Leader Optec Fibre Glossary of Terms

A

ABSORPTION LOSSES
Light losses (Attenuation) normally caused by impurities such as transition metals, neighbouring elements, water and intrinsic metal absorption.
ACCEPTANCE ANGLE
The maximum angle to the axis (centre line) of an optical fibre at which a light ray will enter the core and be propagated. Light striking the optical fibre at an angle greater than the Acceptance Angle will be lost.
ANALOGUE
A data format which uses continuous physical variables such as voltage amplitude or frequency variations.
ANSI
American National Standards Institute - which co-ordinates voluntary standards in the USA.
APEX OFFSET
The distance from the centre of the fibre core to the apex of the ferrule. Poor apex offset results in attenuation due to increases in return loss (reflection) & insertion loss.
ARMOUR
Extra cable protection to improve resistance to crushing, cutting and shearing forces. The usual form is a braided steel outer jacket but tough plastic with steel or plastic strengtheners is also used in many modern cable designs.
ASCII
American Standard Code for Information Interchange. An 8-bit code in which letters, numbers and symbols are represented by 7-bit binary characters. The 8th-bit is often used as a parity check.
ASYNCHRONOUS TRANSFER MODE (ATM)
The technology selected by the CCITT to deliver broadband-ISDN services. A fast packet based technology ATM is based on a fixed packet or cell size of 53 bytes long.
ASYNCHRONOUS TRANSMISSION
A free running transmission mode in which the time intervals between characters may be unequal. Transmission is not synchronised with any external clock.
ATTENUATION
A loss measure for voltage, current or power (optical or electrical). The loss in optical power along an optical fibre is measured in dB/km, and should be quoted at a specified light wavelength. Beware when converting linear ratios to dB, which is a logarithmic ratio. The tables for voltages and currents are different from those referring to power.
ATTENUATOR
A device used to increase the attenuation of an Optical Fibre link, generally used to ensure that the signal at the receive end is not too strong.

B

BACKBONE LAN
This is normally a LAN that supports internetworking between access LAN's but exhibits a higher speed and covers a wider area than a standard LAN.
BACK REFLECTION - See Return Loss
BACKSCATTER
Scattering in directions reverse to the incident beam.
BANDWIDTH
Bandwidth is the difference between the lower and upper frequencies that can be sent along a communication channel. When used in radio engineering, bandwidth is quoted in cycles per second (hertz or Hz) but the word bandwidth is now also used to specify digital data transmission channels and Hz then refers to bits per second. The bandwidth of Ethernet, for example, is 10mhz (mega-hertz).
BASEBAND
Used to describe a type of network in which one frequency (or bit rate) is used to carry all information. The alternative is Broadband.
BAUD
A unit used in signalling which indicates a speed equal to the number of shortest signal events per second.

BEND LOSS
Attenuation to an optical signal that occurs when an optical fibre is bent around a tight radius. Light effectively spills out from the core and is lost in the cladding.

BEND RADIUS
The minimum radius around which a fibre may be curved without risk of permanent damage resulting in excessive attenuation, or even breakage.
BER
Bit Error Rate.
BISDNB
Broadband Integrated Services Digital Network.
BIT
The commonly used abbreviation for a binary digit.
BIT ERROR RATE
The percentage of bits that are incorrectly received.
BIT TRANSFER RATE
The bit transfer rate is expressed as bits per second or bps.
BLOCK
A group of digits transmitted as a whole.
BLOWN FIBRE
Empty micro-ducts are pre-installed on-site. As, and when required, fibres are blown into place with compressed air.
BROADBAND
The transmission of digital data streams over a wide bandwidth channel using modulated analogue signals. Several data streams can be carried simultaneously by using different carrier frequencies.
BS7718
Code of Practice for the installation of fibre optic cabling.
BUFFER (1)
A mechanically resilient protective coating that is applied over a fibre. Also referred to as Secondary Coating.
BUFFER (2)
A Storage device used to compensate for a difference between rates of transmission and receipt of data.
BUS
Cabling, carrying signals around inside a computer or between computers and other devices.
BYTE
A binary string which is normally of 8 bits.

