



Agilent Technologies

Wireless Dictionary

In an effort to help you keep up with all the acronyms and terms in the wireless industry Agilent offers you the Wireless Dictionary. A compilation of over 500 terms, the Wireless Dictionary is easily accessible on the web, <http://www.agilent.com/find/wireless>, To order a pocket-size dictionary containing 150 acronyms, contact the Test & Measurement Call Center, 1-800-452-4844, and ask for literature number 5980-1094E.

Acronym/Term	Acronym Definition	Explanation
2G	Second generation of wireless communication systems.	Wireless communications systems using digital transmission and advanced control techniques to improve the performance of voice communications, provide special features and limited digital messaging capabilities.
3G	Third generation of wireless communication systems.	3G is the newest generation of wireless communications systems, allowing greater bandwidth and opening the way to increased data-over-wireless solutions such as described by the ITU's IMT-2000 project. It is not expected to be fully operational until 2002. The 3rd Generation (3G) mobile devices and services will transform wireless communications into on-line, real-time transfer of information, regardless of time and place. You will be able to send electronic postcards with images, and you can even have a live videoconference using your 3G mobile communication device. See also IMT-2000.
3GPP	Third-Generation Partnership Project (W-CDMA)	A global cooperative project in which standardization bodies in Europe, Japan, South Korea and the United States, as founders, are coordinating W-CDMA issues. See also W-CDMA.
3GPP2	Third-Generation Partnership Project 2 (cdma2000)	An organization dedicated to developing international version of the cdma2000 specification.

Acronym/Term	Acronym Definition	Explanation
ACELP	Algebraic Code Excited Linear Predictive	An algebraic technique used to populate codebooks for CELP speech coders. This technique results in more efficient codebook search algorithms. [8]
ACIR	Adjacent Channel Interference Ratio	The ratio of wanted power to the interference power from the adjacent channel(s). [2]
ACLR	Adjacent Channel Leakage Ratio	ACLR is a measure of transmitter performance for W-CDMA. It is defined as the ratio of the transmitted power to the power measured after a receiver filter in the adjacent RF channel. This is what was formerly called Adjacent Channel Power Ratio. ACLR is specified in the 3GPP W-CDMA standard.
ACPR	Adjacent Channel Power Ratio	A measurement of the amount of interference, or power, in the adjacent frequency channel. ACPR is usually defined as the ratio of the average power in the adjacent frequency channel (or offset) to the average power in the transmitted frequency channel. It is a critical measurement for CDMA transmitters and their components. It describes the amount of distortion generated due to nonlinearities in RF components. The ACPR measurement is not part of the cdmaOne standard.
ACS	Adjacent Channel Selectivity	A measurement of a receiver's ability to process a desired signal while rejecting a strong signal in an adjacent frequency channel. ACS is defined as the ratio of the receiver filter attenuation on the assigned channel frequency to the receiver filter attenuation on the adjacent channel frequency.
ACTS	Advanced Communications Technology and Services	One of the groups spearheading the development of 3G technologies in Europe. ACTS succeeded RACE and is focusing on wideband multiple access techniques.
adaptive equalizer		A channel equalizer whose parameters are updated automatically and adaptively during the transmission of data. These equalizers are commonly used in fading channels to improve transmission performance. [4]
ADC	Analog-to-Digital Converter	Converter that uniquely represents all analog input values within a specified total input range by a limited number of digital output codes. [2]

Acronym/Term	Acronym Definition	Explanation
adjacent channel interference		Out of band power generated in adjacent channels by transmitters operating in their assigned channel. The amount of adjacent channel interference a receiver sees is a function of transmitter and receiver filter characteristics and the number of transmitters operating in the area.
ADPCM	Adaptive Differential Pulse Code Modulation	An encoding technique using differential encoding and variable sized quantizing steps. The variance of the step sizes are based on estimates of past signal samples. [4]
ADSL	Asymmetrical Digital Line Subscriber	A method to increase transmission speed in a copper cable. ADSL facilitates the division of capacity into a channel with higher speed to the subscriber, typically for video transmission, and a channel with significantly lower speed in the other direction. [6]
AGC	Automatic Gain Control	System which holds the gain and, accordingly, the output of a receiver substantially constant in spite of input- signal amplitude fluctuations.
AGCH	Access Grant Channel	A downlink control channel used in GSM systems to assign mobiles to a SDCCH for initial assignment.
AIN	Advanced Intelligent Network	A network of equipment, software and protocols used to implement features on the network and support switching and control functions. [1]
A-law companding		A type of non-linear (logarithmic) quantizing, companding and encoding technique for speech signals based on the A-law. This type of compandor is used internationally and has a similar response as the μ -law compandor, except it is optimized to provide a more nearly constant signal-to-quantizing noise ratio at the cost of some dynamic range. [7]
aliasing		A type of signal distortion that occurs when sampling frequency of a signal is less than the Nyquist rate.
ALOHA		A packet-based radio access protocol developed by the University of Hawaii where every packet sent is acknowledged. Lack of an acknowledgement is an indication of a collision and results in a retransmission. [1]

Acronym/Term	Acronym Definition	Explanation
AM	Amplitude Modulation	CW modulation using amplitude variation in proportion to the amplitude of the modulating signal; usually taken as DSB-LC for commercial broadcast transmissions and DSB-SC for multiplexed systems.
AMPS	Advanced Mobile Phone System	The original standard specification for analog systems. Operates in the frequency range of 800 MHz, with a bandwidth of 30kHz. Used primarily in North America, Latin America, Australia and parts of Russia and Asia.
AMR	Advanced Multi Rate Codec	During 1999, ETSI standardized this new speech codec for GSM. The codec adapts its bit-rate allocation between speech and channel coding, thereby optimizing speech quality in various radio channel conditions. For this reason, 3GPP (under which the next stage GSM speech quality will be realized) has selected the AMR codec as an essential speech codec for the next generation system. AMR was jointly developed by Nokia, Ericsson and Siemens.
analog system		A transmission method or way of sending voice, video and data-using signals (such as electricity or sound waves) that are continuously variable rather than discreet units as in digital transmissions. The first networks for mobile phones, built in the 1980s, were analog. Analog systems include AMPS, NMT and ETACS.
angle diversity		A technique using multiple antenna beams to receive multipath signals arriving at different angles. [4]
ANSI	American National Standards Institute	A non-profit organization in the US which pursues standardization within the industrial sector. It is also a member of ISO (International Standard Organization). ANSI itself, however, does not establish standards. Instead, it assists in reviewing proposals put forth by various standardizing bodies in the US and accordingly assigns a category code and number after approval.
antenna		The part of a radio transmission system designed to radiate or receive electromagnetic waves. [7]
antenna beamwidth		More properly referred to as the half-power beamwidth, this is the angle of an antenna pattern or beam over which the relative power is at or above 50% of the peak power.

Acronym/Term	Acronym Definition	Explanation
antenna directivity		This is the relative gain of the main beam of an antenna pattern to a reference antenna, usually an isotropic or standard dipole.
antenna gain		See antenna directivity.
APC	Automatic Power Control	A technique of measuring the performance of a radio channel and adjusting the power of the transmitter to a level appropriate for link characteristics.
ARDIS	Advanced Radio Data Information Systems	A radio system developed jointly by Motorola and IBM to provide mobile data services. The system is now operated solely by Motorola.
ARFCN	Absolute Radio Frequency Channel Numbers	A channel numbering scheme used to identify specific RF channels in a GSM radio system.
ARIB	Association of Radio Industries and Businesses (Japan)	An incorporated body designated by the Ministry of Posts and Communication of the Japanese government to pursue effective radio utilization in the radio communication and broadcast sector. With regard to standardization, ARIB is currently primarily engaged in standardizing procedures for IMT-2000 (next generation mobile communication system) and digital TV broadcasting.
ARQ	Automatic Retransmission Request	A signal used in digital communications systems used to signal the transmitting device to retransmit a block of data.
ASIC	Application-Specific Integrated Circuit	An integrated circuit designed to perform a specific set of functions, usually within a specific device.
asynchronous mode		A way to send transmissions by starting and stopping transmissions with a code rather than sending transmissions at specific time intervals as in synchronous mode. Asynchronous communication devices do not have to be synchronized with a clocking signal, which is required with synchronous transmission. Also frequently referred to as ATM or Asynchronous Transfer Mode. Can also mean that there are different capacities for data transfer in each direction, for example the old 90/200 baud modems and the new ADSL. See also synchronous mode.

Acronym/Term	Acronym Definition	Explanation
ATM	Asynchronous Transfer Mode	A technology for broadband transmission of high-capacity telecommunications signals. In addition to high-capacity signal transmission, ATM provides considerable flexibility, since the individual subscriber is able to adapt the capacity of a switched connection to current requirements.
attenuation		A decrease in signal magnitude between two points. These points may be along a radio path, transmission line or other device.
attenuator		A device specifically designed to decrease the magnitude of a signal transmitted through it.
AUC	Authentication Center	A device, usually located in the HLR of a GSM system that manages the authentication or encryption information associated with individual subscribers.
autocorrelation		The complex inner product of a sequence with a shifted version of its self. It is a measure of how closely a signal matches a delayed version of itself shifted n units in time. [4]
average power		An indication of the peak power averaged over time. Usually applied to pulsed systems where the carrier power is switched on and off.
AWGN	Additive White Gaussian Noise	Statistically random radio noise characterized by a wide frequency range with regards to a signal in a communications channel.
AXE		An open architecture, Ericsson's communications platform. A system for computer-controlled digital exchanges that constitute the nodes in large public telecommunications networks. The basis for Ericsson's wireline and mobile systems.
band		In wireless communication, band refers to a frequency or contiguous range of frequencies. Currently, wireless communication service providers use the 800 MHz, 900 MHz and 1900 MHz bands for transmission in the United States.

Acronym/Term	Acronym Definition	Explanation
band-pass filter		A radio wave filter having a specific range of frequencies it is designed to pass, while rejecting frequencies outside the pass-band.
bandwidth		The information-carrying capacity of a communications channel. Usually expressed in Hertz (cycles per second) for analog circuits and in bits per second (bps) for digital circuits.
base station		The central radio transmitter/receiver that maintains communications with a mobile radio telephone within a given range.
baseband signal		A signal with frequency content centered around DC. Typically the modulating signal for an RF carrier. [4]
BCCH	Broadcast Control Channel	A downlink point to multipoint logical channel in GSM and cdma2000 systems used to send identification and organization information about common control channels and cell services. [1]
BCH	Broadcast Channels	A group of downlink point to multipoint logical channels used by mobiles to synchronize to and receive information necessary to access a cell in GSM, cdma2000, and W-CDMA systems. [1]
BCH code	Bose-Chaudhuri-Hocquenghem Code	A family of powerful cyclic block forward error correction codes used in the transmission of data. [6]
BER	Bit Error Rate	A ratio of the number of errors to data bits received on a digital circuit. BER is usually expressed in exponential form.
BERT	Bit Error Rate Tester	A device used to measure the bit error rate performance of a data circuit.
bit interval		The amount of time, usually in milliseconds or microseconds, a binary one is in the "on" position. [4]

Acronym/Term	Acronym Definition	Explanation
BLER	Block Error Rate	A ratio of the number of erroneous blocks to the total number of blocks received on a digital circuit. Block error rate (BLER) is used for W-CDMA performance requirements tests (demodulation tests in multipath conditions, etc). BLER is measured after channel de-interleaving and decoding by evaluating the Cyclic Redundancy Check (CRC) on each transport block.
block code		A family of codes having a one-to-one mapping between k-symbol source words and n-symbol code words. [4]
blocking probability		The statistical probability that a telephone connection cannot be established due to insufficient transmission resources in the network. Usually expressed as a percentage or decimal equivalent of calls blocked by network congestion during the busy hour.
Bluetooth		A short range radio technology developed by Ericsson and other companies that makes it possible to transmit signals over short distances between telephones, computers and other devices without having to interconnect them with wires.
bps	Bits per Second	The units usually used to express data transmission speed; the number of pieces of information transmitted per second.
BPSK	Binary Phase Shift Keying	A type of phase modulation using 2 distinct carrier phases to signal ones and zeros.
broadband		This term has a number of meanings. It was coined originally to describe a channel having more bandwidth than needed to carry a standard voice grade channel. It is also the term for transmission equipment and media that can support a wide range of electromagnetic frequencies. Broadband frequencies can transmit more data and at a higher speed than narrowband frequencies. In general, paging services and traditional voice grade wireless phones are considered narrow-band. High speed data and video communications are usually considered broadband services and employ broadband equipment.

