



## A

**Ampere** - A unit of measure of electrical current.

**AC** - see Alternating Current.

**Acceptance Angle** - The largest angle that a guided ray of light is accepted by a fiber optic cable.

**Access Method** - The rules by which a network device gains the rights to transmit a communication on the network. Common methods include carrier sense multiple access with collision detection, token passing, and demand priority.

**ACR** - see Attenuation Crosstalk Ratio.

**Alternating Current** - An electric current that cyclically reverses the direction of flow. Frequency is the rate at which a full cycle occurs in one second.

**Amplitude** - The maximum value of a varying signal.

**Amplitude Modulation** - One of three basic methods (see also Frequency and Phase Modulation) of adding information to a sine wave signal in which the magnitude of the signal is varied to impose information on it.

**ANSI** - American National Standards Institute

**Analog Signal** - An electrical signal that varies continuously without having discrete values (as with a "digital" signal).

**AppleTalk** - Apple Computer's networking scheme, integrated into most Apple system software, that allows Apple computing systems to participate in peer to peer computer networks and to also access the services of AppleTalk servers. See also LocalTalk.

**ARCnet** - Attached Resource Computer Network. A relatively low speed form of LAN data link technology (2.5 Mbps) developed by Datapoint, in which all systems are attached to a common coaxial cable. ARCnet uses a token-bus form of medium access control in which a system transmits only when it has the token

**Asynchronous** - Transmission where sending and receiving devices are not synchronized. Data must carry signals to indicate data division.

**Asynchronous Transfer Mode (ATM)** - A form of very fast packet switching in which data is carried in fixed length units called "cells". Each cell is 53 bytes in length, with 5 bytes used as a header in each cell. ATM employs mechanisms that can be used to set up virtual circuits between users, in which a pair of users appear to have a dedicated circuit between them. ATM is defined in specifications from the ITU and ATM Forum.

**Attachment Unit Interface** - The IEEE 802.3 standard name for the cable connecting an Ethernet transceiver (MAU) to a networked device. An AUI cable is equipped with a 15-pin connector that mates with a 15-pin connector on the networked device.

**Attenuation** - The decrease in magnitude of a signal as it travels through any transmission medium such as a cable or optical fiber. Measured in dB per unit of length.

**Attenuation Crosstalk Ratio (ACR)** - The difference between attenuation and crosstalk, measured in dB, at a given frequency. A quality factor for cabling to assure that signal sent down a twisted pair is stronger at the receiving end of the cable than any interference imposed on the same pair by crosstalk from other pairs.

**Audio** - Used to describe the range of frequencies within range of human hearing; approximately 20 to 20,000 Hz.

**AUI** - see Attachment Unit Interface.

**AWG** - American Wire Gage - A wire diameter specification. The smaller the AWG number, the larger the wire diameter.

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## B

**Backbone** - A cable connection between telecommunication or wiring closets, floor distribution terminals, entrance facilities, and equipment rooms either within or between buildings. In star networks, the backbone cable interconnects hubs and similar devices, as opposed to cables running between hub and station. In a bus network, the bus cable.

**Back reflection** - The light reflected back towards the source from the fiber optic ends and deformations.

**Backscattering** - Refers to light diffraction at microscopic non-uniformities in the index of refraction of the optical fiber causing back reflection of optical power towards the source. Used in OTDRs.

**Balanced Cable, Balanced Line** - A cable having two identical conductors that carry voltages of opposite polarities and equal magnitude with respect to ground. The conductors are twisted to maintain balance over a distance.

**Balanced Transmission** - A mode of signal transmission in which each conductor carries the signal of equal magnitude, but opposite polarity. A 5 volt signal for example, appears as a +2.5 Volts on one conductor and -2.5 Volts on the other.

**Balun** - An impedance matching transformer that converts the impedance of one interface to the impedance of another interface. Generally used to connect balanced twisted pair cabling with unbalanced coaxial cabling. The term is derived from "balanced / unbalanced".

**Bandpass** - A range of frequencies or wavelengths within which a component operates.

**Baseband** - A transmission method in which the entire bandwidth of the transmission medium is used to transmit a single digital signal. The signal is driven directly onto the transmission medium without modulation of any kind. Baseband is simpler, cheaper and less sophisticated than Broadband.

**Bandwidth** - The range of frequencies required for proper transmission of a signal. Expressed in Hertz (cycles per second). The higher the bandwidth, the more information that can be carried. A continuous range starting from zero is said to be "baseband", while a range starting substantially above zero is "broadband".

**Baud** - The number of changes in signal per second. A given baud rate does not necessarily transmit an equal number of bits/sec. For example, a signal with four voltage levels may be used to transfer two bits of information for every baud.

**Beacon** - A special frame in Token-Ring systems indicating a serious problem with the ring such as a break.

**Bel** - A unit that represents the logarithm of the ratio of two levels.

**Bend Loss** - A form of increased attenuation in an optical fiber caused by an excessively small bend radius. The attenuation may be permanent if micro-fractures caused by the bend continue to affect transmission of the light signal.

**Bend Radius** - Radius of curvature that a fiber optic or metallic cable can bend before the risk of breakage or increased attenuation occurs.

**BER** - see Bit Error Rate

**BICSI** - Building Industry Consulting Service International.

**Binder** - A tape or thread used to hold assembled cable components in place.

**BISDN** - Broadband ISDN

**Bit** - One binary digit.

**Bit Error Rate** - A measure of data integrity, expressed as the ratio of received bits that are in error, relative to the amount of bits received. Often expressed as a negative power of ten.

**Bit Stream** - A continuous transfer of bits over some medium.

**Bit Stuffing** - A method of breaking up continuous strings of 1 bits by inserting a 0 bit. The 0 bit is removed at the receiver.

**Bit Time** - The length of time required to transmit one bit of information.

**BL** - Blue.

**BNC** - A coaxial connector that uses a "bayonet" style turn and lock mating method. Used with RG-58 or smaller coaxial cable. Used with 10Base2 Ethernet thin coaxial cable. BNC is an acronym for Bayonet-Neill-Concelman.

**Bonding** - A method used to produce good electrical contact between metallic parts. Also refers to the grounding bars and straps used in buildings to bond equipment to an approved ground.

**BPS** - Bits per second.

**BR** - Brown.

**Braid** - Fine wires interwoven to form a tubular flexible structure that may be applied over one or more wires for the purpose of shielding. May also be formed into a flattened conductor to be used as a grounding strap.

**BRI** - ISDN Basic Rate Interface

**Bridged Tap** - Multiple appearances of the same cable pair at several distribution points.

**Broadband** - A transmission facility having a bandwidth sufficient to carry multiple voice, video or data channels simultaneously. Each channel occupies (is modulated to) a different frequency bandwidth on the transmission medium and is demodulated to its original frequency at the receiving end. Channels are separated by "guardbands" (empty spaces) to ensure that each channel will not interfere with its neighboring channels. This technique is used to provide many CATV channels on one coaxial cable.

**Broadcast** - Sending data to more than one receiving device at a time.

**Buffer** - A protective coating over a strand of optical fiber.

**Bus Topology** - 1. In general, a physical layout of network devices in which all devices must share a common medium to transfer data, and no two devices may transmit simultaneously. With LANs, a linear network topology in which all computers are connected to a single cable.

**Butyl Rubber** - A synthetic rubber with good electrical insulating properties.

**Byte** - A group of 8 bits.

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## C

**c** - A small "c" is the symbol for the speed of light in a vacuum.

**C** - A capital "C" is the designation for Celsius.

**Cable** - A group of insulated conductors enclosed within a common jacket.

**Cable Sheath** - A covering over the conductor assembly that may include one or more metallic members, strength members, or jackets.

**Campus** - The buildings and grounds of a complex, such as a university, college, industrial park or military establishment.

**Capacitance** - The ability to store electric charge between two conductors separated by a dielectric material. Capacitance is expressed in Farads.

**Carrier** - An electrical signal of a set frequency that can be modulated in order to carry data.

**Carrier Detect** - A circuit that detects the presence of a carrier.

**Carrier Sense** - With Ethernet, a method of detecting the presence of signal activity on a common channel.

**Carrier Sense Multiple Access with Collision Detect (CSMA/CD)** -A network access method used by Ethernet in which a station listens for traffic before transmitting. If two stations transmit simultaneously, a collision is detected and both stations wait a brief time before attempting to transmit again.

**Category 1, Cat 1** - Unshielded twisted pair used for transmission of audio frequencies. Used as speaker wire, door bell wire, etc. Not suitable for networking applications.

**Category 2, Cat 2** - Unshielded twisted pair used for transmission at frequencies up to 1.5 MHz. Used in analog telephone applications. Not suitable for networking applications.

**Category 3, Cat 3** - Unshielded twisted pair with 100 ohm impedance and electrical characteristics supporting transmission at frequencies up to 16 MHz. Defined by the TIA/EIA 568-A specification.

**Category 4, Cat 4** - Unshielded twisted pair with 100 ohm impedance and electrical characteristics supporting transmission at frequencies up to 20 MHz. Defined by the TIA/EIA 568-A specification.

**Category 5, Cat 5** - Unshielded twisted pair with 100 ohm impedance and electrical characteristics supporting transmission at frequencies up to 100 MHz. Defined by the TIA/EIA 568-A specification.

