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## Appendix A —Glossary of Communications Terms.

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This glossary is not limited to wireless communications terms, nor is it limited to the technologies discussed in this market study. The glossary also includes terms that are used in other areas of modern communications technology, and we hope it will be used as a reference by anyone who works in the field of data communications. Micrologic Research welcomes additions, corrections, and suggestions, which can be E-mailed to:

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Last Modified April 27, 2001

**μ-law**—A North American standard for the non-linear digitization of voice. See *A-law*.

**1G**—A generic name for first-generation analog cellular telephone standards such as AMPS and TACS.

**2G**—A generic name for today's second-generation digital cellular standards including GSM, cdmaOne, IS-136 TDMA, and PDC.

**2.5G**—A generic name for the transitional technologies from second generation cellular (2 G) to third generation cellular (3G). Although the boundary between 2.5G and 3G is not well defined, 2.5G technologies are generally considered to include GPRS, EDGE, and IS-95B.

**3G**—A generic name for third-generation cellular telephone systems that are expected to provide data communications speeds of up to two megabits per second

including W-CDMA (called UMTS in Europe), and cdma2000.

**3WC**—Abbreviation for three-way call.

**1BASE-5 Ethernet**—An early version of Ethernet that operated at one megabit per second over twisted-pair wire. Also known as *StarLAN*. 1BASE-5 Ethernet was superseded by *10BASE-T Ethernet*.

**10BASE-2 Ethernet**—An early version of Ethernet that used thin coaxial cable and operated at 10 megabits per second with a maximum cable length of 185 meters. Also called *Cheapernet* or *Thinwire Ethernet*. Normal Ethernet also operated at 10 megabits per second but required more expensive, heavier coaxial cable. Modern Ethernet operates over twisted pair wires, which are much less expensive to install.

**10BASE-5 Ethernet—**

A version of Ethernet that operated at 10 megabits per second and used 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.

**10GEA—**See *10 Gigabit Ethernet Alliance*.

**10 Gigabit Ethernet Alliance (10GEA)—**An industry group that was formed to promote the 10-gigabit-per-second (10G) Ethernet being developed by the IEEE *802.3ae Working Group*.

**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).

**23B+D—**The North American ISDN Primary Rate Interface that provides 23 circuit-switched 64-kilobits per second B (bearer) channels and one 64-kilobit-per-second D (data) channel for signaling and packet-switched data.

**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.

**2B1Q—**See *2 Binary, 1 Quaternary*.

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

**4B3T—**See *4 Binary, 3 Ternary*.

**802.3ae Working**

**Group—**A group formed by the IEEE to develop a 10-gigabit-per-second Ethernet standard. Also see *10 Gigabit Ethernet Alliance*.

**802.X—**The Institute of Electrical and Electronic Engineers (IEEE) committee that developed standards defining some networks including: 802.3 Ethernet, 802.4 Token Bus, 802.5 Token Ring, 802.6 Metropolitan Area Networks, 802.9 integrated data and voice, and 802.11 wireless LANs.

**A/B Switch—**A switch that enabled subscriber handsets to switch between A-band and B-band carriers in 800-MHz cellular systems.

**AACCh—**Abbreviation for Auxiliary Analog Control Channel.

**AAL—**See *ATM Adaptive Layer*.

**AAL-CU**—Abbreviation for *ATM Adaptation Layer* for Composite User.

**AAL5-CU**—Abbreviation for *ATM Adaptation Layer 5* for Composite User.

**AAV**—Abbreviation for Authentication Algorithm Version.

**A-Band License**—The non-wireline cellular licenses approved by the FCC in 1981. Also see *B-Band License*.

**AC**—Abbreviation for several electronics and communications terms including Advisory Circular, Alternating Current, Authentication Center, and Automatic Callback.

**ACA**—Abbreviation for Adaptive Channel Allocation.

**ACBO**—Abbreviation for Automatic Cross Band Operation.

**ACC**—Abbreviation for Analog Channel Control.

**Access Fee**—The fee that local telephone companies charge to long-distance carriers and others to access their networks.

**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 the services of that network.

**ACCh**—Abbreviation for Associated Control Channel.

**ACELP**—Abbreviation for Adaptive (or Algebraic) Code Excited Linear Predictor.

**ACeS**—abbreviation for Asian Cellular Satellite—an operator for satellite phones.

**ACF**—Abbreviation for Authenticated Control Function.

**ACK**—Abbreviation for Acknowledgement, plural ACKS.

**ACR**—Abbreviation for solute Category Rating or Anonymous Call Rejection.

**ACRE**—Abbreviation for Authorization and Call Routing Equipment.

**ACSB**—Abbreviation for Amplitude Companded Single Sideband.

**ACSE**—Abbreviation for Association Control Service Element.

**ACTE**—Abbreviation for Approvals Committee for Terminals Equipment.

**A/D**—See *Analog-to-Digital Converter*.

**ADA**—Abbreviation for Americans with Disabilities Association.

**ADAAG**—Abbreviation for Americans with Disabilities Association - Association Guidelines.

**ADC**—See *Analog-to-Digital Converter*.

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

**ADDS**—Abbreviation for Application Data Delivery Service.

**ADHAG**—Abbreviation for Ad Hoc Authentication Group. Also referred to AHAG.

**ADL**—Abbreviation for Automatic Determination of Location.

**ADLC**—Abbreviation for Asynchronous Data Link Control.

**ADLG**—Abbreviation for Automatic Determination of Location and Guidance.

**ADP**—Abbreviation for Answer Detection Pattern.

**ADPCM**—Abbreviation for Adaptive Differential Pulse-Code Modulation.

**ADSI**—Abbreviation for Analog Display Services Interface.

**ADSL**—See *Asymmetrical Digital Subscriber Line*.

**ADT**—Abbreviation for Asynchronous Data Teleservice.

**Advanced Intelligent Networks**—Cellular networks that enable users to roam from one network to another.

**Advanced Mobile Phone Service**—An analog or first-generation (1G) cellular telephone standard that was developed in the U.S. and uses frequency modulation for the voice channel and binary frequency-shift keying for signaling.

**AFC**—Abbreviation for Automatic Frequency Control, a technique used to fine tune FM radio receivers so that they do not drift from the frequency of the received signal.

**AFNOR**—Abbreviation for *Association française de normalisation* (French Standardization Association).

**AG**—Abbreviation for Access Grant.

**AGC**—Abbreviation for Automatic Gain Control.

**AGCh**—Abbreviation for Access Grant Channel.

**AGNI**—Abbreviation for Advisory Group for Network Issues.

**A-GPS**—Abbreviation for Assisted Global Positioning System.

**AHAG**—Abbreviation for Ad Hoc Authentication Group. Also referred to as AdHAG.

**AHES**—Abbreviation for Ad Hoc Emergency Services.

**AHG**—Abbreviation for Ad Hoc Group.

**AHMMC**—Abbreviation for Ad Hoc Microcell, Microsystems Guidelines.

**AHPAI**—Abbreviation for Ad Hoc PCS Air Interface Joint Group.

**AI**—Abbreviation for Air Interface, Answer Indicator.

**AIG**—Abbreviation for Authentication Implementation Guide.

**AIIM**—Abbreviation for Association for Information and Image Management.

**AIN**—See *Advanced Intelligent Network*.

**Airtime**—The time a cellular telephone is transmitting and receiving. Airtime is generally the basis for billing. Airtime on outgoing cellular calls is often billed from the time the caller hits the talk button until the caller hits the end button, whether or not the call is completed.

**AIS**—Abbreviation for Alarm Indicator Signal.

**Air Interface**—Any of the various radio technologies used in cellular telephony such as GSM, TDMA, and CDMA.

**AL**—Abbreviation for Answer List.

**A-law**—A European standard for the non-linear digitization of voice signals. See  *$\mu$ -law*.

**ALE**—Abbreviation for Automatic Link Establishment.

**Algorithm**—A prescribed set of rules or processes for finding the solution to a problem.

**ALI**—Abbreviation for Automatic Location Identification.

**ALIT**—Abbreviation for Automatic Line Insulation Test.

**ALPDU**—Abbreviation for Answer List-Protocol Data Unit.

**Alphanumeric**—Text that consists of both letters and numbers.

**ALT**—Abbreviation for Automatic Link Transfer.

**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.

**ALU**—Abbreviation for Arithmetic Logic Unit.

**AM**—Abbreviation for Amplitude Modulation.

**AMA/CDR**—Abbreviation for Automatic Message Accounting/Call Detail Recording.

## **American National Standards Institute**

**(ANSI)**—A membership organization that is devoted to the development of standards for American industry and that represents the United States in the International Standards Institute (ISO).

**American Standard Code for Information Interchange (ASCII)**—A 7-bit code that is widely used in data communications, especially for the communication of text.

**AMI**—See *Alternate Mark Inversion*.

**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**—See *Advanced Mobile Phone Service*.

**Analog**—A signal that varies continuously. “Real-world” information, such as wind speed, is analog. Contrast with *Digital*, which uses numbers (digits) to represent information.

**Analog-to-Digital Converter (A/D or A-to-D)**—A device that converts information, such as voice or video signals, from analog to digital form.

**ANI**—Abbreviation for Automatic Number Identification.

**ANSI**—See *American National Standards Institute*.

**Antenna**—An electrical conductor that is used to transmit and/or receive radio signals. More

specifically, the antenna is a *transducer* that converts high-frequency electrical signals to radio waves and vice versa.

**Answer Back**—A signal from a receiving terminal in response to a 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.

**AOA**—Abbreviation for Angle of Arrival.

**AOC**—Abbreviation for Advice of Change.

**AP**—Abbreviation for Application Protocols.

**APCO**—See *Association of Public Communications Officials*.

**APE**—Abbreviation for Application Protocols Entity.

**API**—See *Applications Programming Interface*.

**APIC**—Abbreviation for APCO Project 25 Interface Committee.

**Application Layer**—The top layer (Layer 7) of the OSI model. The application layer interfaces the communications system to the user's specific application program.

**Applications Programming Interface (API)**—In a computer, an API provides a standard hardware-independent means for software to access devices such as disks, displays, and graphics accelerators or

for one layer of software to communicate with another.

**APS**—Abbreviation for Asynchronous Protocol Specification.

**AR**—Abbreviation for Adaptive Reception, Auto-Regression, or Automatic Recall.

**Architecture**—An overall plan that represents the goal towards which its implementers 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*.

**ARIB**—Abbreviation for Association of Radio Industries and Businesses, the Japanese standards body for radio technology.

**ARCH**—Abbreviation for Adaptive Reception Channel.

**ARLP**—Abbreviation for Acoustic Reference Level Plan.

**ARM**—Abbreviation for Application Resource Manager, Advanced Risk Machines, or may refer to ARM Microprocessors, a semiconductor company.

**ARQ**—Automatic Repeat Request. A general term for error control protocols featuring hardware detection and retransmission of defective data.

**ASCII**—See *American Standard Code for Information Interchange*.

**ASE**—Abbreviation for Applications Service Element.

**ASIC**—Abbreviation for Application Specific Integrated Circuits.

**ASL**—Abbreviation for Active Speech Level.

**ASN**—Abbreviation for Abstract Symbol Notation.

**ASP**—Abbreviation for Average Selling Price.

**ASR**—Abbreviation for Automatic Speech Recognition.

**Association of Public Communications Officials (APCO)**—The world's largest organization for public safety officials, dispatchers, and communication specialists, involved in such issues as E-911.

**ASVD**—Abbreviation for Analog Simultaneous Voice Data.

**Asymmetrical Digital Subscriber Line (ADSL)**—A technology to provide high-speed, one-way digital information to subscribers at speeds of up to several megabits per second over existing telephone company local loops. There is also a low-speed reverse channel from the subscriber to the service provider. A more generic term is *DSL*, which may be symmetrical, or have the same communication speed in both directions.

**Asynchronous Communications**—A form of communications that uses a start bit at the beginning of each data word and a stop bit at the end of each data word. It is called asynchronous, because the start of the data word can occur at any time and does not have to be determined by

a clock signal. However, once transmission begins, the remaining bits of the data word are sent in time to a clock signal.

**Asynchronous Transfer Mode (ATM)**—A connection-oriented communications protocol based on 53-byte packets that is designed to handle both asynchronous and isochronous communications to integrate voice, video, and data communications in a single network. ATM sets up end-to-end virtual connections before data transmission begins, and it guarantees bandwidth to those connections that require it.

**AT**—Abbreviation for Asynchronous Terminal.

**ATA**—Abbreviation for Analog Terminal and Access Project.

**ATAAB**—Abbreviation for Analog Technical Ad hoc Advisory Board.

**ATBCB**—Abbreviation for Architectural and Transportation Barriers Compliance Board.

**ATC**—Abbreviation for Analog Traffic Channel.

**AT Command Set**—A de facto set of standard commands used to control the operation of intelligent modems. Also called the *Hayes Command Set*.

**ATF**—Abbreviation for Administrative Task Force.

**ATIS**—Abbreviation for Alliance for Telecommunications Industry Solutions.

**ATM**—See *Asynchronous Transfer Mode*.

**ATM Forum**—An organization of companies whose purpose is to promote cooperation among its members in developing Asynchronous Transfer Mode (ATM) standards and the ATM market.

**ATM Pipe Switch**—An ATM technology developed and marketed by L.M. Ericsson.

**ATS**—Abbreviation for Abstract Test Suite or Assigned Time Slot.

**Attenuation**—Signal loss in a communications circuit or equipment. Attenuation is usually measured as the ratio of the input signal strength to the output signal strength and is expressed in decibels (dB).

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

**Authentication**—A process to verify users or terminals (computers, cellular telephones, etc.) for security purposes usually managed by alphanumeric codes.

**Auto Answer**—A modem feature that enables the modem to detect an incoming call and answer it without human assistance.

**AV**—Abbreviation for Audiovisual.

**AVC**—Abbreviation for Audiovisual Conferencing.

**AVD**—Abbreviation for Alternating Voice Data.

**AVI**—Abbreviation for Interactive Audiovisual Services.

**AVIS**—Abbreviation for Audiovisual Information Systems.

**AVMMS**—Abbreviation for Audiovisual and Multimedia Services.

**AWG**—Abbreviation for American Wire Gauge, a wire size standard.

**AWI**—Abbreviation for Alert With Info.

**B-Band Licenses**—The cellular licenses that the FCC issued to existing wireline carriers in the U.S. in 1981. Wireline carriers were those carriers such as the Regional Bell Operating Companies that already supplied telephone services over landlines. A second set of licenses, call the A-band licenses, were issued to new entries into the telecommunications market. Also see *A-Band License*.

**B (Bearer) Channel**—A 64-kilobit-per-second ISDN channel whose purpose is to carry digital information between the customer premises equipment and the service provider's switching equipment.

**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.

**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.

**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.

**Basic ISDN**—See *Basic Rate Interface*.

**Basic Rate Interface**—A form of the Integrated Services Digital Network (ISDN) designed for residential subscribers that operates over the local loop with two B and one D channels.

**Basic Trading Area (BTA)**—An FCC geographically defined wireless service area, usually a county. There are 493 BTAs in the U.S. Also see *Major Trading Area*.

**Baud**—A unit of signaling speed that represents the number of discrete conditions or signal events per second of an analog carrier that is modulated by a digital bit stream. In modern modems each signal event represents more than one bit, and the number of bits per second that a modem transmits is a multiple of the baud rate. However, the term baud is frequently misused as a synonym for bits per second.

**BBN**—Abbreviation for Bulk Billing Number.

**BCC**—See *Block Check Character*.

**BCCA**—Abbreviation for Board Committee on Conformity Assessment.

**BCCH**—Abbreviation for Broadcast Control Channel.

**BCD**—Abbreviation for Binary Coded Decimal.

**B-CDMA**—Broadband Code Division Multiple Access, an older term for Wideband—CDMA. See *W-CDMA*.

**BCF**—Abbreviation for Backward Control Field.

**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 300 bit-per-second full-duplex FSK modem standard. The international version is *V.21*.

**Bell 202**—A half-duplex FSK modem standard that operates at 1,200 bits per second over dial-up telephone lines and 1800 bits per second over leased, conditioned lines.

**Bell 212A**—A full-duplex 4PSK modem standard that operates at 1,200 bits per second and 600 baud. The international version of the standard is *V.22*.

**Bell Operating Company (BOC)**—See *Regional Bell Operating Company*.

**Bent Pipe Technology**—The process of transmitting a signal between two points on the

Earth through a communications satellite. The satellite receives the signal and transmits it back to Earth without altering it.

**BER**—Bit error rate. See *error rate*.

**BERT**—Abbreviation for Bit Error Rate Test.

**BFI**—Abbreviation for Bad Frame Indicator.

**BFOC**—Abbreviation for Bayonet Fiber Optic Connector.

**BFSK**—See *Binary Frequency-Shift Keying*.

**BFT**—Abbreviation for Binary File Transfer.

**BGN**—Abbreviation for Background Noise.

**BICSI**—Abbreviation for Building Industry Consulting Services International.

**BID**—Abbreviation for Billing ID.

**Big LEO**—See *Big Low-Earth-Orbit Satellite Systems*.

**Big Low-Earth-Orbit (BLEO) Satellite Systems**—Systems of communications satellites in low-altitude orbits that provide broadband communications services such as voice and high-speed data.

**Binary Frequency-Shift Keying (BFSK)**—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 of approximately 300 bits per second over analog telephone circuits.

### **Binary Phase-Shift**

**Keying (BPSK)**—A modulation scheme that uses two phases to represent data. One phase represents a mark, and the other phase represents a space.

### **Binary Synchronous Communications Protocol**

**(BISYNC)**—A character-oriented communications protocol developed by IBM.

**B-ISDN**—Abbreviation for Broadband Integrated Services Digital Network.

**BISYNC**—See *Binary Synchronous Communications Protocol*.

**Bit**—The smallest information unit used in data communication. A bit has two possible states: 0 or 1. Bit is a contraction of the words “Binary Digit.”

**BITB**—Abbreviation for Boulder Industry Test Bed.

**Bit Error Rate (BER)**—See *Error Rate*.

**Bit Stream**—A continuous series of bits transmitted over a communications link.

**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.

**BLER**—Abbreviation for Block Error Rates.

**B-LLI**—Abbreviation for Broadband-Lower Layer Information.

**Block Check Character (BCC)**—An extra data word added to the end of a data trans-

mission to aid in error detection. Also called Binary Check Character.

**Bluetooth**—A short-range radio technology with a range of 10 meters that enables electronic devices, such as a notebook computer and a cellular telephone, to communicate with each other at a speed of up to 750 kilobits per second.

**Bluetooth Special Interest Group (SIG)**—An industry consortium headed by Ericsson that promotes the Bluetooth wireless technology.

**BMI**—Abbreviation for Base station, Mobile switching center, and Interworking function.

**BMSC**—Abbreviation for Base Station Manufacturer Code.

**BOC**—Bell Operating Company. See *Regional Bell Operating Company*.

**BOM**—Abbreviation for Bill of Materials.

**BPSK**—See *Binary Phase-Shift Keying*.

**BRA**—Abbreviation for Basic Rate Access.

**BRI**—Abbreviation for Basic Rate Interface. See *Basic ISDN*.

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

**Broadband**—In general, an adjective applied to a communications channel that has a bandwidth greater than 64 kilobits per second and that can provide higher-speed data communications than a standard digital telephone

circuit. Broadband PCS usually denotes cellular telephone service in the PCS band where the work “broadband” differentiates this type of service from “narrowband” services such as paging and two-way text-based messaging.

**Broadcast**—The process of sending a message from one station on a network to many or all other stations on the network.

**Broadcast-quality special effects**—Complex operations on video images such as dissolve, fade-in, fade-out, and transparent video.

**B-Router**—A device that performs the functions of both a bridge and a router (*X.25* network product).

**BS**—Abbreviation for Base Station.

**BSC**—Abbreviation for Base Station Controller or Binary Symmetric Channels.

**BSMAP**—Abbreviation for Base Station Management Application Part.

**BSMC**—Abbreviation for Base Station Manufacturer Code.

**B-SMS**—Abbreviation for Broadcasts Short Message Service.

**BSR**—Abbreviation for Board of Standards Review.

**BSS**—Abbreviation for Base Station System and Broadcasting-Satellite Service.

**BST**—Abbreviation for Broadcast Short-Message Service Teleservice.

**BT**—Abbreviation for British Telecom, once the British national telephone carrier and now a

major player in the international telecommunications market.

