



Cambridge
Aero Club

Extra EA200/300

Supplementary Operational Instructions
For Pilots, Students & Instructors



Version 1.3

Introduction

The purpose of this document is to supplement pilot's differences training with a detailed set of supplementary guidance notes. This document should be used in conjunction with all other training materials, particularly the Pilot's Operating Handbook. Use of phrases or words such as DO NOT, NEVER, MUST NOT, ALWAYS etc, are intended to emphasise areas of critical importance and are not meant to dissuade pilots from fully enjoying the aircraft!

Though extremely strong and virtually impossible to break in flight, like a thoroughbred sports car, all high performance aircraft like the Extra are fragile on the ground and require special care when handling. Unlike a touring aircraft such as a Cessna 172, a high performance aircraft is designed and built with a bias towards performance and lightness rather than defences against day to day wear and tear.

The Extra 200 / 300 was designed and built with a single pilot/owner in mind. It was not built to cope with the demands of many different people getting in and out of it on a daily basis. Nor was it built to withstand the potential dangers of repeated ground handling wear and tear. Never the less, if all pilots understand the weaknesses and potential pitfalls and act accordingly, there is no reason why we shouldn't all enjoy trouble free operation.

This supplement has been written based on operational experience. However, it is important and beneficial that the content evolves as we learn more about the aircraft. Therefore, please check regularly for updates and be active when it comes to suggesting additional inclusions. You should also re-read it from time to time to ensure you haven't forgotten something! Suggestions for further development of this document should be made to the CFI/HT

This document should be read, understood and signed by all Extra 200 pilots before solo flight.

Canopy

- Inspect the canopy thoroughly and closely as part of your pre-flight inspection. If you see any cracks, however small, DO NOT fly the aircraft and report your findings to a member of staff. DO NOT TOUCH THE CRACK
- DO NOT allow anyone to lean against the aircraft where they may accidentally place pressure on the canopy
- Consider the effect of wind and aircraft prop-wash on the canopy BEFORE you attempt to open it. If in doubt leave it closed. If you have to open it into a prevailing wind, hold it open
- You MUST NOT place any pressure on the canopy sides or near the cut-out as this will cause terminal damage (costing around £5K+ to repair!)
- The canopy is extremely fragile. **You absolutely must not, under any circumstances or for any reason lift the canopy by the window cut-out.** Carefully unlock the latching mechanism, then lift the canopy by holding the lower edge of the canopy frame. Do not lift or lower the canopy by holding onto the latching handles
- Take great care to prevent your clothing (sleeves) from catching on the edges of the window cut-out when putting your hand through to access the locking mechanism. Similarly, make sure that your wrist does not come into contact with the cut-out sides when operating the latching mechanism
- Ensure to bias the pressure you put on the canopy to the rear of the aircraft to prevent it sliding forward off the hinges.
- ALL operations relating to the canopy should be carried out SLOWLY and with extreme care and thought to prevent any further re-occurrence of recent damage
- NEVER allow your passenger or bystanders to move, open, close or handle the canopy in any way unless you are experiencing an emergency
- NEVER leave the canopy open unless you are sitting in the aircraft or standing at the trailing edge of the port wing
- The canopy MUST be closed and latched before engine start. NEVER unlatch the canopy until the engine is shutdown
- DO NOT allow your or your passenger's headset to come into contact with the inside of the canopy as this may scratch the surface. If contact is occurring then the individual is too tall and may not fly in the aircraft, full stop. This is particularly relevant to front seat occupants but applies to both

- The sliding panel must only be opened and closed from INSIDE the aircraft to prevent side flexing of the canopy. Therefore, the sliding panel should be opened before exiting the aircraft and left open whenever the canopy is shut from the outside
- Clean the canopy only with Plexus spray and a CLEAN yellow duster. Apply only MINIMAL pressure when doing so. Please ask at the Aero Club reception if you don't know where the cleaning equipment is kept
- Extreme care must be taken when using suction mounts for GPS/filming equipment on the canopy.

Re-fuelling

You may be required to request a specific quantity of fuel prior to commencement of delivery. The ACRO tank holds 32 litres, when working out how much to put into the tank, the ACRO tank fuel gauge calibration is such that each quarter division equates to about 5 litres of fuel, as not all of the tanks contents is displayed on the gauge.

