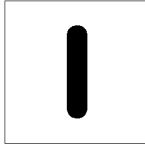


**ICA:** *Abbreviation for International Communications Association.*



**ICI:** *Abbreviation for incoming call identification.*

**ICMP:** *Abbreviation for Internet Control Message Protocol.* An Internet protocol that reports datagram delivery errors. *Note 1:* ICMP is a key part of the TCP/IP protocol suite. *Note 2:* The packet internet gopher (ping) application is based on ICMP.

**icon:** In computer systems, a small, pictorial representation of an application software package, idea, or concept used in a window or a menu to represent commands, files, or options.

**ICW:** *Abbreviation for interrupted continuous wave.*

**identification, friend or foe (IFF):** A system using electromagnetic transmissions to which equipment carried by friendly forces automatically responds, for example, by emitting pulses, thereby distinguishing themselves from enemy forces. [JP1] *Note:* The secondary surveillance radar (SSR) system used in modern air traffic control systems is an outgrowth of the military IFF system used during World War II. The IFF equipment carried by modern military aircraft is compatible with the transponder system used for civilian air traffic control.

**identification friend or foe personal identifier:** The discrete identification, friend or foe code assigned to a particular aircraft, ship, or other vehicle for identification by electronic means. [JP1]

**identifier (ID):** **1.** In telecommunications and data processing systems, one or more characters used to identify, name, or characterize the nature, properties, or contents of a set of data elements. **2.** A string of bits or characters that names an entity, such as a program, device, or system, in order that other entities can call that entity. **3.** In programming languages, a lexical unit that names a language object, such as a variable, array, record, label, or procedure. *Note:* An identifier is placed in a label. The label is attached to, is a part of, or remains associated with, the information it identifies. If the label becomes disassociated from the information it identifies, the information may not be accessible.

**IDF:** *Abbreviation for intermediate distribution frame.*

**idle-channel noise:** Noise that is present in a communications channel when no signals are applied. *Note:* The channel conditions and terminations must be stated for idle-channel noise measurements to be meaningful. (188)

**idle character:** A control character that is transmitted when no useful information is being transmitted. [From Weik '89]

**idle-line termination:** A switch-controlled electrical network that maintains a desired impedance at a trunk or line terminal that is in the idle state. (188)

**idle state:** The telecommunications service condition that exists whenever user messages are not being transmitted but the service is immediately available for use.

**idle time:** A period during which a system, circuit, or component is not in use, but is available.

**IDN:** *Abbreviation for integrated digital network.*

**IDTV:** *Abbreviation for improved-definition television.*

**IF:** *Abbreviation for intermediate frequency.*

**I/F:** *Abbreviation for interface.*

**IFF:** *Abbreviation for identification, friend or foe.*

**IFRB:** *Abbreviation for International Frequency Registration Board.*

**IF repeater:** *See heterodyne repeater.*

**IFS:** *Abbreviation for ionospheric forward scatter. See ionospheric scatter.*

**ILD:** *Abbreviation for injection laser diode.*

**illegal character:** A character, or a combination of bits, that is not valid in a given system according to specified criteria, such as with respect to a specified alphabet, a particular pattern of bits, a rule of formation, or a check code. [From Weik '89]

*Synonyms* **false character, forbidden character, improper character, unallowable character, unused character.**

**ILS:** *Abbreviation for instrument landing system.*

**IM:** *Abbreviation for intensity modulation, intermodulation.*

**image:** In the field of image processing, a two-dimensional representation of a scene. *Synonym picture.*

**image antenna:** A hypothetical mirror-image, *i.e.*, virtual-image, of an antenna, *i.e.*, antenna element, considered to extend as far below ground, *i.e.*, the ground plane, as the actual antenna is above the ground plane. (188) *Note 1:* The image antenna is helpful in calculating electric field vectors, magnetic field vectors, and electromagnetic fields emanating from the real antenna, particularly in the vicinity of the antenna and along the ground. Each charge and current in the real antenna has its image that may also be considered as a source of radiation equal to, but differently directed from, its real counterpart. *Note 2:* An image antenna may also be considered to be on the opposite side of any equipotential plane surface, such as a metal plate acting as a ground plane, analogous to the position of a virtual optical image in a plane mirror. *Note 3:* The ground plane need not be grounded to the Earth.

**image frequency:** In radio reception using heterodyning in the tuning process, an undesired input frequency that is capable of producing the same intermediate frequency (IF) that the desired input frequency produces. (188) *Note:* The term *image* arises from the mirror-like symmetry of signal and image frequencies about the beating-oscillator frequency.

**image frequency rejection ratio:** *Synonym image rejection ratio.*

**image rejection ratio:** In reception using heterodyning in the tuning process, the ratio of (a) the intermediate-frequency (IF) signal level produced by the desired input frequency to (b) that produced by the image frequency. *Note 1:* The image rejection ratio is usually expressed in dB. (188) *Note 2:* When the image rejection ratio is measured, the input signal

levels of the desired and image frequencies must be equal for the measurement to be meaningful. *Synonym image frequency rejection ratio.*

**imagery:** Collectively, the representations of objects reproduced electronically or by optical means on film, electronic display devices, or other media. [JP1]

**IMD:** *Abbreviation for intermodulation distortion.*

**immediate message:** A category of precedence reserved for messages relating to situations that gravely affect the security of national/allied forces or populace and that require immediate delivery to the addressee(s). [JP1]

**IMP:** *Abbreviation for interface message processor.*

**impedance:** The total passive opposition offered to the flow of electric current. *Note 1:* Impedance is determined by the particular combination of resistance, inductive reactance, and capacitive reactance in a given circuit. (188) *Note 2:* Impedance is a function of frequency, except in the case of purely resistive networks.

**impedance matching:** The connection of an additional impedance to an existing one in order to accomplish a specific effect, such as to balance a circuit or to reduce reflection in a transmission line. (188)

**improper character:** *Synonym illegal character.*

**improved-definition television (IDTV):** Television transmitters and receivers that (a) are built to satisfy performance requirements over and above those required by the NTSC standard and (b) remain within the general parameters of NTSC standard emissions. *Note 1:* IDTV improvements may be made at the TV transmitter or the receiver. *Note 2:* Examples of improvements include enhancements in encoding, digital filtering, scan interpolation, interlaced line scanning, and ghost cancellation. *Note 3:* IDTV improvements must allow the TV signal to be transmitted and received in the standard 4:3 aspect ratio. *Synonym enhanced-quality television.*

**improvement threshold:** *See FM improvement threshold.*

**impulse:** A short surge of electrical, magnetic, or electromagnetic energy. (188) *Synonym surge.*

**impulse excitation:** The production of oscillation in a circuit or device by impressing a stimulus (signal) for a period that is extremely short compared to the duration of the oscillation that it produces. (188) *Synonym shock excitation.*

**impulse noise:** Noise consisting of random occurrences of energy spikes having random amplitude and spectral content. *Note:* Impulse noise in a data channel can be a definitive cause of data transmission errors. (188)

**impulse response:** **1.** Of a device, the mathematical function that describes the output waveform that results when the input is excited by a unit impulse. **2.** The waveform that results at the output of a device when the input is excited by a unit impulse.