Acronym/Term	Acronym Definition	Explanation
BS	Base Station	The equipment on the network side of a wireless communications link. The base station contains the tower, antennas and radio equipment needed to allow wireless communications devices to connect with the network.
BSC	Base Station Controller	A device and software associated with a base station that permits it to register mobile phones in the cell, assign control and traffic channels, perform handoff and process call setup and termination.
BSIC	Base Station Identity Code	A unique code contained in messages on the broadcast channels of a cell or base station that uniquely identifies the base station.
BSS	Base Station Subsystem	That portion of a GSM network that includes the base station, base station controller and transcoders (if used). [1]
BT	Bandwidth Time Product	The result obtained by multiplying the system bandwidth by the signal duration. As a general rule, the system bandwidth must be approximately equal to the reciprocal of the signal duration to produce an output signal of the same general form as the input, i.e., $BT \approx 1$. [10]
BTA	Basic Trading Area	A geographic area over which a PCS operator is licensed to provide service. BTAs are a group of counties in metropolitan areas having common financial, commercial and economic ties and were first used to license PCS service in the middle '90s. BTAs are about the size of a cellular MSA and cross state lines in some instances. BTAs are used by the Rand-McNally corporation to summarize economic data. BTAs are grouped into larger areas called MTAs
BTS	Base Transceiver Station	Although specifications differ for each system, the BTS effects radio communication with mobile stations (MS) via its respective radio access system and transmits/receives signals to/from connected radio network controllers (RNC) located along transmission routes.
burst		A term, usually associated with a TDMA system, describing a group of bits or other information transmitted by the system. Also refers to the time the transmitter is on and radiating. [4]

Acronym/Term	Acronym Definition	Explanation
C/I	carrier-to-interference ratio	See carrier-to-interference ratio. [1]
C/N	carrier-to-noise ratio	See carrier-to-noise ratio.
CAI	Common Air Interface	A set of open standards describing the physical and logical characteristics of a link between a base station and mobile station. These standards are used by infrastructure and handset manufactures to design and build equipment that is capable of interoperating with each others systems.
carrier recovery		A technique for extracting the RF carrier from a modulated signal so that it can be reinserted and used to recover the modulating signal.
carrier-to-interference ratio		The ratio of power in an RF carrier to the interference power in the channel.
carrier-to-noise ratio		The ratio of power in an RF carrier to the noise power in the channel.
CBCH	Cell Broadcast Channel	A downlink point to multipoint logical channel in a GSM system used to broadcast user information from a service center to mobile stations listening in a given cell area. [1]
CCDF	Complementary Cumulative Distribution Function	A method used to characterize the peak power statistics of a digitally modulated signal. The CCDF curve can be used to determine design parameters for CDMA systems (such as the amount of back-off to run in a power amplifier). [9]
CCH	Control Channel	A general term used to describe the channels that transmit signaling and control information between the network and the mobile stations. [1]
CDF	Cumulative Distribution Function	The cumulative probability that a parameter will be less than a given value X .
CDG	CDMA Development Group	A technical organization dedicated to developing the CDMA technology and promoting its use world-wide.

Acronym/Term	Acronym Definition	Explanation
CDMA	Code Division Multiple Access	One of several digital wireless transmission methods in which signals are encoded using a specific pseudo-random sequence, or code, to define a communication channel. A receiver, knowing the code, can use it to decode the received signal in the presence of other signals in the channel. This is one of several "spread spectrum" techniques, which allows multiple users to share the same radio frequency spectrum by assigning each active user an unique code. CDMA offers improved spectral efficiency over analog transmission in that it allows for greater frequency reuse. Other characteristics of CDMA systems reduce dropped calls, increase battery life and offer more secure transmission. See also IS-95.
cdma2000	The name identifying the TIA standard (IS-2000) for third generation technology that is an evolutionary outgrowth of cdmaOne.	A radio transmission technology for the evolution of narrowband cdmaOne/IS-95 to 3rd-generation adding up multiple carriers. See also W-CDMA for single carrier/direct spread technology.
cdmaOne		Brand name describing a complete wireless system incorporating the IS-95 CDMA air interface.
CDP	Code Domain Power	A measurement of the power contained in each Walsh coded channel in CDMA signals. The CDP measurement is beneficial in troubleshooting CDMA transmitter designs.
CDPD	Cellular Digital Packet Data	An open wireless transmission standard allowing two-way 19.2-Kbps packet data transmission over existing cellular telephone channels (AMPS with CDPD capability.) In essence, CDPD technology uses idle network capacity caused by pauses in phone conversations and gaps between calls placed, etc. to transmit data.
CDVCC	Coded Digital Verification Color Code	A unique 12 bit code word used to identify the base station. It performs the same function as the SAT in an analog system it that it is added at the base station to the downlink or forward channel. The mobile then detects and returns the code. The CDVCC is used to determine channel continuity, and only one CDVCC is usually assigned to a base station or sector. [1]

Acronym/Term	Acronym Definition	Explanation
cell		The geographic area encompassing the signal range from one base station (a site containing a radio transmitter/receiver and network communication equipment). Wireless transmission networks are comprised of many hexagonal, overlapping cell sites to efficiently use radio spectrum for wireless transmissions. Also, the basis for the term "cellular phone."
cell splitting		The process of splitting a cell into several smaller cells. This is usually done to make more voice channels available to accommodate traffic growth in the area covered by the original cell.
cellular		In wireless communications, cellular refers most basically to the structure of the wireless transmission networks which are comprised of cells or transmission sites. Cellular is also the name of the wireless telephone system originally developed by Bell Laboratories that used low-powered analog radio equipment to transmit within cells. The terms "cellular phone" or "cell phone" are used interchangeably to refer to wireless phones. Within the wireless industry, cellular is also used to refer to non-PCS products and services.
cellular handoff		In cellular communications, a telephone call is switched by computers from one transmitter to the next, without disconnecting the signal, as a vehicle moves from cell to cell. The mobile remains on a specific channel until signal strength diminishes, then, is automatically told to go to another channel and pick up the transferred transmissions there.
cellular mobile telephone system		System where each geographic area is covered by a base station. This area is known as a cell. Each telephone in the cell communicates with the base station. If the phone moves to another cell, the call is automatically transferred to the base station in the new cell.
CELP	Code-Book Excited Linear Predictive	A powerful low-rate coding technique where a short excitation frame, typically 5ms, is modeled by a Gaussian vector chosen from a large stochastic codebook. The vector is chosen such that the error between the original and synthesized speech is minimized. [2]
CEPT	Committee of European Posts & Telephones	A European regulatory body responsible for coordinating telecommunications within Europe.

Acronym/Term	Acronym Definition	Explanation
CGSA	Cellular Geographic Service Area	A general term used to describe the physical area over which a cellular carrier is licensed to provide service. See also MSA, RSA, MTA, BTA, EA and REAG.
channel		A general term used to describe a communications path between two systems. They may be either physical or logical depending on the application. An RF channel is a physical channel, whereas control and traffic channels within the RF channel would be considered logical channels.
channel coding		The application of forward error correction codes to an RF channel to improve performance and throughput.
channel equalization		The process of reducing amplitude, frequency and phase distortion in a radio channel with the intent of improving transmission performance. [7]
CIF	Common Intermediate Format	A video image format using 352 horizontal pixels and 288 vertical lines. The format is adopted in multimedia communication standards.
circuit switched		A switched circuit is only maintained while the sender and recipient are communicating, as opposed to a dedicated circuit which is held open regardless of whether data is being sent or not.
clock recovery		The process of extracting the timing signals from a digitally modulated carrier wave. The recovered clock signal is then used to decode and further process the data.
co-channel interference		Unwanted interference within a radio channel from another transmitter using the same channel at a different location. Co-channel interference is very common in a frequency reuse system and must be carefully controlled to prevent problems. [1]
codebook		An ordered collection of all possible values that can be assigned to a scalar or a vector variable. Each vector is called a codeword. [4]

Acronym/Term	Acronym Definition	Explanation
CODEC	Coder/Decoder	An amalgam of the terms "Coder" and "Decoder". It generally signifies the encoding device/module which carries out highly efficient conversion processing from the basic digital signal to a compressed signal during digitalization of voice and picture signals. Encoding specifications for the voice CODEC and image CODEC are stipulated by the G-series and H-series ITU-T recommendations, respectively. In the case of mobile communication, encoding specifications are established by the concerned standardizing bodies.
coding gain		The effective gain, usually in dB, that coding provides over an uncoded signal. Coding gain is usually measured as the dB difference in C/N ratios between a coded and uncoded signal producing the same BER.
coherent detection		Also referred to as coherent demodulation, this is a technique of phase locking to the carrier wave to improve detection. Knowledge of the carrier phase improves demodulator performance.
companding	Compressing and Expanding	A technique for reducing the dynamic range of a baseband signal. This reduces the number of quantizing steps needed and reduces noise in the process. Most digital systems include nonlinear quantizing to achieve this effect. [4]
concatenated coding		The use of two codes, an inner and outer code, to further improve transmission performance. Using this technique, a data stream is encoded with the outer code and then the coded data is further encoded with the outer code. This technique is particularly effective in bursty environments. The use of concatenated codes is most common in space communications and usually involves a convolutional inner code and Reed-Solomon outer code. [4]
constellation		A graphical representation of signal states for a digital system. [2]
control channel		A channel, usually logical, used to send administrative and supervisory signals between a base station and a mobile station.
convolutional code		A type of forward error correction code using a shift register containing a number of stages to shift the input bits one at a time to produce a coded output. [1]

Acronym/Term	Acronym Definition	Explanation
COST-231		ETSI propagation model for 2 GHz applications.
coverage area		The geographical reach of a mobile communications network or system.
coverage hole		An area within the radio coverage footprint of a wireless system in which the RF signal level is below the design threshold. Coverage holes are usually caused by physical obstructions such as buildings, foliage, hills, tunnels and indoor parking garages.
CPM	Continuous Phase Modulation	A phase modulation technique employing smooth transitions between signal states. This reduces sidelobe spectral energy and improves co-channel performance. [2]
CRC	Cyclic Redundancy Code	The use of the syndrome of a cyclic block code to detect errors. [4]
cross correlation		The complex inner product of a first sequence with a shifted version of a second sequence. Sequences are considered to have good cross correlation properties when there is very little correlation between the sequences as they are shifted against each other. [4]
cross talk		The ability for unwanted information from one channel to "spill over" into an adjacent channel. [4]
CT-2	Cordless Telephone 2	A second generation cordless telephone system that allowed users to roam away from their home base stations and receive service in public places. Away from the home base station, the service was one way outbound from the phone to a telepoint within range. [1]
CT-3		See DECT.
CTIA	Cellular Telecom Industry Association	The membership-based association, located in Washington, D.C., represents the interests of the wireless telecommunications industry.