C

CABLE
A cable construction whereby one or more optical fibres are contained within a jacket, which may also contain a variety of strengthening and other protective materials.
CATV
Community Antenna (Access) TeleVision.
CCITT
Comite Consultatif International de Telegraphique et Telephonique - an international organisation which devises and recommends standards for international telecommunications.
CCTV
Closed Circuit Television.
CHANNEL
A communication path for transmission of data between two points.
CHROMATIC DISPERSION
Pulse spreading in an optical fibre caused by variations in light propagation with wavelength. The sum of waveguide dispersion and material dispersion.
CLADDING
The low refractive index material that surrounds the core of an optical fibre and ensures the internal reflection on which propagation of light signals depends.
COHERENT BUNDLE
Optical fibres that are packed in a coherent bundle retain fixed relative positions at each end and can transmit an optical image. Used extensively in flexible endoscopes (fibrescopes).

COHERENT COMMUNICATIONS
A transmission system in which the phase relationships of signals are known and controlled, leading to higher bandwidths.
CONNECTOR
Termination component installed on ends of fibre optic cables. It provides physical attachment and optical coupling to further cables, transmitters, receivers and other devices.

CONTENTION SYSTEM
A communications network in which two or more stations have equivalent status and contend for access to the transmission medium.
CORE
The centre, light guiding part of an optical fibre. The refractive index is higher than that of the cladding, to ensure propagation of optical signals.
CORE ECCENTRICITY
A measure of the displacement of the centre of a core relative to the cladding centre.
CORE ELLIPTICITY
A measure used to indicate a core's deviation from roundness.
COUPLER
An optical component which splits or combines optical communication channels.
COUPLING
Transfer of light into or out of an optical fibre, (not implying the use of a coupler).
CRITICAL ANGLE
The limiting angle at which a light ray will be totally internally reflected.
CROSS TALK
Interference signal between communication channels.
CSMA
Carrier Sense Multiple Access. A network access procedure whereby before transmitting to the network a station checks for the presence of a carrier signal showing that the network is already being used. Transmission only starts if no other carrier is detected.
CSMA/CD
Carrier Sense Multiple Access with Collision Detection. A type of network, (e.g. Ethernet), in which all connected devices monitor continuously. If a transmitted message overwrites one already on the network a collision is detected and the message is re-transmitted.
CUT-OFF WAVELENGTH
The longest wavelength at which a singlemode fibre can transmit two modes.

D

DATALINK
In fibre optics, a transmitter, optical fibre cable and receiver that transmits digital date between two points.
DATA RATE
The rate at which BITs of information are transmitted along a fibre.
DATA SIGNALLING RATE
The rate at which data bits can be transmitted, measured in bits per second (bps).
DBMS
Decibels relative to a power level of 1mW.
DECIBEL (dB)
A logarithmic comparison of power levels, (optical or electrical), voltages and currents.
DEMODULATION
Re-creation of an original data stream from a modulated signal.
DEMULTIPLEXING
Splitting up a multiplexed signal into its component parts.
DEMUX
De-multiplexer
DETECTOR
In fibre optics, a device that generates an electrical signal when illuminated by light. Examples are photodiodes and phototransistors.
DIGITAL
A series of coded pulses that, according to their absence or presence, can carry streams of data. Their format may use either discrete or separate physical levels.
DIGITAL SIGNAL
A signal encoded in discrete levels, typically binary 1 and binary 0.
DIODE
An electronic device which lets current flow in one direction only. Diodes used in fibre optics include light emitters, (LED's and laser diodes) and detectors (photodiodes).
DIRECTIONAL COUPLER
An optical fibre coupler where light at the input ports is only transferred to one or more defined output ports.
DISPERSION

Dispersion causes a broadening of pulses as they are propagated along an optical fibre, causing limitations in bandwidth.

