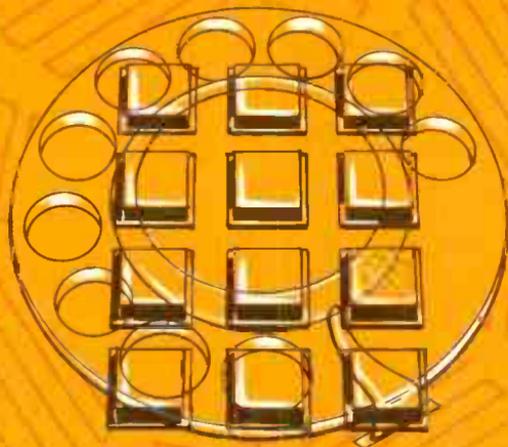


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A Glossary Of Signaling Terms



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Telephone signaling is the process by which a caller on the transmitting end of a line informs a particular party at the receiving end that a message is to be communicated. But signaling is also a two-way process which includes supervision. Supervision informs the caller that the called party is ready to talk, that his line is busy, or that he has hung up. Supervision is also that part of signaling which holds the voice path together while the conversation goes on.

Even the earliest telephones had to have some way of signaling parties at the other end. As the telephone industry grew, and equipment became more complex, new signaling methods had to be designed to complement the new equipment. This, coupled with the fact that an increasing number of communications equipment manufacturers were designing their own type of signaling equipment, made the subject more confusing. This glossary of signaling terms was prepared to aid the reader in understanding some of the most commonly used words in signaling technology.

ac-dc ringing. A type of telephone ringing which makes use of both ac and dc components—alternating current to operate a ringer and direct current to aid the relay action which stops the ringing when the called telephone is answered.

address. (Sometimes referred to as "called number".) That group of digits which makes up a telephone number. For example, an address may consist of area code, central office, and line number.

AMA (automatic message accounting). An automatic recording system which documents all the necessary billing data of subscriber-dialed long distance calls.

ANI (automatic number identification). Automatic equipment located at a local or toll dial central office used to identify the calling number in customer dialed toll calls. The identity of the calling number is transmitted to CAMA by means of multifrequency pulses that are sent over the same trunk after dial pulsing has taken place.

answer signal. A supervisory signal (usually in the form of a closed loop) from the called telephone to the central office, and back to the calling telephone (usually in the form of reverse battery) when the called number answers.

audible ringing tone. That tone received by the calling telephone indicating that the called telephone is being rung (formerly called ringback tone).

battery. Usually refers to the dc power source located in the central office. Nominally -24 or -48 volts.

battery and ground signaling. A type of loop signaling designed to double the available signaling current by using battery and ground at both ends of the loop, but with opposite polarities at each end. This technique doubles the signaling range, but also doubles the impulse noise.

bridged ringing. Any system where all ringers on a line are connected across that line. To avoid shunting of the dc component, a capacitor is placed in series with each ringer.

busy signal. (1) Audible and/or flashing signal, usually 60 impulses per minute (IPM), which indicates that the called number is unavailable, (2) a signal transmitted at 120 IPM which indicates that all voice paths are temporarily unavailable.

CAMA (Centralized Automatic Message Accounting). An automatic message accounting system which is located at a central office, but which serves various adjacent central offices. Calls not processed by ANI (automatic number identification), must be routed through an operator who dials the calling number into the equipment.

carrier signaling. Any of the signaling techniques used in multi-channel carrier transmission. The most commonly used techniques are in-band signaling, out-of-band signaling, and separate channel signaling.

CCIS (Common-Channel Interoffice Signaling). A manner by which the

signaling information for a group of trunks is transmitted over a separate voice channel using time-division techniques.

