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by Harry Newton

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most complex and fastest is 64QAM (64-level QAM), at 1.125 Mbps per channel for a total of 54 Mbps.

The symbol rate is slowed down enough that each symbol transmission is longer than the delay spread. The delay spread is the variation in timing between receipt of the signals associated with a given symbol, with the delay spread caused by multipath fading. Multipath fading is the phenomenon whereby the RF signals carrying a given data symbol arrive at the receiver at slightly different times. This is because the signal spreads out from the transmitter, with certain portions of the signal reaching the receiver more or less directly, while other portions of the signal bounce around off of walls, furniture, your co-worker's pointy head, and such. Now, each of the symbols contains multiple bits, which are imposed on it through the coding processes identified above. As the multiple symbols reach the receiver, they are sorted out and decoded, with the decoding process providing some additional time for the receiver to adjust for the delay spread and to get ready to receive the next symbol. Both 802.11a and 802.11b are designed to be compatible with Ethernet LANs, using the MAC (Media Access Control) technique of CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance).

If this sounds great, that's because it is great. If this sounds too good to be true, that's because it gets a little more complicated. While the 5 GHz spectrum is pretty clear in the US, it's not so readily available elsewhere. Military and government installations use portions of this band overseas. In Japan, only the 5.15-5.25 MHz spectrum is available. In Europe, the 5.725-5.825 MHz spectrum is already allocated for other uses. In Europe, ETSI (European Telecommunications Standards Institute) requires that two additional protocols be used in conjunction with 802.11a in order to protect incumbent applications and systems running over previously allocated shared spectrum. DFS (Dynamic Frequency Selection) allows the 802.11a system to dynamically shift frequency channels and TPC (Transmission Power Control) reduces the power level. In combination, these protocols serve to eliminate interference issues with incumbent signals. See also 802.11b, 802.11g, BPSK, CSMA/CA, MAC, OFDM, QAM, QPSK, WECA and Wi-Fi.

802.11b 802.11b is now the most common wireless local area network. 802.11b is now installed in offices, airports, coffee shops, hotels, boardrooms and homes. Many laptops now come with 802.11b wireless transmit and receive electronics built-in. 802.11b is also called Wi-Fi or WiFI (Wireless Fidelity). 802.11b is a low power wireless system so the closer you are to a transmitter, the faster it will be. This is roughly what you'll get: Wireless operating range (indoors): 100 feet at 11 Mbps, 165 feet at 5.5 Mbps, 230 feet at 2 Mbps, 300 feet at 1 Mbps. Wireless operating range (outdoors): 500 feet at 11 Mbps, 885 feet at 5.5 Mbps, 1,300 feet at 2 Mbps, 1,500 feet at 1 Mbps. 802.11b operates at the same frequency as some cordless phones, garage door openers, walkie-talkies, etc. So there's a real chance for interference in big cities, like New York. An 802.11b basestation is often attached to a local area network, which is then attached to the Internet and/or the corporate network. This means that you use 802.11b to surf the Internet or get to corporate databases, etc.

802.11b defines both the Physical (PHY) and Medium Access Control (MAC) protocols. Specifically, the PHY spec includes three transmission options — one Ir (Infrared), and two RF (Radio Frequency). 802.11b uses DSSS (Direct Sequence Spread Spectrum) modulation for digital communication. DSSS involves the transmission of a stream of one's and zero's, which is modulated with the Barker code chipping sequence. Barker code is an 11-bit sequence (e.g., 10110111000) that has advantages in wireless transmission. Each bit is encoded into an 11-bit Barker code, with each resulting data object forming a "chip." The chip is put on a carrier frequency in the 2.4 GHz range (2.4-2.483 GHz), and the waveform is modulated using one of several techniques. 802.11 systems running at 1 Mbps make use of BPSK (Binary Phase Shift Keying). Systems running at 2 Mbps make use of QPSK (Quaternary Phase Shift Keying). Systems running at 11 Mbps make use of CCK (Complementary Code Keying), which involves 64 unique code sequences, which technique supports six bits per code word. The CCK code word is then modulated onto the RF carrier using QPSK, which allows another two bits to be encoded for each 6-bit symbol. Therefore, each 6-bit symbol contains eight bits. Power output is limited by the FCC to 1 watt EIRP (Equivalent Isotropically Radiated Power). At this low power level, the physical distance between the transmitting devices becomes an issue, with error performance suffering as the distance increases. Therefore, the devices adapt to longer distances by using a less complex encoding technique, and a resulting lower signaling speed, which translates into a lower data rate. For example, a system running at 11 Mbps using CCK and QPSK, might throttle back to 5.5 Mbps by halving the signaling rate as the distances increase and error performance drops. As the situation gets worse, it might throttle back to 2 Mbps using only QPSK, and 1 Mbps using BPSK. Also to be considered in this equation is the fact that the 2.4 GHz range is in the unlicensed ISM (Industrial, Scientific and Medical) band, which is shared by garage door openers, microwave ovens, bar code scanners, cordless phones, Bluetooth LANs, and a wide variety of other devices. As a result, this slice of spectrum can be heavily congested at times, and performance can drop considerably. 802.11 divides the available spectrum into 14 channels. In the US, the FCC allows the use of 11 channels. Four channels are available in France, 13 in the rest of Europe, and only one in Japan. There also is overlap between adjacent channels (e.g., channels one and two), which fact further affects performance; therefore, any given system must maintain maximum channel separation from other systems in proximity.

Both 802.11a and 802.11b are designed to be compatible with Ethernet LANs. 802.11b uses a variation of the MAC (Media Access Control) technique of CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance), which is used in some wired Ethernets, as well. A device seeking to transmit over the shared medium (in this case, a shared RF channel) listens to the network. If it senses no activity over the carrier frequency for a minimum period of time known as the DIFS (DCF (Distributed Coordinated Function) InterFrame Spacing), it requests access by first transmitting a RTS (Request To Send) packet. The RTS packet includes both the source (i.e., transmitter) and destination (i.e., intended receiver) addresses, the duration of the intended session (i.e., transmission), and the ACK (ACKnowledgement) associated with it. If the network is available, the destination device responds with CTS (Clear To Send), repeating both the duration and the ACK. All other devices back off the network until the session is concluded. If the network, on the other hand, is busy, the device waits a period of time equal to the DIFS, plus a random number of slot times, as calculated with several back-off timers. The "listening" process takes several forms. CAM (Constant Access Method), the default method, involves constant monitoring of the network. Since CAM creates a power consumption issue for battery-powered devices, PAM (Polled Access Mode) can be substituted. PAM calls for all client devices to go into sleep mode, all awaking at regular intervals, at the exact same time, to listen for network activity. On January 3, 2000 the 802.11 technology got another boost when Microsoft and Starbucks announced that they were to join forces to offer wireless access, using 802.11b among other standards, in most of Starbucks' coffee outlets over the next two years. The deal, some analysts say, is a further sign that 802.11b could become a serious competitor to better known wireless technologies such as Bluetooth, HomeRF, or even next-generation cellular networks. Apple was the first to launch an 802.11b product line (called AirPort). All Apple computers now include a built-in antenna which, in conjunction with a networking card, can exchange data with a small base station plugged into a broadband Internet connection up to 45 metros (150 feet) away. Although some PC laptops now come pre-equipped with wireless hardware, most users buy a PCMCIA card, or PC card, that serves as a wireless modem and antenna. See also 802.11a, 802.11g, Bluetooth, BPSK, Chip, CSMA/CA, DSSS, EIRP, Ethernet, HomeRF, MAC, QPSK, Spread Spectrum, WECA and Wi-Fi.

