

a. Lecture.

7. **References:**

a. A5

b. A6

c. A15, Section 6

8. **Training Aids:**

9. **Test Details:**

a. The student shall attain a minimum of 70% on a written EC.

b. This material will be examined in conjunction with PO 406.01 and PO 406.02 and will not be examined until all three enabling objectives have been completed.

10. **Remarks:**

a. This subject matter will also be examined as part of the Transport Canada Glider Pilot examination.

## PO 407 – FLIGHT OPERATIONS

Enabling Objective 407.01 – Know Basic Soaring Procedures

1. **Performance: Know Basic Soaring Procedures**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** The student shall pass a written EC with a minimum pass mark of 70%.

4. **Teaching Points:**

   **(1) Lesson 1 (1 period): General Soaring Information**

   a. Describe methods of determining wind direction and wind speed when airborne;

   b. Demonstrate how to calculate maximum gliding distance in calm wind conditions, tailwind conditions and into wind conditions;

   c. Describe the purpose of staying inside the practice area as it applies to ACGP operations; and

   d. Describe the procedure for selection of an airfield for use in off-field landings.

   **(2) Lesson 2 (1 period): Thermals and Thermalling**

   a. Describe how thermals are formed;

   b. Describe thermals in terms of terrain and time of day;

   c. Describe visual indications of thermals;

   d. Describe the procedure for centering a glider in a thermal; and

   e. Emphasize the concept of safety considerations when thermalling, including entry, turn direction, lookout, overtaking another aircraft in a thermal and right of way while thermalling.

   **(3) Lesson 3 (1 period): Ridge and Wave Soaring**

   a. Describe the theory behind hill/ridge soaring;

   b. Describe the factors that affect hill/ridge soaring;

   c. Describe the theory behind wave soaring;

   d. Describe the factors that affect wave soaring;

   e. Describe the considerations for usage of TAS while wave soaring;

   f. Describe other aspects of mountain flying operations including hazards; and

g. Describe the safety considerations while performing hill/ridge/wave soaring, including hazards of lee-side operation, overtaking and right of way.

5. **Time:** 3 X 50 minute periods – Lecture

6. **Approach:**

   a. Lecture.

7. **References:**

   a. A4

   b. A6

   c. A14

8. **Training Aids:**

9. **Test Details:**

   a. The student shall attain a minimum of 70% on a written EC.

   b. This material will be examined in conjunction with PO 407.02 and not until both enabling objectives have been taught.

10. **Remarks:**

This subject matter will also be examined as part of the Transport Canada Glider Pilot examination.

## PO 407 – FLIGHT OPERATIONS

Enabling Objective 407.02 – Understand Flying Hazards

1. **Performance: Understand Flying Hazards**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** The student shall pass a written EC with a minimum pass mark of 70%.

4. **Teaching Points:**

   **(1) Lesson 1 (1 period): Flying Hazards for Glider Pilots**

   a. Describe wind speed and crosswind, and how it is a hazard to aircraft;

   b. Describe the Manufacturer's crosswind limits and why they exist;

   c. Describe how to operate with limited instrumentation;

   d. Describe how to create an alternate static source for the aircraft;

   e. Describe how wind shear and the wind gradient affect the aircraft;

   f. Describe cloud avoidance techniques and the procedure to follow upon inadvertent cloud entry;

   g. Describe flight operations in rain, including refraction error;

   h. Emphasize the characteristics, recognition and recovery of stalls, spins and spiral dives;

   i. Emphasize hazards associated with wake turbulence and how to avoid it; and

   j. Emphasize the hazards associated with aircraft contamination on the ground (CARS).

5. **Time:** 1 X 50 minute period – Lecture
   1 X 50 minute period – Review
   1 X 50 minute period – Written EC

6. **Approach:**

   a. Lecture.

7. **References:**

   a. A4

   b. A6

   c. A14

8. **Training Aids:**

9. **Test Details:**

   a. The student shall attain a minimum of 70% on a written EC.

   b. This material will be examined in conjunction with PO 407.01 and not until both enabling objectives have been taught.

10. **Remarks:**

    a. This subject matter will also be examined as part of the Transport Canada Glider Pilot examination.

## PO 408 – UNDERSTAND THE PRINCIPLES OF HUMAN FACTORS IN AVIATION

Enabling Objective 408.01 – Be Aware of the Principal Aeromedical Requirements in Aviation

1. **Performance: Be aware of the Principal Aeromedical Requirements in Aviation**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** Students must attend a briefing delivered by the Canadian Forces School of Aero-medical training (CFSAT) to become aware of:

   a. Aviation Physiology;

   b. The Pilot and the Operating Environment; and

   c. Aviation Psychology.

4. **Teaching Points:**

   As per CFSAT Brief, which will include as a minimum:

   a. Aviation Physiology:

      (1) Hypoxia/Hyperventilation;

      (2) Gas expansion effects;

      (3) Vision;

      (4) Hearing;

      (5) Orientation/Disorientation (including visual/vestibular illusions); and

      (6) Definitions only of Positive and Negative/Reduced G.

   b. The Pilot and the Operating Environment:

      (1) Personal Health and Fitness;

      (2) Diet and Nutrition;

      (3) Medications (Prescribed/Over the counter);

      (4) Substance Abuse (Alcohol/Drugs); and

      (5) Heat/Cold – Hyperthermia and Hypothermia.

   c. Aviation Psychology:

      (1) Stress.

5. **Time:** 3 X 50 minute periods – Briefing

6. **Approach:**

   a. Briefing.

7. **References:**

   a. A3

   b. A12

8. **Training Aids:**

9. **Test Details:**

   a. This material is not assessed via a separate written EC during the Ground School program.

10. **Remarks:**

    a. This subject matter will be examined as part of the Transport Canada Glider Pilot examination.

## PO 408 – UNDERSTAND THE PRINCIPLES OF HUMAN FACTORS IN AVIATION

Enabling Objective 408.02 – Be Aware of the Basic Principles of Pilot Decision Making

1. **Performance: Be Aware of the Basic Principles of Pilot Decision Making**

2. **Conditions:**

   a. Given:
      (1) Publications.

   b. Denied:
      (1) Assistance.

3. **Standard:** Students must attend a briefing delivered by Transport Canada to become aware of:

   a. Situational Awareness;

   b. Crew Resource Management Issues; and

   c. Human Performance in Aviation.

4. **Teaching Points:**

   As per the Transport Canada Brief.

5. **Time:** 3 X 50 minute period – Briefing

6. **Approach:**

   a. Briefing.

7. **References:**

   a. A3

   b. A12

8. **Training Aids:**

9. **Test Details:**

   a. This material will not be assessed via a separate written EC during the Ground School program.

10. **Remarks:**

   a. This subject matter will be examined as part of the Transport Canada Glider Pilot examination.

## PO 409 – BE AWARE OF FLIGHT SAFETY

Enabling Objective 409.01 – Be Aware of Flight Safety

1. **Performance: Be Aware of Flight Safety**

2. **Conditions:**

    a. Given:
        (1) Publications.

    b. Denied:
        (1) Assistance.

3. **Standard:** Students shall attend a Flight Safety Briefing given by the Directorate of Flight Safety (DFS).

4. **Teaching Points:**

    As per the DFS Briefing.

5. **Time:** 3 X 50 minute period - Briefing

6. **Approach:**

    a. Briefing.

7. **References:**

    a. TBD

8. **Training Aids:**

9. **Test Details:**

    a. This course is attendance only and will not be otherwise assessed as part of the Ground School program.

**MAIN REFERENCES FOR SECTION 4, ACADEMIC TRAINING**

A1 Transport Canada Glider Pilot License and Study Reference Guide, TP876E, 12th edition, April 2002

A2 Transport Canada – Student Pilot Permit or Private Pilot License for Foreign and Military Applicants, Aviation Regulations TP11919E, 4th edition, July 2000

A3 Aeronautical Information Publication (AIP) Canada TP2300E

A4 SOAR and Learn to Fly Gliders, from the Soaring Association of Canada

A5 From the Ground Up A-CR-CCP-263/PT-001 Millennium edition

A6 The Joy of Soaring by Carle Conway

A7 Weather Ways, 3rd edition – Environment Canada

A8 Air Command Weather Manual TP 9352E

A9 Aviation Routine Weather Reporting – METAR

A10 Aviation Weather Services Guide (Nav Canada)

A11 Lambert Conformal Conic Visual Navigational Chart (VNC) Series Maps (1: 500,000)

A12 Canadian Aviation Regulations (CARs) TP12916

A13 Industry Canada Radiotelephone Operators Handbook (RIC 21)

A14 Gliding by Derek Piggott

A15 A-CR-CCP-242/PT-005 Air Cadet Gliding Program Manual

# ANNEX A

# STANDARDIZED NATIONAL STUDENT PILOT PROGRESS BOOK

## PROGRESS BOOK – ASSESSMENT & DOCUMENTATION

| PROGRESS CARDS |
|---|
| PROFICIENCY LEVELS (PL) shall be assigned for all assessed exercises. Below standard PL's on marginal and unsatisfactory trips shall be written in red. |
| An OVERALL FLIGHT RATING (OFR) shall be assigned for each dual flight. Solos, EDs and Review Flights will be graded SAT or UNSAT. AL 1 (famil trip) will not be graded. Unsatisfactory and marginal OFRs shall be circled in red. In the case of Unsatisfactory, Marginal or DNCO flights, the Flight Commander shall be notified prior to the next flight. |
| INSTRUCTOR'S COMMENTS shall be clearly referenced to a specific exercise and shall be written specifically for the Flt Comd. Comments shall not be written as student debriefing points or remedial suggestions. Comments corresponding to a below standard PL shall be written in red. |
| A remark of DNCO (Duty Not Carried Out) shall be assigned in cases where, for reasons beyond the control of the PIC, a specifc task or tasks could not be completed. In cases where DNCO is assigned to a portion of the flight, an OFR shall be awarded based on the tasks completed. Prior to declaring a flight and/or a portion of a flight DNCO, the approval of the Flight Commander is required. The reason for the DNCO shall be indicated in the narrative on the card. |

| STUDENT ACTIVITY RECORD |
|---|
| An entry shall be made for each day of the course. |
| If the student has flown, the Instructor who flew with the student or monitored the solo flight shall be listed in the "Instructor Column". |
| If the student has not flown, the reason shall be detailed in the "Instructor" column, e.g. not scheduled, poor weather, illness, winds out of limits, etc. |
| Extra Duals (Red Card flights) shall be identified with an "R" after the AL#. |
| Review flights (Green Card flights) shall be identified with a "G" after the AL#. |
| An OFR for each flight shall be recorded in the "OFR" column. Unsatisfactory and marginal OFRs shall be written in red. |
| The flight time for each flight shall be recorded in the "FLT TIME" column. |

**Card 1 (Yellow)**

## FLYING TRAINING SYLLABUS – PRE SOLO

| FLT No. | EXERCISE | REL AGL | TIME | | TOTAL |
|---|---|---|---|---|---|
| | | | DUAL | SOLO | |
| AL 1 | Familiarization Flight | 2 000 | :12 | | 0:12 |
| AL 2 | Attitudes and Movements | 2 000 | :12 | | 0:24 |
| AL 3 | Attitudes and Movements | 2 000 | :12 | | 0:36 |
| AL 4 | Air Tow, Straight Glide and Medium Turns | 2 000 | :12 | | 0:48 |
| AL 5 | Take Off, Flight Management , Secondary Effect of Controls and Circuit Procedures | 2 000 | :12 | | 1:00 |
| AL 6 | Gentle Tums, Approach and Landing | 2 000 | :12 | | 1:12 |
| AL 7 | Basic Stalls | 2 500 | :15 | | 1:27 |
| AL 8 | Air Tow Positions and Stalls | 2 500 | :15 | | 1:42 |
| AL 9 | Steep Turns and Stalls in Turns | 2 500 | :12 | | 1:54 |
| AL 10 | Slipping | 2 500 | :12 | | 2:06 |
| AL 11 | Slipping Turns | 2 000 | :12 | | 2:18 |
| AL 12 | Incipient Spins and Drift Illusions | 3 000 | :18 | | 2:36 |
| AL 13 | Spins and Spirals | 3 000 | :18 | | 2:54 |
| AL 14 | Flight Management | 1 500 | :10 | | 3:04 |
| AL 15 | Circuit Modification (High) | 1 500 | :10 | | 3:14 |
| AL 16 | Circuit Modification (High) | 2 500 | :15 | | 3:29 |
| AL 17 | Circuit Modification (Low) | 1 500 | :10 | | 3:39 |
| AL 18 | Circuit Modification (Low) | 1 500 | :10 | | 349 |
| AL 19 | Upgrade | 2 500 | :15 | | 4:04 |
| AL 20 | Launch Emergency, Modified Circuit | 800 | :05 | | 4:09 |
| AL 21 | Launch Emergency, Downwind Landing | 400-600 | :04 | | 4:13 |
| AL 22 | Launch Emergency | A/R | :04 | | 4:17 |
| AL 23 | General Progress Check | 3 000 | :18 | | 4:35 |
| AL 24 | SOLO FLIGHT CHECK | 2 500 | :15 | | 4:50 |

**Card 2 (Yellow)**

**FLYING TRAINING SYLLABUS – POST SOLO**

| Solo | AIR LESS | EXERCISE | REL AGL | TIME | | TOTAL |
|---|---|---|---|---|---|---|
| | | | | DUAL | SOLO | |
| S1 | | First Solo: Gentle and Medium Turns | 2 000 | | :12 | 5:02 |
| | AL25 | Post-Solo Progress Check | 1 500 | :10 | | 5;12 |
| S2 | | Second Solo: Medium Turns | 1 500 | | :10 | 5:22 |
| S3 | | Third Solo: Medium Turns | 1 500 | | :10 | 5;32 |
| S4 | | Fourth Solo: Medium Turns | 1 500 | | :10 | 5:42 |
| S5 | | Fifth Solo: Steep Turns | 1 500 | | :10 | 5:52 |
| | AL26 | Progress Check | 2 000 | :12 | | 6:04 |
| S6 | | Sixth Solo: Steep Turns | 1 500 | | :10 | 6:14 |
| S7 | | Seventh Solo: Steep Turns | 1 500 | | :10 | 6:24 |
| S8 | | Eighth Solo: Gentle Stalls | 2 000 | | :12 | 6:36 |
| S9 | | Ninth Solo: Medium Stalls | 2 000 | | :12 | 6:48 |
| S10 | | Tenth Solo: Spoiler Open Entry Stalls | 2 000 | | :12 | 7:00 |
| | AL27 | Comprehensive Progress Check | 2 500 | :15 | | 7:15 |
| S11 | | Eleventh Solo: Crosswind Operations | 1 500 | | :10 | 7:25 |
| S12 | | Twelfth Solo: Crosswind Operations | 1 500 | | :10 | 7:35 |
| S13 | | Thirteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 7:45 |
| S14 | | Fourteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 7:55 |
| S15 | | Fifteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 8:05 |
| | AL28 | Pre Flight Test Comprehensive Progress Check | 3 000 | :18 | | 8:23 |
| S16 | | Sixteenth Solo: Slipping | 1 500 | | :10 | 8:33 |
| S17 | | Seventeenth Solo: Slipping | 1 500 | | :10 | 8:43 |
| S18 | | Eighteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 8:53 |
| S19 | | Nineteenth Solo: Medium & Steep Turns | 1 500 | | :10 | 9:03 |
| S20 | | Twentieth Solo: Medium & Steep Turns | 1 500 | | :10 | 9:13 |
| | AL29 | FINAL FLIGHT TEST | 2 500 | :15 | | 9:28 |
| TOTAL FLIGHTS: 49 (27 DUAL, 20 SOLO, 2 CHECKS) | | | | 6:00 | 3:28 | 9:28 |

**NOTES**

1. Flight altitudes may be altered throughout the course to meet the aim of the mission.
2. The Final Flight Test should be conducted after all solos have been flown, however, it may be conducted at any time after the Pre Test mission (AL28) has been flown.
3. After six (6) consecutive solo flights, a dual review flight is mandatory.

**Card 3 (Yellow)**

**PROFICIENCY LEVELS (PL)**

| | |
|---|---|
| **1** | **The Student** was not capable of completing the task. Trainee required verbal and/or physical assistance to avoid making major errors. Further instruction is required. |
| **2** | **The Student** completed the task but required verbal and/or minor physical assistance to avoid making major errors. Further practice is required |
| **3** | **The Student** completed the task, making only minor errors. Trainee required minimal verbal cues to analyze and/or correct errors. |
| **4** | **The Student** completed the task without assistance, making only minor errors. Trainee was able to self-analyze and correct errors.. |
| **5** | **The Student** completed the task without assistance and without error. |

**DEFINITIONS: MAJOR AND MINOR ERRORS**

| | |
|---|---|
| **MAJOR** | A **<u>Major Error</u>** is an error that significantly detracts from the ideal and/or jeopardizes the safety or successful completion of the task |
| **MINOR** | A **<u>Minor Error</u>** is an error that detracts from the ideal but does not jeopardize the successful completion of the task**.** |

**OVERALL FLIGHT RATINGS (OFR)**

| | |
|---|---|
| **UNSAT** | The student's overall performance did not meet the level required. The level was not met on two or more exercises or significant regression was shown. UNSAT Course Progress Procedure to be followed. |
| **MARGINAL** | The student was unable to achieve the level required by the TP on one task.<br><u>For a Marginal OFR on Flights AL1 to AL22 inclusive</u>:<br>The failed exercise must be flown to the required standard during the next flight. If the required standard has still not been met, then that flight will be assessed as Unsatisfactory.<br><u>A Marginal OFR cannot be given after AL22</u> |
| **ACHIEVED STANDARD WITH DIFFICULTY** | The student experienced difficulty achieving the minimum levels required by the TP. |
| **ACHIEVED STANDARD** | The student performed all tasks to the level required by the TP. |
| **STANDARD EXCEEDED** | The student performed the majority of the tasks to a level higher than required by the TP, and **easily** performed the remaining tasks to the level required by the TP. |

**Card 4 (Yellow)**

| STUDENT PILOT: |
|---|
| INITIAL INSTRUCTOR: |

**INSTRUCTOR CHANGE RECORD**

| NEW INSTRUCTOR | REASON FOR CHANGE | HOURS | DATE |
|---|---|---|---|
| | | | |
| | | | |
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**STUDENT ACTIVITY RECORD**

| Daily entries are mandatory | | | | | |
|---|---|---|---|---|---|
| If the student does not fly on a particular day, the record shall indicate the date and the reason e.g., sickness, weather, not scheduled, etc. | | | | | |
| DATE | AL No. | OFR | INSTRUCTOR'S NAME or REASON FOR NO FLIGHTS | FLT TIME | REG No. |
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**Card 5 (Yellow)**

**STUDENT ACTIVITY RECORD (continued)**

**Daily entries are mandatory**

**If the student does not fly on a particular day, the record shall indicate the date and the reason e.g., sickness, weather, not scheduled, etc.**

| DATE | AL No. | OFR | INSTRUCTOR'S NAME or REASON FOR NO FLIGHTS | FLT TIME | REG No. |
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**Card 6 (Yellow)** (Note **-** Number of cards used depends on daily activity)

## PROFICIENCY LEVEL STANDARDS

| AIR LESSON | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PRE-FLIGHT | | 1 | | | | | | | | | | 2 | | | | | | | | | | | 3 |
| GROUND HANDLING | | 1 | 2 | 3 | | | | | | | | | | | | | | | | | | | |
| TAKE-OFF | | | | | 1 | | | | | | | | 2 | | | | | | 3 | | | | |
| EMERGENCY | | | | 1 | | | | | | | | | | | | | | | | 2 | | 3 | |
| AIR TOW | | | | 1 | | | | | | | | | 2 | | | | | | 3 | | | | |
| RELEASE | | | | 1 | | | | | | | | | 2 | | | | | | 3 | | | | |
| INCIP SPIN RECOVERY | | | | | | | | | | | | 2 | | | | | | | | | | | 3 |
| SPIRAL DIVE RECOVERY | | | | | | | | | | | | | 2 | | | | | | | | | | 3 |
| STALL | | | | | | | 2 | | | | | | | | | 3 | | | | | | | |
| SLIPPING | | | | | | | | | | 2 | | | | | | | | | | | | | 3 |
| SLIPPING TURNS | | | | | | | | | | | 2 | | | | | | | | | | | | 3 |
| STRAIGHT GLIDE | | | | 1 | | 2 | | | 3 | | | | | | | | | | | | | | |
| GENTLE TURNS | | | | | | 2 | | | | | | | 3 | | | | | | | | | | |
| MEDIUM TURNS | | | | 1 | | 2 | | | | | | | | | | | | 3 | | | | | |
| STEEP TURNS | | | | | | | | | 2 | | | | | | | | | | 3 | | | | |
| DOWNWIND | | | | | 1 | | 2 | | | | | | | | | | | | 3 | | | | |
| BASE TURN | | | | | 1 | | 2 | | | | | | | | | | | | 3 | | | | |
| BASE LEG | | | | | 1 | | 2 | | | | | | | | | | | | 3 | | | | |
| FINAL TURN | | | | | 1 | | 2 | | | | | | | | | | | | | | | | 3 |
| FINAL APPROACH | | | | | | 1 | | | | | | | | | 2 | | | | | | | | 3 |
| LANDING | | | | | | 1 | | | | | | | | | 2 | | | | | | | | 3 |
| CIRCUIT MODIFICATION | | | | | 1 | | | | | | | | | | 2 | | | | | 3 | | | |
| FLIGHT MANAGEMENT | | | | | 1 | | | | | | | | | 2 | | | | | | | | | 3 |
| AIRMANSHIP | | 1 | | | | | | | | 2 | | | | | | | | | | | | 3 | |

Card 7 (Yellow)

☐ Student ☐ Basic ☐ Famil F ☐ Famil R ☐ Instructor ☐ Check ☐ Stds

☐ Training ☐ Proficiency ☐ Currency ☐ Upgrade

| | | |
|---|---|---|
| **STUDENT** | **AL No.** | **FLT TIME** |
| **INSTRUCTOR** | **ALT** | **DATE** |
| **REG** | **WIND** | **RWY** |

| **EXERCISES** | **PL** | **NOTES** |
|---|---|---|
| PRE-FLIGHT | | |
| GRND HANDLING | | |
| TAKE-OFF | | |
| EMERGENCY | | |
| AIR TOW | | |
| RELEASE | | |
| SPIN/INCIPIENT | | |
| SPIRAL DIVE | | |
| STALL | | |
| SLIPPING | | |
| SLIPPING TURN | | |
| STRAIGHT GLIDE | | |
| GENTLE TURNS | | |
| MEDIUM TURNS | | |
| STEEP TURNS | | |
| DOWNWIND | | |
| BASE TURN | | |
| BASE LEG | | |
| FINAL TURN | | |
| APPROACH | | |
| LANDING | | |
| CIRCUIT MOD | | |
| FLT MGMT | | |
| AIRMANSHIP | | |

| | | | | | |
|---|---|---|---|---|---|
| **DUAL OFR:** | **UNSAT** | **MARGINAL** | **— AS** | **AS** | **STD EXCEEDED** |
| **ED/REVIEW/SOLO OFR:** | **UNSAT** | **SAT** | | | |
| **ED / REVIEW AUTH SIGNATURE:** | | **APPT** | | | |
| **INSTRUCTOR INITIALS** | **STUDENT INITIALS** | | | | |

Card 8 (Dual – Blue, Solo – White, Extra Dual – Red, Review – Green)

## ANNEX B to CHAPTER 3

## QUALIFICATION STANDARD

## SGS 2-33A AIR CADET GLIDER PILOT COURSE

## FOREWORD

1. This Qualification Standard (QS) is issued on the authority of the Chief of the Defence Staff.

2. This publication is effective upon receipt.

3. The managing authority for this Quality Standard is 1 CAD HQ, A1 Trg. Suggestions for changes shall be forwarded through normal channels to Central Flying School, ACGP SET.

## PREFACE

1. A Qualification Standard Writing Board, convened at 17 Wing Winnipeg, in December 2003, developed this QS. The members of the board consisted of 1 CAD HQ A1 Trg, CFS and Standards Representatives form each of the Cadet Training Regions. It was prepared in accordance with the concept of training outlined in the A-P9-000 series, Canadian Forces Manual of Individual Training.

2. This QS must be used in conjunction with the applicable specification for the purpose of producing the Training Plan.

## CHAPTER 1 - GENERAL

### AIM

1. The aim of the training resulting from this QS is to award Air Cadet Glider Pilot Wings.

### OUTLINE OF TRAINING

2. This QS contains:

   a. the Performance Objectives (POs) that the member shall achieve;

   b. the requirements needed to support the attainment of these objectives.

### TRAINING STRATEGY

3. The training requirement will be achieved through a formal course. The flying syllabus consists of comprising 29 dual flights and 20 solo flights. The academic training consists of 60 instructional periods.

### USE OF QUALIFICATION STANDARD

4. This QS shall be used as the primary authority governing the design, conduct and evaluation of the training program. The Transport Canada standards for Glider Pilot shall be met.

## CHAPTER 2 - TRAINING MANAGEMENT DETAILS

### RESPONSIBLE AGENCIES AND TRAINING ESTABLISHMENTS

1. Agencies include:

   a. Managing Authority: 1 Canadian Air Division / DCdts

   b. Matching Agency: Air Cadet League of Canada / DCdts

c. Commissioning Agency: DCdts

d. Nominating Agencies: Provincial Air Cadet Leagues / RCSUs

2. The designated Training Establishment are the five Regional Cadet Gliding Schools, which are responsible for the conduct and evaluation of the training program.

**SCHEDULING**

3. Courses will be conducted in each of the five regions annually during the cadet summer training period.

**PREREQUISITES**

4. Personnel must meet the following prerequisites prior to arrival for training:

a. Valid TC Cat 3 Medical (A Medical Cat 4 is acceptable provided that the category has been assigned by a TC Medical Examiner following a normal Aviation Medical)

b. Weight must be between 90 lbs and 200 lbs.

c. Height must be between 4'6" and 6'3".

d. Be not less than 16 years of age and not past his or her 19th birthday as of 1 September for the year of training.

**TRAINING DURATION**

5. This training will require approximately six weeks.

**INSTRUCTOR ALLOCATION**

6. Instructors: Instructors shall hold valid TC Glider Instructor Rating and have completed the ACGP Glider Pilot Instructor Course. The CFI and Flt Commanders shall not normally be assigned instructional responsibilities for specific students; however, if the requirement exists, the maximum number shall be one student. D/Flt Commanders shall not normally carry students; however, if the requirement exists, the maximum number shall be two students. Flight line instructors shall not carry more than four students and, if possible, first-year instructors shall not carry more than three students.

**TRAINING ASSISTANCE**

7. Training assistance will be required from:

i) Wings / bases associated with each of the RGSs.

ii) Provincial Air Cadet Leagues

iii) Regional Cadet Support Units

**CAPACITY**

8. The capacity varies with each RGS.

**LANGUAGE OF INSTRUCTION**

9. This course is offered in both official languages.

**ENVIRONMENTAL PROTECTION CONSIDERATIONS**

10. Relevant environmental protection considerations and procedures are to be included in the production of the training plan where required. (Further information to be added as applicable).

**QUALIFICATION**

11. Successful completion of the training based on this QS will result in the awarding of Air Cadet Glider Wings and Transport Canada Glider Pilot License.

**RELATED DOCUMENTS**

12. The related documents are:

a. A-CR-CCP-242/PT-005

b. 1 CAD Orders

c. CATOs

d. Regional Orders

**TRAINING SUPPORT**

13. RCSUs shall arrange for all facilities and materials required to conduct this course.

**CRITIQUES**

14. Critique sessions will be held at the termination of each course to obtain feedback on learning activities, the presentation of training program content, and administration procedures. This does not preclude the class senior from commenting on positive matters or reporting problems as they arise.

**TERMINOLOGY**

15. The following terminology is used in chapter 4 of this document:

AIRMANSHIP - All aspects of an individual's flying performance that are not covered by established procedures or directives. Good judgement, common sense, situation awareness, air picture, planning, wind assessment and lookout are examples of airmanship.

ANALYZE - To determine logically how the end result was or is to be achieved, and to examine in detail.

CIRCUIT MODIFICATION – Modification to a conventional circuit due to all significant unforeseen events ie. high sink or spoilers stuck scenarios. This specifically excludes downwind, cross-runway and straight ahead landing premature releases.

CREW RESOURCE MANAGEMENT (CRM) – The effective utilization of communication and organizational skills by each crewmember to ensure the safe and effective completion of all tasks and duties.

DEMONSTRATE - A physical performance that may be accompanied by verbal explanation.

ENABLING OBJECTIVE – The knowledge, skills and / or attitudes essential to the attainment of the PO.

ENABLING CHECK – An evaluating instrument used to determine whether or not students have mastered the standards associated with an enabling objective eg. the Solo Check / ground school tests.

FLIGHT MANAGEMENT **–** Manoeuvring a glider from the point of release to the circuit IP that includes the ability to judge altitude, position, traffic, and environmental considerations.

MAJORITY – More than one half (51% or more).

MECHANICS - Applicable airspeeds, power settings, procedures etc., - the rudimentary methods of performance.

MINOR PHYSICAL ASSISTANCE – A control restriction or minor control pressure at a key stage in a flying sequence.

OPERATIONAL LIMITATIONS: Limitations set on gliding operations as described in A-CR-CCP-242/PT-005.

PERFORMANCE CHECK – An evaluating instrument used to determine whether or not students have mastered the standards associated with a performance objective. Performance checks for this course consist of the Final Flight Test and the Transport Canada Written Exam.

PERFORMANCE OBJECTIVE – a formal statement of job-related training requirements, written in a three-part format, which prescribes:

a. performance - What the trained member must be able to do on the job

b. conditions - The conditions under which the performance must be completed

c. standard - How and/or how well the performance must be completed

PROFICIENCY LEVELS – The level of adeptness that a student should be capable of achieving through the combination of knowledge and skill in the performance of a task. Proficiency levels generally increase as the course progresses.

SITUATIONAL AWARENESS - A cognizance or appreciation of the relevant circumstances and conditions occurring at any given moment. Attained through attentiveness.

TASK - The lesson to be learned, a labour, piece of work, or responsibility to be performed. Both knowledge and skill are the enablers by which a task may be performed.

TRIP ASSESSMENT - An appraisal or evaluation of a combination of tasks as observed and commented upon during a flight, trainer, mission, or simulation.

## CHAPTER 3 - ASSESSMENT OF COURSE MEMBERS

### GENERAL

1. Pass/Fail assessment of each course member will be based on the successful completion of all POs as stated in Chapter 4 of this publication and the successful completion of the Transport Canada Glider Pilot Exam.

2. Any course member who fails to demonstrate safe working habits or who does not follow all safety precautions will be considered to have not met the minimum Performance Check (PC) requirements.

### PROGRESS MONITORING

3. The training unit shall monitor the candidate's progress during the training by administering Enabling Checks (ECs). ECs may be in the form of written tests or flights. Continuous monitoring of the course member's progress is required to provide:

a. feedback to the trainee. Members should receive formal indication of their progress in the course. Members who experience difficulty are to be informed of the consequences of marginal assessment, the consequences of further failure(s), and the disposition options available;

b. early warning of difficulty which may allow the avoidance of more serious problems;

c. feedback on the effectiveness of training;

d. information for a Progress Review Board (PRB); and,

e. equitable distribution of training assignments.

4. Record files shall be maintained for each trainee and reflect the following:

a. completion of essential training activities required by POs;

b. results of PCs, Enabling Checks (ECs), written or practical tests, etc. as specified in the assessment plan;

c. identification of elements requiring observations such as leadership, participation, etc; and,

d. interviewing/counselling results.

**PROFICIENCY LEVELS (PROGRESS MONITORING)**

5. These levels are to be used to assist in defining the degree of proficiency required to meet this standard, as well as to provide a vehicle for progress monitoring. The actual proficiency level requirements for any specific task will be determined by the training establishment in their Training Plan/Check Ride details and will be consistent with the Standards as detailed in Chapter 4 of this document.

6. Following each flight, the instructor shall rate individual tasks using one of the five proficiency levels listed below:

LEVEL 1 - Candidate was not capable of completing the task. Candidate required verbal and/or physical assistance to avoid making major errors. Further instruction is required;

LEVEL 2 - Candidate completed the task but required verbal and/or minor physical assistance to avoid making major errors. Further practice is required;

LEVEL 3 - Candidate completed the task, making minor errors. Candidate required minimal assistance to analyze and/or correct errors;

LEVEL 4 - Candidate completed the task without assistance, making only minor errors. Candidate was able to self-analyze and correct errors; or

LEVEL 5 - Candidate completed the task without assistance and without error.

**NOTE:** Where a task is not completed for reasons unrelated to the candidate's performance, such as: unserviceable equipment, unsuitable environmental conditions or the situation not presenting itself during the trip, the task shall be assigned the following designation:

DNCO – Duty Not Carried Out (reason shall be elaborated upon in the narrative).

**NOTE:** Level 3 meets the Performance Objective (Standard) for the Glider Pilot Course

7. The following definitions will apply to the rating of candidates:

major errors - errors that significantly detract from the ideal and/or jeopardize safety or the successful completion of the task; and

minor errors - errors that detract from the ideal but do not jeopardize the successful completion of the task or accomplishment of the Performance Objective

**TRIP ASSESSMENT (TRAINING MISSIONS)**

8. Following the rating of individual tasks using the 1-5 proficiency level scale, the candidate's overall performance of the trip shall be assessed by the instructor as follows:

Standard Exceeded - The student performed the majority of the tasks to a level higher than required by the TP, and **easily** performed the remaining tasks to the level required by the TP.

Achieved Standard – The student performed all tasks to the level required by the TP.

Achieved Standard with Difficulty **-** The student experienced difficulty achieving the minimum levels required by the TP.

Marginal – The student was unable to achieve the level required by the TP on one task.

Unsatisfactory – The Student's overall performance did not meet the level required by the TP. Failure to achieve the required standard on two tasks will constitute an Unsatisfactory rating.

**NOTES:** (1) Every effort shall be made to correct performance deficiencies as soon as possible. In addition:

The trip immediately following a marginal or unsatisfactory (ED) trip may not be rated as marginal.

Solo flight is not authorized following a marginal assessment.

The trip immediately preceding a flight test may not be rated as marginal

No Enabling or Performance Checks may be rated as marginal

(2) Those items which are commented upon in any assessment, and which refer to airmanship or HPMA (CRM) related activities, shall be directly related to, and supported by an observed task.

**SUPPLEMENTAL ASSESSMENT**

9. A course member will normally be permitted one repeat PC on any failed PO, if:

a. the attempt is likely to be successful;

b. extra tutoring, if needed, is practicable in terms of instruction time, the member's time, and training establishment resources and facilities; and,

c. the attempt can be completed before the scheduled training program serial end date.

10. Failure of any supplemental attempt will normally constitute course failure.

**UNSATISFACTORY COURSE PROGRESS**

11. All Unsatisfactory Course Progress will be handled in accordance with 1 CAD Orders 5-212.

12. Unsatisfactory Course Progress includes:

a. any failed EC;

b. a Failed Transport Canada Exam; or

c. any UNSAT Trip, excluding Review Flights.

**COURSE FAILURE**

13. Course failure is deemed as:

a. Four UNSAT trips during the course (including EC's and PC's but not including review flights);

b. Failure of a retest on the PC;

c. Failure of any four ground school ECs, including re-writes; or

d. Failure of a Transport Canada Exam re-write.

14. Once a student's progress has constituted a course failure, a PRB will be convened as per 1 CAD Orders (Vol 5) 5-212, and recommendations made to the RCA Ops O.