CCSS (Common Channel Signaling System). A system whereby all signaling for a number of voice paths is carried over one common channel, instead of within each individual channel. Common channel signaling should not be confused with CCIS.

class of service. The categorization of telephone subscribers according to specific type of telephone usage. Telephone service distinctions include, for example, rate differences between individual and party lines, flat rate and message rate, and restricted and extended area service.

code ringing. The selective alerting of telephone subscribers on multiparty lines by combinations of short and long rings.

coin-collect tone. A low tone which informs the originating toll operator that the change for a call has been collected by the local operator or the coin control circuit.

coin-denomination tones. The tones produced by two gongs in multislotted coin telephones, when nickels, dimes, and quarters are deposited. The tones are detected and transmitted to the operator so that the correct amount can be checked.

coin-return tone. A high tone which informs the originating toll operator that the change for a call has been returned by the local operator or coin control circuit when the connection is not completed.

common battery. A dc power source in the central office that supplies power to all subscriber stations and central office switching equipment.

common-battery signaling. The method by which supervisory and telephone address information is sent to a central office by opening and closing the circuit at the telephone, i.e., depressing and releasing the switch on the cradle of the handset.

common control office. Any of three types of central office—electronic, common control step-by-step, or crossbar. Any common control office receives dial pulses or dual tone multi-frequency (DTMF) signals from calling subscribers, or dial pulses, revertive pulses, or multifrequency signals from other offices.

composite signaling (CX). A dc signaling system which requires a single line conductor for each signaling channel, and which provides full duplex operation. In this system, voice frequencies above 100 Hz are separated from the signaling currents by a filter network known as a composite set. Two composite signaling channels are derived from one pair of wires, and four from a phantom group. Composite signaling channels may also be used for dc telegraph or teletypewriter circuits.

cord circuit. The term applied to a circuit that operates by means of a manual switchboard to make connections to subscriber lines and trunks. A three-conductor cord is used with designations of tip, ring, and sleeve used for the conductors.

crossbar switching system. A method of switching which when directed by a

common control unit, will select and close a path through a matrix arrangement of switches.

decimonic ringing. A type of party line selective ringing which uses ringing frequencies of 20 Hz, 30 Hz, 40 Hz, 50 Hz, and 60 Hz.

delay-pulsing signal (delay dial, stop dial). An off-hook signal from the called end of a trunk, which is sent to the calling end of a trunk, to indicate that it is not ready to be pulsed.

DDD. Abbreviation for direct distance dialing. Subscriber dialing over the nationwide intertoll telephone network.

dial-normal transmission signal. A secondary dial tone which is returned to an operator to indicate that the rest of a number may be dialed.

dial off-normal tone (dial key off normal). The tone that reminds an operator to restore the dial key after a call has been completed into a step-by-step office, and after the called party has answered.

dial pulsing. The transmission of telephone address information by the momentary opening and closing of a dc circuit a specified number of times, corresponding to the decimal digit which is dialed. This is usually accomplished—as with the ordinary telephone dial—by manual operation of a finger wheel.

dial speed. The measurement, in number of pulses, that a rotary dial can transfer in a given amount of time. The dial speed of a typical rotary dial is 10 pulses per second.

its bell and cause a marker to fall "down" at the central switchboard. In ringdown signaling, a key is operated in a cord circuit to ring on a trunk. On intertoll trunks, ringers are used to transmit and receive the signals. While ringdown trunks are unsuitable for intertoll dialing, connection of dial trunks to ringdown trunk can be provided with operator intertoll dialing.

ringing signal. Any ac or dc signal transmitted over a line or trunk for the purpose of alerting a party at the distant end of an incoming call. The signal may operate a visual or aural device.

ring trip. The circuitry required to disable the ringing signal when the called telephone is answered (placed in the off-hook condition).

SATT (Strowger Automatic Toll Ticketing). A system which, when a customer dials a toll call, automatically records a record of the calling number, the called number, the time of day, and the duration of the call.

selective ringing. A system designed with the capability of ringing only the desired subscriber's telephone on a multiparty line. Ringers tuned to one of five possible frequencies are used to achieve this effect.

semi-selective ringing. A four-party line ringing arrangement in which each party hears his own ring plus one other (usually a one and two ring code). Two of the parties on the line are rung from the tip of the line to ground, and the remaining two are rung from the ring of the line to ground.

sender. A unit which receives address information from a register or routing

information from a translator, and then outpulses the proper routing digits to a trunk or to local equipment. Sender and register functions are often combined in a single unit.

separate-channel signaling (a type of CCSS). A carrier system signaling arrangement where the signaling for several channels is multiplexed on a single voice channel.

signaling. The process by which a caller on the transmitting end of a line informs a particular party at the receiving end that a message is to be communicated. Signaling is also that supervisory information that lets the caller know that the called party is ready to talk, that his line is busy, or that he has hung up. Signaling also holds the voice path together while a conversation goes on.

