DUO DISCUS ADDITIONAL BRIEFING NOTES

Any pilot who intends to fly GXT should of course read and absorb the flight manual. It makes sense for that pilot to understand how the power plant systems and switch logic work and to be able to recall the engine/prop extension and starting procedure from memory. An insight into the manufacturers recommended fuel mix ratios and pre start engine priming will be extremely valuable. Fin mounted pitot and static sensors are affected by propeller wash.

Conversion

As the conversion provides two challenges, namely operating a new type and operating a dive start power plant for the first time, it is recommended that pilots learn to fly and operate the glider before attempting a power plant extension and use. The priority emphasis in all cases when attempting to operate the power plant systems should be to FLY THE GLIDER.

At some point pilots should explore the slow speed and pre stall/stall symptoms with the power plant/prop extended. In some cases the airflow break masks pre-stall buffet – critical to note when starts can take place in high pressure scenarios.

Prior to first flight, a 'power plant stuck out but not running' situation should be thought through. In most cases, the additional drag is similar to about 1/3 airbrake so the circuit should be flown accordingly. Pilot should first read the manufacturers notes and then practice this scenario.

Pilots operating the power plant should always consider attempting a start in a position where they can fall back into a sensible high key position for a circuit to land in the event of starting problems. Start attempts below 1000 feet above the potential landing point should be treated with extreme care.

During conversion flights pilots should become aware, of time required for engine to develop power and the eventual climb rates that can be achieved. In sinking air masses / rain it may not be possible to climb at all. Operation in rain will in many cases damage the propeller.

Emergencies

Glider pilots converting to self-sustaining gliders are likely to have little training in dealing with power plant and fuel system related emergencies. The following emergencies should be considered. In all cases, the manufacturer's suggested response to emergency situations should take precedence.

Fire in the Air

- Fly the glider
- Fuel Off and Ignition Off
- Do not retract the pylon

- Land as soon as possible
- Consider bail out

Engine Stop/Failure

- Fly the glider
- Select landing field
- Check fuel selected on, check pump on and contents sufficient
- Restart if height allows
- If the failure is obviously mechanical, do not attempt to start
- Fuel Off and Ignition Off
- Land as soon as possible

Self-Sustained Flight

Prolonged, powered 'cruising' can lead to significantly accelerated engine wear in some self sustaining power plants – the manufacturers operating notes will offer guidance.

Engine noise can make the radio unusable and therefore flight near of within controlled airspace presents difficulties.

Using the power plant to avoid an out landing requires pilots to develop an operating philosophy that reduces the risk associated with either a pilot or mechanically induced failure to start. A recommended priority order when the decision has been made to use the power plant to avoid a field landing is;

- Select a field in the normal manner
- Note the minimum engine start height and position the glider appropriately to cope with a no-start situation
- Extend and start the power plant
- Fly defensively – the power plant may take time to run smoothly and produce full Power

Environmental and Legal Consideration

Self-sustaining sailplane power plants can produce an unpleasant noise and because of the low airspeed at best climbing angle or best rate of climb, the noise can appear to remain over a particular ground position for a prolonged period of time. Pilots should consider their location when flying under power, and thereby give due consideration to people and wildlife. Over-flight of built up areas and public places should be avoided where possible.

Airmanship

As outlined above much can be done to ensure safe operation of the aircraft through familiarity with its systems and characteristics. However, sooner or later the engine will fail to start, either for a technical, or more likely, handling reason. If, as suggested this is at least 1,000 ft agl., then there should be time to attempt to sort out the engine or if that cannot be achieved, land safely.

It is apparent that Turbo pilots, keen to operate for as long as possible as a sailplane, can be tempted to operate below 1,000 ft agl. Also, the more often the engine has been successfully employed the harder it is to believe that it may fail and that a field will be required. The result can be as follows:

Gliding out below 1,000 ft., hoping to get away, the pilot, aware that things can go wrong, flies towards possible fields and makes a selection. The engine is deployed, but fails to start! Disbelief prompts another immediate unsuccessful attempt to start. Now, having wasted valuable height trying to start again, the pilot realises that the field he picked, when he didn't really expect to need it, is not as good as he thought. Further he is low and ill positioned for a circuit he did not expect to make. Now, shocked and perplexed by the failure to start, he is faced with tremendous pressure flying a circuit into a poor field, probably having not landed out for quite some time.

The second attempt to start is understandable but if the failure is technical, it is unlikely to have fixed itself and if finger trouble, the pilot, now under pressure, will almost certainly repeat the mistake.

Much can be gained from flying Turbo's, but the demands on airmanship and self-discipline cannot be overstated.

Mnemonic

This mnemonic requires knowledge of the manual in regard to speed control and sequencing processes but that is the same as our prelaunch and landing mnemonics.

- **50/54 FP IUD R**
- Fuel content should always be above 12 litres and for xcountry and contest flying kept full.
- When approaching decision time (Fisher and Paykel). **F**uel on, **P**itot changed.
- Decision to start (IUD) **I**gnition on, engine comes **U**p, **D**ecompression lever pulled.
  As an addition to this while the engine is coming up the undercarriage should be lowered in preparation for an engine failure
- **R**elease decompression lever
- Engine starts, retract undercarriage, climb away

This effectively has only three critical key actions required to start the engine when you have decided to cease soaring flight. **I** ignition on, **D** pull decompression lever, **R** release decompression lever

In the event of an engine failure, the aircraft can be landed from this position. Attempting to retract the engine not started is not a good idea when low as it introduces conflicting engine speed control between retraction and landing.

- Retraction mnemonic is **50 ID PF**
- I Ignition off (pilot action)
- D Engine comes down
- P Pitot changed (pilot action)
- F Fuel off (pilot action)

The faster the aircraft is travelling the longer it takes to rev down if the propeller is spinning and retract.

Footnote

The increased risk of pilot error due to the added complexity of power plant systems is managed effectively through knowledge, self-discipline and practice. It must be emphasised that the availability of a self-sustaining power plant does not eliminate the need for periodic field selection and field landing practice.