

Sailplanes and Soaring

by Dick Sutton

Sailplanes and power planes, they're both just airplanes - right? They both have wings, a fuselage, flaps, ailerons, elevator, rudder, etc. So why is it that when you hang around (no pun intended!) with glider pilots you hear stuff like camber presets, reflex settings, launch presets, crow, butterfly, and other equally foreign sounding terms?

The challenges faced by power plane and sailplane enthusiasts are quite different. The power pilot is mainly concerned with trimming the plane for optimum aerobatic stability over a given speed range. The sailplane pilot is faced with entirely different problems. First, the quality of the flight is often determined by the launch itself: a low launch may result in a very short flight. In other words, the higher the launch the better the launch! Second, once an acceptable launch is obtained, the plane needs to be trimmed for 'normal' flight which is probably different than for launch. Lastly, landing accuracy is dependent on another set of parameters since we don't have an engine to compensate for that pesky wind that tries to keep our glider airborne. This last item is important because unlike power planes, if we don't like our landing approach we often cannot simply 'go around again' and try another approach!

Well, with the advent of computer radios, glider pilots were quick to take advantage of the mixing capabilities offered by these radios and apply them to their special flying situations.

The sailplane pilot often wants a different set of trims (presets) for launching/landing, normal flight, and perhaps speed. These 'modes' can be defined and programmed to a switch on the transmitter (such as the 'flap' switch for power planes that would provide for three different 'modes'). For example, when launching you may want to maximize your lift for a higher launch. This can be

accomplished by special mixes that cause the flaps and ailerons to work together to provide, in effect, an entire trailing edge set of flaps!

Likewise, the flaps and ailerons can be programmed so that they act as huge ailerons (also called inboard and outboard ailerons) for more precise turns. A modification of this idea is to provide this capability (again under switch control) to say the 'throttle' stick so that the degree of application is minutely adjustable. Changing the 'camber' by raising or lowering the entire trailing edge of the wing span, effectively adjusts the shape of the airfoil and therefore the flight characteristics while the glider is in motion!

Similarly, a different set of presets (trims/mixes) may be desired to maximize speed ('reflex' presets), or perhaps 'normal' flight characteristics (whatever that may be).

When landing, the pilot may wish to provide for the 'crow' (or 'butterfly') effect. This is accomplished by mixing the flaps and ailerons and assigning the mix to, say the 'throttle' stick (again, under switch control) such that as the stick is advanced the 'flaps' travel in an upward direction while at the same time the ailerons move in a downward direction. This greatly facilitates 'spot' landings by selectively killing lift. Of course, while the 'camber' and/or 'crow' mixes are in effect, the ailerons, elevator, and rudder work in the normal manner. They may even have variable amounts of each mixed in with the other functions described above for smoother control.

Let's see how all this works during a typical flight. Let's say you have the presets or modes (launch/landing, normal, and speed) assigned to the 'flap' switch and the 'normal/crow' mixes assigned to the 'mix' switch. First, you set the mix switch to 'normal' and the flap switch to the 'launch/landing' mode. The launch presets ensure that we obtain maximum lift. The sailplane is now launched. After the glider flies off of the towhook, the pilot flips the

flap switch to the 'normal' position. Now the glider is optimized for normal flight. If speed is required we may flip the switch to the speed ('reflex') position for that set of trims. When the glider is positioned for landing, the pilot flips the flap switch to 'landing/launch mode' and the mix switch to 'crow'. Now the throttle stick controls the degree of crow function applied (i.e. the degree of lift that is killed). This helps put the sailplane down on a dime!

So, you thought all airplanes were all alike, huh? Well, not all pilots use all of the features described above but now you know why the programmable radios have special programming for airplanes, sailplanes, and helicopters. The bottom line for you and me is that we have more 'fun' flying our planes and less 'work' while the serious pilot can extract more precise performance from his/her plane.