

PROFESSIONAL PILOT



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PHI and ADS-B in the Gulf

One of the world's largest offshore oil industry and EMS operators, PHI flies a wide variety of helicopters and is a major user of ADS-B. Senior personnel shown with Sikorsky S76C++ and S92 at LFT (Lafayette LA) are (L-R) Dir Avionics Rickey Labit, Dir Mx Tony Gonzalez, Dir Ops Pat Attaway, Chief Pilot Mike Hurst, Check Airman Rich Roy, Line Training Capt & Line Pilot Garry Lee with ADS-B equipment.



FLIGHTCHECK

Nextant 400XT in flight over Ohio.

Nextant 400XT

New cabin, 2 Williams FJ44-3APs with 3050 lbs T/O thrust, 2005 nm, FL450, 2/8 pax, basic price \$3.975 mil.

Photos courtesy Nextant

By Dan Wolfe
ATP/A&P. Challenger 604/605,
Hawker 800XP

Having flown numerous aircraft during my career, I continue to ask myself this question—Why didn't the manufacturer go further in the engineering and development phases? A good example of this can be seen in the Raytheon (now Hawker Beechcraft) Hawker 800 through 900XP. I can count 6 different models where there really should only have been 3, each with easy upgrade ability. And many OEMs seem to come up short more often than not.

The other question I frequently ask myself is—How do you make a good aircraft great? My answer would be to take an aircraft already in service, then have a sample group of pilots, mechanics, engineers and customers come together to work through their wish list, and then put it through a remanufacture process. This is exactly what Nextant Aerospace has done with the 400XT. The company has addressed the Beechjet 400A's shortcomings and developed an aircraft that should exceed most customers' expectations for years to come.

Nextant Aerospace is a leader in the concept of remanufacturing within the business jet market. The company was created in 2007 with a commitment goal of delivering the latest in bizjet technology without passing on the cost of a clean sheet design to its customers. Nextant took on the project of refining the Beech-

jet 400A. The company's STC includes the 400A and 400XP, putting the projected market at more than 600 aircraft, not including the US Air Force trainer version—the T1A Jayhawk.

Beechjet history

The Beechjet has a long history as a solid, durable airframe. The design began as the Mitsubishi MU300 Diamond, which first flew on Aug 29, 1978. Beechcraft bought the production rights from Mitsubishi Heavy Industries and began manufacturing it as the Beechjet 400. FAA certification was achieved in May 1986.

In 1990, Raytheon's Beechcraft division engineered its own improvements to the Beechjet 400 and marketed it as the 400A. Highlights included a glass cockpit, extended range, higher takeoff weights and improved interior options.

The US Air Force uses the Beechcraft version—the T1A—as a crew trainer for large aircraft (tankers and strategic transports) and for navigator training. A total of 180 T1As were delivered between 1992 and 1997. The Japan Air Self Defense Force also operates small numbers of the 400T trainer, which shares the same type certificate as the T1A.

In 1993, British Aerospace sold its Hawker business jet product line to Raytheon. Eventually, the Beechjet 400 was renamed the Hawker 400 to map it into the Hawker product line for marketing purposes. Built from 2003, the Hawker 400XP incorporat-

ed further aerodynamic, mechanical and interior improvements.

So what did it take to make a Beechjet/Hawker 400A/XP a Nextant Aerospace 400XT? For one thing, a remanufacturing process which involved over 6000 man hours. In the process, all work was completed under FAA Part 21 and 145 repair station certification with a cellular production line approach under the AS9100 aerospace quality management system. A through D phase inspections included completion of all AD and mandatory service bulletins. A completely new primary wiring harness was installed and all life-limited components were replaced with new or zero-time units.

Airframe areas that have no access were borescoped for corrosion and fatigue cracks. One of the areas Nextant tackled that I feel really shows commitment to building a quality product is airframe aerodynamic enhancements.

Nextant Aerospace Pres Jim Miller, who is a pilot and engineer, explains the company's use of state-of-art engineering methods, including computational fluid dynamics (CFD), to redesign aerodynamic aspects of the engine installation—namely the engine mount beam. Miller says the engine pylons were also redesigned, helping to remove some excess drag by eliminating the supersonic shock wave that was present at normal cruise speeds in the original design.

Miller goes on to say that the opening and closing of the engine cowling on the Beechjet 400A/XP was a

major event in Nextant's re-engineering process. In fact, during my pre-flight walkaround I opened and closed the newly designed cowling and found it very pilot and mechanic friendly.