Acronym/Term	Acronym Definition	Explanation
CW	Continuous Wave	The term commonly gives to an unmodulated RF carrier.
cyclic codes		These are a subclass of linear block codes with an algebraic structure that enables encoding to be implemented with a linear shift register and decoding to be implemented without a lookup table. [4]
DAC	Digital to Analog Converter	A device that takes a digital representation of a signal and transforms it into a facsimile of its original form.
D-AMPS	Digital-Advanced Mobile Phone System	Earlier designation of American standard for digital mobile telephony used primarily in North America, Latin America, Australia and parts of Russia and Asia. Also known as (North American) TDMA. See also TDMA and IS-136.
dB	deciBel	A technique for expressing voltage, power, gain, loss or frequency in logarithmic form against a reference. Typical references include volts, watts or Hz. DeciBels are calculated using the expression: $dB = 10 \cdot \log(x/y)$.
dBc	deciBels referenced to the carrier	A technique for expressing a power measurement in logarithmic form using the carrier power as a reference.
dBd	deciBels referenced to a dipole antenna	A technique for expressing a power gain measurement in logarithmic form using a standard dipole antenna as a reference.
dBi	deciBels referenced to an isotropic antenna	A technique for expressing a power gain measurement in logarithmic form using a theoretical isotropic antenna as a reference.
dBm	deciBels referenced to a milliWatt	A technique for expressing a power measurement in logarithmic form using 1 mW as a reference.
DCA	Dynamic Channel Allocation	An automatic process for assigning traffic channels in a frequency reuse wireless system. The base station continuously monitors the interference in all idle channels and makes an assignment using an algorithm that determines the channel that will produce the least amount of additional interference.

Acronym/Term	Acronym Definition	Explanation
DCCH	Dedicated Control Channel	A dedicated channel used to carry signalling information in active GSM and cdma2000 traffic channels.
DCS-1800	Digital Communications System - 1800	A delta spec to the GSM specification dealing with the aspects of operating in the 1800 MHz band with an increased number of RF channels. This spec also included features for pedestrian operation of small portable devices. [1]
dead spot		An area within the coverage area of a wireless network in which there is no coverage or transmission falls off. Dead spots are often caused by electronic interference or physical barriers such as hills, tunnels and indoor parking garages. See also coverage area.
DECT	Digital European Cordless Telecommunications	A common standard for cordless personal telephony originally established by ETSI, a European standardization body. Standard based on a micro-cellular radio system that provides low-power cordless access between subscriber and base station up to a few hundred meters. Also known as DCT-900 and CT-3. [1]
delay spread		A type of distortion due to multipath resulting in the spreading out or "smearing" of the received signal. It occurs when identical signals arrive via different paths and have different time delays. [1]
demodulation		Process of recovering the original modulating signal from a modulated carrier. The original modulating signal is usually the information being transmitted, typically voice or data.
differential detection		An encoding and detection technique that uses phase changes in the carrier to signal binary "ones" and "zeros". The signal is sampled every T seconds, and a phase change of 180 degrees could be set to be a "zero" and no phase change would then be a "one". [9]
diffraction		A propagation phenomenon that allows radio waves to propagate beyond obstructions via secondary waves created by the obstruction. Classic types of diffractions are smooth earth and knife-edge. [4]

Acronym/Term	Acronym Definition	Explanation
digital		Describes when information - speech, for example - is encoded before transmission using a binary code - discrete, non-continuous values. Digital networks are rapidly replacing analog ones as they offer improved sound quality, secure transmission and can handle data as well as voice. Digital networks include mobile systems GSM 900, GSM 1800, GSM 1900, D-AMPS and the cordless DECT system.
digital signature		An electronic signature. A technology used to guarantee the reliability of information during electronic transactions. Digital signaturing is enabled through the application of open key encryption technology, and comprises electronic data verifying the identity of the user. A digital signature is created by coding data using an encryption key. Since only the user him/herself is in possession of the corresponding encryption key, the digital signature is essentially unforgeable. The digital signature is subsequently attached to data transmitted to another party to guarantee that the individual sending the message really is who he or she claims to be. [2]
dispersive channel		A radio channel that not only introduces AWGN, but also the effects of multipath and frequency selective fading.
distributed antenna system		A type of antenna system that is distributed or remotely located away from the transmitter. Such an antenna or series of antennas can be connected via coaxial cable, leaky feeder or optical fiber link. [4]
diversity		A technique to reduce the effects of fading by using multiple spatially separated antennas to take independent samples of the same signal at the same time. The theory is that the fading in these signals is uncorrelated and that the probability of all samples being below a threshold at a given instant is low. [5]
DL	Downlink	See downlink. [1]
Doppler Shift		The magnitude of the change in the observed frequency of a wave due to the relative velocity of a transmitter with respect to a receiver.
downlink		The transmission path from the base station down to the mobile station. [7]

Acronym/Term	Acronym Definition	Explanation
DPM	Digital Phase Modulation	A form of CPM in which the shaped symbol pulses are directly applied to the phase modulator. This technique provides the advantages of CPM techniques and is easily implemented in VLSI. It is also easier to demodulate than other types of CPM.
DQPSK	Differential Quadrature Phase Shift Keying	QPSK modulation using differential encoding of the digital information stream.
DS	Direct Sequence	A process of spectrum spreading where the digital information stream is multiplied, using an exclusive OR technique, by a high speed pseudorandom code (spreading sequence) to generate a spread spectrum signal.
DSSS	Direct Sequence Spread Spectrum	A type of spread spectrum modulation using a direct sequence technique to achieve spreading.
DTX	Discontinuous Transmission	A feature in mobile systems where transmitters mute when there is no information to send, such as during periods of silence. This feature prolongs battery life in portable phones and reduces interference in wireless systems.
dual band		A term describing mobile phones that work on networks operating on different frequency bands. This is useful for mobile phone users who move between areas covered by different networks. For example GSM 900, GSM 1800. such as the 800 MHz digital band and the 1900 MHz digital PCS band.
dual mode		An industry term referring to a wireless device that can operate on either an analog or digital transmission network. However, multiple digital transmission systems exist, so dual-mode phone users must ensure that their dual-mode phone will operate on the digital transmission system used by their selected service provider.
duplex/full duplex		Simultaneous two-way transmission, such as experienced in a phone conversation. In contrast, many speakerphones are half-duplex and will transmit in only one direction phone conversation. In contrast, many speakerphones are half-duplex and will transmit in only one direction - from the loudest noise - at a time.

Acronym/Term	Acronym Definition	Explanation
DUT	Device Under Test	An acronym used to describe some type of electrical apparatus connected to test instrumentation. The apparatus can range from a single component to a complex subsystem such as a mobile phone, base station or MSC.
EA	Economic Area	A geographic area over which a WCS operator is licensed to provide service. EAs are a group of counties in metropolitan areas having common financial, commercial and economic ties and were first used to license WCS service in the late '90s. EAs are about the size of a cellular MSA and cross state lines in some instances. EAs are used by the FCC to define areas of economic interest and are grouped into larger areas called REAGs.
E_b/N_0	Bit Energy-to-Noise Density	The ratio of bit energy to noise density. This value is used to specify the lower limit of operation in most digital communications systems and is also used to measure radio channel performance.
EDGE	Enhanced Data for Global Evolution	A technology that gives GSM and TDMA similar capacity to handle services for the third generation of mobile telephony. EDGE was developed to enable the transmission of large amounts of data at a high speed, 384 kilobits per second. (It increases available time slots and data rates over existing wireless networks.)
EFR	Enhanced Full Rate	The second generation full rate speech codec used in GSM systems. This codec replaced the original RPE-LTP codec used in GSM systems. This codec employs ACELP technology. [2]
EHF	Extremely High Frequency	The RF spectrum between 30 GHz and 300 GHz.
EIA	Electronic Industry Association	A trade association and standards setting organization in the USA.
EIR	Equipment Identity Register	A database used by GSM and other second generation wireless systems used to identify the customer devices permitted to access the network. A device is usually placed in the EIR once its operation has been certified for the infrastructure in a laboratory or validation facility. [1]
EIRP	Effective Isotropic Radiated Power	A measure of the power in the main beam of an antenna relative to an isotropic radiator. [1]

Acronym/Term	Acronym Definition	Explanation
encryption		A cryptographic technique utilizing a digital key to scramble and hence "lock" data in such a manner that it cannot be descrambled and decoded without the key.
EPOC		An operating system that turns voice-oriented handsets into Mediaphones and Wireless Information Devices. EPOC places a lighter load on the processor compared to present PDA operating systems and thus has the capacity to enhance the multimedia capacity of mobile phones. EPOC is being developed by Symbian, a joint company of Psion, Nokia, Ericsson, Motorola and Matsushita (Panasonic). It constitutes an open platform optimized for mobile phone use.
equalization		Measures taken to reduce the distortion effects in a radio channel. [4]
ERMES	European Radio Message System	A pan-European wide area paging network working in Europe, the Middle East and Asia.
error correction		The process of correcting errors in data transmitted over a radio channel using forward error correction (FEC) techniques.
error distribution		A description of how errors in a communications channel are distributed. Typical distributions are Gaussian (random) and Raleigh (bursty). [2]
error probability		A computation of the likelihood of an error involving the Probability Density Function (PDF). [2]
error vector		The error vector is the vector difference between a reference signal and a measured signal and is a complex quantity containing a magnitude and phase component. [5]
ESMR	Enhanced Specialized Mobile Radio	The application of second generation wireless technology to the Specialized Mobile Radio Services.
ESN	Electronic Serial Number	A unique electronic identifier given to a mobile terminal. This number is used in verifying the identity of the mobile terminal. [1]

Acronym/Term	Acronym Definition	Explanation
ETACS	Extended Total Access Communications System	The analog mobile phone network developed in the UK and available in Europe and Asia.
E-TDMA	Enhanced TDMA	A TDMA technique using Digital Speech Interpolation (DSI) and half rate coding to allow six calls to be carried in three time slots. The system does this by taking advantage of the 40% speech activity factor. [1]
ETSI	European Telecommunications Standard Institute	The European standardization body for telecommunications.
EVM	Error Vector Magnitude	EVM is a modulation quality metric widely used in digital RF communications systems. It is the root-mean-square (rms) value of the error vector over time at the instants of symbol clock transitions. Used properly, EVM and related measurements can pinpoint exactly the type of degradations present in a signal and can even help identify their sources. [5]
extranet		The extension of a company's intranet out onto the Internet, e.g. to allow selected customers, suppliers and mobile workers to access the company's private data and applications via the World Wide Web. Generally an extranet implies real-time access through a firewall of some kind.
eye diagram		A superposition of segments of a received PAM signal displayed on an oscilloscope or similar instrument. The eye diagram is used to assess impairments in the radio channel. [4]
FACCH	Fast Associated Control Channel	The channel derived by preempting information in a traffic channel. It is used to send handoff and similar messages. [1]
fading		The variation in signal strength from its normal value. Fading is normally negative and can be either fast or slow. It is normally characterized by the distribution of fades, Gaussian, Rician, or Rayleigh. [6]

Acronym/Term	Acronym Definition	Explanation
fast fading		The short term component associated with multipath propagation. It is influenced by the speed of the mobile terminal and the transmission bandwidth of the signal. [4]
fast packet switching		An emerging, packet-orientated, digital technology that differs from traditional packet switching in a number of ways. The most obvious is that it transmits all data in a single packet format whether the information is video, voice or data. Fast packet switching uses short, fixed length packets (cells) and - via hardware switching - is capable of speeds between 100,000 and 1,000,000 packets/second.
FAW	Frame Alignment Word	A unique digital word used by codecs to allow them to re-synchronize to the framing structure in the event of errors. [2]
FCC	Federal Communications Commission	Regulatory body governing communications technologies in the US. established by the Communications Act of 1934, as amended, and regulates interstate communications (wire, radio, telephone, telegraph and telecommunications) originating in the United States.
FCCH	Frequency Correction Channel	A logical channel in GSM systems used to transmit a frequency correction data burst of all "zeros". The resulting frequency shift seen by the mobile is then used for frequency correction. [1]
FDD	Frequency Division Duplex	Radio technology using a paired spectrum. Used in cellular communication systems such as GSM.
FDMA	Frequency Division Multiple Access	Method of allowing multiple users to share the radio frequency spectrum by assigning each active user an individual frequency channel. In this practice, users are dynamically allocated a group of frequencies so that the apparent availability is greater than the number of channels.
FEC	Forward Error Correction	An encoding technique that allows a limited number of errors in digital stream to be corrected based on knowledge of the encoding scheme used.
FER	Frame Erasure/Error Rate	A measure of the number of frames of data that contained errors and could not be processed. FER is usually expressed as a percentage or exponent.

