
Glossary

This glossary contains more than 1,100 communications terms. Several terms are used with permission of *Data Communications Magazine*.

A

A and B signaling—Procedure used in most T1 transmission facilities currently operated by U.S. telephone companies, in which one bit, robbed from each of the 24 subchannels in every sixth frame, is used for carrying dial and control information. A type of in-band signaling used in T1 transmission.

AAR—Automatic Alternative Routing.

A-B Switch—A feature found on a cellular phone that allows a person to select either the (A) non-wireline or (B) wireline carrier that provides cellular telephone service.

Abandoned call—Call in which a caller cancels the call after a connection has been made, but before conversation takes place, for example, after hearing a recorded announcement.

Abbreviated and delayed ringing—Allows the ringing associated with a call on a station line to be transferred to another station that has an appearance of that line; the transfer occurs automatically after two ringing cycles.

Abbreviated dialing—Enables a caller to dial a frequently used number by means of a few digits

instead of the entire telephone number. Also called speed dialing and short-code dialing.

ACA—Automatic Circuit Assurance.

ACC—Automatic Callback Calling.

Acceptance test—Operating and testing of a new communications system to ensure that the system is operating satisfactorily before being accepted by the purchaser.

Access charge—Cost assessed to communications users for access to the interexchange, intrastate, and interstate phone network to originate and receive calls.

Access code—Digit, or digits, that a user must dial to be connected to an outgoing trunk facility.

Access line—Connection from the customer to the local telephone company for access to the telephone network; also represents the connection between the serving toll center and the serving office of the interexchange carrier used for access to public switched network services. Also known as local loop.

Accounting codes (voluntary or forced)—Entered by a caller by dialing the appropriate digits for the call being placed followed by the digits composing the accounting codes. With forced accounting codes, if the caller fails to dial a valid accounting code within a specific time frame, an

intercept tone (or as a customer option, a recorded message) can be played to the caller and the call will be terminated.

Accounting rate—Charge per traffic unit, which can be a unit of time or information content, covering communications between zones controlled by different telecommunications authorities; used to establish international tariffs.

AC-DC ringing—Telephone ringing that makes use of both AC and DC components—alternating current to operate a ringer, and direct current to aid the relay action that stops the ringing when the called telephone is answered.

ACD—automatic call distributor.

ACK/NAK/END—Acknowledged/Not Acknowledged/Inquiry.

Acoustic coupler—Device that allows a telephone handset to be used for access to the switched telephone network for data transmission. Digital signals are modulated as sound waves and data rates are typically limited to about 300 bps—some up to 1.2K bps.

ACSE—Association Control Service Element; an ISO standard specifying how application processes on two remote machines must initiate/terminate a communications session; this session is called an association.

ACTGA—Attendant Control of Trunk Group Access.

ACU—automatic calling unit.

A/D—Analog/Digital.

Adaptive Differential Pulse Code Modulation (ADPCM)—Encoding technique (CCITT) that allows analog voice signals to be carried on a 32K bps digital channel. Sampling is done at 8kHz with three or four bits used to describe the difference between adjacent samples.

ADPCM—Adaptive Differential Pulse Code Modulation.

Adaptive equalization—Equalization that is adjusted during transmission in order to compensate for line characteristics.

Adaptive routing—Routing that automatically adjusts to network changes such as changes of traffic pattern or failures.

Add-on conference—Sometimes referred to as “three-way calling.” Used in association with consultation hold features, it is a conference facility that allows the station user to add another party to the existing conversation.

Add-on data modules—Plug-in circuit boards that allow a PBX to receive and transmit data in addition to voice signals.

Address—1) Coded representation of the destination of data, or of their originating terminal. Multiple terminals on one communications line, for example, must each have a unique address. 2) Group of digits that makes up a telephone number. Also known as the called number.

Address, international telephone—Code that specifies a unique address for any telephone in the world. The number excludes the international prefix, but includes the country code and the national subscriber number.

Advanced Private Line Termination (APLT)—Provides the PBX user with access to all the services of an associated Enhanced Private Switched Communications Services (EPSCS) network. It also functions when associated with a Common Control Switching Arrangement (CCSA) network.

Agent sign-on/sign-off—Enables any ACD agent to take ACD calls from any ACD-assigned set.

AIOD—Automatic Identification of Outward Dialing.

Alarm display—Indicators on attendant console that show the status of the system. Usually two alarms are included: a minor alarm to signal a malfunction in a part of the system and a major alarm to indicate that system will not work at all.

- Alarm signals to stations**—Capability of the system to interface with various types of signaling systems and to transmit such alarms in the form of coded tones to all or preselected stations.
- A-law encoding**—Encoding according to CCITT Recommendation G711, used with European 30-channel PCM systems that comply with CCITT Recommendation G732. Uses nonuniform quantizing to obtain the desired compression characteristic.
- Albo**—Automatic Line Buildout. Used in T1 interface equipment, this is a method of automatic line equalization.
- All Number Calling (ANC)**—Calling by means of seven digits instead of previously used two letters plus five digits.
- All Trunks Busy (ATB)**—Condition in which all trunks in a group are engaged.
- Alphanumeric display for attendant console**—Feature in which the attendant's console provides a visual readout of the source of incoming calls. Allows the attendant to handle calls for several listed number groups easily, with the response depending on the number called.
- Alternate mark inversion**—Digital signaling method in which the signal carrying the binary value alternates between positive and negative polarities; zero and one values are represented by the signal amplitude at either polarity, while no-value "spaces" are at zero amplitude. Also called bipolar.
- Alternate Voice/Data (AVD)**—Method of providing voice grade service on a data circuit.
- Alternative routing**—Method of routing whereby a secondary communications path is used if the usual one is not available.
- ALU**—Arithmetic Logic Unit.
- AM**—amplitude modulation. See **Modulation, amplitude**.
- AMA**—Automatic Message Accounting. See also **Station Message Detail Recording**.
- American Standard Code for Information Interchange (ASCII)**—Eight-bit code yielding 128 characters, both displayed and nondisplayed (for device control); used for text transmission.
- AMIS**—See **Audio Message Interface Standard**.
- Amplitude**—Departure of the value of a wave or alternating current from its average value.
- Amplitude modulation**—Method of modifying a sine wave signal in order to make it "carry" information. The sine wave, or "carrier," has its amplitude modified in accordance with the information to be transmitted.
- Analog loopback**—Technique for testing transmission equipment and devices that isolates faults to the analog signal receiving or transmitting circuitry, where a device such as a modem echoes back a received (test) signal that is then compared with the original signal. Compare with **Digital loopback**.
- Analog signal**—Signal in the form of a continuously varying physical quantity such as voltage, which reflects variations in some quantity, such as loudness of the human voice.
- Analog transmission**—Transmission of a continuously variable signal as opposed to a discretely variable signal. Also called analog signaling.
- ANC**—All-Number Calling.
- Ancillary equipment**—Terminal or communications devices not required for the provision of basic telephone service. Answering machines, conferencing devices, and automatic dialers are types of ancillary equipment.
- ANI**—Automatic Number Identification.
- Announcement, recorded**—Prerecorded spoken message played for incoming calls.
- ANS**—Answer.

Answer signal—Supervisory signal (usually in the form of a closed loop) from the called telephone to the exchange and back to the calling telephone (usually in the form of a reverse battery) when the called number answers. Signal can also initiate call charging.

Answerback—Response of a terminal or other communications device to remotely transmitted control signals; typically part of the establishment of a connection between devices.

Antenna—Device used to transmit and/or receive radio waves. The physical design of the antenna determines the frequency range of transmission/reception.

API—application program interface.

APLT—Advanced Private Line Termination.

APPC—IBM's advanced program-to-program communications.

APPN—IBM's Advanced Peer-to-Peer Networking architecture, an extension of Systems Network Architecture (SNA) and Systems Application Architecture (SAA).

Application program—Software programs in a system are usually known as "application programs" and "supervisory programs." Application programs contain no input/output coding (except in the form of macroinstructions that transfer control to the supervisory programs) and are usually unique to one type of application.

Application processor—Hardware or software that can be added to a computer system to enhance the capabilities of that system. Examples of application processors are automatic call distribution systems, property management systems, and call accounting systems.

Area code—Three-digit code designating a geographical division within which directory numbers are subgrouped. See **Numbering Plan Area**.

Area code restriction—Capability of the switching equipment to selectively identify three-digit area

codes, and either allow or deny passage of long-distance calls to those specific area codes.

Arithmetic Logic Unit (ALU)—Part of a computer that performs the actual computations.

ARL—Attendant Release Loop.

ARO—After Receipt of Order.

ARPA—Advanced Research Projects Agency of the U.S. Department of Defense, which supports the ARPANET resource-sharing computer network.

ARQ—Automatic Repeat Request.

ARS—Automatic Route Selection.

ARU—audio response unit.

ASCII—American Standard Code for Information Interchange.

ASR—automatic send/receive.

Asynchronous transmission—Each information character, or sometimes each word or small block, is individually synchronized, usually by the use of start and stop elements.

ATB—All Trunks Busy.

ATND—Attendant.

Attendant—Usually refers to a local switchboard operator, for example, on a PBX. See also **Operator**.

Attendant conference—Feature that allows the attendant to establish a conference connection between central office trunks and internal stations.

Attendant console—Centralized operator position, either desktop or floor-mounted, that uses push-button keys for all control and call connecting functions.

Attendant Control of Trunk Group Access (ACTGA)—Attendant control and restriction of

access by all stations to various trunk groups. Restricted calls are usually routed to the attendant.

Attendant forced release—Attendant-activated facility that automatically disconnects all parties on a given circuit when that circuit is entered by the attendant and the facility engaged.

Attendant incoming call control—Automatically diverts incoming trunk calls to a predetermined station after a predesignated period of time (or number of rings).

Attendant locked loop operation—Allows the attendant at a console to retain supervision or recall capability of any particular call that was processed.

Attendant lockout—Denies an attendant the ability to reenter an established trunk/station connection unless recalled by the station.

Attendant loop transfer—Allows the attendant to transfer any call to another attendant for processing.

Attendant monitor—Special attendant circuit that allows listening in on all circuits with the console handset/headset transmitter deactivated.

Attendant override—Allows an attendant to enter a busy trunk connection and key the trunk number within the PBX. A warning tone will be heard by the connected parties, after which the connected parties and the attendant will be in a three-way connection.

Attendant recall—Calls held, camped-on, or completed by the attendant are returned to the console if unanswered within a preset period.

Attendant release loop—Incoming trunk and station calls extended by the attendant to idle stations can be released from the console switched loop when the attendant presses the release key. This feature is used for releasing incoming calls to called stations.

Attendant repertory dialing—Single pushbutton selection of repeatedly used preprogrammed

numbers for outgoing calls made by the attendant on central office trunks.

Attendant restriction—Attendant denied the ability to gain access to a trunk in order to originate a call (or to prevent “listening in”) unless assistance is required by station recall.

Attendant station busy lamp—When the desired station number is keyed by the attendant, a lamp lights, providing a positive, visual busy indication.

Attendant station number display—Unit on the attendant’s console that displays the station calling number on an attendant trunk.

Attendant supervisory console—Special attendant console used by the chief operator of large PBX systems. It provides, in addition to standard console operation, certain monitoring and control functions over other consoles.

Attendant transfer of incoming call—Allows the station user connected to an incoming outside call to signal the attendant by flashing the switchhook to request the attendant to transfer the call to another station.

Attendant transfer, outgoing—Allows the attendant to be recalled and to transfer an outgoing exchange call originated by an internal station.

Attendant trunk busy lamp field—Special panel to indicate the busy condition of each trunk circuit, one lamp being associated with each circuit.

Attendant trunk group busy lamps—Provides the attendant at a console with a visual display when all trunks in a given trunk group are busy.

Attended operation—Situation in which both data stations require attendants to establish the connection and transfer the data sets from talk (voice) mode to data mode.

Attenuation—Decrease in magnitude of the current, voltage, or power of a signal in transmission between points because of the transmission medium. Usually expressed in decibels.

Audible ringing tone—Tone received by the calling telephone indicating that the called telephone is being rung (formerly called ringback tone).

Audio frequencies—Frequencies that correspond to those that can be heard by the human ear (usually 30 Hz to 20,000 Hz).

Audio Message Interface Standard (AMIS)— a voice processing standard that specifies the procedures to network voice processing systems, regardless of who manufactures the system.

Audio response unit (ARU)—Device that provides prerecorded spoken responses to digital inquiries from a telephone caller once the connection is established. Requires use of a pushbutton telephone; callers are instructed to press a certain number to obtain a certain type of information.

Authorization code—Code allowing a station user to override the restriction level associated with that user's station line or incoming trunk.

Auto answer—Automatic answering; capability of a terminal, modem, computer, or similar device to respond to an incoming call on a dial-up telephone line, and to establish a data connection with a remote device without operator intervention. Allows unattended operation for incoming dial-up calls.

Automated attendant system—Processor-controlled system that performs most attendant functions, such as answering calls, extending them to station users, taking messages, and providing assistance. The system provides voice prompts, to which users reply via any standard 12-button dialpad.

Automatic Alternative Routing (AAR)—Automatic switching of a call to other routes when first choice routes are unavailable.

Automatic Callback Calling (ACC)—Feature that allows the station user, when encountering an internal station busy signal, to dial a one- or two-digit code and hang up. When both parties are free, the system automatically rings and connects the parties. While activated, this feature

does not prevent the calling station from either initiating or receiving calls.

Automatic call distributor (ACD)—System designed to distribute a large volume of incoming calls uniformly to a number of operators or agents, e.g., for airline reservations.

Automatic calling unit (ACU)—Device that allows a business machine to dial calls automatically.

Automatic Circuit Assurance (ACA)—Assists the customer in identifying possible trunk malfunctions. The PBX maintains a record of the performance of individual trunks relative to short hold time (SHT) and long hold time (LHT) calls. A significant increase in the number of short calls or a single long call can indicate a trunk failure. When a possible failure is detected, a referral call is initiated to the attendant.

Automatic dialer—Device that allows the user to dial preprogrammed numbers by pushing a single button. Also called an auto dialer.

Automatic dialing—Feature button on specialized key sets that can be assigned to dial a user-designated telephone number when pressed.

Automatic dialing unit (ADU)—Device capable of automatically generating dialing digits.

Automatic error correction—Transmission system feature whereby a proportion of errors in the received signal are detected and automatically corrected.

Automatic exclusion—First station accessing a line automatically prevents any other station from gaining access to that line.

Automatic hold—Allows the attendant to go from one trunk call to another without using a "hold" button.

Automatic Identification of Outward Dialing (AIOD)—Hardware system or PBX feature that automatically obtains the identity of a calling station over a separate data link for the purpose of automatic message accounting.

Automatic interflow—Incoming ACD call reroutes from the primary gate to which it is assigned to a PBX hunt group or an alternative ACD system when the queue time exceeds a particular time interval.

Automatic intraflow—Automatic rerouting of an incoming ACD call from the primary gate to which it is assigned to an alternative split within the same ACD.

Automatic line hold—As long as a station does not go on-hook, activation of various line pushbuttons automatically places the first line in a hold condition without the use of a special “hold” button.

Automatic Message Accounting (AMA)—Automatic recording system that documents all the necessary billing data of subscriber-dialed, long-distance calls.

Automatic Number Identification (ANI)—Feature that automatically identifies a calling station; for use in message accounting.

Automatic recall—1) Automatic alert of the attendant, after a prescribed period of time, to a camped-on or unanswered call so the attendant can provide a status report to the calling outside party. 2) Capability of a terminal to automatically attempt to call back a busy terminal in order to establish a call when the called terminal is free.

Automatic redial—Allows any station or trunk circuit to retry a connection to a busy station automatically, or, after a given number of attempts to that busy station, to be rerouted to an intercept or alternate station if the originally desired station does not become free within a prescribed period of time.

Automatic Repeat Request (ARQ)—System employing an error-detecting code such that any false signal initiates a repetition of the transmission of the characters incorrectly received.

Automatic Route Selection (ARS)—Provides automatic routing of outgoing calls over alternative

customer facilities based on the dialed long-distance number. The station user dials either a network access code or a special ARS access code followed by the number. The PBX routes the call over the first available special trunk facility, checking in a customer-specified order. Alternative routes can also include tie trunks to a distant PBX. When such routing is used, the restriction level associated with the call can be transmitted to the distant PBX as a traveling class mark. Incoming tie trunks from other locations (e.g., main or satellite) can be arranged to have automatic access to ARS. This allows station users at these systems to dial a single access code to use the ARS feature at a distant PBX.

Automatic send/receive (ASR)—Teletypewriter unit including a paper tape device. May be used off-line as well as on-line.

Automatic station restriction—Prevents unauthorized (and unaccountable) phone calls from vacant hotel rooms by automatically activating Controlled Outward Restriction when the guest is checked out from the room, and deactivating the restriction when a guest is checked in.

Automatic time-out on uncompleted call—Switching equipment will automatically connect a station to an intercept position if the station stays off-hook without dialing for a predetermined time interval, or stays connected to a busy signal longer than the predetermined time interval.

auto topology—a feature of network management systems that automates the creation of a graphical network configuration map.

AUTOVON—Automatic voice network (U.S. military).

AVD—Alternate Voice/Data.

AVD circuits—Alternate Voice/Data circuits that have been conditioned to handle both voice and data traffic.

B

Babyphone—Feature allowing calls to an off-hook telephone to listen to room noises, for example, to check if a baby is crying.

Backbone network—Transmission facility, or arrangement of such facilities, designed to interconnect lower speed distribution channels or clusters of dispersed users or devices.

Background music—Optional facility provided through the switching equipment, and associated with special stations with paging speakers.

Balanced-to-ground—With a two-wire circuit, the impedance-to-ground on one wire equals the impedance-to-ground on the other wire. Compare with **Unbalanced-to-ground**, a preferable condition for data transmission.

Band—1) Range of frequencies between two defined limits. 2) In relation to WATS service, the specific geographical area that the customer is entitled to call.

Bandpass filter—Circuit designed to allow a single band of frequencies to pass, neither of the cutoff frequencies being zero or infinity.

Bandwidth—The range of frequencies, expressed in hertz (Hz), that can pass over a given transmission channel. The bandwidth determines the rate at which information can be transmitted through the circuit—the greater the bandwidth, the more information that can be sent in a given amount of time.

Baseband—Describing the band of frequencies occupied by a signal below the point that the signal is modulated as an analog carrier frequency. In modulation, the frequency band occupied by the aggregate of the transmitted signals when first used to modulate the carrier (IBM).

Baseband or basic signal—Original signal from which a transmission waveform can be produced by modulation. In telephony it is the speech waveform.

Baseband signaling—Transmission of a digital or analog signal at its original frequencies; i.e., a signal in its original form, not changed by modulation. It can be an analog or digital signal.

Base station—Within a mobile radio system, a fixed radio station providing communication with mobile stations and, where applicable, with other base stations and the public telephone network.

Basic—Beginner's All-purpose Symbolic Instruction Code. A simplified language used in programming computers.

Basic rate interface—In ISDN, the interface to the basic rate CCITT 2B + D, 2 channels + 1 signaling channel. See **Integrated services digital network**.

Battery reserve power—Provides an alternative, independent source of power to maintain PBX service during a power failure or "brownout" at the customer location. The power supply consists of storage batteries and permanently connected battery chargers operating from a commercial AC power source.

Baud—Unit of signaling speed. The speed in baud is the number of discrete conditions or signal elements per second.

Baudot code—Five-bit, 32-character alphanumeric code used in transmission of information by telex.

BCD—binary-coded decimal, a six-bit alphanumeric code.

Beam width—Angular width of an antenna radiation pattern, or beam, within which the radiation exceeds some proportion of the maximum.

Bell Operating Company (BOC)—Any of the divested operating telephone companies in the United States, such as Bell of Pennsylvania, New Jersey Bell, and Southern Bell.

Bellcore—Bell Communications Research; organization established by the AT&T divestiture, representing and funded by the RBHCs, for the

purpose of establishing telephone-network standards and interfaces; includes much of former Bell Labs.

BER—Bit Error Rate.

BERT—Bit Error Rate Test or Tester.

BH—Busy Hour.

Binary code—Representation of quantities expressed in the base-2 number system.

Bipolar—1) Type of integrated circuit (IC or semiconductor) that uses both positively and negatively charged currents, characterized by high operational speed and cost. 2) See **Alternate mark inversion**.

Bisync—Binary synchronous communications (BSC). Character-oriented data communications protocol developed by IBM; oriented towards half-duplex link operation. It is still widely employed, though replaced in current IBM data communications products by the bit-oriented Synchronous Data Link Control (SDLC).

Bit—Contraction of “binary digit,” the smallest unit of information in a binary system. A bit represents the choice between a mark or space (one or zero) condition.

Bit Error Rate (BER)—Proportion of received bits that are in error, relative to a specific number of bits received. Usually expressed as a number referred to a power of 10; e.g., 1 in 10^5 .

Bit Error Rate Test (BERT)—Procedure to identify proportion of transmitted data that is erroneous.

Bit rate—Speed at which bits are transmitted, usually expressed in bits per second.

Bits per second—Basic unit of measurement for serial data transmission capacity; abbreviated as K bps, or kilobit/s, for thousands of bits per second; M bps, or megabit/s, for millions of bits per second; G bps, or gigabit/s for billions of bits per second; T bps, or terabit/s, for trillions of bits per second.

BLF—Busy Lamp Field.

Blocking—Inability to interconnect two lines in a network because all possible paths between them are already in use.

Blue Alarm—An alarm condition that occurs when two consecutive frames have fewer than three zeros.

BOC—Bell Operating Company.

bps—bits per second.

Bridge—A relatively simple device that passes data from one LAN segment to another without examining or altering the data. The bridged LAN segments must use the same protocol. Well suited for centralized networks with a few high-bandwidth links.

Bridged ringing—System in which ringers on a line are connected across that line.

Bridge lifter—Device that removes, either electrically or physically, bridged telephone pairs. Relays, saturable inductors, and semiconductors are used as bridge lifters.

Broadband—1) Transmission equipment and media that can support a wide range of electromagnetic frequencies. 2) Any voice communications channel having a bandwidth greater than a voice grade telecommunications channel; sometimes used synonymously with wideband. 3) Typically the technology of CATV (q.v.) transmission, as applied to data communications; employs coaxial cable as the transmission medium and radio frequency carrier signals in the 50MHz to 500MHz range.

