

Introduction

The following glossary of communication terms is provided as a quick reference to aid understanding of technical communication literature. The list is a collection of terms that the authors encountered in their work and is in no way a complete list. The Glossary of terms is preceded by a list of Acronyms, some of which are included in the Glossary.

Acronyms

AAL	ATM Adaption Layer
ACS	Advanced Cellular System
ACI †	Adjacent Channel Interference
ADSL	Asymmetrical Digital Subscriber Line
AGC †	Automatic Gain Control
ALT	Alternate Local Transport Company
AM †	Amplitude Modulation
AMI	Alternate Mark Inversion
AMPS	Advanced Mobile Phone Service
AMTA	American Mobile Telecommunications Association
ANSI	American National Standard Institute
AP (CO)	Applications Processor
APC	American Personal Communications
ARPANET	Advanced Research Project Agency Network
ART †	Amplitude Radio Transmission
ARQ	Automatic Repeat Request
ASCII	American Standard Code For Information Interchange
ASIC	Application Specific Integrated Circuit
ASP	Average Selling Price
ATG †	Air-To-Ground
ATM †	Asynchronous Transfer Mode
AWG	American Wire Gauge
AWGN †	Additive White Gaussian Noise
B-ISDN †	Broadband ISDN
BBS †	Bulletin Board System
BCC	Block Check Character
BELLCORE	Bell Communications Research
BER	Bit Error Rate
BFSK	Binary Frequency-Shift Keying
BPDU †	Burst Protocol Data Unit
BPF †	Band Pass Filter
BISYNC	Binary Synchronous Communications
BOC †	Bell Operating Company
BPS †	Bits Per Second
BPSK	Binary Phase-Shift Keying
BRI	Basic Rate Interface
BSS †	Broadcasting Satellite Service
BTA	Basic Trading Area
C-NETz	German C System
C/I	Carrier-To-Interference Ratio
CAD †	Computer Aided Design
CAGR	Compound Annual Growth Rate
CAI	Common Air Interface
CAM †	Computer Aided Manufacturing
CAP	Competitive Access Provider
CAP (HDSL)	Carrier-less AM/PM
CBEMA †	Computer And Business Equipment

CC	Manufacturers Association
CC (#)	Cluster Controller
CCA †	Country Code
CCIR †	Clear Channel Assessment
	Consultative Committee On International Radio
CCITT	Consultative Committee On International Telephone And Telegraph
CCS	Common Channel Signaling
CDMA	Code Division Multiple Access
CDPD	Cellular Digital Packet Data
CELP	Code-Excited Linear Predictive Coding
CEPT	Conference Of European Postal And Telecom Administration
CGSA	Cellular Geographic Service Area
CIC	Cascaded Integrator Comb
CMIP	Common Management Information Protocol
CMOS	Complementary Metal Oxide Semiconductor
CO	Central Office
CO switch †	Central Office Switch
COAX	Coaxial Cable
CODEC †	Coder/Decoder
CPE	Customer Premises Equipment
CPFSK †	Constant Phase Frequency Shift Keying
CPS	Characters Per Second
CRC	Cyclic Redundancy Check
CS †	Carrier Sense
CSA	Canadian Standards Association
CSDN	Circuit Switched Digital Network
CSMA/CA	Carrier Sense Multiple Access/Collision Avoidance
CSMA/CD	Carrier Sense Multiple Access With Collision Detection
CSU	Channel Service Unit
CT	Cordless Telephone
CT1	Cordless Telephone - First Generation
CT2	Cordless Telephone - Second Generation
CT3	Cordless Telephone - Third Generation
CTIA	Cellular Telecommunications Industry Association
CVBS †	Composite Video Blanking Synchronization
DAB	Digital Audio Broadcasting
DACS	Digital Access And Cross-Connect System
DAN	Desk Area Network
DARPA	Defense Advanced Research Projects Agency
dB	Decibel
dBm	Decibel Referencing 1 Milliwatt
DBPSK †	Differential Binary Phase Shift Key
DBS	Direct Broadcast From Satellite
DCE	Data Circuit Terminating Equipment
DCS †	Digital Cellular Systems
DCT 900	Ericsson's Digital Cordless Telephone At 900MHz
DCT †	Digital Cordless Telephone
DDC †	Digital Down Converter
DDD	Direct Distance Dial Network
DDS	Digital Dataphone Service
DECT	Digital European Cordless Telephone
DEMUX	Demultiplexing

DIP †	Dual-In-Line Package	GSM	Global System For Mobile Communications
DNL †	Differential Non Linearity	GSO	Geostationary Satellite Orbit
DOC	Dept. Of Communications	HDLC	High-Level Data Link Control
DPI	Dots Per Inch	HDSL	High Bit-Rate Digital Subscriber Line
DPSK †	Differential Phase Shift Keying	HDX †	Half-Duplex
DPN	Digital Packet Network	HPF †	High Pass Filter
DQPSK †	Differential Quadrature Phase Shift Key	HSSI †	High Speed Serial Interface
DQT †	Digital Quadrature Tuner	HW †	Hardware
DS	Direct Sequence	Hz	Cycles Per Second
DSSS †	Direct Sequence Spread Spectrum	IEC	Interchange Carrier
DS0	Digital Signal, Level 0	IEEE	Institute Of Electrical And Electronics Engineers
DS1	Digital Signal, Level 1	IF †	Intermediate Frequency
DS2	Digital Signal, Level 2	IIP3 †	Input Third Order Intercept Point
DS3	Digital Signal, Level 3	IMASS	Intelligent Multiple Access Spectrum Sharing
DSI †	Digital Speech Interpolation	IMD †	Inter-Modulation Distortion
DSL	Digital Subscriber Line	IMTS	Improved Mobile Telephone Service
DSP	Digital Signal Processor	IN	Intelligent Network
DSU	Digital Service Unit	INL †	Integral Non-Linearity
DSX †	Digital Signal Cross-Counter	INMARSAT	The International Maritime Satellite Organization
DTE	Data Terminal Equipment	INTELSAT	International Telecommunications Satellite Organization
DTMF	Dual Tone Multi-Frequency	IP3 †	Third Order Intercept Point
E-mail	Electronic Mail	IRAC	Interagency Radio Advisory Committee
E-TDMA	Enhanced TDMA	IS-54	EIA/TIA Interim Standard-54
E.164	Numbering Plan For The ISDN ERA	ISDN	Integrated Services Digital Network
EAMPS	Expanded Amps	ISI	Intersymbol Interference
EBCDIC	Extended Binary Coded Decimal Interchange Code	ISM BAND	Industrial Scientific and Medical band
ECMA †	European Computer Manufacturers Association	ISO	International Organization For Standardization
ECSA †	Exchange Carrier Standards Association	ITU	International Telecommunications Union
ED †	Energy Detection	JM †	Jamming Margin
EDSL	Extended Digital Subscriber Line	JPEG †	Joint Photographic Experts Group
EIA †	Electronic Industries Association	J-TACS	Japanese TACS
ENOB †	Effective Number Of Bits	Kbps	Kilobits Per Second
ESMR	Enhanced Specialized Mobile Radio	kHz	Thousands Of Cycles Per Second
ET	Exchange Termination	km	Kilometer
ETACS †	Extended TACS	ksps †	Kilo Samples Per Second
ETSI †	European Telecommunications Standards Institute	LAN	Local Area Network
Euro ISDN	Eurofile Transfer Standard For ISDN	LAPB	Link Access Procedure Balanced
FITL	Fiber In The Loop	LAPD	Link Access Procedure D
FAX	Facsimile	LAPM	Link Access Procedure For Modems
FCC	Federal Communications Commission	LATA	Local Access Transport Area
FCS	Frame Check Sequence	LCM	Line Concentrating Module
FDDI	Fiber Data Distributed Interface	LEC	Local Exchange Carrier
FDM	Frequency Division Multiplexing	LEO	Low-Earth Orbit
FDMA	Frequency Division Multiple Access	LME †	Layer Management Entity
FDX	Full Duplex	LNA †	Low Noise Amplifier
FEC	Forward Error Correction	LNB †	Low Noise Block
FEP	Front End Processor	LO †	Local Oscillator
FER †	Frame Error Rate	LPC	Linear Predictive Coding
FFS	For Further Study	LPF †	Low Pass Filter
FH	Frequency Hopping	LSB	Least Significant Bit
FHSS	Frequency Hopping Spread Spectrum	LT	Line Termination
FIFO memory	First-In, First-Out Memory	M13	Multiplexer DS1 To DS3
FM	Frequency Modulation	MAC	Media Access Control
FPLMTS	Future Public Land Mobile Telecommunications System	MAU	Media Access Unit And Multi-Station Access Unit
FSK †	Frequency-Shift Keying	Mbps	Megabits Per Second
FT1	Fractional T1	Mbits	Megabits
FTTC †	Fiber To The Curb	MDS	Minimum Discernible Signal
GAP	Ground-To-Air Paging	MEO	Mid-Earth Orbit
Gb/s	Gigabits Per Second	MF	Multi-Frequency
GCI	General Communication Interface	MFJ	Modified Final Judgment
GFSK	Gaussian Frequency-Shift Keying		
GP †	Processing Gain		

MFLOPS	Millions Of Floating Point Instructions Per Second	PDMA	Phase Division Multiple Access
MIB †	Management Information Base	PDN	Public Data Network
MIPS	Millions Of Instructions Per Second	PDS	Premises Distribution System
MIRS	Motorola Integrated Radio Systems	PDU †	Protocol Data Unit
MNP	Micron Network Protocol	PGA †	Pin Grid Array (Package)
MPDU †	MAC Protocol Data Unit	PHS	Personal Handyphone System
MPEG †	Motion Picture Experts Group	PHY †	Physical Layer (Radio)
MPT	Ministry Of Posts And Telecommunications	PHY_DATA.REQ †	MAC Requests To Sent Data To PHY
MQFP †	Metric Quad Flat Pack (Packages)	PHY_SAP †	Physical Layer Service Access Point
MSA	Metropolitan Statistical Area	PL	Private Line
MSB	Most Significant Bit	PLCP †	Physical Layer Convergence Protocol
MSC	Mobile Services Switching Center	PLL	Phase Locked Loop
msec	Milisecond	PLME †	PHY Layer Management Entity
MSPS †	Mega Samples Per Second	PLMR	Private Land Mobile Radio
MSS	Mobile Satellite Service	PMD †	Physical Medium Dependent
MSK †	Minimum Shift Keying	PMD_ANTSEL †	MD Antenna Select
MTA	Major Trading Area	PMD_FREQ †	PMD Channel Frequency
MTSO	Mobile Telephone Switching Office	PMD_RATE †	PMD Data Rate
MTX	Mobile Telephone Exchange	PMD_SAP †	Physical Medium Dependent Service Access Point
MUX	Multiplexer	PMR	Public Mobile Radio
N-ISDN	Narrowband ISDN	PN	Pseudo-random Noise
N-TACS	Narrowband TACS	PN CODE †	Pseudo-random Noise Code
NAMPS	Narrowband Advanced Mobile Phone Service	POP	Point Of Presence
NANP	North American Numbering Plan	POS †	Point Of Sale
NCO †	Numerically Controlled Oscillator	POTS †	Plain Old Telephone Service
NCOM †	Numerically Controlled Oscillator Modulator	PPDU †	PHY Protocol Data Unit
NFS	Network File System	PPM †	Pulse Position Modulation
NIC	Network Interface Card/Controller	PRA	Primary Rate Access
NMT †	Nordic Mobile Telephone	PRI	Primary Rate Interface
NMT450	Nordic Mobile Telephone at 450MHz	PSK †	Phase-Shift Keying
NMT900	Nordic Mobile Telephone at 900MHz	PSTN	Public Switched Telephone Network
NNI	Network Node Interface And Network-To-Network Interface	PTN	Personal Telephone Number
NPA	Numbering Plan Area	PTT	Postal Telephone and Telegraph
NPRM	Notice Of Proposed Rulemaking (By FCC)	Q †	Quadrature
NT	Network Termination	QAM	Quadrature Amplitude Modulation
NT2 †	Network Termination 2	QFSK †	Quadrature Frequency Shift Keying
NTACS	Nippon TACS	RAM	Random Access Memory
NTIA	National Telecommunications And Information Administration	RBOC	Regional Bell Operating Company
NTSC	National Television Standards Committee	RCC	Radio Common Carrier
NTT	The Japanese Nippon Telephone And Telegraph Cellular System	RDSS	Radio Determination Satellite Service
OA&M †	Operations, Administration And Maintenance	REL	Residual-Excited Linear Predictive Coding
OAM&P	Operations, Administration, Management And Provisioning	RF †	Radio Frequency
OC-n	Optical Carrier At Level N	RISC	Reduced Instruction Set Computing
OOK †	Optical Carrier At Level N	RMTS	The Italian Cellular System
ONA †	Open Network Architecture	RRC †	Root Raised Cosine
OP1db †	Output 1dB Compression Point	RSA	Rural Service Area
OQPSK †	Offset Quadrature Phase Shift Keying	RSSI †	Receive Signal Strength Indicator
OSI	Open System Interconnection Reference Model	RTMS †	Radio Telephone Mobile System
PAD	Packet Assembler/Disassembler	RTU	Right-To-Use
PAL †	Phase Alternate Line	SAMTS †	South American Mobile Telephone Service
PBX	Private Branch Exchange	SAP †	Service Access Point
PC	Personal Computer	SAPI	Service Access Point Identifier
PCM	Pulse Code Modulation	SAR	Segmentation And Reassembly
PCMCIA	Personal Computer Memory Card International Association	SAW †	Surface Acoustic Wave
PCN	Personal Communications Network	SDH	Synchronous Digital Hierarchy
PCS	Personal Communications Service (System)	SDL	Specification Description Language
PDA †	Personal Digital Assistant	SDLC	Synchronous Data Link Control
		SDN	Software Defined Network
		SECAM †	Sequential Color And Memory
		SFD	Start Frame Delimiter
		SFDR †	Spurious Free Dynamic Range
		SIM	Subscriber Identification Module
		SLC	Subscriber Loop Carrier
		SLIC	Subscriber Line Interface Circuit
		SMDS	Switched Multi-Megabit Data Service

Glossary

SMR	Specialized Mobile Radio
SNA	Systems Network Architecture
SNR	Signal To Noise Ratio
SOIC †	Small Outline Integrated Circuit
SONET	Synchronous Optical Network
SQ †	Signal Quality (PN code correlation strength)
SS	Spread Spectrum
SSOP †	Shrink Small Outline Package
STP (SS7)	Signal Transfer Point
STP (WIRE)	Shielded Twisted Pair
STS-n	Synchronous Transport Signal At Level n
SW †	Software
T CARRIER	T1 Carrier
T-MUX	T1 Multiplexer
T1 (ANSI)	Telephony Committee
T1C	T1 Carrier C
T1X1 †	T1 Committee Of The Exchange Carriers Standards Association
TA (BC)	Technical Advisory
TA (ISDN)	Terminal Adapter
TACS	Total Access Cellular System
TAM †	Total Available Market
TCM	Time Compression Multiplexing
TCP/IP	Transmission Control Protocol/Internet Protocol
TDM	Time Division Multiplex
TDMA	Time Division Multiple Access
TE	Terminal Equipment
TE1	Terminal Equipment Type 1
TE2	Terminal Equipment Type 2
TIA	Telecommunications Industry Association
TQFP †	Thin Quad Flat Pack
TR	Technical Requirement
TTC †	Telecommunications Technology Committee
TXE †	Transmit Enable
UDI	Unrestricted Digital Information
UMTS	Universal Mobile Telecommunications Service
UNI	User Network Interface
UPS	Uninterruptable Power Supply
UPT	Universal Personal Telecommunications
UTP †	Unshielded Twisted Pair
UUI	User-To-User Information
VCO †	Voltage Controlled Oscillator
VDSL	Very-High-Bit-Rate Digital Subscriber Line
VIRTUAL POP	Virtual Point Of Presence
VOD †	Video On Demand
VPN	Virtual Private Network
VSCS †	Voice Switching And Control System
VSELP	Vector-Sum Excited Linear Predictive Coding
WARC	World Administrative Radio Conference
WDM	Wavelength Division Multiplexing
WLAN †	Wireless Local Area Network
WLL	Wireless Local Loop
WPBX †	Wireless Private Branch Exchange

1BASE-5 ETHERNET

A version of Ethernet that operates at 1 megabit per second over twisted-pair wire. Also known as StarLAN. 1BASE-5 Ethernet has been superseded by 10BASE-T.

