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WILEY ELECTRICAL AND ELECTRONICS ENGINEERING DICTIONARY

STEVEN M. KAPLAN

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WILEY ELECTRICAL AND ELECTRONICS ENGINEERING DICTIONARY

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binaural 1. Pertaining to both ears, as in binaural sound. 2. Same as **binaural sound**.

binaural sound Sound which is recorded placing two microphones approximately where the ears of a listener would be if present. When reproduced, a pair of headphones should be used to obtain the effect of being at the recording location. Also called **binaural (2)**.

binaural sound reproduction Reproduction of **binaural sound**.

bind 1. To make secure, fasten, restrain, or enclose. For example, to bind multiple twisted-pair wires within a cable sheath. 2. In computers and networks, to associate data, objects, subroutines, communication protocols, units, applications, or the like.

binder 1. A substance, such as a lacquer, resin, or cement, which helps provide consistency, cohesion, or mechanical strength. Used, for instance, to help a phosphor adhere to a screen. 2. A group of 25 twisted-pair wires within a cable sheath. Each group is color-coded for identification. Also called **binder group**. 3. A program that allows two or more programs to be combined in a manner that results in a single executable file. Used, for instance, by those who wish to maliciously include a Trojan horse within another application, such as a game.

binder group Same as **binder (2)**.

binding 1. That which is utilized to secure. 2. Fastening, or tying together. 3. In a computer language, an association, such as that between an operation and a symbol.

binding energy 1. The minimum energy required to remove a particle from a system. For instance, the energy necessary to extract a proton from the nucleus of an atom. 2. The minimum energy required to dissociate a system into its component parts. For example, the energy necessary to dissociate a nucleus into its component protons and neutrons. Also known as **total binding energy**.

binding post A terminal, used for making electrical connections, that incorporates a screw which is usually adjusted by hand. Used, for instance, to connect audio speaker cables. Also called **binding screw**, **screw terminal**, or **post (2)**.

binding screw Same as **binding post**.

binding time In a computer program, the time when **binding (3)** takes place. This is usually either during compilation, or during execution.

binistor A negative-resistance semiconductor switching device that has two stable states.

binocular machine vision In robotics, a method of vision which allows for interpretation of three-dimensional surfaces, by combining the input from each of the two optical sensors. Used, for instance, in obstacle-detection systems in mobile robots. Also called **stereoscopic machine vision**.

binode A dual diode with one cathode and two anodes.

biochemical cell Same as **biochemical fuel cell**.

biochemical fuel cell A fuel cell which utilizes chemical reactions to obtain electricity from biological substances. Used, for instance, for the generation of electricity from industrial waste. Also called **biochemical cell**.

biochip 1. An IC which incorporates biological substances. 2. A chip used to match known and unknown samples of DNA. **DNA** is the abbreviation of **deoxyribonucleic acid**, and in its strands are contained the chemical basis of heredity.

bioelectrical Pertaining to **bioelectricity**.

bioelectricity Electric currents which occur naturally, and flow in living tissue. Brain waves and nerve impulses are two forms of bioelectricity. The stunning charges an electric eel provides is another example.

bioengineering The application of engineering concepts and equipment to the biological sciences. Specifically, the contributions electrical and computer engineering make to bioengineering are numerous, and include electron microscopes, hearing aids, laser surgery, and the computers incorporated in myriad devices.

biofeedback A method for assisting in the awareness and monitoring of a person's own biological responses, such as muscle tension, heart rate, and blood pressure. Various electronic instruments are used to assist in this, such as those which measure and indicate skin temperature.

bioinformatics Abbreviation of **bio**logical **informatics**. The use of computers to gather, process, manipulate, integrate, store, share, apply, and present biological information.

biological informatics Same as **bioinformatics**.

biological shield An absorbing shield placed around a source of ionizing radiation, so as to reduce emissions to a level safe for those nearby. In a nuclear reactor, for instance, such a shield may consist of a thick concrete wall.

bioluminescence 1. The emission of light by living organisms. This light is the result of chemical reactions. 2. The light emitted by living organisms.

