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To the Skies: Engineer creates unconventional jet

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For 20 years, Michimasa Fujino, an engineer for Honda Motor Co., pursued a mission that on the surface seemed both unrealistic and unnecessary: converting Honda from just another Japanese automaker into the first successful Japanese aircraft builder since World War II.

Now, Fujino is close to realizing his dream with a tiny five-passenger jet with the unusual feature of having its engines mounted above its wings. Executives hope the HondaJet, which could start flying in about three years, will shake up the jet business with the same high fuel efficiency, clever design and low price that the first-generation Honda Civic used to rattle Detroit's auto giants 30 years ago.

It's been an arduous quest, taking Fujino from Tokyo, to Starkville, Miss., back to Tokyo and finally to a rented hangar here in the Triad. Along the way, his intelligence has been questioned, his design has been mocked and his friends have feared for his career.

"Even today, so-called experts tell me with a knowing look that the over-the-wing engine mount is doomed," Fujino said. "But anger has been part of the energy that pushed me throughout."

Honda President Takeo Fukui said he believes that the HondaJet, which is awaiting federal certification, could grab 10 percent of the small-jet market and turn a profit in three to four years. As long as it is able to deliver all the performance and price claims, "Honda should be able to nibble a 10 percent share," said Joe Feord, a director of the aviation consulting firm Munro & Associates, based in Troy, Mich. "I don't think that's a big stretch."

Compared with the roughly similar Cessna Citation CJ1+, one of a new breed of less-expensive small jets that seat four to six passengers, the HondaJet is designed to cruise 8 percent faster and can take off and land on shorter runways. It is also a much more economical jet: The $3.65 million Honda plane uses about 22 percent less fuel than the Citation flying, for instance, at a speed of 441 miles an hour and at an altitude of 35,000 feet.

It also has passenger cabin space that is nearly 20 percent larger, and has cargo space "big enough for Paris Hilton," Fujino boasts, with 45 percent more room than the CJ1+.

On top of all that, the Honda is priced $880,000 below the Cessna and boasts the fit and finish of a luxury car.

Cessna, a Textron Inc. unit, said it's watching the HondaJet closely, but says that the CJ1+ is the third generation of Citation and has more advanced electronics than the newcomer, as well as a world-wide service network.

Honda said it has orders and deposits from more than 100 potential customers, but success is far from guaranteed. Honda and its radical design face daunting challenges in an industry in which customers tend to be conservative and the market for tiny jets is getting crowded, with new offerings like the Eclipse jet, designed and marketed by privately held Eclipse Aviation Corp., priced at about $1.5 million.

Honda expects that its jet will be able to compete effectively with less expensive minijets like the Eclipse.

Fujino, 45, succeeded in keeping his project alive by nurturing ties to senior executives, and by linking his risk-taking to Honda's broader efforts to rekindle a spirit of innovation. Fujino remembers occasional late-night dinners and drinks with top executives like Fukui. While formal reviews of the

plane project could be “explosive” and “ugly” at times, Fujino said that behind-the-scenes some of the company’s top managers cheered on his efforts.

“There was a feeling inside the company that Fujino’s idea wasn’t going to fly,” Fukui said. “But we didn’t want to give up because we didn’t want to create an ordinary plane; we wanted Fujino to give us a jet that could create a new value and performance equation.”

Fujino, who is now the president of Honda Aircraft Co., started his journey in 1986 when he was plucked out of a job working on electrical steering control to join a small team designing a personal jet. They were sent to Mississippi State University in Starkville, 125 miles northeast of Jackson, to collaborate with the school on advanced aeronautics. By the mid-1990s, the team developed a jet called Mh02. That design featured a fuselage made of composite materials instead of more conventional aluminum. But the company didn’t believe the design would be competitive and killed the project in 1996.

Amid this uncertainty, Fujino began thinking about an unorthodox design that would prove critical to the HondaJet’s performance: Putting the engines above the wing, instead of underneath the wing or on the rear of the fuselage. Designers usually avoid mounting anything on top of the wings for fear of creating a drag on the plane. Fujino said his design was inspired by a “classical” air-flow calculation described in a 1930s aeronautics textbook.

The initial proposal in 1997 met with skepticism from colleagues. Fujino said that one dubious boss called him the “stupidest engineer I’ve ever met in my life.” But Nobuhiko Kawamoto, then-Honda president and an airplane aficionado who as head of research-and-development in the mid-1980s launched the airplane project, encouraged the idea.

Even after Honda’s board gave Fujino its blessing, the project stalled again in 1998, this time slowed by new team members who expressed renewed design doubts. In the end, he began working exclusively with those who believed in the engine-over-the-wing design and ignored the rest. The project, to his surprise, began gaining steam.

Still, there were skeptics. A friend of Fujino’s who was working for NASA as an engineer warned him against presenting his design to an academic conference, fearing it posed a “career-ending” risk if a flaw were found. Fujino’s concept eventually received a favorable review from the American Institute of Aeronautics and Astronautics in 2002.

Fujino said that the frustrations have been worth it. “A lot of companies try to cut into the small-jet business, but most of them ... repeat the same mistakes,” he said. “If Honda had done it the same way and did not learn all the skills and technologies involved all from scratch, we couldn’t have come up with the design we have today.”