LAW ENFORCEMENT STANDARDS PROGRAM

TECHNICAL TERMS AND DEFINITIONS USED WITH LAW ENFORCEMENT COMMUNICATIONS EQUIPMENT

(RADIO ANTENNAS, TRANSMITTERS AND RECEIVERS)

prepared for the
National Institute of Law Enforcement and Criminal Justice
Law Enforcement Assistance Administration
U. S. Department of Justice

by

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June 1973

U. S. DEPARTMENT OF JUSTICE
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ACKNOWLEDGEMENTS

This report was formulated by the Law Enforcement Standards Laboratory of the National Bureau of Standards under the direction of Marshall J. Treado, Program Manager for Communications, and Jacob J. Diamond, Chief of LESL. The technical review of this report, under the direction of H. E. Taggart, LESL Communication's Project Leader, was conducted by the staff of the NBS Electromagnetics Division.

For sale by the Superintendent of Documents, U.S. Government Printing Office
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FOREWORD

In accordance with Title I, Section 402(b) of the Omnibus Crime Control and Safe Streets Act of 1968, P.L. 90-351, the National Institute of Law Enforcement and Criminal Justice (NILECJ) has established the Law Enforcement Standards Laboratory (LESL) at the National Bureau of Standards.

LESL has been established to conduct research leading to the development and promulgation of national voluntary equipment standards that will assist law enforcement and criminal justice agencies in the selection and procurement of quality equipment. In addition to standards development, LESL is defining minimum performance levels and developing methods for measuring the required performance of equipment designated by NILECJ. This report, LESP-RPT-0203.00, Technical Terms and Definitions Used with Law Enforcement Communications Equipment (Radio Antennas, Transmitters, and Receivers), was prepared by the Electromagnetics Division of the National Bureau of Standards. Additional reports, standards, user guidelines as well as state-of-the-art surveys are planned for issuance under the LESL program in the areas of protective equipment, communications equipment, security systems, weapons, emergency equipment, concealed objects detectors, and vehicles.

NILECJ Standards are subject to continuing review. Technical comments and recommended revisions are invited from all interested parties. Suggestions should be addressed to the Program Manager for Standards, National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, U. S. Department of Justice, Washington, D.C. 20530.

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CATEGORIES OR KEYWORDS

TECHNICAL TERMS AND DEFINITIONS USED WITH LAW ENFORCEMENT COMMUNICATIONS EQUIPMENT (RADIO ANTENNAS, TRANSMITTERS, AND RECEIVERS)

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ABSTRACT

This report is a glossary consisting of approximately 1,000 selected technical terms and their definitions relating (but not exclusively) to land-mobile, portable, and base or fixed-station radio communications antennas, transmitters, and receivers used for law-enforcement communications in the U.S.A. in the frequency range 25 to 960 MHz. These terms and definitions were selected from a total of roughly 4,000 contained in 24 of the most applicable standards published by six major organizations: IEEE, ANSI, EIA, DoD, APCO, and Canadian DoC.

Key Words: Definitions; radio communications; technical terms.

INTRODUCTION

This glossary consists of approximately 1,000 selected technical terms and their definitions relating (but not exclusively) to land-mobile, portable, and base or fixed-station radio communications antennas, transmitters, and receivers used for law-enforcement communications in the U.S.A. in the frequency range 25 to 960 MHz. Minimum performance standards and their associated measurement techniques related to the above are being compiled under a separate cover.

The technical terms and definitions contained herein were selected from 24 of the most applicable standards published by the six major organizations listed below. These publications contain a total of over 4,000 technical terms most of which are of only secondary importance to our present purpose. The terms selected were arranged alphabetically under approximately 69 general categories or key words insofar as possible. The source publications used follow below.

1. Institute of Electrical and Electronics Engineers (IEEE). IEEE Standard Publications:
   - No. 145 - Definitions of Terms for Antennas, March 1969.
   - No. 170 - Definitions of Terms for Modulation Systems, May 1964.
   - No. 182 - Standards on Radio Transmitters: Definitions of Terms, 1961.
   - No. 182A - Definitions of Terms for Radio Transmitters, May 1964.
   - No. 184 - Test Procedure for FM Mobile Communications Receivers, April 1969.

