

GLOSSARY OF TERMS

active application	An application that is currently running and is in the foreground. The active application is the one in which you are currently working.
AC	Alternating Current. The electricity provided by wall-sockets. Many devices, like laptop/notebook computers, use AC adapters.
AC adapter	A power cord designed to allow appliances designed to utilize DC current to be powered from a standard wall outlet by receive incoming power from that source. Common examples of AC adapters include the power cable for a laptop computer that transfers current from a standard wall outlet through a conversion box and into a smaller cable and then plugs into the rear of the laptop computer
active hydrogen maser	Active Hydrogen Maser technology provides the best known frequency stability for any frequency generator commercially available today. Active masers are used when the best stability is needed in a time domain of 1 sec. to a day. At a 1-hour averaging time, the Active Maser exceeds the stability of the best-known cesium oscillators by a factor of at least 100.
ACTS	Automated Computer Time System, a NIST service that provides announced time via telephone.
address	A hexadecimal number designating the location of a device or of a piece of data. The bus address is determined by a setting on a peripheral device that allows the computer to distinguish between two devices connected to the same interface. A bus address is also referred to as a device address.
address lines	The lines in a bus or cable that carry address information rather than data.
AIX	A version of UNIX produced by IBM for their RS/6000 computer systems.
alphanumeric display	A display that gives the information in the form of characters (numbers or letters).
alphanumeric LED display	A display that gives the information in the form of characters (numbers or letters) using light-emitting diodes.
AM	Amplitude modulation (AM) is a transmission technique that blends a data signal into a carrier by varying (modulating) the amplitude of the carrier waveform.
ANSI	ANSI (American National Standards Institute, www.ansi.org) A membership organization founded in 1918 that coordinates the development of U.S. voluntary national standards in both the private and public sectors. It is the U.S. member body to ISO and IEC. The acronym is used to identify standards created by the institute, such as the ANSI 8-bit character set, or "ANSI_C".
anywhere fix	The ability of a receiver to start position calculations without being given an approximate location and approximate time.
API	Application Program Interface. This interface allows software developers to write their software so that it can communicate with the computer's operating system or other programs.
application	A set of computer instructions or programs that accomplish tasks for the end user, rather than control the computer (that is what the operating system does). Examples of applications include spreadsheets, word processing programs, graphics, database management, and communications.
architecture	The structure and organization of a computer's hardware and/or system software, including items such as the CPU type, bus type, etc.
ASCII	(American Standard Code for Information Interchange) Pronounced "ask-ee." The American Standard Code for Information Interchange 7-bit character set. It consists of the first 128 (0-127) characters of the ANSI character set (and most other 8-bit character sets). The ASCII character set is the most universal character-coding set. Historically, ASCII developed from telegraphic codes and first entered commercial use as a 7-bit teleprinter code promoted by [AT&T Bell] data services.
ASCII text file	A File that contains nothing but ASCII characters without special formatting. ASCII text files are sometimes used in file transfers.
AT	Any IBM or compatible computer that contains an 80286 processor and 16-bit bus.

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ATbus	See ISA
ATM	Asynchronous Transfer Mode. A network technology for both local and wide area networks (LANs and WANs) that supports realtime voice and video as well as data. The topology uses switches that establish a logical circuit from end to end, which guarantees quality of service (QoS). However, unlike telephone switches that dedicate circuits end to end, unused bandwidth in ATM's logical circuits can be appropriated when needed. For example, idle bandwidth in a videoconference circuit can be used to transfer data. ATM is a cell relay network protocol which encodes data traffic into small fixed sized (53 byte; 48 bytes of data and 5 bytes of header information) cells instead of variable sized packets as in packet-switched networks (such as the Internet Protocol or Ethernet).
atomic clock	An atomic clock is an extremely accurate timekeeping device regulated by the natural regular oscillations of an atom or molecule. An atomic clock powered by a hydrogen atom (maser) is accurate to 1 part in 2 quadrillion. A cesium atom powered clock has an error of about one second in one million years. GPS satellites carry multiple atomic clocks, regulated by these precise atomic vibrations, to ensure accuracy. The GPS Master Control Station uses cesium clocks and a hydrogen maser clock.
autoconfig	Automatic configuration. The ability of computer hardware to detect the presence of expansion devices, and, using information resident in those devices, configure the system to run the device properly.
AUTOEXEC.BAT	A batch program (set of commands) that is automatically carried out by MS-DOS whenever the computer is started or restarted. The file contains basic startup commands that help configure the system. Often, when a computer stops doing what it normally does when it boots (enters dos shell automatically or starts Windows, etc.), it is because the autoexec.bat file has been deleted. It is a good idea to have a copy of the autoexec.bat file (printed or on a separate disk) in case this happens.
backplane	A circuit board (usually a printed circuit board) that connects several connectors in parallel, forming a computer bus. It is used as a backbone to connect several printed circuit board cards together to make up a complete computer system. Backplanes are normally used in preference to cables because of their greater reliability. A backplane's service life is limited only by the longevity of its connectors. For example, the DIN 41612 connectors used in the VME bus system can withstand 50 to 500 insertions and removals (called mating cycles), depending on their quality. A backplane is generally differentiated from a motherboard by the lack of on-board processing power where the CPU is on a plug-in card.
bandwidth	Bandwidth is the range of frequencies that a communication cable or channel can carry. In the computer world, it generally refers to the amount of data that can be carried by a specific cable or bus.
BCD (Binary Coded Decimal)	Also called packed decimal, this is the representation of each digit of a decimal number by four-bit binary numbers. So the number 29 would be encoded as 0010 1001.
Berkeley Software Distribution	see BSD.
beta	A conventional designation of pre-release software. A beta version of software is usually in secondary testing (alpha versions are earlier releases), and is sometimes publicly available, but sometimes only available to particular users (beta testers). Beta software is usually somewhat unstable, and may have more bugs than a regular release.
binary file	A file containing information that is in machine-readable form; it can be read only by an application. "Binary_file" usually refers to a file that uses all 8 bits of each byte for information. Text files usually use only 7 bits, leaving the 8th bit as 0.
BIOS (Basic Input / Output System)	Hard-wired instructions the CPU uses to boot up and to control I/O devices. The BIOS controls most computers basic input and output functions such as communications with the drives or the system memory
BIPM	One of the three organizations established to maintain the International System of Units (SI) under the terms of the Convention du Mètre (Metre Convention). The averaging and steering of TAI [International Atomic Time, (Temps Atomique International)] is done by the Bureau International des Poids et Mesures (BIPM).
bit	Binary digit. Smallest unit of digital information, either on or off (1 or 0).

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boot	The loading of the operating system and starting of initial processes into a computer. From the saying, "pulling_oneself_up_by one's_bootstraps."
BootP	Bootstrap Protocol
board	A piece of fiberglass that holds integrated circuits (ICs or chips) and contains the connections between chips. A board is also called a card or circuit board.
bps	Bits Per Second. Speed at which data is transferred. Often used in discussing the speed of modems and serial transmissions.
bridge	Traffic filter within a single network. They operate like a traffic cop to direct messages toward a destination and to exclude messages that are intended for other destinations. Like repeaters, they can join network segments. Unlike repeaters, they can extend the network by resending the signal. You may find you need a bridge as traffic on your network increases. Bus: Part of a chip or circuit board designed to send and receive data. The bus on a computer's motherboard contains slots for expansion cards.
BSD	Berkeley Software Distribution is the UNIX derivative distributed by the University of California, Berkeley starting in the 1970s. The name is also used collectively for the modern descendants of these distributions.
BSP	Board Support Package
BUS	In computer architecture, a bus is a subsystem that transfers data or power between computer components inside a computer or between computers. A bus logically connects several peripherals over the same set of wires. (Also, part of a chip or circuit board designed to send and receive data. The bus on a computer's motherboard contains slots for expansion cards.)
bus level products	Plug-in timing boards for various computing platforms.
bus level timing	Board level products may be used to precisely time synchronize one or more computers and/or provide very precise time to the host or a application program.
bus speed	The speed (measured in megahertz, MHz) at which information or data can move across the bus on the motherboard.
bus timing instrumentation	Bus Level Timing boards provide time stamping and synchronization requirements. Synchronizes one or more computers to an external time standard, to provide very accurate time stamps to application programs or storing the time occurrence of external events.
byte	The amount of memory needed to specify one ASCII character: eight bits. Kilobytes (~1000 bytes) and Megabytes (~1,000,000 bytes) are usually used in discussing the amount of memory a computer uses.
C	A popular programming language.
C++	An extension of the C programming language.
C/A code	The standard (Course/Acquisition) GPS code consisting of a sequence of 1023 pseudo-random, binary, bi-phase modulations on the GPS carrier at a chip rate of 1.023 MHz. Also known as the "civilian code."
card	A hardware expansion unit that is installed inside the case of a computer, into an expansion slot on the motherboard.
carrier	A signal that can be varied from a known reference by modulation.
carrier-aided tracking	A signal processing strategy that uses the GPS carrier signal to achieve an exact lock on the pseudo random code.
carrier frequency	The frequency of the unmodulated fundamental output of a radio transmitter.
carrier phase GPS	GPS measurements based on the L1 or L2 carrier signal.
CBO (Cesium Beam Oscillator)	A highly-precise frequency source. Also known as a cesium clock or cesium atomic standard.