2 BINARY, 1 QUATERNARY (2B1Q)

A pulse amplitude modulation scheme used to send high-speed digital signals over ordinary telephone wires in ISDN and HDSL services. The scheme uses four voltage levels, and each level represents a dibit (group of two bits).

2B+D

The Basic Rate Interface ISDN service that provides two 64 kilobit per second circuit switched B (bearer) data channels and one 16 kilobit per second D (data) channel for signaling and low speed packetized data.

30B+D

The European ISDN Primary Rate Interface that provides 30 circuit switched 64 kilobit per second B (bearer) channels and one 64 kilobit per second D (data) channel for signaling and packet switched data.

4 BINARY 3 TERNARY (4B3T)

A line code in which 4 binary bits are converted into three ternary symbols for transmission across the ISDN U interface.

4ESS

AT&T toll/tandem digital switch. The first digital switch (1976) introduced in the North American market. Makes up the bulk of the AT&T long distance network.

5ESS

AT&T medium to large-size digital end office (class 5) switch introduced in 1981.

10BASE-2 ETHERNET

A version of Ethernet that uses thin coaxial cable and operates at 10 megabits per second with a maximum cable length of 185 meters also called Cheapernet or Thinwire Ethernet.

10BASE-5 ETHERNET

A version of Ethernet that operates at 10 megabits per second and uses thick coaxial cable with a maximum network length of 500 meters.

10BASE-T ETHERNET

A version of Ethernet that operates over twisted-pair wire at a speed of 10 megabits per second. 10BASE-T networks must use an Ethernet hub and a star topology.

μ-LAW

A North American standard for the nonlinear digitization of voice.

A-LAW

A European standard for the nonlinear digitization of voice signals.

AAL (ATM Adaption Layer)

ATM formats that specify constant or variable bit rate and connection oriented or connection-less mode.

ACCESS PROTOCOL

A defined set of procedures that is adopted at an interface at a specified reference point between a user and a network to enable the user to employ services of that network.

ACS (ADVANCED CELLULAR SYSTEM)

A Swedish cellular system, operating at 400MHz or 800MHz, introduced in 1983 in Sweden, and later into Hong Kong.

ADDRESS

A designator that defines the identification of a terminal, peripheral device, or any other node on a network.

ADSL (ASYMMETRICAL DIGITAL SUBSCRIBER LINE)

A technology to provide high speed, one way digital information to subscribers at up to 6 megabits per second over existing local loops. There would also be a low speed reverse channel from the subscriber to the service provider.

ALGORITHM

A prescribed set of well defined rules or processes for finding the solution to a problem.

ALT (ALTERNATE LOCAL TRANSPORT COMPANY)

Local exchange competitor such as Metropolitan Fiber Systems (MFS) or Teleport. Currently targeted to large customers operating in metropolitan areas.

ALTERNATE MARK INVERSION

A line code that uses 0 volts to represent 1s and alternate positive and negative voltage levels to represent 0s.

ALTERNATE ROUTE

A secondary communication path between two terminals that is used when the primary route is unavailable.

AMPLIFIER

An electronic circuit that detects weak analog signals and makes them stronger (amplifies them). An amplifier amplifies noise as well as the desired signal.

AMPS (ADVANCED MOBILE PHONE SERVICE)

The predominant cellular system in North and South America and elsewhere (in more than 35 countries) at 800MHz. Analog Cellular FDMA System with 30kHz channels.

AMTA (AMERICAN MOBILE TELECOMMUNICATIONS ASSOCIATION)

The industry trade organization representing Specialized Mobile Radio (SMR) operators.

ANALOG SIGNAL

Continuously varying with an amplitude which is an analog of the original information, and thus may have virtually an infinite numbers of states. Contrasted with a digital signal which has only a very limited number of discrete states.

ANALOG TRANSMISSION

Repeats where necessary by mere amplification without recovering information. Thus noise is cumulative in an analog transmission system.

ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)

A voluntary U.S. industry association to develop standards without undue influence from any one company.

ANSWER BACK

A signal from a receiving terminal in response to transmitting terminal's request. The answer back indicates that the receiving terminal is ready to receive data or has successfully received them.

ANSWER MODEM

The modem that does not originate communication in a full duplex communication system.

AP(CO) (APPLICATIONS PROCESSOR)

Non-real-time adjunct computer for the AT&T 5ESS. Provides advanced features such as Electronic Directory, Facilities Management, and Message Desk.

APC (AMERICAN PERSONAL COMMUNICATIONS)

A corporation developing "Telepoint" and PCS capabilities in the U.S.

APPLICATION LAYER

OSI Reference model top layer - the end user layer.

ARCHITECTURE

An overall plan that represents the goal towards which its implementors strive. Architecture is used to describe data communications system, integrated circuit layouts, operating systems and other complex hardware and/or software structures. See communications architecture.

ARPANET (ADVANCED RESEARCH PROJECT AGENCY NETWORK)

U.S. Department of Defense network to link university and government research centers. Service began in 1969 based on connectionless "Datagram." Has evolved as an Ad Hoc "Standard."

ARQ (AUTOMATIC REPEAT REQUEST)

A general term for error control protocols featuring hardware detection and retransmission of defective data. This term is used primarily by US Robotics.

ASCII (AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE)

A 7-bit code that is widely used in data communications, especially for the communication text.

ASIC (APPLICATION SPECIFIC INTEGRATED CIRCUIT)

Integrated Circuits (ICs) customized to perform a specific task - as opposed to general purpose microprocessors or DSPs.

ASP

Abbreviation for Average Selling Price.

ASRO

Motorola's new digital Public Land Mobile Radio (PLMR) for evolution from analog FM. Band independent, FDMA using VSELP and splitting current 25kHz channels into two 12.5kHz channels.

This is one of four candidates for national standardization by APCO (Associated Public-Safety Communications Officers) which oversees public safety frequencies.

ASYNCHRONOUS COMMUNICATIONS

A form of communication that uses a start bit at the beginning of each data word and a stop bit at the end of each data word.

ASYNCHRONOUS TRANSMISSION

Data is sent character by character. The receiver and transmitter are synchronized for each individual character via a start and stop pulse. Asynchronous transmission is normally found on dial up circuits, usually at speeds between 300 and 28,800 bps.

AT COMMAND SET

A defacto set of standard commands used to control the operation of intelligent modems. Also called the Hayes Command Set.

ATM FORUM

An organization made up of hundreds of companies whose purpose is to promote cooperation among its members in developing ATM standards and the ATM market.

ATM PIPE SWITCH

An ATM technology developed and marketed by L.M. Ericsson.

ATTENUATION

Signal loss in a communications circuit or equipment.

AUDIO FREQUENCIES

Frequencies that can be heard by the human ear, typically 30Hz to 20kHz.

AUTO ANSWER

The modem feature which enables detection of a ring and answering without assistance from a program.

AWG (American Wire Gauge)

A wire size standard.

B-CHANNEL

A 64kb/s (DS0) ISDN user-to-network channel. Used in both the Basic Interface and the Primary Rate Interface. Carries a voice, data or image call, but not the signaling for the call. Normally circuit-switched by the network, but can

be packet-switched, or even semi-permanently connected. When circuit switched, may carry multiplexed information streams, but only to the same destination.

BACKBONE NETWORK

A network that links several smaller networks.

BALANCING NETWORK

Another name for hybrid, a circuit that connects a two-wire line to a four wire line and maximizes power transfer while minimizing echo.

BANDWIDTH

1) In analog signals, the difference between a signals lowest frequency component and its highest signal component as measured in Hertz (Hz).

2) The speed of a digital communications circuit in bits per second.

BASEBAND SIGNAL

A signal that is not modulated onto a carrier. In a cellular telephone, all of the analog and digital signals except the radio frequency portion of the telephone.

BASE STATION

A radio transceiver that is located near the center of each cell in a cellular telephone network and which communicates with all of the active cellular telephones in the cell and provides them with a connection to the switched telephone network.

BAUD

Number of times (per second) the signal can change.

BCC (Block Check Character)

An extra data word added to the end of data transmission to aid in error detection. Also called binary check character.

BEARER CAPABILITY

Information carrying capability requested by the user and provided by the network. For example, bearer capability of voice with possible echo-suppression and loss-insertion is different than bearer capability of digital information where the bits are carried transparently.

BEARER SERVICES

Basic communications services including, but not limited to, voice circuits, 64 kilobit per second switched data circuits, T1 lines in North America and E1 lines in Europe.

BELL 103

A 300b/s full duplex FSK modem standard. The international version is V.21.

BELL 202

A half-duplex FSK modem standard that operates at 1200 b/s over dial up telephone lines and 1800b/s over leased conditioned lines.

BELL 212A

A full duplex 4PSK modem standard that operates at 1200b/s and 600 baud. The international version is V.22.

BELLCORE (BELL COMMUNICATIONS RESEARCH)

Research and Development organization owned by the seven Regional Bell Operating Companies.

BER (BIT ERROR RATE)

A measure of transmission quality. Generally shown as a negative exponent. Example:

10^{-7} means 1 out of 10^7 bits are in error or 1 out of 10,000,000 bits are in error or .0000001 error/bit.

BFSK (BINARY FREQUENCY-SHIFT KEYING)

A modulation technique in which a digital signal shifts the frequency of an analog carrier between two distinct frequencies. BFSK is usually limited to low data communications speeds.

BISYNC (BINARY SYNCHRONOUS COMMUNICATIONS)

An old (pre-SNA) IBM character-oriented, half-duplex protocol.

BIT

Binary character consisting of one of two possible values, 0 or 1.

BIT ORIENTED PROTOCOL

A set of rules for communicating data that divides each block of data into bit fields. Each bit field serves a purpose in the protocol.

BIT STREAM

A continuous series of bits transmitted over a communications link.

BLUE BOOKS

CCITT recommendations published in 1988.

BPSK (BINARY PHASE-SHIFT KEYING)

A modulation scheme that uses two phases to represent data. One phase represents a mark, and the other phase represents a space.

BRI (BASIC RATE INTERFACE)

An ISDN User-to-Network Interface consisting of three full-duplex channels; two 64Kb/s B Channels and one 16 Kb/s D Channel (2B+D). the 2B+D U interface requires two twisted pairs of wire.

BRIDGE

A device that operates at OSM Model levels 1 and 2 to connect two or more LANs of the same type.

BROADBAND

A communications channel that has a bandwidth greater than 64 kilobits per second and that can provide higher speed data communications than a standard telephone circuit. Also called wide band.

BROADCAST

A service with one transmitter and many receivers, where all receivers connected to the network receive the message, often by use of a broadcast address. (Compare to Multicast, where a subset of the receivers are addressed.

BROUTER

A device that performs the functions of both a bridge and a router (X.25 network product).

BTA (BASIC TRADING AREA)

To identify areas of economic integration, Rand McNally (1-800-284-6565) in their \$395 Commercial Atlas and Marketing Guide," has divided the country into 487 Basic Trading Areas (BTAs). A BTA consists of a number of counties; counties are never split between BTAs. For example, the Chicago BTA consists of 14 counties including Kenosha County in Wisconsin and 4 counties in Indiana. Each BTA belongs to a Major Trading Area (MTA). For instance, the Chicago BTA along with 17 other BTAs make up the Chicago MTA.

BUILT-IN MODEM

A modem integrated into the motherboard of a terminal or computer.

BURST

Several events occurring within a short period of time.

BURST ERROR

A series of consecutive errors in data transmissions.

BURSTY

A characteristic of data communications network. It refers to the fact that the bandwidth needed for data communications tends to vary greatly from one moment to the next as data is sent in bursts.

BUS NETWORK

A network topology that uses a single communications link to connect three or more terminals. Also called a multi-drop network.

BYTE

A group of eight bits that is processed as a single logical unit.

C-450

An analog cellular telephone standard used in Germany and Portugal.

C-NETz (GERMAN C SYSTEM)

The German C system is a digital cellular system at 450MHz, introduced prior to 1989, having 237 channels.

C/I (CARRIER-TO-INTERFERENCE RATIO)

The ratio of the desired signal strength to the combined interference from all other mobiles or portables (usually dominated by the co-channel interferers; i.e., those using the SAME frequency in other cells.)

CAGR (Compound Annual Growth Rate)

Abbreviation for compound annual growth rate. The average yearly growth in a market over a period of several years.

CAI (Common Air Interface)

A standard radio and protocol definition which ensures interoperability of mobile and portable radios from one vendor with base stations to another vendor.

