



## Restoring the Skylancer



*ICA began to remove the Skylancer's cockpit control panels to be cleaned and restored. Some of the front panel's gauges had already been removed at the time of this picture. ©ICA, John T. Seyfried.*

*by Brittany Venturella, Curator, Armstrong Air & Space Museum*

Inside the cockpit of the F5D Skylancer, a NASA test pilot flipped down the blue visor on his helmet. The amber mask on the cockpit's canopy then turned opaque through the visor. The once broad view from the canopy became limited through smaller openings simulating those in the canopy of the X-20 Dyna-Soar ("Dynamic Soarer"), a space vehicle and space shuttle precursor.

When the Skylancer was vertical, the pilot reduced the airplane to idle thrust and extended the speed brakes, simulating emergency power and beginning the test procedure. He extended the landing gear as the plane pulled over into an inverted position. When parallel with the ground, the pilot rolled the Skylancer into an upright position. He then turned the plane and landed on the runway.

During the Dyna-Soar program (1957–1963), pilot-consultant Neil Armstrong played an instrumental role in designing this abort launch procedure using the Skylancer, which had a similar lift-to-drag ratio as the X-20 Dyna-Soar. The procedure enabled pilots to maneuver the X-20 to safety in case of a launch pad malfunction.

Of the original fleet of four, two F5D Skylancers remain in existence today. Restorers are transforming BuNo 142350 back into the aircraft that Neil Armstrong flew. ICA-Art Conservation is coordinating the restoration of BuNo 142350 in conjunction with the Ohio History Connection and the Armstrong Air & Space Museum. The project includes restoration of the cockpit by ICA and the plane's exterior by Thomarios.

The Skylancer traveled almost entirely intact on a flatbed trailer from the Armstrong Air & Space Museum in Wapakoneta, Ohio to Copley, Ohio. In order to do

*(continued on page 3)*



BuNo 142350 was lifted onto a flatbed trailer by a crane on the morning of September 11, 2017.



Thomarios cut a metal mount, freeing the Skylancer from its place on the platform on September 11, 2017. The crane's straps, placed through the channel on the custom-made frame, supported the plane.

this, the airplane's physical preparation for its move began a week before. The plane had to be short enough to fit under overpasses and be thin enough to fit on the road. Thomarios' team designed and hand-crafted a steel frame to support the Skylancer through transit and the restoration process. They removed the top piece of the tail's vertical stabilizer; tail bumper cover; and radome, the nose cone that held the plane's radar antenna. Originally designed for a naval aircraft carrier, the plane's wing tips and outboard elevons, used for controlling the aircraft's pitch and roll, manually folded up.

Reminiscent of how BuNo 142350 arrived at the Armstrong Air & Space Museum forty-five years ago, the moving team lifted the Skylancer from its mount using a crane and placed it upon the trailer on September 11, 2017. The next day, an entourage of highway patrol and moving personnel escorted the plane to Copley, where ICA and Thomarios continue to restore the Skylancer.

BuNo 142350 looks very different six months into the



The moving team, including Thomarios and ICA, slid ethafoam between the frame and the Skylancer's wing to provide padding for the wings and prevent any possible abrasions from the support frame.



After being placed on the flatbed trailer, the Skylancer is almost ready for its journey to Copley, OH.

restoration. Thomarios removed almost all of the old paint on the Skylancer and cleaned the interior. Several paint layers appeared that spanned the history of the aircraft. With this discovery, restorers will be able to match the original colors used while Armstrong flew the Skylancer. The airplane will return to its designation as "NASA 213" with dark orange and white paint, potentially indicative of its use as an experimental aircraft. NASA designated the plane to be "NASA 802" towards the end of its career, particularly during its participation in the Lifting Bodies program.

Through stripping the paint on the fiberglass radome, Thomarios discovered a patch that caused a bump in the rounded cone-shaped surface. The radome may have been patched after uninstalling a camera or another instrument while in use as a test plane. Thomarios stabilized the fiberglass by wrapping the radome in a fiberglass cloth. The original patch was kept to maintain the aircraft's history.

*(continued on page 4)*





*By the beginning of February, Thomarios removed almost all paint from BuNo 142350. The radome has been covered with fiberglass cloth.*

ICA has removed the seat and many gauges and controls of the Skylancer's cockpit for restoration in their lab. Their team is stabilizing some of the fragile materials, such as the seat's fabric, and cleaning the components. The cockpit's components will remain outside the airplane and be displayed inside the Armstrong Air & Space Museum in 2019. Visitors will be able to see controls that Neil Armstrong and other pilots used during the abort launch procedure.

By the end of this year, the Skylancer will once again be "taking off" from its runway at the Armstrong Air & Space Museum, where it will continue to be a symbol of aerospace history and a testament to Neil Armstrong, the pilot and engineer.

### **About the Skylancer**

Only four F5D Skylancers were produced. With only two of the initial F5D Skylancers intact, this is one of the world's rarest planes. "We are fortunate to have found a local team able to restore this 60-year-old plane so that future generations can experience an experimental aircraft flown by Neil Armstrong," said Burton. Neil Armstrong flew the Skylancer during the Dyna-Soar Program. Dyna-Soar, or Dynamic Soarer, was a short-lived project to build manned, reusable space planes that predated the manned Mercury flights. Armstrong was instrumental in developing an aborted launch maneuver using the Skylancer.

### **About Armstrong Air & Space Museum**

The Armstrong Air & Space Museum stands as a repository of Ohio's aeronautical history and a monument to Ohio's contribution to aviation and space exploration from the early pioneer days through the space shuttle era. See a moon rock, two full-sized aircraft flown by Neil Armstrong, the Gemini VIII space capsule, artifacts from the Apollo 11 mission and more. The Armstrong Air & Space Museum is part of the Ohio History Connection's statewide system of more than 50 historic, natural and archaeological sites across the state.