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CBT (Cesium Beam Tube)	The key component of a cesium-based atomic clock.
CD (Carrier Detect)	A signal that indicates whether an interface is active. Also, a signal generated by a modem indicating that a call has been connected.
CDMA (Code Division Multiple Access)	A method for transmitting simultaneous signals over a shared portion of the spectrum.
Central Processing Unit	The master chip in a computer that controls the execution of program instructions, arithmetic functions, and access to memory and peripherals. Abbreviated CPU, and also called the microprocessor.
cesium	Also cae-si-um (Symbol Cs) Atomic number 55; atomic weight 132.905; melting point 28.5°C; boiling point 690°C; specific gravity 1.87; valence 1. [From Latin caesius, bluish gray (from its blue spectral lines).]
cesium beam clock	Device that uses as a reference the exact frequency of the microwave spectral line emitted by atoms of the metallic element cesium, in particular its isotope of atomic weight 133 ("Cs-133"). The integral of frequency is time, so this frequency, 9,192,631,770 hertz (Hz = cycles/second), provides the fundamental unit of time.
cesium clock	A clock containing a cesium standard as a frequency-determining element.
cesium drcbt	Cesium Direct Replacement Cesium Beam Tubes
cesium frequency standard	Cesium frequency standards work by squirting Cesium atoms from a reservoir that's heated to boil off some atoms from a small piece of cesium liquid metal. These atoms are processed in such a way that they become an atomic frequency standard.
cesium oscillator	Often used as a primary frequency standard since the SI second is defined from the resonance frequency of the cesium atom (133Cs), which is 9,192,631,770 Hz. A properly working cesium oscillator should be close to its nominal frequency without adjustment, and there should be no change in frequency due to aging. Environmental conditions (motion, vibration, magnetic fields, and so on) do cause small frequency shifts.
channel	A channel of a GPS receiver consists of the circuitry necessary to receive the signal from a single GPS satellite.
chip	The transition time for individual bits in the pseudo-random sequence. Also, an integrated circuit. Also a snack food. Also a betting marker.
CLE	Customer Located Equipment
CLI	See Command Line Interface.
clock	1. An instrument other than a watch for measuring or indicating time, especially a mechanical or electronic device having a numbered dial and moving hands or a digital display. 2. A time clock. 3. A source of regularly occurring pulses used to measure the passage of time, as in a computer. 4. Any of various devices that indicate measurement, such as a speedometer or a taximeter.
clock bias	The difference between the clock's indicated time and true universal time.
coaxial cable	A type of cable that is commonly used due to its insensitivity to noise interference. Coaxial cable is often used in Ethernet networks; both thick (10Base5) and thin (10Base2) ethernet cables are coaxial.
code phase GPS	GPS measurements based on the pseudo random code (C/A or P) as opposed to the carrier of that code.
command	A word or phrase, usually found in a menu, chosen in order to carry out an action. Choose a command from a menu, or type a command at the MS-DOS prompt. Some commands are Format, Edit, Open, etc.

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command line	Commands to run an application. Type commands at an MS-DOS prompt or in the Run dialog box in the Program Manager of Windows. Interfaces where commands are typed rather than chosen from a menu, are often called command line interfaces. MS-DOS has a command line interface while the Macintosh does not.
Command Line Interface (CLI)	A way of accessing a computer, based on typing commands rather than selecting icons and menu items (compare with GUI).
command prompt	Usually refers to the MS-DOS prompt. The character or characters that appear at the beginning of the command line (usually "C:"), indicating that the computer is ready to receive input.
control segment	A world-wide network of GPS monitor and control stations that ensure the accuracy of satellite positions and their clocks.
compactPCI	PCI bus technology implemented on a Eurocard. Eurocards provide more rugged packaging and a more secure plug and socket for embedded systems than the standard PCI card used in desktop computers. CompactPCI may support hot swap and provides higher performance (32-bit, 33MHz).
compiler	A program which translates source code written in a particular programming language into computer-readable machine code that can be executed on its own. Compare with Interpreter.
confidentiality	Keeping secret data from unauthorized eyes.
content filtering	A filter that screens out data by checking, for example, URLs or key words.
crystal oscillator	Oscillator that produces electrical oscillations at a frequency determined by the physical characteristics of a piezoelectric quartz crystals.
crystal oscillator low distortion	Designed to operate with fundamental crystals with less than mW dissipated in the crystal.
Coordinated Universal Time (UTC)	See UTC
COTS	Commercial Off-The-Shelf. Products or services that are generally available and not built to customized specifications.
cPCI	Compact Peripheral Component Interconnect - a bus standard
CPU	See central processing unit
crystal oscillator PLL (Phase-Locked Loop)	A circuit in which a crystal oscillator is used as a time base for a voltage controlled oscillator maintaining frequency and phase lock between the two oscillators. This is a useful technique for achieving a frequency programmable crystal oscillator and output frequencies that are out of the range of a crystal manufactured to achieve certain performance specifications. However, short-term frequency stability is one or two orders of magnitude worse than for a true crystal oscillator.
Cs	Atomic representation for cesium
cycle slip	A discontinuity in the measured carrier beat phase resulting from a temporary loss of lock in the carrier tracking loop of a GPS receiver.
daisy chain	A method of connecting devices on a bus. On a daisy chained bus, devices not requesting a signal respond to it by passing it on. The daisy chain scheme permits assignment of device priorities based on the electrical position of the device on the bus.
data message	A message included in the GPS signal which reports the satellite's location, clock corrections and health. Included is rough information on the other satellites in the constellation.
dB	see decibel
DCLS	Direct Current Level Shift, or digital IRIG.

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decibel (dB)	A measure of the ratio between two quantities, and can be used to express a wide variety of measurements in acoustics and electronics. The decibel is a "dimensionless unit" like percent. Widely used as a measure of the loudness of sound.
DEC	Digital Equipment Corporation
DEC Alpha	A 64-bit RISC microprocessor originally developed and fabricated by Digital Equipment Corp. (DEC), which used it in its own line of workstations and servers. Designed as a successor to the VAX line of computers, it supported the VMS operating system, as well as Digital UNIX. Later open source operating systems also ran on the Alpha, notably Linux and BSD UNIX flavours.
Denial of Service	When a network is flooded with traffic, the systems cannot respond normally, so service is curtailed or denied. This is a favorite technique of network saboteurs.
DGPS	Differential Global Positioning System
DHCP	DHCP is used to assign dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. In some systems, the device's IP address can even change while it is still connected. DHCP also supports a mix of static and dynamic IP addresses.
Digital Equipment Corporation	a pioneering company in the American computer industry. They are generally referred to within the computing industry as DEC. They were later acquired by Compaq, which subsequently merged with Hewlett-Packard. As of 2004 their product lines were still produced under the HP name. Digital Equipment should not be confused with Digital Research; the two were unrelated, separate entities (despite some similarities between the operating systems they produced);
differential positioning	Accurate measurement of the relative positions of two receivers tracking the same GPS signals.
Digital Signature Standard (DSS)	A National Institute of Standards and Technology (NIST) standard for digital signatures, used to authenticate both a message and the signer. DSS has a security level comparable to RSA (Rivest-Shamir-Adleman) cryptography, having 1024-bit keys.
digital time stamp	See Time Stamp.
Dilution of Precision (DOP)	The multiplicative factor that modifies ranging error. It is caused solely by the geometry between the user and his set of satellites. Known as DOP or GDOP.
DIP Switch	Dual Inline Package. Small on-off switches mounted in computer hardware for purposes of user configuration. When adding expansion cards to computers, DIP switches must often be set to make the card compatible with the computer's configuration.
directory	The directory is the storage area for network security information such as keys or server names.
disciplined oscillator	An oscillator with a servo loop that has its phase and frequency locked to an external reference signal.
disciplined oscillators	Locked outputs to the received time input signal. By disciplining the oscillator to the received time input signal, the oscillator is automatically calibrated, ensuring a precise frequency is available.
dithering	The introduction of digital noise. This is the process the DoD uses to add inaccuracy to GPS signals to induce Selective Availability.
DoD or DOD	Abbreviation for The United States Department of Defense, sometimes called the Defense Department. A civilian Cabinet organization of the United States government. The Department of Defense controls the U.S. military and is headquartered at The Pentagon. It is headed by the Secretary of Defense.

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DOP	GPS acronym for Dilution of Precision that describes the geometric quality of a GPS satellite configuration in the sky. The smaller the DOP number, the better the geometry. Factors that affect the DOP are, besides the satellite orbits, the presence of obstructions which make it impossible to use satellites in certain sectors of the local sky. Especially in urban measurements, this may be limiting. GDOP, HDOP, VDOP, PDOP and TDOP respectively, represent Geometrical, Horizontal, Vertical, Position (3-D) and Time Dilution of Precision. These quantities follow mathematically from the positions of the useable satellites on the local sky. GPS receivers allow the display of these positions ("skyplot") as well as the DOP values.
doppler-aiding	A signal processing strategy that uses a measured Doppler shift to help the receiver smoothly track the GPS signal. Allows more precise velocity and position measurement.
doppler shift	The apparent change in the frequency of a signal caused by the relative motion of the transmitter and receiver.
DOS	Disk Operating System See MS-DOS.
dynamic host configuration protocol	See DHCP
DPLL	Digital Phase-Locked Loop
DPRAM (Dual Ported RAM)	A type of Random Access Memory that allows multiple reads or write to occur at the same time, or nearly the same time, unlike single-ported RAM which only allows one access at a time.
DSS (Digital Signature Standard)	A National Institute of Standards and Technology (NIST) standard for digital signatures, used to authenticate both a message and the signer. DSS has a security level comparable to RSA (Rivest-Shamir-Adleman) cryptography, having 1024-bit keys. DSA is the Digital Signature Standard.
E911 (Enhanced 911)	Specification that requires the ability to establish the physical location of a mobile hand set when transmitting to/from a wireless base station. A North American telephone network (NANP) feature that automatically associates the physical address with the calling party's telephone number. This is generally done by a form of reverse telephone directory that is supplied by the telephone company to provide emergency responders with the location of the emergency without the person calling for help having to provide it. Enhanced 911 has been deployed in most metropolitan areas in the United States and Canada.
EEPROM	Electrically Erasable Programmable Read Only Memory is a type of ROM that can be erased electronically and reprogrammed in-circuit (or with a device programmer). From the programmer's perspective, EEPROM is very similar to flash memory. The biggest difference is that the bytes (words) of an EEPROM can be erased.
EISA	(Extended ISA) A PC bus standard that extends the 16-bit ISA bus (AT bus) to 32 bits and provides bus mastering. ISA cards can plug into an EISA slot. EISA runs at the slow 8MHz speed of the ISA bus in order to accommodate any ISA cards that may be plugged into it. EISA has been superseded by PCI.
Electromagnetic Compatibility (EMC)	Electrical sciences branch that studies the unintentional generation, propagation and reception of electromagnetical energy with reference to the unwanted effects that such an energy may induce. Due increased clock speeds used in modern digital equipment coupled with the lower signal voltages, EMC is more and more an issue. Many nations have issued directives to the manufacturers of these kind of equipment, which set out the essential requirements to be satisfied before such equipment may be sold. Organizations in each nation where set up to draw up and safeguard these directives. Among the more well known national organizations are: The FCC for the United states. CEN, CENELEC and ETSI for Europe and BSI for Britain.
embedded system	A combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a dedicated function. In some cases, embedded systems are part of a larger system or product, as in the case of an antilock braking system in a car. Contrast with general-purpose computer.