2. American National Standards Institute (ANSI). Definitions of Electrical Terms C42.65 (Communication), Approved January 24, 1957.
   - Section 02 - General Communication Terms.
   - Section 04 - Transmission Lines.
   - Section 06 - Circuits and Devices.
   - Section 08 - Transmission Characteristics.
   - Section 12 - Inductive Coordination.
   - Section 14 - Electroacoustics.
   - Section 16 - Modulating Systems.
   - Section 36 - Radio Antennas.
   - Section 38 - High-Frequency and Microwave Transmission.
   - Section 42 - Radio Transmitting and Receiving Systems.

   NOTE: A total of approximately 2,000 terms and definitions with numbers ranging from C42.65.02.001 to C42.65.42.258.

3. Electronic Industries Association (EIA). EIA Standard Publications:
   - TR-120 - Minimum Standards for Land-Mobile Selective Signalling Equipment, May 1950.
   - RS-152B - Minimum Standards for Land-Mobile Communication FM or PM Transmitters, 25-470 MHz, February 1970.
   - RS-204 - Minimum Standards for Land-Mobile Communication FM or PM Receivers, January 1958.
   - RS-237 - Minimum Standard for Land-Mobile Communication Systems Using FM or PM in the 25-470 MC Frequency Spectrum, August 1960.
   - RS-316 - Minimum Standards for Portable/Personal Land-Mobile Communications FM or PM Equipment 25-470 MC, July 1965.
   - RS-329 - Minimum Standards for Land-Mobile Communication Antennas; Part I - Base or Fixed-Station Antennas, December 1966.

4. Military Standard - Military Communication System - Technical Standards, MIL-STD-188C, 737 Terms and Definitions, pp 2-54, November 24, 1969.

5. Associated Public Safety Communications Officers, Inc (APCO), Public Safety Communications Equipment Specifications, Glossary, August 1971.

6. Mobile Stations FM or PM Radiotelephone Transceivers, 27-470 MHz, Canadian Radio Standards Specification 121, April 15, 1971.

TERMS AND DEFINITIONS

ANTENNAS

Antenna. An antenna is a means for radiating or receiving radio waves (ANSI C42.65.36.003).

Antenna (aerial). A means for radiating or receiving radio waves (IEEE No. 145, p. 3).

Aerial. An aerial is the elevated conductor portion of a capacitor antenna (ANSI C42.65.36.186).

Antenna. A system of wires or electrical conductors employed for reception or transmission of radio waves. Specifically, a radiator which couples the transmission line or lead-in to space for transmission or reception of electromagnetic radio waves (APCO Specs. 8-71, Glossary).

Antennas. Base or fixed station antennas are antennas used for the Land-Mobile Communications service at the base station or fixed station in a radio relay link (EIA RS-329, p. 1).

Effective Area. The effective area of an antenna in any specified direction is equal to the square of the wavelength multiplied by the power gain (or directive gain) in that direction and divided by 4 pi (ANSI C42.65.36.225).

NOTE: When power gain is used the effective area is that for power reception; when directive gain is used the effective area is that for directivity.

Array Antenna. An antenna comprising a number of radiating elements, generally similar, which are arranged and excited to obtain directional radiation patterns (IEEE No. 145, p. 3).

Antenna Array. An antenna array is a system of antennas coupled together for the purpose of obtaining directional effects (ANSI C42.65.36.132).

Uniform Linear Array. A linear array of identically oriented and equally spaced radiating elements having equal current amplitudes and equal phase increments between excitation currents (IEEE No. 145, p. 8).

Bandwidth, of an Antenna. The range of frequencies within which its performance, in respect to some characteristic, conforms to a specified standard (IEEE No. 145, p. 3).

Bandwidth. The bandwidth of the antenna is the frequency range over which the antenna shall perform within all the electrical performance specifications (EIA RS-329, p. 9).

Beam, of an Antenna. The major lobe of the radiation pattern of an antenna (IEEE No. 145, p. 3).

Shaped-Beam Antenna. A shaped-beam antenna is one whose directional pattern over a certain angular range is designed to a special shape for some particular use (ANSI C42.65.36.021).

Radio Beam. A radio beam is a radio wave most of whose energy is confined within a relatively small angle in at least one plane (ANSI C42.65.36.012).

Elevation Beam Tilt. Elevation Beam Tilt of an antenna is the angle between the direction of maximum radiation and the horizontal plane (EIA RS-329, p. 7).

Elevation Beam-Tilt Loss. Elevation Beam Tilt Loss of an antenna is the difference between the maximum radiation and the radiation in the horizontal plane expressed in dB (EIA RS-329, p. 7).

