

Infrared versus visible light for flight stabilization

Two primary flight stabilization technologies are available to RC modelers. Both use the surrounding environment as a reference point to control aircraft orientation. They differ, however, in what they “see”:

- The older approach senses visible light. In effect, it “sees” what you see around you at the flying field.
- The new technology detects the infrared—or heat—portion of the spectrum, which is invisible to you.

This technology is available exclusively in FMA’s Co-Pilot™ and FS8 Co-Pilot™ products.

Visible light versus infrared sensing may seem like a minor difference, but it has important implications for stabilization system effectiveness. As the comparison below clearly shows, visible light stabilization is unable to match the advanced performance and high reliability of Co-Pilot’s infrared technology.

With Co-Pilot’s infrared stabilization, RC pilots of all experience levels fly better and more safely. Beginners can learn in just a few flights, without crashing. Expert pilots can safely check out new craft and recover quickly when learning new maneuvers. Co-Pilot really does take the fear out of flying!

	Visible Light Flight Stabilization	Co-Pilot™ Infrared Flight Stabilization Technology
How it works	Controls aircraft orientation by sensing visible light in the surrounding area. <i>Visible light is not a stable reference. It varies greatly throughout the day, and may even change significantly during a flight.</i>	Controls aircraft orientation by sensing the temperature difference between Earth (warm) and deep space (cold and quite uniform). <i>Infrared (heat) signatures provide a much more stable and precise reference than visible light.</i>
Calibration	None provided. <i>To decide whether you can use flight stabilization, look at the sky and guess.</i>	Daily infrared calibration—part of normal operation—adjusts operation to current infrared conditions. <i>Co-Pilot™ tells you the relative temperature difference between Earth and sky, so you can decide whether conditions are suitable for stabilization. Co-Pilot™ can be used about 99% of the time.</i>
Influence of Sun’s position	Sun must be at least 25° above horizon. <i>Summer: you can’t use stabilization just after dawn or just before dusk. Spring and fall: restricted period is longer, since the Sun is generally lower in the sky. Winter: the Sun may not reach 25° above the horizon—eliminating the stabilization option.</i>	Not sensitive to Sun’s position. <i>In fact, Co-Pilot™ infrared stabilization works at night, but we recommend against flying in the dark.</i>

continued

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Influence of Sun and bright light sources	<p>On sunny days, aircraft tends to fly toward sun. Also affected by reflective surfaces (for example, a car windshield reflecting sunlight toward aircraft).</p> <p><i>This behavior may be confusing, especially to student fliers.</i></p>	<p>Not affected by Sun or other sources of visible light.</p> <p><i>Operation is consistent throughout each flight.</i></p>
Terrain	<p>Does not work reliably over snow or water.</p>	<p>Works over any terrain for which the calibration senses sufficient temperature difference between Earth and sky.</p> <p><i>Since Co-Pilot™ tells you the temperature difference, you can decide whether conditions are acceptable.</i></p>
Weather	<p>Sunny, no clouds: poor performance. Partly cloudy: moderate performance. Overcast: best performance.</p> <p><i>Okay if you want to fly on cloudy days! Passing clouds may change aircraft orientation.</i></p>	<p>Operates over a large range of weather conditions.</p> <p>Does not operate in fog when the cloud ceiling is less than 200 feet (but you shouldn't fly then anyway).</p> <p><i>If there is a major weather change, just recalibrate.</i></p>
Stabilization reliability	<p>Moderate.</p> <p><i>Due to factors above, stabilization is unpredictable and may fail when needed most.</i></p>	<p>Excellent.</p> <p><i>Almost zero chance of crashing.</i></p>
System integration	<p>Standalone unit works with any receiver. Stabilizes via elevator and aileron servos.</p> <p>Also available integrated in a receiver.</p>	<p>Co-Pilot™ works with any receiver. Stabilizes via elevator and aileron servos.</p> <p>FS5 Receiver plus Co-Pilot™, and the all-in-one FS8 Co-Pilot™, provide full failsafe plus flight stabilization for maximum aircraft protection.</p> <p>Additionally, FS8 Co-Pilot™ stabilizes via any channels, and works with any aircraft configuration. For added safety, its optional Vertical Sensor detects whether the airplane is upright or inverted.</p>

Remember, if it's not a Co-Pilot™, it's not infrared technology!

Co-Pilot products are available exclusively from FMA Direct and authorized FMA dealers.
Co-Pilot technology is protected by U.S. Patent 6,181,989.