



*Questions and Answers:
Video Display Terminals
USACHPPM TG 156*



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QUESTIONS AND ANSWERS: VIDEO DISPLAY TERMINALS

This technical guide (TG) will assist workers in efficient and comfortable use of their video display terminals (VDT).

1. Q. Who is a VDT user?

A. Any worker who uses a VDT for at least 20 hours of work per week.

2. Q. Does VDT use present a radiation health hazard to the user?

A. No. The National Institute for Safety and Health (NIOSH) studies concluded that all measurable radiation emitted by the VDT is well below emission standards established anywhere in the world. There are no known adverse health effects from radiation at the levels measured from VDTs using cathode ray tube (CRT) screens, which are essentially specialized television screens. The newer liquid crystal displays (LCD) produce extremely low emissions, primarily from light and heat, at levels well below standard CRT screens.

3. Q. If I am pregnant or planning to become pregnant, should I request a transfer to a job that does not require operating a VDT?

A. No. The position of the American College of Obstetrics and Gynecology is that VDT use does not present a danger to an unborn child. Extensive research has not produced any link between adverse pregnancy outcomes and operation of a VDT. Experimental exposure to radiation many times greater than that of VDT screens has not caused any pregnancy problems.

4. Q. Will working at a VDT harm my eyes?

A. No. Working at a VDT will not harm your eyes and will not cause cataracts. Surveys reveal that approximately 50 percent of all VDT workers have eye complaints. Needless to say, VDT work is visually intensive and may result in vision difficulties not normally experienced with other types of visual activities. People who must do a significant amount of reading also report similar complaints. Minor eye problems which did not cause any symptoms before using a VDT, may now produce visual symptoms due to the intense, consistent nature of VDT work. Many of the vision difficulties may be relieved or reduced with the use of spectacles specifically prescribed for your VDT use. The local Occupational Health Clinic will screen your visual abilities when you begin employment. If you pass the screening but have vision complaints after using the VDT, an examination by your personal eye care professional is suggested. Obtaining this examination is the responsibility of the employee.

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5. Q. If I go for an eye examination, is there anything my eye care provider needs to know about my work with the VDT?

A. Yes, tell the doctor you work with a VDT. Also, take the following information with you to the examination:

- Distance from eye level to the top of the screen.
- Distance from your eyes to the keyboard.
- Location of your source document and its distance from your eyes.
- Location of the VDT relative to windows and other light sources.
- Room lighting type and intensity.
- Typical font size and color and screen background color you use.
- Whether your VDT is an LCD or CRT type screen.

A co-worker or supervisor may help you obtain the measurements while you sit at your work station.

6. Q. Are special purpose glasses necessary for VDT operators?

A. VDT working distances may not be the same as for conventional reading or other visual activities. Most people who do not currently wear eyeglasses will not need glasses for computer use either. However, if you already need bifocals, trifocals, or reading glasses, working at a VDT or a special task may require special purpose glasses. Some individuals with eye coordination or focusing difficulties may also have special eyewear needs. Only a professional eye care provider can determine if special purpose eyewear is needed.

7. Q. Who pays for the vision examination and glasses if I need them for VDT use?

A. The employee is responsible for these costs (just as an emergency vehicle driver is responsible for the cost of examination and eyewear needed to maintain a driver's license). Civilian employees may use their health insurance plan or private provider for care. Military members and their eligible family members may seek care at their local military treatment facility.

8. Q. Sometimes I can see the screen flicker or pulse rapidly out of the corner of my eye when I look at my source document. Should I worry about it?

A. No, the flicker does not hurt you. However, some people find it very distracting. Different parts of the retina (the tissue in the back of the eye that receives the image you see) are sensitive to different types of images. The periphery (outer part) of the retina detects the flicker better than the central part. The flicker only occurs with users of CRT screens and not with LCD screens. Flicker may be minimized by placing your source document as close as possible to the screen.

9. Q. Does a short break from VDT work help prevent or relieve eye complaints?

A. Yes. Breaks help relieve or prevent eye complaints. This does not mean that you need to stop work altogether. NIOSH recommends 15 minutes of alternate work (non-VDT) for every 2 hours of constant VDT operation. It may also be helpful to occasionally look up

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from the screen or keyboard. Try to look at an object that is over 10 feet away. This will relax the focusing and coordinating muscles of the eye. It may also help to increase the size of the font on the screen.

10. Q. Reflections on the VDT screen make viewing the work difficult. Is there something I can do about this problem?

A. Yes. Position of the VDT screen is very important in reducing reflections. It is usually impractical to eliminate reflected light completely, but it may be reduced to acceptable levels. LCD screens generally have less problems with reflected glare than CRT screens. A trial and error method may be necessary to solve the problem. Try these actions:

- Tilt the top of the screen towards you to help reduce reflections from ceiling lights.
- Place a hood above or to the side of the screen to block light falling on the screen.
- Dim some overhead lights; change to indirect lighting (light that does not shine directly onto the screen); or replace a single light with several less powerful ones.
- Replace standard fluorescent light diffusers with parabolic louvers (special baffles or grates) that direct the illumination.
- Shade windows or place the screen where window light does not shine on the screen or into the eyes of the worker.