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EMC (Electromagnetic Compatibility)	See Electromagnetic Compatibility
EMI (Electromagnetic Interference)	Also known as Radio Frequency Interference (RFI), an electromagnetic radiation emitted by electrical circuits carrying rapidly changing signals, as a by-product of their normal operation. EMI causes unwanted signals (interference or noise) to be induced in other circuits. This interrupts, obstructs, or otherwise degrades or limits the effective performance of those other circuits. It can be induced intentionally, as in some forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and the like.
ephemeris	The predictions of current satellite position that are transmitted to the user in the GPS data message.
ethernet	A data transport standard for Local Area Networks (LANs), initially developed by Xerox, and later refined by Digital, Intel and Xerox (DIX). All hosts are connected to a coaxial cable where they contend for network access using a Carrier Sense Multiple Access with Collision Detection (CSMA/CD) paradigm.
eurocard	Eurocard is a European mechanical system standard format for PCB cards that are plugged together into a standardized subrack and does not define the specific connector to be used or the signals that are assigned to connector contacts.. The subrack consists of a series of slotted card guides on the top and bottom, into which the cards are slid so they stand on end, like books on a shelf. At the "back" of each card is one or more connectors, which plug into mating connectors on a backplane which closes the rear of the subrack. Eurocard subracks have standardized sizes based on the 'U', for unit. 1 U is 1.75 inches. A 3U subrack is 5.25 inches high and accepts a 3U Eurocard that is 100 mm high. Another popular size is the 6U high subrack at 10.5 inches high accepting 6U Eurocards which are 233.35mm high. Eurocards come in modular depths that start at 100 mm and then increase in 60 mm increments. The 160 mm depth is the most common today, however standard hardware is available to accommodate depths of 100 mm, 160 mm, 220 mm, 280 mm, 340 mm, and 400 mm. The Eurocard mechanical architecture was defined originally under IEC-60297-3. Today, the most widely recognized standards for this mechanical structure are IEEE 1101.1, IEEE 1101.10 (also known commonly as "dot ten") and IEEE 1101.11. IEEE 1101.10 covers the additional mechanical and EMI features required for VITA 1.1-1997(R2002) which is the VME64 Extensions standard as well as PICMG 2.0 (R3.0) which is the CompactPCI specification.
fast switching channel	A single channel that rapidly samples a number of satellite ranges. "Fast" means that the switching time is sufficiently fast (2 to 5 milliseconds) to recover the data message.
FCC (Federal Communications Commission)	An independent United States government agency, created, directed, and empowered by Congressional statute, established by the Communications Act of 1934 as the successor to the Federal Radio Commission. The FCC is charged with regulating all non-Federal Government use of the radio spectrum (including radio and television broadcasting), and all interstate telecommunications (wire, satellite and cable) as well as all international communications that originate or terminate in the United States.
FDM	Frequency-division multiplexing (FDM) is a scheme in which numerous signals are combined for transmission on a single communications line or channel. Each signal is assigned a different frequency (subchannel) within the main channel.
fiber optic distribution	A technology that uses glass (or plastic) threads (fibers) to transmit data. A fiber optic cable consists of a bundle of glass threads, each of which is capable of transmitting messages modulated onto light waves.
FIFO	First In First Out This expression describes the principle of a queue or first-come, first-served behavior: what comes in first is handled first, what comes in next waits until the first is finished, etc.
firmware	In computing, firmware is executable software that is embedded in a hardware device. The programs may written permanently into ROM chips or provided in flash ROMs that may be updated by an end user. Unauthorized modified firmware is sometimes used to provide functionality not intended by the manufacturer, for example to defeat the region encoding of DVD players.

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firewall	Software and hardware systems that protect an internal network from outside data that could be harmful to the network, such as a virus sent via the Internet.
flash memory	A RAM-ROM hybrid that can be erased and rewritten under software control. Abbreviated as flash. Flash is an in-circuit programmable nonvolatile memory segmented into blocks called sectors. Each sector can be individually erased, then the data within it rewritten.
FM	Fault Management.
FN	Fiber Node.
frequency	Frequency is the measurement of the number of times that a repeated event occurs per unit time. To calculate the frequency, one fixes a time interval, counts the number of occurrences of the event within that interval, and then divides this count by the length of the time interval. In SI units, the result is measured in hertz (Hz) after the German physicist, Heinrich Rudolf Hertz. 1 Hz means that an event repeats once per second. Other units that have been used to measure frequency include: cycles per second, revolutions per minute (rpm). Heart rate is measured in beats per minute.
frequency and time standards	A radio communication service for scientific, technical and other purposes, providing the transmission of specified frequencies, time signals, or both, of stated high precision, intended for general reception.
frequency band	A particular range of frequencies. frequency control Circuit that maintains the frequency of an oscillator within the specified limits with respect to a reference frequency.
frequency spectrum	The distribution of signal amplitudes as a function of frequency.
frequency standard	A stable oscillator used for frequency calibration or reference. (188) Note 1: A frequency standard generates a fundamental frequency with a high degree of accuracy and precision. Harmonics of this fundamental frequency are used to provide reference points. Note 2: Frequency standards in a network or facility are sometimes administratively designated as "primary" or "secondary." The terms "primary" and "secondary," as used in this context, should not be confused with the respective technical meanings of these words in the discipline of precise time and frequency
FTP (File Transfer Protocol)	Allows users to copy files between the local system and any system reachable over the network. Every UNIX system has ftp and there are version for the Macintosh and Windows. A common way to make software (text files, sounds, pictures, utilities, etc.) available is to put it on an anonymous ftp server. Anonymous ftp servers allow users to login without a password, specifying "guest" as the user, and then copy whatever has been made available. Also, FTP is usually the name of the program the user invokes to execute the protocol.
Galileo	A satellite-based radio navigation system run by the European Space Administration (ESA), the European Commission and the European Organization for the Safety of Air Navigation. Using 27 satellites and three spares Galileo will be an alternative to the US military-controlled Global Positioning System and the Russian GLONASS. The system should be operational by 2008. This system is intended to provide: Greater precision to all users than is currently available. Improved coverage of satellite signals at higher latitudes, which northern regions such as Scandinavia will benefit from. A global positioning system that can be relied on, even in times of war.
gateway	Transfers information between physically separate networks that are based on differing protocols (for example, between Internet and AppleTalk networks). It performs high-level information translation, while routers provide low-level.
Geometric Dilution of Precision (GDOP)	See Dilution of Precision.
GHz	A GigaHertz is one billion (10 ⁹) cycles per second.
gigabyte	1,000 Megabytes. Abbreviated GB.

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Global Positioning System	See GPS (the US military refers to it as NAVSTAR GPS - Navigation Signal Timing and Ranging Global Positioning System).
GLONASS	The Soviet space-based navigation system comparable to the American GPS system. The operational system contains 21 satellites in 3 orbital planes, with 3 on-orbit spares. GLONASS provides 100 meters accuracy with its C/A (deliberately degraded) signals and 10-20 meter accuracy with its P (military) signals. It is operated for the Russian government by the Russian Space Forces.
GMT	Greenwich Mean Time, the mean solar time of the meridian of Greenwich, England. This was the primary basis for calculating standard time throughout the world until 1972 when it was superseded by UTC.
GOS	Grade Of Service.
GPIB	General Purpose Interface Bus, IEEE 488.
GPS	The Global Positioning System, usually called GPS (the US military refers to it as NAVSTAR GPS), is a satellite navigation system used for determining one's precise location and providing a highly accurate time reference almost anywhere on Earth or in Earth orbit. It uses an intermediate circular orbit (ICO) satellite constellation of at least 24 satellites. The GPS system was designed by and is controlled by the United States Department of Defense and can be used by anyone, free of charge. The satellites orbit the earth at approximately 12,000 miles above the surface and make two complete orbits every 24 hours. The GPS satellites continuously transmit digital radio signals that contain data on the satellites location and the exact time to the earth-bound receivers. The satellites are equipped with atomic clocks that are precise to within a billionth of a second. By knowing how far away a satellite is, the receiver knows that it is located somewhere on the surface of an imaginary sphere centered at the satellite. By using three satellites, GPS can calculate the longitude and latitude of the receiver based on where the three spheres intersect. By using four satellites, GPS can also determine altitude.
GUI	Graphical User Interface. A way of interacting with a computer, based on graphics instead of text. GUIs use icons, pictures, and menus to represent commands, files, and windows, and use a mouse as well as a keyboard to accept input. MacOS, MS Windows, and the X windowing system all use GUIs. Contrast with Command Line Interfaces (CLI).
hack/crack	"Hackers" are unauthorized programmers who write code that enables them to break into a computer network or program. "Crackers" are unauthorized programmers whose goal it is to break into computer networks or programs protected by security software or hardware.
HAE	Host Application Equipment.
hash	Also called "hash function" or hashing, used extensively in many encryption algorithms. Hashing transforms a string of characters usually into a shorter, fixed-length value or key.
hardover word	The word in the GPS message that contains synchronization information for the transfer of tracking from the C/A to P code.
hardware	Computer machinery, such as the CPU, disk drives, monitor, and printer. Contrast with software.
HDSL	High-data-rate Digital Subscriber Line. A DSL technology that delivers 1.544 Mbps each way (symmetrically) over two copper twisted pairs. Compare against SHDSL, SDSL, ADSL and VDSL.
holdover	When a clock that is locked to a PRS-traceable input loses that input, it enters a holdover mode where the frequency drift is related to the quality, or stratum level, of its oscillator.
host	A general-purpose computer that communicates with the target via a serial port or network connection.
HTML	HyperText Markup Language, the computer language used to create pages for the World Wide Web.
HTTP	HyperText Transfer (or Transport) Protocol, the protocol most often used to transfer information from World Wide Web servers to users of the Web.

