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18 **ATTORNEYS FOR PLAINTIFF MAX SOUND CORPORATION**

19
20 UNITED STATES DISTRICT COURT
21 NORTHERN DISTRICT OF CALIFORNIA

22 MAX SOUND CORPORATION,
23
24 Plaintiff,
25 v.
26 GOOGLE, INC., *et al.*,
27 Defendants.

Case No. 5:14-cv-04412-EJD
Honorable Edward J. Davila
**PLAINTIFF MAX SOUND
CORPORATION'S DISCLOSURE OF
PRELIMINARY CLAIM
CONSTRUCTIONS AND EXTRINSIC
EVIDENCE**

28

1 Pursuant to P.R. 4-2 and the Court’s Patent Scheduling Order (Dkt. No. 79), Plaintiff Max
2 Sound Corporation (“Plaintiff” or “Max Sound”) hereby discloses its Preliminary Claim
3 Constructions and Extrinsic Evidence for the disputed claim terms of U.S. Patent No. 7,974,339
4 (“the ’339 Patent”), attached hereto as Exhibits A and B.

5 Max Sound’s Preliminary Claim Constructions and Extrinsic Evidence are preliminary in
6 nature and are based on Max Sound’s current knowledge and understanding of the patent-in-suit,
7 its prosecution file history, and Max Sound’s present understanding of the Defendants’ positions.
8 Max Sound reserves the right to modify this disclosure if additional material becomes available to
9 it during discovery or by other means, if Defendants seek and the Court grants leave for the
10 Defendants to amend their Invalidity Contentions, and/or if additional terms or phrases become
11 relevant. Max Sound further reserves the right to modify this list based on the Defendants’
12 positions and in light of their list of proposed terms and claim elements for construction.

13 Max Sound is prepared to meet and confer with the Defendants that have provided terms
14 and proposed constructions at a mutually agreed time for the purposes of finalizing this list,
15 narrowing or resolving any differences between the parties, and facilitating the ultimate
16 preparation of a Joint Claim Construction and Prehearing Statement.

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Dated: August 21, 2015

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EXHIBIT A

**PLAINTIFF MAX SOUND CORPORATION'S
PROPOSED TERMS AND CLAIM ELEMENTS FOR CONSTRUCTION
PURSUANT TO P.R. 4-2**

**U.S. PATENT NO. 7,974,339
CLAIMS 1, 6, 7, 9, 10, 12, AND 13**

Plaintiff's Proposed Terms For Construction	Plaintiff's Preliminary Proposed Construction	Plaintiff's Intrinsic Evidence	Plaintiff's Extrinsic Evidence
<p>a [frame] analysis system</p>	<p>The phrase "a analysis system" should be construed to include the term "frame" as this is an obvious typographical error.</p> <p>The phrase "a frame analysis system" should be construed to mean "a system that analyzes one or more arrays of pixels in a given frame to optimize data used to represent the given frame."</p>	<p>The specification and file history of U.S. Pat. No. 7,974,339 including at least the following:</p> <p>Claims 2, 3, 7, and 10.</p> <p>Abstract; Col. 1: 40-52; Col. 3:13-34; Col. 3:43-Col. 4:10; Col. 4:32-43; Col. 4:53-5:20; 6:17-24; Col. 7:40-45; Col. 9:42-Col. 10:54. Figs. 1-10 and descriptions thereof.</p> <p>Bates Nos. MSFW000085; MSFW000133 – MSFW000134; MSFW000450.</p>	<p>Frame – "character or byte of data recorded on tape." Encyclopedia of Computer Science 900-901 (Anthony Ralston et al. eds., 1st ed. 1976).</p> <p>Frame - "an elementary block of data for transmission over a network or communications system." McGraw-Hill Dictionary of Electrical & Computer Engineering 237 (Elizabeth Geller et al. eds., 2004).</p> <p>Optimize – "<i>Computers</i>. to write or rewrite (the instructions in a program) so as to maximize efficiency and speed in retrieval, storage, or execution." Random House Unabridged Dictionary 1360 (2nd ed.</p>

Plaintiff's Proposed Terms For Construction	Plaintiff's Preliminary Proposed Construction	Plaintiff's Intrinsic Evidence	Plaintiff's Extrinsic Evidence
<p>detail (Although Plaintiff originally proposed "high and or low detail" as a phrase to be construed, Plaintiff believes that only the term "detail" requires construction and that the other words in this phrase should have their plain and</p>	<p>"variation from pixel to pixel of brightness, color, or other information found in a frame"</p>		<p>1993). Optimization – "1. broadly, the efforts and processes of making a decision, a design, or a system as perfect, effective, or functional as possible 2. narrowly, the specific methodology, techniques, and procedures used to decide on the one specific solution in a defined set of possible alternatives that will best satisfy a selected criterion." McGraw-Hill Dictionary of Electrical & Computer Engineering 405 (Elizabeth Geller et al. eds., 2004).</p>
<p>detail (Although Plaintiff originally proposed "high and or low detail" as a phrase to be construed, Plaintiff believes that only the term "detail" requires construction and that the other words in this phrase should have their plain and</p>	<p>"variation from pixel to pixel of brightness, color, or other information found in a frame"</p>	<p>The specification and file history of U.S. Pat. No. 7,974,339 including at least the following: Claim 1. Col. 1:40-52; Col. 3:15-34; Col. 3:35-50; Col. 4:44 – Col. 5:2; Col. 5:21-53; Col. 7:40-45; Col. 8:13-19; Col. 8:24-44; Col. 8:57-Col. 9:4; Col. 10:19-54.</p>	<p>Pixel – "picture element." IBM Dictionary of Computing 324 (8th ed. 1987). Pixel – "short for picture (pix) element. One spot in a rectilinear grid of thousands of such spots that are individually "painted" to</p>

Plaintiff's Proposed Terms For Construction	Plaintiff's Preliminary Proposed Construction	Plaintiff's Intrinsic Evidence	Plaintiff's Extrinsic Evidence
ordinary meaning.)		Figs. 2, 6, 9, 10, and descriptions thereof. Bates Nos. MSFW000087; MSFW000133 – MSFW000134.	form an image produced on the screen by a computer or on paper by a printer. A pixel is the smallest element that display or print hardware and software can manipulate in creating letters, numbers, or graphics.” Microsoft Computer Dictionary 406 (5th ed. 2002). Variation – “n. 1. the act, process, or accident of varying in condition, character, or degree... amount, rate, extent, or degree of change.” Random House Webster’s Unabridged Dictionary 2106 (2nd ed. 2001).
generating a display	No construction necessary. Alternatively, “assembling a given display frame.”	The specification and file history of U.S. Pat. No. 7,974,339 including at least the following: Claims 1, 7, and 10. Col. 1:40-52; Col. 3:13-50; Col. 4:44-60; Col. 5:54-Col. 6:16; Col. 7:40-45;	

Plaintiff's Proposed Terms For Construction	Plaintiff's Preliminary Proposed Construction	Plaintiff's Intrinsic Evidence	Plaintiff's Extrinsic Evidence
<p>selection pixel data / pixel selection data</p>	<p>“selected information representative of one or more arrays of pixels in a frame”</p>	<p>Col. 8:6-24; Col. 9:42-Col. 10:18. Figs. 1, 4, 5, 8, and descriptions thereof. Bates No. MSFW000385.</p> <p>The specification and file history of U.S. Pat. No. 7,974,339 including at least the following: Claims 4-7 and 10. Abstract. Col. 1:46-52; Col. 3:13-34; Col. 4:12-31; Col. 5:21-53; Col. 6:4-16; Col. 6:25-60; Col. 7:55-62; Col. 9:5-12; Col. 10:19-54. Figs. 3, 7, 9, 10, and descriptions thereof. Bates Nos. MSFW000087; MSFW000133 – MSFW000134.</p>	<p>Select – “to pull from a mass of data certain items that require special attention.” McGraw-Hill Dictionary of Electrical & Computer Engineering 511 (Elizabeth Geller et al. eds., 2004).</p> <p>Select – “1. to choose in preference to another or others; pick out. -v.i. 2. to make a choice; pick. -adj. 3. chosen in preference to another or others; selected. 4. choice; of special value.” Random House Unabridged Dictionary 734 (2nd ed. 1993).</p> <p>Data – “general term for numbers, letters, symbols, and analog quantities that serve as input for computer processing 2. any</p>

Plaintiff's Proposed Terms For Construction	Plaintiff's Preliminary Proposed Construction	Plaintiff's Intrinsic Evidence	Plaintiff's Extrinsic Evidence
			<p>representations of characters or analog quantities to which meaning, if not information, may be assigned." McGraw-Hill Dictionary of Electrical & Computer Engineering 136 (Elizabeth Geller et al. eds., 2004).</p>

EXHIBIT B

Dictionary of Computer and Internet Terms

Sixth Edition

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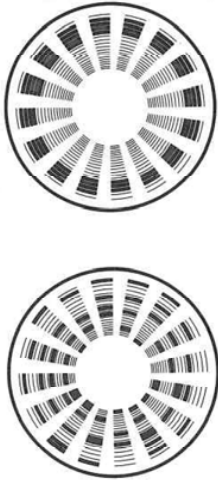
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Fragmented disk **Defragmented disk**
FIGURE 106. FRAGMENTATION
 Dark areas show sectors occupied by one file

frame

1. one in a succession of pictures in a video or animation. When displayed rapidly one after the other, successive frames give the impression of movement. See ANIMATION.
2. a boxed area in a web page. See FRAME, HTML.
3. a boxed area that is to contain text or a graphic (WORD PROCESSING, PAGE LAYOUT SOFTWARE).

frame grabber an accessory device that takes an image from a video camera, VCR, or other video input and digitizes it, creating a bitmap image. A video image consists of *frames* (successive pictures) transmitted at the rate of 30 per second, and the frame grabber must *grab* and digitize one of them.

frame, HTML an area in a web page that scrolls independently of the rest of the web page. A web page can be divided into multiple frames. For example, one frame can include a navigation bar that always stays on the screen as the user moves around the text of the page that appears in the other frame.