**Category 5e, Cat 5e, Enhanced Cat 5** - Category 5e is a new standard that will specify transmission performance that exceeds Cat 5. Cat 5e has improved specifications for NEXT, PSELFEXT, and Attenuation. Like Cat 5, it consists of unshielded twisted pair with 100 ohm impedance and electrical characteristics supporting transmission at frequencies up to 100 MHz. To be defined in the TIA 568-A-5 update.

**Category 6, Cat 6** - Category 6 is a proposed standard that aims to support transmission at frequencies up to 250 MHz over 100 ohm twisted pair.

**Category 7, Cat 7** - Category 7 is a proposed standard that aims to support transmission at frequencies up to 600 MHz over 100 ohm twisted pair.

**CATV** - Community antenna television, or "Cable TV". CATV is a broadband transmission facility which generally uses a 75 Ohm coaxial cable to carry numerous frequency-divided TV channels simultaneously.

**CBX** - Computerized Branch Exchange.

**Cellular Polyethylene** - Expanded or "foam" polyethylene, a material with a reduced dielectric constant consisting of individual closed cells of inert gas suspended in a polyethylene medium.

**CDDI** - Copper Distributed Data Interface - A version of FDDI that uses copper wire media instead of fibre optic cable.

**Channel** - The end to end transmission path between two points at which application specific equipment is connected.

**Channel Insertion Loss** - For fiber optic links, the static loss of a link between a transmitter and receiver. It includes the loss of the fiber, connectors, and splices.

**Characteristic Impedance** - The impedance that an infinitely long transmission line would have at its input terminal. If a transmission line is terminated in its characteristic impedance, it will appear (electrically) to be infinitely long, thus minimizing signal reflections from the end of the line.

**Cheapernet** - Another name for thin Ethernet or 10Base2 systems.

**Chirping** - Refers to the change of optical frequency of laser diodes when the laser diode is pulsed between two different optical power levels. Chirp broadens the laser's spectral width causing chromatic dispersion.

**Chromatic Dispersion** - Synonym for "material dispersion". Characteristic of long fiber runs

**Circuit** - A system of conducting media designed to pass a signal or voltage between two points or a bi-directional communications path between two pieces of associated equipment.

**Cladding** - The material surrounding the core of a fiber optic cable. The cladding must have a lower index of refraction than the core in order to contain the light in the core.

**Class A** - ISO/IEC 11801 designation for twisted pair cabling rated to 100 kHz. Used in voice and low frequency applications. Comparable to Category 1 cabling. Not suitable for networking applications

**Class B** - ISO/IEC 11801 designation for twisted pair cabling rated to 1 MHz. Used in medium bit rate applications. Comparable to Category 2 cabling. Not suitable for networking applications

**Class C** - ISO/IEC 11801 designation for twisted pair cabling rated to 16 MHz. Used in high bit rate applications. Corresponds to TIA/EIA Category 3 cabling.

**Class D - ISO/IEC 11801** designation for twisted pair cabling rated to 100 MHz. Used in very high bit rate applications. Corresponds to TIA/EIA Category 5 cabling.

**Class E - ISO/IEC** proposal for twisted pair cabling rated to 250 MHz. Corresponds to the proposed TIA/EIA Category 6 cabling standard.

**Closet** - An enclosed space for housing telecommunications and networking equipment, cable terminations, and cross-connect cabling. It contains the horizontal cross connect where the backbone cable cross-connects with the horizontal cable.

**Coating** - Material surrounding the cladding of the fibre for protection.

**Coax, Coaxial Cable** - A type of communication transmission cable in which a solid centre conductor is surrounded by an insulating spacer which in turn is surrounded by a tubular outer conductor (usually a braid, foil or both). The entire assembly is then covered with an insulating and protective outer layer. Coaxial cables have a wide bandwidth and can carry many data, voice and video conversations simultaneously.

**Coherence** - Refers to the phase stability of two wavetrains, from the same optical wave, separated in time

**Collision** - When electrical signals from two or more devices sharing a common data transfer medium crash into one another. This commonly happens on Ethernet type systems.

**Conduit** - A rigid or flexible metallic or nonmetallic raceway of circular cross section in which cables are housed for protection and to prevent burning cable from spreading flames or smoke in the event of a fire.

**Conductivity** - The ability of a material to allow the flow of electrical current. It is the reciprocal of resistivity. Measured in "mhos".

**Conductor** - A material that offers low resistance to the flow of electrical current.

**Continuity** - An uninterrupted pathway for electrical signals.

**Cord** - A very flexible insulated cable.

**Core** - The central region of an optical fibre through which light is transmitted.

**Coupling ratio** - The percentage of optical power transferred to the secondary output port of a coupler relative to the total power of the primary and the secondary output ports.

**CRC** - see Cyclic Redundancy Check

**Critical angle** - The angle at the interface between the core & cladding where a guided ray in the core undergoes total internal reflection.

**Cross Connect** - A facility enabling the termination of cable elements and their interconnection, and/or cross-connection, primarily by means of a patch cord or jumper.

**Cross Connection** - A connection scheme between cabling runs, subsystems, and equipment using patch cords or jumpers that attach to connecting hardware at each end.

**Crossover** - A conductor which connects to a different pin number at each end.

**Crossover Cable** - A twisted pair patch cable wired in such a way as to route the transmit signals from one piece of equipment to the receive signals of another piece of equipment, and vice versa.

**Crosstalk** - The coupling of unwanted signals from one pair within a cable to another pair. Crosstalk can be measured at the same (near) end or far end with respect to the signal source.

**CSA** - Canadian Standards Association

**CSMA/CD** - see Carrier Sense Multiple Access with Collision Detect.

**Current** - The flow of charge in a conductor. See "alternating current" and "direct current".

**Current Loop** - A two wire transmit/receive interface.

**Customer Premises** - Buildings, offices, and other structures under the control of a telecommunications customer.

**Cutoff Wavelength** - A distinct boundary, in the wavelength spectrum, which characterizes the mode of operation of a fibre. A fibre operating at wavelengths lower than the cutoff wavelength is multimode while the same fiber operating at wavelengths higher than cutoff wavelength is single mode.

**Cut-through Resistance** - The ability of a material to withstand mechanical pressure without damage.

**Cyclic Redundancy Check (CRC)** - An error checking technique used to ensure the accuracy of transmitting digital code over a communications channel. The transmitted messages are divided into predetermined lengths which, used as dividends, are divided by a fixed divisor. The remainder of the calculation is appended onto and sent with the message. At the receiving end, the computer recalculates the remainder. If it does not match the transmitted remainder, and error is detected.

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D

**D Connector** - see Subminiature D Connector

**Data Connector** - A four position connector for 150-ohm STP used primarily with Token-Ring networks.

**Data Grade** - A term used for twisted-pair cable used in networks to carry data signals. Data grade media has a higher frequency rating than voice grade media used in telephone wiring.

**DAS** - Dual Attachment Station. Term used with FDDI networks to denote a station that attaches to both the primary and secondary rings.

**dB** - Decibel. A unit for measuring the relative strength of a signal. Usually expressed as the logarithmic ratio of the strength of a transmitted signal to the strength of the original signal. A decibel is one tenth of a "bel".

**DB-9** - Nine pin D connector.

**DB-15** - Fifteen pin D connector.

**DB-25** - Twenty-five pin D connector.

**DC** - see Direct Current.

**DCE** - Data Communications Equipment. Any equipment that connects to Data Terminal Equipment (DTE) to allow transmission between DTEs.

**DC Loop Resistance** - The total DC resistance of a cable. For twisted pair cable, it includes the round trip resistance, down one wire of the pair and back up the other wire.

**Demand Priority** - A network access method used by 100VG-AnyLAN. The hub arbitrates requests for network access received from stations, assigning access based on priority and traffic loads.

**Demarcation Point** - A point where the operational control or ownership changes, such as the point of interconnection between telephone company facilities and a user's building or residence.

**DGM** - Data Grade Media (see Data Grade)

**Dielectric** - An insulating (non-conducting) material.

**Dielectric Constant** - The property of a dielectric which determines the amount of electrostatic energy that can be stored by the material when a given voltage is applied to it. Also called permattivity.

**Digital Signal** - An electric signal which possesses two distinct states (on/off, positive/negative, one/zero).

**Direct Current** - An electric current that flows in one direction and does not reverse direction as with "alternating current".

**Dispersion** - The phenomenon in an optical fibre whereby light photons arrive at a distant point in different phase than they entered the fibre. Dispersion causes receive signal distortion that ultimately limits the bandwidth and usable length of the fibre cable. The two major types of dispersion are 1) mode (or modal) dispersion caused by differential optical path lengths in a multimode fibre, and 2) material dispersion caused by differing transmission times of different wavelengths of light in the fibre optic material.

**Distortion** - Any undesired change in a wave for or signal.

**Distribution Frame** - A structure with terminations for connecting the permanent cabling of a facility in a manner that interconnections or cross connects may be readily made.

**DIW** -Direct Inside Wire. Twisted pair wire used inside a building, usually two or four pair AWG 26.

**Drain Wire** - An uninsulated wire in contact with a shield throughout its length. Used to terminate the shield.

**Drop Cable** - The cable which allows connection and access to and from the trunk cables of a network such as the cables that connect individual PCs to the bus on a bus LAN. In a CATV system, the transmission cable from the distribution cable to a dwelling.

**DS1/DS3** - see T1 and T3

**DTE** - Data Terminal Equipment. Any piece of equipment at which a communications path begins or ends.

**Duct** - A single enclosed raceway for wires or cable or an enclosure in which air is moved.

**Duplex** - A circuit used to transmit signals simultaneously in both directions or two receptacles or jacks in a common housing which accepts two plugs.

