



Diamond DA40XLS

Diamond's luxury single

**The DA40XLS's 'standard'
package is loaded with 'options'**

BY THOMAS A. HORNE

Since 2002, Diamond Aircraft Industries, Inc. has been mining the success of its popular DA40 Diamond Star piston singles. With more than 958 deliveries, DA40s have been the mainstay of the Diamond line—accounting for some 77 percent of all Diamond sales in the past four years. In a very large way, the DA40 has helped finance Diamond's entry into the piston twin market (with the DA42 Twin Star) and the very light jet arena (with the D-JET). What accounts for the DA40's enduring appeal?

First off, the DA40's smooth lines let its 180-horsepower Lycoming IO-360 engine extract the maximum possible speed from the airframe. Interior room is another selling point, and so is its large aft passenger door.

PHOTOGRAPHY BY PAUL BOWEN



Diamond says that the DA40 is the only piston single with this kind of easy passenger access. Another advantage is the DA40's docile stall characteristics and responsive controls.

"Our DA40 market is first-time and fleet buyers, and we see our main competition as being the Cessna 172 and 182, the Piper Archer, and maybe the Cirrus SR20," a Diamond salesman said. "But the DA40 is faster than all but the SR20, has more room, a great payload and range, and an outstanding safety record. We like to say that the DA40 is the very best first airplane that you can own." Perhaps the biggest boost to the DA40's capability came in 2004, when the Garmin G1000 avionics suite was added to the airplane's standard equipment package.

"Standard" options

At last year's AOPA Expo in Hartford, Connecticut, Diamond announced some significant tweaks to the previous DA40XL design, which it has renamed the Diamond Star DA40XLS. The standard XLS incorporates the most popular options ordered on previous DA40s—and then some. Here's the rundown of the main improvements:

- Wide Area Augmentation System (WAAS) capability has been added to the

G1000, allowing vertical guidance to a greater range of GPS approaches at more airports. WAAS is essential for GPS localizer performance with vertical guidance (LPV) and LNAV approaches, which have lower descent minimums than traditional nonprecision approaches.

- Garmin's GDL 69A datalink receiver lets XM WX's datalink weather (and entertainment channels) run via the G1000. Graphical and textual weather,

available by subscription, can be called up on the multifunction display (MFD), and occupants can listen to XM Radio.

- Garmin's GFC 700 autopilot also is incorporated in the XLS's G1000. A full-featured flight control system, the GFC 700 can fly autopilot-coupled procedure turns and holding patterns and perform VNAV and flight-level change (FLC—an airspeed-hold mode) functions, as well as the usual autopilot functions.



The 'no-frills' Diamond Star

Diamond also announced its new Diamond Star DA40CS at last year's AOPA Expo. The CS comes with the same WAAS-enabled

G1000, TIS, SafeTaxi, large canopy, and other features included in the XLS package, but leaves many other features on its options list. Features such as TAWS, the Power Flow exhaust, the GFC 700 autopilot and flight control system, the 50-gallon tanks (40-gallon tanks are standard on the CS), and the AmSafe airbag restraints are not standard on the CS. Essentially, the CS is a bare-bones version of the XLS, if you want to think of the G1000 as "bare-bones" equipment.

Base price of the CS is \$259,950. The CS is available only with a Hartzell two-blade constant speed propeller. Performance is nearly identical between the XLS and CS, Diamond says, although the XLS's useful load (860 pounds for the standard airplane) is some 40 pounds less than that of the standard CS. Externally, the only features that distinguish a standard XLS from a standard CS are the CS's propeller and lack of wheel fairings—a \$2,450 option.

—TAH



The DA40 control stick sits in your lap (above) and has a trigger-style microphone switch, plus electric pitch trim and autopilot disconnect switches. The G1000 (left) comes with an engine page on the MFD, plus a traffic information (TIS) and terrain awareness and warning system (TAWS)—all standard.



Leather seats, Bose headsets, extra head- and shoulder room, and AmSafe airbag seat belts (above) are other XLS strong points. AmSafe belts for the rear seats are optional. Rear seat passengers have plenty of room, too—right down to small footwells (left) that yield more leg room. A small overhead panel (below, left) has lighting controls and an emergency door release.

