

From Design, to Delivery

BELL 505



JETRANGER



The Bell 505 JRX, signalling the company's return to the short light single market has finally delivered its first helicopter in the U.S.A. We take a look at how the JRX was designed and built with the customer in mind.

When the curtain dropped at Heli-Expo in 2013 to reveal the Bell 505 JetRanger X to the world, it was standing room only on the show floor, as the biggest announcement in decades from Bell that would signify their reentry into the short light single helicopter market. The interest in the new 505 Jetranger X was immediate and has continued throughout the many shows globally the 505 has headlined since the initial reveal. The new short light single generating over three hundred and fifty letters of intent, most of which are now firm orders, while the Bell sales team works through finalizing conversion of the remainder into firm orders as the first delivery looms.

THE FIRST DELIVERY

By the time you are reading this article, the first 505 to roll off the production line will have been delivered to its first customer, occurring just before this year's Heli-Expo show in Dallas. The first Bell 505, purchased by Scott Urschel, Co-owner of Aviation Battery Systems, who manufacturer and distribute Start Stick. Urschel, an entrepreneur in the helicopter industry, will take delivery of the first 505 under his company Pylon Aviation.

For those not familiar with Urschel (see *Heliweb Magazine October 2016 profile*.) he was also part of the unique approach taken by Bell to seek customer input in the design and development of every aspect of the new helicopter.

Customers from a select group of industry heavyweights, including Urschel, were asked to participate in what Bell named the "Customer Advisory Panel." The group of twenty included many well-known professionals.

The panel put together by Bell, featuring names familiar to many in the helicopter industry, both at home and abroad. The company bringing in professionals from companies large and small, foreign and domestic, that would collectively give their expectations of what they wanted to see in the worlds next short light single helicopter.

Bell gave the Customer Advisory Group an open canvas and tasked the group with writing the story of the new Bell 505. From that point on, the team was involved in every aspect of the design process, assisting in all areas of developing the 505 from the ground up.

The group's input was considered throughout the design process, involving contributions in the 505's interior layout, selection of power plant, transmission, and avionics included in the final version of the 505.

Input from Urschel and other members of the group continued throughout the development process, Urschel describing the group's initial meetings at Bell's Mirabel offices as twenty people put in a room, tasked with coming up with design criteria for the as yet unnamed helicopter that would be something never seen before in the market.

The task ahead included each member of the group listing everything they could think of that was lacking in short light singles in the market at the time. A wish



list of sorts, detailing many items that the group considered were missing in current aircraft.

The list included items on such as performance improvements over current models, a digital cockpit included as standard, all the way down to the way the doors of the helicopter opened, all while remaining cost competitive in line with other models and offering state of the art equipment as standard.

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The list compiled by the group was then given to Bell engineers, who worked diligently to achieve each item listed to incorporate into the 505 design.

In Urschel's mind when he looked at the list, he saw some lofty expectations, wondering if it would even be possible for Bell engineers to achieve the list of items that the group had requested be included in the new 505. To the team's

surprise, what was delivered by Bell's engineers in the initial design, not only met but exceeded everything the collective of industry professionals had asked for.

After the initial unveiling at Heli-Expo in Anaheim, California, Bell faced industry criticism from some, centered on the company's use of legacy parts from the existing Jetranger design that was now almost

forty years old. Leading some in the industry to label the new helicopter "a Jetranger with a new skin."

Some even poking fun at the design of the new helicopter that in some minds, bore an apparent resemblance to that of an Anteater, going as far as depicting the similarity in graphic form that can be found in social media group discussions on the new helicopter.

Bell Helicopter
A Textron Company

JRX

Inspired by Nature

Bell 505
JET RANGER X

The New Bell 505 "Anteater"

INNOVATION

ONE OF THESE WAS BUILT IN 1966,
THE OTHER JUST LOOKS LIKE IT.

Left: While some dismissed the Bell 505 as a "Jetranger in a new skin" Others likened the new body design to something that bore resemblance to an anteater, as seen in these illustrations online. Scott Urschel, the first person to fly the 505 JRX and the first customer to purchase a 505 stated that perceptions would change once it entered the market and people had a chance to fly it for themselves. **Graphic reproduction courtesy Justin Prickett**

In comparing the 505 to other light singles, Urschel stated "this helicopter will likely become the new standard for the short light single market, it has better tail rotor authority, a higher payload capacity and better hot and high performance than anything else in its class. This helicopter is not a Longranger based helicopter, it is a Jetranger sized aircraft, and in my opinion, it outperforms everything else already on the market. Some might disagree because they have not flown the 505, but I believe that once they have flown the aircraft themselves, they will change their opinion."

505 JRX PRODUCTION

The team at Mirabel is currently ramping up final preparation to the production line that will commence shortly producing the new short light single helicopter on a daily basis as they begin to fulfill orders, clearing the backlog of orders.

Some customers, the first to place firm orders for the helicopter, from the United States, China and Australia have now been patiently waiting for their new helicopter since Bell began taking pre-orders for the helicopter almost four years ago.

The reality of what this unique approach to designing and building the new Jetranger X achieved was according to Scott Urschel "an aircraft that outperforms every other helicopter in the light single class on every level."

Urschel remains the only member of the Customer Advisory Panel that has test flown the Bell 505, providing valuable information to Bell engineers during development conducted in Mirabel. Urschel performed multiple test flights, working with engineers at Mirabel to provide valuable feedback on several recommended changes to the flight characteristics.

Based on Urschel's flight experience in the aircraft, and other recommended changes from many of the other advisory panel members. Most of which are now part of the Jetranger X final design specifications.

