



**Strategic**  
Safety Systems

**Training Notes**

**VDU Operation**

## **Introduction and Background**

Visual display units (VDU's) and other display screen equipment are now commonplace in the workplace. Many people use them intermittently and some use them almost continuously.

The risks to health from a VDU stem not from the VDU itself but from the workstyle it imposes. Such a workstyle may comprise long periods sat in one position concentrating on text or images on a screen.

These notes discuss these workstyle risks and shows what you can do to minimise the effects.

The people most at risk are "Users", (this is defined below) though the principles apply to all people who use VDU's.

## **Possible Effects on Health**

### ***Back, neck and upper limb pains and discomfort***

Prolonged static posture of the back, neck and head can cause pains and discomfort to the back, neck and shoulders. Working with the arms tensed or with the shoulders hunched can cause upper limb, shoulder and neck pains. Backward flexing of the wrist by the incorrect relationship between the arms and keyboard can lead to soft tissue disorders around the wrist.

All of these can be reduced by a risk reduction strategy based on the use and correct adjustment of furniture, equipment design and layout and work practices.

### ***Eye and eyesight effects***

Contrary to popular belief, there is no evidence that the use of VDU's causes eye or eyesight damage; nor does it make existing defects worse.

However, pre-existing eyesight defects may become more apparent when using VDU's, making the work more tiring than would otherwise be the case.

In addition, some people may experience temporary visual fatigue, leading to impaired visual performance, red or sore eyes or headaches. These can be prevented by the steps covered below

### ***Fatigue and stress***

Some people complain of symptoms which they blame on VDU work. In general, the symptoms may be attributable to VDU work, but they are not unique to it. They may be secondary effects of upper limb or visual problems or may be due to high repetition rates, social isolation or lack of control of the work by the user. The risks of fatigue and stress can be minimised by following the practices outlined below.

### ***Other effects***

There is no evidence that the levels of electromagnetic radiation from VDU's are anywhere near high enough to constitute a risk to health. This includes risks to pregnant women, though it is logical to expect the other effects due to posture to become more pronounced as the term of the pregnancy increases.

There is also no evidence that working with VDU's induces epileptic seizures.

## What you can do

### *Setting up equipment*

Fig. 1 shows a typical workplace layout.

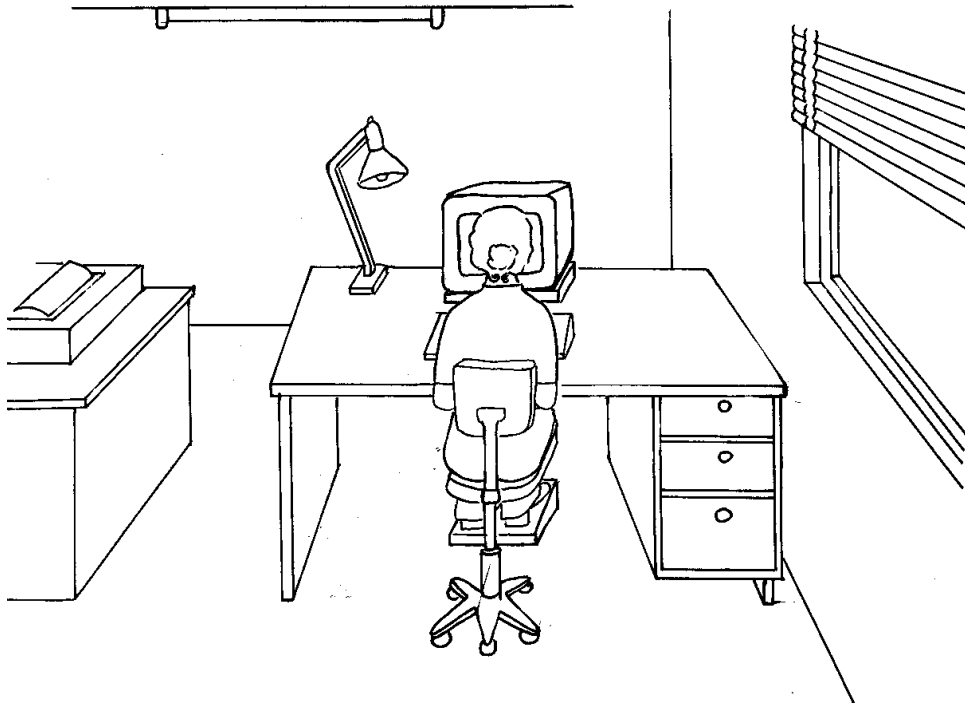


Fig 1

The points to note are:

1. Lighting should be adequate, but not too bright so that it is glaring. Lights should not reflect in the screen
2. There should be an adequate contrast.
3. Distracting noises from other equipment should be minimised. The practice of siting a printer out of reach also promotes periodic exercise.
4. There should be adequate leg room to allow changes in posture.
5. The body should be directly in front of the screen; twisted postures should be avoided where practicable.
6. If window reflections are likely to be a problem, blinds should be available.
7. Software should be appropriate to the task and should be adaptable to the user.
8. The screen should be adjustable for tilt, brightness and contrast and should be free from flicker and reflections.
9. The keyboard should be useable, adjustable, detachable and defect free.
10. The work surface should be glare free, allow flexible arrangements and be as spacious as possible.
11. The chair must be adjustable, and must be adjusted to suit the task.
12. If necessary, a footrest should be provided. See paragraph C on page 4.

Fig. 2 shows how to set up the workstation.

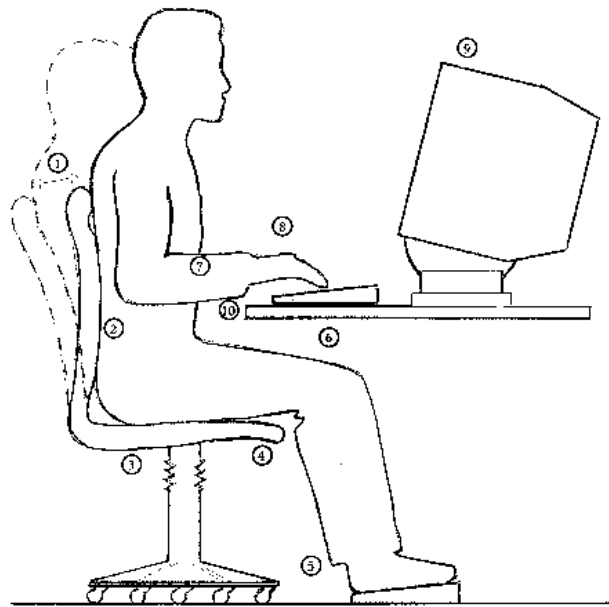


Fig. 2 Workstation Setting Up

Follow this sequence to set up your workstation:

- A. Position the keyboard so that there is adequate room in front to support hands or wrists during pauses. (See 10).
- B. Position the seat and set its height so that your forearms are approximately horizontal and your upper arms are approximately vertical. (See 7).  
**Adjust the seat height to suit your arms, not your legs.**
- C. Verify that your feet reach the ground without excess pressure on the backs of your thighs. If they don't reach the ground, or there is excessive pressure, then use a footrest to effectively bring the ground up to your feet.
- D. Adjust the seat back, so that your back is supported whilst you use the keyboard. You need good support in the lumbar region (See 2).
- E. Adjust the keyboard tilt so that there is minimal extension, deviation or flexion of the wrists. Some people find the use of a padded wrist support beneficial.
- F. Tilt the screen so that your head position is comfortable. Refer to fig.6 for optimum screen heights.
- G. Adjust lamps or window blinds so that there are no reflections

The key to all of these steps is to get yourself comfortable so that your body is not strained. It may be that you change settings as your task changes and I have found it quite useful to change the seat back position for different tasks.

## Effects of different arrangements

Fig. 3 Effects of correct and incorrect seat heights



Seat is too low. This causes strain on the wrists and excessive pressure on the buttocks.

Seat at correct height. Forearm is horizontal and pressure is even on buttocks and back of thighs

Seat is too high. Forearm is below the horizontal and head would have to be tipped down. Pressure on rear of thighs.

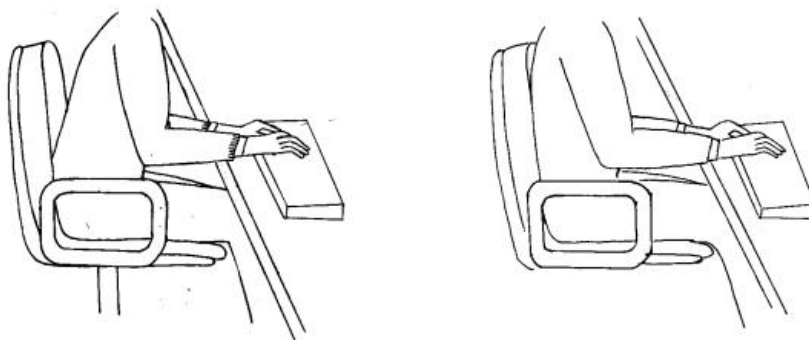


Fig. 4 shows a posture that is commonly adopted. The legs are tucked back and this concentrates pressure on the back of the thigh next to the knee. This is acceptable for only short periods and people should be made aware that this can cause problems if adopted for long periods. This posture also give little lumbar support as discussed with fig. 5.