CALL-SETUP TIME

The time required to establish a connection between two terminals over a communications network.

CAP (COMPETITIVE ACCESS PROVIDER)

Local exchange competitor such as Metropolitan Fiber Systems (MFS) or Digiport. Currently targeted to large customers operating in metropolitan areas.

CAP (HDSL) (Carrierless AM/PM)

A method of transmitting information using two signal phases (Phase Modulation [PM]) and multiple amplitude levels (AM) to represent groups of 2 or more bits.

CARRIER

A continuous frequency capable of being either modulated or impressed with another information carrying signal. Carriers are generated and maintained by modems via the transmission lines of the telephone companies.

CARRIER SYSTEM

A method of obtaining several communications channels over a single communications link by multiplexing the channels together at the transmitting end and demultiplexing them at the receiving end.

CC (CLUSTER CONTROLLER)

BM models 3174/3274, etc. Control Unit serving multiple IBM 3178/3278 and other terminals. The name is derived from the fact that terminals are "clustered" around this. The connection from the 3278 terminal to the 3274 controller is known as COAX Type A, which operates at 2.3 Mb/s.

Cluster controllers are either local or remote. Local cluster controllers are located within 225 feet of the IBM host computer and are connected via the IBM channel protocol operating at 16MB/s (2 megabytes per second). Remote cluster controllers are connected via a 9.6 or 56k/bps dedicated connection using the old bisync or the newer SNA protocol. On the average, eight cluster controllers share a single (multi-drop) communications line.

CC(##) (COUNTRY CODE)

Part of a (telephone) number. The I.463 country code for North America is 1.

CCITT (CONSULTATIVE COMMITTEE ON INTERNATIONAL TELEPHONE AND TELEGRAPH)

International committee under the auspices of the International Telecommunications Union and in turn, the U.N. The CCITT develops "Recommendation" associated with all aspects of international telecommunications and public data network implementations. Organized by topics into Study Groups which publish on a four year cycle in colored books (e.g. Red, Blue). Books are subdivided into fascicles for publications. Fascicles contain recommendations which are referenced as LETTER.NUMBER (e.g., X.25, V.35, Q.931).

Participants come from National Administrations, Public Network Providers and Equipment Vendors. All U.S. participation is coordinated through the State Department.

CCS (COMMON CHANNEL SIGNALING)

A method of using a single signal channel to carry signaling information relating to a number of information channels. The signaling information is sent in packet form. See Signaling System 7 (SS7). Contrast with in-band signaling.

CDMA (CODE DIVISION MULTIPLE ACCESS)

A "spread spectrum" method of allowing multiple users to share the radio frequency spectrum by assigning each active user an individual "code".

CDPD (CELLULAR DIGITAL PACKET DATA)

A piggyback system for sending and receiving digital data on the existing AMPS system. For use with laptop computers.

CELL

An ATM packet that is 53 bytes in length with a 5 byte header and a 48 byte payload.

CELP (CODE-EXCITED LINEAR PREDICTIVE CODING)

A general class of enhancements to Linear Predictive Coders using a combination of a limited number of excitations from a "code book."

CENTRAL OFFICE SWITCH

A system located in a telephone company office that completes dialed up telephone connections.

CENTREX

Service created by software in telephone company local office which simulates multiple virtual PBXs.

CEPT (CONFERENCE OF EUROPEAN POSTAL AND TELECOMM. ADMINISTRATION)

A European telecommunications standard committee.

CEPT1 (E1)

2.048Mb/s European rate. This is the rate used by European CEPT carrier to transmit 30 64Kb/s digital channels for voice or data calls, plus a 64Kb/s channel for signaling (Time Slot 16) and a 64Kb/s channel for framing and maintenance (Time Slot 0).

CEPT3 (E3)

34.368Mb/s European rate. Consists of 16 CEPT1s plus overhead.

CEPT4

139.264Mb/s European rate.

CGSA (CELLULAR GEOGRAPHIC SERVICE AREA)

The region in which a single service provider is licensed to operate. Includes all the cells covered by that license. If a single service provider provides service in multiple disjoint or adjoining areas, each probably has a separate license; is a different RSA or MSA; and therefore each is a different CGSA.

CHAIN

A series of store and forward nodes through which a packet must pass when it is sent from one terminal to another.

CHANNEL

Communication path. Note the ISDN channels are normally full duplex.

CHARACTER-ORIENTED PROTOCOL

A set of rules for communicating data that relies upon special characters, such as SOH, STX and ETX, to control the flow of information. BISYNC is a character-oriented protocol.

CHECKSUM

A block check character that is formed by taking the arithmetical sum of the binary data transmitted.

CHIP SET

A set of integrated circuits that supply all or most of the circuitry needed to build an item of electronic equipment. Most modems and computers are built from chip sets.

CIRCUIT SWITCHING

Dedicates an entire circuit (normally DS0 in a digital system) to each call. Inefficient for bursty data.

CITY-WIDE CENTREX

A combination of multiple centrex switches and SS7, which gives the customers the same features across a LATA that Centrex gives on a single switch.

CLIENT-SERVER NETWORK

A network that uses a central computer, the server, to store data that is accessed from other computers on the network, called clients.

CMIP (COMMON MANAGEMENT INFORMATION PROTOCOL)

An OSI protocol for the exchange of network management information that provides the means to request actions and report events but does not specify what those actions and events are.

CMOS (COMPLEMENTARY METAL OXIDE SEMICONDUCTOR)

A semiconductor field effect transistor (FET) technology which utilizes both N-Channel and P-Channel devices.

CO (CENTRAL OFFICE)

The local telephone company switch that terminates subscribers lines for switching and connection to the public network. Known as a class 5 office. The most popular local exchange switches today are the 5ESS, DMS-100, 1AESS.

COAX (COAXIAL CABLE)

A tubular wire transmission medium that consists of a central conductor surrounded by a dielectric insulator that is in turn surrounded by a tubular conductor. The outer conductor is usually at ground potential and also serves as an electrical shield.

CODE

A system of using symbols to represent other information. ASCII and EBCDIC are two binary codes used in data communications.

CODEC (CODER/DECODER)

A device that converts (codes) an analog signal to a digital PCM format and converts (decodes) an incoming digital PCM signal to analog.

COLLISION

A contention situation in the CMA/CD protocol when two nodes attempt to transmit simultaneously.

COMBINATIONAL NETWORK

A network that uses more than one topology. A combinational network often results when several previously independent networks are linked.

COMMON CARRIER

A company that provides communications services to any member of the public that desires them.

COMMUNICATIONS ARCHITECTURE

A combination of hardware and software that implements some communications function. See architecture.

COMMUNICATIONS CONTROLLER

An IBM satellite processor that manages communications lines from terminals and remote cluster controllers for a large host computer and statistically multiplexes the data into a single channel for transmission to the host computer. Examples are IBM 3725, COMTEN 3690, etc. Also known as a Front End Processor (FEP). Not to be confused with a Cluster Controller.

COMMUNICATIONS PORT

A connection on a terminal through which data is input and/or output.

COMPRESSION RATIO

The ratio of the number of bits required to represent the original information to the number of bits required to represent the compressed signal.

CONCENTRATOR

A hub-like device used on some FDDI networks to connect several single-attached nodes to the network.

CONDITIONED LINE

A telephone circuit that has had its frequency response and/or delay characteristics optimized.

CONDITIONING

Applying electronic filtering to a communication link to improve its ability to support higher communication speeds. Also see equalization.

CONNECTION IDENTIFIER

A part of the header information in an ATM cell that associates the cell with a given virtual channel. The connection identifier is used by network nodes for multiplexing, demultiplexing and switching.

CONNECTION-LESS PROTOCOL

A packet-switched protocol that permits a terminal to send data thorough the network without first establishing a virtual connection to the receiving terminal.

CONNECTION-ORIENTED PROTOCOL

A packet-switching technology, such as ATM, that can establish a virtual circuit between transmitting and receiving terminals so that it appears that the terminals are connected by a switched circuit with a fixed bandwidth. Connection-oriented protocols, unlike other packet-switching technologies, can be used to send information that requires a constant delay and bandwidth such as voice and video.

CONTENTION

A method of line control in which terminals compete with each other for permission to transmit over a common channel. If the channel is free, the terminal transmits. If the channel is in use by another terminal, the terminal attempting to transmit waits until the channel is free.

CORPORATE UTILITY NETWORKS

Private Networks which carry all or nearly all of a company's voice data and voice traffic. They take advantage of the price benefits of buying bandwidth in quantity. The bandwidth is then usually divided up among the applications using T1 time division (TDM) circuit multiplexers. Some have used statistical multiplexers (X.25, or more efficient vendor proprietary protocols) for allocating the bandwidth. These private networks can be designed for higher reliability and greater security than public networks.

CPE (CUSTOMER PREMISES EQUIPMENT)

In the U.S., end-users equipment that may not be owned by the local exchange; Carrier equipment that resides on the end user's side of the network interface boundary established by Computer Inquiry II.

CPS (CHARACTERS PER SECOND)

A transfer rate estimated from the bit rate and length of each character. If each character is 8 bits long and includes a start and stop bit for asynchronous transmission, each character needs 10 bits to be sent. At 2400 baud it is transmitted at approximately 240 CPS.

CRC (CYCLIC REDUNDANCY CHECK)

A type of block check character that is very effective in detecting communications errors. CRC characters are usually 12, 16, 24 or 32 bits long.

CROSSTALK

The unwanted transfer of energy from one communications circuit to another.

CSMA/CD (CARRIER SENSE MULTIPLE ACCESS WITH COLLISION DETECTION)

A protocol that Ethernet and some other LANs use to allow nodes to contend for the right to transmit over the network.

CSU (CHANNEL SERVICE UNIT)

A customer-owned, physical-layer device that connects CPE, such as a router, to a DSU. The CSU uses V.35 or similar protocol to communicate with the CPE. Because of regulatory changes, there is no need for physical separation of CSU and DSU any longer. Most so-called "DSUs" now marketed are really combination CSU/DSUs.

CT (CORDLESS TELEPHONE)

A generic term for systems evolved from the simple residential cordless telephone.

CT0

Another name for the British MTP1233 analog cordless telephone standard. The standard uses eight channel pairs with a base station transmit frequency near 1.7MHz and a handset transmit frequency near 47.5MHz.

CT1 (CORDLESS TELEPHONE - FIRST GENERATION)

First generation CT with analog speech and FDMA.

CT1+

A new version of the European CT1 analog cordless telephone standard that allocates 80 channel pairs in the 885 to 887MHz and 930 to 932MHz bands.

CT2 (CORDLESS TELEPHONE - SECOND GENERATION)

Second generation CT with digital speech and FDMA.

CT2+

An improved version of the CT2 cordless telephone standard that permits both incoming and outgoing calls.

CT3 (CORDLESS TELEPHONE - THIRD GENERATION)

A generic name for third generation CT, or it can refer to Ericsson's implementation of its DCT 900 cordless telephones.

CTIA (CELLULAR TELECOMMUNICATIONS INDUSTRY ASSOCIATION)

The cellular industry association, formed in May, 1984, to promote cellular technology, address common concerns, provide a forum for exchange of non-proprietary information, and provide a strong, effective voice in Washington. Represents more than 90% of the cellular carriers.

D CHANNEL

An ISDN statistically-multiplexed user-to-network channel. It carries signaling messages to control the B channels and/or X.25 packet-switched user data. It operates at 16kb/s in the Basic interface and 64kb/s in the Primary Rate Interface.

DAB (DIGITAL AUDIO BROADCASTING)

A proposed service for satellite broadcasting of CD-quality

audio. The FCC is proposing spectrum allocation in both 1429-1525MHz and 2300-2390MHz bands to WARC.

DACS (DIGITAL ACCESS & CROSS-CONNECT SYSTEM)

Part of AT&T Service NET-2000.

DAN (DESK AREA NETWORK)

The variety, power and complexity of the devices located on the desk top has increased to the point where the management and communications of this area deserves special consideration.

DARPA (DEFENSE ADVANCED RESEARCH PROJECTS AGENCY)

A US Department of Defense Agency that funds high-risk research projects and that funded the development of UNIX 4.2, and the TCP/IP communications protocol.

DATA BASE

An integrated collection of information that supports multiple applications and often multiple users.

DATA COMMUNICATIONS EQUIPMENT

A device that modulates digital signals onto an analog carrier for communications over an analog communications link, or which demodulates received analog signals to recover the digital information. A modem.

DATA COMPRESSION

A method of reducing the number of bits that are needed to represent information. Data compression allows higher communication speeds and allows more information to be stored on a disk.

DATALINK LAYER

Layer 2 of the OSI model. It defines error control, framing, synchronization, link initialization and disconnection, addressing and frame sequence control.

DATA MANAGEMENT

Software that manages the storage, retrieval, security, and integrity of information.

DATA RATE ADAPTATION

A feature of the data service unit (DSU) in the switched 56 service that allows the service to be used with terminals that operate at speed other than 56 kilobit per second. Data rate adaptation is the conversion between whichever clocking scheme and speed the terminal uses and the 56 kilobit per second synchronous clocking of the switched 56 line.

DATA SET

Telephone company jargon for a modem.

DATAGRAM

A Layer 3 packet. Typically in a connectionless service, in which case its header will contain source address and destination address.

dB (DECIBEL)

A unit for measuring the relative strength of signal power. The number of decibels equals ten times the logarithm (to the base 10) of the ratio of the measured signal power to a reference power. One-tenth of a Bell.

dBm (DECIBEL REFERENCING 1 MILLIWATT)

Signal power relative to 1mW expressed in dB.

DBS (DIRECT BROADCAST FROM SATELLITE)

A service for Broadcast of TV (and HDTV) signals from Satellite.

DCE (DATA CIRCUIT TERMINATING EQUIPMENT)

Carrier's equipment that is the DTE's Interface to the Network.

DCT 900 (ERICSSON'S DIGITAL CORDLESS TELEPHONE AT 900MHz)

Ericsson's CT3 implementation of digital cordless telephones and base stations intended for use with PBXs.

DDD (DIRECT DISTANCE DIAL NETWORK)

A telephone network to directly dial long distance telephone calls.

DDS (DIGITAL DATAPHONE SERVICE)

Originally an AT&T nationwide non-switched special service network for synchronous data at speeds up to 56kb/s.

DECnet

Digital Equipment Corporation's family of network products.

