UNIT SIX

SOFTCOPY OUTPUT DEVICES

Tapescript 1

Eyestrain. Headaches. Neck cramps. What is a frequent cause of the complaints? The human display screen, the output device that many business users use the most. Actually, complaints have diminished as video display technology and ergonomics, the science of human comfort, have advanced. The two main types of video screens are the cathode-ray tube (CRT) and the flat panel.

The cathode-ray tube (CRT), probably the most popular softcopy output device, is used with terminals connected to large computer systems and as a monitor for microcomputer systems. This type of video display screen is used to allow the operator to view data entry and computer output. Monitors that display only letters, numbers, and special characters are called alphanumeric monitors (or alphanumeric terminals). They look like television screens and display 80 character per line, with 24 lines visible at one time. Screens that can display both alphanumeric data and graphics are called graphics monitors (or graphics terminals). Graphics monitor can be devided into groups that display one-, two-, and three-dimensional graphics.

The CRT's screen display is made up of small picture elements, called pixels for short. The smaller the pixels (the more points that can be iluuminated on the screen), the better the image clarity, or resolution.

Tapescript 2 – MONOCHROME AND COLOR MONITORS

A monochrome monitor (a monitor capable of displaying only a single-color image) and an RGB color monitor (RGB stands for red, green, and blue) differ in two principal ways. First, they have a different number of electron guns. A monochrome monitor has only one electron gun; however, an RGB color monitor has three electron guns. Second, the screen in an RGB color monitor is coated with three types of phosphoros: red, green, and blue.

The operation principles of both monitors are almost exactly the same. However, each pixel in an RGB monitor is made up of three dots of phosphoros, one of each color. The three electron guns direct their beams together. Each gun is aimed precisely so that it can hit a specific color dot in each pixel. A wide variety of colors can be created by controlling which guns fire and how long a burst they project at each dot. For example, if all three guns are fired at full intensity, a specific color is created fot that pixel. If only two guns are fired at full intensity and the third gun is fired at half intensity, an entirely different color results. By varying the intensity with which the guns fire, RGB monitors are capable of displaying a large number of diffrerent colors. As you might expect, the control circuitry and software to direct the operation of an RGB monitor are somewhat more sophisticated than the corresponding components for a monochrome monitor.

Tapescript 3 – FLAT SCREEN TECHNOLOGIES

PRO'S AND CON'S

Advancements in micro-technology are destined to change fundamentally the character of mankind. In the same way as the Industrial Revolution freed human muscles of a tremendous number of physical tasks and enormously increased productivity, the microprocessors and computers of today are beginning to relieve the human brain of great burdens of drudgery, thereby freeing the individual mind for more interesting activities.

However, against this view of machines as slaves in the service of man there is the less optimistic opinion that the expansion of the activities of the machine will lead to the deterioration through lack of use of the corresponding human abilities. Will the students whose pocket calculators relieve them of the donkey-work arithmetic calculation eventually find themselves unable to do it without them?

The steam engine did not lead to the reduction of men's muscles and the typewriter did not destroy the ability to write longhand.

An authority explains a possible danger in the fact that "a computer will do what you tell it to do, but that may be much different from what you had in mind."

The disadvantages of the CRT-large size, high power consumption, and fragility, plus occasional flickering images have led to the development of flat screen technologies.

Flat screen technology is particulary useful for laptop computers, which can be used in the office and then taken home or on trips. Producing a truly lap-size, or laptop computer - that is one that is fully functional and weighing 15 pounds or less – has not been easy, and designing the video display has been the most difficult problem.

Interest in laptop computers encouraged researchers to explore different approaches to developing high-resolution, low-power consumption, flat screens with the same graphics capabilities of the traditional CRT. The most effective results to date have been achieved in three areas: liquid crystal display, electroluminescent display, and gas plasma display.

LIQUID CRYSTAL DISPLAY

The liquid crystal (LCD) uses a clear liquid chemical trapped in tiny pockets between two pieces of glass. Each pocket of liquid is covered both front and back by very thin wires. When a small amount of current is applied to both wires, a chemical reaction turns the chemical a dark color – thereby blocking light. The point of blocked light is the pixel.

The principal advantages of LCD are:

- low power consumption;
- low costs;
- small size.

The biggest disadvantages are:

· LCDs do not emit light, as a result, the image has very little contrast;

· the screen is very susceptible to glare, so the optimum viewing angle is narrow;

· LCDs as yet have no color capability (however, some can display up to eight levels of grays);

· the resolution is not so good as that of a CRT.