Acronym/Term	Acronym Definition	Explanation
FH	Frequency Hopping	A periodic changing of frequency or frequency set associated with transmission. A sequence of modulated pulses having a pseudorandom selection of carrier frequencies. [1]
FHMA	Frequency Hopped Multiple Access	A set of frequency hopping communicators operating as a system to provide communications services. All communicators traditionally use the same set of carrier frequencies and coordinate their hopping sequences to minimize interference in the network. [1]
FHSS	Frequency Hopped Spread Spectrum	A spectrum spreading technique using an RF carrier hopped across a large number of RF channels using a random or pseudorandom code to determine the sequence of channels used.
FIR	Finite Impulse Response	A technique used to characterize electrical circuits and networks in the time domain. [3]
flat fading		A type of fading in a communications channel that attenuates or fades all frequencies in the channel the same amount. [5]
FM	Frequency Modulation	A form of angle modulation in which the instantaneous frequency of a sine-wave carrier is caused to depart from the carrier frequency by an amount proportional to the instantaneous value of the modulating wave. [7]
forward link		See downlink. [4]
framing		A technique used in digital communications systems for organizing the transmitted data into regular patterns so that the various logical channels in the data stream can be detected and processed.
frequency diversity		The simultaneous use of multiple frequencies to transmit of information. This is a technique used to overcome the effects of multipath fading, since the wavelength for different frequencies result in different and uncorrelated fading characteristics. [5]

Acronym/Term	Acronym Definition	Explanation
frequency reuse		A technique of reusing frequencies and channels within a communications system to improve capacity and spectral efficiency. Frequency reuse generally utilizes regular reuse patterns.
frequency selective fading		A type of signal fading occurring over a small group of frequencies caused by a strong multipath component at those frequencies.
FSK	Frequency Shift Keying	A form of modulation using multiple carrier frequencies to carry the digital information. The most common is the two frequency FSK system using the two frequencies to carry the binary ones and zeros.
full rate		The term commonly applied to voice codecs in a communications system. Most frame formats are designed to accommodate full and half-rate channels, with the intention of implementing half-rate coding as the technology permits to double the capacity of the system. The full-rate codec uses all of the time-slots available.
Gaussian channel		An RF communications channel having the properties of wide-band uniform noise spectral density resulting in a random distribution of errors in the channel. [2]
GGSN	Gateway GPRS Support Node	A gateway from a cellular network to an IP network.
GHz	Gigahertz	A frequency measurement which equals one billion hertz.
GMSK	Gaussian Minimum Shift Keying	A modulation technique involving Gaussian filtering of the input data prior to its application to the phase modulator. This results in a narrow occupied spectrum and better adjacent channel interference performance. [2]
GOS	Grade of Service	A measure of the success a subscriber is expected to have in accessing a network to complete a call. The grade of service is usually expressed as percentage of calls attempted by the subscriber during the busy-hour that are blocked due to insufficient network resources.

Acronym/Term	Acronym Definition	Explanation
GPRS	General Packet Radio Service	A packet-linked technology that enables high-speed (115 kilobit per second) wireless Internet and other data communications over a GSM network. It is considered an efficient use of limited bandwidth and is particularly suited for sending and receiving small bursts of data.
GPS	Global Positioning System	A worldwide radio-navigation system that was developed by the US. Department of Defense. In addition to military purposes it is widely used in marine and terrestrial navigation (for example car navigation systems).
GSM	Global System for Mobile Communication	Originally developed as a pan-European standard for digital mobile telephony, GSM has become the world's most widely used mobile system. It is used on the 900 MHz and 1800 MHz frequencies in Europe, Asia and Australia, and the MHz 1900 frequency in North America and Latin America.
GSM 1800	A digital network working on a frequency of 1800 MHz.	It is used in Europe, Asia-Pacific and Australia. Also known as DCS 1800 or PCN.
GSM 1900	A digital network working on a frequency of 1900 MHz.	It is used in the US and Canada and is scheduled for parts of Latin America and Africa. Also known as PCS 1900.
GSM 900		GSM 900, or just GSM, is the world's most widely used digital network and now operating in over 100 countries around the world, particularly in Europe and Asia Pacific.
guard band		A set of frequencies or band-width used to prevent adjacent systems from interfering with each other. Guard bands are typically used between different types of systems at the edges of the frequency allocations.
HAAT	Height Above Average Terrain	A measure of an antenna's height above average terrain. This value is used by the FCC in determining compliance with height limitations and transmitting powers for high sites.
half rate		The term commonly applied to voice codecs in a communications system. Most frame formats are designed to accommodate full and half-rate channels, with the intention of implementing half-rate coding as the technology permits to double system capacity. The half-rate codec uses only half of the time-slots in the frame. [1]

Acronym/Term	Acronym Definition	Explanation
Hamming code		A well known simple class of block codes capable of detecting up to two errors and correcting one. Although not particularly powerful, they are one of the "perfect" codes in that its standard array has all of the error patterns that can exist for single errors. [3]
hand-off		The process of transferring a call in progress from the current base station to another without interruption as the user moves out of range of the current base station.
hand-over		The passing of a call signal from one base station to the next as the user moves out of range or the network software re-routes the call.
hard hand-off		A term used in CDMA systems to describe a hand-off involving a frequency change. The hard hand-off is a break before make hand-off just like in other wireless systems and must be used where the current and hand-off candidate base stations do not use the same RF channel. See also soft hand-off. [5]
Hata model		Common name used for the Okamura-Hata model used to predict signal strength levels in land-mobile systems.
HLR	Home Location Register	The functional unit responsible for managing mobile subscribers. Two types of information reside in the HLR: subscriber information and part of the mobile information that allow incoming calls to be routed to the mobile subscriber. The HLR stores the IMSI, MS ISDN number, VLR address, and subscriber data on supplementary services. [1]
HPSK	Hybrid Phase Shift Keying	The spreading technique used in the reverse link of 3G systems to reduce the peak-to-average ratio of the signal by reducing zero crossings and 0 degree phase transitions. Also known as Orthogonal Complex Quadrature Phase Shift Keying (OCQPSK). For more information see Agilent application note "HPSK Spreading for 3G".

Acronym/Term	Acronym Definition	Explanation
HSCSD	High Speed Circuit Switched Data	A circuit-linked technology for higher transmission speeds - up to 57 kilobits per second - primarily in GSM systems.
Hz	Hertz	A radio frequency measurement (one hertz = one cycle per second).
I	In-Phase	For PSK modulation, the reference phase channel. See also Q.
IF	Intermediate Frequency	The operating frequency in superheterodyne receivers where amplification, filtering and level control prior to demodulation is accomplished.
IMAP4	Internet Messaging Access Protocol	A remote mailbox access protocol. It enables efficient operation such as downloading only essential data by first acquisitioning the e-mail header prior to actual e-mail download. This feature makes the protocol well suited to remote environments.
IMEI	International Mobile Station Equipment Identity	An identification number assigned to GSM mobile stations that uniquely identifies each one. It is a 15 digit serial number that contains a type approval code, final assembly code and serial number. [1]
i-mode	Internet Mode	A wireless service launched in Japan in spring 1999 by NTT DoCoMo. The service is accessed by a wireless packet network (PDC-P) and the contents are described in a subset of the HTML language.
IMSI	International Mobile Station Identity	A unique 15 digit number assigned to a mobile station at the time of service subscription. It contains a mobile country code, a mobile network code, mobile subscriber identification number, and a national mobile subscriber identity. [1]
IMT-2000	International Mobile Telecommunication 2000	A term used by the International Telecommunication Union, a United Nations agency, to describe the third generation mobile telephony due to be ready in 2000. Can also be applied to mobile telephone standards that meet a number of requirements in terms of transmission speed and other factors.

Acronym/Term	Acronym Definition	Explanation
IMTS	Improved Mobile Telephone Service	A further development of the Mobile Telephone Service (MTS) introduced by the Bell System. This version of mobile service add channels and features, such as automatic dialing, and was the forerunner to the AMPS system. [1]
IN	Intelligent Network	Often referred to as the Advanced Intelligent Network, this is a network of equipment, software and protocols used to implement features on the network and support switching and control functions.
interleaving		The process of spreading a block of data over a wider time frame by placing data bits from other data blocks in between the original data bits in the block. Interleaving is frequently done in digital system to spread the data so that bits from the same block are not contiguous and bit errors are randomized to the point FEC is more effective. Systems using this technique are more likely to withstand Rayleigh and other bursty fading and interference phenomenon. [2]
Internet capability		Functionality in a wireless network enabling access to the Internet for web page viewing and e-mail purposes.
IP	Internet Protocol	A set of instructions defining how information is handled as it travels between systems across the Internet.
IPR	Intellectual Property Rights	Also known as patents, these are the rights of an inventor or assignee to develop and commercialize an invention and license it, usually for a fee, to other manufacturers.
IPv6	Internet Protocol version 6.	The latest IP version. Address exhaustion is prevented by means of a long address field, thereby enabling further Internet expansion. In addition, security and mobility are built into the protocol. Currently utilized IP addresses are almost all IPv4, and with the present rate of Internet growth this type of address will be exhausted by 2010. IPv6 on the other hand enables 10 to the 29th power more available addresses than the previous IPv4.
IS-136	EIA Interim Standard 136 - NADC with Digital Control Channels	The North American digital mobile telephony standard based on TDMA technology. It is the version of the TDMA specification resulting in a fully digital 2nd generation system and is backward compatible with analog AMPS. See also TDMA and D-AMPS.