**IN:** *Abbreviation for intelligent network.*

**in-band noise power ratio:** For multichannel equipment, the ratio of (a) the mean noise power measured in any channel, with all channels loaded with white noise, to (b) the mean noise power measured in the same channel, with all channels but the measured channel loaded with white noise. (188)

**in-band signaling:** Signaling that uses frequencies or time slots within the bandwidth or data stream occupied by the information channel. (188)

**incidental-radiation device:** A device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy. [NTIA]

**inclination of an orbit (of an Earth satellite):** The angle determined by the plane containing the orbit and the plane of the Earth's equator. [NTIA] [RR]

**inclined orbit:** Any nonequatorial orbit of a satellite. (188) *Note:* Inclined orbits may be circular or elliptical, synchronous or asynchronous, and direct or retrograde.

**inclusion:** A foreign object present within, for example, an optical fiber or a crystal.

**incoherent:** In optics, characterized by a degree of coherence significantly less than 0.88.

**incoming call identification (ICI):** A switching system feature that allows an attendant to identify visually the type of service or trunk group associated with a call directed to the attendant's position.

**incorrect block:** A block successfully delivered to the intended destination user, but having one or more incorrect bits, additions, or deletions, in the delivered block.

**incremental compaction:** Data compaction accomplished by specifying only the initial value and all subsequent changes. *Note:* An example of incremental compaction is the storing or transmitting of a line voltage followed only by the deviations from the initial value. Thus, instead of transmitting the values 102, 104, 105, 103, 100, 104 and 106, only the values 102, +2, +1, -2, -3, +4, and +2, or only the values 100, +2, +4, +5, +3, 0, +4, and +6 need be sent, depending on the system used. At a given data rate, transmitting only the initial and incremental values require much less time and space than transmitting the absolute values. [From Weik '89]

**incremental phase modulation (IPM):** In spread-spectrum systems, phase modulation in which one binary code sequence is shifted with respect to another, usually to conduct a synchronizing search, *i.e.*, a search to discover if the two sequences are the same, and perhaps thereby enabling two data streams to be synchronized. [From Weik '89]

**indefinite call sign:** **1.** A call sign that represents a group of facilities, commands, authorities, activities, or units rather than one of these. **2.** In radio communications, a call sign that does not identify a station and that is used in the call-up signal or in a message that has the station call sign encrypted in the text. [From Weik '89]

**independent clocks:** In communication network timing subsystems, free-running precision clocks used, for synchronization purposes, at the nodes. *Note:* Variable storage buffers, installed to accommodate variations in transmission delay between nodes, are made large enough to accommodate small time (phase) departures among

the nodal clocks that control transmission. Traffic may occasionally be interrupted to allow the buffers to be emptied of some or all of their stored data.

**independent-sideband (ISB) transmission:** Double-sideband transmission in which the information carried by each sideband is different. (188) *Note:* The carrier may be suppressed.

**index dip:** In an optical fiber, an undesired decrease in the refractive index at the center of the core. *Note:* An index dip is an artifact of certain manufacturing processes. *Synonym profile dip.*

**indexing:** *See interaction crosstalk.*

**index-matching gel:** *Synonym gel (def. #2).*

**index-matching material:** A substance, usually a liquid, cement (adhesive), or gel, which has an index of refraction that closely approximates that of an optical fiber, and is used to reduce Fresnel reflection at the fiber endface. (FAA) *Note 1:* An index-matching material may be used in conjunction with pairs of mated connectors, with mechanical splices, or at the ends of fibers. *Note 2:* Without the use of an index-matching material, Fresnel reflections will occur at the smooth endfaces of a fiber. These reflections may be as high as -14 dB (*i.e.*, 14 dB below the level of the incident signal). When the reflected signal returns to the transmitting end, it is reflected again and returns to the receiving end at a level that is (28 plus twice the fiber loss) dB below the direct signal. The reflected signal will also be delayed by twice the delay time introduced by the fiber. The reflected signal will have no practical effect on digital systems because of its low level relative to the direct signal; *i.e.*, it will have no practical effect on the detected signal seen at the decision point of the digital optical receiver. It may be noticeable in an analog baseband intensity-modulated video signal.

**index of cooperation:** **1.** In facsimile, the product of the total line length and the number of lines per unit length, divided by  $\pi$ . **2.** For rotating devices, the product of the drum diameter and the number of lines per unit length. (188) *Synonyms:* **diametral index of cooperation, international index of cooperation.**

**index of refraction:** *Synonym refractive index.*

**index profile:** *Synonym refractive index profile.*

**indirect control:** In digital data transmission, the use of a clock rate of  $2^n$  times the modulation rate, where  $n$  is an integer greater than one. (188)

**indirect wave:** A wave, such as a radio wave or sound wave, that arrives at a given point by reflection or scattering from surrounding objects, rather than directly from the source. [From Weik '89]

**individual line:** A line that connects a single user to a switching center.

**individual reception (in the broadcasting-satellite service):** The reception of emissions from a space station in the broadcasting-satellite service by simple domestic installations and in particular those possessing small antennae. [NTIA] [RR]

**inductive coupling:** The transfer of energy from one circuit to another by virtue of the mutual inductance between the circuits. (188) *Note 1:* Inductive coupling may be deliberate and desired (as in an antenna coupler) or may be undesired (as in power line inductive coupling into telephone lines). *Note 2:* Capacitive coupling favors transfer of higher frequency components, whereas inductive coupling favors transfer of lower frequency components.

**industrial, scientific, and medical (ISM) applications (of radio frequency energy):** Operation of equipment or appliances designed to generate and use locally radio-frequency energy for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of telecommunications. [NTIA] [RR]

**industry standard:** A voluntary, industry-developed document that establishes requirements for products, practices, or operations.

**information:** **1.** The meaning that a human assigns to data by means of the known conventions used in their representation. [JP1] (188) **2.** In intelligence usage, unprocessed data of every description which may be used in the production of intelligence. [JP1]

**information-bearer channel:** **1.** A channel capable of transmitting all the information required for communication, such as user data, synchronizing

sequences, and control signals. *Note:* The information-bearer channel may operate at a higher data rate than that required for user data alone. **2.** A basic communications channel with the necessary bandwidth but without enhanced or value-added services. (188)

**information bit:** *See* **user information bit.**

**information feedback:** The return of received data to the source, usually for the purpose of checking the accuracy of transmission by comparison with the original data.

**information field:** In data transmission, a field assigned to contain user information. *Note:* The contents of the information field are not interpreted at the link level.

**information processing:** *Synonym* **data processing.**

**information processing center (IPC):** A facility staffed and equipped for processing and distributing information. (188) *Note:* An IPC may be geographically distributed.