**BTA**—See *Basic Trading Area*.

**BTC**—Abbreviation for Business Telecommunications Committee (ETSI).

**BTS**—Abbreviation for Base Transceiver System.

**Built-in Modem**—A modem integrated into the motherboard of a terminal or computer.

**Bundling**—Grouping of multiple communications services into a package for consumer convenience and appeal such as wired telephone service, call forwarding, and cellular for one monthly charge.

**Burst**—Several events, usually data transfers, occurring within a short period of time.

**Burst Error**—A series of consecutive errors in data transmission.

**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.

**BWS**—Abbreviation for Building Wiring Standard.

**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&I**—Abbreviation for Commands and Indications.

**CA**—Abbreviation for Channel Aggregation, Communication Application, or Conformity Assessment.

**CAC**—Abbreviation for Carrier Access Code.

**CAD**—Abbreviation for Computer Aided Design.

**CAGR**—Abbreviation for Compound Annual Growth Rate—the average yearly growth in a market over a period of several years.

**CAI**—Abbreviation for Common Air Interface.

**CAL**—Abbreviation for Common Application Language.

**CALEA**—See *Communications Assistance to Law Enforcement Act*.

**Calling Party Pays**—A billing system in which the calling party pays for the wireless access call rather than the cellular telephone user, more common in countries other than the U.S. Attempts to establish calling party pays in the U.S. have been unsuccessful, because it is believed that the U.S. consumer is less willing to pay an additional charge to call a cellular telephone.

**Call-Setup Time**—The time required to establish a connection between two terminals or modems over a communications link.

**CAMA**—Abbreviation for Centralized Automatic Message Accounting.

**CANACINTRA**-- Abbreviation for *Cámara Nacional de la Industria de Transformación* in Mexico.

**CANIECE**-- Abbreviation for *Cámara Nacional de la Industria Electrónica Y de Comunicaciones Eléctricas* in Mexico.

**CAP**—Abbreviation for Carrierless Amplitude modulation Phase modulation.

**CAPI**—Abbreviation for Common Applications Programming Interface.

**CAPCS**—Abbreviation for Cellular Auxiliary Personal Communications Service.

**Carrier**—An analog signal modulated by an information-carrying signal. Carriers are used to transmit digital and lower-frequency analog information over analog communications media such as radio links and telephone lines.

**Carrier Sense Multiple Access with Collision Detection (CSMA/CD)**—A protocol that Ethernet and some other LANs use to allow nodes to contend for the right to transmit over the network.

**CAS**—Abbreviation for Customer premises equipment Alerting Signal.

**CATS**—Abbreviation for Consortium for Audiographics Teleconferencing Standards.

**CATV**—Abbreviation for Cable Television.

**CAVE**—Abbreviation for Cellular Authentication and Voice Encryption.

**CAWG**—Abbreviation for Conformity Assessment Working Group.

**CB**—Abbreviation for Certification Body or Citizen's Band.

**CBEMA**—Abbreviation for Computing Business Equipment Manufacturers Association. The organization has been renamed and is now known as the Information Technology Information Council.

**CBPCM**—Abbreviation for Coded Block Pattern Chrominance.

**CBR**—Abbreviation for Constant Bit Rate.

**CC**—Abbreviation for Call Control, Common Carrier, Communication Capability field, or Conference Call.

**CCA**—Abbreviation for Common Cryptographic Algorithm.

**CCBS**—Abbreviation for Completion of Calls to Busy Subscribers.

**CCIR**—Abbreviation for Comité Consultatif International des Radiocommunications (see also *ITU-R*).

**CCITT**—See *Comité Consultatif International Telegraphique et Telephonique*.

**CCR**—Abbreviation for Comparison Category Rating.

**CCSN**—Abbreviation for Common Channel Signaling Network.

**CCT**—Abbreviation for Channel Check Test or Consultative Committee Telecommunications.

**CD**—Abbreviation for Committee Draft.

**CD-ROM**—Abbreviation for Compact Disk-Read Only Memory.

**CDCP**—Abbreviation for Call Detail Collect Point.

**CDG**—Abbreviation for CDMA Development Group, an industry consortium that promotes *cdmaOne* and *cdma2000* technologies.

**CDGP**—Abbreviation for Call Detail Generation Point.

**CDH**—Abbreviation for Cooperative Document Handling.

**CDIS**—Abbreviation for Call Detail Information Source.

**CDL**—Abbreviation for Coded Digital control channel Locator.

**CDMA**—See *Code Division Multiple Access*.

**CdmaOne**—The trade name for the second-generation technology commonly known as CDMA. Also see *Code Division Multiple Access*.

**Cdma2000**—A third-generation cellular technology designed as an upgrade to *cdmaOne*.

**CDPD**—See *Cellular Digital Packet Data*.

**CDR**—Abbreviation for Call Detail Recording.

**CDRP**—Abbreviation for Call Detail Rating Point.

**CDS**—Abbreviation for Caller Display Signaling.

**CE**—Abbreviation for Capabilities Exchange or Core Experiment.

**CEBus**—Abbreviation for Consumer Electronics Bus.

**CEC**—Abbreviation for Canadian Electric Code.

**CEG**—Abbreviation for Card Expert Group.

**Cell**—An ATM packet that is 53 bytes in length with a five-byte header and a 48-byte payload.

**Cell Splitting**—Dividing one cell of a cellular telephone system into sections to increase the number of subscribers that the cell can support.

**Cellemetry**—A data transfer service used to retrieve remote information in such applications as remote meter reading and vehicle tracking.

**Cellular Digital Packet Data (CDPD)**—A technology for sending digital information over *AMPS* analog cellular telephone systems. CDPD breaks the data into packets and sends those packets during idle periods over cellular voice channels.

**CELP**—Abbreviation for Code Excited Linear Prediction, which is a modulation scheme commonly used in wireless communications.

**CEN**—Abbreviation for *Commission Europeenne de Normalisation*, a European Standardization Body.

**CENELEC**—Abbreviation for *Commission Europeenne de*

*Normalisation Electrotechnique* (European Electrotechnical Standards Committee).

**Central Office (CO)**—The place where a communications common carrier, such as a telephone company, terminates subscriber lines and provides switching equipment to interconnect them. Also called an *Exchange*, an *End Office*, or a *Local Central Office*.

**Central Office Switch (COS)**—A system located in a telephone company office that completes dialed-up telephone connections.

**Centrex**—A service offered by telephone companies that uses central office equipment to provide features comparable to those provided by a *PBX*.

**CEPT**—See *Conference for European Post and Telecommunications*.

**CESID**—Abbreviation for Caller Emergency Station Identification.

**CF**—Abbreviation for Center Frequencies or Communication Functions.

**CFA**—Abbreviation for Carrier Failure Alarms.

**CFI**—Abbreviation for Calling Feature Indicator.

**CFP**—Abbreviation for Computer Fax Protocol.

**CFR**—Abbreviation for Confirmation to Receive.

**CFU**—Abbreviation for Call Forwarding-Unconditional.

**CG**—Abbreviation for Correspondence Group.

**CH**—Abbreviation for Compare HDLC. Also see *HDLC*.

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

**Channel**—A transmission path between two communicating locations. A channel is usually the smallest subdivision of a transmission system, e.g. 64 kilobits per second in the case of conventional telephone circuits.

**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.

**Cheapernet**—See *10BASE-2 Ethernet*.

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

**Chipset**—A set of integrated circuits that supply all or most of the circuitry needed to build an item of electronic equipment. Most modems, computers, and wireless telephones are built from chipsets.

**Churn**—The measurement of cellular subscribers who switch carriers.

**CI**—Abbreviation for Call Indicator (V.8), Count Indicator, or Customer Interface.

**C/I**—Abbreviation for Carrier to Interference Ratio.

**CIC**—Abbreviation for Carrier Identification Code.

**CICES**—Abbreviation for Canadian Interference Causing Equipment Standard.

**CID**—Abbreviation for Caller Identification.

**CIDCW**—Abbreviation for Calling Identity Delivery on Call Waiting.

**CIF**—Abbreviation for Common Intermediate Format.

**CILC**—Abbreviation for Canadian Interconnection Liaison Committee.

**CIP**—Abbreviation for Component-Independent Palette.

**CIR**—Abbreviation for Carrier to Interference Ratio.

**Circuit Switching**—A method of establishing a dedicated communications path between two or more locations through one or more switching nodes. Data is sent in a continuous stream; the data rate is constant; the delay is constant and limited to propagation times; and a dedicated end-to-end path remains in effect until the communication is terminated. Contrast with *Packet Switching*.

**CITEL**—Acronym for the Spanish of the Organization of American States' Inter-American Telecommunications Commission (*Comisión Interamericana de Telecomunicaciones*).

**ClassLink**—The Cellular Telephone Industry Association's (CTIA) school program for wireless and Internet access for students.

**CLEC**—Abbreviation for Competitive Local Exchange Carrier, a supplier of wired telephone services, commonly known as the

local telephone company. See also *Incumbent Local Exchange Carrier*.

**CLI**—Abbreviation for Calling Line Identification.

**CLID**—Abbreviation for Calling Line Identity .

**Client-Server Network**—A network that uses a central computer (server) to store data that is accessed from other computers (clients) on the network.

**Cloning**—The practice of copying cellular telephone codes into other telephones. Cloning was once used to enable to cellular telephones to share a service to avoid paying the cellular carrier for an additional cellular number. Cloning has since been declared illegal, and today it is used mainly by people who wish to steal cellular telephone service.

**CLR**—Abbreviation for Capabilities List Request.

**CM**—Abbreviation for Call Menu, Channel Management or Connection Management.

**CMC**—Abbreviation for Common Mail Call, or Common Messaging Call.

**CME**—Abbreviation for Circuit Multiplication Equipment or Communications Management Entity.

**CMI**—Abbreviation for Controlled Mode Idle.

**CMIP**—See *Common Management Information Protocol*.

**CMIS**—Abbreviation for Common Management Information Services.

**CMISE**—Abbreviation for Common Management Information Service Element.

**CMMRD**—Abbreviation for Cellular Microcell/Microsystem Requirements Document.

**CMODES**—Abbreviation for Confidentiality Modes.

**CMOS**—See *Complementary Metal Oxide Semiconductor*.

**CMRS**—See *Commercial Mobile Radio Service*.

**CMS**—Abbreviation for Circuit Multiplication System.

**CMT**—Abbreviation for Cellular Messaging Teleservice.

**CMTSD**—Abbreviation for Cellular Mobile Telephone Service Descriptions.

**CMY**—Abbreviation for Cyan, Magenta, and Yellow, which together with black are the four colors of ink or toner used in color printers.

**CMYK**—Abbreviation for Cyan, Magenta, Yellow, and Black.

**CN**—Abbreviation for Corporate Network.

**CNAD**—Abbreviation for Calling Name Delivery.

**CNAP**—Abbreviation for Calling Name Presentation.

**CNG**—Abbreviation for Comfort Noise Generator.

**CNI**—Abbreviation for Calling Number Identification.

**CNID**—Abbreviation for Calling Number Identification.

**CNIP**—Abbreviation for Calling Number Identification Presentation.

**CNIR**—Abbreviation for Calling Number Identification Restriction.

**CNR**—Abbreviation for Carrier-to-Noise Ratio.

**CO**—See *Central Office*.

**CO Switch**—See *Central Office Switch*.

**Coax**—See *Coaxial Cable*.

### **Coaxial Cable**

**(Coax)**—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 EBCDEC are two binary codes used in data communications.

**Code Division Multiple Access (CDMA)**—A spread-spectrum modulation technology that is used with the IS-95 cellular telephone standard that was developed by QUALCOMM. When digital cellular telephone standards are discussed in the press, CDMA is often used as a synonym for IS-95. Also see *cdmaOne*, *cdma2000*, and *W-CDMA*.

**Codec**—Coder/decoder. A single integrated circuit that contains both an analog-to-digital and a digital-to-analog converter. A codec converts an analog signal, such as a voice, into a digital bit stream for transmission, and it converts a

received digital bit stream to analog.

**Collision**—A contention situation that occurs in the CSMA/CD and other protocols when two nodes attempt to transmit simultaneously. Networks deal with collisions by allowing one of the terminals to transmit while the other waits for the network to be free before it sends its data.

**Collocation**—The act of combining several wireless carriers' antennas in one location to reduce costs and reduce environmental and zoning concerns.

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

**Comite Consultatif International Telegraphique et Telegraphique**

**(CCITT)**—The former name of the committee that published international communications standards. It was known in English as the Consultative Committee on International Telegraph and Telephone. The CCITT has been replaced by the *International Telecommunications Union* (ITU).

**Comm**—Short form of *Communications*.

**Comms**—Short form of *Communications* used mainly in the U.K.

**Commercial Mobile Radio Service (CMRS)**—A term used by the FCC to refer to

any interconnected for-profit mobile service available to the public.

**Common Carrier**—A company that provides communications services to any member of the public that desires them.

**Common Channel Signaling**—A method of using a single signaling channel to carry signaling information relating to a number of information channels. The signaling information is sent in packet form. See *Signaling System 7*. Contrast with *In-Band Signaling*.

**Common Channel Signaling System 7**—See *Signaling System 7*.

**Common Management Information Protocol (CMIP)**—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.

**Communications Assistance to Law Enforcement Act (CALEA)**—A 1994 law that permits law enforcement agencies to conduct lawfully authorized surveillance of both wired and wireless telecommunications.

**Communications Architecture**—A combination of hardware and software that implements some communications function. See *Architecture*.

**Communications Port**—A connection on a terminal through which data is input and/or output.

**Complementary Metal Oxide Semiconductor (CMOS)**—A semiconductor Field Effect Transistor (FET) technology in which both n-channel and p-channel devices are used.

**Compound Annual Growth Rate (CAGR)**—The average yearly growth in a market, expressed as a percent, over a period of several years.

**Compression**—See *Data Compression*.

**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-attach nodes to the network.

**Conditioned Line**—An analog telephone circuit that has had its frequency response and/or delay characteristics optimized.

**Conditioning**—Applying electronic filtering to a communications link to improve its ability to support higher communications speeds. Also see *Equalization*.

**Conference for European Post and Telecommunications (CEPT)**—A European telecommunications standards committee.

**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 through 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.

**COPEE**—Abbreviation for Council on Office Products Energy Efficiency.

**CORD**—Abbreviation for Cibernet Online Roaming Database.

**Core Network**—The communications network that links cellular base stations. The core network consists of wire and microwave links.

**COS**—Abbreviation for Corporation for Open Systems.

**COST**—Abbreviation for Cooperation in the field of Science and Technology research.

**Cost Recovery**—Reimbursement of costs of providing services, especially the cost of implementing E911 service.

**CP**—Abbreviation for Communications Protocol, or Continuous Presence (H.243, SG 15).

**CPA**—Abbreviation for Combined Paging/Access.

**CPAN**—Abbreviation for Customer Premises Area Network.

**CPAP**—Abbreviation for Customer Premises Access Profile.

**CPCS**—Abbreviation for Common Part Convergence Sublayer.

**CPE**—See *Customer Premises Equipment*.

**CPM**—Abbreviation for Continuous Presence Multipoint.

**CPNI**—See *Customer Proprietary Network Information*.

**CPS**—Characters Per Second. A transfer rate estimated from the bit rate and length of each character. If each character is eight bits long and includes a start and stop bit for asynchronous transmission, each character needs ten bits to be sent. At 2,400 bits per second, ten-bit-per-character data are transmitted at 240 CPS.

**CPSII**—Abbreviation for Communications Protocol Stack Independent Interface.

**CPT**—Abbreviation for Cellular Paging Teleservice.

**CPU**—Abbreviation for Central Processing Unit, usually a microprocessor or microcontroller.

**CQ**—Abbreviation for CAS Signal, Communication Quality.

**CQPSK**—Abbreviation for Compatible Differential Offset Quadrature *Phase Shift Keying*, a digital modulation scheme.

**CR**—Abbreviation for Capabilities Request.

**CRC**—See *Cyclic Redundancy Check*.

**CRFP**—Abbreviation for Cordless Radio Fixed Parts, which is jargon for a cordless-telephone base station.

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

**CRP**—Abbreviation for Command Repeat.

**CRT**—Abbreviation for Cathode Ray Tube.

**CRTC**—Abbreviation for Canadian Radio and Television Commission.

**CRTS**—Abbreviation for Cellular Radio Telecommunications Service.

**CS**—Abbreviation for Canadian Standard.

**CS-1**—Abbreviation for Capability Set 1.

**CS-ACELP**—Abbreviation for Conjugate-Structure Algebraic-Code-Excited Linear Predictive.

**CSA**—Abbreviation for Canadian Standards Association.

**CSDN**—Abbreviation for Circuit-Switched Digital Network.

**CSMA/CD**—See *Carrier Sense Multiple Access with Collision Detection*.

**CSD-P**—Abbreviation for Circuit Switched Data, Point-to-Point Service.

**CSPP**—Abbreviation for Computer System Policy Project.

**CSR**—Abbreviation for Communications Standards Review.

**CSS**—Abbreviation for Communications Standards Summary or Composite Source Signal.

**CSU**—Abbreviation for Customer Service Unit.

**CT**—Abbreviation for Call Trace.

**CT0**—Another name for the British MPT1233 analog cordless telephone standard. The standard uses eight channel pairs with a base station transmit frequency near 1.7 MHz and a handset transmit frequency near 47.5 MHz. CT0 performs poorly due to the limited number of channels and the widely separated frequencies for each channel pair.

**CT1**—A European analog cordless telephone standard that uses 40 25-kHz channel pairs in the bands of 914 to 915 MHz and 959 to 960 MHz.

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

**CT2**—A digital cordless telephone standard that was developed to offer Telepoint service in the U.K. CT2 allows only outgoing

calls, but an improved version, CT2+, can also be used to receive calls.

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

**CTB**—Abbreviation for Composite Triple-Beat.

**CTE**—Abbreviation for Connected Terminal Equipment.

**CTI**—Abbreviation for Computer Telephony Integration.

**CTIA**—Abbreviation for Cellular Telecommunications Industry Association, a U.S. cellular trade organization.

**CTE**—Abbreviation for Connected Telecommunications Equipment.

**CTM**—Abbreviation for Cordless Terminal Mobility, which is the ability to use a cordless telephone to access public, cellular-like telephone networks.

**CTN**—Abbreviation for Corporate Telecommunication Networks.

**CTO**—Abbreviation for Chief Technical Officer.

**CTR**—Abbreviation for Common Technical Requirements.

**CTS**—Abbreviation for Cordless Telephone System.

**CTX**—Abbreviation for Centrex.

**CU**—Abbreviation for Composite User.

**Customer Premises Equipment (CPE)**—The apparatus at the subscriber's location that permits the subscriber to use

a telephone or other communications service.

**Customer Proprietary Network Information**

**(CPNI)**—The confidential record of a customer's service with a carrier .

**CVSD**—Abbreviation for Continuous Variable Slope Detection.

**CW**—Abbreviation for Continuous Wave.

**CWD**—Abbreviation for Call Waiting Deluxe.

**CWP**—Abbreviation for Cost Work Program.

**Cyclic Redundancy**

**Check (CRC)**—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 and are generated by a combination of feedback loops and exclusive OR gates.

**D (data) Channel**—A 16-kilobit-per-second or 64-kilobit-per-second ISDN channel whose primary purpose is to carry signaling information between customer premises equipment and the service provider's switching equipment. It can also carry low-speed data in packet form.

**D/A**—See *Digital-to-Analog Converter*.

**DAA**—Abbreviation for Data Access Arrangement.

**DAL**—Abbreviation for Digital Access Line.

**DAM**—Abbreviation for Diagnostic Acceptability Measurement.

**D-AMPS**—Abbreviation for Digital AMPS, another name for the IS-54 digital cellular standard that was designed to replace AMPS (Analog Mobile Phone System) systems. IS-54 and its IS-134 upgrade are often referred to as "TDMA" in the press.

**DAC**—See *digital-to-analog converter*.

**DAP**—Abbreviation for Document Application Profile.

**DARPA**—See *Defense Advanced Research Projects Agency*.

**DAT**—Abbreviation for Digital Audio Tape.

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

**Data Communications Equipment (DCE)**—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 communications speeds and allows more information to be stored on a disk. All data compression methods rely on the fact that data contain inherent redundancies and that some of these redundancies can be removed with

little or no loss of information. Computer files can typically be compressed to one half their original size. Digitized video images may often be compressed by a factor of 200.

**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 digital telephone service that allows the service to be used with terminals that operate at speed other than 56 kilobits 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 Service Unit (DSU)**—A device (sometimes called a “digital modem”) that connects a private network, video conferencing console, computer, or other terminal device to a *Switched-56* line. The DSU handles the protocol conversion between the terminal and the 56-kilobit-per-second digital telephone line.

