HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Commercial Human Spaceflight Programs (2)

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LYNX SUBORBITAL LAUNCH VEHICLE: DEVELOPMENT AND MISSIONS

Abstract

XCOR Aerospace is the designer, builder, and operator of the Lynx, a piloted, two-seat, liquid-rocket powered suborbital reusable launch vehicle (sRLV) that takes off and lands horizontally, and serves research and scientific missions and private spaceflight. The Lynx production models (designated Lynx Mark II) are designed to be robust, multi-mission commercial vehicles capable of flying to 100 km in altitude up to four times per day, and are being offered on a wet lease basis.

Suborbital reusable launch vehicles will provide low-cost, flexible, and frequent access to space. In the case of XCOR's Lynx, the vehicle design and capabilities work well for hosting specially designed experiments that can be flown with a human-tended researcher or alone with the pilot on a unique mission on a customized flight trajectory. This new manned, reusable commercial platform will allow for repeated observations with a single instrument, but without the need to refurbish the vehicle between flights. In addition, the short turn-around means a researcher can do multiple observations, measurements, or targets. The vehicle is designed for multi-mission primary and secondary payload capabilities, including: in-cockpit experiments and instrumentation testing, externally mounted experiments, earth observation, upper atmospheric sampling, and nano and microsatellite launch. This vehicle takes off horizontally from a runway and will go into a powered ascent attaining Mach 2.9 maximum airspeed. After about three minutes and at approximately 58 km (190,000 ft) the engines are shutdown and the RLV then coasts upwards. At approximately four and half minutes the vehicle reaches apogee of 100 km (328, 000 ft). After reentry and a Max-G force pullout of 4 g, the Lynx touches down on the takeoff runway after approximately 30 minutes.

This paper will discuss the status of Lynx development and operations, as well as the planned commercial spaceflight missions.