**information security:** The protection of information against unauthorized disclosure, transfer, modification, or destruction, whether accidental or intentional. (188)

**information source:** *Synonym* **source user.**

**information superhighway:** *Synonym* **National Information Infrastructure.**

**information system:** **1.** A system, whether automated or manual, that comprises people, machines, and/or methods organized to collect, process, transmit, and disseminate data that represent user information. (188) **2.** Any telecommunications and/or computer related equipment or interconnected system or subsystems of equipment that is used in the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of voice and/or data, and includes software, firmware, and hardware. [NIS]

**information systems security (INFOSEC):** The protection of information systems against unauthorized access to or modification of

information, whether in storage, processing or transit, and against the denial of service to authorized users or the provision of service to unauthorized users, including those measures necessary to detect, document, and counter such threats. [NIS]

**information transfer:** The process of moving messages containing user information from a source to a sink. (188) *Note:* The information transfer rate may or may not be equal to the transmission modulation rate.

**information-transfer phase:** In an information-transfer transaction, the phase during which user information blocks are transferred from the source user to a destination user.

**information-transfer transaction:** A coordinated sequence of user and telecommunications system actions that cause information present at a source user to become present at a destination user. *Note:* An information-transfer transaction usually consists of three consecutive phases called the access phase, the information-transfer phase, and the disengagement phase.

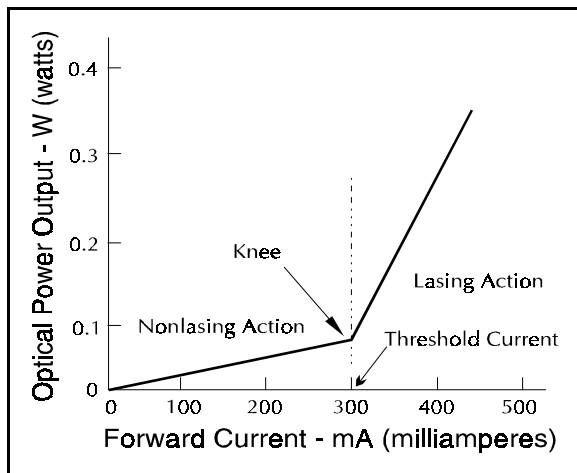
**INFOSEC:** *Acronym for* **information systems security.**

**infrared (IR):** The region of the electromagnetic spectrum bounded by the long-wavelength extreme of the visible spectrum (approximately 0.7  $\mu\text{m}$ ) and the shortest microwaves (approximately 0.1 mm).

**inhibiting signal:** A signal that prevents the occurrence of an event. *Note:* An inhibiting signal may be used, for example, to disable an AND gate, thus preventing any signals from passing through it as long as the inhibiting signal is present. [From Weik '89]

**injection fiber:** *Synonym* **launching fiber.**

**injection laser diode (ILD):** A laser that uses a forward-biased semiconductor junction as the active medium. *Note:* Stimulated emission of coherent light occurs at a p-n junction where electrons and holes are driven into the junction. (188) *Synonyms* **diode laser, laser diode, semiconductor laser.** *See figure on following page.*



injection-laser diode: output vs. input current

**ink vapor recording:** Recording in which vaporized ink particles are deposited directly upon the record medium. (188)

**input:** **1.** In a device, process, or channel, a point that accepts data. **2.** A state, or a sequence of states, of a point that accepts data. **3.** A stimulus, such as a signal or interference, that enters a functional unit, such as a telecommunications system, a computer, or a computer program.

**input data:** **1.** Data being received or to be received by a device or a computer program. **2.** Data to be processed.

**input-output channel:** For a computer, a device that handles the transfer of data between internal memory and peripheral equipment.

**input-output controller (IOC):** A functional unit that controls one or more input-output channels. *Synonym I/O controller.*

**input/output (I/O) device:** A device that introduces data into or extracts data from a system. (188)

**input protection:** For analog input channels, protection against overvoltages that may be applied between any two input connectors or between any input connector and ground.

**insertion gain:** The gain resulting from the insertion of a device in a transmission line, expressed as the ratio of the signal power delivered to that part of the line

following the device to the signal power delivered to that same part before insertion. (188) *Note 1:* If the resulting number is less than unity, an “*insertion loss*” is indicated. *Note 2:* Insertion gain is usually expressed in dB.

**insertion loss:** **1.** The loss resulting from the insertion of a device in a transmission line, expressed as the reciprocal of the ratio of the signal power delivered to that part of the line following the device to the signal power delivered to that same part before insertion. *Note:* Insertion loss is usually expressed in dB. **2.** In an optical fiber system, the total optical power loss caused by insertion of an optical component, such as a connector, splice, or coupler.

**insertion-loss-vs.-frequency characteristic:** Of a system or device, a plot of the amplitude as a function of frequency. (188) *Note:* The insertion-loss-vs.-frequency characteristic may be expressed as absolute gain or loss, or it may be normalized with respect to gain or loss at a specified reference frequency.

**inside call:** *Synonym internal call.*

**inside plant:** **1.** All the cabling and equipment installed in a telecommunications facility, including the main distribution frame (MDF) and all the equipment extending inward therefrom, such as PABX or central office equipment, MDF protectors, and grounding systems. (188) **2.** In radio and radar systems, all communications-electronics (C-E) equipment that is installed in buildings. (188)

**inside wire:** *See on-premises wiring.*

**in-slot signaling:** Signaling performed in the associated channel time slot.

**inspection lot:** A collection of produced units from which a statistically valid sample is to be drawn and inspected to determine conformance with acceptability criteria. *Note:* The inspection lot may differ from a collection of units designated as a lot for other purposes, such as for production, storage, packaging, and shipment.

**instruction:** In a programming language, an expression that specifies one operation and identifies its operands, if any.

**instrument landing system (ILS):** **1.** A radio-navigation system which provides aircraft with horizontal and vertical guidance just before and during landing and, at certain fixed points, indicates the distance to the reference point of landing. [NTIA] [RR] **2.** A system of radio navigation intended to assist aircraft in landing which provides lateral and vertical guidance, which may include indications of distance from the optimum point of landing. [JP1]

**instrument landing system glide path:** A system of vertical guidance embodied in the instrument landing system which indicates the vertical deviation of the aircraft from its optimum path of descent. [NTIA] [RR]

**instrument landing system localizer:** A system of horizontal guidance embodied in the instrument landing system which indicates the horizontal deviation of the aircraft from its optimum path of descent along the axis of the runway. [NTIA] [RR]

**integrated circuit (IC):** An electronic circuit that consists of many individual circuit elements, such as transistors, diodes, resistors, capacitors, inductors, and other active and passive semiconductor devices, formed on a single chip of semiconducting material and mounted on a single piece of substrate material. *Synonyms* **chip (def.#1), microcircuit.** [From Weik '89]

**integrated digital network (IDN):** A network that uses both digital transmission and digital switching.

**integrated optical circuit (IOC):** A circuit, or group of interconnected circuits, consisting of miniature solid-state optical components on semiconductor or dielectric substrates. *Note:* IOC components include light sources, optical filters, photodetectors, and thin-film optical waveguides.

**integrated services digital network:** *See* ISDN.

**integrated station:** A terminal device in which a telephone and one or more other devices, such as a video display unit, keyboard, or printer, are integrated and used over a single circuit.

**integrated system:** A telecommunication system that transfers analog and digital traffic over the same switched network. (188)

**integrated voice and data terminal (IVDT):** *See* **integrated station.**

**integrating network:** A network (circuit) that produces an output waveform that is the time integral of the input waveform. *Note:* Integrating networks are used in signal processing, such as for producing sawtooth waves from square waves.