GLOSSARY OF TERMS continued.

hydrogen maser	A device that produces a radio signal directly from the transition between the upper and lower hyperfine levels in the ground state of atomic hydrogen. The most stable type of frequency standard or clock (for time scales of a few seconds to few hours) that is used in VLBI observations. http://tycho.usno.navy.mil/maser.html .
Hz	Hertz. A measure of frequency relating to cycles per second.
IBM	International Business Machines. Very large company that makes a variety of computers. IBM set the standard for DOS machines. Currently, many companies makes clones of IBM's personal computers which are often called compatibles.
IEC	Inter-exchange Carrier
IEEE	Institute of Electrical and Electronic Engineers, an international organization that sets standards for electrical and computer engineering. It has the most members of any technical professional organization in the world, with more than 360,000 members in around 175 countries.
IEEE 1344	Standard published by the IEEE Power Engineering Society, Power System Relaying Committee (IEEE Std 1344-1995) that discusses unique synchronizing issues that are encountered in the Power Utilities. As a part of that document (Annex F), a specific utilization of the 'Control Bit' segment of IRIG B time code is defined, using the 27 control bits in a standard IRIG B serial time code format to provide additional information as set forth by the IEEE standard.
IETF	Internet Engineering Task Force, an international organization which sets standards for Internet protocols in their Request for Comment (RFC) papers.
integrity	Data that has retained its integrity has not been modified.
Intel	Maker of the 80x86 and Pentium lines of processors which are used in IBM PC and compatible computers.
interface	Part of a computer, program, or peripheral that communicates with other components. Interface also refers to the user interface.
interrupt	This is a signal on which the processor stops execution of the current command sequence and transfers control to the program-handler of the interrupt. The program-handler address is calculated by the interrupt vector table. An interrupt may be initialized either by user programs, while working with disks, screen, printer etc (program interrupts), or by hardware: keyboard, timer (hardware interrupts).
interrupt latency	The amount of time between the assertion of an interrupt signal and the start of the associated interrupt service routine. Factors that affect interrupt latency include the length of time that interrupts are disabled during normal program execution, processor speed, and preemption of the processor by higher priority interrupts.
interrupt request	On IBM PC and compatible computers, hardware lines for devices to send interrupts. Typically each device connected to the computer uses a separate IRQ. It is a good idea to know which IRQ each device on your computer is using (the IRQ for the mouse and keyboard should be found in your manuals). Expansion cards such as Ethernet cards or token ring adaptors also use IRQs. Setting the IRQ so that it does not conflict with (use the same IRQ as) other devices is an essential part of installing expansion cards and new devices.
interrupt service routine (ISR)	A software routine that is executed in response to an interrupt
interrupt vector	This is an element of interrupt vector table that contains address of an interrupt's handler.
interrupt vector table, interrupt table	This is a table containing values of addresses of programs that handle interrupts. Located at lowest addresses (0000:0000 - 0000:03FF) and has 256 4-byte addresses (interrupt vectors).
I/O (input/output)	The interface between a processor and the world around it. The simplest examples are switches (inputs) and LEDs (outputs).

GLOSSARY OF TERMS continued.

I/O address	Locations within the input/output address space of an IBM PC or compatible computer used by a device, such as a printer or modem. The address is used for communication between software and the device.
ionosphere	The band of charged particles 80 to 120 miles above the Earth's surface.
ionospheric refraction	The change in the propagation speed of a signal as it passes through the ionosphere.
IP	Internet Protocol
IRIG	The InterRange Instrumentation Group is the IRIG standards steering committee. IRIG is a serial time format standard.
IRIG B	Sends day of year, hour, minute, and second data on a 1 kHz carrier frequency, with an update rate of once per second.
IRQ	Interrupt ReQuest, the signal that a peripheral or program uses to interrupt the CPU. See Interrupt Request
IRIX	A version of Unix for Silicon Graphics machines. The current major version of IRIX is IRIX 6.5.
ISA	(Industry Standard Architecture) An expansion bus commonly used in earlier PCs that accepted plug-in boards for sound, video display and other peripheral connectivity. Originally called the "AT bus," introduced with the IBM PC AT in 1984, the AT/ISA bus extended the PC bus from 8 to 16 bits.
ISA bus timing	ISA (AT)bus: The ISA bus operates at 8MHz with an 8 and 16 bits data bus, a 24 bit address bus, using +/- 12 volts, +/- 5 volts, and 15 Interrupt lines. The standard drive level is 24mA for all non Open-Collector signals on the bus.
ISDN	Integrated Services Digital Networks. An international communications standard for sending voice, video, and data over digital telephone lines or normal telephone wires. ISDN supports data transfer rates of 64 Kbps (64,000 bits per second). There are two basic types of ISDN service: Basic Rate Interface (BRI) and Primary Rate Interface (PRI). BRI consists of two 64 kb/s B channels and one 16 kb/s D channel for a total of 144 kb/s. PRI is intended for users with greater capacity requirements. Typically the channel structure is 23 B channels plus one 64 kb/s D channel for a total of 1536 kb/s. In Europe, PRI consists of 30 B channels plus one 64 kb/s D channel for a total of 1984 kb/s.
ISP	Internet Service Provider. Allows your computer access to their computers and Internet access for a fee. Most ISPs provide access to the Internet and the World Wide Web with one or more email addresses.
ISR	Interrupt Service Routine
jitter	Short-term variations of a timing signal from its ideal positions in time. Generally, any distortion of a signal or image due to poor synchronization. The term is used in several ways, but it always refers to some offset of time and space from the norm. For example, in a network transmission, jitter would be a bit arriving either ahead or behind a standard clock cycle or, more generally, the variable arrival of packets.
JTF	The Jitter Transfer Function (JTF) of a network element indicates the degree to which an output is affected by input jitter (i.e. amplified or attenuated).
kbit	A kilobit is 1024 or 210 bits.
kernel	The main part or core of an operating system; it provides fundamental operating system services, such as handling interrupts and the I/O system, managing threads and processes, and allocating and scheduling processor resources.
kilobyte	1024 bytes (about 1000 bytes hence kilobyte). Usually abbreviated K, as in 640K. Used in discussing memory and hard drive storage. 1024 Kilobytes is equal to 1Megabyte.
kHz	A kilohertz is 1000 cycles per second.

GLOSSARY OF TERMS continued.

L1 Band, L2 Band	Each Navstar GPS satellite currently transmits in two dedicated frequency bands: L1 and L2, which are centered on 1575.42 and 1227.6 MHz respectively. L1 carries one encrypted signal, as does L2, both being reserved for the military. L1 also carries one unencrypted signal, for civilian use.
LAN (Local Area Network)	A group of personal computers linked together in order to share programs, data, and peripherals.
L-band	The group of radio frequencies extending from 390 MHz to 1550 MHz. The GPS carrier frequencies (1227.6 MHz and 1575.42 MHz) are in the L band.
LCD (Liquid Crystal Display)	Technology used for portable computer displays, as well as many other electronics display applications, such as watches, etc. LCD displays for portables are usually active matrix, passive matrix, and dual scan displays.
Leap Second	The time error that accumulates between the earth's rotation and actual measured time is added (or deleted) as a leap second from UTC time on the last day of June or December in any year in which a leap second is needed to keep in step with the rotation of the earth.
LED (Light Emitting Diode)	Used for display in some electronic devices.
LED alphanumeric display	A display of light emitting diodes consisting of both letters and numbers.
local bus	A bus or electronic pathway that allows access to the CPU at a speed synchronized with the CPU.
LORAN-C	LONG RANGE Navigation, version C. A long-range radio navigation position-fixing system consisting of an array of fixed stations that transmit precisely synchronized signals to mobile receivers.
low phase noise	The ratio of the power density of one phase modulation sideband to the total signal. It is usually specified as the single side band (SSB) power density in a 1Hz bandwidth at a specified offset frequency from the carrier. It is measured in dBc/Hz. The best short- and long-term stability can be obtained only if the frequency synthesis does not introduce noise that masks the atomic noise limit. In the best standards, the signal used for atomic interrogation must have exceptionally clean spectral purity.
Macintosh	Computer developed by Apple Computers, first released in 1984. The Macintosh was one of the first computers to use a graphical user interface. Today, Apple continues to produce many different models of Macintosh.
MacOS:	The operating system produced by Apple for their Macintosh computers.
male connector	A connector with pins that fit into the sockets of a female connector.
MAN	Metropolitan Area Network
master clock	A generator which generates an accurate frequency signal for the control of other generators. Also known as a PRC.
Mbit	Megabit.
Mbps	Megabits per second. One million bits transmitted each second. Used to represent the speed at which data is transferred.
media	Methods of communication. In computers, it refers to the material or device used to store or transmit data. including floppy disks, hard disks, tapes, CD-ROMs, etc
medium	Singular of Media.
megabyte	1,048,576 bytes or 1024 kilobytes (about one million bytes hence megabyte). Usually abbreviated Mb or MB as in 30 Mb.

