

### **Delivering Comfort for Busy Professionals: Comfort Wave Design and Negative Tilt from Logitech**

It's easy to understand why improved comfort can directly result in improved productivity. Data entry. E-mail. Instant messages. Presentations. Spreadsheets. Web searches. In today's workplace, computers are the dominant platform through which work gets done. As a result, more and more time is spent typing on a keyboard. According to a study Harvard University conducted for Logitech (Dennerlein 2006), the average PC user types 2 million keystrokes per year. The result can often be fatigue – and less effective employees.

To improve comfort for busy professionals, Logitech for Business introduced the Logitech® Comfort Wave 450 keyboard, which features the acclaimed Comfort Wave Design, and – in a Logitech first – the innovative negative tilt.

#### **The Comfort Wave Design: Cradling Fingers**

To comfort tired hands and fingers, in 2007 Logitech introduced the Comfort Wave Design. To enhance comfort without requiring that people change how they type, Logitech combined three elements: an innovative wave key-frame design, a U-shaped constant curve and a cushioned, contoured palm rest. In comparison to ergonomic keyboards, the Wave keyboard can be used immediately – there's no learning curve.



*Figure 1. Wave-shaped key frame for C row.*

In 2008, research confirmed that the Logitech Wave Keyboard “improves comfort” (according to an independent study by Peter W. Johnson, Ph.D., of the University of Washington).

The Logitech Comfort Wave Design combines the following three elements:

1. Wave key frame

The Comfort Wave Design features a gradual wave-shaped contour that cradles the fingers with a shape that supports their actual, varied length. Because hands and fingers can rest in a more natural position and keys are closer to fingertips, the Wave key frame helps eliminate awkward hand and forearm positions, enhancing comfort and improving productivity.

2. Constant curve design

The U-shaped constant curve features consistently sized keys that let people type with confidence and comfort. The subtle 5-degree curve allows people's hands to open up and take a natural position instead of forcing the wrists to bend. And because each key is the same size and the same distance from one another, the learning curve is minimal.

3. Cushioned, contoured palm rest

The palm rest mirrors the wave-shaped key frame and provides gentle indents that position hands comfortably on the keyboard. With its padded, soft upholstery, the palm rest offers a comfortable place to rest the palms between typing sessions.

**The Added Benefit of Negative Tilt**

In 2009, Logitech for Business introduced the Logitech® Comfort Wave 450 keyboard, with an innovative feature – negative tilt.

Negative tilt describes the angle one can experience on the Comfort Wave 450 by using the tilt legs to raise the palm rest above the plane of the keyboard. On the Logitech Comfort Wave 450, the tilt legs can create a 4- or an 8-degree downward angle.



**Figure 2 Logitech Comfort Wave 450 keyboard with negative tilt**

This slight negative tilt proved to be a significant change for participants in a study conducted by VSI Risk Management and Ergonomics for Logitech. In fact, study participants reported that they felt the Comfort Wave 450 was the most comfortable keyboard they had ever used.

Before the participants used the Comfort Wave 450 keyboard, initial quantitative data was collected on participant wrist postures (wrist extension and ulnar deviation) with keying tasks using a standard keyboard. During two weeks of using a standard QWERTY keyboard, participant wrist extension angles were measured using a goniometer, and their wrist extension was recorded at range of 16 to 26 degrees.

In comparison, after two weeks using the Comfort Wave 450 with a 4-degree negative tilt, participants demonstrated wrist angles at a range of 0 to 8 degrees, which demonstrated an improvement directly related to reduced fatigue of the extensor muscles of the forearms and flexor muscles at the anterior wrist regions. Ulnar-deviated wrist angles – which showed a range of 8 to 28 degrees with the standard keyboard – were also reduced to 3 to 8 degrees bilaterally with the use of the Comfort 450 keyboard.

This study confirmed that negative tilt helps create improved wrist postures with keying tasks in addition to providing reduced strain at the extensor and flexor muscles of the hands and forearms.

**The Bottom Line: Empowering Your People to Achieve Success**

With the introduction of the Comfort Wave 450 keyboard, Logitech offers busy professionals a new level of comfort. Together, negative tilt and the Comfort Wave Design gives employees the comfort they desire, and managers the confidence that their charges can do more, more comfortably.

Bottom line: Employees that are more comfortable are more likely to do good work. Comfort is not just a luxury: The Comfort Wave 450 keyboard helps empower your people to achieve success.

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