**integrity:** *See* **data integrity, service integrity, and system integrity.**

**intelligent network (IN):** **1.** A network that allows functionality to be distributed flexibly at a variety of nodes on and off the network and allows the architecture to be modified to control the services. **2.** In North America, an advanced network concept that is envisioned to offer such things as (a) distributed call-processing capabilities across multiple network modules, (b) real-time authorization code verification, (c) one-number services, and (d) flexible private network services [including (1) reconfiguration by subscriber, (2) traffic analyses, (3) service restrictions, (4) routing control, and (5) data on call histories]. Levels of IN development are identified below:

➤ **IN/1** A proposed intelligent network targeted toward services that allow increased customer control and that can be provided by centralized switching vehicles serving a large customer base.

➤ **IN/1+** A proposed intelligent network targeted toward services that can be provided by centralized switching vehicles, *e.g.*, access tandems, serving a large customer base.

➤ **IN/2** A proposed, advanced intelligent-network concept that extends the distributed IN/1 architecture to accommodate the concept called "*service independence.*" *Note:* Traditionally, service logic has been localized at individual switching systems. The IN/2 architecture provides flexibility in the placement of service logic, requiring the use of advanced techniques to manage the distribution of both network data and service logic across multiple IN/2 modules.

**intelligent peripheral (IP):** **1.** A functional component that may be used most efficiently when accessed locally. **2.** An intelligent-network feature that provides specialized telecommunication capabilities required by IN/2 service logic programs.

**intelligibility:** For voice communications, the capability of being understood. *Note:* Intelligibility does not imply the recognition of a particular voice. (188)

**intelligible crosstalk:** Crosstalk from which information can be derived. (188)

**intensity:** The square of the electric field strength of an electromagnetic wave. *Note:* Intensity is proportional to irradiance and may be used in place of the term “irradiance” when only relative values are important.

**intensity modulation (IM):** In optical communications, a form of modulation in which the optical power output of a source is varied in accordance with some characteristic of the modulating signal. (188) *Note:* In intensity modulation, there are no discrete upper and lower sidebands in the usually understood sense of these terms, because present optical sources lack sufficient coherence to produce them. The envelope of the modulated optical signal is an analog of the modulating signal in the sense that the instantaneous power of the envelope is an analog of the characteristic of interest in the modulating signal. Recovery of the modulating signal is by direct detection, not heterodyning.

**interaction crosstalk:** Crosstalk caused by coupling between carrier and noncarrier circuits. *Note:* If the interaction crosstalk is, in turn, coupled to another carrier circuit, that crosstalk is called “indexing.” (188)

**interactive data transaction:** A unidirectional message, transmitted via a data channel, that requires a response in order for work to proceed logically.

**interactive service:** In an integrated services digital network (ISDN), a telecommunications service that facilitates a bidirectional exchange of information among users or among users and hosts. *Note:*

Interactive services are grouped into conversational services, messaging services, and retrieval services.

**interblock gap:** On a data recording medium, an area used to indicate the end of a block or physical record. *Note:* Examples of interblock gaps are the gaps between blocks on magnetic tape and disks. (188)

**intercept:** **1.** To stop a telephone call directed to an improper, disconnected, or restricted telephone number, and to redirect that call to an operator or a recording. (188) **2.** To gain possession of communications intended for others without their consent, and, ordinarily, without delaying or preventing the transmission. (188) *Note:* An intercept may be an authorized or unauthorized action. **3.** The acquisition of a transmitted signal with the intent of delaying or eliminating receipt of that signal by the intended destination user. (188)

**interchangeability:** A condition which exists when two or more items possess such functional and physical characteristics as to be equivalent in performance and durability, and are capable of being exchanged one for the other without alteration of the items themselves, or of adjoining items, except for adjustment, and without selection for fit and performance. [JP1]

**interchangeable connectors:** Connectors that share common installation geometry and have the same transmission performance. (188)

**interchange circuit:** A circuit that facilitates the exchange of data and signaling information between data terminal equipment (DTE) and data circuit-terminating equipment (DCE). *Note:* An interchange circuit can carry many types of signals and provide many types of service features, such as control signals, timing signals, and common return functions.

**intercharacter interval:** In asynchronous transmission, the time interval between the end of the stop signal of one character and the beginning of the start signal of the next character. (188) *Note:* The intercharacter interval may be of any duration. The signal sense of the intercharacter interval is always the same as the sense of the stop element, *i.e.*, “1” or “mark.”



**intercom:** **1.** A telephone apparatus by means of which personnel can talk to each other within an aircraft, tank, ship, or activity. [JP1] **2.** A dedicated voice service within a specified user environment. (188)

**interconnect facility:** In a communications network, one or more communications links that (a) are used to provide local area communications service among several locations and (b) collectively form a node in the network. (188) *Note 1:* An interconnect facility may include network control and administrative circuits as well as the primary traffic circuits. *Note 2:* An interconnect facility may use any medium available and may be redundant.

**interconnection:** **1.** The linking together of interoperable systems. [JP1] **2.** The linkage used to join two or more communications units, such as systems, networks, links, nodes, equipment, circuits, and devices.

**interexchange carrier (IXC):** A communications common carrier that provides telecommunications services between LATAs or between exchanges within the same LATA. *Note:* Interexchange carriers have usually relied on local exchange carriers or competitive access providers for the local origination and termination of their traffic.

**interface (I/F):** **1.** In a system, a shared boundary, *i.e.*, the boundary between two subsystems or two devices. (188) **2.** A shared boundary between two functional units, defined by specific attributes, such as functional characteristics, common physical interconnection characteristics, and signal characteristics. **3.** A point of communication between two or more processes, persons, or other physical entities. **4.** A point of interconnection between user terminal equipment and commercial communications facilities. **5.** To interconnect two or more entities at a common point or shared boundary.

**interface functionality:** In telephony, the characteristic of interfaces that allows them to support transmission, switching, and signaling functions identical to those used in the enhanced services provided by the carrier. *Note:* As part of its comparably efficient interconnection (CEI) offering, the carrier must make available standardized hardware and software interfaces that are able to

support transmission, switching, and signaling functions identical to those used in the enhanced services provided by the carrier.

**interface message processor (IMP):** A processor-controlled switch used in packet-switched networks to route packets to their proper destination.

**interface payload:** In integrated services digital networks (ISDN), the part of the bit stream through a framed interface used for telecommunications services and signaling.

**interface point:** *Synonym point of interface.*

**interface standard:** A standard that describes one or more functional characteristics (such as code conversion, line assignments, or protocol compliance) or physical characteristics (such as electrical, mechanical, or optical characteristics) necessary to allow the exchange of information between two or more (usually different) systems or equipment. *Note 1:* An interface standard may include operational characteristics and acceptable levels of performance. *Note 2:* In the military community, interface standards permit command and control functions to be performed using communication and computer systems.

