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solution that eats away the surface not protected by the photoresistive material, creating the desired circuit pattern on the surface of the wafer. *See also* photomask, photoresist.

photomask \fō'tō-mask\ *n.* A photographic negative image of a circuit pattern used in fabrication of integrated circuits. *See also* photolithography.

photorealism \fō'tō-rē'ə-liz'əm\ *n.* The process of creating images that are as close to photographic or "real-life" quality as possible. In computer graphics, photorealism requires powerful computers and highly sophisticated software and is heavily mathematical. *See also* ray tracing.

photoresist \fō'tō-rē-zist\ *n.* A compound that is used in photolithographic fabrication of integrated circuits and printed circuit boards. When exposed to ultraviolet light through a photomask, the photoresistive material exposed to the light polymerizes (hardens); the areas not exposed can be washed away, leaving the pattern of traces on the substrate. Subsequent etching removes areas not protected by the polymerized photoresist.

photosensor \fō'tō-sen'sər\ *n.* *See* photoelectric device.

phototypesetter \fō'tō-tīp'set-ər\ *n.* A printer similar to a laser printer but capable of resolutions over 2,000 dots per inch. Phototypesetters apply light directly to a photographic film or photosensitive paper. *See also* photocomposition. *Compare* imagesetter.

photovoltaic cell \fō'tō-vōl-tā'ik sel\ *n.* *See* solar cell.

phreak¹ \frēk\ *n.* A person who breaks into, or cracks, telephone networks or other secured systems. In the 1970s, the telephone system used audible tones as switching signals, and *phone phreaks* used homebrew hardware to match the tones and steal long-distance service. *See also* homebrew. *Compare* cracker, hacker (definition 2).

phreak² \frēk\ *vb.* To break into, or crack, phone networks or computer systems. *See also* homebrew. *Compare* hack.

physical \fiz'i-kəl\ *adj.* In computing, of, pertaining to, or characteristic of a real, as opposed to a conceptual, piece of equipment or frame of reference. *Compare* logical (definition 2).

physical address \fiz'i-kəl ə'dres, ə-dres\ *n.* An address that corresponds to a hardware memory

location. In simple processors such as the 8088 and the 68000, every address is a physical address. In processors supporting virtual memory, programs reference virtual addresses, which are then mapped by memory management hardware onto physical addresses. *See also* memory management unit, paging, virtual memory.

physical-image file \fiz'i-kəl-im'ej fīl\ *n.* A hard disk copy of the material to be recorded onto a CD-ROM. Creating a complete copy precludes problems in writing the CD-ROM because of delays in assembling the material from a scattered group of files. *See also* CD-ROM. *Compare* virtual-image file.

physical layer \fiz'i-kəl lār, lā'ər\ *n.* The first, or lowest, of the seven layers in the International Organization for Standardization's Open Systems Interconnection (OSI) model for standardizing computer-to-computer communications. The physical layer is totally hardware-oriented and deals with all aspects of establishing and maintaining a physical link between communicating computers. Among specifications covered on the physical layer are cabling, electrical signals, and mechanical connections. *See also* ISO/OSI model.

physical memory \fiz'i-kəl mem'ər-ē\ *n.* Memory actually present in the system, as opposed to virtual memory. A computer might have only 4 megabytes of physical RAM but support a virtual memory capacity of 20 MB. *Compare* virtual memory.

physical storage \fiz'i-kəl stōr'ej\ *n.* *See* real storage.

PIC \P'I-C\ *n.* *See* programmable interrupt controller.

pica \pī'kə\ *n.* **1.** With reference to typewriters, a fixed-width type font that fits 10 characters to the linear inch. *See also* pitch (definition 1). **2.** As used by typographers, a unit of measure equal to 12 points or approximately 1/6 inch. *See also* point¹ (definition 1).

pico- \pē'kō\ *prefix* Abbreviated p. Denotes one trillionth (10⁻¹²), or, in the British numbering system, one million millionth.

picoJava \pē'kō-jä'və\ *n.* A microprocessor developed by Sun Microsystems, Inc., that executes Java code. *See also* Java.

picosecond \pē'kō-sek'ənd\ *n.* Abbreviated psec. One trillionth of a second.

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PICS \piks, P'I-C-S\ *n.* Acronym for **P**latform for **I**nternet **C**ontent **S**election. A standard for enabling users to filter their Web access automatically using software (such as Internet Explorer 3.0) that detects codes for ratings in the sites' HTML files. In addition to filtering out undesirable material, PICS can be used to screen sites according to whether they contain material of interest. Several rating systems, emphasizing different sets of criteria, are in use.

