

GLOSSARY OF TERMS

Approved Floor Ground—A ground on a floor of a high-rise building suitable for connection to the grounding terminal in the riser closet and to the PBX equipment single point ground. Such grounds may be any one of the following: building steel, metallic water pipes, power feed metallic conduit supplying panel boards on the floor, the grounding conductor for the secondary side of the power transformer feeding the floor, or a grounding point specifically provided in the building for the purpose (see Fig. 1-1).

Approved Ground—A ground in a low-rise or non-high-rise building suitable for connection to the Building Entrance Facility protector, the entrance cable shield, or the PBX equipment single point ground. With the 1978 National Electric Code, water pipe electrodes are no longer the first and only choice as a grounding electrode. The new code stresses the importance of bonding together all available electrodes into a system. The first choice for grounding of protectors and the PBX equipment single point ground is to the nearest available location on the system, or to the power service entrance conduit or grounding electrode conductor which is connected to the system, **WHICHEVER RESULTS IN THE SHORTEST RUN OF GROUNDING CONDUCTOR** (see Fig. 1-1).

Arrester—A protection device used on power lines to limit the line-to-ground surge voltage due to lightning while simultaneously interrupting "power follow", i.e., the discharge of normal power.

Bond(ing)—The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct any current likely to be imposed. Bonding provides equalization of potential between separated connections to ground.

Building Entrance Facility—A space provided on the customer premises for termination of distribution cable.

Carbon Blocks—A pair of electrodes made of carbon that provide an air discharge gap of a specified dimension.

Carbon Block Protector—A protector that uses carbon blocks for voltage limiting.

Coupled Bonding Conductor—A conductor following the same route and tie-wrapped to unshielded inside wiring cable. It is connected to the lug on the building entrance facility protector and to the equipment single point ground terminal. Due to the mutual coupling between this wire and the tip and ring conductors, the potential difference appearing on terminating equipment is minimized. This conductor can consist of a shield, spare-pairs of the inside wiring cable, or a wire tie wrapped to the inside wiring cable. In a high-rise building, the Coupled Bonding Conductor terminates on the ground terminals (which is connected to the riser cable shield or ground riser) in the riser closet and is routed with the lateral to each equipment room, where it is terminated on a grounding terminal and extended to each equipment single point ground terminal. In a low-rise building, the coupled bonding conductor is connected to the grounding terminal (or protector ground lug) in the building entrance facility room and is routed with the lateral cables to each equipment room where it is terminated on a grounding terminal and extended to each equipment Single Point Ground terminal (see Fig. 1-1).

Customer Premises Equipment—Any equipment such as PBX systems, key systems, data sets, etc. This term is often used interchangeably with the term station equipment in protection practices.

Equipment Closet—A space provided in a customer's premises where telephone equipment such as PBX and key systems or cross connecting facilities are located. This space is sometimes called apparatus closet, or remote apparatus closet.

Exposed Facilities—Any cable facilities subject to the effects of lightning, power crosses, power

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induction, or differences in ground potential. Exposure to lightning necessitates the use of protectors. Exposure to power (above 300V rms to ground) necessitates the use of cable fuses, fusible links, or station fuses, as well as protectors. Exposure to power also necessitates the use of sneak current fuses or circuits which have a low impedance path to ground.

Foreign Voltage (current)—Any voltage (current) imposed on the telephone plant that is not supplied from the central office or from telephone equipment.

Fuse—An overcurrent protective device with a circuit-opening fusible part that is heated and severed by the passage of overcurrent through it.

Fuse Cable—A length of protective cable having 24- or 26-gauge copper conductors that is inserted in the plant and intended to fuse open on foreign power currents before the station wiring cable or apparatus which it protects. It does not protect against lightning currents.

Fuse Link—A conductor, usually block wire, that serves the same purpose on wire plant as fuse cable on cable plant.

Gas Tube Protector—A protector that has spark gaps which discharge in a gas atmosphere within a glass or ceramic envelope.

Ground—A conducting connection, intentional, or accidental, between a circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

Ground (Earth) Resistivity—The measured DC resistance of a volume of earth usually expressed in meter-ohms.

Ground Potential Rise—A voltage difference between grounding electrodes due to the conduction of earth return currents. Ground Potential Rise (GPR) on cable pairs can exist when lightning currents are conducted to ground at the station protector. The GPR is most widely recognized as voltages generated due to power fault current conducted to ground.

Ground Riser—A No. 6-gauge copper wire run as a coupled wire with a riser cable when a continuous shield cannot be assured. This wire

must be grounded at locations where the riser cable shield would have required a ground.