**interference:** **1.** In general, extraneous energy, from natural or man-made sources, that impedes the reception of desired signals. **2.** A coherent emission having a relatively narrow spectral content, *e.g.*, a radio emission from another transmitter at approximately the same frequency, or having a harmonic frequency approximately the same as, another emission of interest to a given recipient, and which impedes reception of the desired signal by the intended recipient. *Note:* In the context of this definition, interference is distinguished from noise in that the latter is an incoherent emission from a natural source (*e.g.*, lightning) or a man-made source, of a character unlike that of the desired signal (*e.g.*, commutator noise from rotating machinery) and which usually has a broad spectral content. **3.** The effect of unwanted energy due to one or a combination of emissions, radiation, or inductions upon reception in a radiocommunication system, manifested by any performance degradation, misinterpretation, or loss of information which could

be extracted in the absence of such unwanted energy. [NTIA] [RR] (188) **4.** The interaction of two or more coherent or partially coherent waves, which interaction produces a resultant wave that differs from the original waves in phase, amplitude, or both. *Note:* Interference may be constructive or destructive, *i.e.*, it may result in increased amplitude or decreased amplitude, respectively. Two waves equal in frequency and amplitude, and out of phase by  $180^\circ$ , will completely cancel one another. In phase, they create a resultant wave having twice the amplitude of either interfering beam. (188)

**interference emission:** Emission that results in an electrical signal's being propagated into, and interfering with the proper operation of, electronic or electrical equipment. *Note:* The frequency range of interference emissions may include the entire electromagnetic spectrum. (188)

**interference filter:** An optical filter that reflects one or more spectral bands or lines and transmits others, while maintaining a nearly zero coefficient of absorption for all wavelengths of interest. *Note 1:* An interference filter may be high-pass, low-pass, bandpass, or band-rejection. *Note 2:* An interference filter consists of multiple thin layers of dielectric material having different refractive indices. There also may be metallic layers. Interference filters are wavelength-selective by virtue of the interference effects that take place between the incident and reflected waves at the thin-film boundaries.

**interferometer:** An instrument that uses the principle of interference of electromagnetic waves for purposes of measurement. *Note:* Interferometers may be used to measure a variety of physical variables, such as displacement (distance), temperature, pressure, and strain.

**interferometry:** The branch of science devoted to the study and measurement of the interaction of waves, such as electromagnetic waves and acoustic waves. *Note 1:* The interaction of the waves can produce various spatial-, time-, and frequency-domain energy distribution patterns. [After 2196] *Note 2:* Interferometric techniques are used to measure refractive index profiles, *e.g.*, those of the preforms from which optical fibers are drawn, and to sense and measure physical variables, such as displacement (distance), temperature, pressure, and magnetic fields.

**interframe time fill:** In digital data transmission, a sequence of bits transmitted between consecutive frames. *Note:* Interframe time fill does not include bits stuffed within a frame.

**interlaced scanning:** In raster-scanned video displays, a scanning technique in which all odd-numbered scanning lines are first traced in succession, followed by the tracing of the even-numbered scanning lines in succession, each of which is traced between a pair of odd-numbered scanning lines. *Note 1:* The pattern created by tracing the odd-numbered scanning lines is called the "*odd field*", and the pattern created by tracing the even-numbered scanning lines is called the "*even field*". Each field contains half the information content, *i.e.*, pixels, of the complete video frame. *Note 2:* Image flicker is less apparent in an interlaced display than in a noninterlaced display, because the rate at which successive fields occur in an interlaced display is twice that at which successive frames would occur in a noninterlaced display containing the same number of scanning lines and having the same frame refresh rate. *Synonym* **interlacing**.

**interlacing:** *Synonym* **interlaced scanning**.

**inter-LATA:** **1.** Between local access and transport areas (LATAs). **2.** Services, revenues, and functions associated with telecommunications that originate in one LATA and that terminate in another one or that terminate outside of that LATA.

**interleaving:** The transmission of pulses from two or more digital sources in time-division sequence over a single path. (188)

**intermediate distribution frame (IDF):** In a central office or customer premises, a frame that (a) cross-connects the user cable media to individual user line circuits and (b) may serve as a distribution point for multipair cables from the main distribution frame (MDF) or combined distribution frame (CDF) to individual cables connected to equipment in areas remote from these frames.

**intermediate element:** In a network, a line-unit-line termination (LULT) or a line-unit-network termination (LUNT). (188)

**intermediate field:** *Synonym intermediate-field region.*

**intermediate-field region:** For an antenna, the transition region—lying between the near-field region and the far-field region—in which the field strength of an electromagnetic wave is dependent upon the inverse distance, inverse square of the distance, and the inverse cube of the distance from the antenna. (188) *Note:* For an antenna that is small compared to the wavelength in question, the intermediate-field region is considered to exist at all distances between 0.1 wavelength and 1.0 wavelength from the antenna. *Synonyms intermediate field, intermediate zone, transition zone.*

**intermediate frequency (IF):** A frequency to which a carrier frequency is shifted as an intermediate step in transmission or reception. (188)

**intermediate language:** In computer programming, a target language into which all or part of a single statement or a source program—in a source language—is translated before it is further translated or interpreted. *Note:* For a subsequent translation, an intermediate language may serve as a source language.

**intermediate-level language:** In computer, communications, and data processing systems, a programming language that (a) is less machine-oriented than a machine language, (b) is not so machine-independent as a common language, such as Ada®, COBOL, or Fortran, (c) contains macros that are less powerful than common-language macros, and (d) usually is the object language of a root compiler. Examples of intermediate-level languages include assembly languages, such as PL/I. [From Weik '89]

**intermediate system:** A system that provides an Open Systems Interconnection—Reference Model (OSI—RM) Network Layer relay function in which data received from one corresponding network entity are forwarded to another corresponding network entity.

**intermediate zone:** *Synonym intermediate-field region.*

**intermodal delay distortion:** *Synonym multimode distortion.*

**intermodal dispersion:** *Incorrect synonym for multimode distortion.*

**intermodal distortion:** *Synonym multimode distortion.*

**intermodulation (IM):** The production, in a nonlinear element of a system, of frequencies corresponding to the sum and difference frequencies of the fundamentals and harmonics thereof that are transmitted through the element. (188)

**intermodulation distortion:** Nonlinear distortion characterized by the appearance, in the output of a device, of frequencies that are linear combinations of the fundamental frequencies and all harmonics present in the input signals. (188) *Note:* Harmonic components themselves are not usually considered to characterize intermodulation distortion. When the harmonics are included as part of the distortion, a statement to that effect should be made.

**intermodulation noise:** In a transmission path or device, noise, generated during modulation and demodulation, that results from nonlinear characteristics in the path or device. (188)

**intermodulation product:** In the output of a nonlinear system, a frequency produced by intermodulation of harmonics of the frequencies present in the input signal.

