



Selecting Height Adjustable Workstations:

Size &

“You will please suit yourself as to the size and formation (of your workbench), for where there is no law, there is no transgression.”

—Brother Thomas Damon

December 23rd, 1846

Letter to George Wilcox,

Shaker Community Correspondence

Ergonomic principles have been used for centuries to improve workplace comfort and productivity. Decisions about worksurface size, shape, and height were often left to the individual craftsman—the economic drivers of the pre-industrial age. »

Enabling today's economic producers—computerized office workers—to select a comfortable office workstation height can follow in this tradition. Adjustable workstations come in all shapes, sizes, and several adjustment methods. Manual, crank, electric, torsion, or pneumatic technologies each has an appropriate place in today's office workplace. Selecting the right adjustable workstation is very similar to the now familiar process of finding the right chair. Those involved in selecting ergonomic seating know, like Goldilocks, that a good fit requires things aren't "too high or too low, too deep or too shallow...but just right." Though in addition to fitting workers and their tasks, a workstation also needs to fit office equipment and space.

Whether recommending adjustability for injured workers, or furnishing an entire building, these selection guidelines will help you weigh choices about optimal size and shape, adjustment range, and the best adjustment technology for you. They will help you avoid disappointment, too.

There's nothing sacred about the sequence of these steps. If space constraints or wheelchair access or injury accommodation are your most important considerations—start there. Just be aware that all of the factors play a role in how effective your choice is.

Size and shape considerations

To build a picture of the optimal size and shape for the workstation, start with an *equipment and task materials analysis*. How much workspace do workers need to support their tools and materials? For example, a flat panel display (FPD) has a much smaller footprint than a cathode ray tube (CRT) monitor and requires less space. Workers who rely on multiple monitors will need more space than workers who use just one. Include phones and the materials that support paper based activities too—files, reference books and drawings. If office workers frequently access printers and scanners, consider locating them near their computer rather than across the room.



Shape

By Jim Reiland (part 1)

When you know what will be on the desk, move on to a task analysis. How do office workers interact with their equipment and materials? Think in terms of primary, secondary, and tertiary activities. If workers have a single, dedicated computer task that keeps them glued to a single screen for eight hours each day, a smaller size adjustable workstation will probably do the job. Any secondary equipment and tasks can be located nearby, if not on, the primary workstation. On the other end of the scale, some workers have multiple, interruption-driven tasks characterized by frequent movement back and forth between different parts of the workstation, e.g. keying and mousing, phones, writing-reading-referencing, etc. A worksurface that surrounds them with usable space will keep all the different tasks at a comfortable height and within reach.

In general, comfortable viewing and reach distances will govern worksurface depth; FPD equipment needs a 24" minimum depth, larger CRT monitors require 30" minimum depths. Deeper worksurfaces more flexibly support different computer monitor sizes and viewing distances. The trade-off may be increased square footage; large 42" or 48" corners work well for CRTs because they hold the equipment without sacrificing eye comfort, but they might become wasted real estate when used with FPDs. Deeper worksurfaces can present reach issues too, especially if workers frequently reach for overhead storage or to a transaction counter.

Consider which will do the job better; one large worksurface, or several smaller ones. Each has advantages. A large height adjusted worksurface supports all of a work-

er's tasks and equipment at their optimal height. It also offers a relatively lower cost, seamless work flow, and fewer desk legs and feet to impede movement between tasks. On the other hand, where relocating employees involves more than a box move, large workstations are cumbersome to maneuver through narrow doorways. Many choose several smaller independent adjusting worksurfaces instead. This offers greater flexibility in height adjusting each surface to support different tasks, enables workers to rearrange their own offices, and makes facilities furniture moves easier. This choice can also cost more, and there are more feet and legs under the desk to step around.

Do you want the worksurfaces to have organic shapes, sculpted to surround workers and facilitate comfortable reaches and reduce sharp corners? It might be important to aesthetically mimic the angular shapes and modular sizes of more conventional existing fixed height furniture. Or it may be a priority to reduce costs by reusing existing panel hung worksurfaces by attaching them to height adjusting workstation frames.