Please make every reasonable effort to ensure that the aircraft is refuelled after your flight. Standard fuel configuration is a full ACRO tank; this is how the aircraft should be left.

FOD

In this aircraft it may well kill you, simple. We have already had a close call, next time someone may not be so lucky. It is imperative that you thoroughly inspect the inside of the aircraft including the clear panel at the rear BEFORE you climb in. If you subsequently drop something, undo your harness and get out and retrieve it immediately. If you cannot find it you must tell a member of staff. The aircraft must not be flown until the object has been positively identified and retrieved.

If something is missing from the rear cockpit stowage, report it and do not fly until you have assured yourself that it is not loose in the aircraft. The rear fuselage stowage should contain:

- 1:500,000 chart of southern England
- Pitot cover
- Sick Bag

Clothing

Use of approved flight-suits is mandatory. As a guide, flying suits should be the equivalent of the current RAF or USAF pattern. If advice is required, ask the CFI. No person must even enter the aircraft without having first removed all items from pockets and donning a suitable flight suit. All flying suit pockets must be secured before entering the aircraft. No exceptions.

Engine

Cambridge Aero Club requires that the aircraft has a minimum of 6 quarts of oil for ALL operations. Anything less may leave the oil level dangerously low during aerobatics. Anything more than 10 quarts will come out again under reduced 'g' so please don't over fill. 8 quarts is the CAC recommended level for aerobatic flight. Ensure that the correct grade of oil is used – please ask!

During starting you should set the absolute minimum throttle required to allow the engine to pick-up and sustain running. This will allow the oil to reach critical areas like the cam lobes before they are subjected to undue stress. If the engine has not been run for a couple of days the oil will tend to leave the top of the engine, therefore exposing components like cams, tappets and bearings, leading to accelerated levels of wear. Always check for positive oil pressure immediately after starting. When pressure is confirmed gradually increase RPM to 1200 for normal ground idling.

Power and RPM should be reduced to 25"MAP / 2500 RPM immediately after take off to reduce noise, prop stress, engine wear and fuel burn.

Due to the nature of aerobatic sorties, particular care must be taken to avoid engine shock cooling scenarios. During recovery, following periods of high power at altitude, you should make your descent and rejoin with a reasonable amount of power set (15 – 18" MAP is recommended). Further, when climbing in between stalling or spinning, say, allow time to temperature stabilise the engine at medium throttle setting prior setting idle.

The minimum fuel level permitted for landing is 1/8th of the ACRO tank as read on the gauge in level unaccelerated flight. Cambridge Aero Club requires that no pilot should allow the fuel level to drop below this level. Take off and landing must be carried out with the ACRO tank feed selected.

Passengers

Carrying of non-qualified passengers is not permitted unless you are authorised by the CFI/HT

Instructors & solo hire pilots must brief passengers thoroughly. All passengers, including pilots must be given a full demonstration of how to embark and disembark the aircraft. All passengers should be shown available hand-holds, prohibited grab areas, non-load bearing structures and walkway use. It is recommended that passengers watch the briefing DVD before flying.

Once sitting, the pilot of the aircraft should assist the passenger with correct locking, adjustment and tensioning of the seat harness.

Authorisation

Only the following instructors can authorise solo hire of the Extra 200, which must be face-to face in person and in writing:

- Anthony Cooke
- Jon Millson

Any exception to this will be at the sole discretion of the CFI/HT.

Currency requirements

Club Extra pilots may be allowed to fly the Extra without a pre-flight dual check at the CFI/HT's discretion. There are four levels of authorisation listed below. Note that the number of days equates to the number of days that are allowed between solo flights without a dual check. Note also that the experience required is the minimum required and is stated for guidance only; the level of non-dual check solo flight authorisation is at the sole discretion of the CFI/HT.

0 days - for student pilots on the taildragger course.

7 days - For pilots with less than 10 solo hours on Extra and no previous tailwheel experience

14 Days - For pilots with between 10-20 solo hours on Extra and no previous tailwheel experience, or for pilots with less than 10 hours on Extra but who have a reasonable level of previous tailwheel experience

21 Days - For pilots with 20 or more solo hours on Extra

30 Days – For pilots with an extensive background in high performance and taildragger aircraft.

The above requirements are specific to the Extra 200 or 300. Therefore, your currency requirements must be met in either an Extra 200 or 300. Flying other types or class of aircraft other than the Extra 200 or 300 will not count towards your currency quota.