**internal bias:** In a start-stop teletypewriter receiving mechanism, bias generated locally by the mechanism, and which has the same effect on the operating margin as bias external to the receiver, *i.e.*, applied bias. *Note:* Internal bias may be a marking bias or a spacing bias. (188)

**internal call:** A call placed within a private branch exchange (PBX) or local switchboard, *i.e.*, not through a central office in a public switched network. *Synonym inside call.* [From Weik '89]

**internal memory:** In a computer, all of the storage spaces that are accessible by a processor without the use of the computer input-output channels. *Note:* Internal memory usually includes several types of storage, such as main storage, cache memory, and special registers, all of which can be directly accessed by the processor. *Synonym internal storage.*

**internal photoelectric effect:** A photoconductive or photovoltaic effect.

**internal storage:** *Synonym internal memory.*

**International Atomic Time (TAI):** The time scale established by the International Time Bureau (BIH) on the basis of atomic clock data supplied by cooperating institutions. *Note:* The abbreviations “TAI” and “BIH” are a result of literal translation from the official international names that are written in French. (188)

**international index of cooperation:** *Synonym index of cooperation.*

**International Frequency Registration Board (IFRB):** *See Radio Regulations Board.*

**International Organization for Standardization:** *See ISO.*

**International Radio Consultative Committee:** *See CCIR, ITU-R.*

**International System of Units (SI):** The modern form of the metric system, which has been adopted by the United States and most other nations. *Note:* The SI is constructed from seven base units for independent physical quantities. *Tables showing these values are included on the next pages and are current as of Fall 1995.*

**International Telecommunication Union (ITU):** A civil international organization established to promote standardized telecommunications on a worldwide basis. (188) *Note:* The ITU-R and ITU-T are committees under the ITU. The ITU headquarters is located in Geneva, Switzerland. While older than the United Nations, it is recognized by the U.N. as the specialized agency for telecommunications.

**International Telegraph Alphabet Number 5 (ITA-5):** An alphabet in which (a) 128 unique 7-bit strings are used to encode upper- and lower-case letters, 10 decimal numerals, special signs and symbols, diacritical marks, data delimiters, and transmission control characters, (b) 12 of the 7-bit strings are not assigned to any letter, numeral, or control character, and (c) the unassigned bit strings are open for use in a given country that may have

unique requirements, such as monetary symbols; diacritical marks, such as the tilde, umlaut, circumflex, and dieresis, and (d) a two-condition 8-bit pattern may be used that consists of seven information bits and a parity check bit. *Note:* ITA-5 is used for effecting information interchange. It is a result of a joint agreement between the International Telegraph and Telephone Consultative Committee (CCITT), now ITU-T, of the International Telecommunication Union (ITU) and the International Organization for Standardization (ISO). It is published as CCITT Recommendation V.3 and as ISO 646. It has also been adopted by NATO for military use. The United States adaptation of ITA-5 is ASCII (American Standard Code for Information Interchange) published by the American National Standards Institute (ANSI).

**International Telegraph and Telephone Consultative Committee:** *See CCITT, ITU-T.*

**International Time Bureau (BIH):** *See International Atomic Time.*

**SI Prefixes.** The common metric prefixes are:

<b>Multiplication Factor</b>		<b>Prefix Name</b>	<b>Prefix</b>	<b>Symbol</b>
1 000 000 000 000	=	$10^{12}$	tera	T
1 000 000 000	=	$10^9$	giga	G
1 000 000	=	$10^6$	mega	M
1 000	=	$10^3$	kilo	k
100	=	$10^2$	hecto	h
10	=	$10^1$	deka	da
0.1	=	$10^{-1}$	deci	d
0.01	=	$10^{-2}$	centi	c
0.001	=	$10^{-3}$	milli	m
0.000 001	=	$10^{-6}$	micro	$\mu$
0.000 000 001	=	$10^{-9}$	nano	n
0.000 000 000 001	=	$10^{-12}$	pico	p

**SI Base Units.**

<b>Quantity</b>	<b>Unit Name</b>	<b>Unit Symbol</b>
length	meter	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
thermodynamic temperature	kelvin	K
amount of substance	mole	mol
luminous intensity	candela	cd

**SI derived units.** Derived units are formed by combining base units and other derived units according to the algebraic relations linking the corresponding quantities. The symbols for derived units are obtained by means of the mathematical signs for multiplication, division, and use of exponents. For example, the SI unit for velocity is the *meter per second* (m/s or  $\text{m}\cdot\text{s}^{-1}$ ), and that for angular velocity is the *radian per second* (rad/s or  $\text{rad}\cdot\text{s}^{-1}$ ). Some derived SI units have been given special names and symbols, as listed in this table.

Quantity	Unit Name	Unit Symbol	Expression in Terms of Other SI Units
Absorbed dose, specific energy imparted, kerma, absorbed dose index	gray	Gy	J/kg
Activity (of a radionuclide)	becquerel	Bq	1/s
Celsius temperature	degree Celsius	°C	K
Dose equivalent	sievert	Sv	J/kg
Electric capacitance	farad	F	C/V
Electric charge, quantity of electricity	coulomb	C	A•s
Electric conductance	siemens	S	A/V
Electric inductance	henry	H	Wb/A
Electric potential, potential difference, electromotive force	volt	V	W/A
Electric resistance	ohm	Ω	V/A
Energy, work, quantity of heat	joule	J	N•m
Force	newton	N	$\text{kg}\cdot\text{m}/\text{s}^2$
Frequency (of a periodic phenomenon)	hertz	Hz	1/s
Illuminance	lux	lx	$\text{lm}/\text{m}^2$
Luminous flux	lumen	lm	$\text{cd}\cdot\text{sr}$
Magnetic flux	weber	Wb	V•s
Magnetic flux density	tesla	T	$\text{Wb}/\text{m}^2$
Plane angle	radian	rad	m/m
Power, radiant flux	watt	W	J/s
Pressure, stress	pascal	Pa	$\text{N}/\text{m}^2$
Solid angle	steradian	sr	$\text{m}^2/\text{m}^2$

**internet:** An interconnection of networks.

**[The] Internet:** A worldwide interconnection of individual networks operated by government, industry, academia, and private parties. *Note:* The Internet originally served to interconnect laboratories engaged in government research, and has now been expanded to serve millions of users and a multitude of purposes.

**Internet protocol (IP):** A DOD standard protocol designed for use in interconnected systems of packet-switched computer communication networks. *Note:* The internet protocol provides for transmitting blocks of data called *datagrams* from sources to destinations, where sources and destinations are hosts identified by fixed-length addresses. The internet protocol also provides for fragmentation and reassembly of long datagrams, if necessary, for transmission through small-packet networks.

**Internet protocol (IP) spoofing: 1.** The creation of IP packets with counterfeit (spoofed) IP source addresses. **2.** A method of attack used by network intruders to defeat network security measures such as authentication based on IP addresses. *Note 1:* An attack using IP spoofing may lead to unauthorized user access, and possibly root access, on the targeted system. *Note 2:* A packet-filtering-router firewall may not provide adequate protection against IP spoofing attacks. It is possible to route packets through this type of firewall if the router is not configured to filter incoming packets having source addresses on the local domain. *Note 3:* IP spoofing is possible even if no reply packets can reach the attacker. *Note 4:* A method for preventing IP spoofing problems is to install a filtering router that does not allow incoming packets to have a source address different from the local domain. In addition, outgoing packets should not be allowed to contain a source address different from the local domain, in order to prevent an IP spoofing attack from originating from the local network.