By far the most significant upgrade to 400XT is the replacement of the original Pratt & Whitney JT15D-5 powerplants with 2 Williams FJ44-3AP engines. These are rated at 3050 lbs max takeoff thrust (at sea level, 72°F) with a specific fuel consumption 32% less than that of the JT15D-5s. The Williams engines also produce 32% less greenhouse gases than the Pratts.

As you would expect, upgrading to the FJ33-3AP increases overall range significantly. Nextant currently states that the 400XT delivers a 50% range improvement over the 400XP (based on 4 passengers, NBAA IFR reserves), 6% increase in long-range cruise speed and 2% increase in high-speed cruise. Other notable performances include a 144% single-engine climb rate increase over the Beechjet 400A/400XP and 33% better time-to-climb numbers—22 min to FL430 vs 33 min to FL430.

The FJ44-3AP comes standard with dual channel FADEC that truly simplifies all facets of operation from start through shutdown. These engines also support future Stage IV noise criteria.

Support issues seem to have been addressed by Nextant before putting the product in service. CAE is the exclusive flight training provider with a 400XT Level D full flight simulator. CAE also offers a maintenance familiarization course. Nextant's service center network consists currently of 7 maintenance and overhaul facilities available 24/7 and a design and manufacturing facility at CGF (Cuyahoga County, Cleveland OH).

Nextant 400XT warranty is a tip-to-tail program. Airframe, systems and components are all 2 years (or 800 flight hrs), Rockwell Collins avionics are 2 years (with no hour limit), the Williams engines are 3 years (or 1500 hrs) and paint and interior items are 2 years (or 800 hrs).

Walkaround and preliminaries

On Jun 10, 2011, I had the opportunity to fly a Nextant 400XT, one of the 2 aircraft currently in flight test. The morning of my flight I met up



Nextant Chief Pilot Nathan Marker (L) and Wolfe review the Nextant 400XT flight profile.



Williams FJ44-3AP engine and redesigned pylon.

Photo by Dan Wolfe



A well laid out cabin with Wi-Fi allows for a productive work environment.

Rockwell Collins Pro Line 21 integration reveals few signs of the 400A flightdeck.



with Miller as well as Nextant VP Sales Marketing Jay Heublein and Chief Pilot Nathan Marker. The early morning briefing started with me sitting down with the group to learn more about Nextant Aerospace and its strategy along with deep dive into what a Nextant 400XT is all about.

After the initial briefing I paired up with Marker to review the 400XT performance and our scheduled flight profile. Marker's experience flying both the 400A/XP as well as the 400XT allowed him to articulate performance differences fully. We then went out and did our walkaround, with both Marker and Miller going through the items mentioned previously in detail.

Next we looked at the interior, which had also gone through a major update, starting with more effective soundproofing and LED lighting. Some significant passenger comfort items I noticed immediately were the unique flat-floor design and squared oval cabin configuration. The 400XT standard cabin layout consists of 4 seats in a center club arrangement, but other optional cabin layouts are available, including a 3-place divan and 4-place club option.

Moving aft, I went right for the CEO's chair. As I sat down, Miller handed me his smartphone to control the Rockwell Collins Venue IFE cabin management system (CMS),

Nextant 400XT specifications**Price**

Basic equipped (\$ US) \$3,975,000

Powerplants (2)

Williams FJ44-3AP

Thrust at takeoff (lbs) 3050

Dimensions

Wingspan 43 ft 6 in

External length 48 ft 5 in

External height 13 ft 11 in

Internal cabin length 15 ft 6 in

Cabin max width 4 ft 11 in

Internal cabin height 4 ft 11 in

Volume (cu ft) 305.0

Baggage 53.2

Total volume 358.2

Normal seating,

Short-range crew/pax 2/8

Long-range, crew/pax 2/4

Weights and loading

MTOW (lbs) 16,300

Zero fuel weight 13,000

Basic operating weight 10,700

Max payload 2,300

Payload full fuel 899

Max fuel load 4,911

Performance

Balanced field length

(SL, ISA, MGTOW) (ft) 3,821

Landing distance (SL)