DISTRIBUTED SYSTEM
A system containing two or more intelligent stations linked by a communication network.

DOPANT
In fibre optics, a material such as germanium or boron oxide that is added to silica to change the refractive index.

DUAL RING (FDDI DUAL RING)
A pair of counter rotating logical rings.

DUPLEX TRANSMISSION
Simultaneous independent transmission in both directions over a communication link, sometimes over the same fibre.

DUTY CYCLE
When applied to a periodic waveform, this is a measure of the effect of a pulsed input to a device. Normally expressed as the ratio of on time to total cycle time.

DYNAMIC RANGE
In opto-electronics, the maximum operating power range expressed in dB.

E

EDGE LIGHT EMITTING DIODE (ELED)
An LED that emits light from its edge which can be coupled into an optical fibre more efficiently than light from a conventional LED.

EIA
Electronic Industry Association.

ERROR RATE
The ratio of incorrectly received data (bits, characters or blocks) to the total amount of transmitted data.

ESCON
Enterprise System CONnectivity.

ETHERNET
A network using CSMA/CD which is widely used for LANs. Most Ethernets use coaxial cable but optical fibres are usually specified for links between buildings, to avoid risk of lightning damage and EMI, and to provide electrical isolation.

EXPANDED BEAM CONNECTOR
A connector in which the diameter of a beam of light emerging from a fibre is expanded, then focused onto the core of another fibre.

F

FACEPLATE
A rigid array of short fibres fused together to form the face of a cathode ray tube.

FAST ETHERNET
A similar topology to traditional Ethernet operating at 100Mb/s.

FDDI
Fibre optic Distributed Data Interface.

FERRULE
A tube, housed within a connector, in which the central bore contains and aligns the optical fibre.

FIBRE OPTIC DISTRIBUTED DATA INTERFACE (FDDI)
A standard for a 100Mb/s fibre optic local area network.

FIBRE OPTIC SYSTEM
In Datacoms and Telecoms a system employing fibre optic cable to transmit data, voice and video signals.

FIBRE OPTICS
The branch of optical, communication and electronic technologies concerned with the transmission of electromagnetic radiation through thin fibres made of transparent material such as glass, fused silica and plastic.

FIBRE UNDERCUT OR PROTRUSION
It is the distance of the fibre end face relative to the spherical surface of the ferrule. Typically ±50nm, excessive undercut adversely effects both Back Reflection and Insertion Loss, whereas excessive protrusion can lead to fibre damage or even component failure in service.

FLUX
The level of power passing either to, from or through a surface measured on energy per unit time.

FREQUENCY DIVISION MULTIPLEXING
Multiplexing of signals by assigning a different carrier frequency to each and then combining in a single signal.

FREQUENCY MODULATION
Changing the carrier wave frequency according to changes in an information stream.

FRESNEL REFLECTION
Reflection of light at the end of an optical fibre caused by the difference of refractive index between the fibre core and the media (often air) with which it is interfacing.
FTTC
Fibre To The Curb.
FTTH
Fibre To The Home.
FUNDAMENTAL MODE
The lowest order mode of a waveguide.
FUSED (FUSION) SPLICE
Splice in which two optical fibres are fused together by a heat process.

G

GATEWAY
A device that interconnects two communication networks and transfers messages between them by translating protocols, buffering data rates and accommodating different physical interfaces such as connectors and cables. A gateway might by used to link a network using optical fibres with a coaxial cable based system.
GHz (GIGAGHERTZ)
Measure of frequency equal to 10^9 hertz.
G.I
Graded Index
GRADED INDEX FIBRE
Optical fibre with a refractive index profile that is maximum at the centre and decreases until it matches the index of the cladding at the core/cladding interface. Light rays are thus re-focused in the core. They travel more quickly in the lower index regions of the core, which reduces modal dispersion.

