



The New Penguin
DICTIONARY of
COMPUTING

Dick Pountain

AN A-Z OF COMPUTING
JARGON AND CONCEPTS

PENGUIN BOOKS

Penguin Books Ltd, 80 Strand, London WC2R 0RL, England

Penguin Putnam Inc, 375 Hudson Street, New York, New York 10014, USA

Penguin Books Australia Ltd, 250 Camberwell Road, Camberwell, Victoria 3124, Australia

Penguin Books Canada Ltd, 10 Alcorn Avenue, Toronto, Ontario, Canada M4V 3B2

Penguin Books India (P) Ltd, 11, Community Centre, Panchsheel Park, New Delhi - 110 017, India

Penguin Books (NZ) Ltd, Cnr Rosedale and Airborne Roads, Albany, Auckland, New Zealand

Penguin Books (South Africa) (Pty) Ltd, 24 Sturdee Avenue, Rosebank 2196, South Africa

Penguin Books Ltd, Registered Offices: 80 Strand, London WC2R 0RL, England

www.penguin.com

First published 2001

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Typeset in TheAntiquaB and TheSans

Edited and typeset by Book Creation Services Ltd, London

Printed in England by Clays Ltd, St Ives plc

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Guide to the Dictionary

The text of the dictionary has been arranged so as to require a minimum of additional explanation. The structure of entries is as simple as possible, namely a headword in **bold-face** followed by the text of its definition. Many of the definitions are fuller than is usual in less specialist dictionaries, somewhere between a conventional dictionary and an encyclopedia in length: the principle adopted is that the most fundamental and general concepts are treated at greatest length, while highly technical or esoteric topics are dealt with more tersely and with a greater density of cross-reference.

Format

There is no special format for pronunciation, part of speech, derivation or usage in this dictionary, these matters being dealt with as appropriate in the main text. Cross-references are printed in SMALL CAPITALS and *italics* are used for emphasis.

Acronyms and abbreviations are listed in the dictionary itself and cross-referred to their expansions, or vice versa if the acronym is deemed to be much better known than its expansion: for instance Random Access Memory is defined under its ubiquitous acronym RAM, whereas SDLC is defined under Synchronous Data Link Control. 'See more under ...' means that a fuller definition is available under a different headword, whereas 'See also ...' refers the reader to related topics.

Collation order

The headwords are printed in alphabetical order, except that those that begin with numbers are sorted under the first letter of their spoken form: so for example 10baseT ('ten base tee') appears under 't', but 16-bit ('sixteen bit') appears under 's'.

Numbers

Unless otherwise stated all numbers in the text are decimal numbers. Hexadecimal numbers are marked by the suffix h, as in 23D1h. Binary numbers are accompanied by the word binary, as in 'binary 1011' or '1010 binary'.

Keystrokes

The names of special keys on the IBM PC-compatible keyboard are spelled in capital letters (e.g. HOME, END, PAGE UP). Two notations are employed for control sequences: when actual keystrokes typed by a user are meant the convention CTRL+B is used, whereas when

the control code is meant the convention ^B is used. Sequences of typed keystrokes are surrounded by angle brackets, as in <ALT+A+L>.

Trademarks

Because of their frequent occurrence, trademarked product names are not marked with (TM) in this dictionary. Whenever a proper name such as Adobe Photoshop is mentioned, it should be assumed to be a registered trademark.

contextual analysis A set of techniques employed in, for example HANDWRITING RECOGNITION, OPTICAL CHARACTER RECOGNITION and VOICE RECOGNITION systems, which attempt to guess from the rules of the language concerned the likelihood of certain letters or words occurring near to each other. For example, if a recognizer is unsure whether a certain character is a Q, it might check if the next character is a U (in English, but not in Arabic).

contiguous Physically adjacent or neighbouring (literally, touching). In a computing context it is usually used to describe adjacent areas of memory or disk space without any gaps in their ADDRESS range.

continuous availability An alternative term for HIGH-AVAILABILITY, applied to computer systems that have FAULT-TOLERANT features that reduce the amount of time that they are out of service (see DOWNTIME). See also FAIL-OVER, CLUSTER, RAID.

continuous simulation See under SIMULATION.

continuous-speech recognition Any system of computerized SPEECH RECOGNITION that can cope with a naturally paced speaking voice in which successive words often run together into a single sound. Such systems must try to distinguish between the identical sound of, say, 'my nose' and 'mine owes'.

continuous stationery A type of paper for computer printers that has the form of a continuous folded strip (see also FAN FOLD). Such paper may be blank, but is more often pre-printed with a business form such as a company's invoice or blank cheques. See also TRACTOR-FEED, PIN FEED.

continuous tone Properly describes an image in which there is an effectively infinite and continuous gradation of shades of colour, as for example in an original oil painting, water-colour, pastel, or in film-based photographic prints and transparencies.

Digital imaging techniques can depict only finite numbers of colours, (for example 256 or 16 million, depending on how many bits are used to encode each PIXEL) and so must reduce continuous tone originals to a pattern of discrete dots called a HALFTONE, by sampling their colours in a grid pattern, for

example via the CCD array of a scanner or digital camera.

