LEGENDS OF FLIGHT

COMMERCIAL PLANES MUST GLIDE: ***Variable Wings and Other Flight Surface Advances Make the Dreamliner Closer to Natural Flight***

EL SEGUNDO, Calif. -- Every commercial airliner is designed to glide. The benefits of non-powered glide capabilities were dramatically proven in 2009 when a fully loaded Airbus A320 lost power on take-off and then landed in New York's Hudson River. While this safe landing and demonstration of superb piloting owed much to built-in glide properties, the airplane and its glide landing are far removed from the exhilaration enjoyed by true glider enthusiasts the world over - for their planes cannot only glide to the ground; they soar – effortlessly.

Powered flight began with gliding. The Wright Brothers and other pioneer flyers designed gliders first and added motors to assist airborne abilities. Since then, the majority of aircraft have sought to include a measure of glide properties.

In the *Legends of Flight*, a new 3D film for IMAX® theaters and other Giant Screen cinema venues, Boeing Chief Test Pilot for the 787 program Mike Carriker takes his Schleicher high-performance sailplane on a mountain pass rush that visually tells the audience that non-powered flight is indeed possible. The thrilling visuals clearly show wing movement and the benefit of flying an intuitive aircraft - able to climb, bank, accelerate and descend - all without power and always in control.

Like early aircraft, pioneer glider pilots had few of the benefits Carriker and modern sailplane enthusiasts enjoy today. Their gliders were borne aloft and soon came back to the field having lazily descended from altitude. With the advent of new materials and the cross-over of sailing and boat hull fluid dynamic understanding, sailplane designers began to imagine gliders that did more than glide – they would sail the skies

and soar. To do this, weight needed to be at the minimum and wing, tail and fuselage layouts had to more closely emulate the best of nature's gliders – like the Albatross.

It's no surprise that modern gliders look and behave like birds. Once the tow cable has been let go, a glider pilot banks away and immediately confronts gravity. Only his airplane's design and pilot skill can momentarily overcome the earth's pull.

Thanks to lightweight construction and high-aspect wings, pilots like Carriker can thumb their noses at gravity and do what the birds have done - fly.

The significance of high-performance glider flight to everyday commercial aviation is best understood when speaking of the newest jet transports, the Boeing 787 Dreamliner and the Airbus A380. These super airplanes are designed to glide like nothing before them; glide on descent if needed and with the help of adaptive wing technologies, "glide" when flying at cruise speeds.

"Sensors on the airplane signal changes in air pressure and other factors; like the synapses of a bird's brain that control wing position, through a sophisticated network of computers, these sensors actually communicate with the wing and tail surfaces allowing them to adjust for optimal flight control, lift and efficiency," said Stephen Low, the film's director.

Modern gliders have the ability to soar away and up from the point of release. By reading thermals, winds, surface face structures and looking for other environmental clues – the glider pilot is able to stay aloft and in control. Wing designs and flexible air frame structures play a significant role in allowing the glider pilot to soar like the birds, by converting altitude into airspeed and airspeed into climb the pilot can remain aloft.

"The 787 is similarly designed as an intuitive airplane; its intuition is however delivered through computer technologies and other technical advances," Carriker said.

When assembling the menu of aircraft types for Legends, Stephen Low and others concluded that a nod to non-powered flight and a demonstration of wing lift - as only IMAX 3D photography can - were essential to the audience understanding the benefits of design and materials progress.

In one sequence the viewer is taken from an appreciation of the Albatross and its impressive wing array, to being shoved into the cockpit of a soaring high performance glider traversing a mountain range, silently, effortlessly and in control.

To appreciate the 787 and A380's impressive glide ratios - the measurement of how far forward a airplane can travel without power, adjusted for non-powered gravitational descent - and other technical points made during the film, it was important to set a basic understanding of the concepts of lift and wing operation.

A modern glider looks like an albatross or other large-winged bird. Some sailplanes have a variable wing tip ability that will permit up to ten feet of overall flex – this means the wings actually bend up or down in relation to air pressure, speed and pilot directional control.

"To appreciate the concept of variable wings we begin the film with the originators - birds and gliders. The point is that neither has the 787's ability to cross the globe on a single fuel load while carrying hundreds of passengers and tons of cargo, and that these most modern of transports owe in part their abilities to lessons learned from the birds and gliders," Low added.

Legends of Flight is aptly named. The featured aircraft in the newest large format 3D film from K2 Communications are milestones in aviation – not for their singular achievements; rather, for the promise they delivered to later designs. The A380 and the 787 owe some of their performance success to gliders that have come before and to the birds that inspired those who wanted to soar.

Legends of Flight is directed by Stephen Low and produced by The Stephen Low Company (producer Pietro L. Serapiglia), executive produced by K2 Communications (executive producers Bob Kresser and Jan Baird), and is in association with the Smithsonian National Air and Space Museum.

The Stephen Low Company is a producer of leading 3D and IMAX entertainment and a distributor to IMAX theaters and other giant screen theatres worldwide. Award-winning filmmaker Stephen Low is the director of more than a dozen Giant Screen films including, *Across the Sea of Time*, *Mark Twain's America, Beavers*, *Titanica*, *Super Speedway*, *Fighter Pilot* and *The Ultimate Wave Tahiti* among many other classic titles.

Recognized as leaders in the Giant Screen industry, K2 Communications brings a wealth of success and experience in all aspects of production oversight, global distribution, and marketing. K2's distribution arm counts more than 65 large screen format films in its library for non-theatrical distribution, plus more than 25 films for

digital theater distribution, and another five for Giant Screen theatrical distribution. The company has become one of the industry's leading resources for Giant Screen films and will be releasing its next 3D film, *Rescue*, in February 2011.

K2 Communications also operates the only comprehensive Giant Screen consumer/fan website, BigMovieZone.com. For more information, consult www.k2communications.com. For information on film, visit www.legendsofflightfilm.com.

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