**Data Set (DS)**—Telephone company jargon for a modem.

**Data Terminal Equipment (DTE)**—A device, such as a UART, that converts data from the parallel format used within a terminal to the serial format used on a communications link.

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

**DAVIC**—Abbreviation for Digital Audiovisual Council.

**DAWS**—An acronym for *Digital Advanced Wireless System*, which is a proposed standard for a high-speed packet radio system that would be compatible with Tetra.

**dB**—See *Decibel*.

**DBS**—Abbreviation for Direct Broadcast Satellite.

**d.c.**—Abbreviation for Direct Current.

**DCA**—Abbreviation for Dynamic Capacity Allocation.

**DCC**—Abbreviation for Digital Control Channel.

**DCCH**—Abbreviation for Digital Control Channel.

**DCD**—Abbreviation for Data Carrier Detect.

**DCE**—See *Data Communications Equipment*.

**DCME**—Abbreviation for Digital Circuit Multiplication Equipment.

**DCMS**—Abbreviation for Digital Circuit Multiplication Systems.

**DCN**—Abbreviation for Disconnect.

**DCS 1800**—The former name for GSM cellular operating in the 1800-MHz band. Now known as GSM 1800 or PCN. See *GSM 1800*.

**DCT**—Abbreviation for Data Calling Tone or Discrete Cosine Transform.

**DCT-U**—Abbreviation for Digital Cordless Telephone-U.S.

**DDD**—Abbreviation for Direct Distance Dial. See *Direct Distance Dial Network*.

**DDR**—Abbreviation for Document Discrepancy Report.

**DDS**—Abbreviation for Digital Data Service.

**Dead Spot**—A physical location within the coverage of a wireless-communications network where coverage falls off.

**DEC**—Abbreviation for Digital Extended Command and for the now-defunct company Digital Equipment Corporation.

**Decibel (dB)**—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 Bel.

**DECnet**—Digital Equipment Corporation's (DEC) family of network products. DEC no longer exists. DEC was broken up, and its components were purchased by Compaq and Intel.

**DECT**—See *Digital Enhanced Cordless Telephone*.

**Defense Advanced Research Projects Agency (DARPA)**—A U.S. 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.

## **Demultiplexing**

**(DEMUX)**—The process of separating a multiplexed signal into its separate intelligence signals.

**DEMUX**—See *Demultiplexing*.

**DEO**—Abbreviation for Digital End Office.

**DER**—Abbreviation for Digital Extended Request.

**DES**—Abbreviation for Data Encryption Standard or, Digital Extended Signal.

**DF**—Abbreviation for Data Compression Format.

**DFP**—Abbreviation for Distributed Functional Plane.

**DG**—Abbreviation for Drafting Group.

**DH**—Abbreviation for Diffie-Hellman protocol.

**DHE**—Abbreviation for Document Handling Equipment.

**DIC**—Abbreviation for Delay Interval Compensation.

**DID**—Abbreviation for Direct Inward Dialing.

**Digital**—The use of numbers to represent information. Contrast with *Analog*.

## **Digital Enhanced Cordless Telephone**

**(DECT)**—A digital cordless telephone standard that incorporates some of the features of cellular telephone system. The E originally stood for "European," but the name was changed to give the standard more international appeal. DECT telephones use picocells, and calls can be handed off from one cell to the next. In addition to voice,

DECT can handle wireless data, and it is therefore sometimes considered a wireless LAN technology.

**Digital Signal Level 0 (DS-0)**—The 64-kilobit-per-second data speed of a single digitized voice channel on a conventional telephone network.

**Digital Signal Level 1 (DS-1)**—The 1.544-megabit-per-second T1 digital telephony rate.

**Digital Signal Level 3 (DS-3)**—The 44.7-megabits-per-second T3 digital telephony rate.

**Digital Signal Processor (DSP)**—A device similar to a microprocessor but which is specially designed to process digitized analog signals in real time.

**Digital Systems Interface (DSI)**—A chip-to-chip interface for ISDN modules supported by National Semiconductor and SGMicroelectronics.

**Digital-to-Analog Converter (DAC or D/A)**—A device that converts information, such as voice or video signals, from digital form (1s and 0s) to analog form.

**DIMRS**—Abbreviation for Digital Integrated Mobile Radio System.

**Direct Conversion**—The process of converting a signal directly from baseband to RF (up conversion) or from RF directly to baseband (down conversion) without first converting to an *Intermediate Frequency* (IF). Contrast with *Super Heterodyne*. Thanks to modern DSP technology, direct conver-

sion can give good performance, and it is gaining popularity for wireless applications such as cellular, because it consumes less power and requires fewer components.

**Direct Distance Dial (DDD) Network**—A telephone network that enables its users to directly dial long-distance telephone calls. Most of the world's public telephone systems connect to the DDD network.

**Direct Down Conversion**—See *Direct Conversion*.

**Direct Memory Access (DMA)**—A technology that enables a peripheral device to directly access a computer's memory without having to go through the computer's microprocessor. DMA is also widely used in embedded applications.

**Direct-Sequence (DS) Spread Spectrum (DSSS)**—A spread-spectrum technique in which the transmitter continuously spreads the signal across the entire allocated bandwidth. Also see *Frequency Hopping* and *Spread Spectrum*.

**DIS**—Abbreviation for Digital Identification Signal.

**DIS/IS**—Abbreviation for Draft International Standard, Interim Standards.

**DISA**—Abbreviation for Defense Information Systems Agency.

**DKTS**—Abbreviation for Digital Key Telephone Station.

**DLC**—Abbreviation for Dynamic Load Control.

**DLCI**—Abbreviation for Data Link Connection Identifier.

**DLP**—Abbreviation for Data Link Protocol.

**DMA**—See *Direct Memory Access*.

**DMH**—Abbreviation for Data Message Handler.

**DMOS**—Abbreviation for Degradation MOS.

**DMP**—Abbreviation for Downlink Measurement Protocol.

**DMT**—Abbreviation for Discrete Multi-tone Carrier.

**DMTF**—Abbreviation for Desktop Management Task Force.

**DMV**—Abbreviation for Differential Motion Vector.

**DN**—Abbreviation for Directory Number.

**DND**—Abbreviation for Do Not Disturb.

**DNI**—Abbreviation for Digital Negotiation Information Signal.

**DNK**—Abbreviation for Digital Not Acknowledge.

**DOC**—Abbreviation for Data Over Voice, Declaration of Conformity, or Canada's Department of Communications.

**DoD**—Abbreviation for the U.S. Government's Department of Defense.

**DOE**—Abbreviation for the U.S. Government's Department of Energy.

**Downlink**—The receive path in a two-way communications system.

**Download**—The process of transferring a file from a remote

computer (host) to the user's computer (client).

**DOS**—Abbreviation for U.S. Government's Department of State.

**DP**—Abbreviation for Data Privacy or Dial Pulse.

**DPA**—Abbreviation for Data Privacy Algorithm or Document Printing Application.

**DPBX**—Abbreviation for Digital Private Branch exchange (switchboard). See *Private Branch Exchange*.

**DPCM**—Abbreviation for Differential Pulse Code Modulation.

**DPSK**—Abbreviation for Dibit Phase Shift Keying.

**DR**—Abbreviation for Discrepancy Report.

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

**DRT**—Abbreviation for Diagnostic Rhyme Test.

**DS**—See *Direct Sequence Spread Spectrum*.

**DS-0**—See *Digital Signal Level 0*.

**DS-1**—See *Digital Signal Level 1*.

**DS-3**—See *Digital Signal Level 3*.

**DSA**—Abbreviation for Directory System Authentication.

**DSAA**—Abbreviation for Digital Enhanced Cordless Telephone (DECT) Standard Authentication Algorithm.

**DSAP**—Abbreviation for Data Services Access Profile.

**DSAT**—Abbreviation for Digital Supervisory Audio Tone.

**DSC**—Abbreviation for Digital Enhanced Cordless Telephone (DECT) Standard Cipher.

**DSI**—See *Digital Systems Interface*.

**DSL**—Abbreviation for Digital Subscriber Line, a technology used to deliver high-speed data over standard copper telephone lines.

**DSM-CC**—Abbreviation for Digital Storage Media - Command and Control or Digital System Multimedia Communication Control.

**DSP**—See *Digital Signal Processor*.

**DSR**—Abbreviation for Data Set Ready (a modem control signal).

**DSREQ**—Abbreviation for Data Service Request.

**DSS1**—Abbreviation for Digital Subscriber Signaling 1.

**DSSS**—See *Direct-Sequence Spread Spectrum*.

**DSU**—See *Data Service Unit*.

**DSVD**—Abbreviation for Digital Simultaneous Voice Data.

**DT**—Abbreviation for Dual Tone.

**DTAAB**—Abbreviation for Digital Enhanced Cordless Telephone (DECT) Technical Advisory Ad-hoc Board.

**DTAM**—Abbreviation for Document Transfer Access Method.

**DTAP**—Abbreviation for Direct Transfer Application Part.

**DTC**—Abbreviation for Digital Traffic Channel, Digital Transmit Command, or Digital Transmitting Code.

**DTE**—See *Data Terminal Equipment*.

**DTMF**—See *Dual-Tone Multi-Frequency Signaling*.

**DTR**—Abbreviation for Data Terminal Ready (a modem control signal) or Draft Technical Report.

**DTS**—Abbreviation for Definitive Telefax Standard.

**D/TT**—Abbreviation for Digital Tie Trunk.

**DTX**—Abbreviation for Discontinuous Transmission.

### **DU100 Modem Pool**

**Element**—A device once marketed by Motorola that enables users of the *Switched-56* service to communicate with analog modems at speeds of up to 9,600 bits per second.

**Dual-Attach Node**—An FDDI terminal that connects to both the primary and secondary loops of the network. A dual-attach node has two input ports and two output ports.

### **Dual-Tone Multifrequency Signaling**

**(DTMF)**—A system of tones used as dialing signals in the telephone network. Also called Touch Tone™.

**DVCC**—Abbreviation for Digital Verification Color Code.

**DVB**—Abbreviation for Digital Video Broadcasting.

**DVD**—Abbreviation for Digital Video Disk.

**DVEM**—Abbreviation for Differential Vector Error Magnitude.

**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**—Abbreviation for 20-bit sequence.

**E&M**—Abbreviation for Ear and Mouth (receive and transmit). It indicates that receive and transmit use separate signaling lines.

**EAST**—Abbreviation for Euro-African Satellite Telecommunications, a satellite telephone operator.

**EBCDIC**—See *Extended Binary Coded Decimal Interchange Code*.

**EC**—Abbreviation for Echo Canceled, Error Control, European Commission, or Exchange Carriers.

**ECB**—Abbreviation for Electronic Codebook.

**Echo Cancellation**—A circuit that usually uses DSP technology in a full-duplex communications circuit 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.

**ECM**—Abbreviation for Error Correction Mode.

**ECMA**—Abbreviation for European Communications Manufacturers Association.

**ECSP**—Abbreviation for Electronic Communications Service Provider.

**ECTF**—Abbreviation for Enterprise Computer Telephony Forum.

**ECTRA**—Abbreviation for European Commission of Telecommunications Regulatory Authorities.

**EDACS**—Abbreviation for Enhanced Digital Access Communications System.

**EDD**—Abbreviation for Electronic Document Distribution.

**EDGE**—An acronym for *Enhanced Data Rates for Global Evolution*, an improved RF technology for GSM and TDMA cellular systems, specifically GSM and IS-136 that increases data communications speeds to 384 kilobits per second. Upgrading a cellular system to EDGE requires the installation of new base stations.

**EDH**—Abbreviation for Electronic Document Handling.

**EDI**—Abbreviation for Electronic Data Interchange.

**EDT**—Abbreviation for European Deaf Telephone.

**EE**—Abbreviation for Equipment Engineering, Electrical Engineer, or Electrical Engineering.

**EEA**—Abbreviation for European Economic Area.

**EEC**—Abbreviation for European Economic Community.

Often shortened to *EC* for European Community.

**EEMAC**—Abbreviation for Electrical and Electronic Manufacturers Association of Canada.

**EEP**—Abbreviation for Equal Error Protection.

**EES**—Abbreviation for Escrow Encryption Standard.

**EFIS**—Abbreviation for Electronic Flight Instrument Systems.

**Effective Radiated Power (ERP)**—The gain of an antenna multiplied by the power of the transmitted signal. For example, if a directional antenna has a gain of three compared to an omnidirectional antenna and the transmitted power is 100 watts, the ERP is  $3 \times 100 = 300$  watts. The strength of the transmitted signal in the main lobe of the transmitted signal from the directional antenna is the same as it would be if 300 watts were transmitted using an omnidirectional antenna.

**EFR**—Abbreviation for Enhanced Full Rate.

**EFRC**—Abbreviation for Enhanced Full Rate Codec.

**EFT**—Abbreviation for Electrical Fast Transient.

**EG**—Abbreviation for Expert Group.

**EGDIR**—Abbreviation for Expert Group Directory.

**EGMHS**—Abbreviation for Expert Group Message Handling System.

**EI**—Abbreviation for Error Indicator.

**EIA**—Abbreviation for Electronic Industry Association.

**EIC**—Abbreviation for Equipment Installer's Code.

**EICAS**—Abbreviation for Engine Indicating and Condition Advisory System.

**Eighth Floor**—Jargon for the U.S. Federal Communications Commissioners. (The FCC Commissioners' offices are located on the eighth floor of the FCC Building.).

**EII**—Abbreviation for European Information Infrastructure.

**EIRP**—Abbreviation for Effective Isotropic Radiated Power.

**Electromagnetic Compatibility**—The ability of different equipment to function correctly in the same vicinity without causing electromagnetic interference to each other.

**Electronic Mail (E-Mail)**—Text-based electronic messages that can be sent over communications networks such as the Internet from one access device to another.

**Electronic Serial Number (ESN)**—A cellular-telephone authorization code permanently programmed into each cellular telephone by the manufacturer, which the cellular network checks to identify the handset.

**ELFEXT**—Abbreviation for Equal Level Far-End Crosstalk.

**Enhanced Specialized Mobile Radio (ESMR)**—A digital radio service that combines

the features of cellular, wireless data, messaging, and two-way radio. The best know ESMR service is Motorola's iDEN technology, and the best-known provider is the U.S.-based company Nextel.

**EM**—Abbreviation for Electromagnetic.

**EMA**—Abbreviation for Electronic Messaging Association.

**E-Mail**—See *Electronic Mail*.

**EMC**—Abbreviation for Electromagnetic Compatibility or Equipment Manufacturer's Code.

**EMCS**—Abbreviation for Electromagnetic Compatibility Society.

**EME**—Abbreviation for Electromagnetic Emissions.

**EMI**—Abbreviation for Electromagnetic Interference.

**EMS**—Abbreviation for Emergency Management or Medical Services.

**EMT**—Abbreviation for Electrical Metal Tubing.

**EN**—Abbreviation for European Norm.

**Encoding**—The process of putting information such as text, video, or speech into digital format.

**Encryption**—A technique of modifying a bit stream to make it unintelligible to someone who does not have access to the encryption scheme.

**End Office**—See *Central Office*.

**E-Netz**—German GSM 1800. See *GSM 1800*.

**Enhanced Data Rates for Global Evolution**—See *EDGE*.

**ENP**—Abbreviation for Extended Negotiation Procedure.

**Envelope Delay**—A type of distortion on an analog communications link where the signal delay is a function of frequency.

**EOB**—Abbreviation for End of Block.

**EOI**—Abbreviation for End of Image.

**EOL**—Abbreviation for End of Line.

**EOM**—Abbreviation for End of Message.

**EOS**—Abbreviation for End of Selection.

**EOT**—Abbreviation for End of Transmission.

**EP**—Abbreviation for Error Pattern or Extended Protocol.

**EPA**—Abbreviation for the U.S. Government's Environmental Protection Agency.

**EPHOS**—Abbreviation for European Procurement Handbook for Open Systems.

**EPIIC**—Abbreviation for European Program on Information Infrastructure Committee.

**EPIISG**—Abbreviation for European Project on Information Infrastructure Starter Group.

**EPL**—Abbreviation for Echo Path Loss.

**EPT**—Abbreviation for Echo Protect Time.

**Equalization**—Compensation for frequency-

dependent attenuation in a communications circuit. Its purpose is to provide equal signal attenuation over the circuit's full frequency range. Also see *Conditioning*.

**ERC**—Abbreviation for European Radio Committees.

**EREC**—Abbreviation for Error Resilient Entropy Code or Error Robust Entropy Code.

**ERL**—Abbreviation for Echo Return Loss.

**ERP**—See *Effective Radiated Power*.

**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).

**ES**—Abbreviation for Echo Suppressor, Emergency Services, Escape Sequence, or Escape Signal.

**ESD**—Abbreviation for Echo Suppressor Devices, or Electrostatic Discharge.

**ESF**—Abbreviation for Extended Superframe.

**ESI**—Abbreviation for Emergency Services Interface.

**ESMR**—See *Enhanced Specialized Mobile Radio*.

**ES/MS**—Abbreviation for Escape Signal/Mode Select.

**ESMTP**—Abbreviation for Extended Simple Mail Transfer Protocol a variation of the Internet standard Simple Mail Transfer Protocol (SMTP).

**ESN**—See *Electronic Serial Number*.

**ESPM**—Abbreviation for Extended System Parameters Message.

**ET**—See *Exchange Termination*.

**E-TDMA**—Abbreviation for Extended *Time Division Multiple Access*. See *TDMA*.

**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 100 megabits per second, although some legacy devices operate at slower 10 megabits per second.

**ETNO**—Abbreviation for European Telecommunication Network Organization.

**ETR**—Abbreviation for *European Telecommunications Standardization Institute* Technical Reports.

**ETS**—Abbreviation for European Telecommunications Standard.

**ETSI**—See *European Telecommunications Standards Institute*.

**EU**—Abbreviation for European Union.

**EU-MRA**—Abbreviation for European Union Mutual Recognition Agreements.

**Euro ISDN**—See *Eurofile transfer standard for ISDN*.

**European Telecommunications Standardization Institute (ETSI)**—The

organization that is charged with the task of developing telecommunications standards for the Europe Union.

**Eurofile Transfer Standard for ISDN (Euro ISDN)**—An international ISDN standard for Europe that was designed to replace separate national ISDN standards in Europe.

**EUT**—Abbreviation for Equipment Under Test.

**EVRC**—Abbreviation for Enhanced Variable Rate *Codec* (coder/decoder).

**EWOS**—Abbreviation for European Workshop on Open Systems.

**Exchange**—See *Central Office*.

**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.

**Exchange Termination (ET)**.—An ISDN interface located in the telephone company's central office switch.

**Extended Binary Coded Decimal Interchange Code (EBCDIC)**—An eight-bit code that was developed by IBM Corporation and is widely used for the communication of text.

**Extended Passive Bus**—See *Passive Bus*.

**FA**—Abbreviation for Flexible Alerting.

**FAA**—Abbreviation for the U.S. Government's Federal Aviation Administration.

**FACCH**—Abbreviation for Fast Associated Control Channel.

**Facility**—A transmission path between two or more locations that does not include the terminating or signaling equipment.

**Facsimile (Fax)**—A communications terminal for the transmission of graphics and documents over telephone or radio links.

**FAMUS**—Abbreviation for Future Advanced Mobile Universal System.

**FAR**—Abbreviation for the U.S. Government's Federal Aviation Regulations.

**FAS**—Abbreviation for Frame Alignment Signal.

**Fast Ethernet**—An improvement to the Ethernet physical layer to provide 100-megabit-per-second data transfers. Fast Ethernet requires no change to the Ethernet software or media-access control to upgrade from the original 10-megabit-per-second Ethernet speed. Fast Ethernet is presently the most commonly used version of the Ethernet technology. See also *Gigabit Ethernet*.

**Fax**—See *Facsimile*.

**FC**—Abbreviation for Feature Code or Fiber Connector.

**FCA**—Abbreviation for Fixed Channel Allocation.

**FCC**—See *Federal Communications Commission*.

**FDDI**—See *Fiber Data Distributed Interface*.

**FCF**—Abbreviation for Facsimile Control Field or Forward Control Field.

**FCS**—Abbreviation for Frame Check Sequence.

**FDD**—Abbreviation for Frequency Division Duplexing.

**FDDI**—Abbreviation for Fiber Distributed Data Interface.

**FDM**—Abbreviation for Frequency Division Multiplexing, File Diagnostic Messages or Frequency-Division Multiplexing. See *Frequency-Division Multiplexing*.