Fig. 4

Fig 5a

Fig. 5b



These two pictures show the potential problems with fixed-back chairs. Fig 5a shows little support for the lumbar area in the back. In fig. 5b, the operator is sitting back, giving good support to the back. This has been done at the expense of keeping the upper arm vertical but this is much less critical that having insufficient back support.

Note the excellent support to the rear of the thighs provided by this type of seat and such seats are probably more suitable for tall people than those with an adjustable backrest which tend to have short seats.



Fig. 6 Use of footrest.

- The seat has been adjusted so that forearm is horizontal.
- If the feet cannot be placed on the ground so that they are flat without excessive pressure on the rear of the thighs, then use a footrest to bring the feet up.

Correct and incorrect posture on wrist.

- Avoid being wrist back.
- Bring seat to a height which allows the forearm to be horizontal
- Provide support to wrist if necessary



Fig. 7a Correct



Fig. 7b Incorrect



Fig. 8a

Fig. 8a shows good support to the wrist. Note the positions of the fore and upper arms. Having the forearm horizontal is more critical than having the upper arm vertical, but the upper arm should be as close as is comfortable to the vertical



Fig. 8b

Fig. 8b shows the keyboard close to the edge which allows no support.

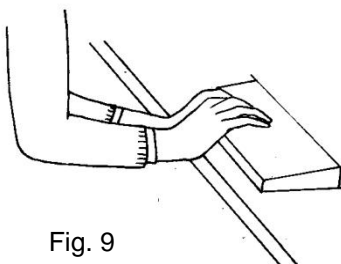
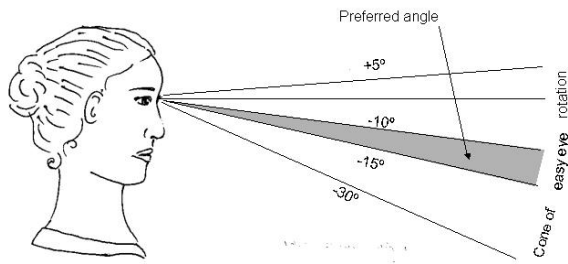
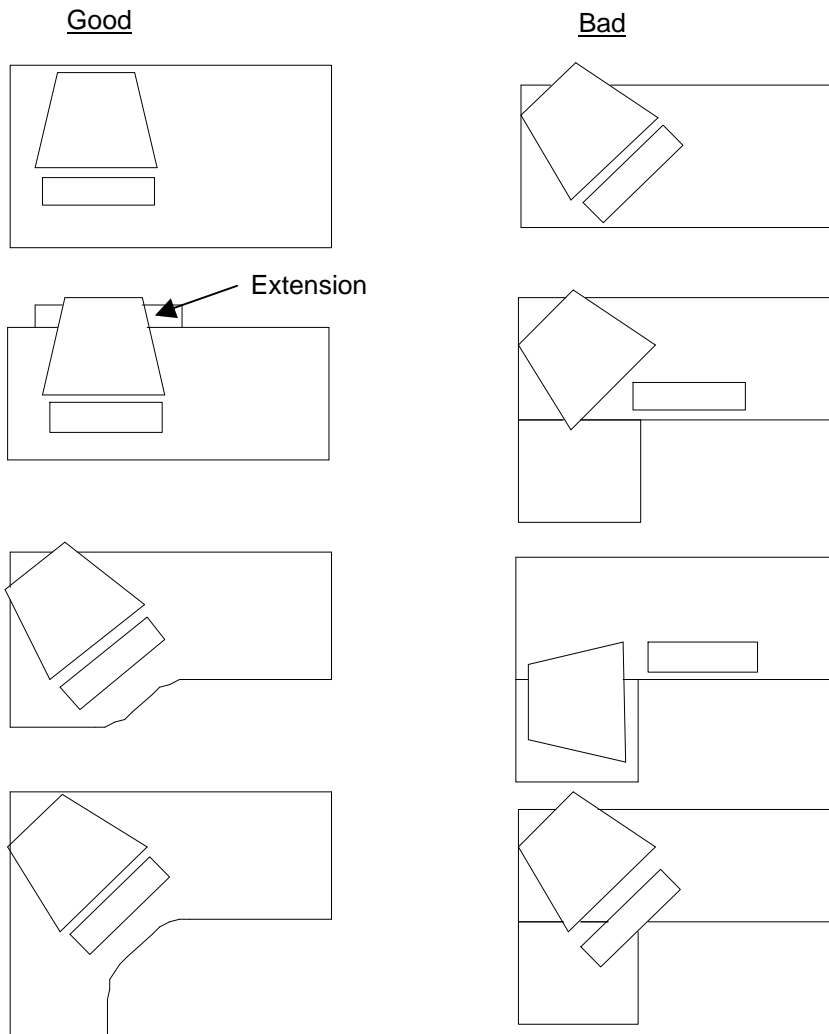


Fig. 9

Fig.9 shows a situation where the wrists are bent backwards (which will occur where the seat is too low, forcing the forearms to be low). Not only are the wrists contorted but the fingers are bent forwards to compensate. If this posture is prolonged, wrist and finger problems will develop.