"Using the Bell Longranger L4 rotor system to speed up the overall development and certification period and get the helicopter to market

faster was a suggestion made during discussions between the advisory group and Bell engineers," said Urschel. "We decided after the engineers informed us that the Longranger rotor system met the design specifications, that it was the smartest option available and would also keep the cost of the helicopter competitive in the market.

What we did not know at the time, was that Bell's combination of a dual FADEC with the L4's high inertia rotor system showed exceptional rotor RPM stability, unlike in any other two-bladed system." He added.

As test vehicles took to the skies in 2015 to perform certification testing, Urschel and others on the panel were regularly consulted as input became available from Bell engineers, and test pilots throughout the testing and certification phase.

The team at Bell, continuing to tweak the performance of the helicopter, which eventually resulted in what became the final configuration used in the latter stages of testing before certification.

INTERNATIONAL MARKET

“Once the 505 goes into full production, which we are aiming for very soon, we are projecting the ability to produce between one hundred and fifty, to two hundred units of the Bell 505 from our production line at the Mirabel facility. Once the backlog of orders is cleared, we can then ramp production up or down as market demands dictate. The figure we have is, of course, an estimate, but we hope that we can beat that number once regular production begins and get the helicopters already ordered by our customers delivered promptly. Once that is accomplished, we can continue producing the 505 to meet the needs of the industry.”

The Bell 505 has seen a steady stream of firm orders since development commenced on the helicopter, not just from the North American market, but according to Evans, between LOI's and firm orders already on the books with Bell, the Jetranger X has keen interest from both the European and South American market.

The interest level in the 505 overseas now rivaling levels domestically for the new helicopter, Evans said.

When speaking about the international sales potential, Evans was extremely optimistic on company projections on

foreign acquisitions of the 505, basing his estimation on the amount of interest also shown in Asia Pacific countries.

China and Japan have also shown significant interest in the model, with Bell also recently entering into agreements with several Chinese partnerships that the company believes will assist in facilitating further market penetration for the company in the Asia Pacific region.

Evans added that Australia has also traditionally been an excellent market for Bell Helicopters, specifically the Jetranger, of which there are over five hundred still in operation in Australia, performing every mission imaginable from tourism to news gathering.

Below: The Bell team celebrated the completion of development and testing as the 505 JRX was issued Canadian type certification on December 19th, 2016, closely followed by the production certificate on February 4, 2017. Photo: Bell Helicopter





FACTORY TRAINING

Bell looked closely at how the company was going to handle the training element that is essential to the safe operation of a new helicopter that is entering the market for the first time.

The company includes providing initial training to new customers of all helicopters at the Bell Helicopter Academy, and while other helicopters in the Bell range offer a mix of simulator-based training and real world training, Bell decided at least initially to concentrate on providing real world training in the Jetranger X in Fort Worth.

All instructors at Bell's Academy are currently all in the process of getting up to speed with the new 505, so they can hit the ground running once deliveries commence.

Although Evans refused to rule out a Bell 505 JRX simulator in the future, he stated that at least for the short term, training would continue through traditional means.

JRX VARIANTS

Initial orders for the 505 JRX, according to Evans are disproportionately slanted towards private ownership in the initial group of existing LOI's and firm orders

in place on the 505. Despite a significant amount of initial interest in the law enforcement variant of the Jetranger X, Bell is yet to sign a launch customer for the law enforcement variant, that will bring the newest entrant into the short light single market back to the law enforcement market it once dominated.

Interest has also been high from potential owners looking to employ the 505 into missions that range from tourism in Australia to line survey in the United States and everything that its older siblings, the Jetranger and Longranger, have dominated in times past.

THIRD PARTY SUPPORT

Although the list of aftermarket suppliers will likely grow as more of the helicopters hit the market and allow companies that produce non-OEM equipment to evaluate where their products could best be utilized in the new JRX.

Bell has already begun working with a select few aftermarket retailers that provide specific add-ons that will enhance the OEM offering from Bell.

Two companies offering enhancements that were developed alongside the ongoing certification efforts of the 505 are Mecaer Aviation, who announced the development of a VIP interior for the 505 that touts several luxury design options for customers to choose from.

United Rotorcraft was also extended an early invitation to collaborate on the 505, subsequently becoming the first in the industry to adapt a functional modular air medical interior for the light single 505, which converts the helicopter into a HEMS configured model while only losing two seats. Designing the HEMS interior placing the patient gurney down the left side of the aircraft, mirroring several other single engine turbine HEMS aircraft, yet only losing a front and rear seat.

“The United Rotorcraft EMS kit for the Bell 505 is something that we have seen lots of interest from in countries that are less likely to use a larger twin engine helicopter for medical missions. A short light single HEMS aircraft could potentially revolutionize



medical transport in third world countries,” said Evans.

“The original Bell 206 JetRanger was the pure definition of a multi-mission helicopter, so the Bell 505 JRX had to be every bit as capable in the marketplace. It had to match or exceed the performance standards held for so long by the JetRanger, but it also had to offer customers more, and we believe we have done that with the Bell 505” Although initial interest in the new short light single is

high, it remains to be seen if the Bell 505 JetRanger X will reach the same heights as the popular 206B JetRanger did over its long production life.

Only time will tell if the 505 will continue to generate sales once the initial backlog is cleared. The ongoing success of the new 505 JRX will hinge on global acceptance of the helicopter once it is brought into the market and adapted into the many missions its predecessors currently execute worldwide.✈



As a key member of the Customer Advisory Panel, Scott Urschel, entrepreneur and owner of Pylon Aviation was the only person outside of the Bell team to fly the Bell 505 during testing and provide valuable feedback that was eventually used in the final design of the helicopter.