H

HALF-DUPLEX TRANSMISSION
Transmission in either direction along a communications link, but not in both directions simultaneously.
HANDSHAKE SIGNALS
Signals used to request permission to send messages, and to acknowledge the receipt of data transfers.
HDTV
High Definition Television.
HEAD END
The central distribution point in a broadband data highway or cable television system.
HERMAPHRODITE CONNECTOR
A connector pair in which each part includes both pins (male) and sockets (female).
HERTZ (Hz)
Unit of frequency, in cycles per second.
HUB
A multi- port repeater used in Ethernet environments to distribute data to multiple users.

I

IEE
The Institution of Electrical Engineers (British).
IEEE
The Institution of Electrical and Electronics Engineers (USA). IEEE Committee 802 and its various sub-committees define interface and communication standards for networks.
INDEX MATCHING MATERIAL
Normally a gel or liquid with a refractive index that is almost equal to the core index. Normally used to reduce reflections at a fibre end face.
INDEX OF REFRACTION
The ratio of the speed of light in a vacuum to the speed in a media such as glass or air.
INDEX PROFILE
Curve of the refractive index over the cross section of an optical waveguide.
INFRARED
The band of electromagnetic wavelengths between 700nm to about 1mm. The transmission of light in glass optical fibres is most efficient in the infrared, at wavelengths from 1100nm to 850nm.
INSERTION LOSS
The extra optical attenuation caused by the insertion of a component into an optical system.

INTEGRATED OPTICS
Design and application of optical devices that perform several functions on a single substrate.
INTEGRATED OPTOELECTRONICS
Integration of optical and electronic devices on the same chip.
INTRINSIC LOSSES
Losses in a splice that arise from differences in the two fibres being joined together.
ISDN
Integrated Services Digital Network. A public network in which a single subscriber interface provides a variety of communication services for voice and data.
ISO
International Standards Organisation.
ISOLATOR
A two part component having greater attenuation in one direction than the other often used to prevent return reflections in a transmission path.

J

JACKET
A layer of material surrounding an optical fibre but not bonded to it; part of the cable, not of the fibre.

K

KEVLAR
A strong synthetic material used widely as strength members within optical fibre cables. The name is a trademark of Dupont.

L

LAN
Local Area Network.
LARGE CORE FIBRE
An optical fibre with core diameter greater than 100 micron.
LASER
Light Amplification by Stimulated Emission of Radiation. In fibre optics, laser diodes are widely used as light emitters, especially in singlemode and long haul systems. Light from laser diodes covers only a narrow band of wavelengths so that dispersion caused by differing light velocities in an optical fibre is substantially reduced.
LD
Laser Diode.
LED
Light Emitting Diode.
LIGHT
Electromagnetic radiation visible to human eye; also applied to invisible near infrared radiation that carries signals in most optical fibre systems.
LIGHT DETECTOR
In fibre optics a semiconductor device that can detect light and transform this into an electrical output.

LIGHTGUIDE
Optical fibre or fibre bundle.
LOCAL AREA NETWORK
A data communications network serving a limited area such as a building or factory site.
LOCAL LOOP
The subscriber link in a telephone network.
LONG HAUL NETWORK
A network that carries data between towns and cities involving long distances. Distances may be up to several hundred miles. Optical fibres are extensively used for this application.
LOOPBACK
Diagnostic test where the transmitted signal is returned to the sending device after passing through a datacomms link or network.
LOOSE TUBE
A protective tube loosely surrounding an optical fibre or cable which is often filled with protective gel.
LOSS
Attenuation of an optical signal, usually measured in dB.
LOSS BUDGET

An account showing the overall loss in an optical fibre link, compared with the minimum received power specified at the receiver and the power available from the transmitter. Because losses are usually expressed in dB, a logarithmic expression, a simple approach need only involve addition and subtraction.