Half-Power Beamwidth. In a plane containing the direction of the maximum of a beam, the angle between the two directions in which the radiation intensity is one-half the maximum value of the beam (IEEE No. 145, p. 5).

Horizontal Beamwidth. The Horizontal Beamwidth of an antenna is the angular width including maximum radiation measured between the two points on the major lobe of the horizontal pattern 3 dB below the maximum (EIA RS-329, p. 7).

Vertical Beamwidth. The Vertical Beamwidth of an antenna is the angular width including maximum radiation measured between the two points on the major lobe of the vertical pattern 3 dB below the maximum (EIA RS-329, p. 7).

Coaxial Antenna. A coaxial antenna is an antenna comprised of a quarter-wavelength extension to the inner conductor of a coaxial line and a quarter-wavelength radiating sleeve which closely surrounds the outer conductor of the coaxial line, but is connected to the outer conductor only at its end (ANSI C42.65.36.072).

Galvanic Corrosion. Galvanic corrosion is the acceleration of corrosive action due to dissimilar metals in contact in the presence of moisture. The action is that of a galvanic cell, in which the metals act as electrodes, with the metal that is corroded acting as an anode with respect to the other metal (EIA RS-329, p. 10).

Counterpoise. A system of conductors, elevated above and insulated from the ground, forming a lower system of conductors of an antenna (IEEE No. 145, p. 3).

Electric Dipole. An elementary radiator consisting of a pair of equal and opposite oscillating electric charges an infinitesimal distance apart (IEEE No. 145, p. 4).

NOTE: It is equivalent to a linear current element.

Dipole Antenna (Doublet Antenna). Any one of a class of antennas producing a radiation pattern approximating that of an elementary electric dipole (IEEE No. 145, p. 4).

NOTE: Common usage considers the dipole antenna to be a metal radiating structure which supports a line current distribution similar to that of a thin straight wire so energized that the current has a node only at each end.

Dipole Antenna. A dipole antenna is a straight radiator, usually fed in the center, and producing a maximum of radiation in the plane normal to its axis. The length specified is the overall length (ANSI C42.65.36.045).

NOTE: Common usage considers a dipole antenna to be a metal radiating structure which supports a line current distribution similar to that of a thin straight wire a half-wavelength long so energized that the current has two nodes, one at each of the far ends.

Folded Dipole Antenna. An antenna composed of two or more parallel, closely spaced dipole antennas connected together at their ends with one of the dipole antennas fed at its center (IEEE No. 145, p. 5).

Folded Dipole Antenna. A folded dipole antenna is composed of two parallel closely spaced dipole antennas connected together at their ends with one of the dipole antennas fed at its center (ANSI C42.65.36.075).

Half-Wave Dipole. A half-wave dipole is an antenna formed by a straight radiator, one-half wavelength long, whose diameter is small compared to its length, so energized that the current has two nodes, one at each end, producing a maximum radiation in the plane normal to its axis (IEEE) (EIA RS-329, p. 1).

Half-Wave Dipole Antenna. A straight, ungrounded antenna having an electrical length equal to half the wavelength of the signal being transmitted or received (APCO Specs. 8-71, Glossary).

Sleeve-Dipole Antenna. A dipole antenna surrounded in its central portion by a coaxial conducting sleeve (IEEE No. 145, p. 8).

Sleeve-Dipole Antenna. A sleeve-dipole antenna is a dipole antenna surrounded in its central portion by a coaxial sleeve. (ANSI C42.65.36.078).

Doublet Antenna. A doublet antenna is an antenna consisting of two elevated conductors substantially in the same straight line, of substantially equal length, with the power delivered at the center (ANSI C42.65.36.048).

Directional Antenna. An antenna having the property of radiating or receiving electromagnetic waves more effectively in some directions than in others (IEEE No. 145, p. 4).

Directional Antenna. A directional antenna is an antenna which radiates or receives radio waves more effectively in some directions than in others (ANSI C42.65.36.009).

NOTE: The term is usually applied to antennas whose directivity is larger than that of a half-wave dipole.

Directional Antenna. A directional antenna is an antenna which radiates or receives radio waves more effectively in some azimuthal directions than in others (EIA RS-329, p. 7).

Directional Pattern (Radiation Pattern). The directional pattern of an antenna is a graphical representation of the radiation or reception of the antenna as a function of direction. Cross-sections in which directional patterns are frequently given are vertical planes and the horizontal plane, or the principal electric and magnetic polarization planes (ANSI C42.65.36.228).