**FDMA**—See *Frequency Division Multiple Access*.

**FDX**—See *Full Duplex*.

**FE**—Abbreviation for Facilities Exchange or Functional Entities.

**FEAL**—Abbreviation for Fast Encryption Algorithm.

**FEC**—See *Forward Error Correction*.

**Federal Communications Commission (FCC)**—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 U.S. and all electrical communications between the U.S. and other countries.

**FGF**—See *Forschungsgemeinschaft Funk*.

**FH**—See *Frequency-Hopping Spread Spectrum*.

**FHSS**—See *Frequency-Hopping Spread Spectrum*.

**FHWA**—Abbreviation for the U.S. Federal Highway Administration.

**FI**—Abbreviation for Format Identifier or Indicator.

**Fiber Data Distributed Interface (FDDI)**—A line standard that used fiber-optic cable or twisted-pair wire to connect computers. FDDI LANs operated at 100 megabits per second. However, the technology was not successful, because designers learned to send data at the same speed over less-expensive copper wire.

**Fiber Optics (FO)**—A transmission medium consisting of thin strands of glass or plastic through which data is sent over pulse-modulated light waves.

**FIF**—Abbreviation for File Interchange Format.

**FIFO memory**—See *First-In, First-Out memory*.

**File Server**—See *Server*.

**Filter**—An electrical circuit that passes certain frequencies within a band of frequencies and attenuates others. A filter is used to eliminate noise, improve quality, separate one signal from others, enhance selected characteristics of data, and to introduce special effects in images and video.

**FIR**—Abbreviation for Finite Impulse Response.

**Firmware**—A set of software instructions placed in a Read-Only Memory (ROM).

**First-In, First-Out (FIFO) 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 a buffer between a terminal and a LAN in a network interface controller.

**Fixed Wireless Access (FWA)**—Another name for *Wireless Local Loop (WLL)*. 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 non-existent.

**FL**—Abbreviation for Facilities List.

**FLMTS**—Abbreviation for Future Land Mobile Telephony Systems.

**Flow Control**—A function performed by a receiving terminal to regulate the rate data is sent to it by a transmitting terminal.

**FM**—Abbreviation for Frequency Modulation.

**FMS**—Abbreviation for Flight Management Systems.

**FNA**—Abbreviation for Functional Network Architecture.

**FNPRM**—Abbreviation for Further Notice of Proposed Rule-Making, an FCC document to announce upcoming issues.

**FNV**—Abbreviation for Field Not Valid or Frame Not Valid.

**FO**—Abbreviation for Fiber Optic.

**FOC**—Abbreviation for Fiber Optic Connector.

**FOM**—Abbreviation for Figure of Merit.

**FOREG**—Abbreviation for Forced Registration.

**Format**—A specified arrangement of data that permits identification of control and information fields by their location in the data stream.

**Forschungsgemeinschaft Funk**—(Literally Research Community Radio) A German organization that was founded in 1992 by the German Federal Ministry of Posts and Telecommunications, equipment manufacturers, network operators, and user associations to bring science to the discussion of European wireless safety standards.

**Forward Error Correction (FEC)**—Any system that allows a terminal to both detect and correct errors in received data.

**FOSS**—Abbreviation for Fiber Optics Standards Summary.

**FOTAG**—Abbreviation for Fiber Optic TAG.

**FOTP**—Abbreviation for Fiber Optic Test Procedure.

**Four-Wire Circuit**—A two-pair full-duplex communications channel. Transmission occurs over one pair of wires, and reception occurs over the other pair.

**FP**—Abbreviation for Fixed Part, DECT jargon for a base station.

**FPLMTS**—Abbreviation for Future Public Land Mobile Telephone Systems.

**Fractional T1**—A portion of the bandwidth of a *T1 Carrier System* that can be separately leased in 64-kilobit-per-second increments.

**Frame**—A sequence of time slots in ISDN and certain other communications technologies. A basic rate interface frame consists of 48-bit time slots repeated every 250  $\mu$ s. A primary rate interfaced frame consists of 192-bit time slots (U.S. and Canada) or 256-bit time slots (ITU) repeated every 125  $\mu$ s.

**Frame Relay**—A bandwidth-on-demand packet-switching technology that is more streamlined and less robust than X.25. Unlike X.25, which includes robust error checking, frame relay relies on the end terminals to detect and correct errors. Frame relay has a higher throughput than X.25 over high-quality communications links. See X.25.

**Framing**—The process of breaking large fields of data into a number of smaller fields, blocks or characters.

**Framing Error**—A communications error that occurs when the receiving terminal is unable to determine where one data word ends and the next one begins.

**FRAPI-A**—Abbreviation for an ISDN Architecture in use in Japan.

**FRC**—Abbreviation for Full Rate Codec.

**Frequency**—A measurement of the number of times per second an electrical or radio signal repeats expressed in hertz (Hz).

**Frequency Division Multiple Access (FDMA)**—A multiplexing scheme used in some cellular telephone standards. In FDMA, each telephone within a cell is assigned an RF channel over which it communicates with the base station.

**Frequency-Division Multiplexing (FDM)**—A multiplexing technique that assigns each communication channel to a different RF channel.

**Frequency Hopping (FH) Spread Spectrum (FHSS)**—An RF transmission technology in which the transmitted signal “hops” from one frequency to the next in discrete steps. The receiver must be programmed to follow the transmitter’s frequency hops. Contrast with *Direct Sequence Spread Spectrum*. See *Spread Spectrum*.

**Frequency Reuse**—In cellular telephony, using the same frequency in multiple cells. Most cellular technologies require there to be sufficient distance between cells to eliminate signal interference although CDMA permits frequency reuse in adjacent cells.

**Frequency-Shift Keying (FSK)**—A type of frequency modulation used by low-speed modems. Also see *Binary Frequency-Shift Keying*.

**Front-End Processor**—An auxiliary computer sys-

tem that performs communications functions and frees the host computer to process data.

**FS**—Abbreviation for Frame Size. Also see *frame* and *framing*.

**FSK**—See *Frequency-Shift Keying*.

**FSS**—Abbreviation for Fixed-Satellite Service.

**FT**—Abbreviation for Fixed (radio) Terminal.

**FTP**—Abbreviation for File Transfer Protocol or Foiled Twisted Pair.

**FTT**—Abbreviation for Failure to Train.

**Full Duplex (FDX)**—Communications that takes place in both directions at the same time.

**FVC**—Abbreviation for Forward Voice Channel.

**FWA**—See *Fixed Wireless Access*.

**FWI**—Abbreviation for Flash With Info.

**FWUF**—Abbreviation for Federal Wireless Users Forum.

**FX**—Abbreviation for Foreign Exchange.

**GaAs**—Abbreviation for gallium arsenide, a semiconductor material that can be used to build higher-frequency parts than can be constructed from silicon.

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

**GAP**—Abbreviation for the DECT Generic Access Profile.

**GAT**—Abbreviation for Generic Application Template.

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

**GATT**—Abbreviation for General Agreement on Trade and Tariffs, an international agreement that has the goal of liberalizing international commerce.

**Gaussian Frequency-Shift-Keying (GFSK)**

**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. See also *Frequency Shift Keying*.

**GBSC**—Abbreviation for Group of Blocks Start Code.

**GCC**—Abbreviation for Generic Conference Control.

**GCI**—See *General Communication Interface*.

**GE**—See *Gigabit Ethernet*.

**General Communication Interface (GCI)**—An ISDN inter-chip standard interface both basic rate and primary rate equipment.

**General Packet Radio Service (GPRS)**—An upgrade for GSM and IS-136 networks that uses packet switching and provides increased bandwidth for data communications, considered a 2.5

generation (2.5G) cellular technology. Whereas standard GSM assigns one time slot to each user for normal voice communication, GPRS increases data communication speed by assigning multiple time slots to an individual user.

### **Geostationary Mobile Satellite Standard**

**(GMSS)**—An air interface system designed to enable roaming with dual mode GSM/satellite telephones.

**Geostationary Mobile Satellite**—A communications satellite that is placed in orbit above that Earth's equator at an altitude of 36,000 kilometers (21,640 miles). At this speed, they travel in their orbits at the correct speed to keep them above the same spot on the Earth's surface as the Earth rotates on its axis.

**GFSK**—See *Gaussian frequency-shift keying*.

**GGSN**—Abbreviation for Gateway (General Packet Radio System) GPRS Support Node. A GGSN is a gateway between a GPRS network and any network that uses a different protocol such as the Internet. See *General Packet Radio Service*.

**GI**—Abbreviation for Graded Index.

### **Gigabit Ethernet**

**(GE)**—The IEEE P802.3z proposed standard that would increase Ethernet's data-transfer speed to 1,000 megabits per second. GE will maintain software and media-access compatibility with present Ethernet standards. Only the

physical layer will be changed. Also see *Fast Ethernet*.

**GII**—Abbreviation for Global Information Infrastructure.

**Global Positioning System (GPS)**—A system of 24 Earth Satellites deployed by the U.S. Department of Defense that enables receivers to calculate their position on the Earth's surface or in the air above it.

### **Global System for Mobile Communications**

**(GSM)**—A second-generation (2G) digital cellular telephone standard that was developed as a pan-European standard, but which has also been installed in other areas of the world and is now the most common cellular standard. GSM was formerly named Groupe Spécial Mobile.

**GMDSS**—Abbreviation for Global Maritime Distress and Safety System.

**GMSK**—Abbreviation for Gaussian Minimum Shift Keying.

**GMSS**—See *Geostationary Mobile Satellite Standard*.

**GNATT**—Abbreviation for Generic Enhanced Teleservice Transport.

**GOB**—Abbreviation for Group of Blocks.

**GOSIP**—Abbreviation for Government Open Systems Interconnection Profile.

**GOSS**—Abbreviation for Guide to Open Systems Specification.

**GPM**—Abbreviation for General Page Message.

**GPRS**—See *General Packet Radio Service*.

**GPS**—See *Global Positioning System*.

**Groupe Spécial Mobile**—Former name of the Global System for Mobile Communications (GSM) European digital cellular standard. See *Global System for Mobile Communications*.

**GSA**—Abbreviation for General Services Administration, a U.S. government agency.

**GSM**—See *Global System for Mobile Communications*.

**GSM 900**—The original 900-MHz version of the Global System for Mobile Communications (GSM) cellular standard.

**GSM 1800**—A version of the Global System for Mobile Communications (GSM) cellular standard used in Europe, parts of Asia, and Australia that operates in the 1,800-M Hz band. Also known as *DCS 1800*, *E-Netz*, and *PCN*.

**GSM 1900**—A version of the Global System for Mobile Communications (GSM) cellular standard used in the Americas and Africa that operates in the 1,900-MHz band. Also known as *PCS 1900*.

**GSO**—Abbreviation for Geostationary Satellite Orbit. See *Geostationary Satellite*.

**GSTN**—Abbreviation for General Switched Telephone Network.

**GTAAB**—Abbreviation for GSM Technical Advisory Ad-hoc Board.

**GUI**—Abbreviation for Graphical User Interface.

**HAC**—Abbreviation for Hearing Aid Compatible.

**Half-Duplex (HDX)**—Communications that can take place in either direction, but in only one direction at a time.

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

**HAN**—Abbreviation for Home ATM Network. See *Asynchronous Transfer Mode*.

**Handheld Device Markup Language**

**(HDML)**—A programming language for writing Web pages so that they can be viewed on wireless devices. HDML is based on the *Hypertext Markup Language* (HTML) that is used in normal Web pages, but it makes allowance for the slower speed of most wireless connections and the smaller screens on most wireless devices.

**Handoff (HO)**—The process of switching a cellular connection from one base station to another when the cellular telephone travels between cells.

**Hands-free**—A safety feature that enables cellular telephones to be operated without having to use the hands. Hands-free operation is generally accomplished by using voice recognition.

**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.

**HATIS**—Abbreviation for Hearing Aid Telephone Interconnect System.

**HATS**—Abbreviation for Head and Torso Simulator.

**Hayes Command Set**—See *AT Command Set*.

**HC**—Abbreviation for Header Counter.

**HDLC**—See *High-Level Data Link Control*.

**HDML**—See *Handheld Device Markup Language*.

**HDSL**—See *High Bit-Rate Digital Subscriber Line*.

**HDTV**—Abbreviation for High Definition Television.

**HDX**—See *Half Duplex*.

**HEMP**—Abbreviation for High Energy Electromagnetic Pulses.

**Heterogeneous**—Made up of different systems, different architectures, or products from different vendors.

**Hertz (Hz)**—A unit of frequency measurement equal to cycles per second (e.g. 30 hertz is the same as 30 cycles per second).

**HF**—Abbreviation for High Frequency, the frequencies from three MHz to 30 MHz.

**HFC**—Abbreviation for Hybrid Fiber Coax.

**HFX**—Abbreviation for Hawthorne Facsimile Cipher.

**HIA**—Abbreviation for Hearing Industries Association.

**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 Network*.

**High Bit-Rate Digital Subscriber Line (HDSL)**—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. HDSL requires two pairs of wire, each of which carries full-duplex data at half the total speed using 2B1Q modulation. HDSL is one of many DSL technologies, all of which are used to carry high-speed digital information over copper wires.

**High Frequency (HF)**—The radio frequencies from three MHz to 30 MHz.

**High-Level Data Link Control (HDLC)**—A bit-oriented protocol published by the International Standards Organization in 1977. HDLC was derived from *SDLC*. Also see *Synchronous Data Link Control*.

**High-Speed Circuit-Switched Data (HSCSD)**—An upgrade to TDMA cellular networks that provides each subscriber up to four 14.4-kilobit-per-second circuits.

**HiperLAN**—Abbreviation for High Performance Radio Local

Area Network, a proposed European standard for wireless local-area communications networks.

**Hit**—Errors on a communications link caused by impulse noise. See *Impulse Noise*.

**HKM**—Abbreviation for Hawthorne Key Management.

**HLC**—Abbreviation for Higher-Layer Compatibility.

**HLR**—See *Home Location Regulator*.

**HLTF**—Abbreviation for High Level Task Force.

**H-MLP**—Abbreviation for High Speed Multi Layer Protocol.

**HNI**—Abbreviation for Home Network Identity.

**HO**—See *Handoff*.

**Home Location Regulator (HLR)**—A database that wireless service providers use to keep track of roaming subscribers.

**House Cable**—Conductors inside a building used to connect communication equipment to outside lines.

**HPLI**—Abbreviation for Higher Layer Protocol Identifiers.

**HRC**—Abbreviation for Half-Rate Codec. See *Codec*.

**HRD**—Abbreviation for Hypothetical Reference Decoder.

**HSCSD**—See *High-Speed Circuit-Switched Data*.

**HSD**—Abbreviation for High-Speed Data Channel.

**HSSI**—Abbreviation for High-Speed Serial Interface.

**HTML**—See *Hypertext Markup Language*.

**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.

**HW**—Abbreviation for Hardware.

**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. Also see *Balancing Network*.

**HyperStream**—The marketing name for MCI's SMDS service.

**HyperText Markup Language (HTML)**—The most common language used to create web pages.

**Hz**—See *Hertz*.

**I&I**—Abbreviation for Interworking and Interoperability.

**IA**—Abbreviation for Implementation Agreement.

**IA5**—Abbreviation for International Alphabet No. 5, now known as the International Reference Alphabet (IRA).

**IAC**—Abbreviation for Industry Advisory Committee.

**IACM**—Abbreviation for Industry Advisory Committee Meeting.

**IAP**—Abbreviation for Intercept Access Point.

**IC**—Abbreviation for Interexchange Carrier.

**I-CAN**—Abbreviation for Integrated Customer Access Network.

**ICC**—Abbreviation for International Coordination Committee.

**ICCF**—Abbreviation for Industry Carriers Compatibility Forum.

**ICEA**—Abbreviation for Insulated Cable Engineers Association.

**ICFA**—Abbreviation for International Computer Facsimile Association.

**ICG**—Abbreviation for Intersector Coordination Group.

**ICS**—Abbreviation for Incoming Call Screening.

**ICT**—Abbreviation for Information and Communication Technology.

**ICTSB**—Abbreviation for Information and Communication Technology Standards Board.

**ICWWG**—Abbreviation for Interagency Cellular and Wireless Working Group.

**ID**—Abbreviation for Identification.

**IDCT**—Abbreviation for Inverted Discrete Cosign Transform.

**iDEN**—Abbreviation for *Integrated Digital Enhanced Network*, a proprietary wireless technology developed by Motorola that supports voice plus circuit- and packet-switched data communica-

tion. Also see *Enhanced Specialized Mobile Radio*.

**IDL**—Abbreviation for Interface Design Language.

**IDRA**—Abbreviation for Integrated Dispatch Radio System.

**IE**—Abbreviation for Information Element.

**IEB**—Abbreviation for Industrial Electronic Bulletin.

**IEC**—Abbreviation for International Electro-technical Committee.

**IEEE**—See *Institute of Electrical and Electronics Engineers*.

### **IEEE Project 802 LAN/MAN Standards**

**Committee (LMSC)**—A committee that defines and proposes standards for LAN and metropolitan-area network (MAN) physical and data-link layers. LMSC standards include 802.1 Network Management and Bridging, 802.2 Logical Link Control, 802.5 Token Ring, 802.10 Security, and 802.11 Wireless LAN.

**IETF**—Abbreviation for Internet Engineering Task Force.

**I-ETS**—Abbreviation for Interim European Telecommunications Standard.

**IF**—See *Intermediate Frequency*.

**IFAST**—Abbreviation for International Forum on AMPS Standards Technology.

**IIF**—Abbreviation for Interworking Interoperability Function.

**IITF**—Abbreviation for Information Infrastructure Task Force.

**ILC**—Abbreviation for Identifier Length Content.

**ILEC**—See *Incumbent Local Exchange Carrier*.

**IM**—Abbreviation for Intermodulation.

**IMA**—Abbreviation for Interactive Multimedia Association.

**IMBE**—Abbreviation for Improved Multi-band Excited.

**IMD**—Abbreviation for Inter Modulation Distortion.

**IMEI**—Abbreviation for International Mobile Equipment Identifier.

**Impulse Noise**—A type of communications line interference characterized by high amplitude and short duration. See *Hit*.

**IMRS**—Abbreviation for Interactive Multimedia Retrieval Services.

**IMS**—Abbreviation for Interactive Multimedia Services.

**IMSF**—Abbreviation for IS-41 Message Security Forum.

**IMSI**—Abbreviation for International Mobile Station Identity.

**IMT**—Abbreviation for International Mobile Telecommunications.

**IMT2000**—A plan by the ITU to create a global 3G standard for cellular communications with speeds of up to two megabits per second from fixed locations and 384 kilobits per second from mobile locations. The number 2000 refers to

the year in which the plan was to have been (but was not) implemented.

**IMT DS**—The ITU designation for the W-CDMA 3G cellular standard, which is known in Europe as UMTS (Universal Mobile Telephone Standard).

**IMT FT**—The ITU designation for the Digital Enhanced Cordless Telephone (DECT) standard as a technology for 3G services.

**IMT MC**—The ITU designation for the wdma2000 3G cellular standard.

**IMT SC**—The ITU designation for UW-136, a proposed 3G upgrade for the 2G IS-136 (American TDMA) technology.

**IMT TC**—The ITU designation for the proposed 3G technology better known as Time Division-Synchronous Code Division Multiple Access (TD-SCDMA).

**IMTC**—Abbreviation for International Multimedia Teleconferencing Consortium.

**IN**—Abbreviation for Intelligent Networking.

**INAP**—Abbreviation for Intelligent Network Application Profile.

**IN/B**—Abbreviation for Intelligent Network/Broadband.

**In-Band Signaling**—A signaling scheme that uses the same path for both data and signaling information. Contrast with *System 7 Signaling*.

**INC**—Abbreviation for International Carrier.

**Incumbent Local Exchange Carriers (ILEC)**—The established local telephone companies. Contrast to *Competitive LECs*. See *Local Exchange Carriers*.

**Infrared (IR)**—Light that lies below the visible light spectrum in frequency and which may be perceived as heat. Infrared light is used as a wireless medium for communicating information in remote-control devices and increasingly for data communications. See *Infrared Data Association*.

**Inmarsat**—A mobile satellite telecommunications system using GEO satellites, originally owned by 85 countries, International Maritime Satellites, formed in 1979.

**Institute of Electrical and Electronics Engineers (IEEE)**—A membership organization of engineers that, among other activities, produces data communications standards.

**Integrated Services Digital Network (ISDN)**—A telephone service that brings a digital local loop to the telephone subscriber's premises and integrates all forms of information—voice, computer data, facsimile, and so on—onto a single communications network.