Acronym/Term	Acronym Definition	Explanation
IS-2000	EIA Interim Standard 2000 (see cdma2000)	A standard for current CDMA systems providing a migration path to 3G services.
IS-41	Inter-network connection protocol for connecting systems based on both analog and digital US standards.	Inter-network connection protocol for connecting systems based on both analog and digital US standards.
IS-54	EIA Interim Standard for U.S. Digital Cellular	Original TDMA digital standard. Implemented in 1992. This standard was the first to permit the use digital channels in AMPS systems. It used digital traffic channels but retained the use of analog control channels. This standard was replaced by the IS-136 digital standard in 1996.
IS-95	EIA Interim Standard 95 (see cdmaOne)	The original digital mobile telephony standard based on CDMA technology. See also CDMA.
ISDN	Integrated Services Digital Network.	A technology offering switched and fixed high speed transmission of voice, data and video through the existing telephone infrastructure. The service is based on 1 or more 64 kbps digital channels and does not use traditional modems.
ISI	Inter-Symbol Interference	An interference effect where energy from prior symbols in a bit stream is present in later symbols. ISI is normally caused by filtering of the data streams.
ITU	International Telecommunications Union	A United Nations agency that deals with telecommunications issues.
IWF	Interworking Function	A technique for interfacing data between a wireless system and the telephone network. It usually involves the use of modems or data terminal adapters to convert the data transmitted over the air interface and mobile network to a format that can be recognized and carried by the public telecommunications network.
kHz	kiloHertz	A radio frequency measurement (one kilohertz = one thousand cycles per second).

Acronym/Term	Acronym Definition	Explanation
LAI	Location Area Identity	Information carried in the SIM of GSM handsets that identify the subscriber's home area. This is used for billing and sub-net operation purposes.
LAN	Local Area Network	A small data network covering a limited area, such as within a building or group of buildings.
Lee's model		A slope-intercept propagation prediction model developed at Bell Laboratories and popularized by William Lee. The model assumes an initial condition at a short distance from a base station and uses that as one end of a slope intercept model to predict path loss between a base station and a mobile unit.
link		The radio connection between a transmitter and a receiver.
link budget		A calculation involving the gain and loss factors associated with the antennas, transmitters, transmission lines and propagation environment used to determine the maximum distance at which a transmitter and receiver can successfully operate.
LMDS	Local Multipoint Distribution System	The name given to point-to-multipoint systems operating at 29 GHz and carrying high speed digital traffic. These systems are usually laid out like cellular systems and are currently being used by entrepreneurs to provide competitive services to the local telephone companies. [4]
LNA	Low Noise Amplifier	A receive preamplifier having very low internal noise characteristics placed very near the antenna of a receiver to capture the C/N before it can be further degraded by noise in the receiving system. [1]
location registration		One of several computer databases used to maintain location and other information on mobile subscribers. See HLR and VLR.
logical channel		A communications channel derived from a physical channel. A physical channel, i.e. RF channel, typically carries a data stream that contains several logical channels. These usually include multiple control and traffic channels. [5]

Acronym/Term	Acronym Definition	Explanation
LOS	loss of signal	A condition where the received signal drops below threshold due to a terrain obstruction or other phenomenon increasing the link budget loss beyond design parameters. [2]
LOS	line of sight	A description of an unobstructed radio path or link between the transmitting and receiving antennas of a communications system. [5]
LPA	linear power amplifier	The final amplification stage in a multicarrier transmitter that has been designed and optimized to produce a linear response. By operating in the linear mode, the amplifier reduces the non-linear effects that produce intermodulation products and side-lobe spectra that cause adjacent channel interference.
LPC	Linear Predictive Coding	A speech encoding scheme that uses periodic pulses to excite a filter, similar to the way human voice is produced. The code is predictive in that it uses knowledge of past data (represented as vectors) to predict future values in a feed forward manner. [1]
LSB	Least Significant Bit	In a binary coding scheme, the bit having the least numerical value. Analogous to the units position in a decimal number.
lu		Standardized interface between a Radio Network Controller Network and Packet Subsystem (e.g. RNC-3GSGSN).
lub		Interface between a Base Station and Radio Network Controller.
lur		Open RNC-RNC interface.
MAC	Medium Access Control	The protocols that arbitrate access between all nodes of a wireless LAN. [4]
macro cell		A large cell in a wireless system capable of covering a large physical area. Macrocells are used in rural areas and other areas where subscriber or traffic densities are low.

Acronym/Term	Acronym Definition	Explanation
MAHO	Mobile Assisted Handoff	A handoff technique involving feedback from the mobile station as part of the handoff process. The feedback is usually in the form of signal level and quality measurements on the downlink and signal level measurements from neighbor cells.
MAP	Mobile Application Part	A protocol using the lower level layers of the SS7 protocol stack (TCAP, SCCP and MTP) for communication between the various registers and other MSCs. [11]
matched filter		The receiver filter with impulse response equal to the time-reversed, complex conjugate impulse response of the combined transmitter filter-channel impulse response. [4]
MC-CDMA	Multi-Carrier Code Division Multiple Access	Typically, this means the combination of three IS-95 carriers to form one wideband carrier. It is an evolution of IS-95 for third generation systems. Also called cdma2000. The current nomenclature is temporary, with a formal name for this technology to be determined under 3GPP2.
Mcps	Mega Chips per Second	A measure of the number of bits (chips) per second in the spreading sequence of direct sequence spreading code.
MHz	Megahertz	A unit of frequency equal to one million hertz or cycles per second. Wireless communications occur in the 800 MHz, 900 MHz and 1900 MHz bands.
micro cell		A base station with a very small coverage area designed to provide service in areas having a very high density of mobile subscribers. Microcells are traditionally used in convention centers, airports and similar areas.
MIN	Mobile Identification Number	A unique identification number given to a mobile unit. In most cases, this number is the telephone number of the handset. In the case of analog cellular, the MIN is used to route the call. In most second generation system, the system assigns temporary numbers to the handset to route calls as a security precaution. See also TMSI. [1]
μ -law companding		A type of non-linear (logarithmic) quantizing, companding and encoding technique for speech signals based on the μ -law. This type of companding uses a μ factor of 255 and is optimized to provide a good signal-to-quantizing noise ratio over a wide dynamic range.

Acronym/Term	Acronym Definition	Explanation
MMM	Mobile Media Mode	The WWW:MMM logo is a marketing innovation comprising a unifying industry-wide marketing symbol representing leading edge web-based products and services.
MMS	Multimedia Messaging Service	MMS is a new standard that is being defined for use in advanced wireless terminals. The service concept is derived from Short Message Service and allows for non-real-time transmission of various kinds of multimedia contents like images, audio, video clips, etc. As a further evolution of the current text mail, for example, electronic postcards, audio/video clips, etc. can be sent.
mobile phone network		A network of cells. Each cell is served by a radio base station from where calls are forwarded to and received from your mobile phone by wireless radio signals.
modulation		The process of coding and decoding information for transmission. For example, a voice conversation is coded into binary bits (digital information), transmitted and then decoded at the receiving end. [1]
MOS	Mean Opinion Score	A statistical rating and scoring technique used to rate the performance of telephone connections by users. [2]
MPE	multi-pulse excited	A multi-pulse process for determining the position and amplitude of sample pulses in a speech codec.
MPEG	Moving Picture Experts Group	The group that has defined the standards for compressed video transmission. Can also refer to the file format itself.
MPEG4	Moving Picture Experts Group Compression Standard Version 4.	MPEG4 is a technology for compressing voice, video and related control data and is one of the MPEG (Moving Picture Experts Group) international standards. It is currently a focus of attention due to the fact that it enables high speed and stable video transmission even in heretofore difficult environments such as mobile communication. Incorporation of this leading edge technology will imbue 3G terminals with a rich multimedia capability.

Acronym/Term	Acronym Definition	Explanation
MS	Mobile Station	The term used to describe the customer terminal in a wireless network.
MSA	Metropolitan Statistical Area	A geographic area over which a cellular operator is licensed to provide service. MSAs are groups of counties in metropolitan areas having common financial, commercial and economic ties and were first used to license cellular service in the early '80s. MSAs cross state lines in some instances. MSAs were first used by the Dept. of Commerce to collect economic data.
MSB	Most Significant Bit	In a binary coding scheme, the bit having the greatest numerical value. Analogous to the left-most numeric position in a decimal number.
MSC	Mobile Switching Center	The location providing the mobile switching function in a second generation network wireless network. The MSC switches all calls between the mobile and the PSTN and other mobiles.
MSK	Minimum Shift Keying	A modulation technique using sinusoidal shaped input data pulses to drive the phase modulator. This results in a linear phase change over conventional QPSK, resulting in lower side lobes and less adjacent channel interference performance. [1]
MTA	Major Trading Area	A geographic area over which a PCS operator is licensed to provide service. MTAs are a group of BTAs having common financial, commercial and economic ties and were first used to license PCS service in the middle '90s. MTAs can be many times larger a cellular MSA and can cross multiple state lines in some instances. MTAs are used by the Rand-McNally corporation to summarize economic data. MTAs are one of the largest licensing areas used by the FCC.

Acronym/Term	Acronym Definition	Explanation
MTSO	Mobile Telephone Switching Office	The location providing the mobile switching function in a first generation wireless network. The MTSO switched all calls between the mobile and the PSTN and other mobiles.
multipath		A propagation phenomenon characterized by the arrival of multiple versions of the same signal from different locations shifted in time due to having taken different transmission paths of varying lengths. [2]
multiple access		The process of allowing multiple radio links or users to address the same radio channel on a coordinated basis. Typical multiple access technologies include FDMA, TDMA, CDMA, and FHMA.
NADC	North American Digital Cellular	See IS-136. [1]
NAM	Number Assignment Module	The programmable module in an AMPS analog phone used to contain the MIN, ESN, home system ID and other information.
N-AMPS	Narrowband Advanced Mobile Phone System	Combines the AMPS transmission standard with digital signaling information to effectively triple the capacity of AMPS while adding basic messaging functionality.
nested codes		A type of concatenated block code where the layers (inner and outer) are amalgamated in such a way that burst errors not able to be corrected by the inner code are sufficiently spread over enough blocks as to be corrected by the outer layer. [2]
NMC	Network Management Center	An operations center used to manage network resources such as the MSC, location registers and base stations.
NMT	Nordic Mobile Telephony	The common Nordic standard for analog mobile telephony as established by the telecommunications administrations in Sweden, Norway, Finland and Denmark in the early 1980s. NMT systems have also been installed in some European countries, including parts of Russia, and in the Middle East and Asia. NMT is operated in 450 MHz and 900 MHz bands.
NMT-450	Nordic Mobile Telephony - 450	An early cellular system developed and operated in northern Europe utilizing the 450 MHz band.

Acronym/Term	Acronym Definition	Explanation
noise figure		A figure of merit for receivers and preamplifiers representing the amount of excess noise added to the signal by the amplifier or receiving system itself. The lower the noise figure, the less excess noise is added to the signal.
NRZ	Non Return to Zero	A type of data stream where successive data pulses "ones" are continuous over several clock cycles without returning to the "zero" state between successive "ones". [1]
NSS	Network Switching Subsystem	That portion of a GSM network that manages the connections and communications within the network. The BSS and OSS complete the major components of the network. [2]
Nyquist filter		An ideal low pass filter with a cutoff frequency equal to the sampling rate. This technique is used to convert PAM pulses to an analog signal in D/A converters. [3]
Nyquist rate		The minimum sampling rate proposed by Nyquist for converting a band limited waveform to digital pulses. The rate must be at least twice the highest frequency of interest in the waveform being sampled.
OAM&P	Operations, Administration, Maintenance & Provisioning Center	An operations center used to operate, administer, maintain and provision the network.
OCQPSK	Orthogonal Complex Quadrature Phase Shift Keying	Also known as HPSK. See HPSK. [2]
OFDM	Orthogonal Frequency Division Multiplex	A modulation technique that transmits blocks of symbols in parallel by employing a large number of orthogonal sub-carriers. The data is divided into blocks and sent in parallel on separate sub-carriers. By doing this, the symbol period can be increased and the effects of delay spread are reduced. [4]
Okamura model		A propagation prediction model for land-mobile communications developed by Yoshi Okamura et al. in the late '60s. [1]
OMC	Operations & Maintenance Center	A location used to operate and maintain a wireless network.