Here is an HTML file that divides the browser window into two frames. The two files mentioned in it, `navbar.html` and `main.html`, are the source files for the separate frames.

```
<HTML>
<frameset rows="100%,*" cols="35%,100%">
<frame src="navbar.html" name="NavigationBar"
scrolling=auto>
<frame src="main.html" name="main"
scrolling=auto>
</frameset>
</HTML>
```



FIGURE 107. HTML FRAMES

Here is file `navbar.html`, which produces the navigation bar in the left-hand frame:

```
<HTML><BODY>
<P><A TARGET="main" HREF="main.html#sec1">
Section 1</A>
<P><A TARGET="main" HREF="main.html#sec2">
Section 2</A>
<P><A TARGET="main" HREF="main.html#sec3">
Section 3</A>
</BODY></HTML>
```

The following file, `main.html`, produces the main frame:

```
<HTML><BODY>
<H1><A NAME="sec1"> Section 1</A></H1>
The rest of the text for section 1 would go here
<H1><A NAME="sec2"> Section 2</A> </H1>
The rest of the text for section 2 would go here
<H1><A NAME="sec3"> Section 3</A></H1>
The rest of the text for section 3 would go here
</HTML></BODY>
```

Figure 107 shows the appearance of this page when displayed by the browser. If the right hand frame did contain a large amount of text, the user could scroll through it while the links on the left hand side always stayed in the same place, making it easier to jump to other sections of the document.

Milk
Milk

Milk
Milk

Fixed pitch

Proportional pitch

FIGURE 195. PITCH, FIXED VS. PROPORTIONAL

DIVISION	MONTH	CATEGORY	AMOUNT
NORTH	January	EMPLOYEES	564
NORTH	January	SUPPLIES	320
NORTH	January	RENT	40
NORTH	February	EMPLOYEES	602
NORTH	February	SUPPLIES	348
NORTH	February	RENT	40
NORTH	March	EMPLOYEES	620
NORTH	March	SUPPLIES	352
NORTH	March	RENT	40
SOUTH	January	EMPLOYEES	212
SOUTH	January	SUPPLIES	180
SOUTH	January	RENT	20
SOUTH	February	EMPLOYEES	240
SOUTH	February	SUPPLIES	200
SOUTH	February	RENT	20
SOUTH	March	EMPLOYEES	265
SOUTH	March	SUPPLIES	160
SOUTH	March	RENT	20

It would be easier to understand the data if it were arranged in a pivot table, like this:

NORTH			TOTAL
EMPLOYEES	SUPPLIES	RENT	
January	564	40	924
February	602	40	990
March	620	40	1012
TOTAL	1786	120	2926

SOUTH			TOTAL
EMPLOYEES	SUPPLIES	RENT	
January	212	20	412
February	240	20	460
March	265	20	445
TOTAL	717	60	1317

Sometimes it helps to rearrange the data. Here are two different ways of doing this:

January				TOTAL
EMPLOYEES	SUPPLIES	RENT		
NORTH	564	40	924	
SOUTH	212	20	412	
TOTAL	776	60	1336	

February				TOTAL
EMPLOYEES	SUPPLIES	RENT		
NORTH	602	40	990	
SOUTH	240	20	460	
TOTAL	842	60	1450	

March				TOTAL
EMPLOYEES	SUPPLIES	RENT		
NORTH	620	40	1012	
SOUTH	265	20	445	
TOTAL	885	60	1457	

EMPLOYEES				TOT
NORTH	SOUTH			
January	564	212	776	
February	602	240	842	
March	620	265	885	
TOT:	1786	717	2503	

SUPPLIES				TOT
NORTH	SOUTH			
January	320	180	500	
February	348	200	548	
March	352	160	512	
TOT:	1020	540	1560	

RENT				TOT
NORTH	SOUTH			
January	40	20	60	
February	40	20	60	
March	40	20	60	
TOT:	120	60	180	

Or, you might wish to consolidate all of the spending categories and create a view like this:

ALL CATEGORIES				TOTAL
January	February	March		
NORTH	924	990	1012	2926
SOUTH	412	460	445	1317
TOTAL	1336	1450	1457	4243

Recent versions of Excel contain a wizard that automatically creates pivot tables.

pixel one of the individual dots that make up a graphical image. For example, a VGA color screen in high-resolution mode consists of a 640 x 480 pixel array. A program can draw pictures on the screen by controlling the color of each pixel. See GRAPHICS.

ENCYCLOPEDIA OF COMPUTER SCIENCE

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CHESTER L. MEEK, Assistant Editor

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MEMORY

For articles on related terms see ARITHMETIC-LOGIC UNIT; and OPEN AND CLOSE A FILE.

Auxiliary memory (AM) is distinguished from main memory (MM) by the fact that only from the latter are instructions taken for execution. In most computers, the arithmetic logic unit (ALU) and MM comprise a carefully designed pair of machine components, matched for speed and data-path width. AM comprises all other memories whose contents (instructions and data) must be fetched into the MM before processing by the ALU.

An exception to the foregoing statement is large-core storage (LCS), an AM out of which instructions can be directly executed by some ALU's. In such cases, LCS behaves like an MM, but slows ALU speed by a factor of 3 to 10.

AM is rewritable; i.e., it can be written, read, rewritten, etc., many times without deterioration. Thus, punched cards, paper tape, and printer paper are not classified as AM's, although the first two store instructions and data in re-readable form. AM generally uses electromagnetic digital technology for storing data.

There are some eight different types of AM's in use today, and the variety and number continue to grow rapidly:

Magnetic tapes	Moving-head disks
Cassette tapes	Data cells
Drums	Photocopy storages
Fixed-head disks	Large core storages

Magnetic Tape. Magnetic tapes are long, narrow ribbons (typically 2,400 ft long and 0.5 in.

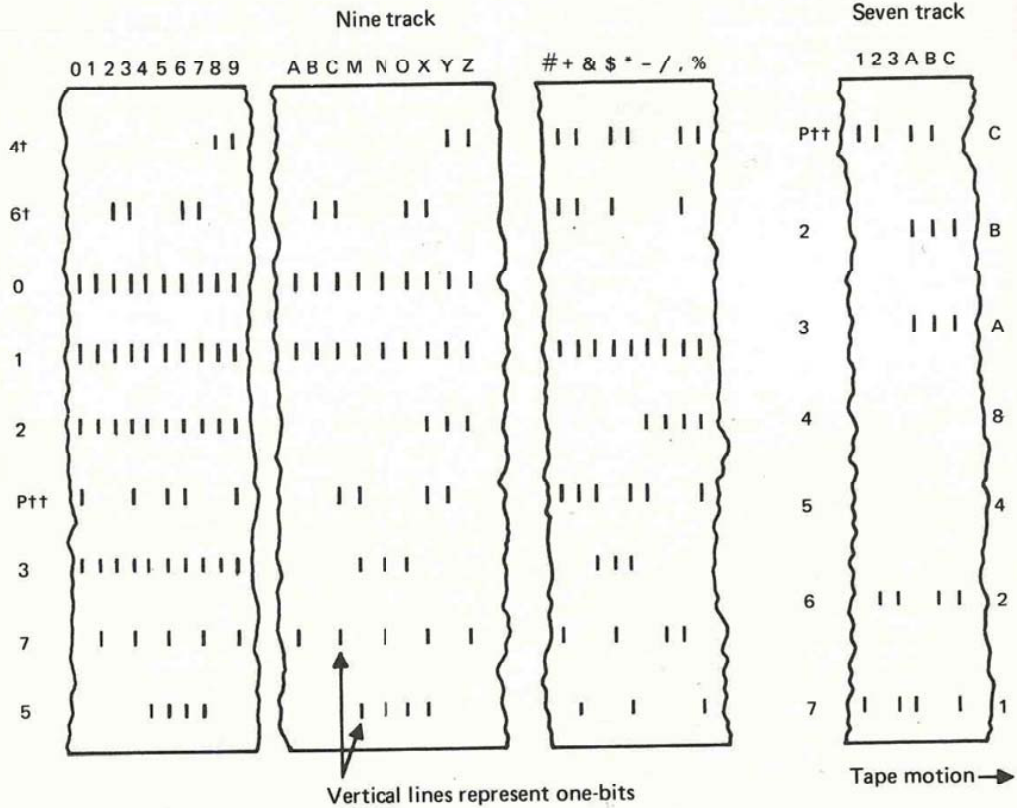


Fig. 1. None- and seven-track tape data format. *Notes:* † Track numbering shows order in which bits are accumulated into bytes (characters); bit 0 is leftmost character and bit 1 is next, etc. Therefore, the character 0 has the bit representation 11110000 on a nine-track tape. †† The parity bit.

wide) of plastic film coated with iron oxide, wound on hard-plastic reels approximately 1 ft in diameter. Information is stored transversely on tape, usually seven or nine bits per *frame* (character or byte of data recorded on tape; see Fig. 1). Longitudinally, data is stored at one of the following densities: 200, 556, 800, or 1,600 frames per inch. (Advanced tape drives store over 6,200 frames per inch.) Thus, a

fully-written reel of tape, recorded at 1,600 frames per inch (also called "bits per inch," bpi), contains over 40 million bytes: $(2,400 \text{ ft} \times 12 \text{ in./foot} \times 1,600 \text{ bytes/inch}) = 46,080,000 \text{ bytes}$.