M

MACROBENDING
Bend of radius much larger than the fibre core as opposed to micro-bending.
MACROBENDING LOSS
Loss in an optical fibre due to bends of radius larger than the fibre diameter.
MAN
Metropolitan Area Network.
MANCHESTER ENCODING
A self-clocking data encoding technique. If an o is sent, a low to high transition occurs halfway through the bit period; conversely if a 1 is sent, a high to low transition occurs. There is at least one signal transition in every bit.
MARGIN
Allowance for attenuation in addition to that allowed for in system design.
MATERIAL DISPERSION
Pulse dispersion in an optical fibre caused by variation of refractive index with wavelength.
Mbit/s Mbps, Mb/s
Mega Bits per Second = 10^6 bits per second; 10^6bps.
MECHANICAL SPLICE
A splice in which optical fibres are joined mechanically but not fused together.
MEDIA INTERFACE CONNECTOR (MIC)
A mated connector pair providing attachment between an FDDI node and a fibre cable plant. Referred to as FDDI connector.
Mhz (MEGAHERTZ)
Unit of frequency equal to 10^6 hertz.
MIC
Media Interface Connector used to describe the duplex FDDI plug.
MICROBENDING
Tiny bends in a fibre that increases loss by allowing spillage of light from the core.
MICROMETRE (um)
10^{-6} metre
MICRON (um)
A micrometre.
MINIMUM BEND RADIUS
See Bend Radius
MODAL DISPERSION
Dispersion caused by the difference in time taken by different modes to travel along a multimode fibre.
MODE
A permitted electromagnetic field pattern in an optical fibre.
MODE FIELD DIAMETER
The diameter of the one mode of light that is being propagated in a singlemode fibre.
MODE SCRAMBLER
A unit containing one or more optical fibres in which strong mode coupling occurs. Normally used as a means of providing a mode distribution independent of source characteristics.
MODE STRIPPER (OR CONDITIONER OR FILTER)
A device that removes high order modes in a multimode fibre, to standardise conditions for measurement.
MODEM
MOdulator-DEModulator. A device which accepts a serial stream of bits as input and produces a modulated analogue signal as output; and vice-versa.
MODULATION
A coding method allowing controlled variation, with time, of any property of a wave for the purpose of transferring information.
MONCHROMATIC
A single wavelength.
MULTI-DROP LINE
A single communications line to which more than one node is attached.
MULTICHANNEL CABLE
Optical cable containing more than one optical fibre.

MULTIMODE DISTORTION
The distortion of a signal in a wave-guide resulting from the superposition of modes with differing delays.
MULTIMODE FIBRE
Optical fibre with a core size that permits propagation of non-axial rays. Usually described by referring to core diameter and cladding diameter, e.g. 62.5/125.
MULTIPLEXING
Combining several data channels so that a composite signal can be transmitted over a single communications link.
MUX
Multiplexer.

N

NA
Numerical Aperture.
NANOMETRE (ns)
10^{-9} metre.
NANOSECOND (ns)
10^{-9} second.
NETWORK TOPOLOGY
The physical and logical arrangement of interconnections between network stations. Most optical fibre networks have star or ring topologies, and their derivatives, because of the difficulty in making a T-junction in optical fibre, needed for a highway configuration.
nm
Nanometre=10^{-9} metre.
NIC
Network Interface Card.
NODE
A point within a communications network at which data is received or from which it is sent. Interconnection points within a network are also called nodes.
NRZ
No Return to Zero. A digital code in which the signal level is low for 0 and high for 1 but does not return to zero between successive bits. Important in fibre optic data transmission because the 0 level at the receiver end of a link can be substantially higher than the dark current level.
ns
Nanosecond=10^{-9} second.
NUMERICAL APERTURE (NA)
The sine of the acceptance angle of a fibre, multiplied by the refractive index of the medium from which the light is entering (which is 1 for air). It can be shown that NA= $n1^2$ -$n2^2$ for light entering from air, (n1 and n2 are the refractive indexes of core and cladding respectively).

