22 - TYPE CONVERSION

Introducing trainees to a new type of two-seater is easy. You'll be up there with them, able to say anything that you forgot to mention during briefing, or remind them about anything they've forgotten! You can even take over. Single-seaters are altogether different. You have one chance to brief on everything, and the trainee has one chance of remembering it all. Once he's taken off, he's on his own.

The first thing to do is **get the pilot to read the glider's flight manual**, plus any briefing notes which the club may have available.

The subsequent briefing should contain only the minimum essential information needed by the pilot (so that he stands a chance of remembering it), and take into account his prior experience on other, possibly similar types. It follows that to brief a pilot for type conversion, the instructor should be able, on demand, to list the significant points that are required. Anything less is unsatisfactory and amounts to negligence.

In general trainees will be keen to progress onto new types, but are seldom 'converted' until they are well up to the standard required. Nonetheless, a disproportionate number of accidents occur during type conversions. This is almost invariably a 'briefing failure', or one of supervision.

Nobody becomes familiar with a new type from one three-minute winch launch! Accidents can and do happen many launches later, possibly because the pilot never really became fully converted, or due to any combination of the following:

- different weather conditions
- different launch method
- different airfield or launch run
- complacency.

Not all the material below may be relevant to a particular glider, and instructors should be experienced enough to emphasise or ignore items, as appropriate. Alternatively, a type conversion card is a good way of ensuring that nothing gets overlooked.

BRIEFING POINTS

☑ The briefing should be conducted by one instructor and not by a crowd of the trainee's mates, however eager they are to share their own experiences.

☑ The instructor should be familiar with the type being converted to, and the one from which the conversion is being made.

☑ An external walk-around similar to a DI can be a useful introduction to the glider, especially if it is a completely unfamiliar type.

☑ Unless the basic flight controls function differently from gliders flown previously by the trainee, they don't need mentioning. Common items which do need mentioning are the undercarriage, and the airbrake and flap levers, which may be subtly different or entirely new.

☑ If the glider has a retractable undercarriage the important points are:

- how to raise and lock the undercarriage up
- how to lower and lock it down
- is there a warning hooter? In particular, explain any clever little triggers or other locks. After the launch the pilot should retract the undercarriage immediately and then cycle it once (i.e. lower it and retract it again) so that any unforseen snags can be dealt with calmly, at altitude. A few gliders have undercarriages which seem to require a special knack to get them to lock up, or down. The technique can be practiced by supporting the glider in its belly dolly (preferably rigged), making sure that when the wheel is down it's just clear of the ground.

☑ The airbrakes may well be different. The following list is not exhaustive, but the usual variations include:

- enormously powerful over-centre locks, making it all too easy to take-off with the brakes unlocked. Perhaps the brakes have no lock at all
- the effectiveness of the airbrakes may leave something to be desired, or they may be quite fierce (more common amongst older gliders)
- there may be marked buffeting when they are deployed, or it may be eerily smooth
- they may suck open and require substantial force to close - especially at higher speeds - , or a positive force may be needed to hold them open
- the airbrake lever may look like and be right next to the wheel and/or flap lever (not uncommon), requiring positive visual identification before use
- the full range of travel may be restricted by the cockpit shape and the room left for the pilot's elbow, and can depend on the pilot's height, or general bulk, and therefore the position of the seat-back. A cramped cockpit may make it impossible to deploy the airbrakes when making other control movements
- if there is a wheel brake it may operate on the last inch or so of airbrake lever travel, or it may be an entirely separate lever - not necessarily on the stick
- the airbrakes may be spoilers, or there may be flaps only for glide path control, as used by the PIK20B.

☑ Ideally, use of flaps would be taught in a two-seater, but this is often not available. [For more detail on flap usage, see chapter 21]. The minimum advice the pilot needs is:

- the flap setting for take-off
- the nominal setting in free flight
- the setting for landing. Warn the pilot that if landing flap is used, the approach speed must be maintained. The briefing also requires mention of the limiting speeds for the various flap settings. Pilots converting to flapped gliders will often be quite experienced and if so, should be encouraged to experiment with the flaps at altitude.

☑ The trainee should:

- sit in the glider for a sufficient time before the launch (preferably off the launch line) to become thoroughly familiar with the positions of the instruments and all controls
- check that, without having to stretch, he is able to get full travel on all the controls, especially full forward stick. If the rudder pedals are adjustable they should be in a comfortable position, with the pilot able to apply full rudder and stick together, in the same direction. Check

that when full left rudder is applied, for example, the pilot's left leg is not at full stretch, making it impossible to apply full left stick at the same time

- be able to reach the cable release easily
- know and understand the various limiting speeds, especially maximum manoeuvring speed (V_A), maximum winching speed (V_W) and the never exceed speed (V_{NE})
- decide sensible minimum launch and approach speeds for the day.

☑ The use of ballast is strongly recommended, unless the trainee is an experienced pilot or at least 30lbs above the placarded minimum figure. Take especial care over cockpit comfort and 'packing'. Don't use soft, compressible cushions behind the pilot. 'Cushions' under the pilot MUST be either impact absorbing foam, or solid. Ensure that any 'cushions' or ballast are properly secured, and not causing the pilot any discomfort [chapter 4].