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## E

**E1/E3** - The European versions of T1 and T3. E1 runs at 2.048 Mbps and E3 runs at 34 Mbps.

**Earth** - A term for zero reference ground.

**EC** - European Community

**ECMA** - European Computer Manufacturer's Association. A European trade organization that issues its own standards and is a member of the ISO.

**EIA** - Electronic Industry Association (formerly RMA or RETMA). An association of manufacturers and users that establishes standards and publishes test methodologies.

**Electromagnetic Coupling** - The transfer of energy by means of a varying magnetic field. Inductive coupling.

**Electromagnetic Field** - The combined electric and magnetic field caused by electron motion in conductors.

**Electromagnetic Interference** - An interfering electromagnetic signal. Network wiring and equipment may be susceptible to EMI as well as emit EMI.

**Electrostatic** - Electrical charge that exists when the charge is at rest.

**Electrostatic Coupling** - The transfer of energy by means of a varying electrostatic field. Capacitive coupling.

**ELFEXT** - Equal Level Far End Crosstalk

**EMI** - see Electromagnetic Interference.

**Encoding** - A means of combining clock and data information into a self-synchronized stream of signals.

**Entrance Facility** - An entrance to a building for both public and private network service cables (including antennae) including the entrance at the building wall and continuing to the entrance room or space.

**Entrance Point** - The point of emergence of telecommunications conductors through an exterior wall, a concrete floor slab, or from a rigid metal conduit or intermediate metal conduit.

**Entrance Room** - A space in which the joining of inter- or intra-building telecommunications or networking backbone facilities takes place. An entrance room may also serve as an equipment room.



**Equipment Room** - An enclosed area housing telecommunications and network equipment, distinguished from the telecommunications or wiring closet by its increased complexity and presence of active equipment.

**EPDM** - Ethylene-propylene-diene monomer rubber. A material with good insulating properties.

**EPR** - Ethylene-propylene copolymer rubber. A material with good insulating properties.

**Ethernet** - A local area network (LAN) protocol defined in the IEEE 802.3 standard in which computers access the network through a Carrier Sense Multiple Access / Collision Detect (CSMA/CD) protocol.

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## F

**f** - Frequency

**Farad** - A unit of capacitance that stores one coulomb of electrical charge when one volt of electrical pressure is applied.

**Far End Cross Talk (FEXT)** - Crosstalk that is measured on the quiet line at the opposite end as the source of energy on the active line. FEXT is not typically measured in cabling, with Near End Cross Talk (NEXT) being the preferred crosstalk measurement.

**Fast Ethernet** - Ethernet standard supporting 100 Mbps operation.

**FCC** - Federal Communications Commission.

**FCS** - Frame Check Sequence. Error detection field.

**FDDI** - Fibre Distributed Data Interface. An ANSI Standard (ANSI X3T12) for a 100 Mbps token passing network based on fibre-optic (FDDI) and twisted-pair (CDDI) cabling.

**Feeder Cable** - In a CATV system, the transmission cable from the head end (signal pickup) to the trunk amplifier. Also called a trunk cable.

**FEP** - Fluorinated ethylene propylene. A thermoplastic with excellent dielectric properties which is often used as insulation in fire rated cables.

**FEXT** - see Far End Cross Talk

**Fibre Optics** - The technology in which communication signals in the form of modulated light beams are transmitted over a glass fibre transmission medium. Fibre optic technology offers high bandwidth, small space needs and protection from electromagnetic interference, eavesdropping and radioactivity.

**Fifty-pin Connector** - Commonly referred to as a Telco, CHAMP, or blue ribbon connector, this connector is used on Ethernet 10Base-T hubs as an alternate twisted-pair segment connection method. The 50-pin connector connects to 25-pair cables, which are frequently used in telephone wiring systems and which typically meet Category 3 specifications.

**Fillers** - Non conducting components cabled with the insulated conductors or optical fibres to impart roundness, flexibility, tensile strength, or a combination of all three.

**Floating** - Refers to a circuit that has no connection to ground.

**FOIRL** - Fibre Optic Inter-Repeater Link. An Ethernet fibre optic connection method intended for connection of repeaters.

**Frequency** - The number of times a periodic action occurs in a unit of time. Expressed in hertz (abbreviated Hz). One hertz equals one cycle per second.

**Frequency Division Multiplexing (FDM)** - A technique for combining many signals on a single circuit by dividing the available transmission bandwidth by frequency into narrower bands, each used for a separate communication channel.

**Frequency Modulation (FM)** - One of three basic methods (see also Amplitude and Phase Modulation) of adding information to a sine wave signal in which its frequency is varied to impose information on it.

**Frequency Response** - The range of frequencies over which a device operates as expected.

**FTP** - see Screened Twisted Pair (ScTP) cable

**Full Duplex Transmission** - Data transmission over a circuit capable of transmitting in both directions simultaneously.

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## G

**G** - Green

**Gbps** -Gigabits per second.

**Giga** - A prefix meaning one billion

**Gigahertz (GHz)** - One billion hertz.

**GIPOF** - Graded Index Plastic Optical Fibre

**Graded Index Fibre** - A multimode fibre optic cable design in which the index of refraction of the core is lower toward the outside of the core and progressively increases toward the centre of the core, thereby reducing modal dispersion of the signal.

**Ground** - A common point of zero potential such as a metal chassis or ground rod.

**Ground Loop** - A condition where an unintended connection to ground is made through an interfering electrical conductor.

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## H

**Half Duplex Transmission** - Data transmission over a circuit capable of transmitting in either direction, but not simultaneously.

**HC** - see Horizontal Cross Connect.

**Headend** - The equipment in a cable system which receives the various program source signals, processes them, and retransmits them to subscribers.

**Headroom** - The amount by which a cable exceeds NEXT.

**Hertz** - The unit of frequency, one cycle per second (abbreviated Hz).

**HF** - High Frequency

**Home Run** - A cable run that connects a user outlet directly with the telecommunications or wiring closet, with no intermediate splices, bridges, taps, or other connections.

**Horizontal Cabling, Horizontal Wiring** - The portion of the cabling system that extends from the work area outlet to the horizontal cross connect in the telecommunications or wiring closet.

**Horizontal Cross Connect** - A cross connect of horizontal cabling to other cabling, e.g. horizontal, backbone, or equipment.

**Host** - Computer that offers services on a network.

**Hub** - A hardware device that contains multiple independent but connected modules of network and internetworking equipment. Hubs can be active (where they repeat signals sent to them) or passive (where they do not repeat but merely split signals sent through them). Hub may also refer to a repeater, bridge, switch, router, or any combination of these.

**HVAC** - Heating, ventilation, and air conditioning system.

**Hybrid Cable** - An assembly of two or more cables (of the same or different types or categories) covered by one overall sheath.

**Hypalon** - A DuPont trade name for a synthetic rubber (chlorosulfonated polyethylene) used as insulating and jacketing material for cabling.

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I

**I** - Symbol used to designate current.

**IC** - see Intermediate Cross Connect.

**ICEA** - Insulated Cable Engineers Association

**ICS** - IBM Cabling System

**IDC** - Insulation Displacement Contact/Connector

**IDF** - Intermediate Distribution Frame. This is usually located on each floor within a building. It is tied directly to the Main Distribution Frame via cables.

**IEC** - International Electrotechnical Commission

**IEEE** - Institute of Electrical and Electronics Engineers. A professional organization and standards body. The IEEE Project 802 is the group within IEEE responsible for LAN technology standards.

**IEEE 802.1** - The IEEE standards committee defining High Level Interfaces, Network Management, Internetworking, and other issues common across LAN technologies.

**IEEE 802.2** - The IEEE standards committee defining Logical Link Control (LLC).

**IEEE 802.3** - The IEEE standards committee defining Ethernet networks.

**IEEE 802.5** - The IEEE standards committee defining Token-Ring standards.

**Impedance** - A unit of measure, expressed in Ohms, of the total opposition (resistance, capacitance and inductance) offered to the flow of an alternating current.

**Impedance Match** - A condition where the impedance of a particular circuit cable or component is the same as the impedance of the circuit, cable, or device to which it is connected.

**Impedance Matching Transformer** - A transformer designed to match the impedance of one circuit to another.

**Index of Refraction** - The ratio of light velocity in a vacuum to its velocity in a given transmission medium.

**Infrastructure, Telecommunications** - A collection of those telecommunications components, excluding equipment, that together provide the basic support for the distribution of all information within a building or campus.

**Interconnection** - A connection scheme that provides for the direct connection of a cable to another cable or to an equipment cable without a patch cord or jumper.

**Intermediate Cross Connect** - A cross-connect between 1st level and 2nd level backbone cabling.

**Injection Laser Diode** - A semiconductor laser in which the lasing occurs at the junction of n-type and p-type semiconductor materials.

**Insertion Loss** - A measure of the attenuation of a device by determining the output of a system before and after the device is inserted into the system. For example, a connector causes insertion loss across the interconnection (in comparison to a continuous cable with no interconnection).

**ISDN** - Integrated Services Digital Network or It Still Does Nothing

**ISO** - International Standards Organization

**Isolated Ground** - A separate ground conductor which is insulated from the equipment or building ground.

**Isolation** - The ability of a circuit or component to reject interference.

**Insulation** - A material which is nonconductive to the flow of electrical current.

**Interference** - Undesirable signals which interfere with the normal operation of electronic equipment or electronic transmission.