**PROGRESS REVIEW BOARD (PRB)**

15. As a result of poor performance or conduct, a member may appear before a PRB convened as per 1 CAD Orders 5-212. The PRB will make a recommendation to the RCA Ops O regarding the disposition of the member. Recommended action will normally be one of the following:

a. continue with remedial training; or

b. cease training.

**REMOVAL FROM TRAINING**

16. The RCA Ops O*,* IAW 1 CAD Orders, may direct that a member be removed from training:

a. when the member's progress is below the minimum standard and there is no likelihood that the required standard will be attained;

b. when the member's continued presence on the training programme is adversely affecting the training, safety or morale of the other members; and/or,

c. for administrative or disciplinary reasons.

**COURSE REPORTS**

17. The training establishment shall prepare a Sea, Army and Air Cadet Course Report, form CF 1364, for each course member. Block 11 shall be completed as either PASS or DID NOT PASS. Block 12 (potential instructor for the course) shall be indicated N/A. Additional comments on the member's strengths and weaknesses may be made with reference made to specific POs.

18. The Commanding Officer shall forward course reports according to RCSU policy.

## ANNEX A - FLYING TEST ADMINISTRATION

**GENERAL**

1. The aim of Regional Gliding Schools is to produce pilots of a pre determined quality. Standardized flying testing provides a consistent assessment of the candidate's level of achievement and a measure of progress at various stages of training.

2. Test results must be valid. To this end all tests must be administered fairly. Any variation from the ideal with respect to such factors as weather and aircraft serviceability must be compensated by a suitable allowance. Candidates should not be tested under adverse weather conditions. The testing Officer should ensure that the aircraft has no unusual characteristics.

3. Flying tests require reliance on the testing officer's experience and judgment. An opinion of ability should be withheld until a task is completed to a allow an overall impression of the performance to be made. Using this system, the candidate is awarded a proficiency level which most accurately describes the performance. The testing officer shall, when judging a performance, consider the candidate's knowledge of procedures, aircraft handling techniques (accuracy and smoothness) and airmanship.

4. Prior to the test the candidate shall be briefed on the conduct of the test. The briefing shall include a brief trip outline and cover the areas of responsibility for lookout, R/T, and aircraft checks. A caution that simulated emergencies may be given at any time during the trip shall be emphasized.

5. To maintain the highest degree of standardization during the test, the testing officer shall adhere to the following:

   a. Each task shall be rated as soon as it has been completed, using on of the proficiency levels defined in Annex A to this Chapter.

   b. The tendency to start with "ideal" (level5) and to reduce the rating by one point for each error is to be avoided.

   c. The tendency to confine ratings to the central range should be avoided. A poor or excellent performance should be rating accordingly.

   d. If possible, the candidate should be allowed to repeat what appears to be an isolated "Unsatisfactory" task; however, the overall rating of the two attempts shall not exceed the minimum acceptable.

   e. Only the performance of the candidate is to be tested. Personality traits must not influence the results of the test.

   f. Suggestions or criticisms are not to be made during the test.

   g. Control of the aircraft is not to be taken unless safety demands or unless an aircraft controllability check is deemed to be necessary.

6. When the test has been completed a thorough debriefing is to be given to the candidate.

7. If practical, a testing officer should not carry out more than one test on the same course member. The testing officer who administered the original test shall not retest a candidate.

8. At the discretion of the CFI, a "partial re-test" *may be* authorized for an otherwise strong test, if a student fails to achieve the required proficiency level in a maximum of two tasks. The partial re-test shall only include the failed sequences and those sequences required to accomplish the re-test.

## CHAPTER 4 - PERFORMANCE OBJECTIVES

**PO 401**

1. **Performance: Support Glider Launch and Recovery**

2. **Conditions:**

   a. Given:

      (1) Glider

(2) Tow-plane

(3) Tow Ropes

(4) Vehicle Tow Ropes/Tow bars

(5) Ground Crew

(6) Daily Ops Brief

b. Denied:

(1) Refs

(2) Supervision

c. Environmental – Within operational limits

3. **Standards:** IAW specified references and established procedures:

a. Positioning Gliders

b. Relay launch Signals

c. Hook Up Tow Plane and Glider

d. Perform Wing/Tail person duties

e. Recover Gliders

4. **Specific Reference Numbers:** A-CR-CCP/242-PT-005, Flying Orders.

5. **Specification Tasks, Skills and Knowledge Numbers:** T11, S23-26, K4, 5, 12, 15, 16, 17, 18

6. **Training Limitation:** Nil

**PO 402**

1. **Performance: Prepare for Daily Operations.**

2. **Conditions:**

a. Given:

(1) Glider

(2) Daily Ops Brief

(3) Daily Inspection Checklist

(4) A/C Logs

(5) Airfield Equip

b. Denied:

(1) Supervision

c. Environmental – Within Operational Limits

3. **Standards:** IAW specified references and established procedures:

a. Apply Weather and Ops Brief Information

b. Apply DI Checklist

c. Verify A/C Logs

d. Set Up and tear down Airfield Equipment (under supervision)

4. **Specific Reference Numbers:** A-CR-CCP-242/005, Flying Orders, CARS

5. **Specification Tasks, Skills and Knowledge Numbers:** T1, 2, 13, S1, 2, 4, 10, 11, 23, K1-4, 6, 7, 12, 15-18

6. **Training Limitation:** Nil

**PO 403**

1. **Performance: Perform Ground Handling**

2. **Conditions:**

a. Given:

(1) Glider

(2) Tow Rope

(3) Ground Crew

b. Denied:

(1) Supervision

(2) Refs

c. Environmental – Within operational limits

3. **Standards:** IAW specified references and established procedures

a. Verify weight and balance within limits

b. Perform Limited Pre Flight Inspection (After Crew Change) to include:

(1) Leading Edges

(2) Wheels/Skid

(3) Elevator pushrod assembly (including bolts)

(4) Pitot/Static Assembly

c. Perform Strap In Procedure

d. Complete Pre Take Off Check

e. Perform Hook Up Procedures

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005

5. **Specification Tasks, Skills and Knowledge Numbers:** T 3, S1, 2, 4-6, K2, 3, 5, 6, 11, 12, 17

6. **Training Limitation:** Nil

**<u>PO 404</u>**

1. **Performance: Perform Takeoff**

2. **Conditions:**

   a. Given:

      (1) Glider/Tow Plane

      (2) Ground Crew

      (3) Airfield Equipment

   b. Denied:

      (1) Supervision/Assistance

      (2) References

   c. Environmental – Within operational limitations

3. **Standards:** IAW specified references and established procedures

   a. Relay air-tow launch signals

   b. Control attitude and direction during ground roll

   c. Execute lift-off

   d. Maintain position after lift-off (prior to tow plane lift-off)

   e. Use proper crosswind technique

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005

5. **Specification Tasks, Skills and Knowledge Numbers:** T4, S1, 2, 7, 8, 9, K1, 3, 4, 5, 8, 12, 15-18

6. **Training Limitation:** Nil

**<u>PO 405</u>**

1. **Performance: Perform Air Tow and Release**

2. **Conditions:**

   a. Given:

      (1) Aircraft in tow

   b. Denied:

      (1) Supervision/Assistance

      (2) Reference

   c. Environmental – Within operational limitations

3. **Standards:** IAW specified references and established procedures

   a. Control attitude and direction

   b. Maintain correct position

c. Execute Slack Rope Procedures

d. Fly Tow Transitions

e. Respond to visual signals

f. Complete the Pre-Release Check

g. Fly the Release Profile

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005, Flying Orders

5. **Specification Tasks, Skills and Knowledge Numbers:** T5, S1, 2, 8, 11, 12, 13, K1-6, 12, 15-18

6. **Training Limitation:** Nil

**PO 406**

1. **Performance: Perform Flight Management**

2. **Conditions:**

    a. Given:

        (1) Glider

    b. Denied:

        (1) Supervision/Assistance

        (2) References

    c. Environmental – Within Operational Limitations

3. **Standards:** IAW specified references and established procedures

    a. Analyze and correct position and altitude with relation to circuit IP

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005, Flying Orders

5. **Specification Tasks, Skills and Knowledge Numbers:** T6, 7, 8 S1, 2, 3, 8, 13-15, 27 K1-7, 12, 15-18

6. **Training Limitation:** Nil

**PO 407**

1. **Performance: Perform Basic Manoeuvres**

2. **Conditions:**

    a. Given:

        (1) Glider

    b. Denied:

        (1) Supervision/Assistance

        (2) References

c. Environmental – Within Operation Limitations

3. **Standards:** IAW specified references and established procedures

a. Fly straight glide

b. Complete gentle turns

c. Complete medium turns

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005

5. **Specification Tasks, Skills and Knowledge Numbers:** T7, S2, 3 8, 13, 14, K3, 5, 8, 11, 15, 17, 18

6. **Training Limitation:** Nil

**PO 408**

1. **Performance: Perform Advanced Manoeuvres**

2. **Conditions:**

a. Given:

(1) Glider

b. Denied:

(1) Supervision/Assistance

(2) References

c. Environmental – Within Operational Limitations

3. **Standards:** IAW specified references and established procedures

a. Complete ASCOT check

b. Complete steep turn

c. Complete stall entry and recovery

(1) Gentle stalls: entry from a near-nose level attitude

(2) Medium stalls: entry from a nose up attitude (max 30°)

d. Perform slips

(1) Forward slips

(2) Side slips

(3) Slipping turns

e. Perform incipient spin recovery

f. Perform spiral dive recovery

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005

5. **Specification Tasks, Skills and Knowledge Numbers:** T8, S3, 8, 11, 13-17, K2-6, 8, 11, 12, 15, 17, 18

6. **Training Limitation:** Nil

**PO 409**

1. **Performance: Perform Circuit**

2. **Conditions:**

   a. Given:

      (1) Glider

   b. Denied:

      (1) Supervision/Assistance

      (2) References

   c. Environmental - Within Operational Limitations

3. **Standards:** IAW specified references and established procedures

   a. Complete pre-landing check

   b. Analyze and correct circuit profile while flying:

      (1) Downwind leg

      (2) Base turn

      (3) Base leg

   c. Adjust airspeed for wind conditions while on base leg

   d. Compensate for environmental conditions

   e. Modify circuit as required

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005, Flying Orders

5. **Specification Tasks, Skills and Knowledge Numbers:** T9, S1-3, 8, 11, 13, 14, 16, 20, K1-6, 11, 12, 15-18

6. **Training Limitation:** Nil

**PO 410**

1. **Performance: Perform Approach and Landing**

2. **Conditions:**

   a. Given:

      (1) Glider

   b. Denied:

      (1) Supervision/Assistance

      (2) References

   a. Environmental - Within Operational Limitations

3. **Standards:** IAW specified references and established procedures

a. Fly final turn to line up with landing area centreline

b. Fly final leg while analyzing and correcting approach profile using:

(1) Spoilers

(2) Slipping

c. Fly correct landing profile including:

(1) Round-out

(2) Hold-off

(3) Touchdown

(4) Ground roll

c. Use proper crosswind technique

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005

5. **Specification Tasks, Skills and Knowledge Numbers:** T10, S1-3, 8, 14, 16, 21, 22, K1, 3-6, 8, 11, 12, 15-18

6. **Training Limitation:** Nil

**PO 411**

1. **Performance:** Respond to emergencies

2. **Conditions:**

a. Given:

(1) Glider

a. Denied: Denied:

(1) Supervision/Assistance

(2) References

b. Environmental - Within Operational Limitation

3. **Standards:** IAW specified references and established procedures

a. Respond to premature releases to include:

(1) Downwind landing

(2) Modified circuit

b. Respond to emergency release signal (tow plane rocks wings)

c. Respond to spoiler stuck open / closed in circuit emergency

d. Respond to emergencies to include:

(1) Spoiler open on tow signal (tow plane waggles rudder)

(2) Glider release failure

(3) Glider and tow plane release failure

(4) Aborted take-off

(5) Off-field landing

(6) Lose sight of tow plane

(7) Crosswind landing after premature release

(8) Straight ahead landing after premature release

7. **Specific Reference Numbers:** A-CR-CCP-242/PT-005

8. **Specification Tasks, Skills and Knowledge Numbers:** T13, S1-3, 8, 11, 13-15, 17, 20, 21, K1-5, 11, 12, 15

9. **Training Limitation:** Standards in para 3.d. will be assessed by verbal response

**ANNEX A**

**MAIN REFERENCES**

a. A-CR-CCP-242/PT-005;

b. From the Ground Up;

c. Joy of Soaring;

d. CARS;

e. Weather Ways; and

f. Flying Orders

**ANNEX B**

**AIR CADET GLIDING TRANSPORT CANADA WINGS**

**Section 1 – Performance Requirement**

**Tasks**

| | |
|---|---|
| 1. Flight Planning | 3 |
| 2. Perform daily inspections to include: | 3 |
| Maintenance set | 3 |
| A/C | 3 |
| 3. Ground handling | 3 |
| 4. Perform Take off | 3 |
| 5. Perform Air Tow and Release | 3 |
| 6. Perform Flight Management to ensure a safe recovery | 3 |
| 7. Perform Basic Manoeuvres | 3 |
| 8. Perform Advanced Manoeuvres | 3 |
| 9. Perform Circuit | 3 |
| 10. Perform Approach and Landing | 3 |
| 11. Support Glider Launch and Recovery | 3 |
| 12. Set up airfield ops | 2 |
| 13. Respond to emergencies | 3 |

**Skills**

| | |
|---|---|
| 1. Communicating to include: | 3 |
| Visual Signals | 3 |
| Radio | 3 |
| 2. Assessing Environmental Conditions | 3 |
| 3. Maintain visual separation from other A/C | 3 |
| 4. Walk Around | 3 |
| 5. Strap In | 3 |
| 6. Perform hook up procedures | 3 |
| 7. Relay Take Off Signals | 3 |
| 8. Control Attitude and direction | 3 |
| 9. Maintain Position after Lift Off | 3 |
| 10. Interpret Weather and Ops Briefs | 3 |
| 11. Follow and Interpret Checklist | 3 |
| 12. Follow release profile | 3 |
| 13. Complete gentle and medium turns | 3 |
| 14. Execute Straight glide | 3 |
| 15. Complete Stalls | 3 |
| 16. Complete Slips | 3 |
| 17. Complete Steep turns | 3 |
| 18. Complete Incipient Spin Recoveries | 3 |
| 19. Spiral Dive Recoveries | 3 |
| 20. Analyze and correct circuit profile | 3 |
| 21. Analyze and correct Approach Profile | 3 |
| 22. Perform Round-out, hold off, T/D and Ground Roll | 3 |
| 23. Positioning Gliders | 3 |
| 24. Relay Launch Signals | 3 |
| 25. Hook Up Tow-plane and Glider | 3 |
| 26. Perform Wing/tail person duties | 3 |
| 27. Continuously analyze and correct position and altitude in relation to circuit IPA/R | 3 |
| 28. Recognize and respond to emergency situations while maintaining control of A/C | 3 |

**Knowledge**

| | |
|---|---|
| 1. Radio Procedures | 3 |
| 2. Checklist | 3 |
| 3. AOIs | 3 |
| 4. SOPs | 3 |
| 5. MFT | 3 |
| 6. Air Law and Procedures | 2 |
| 7. Meteorology | 2 |
| 8. Theory of Flight | 2 |
| 9. Navigation | 2 |
| 10. Radio Theory | 1 |
| 11. Flight Instruments | 2 |
| 12. Flight Operations | 3 |
| 13. Soaring | 1 |
| 14. Human Factors | 1 |
| 15. Flight Safety | 2 |
| 16. Flying Orders | 2 |
| 17. Airframes and systems | 3 |
| 18. Aeronautical terminology | 2 |

# CHAPTER 4

# GLIDER INSTRUCTOR COURSE AND LAUNCH CONTROL OFFICER COURSE

## SECTION 1

## GLIDER INSTRUCTOR COURSE

### COURSE OBJECTIVES

1. This course is designed to train candidates to provide flying instruction, including pre-flight briefing and post-flight analysis, to ab initio glider pilots in accordance with the standards, regulations and procedures detailed in this manual and Canadian Air Regulations (CARs). A successful candidate may subsequently be recommended for a Transport Canada (TC) Glider Pilot Instructor Rating and for an ACGP Glider Instructor qualification.

**NOTE**

> The Instructor Candidate (IC) should also be able to perform the duties of an LCO. The IC must complete the ground school portion of the LCO course prior to starting the LCO Field Training. Completion of the Glider Instructor Course PIP meets the Glider Handling requirement of the LCO academic training (lectures 1 and 2).

### CANDIDATE PREREQUISITES

2. **Minimum Requirements**. Candidates must meet the following prerequisites prior to arriving for the ACGP Glider Instructor Course:

   a. Hold a valid TC Cat 3 Medical;

   b. Hold a valid and current TC glider licence with not less than:

      (1) 20 hours PIC flight time in gliders and at least 125 flights; or

      (2) 10 hours PIC flight time in gliders and at least 200 flights.

   c. Weight must be below 100 kilos/220 lbs;

   d. Be a minimum of 18 years of age; and

   e. Completion of the current Programmed Instructional Package (PIP) for instructor candidates.

### FLYING TRAINING – GENERAL DIRECTIVES

3. The Glider Instructor Course flying syllabus is composed of two separate phases. Phase I (10 Air Lessons, 10 Flights) is designed to provide back seat proficiency for the IC. Phase II (15 Air Lessons, 22 Flights) is designed to provide instructor training.

4. A progress record shall be maintained on each IC identifying training progress achieved in both Phase I (back seat proficiency) and Phase II (instructor training).

5. At the completion of Phase I, the IC shall undertake a Proficiency Flight Test with the RGS Chief Standards Officer or a Glider Instructor Standards Pilot appointed by the RCA Ops O. Successful completion of this Proficiency Flight Test (PL4) is a prerequisite for Phase II of the Glider Instructor Course. The successful candidate shall demonstrate a high level of airmanship, decision-making ability and aircraft handling skills.

6. At the completion of Phase II, the IC shall fly an Instructor Category Flight Test with the RGS Chief Standards Officer or a Glider Instructor Standards Pilot appointed by the RCA Ops O. Successful completion of the Instructor Category Flight Test (PL4), the IC may be recommended for a TC Glider Pilot Instructor Rating.

**UNSTATISFACTORY COURSE PROGRESS**

7. All Unsatisfactory Course Progress will be handled with 1 CAD Orders 5-212.

8. Unsatisfactory Course Progress includes;

a. any failed Enabling Check (EC) or Performance Check (PC); or

b. any Unsatisfactory (UNSAT) Trip.

**EXTRA DUAL FLIGHTS (ADDITIONAL INSTRUCTIONAL)**

9. Extra duals may be authorized for candidates who fail to achieve the required standard. Extra duals shall be graded as SAT or UNSAT. The authorizing signature and appointment must be present on the Extra Dual Card prior to flight.

**COURSE FAILURE**

10. Course failure is deemed as:

a. four UNSAT trips during the course; or

b. failure of a retest on any PC.

Once a student's progress has constituted a course failure, a Progress Review Board (PRB) will be convened as per 1 CAD Orders (Vol 5) 5-212 and recommendations made to the RCA Ops O.

**SCOPE OF FLYING TRAINING**

| PHASE | DETAIL | FLIGHTS | FLYING HOURS |
|---|---|---|---|
| I | Back Seat Proficiency Flying<br>Proficiency Flight Test | 9<br>1 | 1:46<br>0:14 |
| II | Instructor Flying Training<br>Back Seat Proficiency Flying<br>Instructor Category Flight Test | 19<br>2<br>1 | 3:45<br>0:36<br>0:18 |
| | **TOTALS** | **32** | **6:39** |

Figure 4-1-1 Scope – Flying Training

**BRIEFING AND ANALYSIS**

11. **Objectives**. The IC shall:

a. during both Phases I and II, receive a comprehensive briefing on the purpose of each Air Lesson/Flight, and a thorough analysis and debriefing of the results on completion of each flight; and

b. during Phase II, present effective Pre-Flight Briefings, Mission Outlines, and Post-Flight Debriefings for the Air Lessons/Flights.

12. **General Directives.** The following are required:

a. during Phase I, the instructional staff shall carry out a comprehensive pre-flight briefing and post-flight review for each Air Lesson/Flight. Approximately 10 to 15 minutes shall be provided for this purpose; and

b. during Phase II, the IC shall assume the responsibility of a qualified instructor including a Mission Outline and Post-Flight Debriefing for all Air Lessons/Flights following Flight Number 1. A minimum of four Pre-Flight Briefs shall be prepared and given by the ICs during Phase II. At the completion of each flight, the instructional staff shall carry out a comprehensive analysis of the candidates. Pre-Flight Briefing (if required), Mission Outline and Post-Flight Debriefing. In addition, the candidate’s instructional and flying demonstration ability will be assessed. Mission Outlines should take approximately two to five minutes to complete prior to each flight. Post Flight Debriefings should take 5 to 10 minutes and take place as close as possible following each flight.

**PHASE I – INTRODUCTION**

13. **Objectives.** The IC shall be able to fly all exercises and procedures to a PL4 while occupying the instructor’s (rear) seat.

14. **General Directives.** The following are applicable:

a. The Phase I air exercises for each flight in the Air Lessons are defined in Air Lesson descriptions that follow. Each flight provides a challenging sequence of review/proficiency flying experience from the back seat.

b. Several of the exercises include simulated emergencies to assess the in-flight decision-making ability of the IC. Flights 5 and 7 shall be flown such that the modification of the circuit pattern is required to maintain base and final turns no lower than the allowed minimums. Flight 8 specifies deliberately placing the aircraft at an altitude requiring a downwind landing, such that the IC shall be required to demonstrate and explain the correct techniques used to handle this common situation.

c. The IC shall not progress to Phase II until successful completion of the Phase I Proficiency Flight Test.

d. ICs who have mainly winch or auto tow experience may require an air tow refresher prior to the commencement of Phase II.

**PHASE I – COURSE OUTLINE**

15. Progress Cards for each lesson of Phase I are mandatory. The Progress Card and Flight Test Report, Chapter 3, Annex A, shall be the standard used.

16. The PL standard for each lesson of Phase I is detailed in Figure 4-1-2 Instructor Course Phase Chart. Refer to Figure 4-1-7 for PL definitions. Each lesson of Phase I shall be assessed an Overall Flight Rating (OFR). Refer to Figure 4-1-8 for OFR definitions.

| AIR LESSON | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| PRE-FLIGHT | 4 | | | | | | | | | |
| GROUND HANDLING | 4 | | | | | | | | | |
| TAKE-OFF | 2 | | 3 | | | | | | 4 | |
| EMERGENCY | 3 | | | | | | | 4 | | |
| AIR TOW | 2 | 3 | | | | 4 | | | | |
| RELEASE | 2 | 3 | | | | 4 | | | | |
| INCIPIENT SPIN | | | 2 | | 3 | | | | 4 | |
| FULL SPIN | | | | 2 | | 3 | | | 4 | |
| SPIRAL DIVE | | | | | 2 | | 3 | | 4 | |
| STALL | | 3 | | | | | | | 4 | |
| SLIPPING | | | 3 | | | 4 | | | | |
| SLIPPING TURN | | | 3 | | | 4 | | | | |
| STRAIGHT GLIDE | 3 | 4 | | | | | | | | |
| GENTLE TURN | 3 | 4 | | | | | | | | |
| MEDIUM TURN | 3 | 4 | | | | | | | | |
| STEEP TURN | 3 | | | | 4 | | | | | |
| DOWNWIND | 3 | | | | | 4 | | | | |
| BASE TURN | 3 | | | | | 4 | | | | |
| BASE LEG | 3 | | | | | 4 | | | | |
| FINAL TURN | 2 | 3 | | | | 4 | | | | |
| FINAL APPROACH | 2 | 3 | | | | 4 | | | | |
| LANDING | 2 | | 3 | | | | | | 4 | |
| CIRCUIT MOD | | | | 3 | | | 4 | | | |
| FLIGHT MANAGEMENT | 3 | | | 4 | | | | | | |
| AIRMANSHIP | 3 | | | 4 | | | | | | |

Figure 4-1-2 Instructor Course Phase I Phasing Chart

**PHASE I FLIGHT/AIR LESSON SUMMARYCHART**

| Flight # | Air Lesson | Exercises | Altitude | Time |
|---|---|---|---|---|
| 1 | 1 | pre-flight checks, ground handling, take-off, emergency, tow, release, turns, circuit, and flight management | 2000 | 0:12 |
| 2 | 2 | tow, stalls, slow flight, turns and final approach | 2000 | 0:12 |
| 3 | 3 | takeoff, crosswind techniques during launch and in the circuit, incipient spins, slipping, slipping turns, landing | 2500 | 0:14 |
| 4 | 4 | tow positions, spin procedures, circuit modification, flight management, airmanship | 3000 | 0:15 |
| 5 | 5 | tow positions, spin entry and recovery, spiral dive, steep turns, modified circuit | 3000 | 0:15 |
| 6 | 6 | air tow, release, full spin, spiral dives, slips, circuit | 3000 | 0:15 |
| 7 | 7 | spin, spiral dive, low modification circuit/high sink scenario | 3000 | 0:15 |
| 8 | 8 | launch emergencies, tow aircraft simulated emergency | 400 | 0:02 |
| 9 | 9 | Review of all sequences | 3000 | 0:15 |
| 10 | 10 | Phase I Flight Test | 2500 | 0:14 |
| **TOTAL TIME** | | | | **2:09** |

Fig 4-1-3 Phase I Flight/Air Lesson Summary Chart

**PHASE I – FLIGHT/AIR LESSONS**

**AIR LESSON 1**

**AIM**

17. To familiarization the IC with the glider flight attitudes, airport layout, launch, flight management to landing and the local flying area from the glider rear seat.

**OBJECTIVE**

18. At the conclusion of this trip, the IC must demonstrate following PLs:

a. **New Work** — **Level**

| | New Work | Level |
|---|---|---|
| (1) | Pre-Flight | 4 |
| (2) | Ground Handling | 4 |
| (3) | Take-off | 2 |
| (4) | Emergency | 3 |
| (5) | Air Tow | 2 |
| (6) | Release | 2 |
| (7) | Straight Glide | 3 |
| (8) | Gentle Turn | 3 |
| (9) | Medium Turn | 3 |
| (10) | Steep Turn | 3 |
| (11) | Downwind | 3 |
| (12) | Base Turn | 3 |
| (13) | Base Leg | 2 |
| (14) | Final Turn | 2 |
| (15) | Final Approach | 2 |
| (16) | Landing | 2 |
| (17) | Flight Management | 3 |
| (18) | Airmanship | 3 |

**MOTIVATION**

19. A proper introduction to glider attitudes and visual references in the rear seat is essential to making accurate and precise flying demonstrations.

**REFERENCES**

20. The following references apply to this lesson:

    a. Chapter 6, Manual of Glider Flying Training; and

    b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI

**BRIEFING OUTLINE**

21. Briefing. Briefing items to be addressed include:

    a. the glider controls and performance;

    b. pre-take-off and pre-landing checks;

    c. airport layout, ramp areas, taxi ways, runway orientation obstructions, emergency landing areas, local flying area, prominent landmarks, safety factors, look-out, release technique, transfer of control procedure, bank angles for gentle, medium and steep turns, circuit altitudes and references, and flight management to landing; and

    d. differences in operating the glider from the rear seat.

**AIR LESSON OUTLINE – RELEASE HEIGHT OF 2 000 FEET AGL**

22. The IC shall perform:

    a. all checks;

    b. the take-off, climb, and release;

    c. gentle, medium and steep turns and practice transfer of control; and

    d. fly the circuit, approach and landing.

**POST FLIGHT REVIEW**

23. Review the air lesson and ensure the student understands the differences in flying from the rear seat.

## AIR LESSON 2

### AIM

24. To review the dynamics of stalls in level flight and turns; perfect recovery procedures and review aircraft performance during slow flight.

### OBJECTIVE

25. At the conclusion of this trip, the student must demonstrate the following PLs:

a. **New Work** — **Level**

| | | |
|---|---|---|
| (1) | Stall | 3 |
| (2) | Slow Flight | N/A |

b. **Upgrade** — **Level**

| | | |
|---|---|---|
| (1) | Air Tow | 3 |
| (2) | Release | 3 |
| (3) | Straight Glide | 4 |
| (4) | Gentle Turn | 4 |
| (5) | Medium Turn | 4 |
| (6) | Final Turn | 3 |
| (7) | Final Approach | 3 |

### MOTIVATION

26. An instructor must be able to demonstrate slow flight, stall and recovery procedures in addition to performing the required checks and managing aircraft position and altitude entirely from the rear seat.

### REFERENCES

27. The following references apply to this lesson:

a. Chapter 6, Manual of Glider Flying Training; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

### BRIEFING OUTLINE

28. A review of the ASCOT check, stall entry and recovery procedures, aircraft attitude for gentle and medium stalls, and the relationship of bank angle to stall speed shall be covered. The various glider airspeeds for best L/D and minimum sink shall be reviewed with discussion on the effects of speeds below the minimum sink speed on performance.

**AIR LESSON OUTLINE – RELEASE HEIGHT 0F 2 000 FEET AGL**

29. The IC shall fly from the rear seat and perform the take-off, climb, release, ASCOT checks, gentle and medium stalls and recovery procedures. The IC shall fly the circuit and landing, striving for precision in altitude, position and speed. The IC shall also practice slow flying at various speeds in order to gain a greater comprehension of the various sink rates.

**POST-FLIGHT REVIEW**

30. Review the air lesson and ensure the student understands the differences in flying from the back seat,

## AIR LESSON 3

### AIM

31. The IC shall demonstrate the ability to apply crosswind techniques during the launch, circuit and landing phase of the flight. Additionally, the candidate shall demonstrate incipient spins, stalling in a turn, recovery from the stall and slipping manoeuvres.

### OBJECTIVE

32. At the conclusion of this trip, the student must demonstrate the following PLs:

| | | Level |
|---|---|---|
| a. | **New Work** | **Level** |
| (1) | Incipient Spin | 2 |
| (2) | Slipping | 3 |
| (3) | Slipping Turn | 3 |
| b. | **Upgrade** | **Level** |
| (1) | Take-off | 3 |
| (2) | Landing | 3 |

### MOTIVATION

33. The following are applicable:

a. Since glider instructors seldom have the opportunity to teach ab initio students with the wind tracking directly down the runway, it is vital that an instructor be able to effectively demonstrate and instruct crosswind take-offs and landings.

b. An instructor must be able to demonstrate and explain the dynamics of stalling in a turn and impress upon the student the danger of stalling in an turn at low altitude, particularly the danger of uncoordinated turns coupled with stall while manoeuvring in the circuit.

c. An instructor must be able to demonstrate and instruct on the correct slipping technique, maintaining speed and directional control while slipping on a straight track is essential for the safety of this manoeuvre.

### REFERENCES

34. The following references apply for this lesson:

a. Chapter 6, Manual of Glider Flying Training; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

### BRIEFING OUTLINE

35. The briefing shall cover the techniques for compensating for a crosswind, including crabbing and using wing low/opposite rudder during take-off, circuit, approach and landing. A review shall be conducted of the ASCOT check, stalling speed in a turn, recovery for a wing drop during a stall and the consequences of a crossed controls during a stall. This briefing shall also review the techniques for forward slipping and slipping in a turn, and discuss the application of slipping during the approach for landing in terms of direction of the slip and the minimum altitude for slip recovery.

**AIR LESSON OUTLINE – RELEASE HEIGHT OF 2 500 FEET AGL**

36. The IC shall demonstrate crosswind techniques for the take-off, circuit and landing if the conditions are suitable. If necessary, this portion of the exercise shall be repeated in later flights when a suitable crosswind exists. The IC shall complete ASCOT checks as required and execute stalling in a turn, both co-ordinated and uncoordinated, and use opposite rudder to pick up the low wing or recover from the incipient spin if one develops. In addition, the IC shall demonstrate an incipient spin and recovery. The slipping exercise shall focus on maintaining a straight track in a forward slip. This exercise can be included in the final approach phase by flying a higher than normal circuit. The crabbing technique shall be employed in the circuit to maintain a parallel track with the runway during the downwind leg and a correct position on the runway centre line when on final. The transition to the wing low/opposite rudder approach shall be demonstrated prior to the aircraft descending into the flare.

**POST-FLIGHT REVIEW**

37. Review the air lesson and ensure the student understands the differences in flying from the back seat.

## AIR LESSON 4

**AIM**

38. The IC shall review tow positions, spin procedures and modified circuits.

**OBJECTIVE**

39. At the conclusion of this trip, the student must demonstrate the following PL's:

a. **New Work** — **Level**

| | | |
|---|---|---|
| (1) | Full Spin | 2 |
| (2) | Circuit Modification | 3 |

b. **Upgrade** — **Level**

| | | |
|---|---|---|
| (1) | Flight management | 4 |
| (2) | Airmanship | 4 |

**MOTIVATION.**

40. The following is applicable:

a. Transitioning to and from the various tow positions will enable the IC to see how glider position affects the tow aircraft, reinforcing the need to maintain position within the tow envelope and control the rate of change of position to avoid tow aircraft upset.

b. An instructor must to able to demonstrate spin entry and automatic recovery procedures in either direction.

c. An instructor must be able to demonstrate and explain the procedures to modify the circuit in the event of insufficient altitude.

**REFERENCES**

41. The following references apply for this lesson:

a. Chapter 6, Manual of Glider Flying Training; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**BRIEFING OUTLINE**

42. The briefing shall discuss the high and low tow position; the technique for transitioning through the various tow positions; and the dangers of tow aircraft upset. A review of the theory of spinning; techniques used to simulate inadvertent spin entry; and spin recovery shall be completed. The briefing shall include a review of modified circuit procedures and minimum circuit altitudes.

**AIR LESSON OUTLINE – RELEASE HEIGHT OF 3000 FEET AGL**

43. The IC shall review the air tow envelope by demonstrating the various tow positions by carefully manoeuvring the glider to the four corners of the "box". A review of spin entry using a flat skidding turn accompanied by crossed controls shall enable the IC to demonstrate the typical inadvertent spin entry scenario in either direction. The IC shall demonstrate a full spin and recovery. The circuit entry shall be delayed so as to put the glider below the desired altitude opposite the touchdown point by 100 to 150 feet. This positioning will require a modified circuit to be flown by modifying the base leg as determined by the reduced downwind altitude.

**POST FLIGHT REVIEW**

44. Review the air lesson and ensure the student understands the differences in flying from the back seat.

## AIR LESSON 5

### AIM

45. The IC shall demonstrate proficiency in tow positions; spin entry and recovery; spiral dive entry and recovery; and modified circuits.

### OBJECTIVE

46. At the conclusion of this trip the student must demonstrate the following:

a. **New Work** — **Level**

| | | |
|---|---|---|
| (1) | Spiral Dive | 2 |

b. **Upgrade** — **Level**

| | | |
|---|---|---|
| (1) | Incipient Spin | 3 |
| (2) | Steep Turns | 4 |

### MOTIVATION

47. The following is applicable:

a. An instructor must be capable of demonstrating, with precise control, the various tow positions.

b. The important distinction between spin and spiral manoeuvres and the correct recovery procedures must be well understood and demonstrated.

c. Modification of the circuit may be necessary because of vertical position (altitude), horizontal position, and wind effects.

### REFERENCES

48. The following references apply for this lesson:

a. Annex B, ACGP manual of Glider Flying Training, Sections 1 to 6; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

### BRIEFING OUTLINE

49. A review of the tow positions flown in the previous lesson should be compared to the ideal exercise. A discussion of control inputs to generate, maintain and recover from a full spin shall be compared to the same for a spiral dive manoeuvre. A comparison of the aerodynamics of each manoeuvre is appropriate during this lesson. Lastly, the modified circuit flown during Air Lesson 4, Flight 4 shall be thoroughly critiqued and reviewed in preparation for a repeat of the exercise.