802.11g In November, 2001, Task Group G of the IEEE's 802.11 Committee voted to finish the specs on a new wireless networking standard (802.11g) that would allow wireless data rates up to 54 megabits per second in the 2.4 GHz spectrum. Current 802.11b Wi-Fi systems have a maximum data rate of 11 megabits per second. The proposed will be compatible with 802.11b. Mandatory modulation schemes of the proposed standard are Complementary Code Keying (CCK), used in 802.11b, and Orthogonal Frequency Division Multiplexing (OFDM), used in 802.11a. Two optional modulations are allowed if systems manufacturers chose to add them: CCK-OFDM and CCK-PBCC. The new standard 802.11g is important because 802.11a and 802.11b are incompatible, but 802.11g devices will work with both 802.11a and 802.11b devices. On May 15, 2003, the Institute of Electrical and Electronics Engineers Inc. (IEEE), the group responsible for setting standards in the networking industry, approved a new and final draft standard for 802.11g wireless LANs.

802.11i The IEEE's 802.11i working group is developing (or was when I wrote this) a far-reaching standards-based solution for both encryption and authentication on wireless 802 LANs.

802.12 Standard for 100VG-AnyLAN. Addresses 100 Mbps demand-priority access method physical-layer and repeater specifications. Approved in 1995.

802.15.1 The 802.15.1 is an IEEE standard for wireless personal area networks. Basically it is an enhanced Bluetooth v1.1 specification and it is fully compatible with the Bluetooth v1.1 specification. Bluetooth technology defines specifications for small-form-factor, low-cost wireless radio communications among notebook computers, personal digital

Apologize To lay the foundation for a future offense.

APON ATM Passive Optical Network. A passive (i.e., with no repeaters or other active electronics) optical network running ATM. APON is used in the local loop to connect terminal devices to an all optical network running the ATM protocol. See also ATM, Fiber Optics, PON, and SONET.

APOT Additional Point Of Termination. The significance of APOT is that in the CLEC environment APOT is a requirement to submit LSR orders for collocation. These are some requirements that apply to APOT from Bell's point of view: APOT= Location "A" tie down information; CFA= Location "Z" tie down information; ACTL= Location "A" CLLI; LST= Location "Z" CLLI.

Apparent Power The mathematical product of the RMS current and the RMS voltage. Identical to the VA rating.

APPC Advanced Program-To-Program Communications. In SNA, the architectural component that allows sessions between peer-level application transaction programs. The LUs (Logical Units) that communicate during these sessions are known as LU type 6.2. APPC is an IBM protocol analogous to the OSI model's session layer: it sets up the necessary conditions that enable application programs to send data to each other through the network.

APPC/PC An IBM product that implements APPC on a PC.

Appearance Usually refers to a private branch exchange line or extension which is on (i.e. "appears") on a multi-button key telephone. For example, extension 445 appears on three key systems.

Appearance Test Point The point at which a circuit may be measured by test equipment.

Append To add the contents of a list, or file, to those of another.

APPGEN A shortened form of the words APPlications GENerator.

Apple Computer, Inc. Cupertino, CA. Manufacturer of personal computers. Heavy penetration in the graphics/desktop publishing business and in education. Apple was formed on April Fool's Day, 1976, by Steve Wozniak and Steve Jobs, aided greatly by Mike Markkula.

Apple Desktop Bus The interface on a Mac where non-peripheral devices, such as the keyboard, attaches. A Mac keyboard or mouse is called an ADB device. Contrast with peripherals, which attach through the SCSI interface. See also USB, which is a new bus for use on PCs but fulfilling essentially the same function as the Apple Desktop Bus.

Apple Desktop Interface ADI. A set of user-interface guidelines, developed by Apple Computer and published by Addison-Wesley, intended to ensure that the appearance and operation of all Macintosh applications are similar.

Apple Menu The Apple icon in the upper left hand corner of the Apple Macintosh screen. The Apple menu contains aliases, control panels, the chooser and other desk accessories.

Apple Pie Both an American icon, and the name chosen for Apple Computer's Personal Interactive Electronics (PIE) division, chartered with extending the company into new growth areas such as Personal Digital Assistants (PDAs), e.g. the Apple Newton. The PIE division includes Apple Online Services, Newton and Telecommunications group, publishing activities, and ScriptX-based multimedia PDA development.

Apple Remote Access ARA is Apple Computer's dial-in client software for Macintosh users allowing remote access to Apple and third party servers.

Apple URP Apple Update Routing Protocol. The network routing protocol developed by Apple for use with Appletalk.

AppleShare Apple Computer's local area network. It uses AppleTalk protocols. AppleShare is Apple system software that allows sharing of files and network services via a file server in the Apple Macintosh environment. See AppleTalk.

Applet Mini-programs that can be downloaded quickly and used by any computer equipped with a Java-capable browser. Applets carry their own software players. See Java.

AppleTalk Apple Computer's proprietary networking protocol for linking Macintosh computers and peripherals, especially printers. This protocol is independent of what network it is layered on. Current implementations exist for LocalTalk (230.4 Kbps) and EtherTalk (10 Mbps).

AppleTalk Address Resolution Protocol See AARP.

AppleTalk Zone and Device Filtering Provides an additional level of security for AppleTalk networks. On AppleTalk networks, network managers can selectively hide or show devices and/or zones to ARA clients. See ARA.

Appliance See Edge Appliance.

Application A software program that carries out some useful task. Database managers, spreadsheets, communications packages, graphics programs and word processors are all applications.

Application Based Call Routing In addition to the traditional methods of routing and tracking calls by trunk and agent group, the latest Automatic Call Distributors route and track calls by application. An application is a type of call, for example, sales or service. Tracking calls in this manner allows accurately reported calls, especially when they are overflowed to different agent groups. See ACD.

Application Binary Interface ABI. The rules by which software code is written to operate specific computer hardware. Application software, written to conform to an ABI, is able to be run on a wide variety of system platforms that use the computer hardware for which the ABI is designed.

Application Bridge Aspect Telecommunications' ACD to host computer link. Originally it ran only over R2-232 serial connections, but it now runs over Ethernet, using the TCP/IP link protocol. See also Open Application Interface.

Application Class An SCSA term. A group of client applications that perform similar services, such as voice messaging or fax-back services.

Application Entity AE. A cellular radio term. An Application Entity provides the service desired for communication. An Application Entity may exist in an M-ES (Mobile End System) (i.e., mobile application entity) or an F-ES (Fixed End System). An Application Entity is named with an application entity title.

Application Equipment Module AEM. A Northern Telecom term for a device within the Meridian 1 Universal Equipment Module that supports Meridian Link Modules. The Meridian Link Module (MLM) is an Application Module, specially configured to support the Meridian Link interface to host computers.

Application For Service A standard telephone company order form that includes pertinent billing, technical and other descriptive information which enables the company to provide communications network service to the customer and its authorized users.

Application Framework This usually means a class library with a fundamental base class for defining a complete program. The framework provides at least some of the facilities through which a program interfaces with the user, such as menus and windows, in a style that is internally consistent and abstracted from the specific environment for which it has been developed.

This is an explanation I received from Borland. I don't quite understand it, yet. An application framework is an object-oriented class library that integrates user-interface building blocks, fundamental data structures, and support for object-oriented input and output. It defines an application's standard user interface and behavior so that the programmer can concentrate on implementing the specifics of the application. An application framework allows developers to reuse the abstract design of an entire application by modeling each major component of an applications as an abstract class.

Application Gateway A firewall that applies security mechanisms to specific applications, such as FTP and Telnet servers. An application gateway is very effective but can impose a performance degradation.

Application Generator AG. A program to generate actual programming code. An applications generator will let you produce software quickly, but it will not allow you the flexibility had you programmed it from scratch. Voice processing "applications generators," despite the name, often do not generate programming code. Instead they are self-contained environments which allow a user to define and execute applications. They are more commonly called applications generator, since one generator can define and execute many applications. See Applications Generator for a longer explanation.

