

CHAPTER 19

BASIC AEROBATICS

1. Introduction

Aerobatics are not for everyone. But there are those who enjoy aerobatics, for the pure thrill of it, as a means of improving flying skill, or both. Aerobatics are safe as long as the pilot is properly trained and safety considerations are foremost in the pilot's mind. Aerobatics inherently carry more risk than "ordinary" flying, and as such must be treated with due diligence and awareness of the risk in order to manage it.

Almost everything that follows is **related to safety**.

2. When to start

Basic aerobatic manoeuvres can be **started as part of the post solo training** programme where you will learn to polish your flying skills and learn new ones. Advancement will depend on flying ability and skill, attention to detail, safety consciousness and airmanship.

The post solo pilot should already be competent in spin execution and recovery. This skill will be further developed for later use in more advanced training.

Figures that you can learn include 360° turns (techniques as an aerobatic manoeuvre), 45° dive and climb lines, climbing turns and finally chandelles.

Training in more advanced manoeuvres will require further experience - at least 50 hours P1 is recommended, preferably more. Again, this is dependent on flying ability and aptitude.

3. Training

Flight training in aerobatics should be preceded by a **good understanding of flight envelopes**, which describe the load and speed limits, particularly for the gliders that will be used for training and practice. Make sure also that you have read the pilot's handbook for the type.

Although as much reading as possible is encouraged, no amount of study or briefing can replace in-flight training and practice required for proficiency.

Never attempt any manoeuvre for which you have not had proper flight training and written clearance. This is particularly tempting when flying passengers or displaying (showing off). Risk then ceases to be managed and you become a serious danger to yourself and others.

Training may only be given by a full aerobatics instructor. (currently Phil SurrIDGE).

4. Pre-flight

Aerobatics can be fairly demanding physically. Make sure you are

reasonably fit and feeling healthy. Do not fly if you are hung-over, taking medication or otherwise under the weather. Tiredness or fatigue also affect your ability. Aerobatics are not advisable after a long flight, after extended periods at high altitude, or if you are tired at the end of a long day.

Daily inspection prior to an aerobatics flight is important. Relying on the DI that was done at the start of the day is not enough. Before you fly:

- Make sure controls do not have excessive play and do full deflection positive checks;
- Check that all inspection hatches are locked shut and taped as required, and the tape on all other taped joints is in place and in good condition;
- Check for wing cracks, near wing root and at corners of brake and control surface recesses. Take expert advice if cracks are visible fore-aft over the spar or at 45° over the D-box ahead of the spar;
- Clean loose dirt, sand, etc. out of the cockpit (use a dust-buster);
- Check battery secure and stowage area and side pockets for loose objects;
- Straps should be anchored properly and not work loose easily in

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flight. A fifth strap is recommended;

- G-meter fitted and working ('zero' the g-meter just after take-off - moving over rough ground can cause quite large deflections);
- Parachute packed (not out of date) and in good condition.

These items are additional to the normal DI, and I'm sure you could add to them.

5. Weather

Aerobatics can take the airframe near its load limits, and gusts caused by thermic or other turbulence could easily take this loading beyond the limits. Aerobatics are **best flown in stable conditions** when there is good visibility. This is usually early morning or late afternoon, and these times are often low in traffic which is also an advantage.

6. Vital Actions

The pre-aerobatic checks follow the mnemonic HASEL, some of which might have required pre-flight checking.

H - Height: Adequate to complete any manoeuvres at a minimum of 1200 feet QFE, taking into account your distance from the airfield and the low point of any manoeuvre. However, simple lines and similar exercises can be practised below this altitude.

A - Airframe: You know the flight envelope for the glider, particularly v_a (maximum manoeuvring speed) and v_{ne} , and that the glider is cleared for

the manoeuvres you intend (see the pilot's handbook).

- S - Security: Straps tight but comfortable, including fifth strap; first lap straps then shoulder straps. Re-check as necessary. No loose objects, including cameras, books, pens, batteries, glasses, etc. Hatches secure and clear vision panels closed.
- E - Emergency: Check for field availability for emergency landing.
- L - Lookout: Use well banked turns to clear aircraft below and well into the direction you intend to fly at speed. Check that you are not within an active airfield circuit or over a built up area. Keep a sharp lookout at all times - this cannot be over emphasised.