All pilots will be required to undergo a brief 6 monthly proficiency check with a suitably qualified instructor regardless of currency levels. However, the 6 month period stated is for guidance only and may vary at the discretion of the CFI according to individual pilot's circumstances.

Security

Always park the aircraft facing into wind and chock thoroughly. Take care not to damage the spats when chocking the main wheels. Not all chocks will fit underneath the spats, so you may need to try more than one set. The tailwheel should be unlocked and aligned with the aircraft's lateral axis for chocking. 'Heavy' rubber chocks may be arranged around the tailwheel for extra security if required.

If necessary, the rear cockpit straps may be positioned around the control column to form a makeshift control lock.

The ignition key is to be left in the cockpit, hanging from the G-Meter reset button (all the other buttons are too small and will lead to the key falling into the cockpit as a loose article!).

The aircraft **MUST NOT** be left outside during periods of rain or high winds. The pitot cover should be fitted after every flight. This helps make the probe more conspicuous and reduces the risk of accidental damage. Make your passenger or student aware of the pitot probe hazard as it is very easy to walk into!

Harnesses

Hooker harnesses are very expensive! You should treat the harness with the level of respect it deserves. Remember, during aerobatics it is preventing you from being thrown from the aircraft. During aerobatics it may be supporting many times your normal body weight. If you abuse and weaken it, it may fail and you may die as a result.

Always ensure that the harness is feeding through the metal adjusters cleanly, without twists and that the edges of the harness are not chaffing on the buckle edges. Particular care should be taken before tightening the ratchet to ensure the harness material is feeding cleanly onto the ratchet drum and not jamming down the side. If you attempt to tighten the ratchet when the harness is not straight, you will weaken the harness and possibly damage it beyond repair.

Take your time when fitting, fastening and adjusting your harness.

Do not allow your passenger, your student, or yourself to 'throw' off the harness when leaving the aircraft. The metal fittings are very heavy and will cause damage to the inside of the cockpit. They are also heavy enough to crack the external skins if allowed to bang against them with enough force.

For solo flight it is essential that you secure the front harness in such a manner as to prevent the possibility of it interfering with aircraft controls. However, you should **NOT** tie the harness in knots as this will damage the harness. It is sufficient to fasten all buckles of the harness and use the adjusters to take up the excess. You should not tighten the ratchet so far as to bring the ratchet body against the seat edge. This not only damages the seat but also jams the ratchet mechanism making it very difficult to release. When the harness is secure, hold the stick fully back and ensure that the harness will not trap it.

Brakes

Check that the braking system can be pressurised **BEFORE** you start the engine. Following extended periods without use, the master cylinders at the pedals may partially empty. This requires several applications of pedal movement to replenish the fluid before the brakes will work properly. The brake pads are very small and wear very quickly. Please taxi with the minimum power required to avoid excessive pad wear. There is no need to maintain a ground idle of 1200 during taxi! If you detect any grinding noise during brake application, this may indicate that a pad(s) have worn out. If you suspect this, return to start point and inspect the pads. If you are in any doubt do not take off. Controlling your landing rollout with no brakes will only end one way and you won't enjoy it. It is quite normal for a low level of pad binding. You may hear a slight squealing during taxi. This is normal.

Note: The relatively high rotational speed of the tailwheel, particularly during faster taxiing on runway areas may produce a medium frequency rumbling. The intensity and pitch will vary with speed and should not cause concern. Some pilots have previously interpreted this sound as being caused by binding brakes.

Alternator

When the engine is cold, the alternator may not produce a positive charge until the engine RPM have reached approximately 1500. You should check for a positive charge **before** switching on the avionics master. If there is no positive charge indicated, turn off the avionics master (if already on) and gradually increase engine RPM until the alternator comes alive. Be aware of your surroundings as this procedure may produce high noise and prop wash levels!

Walkways

It's not rocket science; however, some deep scratches on the top surface of the wings next to the walkways would suggest that some people do not understand why the walkways are there! Wet shoe soles, gritty ground, soft wing surface... Ensure that your shoes are not carrying excessive amounts of abrasive material before you climb onto the walkway. Take care not to swivel your heels around onto the unprotected area. Supervise your passengers closely. Encourage 'tip-toe' movements.