Broadcast—1) Delivery of a transmission to two or more stations at the same time such as over a bus-type local network or by satellite. 2) Protocol mechanism whereby group and universal addressing is supported.

Broadcasting service—Radio communications service of transmission to be received directly by the general public. It can consist of sound, video, facsimile, or other one-way transmission.

Router—A bridge with minimal routing capabilities (see **Bridge, Router**). In general, a router can deliver least-cost routing; some can also deliver minimal load balancing.

Brownout operation—In response to heavy demand, main system voltages are sometimes lowered leading to brownouts, where power is not lost but reduced. Although conventional PBX equipment is relatively immune to brownouts, the computer controlling the system is very sensitive to voltage variations and could fail under these conditions. Most PBXs today have the capability to cope with these reductions, or a heavy-duty power supply can be furnished as an option. An uninterruptible power supply (UPS) can be installed to ensure continued service during prolonged outages.

BSC—See **Bisync**.

BT—Busy tone.

Buffer—Storage device used to compensate for a difference in rate of data flow, or time of occurrence of events, when transmitting data from one device to another.

Bus—1) Physical transmission path or channel. Typically an electrical connection, with one or more conductors, wherein all attached devices receive all transmissions at the same time.
2) Local network topology, such as used in Ethernet and the token bus, where all network nodes listen to all transmissions, selecting certain ones based on address identification. Involves some type of contention-control mechanism for accessing the bus transmission medium.

Busy (BY)—Describes a line or trunk that is in use.

Busy Hour (BH)—Continuous one-hour period that has the maximum average traffic intensity.

Busy lamp—Visual indicator on a piece of telephone equipment that indicates the associated line is in use.

Busy Lamp Field (BLF)—Panel providing the attendant with visual indications of either busy or

idle conditions for a particular group of 100 station lines selected by the attendant.

Busy override or intrude—See **Busy verification of station lines; Executive busy override**.

Busy signal—1) Audible and/or flashing signal that indicates that the called number is unavailable. Also called engaged tone. 2) Signal that indicates all voice paths are temporarily unavailable.

Busy tone (BT)—See **Busy signal**.

Busy verification of station lines—Attendant confirmation that a line is actually in use by establishing a connection to an apparently busy line. Prior to the attendant's connection, the PBX sends a burst of tone to the line to alert the talking parties.

Butn.—Button.

BY—Busy.

Byte—Small group of bits of data that is handled as a unit. In most cases it is either an 8-bit or 16-bit byte.

C

Cable—Assembly of one or more conductors within a protective sheath; constructed to allow the use of conductors separately or in groups.

CACS—Customer Administration Center System.

CALC—Customer Access Line Charges (Centrex).

Call—Any demand to set up a connection. Also used as a unit of telephone traffic.

Call accounting system—Device that tracks outgoing calls and records data for reporting. See **Station Message Detail Recording (SMDR)**.

Call Detail Recording (CDR)—See **Station Message Detail Recording**.

Call diversion—Automatic switching of a call from the number to which it was directed to another predetermined number.

Call duration—Interval of time between the establishment of the connection between the calling and called stations, and the termination of the call.

Called party—The subscriber requested by the calling subscriber. Also known as called subscriber.

Call Forwarding (CF)—Service or feature that allows a call to be forwarded to a number other than the one dialed.

Call Forwarding, All Calls (CAFC)—User instruction to the system to forward calls directed to his or her station to another number. The feature is usually activated by dialing an access code followed by the number to which calls are to be forwarded. In certain systems, calls can only be directed to other stations within that system, though some PBXs allow calls to be forwarded to points outside the system.

Call forwarding, busy line—Automatic rerouting of incoming calls directly to the attendant or predetermined secondary station when the called station is busy.

Call forwarding, don't answer—Automatic rerouting to a secondary station or attendant when a given station does not answer within a prescribed time interval. (The exact interval depends on the type of switching system, but is generally after three rings.)

Call hold—Allows a station user to hold any call in progress on that station line by flashing the switchhook, dialing a second digit such as "1", or depressing a special station pushbutton, that will automatically provide a second dial tone for the purpose of originating another call.

Call Holding Time (CHT)—Total length of time that a circuit is held busy.

Call information logging—Automatic recording of chargeable calls made on a PBX system, with

details of extension number, exchange line number, time, call duration, and digits dialed. This can be used for call accounting or billing.

Calling number display to attendant—Provides the attendant with the number of the inside station that has been connected either by dialing "0" or through interception. Some systems also display the station's class of service.

Calling number display to station—Provides a called station with a display of the number of the calling station within the PBX. This feature generally requires additional equipment for implementation.

Calling party—The subscriber who originates a call. Also known as calling subscriber.

Calling relay—Relay that is controlled via a subscriber's line or trunk line. Also called a line relay.

Call pickup—Ability of a station user to answer any call directed to another station within a given pickup group by dialing a pickup code from either an idle or a busy state. If more than one call is waiting to be picked up in a group, the call to be answered is selected randomly. The user of an electronic telephone can activate Call Pickup by depressing the assigned button when a station line within the same pickup group is ringing. When a line in the pickup group is ringing, the Call Pickup status lamp will flash. If activated while busy, the present call will automatically be placed on Call Hold.

Call processing—Sequence of operations performed by a switching system from the acceptance of an incoming call through the final disposition of the call.

Call progress tones—Audible signals returned to the station user by the switching equipment to indicate the status of a call; dial tones and busy signals are common examples.

Call record—All recorded data pertaining to a single call.

Call restriction—PBX feature that prevents selected extension stations from dialing external calls or reaching the operator except through the PBX attendant.

Call splitting—Feature that allows an attendant to speak privately to either party in a connection without the other party hearing.

Call transfer—Feature that allows the calling or called customer to instruct the switching equipment or operator to transfer a call or calls to another station.

Call Waiting (CW)—Indication by a lamp on the attendant's position that incoming calls are in a queue. A steady lamp indicates that less than a specified number of calls (usually five) are waiting, and a flashing lamp indicates that more than five calls are waiting.

Call waiting service—Call directed to a busy station is held while a special tone is directed to the busy station user. The station user can then answer this waiting call by hanging up and then being signaled by the waiting call. Alternatively, the user can depress the switchhook and put the first call on hold by dialing the hold code, and then answer the waiting call.

CAMA—Centralized Automatic Message Accounting.

Camp-on—Feature whereby subscriber calling a busy number is placed in a waiting condition; both phones ring automatically when the called party hangs up.

CAP—Customer Administration Panel.

Carrier (CXR)—1) Continuous frequency capable of being modulated, or impressed, with a second (information carrying) signal. 2) Communications company or authority providing circuits to carry traffic (also known as common carrier).

Carrier Alarm—An alarm condition that occurs when excessive zeros or all zeros are transmitted.

Carrier frequency—Frequency of the carrier wave that is modulated to transmit signals.

Carrier Loss—An alarm condition that occurs when 32 consecutive zeros are transmitted.

Carrier signaling—Any of the signaling techniques used in multichannel carrier transmission. The most commonly used techniques are in-band signaling, out-of-band signaling, and separate channel signaling.

Carrier system—Means of obtaining a number of channels over a single path by modulating each channel on a different carrier frequency and demodulating at the receiving point to restore the signals to their original frequency.

Carterfone decision—Landmark 1968 FCC decision that first permitted the electrical connection of customer-owned terminal equipment to the telephone network.

CAS—Centralized Attendant Service.

cascading faults—network faults (outages) that generate other faults.

CATV—Community Antenna Television.

C-band—Portion of the electromagnetic spectrum, approximately 4GHz to 6GHz, used primarily for satellite and microwave transmission.

CBX—1) computerized branch exchange. 2) centralized branch exchange. See **Private branch exchange**.

CCIR—Comité Consultatif International de Radiocommunication. Technical committee set up under the International Telecommunications Union (ITU) with responsibility for radio communications.

CCIS—Common Channel Interoffice Signaling.

CCITT—Comité Consultatif International de Téléphonie et de Télégraphie. An advisory committee to the International Telecommunications Union (ITU) whose recommendations covering

telephony and telegraphy have international influence among telecommunications engineers, manufacturers, and administrators.

C conditioning—Type of line conditioning that controls attenuation, distortion, and delay distortion so they lie within specific limits.

CCS (Hundred Call Seconds)—Unit of telephone traffic load calculated by multiplying the number of calls per hour by the average call duration in seconds and dividing the result by 100 (e.g., 10 CCS = 1,000 seconds).

CCSA—Common Control Switching Arrangement.

CCSA access—Provision of inward and outward service between the PBX and the CCSA (Common Control Switching Arrangement) network.

CCTV—Closed Circuit Television.

CDMA—Code Division Multiple Access. A spread-spectrum approach to digital transmission, where each conversation is digitized and then tagged with a code. In a cellular application, a mobile phone would be instructed to decipher only a particular code to select the right conversation off the air.

CDR—Call Detail Recording. See **Station Message Detail Recording**.

CCSS7—See Common Channel Signaling System Number 7.

cell-relay—not available until the mid-1990s, cell-relay will be used in circuit switched services. Its packet framing technique consists of 48-byte fixed packet lengths and 5-byte headers.

Cell Site—The fixed end of a cellular link.

Cell Splitting—The division of one cell into two or more new cells, providing additional capacity within the original cell's region of coverage.

Cellular Carrier—A cellular service provider operating a cellular system in either a metropolitan

service area or rural service area. The FCC allows two companies to operate in one calling area.

Cellular radio—Technology employing low-power radio transmission as an alternative to local loops for accessing the switched telephone network. Differs from standard mobile telephony in that service is provided through a large number of areas or cells which are served by a low-power transmitter in each cell, rather than through a single high-power transmitter for the entire region. Because any given frequency can be reused in each cell, the number of subscribers who can be served is multiplied dramatically. Users can be stationary or mobile, in which case they are passed under control of a central site from one cell's transmitter to an adjoining one with minimal switchover delay.

central equipment—The term used to refer to the components of a PBX system stored in the switching room or PBX cabinet. Central equipment consists of a cabinet(s) and the following: common control; switching matrix; and line, trunk, and peripheral cards. Station sets and wiring are not part of the central equipment of a PBX.

Centralized Attendant Service (CAS)—A PBX feature that allows a group of attendants at one location to answer and service calls for a number of locations. This arrangement works on a *switched release loop* principle, where the call, arriving on a trunk at location A, is extended through a tie line to the attendant at location B. The attendant answers the call and, using a tie line acting as a data link between the console and the PBX at location B, instructs the switch at that location to complete the call. When the attendant releases the call, the tie line between A and B is freed to handle another call.

Centralized Automatic Message Accounting (CAMA)—Automatic message accounting system that is located at an exchange, but that serves various adjacent exchanges. Calls not processed by Automatic Number Identification (ANI) must be routed through an operator who dials the calling number into the equipment.

Central Office (CO)—See **Exchange**.

Central processing unit (CPU)—Computer circuitry controlling the interpretation and execution of instructions.

Centrex—Service that allows every subscriber to be directly dialed from the outside. Centrex switching equipment is located in the central office (exchange) and allows subscribers to access facilities normally provided by a separate PBX.

Centrex Customer Station Rearrangement (CCSR)—Feature that allows Centrex users to make their own moves and changes. This feature requires the use of CPE.

CF—Call Forwarding.

CFAC—Call Forwarding, All Calls.

Chad—Material removed when forming a hole or notch in a storage medium such as punched tape or punched cards.

Chadless tape—Perforated tape with the chad partially attached like a hinged flap to facilitate interpretive printing on the tape.

Channel—Path for transmission of signals between two or more points. Also called circuit, line, link, path, or facility.

Channel service unit (CSU)—Component of customer premises equipment used to terminate a digital circuit such as a T1 facility.

Channel, voice grade—Channel suitable for transmission of speech, analog data, or facsimile, generally with a frequency range of about 300 Hz to 3000 Hz.

Character—Letter, figure, number, punctuation, or other sign contained in a message.

Check-in/check-out—Feature allowing the hotel console operator to activate or deactivate all hotel service related to a guest room. When

check-in service is activated, the guest room station is enabled for unrestricted use and all room status information is cleared. When check-out service is activated, the guest room telephone is restricted from originating outgoing calls (room cutoff) and the printer (option) will automatically print out room status and message registration information.

Chip—Substrate upon which LSI circuits are fabricated. Sometimes used to refer to the circuits themselves.

CHT—Call Holding Time.

CIM—Computer-integrated manufacturing.

Circuit—1) Means of two-way communication between two or more points. 2) A group of electrical/electronic components connected together to perform a specific function.

Circuit, four-wire—Communications path in which four wires (two for each direction of transmission) are connected to the station equipment.

Circuit switching—Temporary direct connection of one or more channels between two or more points in order to provide the user with exclusive use of an open channel with which to exchange information. A discrete circuit path is set up between the incoming and outgoing lines, in contrast to message switching and packet switching, in which no such physical path is established. Also called line switching.

Circuit, two-wire—Circuit formed by two conductors insulated from each other that can be used as a one-way transmission path, a half-duplex path, or a duplex path.

Ckt.—Circuit.

Class of exchange—Ranking assigned to switching point in the telephone network determined by its switching functions, interrelationships with other exchanges, and transmission requirements. Also called class of office.

Function	U.S.	U.K.	International
Exchange connected to subscribers	Class 5 or End	Local exchange	Local exchange office
First level of trunk switching	Class 4 office or Toll center	Group switching center	Primary center
Second level of trunk switching	Class 3 office or Primary center	District switching center	Secondary center
Third level of trunk switching	Class 2 office or Sectional center	Main switching center	Tertiary center
Fourth level of trunk switching	Class 1 office or Regional center	(None)	Quaternary center

Class of service—Categorization of telephone users according to specific type of telephone use. Telephone service distinctions include, for example, restricted and extended area service. Also applies to PBX station user restrictions.

Class of service display to attendant—Shows the class of service for calls to the attendant console from inside extensions. The class of service shows which trunks or lines the extension is restricted from accessing.

Class of service intercept—Station is automatically routed to the attendant if it attempts to place a call that is not authorized by its class of service.

Clear Channel—A 64K bps channel in which all data bits are used for data transmission. No bits are taken for signaling or overhead, and bit patterns are not restricted.

Clear-forward/clear-back signal—Signal transmitted from one end of a subscriber line or trunk, in the forward/backward direction, to indicate at the other end that the established connection should be disconnected. Also called disconnect signal.

Client—System requesting service from another system.

Client/Server Model—In most cases, the “client” is a desktop computing device or program “served” by another networked computing device. Computers are integrated over the network

by an application, which provides a single system image. The server can be a minicomputer, workstation, or microcomputer with attached storage devices. A client can be served by multiple servers.

Clipping—Loss of initial or final parts of words or syllables due to operation of voice-actuated devices.

Clock—In logic or transmission, repetitive, precisely timed signal used to control a synchronous process.

Closed Circuit Television (CCTV)—Television transmission via direct link between two points, as opposed to broadcast transmission to many receiving locations.

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

CMOL—Common Management Information Protocol (CMIP) over Logical Link Control (LLC). A proprietary network management draft developed jointly by 3Com and IBM that specifies using Common Management Information Protocol (CMIP) over Logical Link Control (LLC) to provide network management of devices on mixed-media LANs. Also known as HLM.

CMOS—Complementary Metal-Oxide Semiconductor (logic circuit).

CMOT—Common Management Information Protocol (CMIP) over TCP/IP.

CO—Central Office.

COS—Corporation for Open Systems.

Coaxial cable—Cable consisting of an outer conductor surrounding an inner conductor, with a layer of insulating material in between. Such cable can carry a much higher bandwidth than a wire pair.

Cobol—Common Business Oriented Language. Language used in programming computers.

COCOT—Customer-Owned, Coin-Operated Telephone.

Codec—Coder-decoder device used to convert analog signals, such as speech, music, or television, to digital form for transmission over a digital medium, and back again to the original analog form. One is required at each end of the channel.

Code call access—Feature that allows attendants and station users to dial an access code and a two- or three-digit called party code to activate signaling devices throughout a customer's premises with a coded signal corresponding to the called code (either audible or visible). The called or "paged" party can then be connected to the calling party by dialing a "meet-me" answering code from any station within the PBX system.

Code character—Set of conventional elements established by the code to enable the transmission of a written character (letter, figure, punctuation sign, arithmetical sign, etc.) or the control of a particular function (spacing, shift, line-feed, carriage return, phase corrections, etc.).

Code restriction—Denies selected station lines completion of dialed outgoing exchange network calls to selected exchange and area codes, both local and distant.

Code ringing—Alerting of telephone subscribers on multiparty lines by combinations of short and long rings that are different for each subscriber.

Coin box—Telephone, usually public, requiring insertion of coins before it can be used.

Coin-value tones—Tones produced in multislotted coin telephones when different coins are deposited. The tones are detected and transmitted to the operator so that the correct amount can be checked. Also called coin-denomination tones.

Collect call—See **Reverse charge call**.

Common battery—DC power source in the exchange that supplies power to all subscriber stations and exchange office switching equipment.

Common-battery signaling—Method by which supervisory and telephone address information is

sent to an exchange by depressing and releasing the switch on the cradle of the handset.

Common bell—Capability of an individual station ringer to respond to all incoming calls on all lines terminated on that instrument.

Common carrier—An organization in the business of providing regulated telephone, telegraph, telex, and data communications services.

Common Channel Interoffice Signaling (CCIS)—Technique by which the signaling information for a group of trunks is transmitted between exchanges over a separate channel using time-division methods.

Common Channel Signaling System Number 7 (CCSS7)—A CCITT-specified signaling protocol used in high-speed digital networks to provide communication between intelligent network nodes.

Common control—Automatic switching arrangement in which the control equipment necessary for the establishment of connections is shared, being associated with a given call only during the period required to accomplish the control function.

Common Control Switching Arrangement (CCSA)—Switching facilities connected by the telephone company to corporate tie line networks. Switching of the leased lines in the organization's network is accomplished by common control exchange switching equipment. All stations in the network can then dial one another regardless of distance and without using exchange facilities. They can also dial outside the network via local and/or foreign exchange lines.

Common Management Information Protocol (CMIP)—OSI's network management protocol. CMIP is not yet widely available and is more expensive to implement than SNMP.

Communications satellite—Earth satellite designed to act as a telecommunications radio relay and usually positioned in geosynchronous orbit 35,800 kilometers above the equator so that it appears from earth to be stationary in space.

Community Antenna Television (CATV)—Where television reception is poor, signals can be received at a selected site by sensitive, directional antennas and then transmitted to subscribers via a cable network. Additional channels, not normally available in that area, can also be transmitted.

Compandor—Combination of a compressor at one point in a communications path for reducing the volume range of signals, followed by an expander at another point for restoring the original volume range; designed to improve the ratio of the signal to the interference entering in the path between the compressor and expander.

Compressor—Electronic device that compresses the volume range of a signal.

Computerized branch exchange (CBX)—See **Private branch exchange**.

Comsat—Communications Satellite Corp., a private U.S. company established by statute as the exclusive international satellite carrier and representing the U.S. in Intelsat.

Concentrator—Device that connects a number of circuits that are not all used at once to a smaller group of circuits for economical transmission. A telephone concentrator achieves the reduction with a circuit-switching mechanism.

Conditioning—Procedure to make transmission impairments of a circuit lie within certain specified limits and typically used on telephone lines leased for data transmission to improve the possible transmission speed. Two types are used: C conditioning and D conditioning.

Conductor—1) Any equipment, such as a wire or cable, that can carry an electric current. 2) One wire of a pair of wires.

Conduit—Pipe or tubing through which telephone cables are passed.

Conf.—Conference.

Conference call—Call established among three or more stations in such a manner that each of the stations is capable of carrying on a communication with the others.

Connect time—See **Holding time**.

Cons.—Consultation.

Console-less operation—Allows internal stations to answer all incoming calls and process them to the proper stations.

Consultation hold—Incoming call is automatically placed on hold and the station user is given a PBX system dial tone. The station user proceeds to establish connection with another station. The original station can return to the incoming call.

Consultation hold, all calls—Similar to the consultation hold facility, but not restricted to incoming calls.

Contact—Part of a switch designed to touch a similar contact to allow current to flow, and to break this union to cause a current to cease.

Contention—Method of line control in which the terminals request to transmit. If the channel in question is free, transmission proceeds; if it is not free, the terminal will have to wait until it becomes free. A queue of contention requests can be built up by a computer, and this queue can either be organized in a prearranged sequence or in the sequence in which requests are made.

Continuity check—In common-channel signaling, a test performed to check that a path exists for speech or data transmission.

Contl.—Control.

Control character—Character that initiates, modifies, or stops a control operation.

Controlled station-to-station restriction—Allows the attendant to inhibit station-to-station calling. When activated, attempted station calls are rerouted to attendant intercept.

Control mode—State that all terminals on a line must be in to allow line control actions or terminal selection to occur.

Control signals—Signals that pass between one part of a communications system and another to control the system.

Control, stored-program—Means of system control using stored logic (software).

Control, wired-program—Means of system control using wired logic (hardware).

COS—class of service.

COS—Corporation for Open Systems; organization started in 1986 to hasten the introduction of products and services that are interoperable from multivendors and based on international standards.

Country code—In direct distance dialing, a code characterizing a particular country. Codes corresponding to the world numbering plan start with a single digit that identifies a particular geographical area. This can be followed by one or two extra digits.

CPE—customer premises equipment.

CPI—Computer to PBX Interface. Gateway providing 24 digital PCM channels at an aggregate rate of 1.544M bps. Developed by Northern Telecom. See also **DMI**.

CPU—central processing unit.

Crossbar switch—Switch having multiple vertical and horizontal paths and an electromagnetically operated mechanical means for interconnecting any one of the vertical paths within any one of the horizontal paths.

Cross-modulation—Interference caused by two or more carriers in a transmission system interacting through nonlinearities in the system.

Crosspoint—1) Switching element in an exchange that can be mechanical or electronic. 2) Two-state semiconductor switching device having a

low transmission system impedance in one state and a very high one in the other.

Cross section—Signal transmission capacity of a transmission system, usually measured in terms of the number of two-way voice channels.

Crosstalk—Unwanted transfer of energy from one circuit to another circuit.