☑ Ancillary equipment should be understood, especially on/off and volume controls for the radio and any audio variometer. If the variometer is a particularly thoughtless and complicated piece of electronic gee-whizzery, what's the minimum the pilot needs to know to get something sensible out of it? Use your discretion here - too much detail may cause him to forget something more important about the aircraft.

☑ Point out and explain the canopy latches, jettison procedures and ventilation knobs.

☑ Nominate the stick and trim positions for take-off. For a glider which can only be run on the main wheel if the nose or skid is lifted first, the stick's initial position will be on the back stop. However, single-seaters often sit tail down, offering a choice between using forward stick to raise the tail, or keeping it central and allowing the glider to fly off the ground [chapter 17]. Holding the stick central is almost always preferable even though it can result in, say, holding it against the force of a spring trimmer. Mention this, if it's likely. If the glider tends to drop a wing at low speeds, lifting the tail is preferable even though most gliders in this category usually manage to drop a wing just before the elevator has become effective. Attempts by inexperienced pilots to lift the tail often result in PIO's when the glider is rotated to take-off. Occasionally the wheel-brake may need to be used to prevent an overrun during 'take up slack'.

☑ It's not advisable to open or close the DV window or scoop during or shortly after take-off, especially on aerotow. Unless weather conditions dictate otherwise, the simplest way to avoid the temptation is to make sure both are closed before take-off.

☑ Set a goal for the flight, perhaps an approximate duration. As a minimum, the pilot should assess the low speed handling characteristics of the glider and find out the stalling speed. Soaring out of range of base shouldn't normally be allowed.

☑ Well worth pointing out that it is very easy in some types of glider to get hold of the undercarriage lever by mistake for the airbrake lever. In general, if pulling a lever doesn't have the effect you expect, or none at all, it's more likely to mean you've got hold of the wrong one than that something's broken [see comments under 'The right lever?' in chapter 11-1, section 2]

The Flying

The trainee's first flight on a new type is effectively a first solo, so try and be around to monitor its progress. The weather might be soarable and the glider could disappear for hours, but it's still worth noting how the launch goes, and if possible, the circuit and landing.

In the event of an imminent wheel-up landing, DON'T call the pilot on the radio to tell him. Doing so will probably distract him from the business of flying the glider, and may cause a crash. A wheel-up landing is infinitely preferable!

DE-BRIEFING

A re-briefing, rather than a de-briefing is often required. It should emphasise the main points again, perhaps explaining subtler points that, in the interests of brevity, were left out of the original briefing. Re-tasking is usually appropriate. Help the trainee extend gradually his knowledge on second and subsequent flights.

A good technique is to ask your trainee some open questions about the glider's characteristics. The answers will tell you what he's discovered, and whether it's been understood.

ADVICE TO INSTRUCTORS

It isn't the handling characteristics so much as the workload that makes new types difficult, and it's the overall combination of pilot and glider which matters, not the glider itself. The briefing's objective is to reduce the pilot's workload so that he can concentrate on the piloting. A pilot converting to a type with an inherently high workload require a very skilful briefing from you, and skilful piloting if he is to stay ahead of the glider.

Type conversion flights can be stressful, so the pilot needs to be in the right frame of mind, and not fatigued or suffering from a hangover. The weather needs to be good, or good enough, and the daylight sufficient.

The trainee's suitability for the type should be reconsidered in the light of his reaction to the briefing points made. Very occasionally, it may be prudent to delay the conversion until another day, perhaps when the weather is a little easier and the workload correspondingly lower. Workload can be lowered further if the conversion takes place at a familiar site, using a launch method with which the pilot is happiest. It's not a good idea to have too many firsts in one flight.

The most dangerous phase of any type conversion flight is a launch failure during the first few seconds. If the pilot is familiar with and in practice at aero-towing, it's preferable to winching for a first 'on-type' flight. Things tend to happen more slowly, and more height - and therefore time - can be taken.

One problem which can occur, particularly if a real or perceived emergency arises, is the pilot reverting to previously learned, but in the circumstances, completely inappropriate behaviour. This can lead to the wrong levers or knobs being pulled so that, for example, the undercarriage is cycled up and down in mistake for the airbrakes.

On some flapped gliders, especially if the pilot is making a big jump in performance (eg. from a Pirat to an ASW20) it may be wise to delay introducing the use of flaps until a later flight, and leave them in neutral for the conversion flight itself. This advice

should be checked against the **flight manual**, which may suggest that neutral flap isn't a good option.

The briefing should contain only the minimum essential information, and take account of the pilot's prior experience of other, similar types. What also needs pointing out are the similarities and differences between the new type and gliders which he has previously flown.

COMMON DIFFICULTIES

PIO on take-off owing to holding the stick forward initially.

Wheel-up landing. This often happens if the wheel was left down throughout the flight and then retracted as part of a pre-circuit 'check'.

Poor speed control initially through not reading the ASI and 'panicking'.

Poor speed control on approach is often associated with inadequate skill in using the airbrakes, commonly compounded by a much too close 'super-safe' circuit, followed by an inevitable overshoot.

Excessive wheel-braking in order to 'spot-land'. The glider tips on its nose and then the tail slams back down.

After landing the pilot reports sink 'everywhere'. This may mean that he was flying much too fast. Another possibility is that the airbrakes were not locked properly on take-off and were partially out for some or all of the flight. Pilots can be reluctant to admit this when it happens. It is conceivable that there really was sink just about everywhere!

Unpreparedness for cable-break or other emergencies.