

## Appendix A: References

(For a list of current references, refer to the AFDLO Home Page – <http://www.au.af.mil/afdlo>)

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University of Idaho, Guide #10, Distance Education: Research, January 1996

## Attachment A: Air Force ISD Documents

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AFPD 36-22	Military Training
AFI 36-2201	Developing, Managing, and Conducting Military Training
AFI 36-2301	Professional Military Education
AFMAN 36-2234	Instructional Systems Development
AFMAN 36-2236	Handbook for Air Force Instructors
MIL-PRF-29612	Training Data Products
MIL-HDBK-29612-1	Department of Defense Handbook, Guide for Acquisition of Training Data Products and Services
MIL-HDBK-29612-2	Department of Defense Handbook, Instructional Systems Development/ Systems Approach to Training and Education
MIL-HDBK-29612-3	Department of Defense Handbook, Development of Interactive Multimedia Instruction (IMI)
MIL-HDBK-29612-4	Department of Defense Handbook, Glossary of Training Terms
AF Manual 36-2234	Instructional Systems Development
AF HDBK 36-2235	Information for Designers of Instructional Systems
	Volume 1, Executive Summary
	Volume 2, ISD Automated Tools/What Works
	Volume 3, Application to Acquisition
	Volume 4, Manager's Guide to New Education and Training Technologies
	Volume 5, Distance Learning and Instructional Technology Handbook
	Volume 6, Guide to Needs Assessment
	Volume 7, Design Guide for Device-based Aircrew Training
	Volume 8, Application to Aircrew Training
	Volume 9, Application to Technical Training
	Volume 10, Application to Education
	Volume 11, Application to Unit Training
	Volume 12, Test and Measurement Handbook

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### **Other DoD and AF Publications Pertinent to Distance Learning**

DoDI 1322-20, <i>Development and Management of Interactive Courseware for Military Training</i>	
AFI 36-2201, <i>Training</i>	AETCI 36-2208, <i>Job Site Training</i>
AFCAT 36-2223, <i>AF Catalog of Formal Schools</i>	AETCI 36-2209, <i>IMI Development</i>

## Attachment B: Abbreviations

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2 AF	Second Air Force
ADL	Advanced Distributed Learning
ADS	Advanced Distributed Simulation
AFCAT	Air Force Catalog
AFCFM	Air Force Career Field Manager
AFDLO	Air Force Distance Learning Office
AFPATS	Air Force Primary Aircrew Training System
AFRC	Air Force Reserves Command
AFTMS	Air Force Training Management System
AI	Artificial Intelligence
AIV	Analog Interactive Video
ANG	Air National Guard
ASCII	American Standard Code for Information Exchange
ASE	Advanced Synthetic Environments
ATN	Air Technology Network
AU	Air University
AV	Audiovisual
BNCC	Base Network Communications Center
CAI	Computer-Assisted Instruction
CAT	Computer Adaptive Testing
CBI	Computer-Based Instruction
CBT	Computer-Based Training
CD-I	Compact Disc Interactive
CD-ROM	Compact Disc-Read-Only Memory

CMC	Computer-Mediated Communication
CMI	Computer Managed Instruction
CODEC	COder/DECoder
COTS	Commercial Off-the-Shelf
CPU	Central Processing Unit
DAVIS	Defense Audio Visual Information System
DFAD	Digital Feature Analysis Data
DHTML	Dynamic Hyper Text Markup Language
DIS	Distributed Interactive Simulation
DISN	Defense Information Services Network
DIV	Digital Interactive Video
DL	Distance Learning
DoD	Department of Defense
DOS	Disk Operating System
DTIS	Defense Technical Information Service
DVD	Digital Video Disc
DVI	Digital Video Interactive
EBB	Electronic Bulletin Board
EC	Electronic Classroom
ECI	Extension Course Institute
EPME	Enlisted Professional Military Education
EPSS	Electronic Performance Support System
ET	Embedded Training
FEA	Front-End Analysis
GETN	Government Education and Training Network
GMT	General Military Training

