

SECTION 16701

DEFINITIONS OF COMMUNICATION SYSTEM TERMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Standard Definitions
 - 1. Definitions pertaining to the communication design and equipment description shall conform to the standard definitions promulgated by the following organizations unless otherwise specified in this Section (16701)
 - a. Current versions of the Association of American Railroads (AAR)
 - b. Electronic Industries Alliance (EIA)
 - c. The Institute of Electrical and Electronics Engineers, Inc. (IEEE)
 - d. The National Fire Prevention Association (NFPA)
 - e. Local and state building and fire procedure codes not superseded by provision of the "Fire Protection Equipment and Life Safety Agreements" executed between WMATA and local jurisdictions.
- B. Order of Priority
 - 1. Where definitions conflict, the order of priority shall be:
 - a. Definitions of Communications Systems Terms (Section 16701)
 - b. Current versions of the Association of American Railroads (AAR);
 - c. EIA;
 - d. IEEE.
 - e. NFPA
- C. Glossary of Communication Terms Used in These Communication Specifications

1.02 RELATED SECTIONS

- 1. All Sections in the 16700 and 16800 Series.

1.03 REFERENCES

- A. Current versions of the Association of American Railroads (AAR)
- B. Electronic Industries Alliance (EIA)
- C. The Institute of Electrical and Electronics Engineers, Inc. (IEEE)
- A. "Fire Protection Equipment and Life Safety Agreements" executed between WMATA and local jurisdictions

1.04 GLOSSARY OF COMMUNICATION TERMS

- A. Words, terms, and phrases used in these Communication System Specifications are defined as follows:
 - 1. AAR:
 - a. Association of American Railroads
50 F Street, N.W.
Washington, D.C. 20001-1564
 - 2. Absorption Losses:

- a. (Fiber Optics) Reduction in light amplitude or strength caused by impurities in the optical fiber and by the scattering of light from the optical fiber.
- 3. AC Service Room:
 - a. Room housing equipment and facilities for the distribution of ac power throughout an installation such as a passenger station or shop building.
- 4. Alarm
 - a. An alerting signal indicating an abnormal condition.
- 5. Alphanumeric:
 - a. Alphabetic and numeric representation, letters, numbers, and symbols.
- 6. Amplitude Modulation (AM):
 - a. The process of varying the amplitude of a carrier wave in accordance with the instantaneous value of a modulating signal.
- 7. Ambient:
 - a. Typical of the environment. Specifically used to designate properties of the surroundings which are measurable and distinguishable from absolute zero energy levels.
- 8. Angstrom:
 - a. (Fiber Optics) A unit of optical wavelength historically used in the field of optics, but not an International System unit.
- 9. 1 Angstrom = 0.1 nanometer
- 10. American Standard Code for Information Interchange (ASCII):
 - a. Consists of 10 or 11 bits per character - one start bit, seven information bits, one parity bit, one or two stop bits.
- 11. Ancillary Building:
 - a. A room, area or structure which is not considered typical to all Metrorail passenger stations.
- 12. Annunciator:
 - a. An audible signaling device which usually includes signal lights, each one indicating the conditions that exist or have existed in an associated circuit.
- 13. ANSI:

1819 L Street, NW
Suite 600
Washington, DC 20036
- 14. Armored Cable:
 - a. A cable provided with a wrapping of metal primarily for the purpose of mechanical protection. The armor is sometimes used as an electrical shield.
- 15. ASTM:
 - a. American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, Pennsylvania 19428-2959
- 16. At-Grade:
 - a. That portion of the system which is constructed at the approximate elevation of the adjacent ground surface.
- 17. Attenuation:
 - a. A decrease in the amplitude of a signal as it travels along or through a transmission medium, usually expressed as a ratio or in dB.
 - b. (Fiber Optics) A measure of the decrease in energy transmission (loss of light) expressed in dB/km. In optical waveguides it is primarily due to absorption losses and scattering losses.
- 18. Attenuation Distortion:
 - a. Distortion caused by the non-uniform attenuation or gain of a system, with respect to frequency, under specified terminal conditions.
- 19. Audio Frequency:

- a. Frequency range approximately equal to 15 Hz to 20,000 Hz (i.e. frequencies typically audible by human ears).
20. Authority, The:
- a. Washington Metropolitan Area Transit Authority (WMATA).
21. Auto Scan:
- a. The automatic scan of the TV cameras in the horizontal (pan) plane.
22. Automatic Fare Collection (AFC):
- a. Computer controlled system for the collection of fares, control of access, and associated functions.
23. Automatic Frequency Control (AFC):
- a. Means whereby the frequency of a circuit is automatically maintained, within specified limits, with respect to a reference frequency.
24. Avalanche Photodiode (APD):
- a. (Fiber Optics) One type of receiver or detector used in the receiving portion of Fiber-Optics terminals or repeaters. It is called a detector or receiver, since it detects and converts the light signal to a copy of the original electrical signal.
25. Bandwidth:
- a. Limiting frequencies between which the performance of a device or system falls within specified limits.
 - b. (Fiber Optics) The capacity of an optical fiber to transmit information, expressed in bits of information transmitted per specific time period for a specific length of optical waveguide. Bandwidth is limited by pulse spreading or broadening due to dispersion, so that adjacent pulses overlap and cannot be distinguished.
26. Ballast:
- a. Crushed rock or stones placed between, under, and at the ends of railroad ties.
 - b. (Electronics) A device utilized to limit current flow.
27. Battery:
- a. An assembly of cells electrically connected for producing electric energy. In telephone systems, it usually refers to centralized dc source, located in the central office, nominally -48 volts.
28. Baud:
- a. Unit of signaling speed equal to the number of discrete signal events per second.
 - b. Binary Coded Decimal (BCD)
 - c. A notation in which each individual decimal digit is represented by a pattern of "ones" and "zeros."
29. Bit:
- a. A binary digit, 0 or 1 in number representation, with the radix 2.
30. Bus:
- a. A conductor, or group of conductors, that serve as a common connection for two or more circuits.
31. Cable Binder:
- a. A wrapping of tapes or cords around several conductors of a multiconductor cable used to hold them together which may be color coded to designate the group of conductors enclosed.
32. Cable Tray:
- a. A tray or rack used for the installation and support of cable.
 - b. Cable Trough
 - c. A trough used for the installation, support, and protection of cable.
33. Call:

- a. The act of establishing and completing a telephone connection from one telephone instrument to another.
- 34. Called Party
 - a. The telephone instrument at the "distant end" being called.
- 35. Calling Party:
 - a. The telephone instrument that originates the call.
- 36. Cardioid (Pattern):
 - a. A heart-shaped pattern obtained as a response or radiation characteristic of certain directional antennas, or as the response characteristic of certain types of microphones.
- 37. Cassette:
 - a. A small reel-to-reel tape magazine on which is recorded analog or digital information.
- 38. Cassette Recorder:
 - a. A tape recorder used to record or playback cassettes.
- 39. CCS:
 - a. Hundred-Call-Seconds - A measure of communications traffic equal to one hundred seconds of communicating. In practice, "CCS" is used for hundred call seconds per hour.
- 40. Central Office:
 - a. Equipment in a telephone system that provides centralized switching, battery, and supervision for a group of subscribers or terminals (i.e. a Main PABX or Satellite PABX Equipment Room).
- 41. Channel:
 - a. A path for transmitting electrical signals.
- 42. Character:
 - a. A combination of bits denoting a specific alphanumeric symbol.
- 43. Chromatic or Material Dispersion:
 - a. (Fiber Optics) This refers to "colors" or wavelengths in a lightwave source. Light rays with different wavelengths travel along a fiber at different speeds. The broader the range of wavelengths emitted, the more light pulse will spread as it traverses the length of the fiber.
- 44. Circuit:
 - a. A conductor or system of conductors through which an electric current is intended to flow. A network providing one or more closed paths.
- 45. Cladding:
 - a. (Fiber Optics) The low refractive index material which surrounds the core of the fiber and protects against surface contaminant scattering. The cladding may be glass or clear plastic. In interoffice telecommunication systems, glass cladding is used.
- 46. C-Message Weighting:
 - a. Noise weighting used in a noise measuring set to simulate use of the Type 500 telephone (which has characteristics that are typical of most modern telephone instruments in commercial use in this Metropolitan area).
- 47. Combined Distribution Frame (CDF):
 - a. A distribution frame which, in addition to the functions of an MDF, provides for the cross-connection of the PABX subscriber line multiple and the subscriber line circuits.
- 48. Command Message:
 - a. Digital message transmitted from the Mobile Radio System control console to base stations to query status or to direct action.
- 49. Command Message Enable:
 - a. Message used to cause selected base station(s) to be ready for two-way voice operation.
- 50. Command Message Station Connect:

- a. Message used to restore a base station(s) to service in the system in a quiescent mode with its receiver in a monitoring condition with squelch operating.
- 51. Command Message Station Disconnect:
 - a. Message used to intentionally remove a base station(s) from service in the system.
- 52. Commercial Telephone Network:
 - a. The public telephone system. In the WMATA area, usually Bell Atlantic for local public network and special services cable connections.
- 53. Communications Equipment Room:
 - a. Room housing centralized communications equipment for an installation such as a Metrorail passenger station or yard.
- 54. Communications Ground:
- 55. Compandor:
 - a. An earth ground connection of 5 ohms or less resistance that is provided in the Communications Equipment Room in each passenger station and yard for the sole purpose of grounding communications equipment. The Communications Ground in the Communications Equipment Room at Jackson Graham Building has a resistance of 1 ohm or less to earth.
 - b. A combination of a compressor at one point in a communications path for reducing the amplitude range of signals followed by an expander at another point for a complementary increase in the amplitude range. The purpose is to improve the ratio of the signal to the interference entering the path between the compressor and the expander.
- 56. Compartmental Cable:
 - a. A multiconductor cable with its core divided into two compartments, a transmit section and a receive section, which are separated by an insulated metallic divider.
- 57. Conduit:
 - a. A tube-like structure for electrical wires or cables. Conduit may be either rigid or flexible, metallic or non-metallic, as specified.
- 58. Conduit Stub Out:
 - a. A short length of conduit that is joined as a branch to a conduit run and, as used in these Specifications, is the termination of a conduit run.
- 59. Console:
 - a. A panel or cabinet on which are mounted switches or lamps for use by a human operator in monitoring and controlling equipment and functions.
- 60. Contact Rail:
 - a. A bus bar alongside a track that carries electric energy for the propulsion of trains.
- 61. (The) Contractor:
 - a. The person, partnership, corporation, or joint venture that is awarded the prime contract to provide the facilities, equipment, and installations described in these Specifications. The usage of this term in these Specifications also includes subcontractors, suppliers, vendors, and employees thereof, except as otherwise stated (subject at all times to the Contractor's responsibility therefore).
 - b. The person or company who is awarded a contract to provide all the facilities, equipment, and installations described in these Specifications.
- 62. Core:
 - a. (Fiber Optics) The light conducting portion of the optical fiber, defined by the high refractive index region. The core is normally in the center of the optical fiber, bounded by the cladding material.
- 63. Coverage:

- a. Inclusion within the range of a communications device, equipment unit, system or medium.
- 64. Crosstalk:
 - a. Undesired signal coupling between two different communications channels or signal components.
- 65. Data Acquisition and Display System (DADS):
 - a. A system for the collection, recording, consolidation, and display of fare collection data at the passenger stations.
- 66. Enhanced Data Acquisition and Display System (EDADS):
 - a. An upgraded version of the DADS System.
- 67. Data Transmission System (DTS):
 - a. The bi-directional, non-vital digital communications system between Central Control and the Train Control Room. The DTS utilizes a channel of the CTS as a transmission medium.
- 68. Decibel (dB):
 - a. Unit used to express the ratio between two amounts of electrical power, P1 and P2, defined as:

$$\text{dB} = 10 \log_{10} \frac{P_1}{P_2}$$

- b. Also used to express voltage and current ratios, defined as:(Voltages and currents must be measured with identical impedances.)

$$\text{dB} = 20 \text{Log}_{10} \frac{V_1}{V_2} = 20 \text{Log}_{10} \frac{I_1}{I_2}$$

- c. Also used to express intensity of sound; defined as equal to 20 times the common logarithm of the ratio of the sound pressure of a wave to a reference pressure of 0.0002 dyne per square centimeter.
- 69. dBm:
 - a. Measure of absolute electrical power in decibels referred to one milliwatt.
- 70. dBm0:
 - a. A measure of power, with reference to zero dBm, at the reference transmission level point (RTLTP).
- 71. dBmnc0:
 - a. A measure of noise power in dB above one picowatt measured with a C-message weighting network referred to or measured at an RTLTP.
- 72. Delay Distortion:
 - a. Distortion caused by differences in transit time for different frequencies within a specified system bandwidth.
- 73. Desk Telephone:
 - a. A telephone instrument designed for desk top use.
- 74. Detector:
 - a. A device used to sense a particular condition - smoke, temperature, open circuit, received signal, etc.
- 75. Dial:
 - a. Normally, a face plate which has been graduated into arbitrary units. As a special case, in telephony, the hand operated device used to generate pulses or tones for establishing connections over a telephone switching system.

76. Dialing:
a. The act of operating a dial - specifically, a telephone dial. As used in this document, includes the act of operating a telephone instrument "touchtone" pad.
77. Diode Auctioneering:
a. A method of obtaining redundancy in use of power supplies by utilizing diode coupling from each power supply to a common load.
78. Direct Burial:
a. A method of installing cable underground, not in conduit or duct, in such a manner that it cannot be removed without disturbing the soil.
79. Dry Contact:
a. An electrical contact through which no direct current flows.
80. Duct Bank:
a. An arrangement of conduit providing more than one duct to accommodate and protect cables between two points.
81. DTMF:
a. Dual Tone Multifrequency audio signaling scheme utilized as the standard subscriber line tone signaling method in the USA. Also known as Touch-tone dialing, which is a copyrighted Bell Telephone Company term for such signaling. (Utilized for some other remote control devices also.)
82. Duplex:
a. Type of operation that permits simultaneous communications in both directions.
83. EIA:
a. Electronic Industries Alliance
2500 Wilson Boulevard
Arlington, Virginia 22201
84. E&M Signaling:
a. A signaling system characterized by the use of separate paths for the signaling and voice signals. The M lead transmits battery or ground to the distant end of the circuit while incoming signals are received as ground or open on the E lead.
85. E&M Trunk:
a. An audio trunk circuit utilizing E&M signaling.
86. Electro-Mechanical:
a. An electrical device with moving parts.
87. Elevated:
a. That portion of the Metrorail System which is constructed above the adjacent ground surface.
88. Emergency Power:
a. Electrical power provided to operate essential equipment during periods of failure of primary power source.
89. Emergency Trip Station: (ETS):
a. An enclosure containing an emergency telephone and an electric switch to de-energize a section of the contact rail.
90. ETS Telephone:
a. An emergency telephone generally located along Metrorail R.O.W. and collocated with or enclosed in Emergency Trip Station boxes in most instances.
91. Engineer (The):
a. Wherever, on the Contract Drawings or in the Specifications, the term "Engineer" is used, it shall mean the Resident Engineer or other duly authorized representative of the Contracting Officer.
92. Engineering Services:

- a. Engineering Service to be provided, as detailed in Article 3.1, Article 3.20, and as required elsewhere in these Specifications and Contract Drawings.
- 93. Entrance Escalator:
 - a. Escalator from street level to a passenger station.
- 94. Environment:
 - a. The universe within which the system must operate, the elements over which the designer has no control.
- 95. Error Rate:
 - a. The ratio of the number of characters of a message(s) received incorrectly to the total number of characters of the message(s) received.
- 96. Factory Test:
 - a. Test of equipment at the manufacturer's plant.
- 97. Failure:
 - a. An inability to perform an intended function.
- 98. Fare Gates:
 - a. Gate in stations through which passengers pass separating FREE (UNPAID) and PAID areas.
- 99. FCC:
 - a. Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554
- 100. Fiber Buffer:
 - a. (Fiber Optics) A material that may be used to protect an optical fiber from physical damage, thus providing mechanical isolation and/or protection.
- 101. Fiber Bundle:
 - a. (Fiber Optics) In a fiber optics cable, a group of parallel optical fibers over which a loose-fitting jacket (fiber buffer) has been extruded. (As used in "loose tube" type fiber optic cables, for example).
- 102. Fiber Optics:
 - a. (Fiber Optics) The branch of optical technology concerned with the transmission of radiant power through fibers made of transparent materials such as glass, fused silica, or plastic.
- 103. Fiber Optics Cable:
 - a. A cable made up of several optical fibers incorporated into an assembly of organic materials arranged for providing the necessary tensile strength, external protection, and handling properties. (Communications cables usually utilize "loose tube" or "open channel" type internal construction.)
- 104. Fire Zone:
 - a. A portion of a building, installation or area designated for fire detection by a specific circuit.
- 105. Flutter:
 - a. Cyclic deviation of signaling power (with a period in the neighborhood of 10 Hz for audio, for example).
- 106. Foot Lambert (fl):
 - a. The amount of light energy reflected from an object or scene equal to the product of illumination in footcandles and the luminous reflectance of the object or scene.
- 107. 4-Wire Terminating Set:
 - a. A hybrid set for interconnecting a four-wire and a two-wire circuit (usually refers to audio frequency devices).
- 108. Free (Unpaid) Area:
 - a. Area of passenger station to which public has access prior to passing through fare gates.
- 109. Frequency Modulation (FM):

- a. The process of varying the instantaneous frequency of a sine wave carrier by an amount proportional to the instantaneous value of a modulating signal.
- 110. Frequency Response:
 - a. The measure of effectiveness with which a circuit or device receives or transmits a range of frequencies.
- 111. Frequency Shift Keying (FSK):
 - a. The form of frequency modulation in which the modulating wave shifts the output frequency between predetermined values, and the output wave has no phase discontinuity (usually accomplished at audio frequencies).
- 112. Fuse:
 - a. An overcurrent protective device with a circuit-opening part that is heated and severed by the passage of overcurrent through it.
- 113. Fuse Alarm:
 - a. A circuit which produces a visual or audible signal to indicate a blown fuse.
- 114. Fusion Splice:
 - a. (Fiber Optics) A splice accomplished by the application of localized heat sufficient to fuse or melt the ends of two lengths of optical fiber, forming a continuous, single fiber.
- 115. Gallery Place:
 - a. A Metrorail passenger station located at the junction of Routes B, E, and F, which is a secondary hub of the WMATA Rail Rapid Transit System.
- 116. Gatehouse:
 - a. A building at the entrance to a Metrorail train yard, from which control of pedestrian and vehicular (other than trains) access to the yard is exercised.
- 117. Graded-Index:
 - a. (Fiber Optics) An optical fiber type wherein the core refractive index decreases almost parabolically radially outward toward the cladding. This type of fiber combines high-bandwidth capacity with moderately high coupling efficiency.
- 118. Ground:
 - a. A conducting connection, whether intentional or accidental, by which an electric circuit or equipment is connected to the earth, or to some conducting body of relatively large extent that serves in place of the earth. A common return to a point of zero potential. (Intentional grounding for WMATA projects providing low resistance current return paths to the earth.)
- 119. Half Duplex:
 - a. A method of operation in which two-way communication is possible, but only one way at a time.
- 120. Handset/Speaker Station:
 - a. A self-contained terminal station of the paging-intercom subsystem of the Yard Public Address System.
- 121. Hardware:
 - a. Physical entities such as computers, equipment, and instruments. Also parts made of metal such as fasteners, straps, clamps, and anchors.
- 122. Harmonic Distortion:
 - a. Non-linear distortion of a system or transducer characterized by the appearance in the output of harmonics, other than the fundamental component, when the input wave is sinusoidal.
- 123. Hertz (Hz):
 - a. Unit of frequency equal to one cycle per second.
- 124. ICEA:

- a. Insulated Cable Engineers Association
PO Box 440
South Yarmouth, Massachusetts 02664
- 125. Identifying Digits:
 - a. Alphanumeric digits that identify each passenger station and yard.
- 126. Idle:
 - a. In communications systems, indicates a circuit, device or system is not in active use (i.e. in the quiescent state).
- 127. Idle Noise:
 - a. That noise which is inherent in a circuit or device and is not contingent upon modulation.
- 128. IEEE:
 - a. Institute of Electrical and Electronics Engineers, Inc.
345 East 74th Street
New York, N.Y. 10017
- 129. Impedance:
 - a. The opposition in an electrical circuit to the flow of alternating current.
- 130. Impulse Noise:
 - a. Noise characterized by transient disturbances separated in time by quiescent intervals.
- 131. Inbound Track:
 - a. Track that is normally used by trains traveling toward Metro Center passenger station in the A, B, C, D, G, and K routes; and towards the Gallery Place passenger station in the E, F, and L routes.
- 132. Incident Scene Illumination:
 - a. The amount of light expressed in foot-candles which is actually falling on an object.
- 133. Index of Refraction:
 - a. (Fiber Optics) The relative index of refraction is a fraction or ratio of the velocity of light in one medium, compared to the velocity of light in another medium.
- 134. Infrared:
 - a. (Fiber Optics) The region of the electromagnetic spectrum between the long-wavelength of the visible spectrum (about 750nm) and the shortest microwaves (about 1300nm). Infrared is used extensively in the transmission of light through optical waveguides.
- 135. Injection Laser Diode:
 - a. (Fiber Optics) A laser employing a forward-biased semiconductor junction as the active medium. Light is emitted from the diode edge.
- 136. Insertion Loss:
 - a. The loss resulting from the insertion of a transducer or other device in a transmission system.
- 137. Install:
 - a. When used in these Specifications, the verb install shall signify that the Contractor shall furnish, install, and test the equipment and materials specified, unless specifically indicated differently in the text.
- 138. Interface:
 - a. A shared boundary. The interconnection between two pieces of equipment or systems/facilities.
- 139. Interlocking:
 - a. An arrangement of signals and signal appliances interconnected so that their operations must succeed each other in proper sequence, thereby permitting train movements over controlled routes, only if safe conditions exist.
- 140. Intermodulation Noise:

- a. That noise which is contingent upon modulation and results from any non-linear characteristic in the path or device.
141. Interphone:
- a. Equipment used to provide telephone communications between personnel at various locations within a defined space. As used in these Specifications, provides communications between the Station Manager in the Kiosk and the public.
142. Intrusion Zone:
- a. A portion of a building, installation or an area designated for detection of intrusion by a specific circuit.
143. Jacket:
- a. A thermoplastic or thermosetting covering, sometimes fabric reinforced, applied over the insulation, core, metallic sheath or armor of a cable.
144. Jackfield:
- a. An arrangement of telephone jacks, usually grouped on a mounting strip, to provide convenient access to lines and equipment for testing.
145. Joint Electron Device Engineering Council (JEDEC):
- a. Cooperative effort of Electronic Industries Alliance (EIA) and National Electrical Manufacturers Association (NEMA).
146. Key Telephone System (KTS):
- a. Assemblage of telephone relay or electronic equipment which provides switching and control of telephone service within a localized area. KTS equipment is differentiated from PABX equipment primarily by more limited switching functions. Insofar as external telephone trunks are concerned, KTS equipment is generally limited to applications requiring less than 100 subscriber lines and the provision of service that is generally limited to a single building or area of a building.
147. Kiosk:
- a. A booth-like structure within Metrorail passenger stations which contains station monitoring and control facilities and from which an attendant may provide information and assistance to passengers.
148. Laser:
- a. (Fiber Optics) A device that produces optical radiation using population inversion to provide Light Amplification by Stimulated Emission of Radiation and (generally) an optical resonant cavity to provide positive feedback.
149. Light Emitting Diode (LED):
- a. A pn junction semiconductor device that emits incoherent optical radiation when biased in the forward direction.
150. Main Distribution Frame (MDF):
- a. Provides for the termination and cross connection of outside lines entering a building, including electrical protection devices, internal subscriber lines, and terminal equipment.
151. Manhole:
- a. A subsurface chamber or opening in the route of a conduit or duct run that provides facilities for splicing, testing, and maintaining cables and conductors.
152. Manual Pull Box:
- a. Specifically refers to FIRE alarm switch which, when operated manually, initiates a FIRE alarm.
153. MDF/Protector Cabinet:
- a. Specifically refers to a cabinet located in passenger stations and yard buildings containing MDF and cable protection facilities.
154. Major Items:

- a. Major Items are defined as items listed in Estimated Quantities Tables 3.1-X.X.
- 155. Mechanical Splice:
 - a. (Fiber Optics) An optical fiber splice accomplished by fixtures or materials, rather than by thermal fusion. Index matching material may be applied between the two fiber ends.
- 156. Metro Center:
 - a. A Metrorail passenger station located at the junction of routes A, B, C, and D which is the major hub of the WMATA Rail Rapid Transit System.
- 157. Microbar:
 - a. Unit of pressure equal to one dyne per square centimeter.
- 158. Millisecond (ms):
 - a. A unit of time equal to one one-thousandth of a second.
- 159. Mobile Radio Unit:
 - a. A radio transmitter/receiver designed for installation in a vehicle or train.
- 160. Modal Dispersion:
 - a. (Fiber Optics) The component of pulse spreading caused by differential optical path lengths in a multimode fiber.
- 161. Modem:
 - a. A modulator and demodulator housed in a common assembly.
- 162. Multi-Mode Fiber:
 - a. (Fiber Optics) An optical fiber that will allow more than one mode to propagate. May be either a graded index or step index configuration.
- 163. Multiline Telephone:
 - a. A telephone instrument with the capability of being connected to more than one line.
- 164. Multiplexer (MUX):
 - a. A device which combines several inputs into a single output.
- 165. Muting:
 - a. The action of reducing a sound level.
- 166. NEMA:
 - a. National Electrical Manufacturers Association
1300 North 17th Street
Suite 1847
Rosslyn, Virginia 22209
- 167. Noise:
 - a. Any undesired, interfering signal contained in a communications channel or circuit.
- 168. Noise Weighting:
 - a. An amplitude-frequency characteristic of a noise measuring set. C-Message weighting is so designed as to give numerical readings which approximate the amount of transmission impairment, due to noise, that an average listener experiences using a specific commonly utilized modern class of telephone subset. "Flat" weighting and other wideband weighting may be utilized to measure noise on data channels. Meters designed to measure ambient noise (environmental) utilize other weighting networks (to obtain readings in dBa, for example).
- 169. Numerical Aperture:
 - a. (Fiber Optics) Measure of light acceptance of an optical fiber.
- 170. OCC:
 - a. Operations Control Center (now in the Jackson Graham Building which was previously designated as the OCC Building - OCCB on some WMATA documentation). The operational center for the WMATA Metrorail and Metrobus systems (includes centralized operations and communications functions). Also known as Central Control and Command Center.

171. OCCS:
a. Operations Control Center - Security. Usually refers to the consoles in the Security Center for the WMATA system.
172. Off-Hook:
a. A telephone line condition or the signal indicating that the circuit is in use (i.e., the handset is off its switch-hook).
173. Omni-Directional:
a. (Antenna) An antenna having essentially non-directional pattern in azimuth but that may have a directional pattern in elevation in many instances.
b. (Microphone) A microphone, the response of which is essentially independent of the direction of sound input.
174. On-Hook:
a. A telephone line condition or the signal indicating that the circuit is idle - not in use.
175. On-Site Test:
a. Test of equipment or system after installation in its operational location.
176. Open:
a. A break or discontinuity in a circuit which normally passes a current.
177. Optical Fiber:
a. (Fiber Optics) Any filament or fiber, made of dielectric material, that guides light.
178. Outbound Track:
a. Track normally used by trains traveling away from Metro Center passenger station in the A, B, C, D, G, and K routes, and away from Gallery Place passenger station in the E, F, and L routes.
179. Override:
a. A communications trunk feature whereby one call has a greater priority of using a common facility over another call.
180. PABX:
a. A designation used in the national telephone system to denote a privately owned telephone switching center which operates by the use of dialing (i.e. Private Automatic Branch Exchange). PABXs can be differentiated from KTS systems by their generally more extensive trunk and remote line switching capability, and by the fact that they generally handle 60 or more subscriber lines.
181. PABX Extension:
a. A telephone instrument connected to a PABX.
182. PAID Area:
a. Area of passenger station to which the passengers have access after passing through fare gates.
183. Paging-Intercom:
a. A system which provides for public address type paging and telephone type intercom service.
184. Parity:
a. Used in digital code formats for self-checking in which the total number of 1s or 0s in an acceptable code is always odd or always even, depending on whether an odd or even parity check is used.
185. Passenger Station:
a. A location which provides the public access to the WMATA Rail Rapid Transit System (Metrorail System). Provides facilities for payment of fares, train information, entrance and exit of passengers.
186. Phase Modulation (PM):
a. The process of varying the angle of a carrier from its reference value by an amount proportional to the instantaneous value of a modulating signal.
187. Pin Photodiode:

- a. (Fiber Optics) A diode with a large intrinsic region sandwiched between p-doped and n-doped semiconducting regions. A commonly used detector or receiver in fiber systems.
- 188. Plug-In Unit:
 - a. A communications device so designed that connections to the device may be completed through pins, plugs, jacks, sockets, receptacles or other forms of ready connectors.
- 189. Portable Radio:
 - a. A radio transmitter/receiver designed to be carried by or on a person.
- 190. Power Distribution Panel:
 - a. A facility which provides for the distribution of power circuits and overload protection for those circuits.
- 191. Power Supply:
 - a. A unit for converting power from an ac or dc source into ac or dc power at voltages suitable for supplying power to equipment.
- 192. Pre-empt:
 - a. A communications trunk feature whereby one call takes a common trunk facility away from another call.
- 193. Primary Cable:
 - a. Specifically refers to the normally on-line cable of the dual redundant communications cable facility of the Fiber Optics/Carrier Transmission Systems.
- 194. Protection Tube:
 - a. An expulsion arrestor or glow-discharge cold cathode tube that employs a low-voltage breakdown between two or more electrodes to protect circuits against over-voltage.
- 195. Pulse Dispersion:
 - a. (Fiber Optics) The separation or spreading of the input characteristics of the optical signal that appears along the length of the optical fiber and limits the useful transmission bandwidth of the fiber. Expressed in time and distance as nanoseconds per kilometer. Three basic mechanisms for dispersion are the material effect, the waveguide effect, and the multimode effect.
- 196. PT&Z Camera(Pan, Tilt, Zoom):
 - a. A television camera with facility for remote control of azimuth, elevation, and zoom.
- 197. Public Address System:
 - a. A system which provides transmission, amplification, and reproduction of speech with high communications band fidelity and sufficient power to make sound simultaneously available, and fully intelligible, to large numbers of people.
- 198. Pulse Code Modulation (PCM):
 - a. A modulation process involving the conversion of a wave form from analog to digital by means of coding. Usually a form of pulse modulation in which a code is used to represent quantized values of instantaneous samples of the signal waves.
- 199. Push-To-Talk (Operation):
 - a. Voice communications on a circuit in one direction at a time requiring activation of a switch prior to and during transmission.
- 200. Quench:
 - a. An action whereby an active circuit is stifled or inhibited.
- 201. Radio Base Station:
 - a. A complete assemblage of equipment for radio transmission and reception including antenna(s) and control devices or interfacing equipment accommodating remote control devices.