Application Layer The topmost, visible to the user, presentation of a communications network; the user interface point in network architectures. See Open Systems Interconnection — Reference Model.

Application Level Firewall A firewall system in which service is provided by processes that maintain complete TCP connection state and sequencing. Application level firewalls often re-address traffic so that outgoing traffic appears to have originated from the firewall, rather than the internal host.

Application Level proxy A firewall technology that involves examining application specific data in order to guard against certain types of improper or threatening behaviors.

Application Metering The process of counting the number of executions of the copies of an application in use on the network at any given time and ensuring that the number does not exceed preset limits. Application metering is usually performed by a network

sion, using IP, HTML and JavaScript. See ATV.

ATX Audiotex. Interactive voice response systems that deliver information or entertainment to general telephone callers, i.e. anyone with a phone. Audiotex services are typically widely advertised. They include everything from sex to the weather. See also Audiotex.

AU 1. A UNIX sound file format, i.e. filename.au. When a Sun Microsystems or other UNIX computer makes a sound, it does so in AU file format. And because the Internet is dominated by Unix boxes, you'll find a lot of AU files there. Macintosh and PC browsers are usually able to play AU files. In contrast, a sound file that originated on a PC is likely to be in WAV or MIDI format instead.

2. Administrative Unit. A SDH term. A element of a SDH frame that contains enough information to the switching and cross-connection of Virtual Channels (VCs). See also SDH and VC.

AuC AuC is also called AC. It stands for Authentication Center. A mobile term. The AuC is a piece of HLR, which is the Home Location Register — a permanent database used in GSM mobile systems (like those in Europe) to identify a subscriber and to contain subscriber data related to features and services. HLR is used to authenticate the user of mobile station equipment, i.e. a cell phone. The AuC performs secret, mathematical computations to verify the authenticity of the cell phone and thus to allow the user to make a phone call. AuC is no longer strictly coupled with the HLR. IS-41 Rev. C (now ANSI-41) defines the AuC as a stand-alone network element. See also CAVE.

Auction An FCC definition. A procedure for choosing the users of spectrum space. In auction, the federal government treasury receives the profits.

Audible Indication Control Three fancy words for the ability to turn up or down the bell or beeper on your PBX attendant console.

Audible Ring A sound sent from the called party's switch to inform the calling party that the called line is being rung. A long explanation for a bell or buzzer that tells you it's for you.

Audible Ringing Tone The information tone sent back to the calling telephone subscriber as an indication that the called line is being rung.

Audible Sound Audible sound spans a huge range of frequencies from around 20 hertz (vibrations per second) to 20 kilohertz. See Sound.

Audible Tones Audible tones are the sounds provided by the network or an attached switch to inform callers of the status of the line or of an event. Audible tones most frequently encountered in computer telephony applications include: ringing, busy tones (called party busy and network busy), SIT tones (Special Information Tones), and special tones used by computer telephony systems such as the "record at the beep" (which is usually a 1,000 Hz tone).

Audio Sound you hear which may be converted to electrical signals for transmission. A human being who hasn't had his ears blown by listening to a Sony Walkman or a ghetto blaster can hear sounds from about 20 to 20,000 hertz.

Audio Bridge In telecommunications, a device that mixes multiple audio inputs and feeds back composite audio to each station, minus that station's input. Also known as a mix-minus audio system.

Audio Crosspoint Module Circuit board containing crosspoints for audio signal switching.

Audio Frequencies Those frequencies which the human ear can detect (usually in the range of 20 to 20,000 hertz). Only those from 300 to 3,000 hertz are transmitted through the phone, which is why the phone doesn't sound "Hi-fi."

Audio Frequency The band of frequencies (approximately 20 hertz to 20,000 hertz) that can be heard by the healthy human ear.

Audio Indexing Software Audio indexing software creates a searchable index of speech content in digitized audio and video files. It allows for quick searches and rapid access to audio content.

Audio Interchange File Format AIFF. A sound file format common to the Macintosh platform used to store digital audio data. This file format also supports position and loop point markers used by audio recording/editing software. Can be compressed into the AIFF-C format.

Audio Menu Options spoken by a voice processing system. The user can choose what he wants done by simply choosing a menu option by hitting a touchtone on his phone or speaking a word or two. Computer or voice processing software can be organized in two basic ways — menu-driven and non-menu driven. Menu-driven programs are easier for users to use, but they can only present as many options as can be reasonably spoken in a few seconds. Audio menus are typically played to callers in automated attendant/voice messaging, voice response and transaction processing applications. See also Menu and Prompts.

Audio Messaging Interchange Specification AMIS. Issued in February 1990, AMIS is a series of standards aimed at addressing the problem of how voice messaging systems produced by different vendors can network or inter-network. Before AMIS, systems from different vendors could not exchange voice messages. AMIS deals only with the interaction between two systems for the purpose of exchanging voice messages. It does not describe the user interface to a voice messaging system, specify how to implement AMIS in a particular systems or limit the features a vendor may implement. AMIS is really two specifications. One, called AMIS-Digital, is based on completely digital interaction between two voice messaging systems. All the control information and the voice message itself, is conveyed between systems in digital form. By contrast, the AMIS-Analog specification calls for the use of DTMF tones to convey control information and transmission of the message itself is in analog form.

Audio Modulator A device which combines audio with higher frequency radio signals for transmission.

Audio Oscillator Hewlett-Packard's first product. They sold them at $54.40.

Audio Response Unit A device which translates computer output into spoken voice. Let's say you dial a computer and it said "If you want the weather in Chicago, push 123," then it would give you the weather. But that weather would be "spoken" by an audio response unit. Here's a slightly more technical explanation: An audio response unit is a device that provides synthesized voice responses to dual-tone multi-frequency signaling input. These devices process calls based on the caller's input, information received from a host data base, and information carried with the incoming call (e.g., time of day). ARUs are used to increase the number of information calls handled and to provide consistent quality in information retrieval. See also Audiotex and Interactive Voice Response.

Audio Server An audio server is a big PC which contains digitized music and software and sits on a network, local or distance. You use your browser to talk to your audio server. Its software responds. It allows you to choose which songs you want played and where — in which rooms of your house, etc.

Audio Subcarrier A Satellite Term. Carrier wave that transmits audio information.

Audio Text The term used to describe a system that provides automated interactive telephone information, such as stock prices, sports scores and personals. Also spelled Audiotex and Audiotext.

Audio Track The section of a videodisc or tape which contains the sound signal that accompanies the video signal. Systems with two separate audio tracks (most videodiscs) can offer either stereo sound or two independent soundtracks.

Audioconference Another term for Teleconference. Teleconferences make use of conference bridges to allow participants to join a voice conference over the PSTN. See Teleconference.

Audiographic Conferencing Teleconferencing that also allows participants to share and interact through graphics, figures and printed text. Hardware used during audiographic conferences includes facsimile, telewriters and film-based projectors. Transmission is via a narrowband telecommunications channel such as a telephone line or a radio subcarrier.

Audiographics The technology which allows sound and visual images to be transmitted simultaneously. According to AT&T, audiographics generally refers to single frame or slow frame visual images as opposed to continuous frame image transmission (e.g. television). Audiographic transmission is often used to teach or train people in remote locations from an educational institution or business training center, saving travel and housing expense.

Audiotex A generic term for interactive voice response equipment and services. Audiotex is to voice what on-line data processing is to data terminals. The idea is you call a phone number. A machine answers, presenting you with several options, "Push 1 for information on Plays, Push 2 for information on movies, Push 3 for information on Museums." If you push 2, the machine may come back, "Push 1 for movies on the south side of town, Push 2 for movies on the north side of town, etc." See also Information Center Mailbox.