DECT (DIGITAL EUROPEAN CORDLESS TELEPHONE)

A digital cordless telephone standard that incorporates some of the features of a cellular telephone system. DECT telephones use picocells and calls can be handed off from one cell to the next.

DEMUX (DEMULTIPLEXING)

The process of separating a multiplexed signal into its separate intelligence signals.

DETERMINISTIC MULTIPLEXING

Each channel takes a constant, determined space. Digital systems use time division multiplexing (TDM) while analog systems use frequency division multiplexing.

DIGITAL INFORMATION

A stream of binary (0's and 1's) bits. Voice, documents, and even television can be sampled, quantized and converted to a digital bit stream.

DIGITAL SIGNAL

Has a very limited number of discrete states. (Usually no more than 4.) Contrasted with an analog signal which varies continuously and thus may have virtually an infinite number of states.

DIGITAL SYSTEMS INTERFACE

A chip-to-chip interface for ISDN modules supported by National Semiconductor and SGS-Thomson.

DIGITAL TRANSMISSION

Repeats where necessary by deriving then regenerating the original digital data. Much of the noise is removed by a digital system.

DMS-10

NT small to medium-size digital end office (class 5) switch.

DMS-100

NT large digital end office (class 5) switch.

DMS-200

NT large digital toll, access tandem, and/or operator switch.

DMS-250

NT large digital toll and operator switch for Interexchange Carriers. Makes up the bulk of the Sprint and half of the MCI long distance networks.

DOC (DEPT. OF COMMUNICATIONS)

The Canadian equivalent of FCC. Responsible for allocating spectrum in Canada.

DOWNLOAD

The process of transferring a file from a remote computer (called the host) to the user's computer.

dpi (DOTS PER INCH)

DPN (DIGITAL PACKET NETWORK)

NT packet-switched product line evolved from the successful SL10 packet switch.

DROP

A connection between a terminal and a multi-drop (bus) network.

DS (DIRECT SEQUENCE)

The most common "spread spectrum" technique used in CDMA which spreads the signal bandwidth by directly modulating the signal with a pseudo noise sequence.

DS0 (DIGITAL SIGNAL, LEVEL 0)

64kb/s rate. This is the basic building block in both the North American and European digital hierarchies. A DS0 channel can carry any one of the following:

An uncompressed voice call

A compressed high quality voice call

2 or more compressed voice calls

Data at speeds up to 56 or 64kb/s.

DS1 (DIGITAL SIGNAL, LEVEL 1)

1.544Mb/s North American rate. This is the rate used by T1 carrier.

DS2 (DIGITAL SIGNAL, LEVEL 2)

6.312Mb/s North American rate. This is the rate used by T2 carrier for 96 calls. It is expensive to install since it requires special cable, therefore, it is quite rare.

DS3 (DIGITAL SIGNAL, LEVEL 3)

44.736Mb/s North American rate. Consists of 28 DS1S plus overhead.

DSL (DIGITAL SUBSCRIBER LINE)

ISDN Basic Interface (2B+D) provided over a normal customer line (or loop).

DSP (DIGITAL SIGNAL PROCESSOR)

A digital integrated circuit (IC) designed as a general purpose filter and signal processor.

DSU (DIGITAL SERVICE UNIT)

A customer-owned, physical-layer device that terminates an access line, such as a T1, from the network. The customer's "mirror image" of a central office repeater. Traditionally, DSUs were network equipment used in conjunction with customer-owned CSUs (Channel Service Units) to terminate access lines. Because of regulatory changes, there is no need for physical separation of CSU and DSU any longer. Most so-called "DSUs" now marketed are really combination CSU/DSUs.

DTE (DATA TERMINAL EQUIPMENT)

User terminal equipment.

DTMF (DUAL TONE MULTI-FREQUENCY)

We can say Touchtone now that AT&T no longer enforces the trademark.

DU100 MODEM POOL ELEMENT

A device marketed by Motorola that allows users of the switched 56 service to communicate with analog modems at speeds of up to 9,600 b/s.

DUAL ATTACH NODE

An FDDI terminal that connects to both the primary and secondary nodes. A dual-attach node has two input ports and two output ports.

DYNAMIC ROUTER

A router that automatically broadcasts routing information throughout the internet work at regular intervals. Other dynamic routers use this information to update their routing tables in case any changes have been made to the network.

E - MAIL (ELECTRONIC MAIL)

Electronic messages that can be sent over a communications network from one computer to another.

E-TDMA (ENHANCED TDMA)

Proposal by Hughes, and others, with DSI and lower bit-rate vocoder to increase TDMA capacity.

E.164

Numbering Plan for the ISDN Era.

EAMPS (EXPANDED AMPS)

Expansion of AMPS to utilize the extra 10MHz BW allocated by the FCC.

EBCDIC (EXTENDED BINARY CODED DECIMAL INTER-CHANGE CODE)

An eight bit code that was developed by IBM Corporation and is widely used for the communication of text.

ECHO CANCELLATION

A circuit that uses DSP technology in a full duplex communications node to remove echoes of the transmitted signal from the received signal.

ECHO DISTORTION

A telephone line impairment caused by electrical reflections (echoes) where line impedances are dissimilar.

EDSL (EXTENDED DIGITAL SUBSCRIBER LINE)

Old name for Primary Rate Interface (PRI).

EMSR (ENHANCED SPECIALIZED MOBILE RADIO)

Enhanced Specialized Mobile Radio services proposed recently by Fleet Call to FCC. Would provide improved digital mobile radio and telephone service over aggregated channels in major markets. This is seen as competition to cellular. Would also provide FAX, vehicle location, and emergency service as well as dispatching and mobile phone services.

ENCODING

The process of putting information into digital format.

ENCRYPTION

A technique of modifying a bit stream to make it appear to be a random sequence of bits to someone who does not have access to the encryption scheme.

END-TO-END

An operation that proceeds from one end point to the other without being processed in each switch along the way. Not link-by-link.

ENVELOPE DELAY

A type of distortion on an analog line where the signal delay is a function of frequency.

EQUALIZATION

Compensation for frequency dependent attenuation in a communications circuit. Its purpose is to provide an equal signal attenuation over the circuit's full frequency range. See conditioning.

ERROR CONTROL

A method of detecting and correcting errors within a block of data.

ERROR RATE

The ratio of the number of data units received in error to the total number of data units. Also called bit error rate (BER).

ET (EXCHANGE TERMINATION)

An ISDN interface located in the telephone company central office switch.

ETHERNET

A LAN standard, also known as IEEE 802.3, that connects personal computers by means of coaxial cable or twisted pair conductors. Most Ethernet LANs operate at 10 mega-bits per second.

EURO ISDN (EUROFILE TRANSFER STANDARD FOR ISDN)

An international ISDN standard for Europe that is presently being installed and will eventually replace national ISDN standards.

EXCHANGE AREA

A geographical area with which there is a uniform set of charges for a communications service. In a telephone system, a call between any two points within an exchange area is a local call.

FACILITY

A transmission path between two or more locations without terminating or signaling equipment.

FAX (FACSIMILE)

A communications terminal for the transmission of graphics and documents.

FCC (FEDERAL COMMUNICATIONS COMMISSION)

A U.S. Federal government agency made up of seven commissioners appointed by the president and having the power to regulate all radio communications and all interstate electrical communications within the US and all electrical communications between the US and other countries.

FCS (FRAME CHECK SEQUENCE)

A CRC used in LAPD.

FDDI (FIBER DATA DISTRIBUTED INTERFACE)

A line standard that uses fiber-optic cable or twisted pair wire to connect computers. FDDI LANs operate at 100 megabits per second.

FDMA (FREQUENCY DIVISION MULTIPLE ACCESS)

A method of allowing multiple users to share the radio frequency spectrum by assigning each active user an individual frequency channel.

FDX (FULL DUPLEX)

A communications method where each end simultaneously transmits and receives.

FEC (FORWARD ERROR CORRECTION)

Any system that allows a terminal to both detect and correct errors in received data.

FEP (FRONT END PROCESSOR)

Synonym for IBM Communications Controller. Routes the traffic to and from the cluster controllers. Is usually co-located with the host computer, but can be remotely deployed either to save polling overhead or to serve as a routing device.

FFS (For Further Study)**FHSS (FREQUENCY HOPPING SPREAD SPECTRUM)**

A spread spectrum technology in which the transmitted signal "hops" from one frequency to the next in discrete steps. Contrast with direct sequence spread spectrum.

FIBER NODE

A field cabinet, or accessible service point, served by fiber, in Cable Television or Telephone Company distribution plant.

FIBER OPTICS

A transmission medium consisting of thin strands of glass or plastic through which data is sent over pulse-modulated light waves.

FIFO MEMORY (FIRST-IN, FIRST-OUT MEMORY)

A type of memory with separate input and output ports. The first data to enter the input port are the first to exit the output port. One use of FIFO memory is as buffer between a terminal and a LAN in a network interface controller.

FILTER

An electrical circuit that passes frequencies within a certain band and attenuates others.

FIRM WARE

A set of software instructions placed in a read-only memory (ROM).

FKS (FREQUENCY-SHIFT KEYING)

A type of frequency modulation used by low-speed modems.

FLAG CHARACTER

Layer 2 start of transmission and end of transmission character. Value is 01111110.

FLOW CONTROL

A method for a receiver to govern the information flow from a transmitter. This avoids the receiver being overrun and losing data, or needing a potentially infinite number of buffers.

FM (FREQUENCY MODULATION)

A method of impressing information on a carrier wave, in which the frequency of the carrier is modified according to a plan agreed to by the transmitter and receiver. Frequency Modulation can be analog (where the frequency modifications are continuous over a specified range) or digital (where the frequency modifications are according to discrete intervals which represent ones and zeros). Compare Frequency Modulation to Amplitude Modulation and Phase Modulation. Frequency Modulation has been used extensively in broadcast radio and traditional AMPS cellular service. FM has a useful characteristic that the receiver tends

to "lock on" to the strongest signal at the given carrier frequency, and is therefore somewhat better able to withstand co-channel interference than other modulation techniques.

FORMAT

A specified arrangement of data that permits identification of control and information field by their location in the data stream.

FOUR-WIRE CIRCUIT

A full-duplex communication channel over which transmission occurs over one pair of wires, and reception occurs over a separate pair.

FPLMTS (FUTURE PUBLIC LAND MOBILE TELECOMMUNICATIONS SYSTEMS)

CCITT's term for the next generation(s) of wireless access to public mobile and personal network services. Sometimes pronounced "Flumpits" or "Flumpts". Another term for UMTS.

FRAME (LAYER 1)

On digital transmission facilities in the telephone network the digital bit stream is organized into fixed units, called frames, which are transmitted every 125 microseconds (8000 times per second). Typically, on time division multiplexed lines, the frame consists of a block of data consisting of one time slot from each channel plus synchronization and other overhead bits.

FRAME (LAYER 2)

Block of data at Layer 2. Begins and ends with a flag character.

FRAMING ERROR

A communications error that occurs when the receiving terminal is unable to determine where a data word begins and ends.

FRAME RELAY

Basically a stripped-down, souped-up X.25 optimized for low error rate networks carrying up to about 4000 bytes per frame. A connection-oriented, multiplexed, Layer 2, HDLC protocol with almost no procedures. In particular the HDLC control field is not included in the procedures. Two kinds of calls are defined, Permanent Virtual Circuits (PVCs), which are set up with administrative procedures and Switched Virtual Circuits (SVCs), which are set up with Q.931. Setting up a call creates a connection between one Data Link Connection Identifier (DLCI) on a user-to-network interface (UNI) and another DLCI on another UNI. Error recovery and flow control are not part of Frame Relay procedures and must be performed end-to-end. Congestion control procedures are defined using three congestion control bits.

FRAMING (LAYER 1)

The method and process for locating the start of every 125ms Layer 1 frame. Then each time slot of element within a frame can be identified.

FT1 (FRACTIONAL T1)

In T1 carrier systems when a fraction of the total twenty-four 64kb/s channels are assigned to an individual customer. The remainder of the channels are then available to be used by other customers. This provides intermediate pricing levels between a DS0 channel (56kb/s or 64kb/s) and a full T1. IECs are in the best position to share channels and generally offer these pricing levels.

GAP (GROUND-TO-AIR PAGING)

The ability to page a station in an airplane from the ground.

GAIN

The amount by which a signal's strength is increased when it passes through an amplifier or a repeater. Gain is usually measured in decibels, but it can also be expressed as the ratio of output power to input power.

GATEWAY

A device that connects two or more networks of different types together and functions at OSI layers 1 through 3.

GCI (GENERAL COMMUNICATION INTERFACE)

An ISDN inter-chip standard interface both basic rate and primary rate equipment.

GFSK (GAUSSIAN FREQUENCY-SHIFT-KEYING MODULATION)

A form of filtered FSK that greatly reduces the bandwidth required to transmit information. The data stream passes through a Gaussian shaped digital finite-impulse response (FIR) filter, which uses DSP techniques to shape the signal.

GROUPE SPECIAL MOBILE

Former name of the Global Systems for Mobile Communications (GSM) European digital cellular standard.

GSM (GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS)

The pan-European Digital Cellular Radio Standard (based on TDMA-8) in 900MHz band. Previously called Group Special Mobile after the standards committee that developed it.

GSO (GEOSTATIONARY SATELLITE ORBIT)

A satellite orbit 23,000 miles over the equator with an orbit time of exactly 24 hours. Thus a satellite in a Geostationary Satellite Orbit appears motionless to an earth station which can receive it with a stationary antenna. One drawback is that a two way communication channel through a geostationary satellite incurs a round trip, speed of light delay of over one half second.

H0 CHANNEL

384kb/s channel (6 64kb/s channels or one-quarter of a T1 line).

H10 CHANNEL

North American 1472kb/s channel from a T1 or primary rate carrier. Equivalent to 23kb/s channels.

H11 CHANNEL

North American primary rate used as a single 1536kb/s channel (24 64kb/s channels or an entire T1 line except for the 8kb/s framing pattern.)

H12 CHANNEL

European primary rate used as a single 1920kb/s channel (30 64kb/s channels or an entire primary rate carrier, except the 64kb/s signaling channel and the 64kb/s framing and maintenance channel.)

HALF DUPLEX

A communications method where one end transmits while the other end receives, then the process is reversed.

HAMMING CODE

A forward error correction scheme named for its inventor that can correct single bit errors without the need for retransmission.

HANDSHAKING

A set of signals that coordinate the transfer of data from one device to another.