GLOSSARY OF TERMS continued.

megahertz	Abbreviated MHz, a system's clock speed is measured in Megahertz or millions of cycles per second. The speed of computer devices or chips associated or synchronized with the system clock will be measured in MHz. e.g.: CPUs and system Bus.
memory	The part of a computer that holds data. This usually refers to RAM. A temporary storage area for information and applications. RAM, ROM, conventional memory, expanded memory, and extended memory are all different types of memory. RAM and hard disk space should not be confused. RAM is temporary storage while the hard disk offers semi-permanent storage.
memory address	The computer assigns numbers or addresses to physical memory locations on boot up to keep track of the information that the CPU has access to. This process is referred to as Memory Mapping.
memory mapping	See Memory Address.
memory resident program	See TSR.
menu	A screen image displaying a series of options from which the user can choose.
metrology	The science of weights and measures or of measurement. A system of weights and measures.
Mhz	A MegaHertz is one million (1,000,000) cycles per second. See megahertz.
microcontroller	A highly integrated microprocessor designed specifically for use in embedded systems. Microcontrollers typically include an integrated CPU, memory (a small amount of RAM, ROM, or both), and other peripherals on the same chip.
microprocessor	A piece of silicon containing a general-purpose CPU. Examples of microprocessors include NetSilicon's NS9750, NS7520 and NET+50 chips.
microprocessor	A master control circuit. See central processing unit (CPU).
Microsoft	A huge software company founded and run by Bill Gates. Microsoft produces MS-DOS and Windows. Microsoft also produces a number of applications including Word for Windows and the Macintosh, Excel for Windows and the Macintosh, and Flight Simulator.
modulate	To change a signal in a way that conveys information. For instance, a tone sent over a phone line can be changed in volume or frequency to represent Ones and Zeroes, thus sending digital data over an audio line.
motherboard	The main circuit board, containing the CPU. All of the other functions and peripherals are connected in some way to the motherboard.
Motorola	Manufacturer of computer chips. Makes the 680x0 chip family, and is part of the industry group that developed the PowerPC chips.
MS-DOS	Microsoft Disk Operating System. The most common operating system for IBM and compatible PCs. Produced by Microsoft. Sometimes referred to simply as DOS.
MS-DOS prompt	See command prompt.
MTBF	Mean Time Between Failure, a measure of reliability. The longer the time span between failures, the more reliable the device.
MTIE	Maximum Time Interval Error.
MTTR	Mean Time To Repair.
multipath error	Errors caused by the interference of a signal that has reached the receiver antenna by two or more different paths. Usually caused by one path being bounced or reflected.
multi-channel receiver	A GPS receiver that can simultaneously track more than one satellite signal.

GLOSSARY OF TERMS continued.

multiplexing	Process during which two or more signals are combined into one; at the other end, signals are “unbundled” by a demultiplexer. TDM is Time Division Multiplexing, FDM is Frequency Division Multiplexing, and CDMA is Code Division Multiple Access.
multiplexing channel	A channel of a GPS receiver that can be sequenced through a number of satellite signals.
multiprocessor	A computer system that uses more than one CPU running in parallel for faster performance.
multithreading	The ability to have more than one task occurring in an application. For example, you could have a large spreadsheet calculate values while continuing to use that spreadsheet or print a complicated document while continuing to work on that document. OS/2 has multithreading capabilities. Applications must be written according to certain specifications in order to multithread.
nanosecond	One-billionth of a second.
NBS (See NIST)	NIST was originally called the National Bureau of Standards (NBS), a name that it had from 1901 until 1988.
NEBS	Network Equipment Building Standard.
NEC	National Electrical Code.
network	A group of computers connected together capable of sharing files and resources such as a modems, printers or hard drives.
network synchronization	A generic concept that depicts the way of distributing a common time and/or frequency to all elements in a network.
NI	Network Interface.
NIST	National Institute of Standards and Technology, the National Measurement Institute in the United States. The institute’s mission is to develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life. NIST is directly involved in standards development and testing done by the private sector and government agencies. U.S. technological innovation and progress depend on NIST’s unique skills and capabilities, especially in four key areas: biotechnology, nanotechnology, information technology and advanced manufacturing.
NMI	National Measurement Institute(s), the national authority in each country that is recognized as the source of official time. Also stands for Non-Maskable Interrupt, a computing term. Also an abbreviation for nautical mile.
NMIServer	National Measurement Institute Server.
noise	Interference on a communications channel often caused by nearby electrical equipment, power lines, or poor connections.
ns	A nanosecond is one billionth (10 ⁻⁹) of a second.
NTMS	Network Time Management System.
NTP	Network Time Protocol provides a reliable way of transmitting and receiving time over TCP/IP networks and is useful for synchronizing the internal clock of computers to a common time source.
object code	A set of processor-readable opcodes and data. The output of compilers and assemblers and the input and output of a linker are files containing object code. There are a variety of standardized and proprietary object file formats, and development tools from one vendor can only rarely read the object code produced by those of another.
Object Linking and Embedding (OLE)	A proprietary software system from Microsoft that allows applications to transfer and share information. When a change is made to a shared object in the original application, any document that contains that object is updated automatically to reflect the changes.

GLOSSARY OF TERMS continued.

OEM	Original Equipment Manufacturer. The original manufacturer of a hardware component or sub-component.
OLE	See Object Linking and Embedding.
on-board	Actually located on a circuit board. Often refers to components or devices that are usually connected to the computer through expansion slots or ports, that are integrated onto the motherboard such as video adapters, sound cards or network cards. A motherboard that has integrated video can be said to have Video On-board.
open architecture	A type of IBM PC and compatible architecture that allows third party manufacturers to produce additional interior add-ons (usually circuit boards & drivers), and to allow users to easily install these add-ons.
OpenVMS (Open Virtual Memory System or just VMS)	High-end computer server operating system that runs on the VAX and Alpha family of computers developed by Digital Equipment Corporation (now owned by Hewlett-Packard); it has also recently been ported to servers based on Intel's Itanium architecture. OpenVMS is a multi-user, multiprocessing virtual memory-based operating system (OS) specifically designed for use in time sharing, batch processing, and transaction processing. OpenVMS commercialized many features that are now considered standard requirements for any high-end server operating system.
operating system	In computing, the system software responsible for the direct control and management of hardware and basic system operations. Additionally, it provides a foundation upon which to run application software such as word processing programs and web browsers. An operating system typically consists of a set of system calls and a periodic clock tick ISR. The operating system is responsible for deciding which task should be using the processor at any given time and for controlling access to shared resources. There are a number of different operating systems, which have different design philosophies, provide different facilities, and have different looks and feels. Among popular operating systems are MacOS, MS-DOS, the various incarnations of Windows, Unix in its various flavors, OS/2, etc. See also real-time operating system.
OS	Operating System.
OS/2	Operating System/2. A multitasking and multithreading operating system developed by IBM and originally Microsoft for use on the 80x86 computers. OS/2 Warp is the current version of OS/2, and has received attention as a possible replacement (and improvement) for both DOS and Windows since it can run DOS, Windows, and OS/2 applications.
oscillator	An electronic circuit that produces an output signal of a specific frequency. An oscillator generally consists of an amplifier having part of its output returned to the input by means of a feedback loop; the necessary and sufficient condition for oscillation is that the signal, in passing from input to output and back to input via the feedback loop, arrive at the input with no change in amplitude or phase. If this condition is met for only a single frequency, the output is a pure sine wave; if it is met for more than one frequency, the output is a complex wave. Some oscillators are designed to operate under certain conditions so that the output is a square wave, a triangular wave, or a pulse.
oscillator crystal	A timing device that consists of a crystal and an oscillator circuit, providing an output waveform at a specified reference frequency.
OSS	Operational Support System
passive fiber splitters	Devices that are approximately the size of a pen that allow the fiber to be split without a reduction in the bit rate.
PC (Personal Computer)	An IBM or IBM-compatible self-contained computer system, designed to be used by one person at a time. Personal Computer. Strictly speaking, this refers to the IBM PC, which is any IBM-manufactured personal computer made prior to the PS/2 Series. Usually PC refers to any personal computer compatible with IBMs. It is also used to refer to any personal computer.
PCB	See printed circuit board
PC GPS	Master clock solution for synchronizing one or more computers to the UTC time reference.

GLOSSARY OF TERMS continued.