Data is read from a magnetic-tape AM into MM via a tape drive (also called "tape station," or "tape controller"), depicted in the photo in Fig. 2 and the schematic in Fig. 3. Referring to Fig. 3, the tape is pulled from the supply reel to the takeup reel by motors driving the two hubs. These motors operate independently, so that the length of tape between the two reels varies from instant to instant. This permits the takeup reel to accelerate quickly at the start of each read/write (R/W) operation without requiring synchronized acceleration of the supply reel. The interhub strand of tape droops into two vacuum columns in many widely used tape drives, where it is held lightly taut by air-pressure differences (Fig. 4). As the loop drops below a vacuum-sensing hole in the takeup column, an electric signal engages the takeup motor with the corresponding reel. The motor disengages as soon as the loop is pulled above a second vacuum-sensing hold (Fig. 5). Analogous controls keep a varying-length loop suspended in the supply column.

The foregoing describes *forward* R/W operations; *backward* R/W operations are commonly



Fig. 2. Magnetic tape units on Honeywell Model 8200 computer.

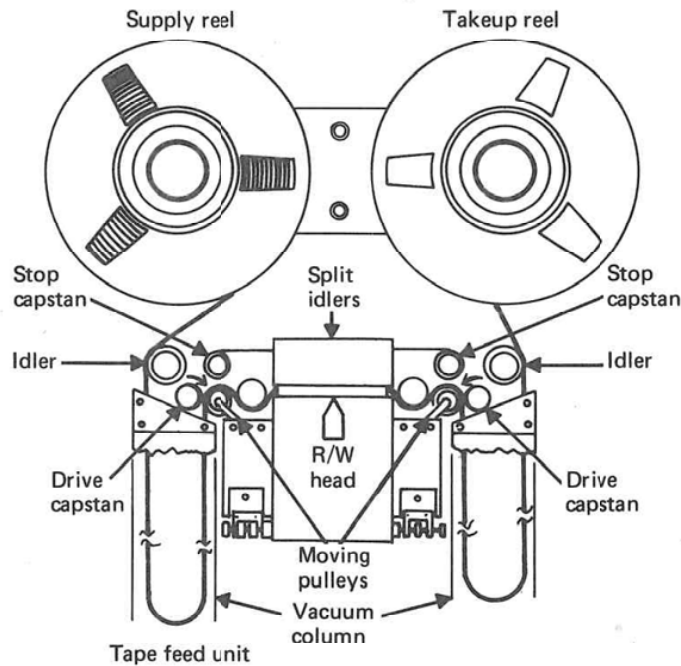


Fig. 3. Tape-drive schematic.



Dictionary of Computing

Information Processing,
Personal Computing,
Telecommunications,
Office Systems,
IBM-specific Terms

Eighth Edition (March 1987)

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pinboard

a project to develop a limited version of a system to be used under restricted yet real conditions to gain experience for the development of a full-scale system. (T) See also prototype.

pinboard Synonym for plugboard.

pin-feed device On a typewriter, a device that guides and feeds paper provided with sprocket feed holes by means of pins engaging in these holes. (T)

pinfeed platen A cylindrical platen that drives paper by means of integral rings of pins engaging perforated holes, rather than by pressure.

PIO Programmed I/O.

PIOCS Physical IOCS.

pipeline *1.* A serial arrangement of processors or a serial arrangement of registers within a processor. Each processor or register performs part of a task and passes results to the next processor; several parts of different tasks can be performed at the same time. *2.* To perform processes in series. *3.* To start execution of an instruction sequence before the previous instruction sequence is completed to increase processing speed.

pipeline processor A processor that consists of a series of functional units that can execute parts of instructions simultaneously.

piping In Advanced DOS, a feature that allows the output of a program as it is displayed on the screen to be used as input to another program without reentering the data on the keyboard.

piracy Illegal copying of software products or microchips.

PIRV Programmed interrupt request vector.

pitch *1.* On a typewriter, the distance

between corresponding points of two equal characters that are typed immediately adjacent to one another. (T) See typewriter with constant pitch, typewriter with proportional pitch. *2.* A unit of width of type, based on the number of characters that can be placed in a linear inch; for example, 10-pitch type has ten characters per inch. *3.* See feed pitch, row pitch, track pitch.

pitch selector On a typewriter, a control by means of which one of several pitch spacings can be set. (T)

PIU Path information unit.

PIXEL Picture element.

PL/I (programming language one) A programming language designed for numeric scientific computations, business data processing, systems programming, and other applications. PL/I is capable of handling a large variety of data structures and easily allows variation of precision in numeric computation. (T)

PLA Programmable logic array. (A)

placeholder record In MSS, a temporary base-volume or copy-volume record that the mass storage volume control functions create and add to the inventory data set during operation of some of the Access Method Services commands of the 3850 Mass Storage System.

plaintext Synonym for clear data.

plasma panel A part of a display device that consists of a grid of electrodes in a flat, gas-filled panel. The image can persist for a long period of time without refresh. (T) Synonymous with gas panel.

plated wire storage A magnetic storage in which data are stored by magnetic recording in a film coated on the surface of wire. (I) (A)

platen *1.* On a typewriter, a roller-type support around which the paper is guided and held during the typing operation. (T) *2.* The part of a document copying machine, usually in the form of a glass plate, which may be curved, upon which the original is placed for copying. (T) *3.* A backing, usually cylindrical, against which printing mechanisms strike or otherwise deposit ink to produce an image.

platen cover On a document copying machine, a cover made of some opaque material, usually with an inner light-reflective surface, which is placed over the platen during the copying process. (T) See also vacuum platen cover.

platen knob On a typewriter, the control by means of which the platen can be turned. (T)

platen machine See moving platen document copying machine, stationary platen document copying machine.

platen release lever On a typewriter, a control by means of which the descent for line spacing is released. (T)

platen variable knob On a typewriter, a control for operating the platen variable mechanism. (T)

platen variable mechanism On a typewriter, a device that permits adjustment of the platen independently of the line space ratchet. (T)

playback *1.* On dictation equipment, the process of reproducing a recording by means of a playback head or a combined head. (I) *2.* In word processing, to display or print out text from a recording medium. Synonymous with payout.

playback control *1.* On dictation equipment, a device that enables a dictation machine to be made ready to reproduce information already recorded on

10

McGraw-Hill

**Dictionary of
Electrical and
Computer
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Darlington amplifier

hit by the electron beam. Also known as skiatron. ('därk, iräs, tüb)

Darlington amplifier [ELECTR] A current amplifier consisting essentially of two separate transistors and often mounted in a single transistor housing. ('dar-lip-tən, am-plä-fi-är)

DARS See direct audio radio service. ('dè:ljär'ès or därz)

d'Arsonval current [ELEC] A current consisting of isolated trains of heavily damped high-frequency oscillations of high voltage and relatively low current, used in diathermy. ('därs-ən, vö-l, kär-ənt)

d'Arsonval galvanometer [ENG] A galvanometer in which a light coil of wire, suspended from thin copper or gold ribbons rotates in the field of a permanent magnet when current is carried to it through the ribbons; the position of the coil is indicated by a mirror carried on it, which reflects a light beam onto a fixed scale. Also known as light-beam galvanometer. ('därs-ən, vö-l, gal-vö'näm-əd-är)

DASD See direct-access storage device. ('daz,dè)

data [COMPUT SCI] 1. General term for numbers, letters, symbols, and analog quantities that serve as input for computer processing. 2. Any representations of characters or analog quantities to which meaning, if not information, may be assigned. ('däd-ə, 'däd-ə, v, 'däd-ə)

data acquisition [COMMUN] The phase of data handling that begins with the sensing of variables and ends with a magnetic recording or other record of raw data; may include a complete radio telemetering link. ('däd-ə, 'ak-wə, 'zish-ən)

data acquisition computer [COMPUT SCI] A computer that is used to acquire and analyze data generated by instruments. ('däd-ə, 'ak-wə, 'zish-ən, kəm'pyüt-ər)

data aggregate [COMPUT SCI] The set of data items within a record. ('däd-ə, 'äg-rə-gət)

data analysis [COMPUT SCI] The evaluation of digital data. ('däd-ə, 'nal-i-səs)

data attribute [COMPUT SCI] A characteristic of a block of data, such as the type of representation used or the length in characters. ('däd-ə, 'ä-trä'byüt)

data automation [COMPUT SCI] The use of electronic, electromechanical, or mechanical equipment and associated techniques to automatically record, communicate, and process data and to present the resultant information. ('däd-ə, 'öd-ə'mä-shən)

data bank [COMPUT SCI] A complete collection of information such as contained in automated files, a library, or a set of computer disks. ('däd-ə, 'bänk)

database [COMPUT SCI] A nonredundant collection of interrelated data items that can be shared and used by several different subsystems. ('däd-ə, 'bäs)

database/data communication [COMPUT SCI] An advanced software product that combines a database management system with data com-

munications procedures. Abbreviated DBPC. ('däd-ə, 'bäs 'däd-ə, 'ka-myü-nä'kä-shən)

database machine [COMPUT SCI] A computer that handles the storage and retrieval of data into and out of a database. ('däd-ə, 'bäs mə'shīn)

database management system [COMPUT SCI] A special data processing system, or part of a data processing system, which aids in the storage, manipulation, reporting, management, and control of data. Abbreviated DBMS. ('däd-ə, 'bäs 'man-ij-mənt, 'sis-təm)

database server [COMPUT SCI] An independently functioning computer in a local-area network that holds and manages the database. ('däd-ə, 'bäs 'sär-vər)

data break [COMPUT SCI] A facility which permits input/output transfers to occur without disturbing program execution in a computer. ('däd-ə, 'bräk)

data buffering [COMPUT SCI] The temporary collection and storage of data awaiting further processing in physical storage devices, allowing a computer and its peripheral devices to operate at different speeds. ('däd-ə, 'büf-ə-rīŋ)

data bus [ELECTR] An internal channel that carries data between a computer's central processing unit and its random-access memory. ('däd-ə, 'bäs)

data capture [COMPUT SCI] The acquisition of data to be entered into a computer. ('däd-ə, 'kæp-tʃər)

data carrier [COMPUT SCI] A medium on which data can be recorded, and which is usually easily transportable, such as disks or tape. ('däd-ə, 'kär-ē-ər)