**internetwork connection:** *See gateway.*

**internetworking:** The process of interconnecting two or more individual networks to facilitate communications among their respective nodes. *Note:* The interconnected networks may be different types. Each

network is distinct, with its own addresses, internal protocols, access methods, and administration.

**interoffice trunk:** A single direct transmission channel, *e.g.*, voice-frequency circuit, between central offices.

**interoperability: 1.** The ability of systems, units, or forces to provide services to and accept services from other systems, units or forces and to use the services so exchanged to enable them to operate effectively together. [JP1] **2.** The condition achieved among communications-electronics systems or items of communications-electronics equipment when information or services can be exchanged directly and satisfactorily between them and/or their users. The degree of interoperability should be defined when referring to specific cases. [JP1] (188)

**interoperability standard:** A document that establishes engineering and technical requirements that are necessary to be employed in the design of systems, units, or forces and to use the services so exchanged to enable them to operate effectively together.

**interoperation:** The use of interoperable systems, units, or forces. [JP1]

**interposition trunk: 1.** A single direct transmission channel, *e.g.*, voice-frequency circuit, between two positions of a large switchboard to facilitate the interconnection of other circuits appearing at the respective switchboard positions. **2.** Within a technical control facility, a single direct transmission circuit, between positions in a testboard or patch bay, which circuit facilitates testing or patching between the respective positions. (188)

**interpret:** To translate and to execute each source language statement of a computer program before translating and executing the next statement.

**interrogation: 1.** The transmission of a signal or combination of signals intended to trigger a response. **2.** The process whereby a station or device requests another station or device to identify itself or to give its status. (188)

**interrupt:** A suspension of a process, such as the execution of a computer program, caused by an event external to that process, and performed in such a way that the process can be resumed. *Synonym* **interruption.**

**interrupted continuous wave (ICW):** Modulation in which there is on-off keying of a continuous wave. (188)

**interrupted isochronous transmission:** *Synonym* **isochronous burst transmission.**

**interruption:** *Synonym* **interrupt.**

**inter-satellite service:** A radiocommunication service providing links between artificial Earth satellites. [NTIA] [RR]

**interswitch trunk:** A single direct transmission channel, *e.g.*, voice-frequency circuit, between switching nodes. (188)

**intersymbol interference:** **1.** In a digital transmission system, distortion of the received signal, which distortion is manifested in the temporal spreading and consequent overlap of individual pulses to the degree that the receiver cannot reliably distinguish between changes of state, *i.e.*, between individual signal elements. *Note 1:* At a certain threshold, intersymbol interference will compromise the integrity of the received data. *Note 2:* Intersymbol interference attributable to the statistical nature of quantum mechanisms sets the fundamental limit to receiver sensitivity. *Note 3:* Intersymbol interference may be measured by eye patterns. **2.** Extraneous energy from the signal in one or more keying intervals that interferes with the reception of the signal in another keying interval. (188) **3.** The disturbance caused by extraneous energy from the signal in one or more keying intervals that interferes with the reception of the signal in another keying interval. (188)

**intertoll trunk:** A single direct transmission channel, *e.g.*, voice-frequency circuit, between two toll offices.

**interworking functions:** Mechanisms that mask differences in physical, link, and network technologies by converting (or mapping) states and protocols into consistent network and user services.

**intra-LATA:** Within the boundaries of a local access and transport area (LATA).

**intramodal distortion:** In an optical fiber, distortion caused by dispersion, such as material or profile dispersion, of a given propagating mode. (188) [After 2196]

**intraoffice trunk:** A single direct transmission channel, *e.g.*, voice-frequency circuit, within a given switching center.

**intrinsic joint loss:** Of nonidentical optical fibers joined by a splice or a mated pair of connectors, the power loss attributable to manufacturing variations, in such parameters as physical dimensions, differences in refractive index (including profile parameter), numerical aperture, and mode field diameter.

**intrinsic noise:** In a transmission path or device, that noise inherent to the path or device and not contingent upon modulation. (188)

**inverse multiplexer:** A functional unit capable of accessing and combining two or more low-speed circuits into a virtual broadband circuit, up to and including an aggregate equal to a T1 rate.

**inverse-square law:** The physical law stating that irradiance, *i.e.*, the power per unit area in the direction of propagation, of a spherical wavefront varies inversely as the square of the distance from the source, assuming there are no losses caused by absorption or scattering. *Note:* For example, the power radiated from a point source, *e.g.*, an omnidirectional isotropic antenna, or from any source at very large distances from the source compared to the size of the source, must spread itself over larger and larger spherical surfaces as the distance from the source increases. Diffuse and incoherent radiation are similarly affected.

**inverted position:** In frequency-division multiplexing, a position of a translated channel in which an increasing signal frequency in the untranslated channel causes a decreasing signal frequency in the translated channel. (188)

**inverter:** **1.** In electrical engineering, a device for converting direct current into alternating current.



[JP1] (188) **2.** In computers, a device or circuit that inverts the polarity of a signal or pulse. *Deprecated synonym negation circuit.*

**Inward Wide-Area Telephone Service (INWATS):**  
*See eight-hundred (800) service.*

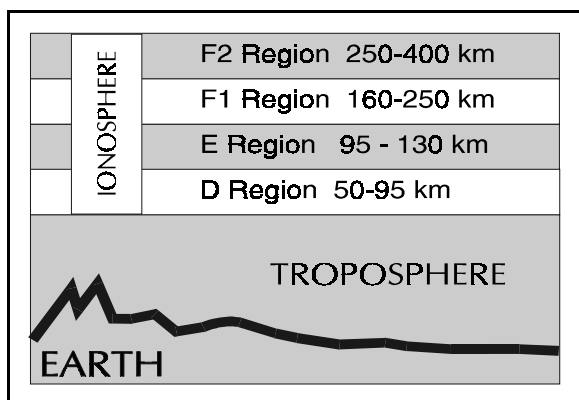
**INWATS:** *Acronym for Inward Wide-Area Telephone Service. See eight-hundred (800) service.*

**I/O:** *Abbreviation for input/output.*

**IOC:** *Abbreviation for input-output controller, integrated optical circuit.*

**I/O controller:** *Synonym input-output controller.*

**ionosphere:** That part of the atmosphere, extending from about 70 to 500 kilometers, in which ions and free electrons exist in sufficient quantities to reflect and/or refract electromagnetic waves. [After JP1]



ionosphere

**ionosphere sounder:** A device that transmits signals for the purpose of determining ionospheric conditions. [NTIA] [RR]

**ionospheric absorption:** Absorption occurring as a result of interaction between an electromagnetic wave and free electrons in the ionosphere. (188)

**ionospheric disturbance:** An increase in the ionization of the ionosphere, caused by solar activity, which results in greatly increased radio wave absorption. (188)

**ionospheric forward scatter (IFS):** *Synonym ionospheric scatter.*

**ionospheric reflection:** Of electromagnetic waves propagating in the ionosphere, a redirection, *i.e.*, bending—by a complex process involving reflection and refraction—of the waves back toward the Earth. *Note:* The amount of bending depends on the extent of penetration (which is a function of frequency), the angle of incidence, polarization of the wave, and ionospheric conditions, such as the ionization density.