biomechatronics Acronym for **bio**logy, **mecha**nics, and **electronics**. A science which draws from these three fields to create, adapt, and improve electromechanical devices intended for living organisms.

biometric access control The use of a **biometric system** to authenticate an individual, such as that wishing to access a computer system or network.

biometric authentication The use of a **biometric system** to control access to a network, system, facility, or the like.

biometric device Same as **biometric system**.

biometric identification The use of a **biometric system** to identify an individual.

biometric system An automated system which can measure and analyze a human biological characteristic such as fingerprints, voice, or the patterns of ocular blood vessels, and yield an output which serves to verify of a person's identity. Also called **biometric device**.

biometric technique Any technique, such as fingerprint or voice recognition, employed by a **biometric system**.

biometrics 1. The statistical study of biological phenomena. 2. The measurement and analysis of human biological characteristics, such as fingerprints, voice, or the patterns of ocular blood vessels, for verification of a person's identity.

biomimetics The techniques employed in the development of materials, devices, systems, and the like which emulate biological entities, natural materials, and/or naturally-occurring processes. For example, the creation of artificial strands or fibers that are comparable in strength and elasticity to spider webs, or the formation of artificial neural networks that mimic biologic neural networks.

bionics The science of creating, adapting, and improving devices and systems intended for living organisms, based on the understanding of how and why things work in nature. A product of this field, for example, would be an electromechanical device that serves as a replacement for a lost limb.

BIOS Acronym for **basic input/output system**. A set of indispensable software routines that enable a computer to boot itself. It has the code necessary to control all peripherals and perform other functions, such as testing, and is generally stored on a ROM chip so that disk failures do not disable it. Currently, it is usually contained in a flash-memory chip, and is typically copied to the RAM at startup, as RAM is faster. Also called **system BIOS (1)**.

BIOS beep codes When a computer is started up, one or more short and/or long beeps which indicate the results of funda-

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hazbot A remote-controlled robot designed to work under hazardous circumstances, such as nuclear reactor repair, fire fighting, or space exploration.

HBT Abbreviation of **heterojunction bipolar transistor**.

HC Abbreviation of **Hefner candle**.

HCI 1. Abbreviation of **human-computer interaction**. 2. Abbreviation of **human-computer interface**.

HCMOS Abbreviation of high-speed complementary metal-oxide semiconductor, or high-density complementary metal-oxide semiconductor. A CMOS technology with enhanced speed and performance. Used, for instance, in smart cards.

HD 1. Abbreviation of **high-density**. 2. Abbreviation of **high-definition**. 3. Abbreviation of **hard drive**. 4. Abbreviation of **hard disk**.

HDA Abbreviation of **head drive assembly**.

HDD Abbreviation of **hard disk drive**.

HDF Abbreviation of **Hierarchical Data Format**.

HDL Abbreviation of **hardware description language**.

HDLC Abbreviation of **High-Level Data Link Control**.

HDML Abbreviation of Handheld Device Markup Language. A version of HTML tailored to wireless devices such as properly equipped cell phones and PDAs.

HDSL Abbreviation of high bit-rate digital subscriber line, high-speed digital subscriber line, or high bit-rate **DSL**. A version of DSL utilizing two cable pairs, and which supports up to T1 signaling rates in both directions. There is an equal amount of bandwidth in each direction. For instance, the transmission rate may be 1.544 Mbps upstream, and 1.544 Mbps downstream. E1 is supported with the use of 3 cable pairs.

HDSL2 Abbreviation of high bit-rate digital subscriber line-2, or high bit-rate **DSL-2**. An enhanced version of **HDSL** which utilizes 1 cable pair, and provides other benefits, such as a more reliable connection.

HDSS Abbreviation of **holographic data storage system**.

HDT Abbreviation of **host digital terminal**.