**Isochronous** - Signals which are dependent on some uniform timing or carry their own timing information imbedded as part of the signal. Voice and video signals are isochronous signals, but data transfer is generally not.

**ITU** - International Telecommunications Union. An international organization that develops communications standards.

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## J

**Jabber** - Term used with Ethernet to describe the act of continuously sending data. A jabbering station is one whose circuitry or logic has failed, and which has locked up a network channel with its incessant transmission.

**Jack** - A female connector. (Am I the only one to think this is strange!)

**Jacket** - The outer protective covering of a cable.

**Jitter** - The slight movement of a transmission signal in time or phase that can introduce errors and loss of synchronization. More jitter will be encountered with longer cables, cables with higher attenuation, and signals at higher data rates. Also, called phase jitter, timing distortion, or intersymbol interference.

**Jumper** - An assembly of twisted pairs without connectors used to used to join telecommunications circuits at the cross connect. Similar to a patch cable (which has connectors).

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## K

**Keying** - The mechanical feature of a connector system that guarantees correct orientation of a connection, or prevents the connection to a jack, or to an optical fiber adapter, of the same type intended for another purpose.

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## L

**L** - Symbol used to designate inductance.

**LAN** - Local Area Network

**LAN Adapter** - see Network Interface Card

**Laser** - Light Amplification by Stimulated Emission of Radiation. A device which produces light with a narrow spectral width. Used in fibre optic communication systems, usually single mode, where high capacity and low attenuation are required.

**LATA** - Local Access and Transport Area.

**Lay** - The axial distance required for one cabled conductor or conductor strand to complete one revolution about the axis around which it is cabled.

**Lay Direction** - The direction of the progressing spiral twist in while looking along the axis of the cable away from the observer. The lay direction can be either "left" or "right".

**LCL** - see Longitudinal Conversion Loss

**LCTL** - see Longitudinal Conversion Transfer Loss

**Leakage** - An undesirable passage of current over the surface of or through a connector.

**Leased Line** - A private telephone line rented for the exclusive use of a leasing customer, without interchange switching arrangements.

**LED** - see Light Emitting Diode.

**LF** - Low frequency.

**Light Emitting Diode** - A semiconductor diode which emits incoherent light when a current is passed through it. Used as a light source in fibre optic transmission.

**Link** - A transmission path between two points not including terminal equipment, work area cables, or equipment cables.

**Listed** - Equipment included on a list published by an organization, acceptable to the authority having jurisdiction, that maintains periodic inspection of production of listed equipment, and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

**Lobe** - An arm of a Token-Ring which extends from a Multistation Access Unit (MSAU) to a workstation adapter.

**LocalTalk** - A low-speed form of LAN data link technology, part of Apple Computer's AppleTalk networking scheme, that uses a carrier sense multiple access with collision avoidance (CSMA/CA) form of medium access control. Supports transmission at 230 Kbps.

**Longitudinal Conversion Loss (LCL)** - Also called near-end unbalance attenuation, measures cable balance by comparing the signal appearing across the pair to the signal applied between ground and the pair, where the applied signal and the across pair signal are at the same end of the cable.

**Longitudinal Conversion Transfer Loss (LCTL)** - Also called far-end unbalance attenuation, measures cable balance by the comparison of the signal appearing across the pair to the signal between ground and the pair, where the applied signal is at the opposite end of the cable from where the across pair signal is measured.

**Loopback** - A type of diagnostic test in which a transmitted signal is returned to the sending device after passing through a data communications link or network. This test allows the comparison of a returned signal with the transmitted signal.

**Loss** - The portion of energy applied to a system that is dissipated and performs no useful work.

**Lossy** - Having poor efficiency.

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## M

**M** - Mutual Inductance

**mA** - Milliampere (one thousandth of an ampere)

**MAC** - see Medium Access Control

**Main Cross Connect** - A cross connect for first level backbone cables, entrance cables, and equipment cables. The main cross connect is at the top level of the premises cabling tree.

**Manchester Coding** - A method of LAN signal encoding in which each bit time that represents a data bit has a transition in the middle of the bit time. Used with 10 Mbps Ethernet (10Base2, 10Base5, 10Base-F, & 10Base-T), and Token-Ring LANs.

**Material Dispersion** - Dispersion that results from each wavelength traveling at a different speed than other wavelengths through an optical fiber. Also called "chromatic dispersion".

**MAU** - Media Attachment Unit. The transceiver in Ethernet networks. Also a common name for the MSAU (Multi-station Access Unit) in Token-Ring networks.

**Mbaud** - Megabaud. One million baud.

**Mbps** - Megabits per second.

**MC** - see Main Cross Connect

**MDF** - Main Distribution Frame

**MDI** - see Media Dependent Interface

**Media** - Wire, cable, or conductors used for transmission of signals.

**Media Filter** - An impedance matching component used in Token-Ring networks to transform the 100 ohm impedance of UTP cabling to the 150 ohm impedance of media interface connections.

**Medium Access Control (MAC)** - A mechanism operating at the data link layer of local area networks which manages access to the communications channel (medium).

**Medium Dependent Interface (MDI)** - In Ethernet, the connector used to make the mechanical and electrical interface between a transceiver and a media segment. An 8-pin RJ-45 connector is the MDI for the 10Base-T, 100Base-TX, 100Base-T2, 100Base-T4, and 1000Base-T media systems.

**Medium Independent Interface (MII)** - Used with 100 Mbps Ethernet systems to attach MAC level hardware to a variety of physical media systems. Similar to the AUI interface used with 10 Mbps Ethernet systems. An MII provides a 40-pin connection to outboard transceivers (also called PHY devices).

**Mega** - Prefix meaning one million.

**Megahertz (MHz)** - One million hertz.

**MIC** - Medium Interface Connector. Duplex fibre optic connector used with Fibre Distributed Data Interface (FDDI) networks.

**Micro** - Prefix meaning one millionth.

**Microfarad** - One millionth of a farad. Abbreviated  $\mu\text{F}$  (less commonly  $\mu\text{fd}$ ,  $\text{mf}$ , and  $\text{mfd}$ ).

**Micron** - One millionth of a meter. Abbreviated  $\mu\text{m}$ .

**Midsplit Broadband** - A broadcast network configuration in which the cable is divided into two channels, each using a different range of frequencies. One channel is used to transmit signals and the other is used to receive.

**MII** - see Medium Independent Interface.

**Mil** - Unit of length equal to one thousandth of an inch (0.001 inch).

**Milli** - Prefix meaning one thousandth.

**Mixing Segment** - Ethernet term used in IEEE 802.3 standards to describe a segment that may have more than two MDI connections.

**MMF** - set Multimode Fibre

**Modal Dispersion** - Dispersion that results from the different transit lengths of different propagating modes in a multimode optical fibre.

**Mode** - A single electromagnetic wave traveling in an optical fibre.

**Mode Field Diameter** - The diameter of optical energy in a single mode fibre. Because the mode-field diameter is larger than the core diameter, it replaces core diameter as a practical parameter.

**Modem** - A device that implements "modulator-demodulator" functions to convert between digital data and analog signals.

**Modular Jack** - The equipment mounted half of a modular interconnection. Typically a female connector. A modular jack may be keyed or unkeyed and may have six or eight contact positions, but not all the positions need to be equipped with jack contacts.

**Modular Plug** - The cable mounted half of a modular interconnection. Typically a male connector. A modular plug may be keyed or unkeyed and may have six or eight contact positions, but not all the positions need to be equipped with contacts.

**Modulation** - Altering the characteristics of a carrier wave to convey information. Modulation techniques include amplitude, frequency, phase, plus many other forms of digital encoding.

**MSAU** - Multi-station Access Unit. Device used to interconnect lobe cables from stations on a Token-Ring network.

**MT-RJ** - Proposal for a new duplex fibre optic connector standard from AMP/Siecor.

**Multimode Fiber** - A fibre optic cable which supports the propagation of multiple modes. Multimode fibre may have a typical core diameter of 50 to 100  $\mu\text{m}$  with a refractive index that is graded or stepped. It allows the use of inexpensive

LED light sources and connector alignment and coupling is less critical than single mode fibre. Distances of transmission and transmission bandwidth are less than with single mode fibre due to dispersion.

**Mutual Capacitance** - Capacitance between two conductors when all other conductors are connected together.

**MV** - Millivolt (one thousandth of a volt)

**MW** - Milliwatt (one thousandth of a watt)

**Mylar** - DuPont trademark for polyethylene terephthalate (polyester) film.

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## N

**NA** - see Numerical Aperture

**N connector** - A coaxial connector used for Ethernet 10Base5 thick coax segments.

**Nanometer (nm)** - One billionth of a meter.

**Nanosecond (ns)** - One billionth of a second.

**NBR** - Butadiene-acrylonitrile copolymer rubber, a material with good oil and chemical resistance.

**Near-End Crosstalk** - Crosstalk between two twisted pairs measured at the same end of the cable as the disturbing signal source. NEXT is the measurement of interest for crosstalk specifications.

**NEC** - National Electrical Code.

**NEMA** - National Electrical Manufacturers Association.

**Neoprene** - A synthetic rubber with good resistance to oil, chemical, and flame. Also called polychloroprene.

**Network** - An interconnection of computer systems, terminals or data communications facilities.

**Network Interface Card** - A circuit board installed in a computing device used to attach the device to a network. A NIC performs the hardware functions that are required to provide a computing device with physical communications capabilities. Also Network Interface Unit (NIU).