Bidirectional Antenna. A bidirectional antenna is an antenna having two directions of maximum response (ANSI C42.65.36.019).

Omnidirectional Antenna. An antenna having an essentially nondirectional pattern in aximuth and a directional pattern in elevation (IEEE No. 145, p. 6).

Omni-Directional Antenna. An omni-directional antenna is an antenna having an essentially non-directive pattern in aximuth and a directive pattern in elevation (ASA Standard) (EIA RS-329, p. 6).

Unidirectional Artenna. A unidirectional antenna is one which has a single well-defined direction of maximum radiation intensity (ANSI C42.65.36.018).

Directivity. The directivity of an antenna is the value of the directive gain in the direction of its maximum value (ANSI C42.65.36.231).

Director. In antenna practice, a director is a parasitic element located in the general direction of the major lobe of radiation for the purpose of increasing radiation in that direction (ANSI C42.65.36.156).

Antenna Effect. In a loop antenna, any spurious radiation effect resulting from the capacitance of the loop to ground (IEEE No. 145, p. 3).

Antenna Effect. In a loop antenna, antenna effect is any spurious effect resulting from the capacitance of the loop to ground (ANSI C42.65.36.276).

Array Element. In any array antenna, a single radiating element or a convenient grouping of radiating elements that have a fixed relative excitation (IEEE No. 145, p. 3).

Director Element. A parasitic element located forward of the driven element of an antenna, intended to increase the directive gain of the antenna in the forward direction (IEEE No. 145, p. 4).

Driven Element. A radiating element coupled directly to the feed line of an antenna. (See Parasitic Element.) (IEEE No. 145, p. 4).

Parasitic Element. In antenna practice, a parasitic element is a radiating element, not coupled directly to the feed line of the antenna, which materially affects the pattern of the antenna (ANSI C42.65.36.153).

Radiating Element. A basic subdivision of an antenna which in itself is capable of effectively radiating or receiving radio waves (IEEE No. 145, p. 7).

NOTE: Typical examples of a radiating element are a slot, horn, or dipole antenna.

Radiating Element. In antenna practice, a radiating element is a basic subdivision of an antenna which in itself is capable of radiating or receiving radio frequency energy (ANSI C42.65.36.150).

Reflector Element. A parasitic element located in a direction other than forward of the driven element of an antenna intended to increase the directive gain of the antenna in the forward direction (IEEE No. 145, p. 7).

Exciter. In antenna practice, an exciter is the portion of a transmitting array, of the type which includes a reflector or director, which is directly connected with the source of power (ANSI C42.65.36.159).

Natural Frequency of an Antenna. The natural frequency of an antenna is its lowest resonant frequency without added inductance or capacitance (ANSI C42.65.36.219).

Front-to-Back Ratio. The ratio of the directivity of an antenna to its directive gain in a specified direction toward the back (IEEE No. 145, p. 5).

Front-to-Back Ratio. The front-to-back ratio of a directional antenna is the ratio of its effectiveness toward the front, to its effectiveness toward the back (ANSI C42.65.36.267).

Antenna Gain. Antenna gain is commonly defined as the ratio of the maximum radiation intensity in a given direction to the maximum radiation intensity produced in the same direction from a reference antenna with the same power input (Mil-Std-188C, p. 23).

Directive Gain. The directive gain of an antenna in a given direction is 4 pi times the ratio of the radiation intensity in that direction, to the total power radiated by the antenna (ANSI C42.65.36.234).

NOTE: The term is also applied to receiving antennas.

Directive Gain, of an Antenna. In a given direction, 4 pi times the ratio of the radiation intensity in that direction to the total power radiated by the antenna (IEEE No. 145, p. 4).

NOTE: The directive gain is fully realized on reception only when the incident polarization is the same as the polarization of the antenna on transmission.

Directivity (Gain). The value of the directive gain in the direction of its maximum value (IEEE No. 145, p. 4).

Power Gain of an Antenna. The power gain of an antenna in a given direction is 4 pi times the ratio of the radiation intensity in that direction, to the total power delivered to the antenna (ANSI C42.65.36.237).

NOTE: The term is also applied to receiving antennas.

Power Gain, of an Antenna. In a given direction, 4 pi times the ratio of the radiation intensity in that direction to the net power accepted by the antenna from the connected transmitter (IEEE No. 145, p. 6).