Significant research is being conducted to overcome the limitations of LCS screens to decrease glare and improve contrast, thereby making the screen easier to look at. (If you buy a laptop computer with an LCD display screen to obtain a "backlit", one, which is easier to view the image greater contrast.) Several companies are also actively working on the development of LCDs with full capability. It is anticipated that LCD will continue to be a popular technology for some time.

ELECTROLUMINESCENT DISPLAY

Electroluminescent (EL) display uses a thin film of solid specially treated material that glows in response to electric current. To form a pixel on the screen, current is sent to the intersection of the appropiate row and the column causes the screen to glow at that point.

EL display provides very image resolution and excellent graphics capability; it also generates its own light (called an active display), unlike LCS, which only reflects light. Several manufacturers are currently working on the development of electroluminescent displays with full color capability. Most experts have predicted that this technology will come closest to matching or even surpassing all of the capabilities of the traditional CRT. The major limitation of this technology has been cost.

GAS PLASMA DISPLAY

The oldest flat screen technology is the gas plasma display. This technology uses predominantly neon gas and electrodes above and below the gas. When electric current passes between the electrodes, the gas glows. Depending on the mixture of gases, the color displayed ranges from orange to red.

The principal advantages of gas plasma display are:

- the images are much brighter than on a standard CRT;
- the resolution is excellent;
- glare is not a significant problem;
- the scree does not flicker like some CRT.

The main disadvantages are:

- only a single color is available (reddish orange);
- the technology is expensive;
- it uses a lot of power;
- it does not show sharp contrast.

Several laptop computers use gas plasma display, including models produced by Grid Compass, Ericsson, Sharp, and Toshiba.

Key for Activity I

1. output device	2. terminal	3. monitor	4. display	5. to view
6. output	7. alphanumeric	8. 80	9. 24	10. visible

11. terminals 12. pixels 13. clarity 14. standard 15. data
16. vertically 17. boxes 18. gun 19. two thousand
20. fit 21. resulting

Key for Activity II

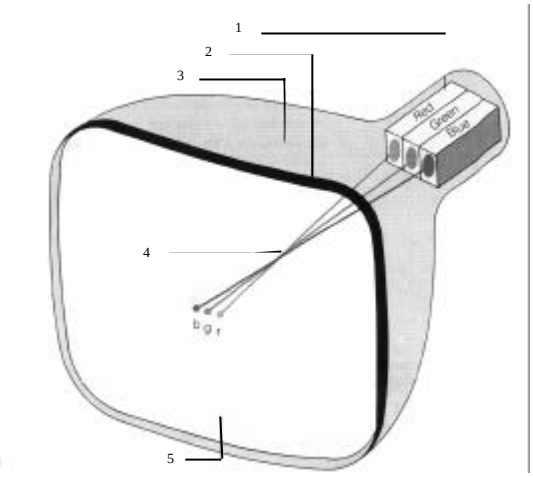

Figure M2. RGB color monitor.

1- electron guns; 2. shadow mask; 3. RGB cathode-ray tube; 4. electron beams; 5. phosphor-coated screen

Key for Activity III

a. higher power consumption; fragility; flickering images.
b. laptop computers.
c. laptop computers are fully functional; they are easy to handle (lapsize); light (less than 15 pound in weight) and can be taken home or on trips.
d. reseachers want to develop glass screens with improved qualities: high resolution, low-power consumption, high graphics capabilities.
e. liquid crystal display; electroluminescent display; gas plasma display.
f. a clear liquid chemical trapped in tiny pockets between two pieces of glass. Each pocket of liquid is covered – front and back – by very thin wires. When a small amount of current is applied to both wires, the chemical becomes dark and blocks light. The point of blocked ligt is the pixel.
g. Advantages:

- low-power consumption;
- low cost;
- small size.

Disadvantages:

- the image has very little contrast;
- the screen is susceptible to glare;
- have no color capability;
- low resolution.

a. An EL display uses a thin film of solid, a material specially treated to glow in response to

electric current. To form a pixel on the screen, current is sent to the intersection of the appropiate row and column. The combined voltages from the row and the column cause the screen to glow at that point, and a pixel is formed on the screen.

b. Advantages:

- high resolution;
- excellent graphics capabilities;
- they are active displays, being able to generate their own light.

Main disadvantages: high costs.

a. GAS PLASMA DISPLAY is based on neon gas and electrodes above and below the gas. When electric curent passes between the electrodes, the gas glows.

b. It depends on the mixture of gases.