### AIR LESSON OUTLINE – RELEASE HEIGHT OF 3000 FEET AGL

50. The IC shall accurately and smoothly manoeuvre the glider to the four corners of the air tow envelope. During this exercise, another IC who can experience the significant effect of glider position on tow aircraft controllability and the potential for upset should occupy the back seat of the tow aircraft. The IC shall complete spins as required. The spiral dive entry and recovery shall follow with recovery completed by 1 500 feet AGL. All spin and spiral manoeuvres shall be preceded by an ASCOT check. A low entry to the circuit shall be used to create the circumstance from which a modified pattern to a landing at the standard touchdown point can be completed.

**POST FLIGHT REVIEW**

51. Review the air lesson and ensure the student understands the differences in flying from the back seat.

## AIR LESSON 6

### AIM

52. Spiral dive recognition and recovery shall be perfected with additional practice. Slipping the glider in both directions at altitude and during the final approach will also be mastered with additional practice.

### OBJECTIVE

53. At the conclusion of this trip, the student must demonstrate the following PLs:

a.

| | Upgrade | Level |
|---|---|---|
| (1) | Air Tow | 4 |
| (2) | Release | 4 |
| (3) | Full Spin | 3 |
| (4) | Slipping | 4 |
| (5) | Slipping Turn | 4 |
| (6) | Downwind | 4 |
| (7) | Base Turn | 4 |
| (8) | Base Leg | 4 |
| (9) | Final Turn | 4 |
| (10) | Final Approach | 4 |

### MOTIVATION

54. The following is applicable:

a. An instructor must be capable of explaining and demonstrating the dynamics, the recognition, and the proper recovery from a spiral dive.

b. Accurate control of speed and direction during slipping manoeuvres from the rear seat are necessary skills for a glider instructor.

### REFERENCES

55. The following references apply for this lesson:

a. Chapter 6, Manual of Glider Flying Training; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**BRIEFING OUTLINE**

56. A review of spiral dives and the spiral exercise flown in the previous lesson will prepare the IC for a thorough examination of the manoeuvre. The briefing shall include a discussion of the techniques for slipping and the application of slipping during the approach for landing in terms of direction of the slip, speed control and the minimum altitude for slip recovery.

**AIR LESSON OUTLINE – RELEASE HEIGHT OF 3000 FEET AGL**

57. Spiral dive manoeuvres flown in both directions shall be preceded by the required ASCOT checks. The review of slipping both to the left and right shall be completed at altitude by tracking to a target on the horizon and maintaining appropriate speeds. The practical application of slipping shall be demonstrated in the circuit by approaching at a higher than necessary altitude and using a forward slip to execute an accurate landing at the launch site.

**POST FLIGHT REVIEW**

58. Review the air lesson and ensure the student understands the differences in flying from the back seat.

## AIR LESSON 7

### AIM

59. The characteristics, entry, control, and recovery of spin and spiral manoeuvres shall by fully understood and demonstrated by the IC. Above average decision-making and aircraft handling shall be demonstrated during a low circuit entry/high sink scenario.

### OBJECTIVE

60. At the conclusion of this trip, the student must demonstrate the following PLs:

a. **Upgrade** **Level**

| | Upgrade | Level |
|---|---|---|
| (1) | Spiral Dive | 3 |
| (2) | Circuit Modification | 4 |

### MOTIVATION

61. The following is applicable:

a. An instructor must be completely knowledgeable of the theory and practice of spin and spiral manoeuvres.

b. Responding to non-ideal situations in the circuit is a necessary skill of a glider instructor.

### REFERENCES

62. The following references apply for this lesson:

a. Chapter 6, Manual of Glider Flying Training; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

### BREIFING OUTLINE

63. A limited review of the spin and spiral procedures may be necessary to correct any inadequacies observed in the previously flown exercises. The altitudes to be used and the degree of circuit modification required shall also be planned prior to conducting the flight. The briefing shall also include a discussion of theory of approach speed calculation and the prohibition of using penetration in the circuit.

### AIR LESSON OUTLINE – RELEASE HEIGHT OF 3000 FEET AGL

64. The IC shall demonstrate spins, spirals and correct recovery procedures. Entry to the circuit shall be made at the pre-briefed altitude, followed by the application of modified circuit procedures to affect an accurate landing at the touchdown point. The creation of a high sink rate through the use of stuck open spoilers may also be included in the circuit, approach and landing to assess the IC's response to significantly diminished glide performance. The IC must demonstrate an excellent cross-check and an ability to rationalize real as opposed to perceived sink.

### POST FLIGHT REVIEW

65. Review the air lesson and ensure the student understands the differences in flying from the back seat.

## AIR LESSON 8

**AIM**

66. The IC shall be completely knowledgeable with ground and airborne emergency signals and procedures.

**OBJECTIVE**

67. At the conclusion of the trip, the student must demonstrate the following PLs:

a. **Upgrade** **Level**

(1) Emergency 4

**MOTIVATION**

68. An instructor must be capable of prompt and automatic response in dealing with various emergencies encountered in the gliding environment.

**REFERENCES**

69. The following references apply for this lesson:

a. Chapter 6, Manual of Glider Flying Training; and

b. Chapter 2, Section 1, Schweizer 2-33 Glider AOI.

**BRIEFING OUTLINE**

70. The correct response to a rope break or engine failure at 400 feet AGL shall be briefed. Other emergencies should be discussed including an aborted launch during take-off; rope breaks between ground level and 200 feet AGL; rope breaks between 200 feet and 500 feet AGL; downwind landings in high winds; rope breaks above 500 feet AGL; release failure; and double release failure procedures. See Chapter 2 for a discussion of emergency procedures.

**AIR LESSON OUTLINE - RELEASE HEIGHT OF APPROXIMATELY 400 FEET AGL**

71. The instructor shall activate the release at about 400 feet AGL permitting a downwind landing to be flown by the IC. The downwind landing should be flown bearing in mind wind effects and limitations. Additionally, a level and smooth lateral landing area should be available in case directional control during the landing roll is lost due to a tailwind component. This exercise must be approved by the LCO who will co-ordinate launch and recovery to ensure that no traffic conflict exists.

**POST FLIGHT REVIEW**

72. Review the air lesson and ensure the student understands the differences in flying from the back seat.

## AIR LESSON 9

### AIM

73. The IC shall review and demonstrate those sequences for which a PL 4 has not been previously demonstrated since all sequences cannot be accomplished during the Phase I Proficiency Flight Test. A simulated cable break may also be substituted to assess response to an unanticipated situation.

### OBJECTIVE

74. At the conclusion of this trip, the student must demonstrate the following PLs:

| Upgrade | | Level |
|---|---|---|
| a. | Take-off | 4 |
| b. | Incipient Spin | 4 |
| c. | Full Spin | 4 |
| d. | Spiral Dive | 4 |
| e. | Stall | 4 |
| f. | Landing | 4 |

### MOTIVATION

75. The IC must be able to demonstrate a PL 4 on all glider handing procedures and sequences before proceeding to Phase II.

### BRIEFING OUTLINE

76. The briefing shall cover the elements of the air lessons to be reviewed.

### AIR LESSON OUTLINE - RELEASE HEIGHT OF 3 000 FEET AGL

77. The air exercises relating to the lessons being reviewed shall be flown as briefed. This flight may also be used to assess the IC response to an unanticipated emergency. Note that this no-notice emergency may be simulated at any time during Phase I.

### POST FLIGHT REVIEW

78. Review the air lesson and ensure the student understands the differences in flying from the back seat.

## AIR LESSON 10

### AIM

79. The Phase I Proficiency Flight Test shall evaluate the flying ability of the IC from the rear seat of the glider. Refer to the Progress Card and Flight Test Report, Chapter 3, Annex A.

### MOTIVATION

80. The IC advancing to Phase II must demonstrate above-average flying skills.

### BRIEFING

81. The IC shall be briefed on the sequences to be flown by the CFI or the delegated testing officer.

### AIR LESSON OUTLINE - RELEASE HEIGHT OF 2 500 FEET AGL

82. The IC shall perform the take-off, tow, release, all planned sequences, circuit and landing. The IC shall demonstrate a PL 4 flying ability from the rear seat.

**PHASE II – INTRODUCTION**

83. **Objective.** The IC shall be capable of instructing all exercises in the Flights/Air Lessons of the Glider Pilot course, Chapter 3. Each Phase II Flight/Air Lesson shall include:

a. a Mission Outline,

b. the air exercise(s), including demos and instruction,

c. a Post-Flight Debriefing and review, and

d. a progress log of the candidate's performance.

84. **General Information.** The Phase II flying syllabus utilizes Flights/Air Lessons from the Glider Pilot Course, Chapter 3. Therefore, ICs will have the opportunity to prepare lesson plans and instruct, in proper sequence under supervision and training, most of the Student Glider Pilot Course. Consequently, successful graduates will have a solid foundation of the Student Glider Pilot Course before being assigned their first ab initio student glider pilot.

85. Phase II Flights 1 covers Air Lesson 7 twice. For the first flight of this flight the staff instructor shall give the briefing and fly the lesson from the back seat. For the second flight, the IC shall give the briefing and fly the lesson from the back seat. The purpose of the demo flight is to provide the IC with the opportunity to experience the sequencing and "patter" necessary to teach an air lesson without the pressure of actually instructing the lesson.

86. For the remaining Flights/Air Lessons, IC/instructor responsibilities are as follows:

a. **IC's Responsibilities.** The following are the IC's responsibilities:

(1) give at least four Pre-Flight Briefs to a staff instructor

(2) give Mission Outline to the “student” for each flight,

(3) teach applicable air lessons and critique of the "student's" efforts, and

(4) give Post-Flight Debriefing of each lesson as flown by the "student".

b. **Staff Instructor's Responsibilities.** The following are the Staff Instructor's responsibilities:

(1) flying duties as assigned by the IC, simulating as closely as possible the skill level appropriate to a student glider pilot at that level of training,

(2) post-flight debriefing of IC's pre-flight briefing, flying demos and instruction, and post-flight debriefing, and

(3) completion of a Progress Card in accordance with Figure 4-1-5 following each Phase II Pre-Flight Brief.

(4) completion of a Progress Card In accordance with Figure 4-1-6 following each Phase II Flight / Air Lesson.

87. All Phase II Flights/Air Lessons shall be completed prior to the Instructor Category Flight Test.

88. **Safety Limits.** While Phase II is designed to teach the candidate how to instruct an ab initio student glider pilot, emphasis must be given to the issue of safety limits. To that end, the IC must demonstrate the ability to allow the student to make mistakes without exceeding the safety limits. Every Glider Instructor must be able to recognize when the learning objective has been lost and the safety margin is in jeopardy, and to take immediate, positive action to prevent risk to personnel and equipment.

## PHASE II COURSE OUTLINE

89. **Progress Cards.** Progress Cards for each lesson of Phase II are mandatory. Phase II Progress Cards (Figure 4-1-4 and 4-1-5) shall be the standard used.

90. **Standards and Definitions**. Proficiency Level (PL) standards, detailed in Figure 4-1-6, shall be assigned to the various sequences of each Air Lesson. An OFR shall be assigned to each Air Lesson. OFR definitions are detailed in Figure 4-1-7.

91. **Phase II Flight/Air Lesson Summary Chart**. The following is applicable**:**

| Flight No. | Air Lesson | Exercise | Release (ft AGL) | Time |
|---|---|---|---|---|
| 1 | 7 | Basic Stalls<br>(Demo by Instructor – IC in front seat) | 2 500 | 0:15 |
| 2 | | Basic Stalls | 2 500 | 0:15 |
| 3 | 9 | Steep Turns and Stalls In Turns | 2 500 | 0:15 |
| 4 | 10 | Slipping | 2 500 | 0:12 |
| 5 | 12 | Incipient Spins and Drift Illusions | 3 000 | 0:12 |
| 6 | NA | Staff/Instructor Candidate Mutual Proficiency Flight | 3 000 | 0:18 |
| 7 | 13 | Spins and Spirals | 3 000 | 0:18 |
| 8 | 15 | Circuit Modification (High) | 1 500 | 0:10 |
| 9 | 17 | Circuit Modification (Low) | 1 500 | 0:12 |
| 10 | NA | Review | 3 000 | 0:18 |
| 11 | 20 | Launch Emergency, Modified Circuit | 800 | 0:05 |
| 12 | 21 | Launch Emergency, Downwind landing | 400-600 | 0:04 |
| 13 | 22 | Launch Emergency | AR | 0:04 |
| 14 | 23 | General Progress Check | 3 000 | 0:18 |
| 15 | NA | Staff/Instructor Candidate Mutual Proficiency Flight | 3 000 | 0:18 |
| 16 | 2 | Attitudes and Movements | 2 000 | 0:12 |
| 17 | 4 | Air Tow, Straight Glide and Medium Turns | 2 000 | 0:12 |
| 18 | 5 | Take-off, Flight Management, Secondary Effect of Controls and Circuit Procedures | 2 000 | 0:12 |
| 19 | 6 | Gentle Turns, Approach and Landings | 2 000 | 0:12 |
| 20 | NA | Simulated Rope Break<br>(selected surprise scenario on any flight) | 400/600 | 0:04 |
| 21 | NA | Review | 3 000 | 0:18 |
| 22 | NA | Instructor Category Flight Test | 3 000 | 0:18 |
| **Total Phase II: 20 Flights 4:06 Flying Hours (Dual Instruction)** | | | | |

Figure 4-1-4 Phase II Flight/Air Lesson Summary Chart

**PHASE II FLIGHTS/AIR LESSONS**

92. **Flights 1 and 2, Air Lesson 7 Basic Stalls.** The reference for these flights is Chapter 3, Glider Pilot Course, Air Lesson 7. This Air Lesson consists of two flights. The first flight is a demo by the instructional staff with the IC in the front seat. The second flight is an instructional flight with the IC in the rear seat.

93. **Flight 3, Air Lesson 9 Steep Turns and Stalls in Turns.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 9.

94. **Flight 4, Air Lesson 10 – Slipping.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 10.

95. **Flight 5, Air Lesson 12 – Incipient Spins and Drift Illusions.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 12.

96. **Flight 6 - Staff/Instructor Candidate Mutual Proficiency Flight.** This flight is designated as an un-graded mutual proficiency flight for the Instructor Candidate to improve or maintain their personal proficiency. This flight will not be graded or awarded an OFR. The Instructor Candidate shall fly the entire mission from the rear seat and the Standards Pilot shall observe the flight, providing critique where applicable. The Instructor Candidate will log this mission as dual time, and the Standards Pilot will log this mission as instructor time.

97. **Flight 7, Air Lesson 13 – Spins and Spirals.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 13.

98. **Flight 8, Air Lesson 15 – Circuit Modification (High).** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 15

99. **Flight 9, Air Lesson 17 – Circuit Modification (Low).** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 17.

100. **Flight 10, Review.** The following are applicable:

a. The purpose of this flight is to review weak sequences or it may be used to repeat a marginal lesson.

b. IC should be briefed by the instructor on weak sequences and then given sufficient time to properly prepare.

101. **Flight 11, Air Lesson 20 Launch Emergency, Modified Circuit.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 20.

102. **Flight 12, Air Lesson 21 Launch Emergency, Downwind Landing.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 21.

103. **Flight 13, Air Lesson 22 Launch Emergency.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 22.

104. **Flight 14, Air Lesson 23 General Progress Check.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 23.

105. **Flight 15 - Staff/Instructor Candidate Mutual Proficiency Flight.** This flight is designated as an un-graded mutual proficiency flight for the Instructor Candidate to improve or maintain their personal proficiency. This flight will not be graded or awarded an OFR. The Instructor Candidate shall fly the entire mission from the rear seat and the Standards Pilot shall observe the flight, providing critique where applicable. The Instructor Candidate will log this mission as dual time, and the Standards Pilot will log this mission as instructor time.

106. **Flight 16, Air Lesson 24 Attitudes and Movements.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 2. Attitudes and Movements are the building blocks to all other manoeuvres performed in gliders. ICs must understand this rationale and the requirement for emphasis on this Air Lesson during instructional flights for ab initio students.

107. **Flight 17, Air Lesson 4 - Air Tow, Straight Glide and Medium Turns.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 4. ICs must understand how quickly an ab initio student can inadvertently place the glider in an unsafe position during tow, and therefore the requirement for vigilance in order to take control when necessary. Limits of the box, tow aircraft upset, slack rope procedures and attitude flying must be stressed during this Air Lesson.

108. **Flight 18, Air Lesson 5 Take Off, Flight Management, Secondary Effects of Controls and Circuit Procedures.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 5.

109. **Flight 19, Air Lesson 6 Gentle Turns, Approach and Landing.** The reference for this flight is Chapter 3, Glider Pilot Course, Air Lesson 6.

110. **Flight 20, Surprise Simulated Rope Break.** This flight may be flown at any time in Phase II. The staff instructor shall select the most appropriate time without informing the IC. The goal is to ensure that the IC can safely handle the situation and allow the simulated student pilot to learn as much as possible from the incident. Student pilot skills should be commensurate with that expected for the lesson that was being taught prior to the simulated rope break.

111. **Flight 21, Review.** The following are applicable:

a. The purpose of this flight is to review weak sequences or it may be used to repeat a marginal lesson.

b. IC should be briefed by the instructor on weak sequences and then given sufficient time to properly prepare.

112. **Flight 22 Instructor Category Flight Test.** The following are applicable:

a. **Objective.** The Phase II Instructor Category Flight Test shall evaluate the aircraft handling, decision-making, and instructional abilities of the IC.

b. **Motivation.** Above-average skills in all areas of flying and instructional technique are required of gliding instructors employed in the ACGP. A high standard of performance during this flight test is the basis for the recommendation for the glider instructor rating submitted to TC for approval.

c. **Briefing.** The IC shall be fully briefed by the testing pilot on the sequences to be flown and/or instructed and the responsibilities of the IC during the test.

d. **Exercise.** The IC shall conduct the flight test as briefed and shall be responsible for providing a pre-flight briefing; demonstrating, instructing, monitoring and correcting all air exercises, as required; and debriefing the "student".

e. **Standard.** In order to be recommended as a glider instructor in accordance with TC regulations, the IC shall perform both rear seat flying demos and instructional duties consistently well and without hesitation. Additionally, all flying and instructional tasks shall be performed without assistance and with only minor errors.

f. **Release Height.** The release height shall be appropriate with the mission flown.

**NOTE**

An Instructor Flight Test Report shall be completed In accordance with Figure 4-1-4.

**PHASE II AIR LESSON PROGRESS CARD / FLIGHT TEST REPORT**

**NAME** ________________________________ **DATE** _______________________

**AIR LESSON No.** _______________________ **FLT No.** _____________________

**INSTRUCTOR** ___________________________

| MISSION OUTLINE | PL | NOTES |
|---|---|---|
| Aim | | |
| Sequence | | |
| Confirmation | | |
| Conditions | | |
| Voice and Manner | | |
| Use of Patter Card | | |
| **AIR LESSON** | **PL** | **NOTES** |
| Review | | |
| EDIC | | |
| Trip Planning | | |
| Material Coverage | | |
| Fault Analysis | | |
| Safety Limits | | |
| Voice and Manner | | |
| Random Air Lesson | | |
| **POST-FLIGHT DEBRIEFING** | **PL** | **NOTES** |
| Coverage | | |
| Fault Analysis | | |
| Voice and Manner | | |
| Progress Book (PL, OFR and cards) | | |

. ↑ **PL = Proficiency Level**

**PL = Proficiency Level ↓**

| HANDLING AND AIRMANSHIP | PL | NOTES |
|---|---|---|
| Flying Proficiency | | |
| Airmanship | | |

| OVERALL FLIGHT RATING (OFR) | U | M | –AS | AS | SE |
|---|---|---|---|---|---|

| STAFF INSTRUCTOR'S OR FLIGHT EXAMINER'S INITIALS | | IC'S INITIALS | |
|---|---|---|---|

Figure 4-1-5 Phase II Air Lesson Progress Card / Flight Test Report

**PHASE II PRE-FLIGHT BRIEFING PROGRESS CARD**

**NAME** ______________________________ **DATE**____________________

**AIR LESSON No.** _____________________ **FLT No.** _____________________

**INSTRUCTOR**_________________________

| PRE-FLIGHT BRIEFING | PL | NOTES |
|---|---|---|
| Preparation | | |
| Review | | |
| Voice and Manner | | |
| Visual Aids/Training Aids | | |
| AMOL | | |
| Content | | |
| Student Participation | | |
| Use of Instructor Guide/ Air Lesson | | |
| Use of Progress Book | | |
| Flight Outline | | |

| OVERALL RATING (OR) | U | M | —AS | AS | SE |
|---|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| STAFF INSTRUCTOR'S OR FLIGHT EXAMINER'S INITIALS | | | IC'S INITIALS | |

Figure 4-1-6 Pre Flight Brief Progress Card

**PROFICIENCY LEVEL (PL) DEFINITIONS**

| PL | PL DEFINITION |
|---|---|
| **1** | **The Instructor Candidate** was not capable of completing the task. Trainee required verbal and/or physical assistance to avoid making major errors. Further instruction is required |
| **2** | **The Instructor Candidate** completed the task but required verbal and/or minor physical assistance to avoid making major errors. Further practice is required |
| **3** | **The Instructor Candidate** completed the task, making only minor errors. Trainee required minimal verbal cues to analyze and/or correct errors. |
| **4** | **The Instructor Candidate** completed the task without assistance, making only minor errors. Trainee was able to self-analyze and correct errors. |
| **5** | **The Instructor Candidate** completed the task without assistance and without error. |

Figure 4-1-7 Definitions –Proficiency Levels

**OVERALL FLIGHT RATING (OFR) DEFINITIONS**

| OFR | DEFINITION |
|---|---|
| **Unsatisfactory** | The IC's overall performance did not meet the level required. The level was not met on two or more exercises or significant regression was shown. An Extra Dual is mandatory. |
| **Marginal** | The IC was unable to achieve the level required by the TP on one task.<br>An Extra Dual is not required after a marginal flight, but the failed sequence must be flown to the required standard during the next flight. If the IC fails to meet the required standard on any sequence on the next flight, then that flight will be assessed as Unsatisfactory. |
| **Achieved Standard with Difficulty** | The IC experienced difficulty achieving the minimum levels required by the TP. |
| **Achieved Standard** | The IC performed all tasks to the level required by the TP. |
| **Standard Exceeded** | The IC performed the majority of the tasks to a level higher than required by the TS, and **easily** performed the remaining tasks to the level required by the TS. |

Figure 4-1-8 Definitions – Overall Flight Ratings

## PHASE II PROFICIENCY LEVEL STANDARDS

| FLIGHT NUMBER | 1 | 2 | 3 | 4 | 5 | 7* | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 16* | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRIEF NUMBER** | | 1 | | | 2 | | | 3 | | | 4 | | | 5 | | | | | 7 | |
| **AIR LESSON (FROM CH 3)** | 7D | 7 | 9 | 10 | 12 | 13 | 15 | 17 | R | 20 | 21 | 22 | 23 | 2 | 4 | 5 | 6 | R B | R | T |
| **PRE-FLIGHT BRIEF** | | | | | | | | | | | | | | | | | | | | |
| Preparation | | 2 | | | | | | 3 | | | | | | 4 | | | | | | |
| Review | | 2 | | | | | | 3 | | | | | | 4 | | | | | | |
| Voice and Manner | | 2 | | | | | | 3 | | | | | | 4 | | | | | | |
| Visual Aids /Training Aids | | 2 | | | | | | 3 | | | | | | 4 | | | | | | |
| AMOL | | 2 | | | | | | | | | 3 | | | | | | 4 | | | |
| Content | | 2 | | | | | | | | | 3 | | | | | | 4 | | | |
| Student Participation | | 2 | | | | | | | | | 3 | | | | | | 4 | | | |
| Use of Instructor Guide | | 2 | | | | | | 3 | | | | | | 4 | | | | | | |
| Use of Progress Book | | 2 | | | | | | 3 | | | | | | 4 | | | | | | |
| Flight Outline | | 2 | | | | | | 3 | | | | | | 4 | | | | | | |
| **MISSION OUTLINE** | | | | | | | | | | | | | | | | | | | | |
| Aim | | 2 | | | | | | | | 3 | | | | | 4 | | | | | |
| Sequence | | 2 | | | | | | | | | | | | 3 | | | | | 4 | |
| Confirmation | | 2 | | | | | | | | | | | | 3 | | | | | 4 | |
| Conditions | | 2 | | | | | | | | 3 | | | | | 4 | | | | | |
| Voice and Manner | | 2 | | | | | | | | 3 | | | | | 4 | | | | | |
| Use of Patter Cards | | 2 | | | | | | | | 3 | | | | | 4 | | | | | |
| **AIR LESSON** | | | | | | | | | | | | | | | | | | | | |
| Review | | 2 | | | | | 3 | | | | | | 4 | | | | | | | |
| EDIC | | 2 | | | | | | 3 | | | | | | | | 4 | | | | |
| Mission Planning | | 2 | | | | | | | 3 | | | | | | | | | | 4 | |
| Material Coverage | | 2 | | | | | | | 3 | | | | | | | | | | 4 | |
| Fault Analysis | | 2 | | | | | | | | | | 3 | | | | | | | 4 | |
| Safety Limits | | | 2 | | | | | | | | | | 3 | | | | | | 4 | |
| Voice and Manner | | 2 | | | | | | | 3 | | | | | | 4 | | | | | |
| Random Air Lesson | | | | 2 | | | | | 3 | | | | | | | 4 | | | | |
| **POST FLIGHT** | | | | | | | | | | | | | | | | | | | | |
| Coverage | | 2 | | | | | | | | | | 3 | | | | | | | 4 | |
| Voice and Manner | | 2 | | | | 3 | | | | | | | | | 4 | | | | | |
| Progress Book | | 2 | | | | | | | | 3 | | | | | | | 4 | | | |
| Fault Analysis | | 2 | | | 3 | | | | | | | | | | | | | | 4 | |
| **HANDLING AND AIRMANSHIP** | | | | | | | | | | | | | | | | | | | | |
| Flying Proficiency | | 3 | | | | | | | | | | | | | 4 | | | | | |
| Airmanship | | 3 | | | | | | | | | | | | | 4 | | | | | |

***** NOTE: Flight Numbers 6 and 15 are the un-graded mutual flights.  This chart does not apply to those flights.

Figure 4-1-9 Phase II Flying and Mission Outline PL Standards

**ACADEMIC TRAINING**

113. Ground school is integral to the Glider Instructor Course. Many concepts developed during practical training are further reinforced in the classroom environment. Core topics shall consist of glider handling, SOPs, emergency procedures, instructor development, student evaluation and assessment, flight safety and decision making. Emphasis shall be placed on applying knowledge of aircraft performance, SOPs and airmanship to achieve a high level of flight safety.

114. Due to the nature of the course, a high level of threshold knowledge is expected prior to commencement of the course. In order to assure this, a Programmed Instructional Package (PIP) shall be completed prior to arrival on the Glider Instructor Course. The PIP shall cover the following subjects: Air Regulations/Air Law, Theory of Flight, Meteorology, Glider Handling, Air Navigation, Radio Theory and Flight Operations. An EC confirming knowledge of these subjects will be administered when the course begins. The pass mark for the EC will be 75%, except for the Glider Handling portion which will have a pass mark of 90%.

115. Formal lecture periods shall be approximately 50 minutes with suitable breaks between consecutive lectures. A full day of ground training should consist of no more than six formal lecture periods; the remaining periods of that working day should be scheduled for administration or supervised study.

| Subject | Periods | Hours |
|---|---|---|
| Instructor Development | 14 | 11:40 |
| Flight Safety and Pilot Decision Making | 3 | 2:30 |
| PIP EC and Review | 2 | 1:40 |
| **TOTAL MANDATORY PERIODS** | **19** | **15:50** |

Figure 4-1-10 Academic Training Summary

**INSTRUCTOR DEVELOPMENT**

116. **Periods Allotted.** There shall be 14 periods allotted which will include: 8 formal lectures, a final exam and 5 periods for the completion of the IC's Practical Ground School Lectures.

117. **Main References.** The following references are applicable:

a. Chapter 3, Glider Pilot Course;

b. Central Flying School Flight Instructor's Handbook A-PD-050-001/PF-001; and

c. Chapter 4, Annex A, Additional Instructional Notes.

119. **Objectives.** The IC shall be acquainted with the Qualification Standards, the manuals and the methods that are employed in during instruction in both the ground school and the air lesson instructional tasks.

120. **General Directive.** The IC shall read the main references prior to the completion of the course, because the information and philosophy are pertinent to flying instructors on all types of aircraft in the various training systems. The final examination shall include questions on instructional technique and will be completed prior to the beginning of Phase II Flying Training. The presentation of the IC's Practical Ground School Lectures may be conducted at any time, including during Phase II, once the Instructional Development test has been completed.

121. **Lecture 1. Instructional Theory I**

a. **Role and Responsibilities of the Glider Instructor.** The IC must be able to:

(1) describe the role of an instructor; and

(2) describe the attitudes of an effective instructor;

(3) describe the student instructor relationship.

b. **Dealing With Students.** The IC must be able to:

(1) identify individual personality traits;

(2) recognize key body language;

(3) identify emotional escape mechanisms; and

(4) describe how to deal with student behaviour.

122. **Lecture 2. Instructional Theory II**

a. **Instructional Technique.** The IC must be able to:

(1) explain how each Principle of Instruction (ICEPAC) contributes to successful achievement of lesson objectives;

(2) describe the various forms of verbal support (CREST);

(3) describe the qualities of good questioning technique;

b. **The Learning Process.** The IC must be able to:

(1) describe the four patterns of learning (GRAT);

(2) describe the seven laws of learning (PERRIER);

(3) explain the concept of developmental teaching; and

(4) explain motivational effects on learning.

123. **Lecture 3. Ground Lesson Preparation.** The IC must be able to:

a. describe the components and content of a Lesson Plan;

b. explain the Confirmation of Learning;

c. Prepare the Instructional Environment;

d. Describe the various types of questions and their specific uses;

e. Describe the various training aids and their specific uses; and

f. Prepare a lesson plan.

124. **Lecture 4. Flight Line Lesson Preparation and Briefs.** The IC must be able to:

a. Prepare an Air Lesson;

b. Deliver an Air Lesson Brief;

c. Deliver a Mission Outline Brief (ASCC)

(1) Aim of the mission (tasks and levels);

(2) Sequence to be flown (instructor/student responsibilities);

(3) Confirmation of student knowledge; and

(4) Conditions of the day applicable to the flight (surface and upper winds, active runway, alternate runways, etc).

125. **Lecture 5. The Air Lesson and Debrief.** The IC must be able to:

a. Conduct an Air Lesson;

b. Conduct an effective Post Flight debrief;

c. Explain both Flight Safety and Environmental Limitations placed on the aircrew during flight; and

d. Discuss airsickness.

126. **Lecture 6. Performance Levels, Overall Flight Ratings and Grading Errors.** The IC must display a thorough understanding of:

a. The five Proficiency Levels (PL) definitions, their application, and the relationship between Flights/Air Lessons and PL Standards; and

b. The Overall Flight Ratings (OFR) System in relation to Flights/Air Lessons and PL Standards; and

c. Grading Errors and how they detract from correct Grading methods.

127. **Lecture 7. Progress Books/ Progress Cards / Record Keeping / Monitoring Solo Students.** The IC shall:

a. thoroughly understand and practically demonstrate the use of the Progress Book as detailed in Chapter 3, Annex A, including Progress Cards for various flights (Instructional Flights – blue, Extra Duals – red, Solo Flights – white and Review Flights – green), the proper method of writing Instructor's Comments, and daily completion of the Student Activity record;

b. be able to complete other forms of record keeping used by the RGS, and understand the need for timely completion of all record keeping and administrative duties; and

c. Thoroughly understand the methods involved in monitoring solo students.

128. **Lecture 8, Unsatisfactory Course Progress and Course Failures**

The IC must be display familiarity with:

(1) Qualification Standards and The Glider Pilot Course QS;

(2) 1 CAD Order 5-212;

(3) Review Flight Process;

(4) Unsatisfactory Course Progress;

(5) Independent Reviews;

(6) Independent Review Boards;

(7) Progress Review Boards; and

(8) Course Failure.

129. **Lecture 9 Instructional Development Test.** The pass mark shall be 75 per cent corrected to 100 per cent in a face-to-face debriefing.

130. **Classes 10-14. Practical Ground School Lectures**. The IC must be able to prepare and deliver a Ground School Lecture. Lessons taught by Candidates should last twenty minutes, and shall be a portion of a Glider Pilot Course ground school lesson, as selected by course staff.

**FLIGHT SAFETY AND PILOT DECISION MAKING IN THE TRAINING ENVIRONMENT**

**Periods Allotted.** There shall be 3 periods allotted.

131. **Main References.** The following are applicable:

a. A-GA-135-001/AA-001, Canadian Forces Flight Safety Manual;

b. ACGP Accident/Incident Reports; and

c. Transport Canada Pilot Decision Making Package

132. **Objectives.** The IC shall be familiar with the CF Flight Safety system, the Pilot Decision Making Process, and be exposed to a wide variety of previous ACGP Flight Safety incidents and accidents.

133. **Subject Outline.** The following are applicable:

a. **Lecture 1. Flight Safety System.** The IC shall become familiar with the CF Flight Safety System, as follows:

(1) organization;

(2) purpose;

(3) reporting; and

(4) responsibilities.

b. **Lecture 2. Pilot Decision Making**. The IC will become familiar with the following subjects:

(1) the decision making process, and the significant impact of decision making skills on flight safety; and

(2) elements of good decisions:

i. timing,

ii. evaluation of situation, and

iii. based on knowledge, skill, and experience;

iv. stress and managing risk;

v. process of self-evaluation

vi. hazardous attitudes and their antidotes; and

vii. case study of ACGP incidents/accidents to reveal examples of flaws in decision making.

c. **Lecture 3. ACGP Accident/Incident Reports.** Mindful of the Pilot Decision Making Process, the IC shall review accidents/incidents, including:

(3) off-field landings resulting from channelized instructor attention;

(4) tow aircraft upset;

(5) poorly executed simulated cable/rope breaks;

(6) hard landings and landing short;

(7) open canopy during flight, and any other category of flight safety occurrence; and

(8) incorrect circuit modification due to "perceived" or real sink.

## SECTION 2

## LAUNCH CONTROL OFFICER (LCO) COURSE

### GENERAL

1. This Course is designed to determine the ability of the candidate to safely, effectively and efficiently supervise and control flying operations at either a RGS or glider famil site.

2. The training that is discussed in the paragraphs that follow is a combination of self-study, ground school presentations and discussions, and supervised practical training at an active gliding site.

3. The course is designed specifically for glider instructors, tow pilots and selected glider famil pilots.

### CANDIDATE PREREQUISITES

4. LCO Course candidate prerequisites are as follows:

   a. a Glider Instructor or Tow Pilot qualification; or

   b. a Glider Familiarization Pilot qualification providing that:

      (1) the candidate has acquired not less than 20 hours PIC in gliders including not less than 125 flights; or

      (2) The candidate has acquired not less than 10 hours PIC in gliders including not less than 200 flights.

### REFERENCES

5. LCO Course references are as follows:

   a. A-CR-CCP-242/PT-005, Air Cadet Gliding Program Manual; and

   b. Regional and local flying orders and SOPs, as applicable.

### COURSE CONTENT

6. The course shall be conducted in two phases:

   a. **Phase 1.** Ground school instruction consisting of:

      (1) four lectures, each approximately 50 minutes in length;

      (2) an open book examination; and

      (3) a closed book examination.

   b. **Phase 2.** Field training consisting of:

      (1) Two supervised launch control training periods, under the direction of an experienced LCO designated by the RCA Ops O; and

      (2) One period of assessed launch control practice, under the supervision of an experienced LCO designated by the RCA Ops O, to confirm the candidate's ability and proficiency to conduct LCO duties.

