

# Flying the Plastic Duck

*The long-awaited Diamond DA42 Twin Star is finally earning a living in the UK. Atlantic Flight Training's Ian Sturgess gives his impressions*

I don't know where the name Plastic Duck came from; obviously 'plastic' stems from the Diamond DA42 Twin Star's composite construction, but the 'duck' – that's in the eye of the beholder. What's certain is that it's an affectionate nickname, because this is a very capable aircraft that's a joy to fly.

The Twin Star is revolutionary because of its composite hull, diesel engines and glass cockpit, and it also brings general handling qualities into the modern age. Compared to an air-cooled petrol-engined aircraft it is remarkably simple to operate, and its handling qualities are straightforward and benign.

The first impression one gets on approaching the Twin Star is its size when compared to other twin piston-engine aircraft. Its large wingspan – with fitted winglets – and sitting height on the ground create an illusion of size. In fact it's 44 feet from wingtip to wingtip, just over 28 feet long and more than eight feet tall at the top of the vertical stabiliser.

Undoubtedly, the clean lines of the DA42 are a matter for individual appreciation, but without doubt the aircraft has an attractive finish – although care has to be exercised in deciding where and how to handle the aircraft while performing the external checks. The walk-round is simple, with good accessibility to everything that needs to be checked.

While the Twin Star sits high off the ground, access to the cockpit from either side is very easy. The one-piece cockpit door opens onto a pleasantly furnished interior, with accommodation for four people in fixed-position seats with only rudder pedal adjustment. It's fairly basic, but reasonably comfortable.

Once seated and with rudder pedal length adjusted, I found the cockpit ergonomics and layout to be obvious and appealing. There are no hidden switches to seek, no awkward flap levers or cowl flaps. Everything falls easily to

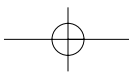
hand. I found the control column particularly appealing, especially as it allows easy access to the front cockpit seats. No doubt some people will readily adapt to flying an aircraft fitted with a control column rather than a control wheel; others may have their reservations.

The flight instrument layout – the Garmin 1000 series – is already widely appreciated for its clarity of presentation. The two large flight displays dominate the flight instrument screen, with a smaller standby flight instrument panel section mounted above. The total display represents a quantum leap forward in information presentation, and brings the standard of display up to and often

exceeding the flight displays of modern jets. It does, however, need a certain amount of understanding to get full utilisation from the system. For those well versed in the use of previous Garmin products such as the G430 displays, the transition to the G1000 display will not prove too daunting.

Preparing the aircraft for flight is a much





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simpler and quicker exercise than for normal twin piston engine aircraft. The automatic engine controls have allowed the replacement of the multitude of engine and propellers levers by one throttle per engine. Additionally, incorporating a multi-sensor fault warning display within the flight display reduces the need for extensive check procedures on the ground prior to flight.

The two throttle levers fall to the pilot's right hand, while in front of them there are three smaller levers – the park brake and the cabin heat and air controls. Above them is a rudder trim wheel, with direction arrows for those who have to think about it. On the right, underneath the second flight display screen, there's a flap selector with three lights – one for up, one for approach flap with a 140kt limitation and one for landing flap, with a 113kt limit. Just above the pilot's right knee is the gear selector, with the manual gear selector to be pulled out beneath it.

Starting the engines is very similar to starting a diesel-engined car. Check the throttle is at idle, turn the engine master switch on and wait for the glow plug warning to clear, then turn the key.

The actual flying characteristics of the aircraft are not a great departure from other twins, performance being on a par, including single engine performance. The blue line speed is 82 knots, and the aircraft is said to be able to maintain height on one engine at max AUW.

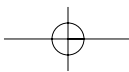
Stalling is positively benign, and classic. Flaps reduce the stalling speed, but the aircraft retains its viceless characteristics at all flap settings.

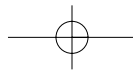
The big difference between this aircraft and older piston twins is the reduced fuel consumption. The fact that jet fuel is used, in this age of higher petrol prices, is a definite plus. Fuel capacity is good – the tanks hold 197 litres, and with the aircraft burning something around 60 litres an hour it's easily possible to fly two normal training flights between fill-ups. The lack of de-ice/anti-ice facilities is about to be addressed, eliminating most weather problems associated with normal winter flying. The provision of water cooled engines also removes another familiar winter operating problem, that of using a separate cabin heater. The heating arrangements are very similar to those fitted in cars, and as easy to operate.

