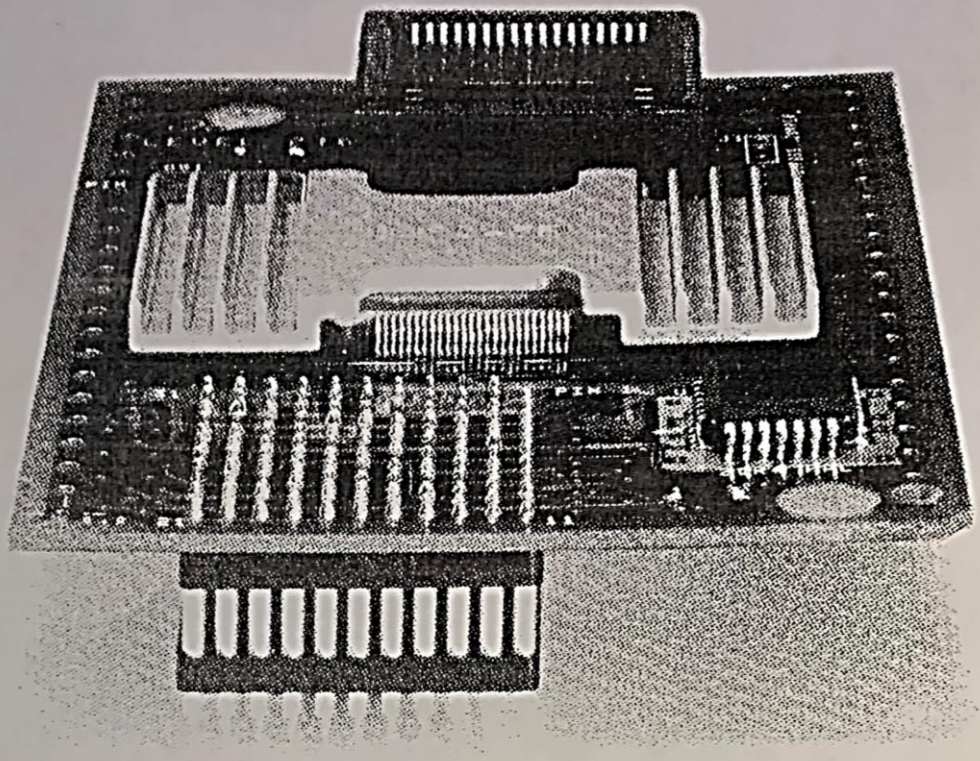
TD 30 June

# The processor



## Reading

**Task 11**

Read this passage about the structure of the processor and fill in the gaps using the words below.

**Structure of the processor**

The processor consists of a [1] _____, which is a circuit board on which are mounted [2] _____ chips, memory chips, and other components linked together by [3] _____ lines or channels in the form of control, address, and data [4] _____. In addition, a processor has [5] _____, which are electronic circuits providing specialized functions such as graphics, or which connect a system board to [6] _____. The system board also consists of electronic devices, such as an electronic [7] _____ for controlling the speed of operation; [8] _____, which store numeric data during the course of processing; and various [9] _____, including sequence control register, address register, and function register.