NOTE 1: When the direction is not stated, the power gain is usually taken to be the power gain in the direction of its maximum value.

NOTE 2: Power gain does not include reflection losses arising from mismatch of impedance.

NOTE 3: Power gain is fully realized on reception only when the incident polarization is the same as the polarization of the antenna on transmission.

Antenna Power Gain. The power gain of an antenna is the ratio of the radiation intensity of the antenna in a given direction, usually on the horizon, to the maximum radiation intensity of a lossless reference antenna, usually a half-wave dipole, with same input power (EIA RS-329, p. 8).

Relative Gain, of an Antenna. The ratio of the power gain in a given direction to the power gain of a reference antenna in its reference direction (IEEE No. 145, p. 7).

NOTE: Common reference antennas are half-wave dipoles, electric dipoles, magnetic dipoles, monopoles, and calibrated horn antennas.

Relative Power Gain. The relative power gain of one transmitting or receiving antenna over another is the measured ratio of the signal power one produces at the receiver input terminals to that produced by the other, the transmitting power level remaining fixed (ANSI C42.65.36.240).

NOTE: In long-range communication measurements the relative power gain is affected by the propagation characteristics of the medium (e.g., ionosphere).

Ground System of an Antenna. The ground system of an antenna is that portion of an antenna closely associated with and including an extensive conducting surface which may be the earth itself (ANSI C42.65.36.195).

Ground Wire. A ground wire is a conductor leading to an electric connection with the ground (ANSI C42.65.36.198).

Effective Height. (1) The effective height of an antenna is the height of its center of radiation above the effective ground level. (2) In low-frequency applications the term effective height is applied to loaded or nonloaded vertical antennas and is equal to the moment of the current distribution in the vertical section, divided by the input current (ANSI C42.65.36.222).

NOTE: For an antenna with symmetrical current distribution the center of radiation is the center of distribution. For an antenna with asymmetrical current distribution the center of radiation is the center of current moments when viewed from directions near the direction of maximum radiation.

Effective Height, of an Antenna (high-frequency usage). The height of the antenna center of radiation above the ground level (IEEE No. 145, p. 4).

NOTE: For an antenna with symmetrical current distribution, the center of radiation is the center of distribution. For an antenna with asymmetrical current distribution, the center of radiation is the center of current mements when viewed from directions near the direction of maximum radiation.

Antenna Height Above Average Terrain. The antenna height above average terrain is the average of the antenna heights above the terrain from two to ten miles from the antenna (ANSI C42.65.36.223).

NOTE: In general, a different antenna height will be determined by each direction from the antenna. The average of these various heights is considered as the antenna height above average terrain.

Image Antenna. An image antenna is the imaginary counterpart of an actual actual antenna, assumed for mathematical purposes to be located below the surface of the ground, and symmetrical with the actual antenna above ground (ANSI C42.65.36.007).

Input Impedance, of an Antenna. The impedance presented by an antenna at its terminals (IEEE No. 145, p. 5).

Mutual Impedance. The mutual impedance between any two terminal pairs in a multielement array antenna is equal to the open-circuit voltage produced at the first terminal pair divided by the current supplied to the second when all other terminal pairs are open-circuited (IEEE No. 145, p. 6).

Self-Impedance, of a Radiating Element. The input impedance of a radiating element of an array antenna with all other elements in the array open-circuited (IEEE No. 145, p. 7).

NOTE: In general, the self-impedance of a radiating element in an array is not the same as the input impedance of the same element with the other elements absent.

Isolation, between Antennas. A measure of power transfer from one antenna to another (IEEE No. 145, p. 5).

NOTE: The isolation between antennas is the ratio of power input to one antenna to the power received by the other, usually expressed in decibels.

Lead-In. A lead-in is that portion of an antenna system which connects the elevated conductor portion to the radio equipment (ANSI C42.65.36.189).

Effective Length, of an Antenna. For an antenna radiating linearly polarized waves, the length of a thin straight conductor oriented perpendicular to the direction of maximum radiation, having a uniform current equal to that at the antenna terminals and producing the same far-field strength as the antenna. Alternatively, for the same antenna receiving linearly polarized waves from the same direction, the ratio of the open-circuit voltage developed at the terminals of the antenna to the component of the electric field strength in the direction of antenna polarization (IEEE No. 145, p. 4).

NOTE 1: The two definitions yield equal effective lengths.