Audiotext A different, and less preferred, spelling of Audiotex. See Audiotex.

Audio/visual Multimedia Services AMS is an ATM term. It specifies service requirements and defines application requirements and application program interfaces (APIs) for broadcast video, videoconferencing, and multimedia traffic. AMS is being developed by the ATM Forum's Service Aspects and Applications (SAA) working group. An

be either management or a non-management "professional," and is theoretically a step above a blue-collar worker in the company hierarchy. The term originated in the fact that, in years gone by, such folks wore white shirts with white collars as evidence of the fact that they didn't do the kind of "dirty" work that would soil a shirt.

Blue Glue IBM's SNA (Systems Network Architecture). Blue Glue is a "glue logic" architecture that serves to interface physical and logical units in the IBM world. See also Glue Logic and Systems Network Architecture.

Blue Goo Nanotechnological machines that monitor and control other machines to ensure that their replication does not get out of control.

Blue Grommet The rubber collar over the joint between the handset and the armored cable on a pay phone. Blue identifies a "hearing aid compatible" handset.

Blue Laser A blue laser is a short-wave lasers with concentration in the blue and violet part of the spectrum, as opposed to the red portion. Blue lasers have wide commercial applications. They can create high-definition DVDs that deliver HDTV quality reproduction; a single disc could contain more than 12 hours of music per side. Blue lasers can also make possible digital tape recorders that are comparable to today's VCRs, but can store high-definition images. The first blue laser with commercial possibilities was developed in January 1999 by Shuji Nakamura, a Japanese inventor. In 1993 IBM announced that it had used blue laser technology to read and write data at a rate five times faster than the infrared laser rewritable optical disk drives of the day.

Blue Laser Disc An optical storage medium that uses shorter wavelength blue laser light instead of the red laser light used in CDs and DVDs to fit more bits onto the disc surface. Storage capacity is expected up to 50 Gb. See also Blue Laser, Blu-Ray, DVD.

Blue Pages Section of a phone directory commonly used for government phone numbers, as distinct from white and yellow pages.

Blu-Ray A standard for recording onto a digital video disc (DVD). Blu-Ray boosts the disc's storage capacity from its present 4.7 gigabytes to 27 gigabytes, sufficient to store a two-hour movie in high-definition video format, or over ten hours of standard television broadcast. The technique uses blue-violet laser light, which has a shorter wavelength (405 nanometres) than the red laser light traditionally used with DVD players (650 nm). This clearly allows a greater number of bits that can fit onto a disc. A consortium of nine firms including Sony, Philips, Samsung, Sharp and Thomson Multimedia backs this format. It is in competition with another protocol backed by NEC and Toshiba, which can hold up to 20 gigabytes. See also Blue Laser Disc and DVD.

Blue Screen of Death BSOD. An affectionate name for the screen displayed when Microsoft Windows encounters an error so serious that the operating system cannot continue to run. Windows may also display information about the failure and may perform a memory dump and an automatic system restart. The Macintosh equivalent is a blank screen with a text box containing a graphic of a bomb with a lit fuse. There are two typical causes of a BSOD — a bad driver or bad memory. You get a new driver from the software company whose driver was bad. You get new memory. The problem is figuring out which driver and which memory. Using a program call Alexander SPK from www.Alexander.com may help you figure out which driver. Memory is a different problem. You may never figure out which memory is bad. You got to do it by trial and error. See also Crash.

Blue Sky Laws State securities laws designed to protect individual investors. The phrase purportedly originated from a state judge who said that the securities of a particular company had all the value of a patch of blue sky. Companies and mutual funds are affected by state blue sky laws. However, the SEC and Congress have superceded most of these these state laws because they were obsolete, arbitrary, and poorly enforced.

Blue Stake A verb that means to mark an area. Here's how it works. Let's say you're a phone company and you want to lay a cable alongside a highway. You go to the highway authority and ask for permission to lay your cable. They give it to you. Then you call for "blue staking." This means that one organization comes out and marks on the ground using blue paint where all the stuff is located. This one organization represents all the various utilities who have stuff buried in the proposed running line (the path that you intend to lay your cable in). There is a legality here. If you then dig and hit someone's buried cable, you are absolved from legal responsibility — so long as you called for blue staking. If you hit something that was not located (i.e. not blue staked and not located on any map), it's called "off locate."

Bluejack To temporarily hijack another person's cell phone by using Bluetooth wireless networking. This involves sending anonymous text messages to other phone users via Bluetooth short-range radio. Bluetooth works over a range of about 10 metres and phones fitted with it can be made to search for other handsets using it that will accept messages sent to them. The group of lanky tourists strolling through Stockholm's old town never knew what hit them. As they admired Swedish handicrafts in a storefront window, one of their cell phones chirped with an anonymous note: "Try the blue sweaters. They keep you warm in the winter." The tourist was "bluejacked" - surreptitiously surprised with a text message sent using a short-range wireless technology called Bluetooth. Already, Web sites are offering tips on bluejacking, and collections of startled reactions are popping up on the Internet, reported the Associated Press. See also Bluetooth.

Bluetooth A wireless protocol that is used to communicate from one device to another in a small area usually less than 30 feet. It uses the 2.4 ghz spectrum to communicate a 1 megabit connection between 2 devices for both a voice channel and a 768k data channel. The Bluetooth specification calls for different profiles such as voice and serial emulation to be used by devices to communicate. However interoperability needs to be tested to confirm compatibility of the higher level protocols that use Bluetooth to communicate between devices. Version 1.0 requires users to register the connection between the 2 devices while version 1.1 allows a Bluetooth device to communicate with up to 8 devices.

A specification to standardize wireless transmission between a wide variety of devices such as PCs, cordless telephones, headsets, printers, and PDAs. The initial effort (April, 1998) was in the form of a consortium of Intel, Microsoft, IBM, Toshiba, Nokia, Ericsson and Puma Technology. The project was code-named Bluetooth after Harald Blaatand, the 10th century Danish king who unified Denmark. The idea of Bluetooth is to create a single digital wireless protocol to address end-user problems arising from the proliferation of various mobile devices that need to keep data synchronized (i.e., consistent from one device to another). According to an article in Telecommunications Magazine, December, 1998, "The standard's proponents (Ericsson, Nokia, IBM, Intel, Toshiba) talk of a world where equipment from different vendors works seamlessly together using Bluetooth as a sort of virtual cable, where a laptop can automatically use a mobile phone to pick up e-mail or a PDA can send data wirelessly to a fax machine." Bluetooth operates using FHSS (Frequency Hopping Spread Spectrum), spreading data packets across the designated frequency range (2.45 GHz) at a rate of 1,600 hops per second to lesson interference. The nominal link range is 10 meters, and the gross data rate is 1 Mbps, with plans to double the data rate in the future.

Bluetooth devices will operate in a picocell topology in the 2.45 GHz range of the unlicensed ISM (Industrial, Scientific and Medical) spectrum. Note that this same frequency band is used by a wide variety of other devices, which fact causes some concern in terms of the potential for interference. For example, both HomeRF and IEEE 802.11, the specification for wireless Ethernet LANs, specifies this frequency range for RF (Radio Frequency) communications. The Bluetooth baseband technology will support both SCO (Synchronous Connection Oriented) links for voice and AC (Asynchronous Connectionless) links for packet data. Bluetooth can support 1) an asynchronous data channel in asymmetric mode of maximally 721 Kbps in either direction and 57.6 Kbps in the reverse direction; alternatively, the data channel can be supported in symmetric mode of maximally 432.6 Kbps; 2) up to three simultaneous synchronous packet voice channels; or 3) a channel which simultaneously supports both asynchronous data and synchronous voice. Full-duplex communications will be supported using TDD (Time Division Duplex) as the access technique. Voice coding will be accomplished using the CVSD (Continuously Variable Slope Delta) modulation technique. Security will be provided through encryption and authentication, using the challenge-response mechanism. Frequency hopping, a spread spectrum technique, is used to improve performance in the unlicensed and heavily-used ISM band. www.bluetooth.com. See also 802.11, CVSD, HomeRF, ISM, Picocell, Spread Spectrum, SWAP, and TDD.