Good points:

- bright iamge;
- excellent resolution;
- insignificant glare;
- the screen does not flicker.

Weak points:

- only a single color is available (reddish orange);
- expensive technology
- high power consumption;
- does not show sharp contrast.

Tapescript and answer key for Activity IV

Probability plays a special role in our lives because we use it to measure uncertainty. We are continually faced with decisions leading to uncertain outcomes, and we rely on probability to help us make our choice.

A theory was built around the mathematical concept of probability. Due to it we can predict with a certain amount of confidence, say, the maximum possible error in calculations performed by a computer; the maximum and minimum number of spare parts needed by a lorry fleet per year; or the defective articles in a factory. Such predictions are possible when considering a large number of events, that is to say if we make use of the probabilistic (statistical) method of investigation.

1:False; 2:False; 3:True; 4:True; 5:Fasle; 6:False; 7:True; 8:False; 9:True

Tapescript and answer key for Activity V, VI

1) In statistics, **frequency** is the ratio of the actual to the possible number of occurrences of an event.

2) The frequency of an event in a series of **n** repetitions is thus called its **statistical probability**.

3) If we repeat an experiment many times the frequency of the event will level out and finally approach a constant; this is what is called **stabilisation frequency**.

Tapescript and answer key for Activity VII

Every age has produced a synthesis of its most trusted items of knowledge. In this view ours is, perhaps, the most diversified, the least integrated and most diffusely applied body of knowledge

mankind has yet produced. It is as well, the most exact in specific, fragmented areas, and the most operational. That it has brought about the greatest disorder in the terrestrial household of man is little wonder. It is likewise obvious that unless we integrate and focus our knowledge the disorder will grow into disaster.

Tapescript and answer key for Activity VIII

The notion of "system-cybernetics" refers to control processes; it interrelates input-output functional analysis with internal state-description. That is, cybernetics is used as a general term for the process relationship between an "ordered whole" (the system) and its environment – i.e. feedback.

Key for the Self-evaluation Test

6.1. a) 1-whose, 2-who, 3-which, 4-who, 5-what, 6-whom, 7-that, 8-there, 9-which, 10-when, 11-that, 12-what.

b) 1. For instance; 2. Thus

2. 1-thus, 2-This is why, 3-As a matter of fact, 4-But, 5-so, 6-that, 7-And, 8-as, 9-Thus, 10-However, 11-Therefore, 12-with a view to, 13-Finally, 14-this way.

6.2. 1-problem, 2-progress, 3-life, 4-experience, 5-knowledge, 6-description, 7-inferences, 8-experience, 9-experience (/possibilities), 10-induction, 11-law, 12-law.

6.3. 1g, 2c, 3f, 4a, 5b, 6I, 7e, 8h, 9d.

6.4. 1 o, 2 a, 3 the, 4 o, 5 the, 6 the, 7 the, 8 o, 9 a, 10 the, 11 o, 12 the, 13 o, 14 the, 15 an, 16 o, 17 o, 18 o, 19 o, 20 o, 21 o, 22 o, 23 o, 24 o, 25 o, 26 o, 27 o, 28 o, 29 the, 30 the, 31 a, 32 the, 33 o, 34 the, 35 o, 36 the, 37 o, 38 o, 39 a, 40 o, 41 the, 43 o, 44 o.

Tapescript and answer key for Activity IX

6.5. a) 1. gather, store (and pour out); 2. prepare; 3. sort; 4. make out; 5. control; 6. grade; 7. keep (up to date); 8. keep and analyse; 9. direct; 10. mail; 11. make out; 12. find out; 13. keep track of; 14. forecast

b) business	4,7,10
industry	2,11,13
travelling	5,9,12
weather forecast	1
medicine	8
education	6
post	3
research	
everyday life	

6.6. 1. the electronic computer, 2. 1946, 3. add, subtract, multiply, 4. divide, 5. speed, 6. accuracy, 7. work, 8. than man, 9. once it is asked a carefully worked out set of questions, 10. a technician, 11. computer language, 12. gather, 13. information, 14. many, various purposes, 15.

can the computer gather facts, 16. whenever, 17. are needed/required, 18. gathering, 19. storing, 20. the computer can, 21. solve, 22. took month (week, etc.), 23. to do, 24. predict, 25. but, 26. are becoming/become, 27. Even though, 28. some of the tasks, 29. performed by our, 30. computers, 31. us, 32. not yet.