**NEXT** - see Near-End Crosstalk.

**NFPA** - National Fire Protection Association

**Nibble** - One half byte or when one is hungry.

**NIC** - see Network Interface Card.

**NIR** - Near-end Crosstalk-to-Insertion Loss Ratio

**Node** - End point of a network connection. Nodes include any device connected to a network such as file servers, printers, or workstations.

**Noise** - In a cable or circuit, any extraneous signal which interferes with the desired signal.

**Nomex** - Dupont trademark for a temperature-resistant, flame retardant nylon.



**NRZ** - Non Return to Zero.

**NRZI** - Non Return to Zero Inverted.

**Numerical Aperture (NA)** - The "light gathering ability" of an optical fibre, defining the maximum angle to the fibre axis at which light will be accepted and propagated.

**NVP** - Nominal Velocity of Propagation. The speed a signal propagates through a cable expressed as a decimal fraction of the speed of light in a vacuum.

**Nylon** - An abrasion resistant thermoplastic with good chemical resistance.

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## O

**O** - Orange

**OC-n** - See Optical Carrier n

**Octet** - 8 bits (also called a byte).

**OFSTP** - Optical Fibre Standard Test Procedure.

**Ohm** -The electrical unit of resistance. The value of resistance through which a potential of one volt will maintain a current of one ampere.

**Ohm's Law** - Stated  $E=IR$ ,  $I=E/R$ , or  $R=E/I$ , the current "I" in a circuit is directly proportional to the voltage "E", and inversely proportional to the resistance "R".

**Optical Carrier n** - Optical signal standards. The "n" indicates the level where the respective data rate is exactly "n" times the first level OC-1. OC-1 has a data rate of 51.84 Mbps. OC-3 is 3 times that rate or 155.52 Mbps, etc. Associated with SONET.

**OLTS** - Optical Loss Test Set

**Open** - A break in the continuity of a circuit.

**Optical Fibre** - A thin glass or plastic filament used for the transmission of information via light signals. The signal carrying part of a fibre optic cable.

**Optical Fibre Cable** - An assembly consisting of one or more optical fibres.

**Optical Fibre Duplex Adapter** - A mechanical media termination device designed to align and join two duplex connectors.

**Optical Fibre Duplex Connection** - A mated assembly of two duplex connectors and a duplex adapter.

**Optical Fibre Duplex Connector** - A mechanical media termination device designed to transfer optical power between two pairs of optical fibres.

**Optical Time Domain Reflectometry** - A method for evaluating optical fibre based on detecting and measuring backscattered (reflected) light. Used to measure fibre length and attenuation, evaluate splice and connector joints, locate faults, and certify cabling systems.

**OSI** - Open Systems Interconnection

**Outside Plant** - Cabling, equipment, or structures that are out of doors.

**OTDR** - Optical Time Domain Reflectometry.

**Outlet** - A connecting device in the work area on which a horizontal cable terminates.

**Outlet Box** - A metallic or non-metallic box mounted within a wall, floor, or ceiling used to hold outlet, connector, or transition devices.

**Output** - The useful signal or power delivered by a circuit or device.

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## P

**PABX** - Private Automatic Branch Exchange

**Packet** - Bits grouped serially in a defined format, containing a command or data message sent over a network.

**PAM5x5** - Signal encoding scheme used in the Ethernet 100Base-T2 and 1000Base-T media systems.

**Patch Cord** - A flexible piece of cable terminated at both ends with connectors. Used for interconnecting circuits on a patch panel or cross connect.

**Patch Panel** - A passive device, typically flat plate holding feed through connectors, to allow circuit arrangements and rearrangements by simply plugging and unplugging patch cables.

**Pathway** - A facility for the placement of telecommunication or networking cables.

**PBX** - Private Branch Exchange

**PC** - Personal Computer

**PCC** - Premises Communication Cable, CSA Cable Designation.

**PDN** - Public Data Network

**Peak** - The maximum instantaneous value of a varying current or voltage.

**Pedestal** - A device, usually mounted on the floor, which is used to house voice/data jacks or power outlets at the point of use. Also referred to as a monument, tombstone, above floor fitting or doghouse.

**Periodicity** - Uniformly spaced variations in the insulation diameter of a transmission cable that result in reflections of a signal.

**Phase** - An angular relationship between waves.

**Phase Modulation (PM)** - One of three basic methods (see also Amplitude and Frequency Modulation) of adding information to a sine wave signal in which its phase is varied to impose information on it.

**Phase Shift** - A change in the phase relationship between two alternating quantities.

**Photo detector** - Used on the receiving end of a fibre optic cable to convert light energy into electrical energy.

**PHY** - Physical Layer device.

**Physical Layer** - Layer one of the seven layer ISO *Reference Model for Open Systems Interconnection*. The physical layer is responsible for the transmission of signals, such as electrical signals, optical signals, or radio signals, between computing machines.

**Pico** - Prefix meaning one millionth of one millionth.

**Picofarad** - One millionth of one millionth of a farad. Abbreviated "pf".

**Pin-diode** - A photodetector used to convert optical signals to electrical signals in a receiver.

**Plastic** - High polymeric substances, including both natural and synthetic products, but excluding the rubbers that are capable of flowing under heat and pressure.

**Plastic Fibre** - An optical fibre made of plastic rather than glass.

**Plasticizer** - A chemical added to plastics to make them softer and more flexible.

**Plenum** - The air handling space between the walls, under structural floors, and above drop ceilings used to circulate and otherwise handle air in a building. Such spaces are considered plenums only if they are used for air handling. Work spaces are generally not considered plenums.

**Plenum Cable** - A cable that is rated as having adequate fire resistance and low smoke producing characteristics for use in air handling spaces (plenum).

**Plug** - A male connector.

**PMD** - Physical Media Dependent or Polarisation Model Dispersion

**POF** - Plastic Optical Fibre.

**Polybutadiene** - A type of synthetic rubber often blended with other synthetic rubbers to improve their properties.

**Polyethylene** - A thermoplastic material having excellent electrical properties.

**Polymer** - A substance made of repeating chemical units or molecules. The term is often used in place of plastic, rubber, or elastomer.

**Polypropylene** - A thermoplastic material similar to polyethylene but somewhat stiffer and with a higher softening point (temperature).

**Polyurethane** - Broad class of thermoplastic polymers with good abrasion and solvent resistance. Can be solid or cellular (foam).

**Polyvinyl Chloride (PVC)** - A general purpose thermoplastic used for wire and cable insulation and plastics. PVC is known for high flexibility. Often used in nonplenum wire insulation and cable jackets. A modified version of the material may be found in jacketing of some plenum rated cables.

**POTS** - Plain Old Telephone System

**Potting** - Sealing by filling with a substance to exclude moisture.

**Power Level** - The difference between the total power delivered to a circuit, cable, or device and the power delivered by that device to a load.

**Power Ratio** - The ratio of power appearing at the load to the input power. Expressed in dB.

**Premise Cabling** - The entire cabling system on the user's premises used for transmission of voice, data, video and power.

**Pre-wiring** - Wiring installed before walls and ceilings are enclosed.

**Private Branch Exchange (PBX)** - A private telephone switching system, usually located on a customer's premises connecting a common group of lines from one or more central offices to provide service to a number of individual phones. Now used interchangeably with PABX (Private Automatic Branch Exchange).

**Propagation Delay** - Time required for a signal to pass from the input to the output of a device.

**Protector** - A device that limits damaging voltages on metallic conductors.

**Protocol** - A set of agree-upon rules and message formats for exchanging information among devices on a network.

**PSELFEXT** - Power Sum Equal Level Far End Crosstalk

**PSNEXT** - Power Sum Near End Crosstalk

**Public Data Network** - A network established and operated for the specific purpose of Providing data transmission services to the public.

**Public Switched Network** - Any common carrier network that provides circuit switching between public users, such as the public telephone network, telex or MCI's Execunet.

**Pull Strength, Pull Tension** - The pulling force that can be applied to a cable without affecting the specified characteristics of the cable.

**Pulse** - A current or voltage which changes abruptly from one value to another and back to the original value in a finite length of time.

**Pulse Code Modulation (PCM)** - The most common method of representing an analog signal, such as speech, by sampling at a regular rate and converting each sample to an equivalent digital code.

**PVC** - Polyvinyl Chloride

**PVDF** - Polyvinylidene Fluoride

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## Q

**Quartet Signaling** - The signaling method used by 100VG-AnyLAN, in which the 100 Mbps signal is divided into four 25 Mbps channels and then transmitted over different pairs of a cable. Category 3 cables transmit one channel on each of four pairs.

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## R

**R** - Symbol for Resistance

**Raceway** - Any channel designated for holding wires or cables. Raceways may be metallic or nonmetallic and may totally or partially enclose the wiring. (e.g. conduit, cable trough, cellular floor, electrical metallic tubing, sleeves, slots, underfloor raceways, surface raceways, lighting fixture raceways, wireways, busways, auxiliary gutters, and ventilated flexible cableways)

**Radio Frequency** - The frequencies in the electromagnetic spectrum that are used for radio communications.

**RBOC** - Regional Bell Operating Company. One of the seven Bell operating companies that were formed during the divestiture of AT&T.

**RCDD** - Registered Communication Distribution Designer. A certification of BICSI, an industry organization, for individuals qualified to consult and design telecommunications distribution systems.