**ionospheric scatter:** The propagation of radio waves by scattering as a result of irregularities or discontinuities in the ionization of the ionosphere. [NTIA] [RR] (188) *Synonym forward propagation ionospheric scatter.*

**ionospheric sounding:** A technique that provides real-time data on high-frequency ionospheric-dependent radio propagation, using a basic system consisting of a synchronized transmitter and receiver. *Note:* The time delay between transmission and reception is translated into effective ionospheric layer altitude. Vertical incident sounding uses a collocated transmitter and receiver and involves directing a range of frequencies vertically to the ionosphere and measuring the values of the reflected returned signals to determine the effective ionosphere layer altitude. This technique is also used to determine the critical frequency. Oblique sounders use a transmitter at one end of a given propagation path, and a synchronized receiver, usually with an oscilloscope-type display (ionogram), at the other end. The transmitter emits a stepped- or swept-frequency signal which is displayed or measured at the receiver. The measurement converts time delay to effective altitude of the ionospheric layer. The ionogram display shows the effective altitude of the ionospheric layer as a function of frequency.

**ionospheric turbulence:** Ongoing disturbances of the ionosphere that scatter incident electromagnetic waves. *Note:* Ionospheric turbulence results in irregularities in the composition of the ionosphere that change with time. This causes changes in reflection properties. These, in turn, cause changes in skip distance, fading, local intensification, and distortion of the incident waves. [From Weik '89]

**IP:** *Abbreviation for intelligent peripheral, Internet protocol.*

**IPC:** *Abbreviation for information processing center.*

**IPX:** *Abbreviation for Internetwork Packet Exchange.* A proprietary LAN protocol.

**IR:** *Abbreviation for infrared.*

**irradiance:** Radiant power incident per unit area upon a surface. *Note:* Irradiance is usually expressed in watts per square meter, but may also be expressed in joules per square meter. (188) *Deprecated synonym power density.*

**irradiation:** The product of irradiance and time, *i.e.*, the time integral of irradiance. *Note:* For example, an irradiation of 100 J/m<sup>2</sup> (joules per square meter) is obtained when an irradiance of 25 W/m<sup>2</sup> (watts per square meter) is continuously incident for 4 seconds.

**ISB:** *Abbreviation for independent sideband.* *See independent-sideband transmission.*

**ISDN:** *Abbreviation for integrated services digital network.* An integrated digital network in which the same time-division switches and digital transmission paths are used to establish connections for different services. *Note 1:* ISDN services include telephone, data, electronic mail, and facsimile. *Note 2:* The method used to accomplish a connection is often specified: for example, switched connection, nonswitched connection, exchange connection, ISDN connection.

**ISM:** *Abbreviation for industrial, scientific, and medical applications (of radio frequency energy).*

**ISO:** *Abbreviation for International Organization for Standardization.* An international organization that (a) consists of member bodies that are the national standards bodies of most of the countries of the world, (b) is responsible for the development and publication of international standards in various technical fields, after developing a suitable consensus, (c) is affiliated with the United Nations, and (d) has its headquarters at 1, rue de Varembé, Geneva, Switzerland. *Note:* Member bodies of ISO include, among others, the American National Standards

Institute (ANSI), the Association Française de Normalisation (AFNOR), the British Standards Institution (BSI), and the Deutsche Institut für Normung (DIN).

**isochrone:** A line on a map or chart joining points associated with a constant time difference from the transmitter to receiver of electromagnetic waves, such as radio waves, at all points along the line. [From Weik '89]

**isochronous:** **1.** Of a periodic signal, pertaining to transmission in which the time interval separating any two corresponding transitions is equal to the unit interval or to a multiple of the unit interval. (188) **2.** Pertaining to data transmission in which corresponding significant instants of two or more sequential signals have a constant phase relationship. *Note:* “Isochronous” and “anisochronous” are characteristics, while “synchronous” and “asynchronous” are relationships.

**isochronous burst transmission:** In a data network where the information-bearer channel rate is higher than the input data signaling rate, transmission performed by interrupting, at controlled intervals, the data stream being transmitted. *Note 1:* Isochronous burst transmission enables communication between data terminal equipment (DTE) and data networks that operate at dissimilar data signaling rates, such as when the information-bearer channel rate is higher than the DTE output data signaling rate. *Note 2:* The binary digits are transferred at the information-bearer channel rate. The transfer is interrupted at intervals in order to produce the required average data signaling rate. *Note 3:* The interruption is always for an integral number of unit intervals. (188) *Note 4:* Isochronous burst transmission has particular application where envelopes are being transferred between data circuit-terminating equipment (DCE) and only the bytes contained within the envelopes are being transferred between the DCE and the DTE. *Synonyms burst isochronous (deprecated), interrupted isochronous transmission.*

**isochronous demodulation:** Demodulation in which the time interval separating any two significant instants is equal to the unit interval or a multiple of the unit interval. (188)

**isochronous distortion:** The difference between the measured modulation rate and the theoretical modulation rate in a digital system. (188)

**isochronous modulation:** Modulation in which the time interval separating any two significant instants is equal to the unit interval or a multiple of the unit interval. (188)

**isochronous signal:** A signal in which the time interval separating any two significant instants is equal to the unit interval or a multiple of the unit interval. (188) *Note 1:* Variations in the time intervals are constrained within specified limits. *Note 2:* “Isochronous” is a characteristic, while “synchronous” indicates a relationship.

**isolator:** *See* optical isolator.

**isotropic:** **1.** Pertaining to a material with properties, such as density, electrical conductivity, electric permittivity, magnetic permeability, or refractive index that do not vary with distance or direction. **2.** Pertaining to a material with magnetic, electrical, or electromagnetic properties that do not vary with the direction of static or propagating magnetic, electrical, or electromagnetic fields within the material. (188)

**isotropic antenna:** A hypothetical antenna that radiates or receives equally in all directions. (188) *Note:* Isotropic antennas do not exist physically but represent convenient reference antennas for expressing directional properties of physical antennas.

**isotropic gain:** *Synonym* absolute gain (def. #1).

**iterative impedance:** In electrical circuits, for a four-terminal network, the impedance that, if connected across one pair of terminals, will match the impedance across the other pair of terminals. (188) *Note:* The iterative impedance of a uniform line is the same as its characteristic impedance.

**ITU:** *Abbreviation for International Telecommunication Union.*

**ITU-R:** The Radiocommunications Sector of the ITU; responsible for studying technical issues related to radiocommunications, and having some regulatory powers. *Note:* A predecessor organization was the CCIR.

**ITU-T:** *Abbreviation for International Telecommunication Union—Telecommunication Standardization Bureau.* The Telecommunications Standardization Sector of the International Telecommunication Union (ITU). *Note 1:* ITU-T is responsible for studying technical, operating, and tariff Questions and issuing Recommendations on them, with the goal of standardizing telecommunications worldwide. *Note 2:* The ITU-T combines the standards-setting activities of the predecessor organizations formerly called the International Telegraph and Telephone Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR).

**IVDT:** *Abbreviation for integrated voice data terminal. See integrated station.*

**IXC:** *Abbreviation for interexchange carrier.*

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