O

OEM
Original Equipment Manufacturer.
OPEN SYSTEMS INTERCONNECTION REFERENCE MODEL
A seven-layer model, produced by the ISO, which defines the hierarchy and standard procedures for operating a communications system that provides open access between network stations.
OPTICAL FIBRE
A cylindrical core of flexible transparent material surrounded by a tubular cladding of material with a lower refractive index. Light enters at one end of the optical fibre and emerges at the other end, after propagation by internal reflection along the core.
OPTICAL TIME DOMAIN REFLECTOMETER (OTDR)
An instrument that measures transmission characteristics of an optical fibre by sending a short pulse and measuring the return signals resulting from backscatter and reflections.
OPTICAL WAVEGUIDE
Any structure that can guide light along a preset path. One example is an optical fibre. Optical wave-guides can also be formed from solid material.
OPTOELECTRONIC
A technology-encompassing device that's function as electrical-to-electrical transducers capable of: responding to optical power; the emission or modification of optical radiation; and the utilisation of optical radiation for their internal operation.
OSI

Open System Interconnection.

P

PACKET
A unit of information, comprising a group of bits including data and control elements, which is switched and transmitted as a composite.
PATCHCORD
A length of (Usually) ruggedised fibre with a connector at both ends.
PARITY CHECK
A means of detection transmission errors.
PASSIVE COUPLER
A coupler that divides a light input between output ports without adding any light power.
PATCHBOX (PatchPanel)
A cable termination enclosure which allows demountable interconnection between the discrete fibres in a cable or to another patchbox. Allows signal routing to be re-configured as required.
PCS FIBRE
Plastic-Clad Silica fibre.
PEAK WAVELENGTH
The wavelength at which the optical power of a source is at its maximum.
PHASE MODULATION
Modulation of the phase angle of a signal in accordance with an input signal. (Used in both optical and electrical circuits).
PHOTODETECTOR
A detector that converts a light input into an electrical output signal.
PHOTODIODE
A diode which acts as a photodetector.
PHOTON
The quantum of electromagnetic radiation. The phenomenon of light can be described as a series of photons; this is an alternative to wave theory.
PHOTOTRANSISTOR
A transistor in which an amplified current is generated when light falls on the base-collector junction.
PHYSICAL LAYER
Layer 1 of the OSI model, which specifies mechanical and functional characteristics between nodes. Relevant to optical fibre links.
PICOSECOND
10^{-12} second

PIGTAIL
A length of optical fibre or cable attached to a connector or component intended to facilitate jointing between that component and another optical fibre or component. Usually buffered fibre only with a connector at 1 end only – the other is spliced.
PIN PHOTODIODE
A fast linear photodetector, widely used in fibre optic receivers.
PLANAR WAVEGUIDE
A step-index multimode fibre in which a silica core is surrounded by a plastic cladding with lower refractive index.
PLENUM
The air handing space between walls, under structural floors, and above drop ceilings, which can be used to route intrabuilding cabling.
PLENUM CABLE
A cable whose flammability and smoke characteristics allow it to be routed in a plenum area without being enclosed in a conduit.
PMD
Physical Media Independent as defined by ANSI X3T9.5 document.
POLARIZATION MAINTAINING OPTICAL FIBRE
Optical fibre which maintains the polarization of incoming light.
POLARIZED LIGHT
Light for which the electrical vector of the electromagnetic field has been oriented, instead of being at random.
PORT
Hardware entity at each end of the link.

PREFORM
A cylindrical rod of glass from which an optical fibre is drawn. The preform is fabricated with refractive index variations and other characteristics that are maintained in the drawn fibre.
PRIMARY COATING
A thin plastic coating applied to the outer cladding of an optical fibre to protect from contamination and abrasion.
PROTOCOL
A set of rules for operating a communications system.
PULSE DISPERSION
The lengthening of a pulse as it travels along an optical fibre.
PULSE SPREADING
Pulse dispersion.

