## NEWTON's TELECOM DICTIONARY

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AT&T WATS service was organized circle or BAND (also called SERVICE area, each call costs the same per ht be different. There were typically ate bands (depending on how large d "band" was invented by AT&T s) when it introduced WATS service. Recently it changed the word "band" to "Service Area." Nobody knows why. See Postalized and WATS.

2. Band can also be the range of frequencies between two defined limits. For examnle, the band of frequencies able to be heard by the human ear ranges between 30 to 25,000 hertz. The ear can hear a band (or more correctly, a bandwidth) of about 25,000

Band Elimination Filter BEF. A filter that has a single continuous attenuation band, with neither the upper nor lower cut-off frequencies being zero or infinite.

Band Marking A label placed on an insulated wire or fiber during installation or manufacture to identify it.

Band Pass Filter BPF. A device which passes a specific range of frequencies and (in theory) blocks all others.

Band Splitter A multiplexer designed to split the available frequency band into several smaller channels. A band splitter can use time division or frequency division multiplex-

Band Stop Filter BSF. A device which blocks a specific range of frequencies and (in theory) passes all others.

Band, Citizens One of two bands used for low power radio transmissions in the United States — either 26.965 to 27.225 megahertz or 462.55 to 469.95 megahertz. Citizens band radio is not allowed in many countries, even some civilized countries. In some countries they use different frequencies. CB radios, in the United States, are limited by FCC rule to four WATTS of power, which gives each CB radio a range of several miles. Some naughty people boost their CBs with external power. The author of this dictionary has actually spoken to Australia while driving on the Santa Monica Freeway in Los Angeles. See

Band, Frequency The frequencies between the upper and lower bands. See also BAND. Here is the accepted explanation of "bands:"

Below 300 Hertz	ELF	<ul> <li>Extremely low frequency</li> </ul>
300-3,000 Hertz	— ILF -	<ul> <li>Infra Low Frequency</li> </ul>
3—30 kHz	VLF -	<ul> <li>Very Low Frequency</li> </ul>
30300 kHz	— LF -	<ul> <li>Low Frequency</li> </ul>
3003,000 kHz	MF -	<ul> <li>Medium Frequency</li> </ul>
330 MHz	— HF -	<ul> <li>High Frequency</li> </ul>
30300 MHz	— VHF -	<ul> <li>Very High Frequency</li> </ul>
300—3,000 MHz	— UHF -	<ul> <li>Ultra High Frequency</li> </ul>
330GHz	— SHF -	<ul> <li>Super High Frequency</li> </ul>
30300GHz	— EHF -	<ul> <li>Extremely High Frequency</li> </ul>
3003,000 GHz	— THF -	<ul> <li>Tremendously High Frequency</li> </ul>

Band	American	European
P	0.2-1.0 Ghz	0.2-0.375 Ghz
L	1-2 Ghz	0.375-1.5 Ghz
S	2-4 Ghz	1.5-3.75 Ghz
(	4-8 Ghz	3.75-6 Ghz
χ	8-12.5 Ghz	6-11.5 Ghz
J	-	11.5-18 Ghz
Ku	12.5-18 Ghz	_
K	18-26.5 Ghz	18-30 Ghz
Ka	26.5-40 Ghz	
Q	_	30-47 Ghz

Banded Memory In a PostScript printer, virtual printer memory is a part of memory that stores font information. The memory in PostScript printers is divided into banded memory and virtual memory. Banded memory contains graphics and page-layout information needed to print your documents. Virtual memory contains any font information that is sent to your printer either when you print a document or when you download fonts.

Banded Rate A price range for regulated telephone service that has a minimum floor and maximum ceiling. The minimum covers the cost of service; the maximum is the rate

Bandit Mobile A mobile subscriber that is revealed in the toll-ticketing records as having an invalid ESN, invalid telephone number, or other problem that warrants denial of service to that mobile.

Banjo Also called beaver tail. Used to connect devices to modular jack wiring for testing. See Modular Breakout Adapter.

Banjo Clip See Modular Breakout Adapter.

Bandmarking A continuous circumferential band applied to an insulated conductor at regular intervals for identification.