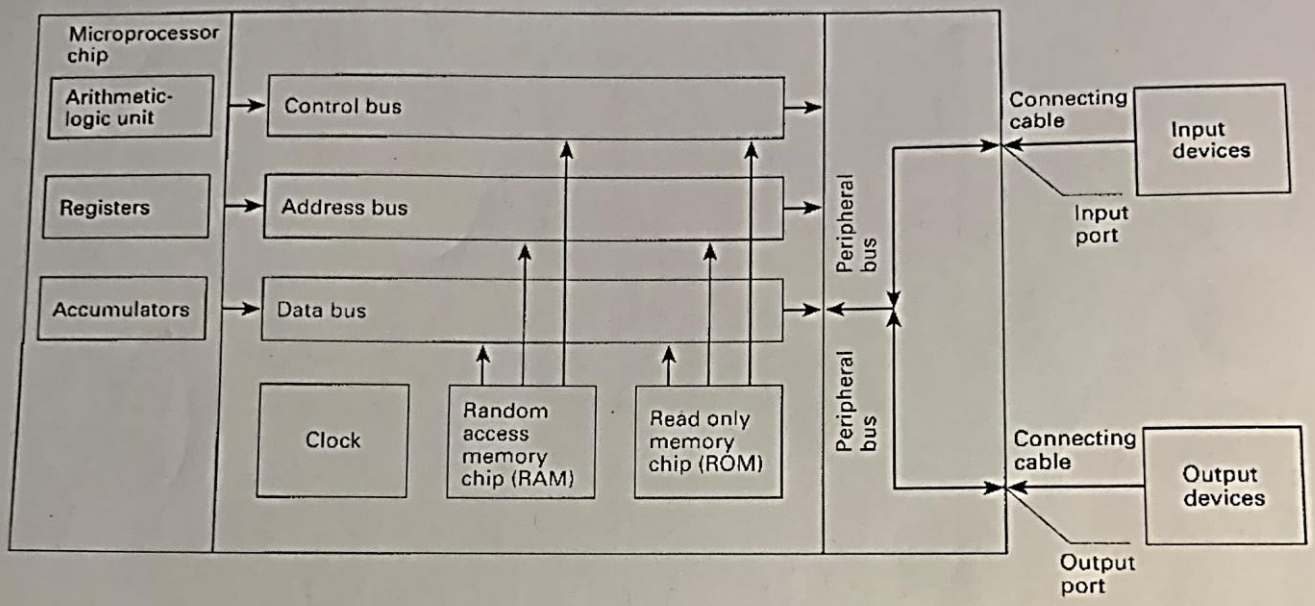
*adaptor boards* *registers* *microprocessor*
*clock* *conductive* *buses*
*system board* *accumulators* *input or output devices*

## Reading

**Task 12**

Use the information in the reading passage and the diagram to help you match the terms below with the appropriate explanation or definition.

A processor consists of many different electronic circuits and devices for performing control functions, arithmetic and logic operations, and data transfers. Data may be transferred from backing storage to the internal memory or from the internal memory to the arithmetic unit by means of conductive channels known as buses. The part of the processor which controls data transfers between the various input and output devices is called the control unit.




| | | | |
|---|---|---|---|
| **1** | microprocessor chip | **a** | used to send address details between the memory and the address register |
| **2** | registers | **b** | consists of an arithmetic-logic unit, one or more working registers to store data being processed, and accumulators for storing the results of calculations |
| **3** | accumulators | **c** | a group of signal lines used to transmit data in parallel from one element of a computer to another |
| **4** | control bus | **d** | groups of bistable devices used to store information in a computer system for high-speed access |
| **5** | address bus | **e** | an electronic circuit, usually a quartz crystal, that generates electronic pulses at fixed time intervals to control the timing of all operations in the processor |
| **6** | data bus | **f** | used for storing part of the operating system and application software known as 'firmware'; can only be read; cannot be written to or altered in any way |
| **7** | clock | **g** | used to store numeric data during processing |
| **8** | RAM | **h** | a group of signal lines dedicated to the passing of control signals |
| **9** | ROM | **i** | used for the temporary storage of application programs and data; can be written to and read from |

## Speaking

**Task 13**

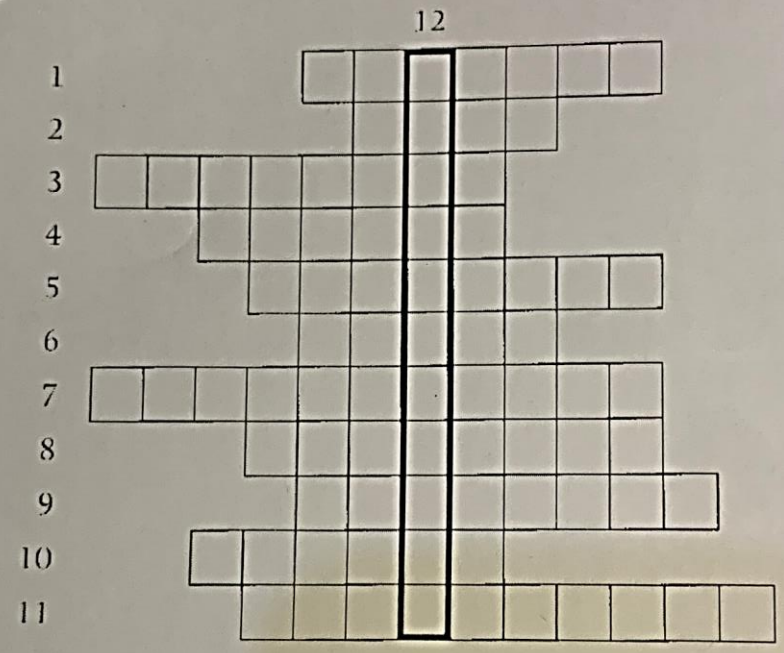
Work in pairs. Write down the list of terms (1–9) in Task 12 on a piece of paper. Without referring to your book, take turns to ask and answer questions about their functions.