Crosstalk attenuation—Extent to which a communications system resists crosstalk.

CRT—cathode-ray tube. Commonly used to denote the screen on a TV monitor or terminal. See also **VDT**.

CSMA/CA—carrier sense multiple access with collision avoidance.

CSR—Customer Service Record.

CSU—channel service unit.

CT-2 Technology—A cordless telephone second-generation technology. A pocket-sized portable, push-button cordless telephone is used with this technology. The handset operates on a low-power level and is powered by rechargeable or disposable batteries that provide 20 or more hours of use. The second piece of equipment that is used is the base station. The base station is a low-powered radio transmitter. The base station is usually called by two names: a home base station or a telepoint. The home base station is located in the home or office. The telepoint is located in a public area such as near a shopping mall or on a highway. Calls made on CT-2 phones must be made within a certain distance (about 100 yards) of a base station. (See **PCN**, **PCS**).

Customer Access Line Charges (CALC)—Basic rates paid for lines from customer premises to central office.

Customer Administration Center System (CACS)—Allows the customer to administer station and electronic tandem switching features as well as obtain traffic measurements and recent circuit assurance data from one or more PBX switching

locations. The user operates the CACS system via an interactive terminal. The following features can optionally be provided: station rearrangement and change, facilities administration and control, traffic data to customer, and facilities assurance reports.

Customer Administration Panel (CAP)—Provides a panel that is a simplified alternative to the customer administration center system. With this panel, the customer has plug-in access to a PBX for the purpose of performing administration of station features and/or electronic tandem switching capabilities.

Customer premises equipment (CPE)—Terminal equipment that is connected to the telephone network.

Customer Service Record (CSR)—Detailed description of a subscriber's service and equipment charges.

Custom key set—Specialized multibutton telephones designed expressly for a particular PBX. Unlike the locking buttons on normal key telephones, the buttons on a custom key set are used to communicate with the system and are typically nonlocking buttons. Custom key set buttons can be arranged to activate specific features such as speed dialing and executive override as well as to select lines.

Cutover—Physical changing of lines from one system to another, usually at the time of a new system installation.

CVSD—Continuous Variable Slope Delta Modulation. Speech encoding and digitizing technique that uses one bit to describe the change in the slope of the curve between two samples, rather than the absolute change between the samples. Sampling is usually done at 32K bps.

CW—Call Waiting.

CXR—Carrier.

D

DA—Don't Answer. See **Call forwarding, don't answer**.

DAMA—Demand Assigned Multiple Access.

Data circuit—Communications facility that allows transmission of data in either direction, in either analog or digital form.

Data circuit-terminating equipment (DCE)—In a communications link, equipment that is either part of the network, an access point to the network, a network node, or equipment at which a network circuit terminates. In the case of an RS-232-C connection, the modem is usually regarded as DCE while the user device is DTE, or data terminal equipment; in a CCITT X.25 connection, the network access and packet-switching node is viewed as the DCE. See also **Data communications equipment**.

Data communications equipment—Equipment that performs the functions required to connect data terminal equipment (DTE) to the data circuit; a modem is a common example.

Data line interface (DLI)—Point at which a data line is connected to a telephone system.

Data line privacy—Critical system extension lines, used with such devices as facsimile machines and computer terminals, are very sensitive to extraneous noise. Data privacy prohibits activities that would insert tones on the station line while it is in use. Data lines can then be connected through the PBX without danger of losing data through interference.

Data link—Any serial data communications transmission path, generally between two adjacent nodes or devices, and without any intermediate switching nodes.

Data Service Unit (DSU)—Simplified modem for the transmission of digital data over a private line, or for limited distance communications over the PSTN where it is not necessary to comply with all the requirements for a high speed modem.

Data set—Infrequently used term for a modem.

Data terminal equipment (DTE)—Generally end-user devices, such as terminals and computers, that connect to DCE, which either generate or receive the data carried by the network. In RS-232-C connections, designation as either DTE or DCE determines signaling role in handshaking; in a CCITT X.25 interface, the device or equipment that manages the interface at the user premises. Compare with **DCE**.

Data transmission—Process of transmitting information as digital pulses; the movement of information in coded form as electrical energy. As more PBX systems accept datastreams as well as voice signals for switching and transmission, the flexibility of the switch increases, allowing a user with a central computer and remote terminals in the same building to provide dial-up service to connect the terminals with the computer without the use of modems.

Datel—Data transmission services offered by European PTTs, using switched public telephone networks.

dB—decibel.

dBK—Figure of merit (antenna system performance).

dBm—Decibels relative to one milliwatt.

dB_r—Relative level in decibels.

DCE—data circuit-terminating equipment.

D conditioning—Type of conditioning that controls harmonic distortion and signal-to-noise ratio so that they lie within specified limits.

DDC—Direct Department Calling.

DDD—direct distance dialing.

DDI—Direct Dialing In. See **Direct inward dialing**.

DDN—Defense Data Network.

Decibel (dB)—Unit for measuring relative strength of a signal parameter such as power or voltage. The number of decibels is 10 times the logarithm (base 10) of the ratio of the power of two signals, or ratio of the power of one signal to a reference level.

Dedicated—Used exclusively for a single purpose or by a single subscriber.

Dedicated attendant link—Ensures the availability of an intercom link for the attendant announcing incoming calls to the station within the system.

Dedicated circuit—Line used exclusively by one person at each end for communications.

Delay—In communications, the wait time between two events, such as from the moment when a signal is sent until it is received. See **Propagation delay**, **Response time**.

Delay announcements—Associated with Automatic Call Distribution capability, provides a recorded announcement to incoming calls that are delayed and placed in queue. The user can vary the time interval between the first and second delay announcements.

Delta modulation—Method of representing a speech waveform (or other analog signal) in which successive bits represent increments of the waveform. The increment size is not necessarily constant.

Deluxe queuing—Allows station users, tie trunks and attendants, or attendant-assisted calls to be placed in a queue whenever all routes for completing a particular call are busy. The queue can be a Ringback Queue (RBQ), in which case a user goes on-hook and is called back when a trunk becomes available, or an Off-Hook Queue (OHQ), in which case the user remains off-hook and is connected to a trunk when it becomes available. Four types of specialized queuing arrangements are available; these are combinations of RBQ and OHQ with one or two queues.

Demand Assigned Multiple Access (DAMA)—Allocation of communication satellite time to earth stations as the need arises.

Demarc—Demarcation point between carrier equipment and customer premises equipment (CPE); usually a terminal block.

Demodulation—Process of retrieving data from a modulated carrier wave; the reverse of modulation.

Derivation equipment—Equipment used to produce narrowband facilities from a wider band facility. Commonly used on AVD circuits to derive telegraph-grade lines from unused portions of a voice circuit.

Diagnostic programs—Software routines used to check equipment malfunctions and to pinpoint faulty components.

Dial—Device that transmits a coded signal to actuate the exchange switching equipment according to the digit dialed.

Dial call pickup—Station user can dial a special code and thereby answer incoming calls ringing on any other station within his/her own pre-defined pickup group.

Dial pulse (DP)—Current interruption in the DC loop of a calling telephone produced by the breaking and making of the dial pulse contacts of a calling telephone when a digit is dialed.

Dial selection of stations—Indicates that the system accepts dialing of the number of the desired intercom station.

Dial speed—The number of pulses that a rotary dial can transfer in a given amount of time, typically 10 pulses per second.

Dial tone (DT)—Signal sent to an operator or subscriber indicating that the switch is ready to receive dial pulses.

Dial-up—Describing the process, equipment, or facilities involved in establishing a temporary connection via the switched telephone network.

Dial “0” trunks to attendant—Special single-digit dialing service by any station to the attendant console or cord switchboard.

Dictation access and control—Allows station users to have dial access to centralized dictation equipment and to maintain telephone dial control of all normal dictation system features.

DID—direct inward dialing.

Digital—Referring to communications procedures, techniques, and equipment whereby information is encoded as either binary “1” or “0”; the representation of information in discrete binary form, discontinuous in time, as opposed to the analog representation of information in variable, but continuous, waveforms.

Digital loopback—Technique for testing the digital processing circuitry of a communications device. It can be initiated locally, or remotely via a telecommunications circuit; the device being tested will echo back a received test message, after first decoding and then reencoding it, the results of which are compared with the original message. Compare with **Analog loopback**.

Digital network—Network incorporating both digital switching and digital transmission.

Digital signal—Discrete or discontinuous signal; one whose various states are discrete intervals apart.

Digital Speech Interpolation (DSI)—When speech is digitized, it can be cut into slices such that no bits are transmitted when a person is silent. As soon as speech begins, bits flow again.

Digital switching—Process of establishing and maintaining a connection, under stored program control, in which binary-encoded information is routed between an input and an output port. Generally, a “virtual” through circuit is derived from a series of time slots (time-division multiplexing). This method is more efficient than requiring dedicated circuits for the period of time that connections are set up.

DIP—dual in-line package. Method of packaging electronic components for mounting on printed circuit boards.

Direct attendant signaling lines—Station user (momentarily) activates the pushbutton to signal the attendant, and when time permits, the attendant rings the station and verbally seeks instructions.

Direct call pickup—Station user is able to answer calls ringing on any other station within the PBX system by dialing the unique answer code of that station to be answered. If the call has already been answered, the station user who dials the answer code can be added on (in conference) to the connection.

Direct Department Calling (DDC)—Incoming calls on a specific trunk or group of trunks are routed to specific stations or groups of stations.

Direct distance dialing (DDD)—Telephone exchange service that enables the telephone user to call long distances without operator assistance.

Direct-in lines—Allow direct termination of separate exchange lines to station instruments, bypassing the attendant console.

Direct inward dialing (DID)—Incoming calls from the exchange network can be completed to specific station lines without attendant assistance. Also called direct dialing in (DDI).

Direct Inward System Access (DISA)—Feature that allows an outside caller the ability to dial directly into a PBX system, without attendant intervention, and gain complete access to PBX system facilities and outgoing trunk circuits and tie line circuits.

Directory number—The full complement of digits (or letters and figures) associated with the name of a subscriber in the directory.

Direct outward dialing (DOD)—Allows a PBX, Centrex, or hybrid system user to gain access to the exchange network without the assistance of the attendant.

Direct Station Selection (DSS)—Ability to call any station within a PBX by means of a single push-button associated with that station number. A DSS panel is usually part of an attendant console.

Direct trunk group selection—Allows the attendant to access an outgoing trunk from a particular group by pushing a single button associated with the group rather than dialing an access code.

DISA—Direct Inward System Access.

Disconnect signal—See **Clear-forward signal**.

Discriminating ringing—Different types of station ringing are provided to give audible indication of internal or external incoming calls and other special calls.

Distinctive dial tones—Internal calls, external calls, and internal calls originated with a caller on hold are provided with different dial tones.

Distinctive ringing tones—Different ringing tones provided for an extension user to indicate whether the call is internal or external.

Distortion—Unwanted change in waveform that occurs between points in a transmission system.

Distributing frame—Structure for terminating permanent wires of telephone exchanges, private branch exchanges, or private exchanges and for facilitating the change of connections between them by means of cross-connecting wires.

Distribution frame—Structure (typically wall-mounted) for terminating telephone wiring, usually the permanent wires from, or at, the telephone exchange, where cross-connections are readily made to extensions. Also called distribution block.

Diversity—Provision of more than one communications channel to improve the reliability of a service.

Divestiture—Breakup of AT&T in 1984 that included the separation of 22 AT&T-owned local

Bell Operating Companies (BOCs) into seven independent Regional Bell Holding Companies (RBHCs).

DME—Distributed Management Environment; a mix of network management specifications endorsed by the Open Software Foundation (OSF).

DMI—Digital Multiplexed Interface. Gateway providing 23 digital PCM channels + 1 signaling channel at an aggregate rate of 1.544M bps. Developed by AT&T. See also **CPI**.

DOD—Direct outward dialing.

Do not disturb—User can instruct the system to cancel all ringing at the station.

Don't answer recall—For either internal or outside calls, a station user who experiences a "don't answer" condition at the called station can have the call automatically retried at a later time by the use of a preassigned single- or double-digit code.

Double camp-on indication—Station attempting to camp on to another station that is already being camped on receives a distinctive audible signal and can be denied the capability to camp on.

Downtime—Total time a system is out of service due to equipment failure.

DP—1) Dial pulse (signaling). 2) Distribution point.

DPC—Data Processing Center.

Drop—Connection made available for a terminal unit on a transmission line.

Drop, subscriber's—Line from a telephone cable to a subscriber's building.

DS1—Digital Signal 1, a digital transmission format in which 24 voice channels are multiplexed into one 1.544M bps (U.S.) or 2.108M bps (Europe) T1 digital channel.

DSI—Digital Speech Interpolation.

DSS—Direct Station Selection.

DSU—Data Service Unit.

DT—dial tone.

DTE—data terminal equipment.

DTMF—Dual Tone Multifrequency Signaling.

Dual Tone Multifrequency (DTMF) signaling—Basis for operation of pushbutton telephone sets. A method of signaling in which a matrix combination of two frequencies, each from a group of four, are used to transmit numerical address information. The two groups of four frequencies are 697 Hz, 770 Hz, 852 Hz, and 941 Hz, and 1209 Hz, 1336 Hz, 1477 Hz, and 1633 Hz.

Duplex circuit—Circuit used for transmission in both directions at the same time. It can be called "full duplex" to distinguish it from "half duplex."

Duplex Signaling (DX)—Signaling system that occupies the same cable pair as the voice path, yet does not require filters.

Duplex transmission—Simultaneous, two-way, independent transmission. Also called full-duplex transmission.

DX—Duplex (signaling).

E

E—Erlang.

E & M signaling—Signaling arrangement that uses separate paths for signaling and voice signals. The M lead (derived from "mouth") transmits ground or battery to the distant end of the circuit, while incoming signals are received as either a grounded or open condition on the E (derived from "ear") lead.

EAROM—electrically alterable read-only memory.

Earth station—Ground-based equipment used to communicate via satellites. Also called ground station.

EAS—extended area service.

EAX—electronic automatic exchange.

EBCDIC—extended binary-coded decimal interchange code: an 8-bit alphanumeric code.

Echo—Wave that has been reflected or otherwise returned with sufficient magnitude and delay for it to be perceived as a wave distinct from that directly transmitted.

Echo cancellation—Technique being used in new higher speed modems that allows for the isolation and filtering of unwanted signal energy resulting from echoes from the main transmitted signal.

Echo check—Method of checking data transmission accuracy whereby the received data are returned to the sending end for comparison with the original data.

Echo Return Loss (ERL)—Attenuation of echo currents in one direction caused by telephone circuits operating in the other direction.

Echo suppressor—Used to attenuate echoes on long-distance telephone connections. The unit, inserted at four-wire points, is voice actuated, and functions by increasing loss into the transmission path opposite in direction to the one being used.

ECL—Emitter-Coupled Logic. Type of ALU technology.

ECS—European fixed-service satellite system.

EEPROM—electronically erasable and programmable read-only memory.

EIA interface—A standardized set of signal characteristics (time duration, voltage, and current) specified by the Electronic Industries Association.

EISA—Extended Industry Standard Architecture.

EKTS—Electronic Key Telephone System.

Electromagnetic Interference (EMI)—Radiation leakage outside a transmission medium that results mainly from the use of high-frequency wave energy and signal modulation. EMI can be reduced by appropriate shielding.

Electromechanical ringing—Bell or buzzer provided in the station instrument to give audible incoming call indication.

Electronic automatic exchange (EAX)—Term used by the General Telephone Co. for electronic exchange equipment.

Electronic Switching System (ESS)—System using computer-like operations to switch the telephone calls.

Electronic tandem networking—Operation of two or more switching systems in parallel.

Emergency access—Emergency alarm system integrated into the PBX switching system that can be implemented by uniquely ringing all station instruments to indicate an emergency condition.

Emergency dialing—Allows all system users the ability to use preassigned two- or three-digit numbers that translate to the outside exchange numbers for local police, local fire, ambulance service, etc.

EMI—Electromagnetic Interference.

EN—Equipment Number.

End Office—Class 5 Central Office, at which subscriber loops terminate.

Energy communications—Provides the capability for the PBX to communicate with energy-consuming devices throughout a hotel or business complex. Audio signals are sent over the telephone wiring to power unit consumption devices in the building. This feature is designed

to use existing telephone wiring wherever possible. A separate interface unit is required for each power unit. Specific operating modes include

- Guest room cycling function,
- Vacant room energy function,
- Individual load cycling function,
- Peak demand shedding function, and
- Energy consumption and demand monitoring.

Engaged tone—See **Busy tone**.

Enhanced Private Switched Communications Service (EPSCS)—AT&T Communications service providing a private interLATA electronic tandem tie-line network linking several of a customer's locations together.

EOM—end-of-message (indicator).

EOT—1) end-of-transmission. 2) end-of-tape.

EPABX—electronic private automatic branch exchange. See **Exchange, private automatic branch**.

EPROM—erasable and programmable read-only memory.

EPSCS—Enhanced Private Switched Communications Service.

Equal access—Department of Justice ruling (effective 9/84) that requires all RBHCs with ESS systems using SPC technology, and serving a market of at least 10,000 access lines, to offer the same quality of connection at the same rates to all common carriers. Under this arrangement, subscribers choose a primary long-distance carrier that they access by dialing "1" + area code + telephone number. Other long-distance carriers are reached by dialing "10" plus a three-digit access code unique to each carrier, then dialing "1" + area code + telephone number.

Equalization—Compensation for the attenuation (signal loss) variation with frequency (attenuation equalization) and propagation time variations with frequency (delay equalization).

ERL—Echo Return Loss.

Erlang (E)—Unit of traffic intensity. One Erlang is the intensity at which one traffic path would be continuously occupied, e.g., one call-hour per hour, one call-minute per minute, etc. Generally referred to as 36 CCS.

Erlang B—Traffic engineering formula used when traffic is random and there is no queuing. Erlang B assumes that blocked callers either automatically use another route, or blocked calls disappear entirely.

Erlang C—Traffic engineering formula used when traffic is random and queuing is provided. Erlang C assumes that all callers will wait indefinitely until a line becomes available.

Error control—Arrangement that will detect the presence of errors. In some systems, refinements are added that will correct the detected errors, either by operations on the received data or by retransmission from the source.

Error-correcting code—Code incorporating sufficient additional signaling elements to enable the nature of some or all of the errors to be indicated and corrected entirely at the receiving end.

Error-detecting code—Code in which each telegraph or data signal conforms to specific rules of construction so that departures from this construction in the received signals can be automatically detected.

Error rate—Ratio of the number of bits, elements, characters, or blocks incorrectly received to the total number of bits, elements, characters, or blocks transmitted.

ESA—European Space Agency.

ESF—Extended Superframe. A T1 format that comprised 24 frames of 192 bits each. A 193rd bit is used for link control and error checking.

ESS—Electronic Switching System.

ETN—Electronic Tandem Network.

ETX—End Of Text (indicator).

Even parity check (odd parity check)—Tests whether the number of digits in a group of binary digits is even (even parity check) or odd (odd parity check).

Exchange—Assembly of equipment in a communications system that controls the connection of incoming and outgoing lines, and includes the necessary signaling and supervisory functions. Different exchanges, or switches, can be cosited to perform different functions, e.g., local exchange, trunk exchange, etc. See **Class of exchange**. Also known as Central Office (U.S. term).

Exchange, private (PX)—Exchange serving a particular organization and having no means of connection with a public exchange.

Exchange, private automatic—(PAX)—Dial telephone exchange that provides private telephone service to an organization and that does not allow calls to be transmitted to or from the public telephone network.

Exchange, private automatic branch (PABX)—See **Exchange, private branch (PBX)**.

Exchange, private automatic telex—See **PATX**.

Exchange, private branch (PBX)—Private automatic telephone exchange that provides for the switching of calls internally and to and from the public telephone network.

Exchange, private manual branch (PMBX)—Private, manually operated telephone exchange that provides private telephone service to an organization and that allows calls to be transmitted to or from the public telephone network.

Exchange area—Area containing subscribers served by a local exchange.

Exclusive hold—Only the station that has placed a line circuit on hold is capable of breaking the hold condition and reestablishing conversation.

Executive busy override—Allows preselected stations to dial a single digit and gain access to the conversation taking place upon encountering a busy signal.

Expander—Transducer that, for a given amplitude range of input voltages, produces a larger range of output voltages.

Extended area service (EAS)—Option whereby the telephone subscriber can pay a higher flat rate in order to obtain wider geographical coverage without additional per-call charges.

Extension telephone—Additional telephone set on the same line but at a different location than the main station.

Extn.—Extension.

F

Facilities administration and control—Allows customer to administer the assignment of parameters that determine user calling privileges, such as restriction levels and authorization codes. Manual control (override) of time of day routing is provided. Activation and deactivation of trunk group queues are also provided.

Facilities assurance reports—Allows customer to obtain an audit trail of the data generated by the automatic circuit assurance feature. The audit trail indicates the identity of the trunk circuit, time of referral, date, nature of the referral (e.g., short-holding-time failure or long-holding-time failure), and whether a test was performed in response to the referral.

Facilities restriction level—Parameter associated with each authorization code, each station at a PBX, each incoming tie trunk group from subtending PBXs, and attendants as a whole, which determines both the types of calls and types of facilities within the privileges of the associated user. These restriction levels are used in routing

calls via Automatic Route Selection (ARS) and Uniform Numbering/Automatic Alternate Routing (UN/AAR) features. Each route in each route pattern has a minimum restriction level required to use it. This feature replaces the code restriction level that can be used with ARS. When the restriction level of the calling party is transmitted over an intertandem tie trunk to a distant PBX, it is called a traveling class mark (TCM).

Facility—Transmission path between two or more points, provided by a common carrier.

Facsimile—System for the transmission of images, usually over the public telephone network. The image is scanned at the transmitter, reconstructed at the receiving station, and duplicated on some form of paper.

Fading—Changes in the strength of the received radio signal caused by varying propagation conditions.

Fail softly—When a piece of equipment fails, the programs let the system fall back to a degraded mode of operation rather than let it fail completely.

Far-end crosstalk—Crosstalk that travels along a circuit in the same direction as the signals in that circuit. Compare with **Near-end crosstalk**.

