Got a 38-metre runway?

A jet-powered roller skate with impressive climb performance, the Finist is a consummate parachute aircraft, says ***Steve Copeland***

Flying for me has always been about the challenge, whether it was studying for a new licence or rating or being able to fly a new type. So when I was offered the opportunity to do some flying work in a very unusual aircraft, I jumped at the chance.

The Technoavia SMG-92 Turbine Finist is an all-metal high wing single-engine turboprop airplane with a conventional non-retractable gear and steerable tail wheel. It is powered by a Walter M601D-2 reverse flow free-driving turbine producing 721-shaft horsepower (SHP).

Originally designed by Technoavia in Smolensk in the Russian Federation as a piston aircraft for a variety of purposes including air taxi, freight, medevac, air observation and parachute dropping it was re-engined by the Hungarians to take the Czech-built Walter engine, which effectively doubled the available horsepower!

Walking up to the aircraft, the first thing you notice is the size; with a wingspan of 15m and an overall length touching 10m, and standing over 3m high in the three point attitude this is a big aeroplane. Coupled to the engine is a huge three-blade Avia propeller with a 2.5m arc. Standing on a pair of gangly looking main legs, with the long nose accommodating the turbine engine, it reminds me of a daddy long legs. With an empty weight of 1507kg and a MTOW in parachute configuration of 2700kg the aircraft has a useful load of 1207kg. In passenger configuration as a seven-seater it has a basic empty weight of 1544kg which reduces the available load slightly.

The walk-round is a pretty simple affair, inspecting the airframe and control surfaces. The engine checks are a simple oil check ensuring that we have 5.5 to 7 litres. The engine uses Aero Shell Turbine 500 as a norm, and generally it's not permitted to mix other brands. One thing you do notice is how clean the oil is – a pale clear purple, unlike the black sludge we are used to on piston engines. Refuelling is carried out with JetA1 through standard filler caps located on the wings. At 3m it is a mountaineering expedition to get up to them! The long climb up to the front door (there are doors on both sides as well as the side entry cargo door) is accomplished by climbing onto the front wheel, then onto a step on the main leg, allows you access to a spacious flight deck with a large centre console containing the throttle, propeller control and condition lever as well engine starting and over-ride systems and the avionics stack. An

Steve Copeland flies the Finist, a STOL champion with fantastic climb performance and benign handling characteristics

Photos: Keith Wilson

overhead panel contains switches and CBs for engine and avionics operation. The main panel contains a standard 'six pack' replicated onto the co-pilot's side as well. In front of you is a standard yoke.

Both the seats and the rudder pedals are adjustable and it is quite easy for even a tall person like me to get comfortable. The width of the airplane is such that the shoulder distance between the fronts seats is around two feet, leaving the cabin feeling very spacious and bright.

Strapping yourself in you notice just how high you are above the ground and how the nose of the aircraft seems to stretch ahead of you for an eternity, the two jet pipes clearly visible either side of the long sharp nose.

Engine start-up is a fairly simple process; generally a start is performed using a Ground Power unit as the internal batteries are easily drained and a constant voltage during start is critical for a good start. Starting a turbine engine is quite different to starting a piston engine – we need to spin the gas generator up prior to adding fuel and igniting it. Once ignited the engine should continue to spin up to operating speed and become self-sustaining. To do this we use a starter-generator unit that sits on the back of the turbine shaft. During starting it turns the turbine shaft to bring the gas generator up to ignition speed, and once the engine is running it then becomes an AC generator.

To start we first switch on the master, and the annunciator panel will give us a Min Fuel Pressure warning. Switch on the boost pumps and check the voltage, it must be no less than 24v or the start will fail. We push the start button and wait for the gas generator speed (Ng) to rise to 15% and push the condition lever to interlock; this feeds fuel into the combustion chamber, and the igniters do the rest. Keep an eye on the ITT (Inter Turbine Temperature) gauge to ensure that it does not exceed 735C. The engine then accelerates and settles at the idling RPM of 60-63% Ng, and as the oil pressure rises the Min Oil Pressure light should go out.

On the Walter engine start is protected by the IELU system, Integrated Electronic Limiting Unit; this intervenes through the Fuel Control Unit to help prevent hot starts by reducing the fuel flow to prevent overheating of the turbine. The IELU's cut out after 40 seconds when the start cycle is complete. Once the start is

Left: getting in calls for some mountaineering on spindly undercarriage legs
Above: cockpit is bright and spacious with two feet of space between the seats
Right: in parachute configuration the Finist has a useful load of 1,207 kg
Bottom right: the way out – the aircraft will climb to FL150 in 11 minutes

complete the ground power unit is disconnected, the generators turned on, we are ready for taxi.