IBI	Internet-Based Instruction
IBT	Internet-Based Training
ICAI	Intelligent Computer-Assisted Instruction
ICW	Interactive Courseware
IETM	Interactive Electronic Technical Manual
IGR	Instructor-Guided Review
IMI	Interactive Multimedia Instruction
IMS	Instructional Management System
IOE	Integrated Operational Environment
IPR	In-Process Review
IPS	Interactive Performance Systems
ISD	Instructional Systems Development
ISP	Internet Service Provider
IT	Instructional Technology
ITS	Intelligent Tutoring Systems
ITV	Interactive Television
IVT	Interactive Video Teletraining
JPA	Job Performance Aid
JPEG	Joint Picture Expert Group
KSA	Knowledge, Skills, and Attitudes
LAN	Local Area Network
LC	Learning Center
M&S	Modeling and Simulation
Mb	Megabyte
Mbps	Megabits per second
MHz	Megahertz

MIL	Mediated Interactive Lecture
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
OJT	On-the-Job Training
OMT	On-Board Maintenance Training
PDU	Packet Data Unit
PEDD	Portable Electronic Display Device
PLV	Production Level Video
POA&M	Plan of Action and Milestones
PQS	Personal Qualification Standards
PSS	Performance Support System
PST	Performance Support Tools
QC	Quality Control
ROI	Return On Investment
RTV	Real Time Video
SEN	Satellite Education Network
SME	Subject Matter Expert
SRU	Student Response Unit
SSS	Staff Summary Sheet
SVGA	Super Video Graphics Adapter
TRADOC	Training and Doctrine Command
VRML	Virtual Reality Markup Language
VRAM	Virtual Random Access Memory
VTC	Video Teleconferencing
VTT	Video Teletraining
WAN	Wide Area Network

WBI	Web Based Instruction (Browser Based)
WWW	World Wide Web
XML	Extensible Markup Language

## Attachment C: Definitions

### ***Advanced Distributed Learning***

A DoD initiative to promote widespread collaboration, exploit Internet technologies, develop next generation learning technologies and create reusable content, and lower costs, with object-based tools.

### ***Air Force Catalog of Formal Schools (AFCAT)***

The AFCAT is a listing of nearly all formal courses offered within the AF. The AFCAT is a formal publication that is updated semiannually. Its publication number is AFCAT 36-2223.

### ***Air Force Distance Learning Office***

The focal point for implementation of distance learning policy and emerging distance learning technologies within the Air Force. It is located at Maxwell Air Force Base.

### ***Air National Guard (ANG)***

A wartime mobilization force providing personnel and aircraft to augment the active duty forces.

### ***Air Technology Network (ATN)***

The Air Force education and training interactive TV network. Created in 1992 to broadcast the newly-required acquisition courses, ATN has expanded to four uplink sites at Wright-Patterson, Maxwell, Sheppard and Keesler Air Force bases with more than 80 downlink receive sites typically located at base education offices and five sites within AFRC. The system uses 1-way video, 2-way audio over a compressed digital video signal, along with a terrestrial audioconferencing system that permits interaction with all participants. Combined with ANG's Warrior Network, the Air Force can reach almost 300 sites within the US and Europe.

### ***Analog***

Information, such as video and audio, that is recorded and stored in a continuously variable form similar to its source: information that is not digital.

### ***Appended Systems***

Embedded Training systems appended, or strapped on to operational equipment.

### ***Asynchronous***

Transmission which does not occur simultaneously with the audio and video associated with the broadcast. Computer Based Training (CBT) and traditional correspondence courses would be considered to operate in the asynchronous mode.

### ***Audio Bridge***

Specialized equipment that permits several telephone lines to be joined together in a conference call.

### ***Audioconferencing***

Instruction delivered by two-way voice communication.

### ***Audioconferencing Unit***

A stand-alone microphone that provides a means for students to provide verbal feedback to the instructor.

### ***Audio Conferencing System (ACS)***

ACS uses ordinary phone lines for transmitting voice for multipoint, synchronous interaction. It allows for a free and open exchange instructor-to-student and student-to-student. The ACS includes microphones, and a speaker and sound mixer unit, and is the interactive part of interactive video teletraining.

***Audiographics***

Two-way audio and two-way computer data exchange.

***Bandwidth***

Capacity of a communications channel. The frequency width needed to transmit a communications signal without excessive distortion. The more information contained in a signal, the more bandwidth it requires for distortion-free transmission. For digital transmission, generally measured in kilobits (kbps) or megabits per second (Mbps). The higher the compression, the greater the loss of resolution and fluidity of motion. But, the higher the compression, the lower the bandwidth requirements, and consequently, the lower the cost of transmission.

