

# VDTs in the Workplace

by Pat Foreman

When video display terminals (VDTs) came on the scene in the 1960s, they were few in number, and operator exposure was intermittent and of brief duration.

VDTs, comprised of a display screen, a keyboard, and a central processing unit, rapidly replaced the use of typewriters and other office machines (see Figure 1). In 1976, for example, there were only 675,000 VDTs in use in U.S. offices; in 1986, there were an estimated 28 million. The number of VDTs in use is growing rapidly, and in the 1990s, the estimates range from 40 to 80 million VDTs in the workplace [1, 2].

In the wake of this expanding use of VDTs, however, concern has been expressed about their potential health effects. Some of these include visual problems, physical discomfort, cumulative trauma disorders, and radiation. Visual problems are one of the most frequently reported complaints by VDT operators. Complaints include eye fatigue and irritation, blurred vision, headaches, and dizziness.

These symptoms can result from improper lighting, glare from the screen, poor positioning of the screen itself, or copy that is difficult to read. These problems usually can be corrected by adjusting the physical and environmental setting where the VDT operators work. For example, work stations and lighting can and should be arranged to avoid reflections and glare on the screen or from surrounding surfaces. Light should be directed so that it does not shine into the operator's eyes

when the operator is looking at the screen. Further, lighting should be adequate enough for the operator to see the text and the screen, but not so bright as to cause glare or other discomfort (see Figure 2).

Glare is defined as a harsh, uncomfortably bright light. At a VDT, glare can result from the reflection of light on the VDT screen or other reflective surface, such as a shiny keyboard. Anti-reflective devices can be added to a VDT screen to lessen or reduce glare. Processor keyboards with an anti-glare matte finish also are available. VDT operators also can reduce eyestrain by taking vision breaks, which may include exercises to relax eye muscles after each hour of operating a VDT.

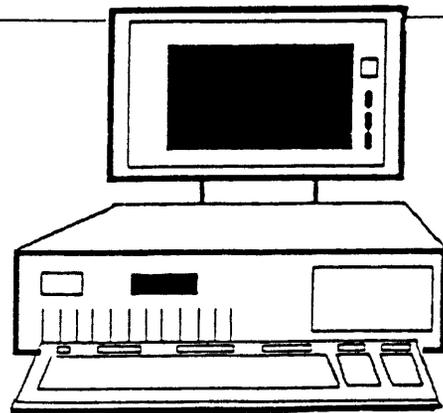
VDT operators also have experienced musculoskeletal problems of varying severity, including pain and stiffness in the neck, back, shoulders, arms, wrists, and hands; as well as more severe cumulative trauma disorders such as carpal tunnel syndrome. Proper work station design is extremely important in eliminating these types of problems (see Figure 3).

Some of the components that must be considered in proper work station design include the VDT table, chair, and document holder. For example, VDT tables or desks should be vertically adjustable so the screen and keyboard can be positioned correctly for each operator. Proper chair height and support to the lumbar region of the back are critical factors in reducing musculoskeletal complaints. Document holders also allow the operator to position and view material without straining eye, neck, shoulder, or back muscles.

VDT operators are at potential risk of cumulative trauma, or repetitive motion, disorders. Carpal tunnel syndrome (CTS) is one commonly recognized cumulative trauma disorder among VDT users. CTS is caused by repetitive wrist-hand movement and exertion. CTS is the compression and entrapment of the median nerve where it passes through the wrist into the hand--in the carpal tunnel. When irritated, tendons housed inside the narrow carpal tunnel swell and press against the nearby median nerve. The pressure causes tingling, numbness, or severe pain