Acronym/Term	Acronym Definition	Explanation
operator		Company that operates a telephone network, for example AT&T, Vodaphone and BT. [1]
OQPSK	Offset Quadrature Phase Shift Keying	A type of QPSK modulation that offsets the bit streams on the I and Q channels by a half bit. This reduces amplitude fluctuations and helps improve spectral efficiency.
ORFS	Output Radio Frequency Spectrum	A measurement for GSM signals that tests for interference in the adjacent frequency channels (ARFCNs) and results from two effects: modulation within the bursts and the power that ramps up and down, or switching transients. ORFS is a critical GSM transmitter measurement. [5]
OSI	Open System Interconnect	A reference model that describes a layered structure for modeling the interconnection and exchange of information between users in a communications system. The 7 layers are: the physical layer, the link layer, the network layer, the transport layer, the session layer, the presentation layer and the application layer. [8]
OVSF	Orthogonal Variable Spreading Function	A set of spreading codes derived from tree structured set of orthogonal codes and are used to channelize the IMT-2000/ULTRA system. [2]
PA	Power Amplifier	A device for taking a low or intermediate-level signal and significantly boosting its power level. A power amplifier is usually the final stage of amplification in a transmitter.
PABX	Private Automatic Branch Exchange	A customer premise telephone switching system capable of interfacing to a telephone central office with trunk groups and routing calls based on a 3 or 4 digit telephone extension number.
packet		A piece of data transmitted over a packet-switching network such as the Internet. A packet includes not just data but also address information about its origination and destination.
packet radio		A radio system that operates by sending data in packets.

Acronym/Term	Acronym Definition	Explanation
packet switching		A method of switching data in a network where individual packets of a set size and format are accepted by the network and delivered to their destinations. The sequence of the packets is maintained and the destination established by the exchange of control information (also contained in the packets) between the sending terminal and the network before the transmission starts. The network is open to all users, all the time, with packets from the various nodes being interleaved throughout the network. The packets can be sent in any order, as the control information sent at the beginning of the transmission ensures they are interpreted in the correct order at the receiving end. Because each packet carries its own control instructions, it can use any route to reach its destination. [1]
PACS	Personal Access Communications System	A low mobility low power wireless system designed for residential use. [1]
PAD	Packet Assembler/Disassembler	The part of a packet transmission system that segments the transmit data into packets and returns the receive data to longer messages. [5]
pad		See attenuator.
paging		Single direction radio service for alerting subscribers and delivering messages. [1]
PAM	pulse amplitude modulation	A technique for encoding the samples of an analog waveform as part of the PCM process. Also used to display the amplitude of QAM signals in an eye diagram.
partial response signalling		A signalling technique in which a controlled amount of intersymbol interference is introduced at the transmitter to shape the transmitted spectrum. [4]
path loss		The amount of loss introduced by the propagation environment between a transmitter and receiver.
PBX	Private Branch Exchange	An exchange system used in companies and organizations to handle internal and external calls.

Acronym/Term	Acronym Definition	Explanation
PCH	Paging Channel	A logical channel in GSM, cdma2000, and W-CDMA systems used to send messages to mobile station. Used primarily to notify the mobile that it has an incoming call. [1]
PCIA	Personal Communications Industry Association	A leading international trade association representing the personal communications services (PCS) industry. Its primary objective is to advance regulatory policies, legislation, and technical standards in this industry.
PCM	Pulse Code Modulation	The most predominant type of digital modulation in use today. PCM performs an analog to digital conversion of the speech waveform through a sampling process and encodes and transmits the samples in a serial bit stream as 8-bit digital words. [4]
PCN	Personal Communications Network	A standard for digital mobile phone transmissions operating at a frequency of 1800 MHz (also referred to as GSM 1800). It is used in Europe and Asia Pacific.
PCS	Personal Communications Services	Generally, a marketing term used to describe a wide variety of two-way digital wireless service offerings in North America operating at 1900 MHz. PCS services include next generation wireless phone and communication services, wireless local loop, inexpensive walk-around communications service with lightweight, low-powered handsets, in-building cordless voice services for business, in-building wireless LAN service for business, enhanced paging service as well as wireless services integrated with wired networks. A Personal Communications System refers to the hardware and software that provide communications services.
PCS	Personal Communications System	The infrastructure used to provide personal communications services.
PDA	Personal Data Appliance/Assistant	Also known as Personal Digital Appliance.

Acronym/Term	Acronym Definition	Explanation
PDC	Personal or Pacific Digital Cellular	A Japanese standard for digital mobile telephony in the 800 MHz and 1500 MHz bands. To avoid the previous problem of lack of compatibility between the differing types of earlier analog mobile phones in Japan (i.e. NTT type and US developed TACS type), digital mobile phones have been standardized under PDC. In the case of the PDC standard, primarily six channel TDMA (Time Division Multiple Access) technology is applied. PDC, however, is a standard unique to Japan which renders such phone units incompatible with devices which adopt the more worldwide prevalent GSM standard. Nevertheless, digitalization under the standard enables ever smaller and lighter mobile phones which in turn has spurred market expansion. As a result, over 93% of all mobile phones in Japan are now digital. [5]
PDF	Probability Density Function	The probability that X lies between two values, $x1$ and $x2$. [10]
peak power		The maximum instantaneous power radiated by a pulsed or bursted transmitter. It is the power radiated while the transmitter is keyed or operated. [2]
phase jitter		The amount of uncertainty introduced in digital demodulation caused by imperfections in the clock recovery timing. [2]
PHP	Personal Handy Phone	The mobile hand-set used with the Japanese Personal Handy Phone system.
PHS	Personal Handy Phone System	A digitalized evolution of the earlier analog cordless phone concept which enables outdoor use as well. PHS incorporates a unique Japanese standard which melds the advantages of the European DECT and CT2. The system operates in the 1.9 GHz band. [2]
physical channel		The actual radio channel that carries the various logical and traffic channels in a wireless system.
pico cell		Very small cell in a mobile network for boosting capacity within buildings.

Acronym/Term	Acronym Definition	Explanation
pilot code		This is a logical channel in a CDMA system characterized by an unmodulated direct sequence spread-spectrum signal continuously monitored by each base station. It allows the mobile stations to acquire the timing of the forward channel, serves as a phase reference for demodulation, and allows the mobile to search out the best (strongest) base stations for acquisition and hand-off. [4]
pilot pollution		A type of co-channel interference in CDMA systems caused when the pilot code from a distant cell or base station is powerful enough to create an interference problem.
PIN	Personal Identification Number	A code used for all GSM-based phones to establish authorization for access to certain functions or information. The PIN code is delivered together with your subscription.
PLL	Phase Locked Loop	PLL is a major component in the frequency synthesizer scheme. This device provides a wide, flexible range of internal frequency dividers which allow the designer the ability to create a synthesizer to match design requirements.
PLMN	Public Land-Mobile Network	A European term used to describe the GSM system.
PMR	Private Mobile Radio	Generally for use within a defined user group such as the emergency services or by the employees of a mining project.
PN	Pseudo-Noise	Historically, the Ministry of Post, Telecommunications and Telegraph. Now a term to describe the incumbent, dominant operator in a country, many of which are being or have been privatized.
PNCQPSK	Pseudo-Noise Complex Quadrature Phase Shift Keying	The spreading technique that uses basic complex scrambling and PN signals for I_s and Q_s . For more information see Agilent application note "HPSK Spreading for 3G".
POCSAG	Post Office Code Special Advisory Group	An international group that develops and sets standards for the paging industry. [4]

Acronym/Term	Acronym Definition	Explanation
polarization diversity		A diversity technique where antennas of different polarizations, I.e. horizontal and vertical, are used to provide diversity reception. The antennas take advantage of the multipath propagation characteristics to receive separate uncorrelated signals. [1]
power control		A technique for managing the transmit power in base stations and mobiles to a minimum level needed for proper performance. Downlink power control applies to base stations and uplink power control to mobiles. Power control is used in nearly all wireless systems to manage interference, and in the case of mobiles, to extend battery life.
power spectral density		Power normalized to 1 Hz. Knowing the power spectral density and system bandwidth, the total power can be calculated.
PQA	Palm Query Applications	An Internet clipping application developed from HTML code and run on Palm PDAs. The application is designed to streamline the flow to the PDA to minimize the number of kilobytes sent and ultimately paid for. [2]
PRBS	Pseudo-Random Binary Sequence	A digital signal having framing information and using pseudo-noise in the individual traffic channels. Commonly used to performance test PCM systems. [1]
PRMA	Packet Reservation Multiple Access	PRMA is a packet-based TDMA concept where the users contend for the time slots. In situations where the system is not near capacity, a user can reserve a time slot for future use. [2]
processing gain		The amount of gain, in dB, provided by the spreading code in a CDMA system, usually the ratio of the spreading rate to the information rate. [4]
propagation		The process an electromagnetic wave undergoes as it is radiated from the antenna and spreads out across the physical terrain. See also propagation channel. [2]
propagation channel		The physical medium electromagnetic wave propagation between the transmit and receive antennas, and includes everything that influences the propagation between the two antennas. [2]

Acronym/Term	Acronym Definition	Explanation
PSD	Power Spectral Density	See power spectral density.
PSK	Phase Shift Keying	A broad classification of modulation techniques where the information to be transmitted is contained in the phase of the carrier wave.
PSTN	Public Switched Telephone Network	Standard domestic and commercial phone service.
PTT		Historically, the Ministry of Post, Telecommunications and Telegraph. Now a term to describe the incumbent, dominant operator in a country, many of which are being or have been privatized. [2]
punctured code		A technique used in convolutional decoders that allows a limited number of coded bits to be deleted to greatly simplify processing in the codec. This is extremely useful with long codes. [2]
Q	Quadrature-Phase	The quadrature phase channel in a phase shift keyed system having more than 2 phase states.
QAM	Quadrature Amplitude Modulation	A type of modulation where the signalling information is carried in the phase and amplitude of the modulated carrier wave. [4]
QCIF	Quarter CIF (1/4 CIF). A video image format which employs 176 horizontal pixels and 144 vertical lines.	Although resolution is coarser than CIF, QCIF consumes less memory while still achieving an acceptable level of clarity on small displays such as those incorporated in mobile phones.
QoS	quality of service	A measure of the quality of the signal transmitted over the RF channel. In some systems, the QoS measurement is used to dynamically adjust operational parameters such as transmitter power levels and coding rates.
QPSK	Quadrature Phase Shift Keying	A type of phase modulation using 2 pairs of distinct carrier phases, in quadrature, to signal ones and zeros. [4]

Acronym/Term	Acronym Definition	Explanation
quantizing		The process of assigning values to waveform samples by comparing the samples to discrete steps. [2]
RACE	Research in Advanced Communications Equipment	An ETSI research project that has subsequently been replaced by ACTS. [1]
RACH	Random Access Channel	The channel used by mobiles in GSM and W-CDMA systems to attempt to gain access to the system when first attaching to it.
radio link		The equipment and transmission path (propagation channel) used to carry on communications. It includes the transmitting system, the propagation channel and receiving system. [1]
radio port		The T1P1 PCS architecture model equivalent to the BTS.
radio propagation		The science associated with the description of electromagnetic waves at radio frequencies as they radiate from a transmitting antenna. [1]
rake receiver		A radio receiver having multiple "fingers" and utilizing off-sets of a common spreading code to receive and combine several multipath (time delayed) signals, in effect using "time diversity" to overcome deep fades. [2]
RAN	Radio Access Network	The ground-based infrastructure required for delivery of third-generation (3G) wireless communications services, including high-speed mobile access to the Internet. The RAN must be able to manage a wide range of tasks for each 3G user, including access, roaming, transparent connection to the public switched telephone network and the Internet, and Quality of Service (QoS) management for data and Web connections. [2]
random access		A technique for radio access to a network where an access message is not coordinated or administered by the network and can collide with other attempts by others to access the network over the same channel.