7. Airmanship

Review the earlier chapter on Airmanship in Cloudbase. (Chapter 11)

You must **act responsibly** when flying aerobatics and should at no time endanger other persons. This includes **reporting any overload registered on the G-meter**, which should be checked in the circuit prior to landing. You should be able to repeat these maximum and minimum G-meter readings after landing.

Maintain your currency and always ask for a check if you are not current in any manoeuvre you wish to practise.

Doing aerobatics with passengers or early pupils is generally

prohibited. This could scare them off gliding permanently. Even when specifically requested, this is sometimes due to peer pressure when the individual personally prefers otherwise. [On the rare occasion when this may be acceptable, do one simple manoeuvre at a time. After each one, ask and check behaviour to ensure that any more is entirely appropriate. The temptation to attempt a manoeuvre for which you have not had proper flight training and clearance must be avoided].

Stop at the first sign of unease or motion sickness. Always carry an airsick bag and make sure it is used. If not, it is your responsibility to remove and thoroughly wash all affected parts (straps, seat, etc.) before the next flight.

8. The 'Figures'

Basic Figures

Intermediate Figures

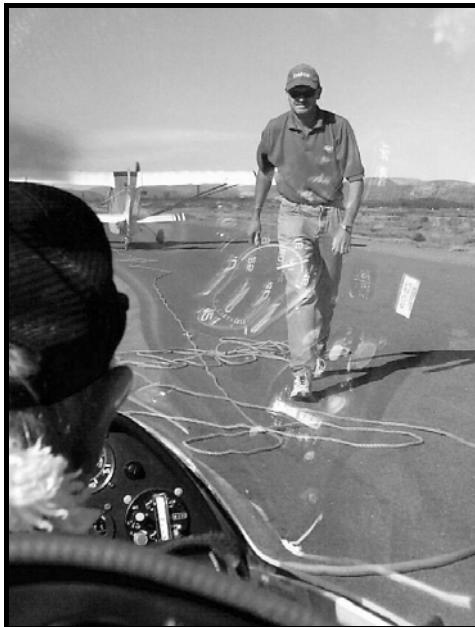
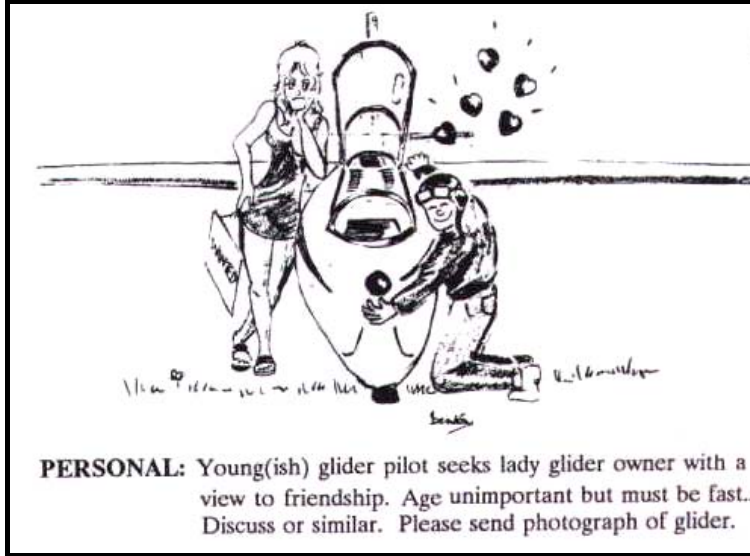
- 45° Up-Line
- Quarter Cloverleaf
- 45° Down-Line
- Humpty Bump
- 360° Turn
- Stall Turn
- Climbing Turn

Advanced Figures

- Spin
- Tail-Slide
- Chandelle
- Rolling
- Loop
- Inverted Flight

Note: - Club gliders are not cleared for Intermediate or Advanced Figures.

Steve Mattchett



Hooking-up (photo by Bruce Clemence)



Rico Suter's DG 500 preparing to lunch (photo by Bruce Clemence)