data carrier storage [COMPUT SCI] Any type of storage in which the storage medium is outside the computer, such as disks and tape, in contrast to inherent storage. ('däd-ə, 'kär-ē-ər, 'stör-ij)

data cartridge [COMPUT SCI] A tape cartridge used for nonvolatile and removable data storage in small digital systems. ('däd-ə, 'kär-trīj)

data cell drive [COMPUT SCI] A large-capacity storage device consisting of strips of magnetic tape which can be individually transferred to the read-write head. ('däd-ə, 'sel, 'driv)

data center [COMPUT SCI] An organization established primarily to acquire, analyze, process, store, retrieve, and disseminate one or more types of data. ('däd-ə, 'sen-tər)

data chain [COMPUT SCI] Any combination of two or more data elements, data items, data codes, and data abbreviations in a prescribed sequence to yield meaningful information; for example, "date" consists of data elements year, month, and day. ('däd-ə, 'čhän)

data chaining [COMPUT SCI] A technique used in scatter reading or scatter writing in which new storage areas are defined for use as soon as the current data transfer is completed. ('däd-ə, 'čhän-ŋ)

data channel [COMPUT SCI] A bidirectional data path between input/output devices and the main memory of a digital computer permitting one or more input/output operations to proceed

forward chaining [COMPUT SCI] In artificial intelligence, a method of reasoning which begins with a statement of all the relevant data and works toward the solution using the system's rules of inference. (f'or-w'rd ch'ain-tj)

forward compatibility See upward compatibility. (f'or-w'rd kam-pad-'a-bil-əd-ē)

forward coupler [ELECTR] Directional coupler used to sample incident power. (f'or-w'rd 'kə-plər)

forward current [ELECTR] Current which flows upon application of forward voltage. (f'or-w'rd 'kə-rənt)

forward direction [ELECTR] Of a semiconductor diode, the direction of lower resistance to the flow of steady direct current. (f'or-w'rd dō-rēk-shən)

forward drop [ELECTR] The voltage drop in the forward direction across a rectifier. (f'or-w'rd 'drāp)

forward error analysis [COMPUT SCI] A method of error analysis based on the assumption that small changes in the input data lead to small changes in the results, so that bounds for the errors in the results caused by rounding or truncation errors in the input can be calculated. (f'or-w'rd 'er-ər ə-nal-ə-səs)

forward error correction [COMMUN] The location and correction of errors occurring in data communications by the receiver without retransmission of data. (f'or-w'rd 'er-ər kə-rēk-shən)

forward path [CONT SVS] The transmission path from the loop actuating signal to the loop output signal in a feedback control loop. (f'or-w'rd 'pəθ)

forward propagation by ionospheric scatter [COMMUN] Radio communications technique using the scattering phenomenon exhibited by electromagnetic waves in the 30-100-megahertz region when passing through the ionosphere at an elevation of about 50 miles (85 kilometers). (f'or-w'rd 'prəp-ə-gā-shən bi t'ān-ə-sfir-ik skad-ər)

forward propagation by tropospheric scatter [COMMUN] Radio communications technique using high transmitting power levels, large antenna arrays, and the scattering phenomenon of the troposphere to permit communications far beyond line-of-sight distances. (f'or-w'rd 'prəp-ə-gā-shən bi t'rəp-ə-sfir-ik skad-ər)

forward recovery time [ELECTR] Of a semiconductor diode, the time required for the forward current or voltage to reach a specified value after instantaneous application of a forward bias in a given circuit. (f'or-w'rd rī'kav-ər-ē tīm)

forward reference [COMPUT SCI] Reference to a data element that has not yet been defined in the program being compiled. (f'or-w'rd 'rē-frəns)

forward resistance [ELECTR] The resistance of a semiconductor diode to current flow in the forward direction. (f'or-w'rd rī'z-ans-təns)

forward scatter [COMMUN] 1. Propagation of electromagnetic waves at frequencies above the maximum usable high frequency through use of the scattering of a small portion of the

transmitted energy when the signal passes from an ionized medium into a layer of the ionosphere. 2. Collectively, the very-high-frequency forward propagation by ionospheric scatter and ultra-high-frequency forward propagation by tropospheric scatter communications techniques. (f'or-w'rd 'skad-ər)

forward-scatter propagation See scatter propagation. (f'or-w'rd 'skad-ər prəp-ə-gā-shən)

forward transfer function [CONT SVS] In a feedback control loop, the transfer function of the forward path. (f'or-w'rd t'rānz-fər-f'ānk-shən)

forward voltage drop See diode forward voltage. (f'or-w'rd 'vōl-tj 'drāp)

forward wave [ELECTR] Wave whose group velocity is the same direction as the electron stream motion. (f'or-w'rd 'wāv)

Foster-Seely discriminator See phase-slit discriminator. (f'os-tər 'sē-lē ē-dī-skrim-ə-nād-ər)

Foster's reactance theorem [CONT SVS] The theorem that the most general driving point impedance or admittance of a network, in which every mesh contains independent inductance and capacitance, is a meromorphic function whose poles and zeros are all simple and occur in conjugate pairs on the imaginary axis, and in which these poles and zeros alternate. (f'os-təz 'rē-akt-əns 'θīr-əm)

four-address [COMPUT SCI] Pertaining to an instruction address which contains four address parts. (f'or 'ə-drēs)

four-channel sound system See quadraphonic sound system. (f'or 'tʃən-əl 'saund sɪs-təm)

four-frequency duplex telegraphy [COMMUN] Frequency-shift telegraphy in which each of the four possible signal combinations corresponding to two telegraph channels is represented by a separate frequency. (f'or 'frē-kwən-sē 'dɪ-pleks tē-lē-g'rā-fē)

Fourier analyzer [ENGI] A digital spectrum analyzer that provides push-button or other switch selection of averaging, coherence function, correlation, power spectrum, and other mathematical operations involved in calculating Fourier transforms of time-varying signal voltages for such applications as identification of underwater sounds, vibration analysis, oil prospecting, and brain-wave analysis. (f'ūr-ē-ə 'an-ə-līz-ər)

four-layer device [ELECTR] A pnp semiconductor device, such as a silicon controlled rectifier, that has four layers of alternating p-n-p-n-type material to give three pn junctions. (f'or 'lā-ə 'dī-vīs)

four-layer diode [ELECTR] A semiconductor diode having three junctions, terminal connections being made to the two outer layers that form the junctions; a Shockley diode is an example. (f'or 'lā-ər 'dī-əd)

four-layer transistor [ELECTR] A junction transistor having four conductivity regions but only three terminals; a thyristor is an example. (f'or 'lā-ər t'rānz-ist-ər)

four-phase modulation [COMMUN] Modulation in which data are encoded on a carrier frequency as a succession of phase shifts that will be 45°

135°, 225°, or 315°; each phase shift contains 2 bits of information called dibits, as follows: 225° represents 00, 315° is 01, 45° is 11, and 135° is 10. (f'or 'fāz m'ā-j-ə 'lā-shən)

four-plus-one address [COMPUT SCI] An instruction that contains four operand addresses and a control address. (f'or 'plʌs 'wən ə 'drēs)

four-pole double-throw [ELECTR] A 12-terminal switch or relay contact arrangement that simultaneously connects two pairs of terminals to either of two other pairs of terminals. Abbreviated 4PDT. (f'or 'pɔl 'dʌb-əl 'θrə)

four-quadrant multiplier [COMPUT SCI] A multiplier in an analog computer in which both the reference signal and the number represented by the input may be bipolar, and the multiplication rules for algebraic sign are obeyed. Also known as quarter-square multiplier. (f'or 'kwɔd-rənt 'mʌlt-ə-plī-ər)

four-tape [COMPUT SCI] To sort input data, supplied on two tapes, into incomplete sequences alternately on two output tapes; the output tapes are used for input on the succeeding pass, resulting in longer and longer sequences after each pass, until the data are all in one sequence on one output tape. (f'or 'tēp)

fourth-generation computer [COMPUT SCI] A type of general-purpose digital computer used in the 1970s and 1980s that is characterized by increasingly advanced very large-scale integrated circuits and increasing use of a hierarchy of memory devices. (f'ɔrθ 'jen-ə-rā-shən kəm'pyʊt-ər)

fourth-generation language [COMPUT SCI] A higher-level programming language that automates many of the basic functions that must be spelled out in conventional languages, and can obtain results with an order-of-magnitude less coding because of its richer content of commands. (f'ɔrθ 'jen-ə-rā-shən 'lāŋ-gwɪ)

four-track tape [ENGI] Magnetic tape on which two tracks are recorded for each direction of travel, to provide stereo sound reproduction or to double the amount of source material that can be recorded on a given length of 1/4-inch (0.635-centimeter) tape. (f'or 'træk tēp)

four-way switch [ELECTR] An electric switch employed in house wiring, that makes it possible to turn a light on or off at three or more places. (f'or 'wē 'swɪtʃ)

four-wire circuit [COMMUN] A two-way circuit using two paths so arranged that communication currents are transmitted in one direction only on one path, and in the opposite direction on the other path; the transmission path may or may not employ four wires. (f'or 'wɪr 'sər-kət)

four-wire repeater [ELECTR] Telephone repeater for use in a four-wire circuit and in which there are two amplifiers, one serving to amplify the telephone currents in one side of the fourwire circuit, and the other serving to amplify the telephone currents in the other side of the four-wire circuit. (f'or 'wɪr rɪ'pē-ər)

four-wire subscriber line [COMMUN] Four-wire circuit connecting a subscriber directly to a switching center. (f'or 'wɪr sʌb skrib-ər 'lɪn)

four-wire terminating set [ELECTR] Hybrid arrangement by which four-wire circuits are terminated on a two-wire basis for interconnection with two-wire circuits. (f'or 'wɪr tər-mɪ-nād-ɪŋ 'set)

four-wire terminating set [ELECTR] Hybrid arrangement by which four-wire circuits are terminated on a two-wire basis for interconnection with two-wire circuits. (f'or 'wɪr tər-mɪ-nād-ɪŋ 'set)

fox [COMPUT SCI] A name for the hexadecimal digit whose decimal equivalent is 15. (f'ɔks)

Fox broadcast [COMMUN] Radio broadcast of messages for which receiving stations make no acknowledgment. (f'ɔks 'brɔd-kast)

FPLA See field-programmable logic array.