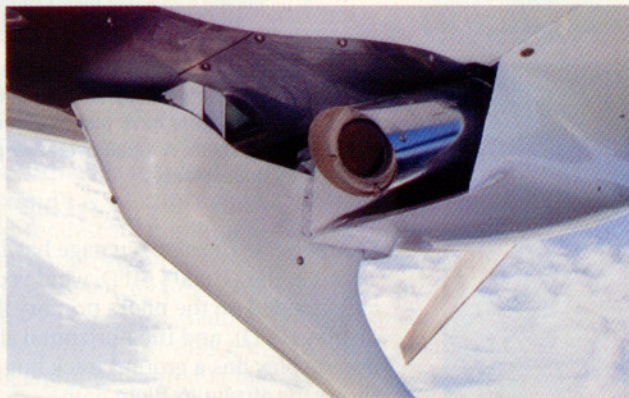


- An engine monitoring page has been added to the G1000's MFD, wind vectors are provided on the pilot's primary flight display (PFD), and the horizontal situation display has a ground track bug that shows the airplane's flight path.
- Garmin produces SafeTaxi and FliteCharts, which show the airplane's position on runway diagrams and are a great aid to situational awareness at unfamiliar airports. Geo-synchronized approach-plate information for instrument arrival, approach, and departure charts is available via an optional Garmin ChartView package, priced at \$3,495 and which requires a Jeppesen subscription. This feature shows the airplane as it tracks charted routes and approach procedures.
- Traffic Information System (TIS) traffic advisories come standard as well. An optional Avidyne TAS600 active traffic system with voice callouts for nearby conflicting traffic is priced at \$12,950.
- Garmin's Class B Terrain Awareness and Warning System (TAWS) alerts the pilot when terrain and/or obstacles are in the airplane's projected flight path.

- MT-Propeller manufactures the three-blade, composite-construction propeller with a polished spinner.
- Fifty-gallon long-range fuel tanks also are standard on the DA40XLS.
- A Power Flow Systems, Inc. tuned exhaust helps recover some of the engine power loss created by alternator friction and other accessories. Power Flow says its exhaust system adds eight knots to the DA40XLS's standard maximum cruise speed, giving it a 158-knot top speed. But even Diamond salespeople say that this number may be an exaggeration. Count on 150 knots, they say.
- A redesigned, larger canopy gives more headroom and wider dimensions at head level. This expansion prevents headsets from banging into the top and sides of the canopy—a complaint on earlier DA40s—and provides more elbow room.
- A leather interior comes with brushed aluminum trim, wood-insert sidewall panels, electrically adjustable rudder pedals, and electronic cabin carbon monoxide detector.



Though the canopy is slightly taller and beamier than those of previous DA40s, you'd have to look pretty closely to notice the comparative difference. Spotters can tell an XLS by the Power Flow exhaust system's large chrome external stack (below).



Bundling popular options into a standard airplane package is a common marketing tool, and it seems to be a successful tactic. Even so, the resultant price (the XLS sells for \$334,950) is bound to scare off price-sensitive customers. But then again, prices at this level—and higher—are common among many new piston singles.

For those who want it all, there is an options list for the XLS. Options include the Garmin ChartView package and TAS 600 we already mentioned, AmSafe airbag seatbelts for the rear passengers, an engine pre-heater system, an automatic direction finder

(ADF) and distance measuring equipment (DME), sheepskin seat covers, and Diamond's two-year "Premium Care" maintenance program.

Flying the XLS

It had been a couple of years since I'd flown a DA40, but getting reacquainted with the airplane proved to be a non-event. Yes, the entry procedure takes some getting used to, what with the step mounted ahead of the leading edge, and the need to step into the cabin from above, but in all the DA40 is a straightforward, ergonomically correct airplane. The canopy's extra head

and shoulder room does make a difference. In previous DA40s I recall my headset bumping against the canopy's top and sides. No more.

Anyone who hasn't sampled SafeTaxi will soon come to realize its value—it's a great situational awareness tool, especially if you fly to many different airports. That goes double for nighttime taxiing. At unfamiliar airports you'll wonder how you got along without SafeTaxi.

Pretakeoff checks are conventional, with the exception that you leave the battery master on so that the G1000 can go through its start sequence and initialization. During the runup you



Composite construction; sleek, Wortmann-profile, glider-like wings; a wasp waist; dual elevator trim tabs; and responsive controls mark all Diamond piston airplanes. Winglets help boost wing efficiency by cutting back on induced drag.

screens—instead of the world outside. You can't help it. That's why having a traffic detection system is essential. Fortunately, the XLS comes with one.

For landings, select full flaps and slow to 85 knots or so on downwind. By short final plan to fly at 70 knots, then bleed off airspeed during the flare. I was rewarded with two nice full-stall landings—despite of my lack of currency. Everything about the approach and landing felt intuitive and predictable—including the position and manipulation of the control stick.

