BLACKHAWK AEROSPACE

# New Skywheels Rotor Blades Are Back in Production Following an 18-Year Pause in Manufacturing

Following three years of work, Skywheels LLC President Joe Covelli is pleased to share that customer deliveries have begun. According to Joe, *"Our first two customer orders have shipped from the factory, and we are now officially in the rotor blade business. It has been a strong team effort getting Skywheels back into manufacturing and on the market again for new rotor sales."*

The effort represents a culmination of work to bring back one of the best–if not the best–gyroplane rotors engineered to date. Skywheels has had a loyal pilot following since 1985 when Founder Jim McCutchen first introduced them. The high-inertia design favors performance, stability, predictability, and forgiveness. They are designed to exceed Federal Aviation Administration Regulation Part 27 (requirements for normal category rotorcraft).

## Flight Tests and Process Improvements

Two pilots familiar with Skywheels flight-tested the new rotors during the summer and fall of 2020. *"I've trained students on these blades for hundreds of hours over the years,"* CFI and Skywheels test pilot Greg Bradley said. *"Man, they nailed it. These blades are a joy to fly."*

Skywheels partnered with Blackhawk Aerospace in October 2019 to manufacture the new rotors to the same high-quality standard as the original blades. According to the two test pilots, the new rotors met and exceeded the flight performance characteristics of the original blades.

As the Blackhawk team reviewed its processes, it realized the improvements were due to manufacturing hardware and software advancements. *"The technology advancement that we see here is the precision and reproducibility of what's being made,"* said Bill Smrtic, Senior Manufacturing Engineering Tech at Blackhawk.

## Rotor Dynamic Spin Testing Upgraded To A Digital Platform

To adhere to Blackhawk's AS9100 aerospace quality control standards in workflow management and documentation, Skywheels and Blackhawk shared in the $40,000 investment to custom-design a new high-tech digital spin test platform. Bill said, *"The most high-tech part on the original blade spin-up machine was a 2-foot-long piece of 1/8-inch diameter all-thread (rod) extending down from below the rotor head you watched for vibration."* The original test stand was built in the 1980s and spin tested 3,000 blade sets with passing

Joe Covelli and Bill Smrtic

Skywheels test gyroplane with pilot Bill Kieffer

results and a strong reputation for quality and performance.

With the new spin-up platform, dynamic rotor testing is consistently done at 300 RPM and can go as high as 420 RPM. The new rotors are optimally tracked and balanced to precision using mounted digital sensors and machine-learning computer software. Blackhawk has been working with the new equipment over many months to dial-in the equipment while getting rotor spin-up numbers for various blade set lengths between .01 ips and .05 ips. For the rotor spin test, .1 ips is acceptable, and anything less is outstanding.

*"Following an eighteen-year pause in manufacturing, it's a privilege to offer Skywheels rotors again to the sport-flying gyroplane market,"* said Joe.

For more information about Skywheels rotor blade systems, visit **http://www.skywheels.com**/. For more information about Blackhawk Aerospace Composites and their capabilities, visit **composites.blackhawk.aero**.

## About Skywheels

Skywheels quickly became the leading rotor system for kit-built and experimental gyroplanes and was paired with Air Command gyroplanes. Nearly 3,000 rotor blade sets (6,000 individual rotor blades) were delivered from 1984 through 2001. The company discontinued production in 2003 and went dormant for 18 years. The interest to restart manufacturing Skywheels again began in 2018, and in 2020 the first flight tests of newly manufactured rotors was completed.