**Reactance** - A measure of the combined effects of capacitance and inductance on an alternating current. The amount of such opposition varies with the frequency of the current. The reactance of a capacitor decreases with an increase in frequency. The opposite occurs with an inductance.

**Receiver** - A device whose purpose is to capture transmitted signal energy and convert that energy for useful functions. In fibre optic systems, an electronic component that converts light energy to electrical energy.

**Reflection** - A return of electromagnetic energy that occurs at an impedance mismatch in a transmission line, such as a LAN cable.

**Refractive Index** - The ratio of the speed of light in a vacuum to its velocity in a transmitting medium, such as an optical fibre core.

**Repeater** - A device that receives, amplifies (and sometimes reshapes), and retransmits a signal. It is used to boost signal levels and extend the distance a signal can be transmitted. It can physically extend the distance of a LAN or connect two LAN segments.

**Resistance** - In dc circuits, the opposition a material offers to current flow, measured in ohms. In ac circuits, resistance is the real component of impedance and may be higher than the value measured at dc.

**Resonance** - An ac circuit condition in which inductive and capacitive interact to cause a minimum or maximum circuit impedance.

**Retractable Cord** - A cord having specially treated insulation or jacket so that it will retract like a spring. Retractibility may be added to all or part of a cord's length.

**Reversed Pair** - A wiring error in twisted pair cabling where the conductors of a pair are reversed between connector pins at each end of a cable.

**RF** - see Radio Frequency

**RFI** - Radio Frequency Interference. Electromagnetic interference at radio frequencies.

**RFP** - Request for Proposal

**RFQ** - Request for Quote (or Quotation)

**RG/U** - Radio Grade/Universal. RG is the common military designation for coaxial cable.

**Ring** - A polarity designation of one wire of a pair indicating that the wire is that of the secondary color of a 5-pair group (e.g. the blue white wire of the blue pair) or a wiring contact to which the ring wire is attached or the negative wiring polarity (see Tip).

**Ring Network** - A network topology in which terminals are connected in a point-to-point serial fashion in an unbroken circular configuration. Many logical rings are wired as a star for greater reliability.

**Ripcord** - A cord placed directly under the jacket of a cable in order to facilitate stripping (removal) of the jacket.

**Riser** - The conduit or path between floors of a building into which telephone, networking, and other utility cables are placed to bring service from one floor to another.

**Riser Cable** - A type of cable used in vertical building shafts, such as telecommunications and utility shafts. Riser cable typically has more mechanical strength than general use cable and has an intermediate fire protection rating.

**RJ** - A term from the telephone industry, used for jacks (connectors) that were registered for use with particular types of telephone services. RJ stands for "registered jack".

**RJ-45** - A USOC code identifying an 8-pin modular plug or jack used with unshielded twisted pair cable. Officially, an RJ-45 connector is a telephone connector designed for voice grade circuits only. RJ-45 type connectors with better signal handling characteristics are called 8-pin connectors in most standards documents, though most people continue to use the RJ-45 name for all 8-pin connectors.

**RMS** - Root Mean Square.

**Rope Strand** - A conductor composed of groups of twisted strands.

**Rubber** - A general term used to describe wire insulations made of thermosetting elastomers, such as natural or synthetic rubbers, neoprene, Hypalon, butyl rubber, and others and yes a condom.

**Rx** - Receive

**RZ** - Return to Zero

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## S

**SAS** - Single Attachment Station. Term used with FDDI networks to denote a station that attaches to only one of two rings in a dual ring environment.

**SBR** - A copolymer of styrene and butadiene. Also GR-S or Buna-S. Most commonly used type of synthetic rubber.

**SC Connector** - A fibre optic connector having a 2.5mm ferrule, push-pull latching mechanism, and the ability to be snapped together to form duplex and multifibre connectors. SC connectors are the preferred fibre optic cable for premises cabling, and are recommended by the TIA/EIA-568-A Standard for structured cabling. Used with Ethernet 100Base-FX and 1000Base-LX/SX fibre optic media systems.

**Scanner** - A cable testing device which uses TDR methods to detect cable transmission anomalies and error conditions.

**Screen** - see Shield

**Screened Twisted Pair (ScTP) cable** - Four pair UTP, with a single foil or braided screen surrounding all four pairs in order to minimize EMI radiation or susceptibility. Screened twisted pair is sometimes called Foil Twisted Pair (FTP). ScTP can be thought of as a shielded version of the Category 3, 4, & 5 UTP cables.

**Screened/Shielded Twisted Pair (SSTP)** - Four pair cabling, with each pair having its own individual Shield, in addition to an overall shield surrounding all four pairs. SSTP offers similar performance to Type 1 STP except with 4 pairs (rather than 2) and in a 100 ohm impedance (rather than 150). Associated with Category 7.

**ScTP** - see Screened Twisted Pair cable

**SDH** - see Synchronous Digital Hierarchy.

**Segment** - On Ethernet a media segment may be made up of one or more cable sections joined together to produce a continuous cable for carrying Ethernet signals.

**Semiconductor** - In wire industry terminology, a material possessing electrical conductivity that falls somewhere between that of conductors and insulators. Usually made by adding carbon particles to an insulator. Not the same as semiconductor materials such as silicon, germanium, etc.

**Separator** - Pertaining to wire and cable, a layer of insulating material such as textile, paper, Mylar, etc. which is placed between a conductor and its dielectric, between a cable jacket and the components it covers, or between various components of a multiple conductor cable. It can be utilized to improve stripping qualities, flexibility, or can offer additional mechanical or electrical protection to the components it separates.

**Sheath** - see Jacket

**Shield** - A metallic foil or multiwire screen mesh that is used to prevent electromagnetic fields from penetrating or exiting a transmission cable. Also referred to as a "screen".

**Shield Coverage** - The physical area of a cable that is actually covered by shielding material, often expressed as a percentage.

**Shield Effectiveness** - The relative ability of a shield to screen out undesirable interference. Frequently confused with the term shield coverage.

**Shielded Twisted Pair (STP)** - A type of twisted pair cable in which the pairs are enclosed in an outer braided shield, although individual pairs may also be shielded. STP most often refers to the 150 ohm IBM Type 1, 2, 6, 8, & 9 cables used with Token Ring networks.

**Signal** - The information conveyed through a communication system.

**Signal to noise ratio** - The ratio of received signal level to received noise level, expressed in dB. Abbreviated S/N. A higher S/N ratio indicates better channel performance.

**Silicone** - General Electric trademark for a material made from silicone and oxygen. Can be in thermosetting elastomer or liquid form. The thermosetting elastomer form is noted for high heat resistance.

**Silver Satin** - The name for the silver-gray voice-grade patch cable used to connect a telephone to a wall jacket. Typical silver satin patch cables do not have twisted pair wires, which makes them unsuitable for use in LAN applications. The lack of twisted pairs will result in high levels of crosstalk.

**Simplex Transmission** - Data transmission over a circuit capable of transmitting in one preassigned direction only.

**Single Mode Fibre** - An optical fibre that will allow only one mode to propagate. The fibre has a very small core diameter of approximately 8  $\mu\text{m}$ . It permits signal transmission at extremely high bandwidth and allows very long transmission distances.

**Single-ended** - An unbalanced circuit or transmission line, such as a coaxial cable transmission line (see also Balanced Line).

**Sinusoidal** - A signal which varies over time in proportion to the sine of an angle. Ordinary alternating current is sinusoidal.

**Skew Rays** - A ray that does not intersect the fibre axis. Generally, a light ray that enters the fibre at a very high angle.

**Skin Effect** - The tendency of alternating current to travel on the surface of a conductor as the frequency increases.

**SMA Connector** - A threaded type fibre optic connector. The 905 version is a straight ferrule design, whereas the 906 is a stepped ferrule design.

**SMF** - see Single Mode Fibre

**S/N** - see Signal to noise ratio

**SNR** - see Signal to noise ratio

**SONET** - see Synchronous Optical Network.

**Source** - In fibre optics, the device which converts the electrical information carrying signal to an optical signal for transmission over an optical fibre. A fibre-optic source may be a light emitting diode or laser diode.

**Spectral Bandwidth** - The difference between wavelengths at which the radiant intensity of illumination is half its peak intensity.

**Spectrum** - Frequencies that exist in a continuous range and have a common characteristic. A spectrum may be inclusive of many spectrums (e.g. the electromagnetic radiation spectrum includes the light spectrum, radio spectrum, infrared spectrum, etc.)

**Speed of Light** - In a vacuum, 299,800,000 meters per second.

**Splice** - A joining of conductors generally from separate sheaths.

**Splice Closure** - A device used to protect a cable or wire splice.

**Split Pair** - A wiring error in twisted pair cabling where one of a pair's wires is interchanged with one of another pair's wires. Split pair conditions may be determined with a transmission test. Simple DC continuity testing will not reveal the error, because the correct pin-to-pin continuity exists between ends. However, the error may result in impedance mismatch, excessive crosstalk, susceptibility to interference, and signal radiation.

**SRL** - see Structural Return Loss

**SSTP, S/STP** - see Screened/Shielded Twisted Pair

**ST Connector** - Designation for the "straight tip" connector developed by AT&T. This fibre optic connector features a physically contacting non-rotating 2.5mm ferrule design and bayonet connector-to-adapter mating. Used with Ethernet 10Base-FL and FIORL links.

**Standing Wave** - The stationary pattern of waves produced by two waves of the same frequency travelling in opposite directions on the same transmission line. The existence of voltage and current maxima and minima along a transmission line is a result of reflected energy from an impedance mismatch.