NOTE 2: In low-frequency usage the effective length of a ground-based antenna is taken in the vertical direction and is frequently referred to as effective height. Such usage should not be confused with Effective Height, of an Antenna (high-frequency usage).

Loading, of an Antenna. The modification of a basic antenna, such as a dipole or monopole, by adding conductors or circuit elements that change the current distribution or input impedance (IEEE No. 145, p. 5).

Lobe (Directional Lobe)(Radiation Lobe) (Antenna Lobe). A lobe is a portion of the directional pattern bounded by one or two cones of nulls (ANSI C42.65.36.243).

Major Lobe. A major lobe is the lobe containing the direction of maximum radiation or reception (ANSI C42.65.36.246).

Major Lobe (Main Lobe). The radiation lobe containing the direction of maximum radiation (IEEE No. 145, p. 6).

NOTE: In certain antennas, such as multilobed or split-beam antennas, there may exist more than one major lobe.

Major Lobe. The radiation lobe containing the direction of maximum radiation (EIA RS-329, p. 7).

Minor Lobe. A minor lobe is any lobe except the major lobe (ANSI C42.65.36.249).

Minor Lobe. Any lobe except a major lobe (IEEE No. 145, p. 6).

Minor Lobe. Any radiation lobe except the major lobe (EIA RS-329, p.7).

Half-Power Width of a Lobe. The half-power width of a lobe in a plane containing the direction of the maximum of the lobe is the angle between the two directions in that plane about the maximum in which the radiation intensity is one-half the maximum value of the lobe (ANSI C42.65.36.252).

Radiation Lobe. A portion of the radiation pattern bounded by regions of relatively weak radiation intensity (IEEE No. 145, p. 7).

Radiation Lobe. Radiation lobe is a portion of a radiation pattern bounded by one or two angular regions of minimum radiated electric field (EIA RS-329, p. 7).

Side Lobe. A radiation lobe in any direction other than that of the intended lobe (IEEE No. 145, p. 7).

Side-Lobe Level, Maximum Relative. The relative level of the highest side lobe (IEEE No. 145, p. 7).

Side Lobe, Relative Level of. The ratio of the radiation intensity of a side lobe in the direction of its maximum value to that of the intended lobe, usually expressed in decibels (IEEE No. 145, p. 8).

Log-Periodic Antenna. Any one of a class of antennas having a structural geometry such that its electrical characteristics repeat periodically as the logarithm of frequency (IEEE No. 145, p. 5).

Loop Antenna. A loop antenna is an antenna consisting of one or more complete turns of conductor in approximately the same plane arranged to enclose an area in the electromagnetic field (ANSI C42.65.36.042).

Loop Antenna. An antenna whose configuration is that of a loop (IEEE No. 145, p. 6).

NOTE: If the current in the loop, or in multiple parallel turns of the loop, is essentially uniform and the loop circumference is small compared with the wavelength, the radiation pattern approximates that of a magnetic dipole.

Monopole. Any one of a class of antennas constructed normal to an imaging plane to produce a radiation pattern approximating that of an electric dipole in the half-space above the imaging plane (IEEE No. 145, p. 6).

Pattern Circularity. The pattern circularity of an omni-directional antenna is the deviation of its horizontal radiation pattern from a true circle (EIA RS-329, p. 6).

Polarization. The polarization of an antenna is the orientation of the electric vector of the wave radiated by the antenna (EIA RS-329, p.3)

Polarization, of an Antenna. In a given direction, the polarization of the radiated wave, when the antenna is excited. Alternatively, the polarization of an incident wave from the given direction which results in maximum available power at the antenna terminals (IEEE No. 145, p. 6).

NOTE: When the direction is not stated, the polarization is taken to be the polarization in the direction of maximum gain.

Cross Polarization. The polarization orthogonal to a reference polarization (IEEE No. 145, p. 4).

NOTE: If the reference polarization is right-handed circular, the cross polarization is left-handed circular, and vice versa.

Polarization, of a Radiated Wave. That property of a radiated electromagnetic wave describing the time-varying direction and relative magnitude of the electric-field vector; specifically, the figure traced as a function of time by the extremity of the vector at a fixed location in space, and the sense in which it is traced, as observed along the direction of propagation (IEEE No. 145, p. 6).

NOTE: In general, the figure is elliptical and it is traced in a clockwise or counterclockwise sense. The commonly reference circular and linear polarizations are obtained when the ellipse becomes a circle or a straight line, respectively. Clockwise-sense rotation of the electrical vector is designated "right-hand polarization" and counterclockwise-sense rotation is designated "left-hand polarization."