Fast Packet Switching—A generic term for improved packet-switching technologies such as frame relay and cell relay. Fast packet techniques feature less functionality than traditional X.25 packet switching for higher packet-switching speeds and lower processing costs.

Fax—Facsimile.

FCC—U.S. Federal Communications Commission.

FDDI—See Fiber Distributed Data Interface.

FDM—frequency-division multiplexing.

FDMA—frequency-division multiple access.

FDX—full duplex.

Feature Group—Under the provisions of Equal Access, three types of local-line access must presently be provided by the BOCs to long-distance carriers:

—Feature Group A access, which amounts to dialing the carrier's 7-digit access number, as well as an account code and a 10-digit long-distance number (you could use an automatic dialer for this purpose);

—Feature Group B access, which is a trunk-side connection accessed by dialing 950-XXXX plus a 10-digit, long-distance number. Feature Group B provides better quality, but is more expensive; and

—Feature Group D access, which is similar to FGB, permits 1 + 10-digit dialing of the primary long-distance carrier, and can be considered the most complete form of access.

Federal Communications Commission—Washington, DC regulatory agency established by the Communications Act of 1934, charged with regulating all electrical and radio communications in the U.S.

Feedback—Method of signal regeneration involving a coupling from a high-level point in an amplifier to a lower level point in the same or previous stage in such a manner as either to increase or decrease apparent gain of the amplifier.

Fiber Distributed Data Interface (FDDI)—A LAN standard specifying a LAN-to-LAN backbone for transmitting data at 100-megabit-per-second speeds over fiber optic media.

Fiber optics—A technology that uses light as a digital information carrier. Glass-based fiber optic cables occupy far less physical volume than conventional coaxial cables and wire pairs for an equivalent transmission capacity. The fibers are immune to electrical interference.

Fiber optic waveguides—Thin filaments of glass through which a light beam can be transmitted

for long distances by means of multiple internal reflections. Occasionally, other transparent materials, such as plastic, are used.

Figures shift—Physical shift in a teletypewriter (specifically Telex) that enables the printing of numbers, symbols, uppercase characters, etc.

Filter—Circuit designed to transmit signals of frequencies within one or more frequency bands and to attenuate signals of other frequencies.

Fixed night service—Routes incoming exchange calls to preselected stations within the PBX system when the attendant is not on duty.

Flat rate—Fixed payment for service within a defined area, independent of use, with an additional charge for each call outside the area.

Flexible intercept—Allows completely flexible and instantly changeable intercept conditions to the attendant, such as unassigned number, temporary disconnect, etc.

Flexible line ringing—Indicates the ability to arrange each station within the system with complete flexibility in regard to the ringing on incoming outside calls.

Flexible night selection—Allows the attendant to “set up” night connections in accordance with day-to-day requirements.

Flexible numbering of stations—Station numbers can be assigned to lines at installation based on customer specifications and can easily be changed thereafter. Some PBXs allow the user to perform the modifications while others require the attention of a service person. This feature is frequently used in hotels where the extension number is the same as the room number.

Flexible release—Capability of the switching system to effect connection release either by the calling party or by the first party to hang up.

Flexible Route Selection (FRS)—Used with Centrex service to achieve least-cost routing.

FM—frequency modulation. See **Modulation, frequency**.

Footprint—1) Surface area within which the strength of a projected beam is above a certain level. Usually used in satellite communications to refer to the area where downlink signals above a minimum quality level can be received. 2) Amount of desktop space a piece of equipment (e.g., a terminal) requires.

Foreign Exchange (FX)—(U.S. term) Connects a customer's location to a remote exchange. This service provides the equivalent of local service from the distant exchange.

Fortran—FORMula TRANslation. Language used in programming computers.

FOTS—Fiber Optic Transmission Systems. See **Fiber optic waveguides**.

Four-wire circuit—Circuit using two pairs of conductors, one pair for the outbound channel and the other pair for the return channel.

Frame—1) One complete cycle of events in time-division multiplexing; usually includes a sequence of time slots for the various subchannels and extra bits for control, framing, etc. 2) Metal racks into which telephone equipment, especially printed circuit boards, is installed.

Frame-grabber—Device that can seize and record a single frame of video information out of a sequence of many frames.

Frame Relay—A switching interface that is designed to get frames from one part of the network to another as quickly as possible. Frame relay operates in packet mode, but it uses Link Access Protocol for ISDN channels (LAPD) and so involves less processing than X.25 packet switching. Frame relay is designed for high-speed networking of “bursty” data. It is defined by ANSI and CCITT standards.

Framing—Control procedure used with multiplexed digital channels whereby bits are inserted

so the receiver can identify the time slots allocated to each channel. Framing bits can also carry alarm signals indicating specific alarm conditions.

Frequency—Rate at which a current alternates, measured in hertz, kilohertz, megahertz, etc.

Frequency bands—Frequency bands are defined arbitrarily as follows:

Range (MHz)	Name
0.03-0.3	Low frequency (LF)
0.3-3.0	Medium frequency (MF)
3-30	High frequency (HF)
30-300	Very high frequency (VHF)
300-3000	Ultrahigh frequency (UHF)
3000-30,000	Super high frequency (SHF) (microwave)
30,000-300,000	Extremely high frequency (EHF) (millimeterwave)

Frequency coordination—International procedure to prevent interference between new and existing radiocommunications services. Under ITU Radio Regulations, potential operators must consult countries and administrations whose services might be affected.

Frequency-division multiple access (FDMA)—Communicating devices at different locations sharing a multipoint or broadcast channel by means of a technique that allocates different frequencies to different users.

Frequency-division multiplexing (FDM)—Multiplex system in which the available transmission frequency range is divided into narrower bands, each used for a separate channel.

Frequency modulation (FM)—One of three ways of modifying a sine wave signal to make it carry information. The sine wave or “carrier” has its frequency modified in accordance with the information to be transmitted. The frequency function of the modulated wave can be continuous or discontinuous.

Frequency-shift keying (FSK)—Frequency modulation method in which the frequency is made to vary at significant instants.

Fresnel zone—Zone of clearance used in calculations during the setting up of a microwave link. Although not directly between the transmitter and receiver, an object near the line-of-sight path can interfere with the propagated signal.

FRS—Flexible Route Selection.

FSK—frequency-shift keying.

Full duplex (FDX)—Refers to a communications system or equipment capable of transmission simultaneously in two directions.

Fully restricted stations—Feature that denies selected station lines the capability to place or receive any but internal station-to-station calls.

Functional split—Division within an automatic call distributor (ACD) that allows incoming calls to be directed from a specific group of trunks to a specific group of agents.

Functional test—Test carried out under normal working conditions to verify that a circuit or a particular part of the equipment functions correctly.

FX—Foreign Exchange.

G

Gain—Denotes an increase in signal power in transmission from one point to another, usually expressed in dB.

Gate assignments—Used in context of ACD equipment. Gates are made up of trunks that require similar agent processing. Individual agents can be reassigned from one gate to another gate by the customer via the supervisory control and display station. Also called splits.

Gateway—A protocol converter that restructures packets of information so they can pass between networks using different standards.

Geostationary satellite—Satellite orbiting about 35,800 kilometers above the equator, remaining vertically above the same point and hence appearing to be stationary. Such a satellite can be used as part of a permanent communications system.

GHz—gigahertz (1 billion cycles per second).

Global satellite communications system—International commercial communications system established by Intelsat, consisting of geostationary satellites above the Atlantic, Pacific, and Indian Oceans owned by Intelsat and earth stations belonging to the individual countries.

Grade of service—Quality of telephone service provided by a system described in terms of the probability that a call will encounter a busy signal during the busiest hour of the day.

Grd.—Ground.

Ground circuit—1) Circuit in which energy is carried one way over a metallic path and returned through the earth. 2) Circuit connected to earth at one or more points.

Ground start—Off-hook calling condition signaled to a Central Office when one side of a line is grounded.

Ground station—Assemblage of communications equipment, including signal generator, transmitter, receiver, and antenna, that receives (and usually transmits) signals to/from a communications satellite. Also called earth station.

Group call—Special type of station hunting, requiring a special access number that will allow a call to the special access number, and ring the first available number in that group.

Grps.—Groups.

H

Half duplex (HD or HDX)—Refers to a communications system or equipment capable of transmission in either direction, but not in both directions simultaneously.

Hamming code—Code using redundant bits to detect errors in data (transmission errors).

Handoff—The transfer of a cellular conversation from one cell to another.

Handset—Portion of the telephone containing the transmitter and receiver, which is handled when the telephone is used.

Hands-free phone—A phone that allows a person to talk and listen via a microphone and speaker rather than through a handset held to the ear.

Hands-free station—Capability of the station user to have speakerphone operation on all calls.

Handshaking—Exchange of predetermined signals for control when a connection is established between two modems or other devices.

Hard copy—Permanent, tangible record such as information printed on paper or recorded on film.

Hardwired—1) Referring to a communications link, whether remote phone line or local cable, that permanently connects two nodes, stations, or devices. 2) Descriptive of electronic circuitry that performs fixed logical operations by virtue of unalterable circuit layout, rather than under computer or stored-program control.

Harmonic distortion—Presence of harmonic frequencies in a received signal due to nonlinear characteristics of a transmission line.

HD or HDX—half duplex.

HDLC—high-level data link control. Bit-oriented communication protocol developed by the ISO.

Headset—Operator or attendant telephone set that consists of a telephone transmitter, a receiver, and cord and plug, designed to leave the operator's hands free.

Headset/Recorder jack—Allows a headset or input plug from a recorder to be connected to the talk circuit on the station instrument.

Hertz (Hz)—Unit of frequency equal to one cycle per second.

Heterogeneous LAN Management (HLM)

Specification—a proprietary network management draft developed jointly by 3Com and IBM that specifies using Common Management Information Protocol (CMIP) over logical link control (LLC) to provide network management of devices on mixed-media LANs. Also known as CMOL.

HF—high frequency.

High frequency (HF)—Portion of the electromagnetic spectrum, typically used in short-wave radio applications. Frequencies approximately in the 3MHz to 30MHz range.

High-usage trunk—Direct trunks provided, where traffic volume warrants, to bypass a part of the DDD switching network.

HLM—see Heterogeneous LAN Management Specification.

Hold—Feature whereby a station user can remain connected to a line while not off-hook to the line. PBXs have provided a new range of hold features that are more easily implemented by means of their programmed intelligence than through mechanical arrangements.

Holding time—Length of time a communications channel is in use for each transmission. Includes both message time and operating time. Also called connect time.

Hookswitch—See **Switchhook**.

Hoot and holler circuit—Four-wire, private line circuit using manual or automatic voice signaling or ringdown to transmit voice information among dispersed sites, such as branch offices. Used primarily in financial institutions to provide timely communication of investment information among traders. Derived from the lively conversational mode of the investment trading environment.

Hot line—Line serving two telephone sets exclusively, on which one set will ring immediately when the receiver of the other set is lifted.

Hot standby—Alternate equipment ready to take over an operation immediately if the equipment presently in use fails.

Hotel/motel console—Usually located at the hotel front desk, provides room status information as well as outgoing call records for guest stations. A 24-hour clock can be provided (month, day, hour, and minutes).

House phone—Allows certain stations to reach the attendant or another station by merely going off-hook.

Howler tone—Tone used to alert a subscriber when the handset is off-hook.

HU—1) High Usage (direct trunk group). 2) Hang Up.

Hub—A Central device, usually in a star topology LAN, to which each station's wiring is attached.

Hum—Spurious electrical interference usually picked up from a conventional alternating current power supply.

Hunting—Movement of a call as it progresses through a group of lines. Typically, the call will try to be connected on the first line of the group; if that line is busy, it will try the second line, and then the third, etc.

Hybrid circuit—Circuit having four sets of terminals arranged in two pairs designed so that there is high loss between the two sets of terminals of a pair when the terminals of the other pair are

suitably terminated. Commonly used to couple four-wire circuits to two-wire circuits.

Hz—hertz.

I

I/O channel—Equipment forming part of the input/output system of a computer. Under the control of I/O commands, the channel transfers blocks of data between main storage and peripherals.

ICC—International Control Center.

ICI—Incoming Call Identification.

ICPT—Intercept Tone. See **Vacant number intercept**.

IDD—international direct dialing.

Identified Outward Dialing (IOD)—See **Automatic Identification of Outward Dialing (AIOD)**.

IDF—intermediate distributing frame.

IDN—integrated digital network.

IEC—interexchange carrier; since divestiture, any carrier registered with the FCC that is authorized to carry customer transmissions between LATAs interstate or, if approved by a state public utility commission, intrastate; includes carriers such as AT&T (formerly AT&T Long Lines), Satellite Business Systems, MCI, and US Sprint.

IEEE—Institute of Electrical and Electronics Engineers.

IETF—Internet Engineering Task Force. A group of volunteers responsible for recommending protocols and procedures used over the Internet. The IETF is composed of representatives from vendor, government, and academic communities. IETF working group meetings are open to the public.

IFRB—International Frequency Registration Board.

Inc.—Incoming.

Incoming Call Identification (ICI)—Allows the attendant to identify visually the type of service, trunk circuit, or trunk group associated with a call.

Incoming call indicator—Lamp panel and associated audible tone providing an alert signal to personnel for incoming calls. This unit is usually placed at strategic locations within a customer's premises.

Indication of camp-on to station—Short bursts of tone periodically transmitted to the busy station to indicate to that station that another call is waiting.

Individual transfer, all calls—Provides the capability of transferring any call by the station to another internal station. Features of consultation hold and add-on conference are usually included.

Induction coil—Apparatus for obtaining intermittent high voltage consisting of a primary coil through which the direct current flows, an interrupter, and a secondary coil of a larger number of turns in which the high voltage is induced.

Information feedback—See **Message feedback**.

Infrared radiation—Electromagnetic radiation with wavelengths of between 780 and 10⁵ nanometers.

Insertion loss—Difference in the amount of power received before and after a device is inserted into a circuit or a call is connected.

Integrated digital network (IDN)—Network employing both digital switches and digital transmission.

Integrated services digital network (ISDN)—Project under way for standardization of operating parameters and interfaces for a network that will accommodate a variety of mixed digital transmission services.

Integrated Voice/Data Terminal (IVDT)—One of a relatively new family of devices that features a terminal keyboard/display and voice telephone instrument. Many contain varying degrees of local processing power, ranging from full personal computer capacity to directory storage for automatic telephone dialing. They can be designed to work with a specific customer premises PBX, or else be PBX independent.

Intelligent terminal—Terminal that is programmable and can process its messages; typically comprised of a CRT, keyboard, microprocessor, and local storage.

Intelsat—International Telecommunications Satellite Consortium, formed in 1964 with the purpose of creating a worldwide communications satellite system.

Inter-PBX call transfer—Part of a main/satellite configuration. An incoming exchange call to a main PBX or a satellite PBX can be put in a three-way conference mode. In addition, an incoming exchange call to a main PBX can be transferred over a tie trunk to a satellite PBX station and vice versa.

Inter-PABX coordinated station numbering—Component of main/satellite configurations. Stations at the main and satellite can dial each other without intervening dial tone. The dialing plan for an inter-PBX call is the same as for an intra-PBX (station-to-station) call.

Interactive—1) In communications, describing time-dependent data communications, typically where a user enters data and then awaits a response message from the destination before continuing. 2) Conversational.

Intercept—See **Vacant code**, **Vacant number intercept**.

Intercom—Internal communications system that allows calling generally within the same building, but not outside the system. Key systems are frequently provided with intercom lines that allow quick communication between stations on the key system. The PBX has features that can

replace or enhance the familiar key system intercom functions on custom key sets.

Interconnect company—Organization, other than the serving telephone company, that supplies telephone equipment by sale, rental, or leasing.

Interexchange channel (IXT)—Direct circuit between exchanges.

Interface—The physical connection between two communications devices, comparable to an electrical plug and socket connection with “male” and “female” components.

Intermediate distributing frame (IDF)—Frame having distributing blocks on both sides, permitting connection of any telephone number with any line circuit.

International Direct Dialing (IDD)—Cooperative service enabling subscribers to place international calls without operator assistance.

International Frequency Registration Board (IFRB)—Within the ITU, the IFRB is responsible for the maintenance of an international list of radio frequency usage and the allocation of new frequencies.

International number—Digits that have to be dialed after the international prefix to call a subscriber in another country; i.e., the country code followed by the subscriber’s national number.

International Record Carrier (IRC)—Term for group of common carriers that until recently provided data and text service between certain U.S. gateway cities and locations abroad.

International Organization for Standardization (ISO)—Agency of the United Nations concerned with international standardization in a broad range of industrial and technical fields.

International Switching Center (ISC)—Exchange used to switch traffic between different countries over international circuits.

International Telecommunication Union (ITU)—Telecommunications agency of the United Nations, established to provide standardized communications procedures and practices including frequency allocation and radio regulations on a worldwide basis.

Internet(work)—Two or more linked together. A local internet is confined within a single building; a campus internet includes two or more nearby buildings.

Interoffice trunk—Direct trunk between local central offices (Class 5 offices), or between Class 2, 3, or 4 offices; also called intertoll trunk.

Interoperability—Mixing products from various vendors in a local area network.

Interposition calling—One attendant in a multiposition system can call an attendant at another position for consultation.

Interposition transfer—An operator at one console can transfer a call to an operator at another position. Used where certain positions are assigned to handle specific types of calls.

Interrupt—Jump out of one software program into another due to an external event. A mechanism is usually provided to store the information needed for a return to the interrupted program.

Interstate—Between different states; over a state line.

Intraoffice trunk—Trunk connection within the same Central Office.

Intrastate—Within a single state's boundaries.

Inverter—Used to convert a direct current into a higher voltage direct current or an alternating current.

Inward restriction—Blocks selected extension lines from receiving incoming exchange network calls and CCSA calls, completed via either DID or the attendant. Calls can be given any intercept treatment.

IOD—Identified Outward Dialing (may use operator).

IPM—Impulses Per Minute (interruption rate for call progress tones).

IRC—International Record Carrier.

ISC—International Switching Center.

ISD—International Subscriber Dialing. See **International direct dialing**.

ISDN—integrated services digital network.

ISO—International Organization for Standardization.

ITU—International Telecommunication Union.

IVDT—Integrated Voice/Data Terminal.

IXSD—International Telex Subscriber Dialing.

IXT—interexchange channel.

J

jabber—a data packet with more than 1518 bytes and a faulty frame check sequence (FCS).

Jack—Device used generally for terminating the permanent wiring of a circuit, access to which is obtained by the insertion of a plug.

Jitter—Slight movement of a transmission signal in time or phase that can introduce errors and loss of synchronization for high-speed synchronous communications. See **Phase jitter**.

Journal printer—Provides hard copy output for audit trail and demand printing functions associated with hotel management features.

Jumper—Patch cable or wire used to establish a circuit, often temporarily, for testing or diagnostics.

Junctor—In crossbar systems, a circuit extending between frames of a switching unit and terminating in a switching device on each frame.

K

Keyboard perforator—Perforator provided with a bank of keys, the manual depression of any one of which will cause the code of the corresponding character or function to be punched in a tape.

Keyboard send/receive (KSR)—Combination teletypewriter transmitter and receiver with transmission capability from the keyboard only.

K bps—kilobits per second.

Key illumination: incandescent lamp behind key—Circuit status lamp indication behind circuit pushbutton with flashing incoming, steady busy, and “wink” hold visual indications.

Key pulsing (KP)—Manual method of sending numerical and other signals by the operation of nonlocking pushkeys. Also called key sending.

Key Service Unit (KSU)—Main operating unit of a key telephone system.

Key system features—Central PBX switching equipment contains all the necessary standard circuitry and control elements for standard key telephone station instruments to be served by the PBX system.

Key Telephone System (KTS)—When more than one telephone line per set is required, pushbutton or key telephone systems offer flexibility and a wide variety of uses, e.g., pickup of several exchange lines, PBX station lines, private lines, and intercommunicating lines. Features of the system include pickup and holding, intercommunications, visual and audible signals, cutoff, exclusion, and signaling.

kHz—kilohertz (one thousand cycles per second).

KP—Key pulse (signaling unlocking signal). See **Key pulsing**.

KSR—keyboard send/receive.

KSU—Key Service Unit.

KTS—Key Telephone System.

KTU—Key Telephone Unit. See **Key Service Unit**.

Ku-band—Portion of the electromagnetic spectrum, being used increasingly for satellite communications. Frequencies approximately in the 12GHz to 14GHz range.

kW—kilowatt.

kWh—kilowatt hour.

L

Label—Set of symbols used to identify or describe an item, record, message, or file. Occasionally it can be the same as the address in storage.

LAMA—Local Automatic Message Accounting.

LAN—local area network.

Laser—Acronym for “light amplification by stimulated emission of radiation.” Lasers convert electrical energy into radiant energy in the visible or infrared parts of the spectrum, emitting light with a small spectral bandwidth. For this reason, they are widely used in fiber optic communications, particularly as sources for long-haul links.

Last extension called—PBX records the last extension number called by a user, and will redial it when signaled with a special code or button.

Last number dialed—See **Last extension called; Ring again**.

Last Trunk Busy (LTB)—Condition in which the last-choice trunk of a given group is busy.

LAT—Local Area Transport; protocol used in a LAN.

LATA—Local Access and Transport Area.

LCD—liquid crystal display.

LCR—Least Cost Routing. See **Automatic Route Selection**.

LCU—Line Control Unit.

LD—long distance.

LDN—listed directory number.

Leased line—Dedicated circuit, typically supplied by the telephone company or transmission authority, that permanently connects two or more user locations and is for the sole use of the subscriber. Such circuits are generally voice grade in capacity and in range of frequencies supported, are typically analog, are used for voice or data, can be point-to-point or multipoint, and can be enhanced with line conditioning. Also called private line.

Least Cost Routing (LCR)—See **Automatic Route Selection (ARS)**.

LED—light-emitting diode.

Letters shift—Physical shift in a teletypewriter, specifically telex, which enables the printing of alphabetic characters. Also the name of the character that causes this shift.

LF—low frequency.

LHT—Long Holding Time. See **Holding time**.

Light-emitting diode (LED)—Semiconductor junction diode that emits radiant energy and is used as a light source for fiber optic communications, particularly for short-haul links.

Line—Transmission path from a nonswitching subscriber terminal to a switching system.