PCI	Peripheral Component Interconnect, a local bus that supports high-speed connection with peripherals. It plugs into a PCI slot on the motherboard. The Peripheral Component Interconnect standard (in practice almost always shortened to PCI) specifies a computer bus for attaching peripheral devices to a computer motherboard. These devices can take the form of integrated circuits fitted on the motherboard itself (called planar devices in the PCI specification), or expansion cards that fit in sockets. The PCI bus occurs commonly in PCs, where it has displaced ISA and VESA Local Bus as the standard expansion bus, but it also appears in many other computer types. The bus will eventually be succeeded by PCI Express and other technologies, which have already started to appear in new computers. The PCI specification covers the physical size of the bus (including wire spacing), electrical characteristics, bus timing and protocols.
PCibus	The PCI Local Bus is a high performance bus for interconnecting chips, expansion boards, and processor/memory subsystems. A high-speed bus for 486, Pentium and compatible systems. PCI stands for Peripheral Component Interconnect. Peripheral Component Interconnect is common to newer Macintosh and Pentium machines. This bus features faster bus throughput, as well as hardware compatibility across computer platforms, so a card could be used on both a PCI Mac and a PCI Pentium machine, though different software drivers would be needed. pci bus specification PCI is a synchronous bus architecture with all data transfers being performed relative to a system clock (CLK). The initial PCI specification permitted a maximum clock rate of 33 MHz allowing one bus transfer to be performed every 30 nanoseconds. Later, Revision 2.1 of the PCI specification extended the bus definition to support operation at 66 MHz, but the vast majority of today's personal computers continue to implement a PCI bus that runs at a maximum speed of 33 MHz. The current PCI specification is 2.3. The specification can be purchased from the PCI Special Interest Group (PCISIG).
pci card	A card designed per the PCI specification. PCI (Peripheral Component Interconnect) is an interconnection system between a microprocessor and attached devices in which expansion slots are spaced closely for high-speed operation.
PCI Express	A high-speed peripheral interconnect from Intel introduced in 2002. Note that although sometimes abbreviated "PCX," PCI Express is not the same as "PCI-X". As a result of the confusion, "PCI-E" is the accepted abbreviation. PCI Express was designed to match the higher speeds of today's CPUs, accommodating Gigabit and 10 Gigabit Ethernet and even support chip-to-chip transfers. PCI Express provides a high-speed, switched architecture. Each PCI Express link is a serial communications channel made up of two differential wire pairs that provide 2.5 Gbits/sec in each direction. Up to 32 of these "lanes" may be combined in x2, x4, x8, x16 and x32 configurations, creating a parallel interface of independently controlled serial links. The bandwidth of the switch backplane determines the total capacity of a PCI Express implementation.
PCI-SIG	PCI Special Interest Group (SIG) - an industry consortium that owns and maintains all PCI technologies, www.pci-sig.com .
PCI-X	(PCI eXtended) An enhanced PCI bus technology originally developed by IBM, HP and Compaq that is backward compatible with existing PCI cards. PCI and 32-bit PCI-X slots are physically the same, and PCI cards can plug into PCI-X slots. PCI-X cards will run in PCI slots, but at the slower PCI rates. The 64-bit PCI-X slots are longer.
PCM	Pulse Code Modulation.
PCMCIA	A standard for hardware expansion, mainly for notebook computers. PCMCIA is supported by Macintosh and IBM compatible notebooks, and features ease of use. Often simply called a PC Card.
P-code	The Precise code. A very long sequence of pseudo random binary biphasic modulations on the GPS carrier at a chip rate of 10.23 MHz which repeats about every 267 days. Each one week segment of this code is unique to one GPS satellite and is reset each week.
PCS	Personal Communications Services.
PDA	Personal Digital Assistant.
PDOP	Position Dilution of Precision.

GLOSSARY OF TERMS continued.

Pentium	A high-speed microprocessor chip made by Intel. A CPU chip produced by Intel, used in IBM compatible machines. The Pentium is the equivalent of the 586 (of the 80x86 chip family).
peripheral	Any of the devices which connect to the CPU and exchange information under the CPU's control. Peripherals include all of the computer's input and output devices.
PICMG	(PCI Industrial Computer Manufacturers Group) An industry consortium that develops specifications for PCI-based systems for industrial use. It supports the CompactPCI and PCI-ISA Passive Backplane architectures.
phase-locked loop (PLL)	an electronic circuit that controls an oscillator so that it maintains a constant phase angle (i.e., lock) on the frequency of an input, or reference, signal. A PLL ensures that a communication signal is locked on a specific frequency and can also be used to generate, modulate and demodulate a signal and divide a frequency.
PLL	Phase-Locked Loop. Closed-loop feedback control system in electronics that maintains a generated signal in a fixed phase relationship to a reference signal. Since an integrated circuit can hold a complete phase-locked loop building block, the technique is widely used in modern electronic devices, with signal frequencies from a fraction of a cycle per second up to many gigahertz.
plug-and-play	A hardware standard for auto configuration, which requires operating system support. The standard allows the system to automatically configure adapter-card resources. Plug and Play is a technology that can reduce conflicts between computer devices by automatically configuring them at startup. However, for it to work properly the computer BIOS and the Operating System both must support PnP, and the device being configured must be a Plug and Play device. There can be problems when mixing legacy devices with PnP. Also slang for autoconfig.
PM	Performance Monitoring.
PMC	PCI Mezzanine Card.
PnP	See Plug and Play.
polling	Polling is a routine that is constantly being performed by your computer. It checks each device individually to see if there is any new information or if the device is ready to send or receive data.
PowerPC	A CPU chip family produced by an industry group including Motorola, IBM, and Apple that are used in Macintosh and other computers.
PowerPC Platform (PPCP)	A standard hardware architecture developed by a consortium including Apple, IBM, and several other companies. PPCP machines use the PowerPC CPU and a PCI bus. A number of operating systems, including Copland, AIX, Windows NT, etc. should be able to run on PPCP machines. Also called the Common Hardware Reference Platform (CHRP).
power supply	The box inside your computer that supplies it with the electricity that it needs. The Power Supply converts the house AC current to voltages the computer can use, 3.3, 5, and 12 volts DC.
PPCP	See PowerPC Platform.
ppm	Parts per million.
pps	Pulse per second.
PPS	Precise Positioning Service (PPS), is the most accurate positioning, velocity, and timing information continuously available, worldwide, from the basic GPS. This service is limited to authorized U.S. and allied Federal Governments; authorized foreign and military users; and eligible civil users.
PRC	Primary Reference Clock.
precise frequency	A frequency that is maintained to the known accuracy of an accepted reference frequency standard.
precision frequency	Frequency assigned for usual use on a particular circuit. The first-choice frequency that is assigned to a fixed or mobile station for radiotelephone communications.

GLOSSARY OF TERMS continued.

precision frequency references	Frequency having a fixed and specified position with respect to the assigned frequency.
Precise Positioning Service (PPS)	The most accurate dynamic positioning possible with standard GPS, based on the dual frequency P-code and no SA.
precise time	A time mark that is accurately known with respect to an accepted reference time standard.
Primary Reference Source	Equipment that provides the highest quality sync for telecom networking as required by international standards. Typically derive source timing from GPS or CDMA signals or from stand-alone sources such as cesium.
printed circuit board	A thin board, usually fiberglass, on which components are mounted. So called because the connections between the components are printed onto the board. Abbreviated PCB.
PRN	Pseudo/Random Noise Code.
processing	Using a computer program to manage data, either sorting it, storing it or changing it in some way.
processor	The part of the computer that controls the execution of program instructions. See CPU. This generic term does not distinguish between microprocessor, microcontroller, network processor, or digital signal processor.
processor speed	The speed, or frequency, (in MHz) at which the Central Processing Unit (CPU) in a computer operates.
program	A series of instructions for completion of a specific task or for performance of an activity. See application.
protocol	A set of rules for communicating, particularly for the format and transmission of data, typically defined between two computers or devices so they can communicate. Some of the operations defined are error detection and correction, data format and readiness to receive or send. There are different protocols but two communicating devices must follow the same protocol in order to understand each other. A formal description of message formats and the rules two computers must follow to exchange those messages.
PRR	Primary Reference Receiver.
PRS	Primary Reference Source.
pseudolite	A ground-based differential GPS receiver which transmits a signal like that of an actual GPS satellite, and can be used for ranging.
pseudo random code	A signal with random noise-like properties. It is a very complicated but repeating pattern of 1's and 0's.
pseudorange	A distance measurement based on the correlation of a satellite transmitted code and the local receiver's reference code, that has not been corrected for errors in synchronization between the transmitter's clock and the receiver's clock.
PXI	PCI EXtensions for Instrumentation) A peripheral bus based on PCI specialized for data acquisition and real-time control systems. Introduced in 1997, PXI uses the CompactPCI 3U and 6U form factors and adds trigger lines, a local bus and other functions suited for measurement applications.
PXO	Precision clock oscillators. PXO applications include PCS base stations, cellular base stations, telecom and wireless infrastructure, and digital switching.
P{Y} Code	See P-code
Qbus	Digital Equipment Corporation Bus used on Alpha machines.
QoE	Quality of Experience: a subjective term associated with the end user's perception of next generation services.

GLOSSARY OF TERMS continued.

QoS	Quality of Service. An expression of transmission error rates, often established by a network policy server.
QWERTY	Name of the standard American-English keyboard. The letters keys in the top row from left to right are "Q-W-E-R-T-Y," hence the name.
quartz crystal oscillators	A timing device that consists of a crystal and an oscillator circuit, providing an output waveform at a specified reference frequency.
RAIM	Receiver Autonomous Integrity Monitoring.
RAM	Random Access Memory.
RAN	Radio Access Network.
random access memory	The standard operating memory of the computer, the workspace of a computer. It's the area that stores the information and data for processing by the computer's CPU. Retrieving data from the hard drive is much slower, but once the data is loaded into RAM, it can be accessed instantly and randomly. RAM is volatile, meaning that once the power is cycled, all data in memory disappears. These memory chips hold the changed information as long as there is an electric current running through them, but go blank when the electricity is cut off. RAM is stored in chips on small circuit boards called SIMMs or DIMMs, that attach to the motherboard. Many people confuse RAM and the hard disk. The RAM is temporary storage while the hard disk is semi-permanent storage. One way to understand the difference between the two is to relate RAM to short term memory and the hard disk to long term memory. Just as lots of memories are stored in your brain, lots of information is stored in a computer's hard drive. However, you can only actively think about and use a small portion of what you remember at any given time. This is similar to RAM. When a computer is using an application, it is loaded into RAM.
read-only memory (ROM)	Information hard-wired into chips, usually a program- written into them at the time of their manufacture. The data or code written to chips (or CDs) is typically burned on the media at the factory and cannot be erased or changed. These chips cannot be re-written, hence "read-only." The contents of ROM remains even when the computer is turned off. Used for the BIOS and in many I/O devices. Abbreviated as ROM.
real-time clock	The CMOS circuitry that keeps track of the year, day and time of day for the system. Abbreviated RTC.
real-time operating system (RTOS)	An operating system designed specifically for use in real-time systems.
real-time system	Any computer system, embedded or otherwise, that has timeliness requirements.
registry	The Registry is a database used by Windows95, 98 and NT to store user preferences, setup, device, and system configuration. The Registry files are vital to the proper execution of the Operating Systems.
resolution	Resolution of a time code refers to the smallest increment of time, whether it is days, hours, seconds, or other.
resources	See system resources.
RF distribution	Delivering a centralized reference signal to a number of different equipment stations without degrading the signal or creating crosstalk.
risk management	The tasks and plans that help avoid security risk, and if security is breached, helps minimize damage.
Rf or RF Radio frequency	A term used in broadcasting refers to that portion of the electromagnetic spectrum in which electromagnetic waves can be generated by alternating current fed to an antenna.
rms or RMS	Root mean square, a concept used in statistics and electronics. In mathematics, root mean square is a statistical measure of the magnitude of a varying quantity. It can be calculated for a series of discrete values or for a continuously varying function. The name comes from the fact that it is the square root of the mean of the squares of the values.

