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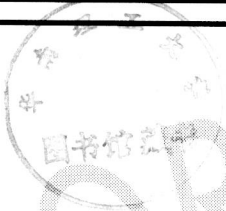- **Covers Enterprise-Wide Networking, Local Area Networking, and Communications Terms**

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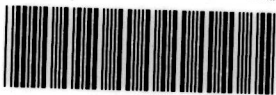# Networking and Communications Desk Reference

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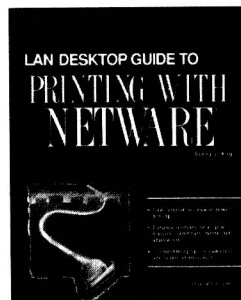# Hardware and Networking Information
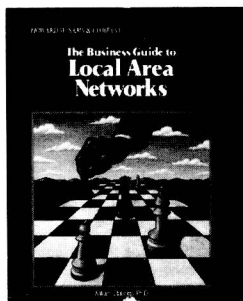
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Introduction

In a sense, we wrote this book for ourselves. In our combined 50+ years of experience in the communications field, we have always had to search a large number of sources to find the answers to our questions. So many times we have said "Wouldn't it be nice to have all of this information in one place." When Sam's gave us the opportunity to do just that, we jumped at the chance.

The *Networking and Communications Desk Reference* is designed to serve two audiences. Newcomers to the communications field will find the glossary of terms, particularly the acronyms, very useful. Communications acronyms are usually very frustrating for anyone new to the field and they can be confusing to us oldtimers, too. Some acronyms like ATM and CASE have several meanings, further adding to the frustration and confusion. At last count, this book defines close to 400 of the common communications acronyms.

The communications professional will find this book valuable for its appendixes as well as the formulas provided in term definitions. We have tried to include in the appendixes numerous tables and charts that will answer practical questions for the professional who is analyzing and designing networks.

How It Came Together

We have devoted a lot of time to covering many of the subfields of communications and networks. Particular effort was focused on local area networks, wide area networks, telephony, signaling, radio, television, and microwave communications.

This book started out as a dictionary of telecommunications. Our team scanned hundreds of books, periodicals, brochures, standards documents, government publications, advertisements and other forms of information. From these sources and our collective experience, we developed a long list of terms to be included in this book. During this process, it became apparent to us that the book should include other types of information that would be useful to the telecommunications practitioner. Thus, the appendixes were born and the dictionary became the desk reference.

The term list was reviewed for coverage and relevance. Terms were added, terms were deleted and many interesting discussions ensued. The fields of telecommunications, electrical engineering and computer science are so closely intertwined that a considerable amount of overlap in terms is unavoidable. Some terms were eliminated because they were too product specific. Other product terms were included because of their prominence. These decisions we made mostly on the basis of our judgment and we apologize in advance if we slighted someone or a particular company.

The definitions for the terms were developed in the same framework. Many terms that started out as product specific have migrated into common use and interpretation (e.g., AT&T's Software Defined Networks). Other terms have multiple interpretations depending on the subfield (e.g., data set). We have tried to steer a middle course in defining these terms either by giving multiple definitions or by giving what we consider the most popular definition.

This book represents our initial effort to create a reference work that would prove to be a valuable resource to communications professionals. While the book represents a considerable amount of effort and covers a large area of communications, there is still more material we could have provided. Our publication schedule, however, defined when we were forced to exit our word processors and ship the copy. Our publisher assures us that there will be space in the next edition for the material that did not make it into this one. We have already begun to collect new terms, acronyms, and appendix material. We would like to encourage our readers to submit terms and/or subject areas that they would like to see covered. Suggestions can be e-mailed over the Internet to:

sochats@lis.pitt.edu

or

jim@lis.pitt.edu

or via regular mail addressed to

Ken Sochats or Jim Williams
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Where Do We Go From Here

We would also like to thank the crew at Prentice Hall Computer Publishing. Thanks go to Gregg Bushyeager and Steve Poland for showing enough faith in our abilities to sign us to do this book; Seta Frantz and again Gregg Bushyeager for their developmental expertise; Nancy Albright and Howard Peirce for their adept translation of our pseudo-English; and finally, anyone else who had a hand in making this book a reality.