Line Control Unit (LCU)—In data communications, a special-purpose processor that controls input/output of communication lines not directly accessed by the computer.

Line finder—Switch that finds a calling line among a group of lines and connects it to another device. Used typically in step-by-step (S × S) switching.

Line hit—Electrical interference causing the introduction of undesirable signals on a circuit.

Line hold recall—The held line automatically reverts to the incoming call condition both visually and audibly when a station places a line on hold and goes on-hook.

Line lockout with warning—Provides 10 seconds of intercept tone and then holds the line out of service when a station line remains off-hook for longer than a predetermined time.

Line of sight—1) Characteristic of some open-air transmission technologies, such as microwave, infrared, and open-air, laser-type transmission, where the area between a transmitter and a receiver must be clear and unobstructed. 2) Clear, open-air, direct transmission path free of obstructions such as buildings but in some cases impeded by adverse weather or environmental conditions.

Line preference—On standard key systems, the user selects the line to be used by pressing the button associated with that line. The line buttons on an electronic key set are nonlocking and, instead of selecting a line, they signal the PBX, which actually connects the desired line. There are several ways to specify which line is to be connected when the user picks up the handset without requiring that a line selection button be depressed before going off-hook.

Line processing—See **Processing, line**.

Line speed—Maximum data rate that can be reliably transmitted over a line.

Line switching—See **Circuit switching**.

Link—1) Physical circuit between two points. 2) Conceptual (or virtual) circuit between two users of a packet switched (or other) network that allows them to communicate, even when different physical paths are used.

Listed directory number (LDN)—Incoming exchange network calls to the PBX via the assigned listed local telephone directory number are directed to the attendant. The attendant can complete these calls to station lines within the system or certain trunk facilities.

LND—local number dialing. Calling a subscriber connected to the same exchange; the call is made without entering the trunk network.

Load balancing for Station/Trunk lines—Traffic balancing may be required when system traffic limits are approached. This feature provides the capability, during installation or on an in-service system, to change specific station and trunk terminations on the PBX system switching network with minimum installer effort and without requiring number changes for the purpose of balancing the traffic load on the switch network.

Loading—Adding inductance (load coils) to a transmission line to minimize amplitude distortion.

Loading coil—Induction device employed in local loops, generally those exceeding 5,500 meters in length, that compensates for the wire capacitance and serves to boost voice grade frequencies. The coils are often removed for new-generation, high-speed, local-loop data services as they can distort data signals at higher frequencies than those used for voice.

Local Access and Transport Area (LATA)—Geographic regions within the U.S. that define areas within which the Bell Operating Companies (BOCs) can offer exchange and exchange access services (local calling, private lines, etc.).

Local area network (LAN)—One of the several types of geographically limited communications networks intended primarily for such high-speed data transmission applications as data transfer, text, facsimile, and video.

Local Automatic Message Accounting (LAMA)—Combination of automatic message accounting equipment, automatic number accounting

equipment, and automatic number identification equipment in the same office. In such a system, a subscriber-dialed call can automatically be processed without operator assistance.

Local call—Any call for a destination within the local service area of the calling station.

Local call billing—Computes the charges for local calls placed by guests based on total message units and, optionally, service charges stored for each guest room telephone via the station message register service feature and the hotel local call billing rate parameter.

Local exchange—Exchange in which subscribers' lines terminate. The exchange has access to other exchanges and to national trunk networks. Also called local central office, end office.

Local loop—The part of a communications circuit between the subscriber's equipment and the equipment in the local exchange.

Local number dialing—See LND.

Local service area—Area within which two subscribers can be connected on payment of a local fee.

Local trunk—Trunks between local exchanges.

Lockout—Denies the attendant the ability to reenter an incoming exchange connection directly terminated or held on his/her position, unless specifically recalled by the station user.

Long distance—Any telephone call, subject to charge, to a destination outside the local service area of the calling station. Also called toll call.

Long-haul—Long distance, describing (primarily) telephone circuits that cross out of the local exchange.

Longitudinal balance—Measure of the electrical balance between the two conductors (tip and ring) of a telephone circuit. Specifically, the difference between the tip-to-ground and ring-to-ground AC signal voltages, expressed in decibels.

Longitudinal redundancy check (LRC)—System of error control based on the formation of a block check following preset rules. The check formation rule is applied in the same manner to each character.

Loop—Local circuit between an exchange and a subscriber telephone station. Also called subscriber loop and local line.

Loopback—Test of the performance and quality of a line and/or terminating equipment. See **Analog loopback**, **Digital loopback**.

Loop checking—See **Message feedback**.

Loop circuit—Generally refers to the circuit connecting the subscriber's equipment with local switching. Also called metallic circuit and local loop.

Loop signaling systems—Any of three types of signaling that transmit signaling information over the metallic loop formed by the trunk conductors and the terminating equipment bridges. Transmission of the loop signals can be accomplished by 1) opening and closing the DC path around the loop, 2) reversing the voltage polarity, or 3) varying the value of the equipment resistance.

Loop start—Most commonly used method of signaling an off-hook condition between an analog phone set and a switch, where picking up the receiver closes a wire loop, allowing DC current to flow, which is detected by a PBX or local exchange and interpreted as a request for service.

Loop Timing—A means of synchronizing a transmission circuit by using the receive data clock as the transmit clock.

Loss (transmission)—Decrease in energy of signal power in transmission along a circuit due to the resistance or impedance of the circuit or equipment.

Loudspeaker paging access—Allows the attendant and station users to have access to COAM paging equipment for the purpose of voice paging.

All voice paging facilities make use of the telephone transmitter as the microphone. Available to station users on a class-of-service basis, this function allows direct connection to the paging system by dialing a unique number for each zone or for all zones simultaneously.

Low frequency (LF)—Generally indicates frequencies between 30kHz and 300kHz.

LRC—longitudinal redundancy check.

LSI—large scale integration. Method of fabricating electronic chips permitting a large number of circuits on a single chip.

LTB—Last Trunk Busy.

LTE—Local Telephone Exchange. See **Local exchange**.

M

MAC—medium access control; the method that enables network stations to access network media and transmit information; corresponds to the second layer of the OSI model.

Main distributing frame (MDF)—Distribution frame that connects outside lines on one side and internal lines from exchange equipment on the other.

Main/satellite service—Allows multilocation PBX customers to concentrate their attendant positions at one location, referred to as the main. Other unattended locations, equipped with dial switching equipment, are referred to as satellites. Only one listed directory number (LDN) is provided per complex, and all attendant-handled calls are switched through the main PBX over tie trunks to and from satellite PBX locations.

Main station—Subscriber's instrument (e.g., telephone or terminal) connected to a local loop, used for originating calls and answering incoming calls from the exchange.

Manual exchange—Exchange in which connections are made by an operator.

Manual exclusion—Method by which a PABX station user, by entering a special code, can block all other stations on that line from entering the call, ensuring privacy on the line.

Manual hold—Method of placing a line circuit on “hold” by activating a nonlocking common hold button.

Manual originating line service—Provides station lines that require the attendant to complete all outgoing calls. All nonattendant-handled call attempts are intercepted. This arrangement can be used for lobby phones or emergency telephones to minimize system abuse.

Manual PBXs—PBX systems that are not automatic and that require all calls to be connected through the attendant position, including station-to-station calls.

Manual signaling—Depressing a specific button on a telephone to send an audible signal to a predetermined station.

Manual terminating line service—Provides extension lines that require all terminating calls to be completed by the attendant. Intercepts all call attempts not handled by the attendant. This feature can be activated, for example, on patient phones in a hospital to prevent disturbance.

MARECS—European maritime satellite system.

MARISAT—Maritime Satellite service.

Marker—Wired-logic control circuit that, among other functions, tests, selects, and establishes paths through a switching state(s) in response to external signals.

Master number hunting—Specific number is assigned as the first number in the hunt group, rather than the more traditional procedure of using the first station within the group.

Master station—Unit having control of all other terminals on a multipoint circuit for purposes of polling and/or selection.

Matrix—In switch technology, that portion of the switch architecture where input leads and output leads meet, any pair of which may be connected to establish a through circuit. Also called switching matrix.

MAU—Media Access Unit.

M bps—megabits per second.

MCA—IBM Micro Channel Architecture used in PS/2 Models 50 and above.

MDF—main distributing frame.

Mean-time-between-failure (MTBF)—Average length of time for which the system, or a component of the system, works without fault.

Mean-time-to-repair (MTTR)—Average time taken to correct a fault when the system, or a component of the system, develops one.

Measured rate—Message rate structure in which the rental includes payment for a specified number of calls within a defined area, plus a charge for additional calls.

Medium—Any material substance that is, or can be, used for the propagation of signals, usually in the form of modulated radio, light, or acoustic waves, from one point to another, such as optical fiber, cable, wire, dielectric slab, water, air, or free space (ISO).

Medium frequency (MF)—Frequencies in the range between 300kHz and 3MHz.

Meet-me conference—Conference circuit on a PBX given a dial access code. All stations dialing that code at a predetermined time (or upon direction by the operator) are connected in conference.

Message—Sequence of characters used to convey information or data. In data communications, messages are usually in agreed format with a

heading, which establishes the destiny of the message, and text, which consists of the data being sent.

Message feedback—Method of checking the accuracy of data transmission in which the received data are returned to the sending end for comparison with the original data, which are stored there for this purpose. Also called information feedback and loop checking.

Message format—Rules for the placement of such portions of a message as message heading, address, text, end-of-message indication, and error-detecting bits.

Message numbering—Identification of each message within a communications system by the assignment of a sequential number.

Message registration—Provides an electronic or mechanical readout of outgoing local and long-distance calls from each guest station. This information can be displayed at a hotel console or on mechanical counters.

Message relay—Allows a PBX extension user to record and store a message for transmission to a given extension by a given time, after which it is relayed to the attendant.

Message switching—Technique of receiving a message, storing it until the proper outgoing line is available, and then retransmitting. No direct connection between the incoming and outgoing lines is set up as in line switching.

Message unit (MU)—Unit of measure for charging local calls that details the length of call, distance called, and time of day.

Message waiting—Feature that allows an attendant to light an indicator lamp to show that a message is waiting.

MF—1) medium frequency. 2) multifrequency. See **Dual Tone Multifrequency (DTMF) signaling**.

MHS—Message Handling System; also used for electronic mail.

MHz—megahertz (megacycles per second).

Microcells—Small, low-powered radio cells closely spaced to maximize frequency reuse in a high-density area.

Microwave—1) Portion of the electromagnetic spectrum above about 760MHz. 2) Describing high-frequency transmission signals and equipment that employ microwave frequencies, including line-of-sight, open-air microwave transmission and, increasingly, satellite communications.

Min.—minimum.

Mixed station dialing—Indicates the capability of the switching system to accommodate both rotary dial and pushbutton dial stations.

Mobile Communications—A general term used to describe personal communications services such as cellular, paging and cordless phone technologies, and two-way voice and data radio transmission.

Mobile earth station—Radio transmitter and/or receiver situated on a ship, vehicle, or aircraft and used for satellite communications.

Mobile phone—A phone that is installed inside a vehicle, where it operates by using the vehicle's electrical system. Portable phones can be mobile, but mobile phones are not necessarily portable.

Mobile Telephone Service (MTS)—Telephone service provided between mobile stations and the public switched telephone network; radio transmission provides the equivalent of a local loop. See also **Cellular radio**.

Mobile Telephone Switching Office (MTSO)—The MTSO controls the switching between the public switched telephone network and the cell sites for all wireline-to-mobile and mobile-to-wireline calls as well as for mobile-to-mobile calls.

Modem—Contraction of modulator-demodulator. A device that modulates and demodulates signals transmitted over communications facilities.

The modulator is included for transmission and the demodulator for reception. A modem is used to allow digital signals to be sent over analog lines. Occasionally called data set.

Modular—Made up of replaceable units that can be added together to make the system larger, or modify its capabilities.

Modulation—Process of varying some characteristics of the carrier wave in accordance with the instantaneous value or samples of the intelligence to be transmitted.

Modulation, amplitude (AM)—Form of modulation in which the amplitude of the carrier is varied in accordance with the instantaneous value of the modulating signal.

Modulation, frequency (FM)—Form of modulation in which the instantaneous frequency of a sine wave carrier is caused to depart from the carrier frequency by an amount proportional to the instantaneous value of the modulating signal.

Modulation, pulse amplitude (PAM)—Form of modulation in which the amplitude of the pulse carrier is varied in accordance with successive samples of the modulating signal.

Modulation, pulse code (PCM)—Digital transmission technique that involves sampling of an analog information signal at regular time intervals and coding the measured amplitude value into a series of binary values, which are transmitted by modulation of a pulsed, or intermittent, carrier. A common method of speech digitizing using 8-bit code words, or samples, and a sampling rate of 8kHz.

Modulation, pulse width (PWM)—Process of encoding information based on variations of the duration of carrier pulses. Also called pulse duration modulation or PDM.

Modulator—Device that converts a signal (voice or other) into a form that can be transmitted.

Monitoring (ACD)—Two distinct types of supervisor monitoring are available: assistance monitoring, which is “barge-in/-out,” and observation monitoring.

Monitoring key—Key that allows an operator to monitor or to listen on a circuit without sensibly affecting the transmission quality of that circuit.

Morse code—Two-condition telegraph code in which characters are represented by groups of dots and dashes.

MOS—metal oxide semiconductor.

MOTIS—Message-oriented Text Interchange Standard; ISO supports MOTIS for the X.400 Mail Message Service, mostly used in Europe.

msec.—millisecond.

MSDN—Mitel’s proprietary version of ISDN.

MSG—message.

MTBF—mean-time-between-failure.

MTS—Mobile Telephone Service.

MTTR—mean-time-to-repair.

MTX—Mobile Telephone Exchange.

MU—message unit.

Mu-law encoding—Encoding according to CCITT Recommendation G.711, used with 24-channel PCM systems in the U.S. It is similar to A-law encoding, but the two differ in the size of the quantizing intervals.

Multidrop line—See **Multipoint line**.

Multiple—System of wiring so arranged that a circuit, a line, or a group of lines are accessible at a number of points. Also called multipoint.

Multiple console operation—PBX supporting more than one attendant’s position to handle heavy traffic. Call traffic is distributed evenly among consoles in use.

Multiple customer group operation—PBX that can be shared by several different companies, each having separate consoles and trunks. Stations are assigned to one company or the other and are then capable of reaching only that company's trunks and attendants.

Multiple listed directory number service—Allows more than one listed directory number to be associated with a single PBX installation. Each listed number can be assigned a unique incoming call identification.

Multiple trunk groups—Indicates that the switching system is capable of being equipped for more than one group of trunk circuits.

Multiplex—To interleave or simultaneously transmit two or more messages on a single channel.

Multiplexer—Device that enables more than one signal to be sent simultaneously over one physical channel.

Multiplex hierarchy—12 channels = 1 group; 5 groups (60 channels) = 1 supergroup; 10 supergroups (600 channels) = 1 mastergroup (U.S. standard); 5 supergroups (300 channels) = 1 mastergroup (CCITT standard); 6 U.S. mastergroups = 1 jumbo group.

Multiplexing—Division of a transmission facility into two or more channels either by splitting the frequency band transmitted by the channel into narrower bands, each of which is used to constitute a distinct channel (frequency-division multiplexing), or by allotting this common channel to several different information channels, one at a time (time-division multiplexing).

Multipoint—Pertaining or referring to a communications line to which three or more stations are connected. It implies that the line physically extends from one station to another until all are connected. (Contrast with point-to-point.)

Multipoint line—Single communications channel (typically a leased telephone circuit) to which more than one station or logical unit are attached, though only one can transmit at a time. Such arrangements usually require a polling

mechanism under the control of a master station to ensure that only one device transmits data at a time. Also called a multidrop line.

Multiprocessing—Simultaneous application of more than one processor in a multi-CPU computer system to the execution of a single user job, which is possible only if the job can be effectively defined in terms of a number of independently executable components.

Multiprogramming—Computer system operation whereby a number of independent jobs are processed together. Rather than allow each job to run to completion in turn, the computer switches between them so as to improve the utilization of the system hardware components.

Multithreading—Concurrent processing of more than one message (or similar service request) by an application program.

Music on Camp-on—Capability of the system to accommodate an audio source input for use with the attendant camp-on facility.

Music on hold, system—Availability of audio source input for system-wide distribution to all "held call" conditions within the system, for attendant and station use.

Music on hold, trunk—Availability of audio source input for all "held" conditions placed on trunk circuits in the system.

Mux—multiplexer.

N

Nailed-up connection—Slang term for permanent, dedicated path through a switch; often used for lengthy, regular data transmissions going through a PBX.

NAK—negative acknowledge character.

NARUC—National Association of Regulatory Utility Commissioners.

NATA—North American Telecommunications Association.

National number—Digits that have to be dialed following the trunk prefix to call a subscriber in the same country but outside the local numbering area. These digits uniquely identify a station in an area identified by a country code.

NDIS—Network Driver Interface Specification.

Near-end crosstalk (NEXT)—Unwanted energy transferred from one circuit usually to an adjoining circuit. It occurs at the end of the transmission link where the signal source is located, with the absorbed energy usually propagated in the opposite direction of the absorbing channel's normal current flow. Usually caused by high-frequency or unbalanced signals and insufficient shielding.

Negative acknowledge character (NAK)—Return signal that reports an error in the method of error control that relies on repeating any message received with detectable errors.

Neper—Basic unit of a logarithmic scale used for the expression of ratios of voltages, currents, and similar quantities.

NETBIOS—Network Basic Input/Output System interface, created by Microsoft and IBM.

Network—1) Series of points connected by communications channels. 2) Switched telephone network is the network of telephone lines normally used for dialed telephone calls. 3) Private network is a network of communications channels confined to the use of one customer.

Network File System (NFS)—a machine and operating system-independent protocol that supports transparent, remote access to shared file systems.

Network Interface Cards—Cards that plug into an expansion slot on a PC that is to be networked.

Network Inward/Outward Dialing (NIOD)—Ability to provide dialing both ways between a toll network and a local network.

Network Management Center (NMC)—Center used for control of a network. May provide traffic analysis, call detail recording, configuration control, fault detection and diagnosis, and maintenance.

Network Redundancy—A communications pathway that has additional links to connect all nodes in case one link goes down.

Network Terminating Unit (NTU)—The part of the network equipment that connects directly to the data terminal equipment.

Network topology—Describes the physical and logical relationship of nodes in a network, the schematic arrangement of the links and nodes (see **Bus, Ring**), or some hybrid combination thereof.

NEXT—near-end crosstalk.

Night audit—Provides automatic printout of message registration data for all guest rooms by key operation at front desk console.

Night console position—Provides an alternate attendant position that can be used at night in lieu of the regular console.

Night service automatic switching—Should the attendant neglect to place the console in the night answering mode, after a certain period of time ringing from an incoming exchange call, the entire system will automatically engage the night service mode.

Night station service—1) Fixed Service—provides arrangements to route calls normally directed to the attendant to preselected station lines within the PBX system when regular attendant positions are not in use. In addition, calls to specific trunks can be arranged to ring on specific station lines. The receiving station can then transfer the call if necessary. 2) Expanded Service—routes calls normally directed to the attendant to preselected station lines within the system when when it is arranged for night service. Calls to specific exchange trunks can be arranged to route to specific station lines, and can be assigned on a flexible basis. Trunk Answer from

Any Station capability is provided for calls that are not handled by assigned night stations.

NIOD—Network Inward/Outward Dialing.

Nmbr.—Number.

NMC—Network Management Center.

NMOS—N-channel Metal Oxide Semiconductor.

NM/SIG—The Network Management Special Interest Group of the OSI Implementer's Workshop (OIW), sponsored by the National Institute of Standards and Technology (NIST).

NND—National Number Dialing. See **National number**.

NNX—Older form of Central Office code where N is any digit Room 2 to 9 and X is any digit from 0 to 9.

Node—1) In a topological description of a network, a point of junction of the links. 2) Switching center used in data networks, particularly in the context of packet switching.

Noise—Unwanted electrical signals, introduced by circuit components or natural disturbances, that tend to degrade the performance of a communications channel.

Nonblocking—Describing a switch where a through traffic path always exists for each attached station. Generically, a switch or switching environment designed to never experience a busy condition due to call volume.

Nonconsecutive hunting—Nonconsecutive station numbers can be "searched" by the switching equipment upon dialing the initial number in the hunting group to find connection to the first nonbusy station.

NPA—Numbering Plan Area.

NRZ—non-return-to-zero (magnetic tape format).

ns.—nanosecond (also nsec.).

NTSC—National Television Systems Committee. Television broadcasting system using 525 picture lines and a 60-Hz field frequency. Developed by the Committee, and used primarily in the U.S., Canada, Mexico, and Japan. See also **PAL** and **SECAM**.

NTU—Network Terminating Unit.

Numbering Plan Area (NPA)—Geographic subdivision of the territory covered by a national or integrated numbering plan. An NPA is identified by a distinctive area code (NPA code).

Numbering zone—One of the nine geographical areas in the world numbering plan.

Number-unobtainable tone—Audible signal received by the caller indicating that the attempted call cannot be completed due to faulty equipment or lines, invalid number dialing, or because access to that number is barred.

NXX code—Central Office code of three digits that designates a particular Central Office or a given 10,000-line unit of subscriber lines; "N" is any digit from 2 to 9, and "X" is any digit from 0 to 9.

○

OCB—Outgoing Calls Barred. Prevention of calls to distant addresses; in particular, preventing PBX users from making calls outside the PBX system.

OCC—Other Charges or Credits (on phone bill), also Other Common Carrier (MCI, US Sprint, etc.).

ODD—Operator Distance Dialing.

OEM—original equipment manufacturer.

Off-hook—Telephone set in use; handset is removed from its cradle.

Office classification—See **Class of exchange**.

Off-line—1) Pertaining to equipment or devices not under direct control of the central processing unit. 2) Used to describe terminal equipment that is not connected to a transmission line.

Off-premises Extension (OPX)—Telephone extension located other than where the main switch is.

Off-the-shelf—Equipment already manufactured and available for delivery from stock.

OGT—Outgoing Trunk.

OHQ—Off-Hook Queue. See **Queue**.

OLTP—On-Line Transaction Processing.