Grounding Terminal—A suitable bar, bus, terminal strip or binding post terminal whereby grounding and bonding conductors can be connected. A grounding terminal may be required in the BEF room to accommodate connection of the ground riser, equipment bonding conductors, entrance cable shield and protector ground lug. Connections to the riser cable shield, ground-riser, approved floor ground, and equipment bonding conductor should be made on the grounding terminal in a riser closet in a high-rise building. Connection to the equipment bonding conductor from the PBX or key system single point ground may be made to the grounding terminal in the equipment room. Connections to the grounding terminals are considered to be terminations of grounding conductors and do not qualify as splices, and thus are permitted. The grounding terminal in the BEF may be located on or adjacent to the station protector (see Fig. 1-1).

Heat Coil—A device which grounds a conductor when overheated by current.

High Rise Building—Any multi-story building over three stories of structural steel or reinforced concrete construction.

Induction—

(a) **Electric Induction**—Voltage-controlled currents induced in a conductor, such as telephone lines, by capacitive coupling from the electric field of a nearby power line.

(b) **Magnetic Induction**—Currents induced in a conductor, such as telephone lines, by inductive couplings from the magnetic field of a nearby power line.

Insulating Joint—A splice in a cable sheath where the continuity of the sheath, shield, and moisture barriers are deliberately interrupted to prevent the flow of electrolytic currents that may cause corrosion.

Joint Random Spacing (Separation)—Where telephone cable is buried in the same trench with power conductors and no deliberate attempt is made to maintain a separation between the two systems.

Key Telephone System Ground Terminal—A screw terminal located on the Key System power supply which must be connected to the grounding lug on the station protector. This connection must be made via a coupled bonding conductor. The ground terminal may be marked "G", "GRD", or "LOC GRD," but is the power supply output ground and designated as the Key Telephone System (KTS) Single Point Ground terminal for purposes of this document. No connections other than to the protector grounding lug are permitted from the KTS Single Point Ground terminal.

Low-Wide Building—A building typified by the large shopping mall, factory or warehouse. The PBX and key systems may be located remotely from the entrance facility protector and thus creating the need for paying special attention to grounding and bonding.

Multiground Neutral (MGN) System—A power system where the neutral conductor is continuously present along with the phase conductors and is grounded at least four times per mile.

PBX Ground Conductor—A connection from the PBX single point ground terminal to an approved ground in a non-high-rise building via the shortest and straightest route. It is a connection from the PBX Single Point Ground terminal to an approved floor ground in a high-rise building via the shortest and straightest route (see Fig. 1-1).

Primary Power—Power operating at more than 300 volts rms to ground.

Protector—A device used to limit foreign voltages on telephone conductors.

Protector (Station or Central Office)—A protector which limits voltage between telephone conductors and ground. Equipped with 3-mil (white) blocks or gas tubes.

Protector Bond—This is the wire called the coupled bonding conductor and has been referred to as the protector bond in some documentation of PBX systems.

Protector Ground Conductor—A wire run from the ground lug on the protector to an approved ground via the shortest and straightest route (see Fig. 1-1).

Protector Unit—A device containing carbon blocks, or a gas tube, in combination with shorting devices and/or heat coils, that screws or plugs into a protector, protected terminal, connecting block or central office connector.

Riser Cable—A cable run vertically in a high-rise building for providing pairs to each floor. It is preferable that this cable be shielded. To minimize voltages due to lightning strokes to the building, the riser cables should run along the central axis of the building.

Riser Closet—A space provided on a floor of a high-rise building for terminating pairs which leave the riser cable to feed that floor.

Secondary Power—Power operating at less than 300 volts to ground. Typically 120/240 or 277/480 volts rms.

Single Point Ground Terminal—A connecting point provided with PBX and key systems. It is the only acceptable point for connection from the equipment to the external protection grounding system. The Single Point Ground terminal for key systems is called the power supply output circuit ground (local ground). The Single Point Ground terminal for PBX systems has been called the wall mounted ground window for the Dimension® PBX and it has been called the Thomas and Betts (T&B) Lug for the 800/801 PBX systems (see Fig. 1-1).

Sneak Current—A foreign current flowing to ground through terminal wiring and equipment that is driven by a voltage that is too low to cause a protector to arc over to ground.

Sneak Current Fuses—Devices which either divert or interrupt currents which flow through station wiring and equipment to ground. These currents are driven by voltages which are too low to operate station protectors. Heat coils are sneak current fuses which divert such current to ground. Sixty-type fuses interrupt such current flow.

