Burt Rutan’s Ski-Gull and Other Would-Be Seaplanes

There’s more than one way to build an amphibious aircraft.

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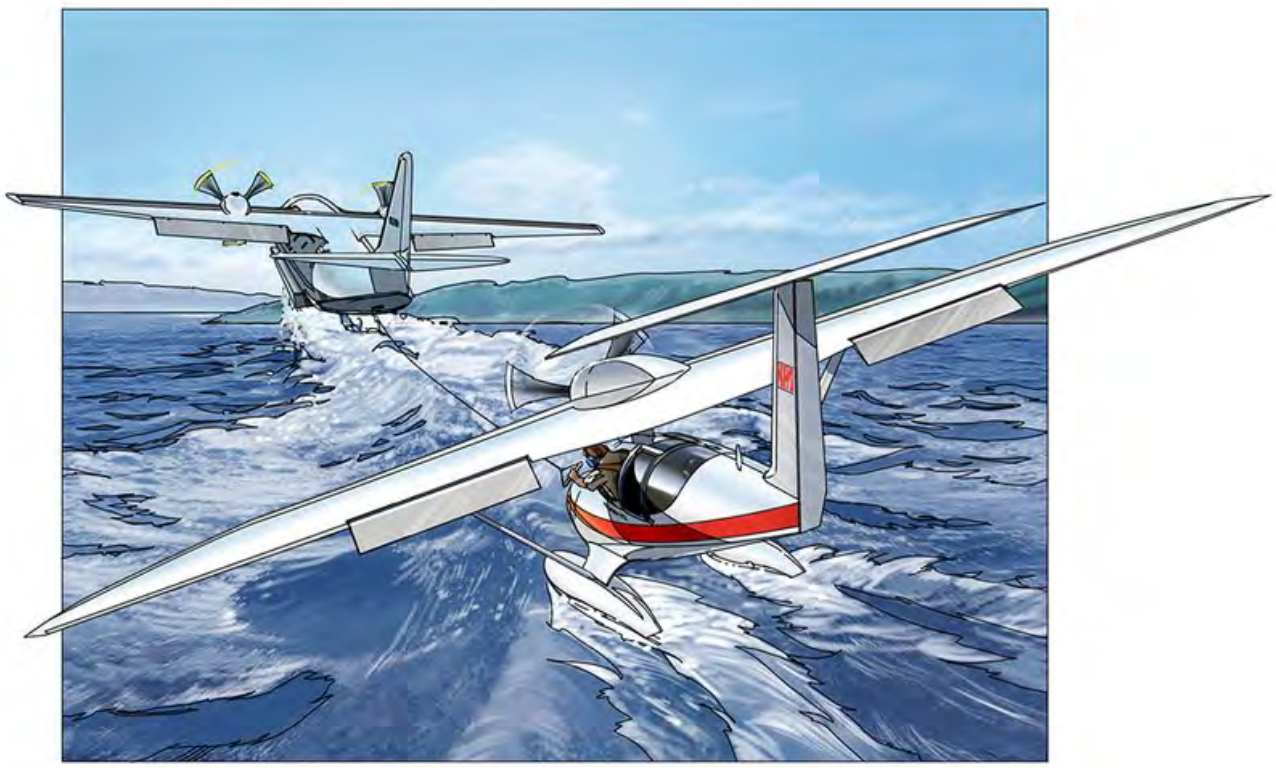

(Harry Whitver)

Burt Rutan is one of the most significant aircraft designers in history. Six of his creations are in the National Air and Space Museum. Rutan is also the man who predicted, on a 2003 panel convened by Popular Science magazine, that the porn industry would fund the development of virtual reality technology so lifelike it’ll eventually spell the end of air travel. So anyone who says he knows what to expect from Burt Rutan is either Burt Rutan or a liar.

But Rutan has been talking for a long time about personal aircraft that would not be tied to airports. At the Experimental Aircraft Association AirVenture in Oshkosh last July, he revealed a few details of Ski-Gull, his first design since his retirement from Scaled Composites. Ski-Gull is intended to go runway-free by operating from water, ice, and snow, as well as ground too soft for wheels.

In other recent news, one of Japan’s first military aircraft sales—following its decision last year to permit defense exports—could be a batch of 10 ShinMaywa US-2 amphibious aircraft,

the latest version of a 50-year-old design. The US-2 is at least 20 times larger than the Ski-Gull, but both designs have roots in the fertile ground of 1950s U.S. aviation—in particular, the aircraft developed to support the cold war at sea.

Back then, the U.S. Navy needed a counter to Soviet submarines that were based on the World War II-era German Type XXI, with its snorkel and large battery capacity. One idea was to fit a large dipping sonar—an acoustic transmitter and receiver, lowered deep into the water on a cable—to a seaplane that could take off and land in the open ocean.

Previous seaplanes were best suited for sheltered water, but designers at Convair and Martin worked the problem from two directions: hulls with high length-to-beam ratios for better stability and lower water resistance, and auxiliary jet engines blowing high-pressure air across oversize wing flaps to cut landing and takeoff speeds. Neither got past the mockup stage, due to 1957 budget cuts and the fact that a highly secret project called SOSUS—Sound Surveillance System—turned out to work very well, particularly against new, noisy nuclear subs.

But Japan, vividly recalling how U.S. submarines decimated its merchant fleet in World War II, took up the idea of a blown-wing, sonar-carrying seaplane. The US-2's ancestor, the PS-1, was Japan's biggest and costliest postwar airplane when it first flew in 1967. Videos of the airplanes in operation and under testing are impressive, with the airplane plowing through 13-foot waves and at times almost disappearing from view—before lifting off at speeds of little more than 50 knots (58 mph).

The hydro-ski was another cold war innovation in marine aircraft. The U.S. Navy's first attempt to use skis was on the supersonic Convair Sea Dart fighter. In retrospect it is astounding that anyone thought it would work: The takeoff speed was 125 knots at a time when the world's water speed record was 150 knots, and more than one man died in the process of getting it there. But the Sea Dart was not the only hydro-ski aircraft of the 1950s.

Russian-born designer Michael Stroukoff had created the Fairchild C-123 military transport and worked on the same blown-wing, slow-flight technologies as Convair and Martin. His own company tested them in the YC-134, a much modified C-123. (NASA later tapped its YC-134 test experience in support of the Japanese PS-1 project.)

Stroukoff's hydro-ski experiment was focused on tactical transport rather than submarine warfare. His goal was to couple short-runway and off-runway performance with a patented ski system that he called Pantobase: a pair of broad shock-mounted skis located ahead of the main wheels. In tests done in 1955 on the Delaware River, a Pantobase-equipped C-123, its fuselage water-sealed but otherwise unmodified—no boat-shaped hull and no step—lifted cleanly from the water after a 30-second run. The Pantobase was designed to operate from soft ground or snow, but the project fell victim to the same budget crisis as the Navy's flying boats, and a lack of interest in things that weren't supersonic or nuclear.

Images of Rutan's Ski-Gull have so far been limited to photos of the screen in his Oshkosh presentation. But two features are quite clear: The body is not boat-shaped, and it has a broad, short ski on each side.

Just like the Pantobase.