***C-Band***

A type of satellite transmission with less path loss than other satellite standards such as Ku-Band. C-Band, however, requires a relatively large antenna. C-Band frequencies are shared with terrestrial microwave transmissions, which cause interference with weaker satellite signals.

***Coaxial Cable System***

Thinnet (10 Base T2) cable, similar to TV cable. 10 Base T-5 is a thicker cable that permits computers to be farther apart.

***CODEC***

Coding-decoding equipment used to convert and compress analog video signals into a digital format for two-way video transmission, then convert them back to analog signal upon reaching their destination. Codecs may also be configured as send-only and receive-only, and be used to transfer a terrestrial signal to a broadcast satellite, or vice versa.

***Collective Training***

Training conducted with a team, crew, or group.

***Compressed Digital Video (CDV)***

Compressed Digital Video (CDV) is a signal coding technology used to compress the bandwidth required for the transmission of video images by eliminating redundant information within or between video frames; also called data compression, bandwidth compression, or bit rate reduction. The higher the compression, the lower the bit transmission rate. Terrestrial VTC network (desktop to large-screen monitors) use a variety of compression rates beginning at 56 kbps (low resolution, less than full motion) to 1.5Mbps (intermittently full-motion, broadcast-quality video). Satellite broadcast systems allow for the use of full-motion, broadcast-quality video. It is common to see rates of transmission of 3 to 20 Mbps. ATN uses 3.3 or 6.6 Mbps. This compression rate gives full-motion with a resolution quality that is very nearly that of normal analog broadcasting. At 3.3 Mbps, you may notice some image skipping when there is a lot of motion. While most ATN broadcasting is done at 3.3 Mbps, ATN can broadcast at 6.6 Mbps when it is necessary to eliminate all such skipping. The costs of transmission, however, double for 6.6 Mbps.

***Computer Assisted Instruction (CAI)***

A term referring to courses delivered using a personal computer and includes floppy disks, CD-ROMs, and Internet-delivered courseware.

***Computer Based Instruction (CBI)***

The same as computer assisted instruction.

***Computer Based Training (CBT)***

The same as computer assisted instruction.

***Compact Disk-Read Only Memory (CD-ROM)***

A disc designed to hold up to 600 MB of data in a digitized format. Because it is “read only,” users cannot alter or write over the data on the CD making it very popular with courseware developers.

***Compression Rate***

The figure used to estimate the number of hours of instruction required to conduct an existing resident course if converted to the given technology.

***Compression Software***

Compresses digital video for storage and transfer using CODECs (COder/DECoder) algorithms.

***Computer-Managed Instruction (CMI)***

Interactive Courseware (ICW) component that enables student record-keeping.

***Computer-Mediated Conferencing (CMC)***

Another way of conferencing using the personal computer and telephone lines as the communication vehicles. It provides instructor-student and student-student interaction in both an asynchronous and synchronous mode.

***Constructed Model or Simulation***

Models and simulations that involve simulated people operating real systems.

***Course Director/Manager***

The person responsible for the development of an instructional sequence. This person often serves as the primary presenter.

***Digital***

The representation of information as discrete numbers; in contrast with analog information, represented as a continuously variable signal.

***Digital Video Disc (DVD)***

An electronic storage and read-only medium with 5 to 50 gigabits of storage space.

***Distance Learning (DL)***

Distance learning is defined as “Structured learning that takes place without the physical presence of the instructor.” With this definition, the Air Force includes correspondence courses, satellite broadcasts, videotape and computer-based instruction or any combination thereof.

***Distance Learning Classroom; same as Electronic Classroom (EC)***

Any location where learners can receive instruction electronically from a remote or local instructor. An EC can include Student Stations, Instructor Stations, Presentation Monitors, Audiovisual Equipment, and Telecommunications Equipment. Electronic communication with the EC can include Television, Satellite, Internet, Commercial Education and Training Networks, and Military Education and Training Networks.

***Distance Learning Office POC***

The term used by MAJCOMs and others to describe the individual responsible for administering distance learning programs within an organization.