Splice (Ground Wire)—A method whereby ground wire is extended by joining two or more separate sections together by mechanical connectors. Every attempt must be made to keep ground or bond conductors free of splices between authorized terminations. Authorized terminations for ground and bond wire include approved ground, approved floor ground, protector ground lug, grounding

terminal, cable shield, and ground riser and equipment Single Point Ground terminal. Where spare pairs are used for the coupled bonding conductor, through connections at cross-connect points are unavoidable. Measures should be taken to tag each spliced access point indicating the use of these pairs as coupled bonding conductors.

Station Equipment—see customer premises equipment.

Station Fuses—A device such as an 11-type fuse which is used in place of a cable fuse link, stub fuse link, or fine gauge cable. The station fuse **does not** satisfy requirements for protectors or sneak current fuses.

Surge Impedance—The impedance of a ground electrode at the frequency of the current wave

applied. At low frequency, the surge impedance is close to the dc resistance. When a surge is applied, the instantaneous impedance varies with time and is dependent on the waveform of the surge and the physical characteristics of the particular grounding electrode.

Thunderstorm Day—Any day during which thunder is heard at a specific observation point. Such observations confirm the presence of lightning but do not provide information on the number of strokes to earth.

Water Pipe Area—An area, usually urban or suburban, having an extensive metallic underground water system and where the power services at buildings are normally grounded to the water pipe system.

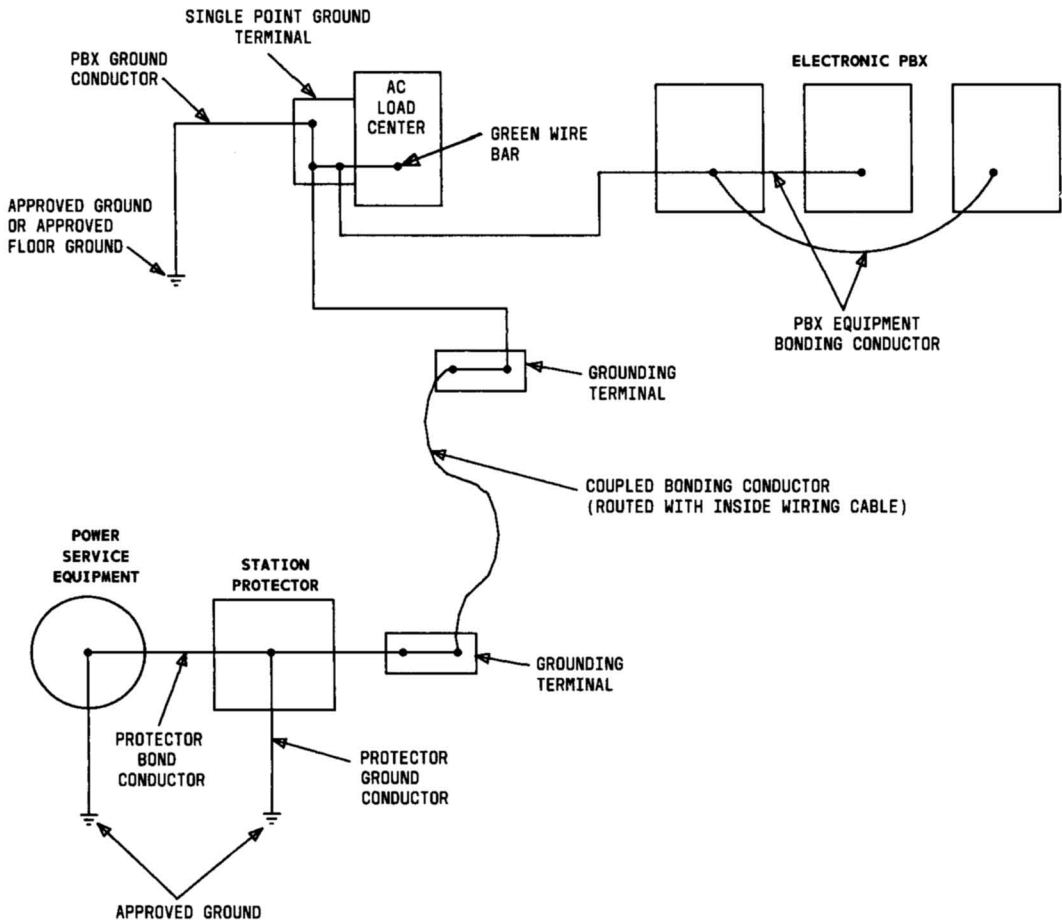


Fig. 1-1—Terminology Used in Typical Electronic PBX Installation