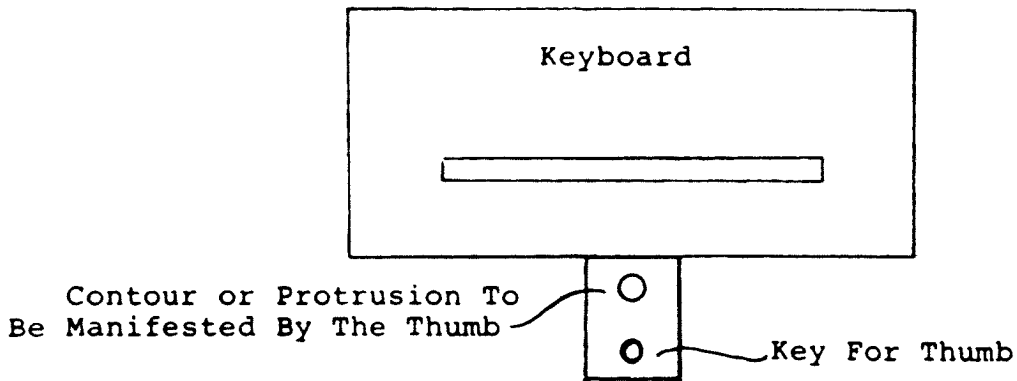


THUMB CONTROL ENSEMBLE FOR DATA-ENTRY AND CONTROL-ENTRY DEVICES



Disclosed is an apparatus for making extensive use of the thumb(s) in entering data and control movements. The apparatus forms an ensemble of controls contoured and placed for easy use by the thumb(s) on any hand-operated or hand-held input, control or data entry device, including keyboards, keypads, wheel controls, stick controls, or hand-held devices such as, but not limited to, telephones and remote control units. The control ensemble includes a protrusion and/or surface contoured for use by a thumb and/or one or more keys sized and contoured for thumb use. The control action and control gain characteristics are appropriate for the thumb, and suitable for both ballistic and fine-grain movements. The control ensemble is positioned on the entry device in a location where the thumb normally resides for that device. In the example illustrated in the figure, the control is positioned where the thumb(s) rest on the keyboard. On other data-entry or control devices, the thumb control ensemble is located for convenient use by the thumb(s).

The thumb control addresses problems with conventional entry devices that recently have arisen stemming from the addition of function to controls. The additional function requires users to move their hands back and forth between different areas of the control ensemble, and also requires users to move their eyes between the display and the control [1,2]. Because the thumb is the digit that has the greatest range of movement freedom, the greatest angular volume of movement, and the densest projection on the somesthetic cortex of the brain, the thumb control ensemble addresses these problems. For data entry and control devices, it provides an improved allocation and distribution of function to the digits, makes fuller use of the unique capabilities of the thumb, and reduces the necessity of eye and/or hand movement during data entry.

References

- [1] S. K. Card, W. K. English and B. Burr, "Evaluation of Mouse, Rate-Controlled Isometric Joystick, Step Keys, and Test Keys for Text Selection on a CRT," Xerox Technical Report SSL-77-1, Palo Alto, CA (1977).
- [2] S. E. Engel and R. E. Granda, "Guidelines for Man/Display Interfaces," IBM Technical Report TR00.2720, Poughkeepsie, NY (1975).