**Interconnection**—A connection between two or more communications networks such as a connection between a cellular network and the wired public switched telephone network.

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

**Intermediate Frequency (IF)**—An RF signal generally lower in frequency than the transmit and receive frequencies that is used in super heterodyne transmitters and receivers. In a super heterodyne receiver, the received signal is first converted to an IF where most of the selectivity and amplification take place. The amplified IF is then demodulated to baseband. Also see *Direct Conversion*.

**International Standards Organization (ISO)**—The standards organization that developed the Open Systems Interconnect Model and other international communications standards.

**International Telecommunication Union (ITU)**—A telecommunications agency established by the United Nations to provide standardized communication procedures and practices including frequency allocation and worldwide radio regulation. The ITU is the successor organization to the CCITT.

**Internet Working**—The technique of connecting individual communications networks to form a larger network.

**Interoffice Trunk**—A telephone circuit that connects two telephone company offices.

**Interoperability**—The ability of a system, technology, or network to function with another.

**INTSERV**—Abbreviation for Integrated Services.

**IVNS**—Abbreviation for *In-Vehicle Navigation System*, which uses the *Global Positioning System* (GPS) to help drivers navigate in unfamiliar territory, usually with the aid of an electronic map displayed on a screen.

**I/O**—Abbreviation for Input/Output.

**IP**—Abbreviation for Intelligent Peripheral, Intellectual Property or Internet Protocol.

**IPR**—Abbreviation for Intellectual Property Rights.

**IPUI**—Abbreviation for International Portable User Identity.

**IPUI R**—Abbreviation for International Portable User Identity (for GSM cellular telephones).

**IR**—See *Infrared*.

**IRA**—Abbreviation for International Reference Alphabet. Also see *IA5*.

**IrDA**—Abbreviation for the Infrared Data Association, an industry group that has developed standards for using infrared light for point-to-point, short-distance data communications.

**Iridium**—A satellite-based telephone service that was formed in 1998 under the direction of Motorola and uses 66 LEO satellites. Iridium was unsuccessful and went bankrupt. As this was written in 2001, a new group had acquired the Iridium system from the bank-

ruptcy court as preparing to re-launch service.

**IRS**—Abbreviation for Intermediate Reference System.

**IS**—Abbreviation for Interim Standard. American National Standards Institute (ANSI) designation of protocols. As shown in the following glossary entries, each standard is designated by the letters IS followed by a dash, followed by a number.

**IS-41**—The standard backbone network used with several cellular telephone technologies that were developed in the U.S. including AMPS, IS-136, and cdmaOne.

**IS-54**—An earlier version of the IS-136 digital cellular telephone standard that is often referred to as TDMA. See *IS-136*.

**IS-95**—The ANSI designation for the cellular technology that is known commercially as cdmaOne.

**IS-95b**—The ANSI designation for the cellular technology upgraded from *IS-95* to rates of 64 kilobits per second.

**IS-136**—A 2G digital cellular standard that was originally proposed as the proposed as the standard for North America, much as GSM was once viewed as a standard for Europe. An earlier version of the standard is called *IS-54*. Commonly referred to as *TDMA*, even though it is only one of several digital cellular standards that use TDMA technology. It has also been called *D-AMPS* and American TDMA (to distinguish it

from *GSM*, which is also based on TDMA technology).

**IS-661**—A standard for Composite CDMA/TDMA cellular telephone technology.

**ISA**—Abbreviation for Industry Standard Architecture. The 16-bit ISA bus has long been a standard bus for computers based on x85 microprocessors, although it is being phased out in favor of the faster 32-bit PCI bus.

**ISC**—Abbreviation for International Switching Center.

**ISCRI**—Abbreviation for International Special Committee on Radio Interface.

**ISD**—Abbreviation for International Standards Development.

**ISDN**—See *Integrated Services Digital Network*.

**ISD/TT**—Abbreviation for Integrated Services Digital/Tie Trunk.

**ISI**—Abbreviation for Inter-Symbol Interference.

**ISLP**—Abbreviation for Intersystem Link Protocol.

**ISM Bands**—Abbreviation for the “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, wireless LANs, and Bluetooth.

**ISO**—See *International Standards Organization*.

**ISOL**—Abbreviation for Integrated Services over Low speed serial Links.

**ISP**—Abbreviation for International Standardized Profile or Internet Service Provider.

**ISPBX**—Abbreviation for Integrated Services Private Branch Exchange.

**ISS**—Abbreviation for Inter-Satellite Service.

**ISSLL**—Abbreviation for Integrated Services over Specific Links.

**ISUP**—Abbreviation for ISDN User Part.

**IT**—Abbreviation for Information Technology.

**ITAAB**—Abbreviation for ISDN Technical Advisory Ad-hoc Board.

**ITAAG**—Abbreviation for ISDN Technical Advisory Ad-Hoc Group.

**ITAC**—Abbreviation for Information Technology Association of Canada.

**ITE**—Abbreviation for Information Technology Equipment.

**ITI**—Abbreviation for Information Technology Industry Council (formerly CBEMA).

**ITIC**—Abbreviation for Information Technology Industry Council.

**ITM**—Abbreviation for Informative Test Methods.

**ITS**—Abbreviation for Institute for Telecommunications Sciences.

**ITSB**—Abbreviation for Image Technology Standards Board.

**ITU**—See *International Telecommunication Union*.

**ITU-R**—Abbreviation for International Telecommunications Union-Radiocommunications sector.

**ITU-T**—Abbreviation for International Telecommunications Union-Telecommunications Sector.

**ITU-TSB**—Abbreviation for International Telecommunications Union Telecommunications Standardization Board.

**IVCD**—Abbreviation for Initial Voice Channel Designation.

**IVP**—Abbreviation for Integrated Voice Protocol.

**IVPC**—Abbreviation for Integrated Voice Protocol and Commands.

**IVR**—Abbreviation for Interactive Voice Response.

**IVS**—Abbreviation for Integrated Video Services.

**IWF**—Abbreviation for Interworking Function.

**JBIG**—Abbreviation for Joint Binary Image Group.

**JC**—Abbreviation for Joint Capabilities.

**JCCR**—Abbreviation for Joint Committee on Cellular Roaming.

**JCG**—Abbreviation for Joint Coordination Group.

**JECC**—Abbreviation for Joint ETSI/ECMA Committee.

**JEM**—Abbreviation for Joint Experts Meeting.

**JFIF**—Abbreviation for JPEG File Interchange Format.

**JITC**—Abbreviation for Joint Interoperability Test Center.

**Jitter**—A type of communications line distortion caused by a signal's random variation from its reference timing position. Jitter causes short-term changes in timing, frequency, and phase.

**JM**—Abbreviation for Joint Menu.

**JPC**—Abbreviation for Joint Project Committee.

**JPT**—Abbreviation for Joint Project Team.

**JPEG**—Abbreviation for Joint Photographics Expert Group and for a method of compressing digital, bit-mapped image files.

**JRG**—Abbreviation for Joint Rapporteurs Group.

**JSD**—Abbreviation for Joint Standards Document.

**JTC**—Abbreviation for Joint Technical Committee.

**JTACS**—Abbreviation for Japanese Total Access Communication System analog cellular-telephone standard. See *Total Access Communication System*.

**JWG**—Abbreviation for Joint Working Group.

**Ka-Band**—Microwave communications spectrum from 18 to 31 GHz. Contrast with *Ku-Band*.

**KTA**—Abbreviation for Key Technical Areas.

**KTS**—Abbreviation for Key Telephone System.

**Ku-Band**—Microwave communications spectrum from

10.9 to 17 GHz. Contrast with *Ka-Band*.

**LADC**—Abbreviation for Local Area Data Channels.

**LAES**—Abbreviation for Lawfully Authorized Electronic Surveillance.

**LAIC**—Abbreviation for Lawfully Authorized Intercept Capability.

**LAN**—See *Local Area Network*.

**LAP**—Abbreviation for Link Access Protocol.

**LAPB & LAPD**—See *Link Access Protocol Balanced & D Channel*.

**LAPF**—Abbreviation for Link Access Protocol Frame.

**LAPM**—See *Link Access Procedure for Modems*.

**LAPV**—Abbreviation for Link Access Protocol Video Telephone.

**LAR**—Abbreviation for Log Area Ratio.

**LATA**—Abbreviation for Local Access Transport Area.

**LBC**—Abbreviation for Low Bitrate Coder.

**LBO**—Abbreviation for Line Build Out.

**LCAP**—Abbreviation for Large Cell Access Profile.

**LCFO**—Abbreviation for Line Current Feed Open.

**LCF-PMD**—Abbreviation for Low Cost Fiber-Physical Medium Dependent.

**LC**—Abbreviation for Logic Channel.

**LCL**—Abbreviation for Longitudinal Conversion Loss.

**LCN**—Abbreviation for Logical Channel Number.

**LDCELP**—Abbreviation for Low Delay Code Excited Linear Prediction. Also see *CELP*.

**LDM**—Abbreviation for Limited Distance Modem.

**LDPA**—Abbreviation for Light Document Printing Architecture.

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

**LEC**—See *Local Exchange Carrier*.

**LEO**—Abbreviation for Low-Earth Orbit. See *Big Low-Earth-Orbit (LEO) Satellite Systems* and *Little Low-Earth-Orbit Satellite Systems*.

**Limited-Size Messaging (LSM)**—An AT&T-developed enhancement to the Cellular Digital Packet Data (CDPD) wireless protocol that AT&T says allows more efficient delivery of short messages and simplifies wireless E-mail communications and remote access to LANs and data bases.

**Line Protocol**—A control program used to perform data communication functions over network lines and which consists of handshaking and line-control functions that move the data between the transmit and receive terminals.

**Line Termination (LT)**—An ISDN interface used

between the local loop and the telco central office switch.

**Link Access Procedure for Modems**

**(LAPM)**—An error correction scheme.

**Link Access Protocol Balanced & D Channel**

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

**LISN**—Abbreviation for Line Impedance Stabilization Network.

**Little LEO**—See *Little Low-Earth Orbit Satellite Systems*.

**Little low-Earth-Orbit (LEO) Satellite Systems**

Systems of communications satellites in low-altitude orbits that provide narrowband communications services such as paging. Also see *Big Low-Earth-Orbit Satellite Systems*.

**LLC**—Abbreviation for Logical Link Control.

**LMCS**—Abbreviation for Local Multipoint Communications System.

**LMDS**—Abbreviation for Local Multipoint Distribution Service.

**LMR**—Abbreviation for Land Mobile Radio.

**LMS**—Abbreviation for Land Mobile Service.

**LMSI**—Abbreviation for Local Mobile Station Identity.

**LNP**—See *Local Number Portability*.

**LO**—See *Local Oscillator*.

**Local Area Network**

**(LAN)**—A communications system that connects computers and peripherals devices that are located within a single office, a single building, or in adjacent buildings.

**Local Calling Area**

The calling area in which calls can be placed without going through a long-distance company. In the U.S., the area in which unlimited telephone calls can be placed without incurring additional charges.

**Local Central Office**—See *Central Office*.

**Local Exchange Carrier (LEC)**—Telephone companies that provide local service. See also *Incumbent LECs* or *Competitive LECs*.

**Local Multipoint Distribution Service**

**(LMDS)**—A broadband wireless technology that uses spectrum in the 27-to-31-GHz range and serves as an alternative to fiber-optic and coax to provide voice and high-speed data services.

**Local Loop**—A telephone circuit that connects a subscriber's station equipment to the switching equipment in the telephone-company local office. Also referred to as a subscriber loop. See also *Wireless Local Loop*.

**Local Number Portability (LNP)**—The ability of

telephone subscribers to change retain their telephone numbers when they switch local service from one telephone company to another.

**Local Office Switch—**

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

**Local Oscillator**

**(LO)**—In super heterodyne transmitters and receivers, the circuit that generates the signal that is mixed with the *Radio-Frequency* (RF) signal to convert it to the *Intermediate Frequency* (IF) during reception or from the IF to the RF during transmission.

**Local State Government Advisory Committee**

**(LSGAC)**—A local group established by the FCC to assist in local, communications-related issues such as antenna siting.

**LOO**—Abbreviation for Likelihood of Occurrence.

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

**LOS**—Abbreviation for Line Of Sight.

**Low Noise Amplifier**

**(LNA)**—An RF amplifier generally located immediately after the antenna in a radio receiver. The LNA's function is to amplify the received signal before it is processed and thereby improve the signal-to-noise (S/N) ration.

**LPC**—Abbreviation for Linear Predictive Coding.

**LR**—Abbreviation for Loudness Rating.

**LRF**—Abbreviation for Location Registration Function.

**LRCC**—Abbreviation for Last Registration Control Channel.

**LSAS**—Abbreviation for Line-Side Answer Supervision.

**LSB**—Abbreviation for Least Significant Bit.

**LSD**—Abbreviation for Low Speed Data channel.

**LSGAC**—See *Local State Government Advisory Committee*.

**LSM**—See *Limited-Size Messaging*.

**LSP**—Abbreviation for Line Spectral Pair.

**LSTR**—Abbreviation for Listener Sidetone Rating.

**LTP**—Abbreviation for Long Term Prediction.

**LU**—Abbreviation for Logical Unit.

**LVD**—Abbreviation for Low-Voltage Directive.

**LVDS**—Abbreviation for Low-Voltage Differential Signaling.

**MA**—Abbreviation for Moving Average.

**MAC**—Abbreviation for Management Ad Hoc Committee or Media Access Control.

**MACA**—Abbreviation for Mobile Assisted Channel Allocation.

**Magnitude Bit**—The second bit in a dibit (group of two bits) in 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.

**MAH**—Abbreviation for Mobile Access Hunting.

**MAHO**—Abbreviation for Mobile Assisted Handoff. See *Handoff*.

**Major Trading Area (MTA)**—One of 51 FCC geographically defined communication service areas. Also see *Basic Trading Area*.

**Manchester Encoding**—A coding scheme used with several LANs and other communications systems. Manchester encoding has a logic transition in the center of each bit. A positive transition indicates logic 1, and a negative transition indicates logic 0.

**MAP**—Abbreviation for Mobile Application Part.

**MAPI**—Abbreviation for Messaging Applications Protocol Interface. Also see *Applications Protocol Interface*.

**Mark**—Communications terminology for a binary 1.

**MAU**—See *Media Access Unit* or *Multi-station Access Unit*.

**MAWG**—Abbreviation for Message Attachment Work Group.

**MB**—Abbreviation for Macro Block.

**MBE**—Abbreviation for Multi-Byte Extension.

**MBFT**—Abbreviation for Multipoint Binary File Transfer.

**MBS**—See *Mobile Broad-band System*.

**MC**—Abbreviation for Message Center or Manchester Coding. See *Manchester Encoding*.

**MCC**—Abbreviation for Mobile Country Code or Modem Control Channel.

**MCD**—Abbreviation for Mobile Communications Division.

**MCF**—Abbreviation for Message Confirmation.

**Mcps**—Abbreviation for Megachips per second.

**MCS**—Abbreviation for Multi-point Control Services.

**MCU**—Abbreviation for Multi-point Control Unit.

**MD**—Abbreviation for Manufacturer Defined.

**MDN**—Abbreviation for Mobile Directory Number.

**MDS**—See *Multipoint Distribution Service*.

**ME**—Abbreviation for Mobile Equipment.

**MED**—Abbreviation for Multiplexer Entry Descriptor.

**Media Access Unit (MAU)**—A device used to connect a terminal to a *10BASE-5 Ethernet* LAN.

**Medium**—(plural media) The path information travels from the transmitter to the receiver in a communications system.

**MELP**—Abbreviation for Mixed Excitation Linear Prediction.

**MEO**—Abbreviation for Mid-Earth Orbit.

**MER**—Abbreviation for Message Error Rate.

**MERS**—Abbreviation for Minimal Essential Requirements.

**Mesh Network**—A network topology that features numerous communications links among the terminals and many possible communications paths between terminals. An example of a mesh network is the direct-dial telephone system.

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

**Message Alert**—An indication that a voice of text message has been left.

**MExE**—See *Mobile Execution Environment*.

**MF**—Abbreviation for Multi-tone Frequency.

**MFP**—Abbreviation for Multi-Functional Peripheral.

**MFPA**—Abbreviation for Multi-Function Peripheral Association.

**MFPI**—Abbreviation for Multi-Function Peripheral Interface.

**MFPL**—Abbreviation for Multi-Function Peripheral Language.

**MFPP**—Abbreviation for Multi-Function Packet Protocol.

**MGT**—Abbreviation for Mobile Global Title.

**MHEG**—Abbreviation for Multimedia and Hypermedia Experts Group.

**MHP**—Abbreviation for Multimedia Home Platform.

**MHS**—Abbreviation for Message Handling System.

**MI**—Abbreviation for Mode Indicator.

**MIB**—Abbreviation for Management Information Base.

**Micron Network Protocol (MNP)**—A system of error-checking and data compression protocols that has become a de facto standard for modem communications.

**Midspan Meet**—The ability to connect different vendors' equipment to each other on a communications network and have them function properly together.

**MIF**—Abbreviation for Management Information File.

**MIME**—Abbreviation for Multipurpose Internet Mail Extension.

**MIN**—See *Mobile Identification Number*.

**Ministry of Posts and Telecommunications**

**(MPT)**—Japanese government regulatory agency that oversees communications.

**MIPS**—Millions of Instructions Per Second, a crude measurement of microprocessor and digital signal processor performance. Compare with *MOPS*.

**MIRS**—Abbreviation for Multimedia Information Retrieval Services.

**Mixed-Signal Semiconductors**—Integrated circuits that combine both analog and digital technology. Examples of mixed-signal semiconductors are

analog-to-digital converters, digital-to-analog converters, codecs, and vocoders.

**MLC**—Abbreviation for Multiple Logical Channel.

**MLP**—Abbreviation for Multi-Layer Protocol.

**MLT**—Abbreviation for Modulated Lapped Transform.

**MLPP**—Abbreviation for Multi-Level Precedence and Pre-emption.

**MLTS**—Abbreviation for Multi-Line Telecommunications Systems.

**MM**—Abbreviation for Mass Media, Mobility Management, Multimedia, or Multimode.

**MMAP**—Abbreviation for Mobility Management Application Protocol.

**MMCF**—Abbreviation for Multimedia Communications Forum.

**MMCOI**—Abbreviation for Multimedia Communications Community of Interest.

**MMDS**—Abbreviation for Multichannel Multipoint Distribution Service, a wideband wireless technology.

**MMG**—Abbreviation for Multimedia Management Group.

**MMITS**—Abbreviation for Modular Multifunction Information Transfer System.

**MNC**—Abbreviation for Mobile Network Codes.

**MNE**—Abbreviation for Mobile Network Entity.

**MNP**—See *Micron Network Protocol*.

**Mobile Broadband System (MBS)**—The ITU's fourth-generation (4G) cellular proposal, which promises data rates much faster than 3G's two megabits per second.

**Mobile Execution Environment (MExE)**—An ITU proposed standard for an operating system that would run on mobile devices and will be able display WAP pages and run Java applets.

**Mobile Identification Number (MIN)**—A unique authentication code assigned to each cellular telephone in a network.

**Mobile Public Telephone Switching Office (MTSO)**—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.

**Mobile Satellite Service (MSS)**—A wireless communications service, such as Iridium, that uses Earth-orbiting satellites to relay data to mobile terminals.

**Mobile Switching Center (MSC)**—A switching node in a cellular network. The MSC routes traffic between base stations and the public switched telephone network and also gathers billing information.

**Modem**—A contraction of the words modulator and demodulator. A DCE. A modem is 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 by which some characteristic of one wave (the carrier) is varied in accordance with the characteristics of another wave (the intelligence signal).

**MOPS**—Abbreviation for Million Operations Per Second, a commonly used measure of DSP performance. Compare to *MIPS*.

**MOS**—Abbreviation for Mean Opinion Score or Metal Oxide Semiconductor.

**MOU**—Abbreviation for Memorandum of Understanding.

**MP**—Abbreviation for Modulation Parameter.

**MPCI**—Abbreviation for Mobile Protocol Capability Indicator.

**MPD**—Abbreviation for Mode Power Distribution.

**MPEG**—An acronym for Motion Picture Experts Group and for the several methods of video and audio compression that the group has developed. See also *MPEG-1*, *MPEG-2*, *MPEG-4*.

**MPEG-1**—Motion Picture Experts Group standards developed for the storage and playback of video and audio from CD-ROMs. Also see *MPEG*.

**MPEG-2**—Motion Picture Experts Group standards developed primarily for broadcast video, cable TV, satellite video, and high-

definition television (HDTV). Also see *MPEG*.