The authors would also like to thank Black Box Corporation for providing most of the photographs used in this book. Black Box is a major supplier of telecommunications and computer equipment and may be reached at:

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All terms mentioned in this book that are known to be trademarks or service marks have been appropriately capitalized. Sams cannot attest to the accuracy of this information. Use of a term in this book should not be regarded as affecting the validity of any trademark or service mark.

Contents

abandon call timer   In telephone equipment with automatic dialing features, a timer that instructs the equipment to discontinue attempts to complete an unanswered call. *See* Figure A-l.
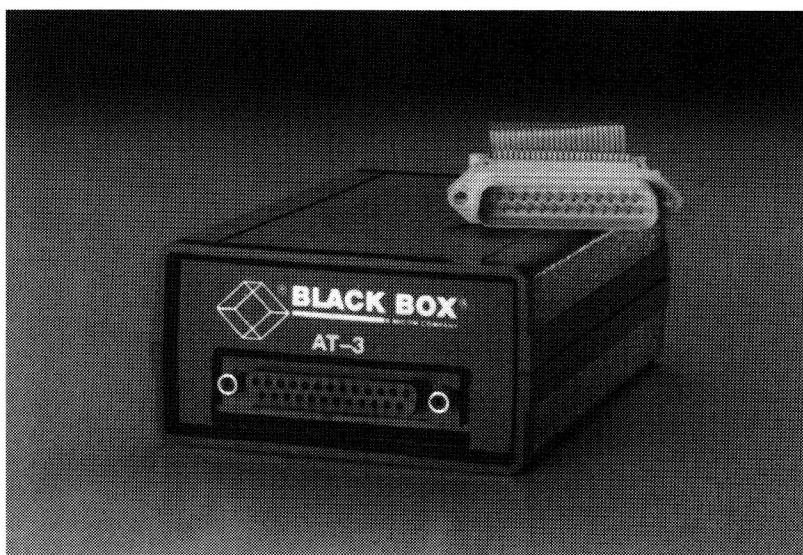

Figure A-1   *An abandon call timer.* Reproduced by permission, BLACK BOX Corporation, Pittsburgh, PA. ©Copyright 1991. All rights reserved. Printed in the USA.

ABATS   *See* automatic bit access test system.

ABC   *See* American Broadcasting Company.

ABM   *See* asynchronous balanced mode.

absolute bandwidth   The range of frequencies to which a system or device responds or transmits. *See also* effective bandwidth.

absorption   In fiber optic transmission, the attenuation of the light signal by the medium. Absorption is analogous to resistance in electrical systems.

abstract syntax notation (ASN)   A syntax structure used to define the syntax of the protocol data units generated by a protocol entity.

A-B switch   **1.** In data communications, a device that permits a communications line to be connected to one of two other lines. Switches of this type for connecting a line to one of three other lines (A-B-C switches) or four lines (A-B-C-D switches) and other configurations are common. *See* Figure A-2. **2.** In cellular telephony, a switch that directs a mobile phone to operate on one of two frequencies.
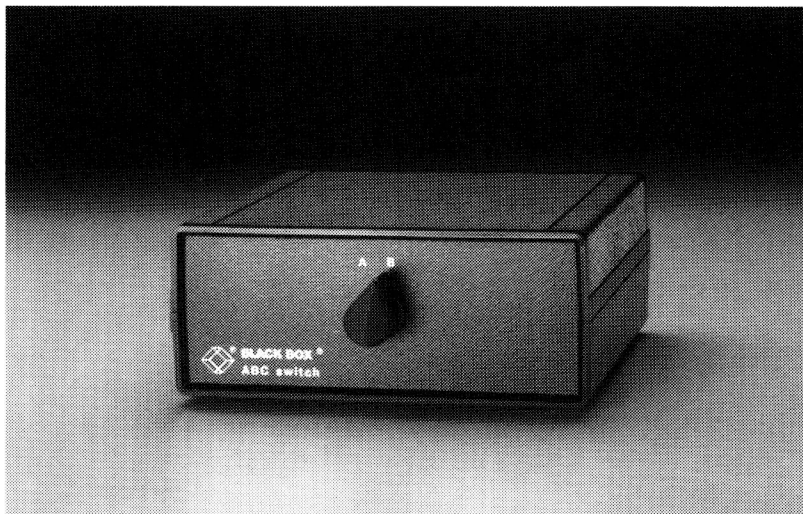