**Standing Wave Ratio (swr)** - A ratio of the maximum amplitude to the minimum amplitude of a standing wave stated in current or voltage amplitudes.

**Star Network** - A network in which all stations are connected through a single point.

**Star Topology** - A topology in which each outlet/connector is wired directly to the distribution device.

**Static Charge** - An electrical charge that is bound to an object. An unmoving electrical charge.

**Station** - A unique, addressable device on a network.

**Stay Cord** - A component of a cable, usually of high tensile strength, used to anchor the cable ends at their points of termination and keep any pull on the cable from being transferred to the electrical conductors.

**Step Index Fibre** - An optical fibre in which the core is of uniform refractive index with a sharp decrease in the index of refraction at the core-cladding interface. Step index multimode fibres generally have lower bandwidths than graded index multimode fibres.



**Step Insulated** - Process of applying insulation in two layers. Typically used in shielded networking cables such that the outer layer of insulation can be removed and remaining conductor and insulation can be terminated in a RJ-45 type connector.

**Stitching** - The activity of terminating multiconductor cables on a punchdown block.

**STP** - see Shielded Twisted Pair

**STP-A** - Refers to the enhanced IBM Cabling System specifications with the Type "A" suffix. The original IBM Type 1, 2, 6, & 9 specifications were designed to support operation of 4 and 16 Mbps Token-Ring. The enhanced Type 1A, 2A, 6A, & 9A cable specifications were designed to support operation of 100 Mbps FDDI signals over copper.

**Strain Gauge** - A device for determining the amount of strain (change in dimensions) when a stress is applied.

**Strength Member** - That part of a fibre optic cable that increases the cable's tensile strength and serves as a load bearing component. Usually made of Kevlar aramid yarn, fibreglass filaments, or steel strands.

**Structural Return Loss (SRL)** - A measure of the impedance uniformity of a cable. It measures energy reflected due to structural variations in the cable. A higher SRL number indicates better performance (more uniformity and lower reflections).

**Structured Wiring** - Telecommunications cabling that is organized into a hierarchy of wiring termination and interconnection structures. The concept of structured wiring is used in the common standards from the TIA and EIA.

**STS-n** - Synchronous Transport Signal-n (see Optical Carrier-n).

**Subminiature D Connector** - A family of multipin data connectors available in 9, 15, 25 and 37 pin configurations. Sometimes referred to as DB9, DB15, DB25 and DB37 connectors respectively.

**Surge** - A temporary and relatively large increase in the voltage or current in an electric circuit or cable. Also called transient.

**Surge Suppression** - The process by which transient voltage surges are prevented from reaching sensitive electronic equipment.

**Sweep Test** - Pertaining to cable, the frequency response is verified by generating an rf voltage whose frequency is swept repeatedly through a given frequency range at a rapid constant range. The cable response is observed on an oscilloscope. The structural return loss sweep test measures the magnitude of internal cable reflections. A high structural return loss is desirable.

**Synchronous** - Transmission in which the data character and bits are transmitted at a fixed rate with the transmitter and receiver being synchronized.

**Synchronous Digital Hierarchy (SDH)** - International standard for optical digital transmission at hierarchical rates from 155 Mbps to 2.5 Gbps and beyond.

**Synchronous Optical Network (SONET)** - A USA standard for optical digital transmission at hierarchical rates from 155 Mbps to 2.5 Gbps and beyond.

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## T

**T1** - T1 is a 1.544 Mbps multichannel digital transmission system for voice or data provided by long distance carriers. Also referred to as DS1 (Data Services).

**T3** - T3 is a 44.736 Mbps multichannel digital transmission system for voice or data provided by long distance carriers. Also referred to as DS3 (Data Services).

**Tap** - On Ethernet 10Base5 thick coaxial cable, a tap is a method of connecting a transceiver to the cable by drilling a hole in the cable, inserting a contact to the centre conductor, and clamping the transceiver onto the cable at the tap.

**TC** - Telecommunications Cross Connect.

**TDR** - See Time Domain Reflectometry

**Teflon** - Dupont Company trademark for flouorocarbon resins (see FEP and TFE).

**Telecommunications Closet** - see Closet

**Telecommunications Equipment Room** - see Equipment Room

**Terminal** - A point at which information may enter or leave a communications network or a device by means of which wires may be connected to each other.

**Terminator** - A device that provides electrical resistance at the end of a transmission line. Its function is to absorb signals on the line, thereby keeping them from bouncing back and being received again by the network.

**TFE** - Tetraflouroethylene. A thermoplastic material with good electrical insulating properties and chemical and heat resistance.

**Thermal Rating** - The temperature range in which a material will perform its function without undue degradation.

**Thermoplastic** - A material which will soften, flow, or distort appreciably when subjected to sufficient heat and pressure. Examples are polyvinyl chloride and polyethylene.

**Thermosetting** - A material which will not soften, flow, or distort appreciably when subjected to sufficient head and pressure. Examples are rubber and neoprene.

**Thicknet** - Ethernet 10Base5 coaxial cable.

**Thinnet** - Ethernet 10Base2 coaxial cable. Also called "cheapernet".

**TIA** - Telecommunications Industry Association. Body which authored the TIA/EIA 568-A "Commercial Building Telecommunications Wiring Standard" in conjunction with EIA.

**Time Division Multiplexing (TDM)** - A technique for combining many signals on a single circuit by interleaving bits or bytes of data from successive channels.

**Time Domain Reflectometry** - A technique for measuring cable lengths by timing the period between a test pulse and the reflection of the pulse from an impedance discontinuity on the cable. The returned waveform reveals many undesired cable conditions, including shorts, opens, and transmission anomalies due to excessive bends or crushing. The length to any anomaly, including the unterminated cable end, may be computed from the relative time of the wave return and nominal velocity of propagation of the pulse through the cable. See also Optical Time Domain Reflectometry.

**Tinsel** - A type of electrical conductor comprised of a number of tiny threads, each having a fine, flat ribbon of copper or other metal closely spiralled about it. Used for small size cables requiring limpness and extra-long flex life.

**Tip** - A polarity designation of one wire of a pair indicating that the wire is that of the primary (common) colour of a 5-pair group (e.g. the white-blue wire of the blue pair) or a wiring contact to which the tip wire is connected or the positive wiring polarity (also see "ring").

**TNC** - A threaded connector used to terminate coaxial cables. TNC is an acronym for threaded Neill-Concelman.

**Token Passing** - A network access method in which a station must wait to receive a special token frame before transmitting.

**Token-Ring** - A local area network (LAN) protocol defined in the IEEE 802.5 standard in which computers access the network through a token passing scheme. Uses a star-wired ring topology.

**Topology** - The physical or logical interconnection pattern of a network.

**Transceiver** - A combination of the words TRANSMITTER and RECEIVER. A transceiver is the set of electronics that send and receive signals on the Ethernet media system. Transceivers may be small outboard devices, or may be built into an Ethernet port. Also called Media Attachment Unit, or MAU.

**Tracer** - The contrasting colour coding stripe along an insulated conductor of a wire pair.

**Transducer** - A device for converting mechanical energy into electrical energy.

**Transfer Impedance** - For a specified cable length, transfer impedance relates to a current on one surface of a shield to the voltage drop generated by this current on the opposite surface of the shield. Transfer impedance is used to determine shield effectiveness against both ingress and egress of interfering signals. Shields with lower transfer impedance are more effective than shields with higher transfer impedance.

**Transmission Line** - An arrangement of two or more conductors or a wave guide used to transfer a signal from one location to another.

**Transmission Media** - Anything such as wire, coaxial cable, fibre optics, air or vacuum, that is used to carry a signal.

**Transmitter** - A device that converts electrical signals for transmission to a distant point. In fibre optic systems, the electronic component that converts electrical energy to light energy.

**Transition Point** - A location in the horizontal cabling where flat under carpet cable connects to round cable.

**Tree Topology** - LAN topology similar to linear bus topology, except that tree networks can contain branches with multiple nodes.

**Triaxial Cable, Triax** - Triax cable is coax cable with an additional outer copper braid insulated from signal carrying conductors. It has a core conductor and two concentric conductive shields.

**Triboelectric Noise** - Noise generated in a shielded cable due to variations in capacitance between the shield and conductor as the cable is flexed.

**Trunk Cable** - see Feeder Cable.

**TSB** - Telecommunications Systems Bulletin

**Turn-key** - A contractual arrangement in which one party designs and installs a system and "turns over the keys" to another party who will operate the system.

**Twinaxial Cable, Twinax** - A type of communication transmission cable consisting of two centre conductors surrounded by an insulating spacer which in turn is surrounded by a tubular outer conductor (usually a braid, foil or both). The entire assembly is then covered with an insulating and protective outer layer. It is similar to coaxial cable except that there are two conductors at the centre.

**Twin-lead** - A transmission line having two parallel conductors separated by insulating material. Line impedance is determined by the diameter and spacing of the conductors and the insulating material and is usually 300 ohms for television receiving antennas.

**Twisted Pair** - A multiple conductor cable whose component wires are paired together, twisted, and enclosed in a single jacket. Each pair consists of two insulated copper wires twisted together. When driven as a balanced line, the twisting reduces the susceptibility to external interference and the radiation of signal energy. Most twisted-pair cabling contains either 2, 4, or 25 pairs of wires.

**Tx** - Transmit

**Type N Connector** - A threaded barrel constant impedance coaxial connector for large diameter cable such as Ethernet 10Base5 thicknet cable.