1BASE-5—1M bps transmission over twisted pair configuration.

One-way splitting—When the attendant is in connection with an outside trunk and an internal station, activation of a key allows the attendant to speak privately with the internal station.

One-way trunk—Trunk between a switch (PBX) and an exchange, or between exchanges, where traffic originates from only one end.

On-hook—Telephone set not in use; handset resting in cradle.

On-hook dialing—Station user can dial a number and listen to the call's progress over the set's speaker, leaving the receiver on-hook until the call goes through and conversation begins.

On-line—1) Connected to a computer so that data can pass to or from the computer without human intervention. 2) Directly in the line loop. 3) In telegraph usage, transmitting directly onto the line rather than, for example, perforating a tape for later transmission.

On-line computer system—An on-line system can be defined as one in which the input data enter the computer directly from their point of origin and/or output data are transmitted directly to where they are used. The intermediate stages,

such as punching data into cards or paper tape, writing magnetic tape, or off-line printing, are largely avoided.

ONI—Operator Number Identification.

Open systems interconnection (OSI)—A classification of standards for promoting global connectivity. OSI standards are generally promulgated by the International Organization for Standardization and used by a variety of standards-setting bodies.

Operating time—The time required for dialing the call, waiting for the connection to be established, and coordinating the transaction with the personnel or equipment at the receiving end. Also known as call setup time.

Operator—Person assigned to the operation of a switchboard or comparable equipment. Usually refers to telephone company personnel, but often used interchangeably with the term attendant.

Operator Distance Dialing (ODD)—Establishment of long-distance calls requiring the intervention of an intermediate operator.

Operator Number Identification (ONI)—At an exchange, a feature that allows the operator to come in long enough to acquire the calling number so that it can be keyed into CAMA equipment.

OPS—Off-premises Station. See **Off-premises Extension**.

Optical fiber—Any filament or fiber, made of dielectric materials, that is used to transmit laser- or LED-generated light signals, usually for digital communications. An optical fiber consists of a core, which carries the signal, and cladding, a substance with a slightly higher refractive index than the core, which surrounds the core and serves to reflect the light signal back into it. Also called lightguide or fiber optic waveguide.

OPX—Off-premises Extension.

OR—Originating Register (crossbar switching).

Original equipment manufacturer (OEM)—Maker of equipment that is marketed by another vendor, usually under the name of the reseller. The OEM may only manufacture certain components, or complete computers, which are then often configured with software, and/or other hardware, by the reseller.

Originating restriction—Station line with this restriction cannot place calls at any time. Calls directed to the station, however, will be completed normally.

OSI—open systems interconnection. ISO's reference model for a seven-layer network architecture used for the definition of network protocol standards enabling all OSI-compliant computers or devices to communicate with each other.

OSI/Network Management Forum—Consortium of over 100 equipment vendors and carriers that are developing implementation specifications for OSI-based network management.

Other common carrier (OCC)—Specialized common carriers (SCCs), domestic and international record carriers, and domestic satellite carriers engaged in providing services authorized by the Federal Communications Commission.

OTQ—Outgoing Trunk Queuing.

Outgoing Calls Barred—See **OCB**.

Outgoing line restriction—Capability of the system to selectively restrict any outside line to an "incoming only" line.

Outgoing station restriction—Capability of the system to restrict any given station from originating outgoing calls.

Outgoing Trunk (OGT)—One-way trunk that carries only outgoing traffic.

Outgoing Trunk Queuing (OTQ)—Extensions can dial a busy outgoing trunk group, be automatically placed in a queue, and then be called back when a trunk in the group is available. This feature allows more efficient use of expensive, special lines as, instead of having to redial the trunk

access code until a line is free, the caller can activate OTQ, followed by the trunk access code, and take care of other affairs until a line is free.

Outward restriction—Station lines within the PBX can be denied the capability to access the exchange network without the assistance of the attendant. Restricted calls are routed to intercept tone.

Overflow—Excess traffic, on a particular route, that is offered to another (alternate) route.

Override—Seizure of a circuit even though the circuit is already occupied.

P

PA—Public Address (loudspeaker system, sometimes used for paging).

PABX—private automatic branch exchange. See **Exchange, private branch (PBX)**.

Packet—Group of binary digits, including data and call control signals, that is switched as a composite whole. The data, call control signals, and error control information are arranged in a specified format.

Packet switching—A data communications technique where a message is broken down into fixed-length units (packets), which are then transmitted to their destination through the fastest route. Although all units in a message may not travel the same pathway, the receiving station ascertains that all units are received and in proper sequence before forwarding the complete message to an addressee.

Packet-switching network—Network designed to carry data in the form of packets. The packet and its format are internal to that network. The external interfaces can handle data in different formats, and conversion is done by an interface computer.

Pager Phone—A pocket-sized, portable phone that combines cellular or advanced cordless telephone technology with paging capabilities.

Paging—See **Radio paging**.

Paging by zone—By dialing the appropriate access code, any station is capable of selectively paging groups of predesignated stations or speakers.

Paging speakers—Inclusion of such speakers within the station instrument. Also includes external units located in larger areas.

Paging, total system—Upon dialing the appropriate special code, any station can originate a paging announcement through all loudspeakers.

PAL—phase alternate line. Color television broadcasting system developed in West Germany and the U.K. that uses 650 picture lines and a 50-Hz field frequency. See also **NTSC** and **SECAM**.

PAM—pulse amplitude modulation. See **Modulation, pulse amplitude**.

Parallel transmission—Simultaneous transmission of the bits making up a character or byte, either over separate channels or on different carrier frequencies on one channel. See also **Serial transmission**.

Parity check—Addition of noninformation bits to data to make the number of ones in a grouping of bits either always even or always odd. This procedure allows detection of bit groupings that contain single errors. It can be applied to characters, blocks, or any specific bit grouping.

Part 68—Section of FCC rules governing the direct connection of nontelephone company-provided terminal equipment to the telephone network.

Party line—Subscriber line upon which several subscribers' stations are connected, possibly with selective calling.

Party line stations—Two-party station service can be expanded to support multiparty service.

PATX—private automatic telex exchange. Exchange used for a private telex network within an organization.

PAX—private automatic exchange. See **Exchange, private automatic**.

PBX—private branch exchange. See **Exchange, private branch**.

PCB—Printed Circuit Board.

PCM—pulse code modulation. See **Modulation, pulse code**.

PCN—Personal Communications Network.

PCS—Personal Communications Services.

PDS—Premises Distribution Cabling System.

Peg Count—Tally of the number of calls made or received over a specified period of time.

Perforator—Instrument for the manual preparation of a perforated tape, in which telegraph signals are represented by holes punched in accordance with a predetermined code.

Peripheral device or equipment—Input or output unit that is not included within the confines of the primary system, e.g., data printer or diskette.

Personal Communications Network—A technology in which portable handset users can dial other PCN handsets or route a call over the public switched network. When a user places a call, the handset radios the transmission to a micro-cell, where radio base stations, which rely on many low-powered transmitters, exist. From there, transmission is deployed throughout buildings, cities, and across the country. (See **CT-2 Technology, PCS**.)

Personal Communications Services (PCS)—Encompass a broad range of radio communications services that enable individuals to communicate with others when they are away from their home or office telephone. Basic forms of PCS include the cordless telephone and paging services. Cellular telephone service represents another form of PCS. (See **PCN, CT-2 Technology**.)

Phantom circuit—Third voice circuit, which is superimposed on two 2-wire voice circuits.

Phase alternate line—See **PAL**.

Phase jitter—In telephony, the measurement, in degrees out of phase, that an analog signal deviates from the referenced phase of the main data-carrying signal. Often caused by alternating current components in a telecommunications network.

Phase modulation—One of three ways of modifying a sine wave signal to make it carry information. The sine wave or “carrier” has its phase changed in accordance with the information to be transmitted.

Phase-shift Keying (PSK)—Encoding of digital information as varying phases of a carrier signal.

Photodiode—Device consisting essentially of a pin or pin junction diode that converts electromagnetic radiation in the visible or infrared wavelengths into an electric current. Different types are used as detectors in fiber optic communications including sensitive avalanche photodiodes.

Pilot tone—Test frequency of controlled amplitude transmitted over carrier system for monitoring and control purposes.

ping—a TCP/IP procedure that uses the Internet Control Message Protocol (ICMP) echo to check whether a network device is active.

Plant—General term used to describe the physical equipment of a telephone network that provides communications services.

Plug-in stations—Station cabling requirement remains constant for all types of station instruments. For ease in station moves and rearrangements, all stations are provided and installed as plug-in instruments.

PMBX—private manual branch exchange. See **Exchange, private manual branch**.

PMOS—P-channel Metal Oxide Semiconductor.

Point of presence (POP)—Since divestiture, the physical access location within a LATA of a long-distance and/or inter-LATA common carrier; the point to which the local telephone company terminates subscribers' circuits for long-distance, dial-up, or leased-line communications.

Point-to-point—Describes a circuit that connects two points directly, where there are generally no intermediate processing nodes, though there could be switching facilities. See **Multipoint; Broadcast**.

Polarization—Property of an electromagnetic wave characterized by the direction of the electric field.

Polling—Means of controlling communications lines. When many stations are connected to the same circuit, polling from the center is used to ensure an orderly flow of data to the central location. An alternative to contention, and makes sure that no terminal is kept waiting for a long time.

POPs—In terms of cellular technology, means the population of a market multiplied by a percentage ownership interest in an entity licensed or designated to receive a license (a licensee) by the FCC to construct or operate a cellular telephone system in the given market.

Port—1) Point of access into a communications switch, a network, or other electronic device. 2) Physical or electrical interface through which one gains access. 3) Interface between a process and a communications or transmission facility.

Portable Cellular Phone—A cellular phone that includes its own power supplies and can be used anywhere there is cellular telephone service. A portable can be carried from one place to another easily and is typically smaller than transportables. Some portables are small enough to fit into a briefcase or pocket. They are generally less powerful than the vehicular mobile phones.

Position—Part of a switchboard normally controlled by an operator or attendant.

POTS—Plain Old Telephone Service.

Power failure—PBX users attempting to cope with commercial power failures have a number of alternatives available, ranging from setting up alternative power sources to arranging for the system to fail gradually. See **Brownout operation**; **Reserve power**; **Uninterruptible Power Supply (UPS)**.

Power failure transfer—If the PBX is incapable of getting enough power, this feature provides service to and/or from the exchange network for a limited number of prearranged stations at the customer location. This feature is not available with DID service. Power failure stations usually have an external button that will establish dial tone during outage.

PPS—Pulses Per Second.

Prefix—Digits that must be dialed to indicate that a call is directed outside the local area.

Preset call forwarding—Incoming calls are routed to a predetermined secondary number.

Primary carrier—Long-distance carrier selected by a subscriber as the first-choice provider of long-distance service. Calls placed through the primary carrier require no additional digits, while calls placed with other carriers require that a five-digit access code be dialed.

Primary center—In international terms, a switching center through which trunk traffic is passed and to which local exchanges are connected; i.e., the equivalent of a class 4 office in the U.S. In the U.S., however, a primary center is defined as a class 3 office and is used for toll switching. See **Class of exchange**.

Primary group—Group of basic signals that are combined by multiplexing; the lowest level of the multiplexing hierarchy. The term is also used for the signal obtained by multiplexing these basic signals, or for the transmission channel that carries it. Also called primary block.

Primary rate interface—In ISDN, the interface to the primary rate CCITT 23B + D, 23 channels + 1 signaling channel. See **Integrated services digital network**.

Priority trunk queuing—Through a customer-chosen preferential trunk access level, this feature places any caller with this or higher level in the class of service assignment ahead of all callers with a lower trunk access level in the queue of callers waiting for the same trunk group.

Privacy and privacy release—All other extensions of a line are incapable of entering a conversation in progress on that line unless the initiating station releases the feature.

Privacy lockout—Automatically splits the connection whenever an attendant would otherwise be included on a call with more than one person. When privacy is provided, the attendant lockout feature is also supplied. A tone warning is generated when the attendant bridges into a conversation in progress.

Privacy override—Activation of a special pushbutton allows the station user to gain access to a given busy line, even though the automatic exclusion facility is engaged by the station using that line.

Private automatic branch exchange (PABX)—See **Exchange, private branch (PBX)**.

Private automatic exchange (PAX)—See **Exchange, private automatic**.

Private branch exchange (PBX)—See **Exchange, private branch**.

Private exchange (PX)—See **Exchange, private**.

Private line—Denotes the channel and channel equipment furnished to a customer as a unit for exclusive use, generally with no access to or from the public switched telephone network. Also called leased line.

Private manual branch exchange—See **Exchange, private manual branch**.

Private network—Network established and operated by a private organization or corporation. Compare with **Public switched telephone network**.

Processing, batch—Method of computer operation in which a number of similar input items are accumulated and sorted for processing.

Processing, line—Processing of transactions as they occur, with no preliminary editing or sorting of them before they enter the system.

PROM—programmable read-only memory.

Propagation delay—Time necessary for a signal to travel from one point on a circuit to another.

Protector—Interface between inside and outside plant providing against hazardous voltages or currents.

Protocol—A collection of rules, voluntarily agreed upon by vendors and users, to ensure that the equipment transmitting and receiving data understands each other. In general, protocols comprise three major areas; the method in which data is represented or coded (e.g., ASCII); the method in which the codes are received (e.g., synchronously or asynchronously); and the methods used to establish control, detect failures or errors, and initiate corrective action. Terminals performing the same functions under different protocols cannot be used on the same system without protocol converters or emulators.

PRX—Program.

PSK—Phase-shift Keying.

PSTN—public switched telephone network.

PTT—Postal, Telegraph, and Telephone organization. Usually a governmental department that acts as its nation's common carrier.

Pty.—Party.

Public switched telephone network (PSTN)—The complete public telephone system, including telephones, local and trunk lines, and exchanges.

Pulse—Brief change of current or voltage produced in a circuit to operate a switch or relay or which can be detected by a logic circuit.

Pulse amplitude modulation (PAM)—See **Modulation, pulse amplitude (PAM)**.

Pulse carrier—Series of identical pulses intended for modulation.

Pulse code modulation (PCM)—See **Modulation, pulse code (PCM)**.

Pulse width modulation (PWM)—See **Modulation, pulse width (PWM)**.

Pulsing—Transmission of address information to an exchange by means of digital pulses. Pulsing methods include multifrequency, rotary dial, and revertive.

Pushbutton dialing—Use of keys or pushbuttons instead of a rotary dial to generate a sequence of digits to establish a circuit connection. The signal form is usually multiple tones. See **Dual Tone Multifrequency (DTMF) signaling**.

Pushbutton dialing to stations—Special attendant console feature in which the switching system is served by rotary dial exchange trunk circuits. A 10-button key set is provided on the console to allow fast dialing of extension numbers in order to complete incoming outside calls.

PWM—pulse width modulation. See **Modulation, pulse width**.

Pwr.—Power.

PX—private exchange. See **Exchange, private**.

Q

Q—Queue.

QOS—Quality Of Service.

Quality Of Service (QOS)—Measure of the performance of a telephone system in terms of the quality of the lines and the amount of call blocking experienced.

Queue—Series of telephone calls, arranged in sequence, the two ends being the head and tail. New calls are added to the tail. Calls can be removed either from the head or tail.

Queuing—1) In telephony, a feature that allows calls to be “held” or delayed at the origination switch while waiting for a trunk to become available. 2) Sequencing of batch data sessions.

R

Rack—Framework or structure on which apparatus is mounted, usually by means of shelves or mounting plates. Also known as a bay.

Radio channel—Frequency band allocated to a service provider or transmitter.

Radio circuit—Physical circuit consisting of two unidirectional radio links and connections to terminal exchanges.

Radio communications—Any telecommunications by means of radio waves.

Radio Frequency (RF)—Describing transmission at any frequency at which coherent electromagnetic energy radiation is possible, usually above 20kHz.

Radio paging—Provides attendant and station user dial access to customer-owned radio paging equipment to selectively tone-alert or voice-page individuals carrying pocket radio receivers. The paged party can answer by dialing an answering code from a station within the PBX system.

Radio paging access with answerback—Allows access to customer-provided paging systems, and provides the capability in PBX to connect the paged party to the paging party when the former answers the radio page by dialing a special code from any PBX telephone.

Radio wave—Electromagnetic waves of frequencies between 20kHz and 3GHz approximately.

RAM—random access memory.

Rate—Charge for a particular service or equipment usage.

Rate averaging—Telephone companies’ method for establishing uniform toll rates based on distance rather than on the relative cost and/or volume of telephone traffic on a given route.

Rate base—Total invested capital on which a regulated company is entitled a reasonable rate of return.

Rate center—Defined geographic point used by telephone companies in determining distance measurements for inter-LATA mileage rates.

Rate of return—Percentage net profit that a telephone company is authorized to earn.

RBHC—Regional Bell Holding Company.

RCL—Recall.

RDT—Recall Dial Tone.

RDY—Ready.

Realtime—1) Pertaining to actual time during which a physical process transpires. 2) Pertaining to an application in which response to input is fast enough to effect subsequent input, as when conducting the dialog that takes place at terminals in interactive systems.

Reasonableness checks—Tests made on information reaching a realtime system or being transmitted from it to ensure that the data in question lie within a given range.

Recall (RCL)—PBX feature allowing a station user engaged in a call to signal the operator, often by a switchhook flash, to enter the conversation.

Recall Dial Tone (RDT)—Stutter, or interrupted, dial tone indicating to a station user that the

switchhook flash has been properly used to gain access to system features.

Receiving Perforator (Reperforator)—Telegraph instrument in which the received signals cause the code of the corresponding characters or functions to be punched in a tape.

Record communication—Communication that produces a hard copy record of the transmission, such as teletypewriter and facsimile.

Recorded announcement service—Special type of access trunk that, when dialed, will connect the caller to a prerecorded message.

Recovery from fallback—When the system has switched to a fallback mode of operation and the cause of the fallback has been removed. This is the process that restores the system to its former condition.

Redundancy—1) Portion of the total information contained in a message that can be eliminated without loss of essential information. 2) Provision of duplicate, backup equipment to immediately take over the function of equipment that fails.

Redundancy check—Automatic or programmed check based on the systematic insertion of components or characters used especially for checking purposes.

Reed switch—Special type of relay consisting of five moving, reed-like contacts controlled by an electromagnet where the reeds themselves are part of the magnet as well as the electrical circuit being controlled.

Regenerative repeater—1) Repeater utilized in telegraph applications to retime and retransmit the received signal impulses and restore them to their original strength. These repeaters are speed and code sensitive and are intended for use with standard telegraph speeds and codes. 2) Repeater used in PCM or digital circuits which detects, retimes, and reconstructs the bits transmitted.

Regenerator—Equipment that takes a digital signal that has been distorted by transmission and produces from it a new signal in which the shape, timing, and amplitude of the pulses are the same as those of the original before distortion.

Regional Bell Holding Company (RBHC)—One of the seven holding companies formed by the divestiture of AT&T to provide both regulated and nonregulated telephone services.

Regional center—See **Class of exchange**.

Register—First unit in the assembly of common control equipment in an automatic exchange. The register receives address information in the form of dial pulses or Dual Tone Multifrequency (DTMF) signals and stores it for possible conversion or translation.

Reinitiation time—Time required for a device or system to restart (usually after a power outage).

Relay—Device, operated electrically, that causes by its operation abrupt changes in an electrical circuit, such as breaking the circuit, changing the circuit connection, or varying the circuit characteristics.

Release with howler—If a phone stays offhook without originating a call, the system transmits a loud tone over the line and then “disconnects” it, ignoring it until it goes on-hook again.

Remote access—PBX feature that allows a user at a remote location to access PBX features by telephone; individual authorization codes are usually required.

Remote maintenance—Feature or service in which a service technician can dial the PBX and be connected, usually through the attendant, to the system processor to test or modify the program.

Remote station lamp field—For use by stations, usually staffed by secretarial personnel, that frequently answer several station lines.

Remote traffic measurement—Traffic and feature usage data transmitted by the system to a distant service technician.

Reorder Tone (RT)—Tone signal placed on a line by the switching equipment to tell the user that an error has been made in dialing the number or selecting a feature, and/or that the call cannot be completed.

Repeater—1) In digital transmission, equipment that receives a pulse train, amplifies it, retimes it, and then reconstructs the signal for retransmission. 2) In fiber optics, a device that decodes a low-power light signal, converts it to electrical energy, and then retransmits it via an LED or laser light source; often including some form of signal amplification. See also **Regenerative repeater**.

Reperforator—See **Receiving Perforator**.

Reperforator/Transmitter (RT)—A teletypewriter unit consisting of a reperforator and a tape transmitter, each independent of the other. It is used as a relaying device and is especially suitable for transforming the incoming speed to a different outgoing speed and for temporary queuing.

Resale carrier—Company that redistributes the services of another common carrier and retails the services to the public.

Reserve power—In case of the failure of a PBX power supply, rechargeable batteries can be added to the system allowing system operation for some length of time—15 minutes to 12 hours—after commercial power has failed. Two different situations can occur: 1) the system has enough power to maintain memory but is incapable of supplying talking voltage and ringing signals, leading to an interruption in services but allowing a fast recovery, and 2) a more adequate reserve power supply will keep the system running during the failure or brownout.

Residual error rate, undetected error rate—The ratio of the number of bits, unit elements, characters, or blocks incorrectly received but undetected or uncorrected by the error-control equipment, to the total number of bits, unit elements, characters, or blocks sent.

Resolution—Measure of the capability of a visual system, e.g., television, facsimile, etc., to reproduce detail. Usually given as resolution along the scanning lines and parallel to the scanning lines, as these two may differ.

Response time—Length of time a system takes to react to a given input. If the message is keyed into a terminal by an operator, and the reply from the computer, when it comes, is typed at the same terminal, response time may be defined as the time interval between the operator pressing the last key and the terminal typing the first letter of the reply.

Restriction services—Allow the attendant to control the restriction of stations or groups of stations. It can be very useful in hotels, for example, to turn off service to room phones during the time between check out and check in of guests.

- **Controlled outward restriction**—Stations can be restricted from making dialed outgoing calls while inward calls are completed normally.
- **Controlled station-to-station restriction**—Originating station calls to other extensions in the system are blocked; however, normal incoming and outgoing calls can be completed.
- **Controlled termination restriction**—Stations can complete outgoing calls normally, but incoming calls are directed to either the attendant or intercept tone.
- **Controlled total restriction**—Restricted lines in this situation cannot make or receive any calls.