Introducing the DA42 into flying training world exposes the aircraft into a harsher utilisation environment than that of the private owner. The Twin Star I'm describing, for instance, flies 130 hours a month in



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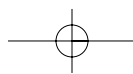
relatively short sorties. Expected difficulties of component failures have transpired, but niggling as these events are, the reliability of the aircraft is starting to show. Whilst the landing gear is of a rugged and forgiving construction, the readiness of tyres to flat spot

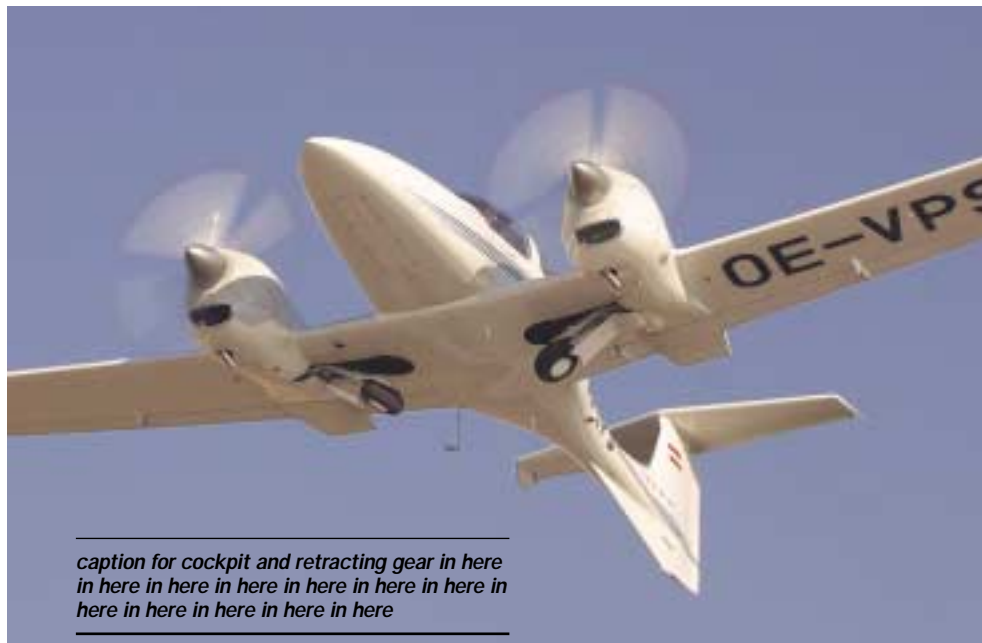
on crosswind landings needing careful consideration.

Another unusual aspect is the design of the rudder pedals, which are very different in their application than other aircraft types – more akin to the accelerator on a car, they pivot



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vertically rather than displacing about a central pivot. The difference is most evident when one first gets airborne, but the rudder loads lighten noticeably when the undercarriage is selected up as the nosewheel steering linkage slackens. Adjustment to accommodate these small idiosyncrasies is very straightforward. Personally I found my conversion onto the DA42 to be without drama.

From the commercial student's point of view, the Twin Star has the advantage of having a display which is very similar to modern glass cockpit displays in aircraft like the Airbus A320, the B737-500 plus, the B757/767 etc, and the enhancement of knowledge of glass cockpit technology must be a major advantage. The DA42 dispels the aura

of the glass cockpit.

Whether the Twin Star would make a good private owner's machine depends very much on what the individual owner is looking for. Obviously the owner of an aircraft with six seats may be happy to trade off range and carrying capacity in order to move six people, but the Twin Star bulks out before it weights out – that is, it's a little short of baggage space for four people.

From the engineering perspective, the aircraft is more complex in certain areas than older twins, and accessibility is not so good for certain avionics components, but it's too early to establish whether it will prove to be more robust than older aircraft. However, we're fully satisfied with the aircraft to date, and we're

DA42 TDI Twin Star	
<b>Dimensions:</b>	
Length	8.56 m
Height	2.49 m
Wingspan	13.42m
<b>Weights &amp; loadings:</b>	
Empty weight	2,778 lbs
MTOW	3748 lbs
Useful load	970 lbs
Fuel capacity (standard)*	52 gals (US)
*Long range tanks 74 gals US	
Fuel consumption quoted as 14.3 gph (US) at 90% power at 10,000 feet, giving 164kt, down to 7.1 gph at 50% and 18,000 feet giving 135kt.	
<b>Performance:</b>	
Take-off distance (50ft)	530m
Climb rate	1,100 fpm
<b>Powerplant:</b>	
2x 135hp Thielert Centurion 1.7	
Props:MT three-blade hydraulic constant speed	
<b>Full details:</b>	
Henrik Burkal, Diamond UK, 01777 839200	

very much looking forward to having more Twin Stars on the flightline.  
*\*Ian Sturgess has 14,000 hours on military and civilian aircraft up to the B767, and has 3,000 hours as an instructor ■*

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