



TTx™ cockpit technology design reduces pilot workload

When Cessna's TTx team began designing the latest evolution of the high-performance, turbocharged, single-engine piston aircraft, engineers wanted to do more than provide an avionics upgrade. "We wanted to completely change the cockpit experience for the customer," said Brian Steele, TTx business leader.

The final design the team delivered is so striking its differences are immediately apparent. A side-stick control is positioned so the pilot's arm and elbow lie naturally on the armrest. Two 14-in. high-definition monitors replace a collection of mechanical gauges and dials, and designers swapped out an assembly of knobs and levers for a touchscreen control panel between the seats.

"We wanted to completely change the cockpit experience for the customer. "

— Brian Steel, TTx business leader

While Steele admits the changes inspire awe and curiosity at first glance, he wants pilots to appreciate the deeper reason for the upgrades. The IntrinziC™ Flight Deck offers pilots the added confidence of more situational awareness, primarily from the Garmin® G2000® avionics suite. Among other advantages, the system reduces pilot workload by readily displaying the information pilots need when pilots need it.



"Not only does it synchronize the information for you, but with two displays, you can see multiple sets of information," Steele said. "Or, you can select only what's most important for the given phase of flight."

The control is a touchscreen display with a user experience similar to that of a smartphone or tablet.

"With a home screen and tile icons for all the commonly-used features, you can just touch what you want to do," Steele said. "And since it's context-sensitive, it will pull up all the controls for that particular need."



While the user experience is similar to smart devices, the technology is different. It uses infrared beams to sense what pilots are touching on the screen, so users can wear gloves and still interact with the system. The infrared technology also makes the screen easier to use during turbulence.

On the main panel, the TTx team also made three of the aircraft's most commonly-used instruments easier to interpret. The electronic standby instrument screen replaces three gauges that were traditionally mechanical—the attitude indicator, air speed indicator and altimeter—and intuitively displays each piece of information together on a single screen to the left of

the main display.

“It cleans up the cockpit, providing more legroom,” Steele said. “It also simplifies the instrument panel with fewer dials to read.”

The side-stick control design also reduces pilot workload by giving pilots immediate access to common controls. The aircraft’s trim, push-to-talk, autopilot disconnect and control-stick steering buttons are comfortably located at the end of the handle where the hand naturally lies.



While the cockpit is primarily designed to quickly offer real-time information regarding the aircraft, it’s also equipped to deliver vital information regarding the pilot. Cessna engineers installed a sensor that measures the pilot’s oxygen and pulse rates. The pilot simply slides an index finger into the sensor, and it displays the pulse and oxygen rates, similar to a device used by doctors. Knowing when it’s time to decide whether to use an oxygen mask or go to a lower altitude can reduce the effects of hypoxia.

“That’s really important in a turbocharged aircraft, because the airplane can develop power and go very high—25,000 feet,” Steele said. “You’re almost climbing Mt. Everest.”

The aircraft’s speed, avionics and cockpit design help prepare pilots for larger aircraft, including jets. With the proper training and experience, it’s absolutely possible to transition directly from a TTx single-engine, high-performance piston aircraft to an M2 entry-level jet. The Intrinziic Flight Decks in both are remarkably similar.

No matter how a pilot plans to progress in the months and years to follow, the TTx offers advanced technology and equipment today. With digitally-integrated technology and intuitive control panels, pilots appreciate the reduced workload in the cockpit, allowing them to enjoy the ride even more.

Unmatched experience in aircraft design and manufacturing has established Cessna Aircraft Company as the world’s general aviation authority. Since its inception in 1927, Cessna has designed, produced and delivered nearly 200,000 airplanes around the globe. This includes more than 6,600 Citation business jets, making it the largest fleet of business jets in the world. Today, Cessna has two principal lines of business: aircraft sales and aftermarket services. Aircraft sales include Citation business jets, Caravan single-engine utility turboprops and single-engine utility and high performance piston aircraft. Aftermarket services include parts, maintenance, inspection and repair services. In 2013, Cessna delivered 467 aircraft, including 139 Citation business jets, and reported revenues of \$2.784 billion. More information about Cessna Aircraft Company is available at cessna.com. ©Cessna Aircraft Company.