If these modifications do not help or are impractical to accomplish, an anti-reflective screen may be of value. However, this device may also reduce the image clarity on the screen. Some polarized screens with polished surfaces may actually increase the amount of glare.

11. Q. My eyes feel more comfortable if the room lights are turned off when I use my VDT. Is this harmful to my eyes?

A. No. This may be acceptable if you do not have to read a document. Viewing a VDT screen requires a lower illumination level for most offices. A small light over your source document will help when reading in a room with reduced background lighting. The overall lighting is usually a compromise that meets the needs of all the workers in the office.

12. Q. Is one screen and letter color combination better than another?

A. No. At least one study shows no significant difference in efficiency with any of the major color combinations. However, individual preferences may make a difference, and the worker may modify the screen colors to match individual taste and comfort. Adjusting the brightness or contrast may also make VDT use more comfortable to the individual worker. Some experimentation may be necessary to find the best combination.

13. Q. I have heard that operating a VDT is one of the most stressful types of work. Is this true?

A. Stress is a common complaint of VDT workers (and other workers as well). Some stress may be beneficial because it helps most of us to function. However, excessive stress may be a problem. Stress with VDT use may be related to:

- Job demands and the nature of the work environment.

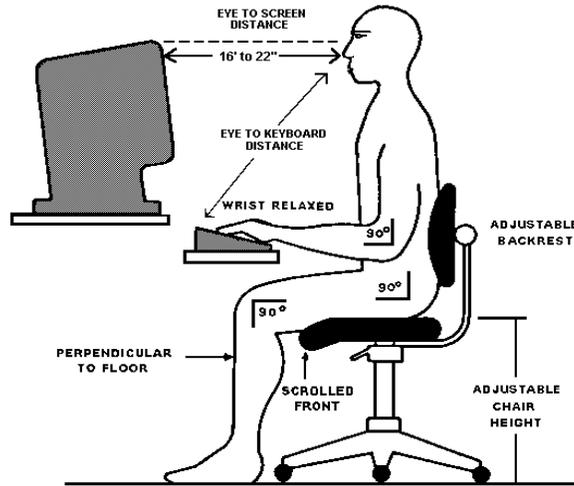
- Poor workstation design that may cause physical and psychological stress.
- Conditions such as temperature, humidity, and noise.

14. Q. I hear a lot about Carpal Tunnel Syndrome in VDT users. What is Carpal Tunnel Syndrome, who is likely to get it, and how can it be prevented?

- A. Less than 0.1 percent of the general population has Carpal Tunnel Syndrome but in some work settings (like meat packers) it can reach 15 percent. Carpal Tunnel Syndrome occurs with repetitive motion of the hands and wrists, especially when high force levels are required. This causes swelling at the base of the wrist. There is a small “tunnel” or aperture in the wrist that is shared by a major nerve and nine ligaments (that control finger movement). When this area gets irritated from over use, it swells slightly and puts pressure on the nerve. The result may be pain in the wrist or arm or a slight numbness or tingling in the thumb and first three fingers. This problem is common to more than just VDT operators. It is also found in meat packers, musicians, dental hygienists, and others. It is more common in individuals with medical conditions such as diabetes, arthritis, and thyroid disease who work in repetitive work. Having good wrist support at the VDT work station helps most people avoid the problem. If you develop symptoms of Carpal Tunnel Syndrome, contact your local Occupational Health Clinic for assistance.

15. Q. Is it possible to reduce the risk of back, neck, and other muscular discomfort from prolonged VDT use?

- A. Yes. Proper design of the work station will reduce muscular discomfort. Figure 1 demonstrates proper posture and work station design. Consider the following suggestions:
- The keyboard and chair should be adjusted to a height that will allow approximately a 90 degree bend of the elbow.
 - The hip, knee, and ankle joints should be at approximately a 90 degree angle.
 - The feet should be flat on the floor. Individuals with shorter legs should use a foot rest to allow firm support for their legs and feet.
 - The top of the screen should be just below eye level so the neck and head remain erect.
 - The keyboard should be detachable and independently adjustable in height to allow the 90 degree bend of the elbow. The wrists should be kept straight. (A wrist rest may be helpful for those who spend long hours at the keyboard.)
 - The screen angle should be adjustable up and down to reduce glare. If used, a document holder should be at the same height and distance as the screen to reduce eye fatigue.
 - The chair should be on a wide base (5 casters are the most stable), able to swivel, and adjustable in height. To properly support the lower back, the backrest should be adjustable up and down and also forwards and backwards. The front edge of the seat cushion should be rolled down at the front edge, and the seat should have a cloth covering with firm padding.
 - Occasional minor shifts in posture or getting up and moving around may help prevent muscle fatigue.



f Figure 1 – Work Station Design

Physical work station design assistance may be obtained by contacting
 USACHPPM, Ergonomics Program, APG, MD
 at DSN 584-3928 or Commercial (410) 436-3928; or FAX to DSN 584-5471 or Commercial (410) 436-5471.

For comments concerning this TG or for further assistance, contact
 USACHPPM, Tri-Service Vision Conservation and Readiness Program, APG, MD
 at DSN 584-2714 or Commercial (410) 436-2714; or FAX to DSN 584-4117 or Commercial (410) 436-4117.

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