Bluetooth Device Class A parameter that indicates the type of device and which types of services that are supported. The class is received during the discovery procedure. The parameter contains the major and minor device class fields. The term "Bluetooth device class" is used on the UI (User Interface) level. See the next definition and Bluetooth.

Bluetooth Device Type The term "Bluetooth Device Type" is used on the UI (User Interface) level. This term overrides the terms "Bluetooth device class" and "Bluetooth service type" when there is a mix of information containing both Bluetooth Device Class and Bluetooth Service Types.

Bluetooth Passkey The name of the PIN. The term "Bluetooth passkey" is used in the UI. See PIN.

Bluetooth Service Type One or more services a device can provide to other

information bits can be greater in the vertical plane. This would be advantageous if the size of the data blocks is large, as the level of overhead would be less, relative to the data bits to be transmitted.) The receiving (i.e., Forward) device re-computes the parity bits, and compares the resulting bit sequences to those sent along with the data. If the two sets of parity bits do not match exactly, there almost certainly was an error created as the data transited the network. If errors are detected, the receiving device almost always has enough information to isolate the error, and to correct it without the requirement for a retransmission. See also Forward Error Correction and SISO.

HAN Home Area Network. A residential network for data communication and control based on the same concepts as a LAN, but using standard electrical wiring. For more detail, see CEBus.

Han Characters Han characters are Chinese language symbols which are used to represent whole words or concepts in Chinese, Japanese and Korean. See Unicode.

Hand Off See Handoff.

Hand-off See Handoff.

Handhole A buried box whose lid is even with the surface of the ground. It provides a space for splicing and terminating cables.

Handle 1. In the Windows 95 user interface, an interface added to the object that facilitates moving, sizing, reshaping, or other functions pertaining to an object.

2. In programming, a pointer to a pointer that is, a token that lets a program access a resource identified in another variable. See also object handle.

3. The name you use in an online computer service. It's typically not your own name. You adopt this name to give yourself anonymity for whatever reasons you find convenient. A handle is called a "Nom de ligne" in some circles.

Handled Call A call center term. A call that is answered by an employee, as opposed to being blocked or abandoned.

Handoff 1. The process by which the Mobile Telephone Switching Office (MTSO) passes a cellular phone conversation from one cell to another. There are two forms of handoff: hard and soft. A hard handoff is performed on a "break and make" basis, requiring the connection to be broken in the original cell before it is made in the successor cell. Hard handoffs are required in cellular systems using FDMA (Frequency Division Multiple Access), such as the analog AMPS (Advanced Mobile Phone System), and those using TDMA (Time Division Multiple Access), such as GSM (Global System for Mobile Communications). As AMPS and GSM employ different frequencies in adjacent cells, hard handoffs are required — you don't notice the difference in a voice conversation, as the process takes only 250 milliseconds or so, but data communications are affected very adversely. A soft handoff, on the other hand, employs a "make and break" handoff algorithm. Some PCS (Personal Communications Services) systems employ CDMA (Code Division Multiple Access), which does not require the use of different frequencies in adjacent cells. Those systems, therefore, take advantage of soft handoffs. If the mobile user is moving quickly through cell sites (e.g. traveling in a car), handoff becomes harder and the user may get dropped. See also AMPS, CDMA, FDMA, GSM, MTSO, PCS, and TDMA.

2. To connect a phone call or service from one telephone company to another. These usually occur in a place called co-location.

3. The process of transferring a subscriber call from one satellite to another.

4. An SCSA definition. The change of ownership of a Group (and therefore, typically, a call) from one session to another. For example, if a call center application discovers that a caller wishes to access a technical support audiotex database, it hands off the call to an application servicing that database.

Handover Word The word in the GPS (Global Positioning System) message that contains synchronization information for the transfer of tracking from C/A to P code.

Handset The part of a phone held in the hand to speak and listen, it contains a transmitter and receiver. In the old days, the transmitter was a carbon mike. Now it's mostly electronic. Some electronic mikes are awful. Some phone makers are going back to carbon mikes. There are two basic types of telephone handsets in North America: the G-style handset, which has round, screw-in ear and mouthpiece, and the new K-style handset, which has square ear and mouthpiece and has the two screws in the middle. I prefer the older G-style one. I think it's sturdier. It also has the advantage that you can unscrew it and quickly remove the transmitter — very useful if you want someone to listen in on your conversation, but you don't want the other party to hear his breathing and coughing.

Handset Management Imagine you have a phone attached to your computer through a telephony board inside your computer. Now imagine that you pick up the phone and dial a number. If the company knows you have dialed a number and knows which number you have dialed, that feature is called handset management. It is the ability of the computer to be aware of every button pushed on the phone. The advantage of this is obvious: You really want the PC to collect those digits, so it can, for example, add a price to each call and use them for monthly billing (lawyer, accountant, etc.). You also want to be able re-dial those numbers by simply clicking on the number one you want, hitting Enter and bingo, you're redialing that number, without having to key it in again. This term, handset management, has now been replaced by a more meaningful term which we're now calling "Telephone Set Management."

Handsfree This a term with different meanings in the telephone business. It can mean that you have a telephone with a speakerphone and thus you are able to talk on it "handsfree," i.e. without your hands touching the handset, but you still must dial manually. In the car phone business, it means the same thing, i.e. the ability to use your phone without lifting or holding the handset to your ear, plus it may mean that your car phone has voice recognition and you can also dial handsfree by talking to your car phone, e.g. "Call mother." See also Handsfree Dialing.

Handsfree Answerback This feature, when activated, automatically turns ON the microphone at a telephone receiving a call so that the person receiving the call can respond without lifting the receiver. Handsfree answerback is typically used on intercom calls.

Handsfree Dialing A telephone feature which allows the user to place outside calls and listen to the progress of those calls without lifting the handset of his telephone. This feature is unbelievably useful when calling airlines which inevitably put you on "eternity hold." (We made that term up.)

Handsfree Monitoring You can dial an outside call and hear the call's progress without having to lift your handset. Similar to hands-free dialing. With hands-free monitoring, you can only listen. To speak, you must pick up the handset. To be able to speak, you need a full speakerphone. Be careful of the distinction. Many people have been caught.

Handsfree Telephone Could be another word for a speakerphone or for a phone that does hands-free dialing.

Handshake Two modems trying to connect. Two modems trying to agree on how to transfer data. The series of signals between a computer and another peripheral device (for example, a modem) that establishes the parameters required for passing data.

Handshake In HIN. A general purpose control signal sent from the DTE to DCE in a Newbridge Networks RS-232-C connection. HIN can be used in place of Request to Send (RTS), Carrier Detect (CD) or Ring Indicator (RI).

Handshake Out HOUT. A general purpose control signal sent from the DCE to the DTE. For example, in the case of a Newbridge Networks Mainstreet Data Controller with ports configured as DCE, HOUT is sent from the Data Controller to an attached device. HOUT can be used in place of Clear to Send (CTS), Carrier Detect (CD) or Ring Indicator (RI).

Handshaking The initial exchange between two data communications systems prior to and during data transmission to ensure proper data transmission. Handshaking and Line Discipline are the two most basic elements of a communications protocol. A serial (asynchronous) transmission protocol might include the handshake method (XON/XOFF), baud rate, parity setting, number of data bits and number of stop bits. Just as people shake hands, and go through a perfunctory "Hi, how are ya?", computers must go through a procedure of greeting the opposite party, verifying the identity of the other party, determining the maximum speed at which the devices can intercommunicate over a circuit, and other functions that can be described by this "humanizing term." As with human contacts, once the handshaking is complete, the business of communications begins, which is where line discipline comes in. As is always the case, the least capable device determines the specifics of the communication. In other words, the lowest common denominator rules. See also Line Discipline and Protocol.