► Useful expressions
*What is/are . . .?*
*What does/do . . . do?*

## Word-play

Complete the puzzle and find the key word in 12 down.

**Task 14**




**Across**

**1** A conductive line such as a data bus. (7)
**2** A visual symbol used in a menu to represent a file or program. (4)
**3** An input device used in computer games. (7)
**4** An ____ device converts the electrical signals inside a computer into a form that can exist outside the computer. (6)
**5** The name given to system software that is held in ROM. (8)
**6** A device with one or more buttons used to point at locations on a computer screen. (5)
**7** The part of the CPU that transmits co-ordinating control signals and commands to the computer. (7,4)
**8** 1,048,576 bytes. (8)
**9** A large store of computerized data. (8)
**10** The ____ system was first used commercially on the Apple Macintosh computer, but is now widely used on IBM machines. (7)
**11** A signal route dedicated to sending information about locations within a computer. (7,3)

**Down**

**12** A register containing the results of an operation performed by the arithmetic-logic unit. (11)

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## Speaking

**Task 13**

Work in pairs.

**Student A:** You are a sales representative trying to sell your company's notebook computer. You are presenting your product to the Sales Director of a manufacturing company which is thinking of buying 30 notebook computers for the sales staff. Decide on the specifications and complete the table below. Then try to persuade the Sales Director to buy your product.

| | |
|---|---|
| Name | |
| Type (size) | |
| Processor type | |
| Operating speed | |
| Memory | |
| Display | |
| Power supply | |
| Cost | |
| Other features | |
| | |
| | |

▶ Useful expressions
*It costs...*
*It runs/operates on...*
*It weighs...*

**Student B:** You are the Sales Director of a manufacturing company. You are considering buying 30 notebook computers for your sales staff. Find out about all the specifications of the model on offer. Decide whether it is suitable for your needs.

▶ Useful expressions
*How much does it cost?*
*What power source does it use?*
*How big/heavy is it?*

# Operating systems

## Reading

**Task 14**

Before you read the text, try to answer the following questions:

1 What is an operating system and what is its purpose?
2 Where is an operating system stored and how is it transferred to internal memory?
3 List some of the tasks typically performed by an operating system.

Now read the text and check your answers.

# General features of operating systems

An operating system is a master control program which controls the functions of the computer system as a whole and the running of application programs. All computers do not use the same operating systems. It is therefore important to assess the operating system used on a particular model before initial commitment because some software is only designed to run under the control of specific operating systems. Some operating systems are adopted as 'industry standards' and these are the ones which should be evaluated because they normally have a good software base. The reason for this is that software houses are willing to expand resources on the development of application packages for machines functioning under the control of an operating system which is widely used. The cost of software is likely to be lower in such circumstances as the development costs are spread over a greater number of users, both actual and potential.

Mainframe computers usually process several application programs concurrently, switching from one to the other, for the purpose of increasing processing productivity. This is known as multiprogramming (multi-tasking in the context of microcomputers), which requires a powerful operating system incorporating work scheduling facilities to control the switching between programs. This entails reading in data for one program while the processor is performing computations on another and printing out results on yet another.

In multi-user environments an operating system is required to control terminal operations on a shared access basis as only one user can access the system at any moment of time. The operating system allocates control to each terminal in turn. Such systems also require a system for record locking and unlocking, to prevent one user attempting to read a record whilst another user is updating it, for instance. The first user is allocated control to write to a record (or file in some instances) and other users are denied access until the record is updated and unlocked.

Some environments operate in concurrent batch and real-time mode. This means that a 'background' job deals with routine batch processing whilst the 'foreground' job deals with real-time operations such as airline seat reservations, on-line booking of hotel accommodation, or control of warehouse stocks, etc. The real-time operation has priority, and the operating system interrupts batch processing operations to deal with real-time enquiries or file updates. The stage of batch processing attained at the time of the interrupt is temporarily transferred to backing storage. After the real-time operation has been dealt with, the interrupted program is transferred back to internal memory from backing storage, and processing recommences from a 'restart' point. The operating system also copies to disk backing storage the state of the real-time system every few minutes (periodic check points) to provide a means of 'recovering' the system in the event of a malfunction.