Fr See statcoulomb.

fractional horsepower motor [ELECTR] Any motor built into a frame smaller than that for a motor having an open construction and a continuous rating of 1 horsepower (745.7 watts) at 1800 revolutions per minute. (f'rak-shən-əl 'hɔrs 'pau-ər 'mɔd-ər)

fractional quantum Hall effect [ELECTR] The version of the quantum Hall effect in which the Hall resistance becomes precisely equal to $h/νq^2$, where h is Planck's constant, e is the electronic charge, q is an odd integer, and $ν$ is an integer not divisible by q . (f'rak-shən-əl 'kwān-təm 'hɔl 'i-ekt)

fragmentation [COMPUT SCI] The tendency of files in disk storage to be divided up into many small areas scattered around the disk. (f'ræg-mənt-ə-shən)

fragmenting [COMPUT SCI] The breaking up of a document into its various components. (f'ræg-mənt-ɪŋ)

Frame frequency meter See vibrating-reed frequency meter. (f'rām 'frē-kwən-sē mē-tər)

frame [COMMUN] 1. One cycle of a regularly recurring series of pulses. 2. An elementary block of data for transmission over a network or communications system. [COMPUT SCI] 1. Subdivision of a browser window, with each section containing a separate Web page. 2. See main frame. [ELECTR] One complete representation of a video image. (f'rām)

frame buffer [COMPUT SCI] A device that stores a television picture or frame for processing. (f'rām 'bʌf-ər)

frame frequency [ELECTR] The number of times per second that the frame is completely scanned in a video system. Also known as picture frequency. (f'rām 'frē-kwən-sē)

frame grabber [COMPUT SCI] An external device that digitizes standard television video images for storage or processing in a computer. (f'rām 'grəb-ər)

frame period [ELECTR] A time interval equal to the reciprocal of the frame frequency. (f'rām 'pɪr-ē-əd)

framer [ELECTR] Device for adjusting facsimile equipment so the start and end of a recorded line are the same as on the corresponding line of the subject copy. (f'rām-ər)

framing [ELECTR] Adjusting a facsimile picture to a desired position in the direction of line progression. Also known as phasing. (f'rām-ɪŋ)

framing control [ELECTR] 1. A control that adjusts the centering, width, or height of the image

optical character recognition [COMPUT SCI] That branch of character recognition of handwritten or the automatic identification of hand-written or printed characters by any of various photoelectric methods. Abbreviated OCR. Also known as electrooptical character recognition. ('ap-ta-ka'l 'kar-i-ka-r, rek-i-gnish-an)
optical communication [COMMON] The use of electromagnetic waves in the region of the spectrum near visible light for the transmission of signals representing speech, pictures, data pulses, or other information, usually in the form of a laser beam modulated by the information signal. ('ap-ta-ka'l ka-myü-nä-kä-shan)
optical computer [COMPUT SCI] A computer that uses various combinations of holography, lasers, and mass-storage memories for such applications as ultra-high-speed signal processing, image deburring, and character recognition. ('ap-ta-ka'l kam pyüd-ar)
optical coupler See optoisolator. ('ap-ta-ka'l 'kap-lar)
optical coupling [ELECTR] Coupling between two circuits by means of a light beam or light pipe having transducers at opposite ends, to isolate the circuits electrically. ('ap-ta-ka'l 'kap-liq)
optical data storage [COMPUT SCI] The technology of placing information in a medium so that, when a light beam scans the medium, the reflected light can be used to recover the information. ('ap-ta-ka'l 'dad-a 'stör-iq)
optical disk [COMPUT SCI] A type of video disk storage device consisting of a pressed disk with a spiral groove at the bottom of which are submicrometer-sized depressions that are sensed by a laser beam. ('ap-ta-ka'l 'disk)
optical disk storage [COMPUT SCI] A computer storage technology in which information is stored in submicrometer-sized holes on a rotating disk, and is recorded and read by laser beams focused on the disk. Also known as laser disk storage; video disk storage. ('ap-ta-ka'l 'disk 'stör-iq)
optical electronic reproducer See optical sound head. ('ap-ta-ka'l 'lek-trän-ik, rë-prä'dü-sär)
optical encoder [ELECTR] An encoder that converts positional information into corresponding digital data by interrupting light beams directed on photoelectric devices. ('ap-ta-ka'l in köd-ar)
optical fiber [OPTICS] A long, thin thread of fused silica, or other transparent substance, used to transmit light. Also known as light guide. ('ap-ta-ka'l 'fi-bar)
optical-fiber amplifier [COMMON] A device for amplifying signals transmitted over optical fibers, consisting of a low-loss single-mode fiber made of basic silica glass, along whose length gain is generated by coupling pump light at either end or both fiber ends, or at periodic locations in between. ('ap-ta-ka'l, fi-bar 'am-plä-fi-ar)
optical-fiber cable See optical waveguide. ('ap-ta-ka'l fi-bar 'kä-bäl)
optical-fiber sensor [ENG] An instrument in which the physical quantity to be measured is made to modulate the intensity, spectrum, phase, or polarization of light from a light-

emitting diode or laser diode traveling through an optical fiber; the modulated light is detected by a photodiode. Also known as fiber-optic sensor. ('ap-ta-ka'l fi-bar 'sen-sär)
optical filter See filter. ('ap-ta-ka'l 'fi-ltär)
optical information processor See optical information system. ('ap-ta-ka'l in-för-mä-shän, 'prö-ses-ar)
optical information system [COMPUT SCI] A device that uses light to process information, consists of one or several light sources, a one- or two-dimensional plane of data such as a film transparency, lens, or other optical component, and a detector. Also known as optical information processor. ('ap-ta-ka'l in-för-mä-shän, 'süs-täm)
optical isolator See optoisolator. ('ap-ta-ka'l 'i-sä-lä-där)
optical lithography [ELECTR] Lithography in which an integrated circuit pattern is first created on a glass plate or mask and is then transferred to the resist by one of a number of optical techniques by using visible or ultraviolet light. ('ap-ta-ka'l li-thä-grä-fä)
optically coupled isolator See optoisolator. ('ap-ta-ka'l 'kup-äld 'i-sä-lä-där)
optical mark reading [COMPUT SCI] Optically sensing information encoded as a series of marks, such as lines or filled-in boxes on a test answer sheet, or some special pattern, such as the Universal Product Code. Abbreviated OMR. ('ap-ta-ka'l 'märk, rëd-iq)
optical mask [ELECTR] A thin sheet of metal or other substance containing an open pattern, used to suitably expose to light a photosensitive substance overlaid on a semiconductor or other surface to form an integrated circuit. ('ap-ta-ka'l 'mask)
optical memory [COMPUT SCI] A computer memory that uses optical techniques which generally involve an addressable laser beam, a storage medium which responds to the beam for writing and sometimes for erasing, and a detector which reacts to the altered character of the medium when it uses the beam to read out stored data. ('ap-ta-ka'l 'mem-rë)
optical microphone [ENG ACQUIS] A microphone in which the motion of a membrane is detected using a light beam reflected from it, either with the aid of an interferometer or by detecting the deflection of the beam. ('ap-ta-ka'l 'mi-kro-fön)
optical modulator [COMMON] A device used for impressing information on a light beam. ('ap-ta-ka'l 'mä-dä-lä-där)
optical mouse [COMPUT SCI] A mouse that emits a light signal and uses its reflection from a reflective grid to determine position and movement. ('ap-ta-ka'l 'mäus)
optical processing [COMPUT SCI] The use of light, including visible and infrared, to handle data-processing information. ('ap-ta-ka'l 'prä-ses-iq)
optical proximity sensor [ENG] A device that uses the principle of triangulation of reflected infrared or visible light to measure small distances in a robotic system. ('ap-ta-ka'l 'präk 'süm-ädt 'sen-sär)

specified initial state of the system. ('ap-ta-mäl 'prö-gram-iq)
optimal regulator problem See linear regulator problem. ('ap-ta-mäl 'reg-yä-lä-där, 'prö-bläm)
optimal smoother [CONT SYS] An optimal filter algorithm which generates the best estimate of a dynamical variable at a certain time based on all available data, both past and future. ('ap-ta-mäl 'smüth-är)
optimization [SYS ENG] 1. Broadly, the efforts and processes of making a decision, a design, or a system as perfect, effective, or functional as possible. 2. Narrowly, the specific methodology, techniques, and procedures used to decide on the one specific solution in a defined set of possible alternatives that will best satisfy a selected criterion. Also known as system optimization. ('ap-ta-mä-zä-shän)
optimize [COMPUT SCI] To rearrange the instructions or data in storage so that a minimum number of time-consuming jumps or transfers are required in the running of a program. ('ap-ta-miz)
optimized code [COMPUT SCI] A machine-language program that has been revised to remove inefficiencies and unused or unnecessary instructions so that the program is executed more quickly and occupies less storage space. ('ap-ta-mizid 'küd)
optimizer [COMPUT SCI] A utility program that processes machine-language programs and generates optimized code. ('ap-ta-miz-ar)
optimum array current [ELECTROMAG] The current distribution in a broadside antenna array which is such that for a specified side-lobe level the beam width is as narrow as possible, and for a specified first null the side-lobe level is as small as possible. ('ap-ta-mäm 'ä-rä, 'kä-ränt)
optimum bunching [ELECTR] Bunching condition required for maximum output in a velocity modulation tube. ('ap-ta-mäm 'bänch-iq)
optimum code [COMPUT SCI] A computer code which is particularly efficient with regard to a particular aspect; for example, minimum time of execution, minimum or efficient use of storage space, and minimum coding time. ('ap-ta-mäm 'küd)
optimum coupling See critical coupling. ('ap-ta-mäm 'kap-liq)
optimum filter [ELECTR] An electric filter in which the mean square value of the error between a desired output and the actual output is at a minimum. ('ap-ta-mäm 'filtär)
optimum programming [COMPUT SCI] Production of computer programs that maximize efficiency with respect to some criteria such as least cost, least use of storage, least time, or least use of time-sharing peripheral equipment. ('ap-ta-mäm 'prö-gram-iq)
optimum traffic frequency See optimum working frequency. ('ap-ta-mäm 'trä-ik, 'frë-kwän-së)
optimum working frequency [COMMON] The most effective frequency at a specified time for ionospheric propagation of radio waves between two specified points. Also known as frequency