**Fig. 10 Ideal Screen Height**  
 This shows the optimum height to minimise eye tiredness.



**Fig. 11 Examples of good and bad desk/VDU arrangements**

**Work routine**

Wherever possible, arrange your work routine as follows:

- Mix your tasks so that VDU work is broken by work away from the screen.
- Use informal breaks on other tasks rather than formal breaks. Studies have shown these to be much more effective.
- Use short more frequent breaks rather than longer breaks. 5 minutes every hour is more effective than 15 minutes every 2 hours.
- Take breaks before the onset of fatigue.

### ***Maintenance of your work environment***

Keep your work area uncluttered and clean. Also, clean your screen frequently so that you do not end up (unwittingly) focussing on the dust.

### ***Contributing to assessments and reporting problems***

You are the person who knows most about how it feels to work with your VDU.

The key ways of influencing the factors that affect your health when using VDU's are:

- Contribute to any assessment of your VDU.
- Bring to the attention of your supervisor any symptoms which you may suspect to be due to VDU work, or any problems such as the presence of reflections or the lack of an adjustable chair.

### **What the employer must do**

The employer is obliged to:

- Make an assessment of each VDU where people are habitual users. This does not mean that every VDU must be assessed.
- Take all practical steps to minimise the risk to health
- Provide (ie pay for) eyesight tests for any habitual user who requests such a test, at regular intervals determined by an optometrist, or for users experiencing difficulties which may be related to VDU work. There is no compulsion on you, the operator, to undergo these tests.

It is up to the individual concerned to purchase "normal" spectacles or contact lenses, though if special spectacles are necessary for VDU work then the employer must pay for a reasonable pair.

### **Who is a User?**

A person may be classified as a user if most or all of the following apply:

- The person depends on the use of the display screen to do his or her job
- The person has no discretion whether or not to use the display screen
- The person needs significant training or particular skills in the use of display screen equipment to do his or her job
- The person uses display screen equipment for continuous spells of an hour or more at a time
- The person uses display screen equipment in this way more or less daily
- Fast transfer of information between the user and the screen is an important requirement of the job
- The performance requirements of the system demand high levels of attention and concentration by the user, eg where the consequences of error may be critical



## Checklist

Here is a checklist against which a VDU for an habitual user can be assessed.

### Screen:

Are the characters well defined and clearly formed?	
Is the image stable, not flickering or wavering?	
Can brightness and contrast be adjusted by user?	
Can the screen tilt and swivel?	
Can the screen be split from the PC?	
Is the screen free from glare or reflections?	
Is the screen at the optimum height?	

### Keyboard

Is the keyboard tiltable and separate from the screen?	
Is there sufficient space in front of keyboard for hands and arms?	
Does the keyboard have a matt surface?	
Does the keyboard design facilitate the use of the keys?	
Are the symbols adequately contrasted?	

### Work Desk and Surface

Is work desk sufficiently large, have low reflectance and allow flexibility?	
Is the document holder stable?	
Is there enough space for user to find a comfortable position?	

### Chair

Is chair stable and does it allow user easy movement?	
Is seat height adjustable?	
Is seat back adjustable for height and tilt?	

### General

Is it possible for all people to sit at correct height? eg Is keyboard height adjustable or a footrest provided if needed?	
Is there sufficient space to allow user to change position?	
Are people free from having to sit contorted? ie The screen and keyboard are best in front of them.	

### Lighting, reflections and glare

Is lighting sufficient for task? Is not too high so that it fails to provide adequate contrast?	
Is screen free from reflections from windows, lights etc., at all times? If daylight falls on the workstation are curtains or blinds provided?	

### Noise and heat

Is the noise level of the equipment low? eg freedom from distraction; speech not disturbed.	
Does the equipment produce low levels of heat?	

### Interface between computer etc. and user

Is the software suitable for the task?	
Is the software easy to use? Is it adaptable to the abilities of the user?	
Do the systems provide feedback to the user?	
Does the system display information in a format and at a pace suited to the user?	
Have software ergonomics been considered?	