Some LASER PRINTERS can vary the size of dots they print, which creates many more possible shades, a process described by their manufacturers as multilevel or *contone* printing. It is not, however, truly a continuous tone as the image is still made up of regularly spaced dots. See also DITHER.

contone See under CONTINUOUS TONE.

contract programming Writing computer programs on a freelance basis.

contrast The ratio between the luminous intensity of the darkest and lightest areas in a visual image, which governs how well the human eye can discriminate different objects. The natural world often exhibits contrast ratios of more than 10,000 to 1, for example when bright sunlight is viewed from inside a dark building. Photographic film can capture contrasts of 1000:1, but photographs or type printed on paper and viewed in daylight offer only a few hundreds to one.

The best computer displays now offer contrast in the range from 100:1 to 350:1 (all television sets and computer VDUS provide a separate control to adjust the contrast). For most types of LIQUID CRYSTAL DISPLAY, the contrast diminishes greatly when they are viewed obliquely.

control 1 An abstraction that describes the stream of instructions being executed by a computer processor. See more under CONTROL FLOW, CONTROL STRUCTURE.

2 In VISUAL PROGRAMMING systems, a visual input or output mechanism such as a MENU or LIST BOX that is displayed on the screen for the user to interact with when adjusting the workings of a program. In OBJECT-ORIENTED systems such as Microsoft's ACTIVEX, a control is synonymous with a prefabricated COMPONENT, and may be a complete program in its own right, such as a small TEXT EDITOR or SPREADSHEET. For other examples of commonly used controls see TEXT BOX, COMBO BOX, CHECK BOX, RADIO BUTTON, TOOLBAR.

control character One of the ASCII codes between 0 and 31 which do not correspond to printable characters, but are interpreted by many computer programs as commands to perform some action. Most computer

variable-zone recording See ZONED-BIT RECORDING.

variant 1 The default data type in VISUAL BASIC. It can be used to represent any numeric or string type, with automatic conversion between them as needed.

2 One of the alternative structures defined for a VARIANT RECORD type in programming languages of the PASCAL family.

variant record A more flexible type of RECORD provided in several programming languages (including PASCAL) that may be defined as existing in several different forms each of which is identified by a TAG. A new record instance may be created in any one of these forms by supplying the appropriate tag at the time of its creation. For example an employee record could be created in two variants for weekly or monthly paid staff, selected perhaps by a tag called pay_period.

varistor A special type of RESISTOR whose resistance rises very rapidly with applied voltage, which can be employed in surge-suppression circuits to protect computers against power SPIKES.

VAX A range of 32-BIT MINICOMPUTERS launched by DIGITAL EQUIPMENT CORPORATION in 1978 to replace the aging PDP-11. The VAX was extremely successful until the late 1980s, and pioneered many of the concepts that are now commonplace in the industry such as VIRTUAL MEMORY and CLUSTERED SMP. Its robust and capable operating system VMS influenced the design of many modern operating systems, from MS-DOS to WINDOWS NT. See also DEC ALPHA, DATA GENERAL.

VB Abbreviation of VISUAL BASIC.

VBA Abbreviation of VISUAL BASIC FOR APPLICATIONS.

VBI Abbreviation of VERTICAL BLANKING INTERVAL.

VBR Abbreviation of VARIABLE BIT RATE.

VBScript A subset of the VISUAL BASIC language that is employed as a client and server-side SCRIPTING LANGUAGE in Microsoft's ACTIVE SERVER PAGES system.

VBX (Visual Basic Extension) The original VISUAL BASIC file format for reusable software components, which has since been replaced by the more fully object-oriented ocx format. VBX files were in fact plain DLL files given a different name, and as such did not support INHERITANCE, which OCX files do.

VC Abbreviation of VERSION CONTROL.

VCL Abbreviation of VISUAL COMPONENT LIBRARY.

VDL Abbreviation of VIENNA DEFINITION LANGUAGE.

VDM (Virtual DOS Machine) A 640 kilobyte software VIRTUAL MACHINE that is created whenever a 16-bit program is run under a 32-bit version of WINDOWS or OS/2. Multiple 16-bit applications may run in separate VDMs, each one believing it has the computer to itself.

VDSL Abbreviation of very high bit-rate DIGITAL SUBSCRIBER LINE.

VDU (visual display unit) Also called a *monitor*. A device based on either a CATHODE RAY TUBE or, more recently, an LCD, that displays the output from a computer. The important statistics of a VDU from the user's point of view are: its size (measured diagonally across the screen), its RESOLUTION (that is the number of PIXELS on its screen), the number of colours it can display, its DOT PITCH, and its REFRESH RATE (which determines whether its display will appear to flicker or not). Other factors such as uniformity of focus over different parts of the screen, and distortions such as PINCUSHIONING can greatly affect the subjective experience of using a VDU. See more under DISPLAY ADAPTER, GRAPHICS ADAPTER, VGA.

vector 1 In mathematics and physics, a quantity that has both a magnitude and a direction. Examples include velocity or magnetic field, but not temperature. See also SCALAR.

2 In computer graphics, a line defined by the coordinates of its endpoints rather than as a list of PIXELS. See more under VECTOR GRAPHICS.

3 A memory location that contains the address of an executable program (for example an INTERRUPT HANDLER or a DEVICE DRIVER).