optical reader [COMPUT SCI] A computer data-entry machine that converts printed characters, bar or line codes, and pencil-shaded areas into a computer-input code format. ('ap-ta-ka'l 'rë-där)
optical relay [ELECTR] An optoisolator in which the output device is a light-sensitive switch that provides the same on and off operations as the contacts of a relay. ('ap-ta-ka'l 'rë-lä)
optical scanner See flying-spot scanner. ('ap-ta-ka'l 'skän-är)
optical sound head [ELECTR] The assembly in motion picture projection which reproduces photographically recorded sound; light from an incandescent lamp is focused on a slit, light from the slit is in turn focused on the optical sound track of a film, and the light passing through the film is detected by a photoelectric cell. Also known as optical electronic reproducer. ('ap-ta-ka'l 'säund 'rë-prä 'dük-tör)
optical sound recorder See photographic sound recorder. ('ap-ta-ka'l 'säund ri, körd-ar)
optical sound reproducer See photographic sound reproducer. ('ap-ta-ka'l 'säund 'rë-prä 'dük-tör)
optical storage [COMPUT SCI] Storage of large amounts of data in permanent form on photographic film or its equivalent, for nondestructive readout by means of a light source and photodetector. ('ap-ta-ka'l 'stör-iq)
optical tape storage [COMMON] A data storage technology in which information is stored on a tape that is wound on a spool and has a large number of parallel channels, and information is retrieved by sensing the reflected light when a light beam scans the medium. ('ap-ta-ka'l 'täp 'stör-iq)
optical type font [COMPUT SCI] A special type font whose characters are designed to be easily read by both people and optical character recognition machines. ('ap-ta-ka'l 'tip 'fänt)
optical waveguide [ELECTROMAG] A waveguide in which a light-transmitting material such as glass or plastic fiber is used for transmitting information from point to point at wavelengths somewhere in the ultraviolet, visible-light, or infrared portions of the spectrum. Also known as fiber waveguide; optical-fiber cable. ('ap-ta-ka'l 'väv-gäid)
optimal control theory [CONT SYS] An extension of the calculus of variations for dynamic systems with one independent variable, usually time, in which control (input) variables are determined to maximize (or minimize) some measure of the performance (output) of a system while satisfying specified constraints. ('ap-ta-tä-mäl 'kä-ntröl, 'ih-ä-rë)
optimal feedback control [CONT SYS] A subfield of optimal control theory in which the control variables are determined as functions of the current state of the system. ('ap-ta-tä-mäl 'fä-d-bäk 'kä-ntröl)
optimal programming [CONT SYS] A subfield of optimal control theory in which the control variables are determined as functions of time for a

pipe-to-soil potential

pipe-to-soil potential [ELEC] The voltage potential (emf) generated between a buried pipe and its surrounding soil, the result of electrolytic action and a cause of electrolytic corrosion of the pipe. ('pɪp tə sɔɪl pəʊ tenʃəl)

pi point [ELEC] Frequency at which the insertion phase shift of an electric structure is 180° or an integral multiple of 180°. ('pi ˌpɔɪnt)

pi section filter [ELEC] An electric filter made of several pi networks connected in series. ('pi ˌsekʃən ˌfɪltə)

piston [ELECTROMAG] A sliding metal cylinder used in waveguides and cavities for tuning purposes or for reflecting essentially all of the incident energy. Also known as plunger; waveguide plunger. ('pɪs-tən)

piston attenuator [ELECTROMAG] A microwave attenuator inserted in a waveguide to introduce an amount of attenuation that can be varied by moving an output coupling device along its longitudinal axis. ('pɪs-tən ə'ten-yə-wɑ:d-ər)

pitch [COMPUT SCI] The distance between the centerlines of adjacent rows of hole positions in punched paper tape. ('pɪtʃ)

pitch-row [COMPUT SCI] The distance between two adjacent holes in a paper tape. ('pɪtʃ ˌrɔ)

pi-T transformation See Y-delta transformation. ('pi ˌtɪ ˌtranz-fər-mā-shən)

pixel [COMPUT SCI] The smallest part of an electronically coded picture image. [ELECTR] The smallest addressable element in an electronic display; a short form for picture element. Also known as pel. ('pɪksəl)

PL/I [COMPUT SCI] A multipurpose programming language, developed by IBM for the Model 360 systems, which can be used for both commercial and scientific applications. ('pi:el ˌwaɪ)

PLA See programmed logic array.

placeholder [COMPUT SCI] A section of computer storage reserved for information that will be provided later. ('plæs-hòl-də)

plaintext [COMMUN] The form of a message in which it can be generally understood, before it has been transformed by a code or cipher into a form in which it can be read only by those privy to the secrets of the cipher. [COMPUT SCI] Data that are to be encrypted. ('plæn,tɛkst)

plain vanilla See vanilla. ('plæn və'nɪlə)

planar area [COMPUT SCI] In computer graphics, an object with boundaries, such as a circle or polygon. ('plæn-ər ˌeɪ-ə)

planar array [ELECTR] An array of ultrasonic transducers that can be mounted in a single plane or sheet, to permit closer conformation with the hull design of a sonar-carrying ship. ('plæn-ər ˌeɪ-rə)

planar-array antenna [ELECTROMAG] An array antenna in which the centers of the radiating elements are all in the same plane. ('plæn-ər ˌeɪ-rə ˌæn-ten-ə)

planar ceramic tube [ELECTR] Electron tube having parallel planar electrodes and a ceramic envelope. ('plæn-ər ˌseɪr-əm-ɪk ˌtʌb)

planar device [ELECTR] A semiconductor device having planar electrodes in parallel planes, made

by alternate diffusion of p- and n-type impurities into a substrate. ('plæn-ər ˌdi-vɪs)

planar diode [ELECTR] A diode having planar electrodes in parallel planes. ('plæn-ər ˌdi-òd)

planar photodiode [ELECTR] A vacuum photodiode consisting simply of a photocathode and an anode; light enters through a window sealed into the base, behind the photocathode. ('plæn-ər ˌfòd-ò-di-òd)

planar process [ENG] A silicon-transistor manufacturing process in which a fractional-micrometer-thick oxide layer is grown on a silicon substrate; a series of etching and diffusion steps is then used to produce the transistor inside the silicon substrate. ('plæn-ər ˌprɒs-səs)

planar transistor [ELECTR] A transistor constructed by an etching and diffusion technique in which the junction is never exposed during processing, and the junctions reach the surface in one plane; characterized by very low leakage current and relatively high gain. ('plæn-ər ˌtranz-ɪs-tər)

plane [ELECTR] Screen of magnetic cores; planes are combined to form stacks. ('plæn)

plane earth [ELECTROMAG] Earth that is considered to be a plane surface as used in ground-wave calculations. ('plæn ˌəθ)

plane-earth attenuation [ELECTROMAG] Attenuation of an electromagnetic wave over an imperfectly conducting plane earth in excess of that over a perfectly conducting plane. ('plæn ˌəθ ˌæ-tən-yə-wā-shən)

plane of polarization [ELECTROMAG] Plane containing the electric vector and the direction of propagation of electromagnetic wave. ('plæn ˌəv ˌpò-lə-rə-zā-shən)

plane polarization See linear polarization. ('plæn ˌpò-lə-rə-zā-shən)

plane-polarized wave [ELECTROMAG] An electromagnetic wave whose electric field vector at all times lies in a fixed plane that contains the direction of propagation through a homogeneous isotropic medium. ('plæn ˌpò-lə-rə-zəd wā)

plane reflector See passive reflector. ('plæn ˌrɪflek-tər)

planetary wave See long wave. ('plæn-ə'ter-ē wāv)

planigraphy See sectional radiography. ('plæn-ə'grɪ-fə)

planiconvex spotlight [ELEC] A light that can be used as a sharply defined spotlight or for soft-edged lighting; ranges in power from 100 to 2000 watts. ('plæn-ɪk'ɒn ˌkɒn-veks ˌspɔt,lɪt)

plan position indicator [ELECTR] A radar display in which echoes from various targets appear as bright spots at the same locations as they would on a circular map of the area being scanned, the radar antenna being at the center of the map. Variations of the plan position indicator format include limited-sector display with the radar location offset from the center appropriately, the orientation to true or magnetic north or the radar-vehicle heading at the top, and so on. Abbreviated PPI. ('plæn pə'zɪʃ-ən ˌɪn-də-kæd-ər)

plan position indicator repeater [ELECTR] (PPI) which repeats a plan position indicator (PPI)

at a location remote from the radar console. Also known as remote plan position indicator. ('plæn pə'zɪʃ-ən ˌɪn-də-kæd-ər ˌrɪ-pi:əd-ər)

plant [COMPUT SCI] To place a number or instruction that has been generated in the course of a computer program in a storage location where it will be used or obeyed at a later stage of the program. ('plænt)

plate cell [ELEC] A type of lead-acid cell in which the active material is formed on the plates by electrochemical means during repeated charging and discharging, instead of being applied as a prepared paste. ('plæt ˌtɛl)