Reverse-battery signaling—Type of loop signaling in which battery and ground are reversed on the tip and ring of the loop to give an off-hook signal, when the called party answers.

Reverse charge call—Call in which the caller specifies that the charge should be paid by the called party. Also called collect call.

RF—Radio Frequency.

RFI—Radio Frequency Interference.

RFP—Request For Proposal.

Ring—1) Ring-shaped contact of a plug usually positioned between, but insulated from, the tip and sleeve. 2) Audible alerting signal on a telephone line.

Ring again—The PBX remembers the last number called by a station and will redial it when the feature is activated. Also called last number dialed.

Ringback tone—See **Ringtone**.

Ringdown—To gain the attention of an operator, a ringing current is applied to a line to operate a device producing a steady signal.

Ring key—Key whose operation causes the sending of a ringing current.

Ring signal—Any AC or DC signal transmitted over a line or trunk for the purpose of alerting a party at the distant end of an incoming call. The signal can operate a visual or sound-producing device.

Ringtone—Tone received by the calling telephone indicating that the called telephone is being rung.

Ring transfer—Provides for designated bells in a group of stations to ring for incoming calls. Ringing transfer allows additional sets of bells to be designated, with the user controlling which set is to ring.

Ring network—Network topology in which each node is connected to two adjacent nodes to form a continuous ring configuration. Used particularly in the context of local area networks.

RIP—Routing Information Protocol.

RO—Receive-only.

Roaming—A feature that allows a cellular telephone subscriber to use the cellular phone service outside of a home service area.

ROH—Receiver Off-Hook (permanent signal).

ROM—read-only memory.

Room cutoff—Allows guest telephones to be restricted from outgoing calls when the room is unoccupied (hotel checkout). This feature is activated on an individual station basis from the front desk.

Room status—Provides room status indication from hotel console, with optional printer, for the following conditions:

- Room vacant,
- Room occupied,
- Room reserved,
- Message registration data,
- Message waiting,
- Wake-up, and
- Do not disturb.

Rotary dial calling—System that will accept dialing from conventional rotary dial sets, which generate pulses although pushbutton (DTMF) dial sets offer faster calling and greater reliability.

Rotary output to exchange—Many systems are equipped to provide pushbutton dial service in all areas. In cases where the telephone exchange trunks are not designed to accept tone signaling, the system will translate the number entered by a station in tones into rotary dial pulses that can be processed by the exchange.

Route advance—Variation of Automatic Route Selection that allows the caller to select the first-choice trunk group. If that group is busy, the system will attempt to place the call over alternate trunk groups. Unlike ARS, translation is not provided. If ARS is available, Route Advance is generally unnecessary.

Router—A sophisticated, protocol-specific device that examines data and finds the best route for it between sender and receiver. Selects the cheapest, fastest, or least-busy of all available routes.

Routers are preferable to bridges for large networks with relatively low bandwidth connections.

Routing—Assignment of the communications path by which a message or telephone call will reach its destination.

Routing code—Address, or group of characters, in the heading of a message defining the final circuit or terminal to which the message has to be delivered. Also called routing indicator.

Routing Information Protocol (RIP)—a TCP/IP protocol that supports the exchange of information between hosts and gateways.

Routing table—Table associated with a network node that states for each message (or packet) destination the preferred outgoing link that the message should use.

RPQ—Request for Price Quotation.

RS-232-C—EIA-specified physical interface, with associated electrical signaling, between data circuit-terminating equipment (DCE) and data terminal equipment (DTE); the most commonly employed interface between computers and modems.

RS-422-A—EIA specification for electrical characteristics of balanced-voltage digital interface circuits.

RS-423-A—EIA specification for electrical characteristics of unbalanced-voltage digital interface circuits.

RS-449—EIA specification for general-purpose, 37-position and 9-position interface for data terminal equipment (DTE) and data circuit-terminating equipment (DCE) employing serial binary data interchange. RS-449-1 includes Addendum 1.

RT—1) Reperforator/Transmitter. 2) Reorder Tone.

RTNR—Ringing Tone No Reply.

S

Satellite communications—Use of geostationary orbiting satellites to relay transmissions from one sending earth station to another, perhaps multiple other, earth stations.

SCA—Short Code Address.

Scattering—Cause of lightwave signal loss in optical fiber transmission. Diffusion of a light beam caused by microscopic variations in the material density of the transmission medium.

Schematic—Diagram that details the electrical elements of a circuit or system.

SCPC—Single Channel Per Carrier.

Scrambler—Coding device applied to a digital channel that produces an apparently random bit sequence. A corresponding device is used to decode the channel; i.e., the coding is reversible.

Screening—Prevention of electric, magnetic, or electromagnetic fields from escaping or entering an enclosed area by means of a barrier. Also called (U.S. term) shielding.

SDLC—Synchronous Data Link Control. IBM communications line protocol providing for full-duplex transmission; associated with IBM's Systems Network Architecture (SNA).

SECAM—Sequential Couleur à Mémoire. Color television broadcasting system using 625 picture lines and a 50-Hz field frequency, in which the two color-difference signals are transmitted sequentially instead of simultaneously. Developed and used in France, also used in the Soviet Union. See also **NTSC** and **PAL**.

Secretarial intercept—Call forwarding of executives' telephones to a secretary/receptionist who can take messages.

Sectional center—See **Class of exchange**.

Selective calling—Capability of the transmitting station to specify which of several stations on the same line is to receive a message.

Selective paging to station—An originating station is capable of paging to specific individual station instruments.

Selective ringing—System designed with the capability of ringing only the desired subscriber's telephone on a multiparty line. Ringers tuned to one of five possible frequencies are used to achieve this effect.

Self-test and fault isolation—Most systems include a processor-check capability that allows the controlling computer to test itself and the rest of the system. If a fault is found, an alarm light is lit and a message is given on the system printer teletype, if one is provided. This feature also expedites service since the computer can pinpoint faulty equipment, saving diagnostic time.

Sender—Device that receives address information from a register or routing information from a translator and then outputs the proper routing digits to a trunk or to local equipment. Sender and register functions are often combined in a single unit.

SER—Satellite Equipment Room; wiring closet.

Serial transmission—Method whereby the bits of a character are sent sequentially on a single transmission channel. See also **Parallel transmission**.

Series call—Operator arranges for a call to return to the console after the extension it was connected to hangs up. Lets the attendant easily connect a caller with a series of inside extensions without the risk of losing the call. Also called serial call.

Service bureau—Company that processes various types of data for a client for a fee: SMDR and call-costing reports are typically provided.

Service code—One or more digits dialed by a customer to access services such as directory inquiries or operator assistance.

Service order—Request to a telecommunications vendor or carrier for service or equipment.

Service terminal—Equipment needed to terminate the channel and connect to the station apparatus or customer terminal.

Serving area—1) Region surrounding a broadcasting station where signal strength is at or above a stated minimum. 2) Geographic area handled by a telephone exchange, generally equivalent to a LATA.

Severely Errored Seconds (SES)—Any second with more than 1544 bit errors.

SF—single frequency.

Shared tenant service—See **Tenant service**.

SHF—super high frequency.

Shielded pair—Two insulated wires in a cable wrapped with metallic braid or foil to prevent interference and provide noise-free transmission.

Shielding—See **Screening**.

Short Code Address (SCA)—Those few digits allocated to any frequently dialed number, which when dialed are translated by the exchange into the required full number. See also **Abbreviated dialing**.

SHT—Short Holding Time. See also **Holding time**.

Sideband—Frequency band on either the upper or lower side of the carrier frequency within which fall the frequencies produced by the process of modulation.

Sidetone—Reproduction in a telephone receiver of sounds picked up by the associated microphone. The microphone can pick up either the voice of the speaker or the room noise.

Signal—Aggregate waves propagated along a transmission channel and intended to act on a receiving unit.

Signaling—Process by which a caller or equipment on the transmitting end of a line informs a particular party or equipment at the receiving end that a message is to be communicated.

Signal-to-Noise Ratio (SNR)—Ratio, expressed in dB, of the usable signal to the noise signal present in a transmission.

Simple Network Management Protocol (SNMP)—A protocol recommended by the IETF for managing TCP/IP networks, internet-worked LANs, and packet switched networks; most commonly employed using TCP/IP protocols.

Simplex circuit—Circuit permitting the transmission of signals in one specified direction only.

Single Channel Per Carrier (SCPC)—Transmission system in which a physical channel is allocated solely to one carrier for the duration of the transmission.

Single-digit dialing—Provides for single-digit dialing to reach a preselected group of stations. A variation of speed dialing, it also helps reduce the need for key systems by replacing the intercom function.

Single-sideband transmission—To make efficient use of the frequency band available, the carrier and the unwanted sideband of an amplitude-modulated wave can be filtered out so that only the sideband that contains all the information is transmitted.

Sleeve—Third contacting part on a telephone plug preceded in the location by the tip and ring.
2) The sleeve wire is the third control wire of each telephone in an automatic switching office.

SLIP—Serial Line Internet Protocol.

SMDR—Station Message Detail Recording (See also **AMA**, **CDR**.)

SMDS—See **Switched Multimegabit Data Service**.

SMT—Station Management; that portion of the Fiber Distributed Data Interface (FDDI) standard that governs physical layer network management.

SNMP—See Simple Network Management Protocol.

SNR—signal-to-noise ratio.

Software-Defined Network (SDN)—Also known as Virtual Private Networks, SDNs use the carrier's public telephony network to provide the network functions of private lines. Users can design, change, and manage a national network without investing in capital equipment of managing switches and leased lines. AT&T, MCI, and US Sprint all offer SDNs.

SONET—See Synchronous Optical Network.

SOP—Standard Operating Procedure.

Source Routing—Technique used in LANs in which the source of the frame specifies the route that the frame has to follow; the source furnishes a routing information field that designates the entire route to the destination.

Space—Opposite signal condition to a "mark." A space impulse is equivalent to a binary 0, a mark is equivalent to a binary 1. In a neutral circuit, it causes the loop to open or causes the absence of a signal, while in a polar circuit it causes the loop current to flow in a direction opposite to that for a mark impulse.

Space-diversity reception—To reduce the effects of fading and attenuation, a radio signal is received at more than one site, the sites being separated by a few wavelengths. The signals are then combined, selected, or both.

Space-division switching—Method for switching circuits in which each connection through the switch takes a physically separate path.

SPC—Stored Program Control.

Spcl.—Special.

Speakerphone—Telephone device that has a speaker-microphone unit allowing hands-free conversation. Also called speakerset.

Spectrum—Continuous range of frequencies, usually wide in extent, within which waves have some specific common characteristics.

Speech circuit—Circuit designed for the transmission of speech, either analog or encoded, but which can also be used for data transmission or telegraphy.

Speed dialing—Feature that enables a PBX or PBX station to store certain telephone numbers and dial them automatically when a short (one-, two-, or three-digit) code is entered. Also called speed calling.

Split access to outgoing trunks—Provides two separate trunk groups for direct outward dialing. The groups can be accessed by dialing the same trunk access code.

Splitting—Permits the operator to consult privately with one party on a call without the other party's hearing.

SSB—single sideband. See **Single-sideband transmission**.

SSN—Switched Service Network.

ST—Start (signal to indicate end of outpulsing).

Standard—A document that recommends a protocol, interface, type of wiring, or some other aspect of a network. It may even recommend something as general as a conceptual framework or model (for instance, a communications architecture). Standards are developed by internationally or nationally recognized standards bodies or vendors. So-called “de facto standards” are widely used vendor-developed protocols or architectures, such as IBM's Systems Network Architecture (SNA).

Standby central control—Second control computer that can be provided to direct PBX operations if the primary one fails.

Start-stop (signaling)—Signaling in which each group of code elements corresponding to an alphabetical signal is preceded by a start signal that serves to prepare the receiving mechanism for the reception and registration of character, and is followed by a stop signal that serves to bring the receiving mechanism to rest in preparation for the reception of the next character.

Station—One of the input or output points of a communications system—e.g., the telephone set in the telephone system or the point where the business machine interfaces the channel on a leased private line.

Station busy lamps—Individual lamps located on the station instrument, providing a visual indication of each station in the system that is busy on an internal call.

Station busy override—Indicates that preselected stations have the facility to “preempt” busy circuits and override a private conversation.

Station call transfer—Station user can transfer incoming exchange calls to another station within the system without the need for attendant assistance.

Station camp-on—Stations can camp on to a busy extension; the called station is usually notified of the camp-on by a special signal.

Station Direct Station Selection (DSS)—Station user is able to place a call to any one of a given number of preselected station lines within the PBX system by depressing a single push button on the station or on the auxiliary push-button miniconsole that is associated with each station number included in the arrangement.

Station equipment—Hardware located at a network station. Telephone examples include rotary-dial and push-button telephones, key telephones, speakerphones, and IVDTs.

Station forced busy—Facility that allows a station user to “busy out” the station for temporary periods of time by dialing a special code.

Station hunting—Routes a call to an idle station line in a prearranged group when the called station line is busy.

Station Message Detail Recording (SMDR)—Processor-generated records of all calls originated and/or received by a PBX system.

Station message registers—Message unit information is centrally recorded on a per-station-line basis for each completed outgoing local call made by the station user. Most systems provide for surcharges on station usage and automatically reset the counter after readout.

Station message waiting—A “message waiting” light on a station activated by either a button on another station or by a dialed code to the PBX. This feature can alert hotel guests to messages waiting at the front desk, or office workers to messages taken while they were out.

Station monitoring—Allows selected stations to monitor any other stations within the system.

Station override security—On an individual station-line basis, designated stations can be “shielded” against the executive busy override facility that is being used by another station.

Station rearrangement and change—Allows the customer to move stations, change the features and/or restrictions assigned to a station, administer features associated with electronic telephones, and perform search routines on individual stations in order to identify the services provided for that station. Station rearrangements and changes are made on a per-line basis.

Station tone ringing—Electronic tone ringer or small loudspeaker that transmits an oscillator-created tone.

Station-to-station dialing—System feature that allows calling between stations by direct dialing without the need for operator assistance in call completion.

Station transfer security—If a trunk call is transferred from one station to another and the second station does not answer within a predetermined time interval, the trunk call is automatically rerouted to the attendant console.

Status information—Information about the logical state of a piece of equipment.

Step call—Allows the attendant or station user, upon finding that the called station is busy, to call a nearby idle station by dialing a single additional digit when the nearby station number has only a different last digit.

Step-by-step switch (SXS)—Switch that moves in synchronism with a pulse device such as a rotary telephone dial. Each digit dialed causes the movement of successive selector switches to carry the connection forward until the desired line is reached.

Stop element—Last bit of a character in asynchronous serial transmission, used to ensure recognition of the next start element.

Store and forward—Applied to communications systems in which messages are received at intermediate routing points and recorded (stored). They are later retransmitted to a further routing point or to the ultimate recipient.

Stored Program Control (SPC)—In processor-controlled switching systems, instructions are held in the form of a program in an electrically alterable store, allowing additions and changes to functions to be made simply by altering the programs.

Straightforward outward completion—Operator can place an outgoing call for the station user, either by dialing “0” or by an intercept arrangement, without requiring the station user to hang up and redial the operator.

STS-1—The basic SONET logical building block signal. The transmission rate is 51.84M bps.

STS-n—This signal is created with byte interleaving of “N” STS-1 signals together. The transmission rate is “N” times the STS-1 rate of 51.84M bps.

STS-Nc—Concatenated synchronous transport signal level N. An STS-N line layer signal combining the STS envelope capabilities from the “N” STS-1s forming an STS-Nc synchronous payload envelope, which is transported as a single entity.

STS envelope capacity—The total bandwidth within the STS frame carrying the STS synchronous payload envelope (SPE). Total bandwidth is the combination of “N” STS-1s required to carry an STS-Nc SPE.

STS POH—STS path overhead. Starting with the first byte of an STS SPE, nine evenly distributed bytes per 125 microseconds. The STS POH provides the communication from the creation of an STS SPE to its disassembly.

STS PTE—STS path terminating equipment. Network devices which multiplex and demultiplex the STS payload. These devices can originate, terminate, and modify the STS POH as required to transport the STS payload.

STS Payload capacity—The maximum bandwidth of an STS SPE.

STS synchronous payload envelope—A generic term referring to both STS-1 SPEs and STS-Nc SPEs, which represents a 125-microsecond frame structure composed of STS POH and STS payload capacity.

Stunt box—1) Device to control the nonprinting functions of a teletypewriter terminal, such as a carriage return and line feed. 2) Device to recognize line control characters.

STX—start-of-text (of message).

Subscriber line—Telephone line connecting the exchange to the subscriber’s station. Also called (U.S. term) access line and subscriber loop.

Subvoice grade channel—Channel with bandwidth narrower than that of voice grade channels. Such channels are usually subchannels of a voice grade line.

Super high frequency (SHF)—Denotes frequencies from 3GHz to 30GHz.

Supergroup—Assembly of five 12-channel groups occupying adjacent bands in the spectrum, for the purpose of simultaneous modulation or demodulation; i.e., 60 voice channels.

Superservers—Multiprocessor machines designed as network servers, combining I/O capabilities of minicomputers with the capability of running industry-standard network operating systems.

Supervised station release—Station that is “off-hook” (that is, the user has not dialed, or is connected to a busy signal for more than a predetermined time interval) is automatically routed to the attendant console.

Supervision—Process of detecting a change of state between idle and busy conditions on a circuit.

Supervisory control—Characters or signals that automatically actuate equipment or indicators at a remote terminal.

Supervisory lamp—Lamp illuminated during a call and indicating to an operator the status of the call.

Supervisory programs—Computer programs designed to coordinate, service, and augment the machine components of the system, and coordinate and service application programs. They handle work scheduling, input/output operations, error actions, and other functions. Also known as operating systems.

Supervisory signal—1) Signal that indicates whether a circuit is in use or that gives an indication of status or change of status in a telephone system. 2) Signal used to indicate the various operating states of circuit combinations.

Switch—A device that makes, breaks, or changes the connections in an electrical circuit; to shift

to another electrical circuit by means of a switch. In the telecommunications industry, the term *switch* is often used as a synonym for a PBX or a Central Office switch.

Switchboard—Equipment on which manual connections are made by operators or attendants; a PBX.

Switched loop operation—Attendant position is arranged so that each call requiring attendant assistance is automatically switched to one of several switched loops in position. Normally, the call automatically releases from the position when answered by the called station (released loop operation). Incoming calls are queued in the order of arrival when all attendant positions are busy and are switched to each attendant position automatically to distribute the call load evenly to each attendant. A console lamp indication is normally given to the attendant when calls are waiting in the queue to be served.

Switched Multimegabit Data Service (SMDS)—A packet-switching data service that provides wide area data transport speeds up to 45 megabits per second. SMDS offers group addressing, connectionless transport, and strict packet delay objectives.

Switched Service Network (SSN)—Network consisting of terminals, transmission links, and at least one exchange, on which any user can communicate with any other user at any time.

Switchhook—Switch on a telephone set, associated with the structure supporting the receiver or handset, and often used to signal the switching equipment or an attendant during a call, e.g., to transfer the call.

Switching—Establishment of transmission path from a particular inlet to a particular outlet of a group of such inlets and outlets.

Switching center—Location that terminates multiple circuits and is capable of interconnecting circuits or transferring traffic between circuits.

Switchover—When a failure occurs in the equipment, a switch can occur to an alternative component.

SXS—step-by-step switch.

Synchronous—Having a constant time interval between successive bits, characters, or events.

Synchronous network—Network in which all the communications links are synchronized to a common clock.

Synchronous Optical Network (SONET)—A North American carrier standard developed by Bell-core that works within the digital hierarchy. SONET-based products offer public-carrier connection of widely distanced LANs at native LAN speeds and are now available from AT&T, Northern Telecom, and others. Offered in basic building blocks of 50M bps, SONET services allow users to construct a single bit stream of up to 13 billion bits in bandwidth.

Synchronous transmission—Timing is achieved by transmitting sync characters prior to data. It does not use such redundant information as the start and stop bits in asynchronous transmission to identify the beginning and end of characters, and is thus faster and more efficient.

T

T carrier—Time-division multiplexed digital transmission facility, operating at an aggregate data rate of 1.544M bps and above.

T-Carrier Services—High-speed, private-line digital transmission services that provide large-volume transmission between two stations. T1, the most common T-carrier service, operates at an aggregate data rate of 1544M bps and consists of 24 separate channels. (T2 and T3 are rated at 6.312M bps and 44M bps, respectively.) T1 channels are 6 to 30 times more cost-effective on a per-bit basis than voice grade lines, but users must be able to fill the 1.544M bps channel to take full advantage of savings. **Fractional T services**, however, enable businesses to lease a fraction of a T line.

T,R—1) Tip, Ring. 2) Transmit and Receive.

TAAS—Trunk Answer from Any Station.

Talking battery—DC voltage supplied by the exchange to the subscriber's loop to operate the carbon transmitter in the handset.

Talking path—In a telephone circuit, the transmission path consisting of the tip and ring conductors.

Tandem exchange—Exchange that serves to switch traffic between other exchanges when direct trunks are not available. Also called tandem office.

Tandem switching—Switching of circuits between exchanges only.

Tandem tie line switching—PBX permits tie lines to "tandem" through the switch. This means that an incoming tie line call from the distant PBX receives a dial tone instead of automatically connecting with the operator. The outgoing line can be a local trunk or another tie line that links a third system.

Tandem trunk—Circuit between a tandem exchange and an exchange.

Tariff—Published rate for a specific communications service, equipment, or facility that constitutes a contract between the user and the communications carrier or supplier.

TAS—Telephone Answering Service.

TASI—Time-Assignment Speech Interpolation.

TAT—Transatlantic Telephone cable.

TCM—Traveling Class Mark.

TCP/IP—See **Transmission Control Protocol/Internet Protocol**.

TDF—Trunk Distribution Frame. See **Main distributing frame**.

Tdm.—Tandem.

TDM—time-division multiplexing.

TDMA—time-division multiple access.

Telco—Telephone company.