HARMONIC

A frequency that is a multiple of a fundamental value.

HARMONIC DISTORTION

A type of communications line distortion that is caused by erroneous frequency generation along the line.

HDLC (HIGH-LEVEL DATA LINK CONTROL)

An ISO bit-oriented protocol Superset that is the basis for most modern Layer 2 protocols.

HDSL (HIGH BIT-RATE DIGITAL SUBSCRIBER LINE)

A technology to transport T1 data (1.544 megabits per second) over 12,000 feet of 24-gauge wire or 9,000 feet of 26-gauge wire without the need for repeaters. It requires two pairs of wire, each of which carries full-duplex data at half the total speed using 2B1Q modulation.

HETEROGENEOUS

Made up of different systems, vendor's products, or architectures.

HIERARCHICAL NETWORK

A network topology organized in the form of a pyramid with one terminal at the top and increasing numbers of terminals at each lower level. Also called a tree.

HIT

Errors on a communications link caused by impulse noise.

HOUSE CABLE

Conductors inside a building used to connect communication equipment to outside lines.

HUB

A central node in a star network. All other nodes are connected to the hub by means of point-to-point communications links.

HUFFMAN ENCODING

A data compression scheme that uses fewer bits to represent frequently occurring characters. Huffman encoding works well with text.

HYBRID

A telephone circuit that joins a two-wire line to a four-wire line. Originally, hybrids were transformers, but today they are electronic circuits.

HYPERSTREAM

The marketing name for MCI's SMDS service.

Hz (CYCLES PER SECOND)

I.441 (Q.921)

ISDN user-network interface - (D Channel) Layer 2 specification. Part of DSS1.

IEC (INTEREXCHANGE CARRIER)

A long distance company such as AT&T, MCI, Sprint, or hundreds of smaller companies.

IEEE (INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS)

A membership organization of engineers that, among other activities, produces data communications standards.

IEEE 802.11

The IEEE 802 committee chartered to develop Physical Layer (PHY) and Medium Access Control Layer (MAC) specifications for wireless LANs.

IMASS (INTELLIGENT MULTIPLE ACCESS SPECTRUM SHARING)

A method of utilizing spectrum "gaps" between existing private operational fixed microwave (OFM) systems. Avoid interference and displacement of current licenses.

IMPULSE NOISE

A type of communications line interference characterized by high amplitude and short duration.

IMTS (IMPROVED MOBILE TELEPHONE SERVICE)

The pre-cellular mobile telephone service enhancement introduced in 1965 which permitted full duplex mobile radio communications.

IN (INTELLIGENT NETWORK)

Initial services are 800, VPN, and calling card.

INBAND SIGNALING

Signaling that travels on the same circuit and uses the same frequencies as the call.

INMARSAT (THE INTERNATIONAL MARITIME SATELLITE ORGANIZATION)

The international organization, with participation for the U.S. solely by Communications Satellite Corp., chartered to develop and operate global maritime facilities and service for the commercial and safety needs of U.S. and foreign countries.

INTEGRATED ACCESS

The use of a single access service, such as T1, to transport multiple service types, such as switched voice and dedicated private lines. As an example a customer may purchase a T1 service from a LEC and arrange with an IEC to have some of the channels connected to a voice switch and some connected to private lines for data.

INTELSAT (INTERNATIONAL TELECOMMUNICATIONS SATELLITE ORGANIZATION)

The international organization, of which the U.S. is a party, established to develop and operate a global commercial communications satellite system.

INTERFACE

A common boundary between two or more systems, integrated circuits, or pieces of equipment that ensures a proper connection between them.

INTERNATIONAL STANDARDS ORGANIZATION (ISO)

The standards organization that developed the Open Systems Interconnect Model and other international communications standards.

INTERNETWORKING

The technique of connecting individual LANs to form a larger network.

INTEROFFICE TRUNK

A telephone circuit that connects two telephone company offices.

IRAC (INTERAGENCY RADIO ADVISORY COMMITTEE)

A government committee which advises the Commerce Secretary on the government's spectrum needs.

IS-54 (EIA/TIA INTERIM STANDARD-54)

The North American Digital Cellular proposed standard recommended by the CTIA. It is based on TDMA.

IS-94

A CDMA standard for use in the U.S.

IS-136

A digital cellular standard proposed for North America. An earlier version of the standard is called IS-95. Commonly referred to as TDMA, even though it is only one of several digital cellular standards that use this technology.

ISDN (INTEGRATED SERVICES DIGITAL NETWORK)

An evolution of the Integrated Digital Network providing end-to-end digital connectivity to which users have access to a wide range of services through a limited set of standard user-to-network interfaces.

ISI (INTERSYMBOL INTERFERENCE)

The interference resulting when delayed signal symbols (e.g., reflected signals) interfere with the symbols of the direct signal.

ISM BANDS (Industrial Scientific and Medical Bands)

Abbreviation for the North American "industrial, scientific, and medical" bands that were originally set aside for heating devices including welders and microwave ovens but which are now open to certain unlicensed communications technologies including digital cordless telephones and wireless LANs.

ISO (INTERNATIONAL ORGANIZATION FOR STANDARDIZATION)

Best known for the 7-layer OSI Reference Model. See OSI

ITU (INTERNATIONAL TELECOMMUNICATIONS UNION)

A telecommunications agency established by the United Nations to provide standardized communication procedures and practices including frequency allocation and world-wide radio regulation. The ITU is the successor organization to the CCITT. Has four permanent organs, the CCITT, CCIR, International Frequency Registration Board (IFRB), and General Secretariat. Founded in 1865.

JITTER

A short-term timing deviation.

J-TACS (JAPANESE TACS)

Narrow band analog FM analog cellular system. 12.5kHz wide channels.

KEY SET

Telephone set having more buttons than the normal 12 button keypad. Additional buttons are for access to multiple lines. Directory numbers, hold, etc.

km (KILOMETER) 3.3 kilofeet**LAN (LOCAL AREA NETWORK)**

As defined by IEEE Committee 802.6: A non-public data network in which serial transmission is used without store and forward techniques for direct communication among data stations on a user's premises. Examples are ethernet (802.3) and token ring (802.5).

LAPB (LINK ACCESS PROCEDURE BALANCED)

Bit-oriented data link protocol standards published by the CCITT that specify the functions of the data link level of CCITT Recommendation X.25. They are compatible subsets of HDLC. (See High-Level Data Link Control).

LAPD (LINK ACCESS PROCEDURE D)

Layer 2 protocol defined in CCITT recommendations I.440/441/442 cross referenced as Q.920/921/922. Reliably transfers blocks of information across a single Layer 1 link.

Unlike LAP and LAPB, supports multiplexing of different connections at Layer 2.

Originally used on the ISDN D Channel, LAPD is the foundation for V.120, frame switching and frame relay.

LAPM (LINK ACCESS PROCEDURE FOR MODEMS)

An error correction scheme.

LATA (LOCAL ACCESS TRANSPORT AREA)

Upon divestiture, the United States, Puerto Rico, Guam and the Virgin Islands were divided into 198 areas for the purpose of interconnectivity, known as Local Access Transport Areas (LATAs). Population density was a primary consideration when LATA boundaries were determined. High population areas, like the North-East U.S., have relatively small LATAs, while places like Wyoming and South Dakota are contained within a single LATA. A LATA defines the boundary within which most LECs (the RBOCS and GTE) can provide end-to-end multi-switch service. If the called party is inside a different LATA than the call originator, then the affected LECs must hand off the call to an IEC (such as AT&T, MCI, Sprint, etc.). This restriction applies to any end-to-end information transfers, not just voice transmission. Currently regulatory interpretation considers SS7 messages as end-to-end information transfers. Thus, a signaling message for a remote LATA must be handed off to an IEC SS7 network for transport. Because the need to hand off inter-LATA requires that the signaling network as well as transport facilities be interconnected across the LATA boundaries, the LECs' implementation of SS7 is more complicated than that of the IECs. Even though the restriction to use an IEC for inter-LATA communications only applies to the BOCs and GTE, most of the smaller independent LECs operate within a single LATA and most inter-LATA communications are handled by and IEC.

LAYER 1

Physical Layer in OSI Reference mode. Includes transmission of signals and the activation and deactivation of physical connections.

LAYER 2

Link Layer in OSI Reference mode. Includes synchronization and some control over the influence of errors within the physical layer.

LAYER 3

Network layer in OSI Reference model. Includes routing and switching functions.

LAYER 4

Transport layer in OSI Reference mode. Uses Layers 1 to 3 to provide an end-to-end service with the required characteristics for the higher layer functions.

LAYER 5

Session layer in OSI Reference model. Allows presentation entities to organize and synchronize their dialogue and to manage their data exchange.

LAYER 6

Presentation layer in OSI Reference model. Includes data formatting and code conversion.

LAYER 7

Application layer in OSI Reference model. Provides the means by which the user programs access the OSI environment and may contain part of these user programs.

LCM (LINE CONCENTRATING MODULE)

Part of NT DMS-100. Handles up to 640 lines with up to 6 duplicated digital links. Occupies 1/2 Bay.

LEASED LINE

A semi-permanent leased telephone circuit that connects two or more points and is continuously available to the subscriber.

LEC (LOCAL EXCHANGE CARRIER)

Local telephone company. Bell company or independent such as Southern New England Telephone (SNET), Cincinnati Bell, GTE (Contel), United, Centel, Rochester Telephone, Wamego Telephone, or hundreds of others.

LEO (LOW-EARTH ORBIT)

The use of satellites much lower than geostationary heights to keep delay low.

LINE

A communication path between a switch and one end user. Analog lines are termed tip and ring and carry one telephone call. ISDN lines are called Digital Subscriber Lines and can carry several calls.

LINE PROTOCOL

A control program used to perform data communication functions over network lines and which consists of hand shaking and line-control functions that move the data between the transmit and receive terminals.

LINK

Circuit or channel from one switch to another.

LINK-BY-LINK

An operation that proceeds sequentially, from one switch to the next over each successive line. Not end-to-end.

LOCAL OFFICE SWITCH

A telephone switch that serves all subscribers connected to a single telephone exchange.

LOOP

Pair of wires connecting the subscriber to the Telephone Company central office.

LOOPBACK

Directing signals back toward the transmitting terminal at some point along the communications path. Used as a method of troubleshooting.

LPC (LINEAR PREDICTIVE CODING)

A method of speech coding which models the vocal tract of humans and transmits model parameters and one of a pair

of simple excitation sources (a tone or noise) to re-create (predict) the next few milliseconds of speech sound.

LSB (LEAST SIGNIFICANT BIT)

Lowest order bit in the binary representation of a numerical value. The LSB has the least impact on the value of the number which is digitally represented. For example, in voice encoding, the least significant bit can occasionally be dropped without causing noticeable degradation of speech quality.

LT (LINE TERMINATION)

An ISDN interface used between the local loop and the telco central office switch.

M13 (MULTIPLEXER DS1 TO DS3)

MAGNITUDE BIT

The second bit in a dibit (group of two bits) in a 2 binary, 1 quaternary modulation. The magnitude bit determines the voltage level of the transmitted signal. The other bit is called the sign bit and determines if the voltage is positive or negative.

MANCHESTER ENCODING

A coding scheme used with several LANs. Manchester encoding has a logic transition in the center of each bit. A positive transition indicates a logic 1 and a negative transition indicates a logic 0.

MARK

Communications terminology for a binary 1 in a data communication.

MAU (MEDIA ACCESS UNIT AND MULTI-STATION ACCESS UNIT)

A device used to connect a terminal to a 10BASE-5 Ethernet LAN. A Token Ring hub. The hub gives the Token Ring LAN the physical appearance of a star network, although electrically it is still a ring.

MDS (MULTIPOINT DISTRIBUTION SERVICE)

A communication system that delivers video programming to subscribers over microwave radio links. From the consumer point of view, MDS is similar to cable television and it is popularly known as wireless cable.

MEDIUM

The path information travels from the transmitter to the receiver in a communications systems.

MESH NETWORK

A network topology that features numerous communications links among the terminals.

MESSAGE

An information package, typically in a specific digital code, that is transmitted over a communications system.

MF (MULTI-FREQUENCY)

System of dual tones used for in-band trunk signaling. Similar to touch tone, but uses different frequencies.

MFJ (MODIFIED FINAL JUDGMENT)

The agreement between AT&T and the Department of Justice, enforced by Judge Greene, wherein AT&T divested itself of the seven regional holding companies and their Bell Operating Companies (BOCs).

MFLOPS (MILLIONS OF FLOATING POINT INSTRUCTIONS PER SECOND)

A measure of the computing power measured in terms of its ability to do complex multiplication, division, addition, and subtraction with "floating point", (i.e., non-integer) numbers - e.g., in DSPs.

MIDSPAN MEET

The ability to connect different vendors' equipment to each other on a communication network and have them function properly with each other.

MIPS (MILLIONS OF INSTRUCTIONS PER SECOND)

A measure of the computing power measured in terms of the number of instructions it can execute in seconds. Its value is highly dependent, of course, on how powerful its instructions actually are.

MIRS (MOTOROLA INTEGRATED RADIO SYSTEM)

Motorola's next generation of trunked SMR using TDMA/6 in bandwidth of one FM channel today. Fleet Call plans to use in its Enhanced Specialized Mobile Radio (ESMR) systems in LA.

MIXED SIGNAL SEMICONDUCTORS

Integrated circuits that combine both analog and digital technology. Examples of mixed signal semiconductor devices are analog to digital converters, digital to analog converters, CODEC's, and vocoders.

MNP (MICRON NETWORK PROTOCOL)

A system of error checking and data compression protocols that has become a defacto standard for modem communications.

MODEM - MODULATOR/DEMODULATOR

A DCE. Used to modulate digital data onto an analog carrier so that it can be sent over an analog communications medium such as a telephone link and to demodulate the data at the receiving terminal.

MODULATION

The process of impressing information on a carrier wave. Modulators change either the amplitude, frequency, or phase of a carrier wave to represent ones and zeros (in digital modulation) or other signals.

MPT (MINISTRY OF POSTS AND TELECOMMUNICATIONS)

Japanese government regulatory agency that oversees communications.

MPT1233

An analog cordless standard used in the U.K. Sometimes called CT0. The standard uses eight channel pairs with a base station transmit frequency near 1.7MHz and a handset transmit frequency near 47.5MHz.

MSA (METROPOLITAN STATISTICAL AREA)

The largest (by population) U.S. 306 Cellular Market areas as defined by the FCC.