plate factor [ELEC] The ratio of the average power load of an electric power plant to its rated capacity. Also known as capacity factor. ('plæt ˌfækt-ər)

plasma cathode [ELECTR] A cathode in which the source of electrons is a gas plasma rather than a solid. ('plæz-mə ˌkæθ-òd)

plasma diode [ELECTR] A diode used for converting heat directly into electricity; it consists of two closely spaced electrodes serving as cathode and anode, mounted in an envelope in which a low-pressure cesium vapor fills the interelectrode space; heat is applied to the cathode, causing emission of electrons. ('plæz-mə ˌdi-òd)

plasma display [ELECTR] A display in which sets of parallel conductors at right angles to each other are deposited on glass plates, with the very small space between the plates filled with a gas; each intersection of two conductors defines a single cell that can be energized to produce a gas discharge forming one element of a dot-matrix display. ('plæz-mə ˌdɪ'splɪ)

plasma etching [ELECTR] A method of forming integrated-circuit patterns on a surface, in which charged species in a plasma formed above a masked surface are directed to impact the nonmasked regions of the surface and knock out substrate atoms. Also known as dry plasma etching. ('plæz-mə ˌetʃ-ɪŋ)

plasma generator [ELECTR] Any device that produces a high-velocity plasma jet, such as a plasma accelerator, engine, oscillator, or torch. ('plæz-mə ˌjen-ə-rəd-ər)

plasma gun [ELECTR] A machine, such as an electric-arc chamber, that will generate very high heat fluxes to convert neutral gases into plasma. [ELECTROMAG] An electromagnetic device which creates and accelerates bursts of plasma. ('plæz-mə ˌgən)

plasma sheath [ELECTR] An envelope of ionized gas that surrounds a spacecraft or other body moving through an atmosphere at hypersonic velocities; affects transmission, reception, and diffraction of radio waves. ('plæz-mə ʃeɪθ)

plasmatron [ELECTR] A gas-discharge tube in which independently generated plasma serves as a conductor between a hot cathode and an anode; the anode current is modulated by varying either the conductivity or the effective cross section of the plasma. ('plæz-mə ˌtræn)

platinotron

plastic film capacitor [ELEC] A capacitor constructed by stacking, or forming into a roll, alternate layers of foil and a dielectric which consists of a plastic, such as polystyrene or Mylar, either alone or as a laminate with paper. ('plæs-tɪk ˌfɪlm kə-pəs-əd-ər)

plastic plate [ELECTR] A plate of plastic dielectric material used as a base for a semiconductor device. ('plæs-tɪk ˌplæt)

plate [ELEC] 1. One of the conducting surfaces in a capacitor. 2. One of the electrodes in a storage battery. [ELECTR] See anode. ('plæt)

plateau [ELECTR] The portion of the plateau characteristic of a counter tube in which the counting rate is substantially independent of the applied voltage. ('plætə)

plateau characteristic [ELECTR] The relation between counting rate and voltage for a counter tube when radiation is constant, showing a plateau after the rise from the starting voltage to the Geiger threshold. Also known as counting rate-voltage characteristic. ('plætə ˌkɑ-rɪ-k-tərɪs-tɪk)

plate circuit See anode circuit. ('plæt ˌsər-kət)

plate-circuit detector See anode-circuit detector. ('plæt ˌsər-kət ˌdɪ-tekt-ər)

plate current See anode current. ('plæt ˌkərənt)

plated circuit [ELECTR] A printed circuit produced by electrodeposition of a conductive pattern on an insulating base. Also known as plated printed circuit. ('plæd-əd ˌsər-kət)

plate detector See anode detector. ('plæt ˌdɪ-tekt-ər)

plate dissipation See anode dissipation. ('plæt ˌdɪs-ə-pə-shən)

plated printed circuit See plated circuit. ('plæd-əd ˌprɪnt-əd ˌsər-kət)

plated wire memory [COMPUT SCI] A nonvolatile magnetic memory utilizing small zones of thin films plated on wires; such memories are characterized by very fast access and nondestructive readout. ('plæd-əd ˌwaɪr ˌmem-əri)

plate efficiency See anode efficiency. ('plæt ˌɪfɪ-ən-si)

plate impedance See anode impedance. ('plæt ˌɪm-pi:ð-əns)

plate input power See anode input power. ('plæt ˌɪn-pʊt ˌpaʊ-ər)

plate-load impedance See anode impedance. ('plæt ˌlɔd ˌɪm-pi:ð-əns)

plate modulation See anode modulation. ('plæt ˌmɔd-ju-lə-shən)

plate neutralization See anode neutralization. ('plæt ˌnɪ:trə-lə-zā-shən)

plate pulse modulation See anode pulse modulation. ('plæt ˌpʊls ˌmɔd-ju-lə-shən)

plate resistance See anode resistance. ('plæt ˌrɪ-zɪ-stəns)

plate saturation See anode saturation. ('plæt ˌsæt-ə-rā-shən)

platform [COMPUT SCI] The hardware system and the system software used by a computer program. ('plæt fɔ:m)

platinotron [ELECTR] A microwave tube that may be used as a high-power saturated amplifier or

second-time-around echo

second-time-around echo [ELECTR] A radar echo received from one pulse after the transmission of a subsequent pulse and liable to be associated with the latter, giving an erroneous indication of range. ('sek-and-tim-a-round-ek-ò)

second-trip echo See second-time-around echo. ('sek-and-trip-ek-ò)

security system See privacy system. ('sè-krà-sè-sis-tém)

secret-key algorithm [COMPUT SCI] A cryptographic algorithm which uses the same cryptographic key for encryption and decryption, requiring that the key first be transmitted from the sender to the recipient via a secure channel. ('sè-krat, kè 'al-gò-rith-m)

section [COMMUN] Each individual transmission span in a radio relay system; a system has one more section than it has repeaters. ('sek-shàn)

sectional center [COMMUN] A long-distance telephone office which connects several primary centers and which is in class number 2; only a regional center has greater importance in routing telephone calls. Abbreviated SC. ('sek-shàn-àl 'sen-'ar)

sectionalized vertical antenna [ELECTROMAG] Vertical antenna that is insulated at one or more points along its length; the insertion of suitable reactances or applications of a driving voltage across the insulated points results in a modified current distribution giving a more desired radiation pattern in the vertical plane. ('sek-shàn-àl 'zàd-'à-kal-ant-è)

sectional radiography [ELECTR] The technique of making radiographs of plane sections of a body or an object; its purpose is to show detail in a predetermined plane of the body, while blurring the images of structures in other planes. Also known as laminography; planigraphy; tomography. ('sek-shàn-àl, 'ràd-'è-gà-rà-fè)

sector [COMPUT SCI] 1. A portion of a track on a magnetic disk or a band on a magnetic drum. 2. A unit of data stored in such a portion. [ELECTROMAG] Coverage of a radar as measured in azimuth. ('sek-tar)

sectoral horn [ELECTROMAG] Horn with two opposite sides parallel and the two remaining sides which diverge. ('sek-tar-àl 'hòrn)

sector display [ELECTR] A display in which only a sector of the total service area of a radar system is shown; usually the sector is selectable. ('sek-tar di-splà)

sector interleave [COMPUT SCI] A sequence indicating the order in which sectors are arranged on a hard disk, generally so as to minimize access times. Also known as sector map. ('sek-tar 'in-'tar, 'lèv)

sector map See sector interleave. ('sek-tar, 'màp)

sector mark [COMPUT SCI] A location on each sector of each track of a disk pack or floppy disk that gives the sector's address, tells whether the sector is in use, and gives other control information. ('sek-tar, 'màrk)

sector scan [ELECTR] A radar scan through a limited angle, as distinguished from complete rotation. ('sek-tar, 'skàn)

secure visual communications [COMMUN] The transmission of an encrypted digital signal consisting of animated visual and audio information; the distance may vary from a few hundred feet to thousands of miles. ('si'kyur 'vizh-à-wàl kò 'mýù-né-'kà-shanz)

secure voice [COMMUN] Voice message that is scrambled or coded; therefore not transmitted in the clear. ('si'kyur 'vòis)

security [COMPUT SCI] The existence and enforcement of techniques which restrict access to data, and the conditions under which data may be obtained. ('si'kyur-àd-è)

security kernel [COMPUT SCI] A portion of an operating system into which all security-related functions have been concentrated, forming a small, certifiably secure nucleus which is separate from the rest of the system. ('si'kyur-àd-è 'kér-nàl)

security perimeter [COMPUT SCI] A logical boundary of a distributed computer system, surrounding all the resources that are controlled and protected by the system. ('sà'kyur-àd-è 'pè-rim-àd-òr)

security target [COMPUT SCI] A description of a product meeting the security and functionality requirements of a computing system. ('sà'kyur-àd-è 'tár-gèt)

Seebeck coefficient [ELECTR] The ratio of the open-circuit voltage to the temperature difference between the hot and cold junctions of a circuit exhibiting the Seebeck effect. ('zà'bek kò-'fìsh-ènt)

Seebeck effect [ELECTR] The development of a voltage due to differences in temperature between two junctions of dissimilar metals in the same circuit. ('zà'bek, 'fèkt)

seed [COMPUT SCI] An initial number used by an algorithm such as a random number generator. ('sèd)

seeding [ELECTR] The introduction of atoms with a low ionization potential into a hot gas to increase electrical conductivity. ('sèd-ìp)

seek [COMPUT SCI] 1. To position the access mechanism of a random-access storage device at a designated location or position. 2. The command that directs the positioning to take place. ('sèk)

seek area [COMPUT SCI] An area of direct-access storage device, such as a magnetic disk file, assigned to hold records to which rapid access is needed, and located so that the physical characteristics of the device permit such access. Also known as cylinder. ('sèk, 'er-è)

seek time [COMPUT SCI] The time required for the access mechanism of a random-access storage device to be properly positioned. ('sèk, 'tìm)

segment [COMPUT SCI] 1. A single section of an overlay program structure, which can be loaded into the main memory when and as needed. 2. In some direct-access storage devices, a hardware-defined portion of a track having fixed data capacity. ('seg-mant)

segmentation [COMMUN] The division of a long communications message into smaller messages.