PICT \dot-pikt\ *n.* The file extension that identifies graphic images in the Macintosh PICT format. See also PICT.

PICT \pikt\ *n.* A file-format standard for encoding graphical images, both object-oriented and bitmapped. The PICT file format was first used in Apple Macintosh applications, but many IBM PC-compatible applications can read the format too. See also bitmapped graphics, object-oriented graphics.

picture element \pik'chur el'ə-mənt\ *n.* See pixel.

pie chart \pī'chärt\ *n.* A type of graph that presents values as percentages (slices) of a whole (a pie).

piezoelectric \pē-ā-zō-ə-lek'trik, pē-āt-sō-ə-lek'trik\ *adj.* Of, pertaining to, or characteristic of crystals that can convert between mechanical and electrical energy. An electric potential applied to a piezoelectric crystal causes a small change in the shape of the crystal. Likewise, physical pressure applied to the crystal creates an electrical potential difference between the surfaces of the crystal.

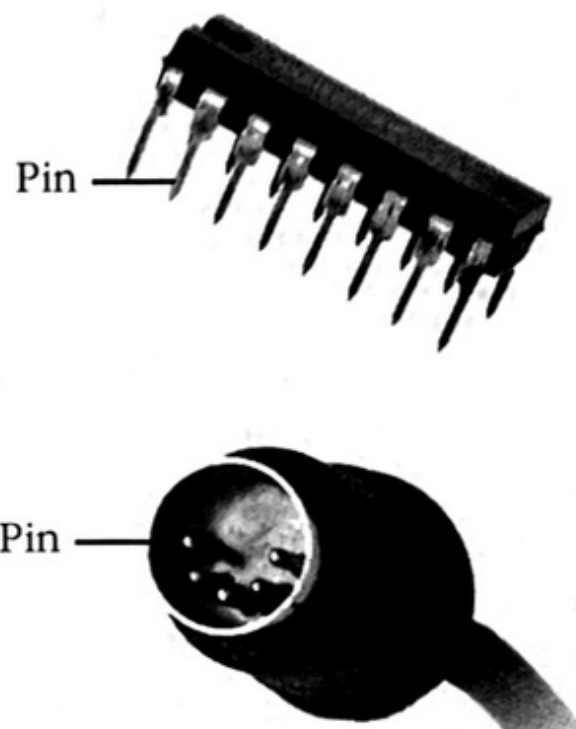
piggyback board \pig'ē-bak bōrd\ *n.* A printed circuit board that plugs into another circuit board to enhance its capabilities. A piggyback board is sometimes used to replace a single chip, in which case the chip is removed and the piggyback board is inserted into the empty socket. See also daughterboard.

PILOT \pī'lət, P'IL'O-T\ *n.* Acronym for **P**rogrammed **I**nquiry, **L**earning or **T**eaching. A programming language developed in 1976 by John A. Starkweather and designed primarily for creating applications for computer-aided instruction.

PIM \P'I-M\ *n.* Acronym for **p**ersonal **i**nformation **m**anager. An application that usually includes an address book and organizes unrelated informa-

tion, such as notes, appointments, and names, in a useful way.

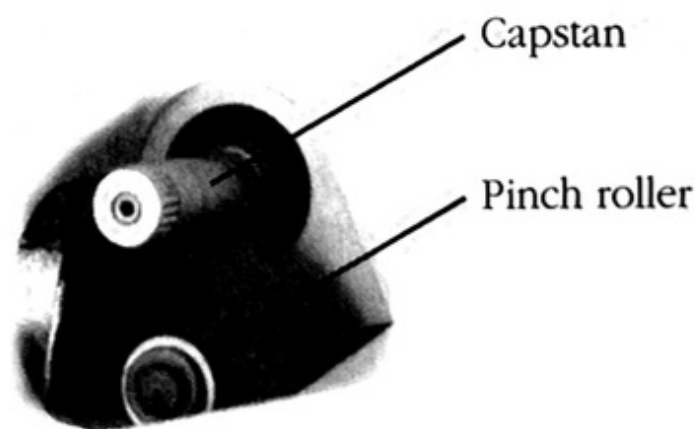
pin \pin\ *n.* A slender prong. Pins are commonly encountered as the contacts protruding from a male connector. Connectors are often identified by the number of pins they have. Other types of pins are the spidery, leglike metal appendages that connect computer chips to sockets on a circuit board or directly to the circuit board. See the illustration.