**NOTE**

A period of field training shall consist of at least 10 launches and recoveries.

## GROUND SCHOOL INSTRUCTION PHASE

7. Lecture details are as follows:

a. **Lecture 1.** Lecture 1 shall consist of a review of Chapter 2, Standard Operating Procedures, covering gliding operations and the applicable launch procedures (air tow, winch launch and/or auto launch).

b. **Lecture 2.** Lecture 2 shall consist of a review of Chapter 2, Standard Operating Procedures, covering all emergency procedures for gliders, tow aircraft, winch launch and auto launch, as applicable.

c. **Lecture 3.** Lecture 3 shall consist of:

(1) a detailed description of LCO duties and responsibilities, with specific reference to pre-flight briefings, the monitoring of circuit traffic and the provision of advice and assistance to airborne aircraft;

(2) a discussion of LCO actions concerning variable weather and wind conditions, runway change procedures, out-of-limit (wind) recoveries and unacceptable circuit procedures by famil pilots;

(3) a review of selected Flight Safety glider incidents which may have been prevented through timely LCO intervention, e.g. disorientation, perceived sink, modified circuits, etc.; and

(4) a discussion of concerns and potential problems associated with low time glider pilots, e.g. the necessity for very close supervision, detailed briefings and debriefings and the application of appropriately stricter guidelines and procedures as a function of experience.

d. **Lecture 4.** Lecture 4 shall consist of:

(1) a review of initial response actions following a Flight Safety occurrence, including emergency response and notification, control of personnel, recovery of airborne gliders/tow aircraft, etc.; and

(2) a review of follow-on and follow-up actions including protection of evidence, impounding of documents, witness statements, notification of DND and TC authorities, etc.

8. Examinations shall be conducted as follows:

a. an open-book examination to confirm knowledge of information presented or discussed during the lecture program; and

b. a closed-book examination to confirm essential information required by the candidate for the safe execution of flying operations, as follows:

(1) glider emergency procedures,

(2) glider reaction to tow aircraft emergencies,

(3) glider crosswind limitations, and

(4) initial LCO responses to tow aircraft or glider Flight Safety occurrences.

**NOTE**

The pass mark for each examination shall be 90 per cent corrected to 100 per cent in a face-to-face debriefing with the LCO candidate.

**FIELD TRAINING PHASE**

9. Field training details are as follows:

a. Two supervised periods during which the candidate is provided assistance while conducting all phases of launch control and associated LCO duties. During these periods, emphasis shall be placed on the following:

(1) aircrew and recovery crew briefings;

(2) cadet supervision procedures;

(3) launch personnel training;

(4) weather monitoring;

(5) the resolution of conflicting itinerant or local traffic;

(6) runway change procedures;

(7) out-of-limit (wind) recoveries;

(8) tow rope change procedures; and

(9) initial and follow up responses to Flight Safety occurrences.

b. One period of assessed LCO duties during which the candidate shall demonstrate the ability to perform the responsibilities of an LCO without assistance.

**COURSE DOCUMENTATION**

10. Course documentation shall consist of:

a. the open book examination;

b. the closed book examination; and

c. written assessment of each practical training period.

**RECOMMENDATION FOR QUALIFICATION**

11. Following successful LCO Course completion, a recommendation that the candidate be certified as an LCO may be made in writing to the RCA Ops O. Recommendation documentation shall include:

a. the results of both examinations;

b. copies of the assessment sheets for the practical training periods; and

c. a written recommendation by the LCO Course Officer.

**QUALIFICATION CERTIFICATION**

12. The RCA Ops O, as the authorizing officer for all ACGP qualification certifications, shall confirm in writing that the qualification is approved.

13. The RCA Ops O in the Pilot Training Record shall hold such certification and supporting recommendation documentation.

**LCO CURRENCY STANDARDS**

14. An LCO who has not performed LCO duties for the previous two years shall undergo a refresher course consisting of:

a. at least one review period covering the content of the lecture program; and

b. one practical period as LCO at an active RGS or glider famil site, under the supervision of an experienced LCO, to confirm the ability and proficiency of the candidate.

15. Following successful completion of the refresher course, a written recommendation for qualification re-certification shall be forwarded to the RCA Ops O.

16. Re-certification of the qualification may be granted by the RCA Ops O. The written recommendation and the written certification by the RCA Ops O shall be held on the Pilot Training Record by the RCA Ops O.

## ANNEX A

## ADDITIONAL INSTRUCTIONAL NOTES

### GENERAL

1. Flying instruction is one of the most important training roles in the Air Cadet Organization. Young air cadet student glider pilots must be trained to the highest possible standard, over a relatively short six-week period, with full regard to the safety of student and machine. Considering the disastrous result of poor instruction, anything less is unacceptable. Glider Instructors, therefore, must be both excellent technicians in the art of flying and effective teachers in imparting that knowledge to their students.

### DELIVER A MISSION OUTLINE BRIEF (ASCC)

2. The instructor shall present a mission outline brief (ASCC) to the student shortly before the flight. The briefing shall last from 3-5 minutes and shall contain the following items:

| | |
|---|---|
| **AIM** | Aim of the mission (tasks and levels): describe the tasks to be flown and the proficiency levels to be attained for the upcoming mission; |
| **SEQUENCE** | Sequence to be flown (instructor/student responsibilities): ensure who will be flying which tasks/sequences; |
| **CONFIRMATION** | Confirmation of student knowledge: confirm through questioning that the student has retained the knowledge required (from the pre-flight brief) to accomplish the mission; and, |
| **CONDITIONS** | Conditions of the day applicable to the flight (surface and upper winds, active runway, alternate runways, etc): brief or have the student brief the instructor on the weather conditions that will affect the mission. |

### SAFETY LIMITS OR HOW FAR TO LET A STUDENT GO

3. This is the instructor's dilemma. Consider the following:

a. **Allow the student time to analyze and correct errors.** The instructor will probably pick up a deviation (a need for correction) before the student will. Immediately directing the student to make a correcti on will violate this first premise. Allow students an opportunity to correct mistakes themselves before doing it for them, as long as safety is not compromised.

b. **Do not allow the students to exceed their capabilities or deviate from normal parameters if the learning value has been lost.** The student does not learn anything by maintaining airspeeds lower than the correct ones. Even if the situation is within safety of flight parameters, there will always be a point where the student must correct a consistent error.

c. **Do not allow the student to go to the extent that someone else’s training time suffers.** This concept is readily apparent in a busy traffic pattern. Do not let the student deviate from the pattern such that it causes another student to alter his or her circuit.

d. **Do not allow the student to exceed the limits of the glider.** Glider limits can be exceeded without warning, especially during manoeuvres such as unusual attitudes, spin recoveries and spiral dives. Instructor vigilance is very important.

e. **Do not allow the student to do anything illegal or unsafe.** Excessive deviations during tow, poor altitude management in the training areas and large deviations in the circuit can place the glider in a situation that may preclude the instructor in effecting a safe recovery. The execution of prohibited manoeuvres shall not be tolerated.

**AIRSICKNESS**

4. Airsickness is the most common Aeromedical problem in flying training. While considered by most to be solely a medical problem to be handled by the Flight Surgeon, the Glider Instructor will sees the problem first, and how it is handled may have a profound effect on the eventual outcome.

5. It is estimated that one or two of every five pilot trainees will suffer from minor airsickness symptoms sufficient to interfere with performance in the air and that one or two of every 20 pilot trainees will have a major problem with airsickness, which may seriously jeopardize their continued training. How the problem is handled by the Glider Instructor and the Flight Surgeon can make the difference between a minor and a major problem.

6. A Glider Instructor does not always recognize that a trainee is suffering from airsickness, and, because airsickness is seen by many to be a moral weakness, the student may not advise the instructor of feeling sick until it can no longer be disguised. Airsickness does not always culminate in severe nausea and vomiting, but can be confined to headache, stomach upset, mild nausea, and general discomfort, which may appear to the Glider Instructor to be lack of interest, preoccupation, lack of motivation, or simply poor performance on the student's part. While one cannot excuse poor performance or lack of motivation for any reason, both can be associated with airsickness. In nearly all cases, real airsickness is treatable, and it is therefore important to make the distinction between lack of motivation and poor performance caused by airsickness, and lack of motivation and poor performance which is caused by some other reason or situation.

7. There are some important **DO's** and **DON'T's** that the Glider Instructor should keep in mind:

a. **DO** recognize that airsickness is a common and natural problem. The two major components that contribute to it, motion and anxiety, are inherent in the flying training environment and anyone can be made airsick under certain conditions. In the past, an aerobatic team leader suffered severely from airsickness in training. Space sickness, an analogue of airsickness, is a major problem even in the highly selected cadre of astronauts and cosmonauts.

b. **DO** be prepared to discuss the problem in a relaxed and understanding fashion with the student after a flight, if he or she has been airsick. **DON'T** discuss the problem before flights or during the flight. There is good evidence that over concern with, or anticipation of, symptoms leads to a more rapid onset of sickness.

c. **DON'T** demonstrate any aggressive manoeuvres on the first couple of flights, even if the student asks for it. Some students feel that they are obligated to ask for such manoeuvres even if they don't feel up to it. If they are made sick on the first couple of flights, this may set the scene for a continuing problem.

d. **DON'T** let a student go flying smelling of vomitus!

e. **DO** observe the student carefully during the pre-solo trips for signs of airsickness, such as heavy breathing, sweating, preoccupation or lack of interest, reduced look-out, and otherwise unexplainable reduced performance. If any of these symptoms are noticed, **DO** ask if the student is feeling all right. **DON'T** ask if the student is feeling sick. If the student is asked to concentrate on and report symptoms, the problem may be aggravated.

f. If the student is feeling sick**, DO** ensure that it is simply a case of airsickness. **DON'T** assume that all sickness in the air is airsickness. If you are unsure, land immediately.

g. When you are satisfied that the student is simply airsick, **DO** attempt to continue with the flight modified if necessary. The more flight time you can give the student, the more chance there will be to adapt. **DON'T** continue with the flight if the student is unable to fly the glider or take instruction even at a reduced efficiency. Some students who get airsick may perform effectively up to the moment that they vomit and, immediately after vomiting, carry on with essentially no ill effect; others may be incapacitated and then relieved by vomiting; still others may be severely incapacitated and unable to continue without ever vomiting. The Glider Instructor will have to make the decision as to which category the student fits. If it is possible, **DON'T** carry on until he or she vomits. **DO** attempt to get the student to carry out the recovery without having to give up control. This will end the trip on a positive rather than a negative note. If the student is able to continue and perform, even at reduced efficiency, this will give the confidence that the problem of airsickness can be dealt with.

h. **DO** guard against the student hyperventilating, a problem which is commonly associated with airsickness and which can produce a real physiological emergency.

i. **DO** give the airsick student control of the glider. **DO** direct the student to fly straight and level. **DO** give the student a mental task on which to concentrate, such as reciting a check or answering questions about the glider; a demand of this sort redirects mental activity and tends to alleviate the symptoms of airsickness. **DON'T** overstress the student, since this may increase the anxiety component and aggravate the problem.

j. **DO** tell the student to stop moving his or her head and to fix his or her gaze on the distant horizon, at least temporarily. Advise that look-out will be momentarily excused. Advise the student to hold his or her head steady and to carry out visual tasks with eye movements only. **DO** advise the student that in future when doing look-out, to be cautious not to move his or her head while rolling into or out of turns. Advise that any head movements should be slow and in only one plane at a time.

k. During the debriefing, **DO** be prepared to discuss airsickness as a naturally and commonly occurring problem which in all probability will resolve itself, and attempt to emphasize any positive aspects of the mission both of these points will tend to reduce the student's anxiety level. One of the student's greatest sources of anxiety is attributable to the desire to please the instructor; if this anxiety can be reduced, the airsickness will be reduced.

l. **DO** consult with the Flight Surgeon at any time. A student who is airsick on three or four consecutive flights or on more than one in every four flights should be referred to the Flight Surgeon.

m. **DON'T** "carry" a student who has a low airsickness threshold by avoiding certain necessary or critical flight manoeuvres early in training. Not only might this develop an undesirable behaviour pattern in the student but also the problem will likely come to attention later when it may be more difficult to deal with it.

8. Airsickness is most common during initial flights; there may be minor recurrences on later flights when spinning and advanced manoeuvres are introduced. Real airsickness either resolves itself (with the Glider Instructor's help), or it is treatable (with the Flight Surgeon's help). Airsickness that manifests itself in severe nausea or vomiting is readily recognized and can be dealt with. Airsickness that is not recognized by the Glider Instructor may be misinterpreted as primary lack of ability or motivation. It is important, therefore, to make this distinction, which requires both directed attention and experience. Making a student airsick during early training by an overaggressive or unsympathetic Glider Instructor will, in all probability, impede progress by engendering anxiety and eroding the student's confidence in his or her ability to become a successful pilot.

**ANNEX B to CHAPTER 4**

**QUALIFICATION STANDARD**

**SGS 2-33A AIR CADET GLIDER INSTRUCTOR COURSE**

**FOREWORD**

1. This Qualification Standard (QS) is issued on the authority of the Chief of the Defence Staff.

2. This publication is effective upon receipt.

3. Managing Authority: 1 Cdn Air Div HQ A1 Trg. Suggestions for changes shall be forwarded through normal channels to Central Flying School, ACGP SET.

**PREFACE**

1. A Qualification Standard Writing Board, convened at 17 Wing Winnipeg, in January 2004, developed this QS. The members of the board consisted of 1 CAD HQ A1 Trg, CFS and Standards Representatives form each of the Cadet Training Regions. It was prepared in accordance with the concept of training outlined in the A-P9-000 series, Canadian Forces Manual of Individual Training.

2. This QS must be used in conjunction with the applicable specification for the purpose of producing the Training Plan.

**CHAPTER 1**

**AIM**

1. The aim of the training resulting from this QS is to produce Instructor Glider Instructor Pilots for the ACGP.

**OUTLINE OF TRAINING**

2. This QS contains:

   a. the seven Performance Objectives (POs) that course candidates shall achieve; and

   b. the requirements needed to support the attainment of these objectives.

**TRAINING STRATEGY**

3. The training requirement will be achieved through a formal course. The course has two-phases:

   a. Phase I consists of 10 sorties and approximately two hours of flying. This phase emphasizes flying proficiency from the rear seat.

   b. Phase II consists of 22 sorties and approximately four hours of flying. This phase emphasizes instructional techniques and air lesson delivery.

The ground school will be conducted concurrently with Phase I. All Instructional Development lectures must be completed prior to starting Phase II.

**USE OF QUALIFICATION STANDARD**

4. This QS shall be used as the primary authority governing the design, conduct and evaluation of the training program. The Transport Canada standards for Glider Instructor Rating shall be met.

## CHAPTER 2

### RESPONSIBLE AGENCIES AND TRAINING ESTABLISHMENTS

1. Agencies include:

   a. Managing Authority: 1 Canadian Air Division / DCdts

   b. Matching Agency: RCSUs

   c. Commissioning Agency: DCdts

   d. Nominating Agencies: RCSUs

2. The designated Training Establishment are the five Regional Cadet Gliding Schools, which are responsible for the conduct and evaluation of the training program.

### SCHEDULING

3. Courses will be conducted in each of the five regions annually prior to the cadet summer training period.

### PREREQUISITES

4. Personnel must meet the following prerequisites prior to arrival for training:

   a. Hold a valid TC Cat 3 Medical;

   b. Hold a valid and current TC glider licence with not less than:

      (1) 20 hours PIC flight time in gliders and at least 125 flights; or

      (2) 10 hours PIC flight time in gliders and at least 200 flights;

   c. Weight must be below 220 lbs;

   d. Be a minimum of 18 years of age; and

   e. Completion of the current instructor candidate PIP.

### TRAINING DURATION

5. This training will require approximately eighteen days.

### INSTRUCTOR ALLOCATION

6. Instructors: Instructors shall hold valid TC Glider Instructor Rating and an ACGP Instructor Standards Pilot Qualification.

### TRAINING ASSISTANCE

7. Training assistance will be required from:

   a. Wings / bases associated with each of the RGSs.

   b. Provincial Air Cadet Leagues

   c. Regional Cadet Support Units

**CAPACITY**

8. The capacity varies with each RGS.

**LANGUAGE OF INSTRUCTION**

9. This course is offered in both official languages.

**ENVIRONMENTAL PROTECTION CONSIDERATIONS**

10. Relevant environmental protection considerations and procedures are to be included in the production of the training plan where required. (Further information to be added as applicable).

**QUALIFICATION**

11. Successful completion of the training based on this QS will result in the awarding of a TC Glider Instructor Rating and ACGP Glider Instructor Pilot Qualification.

**RELATED DOCUMENTS**

12. The related documents are:

   a. A-CR-CCP-242/PT-005

   b. 1 CAD Orders

   c. CATOs

   d. Regional Orders

   e. CARs

**TRAINING SUPPORT**

13. RCSUs shall arrange for all facilities and materials required to conduct this course.

**CRITIQUES**

14. Critique sessions will be held at the termination of each course to obtain feedback on learning activities, the presentation of training program content, and administration procedures. This does not preclude the class senior from commenting on positive matters or reporting problems as they arise.

**TERMINOLOGY**

15. The following terminology is used in chapter 4 of this document:

AIRMANSHIP - All aspects of an individual's flying performance that are not covered by established procedures or directives. Good judgement, common sense, situation awareness, air picture, planning, wind assessment and lookout are examples of airmanship.

ANALYZE - To determine logically how the end result was or is to be achieved, and to examine in detail.

CIRCUIT MODIFICATION – Modification to a conventional circuit due to all significant unforeseen events ie. high sink or spoilers stuck scenarios. This specifically excludes downwind, cross-runway and straight ahead landing premature releases.

CREW RESOURCE MANAGEMENT (CRM) – The effective utilization of communication and organizational skills by each crewmember to ensure the safe and effective completion of all tasks and duties.

DEMONSTRATE - A physical performance that may be accompanied by verbal explanation.

ENABLING OBJECTIVE – The knowledge, skills and / or attitudes essential to the attainment of the PO.

ENABLING CHECK – An evaluating instrument used to determine whether or not students have mastered the standards associated with an enabling objective eg. ground school tests.

FLIGHT MANAGEMENT **–** Manoeuvring a glider from the point of release to the circuit IP that includes the ability to judge altitude, position, traffic, and environmental considerations.

MAJORITY – More than one half (51% or more).

MECHANICS - Applicable airspeeds, power settings, procedures etc., - the rudimentary methods of performance.

MINOR PHYSICAL ASSISTANCE – A control restriction or minor control pressure at a key stage in a flying sequence.

MISSION OUTLINE – Very brief (three to five minutes) flight outline and air exercise review that takes place just prior to flying an air lesson.

OPERATIONAL LIMITATIONS - Limitations set on gliding operations as described in A-CR-CCP-242/PT-005.

PERFORMANCE CHECK – An evaluating instrument used to determine whether or not students have mastered the standards associated with a performance objective. Performance checks for this course consist of the Phase I and Phase II Final Flight Tests and the Written Final Exam.

PERFORMANCE OBJECTIVE – a formal statement of job-related training requirements, written in a three-part format, which prescribes:

a. performance - What the trained member must be able to do on the job

b. conditions - The conditions under which the performance must be completed

c. standard - How and/or how well the performance must be completed

PHASE I – The first phase of this course consisting of flying proficiency from the rear seat.

PHASE II – The final phase of this course emphasizing instructional technique and air lesson delivery.

PRE-FLIGHT BRIEFING – Formal tutorial ground instruction specific to an air lesson.

PROFICIENCY LEVELS – The level of adeptness that a student should be capable of achieving through the combination of knowledge and skill in the performance of a task. Proficiency levels generally increase as the course progresses.

SITUATIONAL AWARENESS - A cognizance or appreciation of the relevant circumstances and conditions occurring at any given moment. Attained through attentiveness.

TASK - The lesson to be learned, a labour, piece of work, or responsibility to be performed. Both knowledge and skill are the enablers by which a task may be performed.

TRIP ASSESSMENT - An appraisal or evaluation of a combination of tasks as observed and commented upon during a flight, trainer, mission, or simulation.

## CHAPTER 3 - ASSESSMENT OF COURSE CANDIDATES

### GENERAL

1. Pass/Fail assessment of each course candidate will be based on the successful completion of all POs as stated in Chapter 4 of this publication.

2. Any course candidate who fails to demonstrate safe working habits or who does not follow all safety precautions will be considered to have not met the minimum Performance Check (PC) requirements.

### PROGRESS MONITORING

3. The training unit shall monitor the candidate's progress by administering Enabling Checks (ECs). ECs may be in the form of written tests, or flights. Continuous monitoring of the course candidate's progress is required to provide:

   a. feedback to the trainee. Candidates should receive formal indication of their progress in the course. Candidates who experience difficulty are to be informed of the consequences and the disposition options available;

   b. early warning of difficulty which may avoid more serious problems;

   c. feedback on the effectiveness of training;

   d. Information in the event of a Progress Review Board (PRB); and,

   e. equitable distribution of training assignments.

4. Records shall be maintained for each trainee and reflect the following:

   a. completion of essential training activities required by POs;

   b. results of PCs, ECs and written or practical tests, etc. as specified in the assessment plan;

   c. identification of elements requiring observations such as leadership, participation, etc; and

   d. interviewing/counselling results.

### PROFICIENCY LEVELS

5. These levels are to be used to assist in defining the degree of proficiency required to meet this standard, as well as to provide a vehicle for progress monitoring. The actual proficiency level requirements for any specific task will be determined by the training establishment in their Training Plan/Check ride details and will be consistent with the Standards as detailed in Chapter 4 of this document.

6. Following each flight, the instructor shall rate individual tasks using one of the five proficiency levels listed below:

LEVEL 1 - Candidate was not capable of completing the task. Candidate required verbal and/or physical assistance to avoid making major errors. Further instruction is required;

LEVEL 2 - Candidate completed the task but required verbal and/or minor physical assistance to avoid making major errors. Further practice is required;

LEVEL 3 - Candidate completed the task, making minor errors. Candidate required minimal assistance to analyze and/or correct errors;

LEVEL 4 - Candidate completed the task without assistance, making only minor errors. Candidate was able to self-analyze and correct errors; or

LEVEL 5 - Candidate completed the task without assistance and without error.

**NOTE:** Where a task is not completed for reasons unrelated to the candidate's performance, such as: unserviceable equipment, unsuitable environmental conditions or the situation not presenting itself during the trip, the task shall be assigned the following designation:

DNCO – Duty Not Carried Out (reason shall be elaborated upon in the narrative).

**NOTE:** Level 4 meets the Performance Objective (Standard) for the Glider Instructor Course

7. The following definitions will apply to the rating of candidates:

**major errors** - errors that significantly detract from the ideal and/or jeopardize safety or the successful completion of the task; and

**minor errors** - errors that detract from the ideal but do not jeopardize the successful completion of the task or accomplishment of the Performance Objective

**TRIP ASSESSMENT (TRAINING MISSIONS)**

8. Following the rating of individual tasks using the 1-5 proficiency level scale, the candidate's overall performance of the trip shall be assessed by the instructor as follows:

**Standard Exceeded** - The student performed the majority of the tasks to a level higher than required by the TP, and **easily** performed the remaining tasks to the level required by the TP.

**Achieved Standard** – The student performed all tasks to the level required by the TP.

**Achieved Standard with Difficulty** - The student experienced difficulty achieving the minimum levels required by the TP.

**Marginal** – The student was unable to achieve the level required by the TP on one task.

**Unsatisfactory** – The Student's overall performance did not meet the level required by the TP. Failure to achieve the required standard on two tasks will constitute an Unsatisfactory rating.

**NOTES:** (1) Every effort shall be made to correct performance deficiencies as soon as possible. In addition:

The trip immediately preceding a flight test may not be rated as marginal

No Enabling or Performance Checks may be rated as marginal

The trip immediately following a marginal or unsatisfactory (ED) trip may not be rated as marginal.

(2) Those items which are commented upon in any assessment, and which refer to airmanship or HPMA (CRM) related activities, shall be directly related to, and supported by an observed task

**SUPPLEMENTAL ASSESSMENT**

9. A course candidate will normally be permitted one repeat PC on any failed PO, if:

a. the attempt is likely to be successful;

b. extra tutoring, if needed, is practicable in terms of instruction time, the member's time, and training establishment resources and facilities; and,

c. the attempt can be completed before the scheduled training program serial end date.

10. Failure of any supplemental attempt will normally constitute course failure.

**ASSESSMENT**

11. Successful completion of this course will be assessed by;

a. a written threshold knowledge EC and a written final PC; and

b. To achieve PO 401 (Prepare a classroom lesson) the student must develop a knowledge lesson based on a portion of a Glider Pilot Course ground school lesson, as approved by the staff. PO 402 (Conduct a classroom lesson) will be achieved using the lesson developed by the student in PO 401. The objective is to ensure that the student gains experience by conducting a lesson that he has developed. The lesson shall be at least twenty minutes in length.

c. PO's 403 (Prepare a training mission), PO 404 (Conduct a training mission) and PO 405 (Assess student performance) shall all be completed in a given mission.

d. completion of the Phase I and Phase II flight tests.

Note: Para 3(a) of PO 405 shall be assessed in the written PC as per para (a) above.

**UNSATISFACTORY COURSE PROGRESS**

12. All Unsatisfactory Course Progress will be handled in accordance with 1 CAD Orders 5-212.

13. Unsatisfactory Course Progress includes:

a. any failed EC or PC;

b. any UNSAT Trip.

**COURSE FAILURE**

14. Course failure is deemed as:

a. Four UNSAT trips during the course; or

b. Failure of a retest on any PC or EC.

Once a student's progress has constituted a course failure, a PRB will be convened as per 1 CAD Orders (Vol 5) 5-212, and recommendations made to the RCA Ops O.

**PROGRESS REVIEW BOARD (PRB)**

15. As a result of poor performance or conduct, a candidate may appear before a PRB convened as per 1 CAD Orders 5-212. The PRB will make a recommendation to the RCA Ops O regarding the disposition of the candidate. Recommended action will normally be one of the following:

a. continue with remedial training;

b. recourse;

c. cease training.

**REMOVAL FROM TRAINING**

16. The RCA Ops O IAW 1 CAD Orders, may direct that a candidate be removed from training:

a. when the candidate's progress is below the minimum standard and there is no likelihood that the required standard will be attained; or,

b. if the candidate is adversely affecting the training, safety or morale of the other candidates; and/or,

c. for administrative or disciplinary reasons.

**COURSE REPORTS**

17. The training establishment shall prepare a Canadian Forces Course Report; form CF 377, for each course candidate. Block 12A shall be completed as either PASS or FAIL. No grade or class standing is to be assigned and the remainder of Block 12 is to be annotated N/A. Additional comments on the candidate's strengths and weaknesses may be shown in Block 17 with reference made to specific POs.

**ANNEX A**

**FLYING TEST ADMINISTRATION**

**GENERAL**

1. The aim of Regional Gliding Schools is to produce pilots of a pre determined quality. Standardized flying testing provides a consistent assessment of the candidate's level of achievement and a measure of progress at various stages of training.

2. Test results must be valid. To this end all tests must be administered fairly. Any variation from the ideal with respect to such factors as weather and aircraft serviceability must be compensated by a suitable allowance. Candidates should not be tested under adverse weather conditions. The testing Officer should ensure that the aircraft has no unusual characteristics.

3. Flying tests require reliance on the testing officer's experience and judgment. An opinion of ability should be withheld until a task is completed to allow an overall impression of the performance to be made. Using this system, the candidate is awarded a proficiency level that most accurately describes the performance. The testing officer shall, when judging a performance, consider the candidate's knowledge of procedures, aircraft handling techniques (accuracy and smoothness) and airmanship.

4. Prior to the test the candidate shall be briefed on the conduct of the test. The briefing shall include a brief trip outline and cover the areas of responsibility for lookout, R/T, and aircraft checks. A caution that simulated emergencies may be given at any time during the trip shall be emphasized.

5. To maintain the highest degree of standardization during the test, the testing officer shall adhere to the following:

a. Each task shall be rated as soon as it has been completed, using on of the proficiency levels defined in Annex A to this Chapter;

b. The tendency to start with "ideal" (level5) and to reduce the rating by one point for each error is to be avoided;

c. The tendency to confine ratings to the central range should be avoided. A poor or excellent performance should be rating accordingly;

d. If possible, the candidate should be allowed to repeat what appears to be an isolated "Unsatisfactory" task; however, the overall rating of the two attempts shall not exceed the minimum acceptable;

e. Only the performance of the candidate is to be tested. Personality traits must not influence the results of the test;

f. Suggestions or criticisms are not to be made during the test; and

g. Control of the aircraft is not to be taken unless safety demands or unless an aircraft controllability check is deemed to be necessary.

6. When the test has been completed a thorough debriefing is to be given to the candidate.

7. If practical, a testing officer should not carry out more than one test on the same course member. The testing officer who administered the original test shall not retest a candidate.

**PHASE I CHECK**

8. The Phase I Check is to be conducted at the completion of Phase I. The test shall include the sequences outlined in A-CR-CCP-242/PT-001 Figure 4-1-2. This form should be used as a guide and any sequence taught may be tested.

9. Although the five level system is used to assess individual sequences during the Phase I Check, a broader assessment is required to grade the candidate's overall performance. One of the terms defined in Chapter 3 para. 8 shall be used.

10. Following the Phase I Check Ride, a test report must be completed as per A-CR-CCP-242/PT-001 Chapter 3 Annex A Card 8.

**PHASE II CHECK**

11. The Category Check Ride shall be administered upon completion of Phase II. The assessment of the test will be determined on the basis of the candidate's ability to effectively present a lesson contained in the 242. Final assessment of the test should not be made until after the candidate has completed the lesson debriefing.

12. **MISSION OUTLINE BY THE CANDIDATE** – The candidate should use recommended instructional techniques while demonstrating a thorough knowledge of procedures as outlined in the 242. Assessment of the Mission Outline is made by forming an overall impression of its effectiveness. A task taught incorrectly constitutes a failure unless the course member corrects the error in the subsequent flight and/or debriefing.

**13. THE CATEGORY FLIGHT -** When assessing instructional ability, the testing officer will act as a student and should attempt to imitate the student's ability that would be expected for a student at that point in the course. The testing officer will also assess the proficiency of the candidate.

14. **THE AIR LESSON** – The objective is to test a course member's ability to instruct effectively in the air. The air lesson is linked directly to the Mission Outline. When assessing the specific points shown on the test card, the testing officer should consider:

a. A instructor candidate's ability to maintain a clear two-way communication with the student:

b. The method of exchanging control;

c. If an instructor candidate "rides" the controls;

d. Whether the follow-through technique is utilized when demonstrating sequences;

e. The validity of the fault analysis; and

f. The efficient use of time and airspace.

15. **THE RANDOM AIR LESSON** – the purpose of the random air lesson is to test the candidate's overall knowledge of the flying syllabus by requiring an air lesson to be taught on a sequence that is introduced at any time during the flight. A candidate must understand that the sequence is taught on the assumption that a pre-flight briefing has been presented.

16. **FLYING PROFICIENCY** – A candidate will be required to perform a representative selection of flying sequences throughout the trip. The proficiency levels required for these sequences are PL4.

17. **THE DEBRIEFING** – A course member is required to give a debriefing that forms the conclusion of the Mission Outline and air lesson. This is a final opportunity to ensure that the lesson has been understood and that the points or questions that appeared during the air lesson are explained. Following a candidate's debriefing, the testing officer will give a complete debriefing of the category test and inform the candidate of the result.

18. Although the items listed in the para 12-17 above are individually assessed during the category ride, a broader assessment is required to grade the candidate's overall performance. One of the terms defined in Chapter 3 para 8. Shall be used.

19. A test report shall be completed following the category ride.

## CHAPTER 4 - PERFORMANCE OBJECTIVES

### <u>PO 401</u>

1. **Performance:** Prepare a classroom lesson

2. **Conditions:**

a. Given:

(1) Course Training Plan / Lesson specification;

(2) References;

(3) Target audience;

(4) Computer resources; and

(5) Training/learning aids.

b. Denied: Assistance

c. Environmental – N/A

3. **Standards:** In accordance with specific references, the instructor will prepare a classroom lesson, to include:

a. Identify lesson objectives;

b. Select delivery method;

d. Selecting and developing training/learning aids;

e. Prepare classroom for lesson;

f. Conducting time appreciation;

g. Preparing lesson plans in accordance with principles of instruction to include:

(1) Introduction, with:

i. Review;

ii. Objective;

iii. Importance;

iv. Application; and

v. Approach.

(2) Body, with:

i. Introduction;

ii. Teaching Points;

iii. Course candidate participation; and

iv. Confirmation.

(3) Conclusion, with:

i. Summary;

ii. Closing Statements; and

iii. Re-motivation of students.

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005, A-PD-050-001/PF-001

5. **Specification Tasks, Skills and Knowledge Numbers:** S1-5, 8, 15, 19, K1-3.

6. **Training Limitation:** Nil.

**PO 402**

1. **Performance:** Conduct a classroom lesson.

2. **Conditions:**

a. Given:

(1) References;

(2) Classroom;

(3) Students;

(4) Training/learning aids;

(5) Lesson Plan.

b. Denied: Assistance

c. Environmental – N/A.

3. **Standards:** In accordance with applicable references, instructor will conduct a classroom lesson to include:

a. Preparing classroom;

b. Delivering classroom lesson; and

c. Evaluating student performance.

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005, A-PD-050-001/PF-001

5. **Specification Tasks, Skills and Knowledge Numbers:** S1, 4, 6-18, 20, 21, K3.

6. **Training Limitation:** Nil.

**<u>PO 403</u>**

1. **Performance:** Prepare a training mission

2. **Conditions:**

a. Given:

(1) References;

(2) Student records;

(3) Training scenario;

(4) Briefing area;

(5) Student(s), and;

(6) Training/learning aids

b. Denied: Assistance

c. Environmental – N/A

3. **Standards:** In accordance with specific references, the instructor will prepare a training mission by:

a. Determining air lesson emphasis based on training syllabus and student progress;

b. Optimizing the sequence of training events;

c. Preparing pre-air lesson briefing and;

d. Briefing the air lesson IAW briefing guide; and

e. Briefing the mission Outline (ASCC).

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005, A-PD-050-001/PF-001

5. **Specification Tasks, Skills and Knowledge Numbers:** S2, 4, 7-13, 18-24, K1-3.

6. **Training Limitation:** Nil.

**PO 404**

1. **Performance:** Conduct an air lesson.

2. **Conditions:**

   a. Given:

      (1) Glider and tow plane;

      (2) Air lesson;

      (3) Student; and

      (4) References.

   b. Denied: Assistance.

   c. Environmental – as required by air lesson.

3. **Standards:** With due regard to CRM, situational awareness, airmanship and flight safety in accordance with specific references, the instructor will conduct an air lesson to include:

   a. EDIC;

   b. Monitoring and supervision of student practice;

   c. Taking control as required; and

   d. Flight and air lesson management.

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005, A-PD-050-001/PF-001

5. **Specification Tasks, Skills and Knowledge Numbers:** S2, 13, 18-21, 24-30, 33, 34, 36, 37, K1-6.

6. **Training Limitation:** Nil.

**PO 405**

1. **Performance:** Assess student performance.

2. **Conditions:**

   a. Given:

      (1) Student;

      (2) Air Lesson;

      (3) Written/practical test (as applicable);

      (4) Progress card;

      (5) Glider;

(6) Briefing area; and

(7) References.

e. Denied: Assistance.

f. Environmental: as required.