R

RAY
A geometric representation of a light path through an optical medium-a line normal to the wave front indication the direction of radiant energy flow.
RADIUS OF CURVATURE
The radius across the mating face of a ferrule, used in connectors. Optically, assures low I.R & R.L
RECEIVER (IN FIBRE OPTICS).
A device that detects an optical signal and converts it into an electrical signal.
REDUNDANCY
Built-in duplication of a vital part of a system that can take over if a fault occurs.
REFRACTION
The bending of light as it passes between materials of different refractive index.
REFRACTIVE INDEX
Ratio of the speed of light in a vacuum to the speed of light in a material.
REFRACTIVE INDEX GRADIENT
The change in refractive index with distance from the longitudinal axis of a graded index optical fibre.
REGENERATOR
A receiver-transmitter unit that detects a weak optical signal, cleans and amplifies it, then sends the regenerated signal on through a further length of optical fibre.
REPEATER
In a fibre system, an opto-electronic device or module that receives an optical signal, converts it to electrical form, amplifies it (or in the case of a digital signal, reshapes, retimes or otherwise reconstructs it and retransmits it in optical fibre).
RESPONSIVITY
The ratio of detector output (electrical) to input (optical), usually measured in micro-amps (electrical) per micro-watt (optical).
RETURN LOSS
The power returned down a fibre after reflection from a component. Usually expressed in dB, as a proportion of through power.
RIBBON CABLE
A cable in which many optical fibres are embedded in parallel, in a plastic sheath, to form a ribbon-like structure. Electrical conductors may also be included.
RING CABLE
Interconnection of nodes in a network to form a complete ring.
RISE TIME
The time taken for a signal (optical or electrical) to rise from low level to peak value (usually taken as the time from 10% to 90% of peak).
RUGGEDISED
A cable construction comprising a secondary coated fibre surrounded with Kevlar and then an outer sheath, usually about 2-3mm in diameter.

S

SCATTERING LOSSES
Losses in optical fibres caused by the material of the fibre or by imperfections.
SECONDARY COATING
See Buffer (1).
SELFOC LENS
Trade name used by Nippon Sheet Glass Company for a graded index fibre lens.

SERIAL TRANSMISSION
A method of transmission in which each bit of information is sent sequentially on a single channel.
SHEATH
The outer protective layer of an optical fibre cable.
SIGNAL-TO-NOISE-RATIO
The ratio of signal to noise (measured in dB).
SILICA GLASS
Glass made mostly of silicon dioxide, used in optical fibres.
SIMPLEX TRANSMISSION
Operation of a communication channel in one direction only.
SINGLE-FREQUENCY LASER
A laser that emits a range of wavelengths that are so close together that they can be considered as a single wavelength.
SINGLEMODE FIBRE
A low loss optical fibre with a core diameter of 2 to 8 microns. Only one mode is transmitted at the wavelength of interest.
SKEW RAY
A light ray that never intersects the axis of a fibre while being internally reflected.
SNELL'S LAW
The law of refraction when a light ray passes between two Media, usually expressed as:
$n1 \sin \theta 1 = n2 \sin \theta 2$
where n1 and n2 are the refractive indices of the media and $\theta 1$ and $\theta 2$ are angles, in the two media, between the ray of light and the normal to the interface.
SONET
Synchronous Optical NETwork
SOURCE
Device that converts an electrical signal carrying information into a corresponding optical signal for transmission by an optical fibre, usually an LED or laser diode.
SOURCE OPTICAL POWER
The mean level of power emitted by a light source.
SPECTRAL WIDTH
The range wavelengths emitted by a source.
SPEED OF LIGHT
Approx.2.998×10^8 metres/second (in vacuum).
SPLICE
A permanent junction between two fibre ends. (See also Fused Splice or Mechanical Splice).