An operating system is stored on disk and has to be booted into the internal memory (RAM) where it must reside throughout processing so that commands are instantly available. The operating system commands may exceed the internal memory capacity of the computer in which case only that portion of the OS which is frequently used is retained internally, other modules being read in from disk as required. Many microcomputers function under the control of a disk operating system known as DOS.

## Task 15

Answer these questions about the text.

1 Why is it important to assess the operating system on a computer before buying it?
2 What is multiprogramming?
3 The text gives some examples of real-time processing. Can you think of some examples of batch-processing?

## Task 16

Here is a list of typical tasks performed by an operating system. In each case the main verb has been omitted. Fill in the blanks from the words given. Sometimes more than one may apply.

A typical operating system will:

1 _____ input and output devices.
2 _____ the status of hardware devices.
3 _____ hardware interrupts.
4 _____ new disks.
5 _____ disk directories.
6 _____ disk reading and writing operations.
7 _____ disk errors.
8 _____ disk commands relating to the deletion, copying, renaming, and dumping of files.

*execute*
*monitor*
*format*
*diagnose*

## Task 17

Match these common DOS commands with the appropriate explanation.

| | | | |
|---|---|---|---|
| 1 | BACKUP | **a** | searches for a specific string of text in a file. |
| 2 | CHDIR or CD | **b** | allows a text file from the current directory to be displayed on screen. |
| 3 | CHKDSK | **c** | allows the user to change the name of a file. |
| 4 | CLS | **d** | saves the contents of the hard disk to a floppy disk for security purposes. |
| 5 | DEL | **e** | is used when it is necessary to change the current directory. |
| 6 | DIR:SORT | **f** | clears data from the screen. |
| 7 | REN | **g** | alphabetically sorts and lists a disk directory. |
| 8 | TYPE | **h** | makes back-up copies of the contents of one disk to another. |
| 9 | FIND | **i** | deletes a specified file from the current directory, specified drive, or specified path. |
| 10 | DISKCOPY | **j** | produces a status report of the currently logged-on disk, indicating the amount of disk space used, the available capacity (in bytes), and the number of files on disk. |

# Word-play

**Task 18**

Find the hidden words in this square. Some appear vertically, some horizontally, and some diagonally. They may be upside-down or back to front. Use the clues below to help you. The number of letters in each word and the first letter of the word appear in brackets after the clue. The first one has been done for you.

C T A A R I T P L R

L P N T P I D A E E

I C E A E E B L X T

P R T D L A F M I E

B R E E S N O T P M

O E T G R I D O T P

A E C V K L M P Y L

R N D S T Y L U S A

D E L V E I Y S T T

T P U R R E T N I E

Find words which mean:

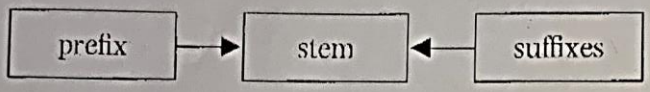
1 a computer that is small enough to hold in the hand. (7, P)
2 an electronic pen. (6, S)
3 to erase or omit. (6, D)
4 one type of portable computer which operates with an electronic pen. (9, C)
5 the information that the computer processes. (4, D)
6 a network of lines crossing at right angles. (4, G)
7 a signal to a processor to suspend temporarily the current sequence of instructions. (9, I)
8 a pattern used as a guide for creating letters or characters. (8, T)
9 an individual dot on a computer screen. (5, P)

TD 14 July

# Language focus B

## Word formation: prefixes

When you are reading, you will come across unfamiliar words. It is often possible to guess the meanings of these words if you understand the way words in English are generally formed.




An English word can be divided into three parts: a prefix, a stem, and a suffix. *Pre-* means 'before'. A prefix, therefore, is what comes before the stem. Consider, as an example, the prefix *de-* (meaning 'reduce' or 'reverse') in a word like **de**magnetize (meaning 'to deprive of magnetism'). A suffix is what is attached to the end of the stem. Consider, as an example, the suffix *-er* (meaning 'someone who') in programm**er** ('a person who programs').

Suffixes change the word from one part of speech to another. For example, *-ly* added to the adjective *quick* gives the adverb *quickly*. Prefixes, on the other hand, usually change the meaning of the word. For example, *un-* changes a word to the negative. **Un**magnetizable means 'not capable of being magnetized'.

Let us now consider some prefixes, their usual meanings, and how they change the meanings of English words.