@max landing weight (ft) 3,510

Max operating altitude (ft) 45,000

Pressurization dif PSI 9.1

Max range, IFR, ISA (nm) 2,160

High-speed cruise (kts) 460

Normal cruise speed 440

Fuel flow (lb/hr total) 770

Range (NBAA, 4 pax, IFR res) (nm) 2,005

V_{so} (kts) 91V_{mo} 320*Figures supplied by Nextant*

which is both slick and easy to navigate. As I looked around I noticed an iPod/iPhone docking station, numerous 110-v AC and Ethernet receptacles throughout the cabin. The cabin and flightdeck management system in the 400XT flight test aircraft were fully loaded with most available options—notable were IFIS, XM weather, a 4th Pro Line display, surround sound system with subwoofer and Aircell Axxess voice and data/Wi-Fi system. The system also supports an array of items from a media file server to a Blu-ray player and HD video.

I asked Heublein what effect a well laid-out cabin has on aircraft empty weight. He revealed that approximately 320 lbs were removed during

the remanufacturing process (60% of the weight reduction was due to engine replacement and removal of the reversers, the remainder from avionics changes). That said, Nextant added about 275 lbs in functionality back into the aircraft, primarily in the form of items mentioned above.

Miller and I then went to the flightdeck. He also flies the 400XT and it was interesting to hear the pilot/engineer side as we worked through the flightdeck and the Pro Line 21 layout. Having quite a bit of Pro Line 21 experience myself, I felt right at home. Marker arrived back after getting a weather update and finished the flightdeck orientation with me.

We waited for some Columbus area thunderstorms to roll through. Once we had a hole we moved the 400XT outside and began preparing for flight. Weight and balance showed our takeoff weight at 14,001 lbs with full wings fuel (2660 lbs), which placed the CG forward of center at 19.6. Takeoff speeds were calculated at V₁=98, V_r=105 and V₂=114.

We started the FJ44-3APs and completed our afterstart checklist. I was in the left seat as we received our taxi clearance and noticed immediately how quiet the flightdeck was as I applied taxi power. We completed our taxi check, takeoff briefing and pre-takeoff checks.

As we taxied into position, we were monitoring the convective weather on the MFD with onboard XM Weather. It's amazing to think how far we've come in the past 10 years—from approach plates on the MFD to XM Weather and Wi-Fi now almost a commonplace.

We were given our takeoff clearance and we were off. Both takeoff power and climb power were easy and smooth with the onboard FADEC system. We requested a straight climb to FL410 but due to traffic and weather we had 2 short level-offs. Even so, we arrived at FL410 in 23 min.

At FL410 we accelerated to Mach 0.77—just off the Mmo of 0.78—with engine fuel flows reading 410 lbs per hour per side, then decelerated to LRC of Mach 0.68. Again I noticed a super quiet cabin as we completed different handling maneuvers. I was pleasantly surprised at how well the Pro Line 21 integration worked and its interface with the autopilot system. It's always a plus to

have an autopilot to keep you out of trouble. And while a look around the flightdeck reveals signs of the older Beechjet 400A/Hawker 400XP, they are few and far between.

After about an hour's flight, we started back to CMH. With good coaching from Marker, I was able to put the 400XT through its paces with a nice touchdown to a full-stop landing.

What had seemed like a 30-min flight was actually 1 hr 15 min chock to chock. We shut down and secured the aircraft and started our debrief.

Summary

From a pilot perspective the 400XT light twin performs well—and it sips fuel, which allows for an outstanding range at a great price. For the base model, pricing starts around \$3.975 million. \$4.600 million will get you a fully loaded model. In today's used aircraft market you might possibly find a larger cabin for close to the same money, but it won't be 88% new (relative to MSRP) with lower DOCs, fuel savings and FJ44-3AP engines that exceed future Stage IV noise requirements. Nextant 400XT is considered a new type in the aircraft bluebook with expectations of supporting superior residual values.

Nextant expects to certify the 400XT in 3Q2011 and plans to deliver 11 aircraft this year. The company has secured an order for 40 aircraft from fractional operator Flight Options.

Nextant Aerospace's future may depend on the success of the 400XT. All the right ingredients are in place for it to be a winner. You wonder what might be on the company's drawing board for its next project, given the glut of used light to midsize jets on the market and few prospects of it changing. Considering the trend of fuel prices and noise requirements, remanufacturing looks more and more attractive. Now might be the time to start collecting inventory. ✈



Dan Wolfe is an aviation manager with over 30 years experience as an aviation professional. He holds an ATP/A&P and has 14,000 hrs TT.