**Type 1** - 150 ohm shielded twisted pair (STP) cabling conforming to the IBM Cabling System Specifications. Two twisted pairs of 22 AWG solid conductors for data communications are enclosed in a braided shield covered with a sheath. Tested for operation up to 16 MHz. Available in plenum, non-plenum, riser, and outdoor versions.

**Type 1A** - Enhanced version of IBM Type 1 cable rated for operation up to 300 Mhz. Meets electrical specifications for 150 ohm STP-A Cable as documented in the TIA/EIA 568-A standard.

**Type 2** - 150 ohm shielded twisted pair (STP) cabling conforming to the IBM Cabling System specifications. Two twisted pairs of 22 AWG solid conductors for data communications are enclosed in a braided shield. Four additional pairs of 22 AWG solid conductors for telephones are also included in the cable jacket but outside the braided shield. Tested for operation up to 16 MHz. Available in plenum and non-plenum versions.

**Type 2A** - Enhanced version of IBM Type 2 cable rated for operation up to 300 Mhz. Meets electrical specifications for 150 ohm STP-A Cable as documented in the TIA/EIA 568-A standard.

**Type 3** - IBM Cabling System designation for 100 ohm unshielded twisted pair (UTP) cabling similar to TIA/EIA Category 3 cabling. 22 AWG or 24 AWG conductors with a minimum of two twists per linear foot. Typically four twisted pairs enclosed within cable jacket.

**Type 5** - 100/140 micron optical fibre cable conforming to the IBM Cabling System specifications. Two optical fibres are surrounded by strength members and a polyurethane jacket. Type 5J is a 50/125 micron version defined for use in Japan.

**Type 6** - 150 ohm shielded twisted pair (STP) cabling conforming to the IBM Cabling System specifications. Two twisted pairs of 26 AWG stranded conductors for data communications. Flexible for use in making patch cables. Tested for operation up to 16 MHz. Available in non-plenum version only.

**Type 6A** - Enhanced version of IBM Type 6 cable rated for operation up to 300 Mhz. Meets electrical specifications for 150 ohm STP-A Cable as documented in the TIA/EIA 568-A standard.

**Type 8** - 150 ohm under-carpet cable conforming to the IBM Cabling System Specifications. Two individually shielded parallel pairs of 26 AWG solid conductors for data communications. The cable includes "ramped wings" to minimize visibility when installed under carpeting. Tested for operation up to 16 MHz.

**Type 9** - 150 ohm shielded twisted pair (STP) cabling conforming to the IBM Cabling System Specifications. A plenum rated cable with two twisted pairs of 26 AWG solid or stranded conductors for data communications enclosed in a braided shield covered with a sheath. Tested for operation up to 16 MHz.

**Type 9A** - Enhanced version of IBM Type 9 cable rated for operation up to 300 Mhz. Meets electrical specifications for 150 ohm STP-A Cable as documented in the TIA/EIA 568-A standard.

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## U

**UL** - Underwriters Laboratories, Inc.

**Unbalanced Line** - A transmission line in which voltages on the two conductors are unequal with respect to ground. Generally one of the conductors is connected to a ground point. An example of an unbalanced line is a coaxial cable.

**Underground Cable** - Cable that is intended to be placed beneath the surface of the ground in ducts or conduit. Not necessarily intended for direct burial in the ground.

**Unilay** - A conductor with more than one layer of helically laid wires with the direction of lay and length of lay the same for all layers.

**Unshielded Twisted Pair (UTP)** - Twisted pair cabling that includes no shielding. UTP most often refers to the 100 ohm Category 3, 4, & 5 cables specified in the TIA/EIA 568-A standard.

**USOC** - Universal Service Order Code. Pronounced "U-Sock". An old Bell System term used to identify a particular service or device offered under tariff. Often used to refer to an old cable color code scheme that was current when USOC codes were in use.

**UTP** - see Unshielded Twisted Pair.

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## V

**V** - Symbol for Volt.

**VA** - Volt-ampere. A designation of power in terms of voltage and current.

**Vampire Tap** - see Tap

**Velocity of Propagation** - The transmission speed of electrical energy in a length of cable compared to speed in free space. Usually expressed as a percentage. Test devices use velocity of propagation to measure a signal's transit time and thereby calculate the cable's length.

**VGM** - Voice Grade Media (see Voice Grade)

**VHF** - Very high frequency. The portion of the electromagnetic spectrum extending from 30 to 300 MHz.

**Video** - A signal which contains visual information, such as a picture in a television system.

**Voice Grade** - A term used for twisted-pair cable used in telephone systems to carry voice signals.

**Volt** - The unit of electrical potential. One volt is the electrical potential that will cause one ampere of current to flow through one ohm of resistance.

**Voltage** - Electrical potential expressed in Volts.

**Voltage Drop** - The voltage developed across a component by the current flow through the resistance of the component.

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## W

**W** - Symbol for Watt or Wattage. Can also be for the colour white.

**Watt** - A unit of electrical power. One watt is equivalent to the power represented by one ampere of current flowing through a load with a voltage drop of one volt in a dc circuit.

**Wave Form** - A graphical representation of the amplitude of a signal over time.

**Wavelength** - The distance between successive peaks or nodes of a wave.

**Wavelength Division Multiplexing (WDM)** - The process of combining and splitting signals on the basis of difference in their wavelengths.

**WAN** - Wide Area Network. A network connecting computers within very large areas, such as states, countries, & the world.

**wire fault** - An error condition caused by a break in the wires or a short between the wires (or shield) in a segment of cable.

**Wiring Closet** - see Closet

**Work Area** - That area of the premises cabling where users are located. The area from the communications outlet to the equipment connected to the premises cabling. Loosely, an office, cubicle, and so forth.

**Workgroup** - A collection of workstations and servers on a LAN that are designated to communicate and exchange data with one another.

**Workstation** - A computer connected to a network at which users interact with software stored on the network.

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## X

**X** - Symbol for reactance or cross-connect.

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## Y

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## Z

**Z** - Symbol for impedance.

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## 0-9

**1Base5** - IEEE 802.3 shorthand term for StarLAN at 1Mbps data transfer rate.

**10Base2** - IEEE 802.3 shorthand term for 10 Mbps Ethernet based on Manchester signal encoding over thin coaxial cable. Also called "Thinnet" or "Cheapernet".

**10Base5** - IEEE 802.3 shorthand term for 10 Mbps Ethernet based on Manchester signal encoding over thick coaxial cable. Also called "Thicknet".

**10Base-F** - IEEE 802.3 shorthand term for 10 Mbps Ethernet based on Manchester signal encoding over fibre optic cable.

**10Base-T** - IEEE 802.3 shorthand term for 10 Mbps Ethernet based on Manchester signal encoding over category 3 or better twisted pair cable.

**10Broad36** - IEEE 802.3 shorthand term for 10 Mbps Ethernet on broadband cable.

**100Base-FX** - IEEE 802.3 shorthand term for 100 Mbps Fast Ethernet based on 4B/5B signal encoding over fibre optic cable.

**100Base-T** - IEEE 802.3 shorthand term for entire 100 Mbps Fast Ethernet system.

**100Base-T2** - IEEE 802.3 shorthand term for 100 Mbps Fast Ethernet based on PAM5x5 signal encoding and using two pairs of category 3 twisted pair cable.

**100Base-T4** - IEEE 802.3 shorthand term for 100 Mbps Fast Ethernet based on 8B6T signal encoding and using four pairs of category 3 twisted pair cable.

**100Base-TX** - IEEE 802.3 shorthand term for 100 Mbps Fast Ethernet based on 4B/5B signal encoding and using two pairs of category 5 twisted pair cable.

**100Base-X** - IEEE 802.3 shorthand term for any 100 Mbps Fast Ethernet system based on 4B/5B signal encoding. Includes 100Base-TX and 100Base-FX.

**1000Base-CX** - IEEE 802.3 shorthand term for 1000 Mbps Gigabit Ethernet based on 8B/10B signalling over copper cable.

**1000Base-LX** - IEEE 802.3 shorthand term for 1000 Mbps Gigabit Ethernet based on 8B/10B signalling using long wavelength laser transmitters over fibre optic cable.

**1000Base-SX** - IEEE 802.3 shorthand term for 1000 Mbps Gigabit Ethernet based on 8B/10B signalling using short wavelength laser transmitters over fibre optic cable.

**1000Base-T** - IEEE 802.3 shorthand term for 1000 Mbps Gigabit Ethernet over twisted pair cable.

**1000Base-X** - IEEE 802.3 shorthand term for any 1000 Mbps Gigabit Ethernet based on 8B/10B signalling. Includes 1000Base-CX, 1000Base-LX, and 1000Base-SX.

**2B+D** - Describes basic ISDN service (2B+D = Two bearer channels and one data channel).

**4B/5B** - Signal encoding method used in 100Base-TX/FX Fast Ethernet and FDDI standards. 4-bit binary values are encoded into 5-bit symbols.

**66-type Connecting Block** - Used by telephone company to terminate twisted pairs. Not recommended for LAN use.

**8B6T** - Signal encoding method used in 100Base-T4 Fast Ethernet standard.

**8B/10B** - Signal encoding method used in the 1000Base-X Gigabit Ethernet standards.

**802.1** - see IEEE 802.1

**802.2** - see IEEE 802.2

**802.3** - see IEEE 802.3

**802.5** - see IEEE 802.5