MSB (MOST SIGNIFICANT BIT)

Highest order bit in the binary representation of a numerical value. The MSB has the most impact on the value of the number which is digitally represented. Loss of the MSB for any encoding, even speech, unacceptably corrupts the received information.

MSC (MOBILE SERVICES SWITCHING CENTER)

A generic name for the main switching center supporting multiple base stations.

msec

Milliseconds. Thousandths of a second.

MSS (MOBILE SATELLITE SERVICE)

A generic name for mobile services provided using earth satellites.

MTA (MAJOR TRADING AREA)

To identify areas of economic integration, Rand McNally (1-800-284-6565) in their \$395 "Commercial Atlas and Marketing Guide," has divided the country into 47 Major Trading Areas (MTAs). An MTA consists of a number of counties; counties are never split between MTAs. For example, the Chicago MTA consists of 84 counties. Each MTA consists of one or more Basic Trading Areas (BTAs). For instance, the Chicago MTA includes 18 BTAs such as Rockford BTA, Springfield BTA, Ft. Wayne BTA, etc. Milwaukee is another MTA.

MTSO (MOBILE TELEPHONE SWITCHING OFFICE)

A system that provides telephone switching services for a cellular telephone network. Wire telephone lines connect the MTSO to each of the cellular base stations that it serves, and trunk lines connect the MTSO to the telephone company's central office switch. An AMPS and cellular term for what is now generically called MSC (Mobile Service Switching Center).

MTX (MOBILE TELEPHONE EXCHANGE)

The Northern Telecom term for MTSO (Mobile Telephone Switching Office).

MULTICAST

A service with one transmitter and more than one addressed receiver. (Compare to broadcast - With broadcast, all receivers on the network are addressed. With multicast, a subset of the receivers are addressed.)

MULTI-MEDIA COMMUNICATIONS

A communication that is made up of a combination of text, graphics, video, and audio.

MULTIPLEXING

Dividing a transmission facility into two or more channels. Please refer to statistical multiplexing or deterministic multiplexing.

MUX (MULTIPLEXER)

Equipment that divides a transmission facility into two or more channels. Please refer to statistical multiplexing or deterministic multiplexing.

N-ISDN (NARROWBAND ISDN)

Includes basic interface (2B+D or BRI) and primary rate interface (23B+D or PRI). Copper based at speeds at or below 1.5Mb/s.

N-TACS (NARROWBAND TACS)

The narrowband version of TACS from Motorola which doubles the capacity of TACS by splitting the 25kHz TACS channel into two 12.5kHz channels.

NAMPS (NARROWBAND ADVANCED MOBILE PHONE SERVICE)

Motorola's narrowband AMPS getting three 10kHz channels in bandwidth of one 30kHz channel, along with improved signaling. Pronounced N-AMPS.

NANP (NORTH AMERICAN NUMBERING PLAN)

Specifies the 10 digit telephone address.

3-digit Area Code or Numbering Plan Area (NPA) plus 7-digit directory number comprised of 3-digit Central Office (CO) code and 4-digit station number.

NETWORK

A set of terminals, the communications links that joint them, and the protocols that allow them to function together and communicate with each other.

NETWORK ADMINISTRATOR

A person who is responsible for the efficient operation of one or more LANs.

NETWORK LAYER

Layer 3 of the OSI model. It defines how data are switched and routed through the network.

NETWORK MANAGEMENT SYSTEM

Software for managing the operation of a multi-point network from a central location.

NETWORK-TO-NETWORK INTERFACE

An ATM interface that connects ATM switches to each other. Also see user-to-network interface.

NETWORK OPERATING SYSTEM

A software program that provides a network user interface and controls the network's operation to allow users to communicate with each other and share files and peripherals.

NFS (NETWORK FILE SYSTEM)

A protocol for transparently sharing files across a computer network that was developed by Sun Microsystems and is now a defacto standard for UNIX computers. It is based upon TCP /IP and Ethernet.

NIC (NETWORK INTERFACE CONTROLLER)

An interface that is usually located within a terminal and which connects a LAN to the terminals address, data and control buses.

NMT450 (NORDIC MOBILE TELEPHONE AT 450MHZ)

The Nordic Mobile Telephone system operating at 450MHz; introduced in 1981.

NMT900 (NORDIC MOBILE TELEPHONE AT 900MHZ)

Essentially an upgrade of the NMT450 to 900MHz with enhancements and more channels.

NNI (NETWORK NODE INTERFACE AND NETWORK-TO-NETWORK INTERFACE)

There are two different interfaces that are abbreviated NNI. Frame Relay defines a Network-to-Network Interface as the interface between two networks. This could be networks of two different carriers; for example between a Local Exchange Carrier and an Interexchange Carrier. Or, this could be between a customer frame relay network and an Interexchange Carrier network. Since the current definition of the Frame Relay NNI is NOT cell based, its use is not appropriate as an efficient interface between Frame Relay switches manufactured by a single vendor used in a single network. Instead vendor-specific interfaces are used. ATM and Broadband ISDN define a Network Node Interface as the interface between two network switches. This could be switches of two different carriers; for example between a Local Exchange Carrier and an Interexchange Carrier. The ATM NNI is also designed to be efficient enough to be the interface between ATM switches manufactured by a single vendor used in a single network.

NODE

A terminal on a data communications network.

NOISE

Random and undesired electrical signals that are introduced into a communications channel by circuit components, natural electrical activity, or the operation of electrical equipment.

NORDIC MOBILE TELEPHONE (NMT)

A European analog cellular telephone standard derived from the U.S. AMPS standard. NMT is deployed in the Scandinavian countries, the Benelux countries, France, Spain, and in much of Eastern Europe.

NPA (NUMBERING PLAN AREA)

Commonly known as "Area Code" (e.g., 212, 800, or 900).

NPRM (NOTICE OF PROPOSED RULEMAKING [BY FCC])

FCC Notification to the Industry of its intent to define new regulations.

NT (NETWORK TERMINATION)

Network Termination, as in NT1, NT2 or NT12. An ISDN interface installed at a subscriber's premises that interfaces the customer's premises equipment to the telephone company local loop.

NT1 (NETWORK TERMINATION 1)

In the U.S., a customer-owned device that converts from external telephone company transmission format (U interface) to internal building transmission format (T interface). Concerned only with Layer 1. Should contain loopback and other maintenance capabilities to enable problems to be isolated to the telephone network or customer's equipment. NT1 for basis interface contains digital hybrid circuitry. Before ISDN this type of equipment was formerly known as NCTE.

NT12 (NETWORK TERMINATION 1 AND 2)

Combination NT1 and NT2 in same unit.

NT2 (NETWORK TERMINATION 2)

Customer premises device to fanout a user-to-network (T) interface into multiple T or R interfaces. Concerned with Layer 1, 2, and 3. Examples are a PBX, Key system, LAN, and terminal controller.

NTACS (Nippon TACS)

A Japanese version of TACS.

NTIA (NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION)

U.S. Government agency responsible for, among other things, administering the use of spectrum allocated for government usage.

NTSC (NATIONAL TELEVISION STANDARDS COMMITTEE)

NTT (THE JAPANESE NIPPON TELEPHONE AND TELEGRAPH CELLULAR SYSTEM)

The Japanese NTT systems are cellular systems operating at 450MHz and 800MHz.

NX64 kb/S

The use of multiple 64kb/s channels as a single bit stream in digital carrier systems such as T1. This bit stream can be used for a single application like video conferencing or for a single customer. Also called Fractional T1 or FT1.

OAM&P (OPERATIONS, ADMINISTRATION, MANAGEMENT AND PROVISIONING)

That portion of the SONET and SDH standards that deals with the administration and management of the networks. The OAM&P standards are still under development.

OC-n (OPTICAL CARRIER AT LEVEL n)

A multiple of SONET's basic optical speed of 51.84 megabits per second, where n is the multiple. The electrical equivalents are known as Synchronous Transport Signal at Level n (STS-n).

OCTET

8 Bits grouped together (256 possible combinations) to form a character. CCITT lingo for a byte.

ORIGINATE MODEM

The modem that originates communication in a full-duplex communications system.

OSI (OPEN SYSTEM INTERCONNECTION REFERENCE MODEL)

International Standards Organization (ISO) model of how data communications systems can be interconnected. Communication is partitioned into seven functional layers. Each layer builds on the service provided by those under it.

OUT-OF BAND SIGNALING

A system that uses a separate communications channel or frequencies outside of voice band for signaling. Digital examples are the ISDN D Channel and common channel signaling.

PACKET

A grouping of data, typically from 1 to 512 characters in size, which usually represents on transaction. A packet is always associated with an address header and control information. The term "Packet" is usually used to refer to a Layer 3 data unit in X.25.

PACKET SWITCHING

A method of transmitting units of data (called packets) through a mesh network. There is no physical circuit established between end points; instead, each packet is relayed from one switching node to the next, and individual packets may take different routes through the switching network.

PACKET-MODE TERMINAL

Data terminal equipment that can format packets and transmit and receive them.

PAD (PAD ASSEMBLER/DISASSEMBLER)

A PAD assembles packets by buffering asynchronous characters, then emitting them with an address header in a burst to a packet switched network when 1) the buffer is full, or 2) an end of transaction character such as line feed is encountered, or 3) a timer expires for characters waiting in the buffer to be transmitted. A PAD disassembles packets by receiving them from a packet-switched network, opening them up, and emitting asynchronous characters to the attached non-packet device.

PARITY

An redundant bit added to each data word in a communication to aid in error detection. All words in the communication have either an even or an odd number of binary 1s.

PARITY ERROR

The error that occurs in a DTE when the received data has the wrong parity.

PASSIVE BUS

A configuration of the ISDN basic interface having up to eight Terminal Equipments (TEs) connected in parallel, each having physical access to the D channel and both B channels. Each TE has a different Terminal Endpoint Identifier (TEI) allowing the switch to individually access them using the point-to-multipoint protocol to LAPD. D channel collisions are resolved by the TE's Level 1 hardware. B channel contention is resolved by the switch using Q.931 messages. There are no active elements in the bus, hence the name.

PBX (PRIVATE BRANCH EXCHANGE)

A customer premises telephone switch connecting 20 or more station sets to each other, to the public network, and possibly to a private network.

PCM (PULSE CODE MODULATION)

A digital modulation scheme for representing analog information such as audio or video. To perform PCM, the analog signal is first sampled, and each sample is quantized. The amplitude of each sample is represented by a binary number, which can in turn be sent over a digital communications network.

PCMCIA (PERSONAL COMPUTER MEMORY CARD INTERNATIONAL ASSOCIATION)

PC Card is the new acronym.

PCN (PERSONAL COMMUNICATIONS NETWORK)

A generic term for a network supporting Personal Communications Service. Also, sometimes used to refer to the specific implementation of early PCS capabilities in the United Kingdom.

PCS (PERSONAL COMMUNICATIONS SERVICE (SYSTEM))

A broad range of communications services that enable communications with PERSONS, wherever they are! Personal Communications System refers to the hardware and software providing Personal Communications capabilities.

PDMA (PHASE DIVISION MULTIPLE ACCESS)

A new radio frequency multiplexing technique in which multiple FM signals share the same frequency division channel by being modulated by carrier signals which are maintained at different phases. Experimental military systems have achieved a 6 to 1 increase in capacity over existing FDMA systems by using carrier signals which are separated in phase by 60 degrees. Most information on PDMA is classified.

PDN (PUBLIC DATA NETWORK)

A generic term for the collection of networks providing public data services.

PDS (PREMISES DISTRIBUTION SYSTEM)

AT&T's twisted pair and fiber optic wiring scheme, which is also supported by other vendors including Xerox and Hewlett Packard.

PHOTONIC

Carrying information with photons (light) rather than with electrons (electricity). While photonic transmission has been extremely successful, the information must still be converted into electrons for switching. Research and development projects are striving to switch information directly in photonic form.

PHS (PERSONAL HANDYPHONE SYSTEM)

A cordless system and digital network that was developed in Japan. PHS uses TDMA and TDD. Each R.F. channel carries four full-duplex bearer channels, and information is transmitted over each R.F. channel at a raw data speed of 384 kilobits per second. Indoors, a PHS mobile telephone works in a manner similar to a conventional cordless telephone. Outside, PHS links with base stations that operate in microcells with ranges from 100 to 500 meters. Hand-offs from cell to cell can take place if the telephone moves through the cells at a walking speed.

PHYSICAL LAYER

The lowest layer (layer 1) of the OSI Model that defines the physical medium for data communications.

PL (PRIVATE LINE)

A non-switched communications channel from one location of a customer to another. Leased from an LEC or IEC.

PLL (PHASE-LOCKED LOOP)

An electronic circuit that consists of a phase detector, low pass filter and voltage controlled oscillator. A PLL can be used as an FSK demodulator.

PLMR (PRIVATE LAND MOBILE RADIO)

PLMR Services include SMR and most traditional forms of radio dispatch of vehicles and personnel. PLMR Providers must be used for business communications. Cannot resell services for profit.

PLUG-IN MODEM

A modem built onto a circuit board which plugs into a slot on the motherboard of a terminal or computer.

PMR (PUBLIC MOBILE RADIO)

Traditional two-way radio, usually push-to-talk, but can be much more sophisticated.

PN (PSEUDO-RANDOM NOISE)

A noise-like sequence of 1's and 0's, but with a predictable pattern which can be reproduced, provided that certain key information is known.

POINT-TO-POINT NETWORK

A communications network consisting of a single combinations link that connects two terminals and is not shared by other terminals.

POLLING

The method used on multi-drop communications line operating from a Front End Processor to multiple cluster controllers which keeps more than one from transmitting at the same time. Operates with a roll call, then speak, but only when asked.

POP (POINT OF PRESENCE)

The physical location in each Local Access Transport Area (LATA) from which an interexchange carrier provides services to the local exchange carrier, and possibly directly to end users.

PORT

The hardware that permits data to enter or exit a computer, network node, or communications device. Also see communications port.

PRA

ISDN primary rate access. See PR1.

PRESENTATION LAYER

Layer 6 of the OSI model. It performs code conversions and data reformatting, formats information for display on the terminal screen and performs data compression and decompression.

PRI (PRIMARY RATE INTERFACE)

An ISDN User-to-Network Interface (based on T1 Carrier in North America and Japan) consisting of (in North America) twenty-four full duplex channels; twenty-three 64kb/s B Channels and one 64kb/s D Channel (23B+D). The physical medium is two twisted-pairs of wire.