3. **Standards:** In accordance with specified references the instructor will assess student performance, to include:

a. Administration of written/practical tests:

b. Monitoring student performance:

c. Debriefing student, to include:

(1) Review aim/objective;

(2) Performance;

(3) Areas for improvement;

(4) Overall performance rating IAW TS/TP; and,

(5) Consequences of performance.

g. Completing Progress Card.

h. Monitoring student solo flights.

4. **Specific Reference Numbers**: A-CR-CCP-242/PT-005, A-PD-050-001/PF-001

5. **Specification Tasks, Skills and Knowledge Numbers:** S2, 4, 8-10, 12, 13, 18, 21, 28, 29, 31, 32, 35, K1-3, 6

6. **Training Limitation:** Nil.

**PO 406**

1. **Performance:** Conduct administrative duties

2. **Conditions**:

a. Given: References

b. Denied: N/A

c. Environmental – N/A

3. **Standards:** In accordance with specified references the instructor will perform administrative duties to include:

a. Maintaining student records;

b. Student progress monitoring;

c. Counselling and interviewing students;

d. Subsequent action in the event of:

(1) Performance deficiencies;

(2) Administrative issues, and;

(3) Personal related issues.

e. Applying/enforcing regulations

f. Preparing course report narratives.

4. **Specific Reference Numbers:** A-CR-CCP-242/PT-005, A-PD-050-001/PF-001, CADO 5-212

5. **Specification Tasks, Skills and Knowledge Numbers**: S29, 32, K1, 2, 5-6

6. **Training Limitation: Nil**.

**PO 407**

1. **Performance:** Demonstrate flying proficiency.

2. **Conditions**:

a. Given:

(1) Glider and tow plane;

(2) Air Lesson;

(3) Student;

b. Denied: Assistance.

c. Environmental: Day VFR

3. **Standards:** In accordance with specific references, the instructor will demonstrate flying proficiency from the rear seat, demonstrating PL4 on all exercises. This w

4. **Specific Reference Numbers:** A-CR-CCP-242/PT ill be confirmed with a PC at the end of Phase I. -005, A-PD-050-001/PF-001

5. **SPECIFIC SKILLS AND KNOWLEDGE NUMBERS:** S33, 34, 36.

**ANNEX A**

**MAIN REFERENCES**

a. A-CR-CCP-242/PT-005;

b. A-PD-050-001/PF-001

c. CARS;

d. Flying Orders

**ANNEX B**

**SKILLS**

| | | |
|---|---|---|
| 1. | Prepare and utilize lesson plan | 3 |
| 2. | Time appreciation | 3 |
| 3. | Select classroom delivery method | 3 |
| 4. | Select, prepare and utilize training aids | 3 |
| 5. | Prepare classroom for lesson | 3 |
| 6. | Deliver classroom lesson | 3 |
| 7. | Utilize AMOL technique | 3 |
| 8. | Apply principles of instruction | 3 |
| 9. | Use questioning techniques | 3 |
| 10. | Listen effectively to student questions | 3 |
| 11. | Encourage active vs. passive learning | 3 |
| 12. | Confirm student learning and understanding | 3 |
| | Interpret and react to body language | |
| 13. | Respond to student difficulties | 3 |
| 14. | Manage classroom environment | 3 |
| 15. | Manage classroom time | 3 |
| 16. | Maintain classroom discipline | 3 |
| 17. | Administer tests | 3 |
| 18. | Provide for individual student learning needs | 3 |
| 19. | Optimize sequence of training events | 3 |
| 20. | Provide assistance and cues | 3 |
| 21. | Adapt lesson to changing situation | 3 |
| 22. | Prepare pre-flight briefing | 3 |
| 23. | Conduct pre-flight briefing | 3 |
| 24. | Explain flying sequences | 3 |
| 25. | Employ subdivision of tasks | 3 |
| 26. | Effectively direct students attention to proper cues | 3 |
| 27. | Demonstrate flying sequences | 3 |
| 28. | Evaluate flying sequences | 3 |
| 29. | Conduct performance analysis including:<br>a. Apply proficiency level to student sequence;<br>b. Use notes properly;<br>c. Identify student strengths and weaknesses; and<br>d. Analyze errors and suggest methods of correcting weaknesses. | 3 |
| 30. | Supervise student including:<br>a. Adherence to applicable orders;<br>b. Recognize the development of unsafe situations;<br>c. Taking control of tasks when required; and<br>d. Dealing with airsickness. | 3 |
| 31. | Conduct post-flight debriefing | 3 |
| 32. | Conduct administrative duties including:<br>a. Completing air lesson progress cards;<br>b. Maintain student progress books;<br>c. Conduct unsatisfactory course progress procedures; and<br>d. Write course report narratives. | 3 |
| 33. | Create safe practice emergency situations | 3 |
| 34. | Utilize safe training practices | 3 |

| | | |
|---|---|---|
| 35. | Supervise student solo flights including:<br>a. Monitor student manoeuvres; and<br>b. Provide corrections and aid via radio as required. | 3 |
| 36. | Demonstrate flying proficiency including:<br>a. Spin entry;<br>b. Full spin;<br>c. Spiral dive entry;<br>d. Turning stalls; and<br>e. Boxing aero tow. | 3 |
| 36. | Manage flight profile to ensure accomplishment of air lesson objectives and safe recovery | 3 |

**KNOWLEDGE**

| | | |
|---|---|---|
| 1. | Training system | 3 |
| 2. | Training documentation | 3 |
| 3. | Learning principles including:<br>a. Laws of learning;<br>b. Patterns of learning;<br>c. Instructional methods;<br>d. ICEPAC; and<br>e. EDIC / AMOL / ASCC. | 3 |
| 4. | Canadian Air Regulations | 2 |
| 5. | Occupational regulations including:<br>a. ACGP Manual;<br>b. 1 CAD Orders; and<br>c. Flying Orders | 3 |
| 6. | Unsatisfactory Course Progress procedures including<br>a. IR;<br>b. IRB;<br>c. PRB; and<br>d. UPR. | 3 |

# CHAPTER 5

# TOW PILOT, POWER PILOT, SOARING PILOT AND WINCH/AUTO LAUNCH OPERATOR CONVERSION COURSES

## SECTION 1

## TOW PILOT CONVERSION COURSE

### GENERAL

1. Pilot requests for the subject course shall be approved in writing by the RCA Ops O in accordance with course candidate prerequisites detailed in the following paragraphs and a personal interview assessment.

### CANDIDATE PREREQUISITES

2. Prior to being selected as a candidate for the tow conversion course, the following prerequisites shall be met:

a. the pilot shall hold a valid Canadian Private Pilot (Aeroplane), Commercial (Aeroplane) or ATR (Aeroplane) Licence and be current in accordance with MOT standards;

b. for the L-19 course, the pilot shall have acquired not less than 150 hours PIC time on aeroplanes;

c. for the Bellanca Scout course, the pilot shall have acquired not less than 100 hours PIC time on aeroplanes; and

d. shall meet recency requirements in accordance with Transport Canada regulations and shall have flown, as a minimum, five hours PIC of aeroplanes in the preceding 12 months.

### REFERENCES

3. The references for the course are as follows:

a. A-CR-CCP-242/PT-005;

b. Regional and Local Flying Orders, as applicable;

c. Regional and Local SOPs, as applicable;

d. AIP; and

e. Aircraft Operator's Manual.

### COURSE CONTENT

4. The course shall be conducted in two phases:

a. Ground school instruction phase consisting of:

(1) six lectures, each approximately 50 minutes in length; and

(2) an open **and** a closed book examination.

b. Air training phase consisting of:

(1) a series of training and review flights, dual and solo, on normal and emergency flying and towing procedures, with mandatory emphasis on three-point landings, crosswind take-offs and landings; and

(2) a flight test to confirm the candidate's ability to conduct normal and emergency flight operations and normal and emergency towing operations.

**GROUND SCHOOL INSTRUCTION PHASE**

5. Lecture details are as follows:

a. **Lectures 1 and 2.** The following are applicable:

(1) review of Air Standards and Course Standards; and

(2) review of regional and local flying orders and SOPs.

b. **Lectures 3 and 4.** The following are applicable:

(1) aircraft and aircraft systems operation;

(2) normal operating procedures, with emphasis on normal three-point landing procedures in conventional gear aircraft; and

(3) aircraft operating data.

c. **Lectures 5 and 6.** The following are applicable:

(1) aircraft emergency operating procedures, with emphasis on the ground loop phenomenon, including the viewing of the USAF film on ground loops in the L-19. Refer to Chapter 2, Section 9;

(2) tow emergency procedures, with emphasis on the tow aircraft upset phenomenon; and

(3) discussion of previous flight safety incidents and accidents related to tow aircraft operations.

6. Examinations shall be conducted as follows:

a. examination questions are to be based on the ground lectures;

b. the open-book examination shall test the candidates knowledge of material presented in Lectures 1 to 4;

c. the closed-book examination shall test the candidates knowledge of material presented in Lectures 5 and 6, including critical aircraft and towing emergencies; and

d. the pass mark for each examination shall be 85 per cent corrected to 100 per cent. Both examinations shall be thoroughly reviewed in face-to-face debriefings prior to the commencement of the air training phase.

**AIR TRAINING PHASE**

7. The flying training syllabus consists of a series of missions, and each mission consists of a series of sequences/exercises (see Figure 5-1-1 below).

8. PL 3 is required for each sequence before the student can go solo. PL 3 is also required on the Aircraft Handling Flight Test and the Glider Towing Flight Test.

9. Individual sequences/exercises shall be assessed in accordance with PL definitions detailed in Chapter 3, Section 1. The flight as a whole shall be assessed in accordance with OFR definitions also detailed in Chapter 3, Section 1.

| Flt. No. | Requirement | Dual | Solo | Sequence / Exercise |
|---|---|---|---|---|
| 1 | Mandatory | 1.5 | | Normal handling, slow flight, slips, spiral dives, stalls, spins, circuits, approaches, landings, touch and goes, overshoots, practice of forced landing. |
| 2 | | 1.5 | | Normal handling, slow flight, slips, spiral dives, stalls, spins, circuits, approaches, landings, touch and goes, overshoots, practice of forced landing. |
| 3 | | 1.0 | | Normal handling, slow flight, slips, spiral dives, stalls, spins, circuits, approaches, landings, touch and goes, overshoots, practice forced landing. |
| 4 | | | 1.0 | Normal handling, circuits, additional exercises as briefed by Standards Pilot. |
| 5 | | | 1.0 | Normal handling, circuits, additional exercises as briefed by Standards Pilot. |
| 6 | | 0.5 | | As briefed by Standards Pilot. |
| 7 | | | 1.0 | Normal handling, circuits, additional exercises as briefed by Standards Pilot. |
| 8 | | | 1.0 | Normal handling, circuits, additional exercises as briefed by Standards Pilot. |
| 9 | | | 1.0 | Normal handling, circuits, additional exercises as briefed by Standards Pilot. |
| 10 | Optional | 1.0 | | Review before Flight Test. |
| 11 | Mandatory | 1.5 | | Aircraft Handling Flight Test. |
| 12 | Mandatory | 1.5 | | Glider Towing Check-Out and Flight Test. |
| **Total Course** | | 8.5 | 5.0 | |
| Note: During all solo flights, the rear control column must be removed. | | | | |

Figure 5-1-1 Flying Training Syllabus

**NOTES TO FLYING SYLLABUS**

10. Based on proficiency, any mission may be waived by the RCA Ops O, except those indicated as mandatory in Fig 5-1-1, provided that:

a. the candidate has a minimum of 500 hours PIC;

b. the candidate has a minimum of 15 hours PIC in aircraft with conventional landing gear; and

c. the candidate meets or exceeds the required standard for every sequence on each mission.

11. All missions shall be preceded and succeeded by face-to-face briefings and debriefings, respectively.

12. The Tow Aircraft Standards Pilot conducting the conversion shall first demonstrate all new sequences or any sequence that is unfamiliar to the pilot undergoing conversion.

13. Three-point landings and crosswind take-offs and landings are mandatory components of the syllabus.

14. Candidate pilots authorized for solo training flights shall be thoroughly briefed on the exercises to be flown and shall be fully monitored by the Tow Aircraft Standards Pilot authorizing the mission.

15. Subsequent to the completion of training, the RCA Ops O may grant a tow pilot qualification provided that:

a. the candidate has achieved a PL 3 on the Aircraft Handling Flight Test and the Glider Towing Check-Out and Flight Test;

b. the candidate has conducted a minimum of 10 glider tows under direct supervision except that if the candidate holds a valid Canadian glider pilot licence, the RCA Ops O may reduce the glider tow requirement from 10 to five.

**FLIGHT TEST ASSESSMENT PROCEDURES**

16. Assessment of the candidate's ability shall be conducted by the RCA Ops O designated Tow Aircraft Standards Pilot and shall consist of the following:

a. a Progress Book comprising one completed copy of the Tow Pilot Progress Card/Flight Test Report for each dual and solo mission (see Figure 5-1-2);

b. a successful open-book examination and a successful closed-book examination;

c. a Flight Test Report (see Figure 5-1-2, Tow Pilot Progress Card/Flight Test Report); and

d. the written recommendation of the Tow Aircraft Standards Pilot with respect to the candidate's ability to be awarded a tow aircraft conversion and tow pilot qualification.

17. Once the RCA Ops O has reviewed the Course Training File and the appropriate action taken with respect to type conversion and tow pilot qualification, the necessary documentation shall be appended to the Pilot Training Record in accordance with the direction detailed in Chapter 1, Section 1, paragraph 13.

| TOW A/C PILOT | | | STDS PILOT |
|---|---|---|---|
| FLT NO | | | FLT TIME |
| LOC/RUNWAY/WIND | | | DATE |
| EXERCISE | | PL | NOTES |
| PRE-FLIGHT | DOCS, WEIGHT AND BALANCE | | |
| | INSPECTION | | |
| PRE-TAKE-OFF | START, TAXI, RUN-UP | | |
| | PRE-TAKE-OFF CHECK | | |
| TAKE-OFF | NORMAL | | |
| | CROSSWIND | | |
| | SHORT FIELD | | |
| CLIMB AND DESCENT | CONTROL | | |
| | SPEED | | |
| SLOW FLIGHT | LEVEL AND TURNS | | |
| TURNS | SPEED, ALTITUDE, BANK | | |
| STALLS | ENTRY | | |
| | RECOVERY | | |
| SPIRAL DIVE | ENTRY | | |
| | RECOVERY | | |
| SLIPS | CONTROL AND RECOVERY | | |
| SPIN | ENTRY | | |
| | RECOVERY | | |
| CIRCUIT | ENTRY AND DOWNWIND | | |
| | BASE LEG | | |
| | FINAL APPROACH | | |
| LANDING | NORMAL (THREE POINT) | | |
| | CROSSWIND | | |
| | SHORT FIELD | | |
| | TOUCH AND GO, OVERSHOOT | | |
| FORCED LANDING | | | |
| TOW AIRCRAFT EMERGENCIES | | | |
| GLIDER TOW | TAKE-OFF | | |
| | CLIMB | | |
| | TURNS | | |
| | DESCENT (UNDER TOW) | | |
| | RELEASE | | |
| GLIDER TOWING EMERGENCIES | | | |
| AIRMANSHIP | AOIs and CHECKS | | |
| | FLIGHT MANAGEMENT | | |
| | LOOK-OUT | | |
| | RADIO | | |
| OVERALL FLIGHT RATING (Circle One) | U | M | -AS AS SE |
| STANDARDS PILOT'S INITIALS | | | TOW AIRCRAFT PILOT'S INITIALS |

Figure 5-1-2 Tow Pilot Progress Card/ Flight Test Report

## SECTION 2

## WINCH AND AUTO LAUNCH CONVERSION COURSE

### GENERAL

1. The conversion to winch/auto launch is conducted over a limited number of flights that requires careful training both in the cockpit and the classroom. A series of ground school lectures, combined with dual and solo winch/auto launch exercises, provides training that has the objective of ensuring that knowledgeable and competent glider pilots are performing duties in the winch or auto launch environment.

2. The course is designed specifically for glider pilots who have been trained using air tow launches exclusively. For those glider pilots converting from auto to winch launch (or the reverse), the training requirements can be significantly reduced if previous training has covered ground school and experience elements of this course. Under these circumstances, the conversion from auto to winch or winch to auto launch shall be conducted under the direction of the RCA Ops O.

### CANDIDATE PREREQUISITE

3. Due to the limited flight training allocated for air tow to winch/auto launch conversion, the candidate shall hold a valid Canadian Glider Pilot Licence.

4. Conversion of a student glider pilot to winch or auto launch may require a more extensive series of dual missions and ground school lessons. Solo winch/auto launches may only be approved under the authority of the RCA Ops O.

### REFERENCES

5. The references for the course are as follows:

   a. Regional and Local Flying Orders;

   b. Regional and Local SOPs;

   c. Standard Operating Procedures, Chapter 2;

   d. AOIs, Chapter 2; and

   e. Launch Equipment details, Chapter 2.

### COURSE CONTENT

6. The course shall consist of two phases:

   a. A ground school instruction phase consisting of:

      (1) two lectures, each approximately 50 minutes in length; and

      (2) a closed book examination.

   b. An air training phase consisting of:

      (1) a minimum of six dual training flights on normal and emergency launch procedures, with emphasis on the recovery from launch failures using simulated cable breaks; and

      (2) a minimum of three solo flights to confirm the candidate's ability to conduct normal and/or emergency flight operations.

### AIR TRAINING PHASE

7. The flying training syllabus consists of a series of dual and solo launches. The first six launches are dual trips with an emphasis on launch techniques and emergency procedures. The times provided for each trip are approximate figures and will be dependant on the actual launch height achieved. Total flying time for the course is approximately one (1) hour.

| Mission | Exercise | Dual : 36 | Solo : 24 | Exercises |
|---|---|---|---|---|
| 1 | Introduction to Winch/Auto Launch | :08 | | Launch signals, rotation and climb techniques, normal release. |
| 2 | Review of Winch/Auto Launch | :08 | | Launch signals, rotation and climb techniques, crosswind correction, normal release. |
| 3 | Review of Winch/Auto Launch | :08 | | Launch signals, rotation and climb techniques, crosswind correction, normal release. |
| 4 | Simulated Emergency | :05 | | Launch failure above 500 feet, simulated cable break, modified circuit. |
| 5 | Simulated Emergency | :02 | | Launch failure below 500 feet, simulated cable break, straight ahead or downwind landing. |
| 6 | Simulated Emergency | :05 | | Launch vehicle failure, power loss at winch or tow vehicle, 400 feet to 700 feet AGL. |
| 7 | Solo Launch | | :08 | Standard launch procedures. |
| 8 | Solo Launch | | :08 | Standard launch procedures. |
| 9 | Solo Launch | | :08 | Standard launch procedures. |

Figure 5-2-1 Winch/Auto Launch Training Syllabus

**GROUND SCHOOL INSTRUCTION PHASE**

8. Lecture details are as follows:

a. **Lecture 1.** The following are applicable:

(1) Air Standards and Course Standards.

(2) Regional and local flying orders and SOPs.

(3) Launch equipment and launch techniques, including:

(a) cable, rope, hooks, drag chute, launch vehicle, winch, aircraft launch speeds, etc;

(b) launch sequence and function of personnel;

(c) rotation techniques, signals, climb attitude control and relationship to airspeed, safe airspeed ranges;

(d) wind velocity factors on airspeed, drift, and height and drift correction techniques; and

(e) porpoising and release procedure.

b. **Lecture 2.** The following are applicable:

(1) Launch Site Safety Procedures, including:

(a) cable/rope handling.

(2) Emergency procedures, including:

(a) stop signal and pilot's response;

(b) over-running launch cable;

(c) cable/rope break procedures for all altitudes;

(d) launch vehicle/winch failure procedures;

(e) failure to release procedures; and

(f) previous flight safety incidents and accidents related to winch/auto launch operations.

# SECTION 3

# POWER PILOT CONVERSION TO GLIDER PILOT

## GENERAL

1. Requests to convert power pilots to glider pilots shall be approved in writing by the RCA Ops O in accordance with the course candidate prerequisites detailed in the paragraphs that follow. Normally, approval will only be granted to satisfy a unique ACGP requirement.

## CANDIDATE PREREQUISITES

2. Prior to being selected as a candidate for the Power Pilot to Glider Pilot Conversion Course, the following prerequisites shall be met:

a. the candidate shall hold a valid Canadian private, commercial (aeroplane) or ATR (aeroplane) licence; and

b. the candidate shall have acquired not less than 35 hours PIC on aeroplanes, with not less than five hours PIC on aeroplanes being flown in the 12 months prior to the course.

## REFERENCES

3. The references for the course are as follows:

a. A-CR-CCP-242/PT-005;

b. CARS;

c. regional and local flying orders as applicable;

d. regional and local SOPs as applicable;

e. AIP; and

f. Chapter 6, Manual of Glider Flying Training.

## COURSE CONTENT

4. The course shall be conducted in two phases:

a. a ground school instruction phase consisting of:

(1) five lectures, each approximately 50 minutes in length;

(2) an open book examination; and

(3) a closed book examination.

b. an air training phase consisting of:

(1) a series of dual training flights to ensure that the candidate is proficient in all normal and emergency procedures prior to solo;

(2) a series of solo and dual review flights to satisfy CARS licensing requirements; and

(3) a flight test to confirm that the candidate meets the proficiency requirements for licensing.

**GROUND SCHOOL INSTRUCTION PHASE**

5. Lecture details are as follows:

a. **Lecture 1.** The following shall be addressed:

(1) a review of air standards and course standards; and

(2) a review of local and regional flying orders and SOPs .

b. **Lecture 2 – Schweizer Introduction, Cockpit Equipment, Ground Equipment and Handling.** The following shall be addressed:

(1) aircraft construction, basic dimensions, empty and gross weight;

(2) the type and location of cockpit equipment and flight controls;

(3) the function and operation of the release handle, spoiler control and trim lever;

(4) overview of glider assembly and disassembly procedures;

(5) ground manoeuvring of gliders according to SOPs including towing, turning, signals, field safety, high wind precautions and hazards of prop and jet blast danger areas;

(6) tie-down procedures and equipment;

(7) handling and inspection of tow ropes;

(8) preflight preparation and inspection of gliders;

(9) the requirements for weight and balance, including C of G limitations, normal flight characteristics at fore and aft C of G, and stall and spin characteristics at fore and aft C of G;

(10) calculation of weight and balance, and interpretation of graphs and charts;

(11) details of the Ballast-CISTRSC pre-take-off check; and

(12) launch and air tow signals.

c. **Lectures 3 and 4 – Air Handling.** The following shall be addressed:

(1) the launch methods including a discussion of:

(a) take-off, tow positions, turns and release,

(b) slack rope procedure for air tow, and

(c) tow aircraft upset phenomenon;

(2) typical airspeeds for air tow and free flight;

(3) optimum gliding speed, minimum sinking speed, normal glider manoeuvring speed, calculating gliding distance (given altitude, L/D and winds), gliding into wind, turning onto final into a wind gradient, and considerations on approach and approach speed;

(4) stalling and side-slipping speeds;

(5) maximum and minimum cockpit weights and requirements for ballast;

(6) the circuit with respect to altitudes and pattern nomenclature;

(7) emergency procedures including rope breaks, release failure, double release failure and off-field landings;

(8) the more common weather hazards to glider pilots including wind speed and crosswind, manufacturer's crosswind limitations, interpretation of crosswind charts, limited instrumentation, cloud avoidance and flight operations in rain (refraction error);

(9) pre-spin/stall ASCOT check; and

(10) pre-landing (downwind) SWARTSC check.

d. **Lecture 5.** The following shall be addressed:

(1) determination of wind direction when airborne;

(2) gliding for maximum distance in calm, downwind and into-wind conditions;

(3) staying within gliding distance of the field;

(4) field selection criteria for off-field landings.;

(5) how thermals are formed;

(6) where thermals are found including terrain types and periods of the day;

(7) visual and other indications of thermals;

(8) centring the glider in a thermal;

(9) safety considerations in thermals (entry, turn direction, look-out, overtaking and right-of-way);

(10) theory of hill/ridge and wave soaring;

(11) factors affecting hill/ridge and wave soaring; and

(12) safety considerations with respect to hill/ridge and wave soaring including hazards of lee side operation, overtaking and the right-of-way.

**AIR TRAINING PHASE**

6. The flying training syllabus comprises a series of flights to allow the candidate to learn the various glider sequences and to develop, through repetition, the judgement needed to fly the glider safely. Although a power pilot will normally quickly grasp the basics of the mechanics of gliding, the subtleties, such as circuit modifications and launch emergencies, can only be acquired through practice.

7. The Air Lessons for this course have been selected from the Glider Pilot Course, Chapter 3, to ensure that all sequences are properly covered. Compared to the ab initio student glider pilot course, the PL Standard for various flights starts at a higher level (normally PL 2) and upgrades much quicker to the final PL Standard (PL 3) for all exercises/sequences. PL standards are identified in Figure 5-3-3.

**PRE-SOLO FLIGHTS/AIR LESSONS**

8. For details on the pre-solo Air Lessons listed below, refer to the corresponding Air Lessons in Chapter 3, Glider Pilot Course.

| Flt No. | Air Lesson | Exercise | Release (Feet AGL) | Time (Approximate) | | Total |
|---|---|---|---|---|---|---|
| | | | | Dual | Solo | |
| D1 | AL2 | Attitude and Movements | 2 000 | :12 | | 0:12 |
| D2 | AL4 | Air Tow, Straight Glide and Medium Turns | 2 000 | :12 | | 0:24 |
| D3 | AL5/6 | Take-Off, Gentle Turns, Further Effect of Controls, Circuit Procedures, Approach and Landing | 2 000 | :12 | | 0:36 |
| D4 | AL7 | Basic Stalls – Recognition and Recovery | 2 500 | :15 | | 0:51 |
| D5 | AL8 | Air Tow Positions and Stalls | 2 500 | :15 | | 1:06 |
| D6 | AL9/10 | Steep Turns, Stalls in Turns and Slipping | 2 500 | :15 | | 1:21 |
| D7 | AL12 | Incipient Spins and Drift Illusions | 3 000 | :18 | | 1:39 |
| D8 | AL13 | Spins and Spirals | 3 000 | :18 | | 1:57 |
| D9 | AL15 | Steep Turns and Circuit Modification (High Entry) | 2 000 | :12 | | 2:09 |
| D10 | AL17 | Slipping and Circuit Modification (Low Entry) | 2 000 | :12 | | 2:21 |
| D11 | AL20 | Launch Emergency – Modified Circuit | 800 | :05 | | 2:26 |
| D12 | AL21 | Launch Emergency – Downwind Landing | 400 | :02 | | 2:28 |
| D13 | AL24 | **Solo Flight Check** | 2 500 | :15 | | 2:43 |

Figure 5-3-1 Pre-Solo Flights/Air Lessons – Syllabus

**POST-SOLO FLIGHTS/AIR LESSONS**

9. For details on the post-solo Air Lessons listed below, refer to the corresponding Air Lessons in Chapter 3, Glider Pilot Course.

| Flt No. | Air Lesson | Exercise | Release (Feet AGL) | Time (Approximate) | | Total |
|---|---|---|---|---|---|---|
| | | | | Dual | Solo | |
| S1 | | First Solo: Gentle and Medium Turns | 2 000 | | :12 | 2:55 |
| S2 | | Second Solo: Medium Turns | 1 500 | | :10 | 3:05 |
| S3 | | Third Solo: Medium Turns | 1 500 | | :10 | 3:15 |
| S4 | | Fourth Solo: Medium Turns | 1 500 | | :10 | 3:25 |
| S5 | | Fifth Solo: Steep Turns | 1 500 | | :10 | 3:35 |
| D14 | 25 | Progress Check | 2 000 | :12 | | 3:47 |
| S6 | | Sixth Solo: Steep Turns | 1 500 | | :10 | 3:57 |
| S7 | | Seventh Solo: Steep Turns | 1 500 | | :10 | 4:07 |
| S8 | | Eighth Solo: Gentle Stalls | 2 000 | | :12 | 4:19 |
| S9 | | Ninth Solo: Medium Stalls | 2 000 | | :12 | 4:31 |
| S10 | | Tenth Solo: Turning Stalls | 2 000 | | :12 | 4:43 |
| D15 | 26 | Progress Check | 2 000 | :12 | | 4:55 |
| S11 | | Eleventh Solo: Crosswind Operations | 1 500 | | :10 | 5:05 |
| S12 | | Twelfth Solo: Crosswind Operations | 1 500 | | :10 | 5:15 |
| S13 | | Thirteenth Solo: Medium and Steep Turns | 1 500 | | 10 | 5:25 |
| S14 | | Fourteenth Solo: Medium and Steep Turns | 1 500 | | :10 | 5:35 |
| S15 | | Fifteenth Solo: Medium and Steep Turns | 1 500 | | :10 | 5:45 |
| D16 | 28 | Pre Flight Test Comprehensive Review | 3 000 | :18 | | 6:03 |
| S16 | | Sixteenth Solo: Slipping | 1 500 | | :10 | 6:13 |
| S17 | | Seventeenth Solo: Slipping | 1 500 | | :10 | 6:23 |
| S18 | | Eighteenth Solo: Medium and Steep Turns | 1 500 | | :10 | 6:33 |
| S19 | | Nineteenth Solo: Medium and Steep Turns | 1 500 | | :10 | 6:43 |
| S20 | | Twentieth Solo: Medium and Steep Turns | 1 500 | | :10 | 6:53 |
| D17 | 29 | **Final Flight Test** | 2 500 | :15 | | 7:08 |
| **Total Flights: 37 (consisting of 17 Dual and 20 Solo)** | | | | **3:40** | **3:28** | **7:08** |

Figure 5-3-2 Post-Solo Flights/Air Lessons – Syllabus

**PROFICIENCY LEVEL (PL) STANDARDS**

| **FLT NUMBER** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AIR LESSON** | **2** | **4** | **5/6** | **7** | **8** | **9/1** | **12** | **13** | **15** | **16** | **17** | **19** |
| PRE-FLIGHT | 2 | | | 3 | | | | | | | | |
| PRE-TAKE-OFF | 2 | | | 3 | | | | | | | | |
| TAKE-OFF | | | 1 | | | 2 | | 3 | | | | |
| EMERGENCY | | 2 | | | | | | | | | | 3 |
| AIR TOW | | 1 | | | 2 | | | | | 3 | | |
| SPIN | | | | | | | 2 | 3 | | | | |
| SPIRAL DIVE | | | | | | | | 3 | | | | |
| STALL | | | | 2 | 3 | | | | | | | |
| SLIPPING | | | | | | 2 | | | | 3 | | |
| STRAIGHT GLIDE | | 2 | | | | 3 | | | | | | |
| GENTLE TURNS | | | 2 | | | 3 | | | | | | |
| MEDIUM TURNS | | 2 | | | | 3 | | | | | | |
| STEEP TURNS | | | | | | 2 | | | 3 | | | |
| DOWNWIND | | | 2 | | | | | | | 3 | | |
| BASE TURN & BASE | | | 2 | | | | | | | 3 | | |
| FINAL TURN | | | 2 | | | | | | | 3 | | |
| FINAL APPROACH | | | 2 | | | | | | | 3 | | |
| LANDING | | | 1 | | 2 | | | | | 3 | | |
| AIRMANSHIP | 2 | | | | | | | | | | 3 | |

Figure 5-3-3  Proficiency Level (PL) Standards

## SECTION 4

## SOARING PILOT CONVERSION TO ACGP PILOT

### GENERAL

1. Requests to convert pilots trained at soaring clubs to the ACGP shall be approved in writing by the RCA Ops O in accordance with the course candidate prerequisites detailed in the following paragraphs. The purpose of this conversion is to ensure that soaring club trained pilots are fully conversant with ACGP procedures and standards.

### CANDIDATE PREREQUISITES

2. Prior to being selected as a candidate for this conversion, the following prerequisites shall be met:

   a. the candidate shall hold a valid Canadian Glider Pilot Licence; and

   b. the candidate shall be qualified in air tow.

### REFERENCES

3. The references for the course are as follows:

   a. A-CR-CCP-242/PT-005;

   b. regional and local flying orders;

   c. regional and local SOPs; and

   d. Chapter 6, Manual of Glider Flying Training.

### COURSE CONTENT

4. The course shall be conducted in two phases:

   a. a ground school instruction phase consisting of:

      (1) four lectures, each approximately 50 minutes in length;

      (2) an open book examination; and

      (3) a closed book examination.

   b. an air training phase consisting of:

      (1) a series of dual training flights to ensure that the candidate is proficient in all normal and emergency procedures; and

      (2) a Proficiency Check to confirm that the candidate meets the ACGP proficiency requirements.

### GROUND SCHOOL INSTRUCTION PHASE

5. Lecture details are as follows:

   a. **Lecture 1.** The following shall be addressed:

      (1) a review of air and course standards; and

      (2) a review of local and regional flying orders and SOPs .

b. **Lecture 2 – Schweizer Introduction, Cockpit Equipment, Ground Equipment and Handling.** The following shall be addressed:

(1) aircraft construction, basic dimensions, empty and gross weight;

(2) the type and location of cockpit equipment and flight controls;

(3) the function and operation of the release handle, spoiler control and trim lever;

(4) overview of glider assembly and disassembly procedures;

(5) ground manoeuvring of gliders according to SOPs including towing, turning, signals, field safety, high wind precautions and hazards of prop and jet blast danger areas;

(6) tie-down procedures and equipment;

(7) handling and inspection of tow ropes;

(8) pre-flight preparation and inspection of gliders;

(9) the requirements for weight and balance, including C of G limitations, normal flight characteristics at fore and aft C of G, and stall and spin characteristics at fore and aft C of G;

(10) calculation of weight and balance, and interpretation of graphs and charts;

(11) details of the Ballast-CISTRSC pre-take-off check; and

(12) launch and air tow signals.

c. **Lectures 3 and 4 – Air Handling.** The following shall be addressed:

(1) the launch methods including a discussion of:

(a) take-off, tow positions, turns and release,

(b) slack rope procedure for air tow, and

(c) tow aircraft upset phenomenon;

(2) typical airspeeds for air tow and free flight;

(3) optimum gliding speed, minimum sinking speed, normal glider manoeuvring speed, calculating gliding distance (given altitude, L/D and winds), gliding into wind, turning onto final into a wind gradient, and considerations on approach and approach speed;

(4) stalling and side-slipping speeds;

(5) maximum and minimum cockpit weights, and requirements for ballast;

(6) the circuit with respect to altitudes and pattern nomenclature;

(7) emergency procedures including rope breaks, single and double release failure and off-field landings;

(8) the more common weather hazards to glider pilots including wind speed and crosswind, manufacturer's crosswind limitations, interpretation of crosswind charts, limited instrumentation, cloud avoidance and flight operations in rain (refraction error);

(9) pre-spin/stall ASCOT check; and

(10) pre-landing (downwind) SWARTSC check.

**AIR TRAINING PHASE**

6. The flying training syllabus consists of a series of dual flights to acquaint the candidate with the ACGP and to ensure that there is a complete understanding of all ACGP standards and procedures.

7. As a licensed glider pilot, the candidate will be expected to make rapid progress through the flying phase and will, therefore, not require more than an exposure to each of the sequences/exercises. Consequently, the PL standard for all flights in this conversion course is PL 3, with the exception of D1 and D2 (familiarization flights) which require not OFR or PL.

8. To assist candidates who experience difficulty in achieving the required standard, the CFI RGS or CO/RCA Ops O may approve a maximum of three (3) extra dual flights and a re-ride. If unsuccessful, this will constitute grounds for cease training.

