In order for an ECS to be successful, one needs a reliable movement which can be used to activate an input device.

How do I make it work? Which movement?
A person’s unique physical ability will determine suitable input devices. One needs to identify a physical movement that is reliable and repeatable. Common movements include nodding the head, tapping the chin or cheek, raising an eyebrow, lifting an elbow, sucking or puffing air, tapping a finger or knuckle, making a loud noise or even simply moving the eyes.

Direct or indirect selection
Direct selection involves activating the buttons on a control unit using the hand, the knuckle, a splint or a mouth stick. It can make some mainstream remotes accessible with no special adjustment. This can be slow, tiring and inaccurate. It may mean relying on someone else to put on a splint, pass a control unit or a mouth stick. Indirect selection involves pressing a switch when a desired option from a list is offered by a control unit.

Types of switches

- **Buddy buttons**, also known as jelly bean switches, are circular and range in colour and size. They are best operated with direct pressure from above.
- **Lever switches** are rectangular in shape and vary in size. These are operated with pressure at the free edge.
- **Micro switches** are smaller discrete switches which are activated by minor movements, such as finger tapping.
- **Joysticks** can be used for direct selection. It is also possible to use a power chair joystick (with support from the wheelchair and ECS suppliers). Micro joysticks are available and can be discrete options, often mounted alongside a chin control.

Specialised switches

- **Soft switches** are padded cushion switches which are useful in bed when there are pressure concerns;
- **Pillow switches** can be attached to a pillow using a safety pin;
- **Touch plate switches** respond to small movements;
- **Noise activated switches** can be adjusted to respond to variable volume and duration of noise, these are useful as alarm triggers;
- **Sip and puff switches** make use of small breaths in and out to select buttons on a control unit;
- **SCATIR switches** work by detecting a beam of reflected pulsed infrared light. They are suitable for use with a variety of control gestures, such as eye-blink, eyebrow movement, finger movement, head movement, and facial muscle movement. The controlling body part does not need to be in physical contact with the switch sensor.

Mounting the switch
It is vital that switches are accessible when an Environmental Control System needs to be activated in order to ensure independence. Mounts can be static or flexible. Static mounts are useful if the positioning of the switch does not need to be adjusted and can prevent unwanted ‘moving’ of switches by others. Flexible mounts, such as photographic camera mounts, can be useful for people with spasm whose positioning can change. On the other hand it can be tricky to position a mount correctly resulting in difficulty or even inability to hit the switch. Power wheelchairs with seat adjustment can be useful for independently changing one’s position to reach a switch. It may be necessary to have a second mount and / or switch for use when lying down.

Alternative technology
Control units that can be activated by speaking commands are available, but are reported to be unreliable and not a popular option. Eye gaze requires a specialised computer and thus not a mobile solution.

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Next issue: Control Units