**Bandpass** The range of frequencies that a channel will transmit (i.e. pass through) without excessive attenuation.

Bandpass Filter A device which transmits a band of frequencies and blocks or absorbs all other frequencies not in the specified band. Often used in frequency division multiplexing to separate one conversation from many.

Bandpass Limiter A device that imposes hard limiting on a signal and contains a filter that suppresses the unwanted products of the limiting process.

**Bandwidth** 1. In telecommunications, bandwidth is the width of a communications channel. In analog communications, bandwidth is typically measured in Hertz — cycles per second. In digital communications, bandwidth is typically measured in bits per second (bps). A voice conversation in analog format is typically 3,000 Hertz, carried in a 4,000 Hertz analog channel. In digital communications, encoded in PCM, it's 64,000 bits per second. Do not confuse bandwidth with band. Let's say we're running a communications device in the 12 GHz band. What's its bandwidth? That's the space it's occupying. Let's say it's occupying from 12 GHz to 12.1 GHz. This means that it's occupying the space from 12,000,000,000 Hz to 12,100,000,000 Hz. This means its bandwidth is one hundred million cycles or one hundred megahertz (100 MHz). Affiliated terms are narrowband, wideband and broadband. While these are not precise terms, narrowband generally refers to some number of 64 Kbps channels (Nx64) providing aggregate bandwidth less than 1.544 Mbps (24x64 Kbps, or T-1), wideband is 1.544 Mbps-45 Mbps (T-1 to T-3) and broadband provides 45 Mbps (T-3) or better.

2. The capacity to move information. A person who can master hardware, software, manufacturing and marketing — and plays the oboe or some other musical instrument is "high bandwidth." The term is believed to have originated in Redmond, WA, in the headquarters of Microsoft. People there (e.g., Bill Gates) who are super-intelligent and

have generally broad capabilities, are said to have "high bandwidth."

3. Microsoft jargon for schedule. For example, "I have a bandwidth problem" means that I have an overloaded schedule.

4. The combined girth of a rock band. By way of example, the band "Meatloaf" is broadband, largely due to the individual girth of the singer by the same name. On the other hand, the "Rolling Stones" are narrowband, due largely to the svelte Mick Jagger. While the "Rolling Stones" are older, they are also richer than is "Meatloaf." So, bandwidth isn't everything

Bandwidth Allocation See Bandwidth Reservation.

Bandwidth Augmentation Bandwidth augmentation is the ability to add another communications channel to an already existing communications channel

Bandwidth Broker Imagine you're a long distance carrier and suddenly you need T-3 capacity for one of your customers from New York to Washington for a week. You go to someone called a "bandwidth broker" and ask to rent the capacity. That broker has some form of connecting device, to allow you to connect your network to someone else's network. The bandwidth broker will physically do the connection and charge a fee for doing it. That connecting device is called a pooling point. That device could be anything from a patch panel to a full-fledged real-time expensive switch. Here are some words from the web site of LighTrade.com, a bandwidth broker. "The exploding telecommunications market has made inevitable a day when bandwidth will be traded as a commodity, much as electricity is today. The bandwidth market is likely to center around three areas: (1) a central Bandwidth Trading Organization ("BTO"), functioning much like a commodities exchange, (2) an independent auditor (Pooling Point Administrator or "PPA") and (3) electro-optical switches to effect the physical delivery and Quality of Service verification (Pooling Points or "PPs")."

Bandwidth Compression A technique to reduce the bandwidth needed to transmit a given amount of information. Bandwidth compression is used typically in "picture type" transmissions — such as facsimile, imaging or video-conferencing. For example, early facsimile machines scanned each bit of the document to be sent and sent a YES or NO (if there was material in that spot or not). More modern machines simply skip over all the blank spaces and transmit a message to the receiving facsimile machine when to start printing dots again. A facsimile "picture" is made up of tiny dots, similar to printing photos in a magazine. Today, bandwidth compression is used to transmit voice, video and

sepy phone company who doesn't have a and hasn't improved the quality of the 2003, Motorola introduced radio equipuse their equipment to bypass the local 'last mile" and called it the "first mile."

stronic phones have a button on them is button, your phone will automatically speed dial numbers on your phone, any not appear in Last Number Redial. Most attached to a PBX will only recognize attached to a PBX will only recognize thons are useful. Also useful — but less I a number, punch in "save," then that dialed later, even though you might dial