**MPEG-4**—Motion Picture Experts Group standards developed primarily for broadcast video over wireless broadband networks. Also see *MPEG*.

**MPI**—Abbreviation for Minimum Picture Interval.

**MPS**—Abbreviation for Minimum Performance Specification.

**MPT**—See *Ministry of Posts and Telecommunications*.

**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 1.7 MHz and a handset transmit frequency near 47.5 MHz.

**MS**—Abbreviation for Mobile Station or Mode Select.

**MSA**—Abbreviation for Metropolitan Statistical Area.

**MSB**—Abbreviation for Manufacturer Specified Blocks or Most-Significant Bit.

**MSC**—See *Mobile Switching Center*.

**MSC-BC**—Abbreviation for *Mobile Switching Center-Base Center*.

**MSCID**—Abbreviation for *Mobile Switching Center Identification*.

**MSCIN**—Abbreviation for *Mobile Switching Center Identification Number*.

**MSD**—Abbreviation for Master Slave Determination or Minimum Significant Difference.

**MSDL**—Abbreviation for *MPEG-4* Syntactic Description Language.

**MSDL-M**—Abbreviation for MSDL Multiplex and Control Layer.

**MSID**—Abbreviation for Mobile Station Identity.

**MSIN**—Abbreviation for Mobile Subscriber Identification Number.

**MSISDN**—Abbreviation for Mobile Station Integrated Services Digital Network (ISDN).

**MSJ**—Abbreviation for Multiple Selective Reject.

**MSR**—Abbreviation for Multi-Selective Reject.

**MSS**—See *Mobile Satellite Service*.

**MTA**—See *Major Trading Area*.

**MTIE**—Abbreviation for Maximum Time Interval Error.

**MTM**—Abbreviation for Mobile Test Model.

**MTP**—Abbreviation for Message Transfer Part or Multi-cast Transport Protocol.

**MTS**—Abbreviation for Methodology of Test Suites.

**MTSO**—See *Mobile Public Telephone Switching Office*.

**Multi-Drop Network**—See *Bus Network*.

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

**Multiplexing (MUX)**—A process of combining several sig-

nals so that they can be sent over a single communications link.

**Multipoint Distribution Service (MDS)**—A communications 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.

**Multi-Station Access Unit (MAU)**—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.

**MUT**—Abbreviation for Modem Under Test.

**MUTOA**—Abbreviation for Multi-User Telecommunications Outlet Assemblies.

**MUX**—See *Multiplexing*.

**MVD**—Abbreviation for Motion Vector Data.

**MWC**—Abbreviation for Multi-Way Calling.

**MWI**—Abbreviation for Message Waiting Indication.

**MWN**—Abbreviation for Message Waiting Notification.

**NA**—Abbreviation for Network Aspects.

**NAB**—Abbreviation for National Association of Broadcasters.

**NAFTA**—Abbreviation for North American Free Trade Agreement, known in Spanish as *El tratado de libre comercio (TLC) de Norteamérica*.

**NAK**—Abbreviation for Negative Acknowledgment.

**NAMPS**—See *Narrowband Advanced Mobile Phone Service*.

**NANC**—See *North America Numbering Council*.

**NANP**—Abbreviation for North American Numbering Plan.

**NANPA**—Abbreviation for North American Numbering Plan Administrator.

**Narrowband Advanced Mobile Phone Service (NAMPS)**—An Motorola-developed digitally enhanced version of the AMPS analog cellular telephone standard. NAMPS splits each 30-kHz AMPS channel into three NAMPS channels for increased capacity and adds a 200-bit-per-second signaling channel.

**Narrowband PCS**—Low-speed data services such as wireless text messaging offered in the North American Personal Communications Services (PCS) band.

**National Telecommunications and Information Administration (NTIA)**—A spectrum management authority in the U.S.

**NATO**—Acronym for the North Atlantic Treaty Organization.

**NBS**—Abbreviation for Net Broadcast Service.

**NC**—Abbreviation for Network Codes.

**NCA**—Abbreviation for Non-Call Associated.

**NCAG**—Abbreviation for Network Commonality Ad Hoc Group.

**NCG**—Abbreviation for Number Consulting Group.

**NCAS**—Abbreviation for Non-Call Associated Signaling.

**NCRP**—Abbreviation for National Council of Radiation Protection and Measurement.

**NCTA**—Abbreviation for National Cable Television Association.

**NCTE**—Abbreviation for Network Circuit Terminating Equipment.

**NDIS**—Abbreviation for Network Driver Interface Specification.

**NDSS**—Abbreviation for Network Directed System Selection.

**NE**—Abbreviation for Network Element or Entity.

**NEC**—Abbreviation for the U.S. National Electric Code.

**NECQ**—Abbreviation for National Electronic Components Quality Assessment System.

**NEMA**—Abbreviation for National Electrical Manufacturers Association.

**NENA**—Abbreviation for National Emergency Numbering Association.

**NET**—Abbreviation for Norme Européenne de Télécommunication.

**Network**—A set of terminals, the communications links that joint them, and the protocols that allow them to function to-

gether and communicate with each other.

**Network Administrator**—A person who is responsible for the efficient operation of one or more LANs or other communications networks.

**Network File System (NFS)**—A protocol for transparently sharing files across a computer network that was developed by Sun Microsystems and is now a de facto standard for Unix computers. It is based upon TCP/IP and Ethernet.

**Network Interface Controller (NIC)**—An interface that is usually located within a terminal and which connects a LAN to the terminals address, data and control buses.

**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 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.

**Network Termination (NT)**—An ISDN interface installed at a subscriber's premises that interfaces the premises equipment to the telephone company *Local Loop*.

### **Network Termination**

**1 (NT1)**—An interface between a BRI ISDN line and customer premises equipment. NT1 converts the ISDN U line code (2B1Q) to the S interface format.

### **Network Termination**

**2 (NT2)**—An interface between a primary rate ISDN line and customer premises equipment that is functionally the similar to a PABX. It accepts many S interfaces on the user side and also provides internal switching capability.

### **Network Termination**

**type 1,2 (NT 1,2)**—An interface that integrates the ISDN *NT1* and *NT2* functions in a single circuit.

**Network Topology**—  
See *Topology*.

**Network-to-Network Interface**—An ATM interface that connects ATM switches to each other. Also see *User-to-Network Interface*.

**NEXT**—Acronym for Near-End Cross Talk.

**NFS**—See *Network File System*.

**NGSO**—Abbreviation for Non-Geostationary Satellite Orbit.

**NI**—Abbreviation for Network Interface.

**NIA**—Abbreviation for Network Indicate Address.

**NIC**—See *Network Interface Controller*.

**NID**—Abbreviation for Network Identification.

**NII**—Abbreviation for National Information Infrastructure.

**NIP**—Abbreviation for Number Identification Presentation.

**NIST**—Abbreviation for National Institute of Standards and Technology.

**NIU**—Abbreviation for Network Interface Unit.

**NLP**—Abbreviation for Non-Linear Processor.

**Nm**—Abbreviation for Nanometer.

**NMAG**—Abbreviation for Network Management Ad hoc Group.

**NMC**—Abbreviation for Network Management Center.

**NMSI**—Abbreviation for National Mobile Station Identification.

**NMT**—See *Nordic Mobile Telephone*.

**NMT450**—The original 450-MHz version of the analog *Nordic Mobile Telephone* cellular technology. First deployed in 1981.

**NMT900**—The 900 MHz version of *Nordic Mobile Telephone*. First deployed in 1986.

**NMT-F**—The French version of *NMT900*.

**NNI**—See *Network-to-Network Interface*.

**Node**—A terminal on a data communications network.

**NOF**—Abbreviation for Network Operations Forum.

**NOI**—See *Notice of Inquiry*.

**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. A *First Generation (1G) Cellular Technology*. A digital version of NMT has been proposed.

**North American Numbering Council (NANC)**—The body once responsible for managing all issues concerning telephone numbers such as area codes.

**Notice of Inquiry (NOI)**—A formal, advance notice of an FCC rule-making procedure issued for the purpose of inviting comments. See also *NPRM*.

**NPA**—Abbreviation for Network Provider Access.

**NPI**—Abbreviation for Numbering Plan Indicator.

**NPR**—Abbreviation for Noise-Power Ratio.

**NPRM**—An FCC abbreviation for Notice of Proposed Rule Making. Also see *Notice of Inquiry*.

**NRC**—Abbreviation for Negotiated Rulemaking Committee or Network Reliability Council.

**NRM**—Abbreviation for Network Reference Model.

**NRTL**—Abbreviation for National Registered Test Lab.

**NRZ**—Abbreviation for Non-Return to Zero.

**NS/EP**—Abbreviation for National Security and Emergency Preparedness.

**NSA**—Abbreviation for National Security Agency.

**NSAP**—Abbreviation for Network Service Access Point.

**NSC**—Abbreviation for Non-Standard Facilities Command.

**NSF**—Abbreviation for Non-Standard Facilities.

**NSIE**—Abbreviation for Network Security Information Exchange.

**NSMA**—Abbreviation for National Spectrum Managers Association.

**NSO**—Abbreviation for National Standard Organization.

**NSS**—Abbreviation for Non-Standard Setup.

**NSTAC**—Abbreviation for National Security Telecommunications Advisory Committee.

**NT**—See *Network Termination, Network Termination 1, or Network Termination 2.*

**NT 1,2**—See *Network Termination 1,2.*

**NT1**—See *Network Termination 1.*

**NT2**—See *Network Termination 2.*

**NTIA**—See *National Telecommunications and Information Administration.*

**NTQ**—Abbreviation for Near Toll Quality.

**NTRAC**—Abbreviation for New Technical Recommendation Application Committee.

**NTSC**—Abbreviation for National Television System Committee.

**NTT**—Abbreviation for Japan's Nippon Telephone and Telegraph Company.

**Number Pooling**—The process by which all unused telephone numbers are controlled by a central authority and dispersed to carriers in small lots. Number polling is designed to make the assignment of telephone numbers to carriers more efficient.

**NVCASE**—Abbreviation for National Voluntary Conformity Assessment System Evaluation.

**NVLAP**—Abbreviation for National Voluntary Laboratory Accreditation Program.

**NVRAM**—Abbreviation for Non-Volatile *RAM*.

**NWK**—Abbreviation for Network, Layer 3 of the WCPE protocol stack and Maintenance.

**OAA**—Abbreviation for On Air Activation.

**OA&M**—Abbreviation for Operations, Administration, and Maintenance.

**OAM&P**—See *Operations, Administration, Management and Provisioning.*

**OATS**—Abbreviation for Over-the-Air Activation TeleService.

**OBP**—Abbreviation for On-Board Processing.

**OCDMA**—Abbreviation for Orthogonal Code Division Multiple Access.

**OCI**—Abbreviation for Open Circuit Interval.

**OC-n**—See *Optical Carrier at Level n*.

**OCR**—Abbreviation for Optical Character Recognition.

**ODA**—Abbreviation for Open Document Architecture.

**ODP**—Abbreviation for Originator Detection Pattern.

**ODTC**—Abbreviation for the U.S. Office of Defense Trade Controls.

**OEM**—Abbreviation for Original Equipment Manufacturer.

**OET**—Abbreviation for Office of Engineering and Technology.

**Off Peak Hours**—The time when a telecommunications system carries less traffic, usually in the evenings when businesses have closed. Many long-distance and cellular carriers offer cheaper rates during off-peak hours.

**OFS**—Abbreviation for Operational Fixed Service (Microwave).

**OFSTP**—Abbreviation for Optical Fiber Systems Test Procedure.

**Oftel**—An acronym for British Office of Telecommunications.

**OGM**—Abbreviation for Out-Going Message.

**OID**—Abbreviation for Object Identifiers.

**OIW**—Abbreviation for Open Systems Implementers Workshop.

**OLR**—Abbreviation for Objective Loudness Rating.

**OMG**—Abbreviation for Object Management Group.

**OMT**—Abbreviation for Overhead Message Train.

**One-Stop Shop**—A store that sells multiple communications services including cellular service and handsets, long-distance service, Internet access, telephone accessories, etc.

**ONP**—Abbreviation for Open Network Provision.

**ONS**—Abbreviation for On Premise Station.

**OOB**—Abbreviation for Out of Band.

**OOF**—Abbreviation for Out of Frame.

**Open Systems Interconnect (OSI) Model**—A communications reference model developed by the International Standards Organization (ISO) that divides the data communications process into seven layers.

**Operations, Administration, Management and Provisioning (OAM&P)**—That portion of the SONET and SDH standards that deals with the administration and management of the networks.

**OPS**—Abbreviation for Off Premise Station.

**Optical Carrier at Level n (OC-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)*.

**ORDQ**—Abbreviation for Order Qualification.

**Originate Modem**—The modem that originates communication in a full-duplex communications system.

**ORREQ**—Abbreviation for Origination Request.

**OSP**—Abbreviation for Over-the-Air Service Programming.

**OSH**—Abbreviation for Occupational Safety and Health.

**OSHA**—Abbreviation for the U.S. Occupational Safety and Health Administration

**OSI**—Abbreviation for Open Switching Interval or Open System Interconnect. See *Open Systems Interconnect Model*

**OSI Model**—See *Open Systems Interconnect Model*.

**OTA**—Abbreviation for Over-the-Air Activation.

**OTAFG**—Abbreviation for OTA Focus Group.

**OTFI**—Abbreviation for One Time Feature Indicator.

**OTI**—Abbreviation for Open Telecom Infrastructure.

**Overlay Area Codes**—In the U.S. and Canada, the practice of adding one or more additional area codes to an area, usually because the original area code no longer supports enough telephone numbers to meet the de-

mand. The calling area is then served by multiple area codes.

**Packet**—A fixed-length data unit sent over a communications network. A packet contains data plus the addresses of the sending and receiving terminals, control information, and error checking information. See *packet switching* and *cell*.

**Packet Assembler and Disassembler (PAD)**—Equipment providing packet assembly and disassembly facilities in a terminal connected to a packet-switched network.

**Packet Control Unit (PCU)**—A hardware device that will be used in GSM networks to enable them to support the *General Packet Radio Service*.

**Packet Switching**—A method of routing units of data (called packets) through a 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. Contrast with *Circuit Switching*.

**PABX**—See *Private Branch Exchange*.

**Packet-Mode Terminal**—Data terminal equipment that can format packets and transmit and receive them.

**PACS**—Abbreviation for Personal Access Communications System.

**PAD**—See *Packet Assembler and Disassembler*.

**PAL**—Abbreviation for Phase Alteration Line.

**PAN**—See *Personal Area Network*.

**PAR**—Abbreviation for Peak-to-Average Ratio.

**Parity**—A 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**—An ISDN multi-point S interface bus that can support a maximum of eight TAs or TEs. The short passive bus can be up to 200 meters in length, and the *Extended Passive Bus* has a maximum length of 500 meters.

**PB**—Abbreviation for Personal Base.

**PBS**—Abbreviation for Personal Base Station.

**PBX (also PABX)**—See *Private Branch Exchange*.

**PC**—Abbreviation for Personal Computer.

**PCC**—Abbreviation for Private Control Channel.

**PCC 1**—Abbreviation for Permanent Consultative Committee.

**PCCA**—Abbreviation for PCMCIA Communication Card Association or for Portable Computer Communications Association. See *PC Cards*.

**PC Cards**—PC cards (formerly called PCMCIA cards) are

are small plug-in expansion cards that are commonly used with portable computers to expand memory or add peripheral functions such as modems hard disk drives, and network interfaces.

**PCF**—Abbreviation for Personal Call Forwarding.

**PCH**—Abbreviation for Paging Channel.

**PCI**—Abbreviation for Personal Communications Interface, Programmable Communications Interface, Protocol Capability Indicator.

**PCIA**—Abbreviation for Personal Communications Industry Association.

**PCM**—See *Pulse Code Modulation*.

**PCMCIA Card**—**Abbreviation for** Personal Computer Memory Card International Association. See *PC cards*.

**PCME**—Abbreviation for Packet Circuit Multiplication Equipment.

**PCN**—See *Personal Communications Network*.

**PCR**—Abbreviation for Program Clock Reference.

**PCS**—See *Personal Communications Services*.

**PCSAP**—Abbreviation for Personal Communications System Application.

**PCSC**—Abbreviation for Personal Communications Switching Center.

**PCSD**—Abbreviation for Personal Communications Services Description.

**PCU**—See *Packet Control Unit*.

**PDA**—See *Personal Digital Assistant*.

**PDC**—See *Personal Digital Cellular*.

**PDF**—Abbreviation for Portable Document Format, a format developed by Adobe Systems to display documents with the aid of Adobe software that runs on multiple operating systems.

**PDL**—Abbreviation for Polarization Dependent Loss.

**PDN**—Abbreviation for Packet Data Network, Public Digital Network, or also see *Private Data Network*.

**PDS**—Abbreviation for Phase Dithering Sequence or see *Premises Distribution System*.

**PDU**—Abbreviation for Protocol Data Unit.

**PDU-MUX**—Abbreviation for Protocol Data Unit *Multiplexer*.

**Peak Hours**—The times when a communications system experiences its highest usage and when cellular and long-distance carriers may charge a higher rate. Compare to *Off-Peak Hours*.

**PED**—Abbreviation for Portable Electronic Device.

**PER**—Abbreviation for Packed Encoding Rules or Parameter Error Rate.

**Personal Area Network (PAN)**—A network of portable devices, such as a cellular telephone, a PDA, and notebook computer, that belong to one user

and communicate with each other using *Bluetooth*.

**Personal Communications Network (PCN)**—

Another name for GSM cellular telephone services that operate at 1.9 GHz. See *GSM1800*.

**Personal Communications Services (PCS)**—A

market for wireless communications services in the U.S. and some other countries in the 1.8-GHz band that is used mainly to provide digital-cellular telephone services.

**Personal Digital Assistant (PDA)**—A hand-held computer that uses a stylus for writing on the screen, a detachable keyboard, or a combination of the two for entering data. PDAs almost all have a built-in data base program for keeping track of contacts, and some of them can use a wireless modem to send and receive faxes and E-mail messages.

**Personal Digital Cellular (PDC)**—A second-generation (2G) digital cellular telephony standard developed in Japan that was published in 1991. PDC uses TDMA multiplexing with three slots per channel and 25-kHz channel spacing.

**Personal Handyphone System (PHS)**—A cordless system and digital network that was developed in Japan. PHS uses TDMA and TDD. Each RF channel carries four full-duplex bearer channels, and information is transmitted over each RF 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.

**Personal Identification Number (PIN)**—An authorization number that belongs to a specific person and that must be entered to access certain services such as the withdrawal of money from a bank account through an automated teller machine.

**Persons of Population (POPs)**—Denotes the potential number of subscribers in a region.

**PFD**—Abbreviation for Power-Flux Density.

**Phase-Locked Loop (PLL)**—An electronic circuit that consists of a phase detector, low-pass filter, and voltage-controlled oscillator. PLLs are highly flexible circuits that have a myriad of applications including FSK demodulation and clock generation.

**Phase-Shift Keying (PSK)**—A type of phase modulation used by many modems.

**PHP**—The former abbreviation for Japan's Personal Handyphone System digital cordless telephone standard. The current abbreviation is PHS. See *Personal Handyphone System*.

**PHS**—See *Personal Handyphone System*.

**PHY**—See *Physical Layer*.

## **Physical layer**

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

**PICS**—Abbreviation for Product Implementation Conformance Statement, Profile Implementation Conformance Statement or Protocol Implementation Conformance Statement.

**PIN**—See *Personal Identification Number*.

**Ping-Pong Modulation.**—See *Time Compression Multiplexing*.

**PINS**—Abbreviation for Project Initiation Notification System.

**PISN**—Abbreviation for Private Integrated Services Network.

**PIXIT**—Abbreviation for Profile Initialization for Test Cases.

**PL**—Abbreviation for Physical Layer, Preferred Language or Program Lock.

**PLL**—See *Phase-Locked Loop*.

**PLMN**—Abbreviation for Public Land Mobile Network. Also see *Public Land Mobile Radio Service*.

**PLMRS**—See *Public Land Mobile Radio Service*.

**PLMTS**—Abbreviation for Public Land Mobile Telecommunications System.

**PM**—Abbreviation for Phase Modulation.

**PMC**—Abbreviation for Packet Mode Channel.

**PMCC**—Abbreviation for Packet Mode Channel Connect.

**PMCE**—Abbreviation for Packet Mode Channel Element.

**PMCH**—Abbreviation for Packet Mode Channel Handler.

**PMD**—Abbreviation for Polarization Mode Dispersion.

**PMM**—Abbreviation for Protocol Management Module.

**PMR**—Abbreviation for Peak-to-Mean Ratio.

**PNE**—Abbreviation for Production of Norms in Europe.

**POC**—Abbreviation for Points of Contact (LBC), or Public Operator's Code.

**POCSAG**—Abbreviation for Post Office Code Standardization Advisory Group (UK).

**POF**—Abbreviation for Plastic Optical Fiber, Private Operating Frequencies.

**Point-to-Point Network**—A communications network consisting of a single communications link that connects two terminals and is not shared by other terminals.