Telecommunications—Any process that permits the passage of information from a sender to one or more receivers in any usable form (printed copy, fixed or moving pictures, visible or audible signals, etc.) by means of any electromagnetic system (electrical transmission by wire, radio, optical transmission, waveguides, etc.). Includes telegraphy, telephony, video-telephony, data transmission, etc.

Telegram—Hard copy information, whether in written, printed, or pictorial form, sent to the general telegraph service for transmission and delivery to the addressee.

Telegraph channel—Transmission media and intervening apparatus involved in the transmission of telegraph signals between two terminal sets or two intermediate telegraph installations.

Telegraphy—Branch of telecommunications concerned with processes providing reproduction, at a distance, of written, printed, or pictorial matter or the reproduction at a distance of any kind of information in such form.

Telephone Answering Service (TAS)—Private concern that answers telephone calls and takes messages for a large number of different people and organizations. Because the called number is identified on a special console, the answering service attendant can answer each call as if he or she were actually on the called party's premises.

Telephone channel—Transmission path designed for the transmission of signals representing human speech, or other telephone communication (e.g., facsimile) requiring the same bandwidth. The bandwidth allotted is usually 64K bps, but can be reduced to 32K or even 16K bps with multiplexing techniques.

Telephone circuit—Electrical connection permitting the establishment of a telephone communication in both directions between two points. Also called telephone line.

Telephone exchange—Switching center for interconnecting the lines that terminate therein. Also called Central Office.

Telephone frequency—Any frequency within that part of the audiofrequency range essential for the transmission of speech of commercial quality, i.e., 300 to 3000 Hz.

Telephone receiver—Device within the handset that converts electrical energy into sound energy and designed to be placed next to the ear.

Telephony—Generic term describing voice telecommunications.

Teleprinter—See **Teletypewriter**.

Teleprocessing—Form of information handling in which a data processing system utilizes telecommunications facilities.

Teletex—Service enabling correspondence on an automatic memory-to-memory basis over telecommunications networks. Intended to be complementary to, and to interwork with, telex and data communications services. Information is transmitted in page format to be either displayed on a VDU or used to produce hard copy.

Teletext—Broadcast service for text and graphics transmitted within the standard television signal and requiring a special receiver. Information can be displayed in place of, or superimposed on, the normal program material.

Teletypewriter (TTY)—Start-stop apparatus comprising a keyboard transmitter, together with a printing receiver.

Telex—1) Dial-up telegraph service enabling its subscribers to communicate directly and temporarily among themselves by means of start-stop apparatus and of circuits of the public telegraph network. The service operates worldwide using Baudot equipment.

Telex II—See **TWX**.

TELNET—a TCP/IP service that supports a virtual terminal interface (terminal emulation) to remote computers.

Temporary station disconnection—Allows the attendant to completely remove selected stations from total service at any time on a temporary basis.

Tenant service—Two or more closely located customers can simultaneously be served by the same PBX equipment. Each customer is provided with separate attendant facilities, dedicated trunk facilities, and separate feature and class of service complements. It is often provided by the owner of an office building to the tenants.

10BASE-2—10M bps baseband network.

10BASE-T—Subset of Ethernet IEEE 802.3, which describes transmission on unshielded twisted pair.

10BROAD-36—Broadband 10M bps network running over thick coaxial cable.

Terminal—1) Point at which information can enter or leave a communications network. 2) Any device capable of sending or receiving information over a communications channel.

Test center—Facility that receives customer trouble reports, tests communications lines and equipment, and can dispatch repair technicians.

Test desk—Switchboard equipped with testing apparatus, so arranged that connections can be made from it to telephone lines or exchange equipment for testing purposes. Also called test board.

Text—The part of the message that contains the substantive information to be conveyed. Sometimes called “body” of the message.

TFTP—Trivial File Transfer Protocol; a TCP/IP protocol that supports rudimentary file transfer

over User Datagram Protocol (UDP). TFTP lacks security controls.

TGB—Trunk Group Busy.

TGW—Trunk Group Warning.

Thin Ethernet—Flexible cable useful in connecting PCs, workstations, and systems arranged in a workgroup; supports segment distances up to 185 meters.

Three-way conference transfer—By depressing the switchhook, a user can dial another extension and either 1) hang up and transfer call, 2) get information from the called party and then resume the first call, or 3) bridge all three parties together for a three-way conference.

Throughput—Total useful information processed or communicated during a specified time period.

Tie line (TL)—Private-line communications channel of the type provided by communications common carriers for linking two or more points together, typically PBXs. Also called tie trunk.

Tie trunk access—Allows the system to handle tie lines that can be accessed either by dialing a trunk group access code or through the attendant. Tie lines link a PBX or a distant key system.

Time-Assignment Speech Interpolation (TASI)—Specialized switching equipment that connects a party to an idle circuit while speech is taking place, but disconnects the party when speech stops, so that a different party can use the same circuit. During periods of heavy traffic, TASI can improve line efficiency from 45 percent to 80 percent.

Time-division multiplexing (TDM)—Means of obtaining a number of channels over a single path by dividing the path into a number of time slots and assigning each channel its own intermittently repeated time slot. At the receiving end, each time-separated channel is reassembled.

Time-division multiple access (TDMA)—

Communicating devices at different geographical locations share a multipoint or broadcast channel by means of a technique that allocates different time slots to different users.

Time-division signaling—Signaling over a time-division multiplex system in which all voice channels share a common signaling channel, with time division providing the separation between signaling channels.

Time-division switching—Switching method for TDM channel requiring the shifting of data from one slot to another in the TDM frame. The slot in question can carry a bit; a byte; or, in principle, any other unit of data.

Timed recall—The PBX can be instructed to place a call at a designated time. When the time comes, the PBX rings the station. When the station answers, the call is placed automatically.

Timed recall on outgoing lines—Outgoing trunk calls can be automatically transferred to the attendant after a selected time interval. A warning tone is sent to the calling party several seconds before the transfer takes place.

Timesharing—Method of operation in which a computer facility is shared by several users for different purposes at (apparently) the same time. Although the computer actually services each user in sequence, the high speed of the computer makes it appear that the users are all handled simultaneously.

Tip—Contacting part at the end of a telephone plug or the top spring of a jack. The conductors associated with these contacts. The other contact is called a ring.

TL—tie line.

TLF—Trunk Link Frame (crossbar switching).

TLP—Transmission Level Point. Any point in a transmission system at which the power level of the signal is measured.

Toll call—Call outside the local exchange area, charged at toll rates.

Toll center—Class 4/primary telephone exchange where time- and distance-based toll charge information is collected.

Toll connecting trunk—Trunk used to connect a Class 5/local exchange to the long-distance network.

Toll restriction—Blocking a telephone user's access to the toll network.

Toll terminal access—Allows guest stations to access toll calling trunks. These can be direct dial or operator access depending on the servicing public exchange office.

Tone ringing—Either a steady or oscillating electronic tone is provided at the station instrument to provide incoming calls with audible signaling. Also called tone calling.

Tone signaling—Transmission of supervisory, address, and alerting signals over a telephone circuit by means of tones.

Tone-to-dial-pulse conversion—Converts DTMF signals to dial pulse signals when the trunks associated with outgoing trunk calls are not equipped to receive tone signals. Auxiliary dial pulse conversion equipment is not necessary.

Touch-Tone—Registered AT&T trademark for push-button dialing. See **Dual Tone Multifrequency (DTMF) signaling**.

Trace packet—In packet switching, a special kind of packet that functions as a normal packet but causes a report of each stage of its progress to be sent to the network control center.

Traffic—1) Messages sent and received over a communications channel. 2) Quantitative measurement of the total messages and their length, expressed in hundred call seconds (CCS) or other units.

Traffic data to customer—Customer can poll switching locations on a daily or hourly basis to

obtain traffic measurements, including usage and overflow data. Summary reports, exception reports, and complete traffic register outputs can be obtained.

Traffic flow—Measure of the density of traffic, expressed in Erlangs.

Traffic matrix—Matrix of which the X,Y element contains the amount of traffic originated at node X and destined for node Y. The unit of measurement could be calls or packets per second, for example, depending on the kind of network.

Traffic monitor—PBX feature that provides basic statistics on the amount of traffic handled by the system.

Traffic overflow—Occurs when traffic flow exceeds the capacity of a particular trunk group and is automatically switched over to another trunk group.

Traffic Service Position System (TSPS)—Stored-program computer with telephone operator consoles permitting calls needing operator intervention to be handled as efficiently as possible.

Transceiver—Device that can transmit and receive traffic.

Transducer—Device for converting signals from one form to another, such as a microphone or a receiver.

Transfer, all calls—Allows the station to make one transfer of an outside line to another internal station.

Translation—When using automatic route selection or trunk-to-trunk connection features, the PBX can add or delete area codes and toll access digits from number codes, and toll access digits from numbers so that the call will be handled properly by the switching network.

Translator—Device that converts information from one system of representation into equivalent information in another system of representation. In telephone equipment, it is the device that converts dialed digits into call routing information.

Transmission—Sending information in the form of electrical signals over electric wires, waveguides, or radio.

Transmission Control Protocol/Internet Protocol (TCP/IP)—A protocol suite for networking and internetworking that occupies the middle layers (3 and 4) of the OSI Reference Model. TCP/IP ensures that packets of data are delivered to their destination in the sequence in which they were transmitted. It was originally developed for the U.S. Department of Defense (DOD) for all government and military contracts. TCP/IP has achieved commercial success as a replacement for the still-to-be-developed middle layer ISO/OSI protocols.

Transmobile—A transportable cellular phone (standard three-watt mobile unit) without an external battery pack. It draws its power from the vehicle's battery.

Transparency—If a signal passes through a network or facility unchanged, that network or facility is said to be transparent to it.

Transponder—Receiver-transmitter combination that retransmits the received signal greatly amplified and at a different frequency. Communications satellites usually contain several transponders.

Transportable phone—Contains its own power supply, but can also receive power from other sources. The transportable can be used anywhere there is cellular telephone service. (See **Portable Cellular Phone**.)

Traveling Class Mark (TCM)—When Automatic Route Selection (ARS) or uniform numbering/automatic alternative routing selects a tie trunk to a distant tandem PBX, the traveling class mark is sent over the tie trunk. It is then used by

the distant system to determine the best available facility consistent with the user's calling privileges. The TCM indicates the restriction level to be used based on the station, trunk, or attendant originating the call or the authorization code, if dialed.

TRFR—Transfer.

Trunk—Transmission paths that are used to interconnect exchanges in the main telephone network. Also, a telephone exchange line that terminates in a PBX.

Trunk Answer from Any Station (TAAS)—Night service facility activated by the attendant, whereby incoming calls, normally directed to the attendant, activate a common alerting signal on the customer's premises. These calls can be answered by dialing a special single digit from non-restricted stations.

Trunk code—Code consisting of one or more digits used to designate a called numbering plan area.

Trunk group—Those trunks that connect two points, both of which are exchanges and/or individual message distribution points and both of which use the same multiplex terminal equipment. Also, a discrete group of trunk lines with a specific function in a PBX.

Trunk Group Busy (TGB) indication on attendant position—Light associated with a trunk group, activated when all lines in the group are busy. This allows the attendant to easily monitor the status of the system and its line.

Trunk Group Warning (TGW) indication on attendant position—Provides the attendant with a visual indication when a certain number of trunks in a trunk group are busy.

Trunk reservation—Attendant can hold a single trunk in a group and then extend it to a specific station.

Trunks, direct termination—Each incoming or combination trunk appears on a key at a console or at a jack position on a cord switchboard and

the attendant is always in full visual supervision of the status of all such circuits.

Trunk-to-tie trunk connections—Capability of the switching system to provide the attendant with the capability of extending an incoming exchange call to a tie trunk that terminates within the system.

Trunk-to-trunk connections, attendant—Provides attendant capability to make all types of trunk connections.

Trunk-to-trunk connections, station—Station already in connection with an incoming or outgoing trunk is capable of using the consultation hold and add-on conference circuitry to effect a conference with another circuit or with another trunk.

Trunk-to-trunk consultation—Allows a station connected to an outside trunk circuit to gain access to a second outside trunk circuit for “outside” consultation; however, no conference capability is available with this feature.

Trunk Verification by Customer (TVC)—Provides the attendant or station user with access to individual lines in a trunk group to check their condition.

TSPS—Traffic Service Position System.

Tst.—Test.

TTN—Tandem Trunk Network. Private network making use of tandem switching.

TTY—teletypewriter.

Turnaround time—Actual time required to reverse the direction of transmission from send to receive or vice versa on a half-duplex circuit.

Turnkey system—Complete communications system, including hardware and software, assembled and installed by a vendor and sold as a total package.

TVC—Trunk Verification by Customer.

TVS—Trunk Verification by Station. See **Trunk Verification by Customer**.

Twisted pair—Two insulated wires twisted together but not covered with an outer sheath.

Two-party station service—PBX system with two internal stations and with selective ringing to each.

Two-way splitting—Attendant is able to consult privately with either party (internal or external) on a call.

Two-wire circuit—Circuit formed of two conductors insulated from each other, providing send and return channels in the same frequency.

TWX—teletypewriter exchange service, now known as Telex II (Western Union).

TXK—Telephone Exchange, Crossbar. See **Crossbar switch**.

TXS—Telephone Exchange, Strowger. See **Step-by-step switch (SXS)**.

T1—Digital carrier facility used to transmit a DS1 formatted signal at 1.544M bps.

T1C/T2/T3/T4—Digital carrier facilities used to transmit signals at 3.152M, 6.312M, 44.746M, 274.176M bps, respectively.

U

UCD—uniform call distribution.

UG—underground.

UHF—ultrahigh frequency.

Ultrahigh frequency (UHF)—Portion of the electromagnetic spectrum ranging from about 300MHz to about 3GHz. The frequency band includes television and cellular radio frequencies.

Unbalanced-to-ground—With a two-wire circuit, condition in which the impedance-to-ground on

one wire is measurably different from that on the other. Compare with **Balanced-to-ground**.

Uniform call distribution (UCD)—Allows calls coming in on a group of lines to be assigned stations as smoothly as possible so that all stations can handle similar loads. Most call distribution systems also provide for a queuing of incoming calls with the longest holding time presented for service first.

Uniform numbering plan—Permits station users at a PBX to place calls over tie trunks using a uniform dialing plan.

Uniform-spectrum random noise—Noise distributed over the spectrum in such a way that the power-per-unit bandwidth is constant. Also called white noise.

Uninterruptible power supply (UPS)—Usually includes an inverter, drawing its power from batteries, which generates an extremely “well-behaved” AC power signal for a PBX or other equipment. The UPS cost is related to the amount of power needed and the length of time it must operate during a failure. If a particularly heavy demand is anticipated, the system can be coupled with an auxiliary generator that is started when commercial power is interrupted.

Unlisted number—Telephone number that is not listed in the telephone directory, and not provided by directory-assistance operators. There is usually an additional charge to the subscriber for the deletion from the directory.

Unrestricted extension—PBX extension permitted to make exchange line calls without the assistance of the PBX operator.

UPS—uninterruptible power supply.

User Datagram Protocol (UDP)—A connectionless protocol in the TCP/IP suite that can be used instead of TCP.

USITA—United States Independent Telephone Association.

USOC—Uniform Service Order Code.

UTP—unshielded twisted-pair wiring; standard telephone wiring.

V

VA—volt-ampere.

VAC—volts, alternating current.

Vacant code intercept—Routes all calls made to an unassigned “level” (first digit dialed) to the attendant, a busy signal, a “reorder” signal, or a recorded announcement.

Vacant number intercept—Usually routes all calls of unassigned numbers to the attendant or a recorded announcement.

Value-added common carrier—Company that sells services of a value-added network. It can be a PTT or subsidiary or an independent company.

Value-added network (VAN)—Network built using the communications offerings of traditional common carriers, but connected to computers that permit new types of telecommunications tariffs to be offered. Enhancements to the network can include services ranging from database access and electronic mail to realtime market information and reservation systems.

VAN—value-added network.

VDC—volts, direct current.

VDT—1) video display terminal. 2) visual display terminal.

VDU—visual display unit. See **VDT**.

Very high frequency (VHF)—Portion of the electromagnetic spectrum with frequencies between about 30MHz and 300MHz. Operating band for radio and television channels.

Very low frequency (VLF)—Refers to frequencies below 30kHz.

Very Small Aperture Terminal (VSAT)—An earth station with a small antenna, usually six meters

or less. Used in conjunction with orbiting satellites for point-to-multipoint data networks, they have dramatically lowered the cost of satellite communications.

VF—voice frequency.

VHF—very high frequency.

Video signal—Signal comprised of frequencies normally required to transmit pictorial information (1MHz to 6MHz).

Videotex—Information system broadcast over the public switched telephone network and received on adapted television receivers. Users can interact with the system to select the pages of information required. Also called viewdata.

Virtual circuit—Proposed CCITT definition for a data transmission service in which the user presents a data message for delivery with a header of a specified format. The system delivers the message as though a circuit existed to the specified destination. One of many different routes and techniques could be used to deliver the message, but the user does not know which is employed.

Virtual Private Network—See **Software-Defined Network**.

Virtual storage—Computer that appears to have a much larger memory than its real memory. Accomplished by software that moves pages rapidly in and out of a high-speed, random-access storage device.

Visually impaired attendant service—Achieved by augmenting the normal visual signals provided on a standard attendant position with special tactile devices and/or audible signals that enable a visually impaired person to operate the position.

VLF—very low frequency.

VLSI—very large scale integration. See also **LSI**.

Voice digitization—Conversion of an analog voice into digital symbols for storage or transmission.

Voice frequency (VF)—Any frequency within that part of the audio frequency range essential for the transmission of speech of commercial quality; i.e., 300 to 3000 Hz. Also called telephone frequency.

Voice grade—Telecommunications link with a bandwidth (about 3kHz) appropriate to an audio telephone line.

Voice grade channel—Telecommunications circuit used primarily for speech transmission but suitable for the transmission of analog data, digital data, or facsimile. It typically supports a frequency range of 300 to 3400 Hz. Also called voice band.

Voice message service—Provides the ability for a station user to access an optional voice message recording facility and leave a message for a particular station user.

Voice messaging system—Also called voice mail and, incorrectly, voice processing systems, voice messaging systems are hardware and software products that operate with most PBX, hybrid, or key telephone systems, allowing users to send, receive, and redirect voice messages through office telephone systems and computers. Voice messaging hardware includes a central processor, analog-to-digital converters, disk storage, and input/output ports.

Voice paging access—Allows attendants and station users the ability to have dial access to customer-provided loudspeaker paging equipment.

Voice processing systems—Those hardware and software products that encompass voice messaging, voice recognition, voice response, and any other applications that deal with the processing of voice communications.

Voice Store-and-Forward system (VSF)—Processor-controlled system that allows voice messages to be created, edited, sent, stored, and forwarded. Users access and operate the system by means of any 12-button dialpad, in response to voice prompts from the system.

VSF—Voice Store-and-Forward system.

VT envelope capacity—Bandwidth that is part of the VT superframe and available for the VT synchronous payload envelope.

VT group—A 108-byte structure that carries one or more VTs of the same size.

VTx-Nc—Concatenated virtual tributary. A set of VTs combining the VT envelope capabilities from the “N” VTxs forming a VTx-Nc synchronous payload envelope, which is transported as a single entity.

VT payload capacity—The maximum bandwidth within the VT SPE that is available to transport a payload.

VT POH—VT path overhead. One path overhead byte per 500 microseconds, beginning at the first byte of the VT-SPE. The VT POH provides communication from the point of VT-SPE creation to its disassembly.

VT PTE—VT path terminating equipment. Network devices that multiplex and demultiplex the VT payload. VT PTEs can create, terminate, and modify the VT POH as required to transport the VT payload.

VT SPE—VT synchronous payload envelope. A 500-microsecond frame structure carried by the VT. It provides VT POH and bandwidth for transporting payloads.

VT superframe—An organized 500-microsecond superframe structure overlaid on a 125-microsecond STS-1 SPE. Within this structure are the VT payload pointer and the VT SPE.

W

WAN—wide area network.

WATS—Wide Area Telephone Service.

Waveguide—Transmission path in which a system of boundaries guides electromagnetic energy. The most common of these are hollow metallic

conducting tubes (microwave communications) or rods of dielectric material. See also **Fiber optic waveguides**.

Wide Area Telephone Service (WATS)—Telephone company service allowing reduced costs for certain telephone call arrangements. This can be In-WATS, or 800-number service, where calls can be placed to a location from anywhere at no cost to the calling party, or Out-WATS, where calls are placed out from a central location. Cost is generally based on hourly usage per WATS circuit and on distance based on zones, or bands, to which or from which calls are placed.

Wideband channel—Channel wider in bandwidth than a voice grade channel.

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

Wireless communications—Transmission of voice and/or data over the airwaves. Encompasses technologies such as satellite, microwave, cellular, paging, cordless telephones, two-way radio, etc.

Wireless LANs—Local area networks based on low-power radio transmission; some Wireless LANs transmit over lasers or infrared networks.

Workstation—A powerful microcomputer that features a sophisticated graphical user interface (GUI) and the processing power of a minicomputer.

World numbering plan—CCITT numbering plan that divides the world into nine zones. Each zone is allocated a number that forms the first digit of the country code for every country in that zone. The zones are as follows:

- (1) North America,

- (2) Africa,
- (3 and 4) Europe,
- (5) South America,
- (6) Australia,
- (7) USSR,
- (8) North Pacific (Eastern Asia), and
- (9) Far East and Middle East.

Wtng.—Waiting.

X

X.25—CCITT recommendation that specifies the interface between user data terminal equipment (DTE) and packet-switching data circuit-terminating equipment (DCE).

Xbar—Crossbar.

XD—Ex-directory (XD). Refers to a subscriber number that is not listed in a printed directory. Also called “unlisted number.”

Xfr.—transfer.

Xmit.—transmit.

XNS—Xerox Network System.

X/OPEN—Consortium of vendors working toward advancements in the employment of the UNIX.

Y

Yellow Alarm—An alarm condition that occurs on a T1 line under the following conditions: D4 format—when, starting with bit 2, every eighth bit of 256 or more consecutive channels is a zero; ESF format—a pattern in which eight ones are followed by eight zeros.

Z

Zip tone—Short burst of dial tone to the headset of an ACD agent, indicating that a call is being connected to the agent console. ■