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ne the following memo:

Id it is very strange, indeed! There original Those LATAs were identified by three-dight w Verizon) LATAs; 2xx, Bell Atlantic (now cx Southwestern Bell; 6xx, US West now

Owest); and 7xx, Pacific Telesis (now SBC). 8xx was assigned by Bellcore (now Telcordia Technologies) to areas such as the Commonwealth of North Mariana Islands, Midway/Wake, Guam, and other Caribbean islands. 9xx was assigned by Bellcore to areas bell by Southern New England Telephone (SNET), Cincinnati Bell, and the Navajo Caribbean (one LATA in Arizona and one in Utah). Since the initial designation of LATAs, a number of subLATAs have been identified, for a variety of reasons.

Intere are 17 subLATAs in Florida, mandated in 1984 by the Florida Public Utilities Commission for equal access purposes. There are 23 "900" LATAs set aside for places like SHET (CT), (incinnati Bell (OH), and the Navajo nation (1 in AZ and 1 in UT). Add to that the "800" LATAs for Puerto Rico, the Virgin Islands, the Bahamas, Jamaica, AK, HI, and the various other Caribbean, Atlantic and Pacific Islands and it gets very strange. Most of these are pseudo-LATAs set up by Bellcore for toll routing purposes, especially since many of the island nations were only recently added to the NANP. Equally interesting, if not more so, is the story on the 8xx area codes. There are 8 NPAs in the 8xx range—with 1,298 NXX—set aside for "non-dialable toll points." These are remote areas served by a cord-board. The subscribers are reached from the cordboard via ring-down circuits.

Late Collision A networking term. Late Collision is an Ethernet collision that takes alace on the local segment after 64 bytes of a frame have been placed on the network by the originating device. Late collisions are usually detected only on coax networks, because the 10Base-T monitor station would have to be transmitting at the same time in order to detect a late collision. Late collisions may also be inferred by detecting the presence of a "iam" signal at the end of a frame that is larger than 64 bytes. Note that traditional Ethernet (versus Gigabit Ethernet) specifies a frame size minimum of 64 octets (bytes) and a maximum of 1,514 octets. Also note that a single logical Ethernet may comprise multiple physical segments, with the segments being connected by bridges, hubs, switches or routers. If all of this seems a trite confusing, it's because it is. At some level, however, it's really prety simple. First, it takes a certain amount of time for a data bit, and certainly a frame of ata bits, to propagate (move) across a wire and through all of the intermediate devices that might be involved. The original Ethernet standard specifies big, thick coaxial cable that will support LAN (Local Area Network) communications over a maximum reach of 2.5 kilometers, from one extreme end of the cable to the other. As many as 1,024 devices may be attached, each with a minimum spatial separation of one meter (due to issues of echo, or signal reflection) and with a maximum spatial separation of 500 meters (due to issues of signal attenuation, or power loss). In the most extreme case, therefore, as many as 1,022 devices might be positioned between transmitting device and receiving device. Each device must read the incoming frame of data, determine if it is intended for it, and, if not, pass it on. This process takes some time, and it takes some time for the frame of data to work its way across the wire to the next device, where the process is repeated. Second, Medium Access Control (MAC), or collision control, technique used in Ethernet is CSMA/CD (Carrier Sense Multiple Access with Collision Detection). CSMA/CD allows multiple devices to sense the status of the carrier frequency to determine whether it is "clear" to send a frame of data. Assuming that they sense that it is "clear," they can access the wire at their own option, and at their own risk. If multiple devices access the wire at about the same time, a collision is likely. All attached devices constantly monitor the wire. If a collision is detected, they broadcast a "jam" signal, or collision detection, over a separate subcarrier frequency. All attached devices also monitor the subcarrier frequency, and adjust as necessary, backing off and reaccessing the wire when it becomes available again. Third, a transmitting device is assumed to be transmitting a series of frames of data. The series of frames is assumed to be associated with the transmission of a set of information, which is organized into frames of certain minimum and maximum sizes, 46 bytes and 1,500 bytes, respectively. Small sets of information, such as a query, are very small. Some sets of information, such as file transles, are potentially very large, and are fragmented into data frames of as much as 1,500 bytes, plus overhead. The maximum size of 1,500 is set so that no single transmitting <sup>device can</sup> lay claim to all of the capacity of the network, thereby giving other devices a <sup>chance.</sup> The minimum size is mandated so that a device can be advised of a collision, and have a chance to adjust in that event, and before it assumes that the first frame was received without collision. When you extend the traditional Ethernet with intermediate hubs and switches, you mess with the original concept, and with the underlying physics of signal propogition, which is tuned to network length and link length and number of attached devices and the processes, all of which is tuned to minimum and maximum frame sizes, in consideration of assumptions about the supported applications. It's all very confusing at some level, but relatively simple at another. Read this lucid explanation by Ray Horak several times. You'll get it. See also Ethernet and CSMA/CD.