**Polling**—A control message sent from a master terminal to a slave terminal as an invitation for the slave to transmit.

**POPs**—See *Persons of Population*.

**Port**—The hardware that permits data to enter or exit a computer, network node, or communications device. Also see *Communications Port*.

**POTS**—Abbreviation for Plain Old Telephone Service.

**PP**—Abbreviation for Portable Part.

**PPD**—Abbreviation for Proposal Package Description.

**PPDN**—Abbreviation for Public Packet Data Network.

**PPI**—Abbreviation for PCS to PCS Interference.

**PPP**—Abbreviation for Point-to-Point Protocol.

**PRC**—Abbreviation for Private Channel.

**Pre-emption**—the practice of the federal government overriding local laws and ordinances.

**Premises Distribution System (PDS)**—AT&T's twisted-pair and fiber-optic wiring scheme, which is also supported by other vendors including Xerox and Hewlett-Packard.

**Pre-paid Cellular**—Cellular airtime that is charged for in advance. Pre-paid services are often sold to subscribers who do not have good enough credit ratings to qualify for normal calling plans, which charge for airtime after it is used.

**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**—See *Primary Rate Interface*.

**Primary ISDN**—See *Primary Rate Interface*.

**Primary rate access**—See *Primary Rate Interface*.

**Primary Rate Interface (PRI)**—A form of the integrated services digital network (ISDN) designed for business subscribers. PRI uses the bandwidth of a T1 or E1 carrier system.

**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 Branch Exchange (PBX or PABX)**—Telephone company jargon for switching equipment located on the subscriber's premises.

**Private Data Network**—A communication network (most often using packet-switched technology) that is designed specifically for the communication of computer data and that is used by many subscribers.

**PRNS**—Abbreviation for Pseudorandom Noise Sequence.

**PROM**—Abbreviation for Programmable Read-Only Memory.

**Protocol**—A system of rules that controls the operation of a communications system and facilitates the orderly transfer of information.

**PSAP**—See *Public Safety Answering Point*.

**PSC**—Abbreviation for Picture Start Code.

**PSDN**—Abbreviation for Public Switched Data Network.

**PSDS**—Abbreviation for Public Switched Digital Service.

**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.

**PSI-CELP**—Abbreviation for Pitch Synchronous Innovation Code Excited Linear Prediction, a modulation scheme.

**PSID**—Abbreviation for Private System ID.

**PSIDS**—Abbreviation for Private System ID Service.

**PSK**—See *Phase-Shift Keying*.

**PSNR**—Abbreviation for Peak Signal to Noise Ratio.

**PSP**—Abbreviation for Public Service Profiles.

**PSPDN**—Abbreviation for Packet Switched Public Data Network.

**PSS1**—Abbreviation for Private Network Signaling System 1.

**PSTN**—See *Public Switched Telephone Network*.

**PSWG**—Abbreviation for Product Safety Working Group.

**PTN**—Abbreviation for Private Telecommunication Network.

**PTS**—Abbreviation for Pay Terminal System.

**PTT**—Abbreviation for Push-to-Talk or Postal Telephone and Telegraph. The second term referred to telephone companies that were subsidiaries of government-owned postal systems. Now that many countries have privatized their telephone companies, the abbreviations also stands for Public Telephone and Telegraph.

**PLMRS**—See *Public Land Mobile Radio Service*.

**Public Land Mobile Radio Service (PLMRS)**—The service that includes two-way radio communications to and from moving vehicles. Examples of PLMRS systems include the systems used to communicate with taxis and delivery trucks.

**Public Switched Telephone Network (PSTN)**—Technical jargon for the international direct-dialed telephone network.

**Public Safety Answering Point (PSAP)**—A location that receives emergency calls such as 911 calls in the U.S.

**Public Utility Commission (PUC)**—the state body regulating utilities.

**Pulse Code Modulation (PCM)**—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.

**PUM**—Abbreviation for Personal User Mobility.

**PVC**—Abbreviation for Polyvinyl Chloride.

**PWA**—Abbreviation for Password Access.

**PWD**—Abbreviation for Password.

**PWT**—Abbreviation for Personal Wireless Telecommunications.

**PWT-E**—Abbreviation for Personal Wireless Telecommunications-Enhanced Interoperability Standard.

**QADM**—Abbreviation for Quadrature Audio Data Modulation.

**QAM**—See *Quadrature Amplitude Modulation*.

**QCELP**—Abbreviation for Qualcomm's proprietary version of the *Code Excited Linear Prediction* modulation technique.

**QoS**—Abbreviation for Quality of Service in a communications system. Different applications may require a different QoS. For example, an occasional transmission error may have no noticeable effect on a video image, but it could be disastrous in the transmission of financial data.

**QPSK**—Abbreviation for Quadrature Phase Shift Keying, a modulation technique.

**Quadrature Amplitude Modulation (QAM)**—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**—Connects a terminal adapter (TA) to non-ISDN equipment (TE2), often by means of an RS-232 interface. Also called R Reference Point.

**R Reference Point**—  
See *R interface*.

**RAB**—Abbreviation for Registrar Accreditation Board.

**RACF**—Abbreviation for Radio Access Control Function.

**RACH**—Abbreviation for Random Access Channel.

**Radio Frequency Fingerprinting**—The unique identification code programmed into a digital cellular telephone as an anti-fraud measure.

**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.

**RAL**—Abbreviation for Restricted Access Location.

**RAM**—Abbreviation for Random Access Memory.

**RASC**—Abbreviation for Radio Access System Controller.

**RB**—Abbreviation for Radiocommunications Bureau.

**RBAF**—Abbreviation for Radio Bearer Adaptation Function.

**RBB**—Abbreviation for Residential Broadband.

**RBOC**—See *Regional Bell Operating Company*.

**RBS**—Abbreviation for Robbed-Bit Signaling, a system that drops a small number of information bits in a digital bit stream and replaces them with signaling and control bits.

**RCF**—Abbreviation for Radio Control Function.

**RCH**—Abbreviation for Random Access Channel.

**REA**—Abbreviation for Rural Electrification Association.

**REJ**—Abbreviation for Reject.

**Receiver**—A device to receive a signal and convert it to a usable format (sound, etc.).

**Redundant Data**—Data that is not necessary for the information content of a transmission. Redundant data are usually added to aid in the detection of communications errors.

**Regional Bell Operating Company (RBOC)**—Local telephone operating companies that were split off from AT&T and which provide most local and intrastate telephone service in the U.S.. Also called Bell Operating Companies (BOC).

**RELP**—Abbreviation for Residual Excited Linear Prediction.

**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.

**RF**—Abbreviation for Radio Frequency.

**RFC**—Abbreviation for Remote Feature Control or Request for Comments.

**RFI**—Abbreviation for Radio Frequency Interference.

**RFP**—Abbreviation for Radio Fixed Parts or Request for Proposal.

**RFQ**—Abbreviation for Request for Quotation.

**RG**—Abbreviation for Residential Gateway.

**RGB**—Abbreviation for Red Green Blue, the three primary colors of light.

**Ring Network**—A network topology that connects its terminals in a loop or ring.

**Ring-Wrap**—See *Self-Healing*.

**RL**—Abbreviation for Return Loss.

**RLAN**—Abbreviation for Radio Local Area Network.

**RLP**—Abbreviation for radio link protocol, a specific system of rules used to transmit information over a radio channel.

**RLR**—Abbreviation for Receive Loudness Rating.

**RMS**—Abbreviation for Root Mean Square.

**RNR**—Abbreviation for Receiver Not Ready.

**Roaming**—The ability of a cellular or other wireless communications service subscriber to travel from one service area to another and remain in communication.

**ROLR**—Abbreviation for Receive Objective Loudness Rating.

**ROM**—Abbreviation for Read Only Memory.

**ROSE**—Abbreviation for Remote Operations Service Element.

**Router**—A device that connects two or more local-area networks (LANs) to each other and that operates at Open System Interconnect (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 internetworking device. The routing table allows frames to be forwarded to the LAN where their destination node is located.

**RP**—Abbreviation for Radio Port or Reference Point.

**RPC**—Abbreviation for Remote Procedure Call.

**RPE**—Abbreviation for Regular Pulse Excitation.

**RPCU**—Abbreviation for Radio Port Control Unit.

**RPWM**—Abbreviation for Rules of Procedure and Working Methods.

**RR**—Abbreviation for Receiver Ready.

**RS**—Abbreviation for Radio System, Radiocommunications Sector or Reed-Solomon Code.

**RSA**—See *Rural Service Area*.

**RS-232**—A recommended serial standard published by the Electronic Industry Association (EIA) that was developed to interface a UART and a modem but which is also used as serial ports on personal computers and servers for connection to many different types of peripherals.

**RS-422**—A recommended standard published by the Electronic Industry Association (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-422, RS-423 (discussed below), and RS-449 were once expected to replace RS-232, but they have not.

**RS-423**—A recommended standard published by the Electronic Industry Association (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 Electronic Industry Association (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.

**RSDN**—Abbreviation for Regional Switched Digital Network.

**RSF**—Abbreviation for Residential Standards Forum.

**RSID**—Abbreviation for Residential System Identification.

**RSS**—Abbreviation for Received Signal Strength.

**RSSI**—Abbreviation for Received Signal Strength Indicator.

**RT**—Abbreviation for Round Trip.

**RTC**—Abbreviation for Return to Control.

**RTCA**—Abbreviation for Radio Technical Commission for Aeronautics.

**RTF**—Abbreviation for Radio Terminal Function.

**RTL**—Abbreviation for Real Time Link Management.

**RTMS**—See *Radio Telephone Mobile System*.

**RTP**—Abbreviation for Real-Time Protocol.

**RTS**—Abbreviation for Request to Send, a modem control signal.

**RTT**—Abbreviation for Radio Transmission Technology, spe-

cifically the radio technology used in cellular-telephone systems.

**RTU**—Abbreviation for Right to Use.

**RUF**—Abbreviation for Reflected Unique Findable Pattern.

**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.

**Rural Service Area (RSA)**—One of the FCC's 428 rural markets in the U.S.

**S&R**—Abbreviation for Segmentation and Reassembly.

**S-BCCH**—Abbreviation for Short Message Service Broadcast Control Channel.

**S Interface**—An ISDN four-wire, 1,000-meter Basic Access interface between various TE, TA or NT equipment, usually within a private network such as a PBX. The point where ISDN terminal equipment can be connected to the network termination equipment. It is defined in ITU recommendation 1430. Also called S Reference Point.

**S-PCN**—Abbreviation for Satellite Personal Communications Network.

**S Reference Point**—See *S Interface*.

**SAAC**—Abbreviation for Syntax-Based Adaptive Arithmetic Coding.

**SAC**—Abbreviation for Service Access Code, Subscriber

Access Control, or Syntax-based Arithmetic Coding.

**SACCH**—Abbreviation for Slow Associated Control Channel.

**SAE**—Abbreviation for Society of Automotive Engineers.

**SAFER**—Abbreviation for Secure and Fast Encryption Routine.

**SAGE**—Abbreviation for Security Algorithms Group of Experts.

**SANC**—Abbreviation for Signaling Area Network Code.

**SAP**—Abbreviation for Segmentation Application Part or Service Access Point.

**SAPI**—See *Service Access Point Identifier*.

**SAR**—See *Segmentation and Reassembly*.

**SAW Filter**—See *Surface Acoustic Wave Filter*.

**SBE**—Abbreviation for Single-Byte Extension.

**SBSD**—Abbreviation for Supplementary and Bearer Service Description (T1S1).

**SCC**—Abbreviation for Standards Coordinating Committee or Standards Council of Canada.

**SCCH**—Abbreviation for Single Cell Control Channel.

**SCCP**—Abbreviation for Signaling Connection Control Part.

**SCELP**—Abbreviation for Spike Code-Excited Linear-Prediction.

**SCF**—Abbreviation for Shared Control with Feedback, Supervisory and Control Function,

Synchronization and Convergence Function, or System Communication Function.

**SCM**—Abbreviation for Station Class Mark.

**SCOT**—Abbreviation for Steering Committee on Telecommunications.

**SCP**—Abbreviation for Service Control Point.

**SCR**—Abbreviation for Selective Call Rejection.

**SCSA**—Abbreviation for Signal Computing System Architecture.

**SCSI**—Abbreviation for Small Computer System Interface, a commonly used computer bus.

**SCTE**—Abbreviation for Society of Cable Television Engineers.

**SDCC**—Abbreviation for Supplementary Digital Color Code.

**SDCCH**—Abbreviation for Standalone Dedicated Control Channel.

**SDF**—Abbreviation for System Directory Function.

**SDH**—See *Synchronous Digital Hierarchy*.

**SDL**—Abbreviation for Specification and Description Language.

**SDLC**—See *Synchronous Data Link Control*.

**SDMA**—Abbreviation for Spatial Division Multiple Access, a smart-antenna technology

**SDO**—Abbreviation for Standards Development Organization.

**SDSAF**—Abbreviation for Switched Digital Services Applications Forum.

**SDSS**—Abbreviation for Server Display and Script Services.

**SDU**—Abbreviation for Service Data Unit.

**SE**—Abbreviation for Synchronous Editing.

**SEAD**—Abbreviation for Software Encryption Algorithm for Data Services.

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

**Segmentation and Reassembly (SAR)**—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 receiver.

**Selective Forwarding**—The ability of a bridge or other internetworking device 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*.

**SEP**—Abbreviation for Selective Polling.

**Sequence Control**—A method of numbering blocks of data so that no block will be lost or

uplicated 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 called clients.

**Service Access Point Identifier (SAPI)**—A field of a LAPD frame that indicates the logical address of the called terminal.

**Serving GPRS Support Node (SGSN)**—A device that routes traffic between the *General Packet Radio Service* (GPRS) backbone and the *Mobile Base Station* (MBS).

**SERVNOT**—Acronym for Service Notification.

**SES**—Abbreviation for Standards Engineering Society.

**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.

**SF**—Abbreviation for Single Frequency, Superframe, or Synchronization Flag.

**SG**—Abbreviation for Study Group.

**SGFS**—Abbreviation for Special Group for Functional Standards.

**SGSN**—See *Serving GPRS Support Node*.

**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.

**SHO**—See *Soft Handoff*.

**Short Message Service (SMS)**—A service that enables short text messages to be sent to cellular telephones.

**Short Passive Bus**—See *Passive Bus*.

**SI**—Abbreviation for Still Image.

**SID**—Abbreviation for Send Identifier, Silence Insertion Descriptor, or System Identification.

**SIG**—See *Special Interest Group*.

**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**—In a circuit-switched telecommunications network, the exchange of information that is concerned with the establishment, control, and management of a telephone connection.

**Signaling System 7 (SS7)**—A technology in which signaling information related to many information circuits is conveyed over a separate signaling cir-

cuit by means of addressed packets. See also *Common Channel Signaling*.

**Signal-to-Noise (S/N)**

**Ratio**—The ratio of desired signal level to noise on a communications link, expressed in *decibels* (dB).

**SIM**—See *Subscriber Identification Module*.

**Simplex**—One-way only communications.

**SIN**—Abbreviation for System Identification Network.

**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.

**SIO**—Abbreviation for Scientific or Industrial Organization.

**Slamming**—The unauthorized changing of telephone services by someone other than the subscriber.

**SLE**—Abbreviation for Screen List Editing.

**SLER**—Abbreviation for Signal to Listener Echo Ratio.

**SLIC**—See *Subscriber Line Interface Circuit*.

**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.

**SLR**—Abbreviation for Send Loudness Rating.

**SM**—Abbreviation for Single Mode.

**Smart Antenna**—A technology that enables antennas change their directional patterns dynamically to optimize coverage.

**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.

**Smart Phone**—A cellular telephone that includes advanced features that depend on microprocessor technology.

**SMD**—Abbreviation for Short Message Delivery.

**SMDS**—See *Switched Multi-Megabit Data Service*.

**SMG**—Abbreviation for Special Mobile Group.

**SMM**—Abbreviation for Spectrum Management Methodology.

**SMR**—See *Specialized Mobile Radio*.

**SMS**—See *Short Message Service*.

**SMSA**—Abbreviation for Standard Metropolitan Statistical Area.

**SMSREQ**—Abbreviation for Short Message Service Request.

**S/N**—Abbreviation for Signal to Noise. See *Signal-to-Noise Ratio*.

**SN**—Abbreviation for Scaling Number or Service Node.

**SNA**—Abbreviation for Synchronous Network Architecture.

**SNHC**—Abbreviation for Synthetic-Natural Hybrid Coding.

**SNI**—Abbreviation for Short-Message-Service Notification Indicator.

**SNMP**—Abbreviation for Simple Network Management Protocol.

**SNR**—See *Signal-to-Noise Ratio*.

**SOC**—Abbreviation for System Operator Code or System on-a-Chip.

**Soft Handoff (SO)**—A technology that temporarily maintains a connection with the base stations in both cells during the period when a cellular call is transferred from one cell to another. Soft handoffs reduce call disruption.

**SOI**—Abbreviation for Start of Image.

**SOM**—Abbreviation for Self-Organizing Multicast.

**SONET**—See *Synchronous Optical Network*.

**SOP**—Abbreviation for Standard Operating Procedure.

**SOVA**—Abbreviation for Soft Output Viterbi Algorithm.

**SP**—Abbreviation for Standards Proposal.

**Space**—Communications terminology for a binary 0.

**Special Interest Group (SIG)**—Generally used to refer to a consortium of companies formed to promote a technol-

ogy, e.g. *Bluetooth* Special Interest Group.

**Specialized Mobile Radio (SMR)**—A commercial service that operates in the frequencies of 220 MHz, 800 MHz, and 900MHz.

**Spectrum**—A range of radio frequencies.

**Spectrum Allocation**—The assignment of frequency bands purposes such as high-definition television, cellular telephones, etc.

**Spectrum Assignment**—The division of frequency bands within an allocation to specific carriers.

**Spectrum Cap**—The maximum amount of spectrum that may be assigned to a single licensee.

**SPH**—Abbreviation for Service Profile at the Home location.

**SPI**—Abbreviation for Standard Programmatic Interface.

**SPIFF**—Abbreviation for Still Picture Interchange File Format.

**SPINA**—Abbreviation for Subscriber Personal Identification Number Access.

**SPINI**—Abbreviation for Subscriber Personal Identification Number Intercept.

**SPC**—Abbreviation for Single Parity Check or System Programming Code.

**SPG**—Abbreviation for Special Task Group.

**SPL**—Abbreviation for Sound Pressure Level.

**SPNE**—Abbreviation for Signal Processing Network Equipment.

### **Spread Spectrum**

**(SS)**—A radio communications technique that “spreads” the transmitted signal across a wide band of frequencies by constantly 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*.

**SRC**—Abbreviation for Strategic Review Committee.

**SRD**—Abbreviation for Standards Requirements Document.

**SREJ**—Abbreviation for Selective Reject.

**SRL**—Abbreviation for Secure Radio Link or Structural Return Loss.

**SRM**—Abbreviation for Standards Related Matters.

**SRTS**—Abbreviation for Synchronous Residual Time Stamp.

**SS**—See *Spread Spectrum*.

**SS5**—Abbreviation for Signaling System 5.

**SS7**—See *Signaling System 7*.

**SSI**—Abbreviation for Signal Strength Indicator.

**SSN**—Abbreviation for Sub-System Number or Social Security Number (in the U.S.)

**SSO**—Abbreviation for Speech Service Option.

**SSP**—Abbreviation for Service Switching Point.

**SSPR**—Abbreviation for System Selection for Preferred Roaming.

### **Stand-Alone Modem**

A modem that is located externally to the terminal that it serves connects to the terminal through 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.

**StarLAN**—See *1BASE-5 Ethernet*.

**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 internetwork.

**Station**—A terminal on an Ethernet LAN.

### **Station Equipment**

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

**STB**—Abbreviation for Set-Top Box.

**STC**—Abbreviation for Sub-Technical Committee.

**STD**—Abbreviation for Simplified Trellis Decoder.

**STE**—Abbreviation for Secure Terminal Equipment.

**STG**—Abbreviation for Special Task Group, or Special Topic Group.

**STL**—Abbreviation for Software Tool Library.

**STM**—Abbreviation for Synchronous Transmission Mode.

**STMR**—Abbreviation for Sidetone Masking Rating.

**Stop Bit**—A mark placed at the end of each data word 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**—Abbreviation for Shielded Twisted Pair.