**Prefixes**

| Negative and positive | Size | Location | Time and order | Number |
|---|---|---|---|---|
| un- | semi- | inter- | pre- | mono- |
| non- | mini- | super- | ante- | bi- |
| in- | micro- | trans- | fore- | hex- |
| dis- | | ex- | post- | oct- |
| re- | | extra- | | multi- |
| | | peri- | | |

**Exercise 1** Study these tables. Try to find additional examples, using your dictionary if necessary.

1 **Negative and positive prefixes:**

| | Prefix | Meaning | Examples |
|---|---|---|---|
| Negative | un- | not | unmagnetized |
| | in- | not | incomplete |
| | im- | not | impossible |
| | il- | not | illegal |
| | ir- | not | irregular, irrelevant |
| | non- | not connected with | non-programmable, |
| | mis- | bad, wrong | misdirect |
| | mal- | bad, wrong | malfunction |
| | dis- | opposite feeling | disagree |
| | dis- | opposite action | disconnect |
| | anti- | against | antiglare |
| | de- | reduce, reverse | demagnetize, decode |
| | under- | too little | underestimate |
| Positive | re- | do again | reorganize |
| | over- | too much | overload |

2 **Prefixes of size:**

| Prefix | Meaning | Examples |
|---|---|---|
| semi- | half, partly | semiconductor |
| equi- | equal | equidistant |
| mini- | small | minicomputer |
| micro- | very small | microcomputer |
| macro- | large, great | macroeconomics |
| mega- | large, great | megabyte |

3 **Prefixes of location:**

| Prefix | Meaning | Examples |
|---|---|---|
| inter- | between, among | interface, interactive |
| super- | over | supersonic |
| trans- | across | transmit, transfer |
| ex- | out | exclude, extrinsic |
| extra- | beyond | extraordinary |
| sub- | under | subschema |
| infra- | below | infra-red |
| peri- | around | peripheral |

4 **Prefixes of time and order:**

| Prefix | Meaning | Examples |
|---|---|---|
| ante- / pre- | before | antecedent<br>prefix |
| prime- | first | primary, primitive |
| post- | after | postdated |
| retro- | backward | retroactive |

5 **Prefixes of numbers:**

| Prefix | Meaning | Examples |
|---|---|---|
| semi- | half | semicircle |
| mono- | one | monochromatic |
| bi- | two | binary |
| tri- | three | triangle |
| quad- | four | quadruple |
| penta- | five | pentagon |
| hex- | six | hexadecimal |
| sept(em)- | seven | September |
| oct- | eight | octal |
| dec- | ten | decimal |
| multi- | many | multiplexor |

6 **Other prefixes:**

| Prefix | Meaning | Examples |
|---|---|---|
| pro- | before, in advance<br>forward | program<br>progress |
| auto- | self | automatic |
| co- / con- | together, with | co-ordinate<br>connect |

**Exercise 2**

Read the following sentences and circle the prefixes. For each word that has a prefix, try to decide what the prefix means. Refer back to the table if you need help.

1 Floppy disks are inexpensive and reuseable.
2 If a printer malfunctions, you should check the interface cable.
3 The multiplexor was not working because someone had disconnected it by mistake.
4 Improper installation of the antiglare shield will make it impossible to read what is on the screen.
5 After you transfer text using the 'cut and paste' feature, you may have to reformat the text you have inserted.
6 You can maximize your chances of finding a job if you are bilingual or even trilingual.

7 Peripheral devices can be either input devices (such as keyboards) or output devices (such as printers).
8 Your pay rise is retroactive to the beginning of June and you will receive a bi-annual bonus.
9 The octal and hexadecimal systems are number systems used as a form of shorthand in reading groups of four binary digits.
10 As the results are irregular, the program will have to be rewritten.

**Exercise 3** Fill in the gaps with the correct prefix from the following list.

| | | | |
|---|---|---|---|
| auto | de | dec | inter |
| maxi | mega | micro | mini |
| mono | multi | semi | sub |

1 Most people prefer a colour screen to a _____chrome screen.
2 _____script is a character or symbol written below and to the right of a number or letter, often used in science.
3 A _____byte equals approximately one million bytes.
4 Once you finish your program, you will have to test it and _____bug it to remove all the mistakes.
5 The introduction of _____conductor technology revolutionized the computer industry.
6 If a computer system has two or more central processors which are under common control, it is called a _____processor system.
7 The _____imal system is a number system with a base of 10.
8 When the user and the computer are in active communication on a graphics system, we refer to this as _____active graphics.