PRIMARY RING

The data path that normally carries communication on an FDDI network. There is also a secondary ring, which serves as a backup if the primary ring is damaged.

PRIVATE NETWORK

Used by a single enterprise. Can refer to either Private Voice Networks or Private Data Networks. 1) Private Voice Networks: several PBXs connected together by private lines and/or VPN services. 2) Private Data Networks: often needs only minimal intra-net security and privacy features. Often billing capabilities not needed.

PRIVATIZATION

The process of converting government owned businesses into privately owned companies. Privatization of telecommunications is a major global trend.

PROTOCOL

In general, any agreement that facilitates communications. In data communications, a public (standard) or private (proprietary) specification for communications between peer layers in a layered architecture.

PSEUDOTERNARY CODING

A form of digital signaling that uses three signal levels to represent binary data. In ISDN, pseudoternary coding represents a binary 1 with no signal level and a binary 0 with alternately positive and negative pulses.

PSK(PHASE SHIFT KEYING)

A type of phase modulation used by many modems.

PSTN (PUBLIC SWITCHED TELEPHONE NETWORK)

A generic term for the collection of networks providing public telephone switching service.

PTN (PERSONAL TELEPHONE NUMBER)

A telephone number assigned to a PERSON, rather than to a station or network port.

PTT (POSTAL TELEPHONE AND TELEGRAPH)

Postal telephone and telegraph. A generic term for European telephone companies, which are generally operated by the country's postal service.

PUBLIC NETWORK

Can be shared by independent and several competing customers. Thus has security and privacy features. Has high availability, reliability. Must offer billing capabilities and inter-exchange carrier selection. To fit well into telco's networks, equipment must support standard operations support systems, standard transmission equipment, and standard network equipment.

Q.931(I.451)

Layer 3 protocol for out-of-band message-oriented signaling across user-to-network interface. Originally specified for the D channel of the ISDN Basic Interface (BRI) and Primary Rate Interface (PRI).

Q.932

Q.931 signaling protocol extensions to add supplementary services. These include custom calling features.

QAM (QUADRATURE AMPLITUDE MODULATION)

A combination of phase-shift keying and amplitude modulation used by high speed modems.

QUATERNARY

A coding scheme that uses four different voltage levels to represent information, used over the local loop with basic ISDN.

R INTERFACE

Generic interface between non-ISDN station equipment (TE2) and TA.

RADIO TELEPHONE MOBILE SYSTEM (RTMS)

An analog cellular telephone standard similar to AMPS. RTMS is deployed in Italy.

RADIOCOMM 2000

One of the analog cellular telephone standards deployed in France.

RAM (RANDOM ACCESS MEMORY)

The fastest type of computer storage for information.

RBOC (REGIONAL BELL OPERATING COMPANY)

Local telephone operating companies that were split off from AT&T and which provide most local and interstate telephone services in the US. Also called Bell Operating Companies (BOC).

RCC (RADIO COMMON CARRIER)

A Common Carrier (i.e. providing services uniformly to all desiring service) for Radio Services.

RDSS (RADIO DETERMINATION SATELLITE SERVICE)

The use of satellites to do position location of the user.

RED BOOKS

CCITT Recommendations published in 1984.

REDUNDANT DATA

Data that is not necessary for the information content of a transmission. It is usually added to aid in the detection of communication errors.

RELPC (RESIDUAL-EXCITED LINEAR PREDICTIVE CODING)

A method of enhancing LPC coders by determining the error or "residual", between the actual signal and that generated by the basic LPC coder, and transmitting some information about this residual to improve reconstruction of the signal at the receiver.

RENEGOTIATION PROTOCOL

A protocol that enables two modems to negotiate such factors as the communication speed, data compression speed and error correction scheme that they will use to communicate.

REPEATER

A device that operates at OSI Model level 1 and connects two smaller LAN segments to form a larger network.

RING BACK

Also known as audible alerting. The tones the calling party hears while the called party's phone is ringing.

RING NETWORK

A network topology that connects its terminals in a loop or ring.

RISC (REDUCED INSTRUCTION SET COMPUTING)

A computer processing technology in which the microprocessors understand a few simple instructions (when compared to Complex Instruction Set Computing, or CISC), for fast, predictable instruction flow.

RMST (THE ITALIAN CELLULAR SYSTEM)

The Italian cellular system, operating at 450MHz, introduced in 1985.

ROUTER

A device that connects two or more LANs to each other and that operates at OSI Model layers one through three. A router is able to select among multiple paths to route a data packet through the network based on an address sent with the data.

ROUTING FIELD

Information that a router adds to a frame to specify the path that the frame should take to travel from the LAN where it originated to the LAN where the destination node is located.

ROUTING TABLE

A table of the addresses of the various nodes on the LANs served by a bridge or other internet working device. The routing table allows frames to be forwarded to the LAN where their destination node is located.

RS-232

A recommended serial standard that is frequently used to interface a DTE and a DCE.

RS232C

Collection of specifications defining electrical and mechanical interfaces between terminals, computer, and modems.

RS232C ASYNC

Common interface for asynchronous terminals up to 19.2kb/s or unofficially faster.

RS232C SYNC

Common interface for synchronous terminals at 9.6kb/s.

RS-422

A recommended standard published by the EIA to specify electrical signal levels of a serial interface. RS-422 uses balanced circuits and it is designed to be used with the RS-449 mechanical specification.

RS-423

A recommended standard published by the EIA to specify electrical signal levels of a serial interface. RS-423 uses unbalanced circuits and it is designed to be used with the RS-449 mechanical specification.

RS-449

A recommended standard published by the EIA to specify the functional and mechanical interface between a DTE and a DCE. RS-449 is designed to replace RS-232, but it does not specify the electrical signals.

RSA (RURAL SERVICE AREA)

The smaller U.S. Cellular markets numbered 307 through 734 as defined by FCC.

RUN-LENGTH ENCODING

A data compression scheme that replaces repeated characters in a data stream with a shorter code. Run-length encoding works well with many types of computer files.

RTU (RIGHT-TO-USE)

Fee charged for software on switches, STPs, etc. A significant part of the cost of a modern switch.

S INTERFACE

ISDN interface between station equipment and NT2.

SABRE

The code name for Texas Instrument's ATM physical layer line interface chip, the TDC1500.

SAPI (SERVICE ACCESS POINT IDENTIFIER)

Address indicator within a given layer of a protocol which identifies the protocol at the next higher layer for which the layer service is begin provided. A common example is LAPD which uses the SAPI field to identify whether the Layer 3 Protocol on ISDN D-channels is X.25 or Q.931.

SAR (SEGMENTATION AND REASSEMBLY)

An ATM technology that involves dividing information into ATM cells for transmission over the network and reassembling cells into the original data packages at the receivers.

SCP

A highly-reliable computer and database system which executes Service Logic Programs (SLPs) to provide additional customer services through a switch (SSP). Messages are exchanged with the SSP through the SS7 network.

Since the SCP can be accessed by many switches, it is often used for storage and retrieval of large common data bases, such as for 800 translations and calling card verification.

SDH (SYNCHRONOUS DIGITAL HIERARCHY)

The European and international version of North America's SONET standard for transporting digital information over optical fibers.

SDL (SPECIFICATION DESCRIPTION LANGUAGE)

CCITT symbolic language for state diagrams of finite state systems.

SDLC (SYNCHRONOUS DATA LINK CONTROL)

A bit-oriented, full-duplex Layer 2 protocol invented by IBM. (SDLC was the first of the modern HDLC protocols.) At Layer 2, SNA networks use SDLC between Front End Processors (FEPs) and Cluster Controllers (CCs).

SDN (SOFTWARE DEFINED NETWORK)

AT&T's name for their Virtual Private Network.

SECONDARY RING

A data path that serves as a backup on an FDDI network in case the primary ring is damaged.

SELECTIVE FORWARDING

The ability of a bridge or other internet working devices to pass from one LAN to another only those frames that are addressed to a node on the output side of the bridge.

SELF-HEALING

A feature of an FDDI LAN that permits the nodes on either

side of a break in the primary and secondary rings to connect the two rings together to bypass the break. The resulting configuration is sometimes called a ring-wrap.

SEQUENCE CONTROL

A method of numbering blocks of data so that no block will be lost or duplicated and so that the blocks will be placed in proper sequence at the receiver.

SERVER

A computer on a network that serves as a central repository for data and programs and which can be accessed over the network by other computers, which are called clients.

SESSION LAYER

Layer 5 of the OSI model. It provides a method for data exchange among different software applications and provides a way to recover from major data transfer problems.

SETUP MESSAGE

The most important message in Q.931. Used by both the user and network to hand a call to each other. Specifies all important aspects of a call.

SHARED-BANDWIDTH SERVICES

Common carrier packet-switched wide area networks that charge users only for the amount of information actually transmitted over the network.

SHIELDED PAIR

A pair of conductors that are wrapped with metallic foil to isolate the pair from electrical interference.

SIGN BIT

The first bit in a dibit (group of two bits) in 2 binary, 1 quaternary modulation. The sign bit determines if the voltage level of the transmitted signal is positive or negative. The second bit is the magnitude bit and determines whether the voltage is positive or negative.

SIGNALING

Communication between switches to set-up calls and tear them down. Also includes communication between station sets and switches. Signaling has used dial pulses, then dual tones, now digital messages.

SIM (SUBSCRIBER IDENTIFICATION MODULE)

A credit-card sized device that belongs to a GSM cellular telephone subscriber. When the subscriber inserts the SIM into a GSM telephone, the network recognizes the telephone as belonging to the subscriber.

SIMPLEX

One way only communications.

SINGLE ATTACH NODE

An FDDI terminal that does not connect to the secondary ring of the network. It is connected to the primary ring by means of a concentrator.

SL-1

NT Small Digital PBX. Hardware is often similar to DMS-10.

SL-10

NT Older X.25 Packet Switch.

SL-100

NT Large Digital PBX. Equipment is often similar to DMS-100.

SLC (SUBSCRIBER LOOP CARRIER)

AT&T pair gain system. Digital Loop Carrier system.

SLIC (SUBSCRIBER LINE INTERFACE CIRCUIT)

The telephone company electrical interface between the 2 wire analog copper local loop and the 4 wire (2 for Tx and 2 for Rx) paths in a central office switch.

SLOT

A unit of time in a time division multiplexed frame during which a sub-channel bit or character is carried to the other end of the circuit and extracted by the receiving demultiplexer.

SMART HIGHWAY

A term for a range of technologies that is being developed by the U.S. Department of Transportation. The term has not been precisely defined, but it would likely involve radio communication between moving vehicles and roadside computers for the purpose of traffic control.

SMDS (SWITCHED MULTI-MEGABIT DATA SERVICE)

A high speed packet switched metropolitan area data service that is offered by some telecommunications carriers. The largest use of SMDS is for communication of medical images.

SMR (SPECIALIZED MOBILE RADIO)

A form of private (PLMR) mobile radio services, traditionally providing "dispatch" radio services, but evolving now to cellular-like services.

SNA (SYSTEMS NETWORK ARCHITECTURE)

IBM's seven layer, vendor specific layered architecture for data communication. Specifies the rules governing interactions between network components in an IBM Environment.

SNR (SIGNAL-TO-NOISE RATIO)

The ratio of desired signal level to noise on a communications link, expressed in decibels.

SONET (SYNCHRONOUS OPTICAL NETWORK)

A data transmission standard for sending high-speed data over a fiber-optic network.

SPACE

Communications terminology for a binary 0 in a data communication.

SPECTRUM

A continuous range of frequencies within which signals have some common characteristic.

SS (SPREAD SPECTRUM)

A radio communications technique that "spreads" the transmitted signal across a wide band of frequencies by con-

stantly shifting its frequency. The receiver must be capable of tracking the signal's frequency changes. Also see direct sequence spread spectrum and frequency hopping spread spectrum

STAND-ALONE MODEM

A modem that connects to a terminal by means of an RS-232 or other serial interface.

STANDARD

A specification for data communication that is widely accepted and implemented by communications vendors. Standards may be formal (published by a recognized standards organization) or de facto (accepted without formal publication)

STAR NETWORK

A network topology with a central hub and a number of remote terminals. Each remote is connected to the hub by a point-to-point network.

START BIT

A space placed at the beginning of each data word in asynchronous communications.

STATIC ROUTER

A router whose routing table must be reprogrammed by the network manager every time there is a change made to the network.

STATION

A terminal on the Network.

STATION EQUIPMENT

All parts of the telephone network that are located on the subscriber's premises including the telset, switchboards and wiring.

STATISTICAL DELAY

Delay which can only be determined by knowing the probability distributions of some events: Sending a character, Sending a file, File Lengths, etc. The delay is, itself, a probability distribution and is often expressed as "95% of the time the delay will be less than 100 milliseconds."

STATISTICAL ERROR

Errors, like dropped packets, that are a result of the probability distributions of some event. For example, more than (x) packets in some time interval with the same destination.

STOP BIT

A mark placed at the end of each data work in asynchronous communications.

STORE AND FORWARD

A data communication technique that accepts packets, stores them until they are validated and complete, and then forwards them to the next node on the packet path.

STP (SS7) (SIGNAL TRANSFER POINT)

High speed, ultra-reliable special purpose packet switch for signaling messages in the SS7 network. Since operation of the entire network depends on them, STPs are installed in

mated pairs each in a different location. The interexchange carriers install the two STPs of a mated pair hundreds of miles from each other. Each STP in the mated pair is connected to every switch they directly serve and has sufficient capacity to handle all the signaling traffic should its mate fail.

STP (WIRE) (SHIELDED TWISTED PAIR)

A pair of wires that is twisted and shielded with metallic foil or braid to minimize interference with and from other pairs, radio stations, etc.

STS-n (SYNCHRONOUS TRANSPORT SIGNAL AT LEVEL n.)

At the electrical circuit level, a multiple of SONET's basic speed of 51.48 megabits per second. The equivalent optic speeds are known as Optical Carrier at Level n (OC-n).

SUBSCRIBER

A customer of a telephone company or other communications carrier.

SUPERVISORY INFORMATION

Signaling information used to connect, maintain and disconnect a telephone circuit.

SUPPLEMENTARY SERVICES

Additional services that a telephone company can make available to its subscribers in addition to basic telephone service. Examples include caller identification, call waiting, call rejection and call forwarding.

SWITCH

Generic term for machines that switch telephone calls from/to telephones and/or trunks. Includes private network machines such as a PBX and public network central office machines such as local exchange switches, tandem switches, toll switches, interexchange carrier switches, and gateway switches.