Avionics console

The raised structure that covers the rear cockpit avionics is a lightweight, non-load bearing structure. Do not allow your passenger, your student or yourself to hold onto or lean on it during embarking or disembarking the aircraft. You should also ensure that they do not kick it when swinging their legs over the fuselage sides – they nearly always do. Also, make sure that when lowering themselves up or down in the seat that they do not lean back hard against it. This can be difficult to spot, so be vigilant.

Wiping down

During warmer months it is necessary to wipe the bugs off the prop and leading edges of the wings after every flight. Use a wet cloth. It only takes a few minutes and saves some one else of lot of bother. If left until the end of the day they become very difficult to shift. The cleaning equipment is kept in the Aero Club office. Please ask a member of staff.

Ground Handling

The easiest method of pushing the aircraft from place to place is tail first. However, care should be taken not to place load on the stabiliser. Push only from the root of the vertical stabiliser (fin). Remember, the stabiliser is designed to cope with flight loads, not localised pushing loads.

Rearward pushing force may be applied to the main plane leading edge on the inboard section. Take care not to damage the stall warning vane or pitot probe!

The tailwheel may be carefully unlocked to aid manoeuvring by pushing the vertical stabiliser sideways at the root section.

DO NOT push on the fuselage sides as they are composite and fabric covered.

DO NOT push or pull the aircraft by the propeller at any point other than the blade root.

DO NOT push the aircraft with the spinner.

ALWAYS chock the aircraft!

Pre-flight

In addition to your usual pre-flight external inspection items, there are a number of things specific to the Extra that should be checked:

- **Aileron Spades** – Ensure that they are firmly attached and do not wobble at all. Look out for damage caused by contact with objects during taxiing. Check that all of the mounting screws are present and that the spade shafts do not appear to be bent. Great care must be taken to avoid damaging these during taxiing as they are invisible to both pilots and have only limited ground clearance.
- **Fuel Caps** – It's not easy to see if they are properly closed just by looking. Check them by hand. They need not be tighter than a firm 'finger tight' as the 'O' ring causes sufficient friction to prevent loosening. Over tightening will destroy the threads.
- **FOD Panel** – Inspect carefully and report any items that may have gathered in the tail. Do not be tempted to fly the aircraft until FOD has been removed. Ask a member of the Aero Club staff for assistance in removing the panel for access.
- **Brake Callipers** – Inspect carefully for signs of leakage and pay particular attention to the bleed nipple on the bottom of the calliper. Check for pad wear. Pad friction surface should be clearly visible on their backing plates. If in doubt, consult the CFI/HT.
- **Spats** – It's not unheard of for the mounting bolts to come loose. Please inspect with care.
- **Stabiliser** – This aircraft is frequently used for high stress manoeuvres so check the security of the rear stabiliser. A small amount of flex and movement is normal but not much. Apply GENTLE up and down pressure to the stabiliser tip and watch for any signs of creasing on the fuselage sides. There should be none.
- **Tailwheel Spring** – Some cracking shedding of the paint covering the composite is normal due to the structure flexing. However, if a large chunk

suddenly becomes dislodged revealing large white cracks... tell someone and don't fly the aircraft.

Take great care when taxiing to avoid excessive lateral or torsion loads on the tailwheel spring. The unit is designed to absorb compression loads only i.e. during landing. DO NOT swing the tail around without first considering what the wheel will run over!

- **Wing tip hold-downs** - may become loose, tighten by hand, then turn the hold-down to secure it
- **Control surfaces** - Extreme aerobatics can damage an airframe, and particularly the controls if they have been released in a tail-slide. Pay particular attention to the condition of the flight surfaces in front of the control surfaces. Be alert for signs or buckling, cracking or other damage. Check the stability of the control hinges and the state of the controls themselves.

Aerobatics

All pilots authorised to fly solo aerobatics must conduct all manoeuvres over a suitable location, taking into account noise issues and other aircraft, and having been agreed with the authorising F.I.

Recovery from any manoeuvre should be completed by 2000' agl when flying solo unless authorised by CFI/HT.

Pilot's Name:

Authorisation level	Date	CFI Initials	Other restrictions
0 Days			
7 Days			
14 Days			
21 Days			
30 Days			

Date 6 monthly check due.....

I (Full name of pilot)..... have read this document and agree to operate the aircraft G-GLOC in full accordance with it's procedures.

Signature (Pilot).....

Date.....

SignatureAnthony Cooke
(CFI/HT)

Date.....