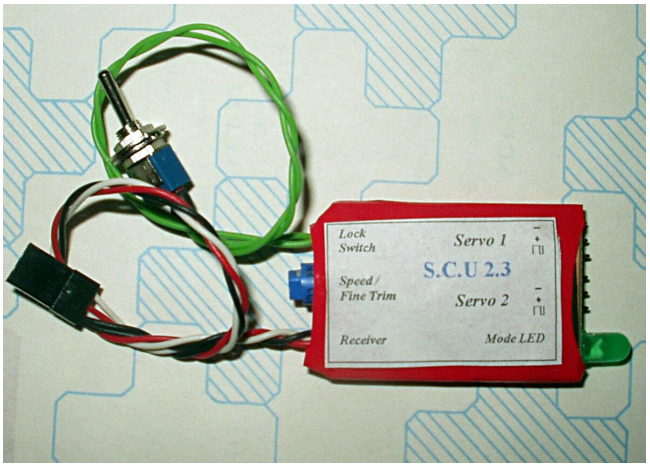
Servo Control Unit v2.3

Version 2 of the Servo Sweeper makes the setting up of the unit much easier:

- Each servo can be set independently for three sweep positions.
- Theoretical resolution of 0.04°.
- Fine servo positioning (+/-1.3°) using trimpot during set-up.
- Trimpot controls servo transition speed (up to 30 seconds).
- Optional oversweep position.
- Transport sweep-lock mode.
- Excellent spurious signal rejection.
- *Hold Last Position* failsafe.



Connection

Connect the two servos to the appropriate outputs of the unit (marked Servo 1 and Servo 2). Connect the desired control channel from you receiver to the input of the unit (this must me a rotary control on the transmitter during set-up, but can be a rotary or three-position switch after set-up is complete). Power to the unit and servos is supplied by the receiver connection. It is perfectly feasible to power the servos from another supply (say 6V). However, the voltage to the unit must not exceed 5.5V.

For descriptive purpose, a rotary flap control on the transmitter is used in this document.

Set-up Mode

The method of entry into the set-up mode will determine the number of sweep positions available (three or four). Setting the unit for three positions is shown in normal text. Setting the unit for four positions is shown in (*italicised parentheses*). The factory setting for all sweep positions is mid-sweep. To change these settings, turn the lock switch off; switch the receiver on; and toggle the lock switch on/off twice *(three times)* within 3 seconds. The unit will respond by flashing the LED at approximately 1-second intervals. If the LED flashes rapidly, turn the lock switch off within 5 seconds or the unit will reset (see Factory Reset).

Six *(eight)* settings can be stored in the unit. These correspond to servo positions for three *(four)* sweep settings for each of the two servos: unswept, mid-sweep, fully swept *(and oversweep)*. Each setting is indicated on the unit by a flashing sequence on the LED: 1 flash for setting 1, 2 flashes for setting 2, and so on.

Setting/Flashes	Description
1	Servo 1 setting for the unswept position.
2	Servo 2 setting for the unswept position.
3	Servo 1 setting for the mid-sweep position.
4	Servo 2 setting for the mid-sweep position.
5	Servo 1 setting for the fully swept position.
6	Servo 2 setting for the fully swept position.
(7)	*(Servo 1 setting for the oversweep position.)*
(8)	*(Servo 2 setting for the oversweep position.)*

For each of the six *(eight)* settings, use the flap control to set the coarse position of the appropriate servo, and fine tune (if required) using the trimpot. The speed of the servos is slowed down to a fixed rate during set-up. Toggle the lock switch on/off once to store the setting (the LED will stay on for 1 second to indicate success) and move on to

the next setting. *If you do not wish to change the setting, do not move the flap control. After 5 sequences, the servo will return to the stored setting, and the next setting will be selected automatically.* After setting 6 *(8)*, the unit will loop back to setting 1. To exit set-up, switch the receiver off.

Factory Reset

To reset the unit to factory settings (mid-sweep for all positions), turn the lock switch on; switch the receiver on; and toggle the lock switch off/on twice *(three times)* within 3 seconds. The unit will respond by flashing the LED rapidly. After 5 seconds, the LED will stay on for 2 seconds and the unit will then reset. The LED will start flashing rapidly again, starting the sequence again. To exit this mode, turn the lock switch off or switch the receiver off. If the lock switch is turned off, the unit will enter set-up mode (see above). If this mode is exited before the LED stops flashing, the unit will not reset.

Normal/Lock Mode

To enter *normal* or *lock* mode, turn the lock switch off or on respectively, and switch the receiver on. The LED will be off and the servos will move to the sweep position selected by the transmitter. After 3 seconds, the unit will enter the selected mode.

Normal Mode

With the lock switch off, the LED will be on and the three main sweep positions can be selected using the flap control. Fully anti-clockwise will select unswept, mid position will select mid-sweep, and fully clockwise will select full sweep. You can reverse this selection order by simply reversing the flap channel on the transmitter. Adjusting the trimpot will set the transition speed between sweep settings. Fully clockwise will slow the servos down to about 30 seconds end-to-end travel. Fully anti-clockwise will give near normal servo speed (about 0.1s), and a mid-position will give about 1 second. To enter *Lock/Transportation* Mode, turn the lock switch on (see below).

Lock/Transportation Mode

With the lock switch on, the LED will blink off once approximately every second and the fully swept *(oversweep)* setting will be selected. The unit will ignore the flap control whilst this switch is on, effectively locking the wings. To set *Normal Mode* turn the lock switch off (see above).

Signal Loss and Signal Rejection

In normal operation, pulses are received approximately every 20ms. If no pulse is received within 33ms, the unit will replace the missing pulse with the last good pulse, effectively acting as a *hold last position* mode. If no signal is being received at all, the LED will flash twice per second. To reduce glitches, acceptable pulses are greater than 0.74ms, and for the unit to accept a new pulse it must have received five pulses in sequence with values within 0.05ms (about 3%) of each other. If these conditions are not met, the invalid pulse is dropped and replaced with the last good pulse, effectively acting as a *hold last position* mode.

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