***Downlink***

A location where equipment receives a satellite or ground based signal(s) for display on video, audio, or data receiving equipment. Normally, a downlink includes a room equipped for display of satellite signal(s) through a TV monitor and permits occupancy by 15 to 50 people.

***E-Mail***

An electronic delivery system used to send digital messages over the Internet/Intranet to contact and collaborate with other individuals.

***Electronic Classroom (EC); same as Distance Learning Classroom***

Any location where learners can receive instruction electronically from a remote or local instructor. An EC can include Student Stations, Instructor Stations, Presentation Monitors, Audiovisual Equipment, and Telecommunications Equipment. Electronic communication with the EC can include Television, Satellite, Internet, Commercial Education and Training Networks, and Military Education and Training Networks.

***Electronic Management Tools***

Computer programs that can aid in the instructional process.

***Electronic Performance Support System (EPSS)***

Just-in time ICW designed to enable learners to gain access to large amounts of information, provide tutorial ICW and ICAI, and provide advice and coaching through a user-friendly interface.

***Electronic Testing***

A general term used to encompass all methods for applying computers in the assessment and reporting of human knowledge, skills, and attitudes. It is also known as Computer Adaptive Testing (CAT).

***Embedded Training***

A training capability which is designed into or added onto operational equipment.

***Encoder***

A hardware device that transforms analog video signal into digital form. One encoder is used for each channel broadcast. ATN, as well as the rest of GETN, uses the CLI Spectrum Saver encoder; as many as six can be used simultaneously on a single uplink.

***Exportable Training***

Training that is sent out or 'exported' to a field location; also referred to as Type 6 training. See Distance Learning.

***Extension Course Institute (ECI)***

The Air Force's correspondence school for military subjects ranging from general courses to specific career areas.

***Facilitator***

(See instructional facilitator)

***Fax Conferencing***

Electronic data transfers between individuals over telephone networks using facsimile equipment or over the Internet using fax modems.

***Fiber Optic Cable System***

Consists of fine fibers of glass. Conducts light (photons) instead of electricity (electrons). Able to transmit audio, video, and data signals on the same cable.

***Formative Evaluation***

Provides information about the effectiveness of products and processes as they are being developed. Performed periodically from initial ISD planning throughout the development phase; can include small-group tryouts of instructional components; used to validate design of individual components of the instructional system for integration. Objective is to identify deficiencies early, when revision is least expensive.

***Government Education & Television Network (GETN)***

GETN is a network of government networks. It was conceived by AFIT in the interest in interagency distance learning. AFIT had its digital network added to the GSA and Defense Information Systems Agency (DISA) contracts. Now, all agencies using the FTS2000-DSCF contract can join the Air Force on a single, interoperable satellite network. Currently, GETN includes 17 Federal agencies that reach over 950 sites within CONUS. Among these are the Dept of Energy, the Federal Aviation Administration, the Environmental Protection Agency, the Internal Revenue Service and the Social Security Administration. The Army Satellite Education Network and the Air National Guard Warrior Network were among the first to join GETN.

***Hypertext Mark-up Language (HTML)***

A language of Internet Web Pages (WWW), allowing authors to create text and graphics, and link to other Web pages.

***Instructional Management System (IMS)***

A non-proprietary, Internet-based Instructional Management System that provides the means to customize and manage the instructional process and to integrate content from multiple publishers in distributed or virtual learning environments.

***Instructional Systems Development***

An adaptation of the systems engineering process to the process of curriculum development.

***Instructor Guided Review (IGR)***

Remote or local instructor presentations in an electronic classroom using a seminar or review format.

***Instructional Facilitator***

A content-knowledgeable person, not an instructor, at a downlink site who assists the content provider (normally at the uplink site) to conduct instruction using the satellite system.

***Intelligent Computer Assisted Instruction (ICAI)***

Interactive Courseware (ICW) component that includes an intelligent tutor that diagnoses student performance and individualizes instruction.

***Internet-Based Instruction (IBI)***

Instruction that makes use of Internet technologies and provides a platform for the integration and distribution of multimedia instructional components.

***Internet-Based Training (IBT)***

A term referring to courses delivered via the Internet.

***Interactive Courseware (ICW)***

Any type of computer-controlled education or training that relies on student inputs to determine pace, sequence and content of training delivery using more than one type of medium to convey the cost of instruction.