Figure A-2   *An A-B switch. Reproduced by permission, BLACK BOX Corporation, Pittsburgh, PA. ©Copyright 1991. All rights reserved. Printed in the USA.*

AC   *See* alternating current.

access code   A password, identification number, or sequence that identifies and/or authenticates a user to a system or network. The user then gains privileges to perform certain functions on the system.

access control list (ACL)   A mechanism used by DEC systems to control access to objects within and across networked computer systems. Objects may refer to programs, data files, directories, etc.

accessibility   An informal measure of the effort required to use a system or network. One aspect of accessibility concerns the number, placement, and physical access to terminal devices. Another deals with the procedures necessary to use the system.

access interface device   A device that connects a terminal to a network. It may take the form of a circuit card that fits in the terminal device or a stand-alone unit such as a controller.

access method   **1.** In telecommunications systems, a technique for allowing a terminal device to gain control of the medium. The two general classes of access methods are contention and noncontention (centralized control). **2.** In database/file systems, a technique for retrieving data from a file. The three primary types of file access methods are sequential, indexed sequential, and direct (sometimes referred to as random access).

access point   A location in a network, usually a node, where attachment facilities to a network are provided.

access protocol, LAN   A technique by which a station gains control over a local area network medium. Examples are token passing and contention techniques.

access time   The average time that it takes from the beginning of the request for a network access to the receipt of the first bit of the transmission.

accounting management   The set of functions that collect, maintain, and report information about the users and use of network resources. It is useful for determining such information as usage pattern, resource utilization, and billing.

account network management program (ANMP)   A software tool that supports the collection, maintenance, and reporting of information about network users and resources.

Accunet   A series of digital data communication services offered by AT&T that uses T1 and T2 circuits. These services include a switched 56-kilobit service, a packet service, a T1 service, and a T1.5 Service.

ACCUNET Packet Service   A packet-switched digital data transmission service offered by AT&T.

accuracy   A measure of the correctness of data. Percent accuracy is the number of correct bits received divided by the total number of bits sent times one hundred.

ACD   *See* automatic call distribution.

ACF   *See* Advanced Communication Function.

ACF/NCP   *See* Advanced Communication Function/Network Control Program.

ACF/TCAM   *See* Advanced Communication Function/Telecommunication Access Method.

ACF/VTAM   *See* Advanced Communication Function/Virtual Telecommunication Access Method.

ACF/VTAME   *See* Advanced Communication Facility/Virtual Telecommunication Access Method-Entry.

ACK (Acknowledgment)   A character in several communications codes that is used in communications protocols to signify positive acknowledgment of the error-free receipt of a message.

ACK0   A character/byte used in the BISYNCH transmission protocol that indicates a positive acknowledgment. ACK0 and ACK1 are sent alternatively to allow the sender to detect whether the receiver has missed a message.

ACK1   A character/byte used in the BISYNCH transmission protocol that indicates a positive acknowledgment. ACK0 and ACK1 are sent alternately to allow the sender to detect whether the receiver has missed a message.

Acknowledgment, bit-oriented protocols   A method of acknowledgment using sequence numbers and a poll/final bit so that acknowledgment can be done for multiple frames instead of a frame at a time. The sender and receiver each keep a sequence count of the messages sent and received. As long as the sequence counts match between sender and receiver, it is assumed that no error has occurred. When the sender turns on the poll/final bit, it indicates to the receiver that a response is required. The receiver sends an

acknowledgment frame with its sequence count which is compared by the original sending station with its expected sequence count. If they match, the transmission sequence is assumed to have been performed correctly.

ACL *See* Access Control List.

acoustical modem A modem designed to transmit data over the telephone system. An acoustical modem has cups which fit over the mouthpiece and earpiece of a standard telephone handset. The modem transmits and receives using audio tones that are modulated using frequency-shift keying.

acoustic coupler *See* acoustical modem.

acoustic data Sound waves in the range of human hearing (20 Hz-20 kHz).