**AIR LESSONS**

9. For details on the Air Lessons listed below, refer to the corresponding Air Lessons in Chapter 3, Glider Pilot Course.

| Flt No. | Air Lesson | Exercise | Release (Feet AGL) | Time | Total |
|---|---|---|---|---|---|
| D1 | AL1 | 2-33A Famil | 2500 | :15 | 0:15 |
| D2 | AL1 | Local Operation and Area Famil | 2500 | :15 | 0:30 |
| D3 | AL4, 5, 6 and 7 | Take-Off, Air Tow, Straight Glide, Medium/Gentle Turns, Stalls, Circuit, Approach and Landing | 2 500 | :15 | 0:45 |
| D4 | AL10, 12 and 13 | Spins, Spirals, Steep Turns and Slipping | 3 000 | :18 | 1:03 |
| D5 | AL16 | Review Circuit Modification (High Entry) | 2 500 | :15 | 1:18 |
| D6 | AL17 | Review Circuit Modification (Low Entry) | 2 500 | :15 | 1:33 |
| D7 | AL20 | Launch Emergency and Circuit Modification | 800 | :05 | 1:38 |
| D8 | AL21 | Launch Emergency and Downwind Landing | 400 | :03 | 1:41 |
| D9 | AL24 | **Proficiency Check** | 2 500 | :15 | 1:56 |

Figure 5-4-1 Air Lessons – Flying Syllabus

# CHAPTER 6

# MANUAL OF GLIDER FLYING TRAINING

## SECTION 1

## STUDENT PREPARATION

### INTRODUCTION

1. All pilots must strive to be highly skilled and thoroughly competent. Initiative, trained reflexes, and skilful techniques all contribute towards becoming professional pilots.

2. This annex is designed to present the fundamentals of basic flying in the 2–33 glider. There must be close coordination between the classroom and the flight line as each clarifies and enhances the other. Theory mastered in the classroom builds the knowledge and confidence required to fly the glider. The information given in this annex, together with ground school instruction, is the foundation on which your instructor will base your flying training.

### PHYSICAL CONDITION AND MENTAL ATTITUDE

3. Your physical condition is extremely important. If flying lessons are to be absorbed quickly and completely, you should have a reserve of physical stamina. Nutrition is also a key element. The physical demands during the Glider Pilot Course are heavy and a good healthy diet is paramount to ensuring that your stamina is maintained. Even if you are in top physical condition, the assimilation of all the information you receive in the first few days will be fatiguing. Try to keep your mind free to take in everything your instructor says.

### YOUR INSTRUCTOR

4. Your instructor is a highly qualified pilot whose aim is to teach you to become a competent pilot. To this end, your instructor will expect your best effort and, when emphasis is placed on exactness, it is done for your benefit.

### PREPARATION

5. To utilize the flying session fully, **<u>you must be completely prepared for the lesson</u>**. Be sure that you read and understand all the reference material assigned to you. Be eager and enthusiastic.

### QUESTIONS

6. Many things may occur that will seem strange to you and contrary to your former ideas about flying. **<u>Do not be afraid to ask questions</u>**.

7. Ensure that you seek a solution to each problem, as no one can learn too much about flying. Pilots with years of experience and thousands of hours are still asking questions and learning.

8. Your instructor will brief you before each trip or series of trips. In the pre-flight briefing you will be told what you will do, why you will do it, and how you should do it. Question any point that is not clear.

9. After each Flight/Air Lesson, your instructor will review the lesson. This is your chance to clear up any misunderstanding and to review what you have learned. Be sure to have a complete understanding of your mistakes and the action you must take to correct them. Again, ask questions while they are still fresh in your mind.

10. Aircraft Operating Instructions (AOIs) contain all the essential information relative to one particular type of aircraft. A copy of the Schweizer 2-33 AOI is in Chapter 2, Section 1 of this manual. Use this as a reference and review it frequently.

**FLIGHT SAFETY**

11. The overriding factor in all aspects of flying is safety. On the flying field there is a great deal of activity. You must always keep a good look-out for aircraft and vehicles. Always use caution when moving around aircraft.

**At all times remain clear of a tow aircraft if the engine is running.**

12. Before take-off, make sure that all necessary checks are completed. Careless pilots are not only a danger to themselves, but also to the occupants of other aircraft.. Do not take your responsibility lightly. For your own safety, as well as for that of others, get into the habit of thoroughly completing your checks. Conversely, do not disturb others while they are completing their checks.

**If you are interrupted during a check, you must restart the check from the beginning.**

13. An important flight safety requirement during your flying training is a clear and positive understanding of who has control of the aircraft. The procedure for handing over control to the student is:

| |
|---|
| Instructor: "YOU HAVE CONTROL." |
| Student response: "I HAVE CONTROL." |

14. When the instructor wishes you to relinquish control, the order is given as follows:

| |
|---|
| Instructor: "I HAVE CONTROL." |
| Student response: "YOU HAVE CONTROL." |

15. Additionally, the pilot taking control should shake the control column. Control must never be relinquished until the order and the response have been given. **Never be in doubt as to who is doing the flying**.

16. Loose articles can be a serious flight hazard. Anything that is loose could reposition itself and jam the controls. Ensure that all loose objects are properly stowed, including the radio and ballast.

**LOOK-OUT**

17. You must keep a good look-out. Obviously, you must stay alert to prevent the development of any situation that could require immediate evasive action. Good look-out techniques learned now will be extremely helpful later. While maintaining a vigilant look-out, be particularly conscious of other aircraft known to be in the area. Remember, there is a blind spot over your wings. **Never assume that others see you.**

18. A technique for improved look-out is to focus your eyes first on a distant object, such as a ground feature or edges of clouds, then divide your field of vision into sectors and scan each individual sector in vertical and horizontal sweeps.

19. Before beginning a turn, scan your whole field of vision, and pay particular attention to the direction in which you are about to turn. Remembering to look in the proper direction at the proper time will keep you busy initially, but as you gain experience, the extent of your look-out and your awareness of other aircraft will improve. **Poor look-out is a primary contributing factor in most mid-air collisions.**

20. Your instructor will explain the clock-elevation system of pointing out other aircraft. An example of an aircraft at "Right – 2 o'clock high**"** is shown in Figure 6-1-1.

**LOCAL FLYING REGULATIONS**

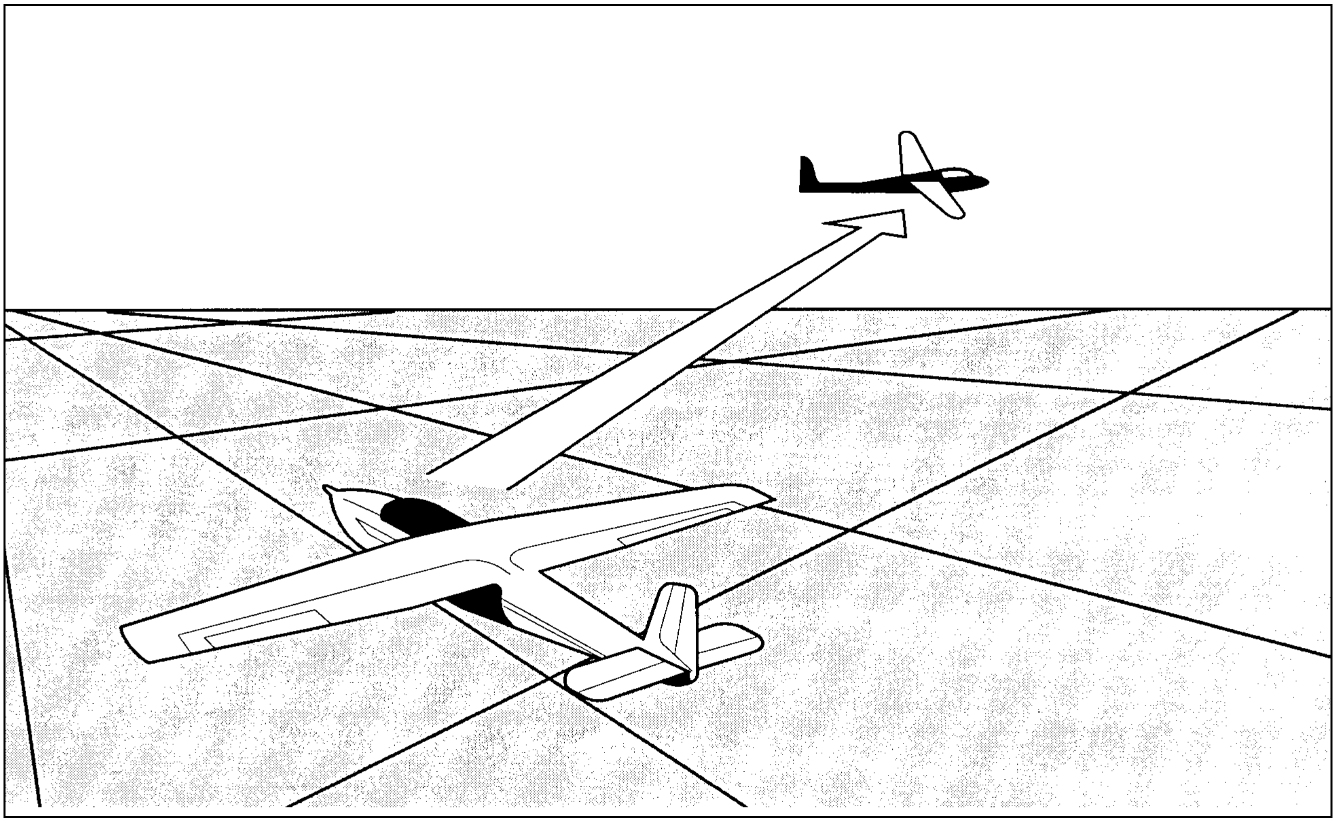


Figure 6-1-1 Clock-Elevation System (Right – 2 o'clock high)

21. Besides the general flying rules covered in this annex, specific regulations are in effect at each Regional Gliding School (RGS) and Gliding Centre. The regulations are published in Regional Flying Orders and School/Local Flying Orders; they cover such subjects as flying areas, traffic rules and patterns. These regulations are written to ensure safe, efficient flying operations and must be adhered to. Copies are available at the RGS's and Gliding Centres and they must be read on a regular basis and thoroughly understood.

**PILOT INFORMATION FILE**

22. A-CR-CCP-242/PT-005 is the governing publication for all Air Cadet gliding operations. Copies are available at all RGS's and Gliding Centres.

23. Besides the rules and regulations covered in the publications mentioned in the preceding paragraphs, you, as a pilot, are also responsible for any material in the Pilot Information File (PIF). The PIF is a compilation of information that each pilot is required to read and sign as having read. The information may include pertinent procedure changes, flight safety concerns or any material that is deemed important for safe flying operations.

## SECTION 2

## GROUND HANDLING

### DAILY INSPECTION

1. Prior to each day's flying, a daily inspection (DI) must be performed on the glider. This is a thorough check of the glider to ensure that it is airworthy. The DI will be carried out as detailed in the AOI and the DI Sheet.

### LIMITED PRE-FLIGHT INSPECTION (WALK-AROUND)

2. Before you strap into any glider as pilot in command or student, you must do a walk-around. This is a quick check of critical components on the glider. During the walk-around, you must verify the following items:

a. Wing leading edges;

b. Wheels and skid;

c. Elevator pushrod assembly (including bolts); and

Mis en forme

d. Pitot/static assembly.

### STRAPPING IN

3. Adjust the rudder pedals to the correct length and determine the need for ballast. If required, install the ballast and ensure the ballast pin is secure.

4. Climb into the aircraft and position yourself comfortably in the seat.

5. Strap yourself in according to the procedures demonstrated by your instructor. Ensure that you tighten the hip belt before you tighten the shoulder straps. This will ensure that the hip belt stays around your hips.

### PRE-TAKE-OFF CHECK

6. The pre-take-off check covers essential items in the cockpit as listed in the text that follows and on the placard on the instrument panel. Note that all items must be completed prior to hook-up:

| | | |
|---|---|---|
| **B** | **B**allast | Check aircraft weight limitations and ballast. |
| **C** | **C**ontrols | Controls functional; rudder pedals adjusted. |
| **I** | **I**nstruments | Instruments zeroed; radio and altimeter set. |
| **S** | **S**poilers | Spoilers operational, closed and locked. |
| **T** | **T**rim | Trim set for take-off. Trim shall be set full forward for aero tow and winch. Trim shall be set full aft for auto tow. |
| **R** | **R**elease | Check release for tension and operation. |
| **S** | **S**traps | Straps secure – front and back seat. |
| **C** | **C**anopy | Canopy, rear window and door closed and locked. Confirm security of canopy latch by touch. |

**NOTE**

The pre-take-off check shall be performed verbally and by touch prior to each launch.
**ANY INTERRUPTION SHALL REQUIRE RE-INITIATION OF THE CHECK.**

**PRE-TAKE-OFF HAND SIGNALS**

7. The hand signals that are used prior to take off are detailed below. Details of the signals to be used for controlling the air tow launch of gliders are found in Chapter 2, Section 4.

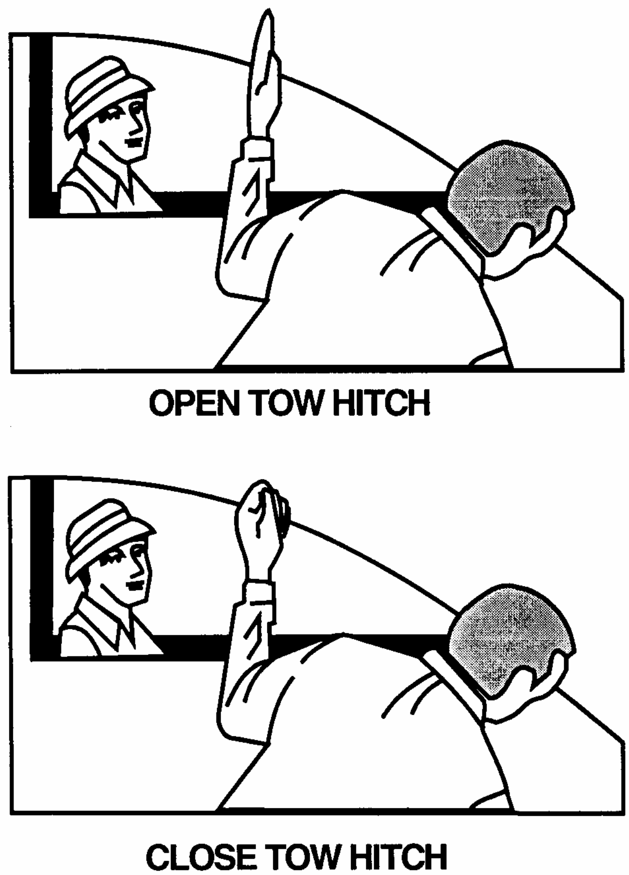



Figure 6-2-1 Pre-Take-Off Hand Signals

## SECTION 3

## AIR HANDLING – GENERAL

### AXES OF THE AIRCRAFT

1. Having control of an aircraft means that you are free to manoeuvre the aircraft into any desired attitude. Unlike land-borne vehicles, an aircraft has the ability to pitch, roll and yaw. This movement is always about the lateral, longitudinal or vertical axes, which pass through the centre of gravity (CG). See Figure 6-3-1.

### CONTROL SURFACES

2. The control surfaces can be used individually or together. They are positioned as far as possible from the CG to give the best leverage.

### APPLICATION OF CONTROLS

3. Your instructor will demonstrate the effect and use of the controls in various attitudes of flight. Normally, no single control can manoeuvre the aircraft correctly. To fly the aircraft accurately, control movements must be co-ordinated and must be applied smoothly and evenly. Rough or erratic movements of any of the controls will cause the aircraft to react accordingly. When a control surface is moved out of the streamlined position, the air flowing past it causes a pressure differential on the control surface that can be felt through the control column and/or rudder pedals.

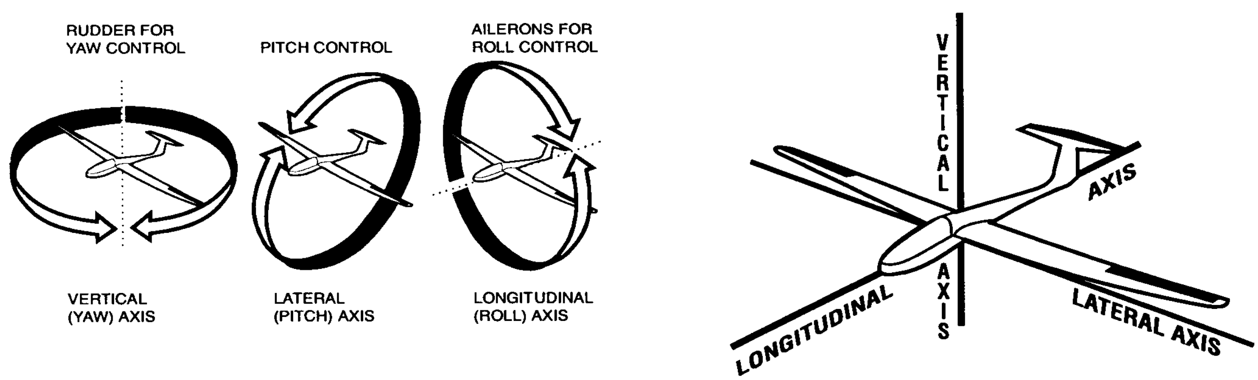



Figure 6-3-1 Axes of an Aircraft

### CONTROL COLUMN

4. Hold the control column with your right hand in a relaxed and comfortable manner. Do not grab or squeeze it. Relax your arm and hand so that you can feel any pressure that is transmitted from the control surfaces.

5. The amount of pressure exerted on the control column by the control surfaces is governed by the speed at which the surface is travelling through the air and the degree of deflection. Conversely, the amount of pressure you have to exert on the control column varies with the pressure transmitted from the control surfaces. Sometimes, especially during air tow, you may have to grasp the control column more firmly, but more often, all necessary pressures can be applied with your hand relaxed on the control column.

**RUDDER PEDALS**

6. Apply pressure to the rudder pedals smoothly and progressively with the balls of the feet. The rudder pedals are interconnected, as one pedal moves forward the other one must be allowed to move rearward. **RELAX!**

**TRIM SYSTEM**

7. The 2-33 has a ratchet or bungee trim system (depending on the model) that is designed to assist the pilot by relieving pressures on the control column. It is operated by pulling back on the trim lever or by squeezing the trim handle on the control column to set the desired control column force. As your speed increases the trim must be set forward to release the pressure on the control column.

8. You will find that the trim is an effective way for the pilot to achieve fore and aft stability. Firstly, set up the attitude for the airspeed desired and check the ASI. If the ASI is correct, and using only a slightly firm hold on the control column, move the trim lever until all pressure is taken out of your hand. For example, if you have to hold back on the control column, move the trim lever back until all pressure is out of your hand. Conversely, if you have to push forward, move the trim lever forward. Re-adjust a little at a time. It takes patience. Always retrim when you feel an unwanted pressure on the control column.

**SPOILERS/DIVE BRAKES**

9. The spoilers/dive brakes are used to reduce lift on the top of the wings and for aerodynamic braking. They can be extended at any speed. Their effectiveness is more pronounced at higher airspeeds.

10. **Effects.** The following effects are applicable:

a. increased rate of descent;

b. slight change in pitch attitude;

c. reduction of airspeed; and

d. increase in stalling speed slightly.

**PRIMARY EFFECTS OF CONTROLS**

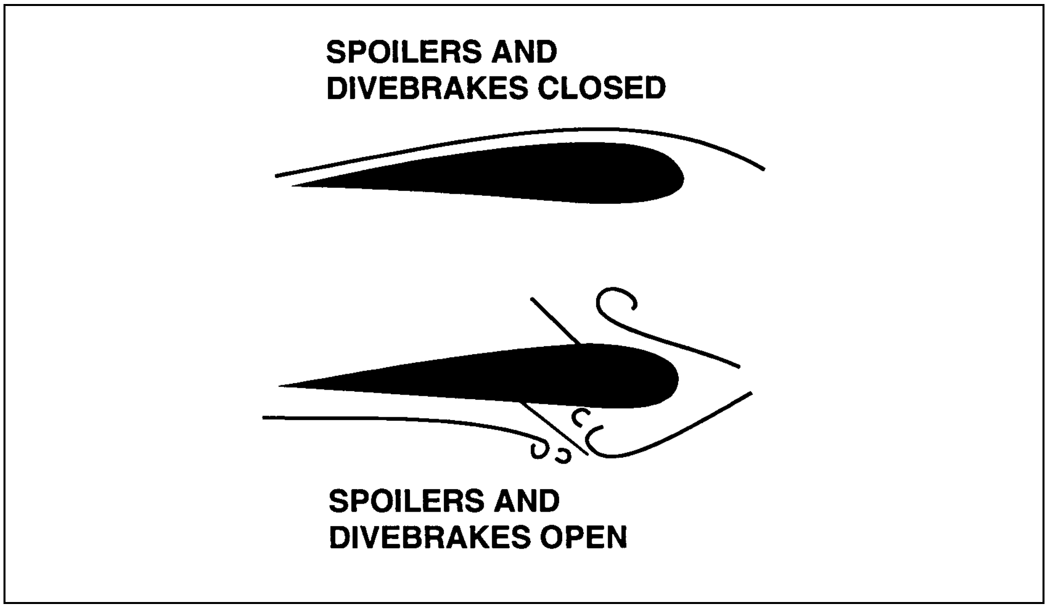



Figure 6-3-2 Spoilers and Dive Brakes

11. The flight attitudes of the glider are described as positions of the glider nose and/or wings in relation to the visible horizon. Your instructor will demonstrate various flight attitudes to you in your first flights.

12. The primary effects of controls (movements) are as follows:

a. **Elevators.** The following are applicable:

(1) Produce and control pitching movement, airspeed and altitude. If in straight glide you ease the control column back (elevator up); the nose of the glider will move upward in relation to the horizon and the airspeed decreases. This can be ascertained, without reference to the ASI, by the reduction in wind noise. If you pull the control column back quickly there will be a marked increase in seat pressure and the airspeed will indicate a more rapid decrease.

(2) Conversely, if you ease the control column forward the nose of the glider will appear to drop in relation to he horizon, the airspeed will increase, wind noise will increase and seat pressure will lighten. Remember, it does not matter what attitude you are in, a movement of the control column forward or back will cause the nose of the glider to move up or down in relation to the horizon.

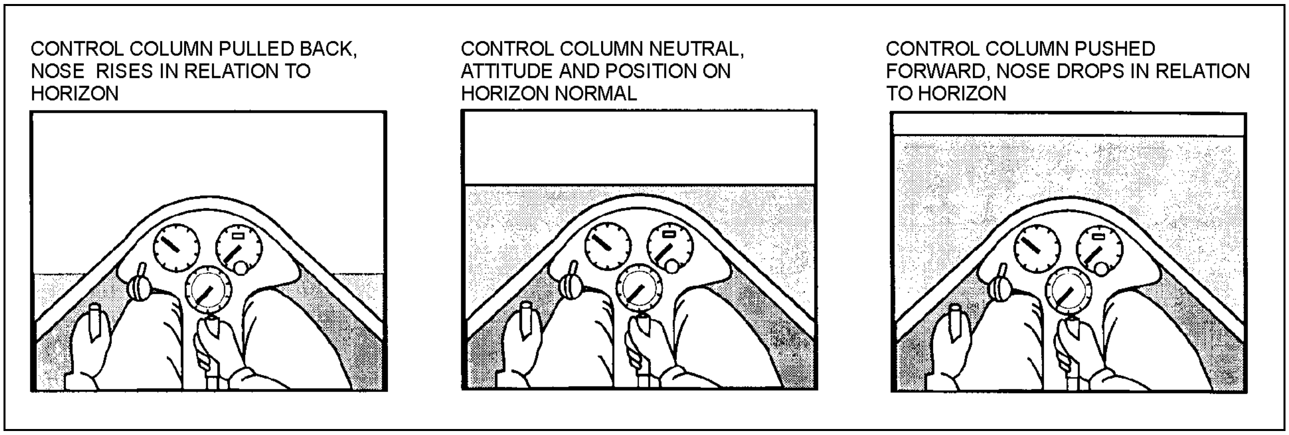



Figure 6-3-3 Pitch Attitudes

b. **Ailerons.** Produce and control rolling movement, banking and turning. Movement of the control column left and right causes the ailerons to move. Left control column causes a roll to the left, and the horizon appears to tilt to the right (movement around the longitudinal axis).

c. **Rudders.** Control, prevent and regulate yawing movements.

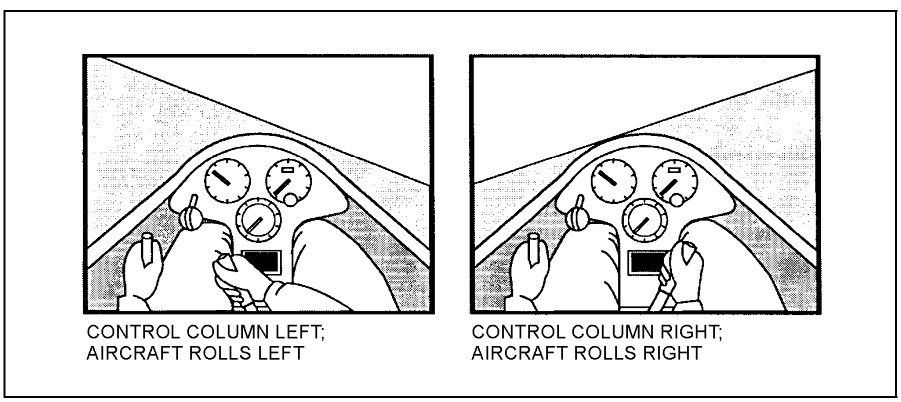



Figure 6-3-4 Roll Attitudes

13. To summarize, the **pitching** movement is perhaps most easily described as the movement of the nose about the lateral axis, produced and controlled by the elevators. The **rolling** movement is the movement of the aircraft about the longitudinal axis, produced and controlled by the ailerons. The **yawing** movement is the movement of the nose about the vertical axis, controlled by the rudder.

## STRAIGHT GLIDE

14. In a straight glide, the glider will maintain a constant descent rate of approximately 200 feet per minute (fpm). To achieve a straight glide, choose an attitude using outside references and confirm your references with a cross-check of the flight instruments. This method of controlling attitude will result in precise aircraft control.

15. Positioning of the canopy frame in relation to the horizon is the most commonly used reference. The distance between the base of the canopy and the horizon assists you in maintaining the correct gliding attitude, while the angle between the canopy base and the horizon assists you in maintaining the correct bank angle.

16. The airspeed indicator will indicate a constant reading in steady-state flight. An increase in airspeed indicates a lower pitch attitude and a decrease in airspeed indicates a higher pitch attitude.

17. Keeping the wings level uses the same concept. Each wing tip should be the same distance above the horizon in straight flight.

18. Do not concentrate too much on one reference. Fixing your attention in one place not only hinders your progress, but is detrimental to safety because you are not maintaining a good look-out

19. Familiarity with outside references and instrument indications enables you to determine the control inputs necessary to control the attitude of the aircraft. Control movements should be smooth and co-ordinated. Accurate control is never a static situation, but requires frequent small corrections to keep the aircraft in the desired flight path.

20. When the aircraft is in uncoordinated flight, the yaw string is displaced from the centre. In uncoordinated flight your body tends to lean towards one side of the cockpit, which gives you the sensation similar to that felt when rounding the corner in a car. Co-ordinated flight should be free of slip or skid (discussed in paragraph 33) even in a steep turn, and your body should remain in a comfortable, upright position.

21. The tendency to fly with one wing low is a common fault among students. The student sitting off-centre in the cockpit usually causes this. Another common problem is fluctuating airspeed. The student referring to the ASI too much usually causes this. Due to the lag in the instrument, the student ends up chasing the airspeed. Fly by reference to the horizon.

22. Do not compromise aircraft control and look-out when carrying out aircraft checks by focusing your attention in the cockpit for too long a period of time.

## CHANGING AIRSPEED

23. Airspeed changes in a glider are made by simply changing the pitch attitude. To change the airspeed, set the nose of the glider to the desired pitch attitude and check the ASI to confirm the proper pitch attitude.

24. It is important to know these attitudes because the glider ASI lags. Students who fly with reference only to the ASI end up chasing the airspeed and have trouble maintaining level glide.

25. Trim is an invaluable aid for accurate gliding flight and is designed to relieve the pilot of a sustained load on the control column. A trim change is called for when you find you have to hold continuous control column pressure, however slight. The ideal method of trimming is to set and maintain the glider in the desired attitude while trimming off all control pressures, so that the glider maintains the desired attitude with minimal pressure on the control column.

26. After you have had some practice in a straight glide and have learned to check all your references properly, you will be able to establish any desired wings level attitude in a few seconds. You will learn to look around quickly and to establish pitch, bank and direction simultaneously.

**SECONDARY EFFECTS OF CONTROLS**

27. If the aircraft is intentionally rolled into a banked attitude and the rudder pedals are held central, the aircraft will sideslip towards the lower wing. As a result of this slip, the airflow will strike the keel surfaces of the aircraft and it will yaw (weathercock) in the direction of the slip, with the nose going around and down towards the lower wing tip.

28. The yaw caused by the slip and weather cocking is a secondary effect of roll, or expressed differently, a further effect of aileron control.

29. The effects of adverse yaw may also be noticeable as the aircraft is initially banked. In a roll, the glider has a tendency to yaw away from the intended direction of the turn. This tendency is the result of aileron drag. The up going wing, as well as gaining more lift, also experiences more induced drag. Use of rudder in the turn corrects this tendency.

30. If an aircraft is allowed to yaw and the ailerons are held neutral, the result is a flat turn in the direction of the yaw – an outward skid. During the skid, a greater amount of lift is produced on the outer wing than on the inner wing that results in a rolling movement or bank.

31. The roll caused by the skid is a secondary effect of yaw, or expressed differently, a further effect of rudder control.

32. The practical points of the secondary effects of controls for the pilot to note are that either a roll or yaw, uncorrected, will lead to a steepening descending turn.

33. A common error that occurs once a turn is established is misuse or over-control of the rudder. One of the least expensive and most efficient slip/skid indicators is the yaw string, a piece of yarn mounted in the free air stream in front of the pilot as shown in Figure 6-3-5 to the right . The yarn remains aligned with the glider when the controls are properly co-ordinated, but indicates a slip by moving toward the outside of a turn, or a skid by moving toward the inside of the turn. A simple rule of thumb for applying the proper amount of rudder is to apply the rudder opposite to the direction the string is pointing until the string is centralized making sure that the angle of bank does not change.

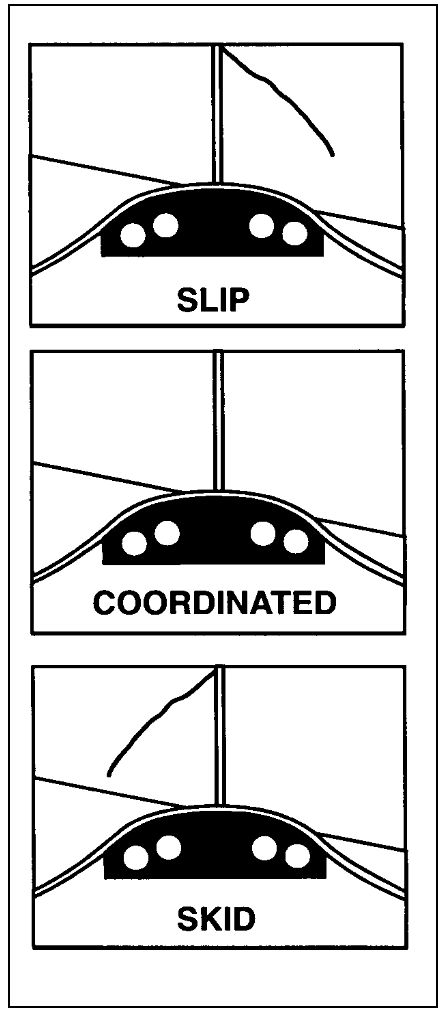



Figure 6-3-5 Yaw String

**TURNING**

34. A co-ordinated turn requires the simultaneous use of all three flight controls.

35. The three classes of turn for the glider are gentle, medium and steep:

a. **Gentle.** The gentle turn is up to 15 degrees of bank.

b. **Medium.** The medium turn is from 15 to 30 degrees of bank. A medium turn is the normal way of changing direction in flight, especially in the circuit.

c. **Steep.** The steep turn is any turn over 30 degrees of bank. It is used for rapid changes of direction and will be discussed in detail in a later section.

d. For training purposes, the following angles of bank will be used:

(1) Gentle 15 degrees.
(2) Medium 30 degrees.
(3) Steep 45 degrees.

36. **Entry.** Before entering a turn, look around to make sure that the area is clear and that it is safe to change direction. Look ahead and correct the nose position so that the proper attitude is achieved prior to the turn. Apply

aileron and rudder pressure together in the direction of the intended turn and roll the aircraft to the desired angle of bank. With this application of pressure, the ailerons move out of the streamlined position and cause the aircraft to roll into a turn. Rudder is used simultaneously to co-ordinate the turn.

37. The response of the aircraft depends on your ability to judge how much pressure should be used on the controls. If you want a slow rate of roll, use light, smooth movement; for a faster rate of roll, apply greater movement. The movement should be applied in proportion to the amount of change desired. In the early part of your training, you should practice rolling into turns slowly, until you have learned to feel the pressure properly. As your proficiency increases, you may roll into the turns at a progressively faster rate.

38. During straight glide, note the attitude of the nose in relation to the horizon. As you apply bank, keep the nose in that position. As the bank increases, apply gentle back pressure to compensate for the loss of the vertical component of lift and balance the effect of centrifugal force. In gentle and medium turns, the required increase in back pressure is comparatively small, but in steep turns, the back-pressure required to hold the attitude becomes more pronounced. An attitude that gives you a 50 mph IAS is sufficient for gentle and medium turns. However, for a steep turn, the pitch attitude will have to be adjusted so that you achieve 55 mph IAS prior to turn entry.

39. **During the Turn.** Once you have established the desired angle-of-bank, release the aileron pressure smoothly. Some of the rudder applied during the roll may be taken out. The aircraft will remain in the turn, and the control surfaces will be in the neutral, or streamlined, position. Do not release the back-pressure because constant pressure is needed to maintain the pitch attitude. Throughout the turn, hold the bank constant and make aileron adjustments similar to those made for a straight line. Yaw is eliminated by correct use of rudder to keep the yaw string centralized. Airspeed is controlled by using the elevator to maintain the proper gliding attitude.

40. During turns, concentrate primarily on visual reference and look-out, while occasionally referring to the flight instruments.

41. **Roll-out.** Take off bank with the aileron, control yaw with rudder and relax back pressure on control column. Centralize the control column and rudder as the wings come level and re-check attitude/speed.

42. **Turning Recap.** Perform the following:

a. look ahead and behind, recheck attitude;

b. watching ahead, apply aileron and rudder together;

c. maintain the desired bank with control column and then reduce rudder. A slight back pressure will be required;

d. re-check nose position and angle of bank; and

e. keep a good look-out.

43. **Remember that in a turn there should be three constants:**

a. constant angle of bank;

b. constant rate of turn; and

c. constant airspeed.

**TAKE-OFF**

44. Control response is very poor during the initial ground run, so all corrections require large control deflections. As speed increases you will find that a reduction in control inputs will be required.

45. Once you are set to go, give the correct signals (Figure6-3-6), remembering to keep the wings level using the ailerons. Maintain directional control with the rudder. Allow the glider to achieve a level attitude and maintain this until airborne. The glider should lift off at about 45 mph. Ideally, the pilot will fly at 3 to 5 feet AGL and keep in position directly behind the tow aircraft. You will find that you have to apply forward pressure on the control column as the glider increases speed.