GLOSSARY OF TERMS continued.

ROM	Read-only memory.
RS232	In telecommunications, TIA 232 (formerly EIA-232, formerly EIA RS-232, the 'RS' meaning Recommended Standard) is a standard for serial binary data interconnection between a DTE (Data terminal equipment) and a DCE (Data communication equipment). It is commonly used in computer serial ports. This standard was originally used for specifying the connection between an electromechanical teletypewriter and a modem. When electronic terminals (smart and dumb) began to be used, they were often designed to be interchangeable with teletypes, and so supported RS-232. The C revision of the standard was issued in 1969 in part to accommodate the electrical characteristics of these devices. Then, because it was there, it was used for all sorts of remote communications, especially through modems, including computer to computer.
RS422	EIA-422 (formerly RS-422) is a serial data communication protocol that specifies 4 wire, full-duplex, differential line, multi-drop communications. It provides for balanced data transmission with unidirectional/non-reversible, terminated or non-terminated transmission lines. In contrast to RS485 (which is multi-point instead of multi-drop) EIA-422 does not allow multiple drivers but only multiple receivers.
RS485	EIA-485 (formerly RS-485 or RS485) is an OSI Model physical layer electrical specification of a two-wire, half-duplex, multipoint serial connection. The standard specifies a differential form of signalling. The difference between the wires' voltages is what conveys the data. One polarity of voltage indicates a logic 1 level, the reverse polarity indicates logic 0. The difference of potential must be at least 0.2 volts for valid operation, but any applied voltages between +12 V and -7 volts will allow correct operation of the receiver. EIA-485 only specifies electrical characteristics of the driver and the receiver. It does not specify or recommend any data protocol.
RTOS	Real-time operating system.
rubidium	Soft silvery metallic element of the alkali metal group; burns in air and reacts violently in water; occurs in carnallite and lepidolite and pollucite.
rubidium clock	A clock containing a quartz oscillator stabilized by a rubidium standard.
rubidium frequency standard	A frequency standard in which a specified hyperfine transition of electrons in rubidium-87 atoms is used to control the output frequency. Note: A rubidium standard consists of a gas cell, which has an inherent long-term instability. This instability relegates the rubidium standard to its status as a secondary standard.
SA	Selective Availability (GPS accuracy limits for civilian users).
SAASM	Selective Availability Anti-Spoofing Module.
SAN	Storage Area Network
satellite constellation	The arrangement in space of a set of satellites.
SBC	Single-board computer, a complete computer built on a single circuit board. The design is always centered around a microprocessor. A single-board computer is of a specific form factor similar to other plug-in cards and is intended to be used in a backplane. Some architectures are dependant entirely on single-board computers, such as Compact PCI, VME, PICMG architecture, etc.
Sbus	Sun(TM) Bus.
SCSI	A high-speed parallel interface used to connect a computer to several devices through one controller used for hard drives, CD-ROM drives, scanners and other devices. SCSI comes from Small Computer System Interface. Devices can be connected together (daisy-chained) and accessed through the controller by an individual ID. Pronounced "scuzzy."
SDA	Space, Defense and Avionics.

GLOSSARY OF TERMS continued.

Selective Availability (SA)	A policy adopted by the Department of Defense to introduce some intentional clock noise into the GPS satellite signals thereby degrading their accuracy for civilian users. This policy was discontinued as of May 1, 2000 and now SA is turned off.
serial interface	An interface between a computer and a serial device, such as a printer or modem, by which the computer sends single bits of information to the device, one after the other.
serial port	A computer input/output port that transmits data sequentially, one bit at a time. The serial ports on the back of the computer are the DB-9 and DB-25 male connections. (DB connectors are the 'D-shaped' ports). Serial ports are used for modems, mice, certain printers and communication devices.
serial time code	Uniquely coded digital serial stream of data (usually in a pulse code modulation form) representing time of year, time of day or countdown time.
server	A network device that provides services to client stations. Servers include file servers, disk servers, print servers, etc.
shell	An operating system shell is a shell for an operating system; it is a program that presents an interface to various operating system functions and services. The shell is so called because it is an outer layer of interface between the user and the innards of the operating system (the kernel). Operating system shells generally fall into one of two categories: command line and graphical. Command line shells provide a command line interface (CLI) to the operating system, while graphical shells provide a graphical user interface (GUI).
Silicon Graphics Incorporated	SGI. Makers of high-end graphics workstations.
slow switching channel	A sequencing GPS receiver channel that switches too slowly to allow the continuous recovery of the data message.
SNR	Signal to Noise Ratio.
software	A set of instructions or programming code that is written to instruct a computer to do a certain task or function. Programs, operating systems, device drivers, and macros are all software. Contrast with hardware.
Solaris	The Sun workstation operating environment, including SunOS and the OpenWindows windowing environment.
solar time	Time based on the revolution of the earth around the sun.
source code	A program in the form of an ASCII text file. Programs as they are written in a programming language, such as C and Pascal. In order to run the program, source code must be translated into machine code by either an interpreter or a compiler.
space segment	The part of the whole GPS system that is in space, i.e. the satellites.
SPARC	The RISC CPU used in newer Sun workstations.
SPARCStation	A Sun workstation model using the SPARC CPU.
spread spectrum	A system in which the transmitted signal is spread over a frequency band much wider than the minimum bandwidth needed to transmit the information being sent. This is done by modulating with a pseudo random code, for GPS.
Standard Positioning Service (SPS)	The normal civilian positioning accuracy obtained by using the single frequency C/A code.
static positioning	Location determination when the receiver's antenna is presumed to be stationary on the Earth. This allows the use of various averaging techniques that improve accuracy by factors of over 1000.
STFP	Sbus Time & Frequency Processor

GLOSSARY OF TERMS continued.

stratum level	Standards set by Network Time Protocol RFC 1305. The highest level are Stratum 0 devices such as GPS, which get their time from a primary time source such as a national atomic clock. Stratum 1 servers, such as TymServe, source their time from a Stratum 0 device. Stratum 2 and beyond obtain their time from Stratum 1 servers. The further away a network is from a primary source, the greater the chance of signal degradations due to variations in communications lines and other factors.
Sun	Sun Microsystems. Makers of high-end UNIX workstations.
Sun Microsystems (Sun Microsystems, Inc.)	A computer, semiconductor and software manufacturer headquartered in Santa Clara, California. Sun's products include computer servers and workstations based on its own SPARC and AMD's Opteron processors, the Solaris and Linux operating systems, the NFS network file system, and the Java platform. From June 2005, Sun also produces laptops called Ultra 3 Mobile Workstation.
SunOS	A version of UNIX produced by Sun Microsystems for their Sun workstations.
surge suppressor	An electrical device that electronic equipment can be plugged into. A surge suppressor includes a circuit breaker that will protect equipment from damage from a surge in electricity (from, e.g., a lightning strike).
SVN	Satellite Vehicle Number.
SYS-file	This is a file containing a system driver. It is loaded into memory on DOS initialization, after the system is loaded. To start up a SYS-file it is necessary to place the corresponding command into file the CONFIG.SYS and reboot the computer.
system	All of the parts that work together for a particular purpose. A computer system consists of the monitor, keyboard, all of the components in the CPU cabinet and any peripherals connected to it. An operating system is all of the routines and utilities needed for control of the computer, organized into one program. System: 1) An essential file (program) which makes up part of the MacOS. The system file controls the basic operation of the computer at a low-level, such as printing, saving, etc. 2) A generic term for an operating system.
system board	See Motherboard; holds the CPU, RAM and other parts, and has slots for expansion cards.
system file	On an MS-DOS system, a file that contains information required for running the MS-DOS operating system. A system file is hidden, that is, it is not shown in the directory listing (unless you use the /a option).
system software	A generic term referring to any computer software whose purpose is to help run the computer system. Most of it is responsible directly for controlling, integrating, and managing the individual hardware components of a computer system. System software is opposed to application software that helps solve user problems directly. System software performs tasks like transferring data from memory to disk, or rendering text onto a display. Specific kinds of system software include loading programs, operating systems, device drivers, programming tools, compilers, assemblers, linkers, and utilities. System software can be stored on non-volatile storage on integrated circuits that is usually termed firmware.
System V	A version of the Unix computer operating system, previously known as AT&T System V. It was originally developed by AT&T and first released in 1983. Four major versions of System V were released, termed Releases 1, 2, 3 and 4. System V Release 4, or SVR4, was the most successful version, and the source of several common Unix features, such as the System V Interface Definition (SVID), a standard defining how System V systems should work.
TA	TA Terminal Adapter; a device for connecting an Integrated Services Digital Network (ISDN) channel to a computer.
TAI	International Atomic Time, (Temps Atomique International), results from the averaging and coordination of several hundred of the best atomic clocks around the world.
TCG	Time Code Generator.

GLOSSARY OF TERMS continued.