***Integrated Electronic Technical Manual (IETM)***

A type of Interactive Courseware (ICW) job aid that incorporates graphics, photographs, video, simulations, text, and access to database information.

***Integrated Operational Environment (IOE)***

Merges real-world and synthetic operations to support all aspects of training and education, weapons systems deployment, strategic and tactical strategies and analysis, Joint theater-level operations, mission planning, mission rehearsal, etc.

***Integrated Receiver Decoder (IRD)***

A hardware device that reconstructs a video signal from a compressed digital format. It is located at each downlink receive site. One IRD decodes one selectable channel. ATN, as well as the rest of GETN, uses the CLI Spectrum Saver IRD.

***Interactive Multimedia Instruction (IMI)***

IMI is a group of computer-based training and training support products. IMI includes source materials that are commonly used in IMI products, electronic products used in the delivery of or supporting the delivery of instruction, and software management tools used to support instructional programs.

***Interactive Television (ITV)***

An interactive means of instructing learners at a distance through the use of one-way video and audio over a satellite communication link with interactive return audio via phone lines. Also referred to as Teleseminar.

***Interactive Video Teletraining (IVT)***

Describes video-based instruction over broadcast television networks (satellite and/or terrestrial). Composed of Video Teleconferencing (VTC) and Interactive Television (ITV).

***Job Site Training (JST)***

Training delivered to learners at their base of assignment without an instructor physically present. The training media can take the form of interactive courseware, interactive video teletraining, videotape, paper or some combination of these. Does not include mobile training teams or CDCs.

***Job Site Training POC***

Organization or person at base-level responsible for all aspect of training administration.

***Ku-Band***

A type of satellite transmission of a higher frequency than C-Band transmission, requiring smaller antennas.

***Live Simulation***

A simulation involving real people operating real systems.

***Local Area Network (LAN)***

A system that connects computers, printers and other office equipment together within a defined area (like your office building).

***Mediated Interactive Lecture (MIL)***

Remote or local instructor presentations in an Electronic Classroom using a lecture format.

***Mobile Training Team***

Any group of personnel and training equipment gathered together to provide instruction on some subject or in some area of endeavor, available for movement from place to place in order to provide instruction at the various locations concerned.

***Model***

A physical, mathematical, or otherwise logical representation of a real-world system, entity, phenomenon, or process.

***Modeling and Simulation (M&S)***

The use of models, including emulations, prototypes, simulations, and stimulations, either statistically or over time to validate a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process.

***Multimedia***

In its strictest definition is anything that includes or involves the use of several media; mixed media. Within communications, the term has evolved to refer to any system or strategy that uses a combination of data, graphics, video and sound. Common storage systems include CD-ROM devices. Combined with hypertext or computer-based instruction, it becomes interactive multimedia.

***Operational Evaluation***

Includes periodic internal and external evaluation of the instructional program to ensure graduates meet established education and training requirements. Performed periodically from completion of the operational tryout throughout the life of the instructional system. Objective is continuous improvement and maintenance of instructional effectiveness.

***Originating Facility***

The site location from which transmissions originate.

***Portable Electronic Display Device***

A small electronic device that has been designed and engineered to facilitate the presentation of an IETM to a technician during maintenance procedures.

***Professional Continuing Education (PCE)***

Provides short course instruction in a broad range of essential educational programs to meet specific skills and functional competencies required in designated career fields. PCE courses provide learners with the opportunity to think critically, plan strategically, and give them the ability to apply those skills and knowledge to undefined future programs and challenges.

***Professional Military Education (PME)***

Education in the profession of arms and the employment of forces. It provides and develops the skills, knowledge, understanding and appreciation of leaders in the nation's armed forces.

***Redundant Arrays of Inexpensive Disks (RAID)***

Two or more hard drives or optical storage devices working together in a file server.

***Remote Site Training***

Any training or education conducted in other than a formal schoolhouse setting.

***Satellite Education Network (SEN)***

The transmission system operated by the Army from Ft Lee, VA. This network serves more than 60 downlinks located at Army posts throughout the US. The SEN is compatible with ATN.

***Senior Non Commissioned Officer Academy (SNCOA)***

Formed to help the Air Force improve leadership and management within senior noncommissioned (NCO) officer grades. Designed for professional managers, the curriculum focuses on leadership and management, communication skills and military studies. The academy uses case studies and group problem solving as well as lectures and small-group activities to promote the exchange of ideas.