This is where the fun begins! The gas generators produce 60% power while at idle, which leaves us with a large amount of residual thrust from the jet pipes as well as the reaction from the propeller. Coupled with being a tail-wheel configuration with its natural tendency to weathercock, this is a real handful of an aircraft to control on the ground. Taxiing on the brakes just overheats them and they fade to useless very quickly. So to taxi we use the beta range – 'fly beta' allows the prop to disc, and we move largely on residual thrust when empty. When at max weight we move in and out between flight idle and fly beta, and to brake, bring back the prop lever to 'ground beta', which gives us reverse thrust. This requires you to keep your wits about you, as the change from forward to reverse thrust causes the aircraft to swing back and forwards – it takes some practice to react correctly and not overcook it and end up in a ground loop!

At the hold, a check on the propeller feather and making sure we have strobes and full and free movement completes the pre-flight checks. No magnetos or carburettor heat to check here!

Lining up with 20 degrees of flaps and a 10kt headwind we allow a little power and wait for the turbine to spool up. This takes the gas generator to about 90% and the torque to around 50%, and you have to get very busy with your feet keeping it straight down the runway. On an ISA day at basic weight this sees a ground roll of 38m. Yes, that was 38m to get a tonne and a half of aircraft into the air! The Finist lifts off in the three point attitude at about 110 kph (59kt) and climbs at around 1800 fpm needing a leg-aching amount of right rudder to keep the ball in the centre.

Climbing to 2000 ft I set the torque to 50%, which leaves the gas generators running at about 95%, and settle into an economy cruise of 310kmh (approx 170kts TAS). We are

Above: with thin fuselage and stalky legs, the Finist looks like a daddy long legs
Below: glide performance with prop feathered is exceptional at about 300 fpm

Below: Finist takes off with a ground run of just 38 metres

burning about 150 kg (187 litres) of Jet fuel an hour in this configuration.

It is worth dwelling for a moment on the climb performance in this aircraft ,which is one of the primary reasons it is used in parachute configuration. It will climb to FL150 in 11 minutes and back again in around four minutes, giving approximately a 15 minute lift time. In the high-pressure world of parachute dropping, this reaps huge dividends.

In cruise flight the aircraft handles very conventionally. Steep turns are easy, requiring no power changes but a careful eye on the altimeter. It's easy with this much power on tap and at these speeds for it to run away from you. The glide performance in a PFL has to be seen to be believed. From 2000 ft with the prop feathered and at best glide, the descent rate is under 300fpm – it takes a very long time to come down!

Returning to circuit for a downwind joins sees the power brought back to flight idle and the speed starts to come back to 150 kmh (81 kt), the residual thrust being enough to keep us in the air. Turning onto base leg I put out first stage of flap, then on final I go to full flap and set the airspeed for 140kmh (75 kt). I have to use fly beta to maintain the airspeed and correct rate of descent in order to get to the threshold and not overshoot. Coming over the hedge I maintain the airspeed and in the flare, bring the speed back to 100kmh (54 kt) and touch down in a three-point attitude. As I touch down I progressively bring in full ground beta, ready to catch any swing from the suddenly reversed airflow, and come to a stop in about 50m. The taxi back is a reverse of the taxi out, ever mindful of the weathercocking effect and the poor brakes.

Overall this is actually a very nice aircraft to fly. It has powerful controls, and for such a large aircraft it is very responsive. Due to the enormous power on tap it does require constant flying – a moment's inattention can see height changes of several hundred feet. It is hard work in the climb, requiring constant significant rudder input, although the second Finist that I fly does have a rudder trim which, while not completely trimming out the rudder forces, is a significant improvement. It has a huge load carrying capacity and breathtaking performance and it is clear to see why it makes such a great parachute aircraft. Not to mention that sitting behind a turbine engine does bring a smile to your face!

Flying the Finist on a JAA licence until recently required the holder to have a specific type rating for the type, but following a recent reclassification by the CAA it is now in the SET Turbine Class as a rating for the Finist SMG 92. This is achieved through five hours of flight training with a Class Rating Instructor who holds the class/type rating and eight hours of ground school and an exam, followed by a flight test with an authorised Class Rating Examiner. ■