Handwriting Recognition A system for taking handwritten text generated with a stylus on a computer pad or directly onto the computer screen, and converting then into machine-readable text.

Hang Up Hang up lets you disconnect from an ISDN call. To hang up from the phone set you must depress and hold the receiver button for a specified amount of time. By default, the time is set for 0.8 of a second.

Hard Cable Coaxial cable commonly used in the cable television industry for trunk and feeder. At a minimum, hard cable consists of a copper (or copper-clad aluminum) center conductor, a plastic foam dielectric and a solid-aluminum sheath. The solid aluminum sheath is quite stiff; hence the name. Hard cable is available in several configurations. The most common are:

Line Voltage Voltage measured on a telephone circuit; typically 48 volts DC when phone is idle. Voltage may be lower at great distance from the central office, or when carrier equipment is used to multiplex several phone lines on one pair of wires. Line voltage on PBX systems is typically 24 volts.

Linea de Abonado Digital Spanish name for DSL. See DSL.

Linear Distortion Amplitude distortion wherein the output signal envelope is not proportional to the input signal envelope. This distortion is often caused by part of the signal being bounced off something, while part arrives free and clear. Thus the receiver hears the same signal but bits of it arrive earlier and later than other bits, causing distortion. See Linearity for a better explanation.

Linear Feedback Shift Register See LFSR.

Linear Power Amplifier LPA.

Linear Predictive Coding A speech coding method that analyzes a speech waveform to produce a time-varying filter as a model of the human vocal tract. See also Digital Signal Processing.

Linear Programming Techniques in Operations Research (OR) to find an optimum solution to a linear function, given certain restrictions and typically expressed in many equations. A typical linear programming problem might be to find the least expensive, most efficient route between various pick-up and drop-off points in a transportation route.

Linearity Think of a cheap sound system. The higher you turn up the volume, the more ugly (i.e. more distorted) your music sounds. Think of an expensive sound system. The higher you turn up the volume, the better your music sounds to you (though not to your wife). Linearity is a term for measuring the amount of distortion you get as your crank up the "volume" — which in transmission terms — might also be called the throughput or the bandwidth. Let's take an example we all understand: To increase their revenues, cable TV operators are offering more and more services to their customers — including high-speed Internet access. They call these "bandwidth-intensive services." Operators are thus faced with a big problem — how to push more information down the existing cable plant. While there are many techniques, the inevitable outcome of expanding the bandwidth (pumping more information down an existing pipe) is that a higher performance distribution system is required. That means the system has to be upgraded with better electronics, better components, better cable, etc. Increasingly, the linearity (or distortion performance) of the delivery system begins to play a critical role in the overall cost per bandwidth (how much your customer will pay) and quality of service provided to the customer. Because you lose signal power (and thus information) as your information travels down a transmission medium (copper or glass), amplifiers are needed. But amplifiers (like those in your sound system) are the key contributor to system non-linearity (lousy sound). Amplifiers with lower distortion allow delivery costs to be reduced and system performance to be improved. Hence, there is strong demand for higher output power, ultra-linear (i.e. non-distorting) amplifiers that operate on a fixed budget of AC-line or battery power -. While it's easy to increase linearity by - consuming more power, this is usually undesirable in applications running from or being backed-up by batteries. And when more AC-line or battery power is consumed, more heat is generated, which decreases operating life expectancy. Thus you see a lot of R&D work happening in this important telecom area. In more technical language, linearity is the consistency of gain as input level is increased. If the gain response (magnitude and phase) of an amplifier changes with an increase of input level, the change indicates harmonic distortion is being generated. . In an A/D (Analog to Digital) or D/A (Digital to Analog), linearity measures the precision with which the digital output/input tracks the analog input/output.

Linearly Polarized A mode of operation of fiber optics for which the field components in the direction of propagation are small compared to components perpendicular to that direction.

Lineman A person who fixes the telephone company's outside aerial plant — typically the wires hanging from poles dotted across the country-side. See also Lineman's Climbers.

Lineman's Climbers Telephone pole climbing irons which are strapped to the telephone lineman's legs, allowing him or her to climb a wooden telephone line. You can tell when a pole has been climbed by the holes left in it by the lineman's climbers.

Lines A computer imaging term. The line tool draws straight lines, typically from point to point. Most paint packages let you continue lines in a fashion that permits rapid creation of polygons.

Lines Of Force The directional lines of magnetic or static field which represent the stresses.

Lines Per Minute The way of measuring the speed of a line printer. Like any measure of speed, the speed you will get from your printer may be different from what the manufacturer says. Your speed will depend on how fast you feed the printer from your computer — a function of how fast you're transmitting, what software you're running, how fast that software can get the information to be printed off your disk, etc.

Line Side See Lineside.

Link 1. Another name for a communications channel or circuit. The ATM Forum defines link as an entity that defines a topological relationship (including available transport capacity) between two nodes in different subnetworks. Multiple links may exist between a pair of subnetworks. Synonymous with logical link.

2. A Windows command that takes several programs and subprograms that were meant to be used together, but were written separately, and combines them into one. Usually used to create an executable program out of modules that were not themselves directly executable.

3. An element in an HTML document that points to a document or to a specific location in a document, using a URL. When the document is displayed in a browser, clicking on a link causes the browser to display the document and/or location that it points to. Links usually appear on-screen as underlined text and are usually in blue, although Web page designers can change how they look.

Link Access Protocol A version of HDLC in which the communication line has no single controller and either of the two connected stations may initiate a data transfer operation.

Link Aggregation The grouping of multiple network links into one logical high bandwidth link. By grouping four 100 Mbps Ethernet connections into one logical link, you can create up to 800 Mbps of bidirectional throughput between the server and the switch.

Link Aggregation Token See Aggregation Token.

Link Attached Describing devices that are connected to a network, a communications data link, or telecommunications circuit; compare with channel-attached.

Link Attribute A link state parameter that is considered individually to determine whether a given link is acceptable and/or desirable for carrying a given connection.

Link Capacity Adjustment Scheme See LCAS.

Link Connection An ATM term. A link connection (e.g., at the VP-level) is a connection capable of transferring information transparently across a link without adding any overhead, such as cells for purposes for monitoring. It is delineated by connection points at the boundary of the subnetwork.

Link Constraint A restriction on the use of links for path selection for a specific connection.

Link Control Facility A Fibre Channel hardware facility which attaches to the end of a link and manages the transmission and reception of data. The LCF is contained within each F Port (Fabric Port, i.e., switch port) and N Port (Node Port, i.e., device port). See Fibre Channel.

Link Control Protocol LCP. A Link Control Protocol is a protocol operating at Layer 2, the Data Link Layer, of the OSI Reference Model. Such a protocol is employed by circuit terminating equipment at each end of the link in order to communicate across it. The specifics of an LCP include packet format, packet size, compression mechanisms, link performance monitoring, handshake and authentication mechanisms, and error detection and correction. LCP examples include HDLC (High-level Data Link Control) and PPP (Point-to-Point Protocol). See also HDLC and PPP.

Link Converter A device for an InteCom S/80 which connects distributed switching modules to the centralized switching equipment through a coaxial cable or a fiber optic cable.

Link Encapsulation LE. A function of the HiPPI Framing Protocol (FP) layer. LE encapsulates IEEE 802.2 Logical Link PDUs (Protocol Data Units) inside of HiPPI packets, thereby allowing IP traffic to travel over a HiPPI connection.