***Simulation***

A method of implementing a model over time.

***Site Coordinator/Monitor***

An individual at a downlink site who is responsible for having the site ready for use, who assists learners and instructional facilitators or Job Site Training POCs in using the equipment in the classroom, and who often has other minor administrative support responsibilities. Often referred to as site monitor.

***Student Response Units (SRU)***

Provide voice, text, and data links from each student to the remote instructor.

***Subject Matter Expert (SME)***

- (a) An individual who has thorough knowledge of a job, duties/tasks, or a particular topic, which qualifies him/her to assist in the training development process (for example, to consult, review, analyze, advise, or critique).
- (b) A person who has high-level knowledge and skill in the performance of a job.

***Summative Evaluation***

Provides information to determine the "summed effect" of instruction under operational conditions. Used to assess full system integration and effectiveness of the individual components; based on an operational tryout of the program (normally 2 or 3 classes) using real student throughput and full instructional system operation. Objective is to ensure that the instructional system is fully integrated and achieves desired outcomes.

***Synthetic Environments (SE)***

Intermittent simulations that represent real-world activities at a high level of realism.

***T-Net***

A two-way video, two-way audio, low-bit rate video system currently used by the AFRC through a contract with Army's TRADOC. ATN can connect to and transmit over T-Net using special arrangements through the Army's Satellite Education Network at Ft Lee. Due to the difference in system configuration and transmission rates, receive locations may experience some difficulties in receiving clear video and audio signals.

***Technology Insertion***

Use of appropriate instructional technology in resident instructional programs.

***Teleconferencing (Video Teleconferencing: VTC)***

Two-way video and two-way audio exchange.

***Telecourse***

Instruction delivered by Telecommunications instructional delivery technology.

***Teleseminar***

See Interactive Television

***Test Administrator***

Person at a downlink who has responsibility for the acceptance, secure storage, distribution, control and return of assessment items.

***10 BaseT Cable System***

A pair of unshielded wires with higher wiring standards than standard telephone systems.

***Uniform Resource Locator (URL)***

An engineer's way of saying "Homepage address." It tells your browser where the file is located on the Internet and the type of file it is.

***Umbilical Systems***

Embedded training systems with a physical umbilical connection to operational equipment.

***Uplink***

The location where equipment permits the transmission of video, audio, and data signal to a satellite. Uplinks can have multiple channels for transmission purposes. An uplink normally has the capability to function as a downlink.

***Video Teletraining (VTT)***

Job site training using one-way video, two-way audio instructional technology delivered to learners at their base of assignment via the Air Technology Network. Also known as interactive television (ITV).

***Video Teleconferencing (VTC)***

Job site training using audio and video instructional delivery technology delivered to learners at their base of assignment via satellite.

***Virtual Classroom***

An Electronic Classroom where learners and instructors are not physically collocated.

***Virtual Simulation***

Models and simulations that involve real people operating simulated systems.

***Virtual Stimulation***

Models and simulations that involve simulated people operating real systems.

***Virtual Reality Mark-up Language (VRML)***

A language of Internet Web Pages (WWW), allowing authors to create animated graphics and simulations.

***Warrior Network***

The Air National Guard's interactive TV network. Created in 1993, the ANG designed the system to be received by every flying unit, geographically separated unit, state headquarters and combat readiness training center. The ANG currently broadcasts from McGhee Tyson ANG base in Knoxville, Tennessee. They are also building broadcast facilities at Andrews AFB in Maryland and at Tyndall AFB in Florida. Warrior Network is part of the Government Education and Training Network.

***Web Based Instruction (WBI)***

Term referring to courses delivered via the World Wide Web (WWW), through a Web Browser and using TCP/IP network protocols.

***Wide Area Network (WAN)***

Used to connect two or more LANs to designated host computers.

***Wireless LAN***

Use of radio waves or infrared light beams to transmit data between a file server and the network computers.

***World Wide Web (WWW)***

A system for sharing many different kinds of information over the Internet. Designed in 1989 by researchers at CERN in Switzerland, the Web is accessed by Web Browsers like Netscape Navigator™ or Microsoft Internet Explorer™.