TCP/IP	Transmission Control Protocol over Internet Protocol Provides dependable communication and multiplexing. It is connection-oriented, meaning it requires a connection be established data transfer. It sits on top of the Internet Protocol (IP), which provides packet routing. This is connectionless, meaning each data packet has its source and destination data embedded, so it can bounce around a network and still get to its destination.
TDEV	Time DEVIation
TDOA	Time Difference of Arrival. A technique for triangulating on the location of a mobile handset from multiple wireless base stations. Used for E911 services.
TDOP	Time Dilution of Precision.
Terminate-and-Stay-Resident Program	See TSR.
TFP	Time & Frequency Processor.
thread	A single task that is part of a larger task or program. In a newsgroup or forum, a Thread is a statement or question and all responses pertaining to it.
TIE	Time Interval Error.
time code	A code (usually digital) that contains enough information to synchronize a clock to the correct time-of-day. NIST time codes can be obtained from the WWV, WWVH, WWVB, GOES, ACTS, and Internet Time Services.
time standards	A time standard is a specification of either the rate at which time passes, or points in time, or both. For example, the standard for civil time specifies both standard time intervals and time-of-day.
tool box	A group of software applications that have similar functions.
transaction	An activity, such as a request or an exchange.
TSR	Terminate-and-Stay-Resident Program. Also called memory resident or pop-up program. An MS-DOS program that is loaded into memory and is available even as another application is active.
Tru64	HP's (formerly Compaq; formerly DEC) 64-bit UNIX operating system for the Alpha AXP platform. It was previously known as Digital UNIX. DEC's prior Unix product was known as Ultrix. It is unique among common commercial UNIX implementations in being built on the Mach kernel often associated with NeXT, and now Mac OS X.
TTL	Transmitter-Transmitter Links.
TVAR	Time VARiance.
Twisted Pair Wire	Commonly used for telephone and network wiring. Twisted pair consists of two pairs of wires- one for transmitting and one for receiving data. The wires in each pair are twisted together to reduce induction between them. 10Base-T Ethernet cable is twisted pair.
UART	Universal Asynchronous Receiver/Transmitter, the control chip or circuitry for a serial port.
UE	User Equipment.
UI	Unit Interval (inverse of a signals' symbol rate).
Universal Resource Locator	See URL .

GLOSSARY OF TERMS continued.

Unix or UNIX	is a computer operating system originally developed in the 1960s and 1970s by a group of AT&T Bell Labs. Unix was designed to be portable, multi-tasking and multi-user. The Unix systems are characterized by various concepts: plain text files, command line interpreter, hierarchical file system, treating devices and certain types of inter-process communication as files, etc. In software engineering, Unix is mainly noted for its use of the C programming language and for the Unix philosophy. During the late 1970s and early 1980s, Unix's influence in academic circles led to massive adoption (particularly of the BSD variant, originating from the University of California at Berkeley) of Unix by commercial startups, the most notable of which is Sun Microsystems. Many versions of UNIX, and UNIX-like clones, have been produced through the years, including System V, BSD, NetBSD, Linux, AIX, A/UX, MINIX, SunOS, etc.
upper memory area	The 384KB of RAM between 640KB and 1MB, reserved in DOS for BIOS, video and adapter card ROMs.
upper memory blocks	Areas of the upper memory area that contain general-purpose memory used to hold device drivers or other memory-resident programs in order to leave more conventional memory available for applications.
UPS (Uninterruptible Power Supply)	A UPS is basically a battery back-up system for your computer. It acts as a surge suppressor, filtering line noise and providing protection against spikes. Most important, in the event of a power outage it keeps your computer up and running, sounding an alarm and allowing you to close any running programs and shut down your computer safely. A UPS is not necessary on most computer systems, but can be important on systems that need to be up 24 hours a day, such as servers.
URL (Universal Resource Locator)	Simply, the address to a website on the Internet. Used with the WWW to identify the type and location of a multimedia resource on the internet.
USB	Universal Serial Bus, a port that allows the hot-plugging of multiple external plug-and-play devices. A Universal Serial Bus is an external bus with a maximum transfer speed of 12 megabits per second. It's hot-swappable, which means that a device can be connected or disconnected while the computer is running. The Operating System can recognize and uses the device as soon as its plugged in. Up to 127 devices can be daisy-chained together.
user interface	The way a receiver conveys information to the person using it. The aspect of a computer or program that is visible to the user, giving and accepting information from him or her. User interfaces are, broadly, CLIs and GUIs.
user profile	A file kept in the Registry that contains a user's desktop settings and personal setup preferences to be retained from session to session.
user segment	The part of the whole GPS system that includes the receivers of GPS signals.
USNO	U.S. Naval Observatory, in Washington, D.C., where the atomic clock that serves as the official source of time for the United States is maintained.
UT1	The time scale derived from the earth's rotation - needed for celestial navigation and surveying
UTC	The international time standard is called Universal Coordinated Time or, more commonly, UTC, for "Universal Time, Coordinated". This ITU standard has been in effect since 1972. UTC is maintained by the Bureau International de l'Heure (BIH), which forms the basis of a coordinated dissemination of standard frequencies and time signals.
utility	A program intended to make the use of a computer or of an application program easier.
VAX	A 32-bit computing architecture that supports an orthogonal instruction set (machine language) and virtual addressing (i.e. demand paged virtual memory). Developed in the mid-1970s by Digital Equipment Corporation (DEC). DEC was later purchased by Compaq, which in turn was purchased by Hewlett-Packard.
VCO	Voltage-controlled Crystal Oscillator.
ViiP	Video over IP. Similar to Voice over IP but typically at higher and constant bit rates (CBR).

GLOSSARY OF TERMS continued.

virus	An unwanted program that hides "behind" legitimate code, and which is activated when the legitimate program is activated.
VISA	Virtual Instrument Software Architecture.
VITA	VMEbus International Trade Association http://www.vita.com/
VME	Versa Module Europe; VMEbus specification governed by the VSO.
VMEbus	(Versa Module Europa) is a fast, flexible, open-ended bus system that uses the Eurocard standard. VME bus supports a variety of computing tasks in industrial applications. It is defined by the IEEE 1014-1987 standard. VMEbus supports many specialized applications and industries, including: industrial controls, military, aerospace, telecommunications, medical, etc.
vme bus specification	The VME64 standard specifies a 64-bit data path for 6U cards, a 32-bit data path for 3U cards, twice the bandwidth for data transmission, lower noise, and Plug and Play features. Since the VME64 standard, an extension called the VME64x was added that supports hot swap.
vme vxi	Bus interfaces or adapters allow the VME / VXI system to communicate with other devices or systems.
VMS	OpenVMS (Open Virtual Memory System)
VoIP	Voice over IP. A set of facilities for managing the delivery of voice information over a packet-switched network.
VPN	Virtual Private Network, a way that authorized individuals can gain secure access to an organization's intranet, usually via the Internet.
VPP	VXI Plug & Play Specification.
VSO	VITA Standards Organization.
VXCO	Voltage-controlled Crystal Oscillator.
VXI	(VME eXTensions for Instrumentation) A peripheral bus based on VME specialized for data acquisition and realtime control systems. Introduced in 1987, VXI uses all Eurocard form factors and adds trigger lines, a local bus and other functions suited for measurement applications.
vxi mxi 2	Extends VXI/VME to several mainframes using MXI-2 bus.
W3C	Based at the Massachusetts Institute of Technology (MIT), this international organization creates standards for the World Wide Web.
WAN	Wide Area Network A network linking computers, terminals, and other equipment over a large geographic area.
warm boot	Restarting the boot-up without first turning off the power. Resetting or restarting a computer that is already on without turning off the power. It restarts the computer without going through the entire POST. This is accomplished by pushing CTRL+ALT+DEL, using restart on the shut down menu, or pushing the restart button on the front of the computer.
watts	A measurement of the electrical power in a circuit. Today's computers will usually have a power supply that puts out 250 - 350 Watts.
web	See World Wide Web.
web browser	A program that accesses the WWW, allowing the user to use the multimedia resources of the internet. A web browser will require internet access (either ethernet hardware or PPP/SLIP), and sufficient graphics hardware.
window	A rectangular area on the screen, showing a section of a program or document. You can open, close, and move windows, as well as change the size of most windows.
Windows	A widespread operating system from Microsoft, used on approximately 80% of all PCs. It is a Graphical User Interface that runs on top of MS-DOS.

GLOSSARY OF TERMS continued.

Windows 3.11	The last release of the Microsoft Windows Operating Environment before Windows 95.
Windows 95	Windows 95 features full 32 bit design, pre-emptive multitasking, and multithreading. Windows 95 is a successor to Windows 3.1 and Windows for Workgroups, but it does not replace Windows NT.
Windows NT	An operating system developed by Microsoft, designed to provide networking services, and to be at least somewhat processor independent. NT shares a common interface with Windows 3.1, but does not require MS-DOS. NT runs on Intel processors (386 and above), MIPS, and the DEC Alpha.
windows sdk	Windows Software Development Kit.
World Wide Web (WWW)	An amalgam of internet sites offering text, graphics, sound, and animation resources in an easy to use way, through the http protocol. More generally, all ftp, gopher, and WAIS sites are also included.
WYSIWYG	What You See Is What You Get. The ability to display, on a monitor, the same image and page layout that will appear on printed output. Pronounced "wizzywig."
X Windowing System	A GUI developed to work with different operating systems, and to support networking. That is, one machine may be running an application, and the user interface to the application can be running on another machine.
XT	The second generation of IBM PCs, distinguished by a hard disk and an eight-bit bus. Any IBM-compatible computer based on the Intel 8088 CPU.
10Base2	Ethernet running on thin coaxial cable.
10Base5	Ethernet running on thick coaxial cable.
10Base-T	Ethernet running on twisted pair cable. It looks like phone cord but the modular plugs at the end, RJ-45 connectors, are slight larger.
3D graphics	Computer graphics that are based on computer generated objects with height, depth, and width information.
680x0	A family of CPU chips, used in Macintosh, NeXT, and other computer systems, including many VME SBCs. The PowerPC chip has replaced the 680x0 in the newest Macs. There are several varieties.
80x86	A family of CPU chips produced by Intel, and used for many years in the IBM and compatible PCs. The Pentium CPU chip is equivalent to the 80586. There are several varieties of 80x86 chips: