

Joby Hits Range and Noise Targets on Road to Certification

➤ S4 TESTS NEW-LOOK, LOW-DRAG LANDING GEAR

➤ eVTOL DEMONSTRATES LOW NOISE IN TRIAL

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In the run-up to taking the company public, California-based electric air taxi developer Joby has marked a series of key test and program milestones including a 150-mi. flight on a single charge, comparative noise tests against other aircraft and applying for air carrier certification.

The long-range flight, which included a vertical takeoff and landing, was completed in early July at the company's remote Electric Flight Base in Big Sur, California. Joby's first S4 prototype was piloted from the ground by Chief Test Pilot Justin Paines. Following a vertical takeoff, the vehicle flew 11 laps of a predefined circuit, covering 154.6 mi. in 1 hr. 17 min.



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The extended flight, which Joby believes to be longest all-electric flight performed to date by an electric vertical-takeoff-and-landing (eVTOL) aircraft, was described by company founder and CEO Joe Ben Bevirt as "something that many thought impossible with today's battery technology."

The aircraft's power system is based on adapted versions of commercially available lithium-ion batteries. Joby says "an 811 NMC [nickel-manganese-cobalt oxide] cathode and a graphite anode cell were selected, following internal testing, to deliver the optimal trade-off between the specific energy required to fly the aircraft 150 mi., the specific power to take off and land vertically and the cycle life to deliver an affordable service."

Joby also demonstrated the low overflight noise of the eVTOL in late July by flying the S4 and a series of fixed- and rotary-wing aircraft over a calibrated microphone array. All the aircraft, which included three helicopters (a Robinson R44, Bell 206 and Leonardo AW109) and two fixed-wing models (a Cirrus SR22 and a Beechcraft

Baron 55), passed over the array at around 1,570 ft. and 100 kt. No details of the comparative test have been released in terms of environmentally perceived noise decibels, though a video of the event provides anecdotal evidence of the eVTOL's extremely low noise signature.

Joby has also begun the process with the FAA to obtain its Part 135 air carrier certificate as a prelude to a broader plan to operate its own eVTOLs on commercial aerial ride-sharing services in U.S. cities in 2024.

The company, which is also pursuing Part 23 type certification of the S4 eVTOL aircraft as well as production certification of the assembly line that will manufacture it, is targeting air carrier approval in 2022. Joby expects to begin the second stage of the five-stage approval process this month with the submission of additional documentation including airline operating manuals.



Tests on the prototype (left) of a new low-drag fixed landing gear design, including a nose leg skid, pave the way for a production configuration (above) incorporating wheel spats.

Although the aircraft itself is not expected to receive certification until 2023, Joby plans to operate traditional certified aircraft under Part 135 air carrier certification starting in 2022—before adding the eVTOL to the airline operating certificate once it is approved. The four-passenger eVTOL will be flown by commercially licensed pilots. Although target launch markets are not due to be announced until later this year, Joby has indicated Los Angeles, Miami, New York and the San Francisco Bay Area as possible initial markets.

Meanwhile, Joby has agreed to the "G-1" certification basis for Part 23 approval of its aircraft with the FAA at the end of 2020 and plans to begin for-credit testing in the second half of this year. The first type-design-representative aircraft is planned to fly in the first half of 2022. This will be the first aircraft to come off Joby's pilot production line in Monterey, California.

The recent busy test period also culminated with an extraordinary general meeting on Aug. 5 at which shareholders were expected to agree to a merger with Reinvent Technology Partners, a special-purpose acquisition company created by LinkedIn co-founder Reid Hoffman and Zynga founder Mark Pincus. ☛