Link Layer The logical second layer of the OSI Reference Model for Open Systems Interconnection, located between the Physical and Network layers. See OSI.

Link Layer Access Method The algorithm that determines when any given network interface in a PC/TCP local area network is allowed to transmit. It is also known as the access method. CSMA/CD is the access method for the Ethernet.

Link Metric An ATM term. A link parameter that requires the values of the parameter for all links along a given path to be combined to determine whether the path is acceptable and/or desirable for carrying a given connection.

Link Optimization ISDN feature that prevents administration packet from open-

—i.e. dial the phone, listen for a carrier tone from a remote modem and connect to that modem. The modem at the receiving end must be set to "Answer" mode. In any asynchronous data conversation, one side must be set to "Originate" and the other to "Answer." Such settings are usually made in software.

Originate/Answer The two modes of operation for a modem. Originate and answer states define the frequencies used to transmit and receive. In a two-way communication system, one modem must be set to originate and the other to answer.

Originating Direction The use of Access Service for the origination of calls from an End User premise to a customer premise.

Originating Office The central office that serves the calling party.

Originating Restriction A phone line with this restriction cannot place calls at any time. Calls directed to the phone, however, will be completed normally.

Origination A call that is placed by the mobile subscriber, calling either a land-line circuit or another mobile subscriber.

Origination Cablecasting Programming over which a cable television system operator exercises editorial control. This term includes programming produced by the operator; Non-broadcast local programming produced by other entities and carried voluntarily by the system. Example: PRISM; regional news channels; Satellite-delivered non-broadcast programming carried voluntarily by the system, such as HBO, ESPN, CNN, C-SPAN, QVC, etc.

This term does not include programming over which the operator does not exercise editorial control, including any broadcast signal, including satellite-delivered broadcast "superstations" (WGN-TV, WWOR, etc.); Any access channel designated by franchise for public, educational, or governmental use; Leased-access channels.

The cable system operator is required by Section 76.225c of the FCC Rules to maintain records, in the PIF, to verify compliance with rules governing commercial matter in children's programming carried on origination-cablecasting channels. See PIF.

Originator The user that is the ultimate source of a message or probe.

ORM Optically Remote Module. A type of switching module made by AT&T which connects directly to the 5ESS switch communications module via optical fibers.

Orphan A Windows NT term. A member of a mirror set or a stripe set with parity that has failed in a severe manner, such as a loss of power or a complete head crash. When this happens, the fault-tolerance driver determines that it can no longer use the orphaned member and directs all new reads and writes to the remaining members of the fault-tolerant volume.

Orthogonal Having, meeting or determined at right angles.

Orthogonal Frequency Division Multiplexing See OFDM.

OS 1. Outage Seconds.

2. Operating System, as in MS-DOS (Microsoft Disk Operating System), Windows NT, Windowsn 2000, Windows XP, Solaris, Unix, Linux, Symbian or OS/2. See Operating System.

3. Operator Services. See Operator Services.

4. Operations System. Includes SCOTS, FMAS, etc.

OS/2 Operating System/2. An operating system originally developed by IBM and Microsoft for use with Intel's microprocessors and for use with IBM personal system/2 personal computers. OS/2 has pretty well died. Microsoft's various flavors of Windows survive it.

Osborne Effect Once there was a personal computer company called Osborne Computer Company. One day, the president announced a revolutionary new computer. It was so good not one of his dealers wanted to (or could) sell the existing product and they sent all their inventory back. Meantime, it was six months before the company could deliver the new product. But without any sales in the meantime, it had no money and Osborne went broke. There is a lesson here for companies who are attempting to manage transition between old and new product lines. Be careful, or suffer the horrible consequences of The Osborne Effect.

Oscar Holywood gives our Oscars for great movies, performances, etc. Apparently when the first statue was cast, someone quipped, "My God. It looks like my uncle Oscar." Apparently it stuck.

Oscillator 1. A device for generating an analog test signal.

2. Electronic circuit that creates a single frequency signal.

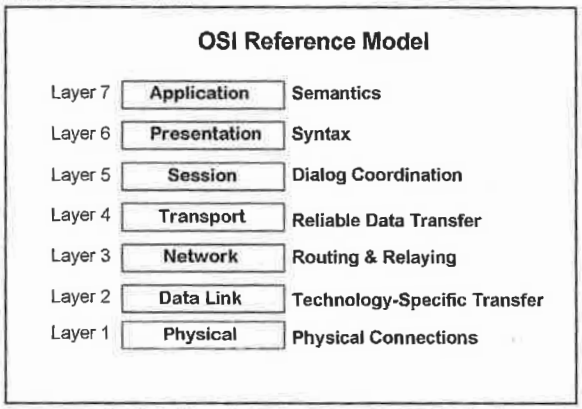
Oscilloscope Electronic testing device that can display wave forms and other information on a TV-screen-like cathode ray tube. A basic fixture in sci-fi movies.

OSDM Optical Spatial Division Multiplexing is a technology developed to improve the efficiency with which SONET (Synchronous Optical NETwork) supports bursty packet data traffic such as LAN traffic. OSDM accomplishes this by dynamically allocating arbitrary levels of bandwidth to such traffic, guaranteeing minimum levels that are supplemented by higher levels of bandwidth as it becomes available. OSDM is a protocol-independent, self-contained technology that adapts to various current and developing physical layer technologies such as digital wrappers and DWDM (Dense Wavelength Division Multiplexing).

OSF Open Software Foundation. An industry organization founded in 1988 to deliver technology innovations in all areas of open computer systems, including interoperability, scalability, portability and usability. The OSF was an international coalition of vendors and users in industry, government and academia that worked to provide technology solutions for a distributed computing environment. In February 1996, the OSF consolidated with X/Open Company Ltd. to form The Open Group. See The Open Group. www.opengroup.org.

OSF/1 Version 1 of the Open Software Foundation's Unix-based operating system

OSI Open Systems Interconnection. A Reference Model developed by the ISO (International Organization for Standardization, as translated into English). The OSI Reference Model is the only internationally accepted framework of standards for communication between different systems made by different vendors. ISO's goal is to create an open systems networking environment where any vendor's computer system, connected to any network, can freely share data with any other computer system on that network or a linked network. Most of the dominant communications protocols used today have a structure based on the OSI model. Although OSI is a model and not an actively used protocol, and there are still very few pure OSI-based products on the market today, it is still important to understand its structure. The OSI model organizes the communications process into seven different categories and places these categories in a layered sequence based on their relation to the user. Layers 7 through 4 deal with end to end communications between the message source and the message destination, while layers 3 through 1 deal with network access.



Layer 1 — The Physical Layer deals with the physical means of sending data over lines (i.e., the electrical, mechanical and functional control of data circuits). Examples include EIA-232 (RS-232), T-carrier and SONET.

Layer 2 — The Data Link Layer is concerned with procedures and protocols for operating the communications lines. It also has a way of detecting and correcting message errors. Examples include Frame Relay, PPP (Point-to-Point Protocol), and SLIP (Serial Line Internet Protocol). ATM runs at Layers 1 & 2, as do LANs.

Layer 3 — The Network Layer determines how data is transferred between computers. It also addresses routing within and between individual networks. The most visible example is IP (Internet Protocol).

Layer 4 — The Transport Layer defines the rules for information exchange and manages end-to-end delivery of information within and between networks, including error recovery and flow control. TCP (Transmission Control Protocol) is an example, as is the OSI Transport Protocol (TP), which comprises five layers of its own. Layer 4 protocols ensure end-to-end integrity of the data in a session. The X.25 packet-switching protocol operates at Layers One, Two, Three, and Four.