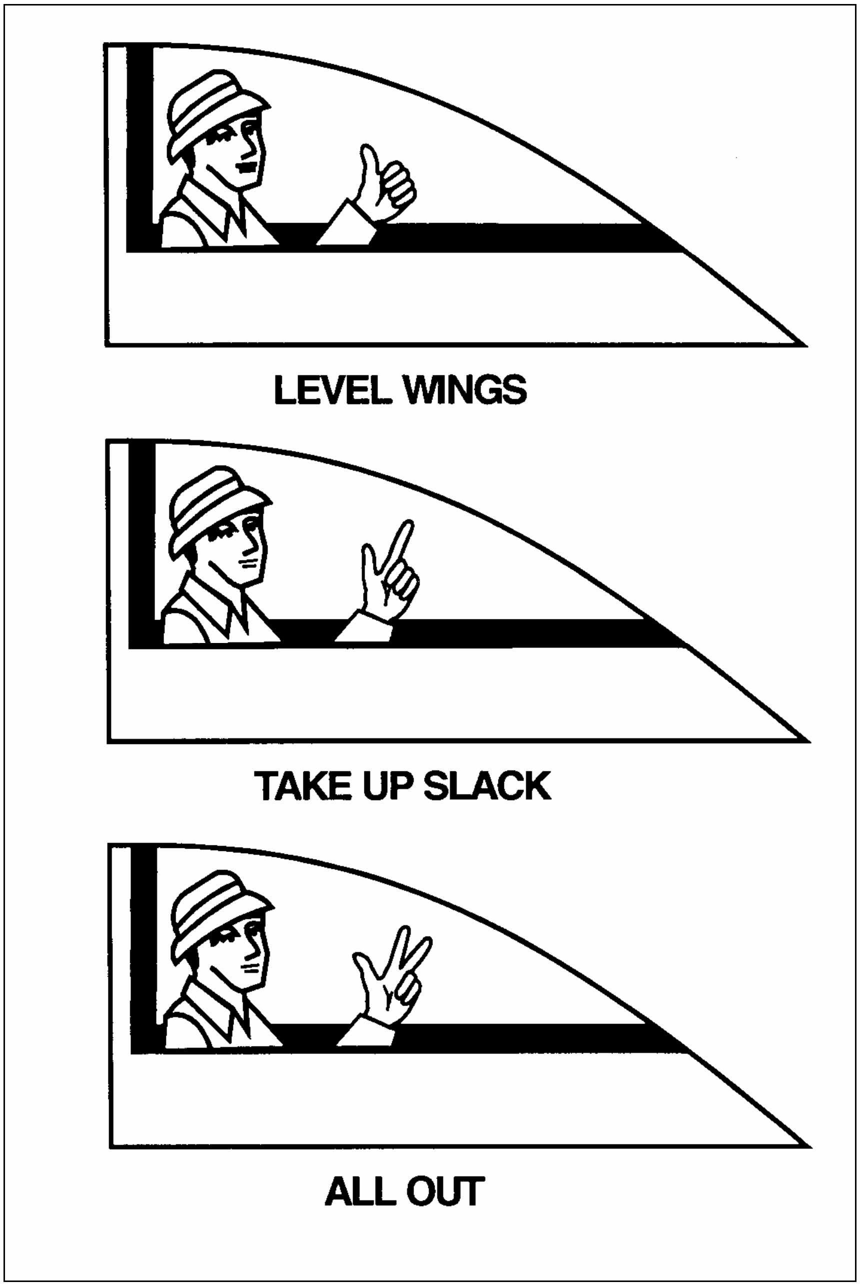



Figure 6-3-6 Take-off hand signals

46. When the tow aircraft achieves climb speed and climbs out, assume the correct tow position. You will be shown the proper position by your instructor.

47. If the initial climb by the tow aircraft is steeper than normal, the glider pilot must be sure to climb away with the tow aircraft, so as to remain in the correct relative position.

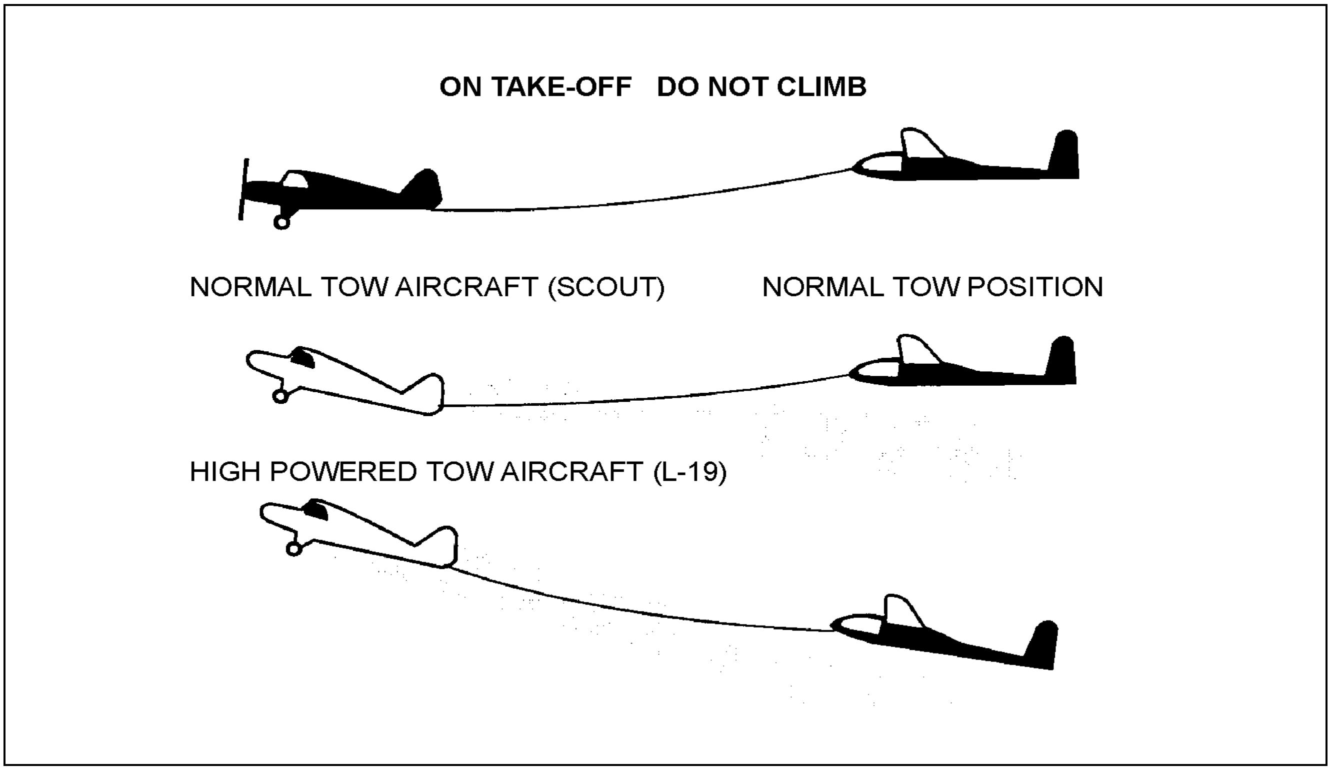



Figure 6-3-7 Take-Off Positions

**CROSSWIND TAKE-OFF**

48. A crosswind affects the glider on take-off. As you move to position on the runway, check the windsock so you can recognize and anticipate a crosswind. Another quick check is to observe the yaw string when lined up behind the tow aircraft. It will tell you the direction of any significant crosswind.

49. Crosswind take-offs require co-ordinated action by the wing runner and the pilot to prevent the glider from weathercocking. The wing person should hold the upwind wing slightly low and continue to do so as the take-off roll begins.

50. Before starting the ground roll, the pilot should position the control column into the wind to keep the wing from lifting and apply opposite rudder to track straight down the runway. As the take-off progresses, the controls become more effective and less input is required. The ailerons will then keep the upwind wing down and the opposite rudder will prevent weathercocking.

51. A crosswind take-off requires a higher than normal take-off airspeed to allow a clean break with the ground. This prevents the glider from drifting during the lift-off transition, which can cause excessive side loads on the main wheel.

52. The tow aircraft will normally still be on the ground immediately after the glider becomes airborne; therefore, crab should be applied to maintain a position directly behind it. Alternatively, the into-wind wing can be kept slightly lower and the opposite rudder applied to maintain a straight track down the runway. This is referred to as the wing low method for crosswinds. If crab or the wing low method is not applied, the glider will drift and this makes it extremely difficult for the tow pilot to maintain directional control and may prevent a safe take-off.

53. Once the tow aircraft is airborne, the tow pilot will apply the necessary crab to maintain runway centreline. The glider should then be manoeuvred directly behind the tow aircraft (see Figure 6-3-8).

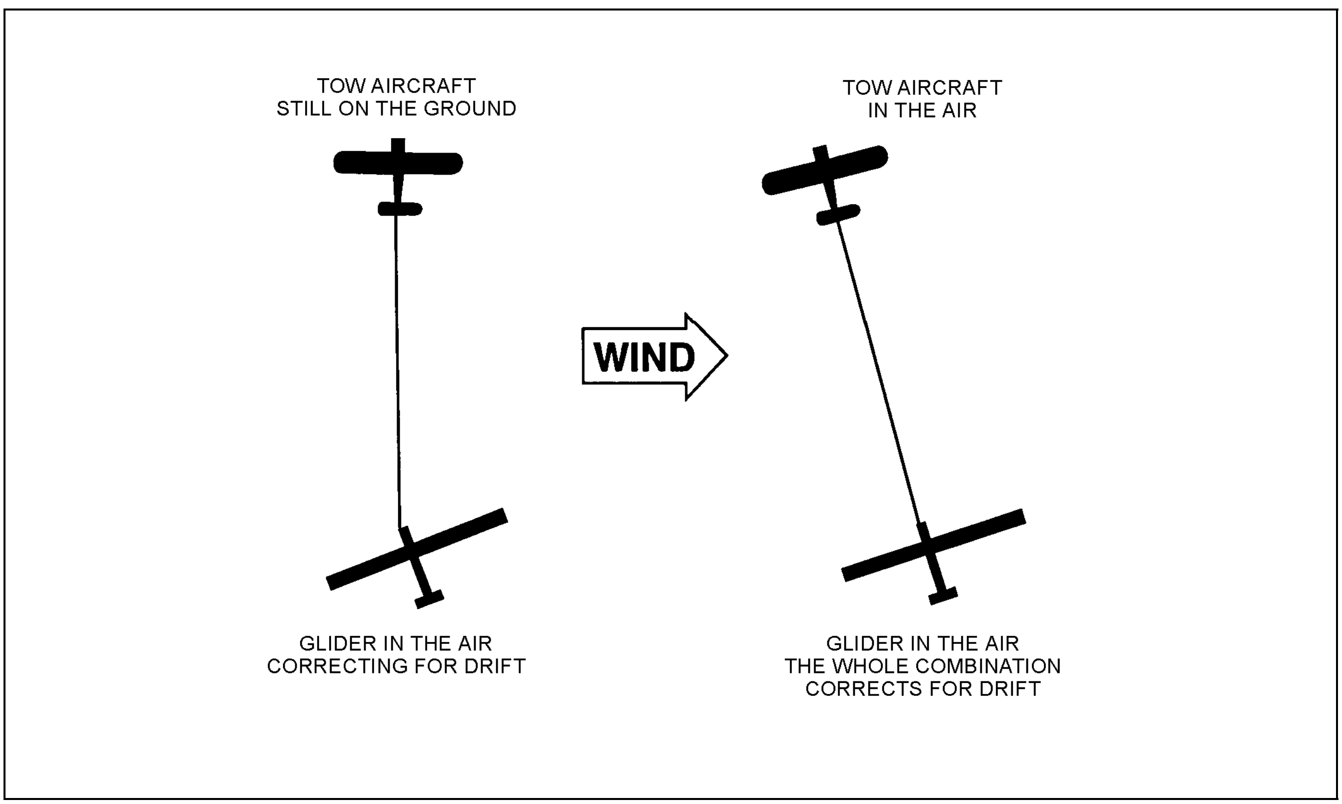



Figure 6-3-8 Crosswind Take-Off – Crab Method

**AIR TOW**

54. At the RGS's, the method of launch is by air tow. The glider is pulled into the air by a tow rope attached to a powered airplane. The glider pilot's aim in an air tow launch is to maintain position behind the aeroplane so that the tow can be carried out safely and efficiently.

55. Air tow requires the pilot to do two things: fly the glider and formate on the tow aircraft. In the beginning, you will have difficulty in coping with a tow until you are able to control the glider. This is what makes the glider handling exercises from previous flights so important.

56. Your instructor will fly the tow for the first few missions until your glider handling skills are sufficient to attempt air tow. Even then, you will be introduced to the tow gradually and for short periods of time, with constant changes of control between you and your instructor. Eventually, as your skill increases, you will put it all together and fly the entire tow from take-off to release.

57. On tow, the glider must maintain either the high tow or low tow position (see Figure 6-3-9). During training you will be using predominantly the high tow position. The proper high tow position places the tow aircraft's wings on the horizon (for the Scout) or has the horizontal stabilizer centred in the "X" made by the struts and landing gear (for the L-19). The vertical fin should bisect the fuselage. An alternate method is to have the tow rope centred between the tow aircraft's main wheels.

58. **Vertical Corrections.** If the glider gets too high on tow, this can be very dangerous, causing the tow aircraft's tail to be pulled up and causing the aircraft to dive. To recover from this position ease forward on the control column without letting too much slack develop in the rope. If needed, side slip a little. In extreme cases, you may use the spoilers. If so, **do this with caution**.

**<u>If you get into a position where you can no longer see the tow plane, release immediately.</u>**

59. If you find yourself too low there is generally no cause for alarm. In fact some countries do their training in the low tow position. For long distance tows it is the preferred method, as you will find it is easier to keep station with the tow aircraft. In any event, all that is required is to ease back on the control column and gently climb back into the proper high tow position.

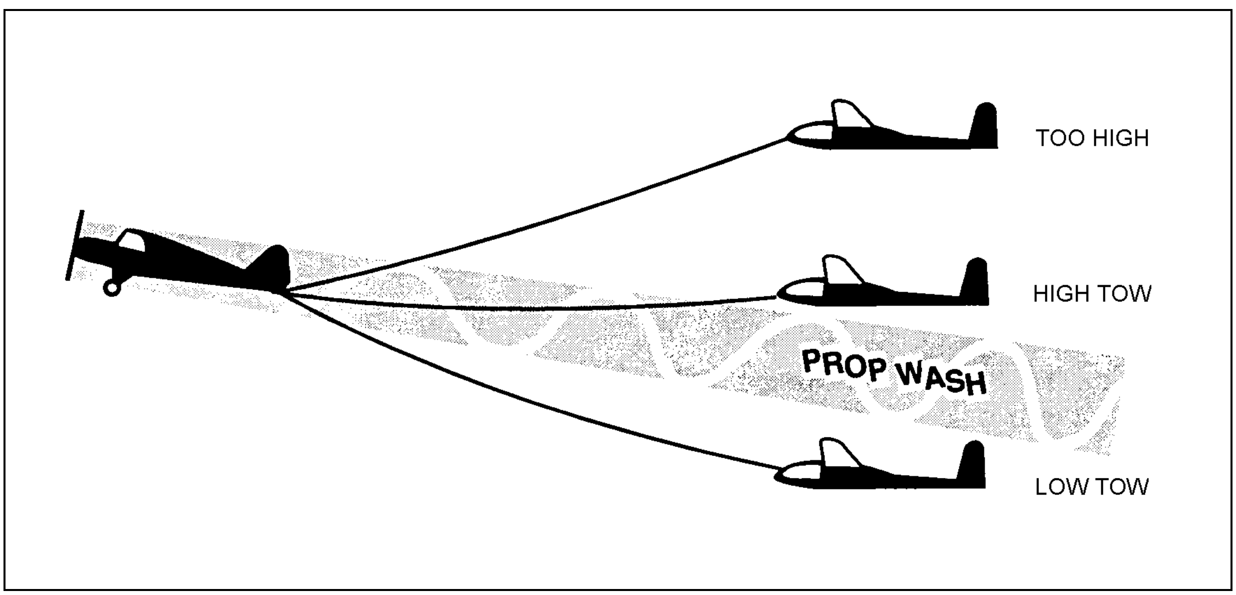



Figure 6-3-9 Tow Positions

60. **Lateral Corrections.** If you find yourself off to the side of the tow plane, do not panic. It is relatively harmless provided you do not start snaking back and forth by making inappropriate control movements.

61. Lateral displacement can be corrected in a variety of ways:

a. **Do Nothing.** Hold wings level and since the rope is under tension it will pull you back in behind the tow aircraft.

b. **Sideslip Back into Position.** Apply a little bank towards the tow aircraft and use opposite rudder to prevent a turn.

c. **Reposition with a Very Shallow "S" Turn.** Make sure you take corrective action prior to obtaining the proper position or you will overshoot your mark.

d. **Keep the wings level and use rudder to ease back into position.**

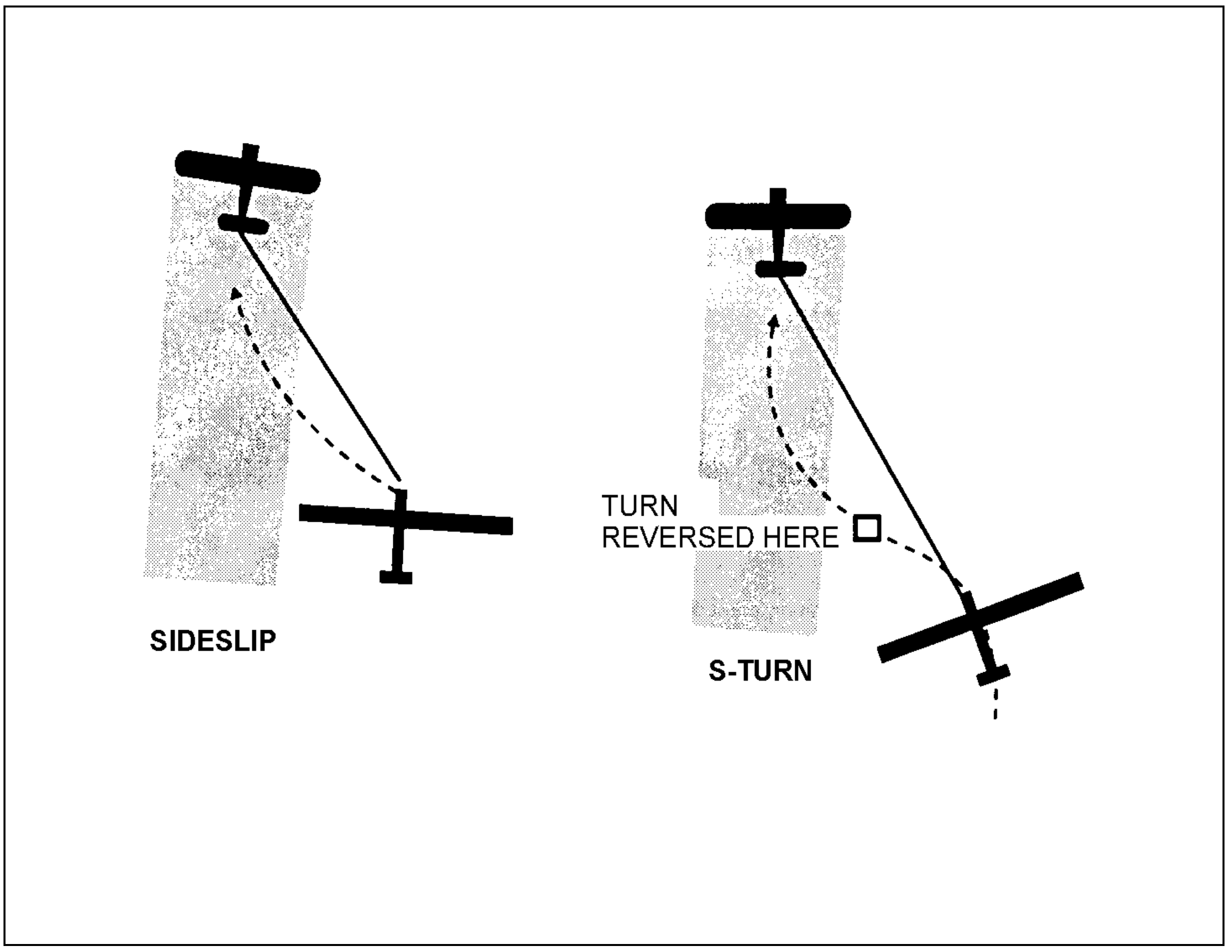



Figure 6-3-10 Lateral Tow Corrections

62. **Turns on Air Tow.** Ideally, the glider and tow aircraft should follow a common circular path, on which the tow rope forms a chord. The longitudinal axis of both aircraft would be at the same angle in relation to the tow rope. The angle of bank of the glider should normally be the same as the tow aircraft's. In turns exceeding 20 degrees of bank, however, it may be slightly shallower.

63. The correct position in a turn is for you to keep the vertical fin of the tow aircraft splitting the fuselage in half. The vertical reference does not change.

64. **Position Error in the Turn.** Unintended changes in the angle of bank can lead rapidly to lateral positioning errors. Too much bank and the glider will track to the inside of the turn; too little bank and the glider will track too far to the outside of the turn.

65. If you are too far out (wide), the glider has further to fly and the airspeed increases and tends to pull the tow aircraft's tail outward causing a tighter turn. The most probable cause is underbanking. Increase your angle of bank to that of the tow plane. You can also sideslip slightly to return to the proper position. Do not waste time; take corrective action immediately.

66. If you are too far inside the turn, the glider cuts the corner and slack in the rope will develop. Reduce the angle of bank slightly and skid outwards. The skid will keep the rope tight and will slowly carry you back to the proper position.

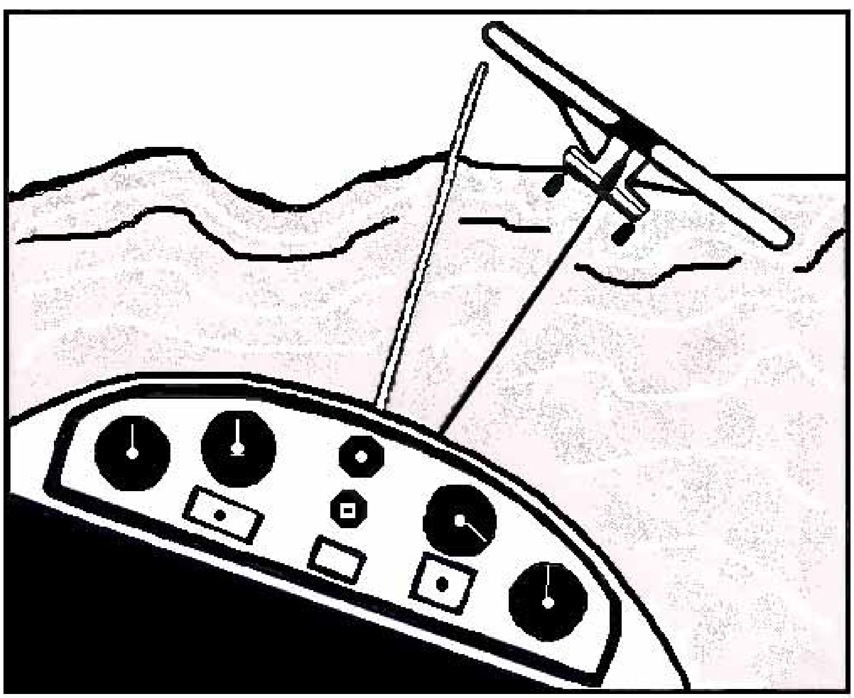


Figure 6-3-11 Tow Position in a Turn

**BOXING THE WAKE**

67. One of the manoeuvres that you will have to do is "Boxing the Wake". This will test your ability to fly around the tow aircraft's wake.

68. The objective of the manoeuvre is to move from one tow position to the other forming a rectangular pattern, returning to the original position while avoiding the wake. The sequence used is as follows:

a. Using a slight amount of bank, move laterally to a point just outside the wing tip of the tow aircraft.

b. Holding rudder (to keep from being pulled in), descend to the low tow position. Hold position with rudder and elevator.

c. Centralize rudder and initiate a slight bank to move back to the central position, maintaining the low tow position.

d. Using a slight bank, move out to the opposite side of the tow aircraft.

e. While holding enough rudder to maintain lateral displacement, raise the nose slightly and climb back up to the high tow position.

f. Slowly release the rudder to allow the glider to resume the normal high tow position behind the tow aircraft. (Figure 6-3-12).

69. You will also be shown how to descend straight down through the wake to the low tow position. Do not worry when you go through the wake, the rumbling and rattling of the glider are just the effects of the turbulence generated by the tow aircraft's propwash.

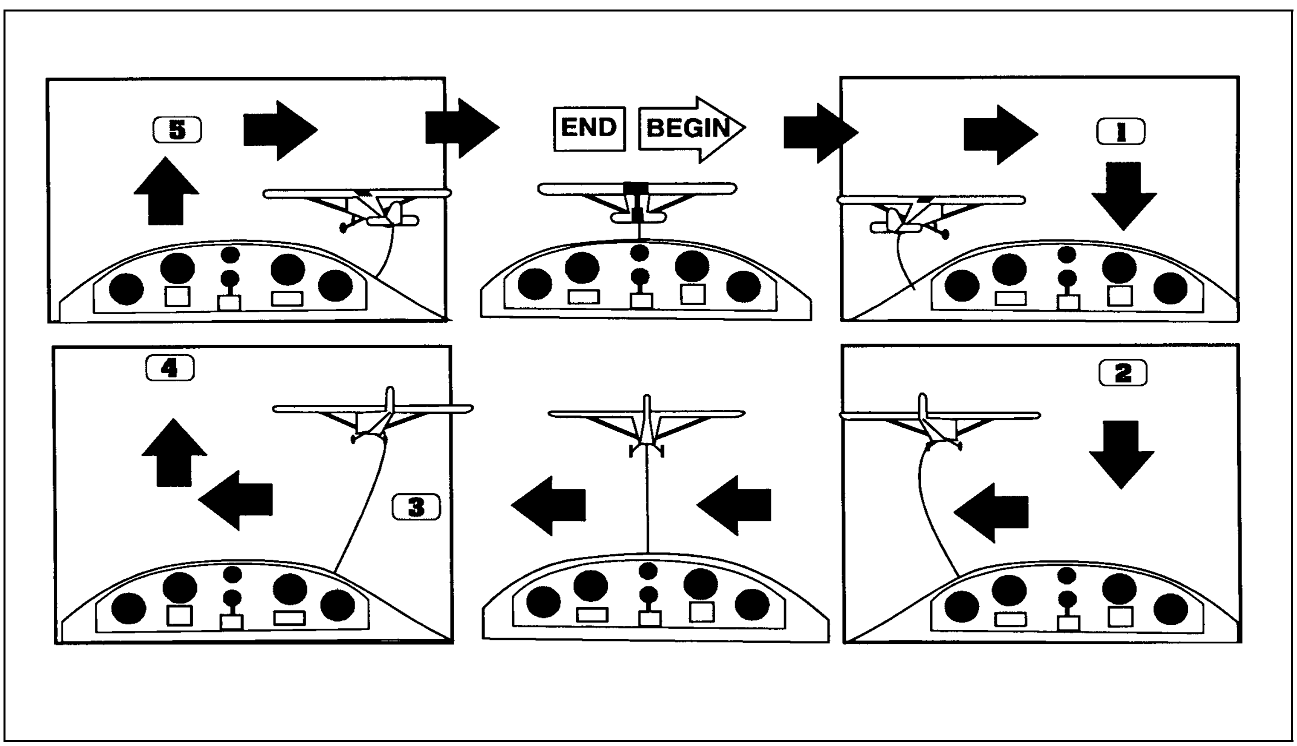



Figure 6-3-12 Boxing the Wake

**SLACK ROPE PROCEDURES**

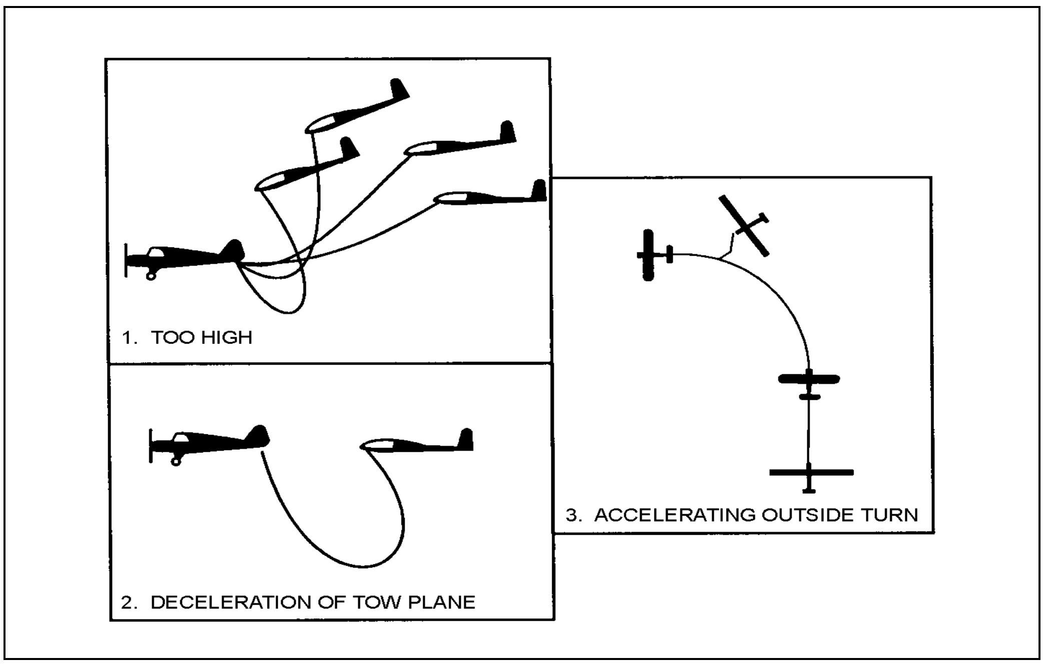
70. The glider normally follows the tow aircraft at a distance dictated by the length of the tow rope. However, changes in relative airspeed by either aircraft can cause slack in the tow rope. If the difference in airspeed is substantial, it is possible for a large loop to develop. This presents an immediate hazard to the glider pilot since a loop of sufficient size could reach back far enough to entangle a wing or control surface.

71. The following are scenarios that can result in a slack towrope:

a. If the glider gets too high, descending to the correct position too rapidly can cause the glider to accelerate, resulting in slack (Figure 6-3-13, item 1).

b. An unexpected deceleration of the tow aircraft can cause the glider to overrun the tow rope (Figure 6-3-13, item 2); and

c. If the glider is too far outside the turn, it accelerates and slack results if the glider pilot turns back towards the tow aircraft too rapidly (Figure 6-3-13, item 3).




72. **Corrective Actions.** The following corrective actions are applicable:

a. Get away from the loop by yawing the nose of the glider away from the slack. When the slack is almost taken up, yaw back into alignment with the tow aircraft and ease forward on the control column. This will prevent excessive stress on the tow rope and reduce the possibility of the weak link breaking.

b. Carefully apply spoilers. When the slack is almost out, close the spoilers and lower the nose slightly.

c. A slack line, caused by turning back too rapidly from an outside acceleration in a turn, can be corrected by:

(1) adjusting the angle of bank to coincide with that of the tow aircraft;
(2) holding position by flying formation with the tow aircraft;
(3) allowing the glider to decelerate; and
(4) when the rope is taut, moving back into the proper position .

**RELEASE**

73. Prior to reaching the programmed release altitude, the glider pilot shall prepare for release by stabilizing the glider in a slightly higher than normal tow position and conducting a traffic check. The higher than normal tow position allows the glider pilot to carry out a **soft release** by gently easing forward on the control column to reduce tension on the rope before releasing.

74. Responsibility to release rests with the glider pilot when position and altitude are suitable. Release procedures may differ depending on local operating procedures. Ensure that you review the School Flying Orders and familiarize yourself with your local procedures.

75. Prior to the point of release, the glider pilot shall carry out the pre-release check that can be easily remembered as the "triple A, T check".

a. **Area.** Ensure that you are approaching the proper release area.

b. **Altitude.** Ensure you are at the required altitude for release.

c. **Attitude.** Ensure glider is in the proper attitude and tow position for release, i.e., not in a turn or in low tow.

d. **Traffic.** Ensure that the area you will be turning into is clear.

76. At the release point, pull the release knob, hold it open momentarily (1 to 2 seconds), repeat and visually confirm separation from the rope. Commence a gentle climbing turn to the right to provide separation from the tow aircraft. Once in a straight glide, trim the glider for the desired airspeed.

**AIR TOW EMERGENCIES**

77. As a glider pilot, it is very important that you are aware of the actions required when an emergency occurs, such as a rope break. Premature releases and tow aircraft engine failures will all be treated as rope breaks for the purpose of this section. Emergency procedures are discussed in detail in Chapter 2, Section 7.

## SECTION 4

## CIRCUIT AND LANDING

### INTRODUCTION

1. This section describes glider circuit procedures including the traffic pattern, final approach; and landing.

2. Established circuit procedures ensure the orderly flow of traffic and that the glider always remains in a position to facilitate a safe landing on the aerodrome in the event of unforeseen circumstances (such as heavy sink).

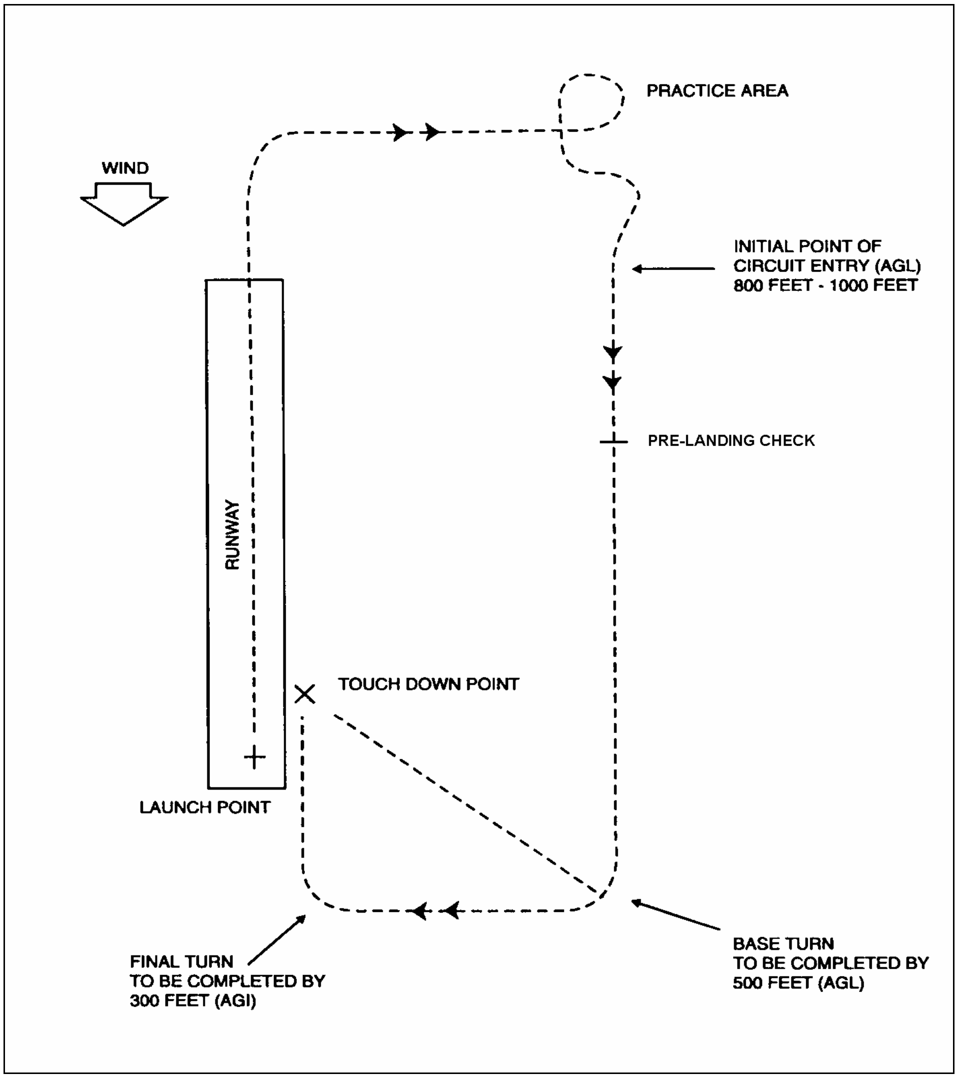



Figure 6-4-1 The Circuit

### CIRCUIT PLANNING

3. The circuit consists of entry at the initial point (IP) at 1 000 feet AGL, a downwind leg, a turn to base leg (completed by 500 feet AGL), a base leg, a turn to final (completed by 300 feet AGL), a final approach, and a landing. The ideal circuit is based on a zero wind condition.