SWITCHED 56 SERVICE

A switched 56-kilobit-per-second digital telephone service widely offered in North America and regarded as an interim technology until ISDN is in place. Switched 56 uses a 64-kilobit-per-second line, but 8 kilobits per second are reserved for in-channel signaling.

SWITCHING EQUIPMENT

Equipment located in the telco offices that makes the interconnection between the station equipment of two or more subscribers.

SYNCHRONOUS COMMUNICATIONS

A form of communications in which the sending and receiving terminals operate from the same clock signal.

SYNCHRONOUS TRANSMISSION

Data communication protocol set where data is sent continuously. The receiver and transmitter are in constant bit synchronization. Character (byte) synchronization is achieved by a Layer 2 Flag character transmitted at the start of each block. Synchronous transmission is normally found on the faster circuits, e.g., rates of 4.8Kb/s and above.

SYSTEM 75

AT&T medium-size digital PBX.

SYSTEM 85

AT&T large digital PBX.

T CARRIER (T1 CARRIER)

A transmission system using time division multiplexing to carry 24 digital voice or data channels each at 64kb/s over copper wire. Total speed is 1.544Mb/s which is called DS1. One pair of wire carries the channels in one direction. A second pair of copper wire in another binder group carries the signals in the other direction. Typically, T1 operates on 22 gauge cable requiring repeaters at least every 6000 feet.

T INTERFACE

ISDN Interface between station equipment and NT1. For the Basic Interface this is a 4 wire connection limited to 1 km.

T-MUX (T1 MULTIPLEXER)

The equipment which takes multiple various lower rate bit streams and multiplexes them into a single bit stream conforming to the DS1 standard (T1). The multiplexing can be either deterministic or statistical.

T1(ANSI) (TELEPHONY COMMITTEE)

An ANSI committee open to the industry at large to develop U.S. Standards for telecommunications. Coordinates U.S. Participation in CCITT under auspices of the State Department. Agrees on content of CCITT recommendations to be included in the national standard. Fills gaps where CCITT is slow, ambiguous, has too many options, or doesn't address the issue. Organized into Working Groups on a topic basis. Uses a letter ballot process to establish standards.

T1C (T1 CARRIER C)

T1 Carrier running at the DS1C rate, which is twice the normal speed.

T1E1

Subcommittee of ANSI T1 Committee dealing with Network Interfaces.

T1M1

Subcommittee of ANSI T1 Committee dealing with Inter-Network Operations, Administration and Maintenance.

T1Q1

The ANSI T1 Committee that has a general systems engineering responsibility for new study areas. The initial focus is on Personal Communications Service (PCS).

T1Q1

Subcommittee of ANSI T1 Committee dealing with Performance.

T1S1

Subcommittee of ANSI T1 Committee dealing with Services, Architecture, and Signaling.

T1X1

Subcommittee of ANSI T1 Committee dealing with Digital Hierarchy and Synchronization,

T1Y1

Subcommittee of ANSI T1 Committee dealing with Specialized Subjects.

T2 CARRIER SYSTEM

A digital communications link that is formed by multiplexing three T1 systems. North American T2 systems operated at 6.312 megabits per second.

T3 CARRIER SYSTEM

A digital communications link that is formed by multiplexing seven T2 systems. T3 systems operate at 47.736 megabits per second.

TA(BC) (TECHNICAL ADVISORY)

Bellcore draft requirements document.

TA(ISDN) (TERMINAL ADAPTER)

ISDN customer-owned protocol converter. Converts from a standard non-ISDN interfaces (e.g., X.25, RS232) to ISDN S/T interface.

TACS (TOTAL ACCESS CELLULAR SYSTEM)

The English rough equivalent of AMPS using 25kHz channels at 900MHz. Used in more than 20 countries.

TCM (TIME COMPRESSION MULTIPLEXING)

A method of providing the appearance of full duplex communication over a single twisted pair half duplex copper loop. Data are buffered at each end and sent across the line at double the subscriber data rate with the two ends taking turns. Also called Ping pong multiplexing.

TCP/IP (TRANSMISSION CONTROL PROTOCOL/INTERNET PROTOCOL)

A packet oriented communications protocol that was developed with funding from the Defense Advanced Research Projects Agency (DARPA) to link computers across large networks.

TDM (TIME DIVISION MULTIPLEX)

The usual way digital facilities are deterministically multiplexed.

TDMA (TIME DIVISION MULTIPLE ACCESS)

A method of multiplexing several digital signals onto the same channel. In cellular telephony, TDMA divides each radio channel into a series of time slots, and each cellular telephone is assigned a specific time slot in a specific radio channel. GSM and IS-136 are two cellular standards that use TDMA. TDMA is sometimes used in the press as a syn-

onym for IS-136 or its predecessor standard, IS-54.

TDMA-3

IS-54 Time division Multiplexing divides a frequency into 6 time slots. Initial "full-rate" vocoders require 2 time slots per user and thus support 3 users on each frequency. This is called TDMA-3. Future "half-rate" vocoders require only 1 time slot and support 6 users per frequency.

TDMA-6

IS-54 Time Division Multiplexing divides a frequency into 6 time slots. Initial "full-rate" vocoders require 2 slots per user and thus support 3 users on each frequency. Future "half-rate" vocoders require only 1 time slot and support 6 users per frequency. This is called TDMA-6.

TE (TERMINAL EQUIPMENT)

ISDN equipment category including TDMA-6 and TE2s.

TE1 (TERMINAL EQUIPMENT TYPE 1)

Terminal Equipment meeting ISDN interface specifications such as ISDN phones, ISDN terminals, etc.

TE2 (TERMINAL EQUIPMENT TYPE 2)

Terminal Equipment providing interfaces other than ISDN, for example, non-ISDN equipment. Needs an appropriate terminal adapter (TA) to connect to ISDN.

TELEACTION SERVICE

An ISDN service that provides telemetry service using slow packet speeds over the ISDN D channel. An example is the remote reading of electrical, water, and gas meters.

TELEMETRY

Transmission and collection of data obtained by sensing conditions in a real-time environment.

TELEPOINT

A wireless pay telephone service through strategically placed stations that uses the CT2 cordless telephone standard. Telepoint was installed with much fanfare in the U.K., but the service failed to attract subscribers. Telepoint service ceased to be offered in that country in 1993. However, there are active Telepoint systems in several Asian countries including China, Malaysia, Hong Kong, Singapore, and Thailand.

TERMINAL

The device on a network that sends or receives data. A terminal is often a computer.

TERMINAL ADAPTER

A circuit that permits non-ISDN equipment to be connected to an ISDN line.

TERMINAL PROGRAM

A communications software package that controls an intelligent modem and performs other communications functions.

TETHERLESS

Tetherless: Tetherless service is an all-encompassing term that includes the concepts of cordless mobility service, wireless network service plus the ability to roam freely among any wired or wireless network to make or receive calls.

TIA (TELECOMMUNICATIONS INDUSTRY ASSOCIATION)

The Telecommunications Industry Association responsible for cellular standards in the U.S. Via its TR45 Committee. Will cooperate with T1P1 to set standards for PCS.

TIME SLOT

Unit of digital time division switching. Normally occurs once every 125 microseconds and contains 8 bits of user data (plus any proprietary bits). Thus carries a DS0.

TIP/RING

The positive and negative wires of an analog telephone line.

TOKEN

A unique bit pattern that controls which terminal has permission to transmit on a Token Ring network. See token passing.

TOKEN PASSING

A protocol that gives a terminal permission to transmit on a Token Ring LAN. The token circulates around the ring from terminal to terminal. The terminal that processes the token has permission to transmit.

TOKEN RING

A LAN standard, also known as IEEE 802.5, that connects personal computers by means of coaxial cable. Token Ring LANs operate at 4 megabits per second or 16 megabits per second.

TOPOLOGY

The physical layout of a communications network. Some popular topologies are bus, ring, star, and point-to-point.

TOTAL ACCESS COMMUNICATIONS SYSTEM

A European analog cellular telephone standard derived from the US AMPS standard. TACS is deployed in Austria, Ireland, Italy, and the U.K.

TR (TECHNICAL REQUIREMENT)

Bellcore final reference document.

TRANSMISSION

The encoding of information and its communication across a communications network.

TRANSMISSION EQUIPMENT

Telephone circuits that carry information from one subscriber to another.

TRANSPORT DEVICE

A device on a communications network that functions without making its presence known to the end terminals.

TRANSPARENT TRANSMISSION

A type of transmission used in BISYNC in which the receiving DTE ignores the contents of the text field. Transparent transmission is used to communicate non-text data where a data word in the text field could be confused with a control character.

TRANSPORT LAYER

Layer 4 of the OSI model. It defines standards that make the network transparent to the user.

TRUNK

A communication path between two switches that carries one telephone call. Each digital trunk occupies one DS0.

TWISTED PAIR

Two insulated wires, usually made from copper, that are twisted in a regular, six turns per inch spiral pattern used to connect most telephones. Also used as a medium by several local area networks.

TWISTED PAIR FDDI

A new FDDI LAN standard that uses twisted pair wire instead of fiber-optic cable as a communications medium. Twisted pair FDDI is more economical, because it eliminates the expensive interface between each node and the fiber optic cable.

TWO WIRE CIRCUIT

A communications circuit that uses a single pair of wires for both transmitted and received information.

U INTERFACE

A two-wire interface required by the FCC (not CCITT) between the Local Exchange Carrier and the customer's NT1. Specification completed during 1Q87 by ANSI T1D1.3.

UDI (UNRESTRICTED DIGITAL INFORMATION)

CCITTese for Clear Channel Capability (CCC).

UMTS (UNIVERSAL MOBILE TELECOMMUNICATIONS SERVICE)

ETSI's term for future mobile and personal wireless access to public network services. Similar to FPLMTS.

UNI (USER NETWORK INTERFACE)

Point of access by the customer to the ISDN (narrowband or broadband) network.

UPS (UNINTERRUPTIBLE POWER SUPPLY)

A powering system which can survive commercial power failures, generally by employing battery backup and/or generators.

UPT (UNIVERSAL PERSONAL TELECOMMUNICATIONS)

The CCITT term for the network architecture and capabilities to support PCS.

UUI (USER-TO-USER INFORMATION)

1) ISDN level 3 capability of passing small amounts of data between two ISDN users via the signaling network. Not a substitute for packet networks, but rather a way to use a small amount of data to improve a circuit switched (usually

voice) call. A Network Interconnect issue is: how are revenues from U-to-U signaling shared?

2) SS7 Signaling information that is sent directly from one end user to another. It is carried transparently by the network and is not processed nor changed by the network. This includes all the information found in the following Q.931 information elements: Lower Layer Compatibility Higher Layer compatibility, User-to-User Information; plus parts of the Bearer Capability Information element. These information elements are carried by the Access Transport Parameter and Use to User Information Parameters of user-to-user.

V.21

An international 300b/s full duplex FSK modem standard. The North American version is Bell 103.

V.22

An international full duplex 4PSK modem standard that operates at 1200b/s and 600 baud. The North American version is Bell 212A.

V.22 bis

An international full duplex QAM modem standard that operates at 2400b/s and 600 baud.

V.32

An international full duplex QAM modem standard that operates at 9600b/s and 2400 baud.

V.32 bis

An international full duplex modem standard that operates at 14,400b/s.

V.32 TERBO

An interim proprietary modem standard published by AT&T that operates at a speed of 19,200 bits per second.

V.35

A CCITT standard protocol for transmitting data. Normally run at speeds of 56 or 64Kb/s in the U.S.

V.42

An error checking standard protocol published by the CCITT that is used for modem communications.

V.42 bis

A standard published by the CCITT that adds data compression to the V.42 modem communications protocol.

V.fast

An interim modem standard that was used in 28,800 modems before the V.34 standard was finalized.

V REFERENCE POINT

An ISDN electrical reference point in the telephone company central office switch that is located between the line termination (LT) and the exchange termination (ET).

VDSL (VERY-HIGH-BIT-RATE DIGITAL SUBSCRIBER LINE)

A proposed service that would provide a multi-megabit digital service to small businesses and homes over 2-wire lines.

VIDEO DIAL TONE

Generally, any service designed to deliver video programs to consumers in their residences on demand. An example would be ADSL (Asymmetrical Digital Subscriber Line) which would provide video over telephone lines.

VIRTUAL CONNECTION

A data path between two terminals that performs as if the two devices were connected directly to each other, although in reality they are not connected.

VIRTUAL POP (VIRTUAL POINT OF PRESENCE)

A Point of Presence (POP) which a carrier uses to price a service or calculate mileage, but which may not actually contain the equipment providing the service. The carrier uses internal private lines to carry the information to the office containing the equipment. Often referred to as "back-haul".

VOCODER

A technical term formed by combining the words "voice" and "encoder". A vocoder encodes and analog voice signal into a digital format.

VPN (VIRTUAL PRIVATE NETWORK)

Uses information stored in the signaling network regarding customer configuration and dialing plans to allow the use of public network facilities as if they were dedicated to a specific private network. Usually includes special billing arrangements, company specific dialing plans and some limited end-to-end feature transparency.

VSELP (VECTOR-SUM EXCITED LINEAR PREDICTIVE CODING)

A method of enhancing Linear Predictive Coders using a combination of a limited number of different excitations (sum of excitation vectors).

WANDER

Long term timing deviation.

WARC (WORLD ADMINISTRATIVE RADIO CONFERENCE)

A World Conference called by the CCIR to get international agreement on Spectrum Allocation. Most recent meeting was February, 1992, in Spain.

WDM (WAVELENGTH DIVISION MULTIPLEXING)

A transmission technique in which two or more signals are sent through a fiber, driven by lasers at different wavelengths.

WIRELESS CABLE

A communications system that delivers video programming to subscribers over microwave radio links. From the consumer point of view, see Multipoint Distribution Service.

WLL (WIRELESS LOCAL LOOP)

Any method of using wireless communication in place of a wired connection to provide subscribers with standard telephone service. WLL is cheaper and faster to install than a wired telephone infrastructure, especially in areas where present telephone service is primitive or nonexistent.

X.25

CCITT recommendation specifying how user equipment (DTE) is to connect to a public, packet-switched network (DCE). Specifies Layer 1, 2, and 3 Protocols.

X.75' (PRIME)

Bellcore standard to allow connection of packet switches from different manufacturers into a single logical X.25 packet network.

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