202. Rail Rapid Transit System:
a. The portion of the WMATA transportation system that is a third rail electrified system as distinguished from the motor bus operations.
203. Rapid Battery Charger:
a. Electrical device used for rapidly charging storage batteries.
204. Redundancy :
a. The existence in a system of more than one means of accomplishing a given function, for the purpose of increasing security or reliability.
205. Reliability :
a. The probability of performing a specified function, without failure and within design parameters, for the period of time intended under actual operating conditions.
206. Redundant Cable:
a. Specifically refers to the secondary cable of the dual cable facility of the Fiber Optic/Carrier Transmission Systems.
207. Reference Transmission Level Point (RTLTP):
a. In a communications system it is an arbitrarily chosen point to which the levels at all other points in the system are referenced. It is frequently the input to the 2-wire side of the 2-wire/4-wire terminating set at the transmitting end of a telephone channel.
208. Remote Building:
a. An area or structure (frequently containing support equipment, such as: Fan shafts, chiller plants, substations, and tie breaker stations) generally within or along the WMATA right-of-way, but not part of a passenger station or yard. Remote buildings may also include MRS Two-Way Line Drivers, Fire and/or Intrusions alarm detectors, wayside telephones, etc.
209. Relay Contact Types:
a. FORM-A: SPNO (Single-Pole, Normally Open) Contact
b. FORM-B: SPNC (Single-Pole, Normally Closed) Contact
c. FORM-C: SPDT (Single-Pole, Double-Throw) Contact
210. Remote Terminal Unit (RTU):
a. A modem installed at each ATC field control location (usually at passenger station TCRs) to act as the interface unit between the Data Transmission System (DTS) and the local ATC and support system functions.
211. Response Message:
a. Digital message transmitted from base station(s) of the Mobile Radio System to the control console with information in reply to a command message initiated at the control console.
212. Revenue Service:
a. The transportation of passengers who have paid a fare.
213. Revenue System:
a. The portion of the METRO System on which revenue service is conducted.
214. Right-of-Way (R.O.W.):
a. The land or structure surface occupied by the Metrorail Transit System, especially for its mainline. Also, the land or structure surface used by another transportation facility such as a railroad or highway.
b. The right of traffic on a given route to take precedence.
215. Ringdown:
a. A method of signaling in which ringing current is transmitted over a circuit to operate a device or circuit to produce a steady signal.
216. Ringing:
a. The audible or visual signal produced by an alternating or pulsating current to signal a telephone station, central office or other terminating equipment.
217. Root Mean Square (rms):

- a. The square root of the mean of the squares of the sum of instantaneous voltages or currents during a complete cycle.
- 218. Rotary Hunting Group (RHG):
 - a. A group of telephone lines which are accessible under a common calling number and are used sequentially as calls are received.
- 219. Scene Highlight Brightness:
 - a. The amount of illumination which is reflected off an object of interest expressed in foot lamberts.
- 220. Seize:
 - a. In communications signaling terminology, to take control of a connecting circuit.
- 221. Sensitivity:
 - a. The degree to which a component, circuit or system is affected by some condition.
- 222. Sensor:
 - a. A device for detection of a condition or change in condition - such as smoke, temperature, humidity, light level, open circuit, closed circuit.
- 223. Service and Inspection (S&I) Yard:
 - a. Yard which provides for the make-up, cleaning, maintenance, inspection, and repair of trains.
- 224. Shield:
 - a. A housing, screen or other object, usually conductive, that substantially reduces the effect of electric or magnetic fields on one side and upon devices or circuits on the other side.
- 225. Shop Building:
 - a. Building within a Metrorail yard or elsewhere which houses repair facilities.
- 226. Short Circuit:
 - a. An abnormal connection of relatively low resistance between two points of different potential in a circuit.
- 227. Simplex:
 - a. A method of operation in which communications takes place in one direction only.
- 228. Singing Point:
 - a. The point at which the gain is just sufficient to make the circuit break into oscillation.
- 229. Single Mode Fiber:
 - a. (Fiber Optics) An optical fiber in which only the lowest order mode can propagate at the wavelength of interest.
- 230. Slotted Coaxial Cable:
 - a. A coaxial cable with slots cut into the outer conductor, thereby permitting radio frequency radiation into and from the cable.
- 231. Software:
 - a. Computer programs and routines; a collection of related utility, assembly, and other programs that are desirable for proper utilization of a device or equipment; detailed procedures, documents, manuals, drawings, and diagrams relating to a device, equipment or system.
- 232. Solid State:
 - a. A device or system whose operation is dependent upon a combination of optical, electrical or magnetic phenomena occurring within a solid. Functions are performed by semiconductors and wholly static components, i.e., resistors, capacitors, etc.
- 233. Span Section:
 - a. A span section is defined in these Specifications as a transmission segment of the Fiber Optic System or Carrier Transmission System that