that can be transmitted intermittently. [COMPUT SCI] 1. The division of virtual storage into identifiable functional regions, each having enough addresses so that programs or data stored in them will not assign the same addresses more than once. 2. The division of a large computer program into smaller units, called segments. See picture segmentation. ('seg-man 'tá-shàn)

segmented aperture-synthetic aperture radar [ENG] An enhancement of synthetic aperture radar that overcomes restrictions on the effective length of the receiving antenna by using a receiving antenna array composed of a set of contiguous subarrays and employing signal processing to provide the proper phase corrections for each subarray. Abbreviated SASAR. ('seg-mant-àp-à-çhàr 'sìn 'thèd-'ik-àp-à-çhàr 'ràd-àr)

segment mark [COMPUT SCI] A special character written on tape to separate one section of a file from another. ('seg-mant, 'màrk)

select [COMPUT SCI] 1. To choose a needed subroutine from a file of subroutines. 2. To take one alternative if the report on a condition is of one state, and another alternative if the report on a condition is of another state. 3. To pull from a mass of data certain items that require special attention. ('sèl-ekt)

select bit [COMPUT SCI] The bit (or bits) in an input/output instruction word which selects the function of a specified device. Also known as subdevice bit. ('sèl-ekt, 'bit)

selecting circuit [ELECTR] A simple switching circuit that receives the identity (the address) of a particular item and selects that item from among a number of similar ones. ('sèl-ekt-ìng, 'sàr-kt)

selection [COMMUN] The process of addressing a call to a specific station in a selective calling system. ('sèl-ek-shàn)

selection check [COMPUT SCI] Electronic computer check, usually automatic, to verify that the correct register, or other device, is selected in the performance of an instruction. ('sèl-ek-shàn 'çhek)

selection sort [COMPUT SCI] A sorting routine that scans a list of items repeatedly and, on each pass, selects the item with the lowest value and places it in its final position. ('sèl-ek-shàn 'sòrt)

selective absorption [ELECTROMAG] A greater absorption of electromagnetic radiation at some wavelengths (or frequencies) than at others. ('sèl-ekt-ìv-àb-sòrp-shàn)

selective calling system [COMMUN] A radio communications system in which the central station transmits a coded call that activates only the receiver with that code is assigned. ('sèl-ekt-ìv-àb-ìng, 'sìst-àm)

selective circuit [ELECTR] A circuit that transmits certain types of signals and fails to transmit or attenuates others. ('sèl-ekt-ìv, 'sàr-kt)

selective dumping [COMPUT SCI] An edited or nonedited listing of the contents of selected areas of memory or auxiliary storage. ('sèl-ekt-ìv 'damp)

selective fading [COMMUN] Fading that is different at different frequencies in a frequency band occupied by a modulated wave, causing

selenium cell

distortion that varies in nature from instant to instant. ('sèl-ekt-ìv 'fàd-ìng)

selective identification feature [ELECTR] Airborne pulse-type transponder which provides automatic selective identification of aircraft in which it is installed to ground, shipboard, or airborne recognition installations. ('sèl-ekt-ìv 'id-èn-tà-'lò-'kà-shàn, 'fè-çhàr)

selective interference [COMMUN] Interference whose energy is concentrated in a narrow band of frequencies. ('sèl-ekt-ìv 'in-'tèr-'fir-àns)

selective jamming [ELECTR] Jamming in which only a single radio channel is jammed. ('sèl-ekt-ìv 'jam-ìng)

selectively doped heterojunction transistor See high-electron-mobility transistor. ('sèl-ekt-ìv-ìl-è 'dòp-t, 'hèd-à-'ròj-àng-'shàn 'tranz-ìst-òr)

selective photoelectric effect [ELECTR] A resonance in the dependence of photoemission on the incident photon energy that is displayed when light is incident on a thin-metal film and the light vector has a component perpendicular to a crystal plane. Also known as spectral selective photoelectric effect; vector effect. ('sèl-ekt-ìv 'fòd-ò-'fèl-ekt-rik, 'fèkt)

selective reflection [ELECTROMAG] Reflection of electromagnetic radiation more strongly at some wavelengths (or frequencies) than at others. ('sèl-ekt-ìv 'rìflek-shàn)

selective ringing [COMMUN] Telephone arrangement on party lines, in which only the bell of the called subscriber rings, with other bells on the party line remaining silent. ('sèl-ekt-ìv-'rìng-ìng)

selective scattering [ELECTROMAG] Scattering of electromagnetic radiation more strongly at some wavelengths than at others. ('sèl-ekt-ìv 'skàd-à-rìng)

selective trace [COMPUT SCI] A tracing routine wherein only instructions satisfying certain specified criteria are subject to tracing. ('sèl-ekt-ìv 'tràs)

selectivity [ELECTR] 1. The ability of a radio receiver to separate a desired signal frequency from other signal frequencies, some of which may differ only slightly from the desired value. 2. The inverse of the shape factor of a bandpass filter. ('sèl-ekt-ìv-əd-è)

selector [COMPUT SCI] Computer device which interrogates a condition and initiates a particular operation dependent upon the report. [ELECTR] An automatic or other device for making connections to any one of a number of circuits, such as a selector relay or selector switch. ('sèl-ekt-òr)

selector channel [COMPUT SCI] A unit which connects high-speed input/output devices, such as magnetic tapes, disks, and drums, to a computer memory. ('sèl-ekt-òr, 'çhàn-àl)

selector switch [ELECTR] A manually operated multiple-position switch. Also called multiple-contact switch. ('sèl-ekt-òr, 'swìçh)

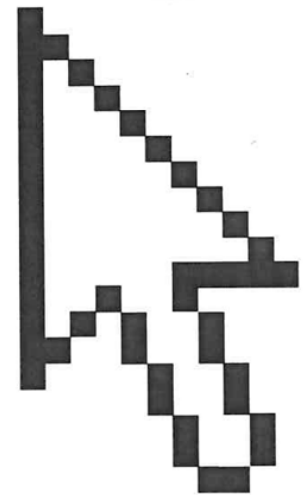
selenium cell [ELECTR] A photoconductive cell in which a thin film of selenium is used between suitable electrodes; the resistance of the cell decreases when the illumination is increased. ('sèl-è-né-əm, 'sel)

Microsoft

Microsoft

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frequently requested data) on computers running at bus speeds of 75 MHz or higher. *Acronym:* PB SRAM. *See also* burst (definition 2), L2 cache, pipelining, static RAM. *Compare* asynchronous static RAM, dynamic RAM, synchronous burst static RAM.

pipeline processing *n.* A method of processing on a computer that allows fast parallel processing of data. This is accomplished by overlapping operations using a *pipe*, or a portion of memory that passes information from one process to another. *See also* parallel processing, pipe (definition 1), pipelining (definition 3).

pipelining *n.* **1.** A method of fetching and decoding instructions (preprocessing) in which, at any given time, several program instructions are in various stages of being fetched or decoded. Ideally, pipelining speeds execution time by ensuring that the microprocessor does not have to wait for instructions; when it completes execution of one instruction, the next is ready and waiting. *See also* superpipelining. **2.** In parallel processing, a method in which instructions are passed from one processing unit to another, as on an assembly line, and each unit is specialized for performing a particular type of operation. **3.** The use of pipes in passing the output of one task as input to another until a desired sequence of tasks has been carried out. *See also* pipe (definition 1), pour.

piracy *n.* **1.** The theft of a computer design or program. **2.** Unauthorized distribution and use of a computer program.

.pit *n.* A file extension for an archive file compressed with PackIT. *See also* PackIT.

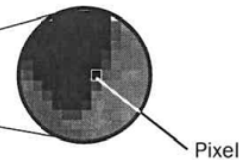
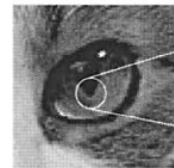
pitch *n.* A measure, generally used with monospace fonts, that describes the number of characters that fit in a horizontal inch. *See also* characters per inch, screen pitch. *Compare* point¹ (definition 1).

PivotChart *adj.* A graphical tool in Microsoft Excel or Access that can be used to display data from a list or database in chart form. Based on user-selected information incorporated in an Excel PivotTable report or list, a PivotChart report provides the ability to chart the data interactively—for example, to “pivot” the chart’s point of view from product sales by category to product sales by region or by salesperson. *See also* PivotTable.

PivotTable *adj.* An interactive table in Microsoft Excel or Access that can show the same data from a list or a database in more than one arrangement. A user can manipulate the rows and columns in a PivotTable to view or summarize the information in different ways for purposes of analysis. In Excel, a PivotTable report is the basis for creating a PivotChart report that displays the same data in chart form. *See also* PivotChart.

pivot year *n.* In Year 2000 windowing, a date in a 100-year period that serves as the point from which correct dates can be calculated in systems or software that can store only 2-digit years. For example, a pivot year of 1970 means that the numbers 70 through 99 are interpreted as the years 1970 to 1999, and the numbers 00 through 69 as the years 2000 through 2069. *See also* windowing.

pixel *n.* Short for picture (**pix**) element. One spot in a rectangular grid of thousands of such spots that are individually “painted” to form an image produced on the screen by a computer or on paper by a printer. A pixel is the smallest element that display or print hardware and software can manipulate in creating letters, numbers, or graphics. *See* the illustration. *Also called:* pel.



Pixel. *The letter A is actually made up of a pattern of pixels in a grid, as is the cat's eye.*

pixel image *n.* The representation of a color graphic in a computer's memory. A pixel image is similar to a bit image, which also describes a screen graphic, but a pixel image has an added dimension, sometimes called depth, that describes the number of bits in memory assigned to each on-screen pixel.

P

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Second Edition

*Dedicated to the memory of
Jess Stein*

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