On the way back to Executive, I floored the IO-360 and watched the G1000's magenta airspeed trend line (it shows the predicted airspeed six seconds in the future) for signs of that promised 158 knots. On this day, it was not to be. We topped out at 147 KTAS, burning 10 gph in the process. On the G1000's MFD, I dialed back the range and saw two concentric rings, one made of dashed lines, the other a solid red. These were our range lines. The dashed line showed our range with a 45-minute fuel reserve; the solid line was our tanks-dry range. Although the thought never crossed our minds, it was interesting to see that we could reach deep into Cuba and still have ample IFR fuel reserves.

Apart from its lofty avionics-dom, the DA40XLS is a nice-to-fly airplane with no nasty habits. Diamond's safety claims appear to be on solid ground. In the past five years there have been only six DA40 accidents, according to the AOPA Air Safety Foundation's Accident Database. Two involved fatalities, one yielded serious injuries, one caused minor injuries, and two resulted in no injuries.

Neophytes will make peace with the airplane in short order, but getting used to the avionics may take a little longer. The visibility out of that huge bubble canopy is exceptional, and those leather seats and other creature comforts (e.g., the electrically adjustable rudder pedals) lend a Lexus-like appeal. The DA40XLS may just be the most comfortable and capable light piston single on the market today.

Some may see irony in a 180-horsepower airplane mated with a flight

check the G1000's PFD and other displays for normal operation. For takeoff you select the first increment of flaps, go to full power, rotate at 59 knots, and climb away at 66 knots—which happens to be both V_X and V_Y in this airplane. The day I flew it—out of Fort Lauderdale Executive Airport—it was 78 degrees Fahrenheit, I was at maximum takeoff weight (full tanks, plus myself, Diamond's Alexander Younger, and a photographer), and the initial rate of climb was 1,100 fpm.

I worked with the G1000 and GFC 700 en route to the Palm Beach County Glades Airport at Pahokee, Florida. Climbs and descents to preselected altitudes were made using the flight level change function, and XM WX's Nexrad imagery identified some showers moving into the area. The TAS 600 showed nearby traffic that would have otherwise gone unnoticed and TAWS pointed out some tall towers along the route.

The GFC 700 is fairly intuitive, but the G1000 definitely calls for some formal training to achieve a safe, comfortable level of competence. There's a lot of button pushing, there are hundreds of data-entry command combinations, and learning the "switchology" takes time. And any pilot thinking of buying a G1000-equipped airplane had better remember that this avionics suite, as wonderful as it is, demands large amounts of heads-down time. It seems as though you're always scanning the display

SPECSHEET

Diamond Star DA40 XLS

Base price: \$334,950

Specifications

Powerplant	.....180-hp Lycoming IO-360-M1A
Propeller	.....MT, composite scimitar, three-blade, constant speed
Length	.....26 ft 5 in
Height	.....6 ft 6 in
Wingspan	.....39 ft 6 in
Wing area	.....145.7 sq ft
Wing loading	.....18.2 lb/sq ft
Power loading	.....14.7 lb/hp
Seats	.....4
Standard empty weight	.....1,785 lb
Max gross takeoff weight	.....2,645 lb
Max useful load	.....860 lb
Max payload w/full fuel	.....560 lb
Fuel capacity, std	.....50 gal
Baggage capacity	.....100 lb

Performance

Takeoff distance, ground roll	.....1,027 ft
Takeoff distance over 50-ft obstacle	.....1,140 ft
Max demonstrated crosswind component	.....20 kt
Rate of climb, sea level	.....1,120 fpm
Cruise speed/range w/45-min rsv, std fuel (fuel consumption), 8,000 ft	.....@ 75% power, best power mixture
	.....150 kt/ 720 nm (10 gph)
Max operating altitude	.....16,400 ft
Landing distance over 50-ft obstacle	.....2,093 ft
Landing distance, ground roll	.....1,155 ft

Limiting and Recommended Airspeeds

V_X (best angle of climb)	.....66 KIAS
V_Y (best rate of climb)	.....66 KIAS
V_A (design maneuvering)	.....89 KIAS
V_{FE} (max flap extended)	.....108 KIAS
V_{NO} (max structural cruising)	.....129 KIAS
V_{NE} (never exceed)	.....178 KIAS
V_R (rotation)	.....59 KIAS
V_{S1} (stall, clean)	.....52 KIAS
V_{SO} (stall, in landing configuration)	.....49 KIAS

For more information, contact Diamond Aircraft Industries, Inc., 1560 Crumlin Side Road, London, Ontario, Canada N5V 1S2; telephone 888-484-1051; www.diamondaircraft.com

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.

deck that rivals that of an upscale business jet. But not enough to deter the 50 pilots who have ordered XLSs since last October.

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