Antenna Power Rating. Antenna power rating is the maximum CW power which can be continuously applied to the antenna without degrading its performance (EIA RS-329, p. 9).

Radiator. Any antenna or radiating element that is a discrete physical and functional entity (IEEE No. 145, p. 7).

Radiation Efficiency. The radiation efficiency of an antenna is the ratio of the power radiated to the total power supplied to the antenna at a given frequency (ANSI C42.65.36.216).

Radiation Efficiency. The ratio of the total power radiated by an antenna to the net power accepted by the antenna from the connected transmitter (IEEE No. 145, p. 7).

Radiation Intensity. The radiation intensity in a given direction is the power radiated from an antenna per unit solid angle in that direction (ANSI C42.65.36.213).

Radiation Intensity. In a given direction, the power radiated from an antenna per unit solid angle (IEEE No. 145, p. 7).

Radiation Pattern (Antenna Pattern). A graphical representation of the radiation properties of the antenna as a function of space coordinates (IEEE No. 145, p. 7).

NOTE 1: In the usual case the radiation pattern is determined in the far-field region and is represented as a function of directional coordinates.

NOTE 2: Radiation properties include radiation intensity, field strength, and phase or polarization.

Radiation Pattern. The radiation pattern is a graphical representation of the magnitude of the relative electric field strength radiated from an antenna in a given plane plotted against direction from a given reference (EIA RS-329, p. 4).

Elevated Range. An elevated range is a range where both test and source antennas are elevated sufficiently to place a minimum of the source antenna at the reflection point, while simultaneously aligning the major lobe maxima of both antennas. The two heights, h_a and h_s in Figure 2, are generally equal (EIA RS-329, p. 4).

Ground-Level Range. A ground-level range is a range where both antennas are close to the ground. The source and test antenna heights, h_s and h_a in Figure 2, are adjusted to place the first maximum of the interference pattern, of the source antenna and its image, at the center of the test aperture (EIA RS-329, p. 4).

Slant Range. A slant range is a range where the source antenna is placed near the ground, and the test antenna is placed at the single elevated point. The angle a in Figure 2 is on the order of tens of degrees (EIA RS-329, p. 4).

Test Range. The test range is the space enclosing the source antenna and the antenna under test. Conditions for the test range are stated in detail in section 2.4.3.1 (EIA RS-329, p. 3).

Reflector. A reflector comprises one or more conductors or conducting surfaces for reflecting radiant energy. Specifically, it is a parasitic element located in a direction other than the general direction of the major lobe of radiation (ANSI C42.65.36.162).

Reflector Antenna. An antenna consisting of a reflecting surface and a feed (IEEE No. 145, p. 7).

Corner Reflector. A corner reflector is a reflecting object consisting of two or three mutually intersecting flat conducting surfaces and functioning by multiple reflection (ANSI C42.65.36.171).

NOTE: Corner reflectors may be dihedral or trihedral. A 90-degree trihedral reflector may be used as a radar target, since regardless of exact orientation the incident wave retraces its path.

Corner Reflector. A reflecting object consisting of two or three mutually intersecting conducting flat surfaces (IEEE No. 145, p. 3).

NOTE: Dihedral forms of corner reflectors are frequently used in antennas; trihedral forms with mutually perpendicular surfaces are more often used as radar targets.

Corner-Reflector Antenna. A corner-reflector antenna consists of a primary radiating element and dihedral corner reflector (ANSI C42.65.36.063).

Corner-Reflector Antenna. An antenna consisting of a feed and a corner reflector (IEEE No. 145, p. 3).

Antenna Resistance. The antenna resistance is equal to the power supplied to the entire antenna circuit, divided by the square of the effective antenna current at a specified point (ANSI C42.65.36.207).

NOTE: Antenna resistance is made up of such components as radiation resistance, ground resistance, radio frequency resistance of conductors in the antenna circuit, and equivalent resistance due to corona, eddy currents, insulator leakage and dielectric power loss.

Antenna Resistance. The real part of the input impedance of an antenna (IEEE No. 145, p. 3).

Radiation Resistance. Radiation resistance is equal to the power radiated by an antenna, divided by the square of the effective antenna current referred to a specified point (ANSI C42.65.36.210).

Radiation Resistance. The ratio of the power radiated by an antenna to the square of the root-mean-square antenna current referred to a specified point (IEEE No. 145, p. 7).