Acronym/Term	Acronym Definition	Explanation
Rayleigh channel		A communications channel having a fading envelope in the form of the Rayleigh Probability Density Function. [2]
Rayleigh fading		A type of signal fading caused by independent multipath signals having a Rayleigh PDF.
RC	Radio Configuration	RC defines the physical channel configuration of cdma2000 (IS-2000) signals. Each RC specifies a set of data rates based on either 9.6 or 14.4 kbps. RC1 is the backwards-compatible mode of cdmaOne for 9.6 kbps voice traffic. It includes 9.6, 4.8, 2.4, 1.2 kbps data rates and operates at Spread Rate 1 (SR1). RC3 is a cdma2000 specific configuration based on 9.6 kbps that also supports 4.8, 2.7, and 1.5 kbps for voice, while supporting data at 19.2, 38.4, 76.8, and 153.6 kbps. RC3 also operates at SR1. For more information see Agilent application note "Performing cdma2000 Measurements Today".
REAG	Region	A geographic area over which a WCS operator is licensed to provide service. REAGs are a group of economic areas (EAs) and were first used to license WCS service in the late '90s. REAGs are very large, with 6 REAGs covering the entire continental United States.
receive diversity		The process of providing two independent receiving systems and spatially separated antennas to overcome fading effects on the radio signal.
receiver		Arrangement of active components such as the LNA, mixer and IF amplifier together with passive components such as the image filter and IF filter. Taken together they perform the task of recovering the modulation from a known RF signal while rejecting unwanted signals. The portion of the communication system that includes a detector and signal processing electronics to convert electrical signals (electric waves) to audio or data signals. It provides reception and, if necessary, demodulation of electronic signals. [2]
Reed Solomon code		A particular implementation of the BCH block (cyclic) coder capable of correcting double errors. [4]

Acronym/Term	Acronym Definition	Explanation
reflection		A process that occurs when a propagating electromagnetic wave impinges upon a obstruction whose dimensions are very large when compared to the wavelength. Reflections from the surface of the earth, and from buildings or walls produce reflected waves which may interfere, constructively or destructively at the receiver. [1]
registration		This is the process by which a mobile station informs the immediate service provider of its presence in the network and its desire to receive service.
Repeater		Receives radio signals from the base station. They are then amplified and re-transmitted to areas where radio shadow occurs. Repeaters also work in the opposite direction, i.e. receiving radio signals from mobile telephones, then amplifying and re-transmitting them to the base station.
reuse factor		Also known as frequency reuse factor, is the number of distinct frequency sets used per cluster of cells.
reverse link		See uplink. [2]
RF	radio frequency	Electromagnetic waves in the frequency range of 30 kHz to 300 GHz. [2]
Rician channel		A transmission channel that may have a line-of-sight component and several scattered or multipath components. This fading characteristic exhibits a Rician PDF. [2]
Rician fading		A type of signal fading having a characteristic similar to the Rician PDF. [1]
RNC	Radio Network Controller under the UMTS system.	A complex network element of the RAN that connects to and co-ordinates as many as 150 base stations in W-CDMA systems. It is involved in managing activities such as hand-over of active calls between base stations.
Roaming		Within your home network, this means that your mobile phone automatically sets up communication procedures with different radio base stations when on the move. International roaming means that you can use networks other than your own when traveling abroad.

Acronym/Term	Acronym Definition	Explanation
Router		A data switch that handles connections between different networks. A router identifies the addresses on data passing through the switch, determines which route the transmission should take and collects data in so-called packets which are then sent to their destinations.
Routing		The forwarding of data packets in packet-switched networks, to the intended address.
RPE-LTP	Regular Pulse Excited-Long Term Prediction	A type of speech coding using regularly spaced pulses in an excitation frame and a long term predictor to model the fine structure (pitch).
RSA	Rural Service Area	A geographic area over which a cellular operator is licensed to provide service. RSAs are a group of rural counties having common financial, commercial and economic ties and were used to license cellular service Rural areas in the latter '80s. RSAs cross state lines in some instances and were developed during a public rule making process at the FCC in 1987 and 1988..
RSSI	Received Signal Strength Indication	An indication of the average signal strength at the input of a receiver produced by measurement circuitry in the receiver. Such a measurement does not normally include antenna gain or transmission system losses. [2]
run length coding		A type of video coding used in H.261 and H.263 codecs. [4]
S/I	signal-to-interference ratio	See signal-to-interference ratio.
S/N	signal-to-noise ratio	See signal-to-noise ratio.
SACCH	Slow Associated Control Channel	A low-speed control channel associated with a traffic channel and used to transmit supervision and control messages between the mobile and the network. [8]
sampling		The first process performed in the conversion of analog waveforms to a digital format. It converts a continuous-time signal into a discrete-time signal or sequence of numbers.

Acronym/Term	Acronym Definition	Explanation
SAT	Set-up Audio Tone	An audio tone in the 6 kHz range added to the downlink or forward channel in analog cellular systems. The mobile detects and returns the tone. The SAT tone is used to determine channel continuity, and only one SAT tone is usually assigned to a base station or sector.
Satellite phone		A type of wireless mobile telecommunications system using satellites as base stations. Such systems have the ability of providing service to the oceans and other remote areas of the globe. [4]
scattering		A phenomenon that occurs when the medium through which a radio wave travels consists of objects with dimensions small compared to the wavelength and diffuses the wave as it propagates through it. [1]
SCCH	Signaling Control Channel	A logical channel used in the GPRS system to convey signalling information between the mobile and the network. [1]
SCH	Synchronization Channel	A logical channel used by mobile stations to achieve time synchronization with the network. Used in GSM, cdma2000, and W-CDMA systems. [1]
SDCCH	Slow Dedicated Control Channel	A low-speed bi-directional point-to-point control channel used to transmit service request, subscriber authentication, ciphering initiation, equipment validation and traffic channel assignment messages between the mobile and the network. [1]
SDH	Synchronous Digital Hierarchy	An international standard for synchronous optical transmission. This standard allows the world-wide connection of digital networks.
SDMA	Space Division Multiple Access	Also known as multiple beam frequency reuse, this technique employs spot beam antennas to reuse frequencies by pointing the antenna beams using the same frequency in different directions.
sector		A physical coverage area associated with a base station having its own antennas, radio ports and control channels. The concept of sectors was developed to improve co-channel interference in cellular systems and most wireless systems use three sector cells. [8]

Acronym/Term	Acronym Definition	Explanation
service area		The specified area over which the operator of a wireless communications network or system provides services. [3]
Service Provider		A company that provides services and subscriptions to telephone, mobile phone and Internet users. [2]
SFHMA	Slow Frequency Hopped Multiple Access	A spread-spectrum system where the hop (dwell) time is much greater the information symbol period. When hopping is coordinated with other elements in the network, the multiple access interference in the network is greatly reduced. [2]
shadow fading		A phenomenon that occurs when a mobile moves behind an obstruction and experiences a significant reduction in signal power.
SHF	Super High Frequency	The RF spectrum between 3 GHz and 30 GHz. [1, 4]
Signal Booster		Compensates for loss of effect (weakening of the signal in the co-axial cable) between the outer antenna and the phone. Applies to both incoming and outgoing signals.
signal-to-interference ratio		The ratio of power in a signal to the interference power in the channel. The term is usually applied to lower frequency signals, such as voice waveforms, but can also be used to describe the carrier wave. See also carrier-to-interference ratio. [1]
signal-to-noise ratio		The ratio of power in a signal to the noise power in the channel. This term is usually applied to lower frequency signals, such as voice waveforms. See also carrier-to-noise ratio. [1]

Acronym/Term	Acronym Definition	Explanation
SIM Card	Subscriber Identity Module Card	A small printed circuit board that must be inserted in any GSM-based mobile phone when signing on as a subscriber. It contains subscriber details, security information and memory for a personal directory of numbers. A Subscriber Identity Module is a card commonly used in a GSM phone. The card holds a microchip that stores information and encrypts voice and data transmissions, making it close to impossible to listen in on calls. The SIM card also stores data that identifies the caller to the network service provider. [2]
slotted ALOHA		An access technique synchronizing the transmitters to time-slots in the channel and having the transmitter wait until the next available slot to send its packet. [1]
slow fading		A long term fading effect changing the mean value of the received signal. Slow fading is usually associated with moving away from the transmitter and experiencing the expected reduction in signal strength.
SMR	Specialized Mobile Radio	A service defined by the FCC operating in the 800 MHz and 900 MHz bands providing a variety of 2-way communications services to various users. This is the basic 2-way trunked service used by many companies in the construction and service industries. These frequencies are gradually being converted to ESMR operation. [1]
SMS	Short Messaging Service (Service Management System)	A store and forward message service available on most second generation digital systems that allows short messages (up to 140 octets) to be sent to the mobile and displayed on a small screen. The control and signalling channels are normally used to deliver these messages. [11]
SNR	Signal-to-Noise Ratio	See signal-to-noise ratio. [4]
soft handoff		A process of establishing a call connection simultaneously to two separate base stations in a CDMA system. This technique allows the use of a dual path in the handoff region to improve performance. Soft handoff can only occur between base stations using the same RF channel. See also hard handoff. [4]
space diversity		A diversity technique widely used in wireless systems since the very beginning. It consists of two receive antennas physically (spatially) separated to provide decorrelated receive signals. [4]

Acronym/Term	Acronym Definition	Explanation
spectrum spreading		The process of increasing the occupied spectrum of a signal well beyond that needed to transmit the information. [2]
speech coding		An electronic process of sampling and digitizing a voice signal. [4]
spread spectrum		A term used to describe a system that uses spectrum spreading techniques in its operation.
SR	Spread Rate	Spread rate is also known as the chip rate and is the rate of the digital code used to spread the information. The spreading rate is typically at least 100x the information rate.
SS	Spread Spectrum	See spread spectrum.
SS7	Signal System 7	International standard protocol defined for open signaling in the digital public switched network. It is based on a 64 kbps channel and allows for information transfer for call control, database and billing management, and for maintenance functions. [1]
SSD	Shared Secret Data	Part of an encryption process supporting authentication of mobile phones. It uses an encryption key installed in the phone at the time of activation and known to the system through an entry in the HLR, that protects signalling and identity information. It can also be used to establish a voice privacy key. [1]
STD	Selective Transmit Diversity	A transmit diversity technique using multiple base stations to originate the signal and provide spatial diversity on the downlink. In STD, the transmitter selection is based on a QoS measurement made at the mobile station. See also transmit diversity, TDTD and TSTD. [1]
supplementary services		A group of network layer protocol functions that provide call independent functions for mobile phones. These include: call forwarding, follow-me, advice of charge, reverse charging, etc.