HDTV Abbreviation of high-definition **TV**, or high-definition television. 1. A standard for the transmission and reception of TV signals with increased resolution and sound quality in comparison to standards such as NTSC or PAL. Such a standard provides for the transmission of a signal providing over 1,000 active lines, a 16:9 aspect ratio, and digital-quality sound. Also called **HDTV standard**. 2. A device, such as a TV receiver, which is compatible with **HDTV** (1). Such a receiver provides, among other benefits, an image equal to or greater in resolution to that of a movie theater, a wider screen which more closely matches the human field of vision, and a multiple-channel sound format which is digitally encoded. Also called **HDTV receiver**.

HDTV receiver Abbreviation of high-definition **TV receiver**. Same as **HDTV** (2).

HDTV standard Abbreviation of high-definition **TV standard**. Same as **HDTV** (1).

HDTV system Abbreviation of high-definition **TV system**. A TV system which employs an **HDTV standard**.

HDX Abbreviation of **half-duplex**.

HDX operation Abbreviation of **half-duplex operation**.

He Chemical symbol for **helium**.

He-Ne laser Same as **helium-neon laser**.

head 1. A device which reads, records, or erases signals on a storage medium such as a magnetic tape or a disk drive. Examples include recording heads, read/write heads, and erase heads. 2. In computers, the top or start of something, such as a program, document, page, or the like.

head alignment The alignment of a **head** (1) to maintain the proper spatial relationship with the magnetic medium being read, recorded, or erased. In a tape deck, for instance, it is the adjustment of a playback or record head to achieve the proper 90° alignment with the tape path.

head amplifier An amplifier utilized at the source of an audio or video signal to amplify a signal which would otherwise be too weak for the main amplifier. For example, it may consist of a preamplifier incorporated into a microphone.

head crash A hard disk failure in which the read/write head collides with the surface of a disk. This may be caused by a foreign object such as dust, or a misalignment. Data is destroyed, and generally both the read/write head and the platter must be replaced. Also called **hard disk crash**, or **crash** (2).

head degausser Same as **head demagnetizer**.

head demagnetizer A circuit or device which removes residual magnetism from a tape head. Also called **head degausser**.

head drive assembly For a disk drive, a sealed assembly which includes the read/write heads, access arms, platters, and associated components. Its abbreviation is **HDA**.

head end Same as **headend**.

head gap 1. The space between a read/write head and a computer magnetic storage medium, such as a disk or tape. 2. The width of the gap between pole pieces in a tape head. Also called **gap width**.

head-mounted device A device, such as a head-mounted display, which is worn on the head. Its abbreviation is **HMD**.

head-mounted display Its abbreviation is **HMD**. A computer monitor, or other display, which is worn on the head. An HMD may display to one or both eyes, and may be in the form of goggles, a helmet, or the like. When displaying for one eye, for instance, it allows a user to view it without looking away from the surrounding environment, which is useful in many technical and scientific applications. When displaying to both eyes, it is especially suited for immersion in virtual reality environments. An HMD often has other associated devices working alongside, such as a microphone and earphones.

head-related transfer function Its abbreviation is **HRTF**. A transfer function that takes into account factors involved in sound reaching the ears of a listener, for sound localization and the determination of the arriving spectrum of sound. Variables such as the dimensions of the ear canal, the exterior part of the ear, head, and torso, and how these modify the spectrum of the sound heard are combined with the azimuth, elevation, range, and frequency of the sound source, the slightly different time at which a sound arrives at each ear, and so on. Each listener has a unique HRTF.

head room Same as **headroom**.

head stack In a tape recorder, two or more heads mounted as a unit and utilized for multi-track recording. Also called **head stack assembly**.

head stack assembly Same as **head stack**.

head-stick Same as **headstick**.

head-to-tape contact The physical contact a tape head makes with a magnetic tape being recorded or reproduced. The proper contact helps optimize recording or reproduction, and helps protect the tape from physical damage such as wrinkling. Also called **tape-to-head contact**.

headend 1. In a TV system, such as satellite TV or cable TV, the location at which signals are received, then processed, and from which they are distributed to the individual subscribers. Also spelled **head end**. Also called **cable headend**. 2. Another such similar location from which a communications entity, such as an ISP, distributes information to individual subscribers.

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