Figure 1

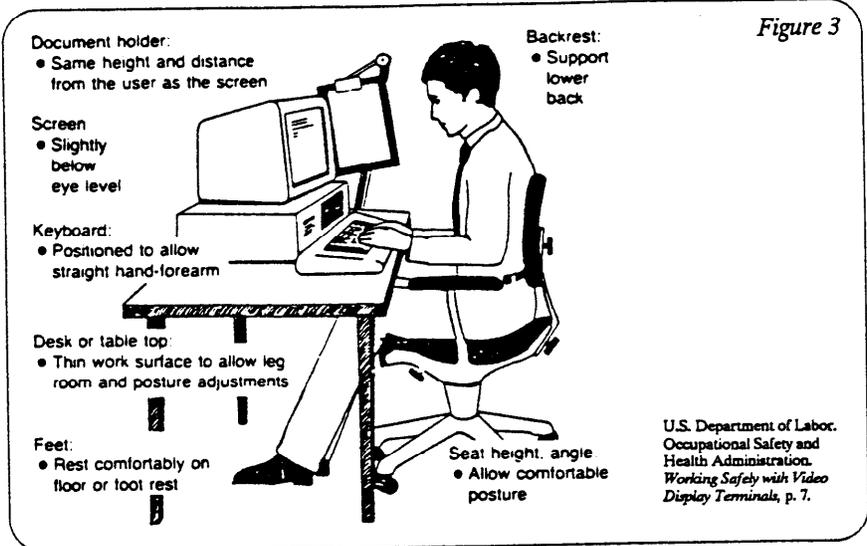
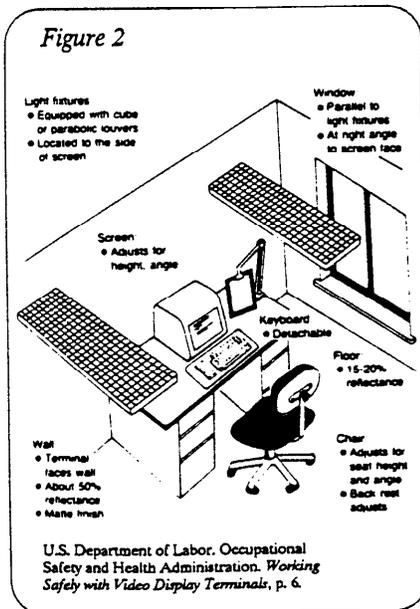
U.S. Department of Labor, Occupational Safety and Health Administration, *Working Safely with Video Display Terminals*, OSHA Publication No. 3092, Washington, DC: U.S. Government Printing Office, 1986, p. 1.



in the wrist and hand. These symptoms can often be allayed by stopping the activity that aggravates them (e.g. data/key-board entry), by splinting the wrist, or by taking anti-inflammatory drugs. Proper work station design and posture can also help prevent CTS. The operator should sit in an upright position at the keyboard, with arms parallel and wrists supported.

Another issue of concern is whether the emission of radiation from VDTs poses a health risk, especially for pregnant women. The health threat from VDT X-ray exposure is largely discounted because of the very low emission levels. Although radio-frequency and extreme low frequency electromagnetic fields occur at only low emission levels, there is still concern about health risks due to this exposure. Some work station designs have incorporated methods to reduce potential radiation exposure, such as increasing the distance between the operator and the terminal [3].

Since the possible effects of radiation from VDTs continue to concern operators, the issue is still being researched and studied.



OSHA has asked the Committee on Interagency Radiation Research and Policy Coordination (CIRRPC) to nominate a panel to read and evaluate all the literature on the subject and to determine whether there is sufficient data upon which to establish a dose response or develop a risk estimate for workers exposed to electro-magnetic radiation at wave lengths relevant to VDTs. The National Institute for Occupational Safety and Health has a resource booklet entitled, "NIOSH Publications on Video Display Terminals" and continues to study the question of radiation as a risk to pregnant women.

For further information on VDTs, please consult the following sources:

Occupational Safety and Health Administration (OSHA)  
 U.S. Department of Labor  
 Technical Data Center, N2439  
 200 Constitution Avenue, NW  
 Washington, DC 20210

U.S. Department of Health and Human Services  
 Public Health Service  
 National Institute for Occupational Safety and Health (NIOSH)  
 Robert A. Taft Laboratories  
 4676 Columbia Parkway  
 Cincinnati, OH 45226-1998

### References

1. Elayne Clift. "Personal Computers - User Friendly?" *Gov Exe* 21 (8): 38-40, August 1989.
2. John E. Peterson. "RMI: The Hazard of the '90s." *Science/Health Section. Marin Indep J*: F6, July 30, 1989.
3. Paul Brodeur. "Our Hidden Enemies." *Bottom Line*. (3): 1-10, February 15, 1990.

### Selected Bibliography

The Newspaper Guild and International Typographical Union (AFL-CIO, CLC). "Getting the Right VDT." In: *Humanizing the VDT Workplace: A Health Manual for Local Officers and Stewards*. Washington, DC, November 1981. Pp. 7-13.

Communications Workers of America, AFL-CIO. "Visual Display Terminal Manual." Washington, DC, 1982. Pp. 14-15. Unpublished.

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