

## Recommendations for Workstation Design

To understand the best way to set up a computer workstation, it is helpful to understand the concept of neutral body positioning. This is a comfortable working posture in which your joints are naturally aligned. Working with the body in a neutral position reduces stress and strain on the muscles, tendons, and skeletal system and reduces your risk of developing a musculoskeletal disorder.

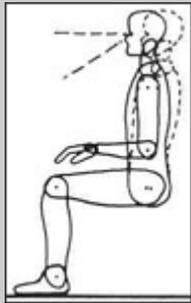
The following are important considerations when attempting to maintain neutral body postures while working at the computer workstation:

- **Hands, wrists, and forearms** are straight, in-line and roughly parallel to the floor.
- **Head** is level, or bent slightly forward, forward facing, and balanced. Generally it is in-line with the **torso**.
- **Shoulders** are relaxed and **upper arms** hang normally at the side of the body.
- **Elbows** stay in close to the body and are bent between 90 and 120 degrees.
- **Feet** are fully supported by floor or footrest.
- **Back** is fully supported with appropriate lumbar support when sitting vertical or leaning back slightly.
- **Thighs and hips** are supported by a well-padded seat and generally parallel to the floor.
- **Knees** are about the same height as the hips with the **feet** slightly forward.

These four **reference postures** are examples of body posture changes that all provide neutral positioning for the body.

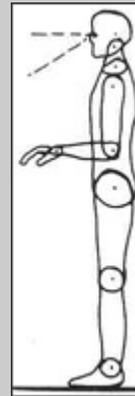
### Upright Sitting

**Upright sitting posture.** The user's torso and neck are approximately vertical and in-line, the thighs are approximately horizontal, and the lower legs are vertical.



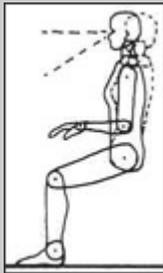
### Standing

**Standing posture.** The user's legs, torso, neck, and head are approximately in-line and vertical. The user may also elevate one foot on a rest while in this posture.



### Declined Sitting

**Declined sitting posture.** The user's thighs are inclined with the buttocks higher than the knee and the angle between the thighs and the torso is greater than 90 degrees. The torso is vertical or slightly reclined and the legs are vertical.



### Reclined Sitting

**Reclined sitting posture.** The user's torso and neck are straight and recline between 105 and 120 degrees from the thighs.



## Chairs

Use a chair with adjustable seat height (in a range of 15 to 21 inches from the floor) to accommodate most operators. Adjust seat height so that the thighs are relatively horizontal, the lower legs vertical, and the feet planted firmly on the floor or footrest. A seat that is too high cuts the circulation in the thighs and legs. When too low, it may cause the arms to assume an uncomfortable angle. Adjust the seat back angle and height to provide needed back support and comfort.

## Keyboard

Once the chair is adjusted, adjust the keyboard height so that the upper arm and forearm form a right angle when the hands are placed on the keyboard. The hands should be in a reasonable straight line with the forearm and upper arms should be in a relaxed position at the side of the body. Adjust the slope of the keyboard to maintain a flat wrist position. The recommended keyboard height is between 23 and 28 inches from the floor. Use a wrist rest for rest between keying, if needed.

## Screen Placement and Viewing Specifications

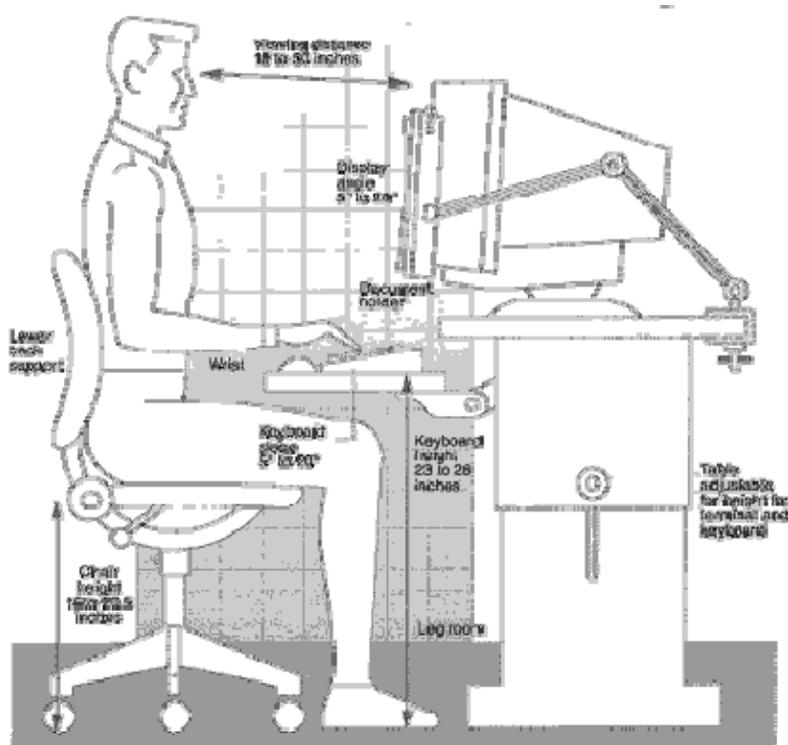
Adjust the height of the screen so that the top of the screen is no higher than eye level. Lower heights are required if you wear bifocals. Incorrect positioning of the screen affects posture. Screens placed too low or angled improperly frequently cause the operator to slouch.

The recommended distance between the eyes and the screen is 18 to 39 inches. Place source documents on the side of the dominant eye and at the same height and angle as the screen to avoid unnecessary neck and shoulder strain. To achieve this use a document holder or bookstand. Adjust the position and angle of the screen and keep it clean to minimize glare and increase character sharpness.

Other techniques to minimize glare are:

1. reduce overhead lighting,
2. close blinds over windows,
3. use a hood or anti-glare screen (the latter may reduce clarity).

Refocus the eyes periodically by looking away from the monitor at something in the distance. Blinking, yawning, moving the eyes up and down, left and right, etc., are also beneficial.



Regardless of how good your working posture is, working in the same posture or sitting still for prolonged periods is not healthy. You should change your working position frequently throughout the day in the following ways:

- Make small adjustments to your chair or backrest.
- Stretch your fingers, hands, arms, and torso.
- Stand up and walk around for a few minutes periodically.

**Sources:**

U.S. Department of Labor - Occupational Safety & Health Administration

Keys to Healthy Computing: an AFSCME Safety and Health Guide. Washington D.C. 2000 American National Standard for Human Factors