Acronym/Term	Acronym Definition	Explanation
Symbian		Symbian is a bold new venture formed by Nokia, Ericsson, Motorola, and Psion to create easy to use operating systems for wireless devices and personal digital assistants (PDAs). The first operating system is called EPOC and was launched earlier this year.
Synchronous Mode		Type of transmission in which the transmission and reception of all data is synchronized by a common clock and transmitted in blocks rather than individual characters. This mode gives higher data throughput than asynchronous mode, but can be less secure. Synchronous mode does not require a start and stop codes as in asynchronous mode. Can also mean that the data stream has the same capacity in both directions. See also asynchronous mode. [1]
TACS	Total Access Communications System	An analog cellular communications system derived from AMPS. It has been adopted in the UK (ETACS) and operates in the 900 MHz band. Likewise adopted in Japan first as JTACS, it exists at present as the further evolved NTACS with narrower bandwidth. [1]
TAMS	Temporary Mobile Station Identity	An identification number assigned to a mobile station while it is attached to the network. This number is maintained in the VLR and SIM while the mobile is attached to the network and is used to route calls to and from the mobile. [1]
TCH	Traffic Channel	A logical channel that allows the transmission of speech or data. In most second generation systems, the traffic channel can be either full or half-rate.
TCH/F	Traffic Channel - full rate	A traffic channel using full rate voice coding. [4]
TCH/H	Traffic Channel - half rate	A traffic channel using half rate voice coding.
TCM	Trellis Code Modulation	A type of channel coding that, unlike block and convolutional codes, provide coding gain by increasing the size of the signal alphabet and use multi-level phase signalling.

Acronym/Term	Acronym Definition	Explanation
TCP	Transmission Control Protocol	TCP/IP is the standard communications protocol required for computers communicating over the Internet. To communicate using TCP/IP, computers need a set of software instructions or components called a TCP/IP stack.
TDD	Time Division Duplex	A duplexing technique dividing a radio channel in time to allow downlink operation during part of the frame period and uplink operation in the remainder of the frame period. See also duplex.
TDMA	Time Division Multiple Access	A technology for digital transmission of radio signals between, for example, a mobile telephone and a radio base station. In TDMA, the frequency band is split into a number of channels which in turn are stacked into short time units so that several calls can share a single channel without interfering with one another. Networks using TDMA assign 6 timeslots for each frequency channel. TDMA is also the name of a digital technology based on the IS-136 standard. TDMA is the current designation for what was formerly known as D-AMPS. See also IS-136 and D-AMPS.
TDN	Temporary Directory Number	A temporary identification number assigned to a mobile while attached to the network. [2]
TDTD	Time Division Transmit Diversity	A technique utilizing multiple transmit stations to originate the downlink signal and improve performance. The transmit station used can be determined by either a fixed pattern or based on a QoS measurement made at the mobile. See also STD and TSTD. [5]
TIA	Telecommunications Industry Association (U.S.)	One of the Telecommunications standards setting bodies in the United States. [1]
time dispersion		Time dispersion is a manifestation of multipath propagation that stretches the signal in time so that the duration of the received signal is greater than the transmitted signal.
time diversity		The technique used by CDMA systems to overcome the effects of multipath fading. Through the use of a rake receiver, individual elements, or fingers, can be offset in time to account for different arrival times of multipath signals. [2]

Acronym/Term	Acronym Definition	Explanation
transceiver		A transmitter and receiver contained in one package. A 2-way radio or cell phone is an example of a transceiver.
transmit diversity		A technique utilizing multiple transmit stations to originate the downlink signal and improve performance. The station used is determined by either a fixed pattern or a quality measurement at the mobile. See also TDTD, STD and TSTD.
transmitter		Equipment which feeds the radio signal to an antenna, for transmission. It consists of active components such as the mixer, driver and PA and passive components such as the TX filter. Taken together, these components impress a signal onto an RF carrier of the correct frequency by instantaneously adjusting its phase, frequency, or amplitude and provide enough gain to the signal to project it through the ether to its intended target. [2]
triple mode (tri-mode)		A combined analog and digital mobile phone. Allows operation of the phone in the existing analog system at 800 MHz and in digital systems at both 800 MHz and 1900 MHz. [2]
TSTD	Time Switched Transmit Diversity	A technique utilizing multiple transmit stations to originate the downlink signal and improve performance. The transmit station used is determined by a fixed selection pattern similar to frequency hopping. See also STD and TDTD. [2]
TTA	Telecommunications Technology Association (Korea)	A telecommunications standards setting body in Korea.
TTC	Telecommunications Technology Committee (Japan)	A private-sector corporate body established in 1985 to prepare domestic standards relevant to Japanese telecommunications.
Twisted Pair		Two insulated copper wires twisted together with the "twists" or "lays" varied in length to reduce potential signal interference between the pairs. Where cables comprise more than 25 pairs, they are usually bundled together and wrapped in a cable sheath. Twisted pair is the most commonly used medium for connecting telephones, computers and terminals to PABXs, supporting speeds up to 64kbits/sec. [8]
UHF	Ultra High Frequency	The RF spectrum between 300 MHz and 3 GHz.

Acronym/Term	Acronym Definition	Explanation
UL	Uplink	See uplink.
UMTS	Universal Mobile Telecommunications System	Third generation telecommunications system based on W-CDMA DS.
UNIX		A computer operating system. UNIX is designed to be used by many people at the same time and has TCP/IP built-in. It is a very common operating system for servers on the Internet.
uplink		The transmission path from the mobile station up to the base station.
UPT	Universal Personal Telecommunications	A set of standards developed by the CCITT for wireline personal communications. [1]
urban cells		The coverage provided by base stations located in urban areas. The radius of these cells is usually much smaller than suburban and rural cells due to the more difficult propagation environment. [2]
USIM	An upgrade of the SIM card.	This upgrade enables use with IMT-2000.
UTRA	UMTS Terrestrial Radio Access	A W-CDMA standard developed ETSI, ARIB and the TTA. This system uses DSSS and either FDD or TDD depending on its frequency assignment and application. [2]
UUT	Unit Under Test	An acronym describing some type of electrical apparatus connected to test instrumentation. The apparatus can range from a simple circuit a complex subsystem such as a mobile phone, base station or MSC. See also DUT.
UWC	Universal Wireless Consortium	Body of vendors and operators promoting and implementing the IS-136 digital standard. Also specifying the future development of the standard and facilitating roaming agreements between IS-136 operators.

Acronym/Term	Acronym Definition	Explanation
VAD	voice activity detector	The device that detects voice activity and allows DTX to operate. VAD, in conjunction with DTX reduces power consumption in the mobile station and RF interference in the system by muting the transmitter when there is no voice to transmit.
VHF	Very High Frequency	The RF spectrum between 30 MHz and 300 MHz. [1]
Viterbi algorithm		A technique for searching a decoding trellis to yield a path with the smallest distance. This is also known as maximum likelihood decoding. [1]
VLR	Visitor Location Register	The functional unit responsible for managing mobile subscribers currently attached to the network. Two types of information reside in the VLR: subscriber information and the part of the mobile information that allows incoming calls to be routed to the mobile subscriber. The VLR stores the MSRN, TMSI, the location area, data on supplementary services, IMSI, MS ISDN number, HLR address or GT, and local MS identity, if used. [2]
vocoder		Refers to a voice encoder which is a device that codes and decodes the human voice (sound waves) into digital transmission. Higher vocoder speeds offer enhanced sound quality. [2]
VOIP	Voice Over Internet Protocol	A technology for transmitting ordinary telephone calls over the Internet using packet-linked routes. VoIP is not simply for voice over IP, but is designed to accommodate two-way video conferencing and application sharing as well.
VPN	Virtual Private Network	A private telecommunications network created using the resources of the PSTN and customized dialing, switching and routing functions. [4]
VSELP	Vector Sum Excited Linear Predictive	A type of speech coding using an excitation signal generated from three components: the output of a long term or pitch filter and two codebooks. VSELP was used in the IS-54 standard and operated at a rate of 8 kbps.
W3C	World Wide Web Consortium	A sector-wide body which promotes standardization of WWW technology. Major Internet related vendors are consortium members, and to date the body has standardized a range of crucial technologies including HTTP, HTML, XML, etc.

Acronym/Term	Acronym Definition	Explanation
Walsh Code		A group of spreading codes having good autocorrelation properties and poor crosscorrelation properties. Walsh codes are the backbone of CDMA systems and are used to develop the individual channels in CDMA. For IS-95, there are 64 codes available. Code 0 is used as the pilot and code 32 is used for synchronization. Codes 1 through 7 are used for control channels, and the remaining codes are available for traffic channels. Codes 2 through 7 are also available for traffic channels if they are not needed. For cdma2000, there exists a multitude of Walsh codes that vary in length to accommodate the different data rates and Spreading Factors of the different Radio Configurations. For more information see Agilent application note "Performing cdma2000 Measurements Today".
WAP	Wireless Application Protocol	A free, unlicensed protocol for wireless communications that makes it possible to create advanced telecommunications services and to access Internet pages from a mobile telephone. WAP is a de facto standard that is supported by a large number of suppliers. See also http://www.wapforum.org
WCA	Wireless Communications Association	The Wireless Communications Association represents the fixed broadband wireless access industry worldwide. Its mission is to advance the interests of the wireless systems that provide data (including Internet and e-commerce), voice and video services on a subscription basis through land-based towers to fixed reception/transmit devices.
WCDMA	Wideband Code Division Multiple Access	See W-CDMA.
W-CDMA	Wideband-Code Division Multiple Access	A 3G radio interface using DSSS, and both Frequency Division (FDD) and Time Division Duplexing (TDD) depending on the frequency assignment. The earlier Japanese W-CDMA trial system and the European UMTS have both served as a foundation for the workings of the current harmonized W-CDMA system, under the supervision of the 3GPP. [2]

Acronym/Term	Acronym Definition	Explanation
WDM	Wavelength Division Multiplexing	A new technology that uses optical signals on different wavelengths to increase the capacity of fiber optic networks in order to handle a number of services simultaneously.
WLAN	Wireless Local Area Network	A wireless version of the LAN. Provides access to the LAN even when the user is not in the office.
WLL	Wireless Local Loop	A wireless connection of a telephone in a home or office to a fixed telephone network.
WML	Wireless Markup Language	A markup language developed specifically for wireless applications. WML is based on XML.
WOS	Wireless Office Systems	A technology that allows the user to transfer calls to a mobile telephone.
WPABX	Wireless Private Automatic Branch Exchange	A customer premise telephone switching system using wireless technology to link the individual user stations to the central switching unit. The WPABX is capable of interfacing to a telephone central office with trunk groups and routing calls based on a 3 or 4 digit telephone extension number.
X.25 protocol		A CCITT recommendation defining the interface between Data Terminal Equipment (DTE) and Data Communications Equipment (DCE) operating in the packet mode on public data networks. It is a set of 3 peer protocols: a physical layer X.21), a link control layer (HDLC) and a network layer. X.25 is based on the concept of virtual circuits, which can be temporary or permanent. [5]
XML	Extensible Markup Language	XML is a format for structured documents and data. It was developed by the World Wide Web Consortium (W3C). It is a meta-language, i.e. content is not directly encoded in XML but in a specific markup language defined using XML. It corresponds to the successor language for the current HTML. In contrast to HTML where tags are pre-defined, the XML user can freely extend a data format applying his or her own uniquely defined tags. Since the tag structure in the case of XML enables the computer to automatically analyze data content, building EC (electronic commerce) and EDI (electronic data interchange) systems is facilitated.

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