Look under the worksurface too. Most height adjustable worksurfaces are free standing. They have frame members—legs and feet and cross bars—that adjust and support the worksurface. Sometimes these frame members inhibit leg movement and task transitions because workers whack their shins or knees when they pull up their chair or scrape their thighs when they turn left of right. While you're under the desk, also think about how file pedestals, wastebaskets, and old document storage boxes inhibit movement.

Bilevel or single surface?

Both can be effective choices. Computer technology drives the change in office furniture, which has followed along much more slowly. It can take several years before furniture design catches up. For example, bilevel desks evolved in response to conventional wisdom about equipment placement to ensure optimal posture. When monitors were small (remember 12" screens?), they needed to be raised to eye level. Early computer keyboards were nearly as tall as typewriters, and needed to be much lower than standard 29" desk heights. Bilevel desks offer independent adjustment of the viewing (FPD-CRT) and reaching (keyboard, mouse, writing, etc.) targets, which allows for more precise adjustment to ensure good posture. New computer equipment presents different challenges, sometimes requiring that the rear surface lower the viewing screen to eye level—often making it lower than the front surface. For all their positive attributes, bilevel workstations come with a few trade-offs. They cost more than single surface desks. Some complain that papers and pens fall through the 1" gap separating the monitor and KB/Mouse surface. Finally, when a bilevel workstations uses a keyboard mechanism and platform to support the KB/Mouse, the mechanism can protrude into the leg envelope, inhibiting movement between tasks.

Single surface desks are simpler, less expensive, and allow workers to more easily move equipment and materials around to suit their evolving work needs and style. They generally have a sleeker profile under the worksurface to facilitate transitions between tasks. Some argue





and activities. Sometimes it might be best to place the worker at the center of an “L” or “U” shaped worksurface where they have easy access to all of their equipment, supported at their optimal height, simply by turning to their left or right.

There are no laws governing workstation size and shape—only practical limits. Doorway width and elevator size have all played a role in furniture selection—sometimes at a most inconvenient moment (don’t ask how I know this). Conventional worksurface sizes, adopted long ago by the North American furniture industry will also play a role—if only because they are so common and familiar.

Whatever form your optimal workstation takes, it is only half the challenge. Next month we’ll address the strengths and weaknesses of various adjustment technologies. **ISSI**



that the ergonomic benefits of bilevel over single surface are diminishing as FPDs can be dropped nearly to desk level to maintain comfortable viewing angles, and more modern, low profile keyboards can sit on the same worksurface. Single surface workstations are an attractive choice, but they don’t offer as much adjustability as a bilevel workstation.

As a final consideration, make sure the worksurface’s size and shape will fit into the work area without pushing workers into aisles, panel walls, or each other. Also, leave a 1” gap between the worksurface and any adjacent worksurface or wall. This

gap reduces the chance of finger or cable pinching as the worksurface travels. For example, if an adjustable desk needs to fit inside a 48” wide space, make sure it is 46” wide.

An optimal size and shape for the worksurface(s) should emerge from the equipment, materials, and task analysis. Perhaps you’ve come up with a small, straight desk, best suited to supporting single, dedicated tasks with infrequent movement to other parts of the work area. Or maybe your ideal workstation is an adjustable corner where workers spend most of their time, surrounded by fixed height returns that support secondary tasks

Jim Reiland has been specifying ergonomic products since 1986, specializing in height adjustable workstations for office applications since 1995 for SIS-USA. Contact him at jreiland@sis-usa-inc.com

Resource: *Ergonomics Guideline For VDT Furniture Used in Office Work Spaces*, BIFMA International, February 2002, pp. 58 - 66.

Also: *The Antique Tool Collectors Guide to Value*, Ronald S. Barlow, 1999. (Gas City, IN, L-W Book Sales, Gas City), p. 233
 —excerpt from *The Young Farmers Manual*, 1858 feat
The Workbench Book: A Craftsman’s Guide to Workbenches, Scott Landis, 1998, The Taunton Press, Inc., p. 47
 —cite of 1846 *Shaker* correspondence