SPLITTING RATIO
The ratio of power emerging from two ports of a coupler.
STAR CONNECTED NETWORK
A network in which each of the secondary stations is connected to a single primary station by a dedicated point-to-point link.
STAR COUPLER
A coupler with more than three ports.
STEP INDEX FIBRE
A fibre in which the refractive index of the core is uniform across its diameter.
STIMULATED EMISSION
An occurrence created in a semiconductor laser diode when photons stimulate available excess charge carriers to the emission of further photons. The emitted light is identical in wavelength and phase with the incident light - thus producing a coherent source.
STRAIN MEMBER (STRENGTH MEMBER)
The part of an optical fibre cable which ensures that no strain is imposed on the fibres. Materials used include steel and synthetic yarns.
SUBSCRIBER LOOP
The link to individual subscribers in a telephone network.
SUPERTRUNK
A cable that carries several video channels between facilities, in a cable TV or data communication network.
SURFACE EMITTING DIODE
An LED which emits light from its surface rather than from its edge.

SYNCHRONOUS TRANSMISSION
A transmission method in which the synchronising of characters is controlled by timing or clock signals. Transmitters and receivers operate continuously at the same frequency.
SYSTEM NETWORK ARCHITECTURE (SNA)
A communication system that links intelligent terminals to large computers, developed by IBM.

T

T-COUPLER
A coupler with three ports.
TDM
Time-Division Multiplexing.
THRESHOLD CURRENT
The minimum current needed to sustain laser action in a laser diode.
TIGHT BUFFER
A material tightly surrounding a fibre in a cable, holding it rigidly in place.
TIME DIVISION MULTIPLEXING
Digital multiplexing by taking one pulse at a time from separate signals and combining them into a signal bit stream.
TOKEN
A unique bit sequence which permits a station to transmit to a token ring network.
TOKEN RING NETWORK
A network which can only be accessed by a station that is allocated the token, which is passed around the network in a predetermined sequence.
TOTAL INTERNAL REFLECTION
Total reflection of light back into a medium when it strikes the interface with another medium having lower refractive index.
TRANSCEIVER
A combined transmitter and receiver.
TRANSMISSION LOSS
Total loss suffered by a lightwave through a system due, for example, to the attenuation created by the fibre, connectors, splices etc.
TRANSMISSION MEDIA
The physical media through which communication signal are transmitted, for example optical fibre, coaxial cable, twisted pairs.
TRANSMITTER
An optoelectronic unit comprising a driver and source which can change electrical signals into optical signals.

TRANSIENT LOSS
An interruption to data flow caused by transient ‘spikes’ incurred usually due to abnormal movement of fibres carrying the signal causing micro / macro bends and corrupting data flow. (See B.E.R)
TRANSPARENCY
A communication system which is transparent imposes no restrictions on the code or bit patterns in the information being transmitted.
TREE COUPLER
A coupler which distributes light signals to several output ports.

U

ULTRAVIOLET
Electromagnetic waves with wavelengths around 100 to 400mm.
UTP
Unshielded Twisted Pair. Copper cable.

V

VISIBLE LIGHT
Electromagnetic radiation that is visible to the human eye, at wavelengths.
VISIBLE RADIATION
Radiation (light) visible to the human eye.

W

WAVEGUIDE
A device which constrains or guides the propagation of electromagnetic waves along a path defined by the construction of the guide. Optical fibres are a form of optical waveguide.
WAVEGUIDE DISPERSION
Dispersion arising from the dependence of the speed of light on wavelength due to the geometrical properties of the fibre.
WAVELENGTH
Electromagnetic energy is transmitted in the form of a sinusoidal wave. The wavelength is the distance covered by one cycle.
WAVELENGTH DIVISION MULTIPLEXING
A technique for increasing the capacity of a fibre channel by combining optical signals at two different wavelengths.
WDM
Wavelength Division Multiplexing.
WIDE AREA NETWORK
Communication network covering long distances, often using some public network facilities.
WINDOWS
When referred to fibre, indicates the three commonly used attenuation minima. 1st, 2nd and 3rd windows refer to 850nm, 1310nm and 1550nm regions respectively.

Z

ZERO DISPERSION WAVELENGTH
Wavelength at which net chromatic dispersion of an optical fibre equals zero. This happens when wavelength dispersion cancels out material dispersion.
ZIRCONIA
Ceramic material used for making ferrules in fibre optic connectors.