4. Unlike power flying, it is not always possible to use the normal rectangular pattern. This is due to thermal activity, downdraughts, windshear, wind drift, etc. As a result, the glider pilot, except in calm wind conditions, is continually adjusting the pattern to suit the conditions encountered. The following diagrams will enable you to appreciate what is required. At each stage of the circuit there are corrections you can make if you are not at the right height (e.g., increase or reduce spoilers, side slip, etc.). It is important to recognize errors early and correct.

**INITIAL POINT (IP)**

5. The circuit is made up of several key points to aid you in judging your altitude with relation to your position in the circuit. The first one is the IP. This is the beginning of the circuit and is located at approximately a 45 degree angle from the landing area. In ideal conditions, you should be over your IP at 1 000 feet AGL.

**DOWNWIND**

6. After crossing over your initial point at 1 000 feet AGL and proceeding downwind, you should complete your pre-landing check as detailed in this manual and placarded in the glider. This should be completed prior to the halfway point of the downwind leg. The following are applicable:

| | | |
|---|---|---|
| **S** | **S**poilers | Check operation and position. |
| **W** | **W**ind | Assess wind speed and direction. |
| **A** | **A**irspeed | Fly downwind at 50 mph. Calculate the final approach speed (FAS) (50 mph plus wind speed including any gust factor. See note). |
| **R** | **R**adio | Radio on. Make radio call as required. |
| **T** | **T**rim/Traffic | Set trim as required. Check for conflicting traffic. |
| **S** | **S**traps | Check front and seat back harness security. |
| **C** | **C**anopy | Ensure canopy rear window and door are secure and locked. |

**Note: The reported wind speed, including any gusts, must be added to 50 mph for base and final approach to a maximum of 65 mph (i.e. if the wind speed is 20 or even 30 mph, the maximum FAS is still 65 mph).**

7. The downwind leg is flown at 50 mph (dual and solo). At the halfway point of the downwind, you should be adjacent to the touchdown point at approximately 800 feet AGL. The touchdown point should be approximately 30 degrees low or, stated a different way, about one-half to two-thirds of the way up the wing strut. This gives you the proper lateral distance out from the touchdown point, as well as a yardstick to judge rate of descent.

8. After the halfway point of the downwind you should have a good idea whether you will be high or low for the base turn and you can adjust accordingly. You can shorten the downwind leg if you are low. You can even start angling in towards the landing area if you are extremely low (note Figure 6-4-2). If you are high you can use spoilers to lose the excess altitude or you can angle out slightly to give yourself a longer base leg. Under extraordinary circumstances you can modify your circuit as required to safely return the glider to the landing strip.

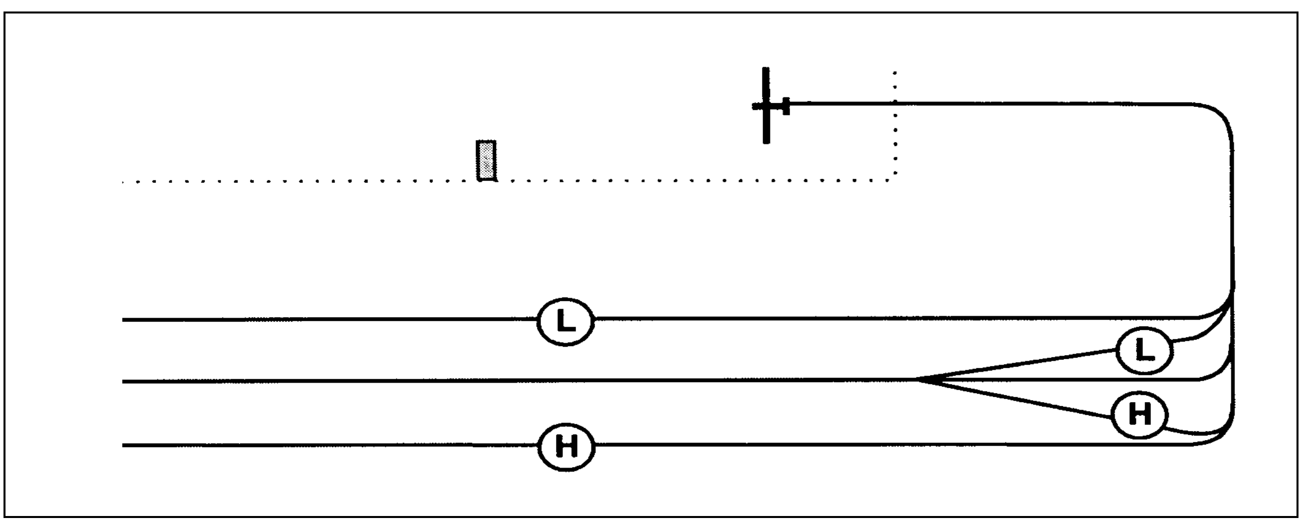



Figure 6-4-2 Downwind Modifications

**BASE LEG**

9. A properly flown base leg is important to set yourself up for a good final approach. It is also the point where you obtain your final approach speed so that you can make adjustments for the increased rate of descent.

10. You will note that the turning point for base leg is normally when your **touchdown point** is about 45 degrees over your shoulder. Any crosswind will require a crab to eliminate sideways drift.

11. Figure 6-4-3 gives you an idea as to corrections that can be made during the base leg. They are self-explanatory. However, remember that wind drift will have to be dealt with at all times, so do not forget crabbing action, if required (see Figure 6-4-5).

12. When flying in high wind conditions (15 knots plus), you should turn onto the base leg early. As your wing tip passes the approach end of the landing strip, commence your base leg turn. If you use this procedure you should not land short.

13. At all times, trim for the proper speed. (50 mph IAS on downwind and 50 mph IAS plus wind speed to a maximum of 65 for base and final). It is better **and safer** to arrive with a few extra miles per hour than to be too slow.

14. In all phases of the circuit, it is permissible to use spoilers if, and when, required. If by chance you encounter a very strong updraft (thermal), then you may combine the spoilers with a side slip to counteract the unwanted lift. But remember, once altitude is lost, it cannot be regained. Early in the circuit, use spoilers with caution.

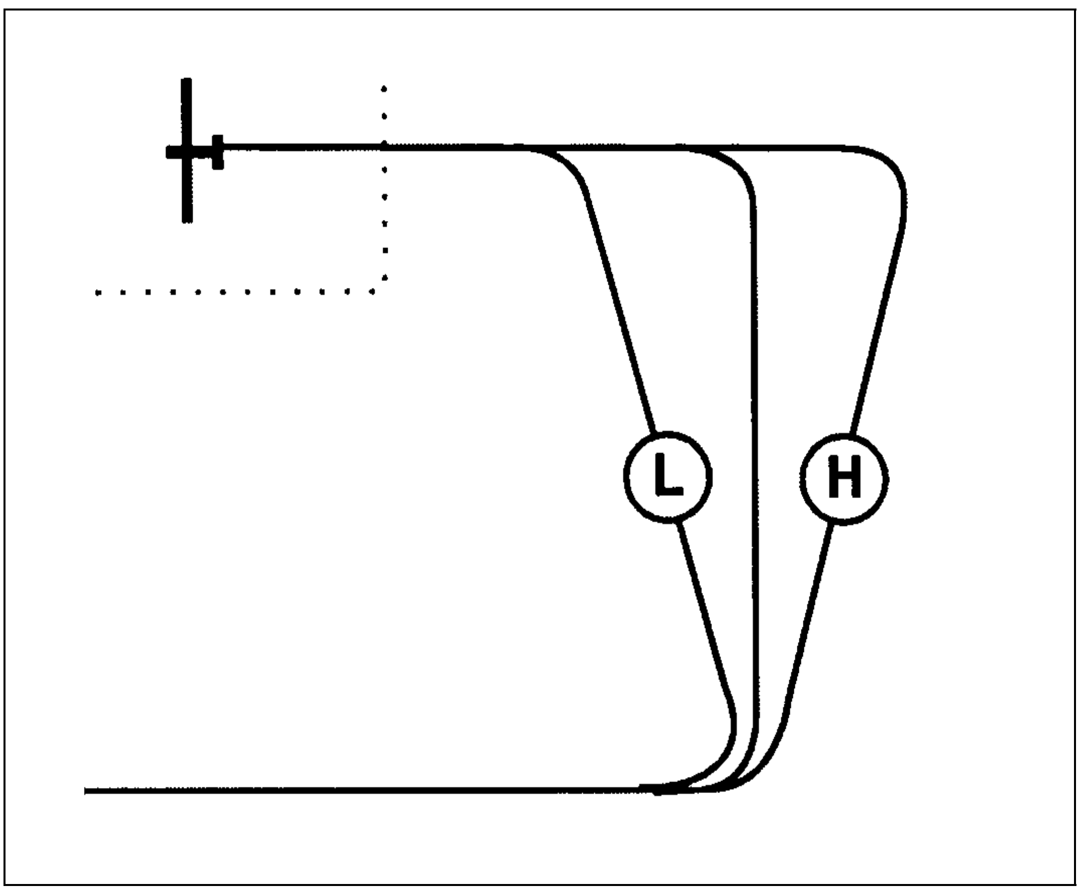



Figure 6-4-3 Base Leg Modifications

**FINAL APPROACH**

15. You should plan your circuit pattern so that the final approach is made with a glide angle that allows two sorts of corrections: steepening the glide path, by further extension of the spoilers; or flattening the glide by closing them. Ideally, the final approach should be flown with a spoiler setting that has 50 per cent of the effect of full spoilers. In no wind conditions, the ideal approach angle will be flatter than when the approach is made into a wind. The more promptly height adjustments are made to maintain the ideal approach path, the fewer problems will be encountered on landing. You should get used to judging your height on final approach without reference to the altimeter.

16. To establish the proper glide path on the final approach, the glider pilot must select an aiming point. This is a point on the ground where you want to round out, short of where you want to touchdown. A convenient mark on the ground or some other obvious point is easiest to see. By noting the position of this object in relation to the nose or some other point on the canopy, any tendency to undershoot or overshoot can be seen.

17. **Final Approach Speed.** To compensate for headwinds during final approach, the FAS is calculated as part of the downwind check. It is the sum of the normal circuit speed of 50 mph and the reported wind speed including

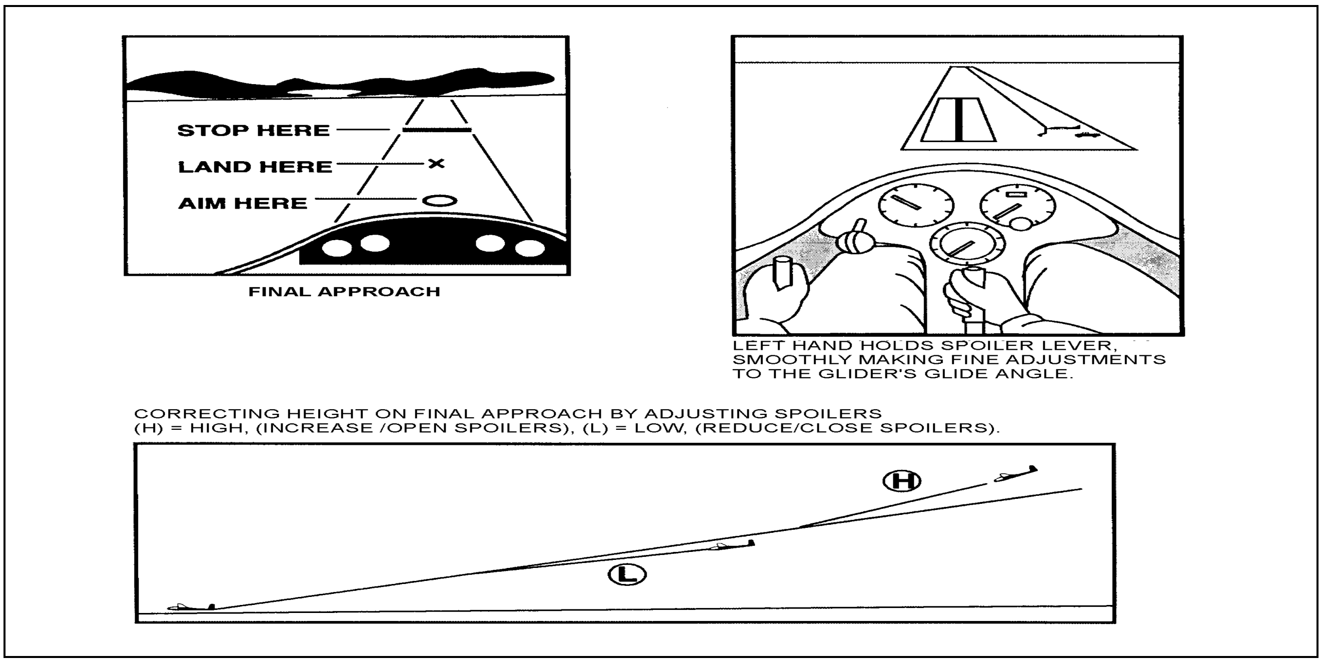



Figure 6-4-4 Final Approach

any gust factor **to a maximum of 65 mph** e.g., if the reported winds were 10 mph gusting to 15, the FAS would be 65 mph (50 + 15 = 65).

18. Once established on final approach, check your aiming point.. It should be stationary on your canopy. If it is moving towards/under you, you are overshooting/high. Use more spoiler, sideslip or both in combination. If your aiming point appears to be going up the canopy/away from you, you are undershooting/low. Close the spoilers. At some time during these corrections you will achieve the desired glide path. Adjust spoilers as required to maintain the desired glide path. On most gliders, provided the airspeed is correct, you can fully open the spoilers once in the position to land. However, when opening the spoilers fully, use caution because the full aft position of the spoiler bar is the wheel brake and you do not want to land with the wheel brake engaged.

19. Maintain your final approach speed to the round out by cross-checking your ASI during the final approach.

## CROSSWIND APPROACHES

20. So that the downwind and final approach legs stay in line with the landing strip, compensate for wind drift using crab, keeping the yaw string central. Use rudder to re-align the fuselage with the landing strip when you are about to touch down.

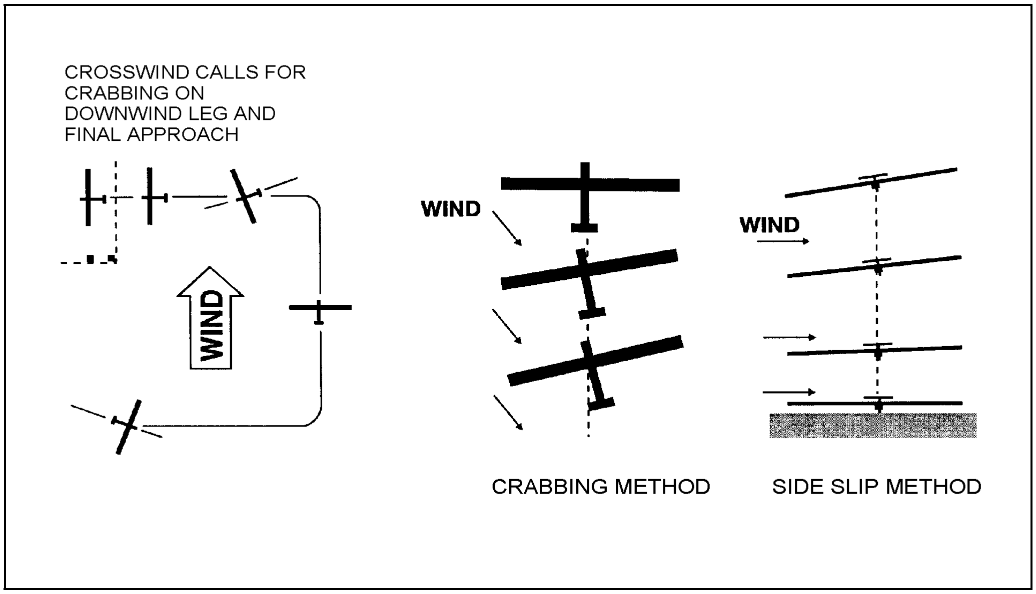



Figure 6-4-5  Crosswind Landing

21. Another crosswind method is to keep the into-wind wing low during the final stages of the approach thus slipping into the wind. Using this method, the fuselage remains lined up with the landing area throughout. As the glider rolls to a stop, use rudder to counteract its tendency to swing into wind (weathercocking effect caused by the vertical tail surface). Keep the into-wind wing down slightly until you come to a full stop.

**STRONG WIND DOWN THE RUNWAY**

22. If strong winds are present or develop unexpectedly, the circuit will require modification, that is, the circuit altitudes or circuit pattern or both will have to be adjusted. Making the circuit smaller (tightening the pattern) results in additional altitude being available which can then be used to counteract the effect of strong winds. As a rule of thumb, 100 feet may be added to circuit altitudes to compensate, approximately, for each 10 mph of headwind. Remember, altitude lost cannot be regained, but excess altitude can be eliminated, when necessary, by the judicious use of spoilers, slipping, positioning or any combination of these methods. In summary, remember these ground rules:

a. Remember that a strong wind down the runway is normally a strong tailwind on downwind, a strong crosswind on base leg and a strong headwind on approach.

b. If the crosswind is strong on downwind, use crab to eliminate drift either away from or into the runway. A 20 mph crosswind on downwind will require approximately 20 degrees of crab to eliminate the drift.

c. If there is a strong headwind, especially over 15 mph, base leg should be started as the glider passes the approach end of the landing strip. Turning early will prevent the glider from being drifted too far downwind.

d. On base leg, crab must be used to prevent drifting too far away from the runway. Remember that a 20 mph approach headwind is a 20 mph crosswind on base leg and will require approximately 20 degrees of crab to eliminate drift.

e. In a strong headwind, the start point for final turn must be higher than normal or closer to the runway than normal or a combination of both because the higher approach speeds result in higher descent rates.

**PENETRATION APPROACHES**

23. A penetration approach is defined as an attempt to increase gliding distance, for whatever reason, by placing the glider in ground effect at a high energy state. The following edited excerpt from an article in **Soaring Magazine** (Feb 90) clearly identifies the futility of the procedure:

"Is diving into ground effect worth it? **NO!** The high aspect ratio of gliders keeps induced drag small, therefore making any drag reduction to ground effect small as well. Additionally, any drag reduction is significant only when the wing is just a few feet above the ground a condition hard to fly consistently or safely, especially in a high-wing glider. **UNLESS THE PILOT FLIES THE PROFILE PERFECTLY AND THE TERRAIN CONDITIONS ARE IDEAL, GLIDING DISTANCE WILL BE LOST.** Therefore, in order to maximize glide distance, fly L/D max airspeed adjusted for wind and hold that airspeed until the flare/round-out."

**WARNING**

**PENETRATION APPROACHES (DIVING INTO GROUND EFFECT TO ATTEMPT TO STRETCH GLIDING DISTANCE) ARE PROHIBITED.**

## LANDING

24. The last phase of the approach is the landing. The aim of the landing is to transfer the glider cleanly from the air to the ground at a minimum rate of descent and forward speed for the conditions prevailing.

25. At a safe height, about 30 feet AGL, the pilot should start slowly easing back on the control column to round the glider out gently into level flight. Make sure you keep the calculated approach speed up to the point of round-out. In doing so, be careful not to pull back too hard and start climbing again.

26. Keep the glider flying about 2 feet above ground for as long as you can (keep looking straight ahead). When the speed has dropped so low that flight can no longer be sustained, the glider will touch down. Touchdown therefore occurs at the lowest possible airspeed. As the speed decreases more pronounced control movements will be needed to hold wings level and to maintain directional control. After touchdown, continue to ease the control column back during the roll-out until it is fully aft.

27. The length of the landing run will vary according to the wind strength and landing surface. If landing in a crosswind and you are using the wing down approach (sideslip), the into-wind wing must remain down during the approach, hold-off and touchdown until the glider comes to a full stop. If the wind is such that sideslipping cannot eliminate the drift, the crab method must be employed. Immediately before touchdown the glider should be yawed so that it is parallel to the landing path. In both methods, crab and sideslip, the tendency of the glider to weathercock after touchdown must be prevented.

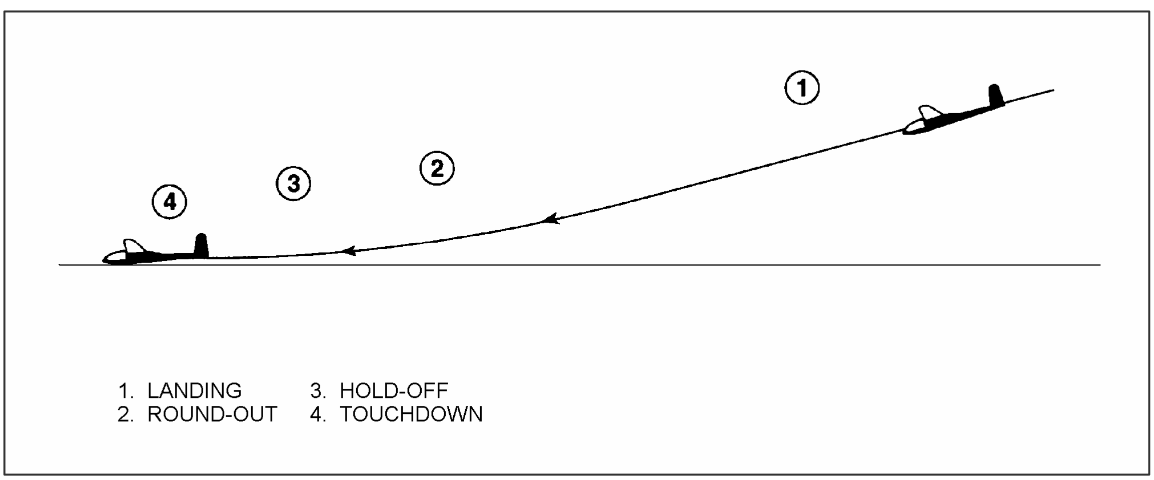



Figure 6-4-6 Landing

28. Monitoring your ASI during the final stages prior to touchdown is essential. If your airspeed is too slow, close the spoilers immediately. Below 50 feet, you do not have room to increase the glide angle for more airspeed; the closure of the spoilers is your best course of action.

29. If you touch down too hard and bounce or apply too much back pressure on the control column and balloon, you should immediately level off and then, if the spoilers are open, close them. From this point it will depend on how high you are above the ground. If you are close to the ground, allow the speed to decrease and carry out a landing. If you are quite high, you will need to make a gradual descent to again round out for the landing. Be careful not to pump the control column back and forth, this only leads to porpoising.

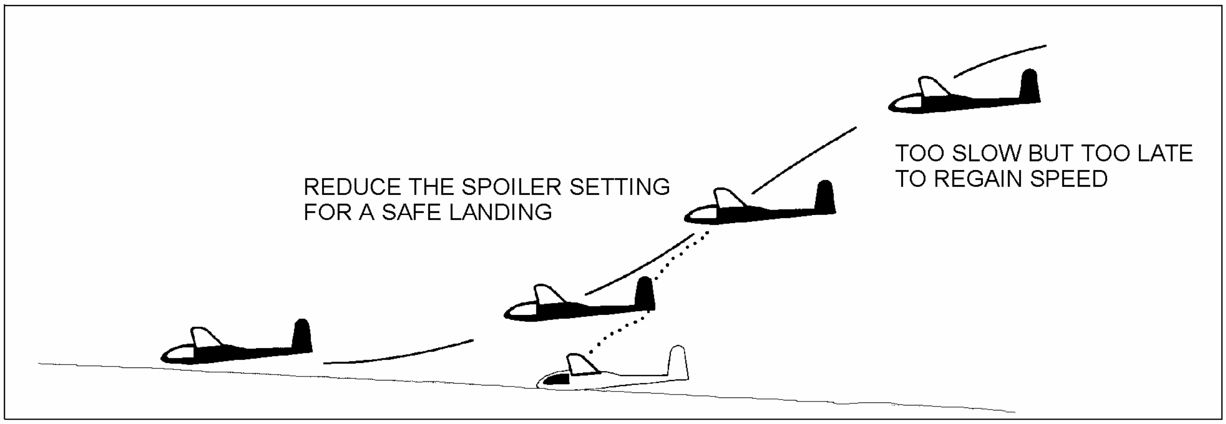



Figure 6-4-7 Slow Approach

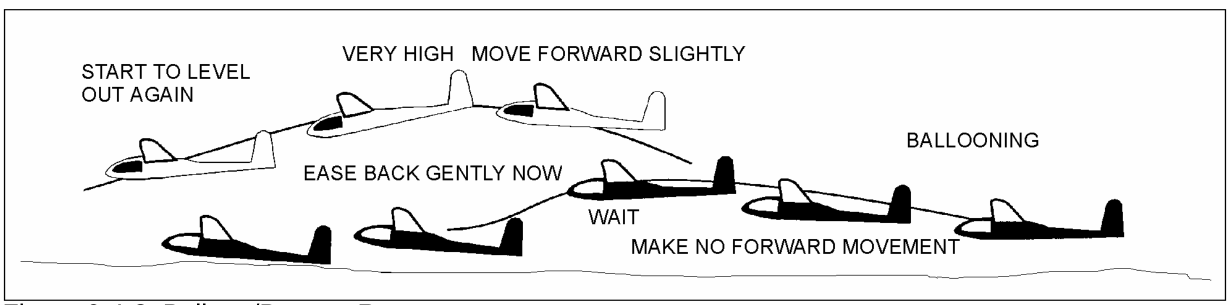



Figure 6-4-8 Balloon/Bounce Recovery

**ILLUSIONS OF DRIFT**

30. The closer one flies to the ground the more apparent illusion of drift becomes. It is particularly dangerous when in the circuit.

31. As the glider is flying in a parcel of air, its movements, or perceived movements, can be misleading, especially if the wind speed is strong and/or gusty. Some of these indications are as follows:

a. when heading into a strong wind, your speed over the ground is markedly reduced;

b. when heading downwind your speed over the ground appears more rapid. One may be tempted to reduce the glider's speed to a point where one may stall;

c. in crosswind conditions, lateral drift is quite apparent. This can be demonstrated if one lines up with a section line or road;

d. when one turns from into wind to downwind you will experience what seems to be an inward slip. Do not be misled by this illusion. Check your yaw string and this will confirm if you are flying co-ordinated or not; and

e. if you are turning from downwind into wind, you will gain the impression that you are skidding. Once again refer to your yaw string. The drift is there; do not let it fool you.

32. The slower you fly and the closer you are to the ground, the more apparent these illusions will become. It is most important to know and interpret these signs and not be fooled into using corrective actions when they are not required. Cross-checking the ASI is critical in conditions of drift illusions.

**FLIGHT IN PRECIPITATION**

33. Flying in rain introduces visual and aerodynamic differences with which the glider pilot must be familiar. During the circuit to landing, as one nears the ground, these differences can pose a significant hazard.

34. Rain droplets on the canopy and the lower light levels common to overcast conditions can reduce the pilot's ability to judge height information. Rain or drizzle streaming across a windscreen also reduces visibility and causes distortions to the visual field known as "refractive error." In these situations, objects appear lower than they actually are, thus pilots tend to believe they are higher than they actually are. Careful monitoring of instruments, especially the airspeed indicator and altimeter, is required in the circuit.

35. Aerodynamic differences have been identified when flying the 2-33 glider in rain. Water build-up on the upper surfaces of the wing can raise stall speeds by 1-2 mph. Water around the static ports of the pitot-static boom can affect position error and raise the indicated airspeed at which stall occurs by an additional 1-2 mph.

36. Forward slips in rain tend to be quite smooth, without the usual pedal vibration and buffeting. Unfortunately, buffeting that normally precedes a stall may also be absent during flight in rain.

## SECTION 5

## STALLS AND STEEP TURNS

### INTRODUCTION

1. This section will familiarize you with the symptoms and recovery from stalls and the differences between steep turns compared to gentle and medium turns.

### STALLS

2. **Theory of Stalls.** The term stalling describes the condition in which the lift from the wings can no longer support the weight of the aircraft. Normally, the airflow over the wings is smooth, with some minor turbulence towards the trailing edge. As the angle of attack is increased beyond the optimum angle, the airflow begins to break up and becomes progressively more turbulent, and the area of turbulence thickens and spreads towards the leading edge. Greater angles of attack produce even more turbulence, until a point is reached beyond which there is a sudden loss of a large percentage of the total lift. This angle is known as the critical angle or stalling angle. The indicated airspeed at which the wings stall is known as the stalling speed. An aircraft can stall at any airspeed, in any attitude, provided that the critical angle is exceeded. The most important factors affecting the indicated stalling speed are weight, spoiler/dive brake position and load factor.

3. Another phenomenon occurs as the angle of attack increases: the centre of pressure (C of P) moves steadily forward until the stalling angle is reached; then it moves sharply back.

4. Because of the loss of lift and the movement of the C of P, two things happen at the stall:

   a. the nose may drop; and
   b. the glider will lose altitude.

5. When the aircraft is completely stalled, a wing may drop and there will be yaw in the direction of the low wing.

6. **What You Must Learn About Stalls.** The four important things you must learn about stalls are as follows:

   a. recognize the symptoms of an approaching stall;
   b. recognize the stall itself;
   c. take the correct recovery action; and
   d. take action to prevent stalls.

### SYMPTOMS AND RECOGNITION OF THE STALL

7. Once you recognize the symptoms of a stall, you know that the aircraft is approaching a critical condition of flight, requiring fast, positive, corrective action. The following table has been prepared to help you interpret the glider's stalling symptoms.

| Symptom | Method of Recognition |
|---|---|
| Nose High<br>Low Airspeed | These warnings are most noticeable when the glider is about to stall from the straight glide attitude and are indicated by the lack of wind noise. Individually, a nose high attitude or a low airspeed does not constitute a symptom of a stall, but when they occur together, the glider will stall if you fail to take recovery action. |
| Sloppy Controls | The effectiveness of the ailerons decreases as the airspeed decreases. At the stall, large movements of the control column can be made with little effect. |
| Buffeting | Just prior to the stall, the glider will be felt to shake as the turbulent air flows over the horizontal stabilizer. This buffet may be absent during flight in precipitation. |

Figure 6-5-1 Stall Symptoms and Methods of Recognition

8. If you continue to ignore the symptoms, you may feel a mushing or sinking sensation indicating that the glider has stalled. Mushing is not always readily apparent, but it is always present. If the stall has been entered from wings level flight, the nose high attitude will still be apparent but the VSI will show a high rate of descent. If back pressure is maintained on the control column, wing and/or nose drop may occur. Depending on weight distribution, the nose may not drop, but the glider will continue to mush through the air with an increased rate of descent.

**STALL RECOVERY**

9. The aim in stall recoveries is to recover with a minimum loss of altitude. The following is the standard stall recovery for the 2-33; it is valid for all types of stalls:

a. release sufficient back pressure to unstall the wings (reduce angle of attack);
b. stop wing drop with opposite rudder;
c. if spoilers are open, close immediately;
d. level the wings with aileron (if necessary) after the wing is unstalled; and
e. ease out of the resultant dive using excess airspeed to regain altitude before establishing normal flight attitude.

10. The amount of initial control-column movement depends on the airspeed and the degree of stall. Sometimes, a relaxation of the back pressure is sufficient, while at other times, a firm positive forward movement is required. If you apply too much forward movement, you will lose too much altitude; if you apply too little, you will not recover. With the aid of your instructor and continued practice, you will learn just how much control movement to use. Similarly, when easing out of the dive, if you raise the nose too rapidly, the aircraft may go into another stall; if you raise it too slowly, the aircraft will lose excessive altitude and gain excessive airspeed.

11. Normally, you will initiate recovery action as soon as any of the stall symptoms become evident. During DUAL practice, however, the instructor may allow the stall to fully develop so that you can learn and understand the whole recovery procedure. If there is a wing drop, do not attempt to raise the wing with aileron until you have first unstalled the wings, as this could aggravate the situation.

12. Your instructor will demonstrate all types of stalls and will explain the degree to which the controls are used for recovery from each type. As you become more proficient you will recover from stalls in any attitude and with minimum loss in altitude.

**PRE-STALL, SPIN AND SPIRAL DIVE CHECK**

13. Before you practice stalls, do the pre-stall, spin check (ASCOT) as detailed in the following table.

| What | How | Why |
|---|---|---|
| **A – Altitude** | Ensure that there is sufficient altitude for the exercise. | Minimum recovery altitude for stalls and spiral dives is 1 500 feet AGL. For incipient and fully developed spins it is 2 000 feet AGL. |
| **S – Straps** | Ensure your straps are tight and locked. | Safety precaution. |
| **C – Canopy** | Ensure canopy, rear window and door are latched. | Safety precaution. |
| **O – Objects** | Check cockpit and your personal equipment for loose articles. | To ensure that everything is properly stowed and nothing can jam in the controls. |
| **T – Traffic and Terrain** | Lookout – Clearing turns. | Last-minute check to ensure that the area is clear of other aircraft and you are clear of built-up areas. |

Figure 6-5-2 Pre-stall, Spin and Spiral Dive Check

## STALL PROCEDURES

14. **Entry.** To enter the stall, raise the nose slightly above the horizon and keep the wings level. Hold this attitude until you feel the buffet, and then ease the control column fully back to stall the glider.

15. **Recovery.** When the glider stalls, use the standard recovery procedure outlined in paragraphs 9 to 12. Do not allow the nose to drop too far or the glider will gain excessive airspeed. The ideal recovery is accomplished by releasing only enough back pressure to unstall the wings and fly the glider out without gaining excessive airspeed.

## STEEP TURNS

16. The steep turn is any turn over 30 degrees of bank. It is used for rapid changes of direction and may be needed in emergency situations to avoid other aircraft. During soaring flight, the steep turn is also used to spiral within a thermal.

17. Steep turns require a high degree of pilot coordination and skill, and are a valuable means of increasing flying proficiency. Poor aircraft control or inattention during steep turns may result in a stall or a spiral dive.

18. The steep turn is just a continuation of a medium turn to 45 degrees of bank (for the purposes of this course). Control inputs are the same but are allowed to take effect longer. However, for a steep turn, the pitch attitude will have to be adjusted so that you achieve 55 mph IAS prior to turn entry. Steep turns require this extra speed because the stalling speed is higher due to the higher wing loading.

19. The amount of back pressure required is dependant on the angle of bank. It is the backward movement that pulls the wing to a slightly larger angle that produces the additional lift required for the turn. Gentle turns require very little extra lift, whereas steep turns need much more. You will notice that if you fail to add back pressure, the nose drops quite quickly in a steep turn. Remember to relax back pressure as you bring the wings level.

20. If the bank becomes too steep, the nose tends to drop due to the resultant slip. If the pilot uses elevators alone to raise the nose and reduce the speed, the glider will tighten into the turn and enter a spiral dive. To correct this situation, the pilot must first reduce the angle of bank and then raise the nose of the glider to reduce the airspeed.