**STQ**—Abbreviation for Speech Transmission Quality.

**STRE**—Abbreviation for Side-Tone Reference Equivalent.

**STS-n**—See *Synchronous Transport Signal at Level n*.

**STU**—Abbreviation for Secure Terminal Unit.

**SU**—Abbreviation for Subscriber Unit.

**SUB**—Abbreviation for Sub-address or *Subscriber*.

**Subscriber**—A customer of a telephone company or other communications carrier.

**Subscriber Fraud**—The illegal practice or avoiding payment for communications services by pretending to be someone else.

**Subscriber Identification Module (SIM)**—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.

**Subscriber Line Interface Circuit (SLIC)**—The telephone company electrical interface between an analog copper local loop and the central office switch.

**Subscriber Loop**—See *Local Loop*. See also *Wireless Local Loop*.

**Superheterodyne Receiver**—A radio receiver that mixes the received radio-frequency signal (heterodyning) to an intermediate frequency, usually 10.7 kHz, for amplification and filtering before the signal is converted to the baseband frequency. Contrast with *Direct Conversion*.

**Supervisory Information**—Signaling information used to connect, maintain, and disconnect a dial-up telephone circuit or similar communications link.

**Supplementary Services**—Services that a telephone company makes available to its subscribers in addition to basic telephone service. Examples in-

clude caller identification, call waiting, call rejection, and call forwarding.

**Surface Acoustic Wave (SAW) Filter**—A passive device used to filter signals used in many radio transmitters and receivers, including those incorporated into cellular telephones.

**SVD**—Abbreviation for Simultaneous Voice and Data.

**SVF**—Abbreviation for Simultaneous Voice and Facsimile (FAX).

**SWELP**—Abbreviation for Switched Excited Linear Predictive.

**SWG**—Abbreviation for Sub-Working Group.

**Switched Multi-megabit Data Service (SMDS)**—A high-speed packet-switched metropolitan area data service that is offered by some telecommunications carriers. The main use of SMDS is for the communication of medical images.

**Switched-56 Service**—A switched 56-kilobit-per-second digital telephone service once widely offered in North America and regarded as an interim technology to ISDN. Switched-56 uses a 64-kilobit-per-second line, but eight kilobits per second are reserved for in-channel signaling.

**Switching**—The routing of information through a communications network.

**Switching Equipment**—Equipment located in the communications service provider's offices that makes the interconnec-

tion between the station equipment of two or more subscribers when one of them dials the other.

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

**Synchronous Data Link Control (SDLC)**—A bit-oriented protocol published by IBM in 1974. Also see *High Level Data Link Control*.

**Synchronous Digital Hierarchy (SDH)**—The European and international version of North America's SONET standard for transporting digital information over optical fibers.

**Synchronous Optical Network (SONET)**—A data transmission standard for sending high-speed data over a fiber-optic network.

**Synchronous Transport Signal at Level n (STN-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).

**T Interface**—Electrically identical to the ISDN S interface but with a different protocol. The T interface links NT2s to the NT1. also calaled T Reference Point.

**T Reference Point**—See *T Interface*.

**T1 Carrier System**—A digital communications link that operates at 1.544 megabits per sec-

ond in North America and Japan. The European equivalent is E1, which operates at a speed of 2.048 megabits per second.

**T1 Committee of the Exchange Carriers Standards Association (T1X1 Subcommittee)**—The American National Standard Institute's subcommittee that developed the SONET standards.

**T1X1 Subcommittee**—See *T1 Committee of the Exchange Carriers Standards Association*.

**T2 Carrier System**—A 6.312-megabit-per-second digital communications link that is formed by multiplexing three T1 systems.

**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**—See *Terminal Adapter*.

**TACS**—See *Total Access Communications System*.

**TAG**—Abbreviation for Technical Advisory Group.

**TAPI**—Abbreviation for Telephony Applications Programming Interface. See *Applications Programming Interface*.

**TBCD**—Abbreviation for Telephony Binary Coded Decimal.

**TBD**—Abbreviation for To be Determined.

**TC**—Abbreviation for Technical Committee, Telecommunications Closet, Test Case, or Transaction Capabilities.

**TCAP**—Abbreviation for Transaction Capabilities Application Part.

**TCH**—Abbreviation for Transparent Circuit Handling.

**TC HF**—Abbreviation for Technical Committee Human Factor (ETSI).

**TCM**—See *Time Compression Multiplexing*.

**TCP/IP**—See *Transmission Control Protocol/Internet Protocol*.

**TCR**—Abbreviation for Technical Committee Report.

**TDD**—Abbreviation for Task Data Descriptions, Telecommunications Devices for the Deaf, or Time Division Duplexing.

**TDF**—Abbreviation for Transportable Document Format.

**TDM**—Abbreviation for Time Division Multiplexer.

**TDMA**—See *Time Division, Multiple Access*.

**TDOA**—Abbreviation for Time Difference of Arrival.

**TE**—See *Terminal Equipment*.

**TE1**—See *Terminal Equipment 1*.

**TE2**—See *Terminal Equipment 2*.

**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.

**Telecommunication Act of 1996**—A U.S. law whose main intent was to increase compe-

tition in the communication markets, although it also address other communications issues.

**Telematics**—A combination of wireless communication, positioning technology, and computing that is integrated into motor vehicle.

**Telemetry**—Transmission and collection of data obtained by sensing conditions in a real-time environment and transmitting the data to a remote location.

**Telepoint**—A wireless pay telephone service through strategically placed base 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. Telepoint was also installed in several Asian countries including China, Malaysia, Hong Kong, Singapore, and Thailand. The widespread availability of cellular technology has made Telepoint obsolete.

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

**Terminal Adapter (TA)**—A circuit that permits non-ISDN equipment to be connected to an ISDN line.

**Terminal Equipment (TE)**—Subscriber equipment connected to an ISDN line. There are two types, TE1 and TE2. TE1 is equipment that is designed to be

used with ISDN. TE2 is pre-ISDN equipment that must be interfaced to the ISDN line with a terminal adapter (TA).

**Terminal Equipment 1 (TE1)**—Any type of equipment designed to be compatible with ISDN.

**Terminal Equipment 2 (TE2)**—Equipment that is not designed to be compatible with ISDN and which requires a *Terminal Adapter* (TA) to connect it to an ISDN line.

**Terminal Program**—A communications software package that controls an intelligent modem and performs other communications functions.

**Termination Charge**—The fee that a communications provider charges to terminate a call that is originated by a subscriber to a different communications provider.

**Terrestrial Trunked Radio (TETRA)**—A European standard for a digital packet-switched radio system. TETRA is used by such organizations as public safety agencies and railroads.

**TES**—Abbreviation for Telecommunication Equipment Safety.

**TETRA**—See *Terrestrial Trunked Radio*.

**TFIG**—Abbreviation for Task Force Implementation Group.

**TG**—Abbreviation for Task Group.

**Thinwire Ethernet**—See *10BASE-2 Ethernet*.

**Third Generation (3G)**—Cellular telephone standards (W-CDMA and cdma2000) that will eventually be capable of data transmission at high speeds of up to two megabits per second.

**TIA**—Abbreviation for Telecommunications Industry Association.

**TICS**—Abbreviation for Transport Information and Control Systems.

**TIES**—Abbreviation for Telecom Information Exchange Services and Time Independent Escape Sequence.

**TIFF**—Abbreviation for Tagged Image File Format, a format often used to store digital images.

**TILU**—Abbreviation for Telecommunications Industry Liaison Unit.

**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*.

**Time Division, Multiple Access (TDMA)**—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 as a synonym for IS-136 or its predecessor standard, IS-54.

**Time-Compression Modulation (TCM)**—See *Time Compression Multiplexing*.

**TIMS**—Abbreviation for Transmission Impairment Measurement System.

**TIP**—Abbreviation for Transport and Internetworking Package.

**TLC**—Abbreviation for Test Loop Combination.

**TLDN**—Abbreviation for Temporary Local Directory Number.

**TLP**—Abbreviation for Test Level Point.

**TOA**—Abbreviation for Time of Arrival.

**TOC**—Abbreviation for Terminated Open Circuit.

**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 possesses the token has permission to transmit. Also see *Token*.

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

Token Ring technology has fallen out of favor, and most Token Ring networks have been replaced with Ethernet.

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

**TOR**—Abbreviation for Terms of Reference.

**TOSCA**—Abbreviation for Text and Office Systems Content Architecture.

**Total Access Communications System (TACS)**—A European analog cellular telephone standard derived from the AMPS standard. TACS was deployed in Austria, Ireland, Italy, the U.K., and in several other locations. It has largely been phased out in favor of GSM. TACS is a first generation (1G) cellular technology.

**TP**—Abbreviation for Test Protocol or Purpose.

**TPUI**—Abbreviation for Temporary Portable User Identity.

**TPKT**—Abbreviation for Transport Packet.

**T/R**—Abbreviation for Tip/Ring. The tip and ring are the names of the two conductors in a two-wire standard telephone circuit.

**TR**—Abbreviation for Technical Report, Technical Requirements (TIA committee), or Temporal Reference.

**TRAC**—Abbreviation for Technical Recommendation Application Committee.

**Transceiver**—A device that includes both a transmitter and a receiver.

**Transducer**—A device that converts intelligence signals from one form of energy to another. For example, an antenna is a transducer that converts electrical signals to radio waves and vice versa.

**Transmission**—The sending of information from one point to another through a communications network.

**Transmission Control Protocol/Internet Protocol (TCP/IP)**—A packet-oriented communications protocol that was developed with funding from the Defense Advanced Research Projects Agency (DARPA) to link computers across large networks. As its name implies, TCP/IP is the protocol used on the Internet.

**Transmission Equipment (TE)**—Telephone circuits that carry information from one subscriber to another.

**Transparent 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 terminal 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.

**Tree Network**—See *Hierarchical Network*.

**Triangulation**—Calculating a location by plotting the direction of radio signals originating from three transmitters whose geographical location is precisely known.

**Tri-band Telephone**—A cellular telephone that can communicate in three different frequency bands. The most common tri-band telephones support GSM 900 and GSM 1800 in Europe plus GSM 1900 in the Americas to enable intercontinental roaming.

**Trunk**—A telephone circuit that connects two telephone switches or two telco local offices.

**TSB**—Abbreviation for Telecommunications Standardization Board or Telecommunications Systems Bulletin.

**TSI**—Abbreviation for Transmitting Subscriber Identification.

**TTE**—Abbreviation for Telecommunications Terminal Equipment.

**TTF**—Abbreviation for Technical Task Force.

**TWAIN**—An Applications Programming Interface that allows a computer to communicate with a scanner. The popular (but probably incorrect) belief is that it stands for Technology (or Toolkit) Without An Interesting Name.

**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 LANs.

**Twisted-pair FDDI**—An 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. However, high-speed Ethernet has made FDDI obsolete.

**Two-Wire Circuit**—A communications circuit that uses a single pair of wires for both transmitted and received information.

**TX**—Abbreviation for Transmit.

**UART**—An acronym for Universal Serial Receiver Transmitter. A UART is used in asynchronous communications to convert data between the parallel format used in computers and terminals and the serial format used on the communications line.

**UHF**—Abbreviation for Ultra High Frequency, which is generally defined as the frequencies from 300 MHz to 3 GHz.

**UL**—Abbreviation for Underwriters Laboratories, a U.S.-based organization that tests electrical appliances for safety.

**ULS**—See *Universal Licensing System*.

**Um**—A designation for the Radio Interface between Mobile and Base Station.

**UMTS**—See *Universal Mobile Telephone System*.

**U Interface**—A twisted-pair ISDN subscriber loop that provides basic-rate access to the NT1 reference point from the ISDN network.

**UNI**—See *User-to-Network Interface*.

**Universal Licensing System (ULS)**—A searchable database of radio licenses located on the FCC Web site at [www.fcc.gov](http://www.fcc.gov).

**Universal Mobile Telephone System (UMTS)**—The European term for what the rest of the world calls 3G and more specifically the European name for *Wideband CDMA*.

**Universal Service**—the established aim to provide telecommunication services throughout the U.S.

**UP**—Abbreviation for User Part

**UPED**—Abbreviation for User Premises Equipment Division.

**UPR**—Abbreviation for Users Performance Requirements.

**UPT**—Abbreviation for CCITT Universal Personal Telecommunications.

**UQ**—Abbreviation for Utility Quality.

**USAG**—Abbreviation for United States Advisory Group.

**USB**—Abbreviation for Universal Serial Bus.

**User-to-Network Interface (UNI)**—An ATM interface that connects a terminal to an ATM switch. Also see *Network-to-Network Interface*.

**UTP**—Abbreviation for Unshielded Twisted Pair.

**UWC-136**—A proposal to upgrade today's *IS-136 TDMA* cellular networks to 3G. UWC stands for Universal Wireless Communications.

**V Interface**—See *V Reference Point*.

**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). Also referred to V Interface.

**V.21**—An international 300 bit-per-second full-duplex FSK modem standard. The North American version is *Bell 103*.

**V.22**—An international full-duplex 4PSK modem standard that operates at 1,200 bits per second and 600 baud. The North American version is *Bell 212A*.

**V.22 Bis**—An international full-duplex QAM modem standard that operates at 2,400 bits per second and 600 baud.

**V.32**—An international full-duplex QAM modem standard that operates at 9,600 bits per second and 2,400 baud.

**V.32 Bis**—An international full-duplex modem standard

that operates at 14,400 bits per second.

**V.32 Terbo**—An interim proprietary modem standard published by AT&T that operates at a speed of 19,200 bits per second.

**V.34**—An international full-duplex modem standard that operates at a maximum speed of 28,800 bits per second.

**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 ITU that adds data compression to the V.42 modem communications protocol.

**V.90**—An international modem standard published by the ITU that supports a maximum receive communications speed of 56 kilobits per second and a maximum transmit speed of 33.6 kilobits per second.

**V.92**—An international modem standard published by the ITU to upgrade the V.90 standard. Enhancements added to the standard are that the setup time was reduced, support for call waiting was added, and the maximum transmit speed was increased from 33.6 to kilobits per second.

**V.fast**—An interim modem standard that was used in 28,800 modems before the V.34 standard was finalized. Also called V.FC.

**VAR**—Abbreviation for Value Added Resellers.

**VCR**—Abbreviation for Video Cassette Recorder.

**VCS**—Abbreviation for Voice Controlled Services.

**VDSL**—See *Very-high-bit-rate Digital Subscriber Line*.

**VDTI**—Abbreviation for Voiceband Data Transmission Interface.

**Very-high-bit-rate Digital Subscriber Line (VDSL)**—A proposed service that would provide a multi-megabit digital service to small businesses and homes over two-wire lines.

**VESA**—Abbreviation for Video Electronic Standard Association.

**VHF**—Abbreviation for Very High Frequency.

**VICS**—Abbreviation for Vehicle Information and Control Systems.

**Video Dial Tone**—Generally, any technology (such as *Asymmetrical Digital Subscriber Line*) designed to deliver video programs to consumers in their residences on demand.

**Virtual Circuit**—See *Virtual Connection*.

**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.

**VLBR**—Abbreviation for Very Low Bit-Rate.

**VLR**—Abbreviation for Visitor Location Register.

**VLRIN**—Abbreviation for Visitor Location Register Identification Number.

**VLSI**—Abbreviation for Very Large Scale Integration.

**VM**—Abbreviation for Verification Model or Voice Mail.

**VMAC**—Abbreviation for Voice Mobile Attenuation Code.

**VMLA**—Abbreviation for Virtual Mobile Location Area.

**VMS**—Abbreviation for Voice Mail System.

**Vocoder**—A technical term formed by combining the words “voice” and “encoder”. A vocoder encodes an analog voice signal into a digital format.

**VOD**—Abbreviation for Video on Demand.

**Voice Activation**—The ability to operate a device using spoken commands.

**Voice Recognition**—See *Voice Activation*.

**VPN**—Abbreviation for Virtual Private Network.

**VQ**—Abbreviation for Vector Quantization.

**VR**—Abbreviation for Vertical Resolution.

**VSF**—Abbreviation for Vestigial Side Band.

**VSC**—Abbreviation for Vertical Service Codes.

**VSELP**—Abbreviation for Vector Sum Excited Linear Predictive Coding.

**VTQME**—Abbreviation for Voice Telephony Quality Methodology.

**VTS**—Abbreviation for Voice Tone Support.

**VWC**—Abbreviation for Vector Wavelet Coding.

**WACS**—Abbreviation for Wireless Access Communication Systems.

**WAEPL**—Abbreviation for Weighted Echo Path Loss.

**WAN**—Abbreviation for Wide Area Network.

**WAP**—See *Wireless Application Protocol*.

**WARC**—Abbreviation for World Administrative Radio Conference.

**WBS**—Abbreviation for Wireless Business System.

**WCAT**—Abbreviation for Wireless Cellular Action Team.

**W-CDMA**—A European proposal for 3G cellular services that is designed to replace today's GSM networks. Japan's NTT DoCoMo also plans to use W-CDMA, which stands for Wideband Code-Division Multiple Access. See also *cdma2000*.

**WCPE**—Abbreviation for Wireless Customer Premises Equipment. See *Customer Premises Equipment*.

**WER**—Abbreviation for Word Error Rate.

**WFOM**—Abbreviation for Wait for Overhead Message.

**WG**—Abbreviation for Working Group.

**Wideband**—See *Broadband*.

**Wideband Code Division Multiple Access**—See *W-CDMA*.

**WiLL**—Motorola's trademarked name for Wireless Local Loop. See *Wireless Local Loop*.

**WIN**—Abbreviation for Wireless Intelligent Network.

**Wireless Application Protocol (WAP)**—A suite of software programs that enable cellular telephones and other wireless devices to browse simplified web pages. Sprint PCS deployed a technology based on WAP throughout its cellular network in the U.S. in 1999 and WAP began to be deployed in Europe in 2000.

**Wireless Cable**—A communications system that delivers video programming to subscribers over microwave radio links. See *Multipoint Distribution Service*.

**Wireless LAN (Local Area Network)**—A LAN that uses radio transmission instead of wires to interconnect computers and computer peripherals.

**Wireless Local Loop (WLL)**—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 non-existent. See also *Fixed Wireless Access*.

**Wireless Markup Language (WML)**—A protocol used to create Web pages that are optimized for wireless devices with their small display screen and low-bandwidth connections. It is based on the *Hypertext Markup Language (HTML)* that is used to create standard Web pages.

**Wireless Middleware**—Software that interfaces between TCP/IP and wireless services and converts data from one protocol to another.

**Wireless Transaction Protocol (WTP)**—A connectionless, low-overhead protocol used with WAP in place of the Internet's HTTP.

**WLAN**—Abbreviation for *Wireless Local-Area Network*.

**WLL**—See *Wireless Local Loop*.

**WLNP**—Abbreviation for Wireless Local Number Portability.

**WML**—See *Wireless Markup Language*.

**World Radio Conference (WRC)**—A meeting of the radio regulatory agencies of national governments to coordinate the allocation of frequency spectrum and other issues related to wireless communications.

**WP**—Abbreviation for Working Party.

**W-PBX**—Abbreviation for Wireless Private Branch Exchange. See *Private Branch Exchange*.

**WPT**—Abbreviation for Wireless Personal Terminal.

**WRC**—See *World Radio Conference*.

**WRE**—Abbreviation for Wireless Residential Extension.

**WSC**—Abbreviation for World Standardization Conference.

**WTP**—See Wireless Transaction Protocol.

**WTSC**—Abbreviation for World Telecommunication Standardization Conference.

**WUPE**—Abbreviation for Wireless User Premises Equipment.

**WWW**—Abbreviation for the Internet's World Wide Web.

**X.25**—An established packet-switched technology. X.25 is being replaced by *Frame Relay* and *ATM*. X.25's advantage over these newer technologies is its robust error correction, a feature that makes it attractive for use over primitive, noisy communications circuits but which also makes the technology unnecessarily slow when it is used over modern, more-reliable communications circuits. See also *Frame Relay*, *ATM*.

**xDSL**—A digital technology that uses standard copper telephone to transmit simultaneous high-speed data. See *Digital Subscriber Line*

**XOR**—Abbreviation for Exclusive OR gate and for the Exclusive OR function in Boolean Algebra.