Layer 5 — The Session Layer is concerned with dialog management. It controls the use of the basic communications facility provided by the Transport layer. If you've ever lost

Whiteboard A device which lets you share images, text and data simultaneously as you speak on the phone with someone else. That someone might be in the next office. Or that someone might be 3,000 miles away. The transport mechanism might be a local area network or an analog phone line running a special modem designed for whiteboarding or it might be an ISDN digital line running special PC software and hardware. The concept of whiteboarding is new; there are no standards. As a result to do whiteboarding successfully, you typically need the same equipment (hardware and software) on either end. Whiteboarding has the potential to be one of the most successful "multimedia" applications around. Whiteboarding is a document-conferencing function that lets multiple users simultaneously view and annotate a document with pens, highlighters, and drawing tools. More advanced whiteboard programs handle multi-page documents and provide tools for delivering them as presentations.

Who-Are-You Code WRU. A control character which operates the answerback unit in a terminal (typically a telex terminal) for identification of sending and receiving stations in a network.

Whodunit None of the kids who live in your house.

Whois 1. A command on some systems that reveals the user's name, based on that person's network username.

2. Whois is a way of looking up names in a remote database. Used initially as an aid for finding e-mail addresses for people at large institutions or companies. It is now a tool of the InterNIC DNS (Domain Name Server). Whois allows anyone to query a database of people and other Internet entities, such as domains, network, and hosts. The data includes company/individual name, address, phone number and electronic mail address. If you have your own domain and thought your personal information was hidden from view, you are in for a shock. Don't believe me, check out www.internic.net. See also InterNIC and RWhois.

Whole Nine Yards The term "the whole 9 yards" came from World War fighter pilots in the Pacific. When arming their airplanes on the ground, the .50 caliber machine gun ammo belts measured exactly 27 feet, before being loaded into the fuselage. If the pilots fired all their ammo at a target, it got "the whole 9 yards."

Whole Person Paradigm This is one of the more fascinating telecom concepts in a while. General Magic created it as some sort of psychological basis for the product/s it is producing. Here's General Magic's definition:

A psychological or behavior model of needs that all people experience. This paradigm is the design center for General Magic's personal intelligent communication products and services. It consists of three elements. 1. Remember - managing your internal agenda, such as things to do and people to see. 2. Communicate - maintaining relationships with your friends, family, and associates. 3. Know - getting information about the world.

Wholesale Access Lines End-user access lines owned by the ILEC but served by another local carrier. Total service resale, UNE-P, and UNE-L are examples of wholesale access lines.

Wholesale Customer A Verizon definition. A wholesale customer purchases products and services under Verizon Wholesale Tariffs.

Wi-Fi Wireless Fidelity, Another name for a wireless network running under the 802.11b standard. My research shows that Wi-Fi and WiFi are used pretty well equally. I personally prefer WiFi.Wi-Fi 5 is the term used for 802.11a systems operating in the 5 MHz band. See also 802.11a, 802.11b and WiFi.

Wi-Fi 5 A new version of Wi-Fi that's even faster, with a maximum speed of 54 megabits per second. Also called 802.11a. See also Wi-Fi and WiFi.

WIA Wireless Institute of Australia. The peak body representing the amateur radiocommunications community in Australia. It is the organization to which the Australian Communications Authority (ACA) has delegated responsibility for conducting examinations for amateur radio operators.

WIC WAN Interface Card.

WID Wireless Integration/Interface Device. Also referred to as a "Proctor" box (name of the vendor), Cell Trace Box (US West's name for it), and protocol converter. One of its functions is helping convert older cellular phone systems which support only old-style 911 service (i.e. no location transmitting) to the newer E911 service which will transmit the cellphone user's location to the correct public safety people. www.proctorinc.com

Wide Area Network See WAN.

Wide Area Service Identifier WASI. Unique identifier for a business grouping of licensed facilities-based cellular service providers of Cellular Digital Packet Data (CDPD). It is used within CDPD for access control decisions.

Wide Area Telecommunications Service WATS. WATS permits customers to make (OUTWATS) or receive (INWATS) long-distance calls and to have them billed on a bulk rather than individual call basis. The service is provided within selected service areas, or bands, originally by means of dedicated WATS Access Lines (WAL) directly connected to the public telephone network at WATS-billing equipped central offices. The dedicated access line operation permits inward or outward service, but not both. Recent evolution permits WATS connection via regular user local PSTN dial lines.

Wide Area Telephone Service 1. A service provided by telephone companies in the United States that permits a customer to make calls to or from telephones in specific zones, with a discounted monthly charge based upon call volume.

2. See WATS and 800 Service.

Wide Band See Wideband.

Wide Band Frequency Hopping See WBFH.

Wide Center The local company's serving central office for a customer or an interexchange carrier.

Wide Characters 16-bit characters. See Unicode.

Wide Frequency Tolerant Power Plant PBX power facilities are provided that will operate from AC energy sources which are not as closely regulated as commercial AC power. The wide tolerant plant will tolerate average frequency deviations of up to plus or minus 3 Hz or voltage variations of -15% to +10% as long as both of the conditions do not occur simultaneously. This feature permits operation with customer provided emergency power generating equipment.

Wide SCSI A type of SCSI that uses a 16- or 32- bit bus. It can transmit twice as much information as narrow SCSI.

Wide Wavelength Division Multiplexing See WWDM.

Wideband The original definition for a channel wider in bandwidth than a voice-grade channel. Then it became a channel wider than 12 voice channels. Now, it means a transmission facility providing capacity greater than narrowband (T-1 at 1.544 Mbps), e.g. T-3 at 45 Mbps. many rich folks in Silicon Valley now have T-1 circuits into their home. This makes surfing the Internet and accessing the Web more pleasurable. But George Lucas, the renowned filmmaker, has a T-3 in his house. He clearly is wideband. See also Bandwidth. Contrast with Narrowband and Broadband.

Wideband Modem A modem whose modulated output signal can have an essential frequency spectrum that is broader than that which can be wholly contained within a voice channel with a nominal 4-kHz bandwidth. A modem whose bandwidth capability is greater than that of a narrow band modem.

Wideband Packet Transport Transmission of addressed, digitized message fragments (packets) interleaved among the addressed fragments of other messages at a rate high enough to support general purpose telecommunications services.

Wideband Switch Switch capable of handling channels wider in bandwidth than voice-grade lines. Radio and TV switches are examples of wideband switches.

Wi-Fi See WiFi.

WiFi Wireless Fidelity, much like the term Hi-Fi (High Fidelity) used to describe audio equipment. Wi-Fi is another name for a wireless local area network (LAN) running under the 802.11b standard in the 2.4-GHz range. See also 802.11.b and Wi-Fi5.

WiFi Switching WiFi switching is a new architecture for wireless local area networks that combines gigabit Ethernet switching, Wi-Fi and smart antenna design. Wi-Fi switches send and receive multiple transmissions simultaneously and extend the range of Wi-Fi from meters to kilometers.

Wi-Fi5 Wireless Fidelity 5, much like the term Hi-Fi (High Fidelity) is used to describe audio equipment. Wi-Fi5 is another name for a wireless locla area network (LAN) running under the 802.11a standard in the 5-GHz range. See also 802.11 and Wi-Fi.

WiFi-x A generic name for 802.11a and 802.11b. When you see WiFi-x chipset, you know it means a chipset that will handle both the slower and faster WiFi connections. See also 802.11a and 802.11b.

Wig Queen ELizabeth I of England was completely bald. She lost her hair after suffering from smallpox at the age of 29. To disguise her loss she always wore a wig, thus creating a vogue for wigs in Europe that lasted several hundred years and giving new meaning to that incredibly bad pun about hair today, gone tomorrow.

Wild Line Any incoming copper loop that is running outside of the PBX. Typically a wild line is an alarm, fax or modem line that you don't want running through the telephone switch. Many installers like to differentiate between these "wild lines" and the stuff that gets punched down and run to the phone switch.