simplex signaling (SX). Signaling over a trunk circuit. Signaling information is sent over the circuit when a signal-transmitting relay at the calling end is energized. A signal-receiving relay at the called end provides the signaling information to the voice channel. Both relays are connected to the midpoints of repeating coils or retardation coils at each end of the circuit.

single-frequency signaling. A method of signaling in which a single frequency tone, 2600 Hz for example, is placed on the voice path. The tone is on during the idle condition, pulsed during dialing, and off when the circuit is being used. (This condition is known as tone-on-when-idle.)

sleeve (S). (1) The third contacting part on a telephone plug—preceded in location by the tip and ring. (2) The

sleeve wire is the third control wire of each telephone in an automatic switching office.

speech-simulated signal. A signal made up of those components of a voice signal which will cause the false operation of tone-operated supervisory equipment.

start-dialing (start pulsing) signal. The on-hook condition indicating that the receiving end is ready to receive pulsing information.

step-by-step. (1) The process by which a call is progressively carried to the desired terminal under the direct control of subscriber-initiated pulses, or pulses from a sender. (2) Also refers to an electromechanical rotary switching system.

subscriber's loop. See "loop."

subset. A subscriber's telephone apparatus.

superimposed ringing. A type of semi-selective ringing which uses a combination of ac and dc.

supervisory signal. A signal which indicates whether a circuit is in use. A signal which gives an indication of status or change of status in a telephone system. For example, a signal used to attract the attention of an operator.

switching office. A location where either toll or local telephone traffic is switched or connected from one line or circuit to another. Also called switching center.

synchronic ringing. A type of party line selective ringing which uses

ringing frequencies of 16 Hz, 30 Hz, 42 Hz, 54 Hz, and 66 Hz.

talking battery. The dc voltage supplied by the central office to the subscriber's loop to operate the carbon transmitter in the handset.

talking path. In a telephone circuit, the transmission path consisting of the tip and ring conductors.

TASI (Time Assignment Speech Interpolation). Because audible speech on the average voice circuit is only present approximately 45% of the time, the efficiency of the expensive overseas channels can be improved if some of the remaining 55% of the time could be utilized. TASI switching equipment connects a party to an idle circuit while speech is taking place, but disconnects the party when speech stops, so that a different party can use the same circuit. During periods of heavy traffic, TASI improves line efficiency from 45% to 75-80%.

through supervision. Total supervision of a toll call by the originating operator through any intermediate switching points to the called telephone.

time-division signaling. Signaling over a time division multiplex system in which all voice channels share a common signaling channel, with time division providing the separation between signaling channels.

tip. The contacting part at the end of a telephone plug or the top spring of a jack. The conductors associated with these contacts.

tone signaling. The transmission of supervisory, address, and alerting signals over a telephone circuit by means

of voice frequency tones. Also used in "Touch Tone" dialing.

trunk. (1) A communications channel connecting two switching centers, or a switching center with an individual terminal. (2) A communications channel between two offices or between equipment within the same office. A trunk is used commonly for all calls of the same class that are generated between two terminals. (3) The different types of trunks, some of which can be classified as (a) direct trunk—interconnects two class five end offices, (b) toll-connecting trunk—connects a class five end office to any higher ranking toll office, (c) intertoll trunk—connects any class one through four toll switching office to any other class one through four office.

two-state signaling. Any signaling system which only transmits two states, such as "on hook" and "off hook", or "off" and "on". Such systems are often used for transmission of dial pulses or supervisory signals.

wet circuit. A circuit which carries direct current.

wink operation. In wink operation, trunk equipment sends on-hook signals toward each end during the idle condition. When a connect signal is received, the called office requests a register or sender. However, the on-hook signal to the calling office remains until the register or sender is connected at the called office. At that time, the idle on-hook signal changes to off-hook. The register or sender retains the off-hook signal for not less than 140 milliseconds, then returns an on-hook signal to the calling end, indicating that it is ready to receive pulses from the calling office.

wink signal. A short interruption of current to a switchboard busy lamp to indicate that the circuit is busy. On key telephone sets, the wink signal indicates that a line is being held. It is also an indication of change of state between an on-hook and off-hook condition.



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