**LATA Access** Any activity or function performed by a local phone company in connection with the origination or termination of interLATA telecommunications for an IC. This includes, but is not limited to, the provision of network control signaling, answer supervision, automatic calling number identification, carrier access codes, directory services, testing and maintenance of facilities, and the provision of information necessary to bill customers. See LATA.

LATA Tandem LT. An LEC switching system that provides an intraLATA traffic concentration/distribution point for end office switching systems or other tandems within a LATA.

Late Target Channel Keyup A cellular term. A condition when the target cell does not receive the execute target order in time for the arriving mobile, caused by link delays between MTSO and target cell site. After the mobile retunes to the target cell, noise will be heard on the downlink audio from the target cell, as the assigned voice channel is not on the air (yet). This results in noise during the handoff.

**Latency** A fancy term for waiting time or time delay. The time it takes to get information through a network. Real-time, interactive applications such as voice and desktop conferencing are sensitive to accumulated delay, which is referred to as latency. For example, telephone networks are engineered to provide less than 400 milliseconds (ms) round-trip latency. You can get latency in several ways:

From propagation delay — the length of time it takes information to travel the distance of the line. This period is mostly determined by the speed of light; therefore, the propagation delay factor is not affected by the networking technology in use.

From transmission delay — the length of time it takes to send the packet across
the given media. Transmission delay is determined by the speed of the media and the size
of the packet.

3. From processing delay - the time required by a networking device for route lookup, changing the header, and other switching tasks. In some cases, the packet also must be manipulated; for instance, changing the encapsulation type, changing the hop count, and so on. Each of these steps can contribute to the processing delay.

Rotation delay. The delay in accessing data which comes from waiting for a disk to rotate to the current location.

In a bridge or a router, latency is the amount of time elapsed between receiving and retransmitting the LAN packet. The length of time the packet is stuck in a bridge or router. See Interrupt Latency.

**Latent Cooling Capacity** An air conditioner's capability to remove moisture from the air.

**Lateral** A fancy word for a trench. In the parlance of digging up roads and the countryside and laying cable, trenching (i.e. building a trench in which to lay cable) is often called "building laterals." As one wag put it, it's where the rubber meets the road as far as enterprise customers go.

**Latitude** The distance, expressed in degrees, from the Earth's equator to points North and South. The equator is assigned the value of 0 degrees; North and South poles are 90 degrees.

Lattice Tower A Lattice tower is a self supported tower without guyed wires. There are generally three types of telecommunications towers: Monopole - Straight solid pole, Guyed Tower — Tower with angled guyed wires attached to support it and Lattice — which has an upside down V look to it.

**LATTIS** Local Area Transport Tariff Information System.

Launch A new term for starting a program from within another. Typically what might happen is you're working in a messaging program, which has individual lines showing you've just received several faxes, voice mails, electronic mail documents. You click on one of the lines. Your program recognizes that it's an electronic mail message and says "quickly open the electronic messaging software and get it to read the message." So it "launches" the messaging software.

**Launch Fiber** An optical fiber used to couple and condition light form an optical source into an optical fiber. Often the launch fiber is used to create an equilibrium mode distribution in multimode fiber. Also called launching fiber.

Laurus Unit A rack for T-1 interface units.

LAVC Local Area VAX Cluster

Law of Unintended Consequences this "Law" states that for every action, there is an excellent chance of producing an opposite and totally disproportionate reaction.

Lawn Sale See Yard Sale.