- extends from the Control Center to and including the passenger station, yard or other intermediate repeater or terminal of the span.
234. Spare:
a. Equipment, assemblies or components, complete or in parts, on hand for repair or replacement.
235. Speech-Plus:
a. Method of operation that permits the simultaneous transmission of speech and telegraph signals over a single voice channel.
236. Sound Pressure Level (SPL):
a. A measure, in dB, of acoustic loudness, usually designated to be the effective rms sound pressure referenced to 0.0002 dyne per square centimeter.
237. Squelch:
a. An action whereby a signal is completely cut off, unless a predetermined threshold level is attained.
238. Stationing:
a. A system for establishing reference points along the Rail System. Civil stationing is used in initial design and development of the Rail Right-Of-Way. Train Control Stationing is later established as a permanent reference for operation of the Rail System.
239. Storage and Inspection Yard:
a. A Metrorail yard which provides for the make up of trains and for the cleaning and minor maintenance of cars. No major repair facilities are provided.
240. Sub-Ballast:
a. Crushed rock or stone that is placed between the ballast and the sub-grade.
241. Subscriber Loop:
a. A circuit that is formed by the subscriber's telephone, the cable pairs and other conductors, and the telephone central office, PABX or other terminating equipment.
242. Substation, Traction Power:
a. Building housing equipment and facilities for providing electrical energy to the trains via the contact rail.
243. Subway:
a. That portion of the system which is constructed beneath the ground surface (i.e. underground Metrorail facilities).
244. Supervision:
a. The process of monitoring the condition of a circuit to determine its status.
245. Supervisory Alarm Subsystem (SAS):
a. A subsystem of the Technical Control Facility which provides for the transmission of alarm information from a remote terminal in passenger stations and yards to the Control Center.
246. Talkback System:
a. A system of the yard which provides two-way voice communications between the Yard Communications Console and the track areas.
247. Talk Path:
a. In a telephone or radio system, the circuit or channel which provides for the transmission of voice signals.
248. Terminal Strip (Board):
a. An insulating base equipped with terminals for connecting wires.
249. Third Rail:
a. See contact rail.
250. Tie Breaker Station:

- a. Building housing power switching equipment for the purpose of sectionalizing contact rail power.
- 251. Tone Call:
 - a. A system of exchanging calling or alerting signals and acknowledgment signals between mobile radio units and base stations that utilize modulated tones in the voice band.
- 252. Tone Dialing:
 - a. The transfer of digital information from a telephone instrument to a central office or other terminal device utilizing multi-frequency tones. (Typically by standard DTMF tone signaling)
- 253. Tone Generator:
 - a. A device for providing audio frequency currents suitable for signaling purposes.
- 254. Total Harmonic Distortion (THD):
 - a. A measure of the total effect of the various higher order harmonics of a sinusoidal signal.
- 255. Trackbed:
 - a. The area and material directly under the track which provides support to the track. It includes ties, ballast or other supporting material.
- 256. Train Control Contractor:
 - a. The contractor who has been awarded a contract to provide Automatic Train Control System.
- 257. Train Control Room:
 - a. A room located in a passenger station or at some other strategic point to house wayside ATC equipment including a Remote Terminal Unit. A major wayside control point for the ATC system.
- 258. Trunk:
 - a. A one or two-way channel connecting two telephone central offices, or a central office and an individual terminal.
- 259. Vehicular Radio:
 - a. Radio transmitter/receiver and associated equipment designed to be installed in and operated from vehicles.
- 260. Voltage Standing Wave Ratio (VSWR):
 - a. The ratio of the highest to the lowest voltage of a standing wave at a feed through point.
- 261. Wayside Telephone System:
 - a. A subsystem of the WMATA Telephone System.
- 262. Wet Contact:
 - a. An electrical contact through which direct current flows.
- 263. WMATA:
 - a. Washington Metropolitan Area Transit Authority
- 264. Headquarters Building:
 - a. Jackson Graham Building
600 Fifth Street, N.W.
Washington, D.C. 20001
- 265. WMATA Configuration:
 - a. The arrangement of hardware or software, wiring, etc. within the equipment, equipment racks, rooms, or systems utilized by WMATA.
- 266. WOW:
 - a. The slow cyclic deviation of audio signaling power with an approximate period of 0.5 Hz.
- 267. Yard:

- a. A system of Metrorail tracks and buildings within defined limits provided for the make-up of trains, storage of cars, and for cleaning, maintenance, inspection, and repair of trains.
268. Yard Control Room:
- a. The room in the yard which contains the yard train control console.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION