

Application Note #4

2 speed preset operation and switch detail

Q: How do the 2 speed presets on Safety-Trim work and why does my homebuilt need this feature?

A: Many homebuilt aircraft have a higher performance range than classic type certified general aviation aircraft. Often, homebuilts operate over a wide airspeed range, with cruise speeds exceeding 2x landing speeds. In these different flight regions it is beneficial to have the aircraft trim system respond at different speeds. In the landing configuration, having a relatively quick moving trim tab works well with the corresponding larger control surface movements required for slow speed flight. When an aircraft is in the cruise configuration at higher airspeeds, a relatively slow moving trim system is desirable as only small adjustments to the control surfaces are usually necessary to maintain a neutral trim condition.

Safety-Trim intelligent servo controllers with 2 adjustable speed presets accomplish this trim feature. Safety-Trim has 2 trim potentiometers on the side of the enclosure labeled "Speed 1" and "Speed 2". These adjustments are used to customize Safety-Trim to your aircraft. Generally, Speed 1 is set up to allow the trim tabs to move quickly for use during slow speed flight. Speed 2 is set-up to allow the trim tabs to move slowly for use during cruise flight. The selection of Speed 1 and Speed 2 is made by a switch closure on Pin 8 of the Safety-Trim controller (see wiring diagram). A flap switch, airspeed switch or manual switch may provide this signal. As shown in the following figure, a micro switch is activated by the flap torque tube which drives the flaps. The micro switch is mounted to the aircraft near the torque tube and a small bracket is fastened to the torque tube. When the torque tube rotates such that the flaps are retracted, the micro switch lever is depressed and the switch is in the closed state. This activates Speed 2. When the flaps are deployed the flap switch opens, this activates Speed 1.

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2 speed switch detail

Mount a micro-switch near the flap torque tube. Attach a small bracket to the torque tube that activates the 2 speed switch when the flaps are retracted