ACS *See* asynchronous communications server.

ACSE *See* association control service element.

active converter A device that converts EIA-RS232-D signals to DEC423 signals.

active hub In the TCP/IP protocol suite, the protocol used to determine the point of attachment address of a host to a network in order to obtain its corresponding internet address.

active rack An equipment rack in a satellite equipment room that contains active equipment (requires an external power source, for example).

active relay node A node that acts as a relay for messages that arrive, but whose destination is another node on the network. These are sometimes called routing nodes.

actuator In manufacturing networks, the component or assembly of components that directly control the motion capabilities of equipment, such as a robotic arm. An example is a motor that converts signals received from a computer to an actual movement of an entity such as a conveyor belt.

ACU *See* autocall unit.

Ada A programming language developed for the Department of Defense and used as the standard programming language for all DOD projects.

adapter In a communication system, a device that acts as an interface between components with dissimilar characteristics, such as electrical voltage. An example is a line adapter.

adaptive delta modulation (ADM)   A method of modulation wherein only the changes in a signal are used to encode information for transmission.

adaptive differential pulse code modulation   A method of pulse code modulation wherein only the difference between signal samples is coded.

adaptive equalization   A modem feature that permits it to compensate for or adapt to changes in signal distortions on a communications line automatically.

adaptive routing   A routing technique that has the capability of changing or developing a route while the transmission of a message is in progress. The route is generally modified in response to traffic congestion, device or line failures, or some other local network condition. Also referred to as dynamic routing.

adaptive routing update time   The amount of time that elapses between the sending of updated routing information by network nodes required for adaptive routing algorithms.

ADCCP   *See* advanced data communication control procedure.

A-D conversion   *See* analog-to-digital conversion.

added-digit framing   An extra character used to frame a transmission in terms of signifying its beginning and/or end.

ADDMD   *See* administrative directory management domain.

add-on conference   A telephone system feature that allows a subscriber to add a third party to a call in progress.

address   A sequence of bits or characters that is used to identify a network device or set of devices. A device usually has a unique address which differentiates it from other devices. It may also have group addresses, to which a number of devices may respond. A broadcast address is reacted to by all the devices in a system.

address field   An area of a block, frame, token, message, packet, or other communication entity that has been reserved to contain an address. *See* Figure A-3.

address resolution protocol (ARP)   In the TCP/IP protocol suite, the protocol used to determine the point of attachment address of a host to a network in order to obtain its corresponding internet address.
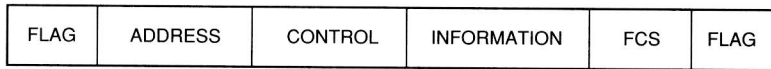
FLAG	ADDRESS	CONTROL	INFORMATION	FCS	FLAG

Figure A-3 *An address field in an HDLC frame.*

addressability   The capability of uniquely identifying and having the ability to communicate with a particular network entity.

ad hoc videoconference   An ad hoc video presentation broadcast to a select number of sites.

ADM   *See* adaptive delta modulation.

ADMD   *See* administrative management domain.

administration   The process of controlling, directing, coordinating, reporting, and organizing the resources in a network.

administrative directory management domain (ADDMD)   In the CCITT X.400 electronic mail specification, a public directory of the domains in a network.

administrative management domain (ADMD)   The portion of the mail exchange administered by the public agency, such as a telephone company in the X.400 standard. The other domain is a private domain, such as a corporate email system.

ADPCM   *See* adaptive differential pulse code modulation.

Advanced Communication Function (ACF)   An IBM communications software product that interfaces a host to other network resources.

Advanced Communication Function/Network Control Program (ACF/NCP)   An IBM communications product that interfaces with an SNA network access method in a host processor in order to control communication across the network. It controls the physical functions of network circuits, such as data transmission, and includes bit assembly/disassembly, polling, routing, code translation, and error recovery.

Advanced Communication Function/Telecommunication Access Method (ACF/TCAM)   An IBM communications product which provides an interface between a host processor and other network objects using the Telecommunication Access Method (TCAM).