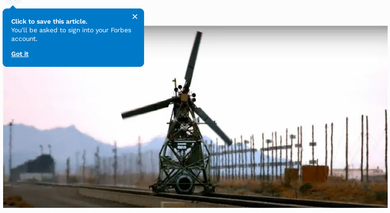
Here's What Bell's New Folding Rotors Look Like in Action

Eric Tegler Contributor

Follow

Feb 9, 2024, 02:40pm EST



A screengrab of Bell's folding rotor test rig demonstrating rotor stop-and-stow for its coming high ... [+] BELL

Bell just released a video showing how its folding rotor design works on a high-speed sled in advance of integrating it on a DARPA X-plane.

DARPA's SPRINT (Speed and Runway Independent Technologies) program calls for designing a scalable vertical takeoff and landing (VTOL) X-plane with the ability to cruise at speeds from 400 to 450 knots (460-518 mph) at cruise altitudes and to hover in austere environments, taking off from and landing on unprepared surfaces.

Four companies are developing concepts for the first phase of SPRINT including Aurora Flight Sciences, Northrop Grumman Aeronautic Systems, Piasecki Aircraft Corporation and Bell Textron, Inc. The project is a joint DARPA/U.S. Special Operations Command effort with air vehicles potentially slated for SOCOM use in the future.

An artist's conception of Bell's scalable HSVTOL concept. TEXTRON BELL

The video Bell provided of the folding-rotor test for its tiltrotor HSVTOL concept is a welcome distraction from news attached to the company which learned this week that it will not be competing to build the Army's next scout helicopter let alone securing a contract to build it. Thursday's announcement that the Army's Future Attack Reconnaissance Aircraft (FARA) program has been canceled reverberated throughout the defense establishment.

Bell has likewise been under a microscope for two months with the grounding of the entire multi-service V-22 tiltrotor fleet following the loss of an Air Force CV-22 in November in which six crewmembers perished.

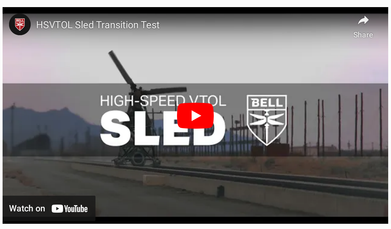
MORE FROM FORBES ADVISOR

Best High-Yield Savings Accounts Of 2024
By **Kevin Payne** Contributor

Best 5% Interest Savings Accounts of 2024
By **Cassidy Horton** Contributor

Earlier this week anonymous Pentagon sources claimed that DoD has found the mechanical issue which caused the crash and implied that a lifting of the fleet grounding was possible. There has been significant subsequent confusion over the lack of clarity surrounding the claims and scarce responses from the Pentagon and the Services.

The video shows Bell's folding rotor mounted on a rail-borne test rig at the high-speed test rack at Holloman Air Force Base in Alamogordo, New Mexico. The rig includes a turboshaft engine which powers the rotor and an additional turbofan to provide thrust for cruise as seen on Bell's HSVTOL concept.



The sled on which the rotor/propulsion combo sits begins to move forward after the rotor has begun spinning at sufficient rpm to produce thrust needed to move the apparatus down-track. It then accelerates to what Bell says in the video description is "representative flight speeds".

What those speeds are, possibly where a transition from VTOL to wing-borne cruise flight would take place, it's tough to say exactly. I had an interview with Bell scheduled for early this afternoon which was abruptly canceled without explanation.

Upon reaching an unspecified threshold speed, a turbofan situated on the bottom of the rig (representing the jet around which the HSVTOL's rotors will fold in wing-borne flight) comes online and adds thrust.

As the thrust increases and rig accelerates to yet higher speed, the rotor is feathered and its rotation slows to a stop. At this juncture the rotor blades begin to fold aft until parallel with the direction of travel, fully retracted. In this cruise-flight configuration they contribute little drag, theoretically allowing the turbofan and wing combination to permit the HSVTOL to fly at something like 400-450 knots.

The folding rotors on Bell's test rig feathered and in the process of retracting as it speeds down ... [+] TEXTRON BELL

In the video, the process takes approximately 50 seconds (allowing for edits) from rotor spool-up to feathering and full retraction. In its release on the test Bell did not say whether it was a one-off, was repeated, or whether there had been multiple days of testing. At least on a terrestrial test track, the folding-rotor idea seems to work. However, its merits will only be proven in flight testing.

Nonetheless, the video shows that Bell has been actively developing its concept. I could not find similar videos detailing tests from the other firms working on SPRINT. DARPA's X-plane program represents potential future business for Bell and others, business that the cancellation of the FARA program has likely made more desirable.

With that in mind, we may see more videos as Bell works through its HSVTOL X-plane offering for DARPA.

Follow me on Twitter.

Eric Tegler

Follow