Pin. A 14-pin DIP (top) and a 5-pin DIN (bottom).

PIN \pin\ *n.* Acronym for **p**ersonal **i**dentification **n**umber. A unique code number assigned, as with automatic teller machine cards, to the authorized user.

pinch roller \pinch' rō-lər\ *n.* A small cylindrical pulley that presses magnetic tape against the drive's capstan to move the tape over the tape machine's heads. See the illustration. See also capstan.



Pinch roller.

pinch-roller plotter \pinch' rō-lər plot'ər\ *n.* A type of plotter, intermediate between drum and

flatbed types, that uses hard rubber or metal wheels to hold the paper against the main roller. *See also* plotter. *Compare* drum plotter, flatbed plotter.

pin-compatible \pin'kəm-pat'ə-bl\ *adj.* Having pins that are equivalent to the pins on another chip or device. A chip, for example, might have different internal circuitry from that used in another chip, but if the two chips use the same pins for input and output of identical signals, they are pin-compatible. *Compare* plug-compatible.

pine \pīn\ *n.* Acronym for **pine is not elm**, or for **Program for Internet News and E-mail**. One of the most commonly encountered programs for reading and composing e-mail on character-based UNIX systems. The pine program was developed as an improved version of elm at the University of Washington. *Compare* elm.

pin feed \pin' fēd\ *n.* A method of feeding paper through a printer in which small pins, mounted on rollers on the ends of the platen, engage holes near the edges of continuous-form paper. *See the illustration. See also* continuous-form paper, paper feed. *Compare* tractor feed.

ping¹ \ping\ *n.* **1.** Acronym for **Packet Internet Groper**. A protocol for testing whether a particular computer is connected to the Internet by sending a packet to its IP address and waiting for a response. The name actually comes from submarine active sonar, where a sound signal—called a “ping”—is broadcast, and surrounding objects are revealed by their reflections of the sound. **2.** A UNIX utility that implements the ping protocol.

ping² \ping\ *vb.* **1.** To test whether a computer is connected to the Internet using the ping utility. **2.** To test which users on a mailing list are current by sending e-mail to the list asking for a response.

Ping of Death \pēng' əv deth\ *n.* A form of Internet vandalism that entails sending a packet that is substantially larger than the usual 64 bytes over the Internet via the ping protocol to a remote computer. The size of the packet causes the computer to crash or reboot. *See also* packet (definition 2), ping¹ (definition 1).

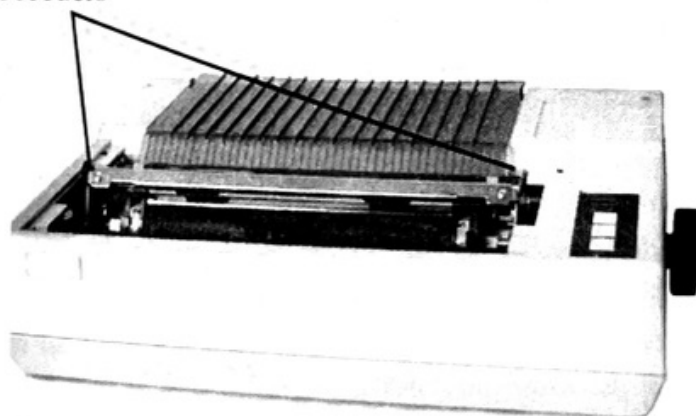
ping pong \pēng' pong\ *n.* **1.** In communications, a technique that changes the direction of transmission so that the sender becomes the receiver and vice versa. **2.** In information processing and transfer, the technique of using two temporary storage areas (buffers) rather than one to hold both input and output.

ping-pong buffer \pēng'pong buf'ər\ *n.* A double buffer in which each part is alternately filled and flushed, resulting in a more or less continuous stream of input and output data. *See also* ping pong (definition 2).

pin grid array \pin' grid ər-ā\ *n.* A method of mounting chips on boards, preferred for chips with a very large number of pins. Pin grid array packages have pins protruding from the bottom surface of the chip, as opposed to dual in-line packages and leadless chip carrier packages, which have pins protruding from the edges. *See the illustration. Acronym:* PGA (P'G-A'). *Compare* DIP, leadless chip carrier.

pinout \pin'out\ *n.* A description or diagram of the pins of a chip or connector. *See also* pin.

Pin feeders



Pin feed. Pin feeders on a dot-matrix printer.