Factor of Safety. The factor of safety of a member under stress is the number which results by dividing the yield point of the material by the actual unit stress on the section area (EIA RS-329, p. 9).

Scale Ratio. The scale ratio is the ratio of the operating frequency of the scale model to that of the full-size antenna. The ratio shall not exceed 5 (EIA RS-329, p. 3).

Sleeve Stub Antenna. A sleeve stub antenna is an antenna consisting of half of a sleeve-dipole antenna projecting from an extended conducting surface (ANSI C42.65.36.081).

Slot Antenna. A slot antenna is a radiating element formed by a slot in a conducting surface (ANSI C42.65.36.084).

Slot Antenna. An antenna that has a radiating element formed by a slot in a metal surface (IEEE No. 145, p. 8).

Source Antenna. The source antenna is any antenna that illuminates the antenna under test for gain or radiation pattern (EIA RS-329, p. 3).

Sectionalized Vertical Antenna. A sectionalized vertical antenna is a vertical antenna in which the continuity is broken at one or more points by the insertion of reactances or driving voltages (ANSI C42.65.36.102).

Series-Fed Vertical Antenna. A series-fed vertical antenna is a vertical antenna which is insulated from ground and energized at the base (ANSI C42.65.36.096).

Shunt-Fed Vertical Antenna. A shunt-fed vertical antenna is a vertical antenna connected to the ground at the base and energized at a point suitably positioned above the grounding point (ANSI C42.65.36.099).

Voltage Standing Wave Ratio (VSWR). Voltage standing wave ratio (VSWR) of the antenna is the ratio of the maximum to the minimum values of voltage in the standing wave pattern that appears along a lossless 50-ohm line with the antenna as a load (EIA RS-329, p. 3).

Effective Antenna Volume. The effective antenna volume is the actual volume occupied by the radiating part of the antenna plus one-half wavelength all the way around (EIA RS-329, p. 3).

Whip Antenna. A whip antenna is a simple vertical antenna consisting of a slender whip-like conductor supported on a base insulator (ANSI C42.65.36.047).

Resistance to Weathering, Fatigue, and Cold Flow. Resistance to weather fatigue, and cold flow is the ability to operate in exposed positions over prolonged periods of time without appreciable degradation of structural strength or electrical characteristics due to corrosion or other chemical decompostion, or fatigue, or cold flow (EIA RS-329, p. 10).

Wind Loads. Wind loading on an antenna assembly shall be those moments and forces caused by the specified wind pressure acting in the direction which produces the maximum value of those forces and moments (EIA RS-329, p. 10).

ATTENUATION

Attenuation. Attenuation is a general term used to denote a decrease in magnitude in transmission from one point to another. It may be expressed as a ratio or, by extension of the term, in decibels (ANSI C42.65.08.069).

Attenuation. The action by which, or the result in which, the power of an electrical signal is decreased; expressed in dB (Mil-Std-188C, p. 2).

Attenuation. The decrease in power of a signal during its transmission from one point to another. It may be expressed as a ratio or by extension of the term in decibels (APCO Specs. B-71, Glossary).

Attenuation Constant. The attenuation constant is the real component of the propagation constant (ANSI C42.65.08.438).

Current Attenuation. The current attenuation of a transducer is the scalar ratio of the current in its input circuit to the current in a specified load impedance (ANSI C42.65.08.075).

NOTE: If more than one component is involved in the input or output, the particular components used must be specified.

By extension of the term decibel this ratio may be expressed in decibels by multiplying its common logarithm by 20.

Voltage Attenuation. The voltage attenuation of a transducer is the scalar ratio of the voltage across its input to the voltage delivered to a specified load impedance (ANSI C42.65.08.072).

NOTE: If more than one component is involved in the input or output, the particular components used must be specified.

By extension of the term decibel this ratio may be expressed in decibels by multiplying its common logarithm by 20.

Attenuator. An attenuator is an adjustable transducer for reducing the amplitude of a wave without introducing appreciable distortion (ANSI C42.65.06.512).

Pad (Attenuating Pad). A pad is a nonadjustable transducer for reducing the amplitude of a wave without introducing appreciable distortion (ANSI C42.65.06.513).

AMPLIFICATION

Amplification. Amplification is a general term used to denote an increase of magnitude in transmission from one point to another. It may be expressed as a ratio or, by extension of the term, in decibels (ANSI C42.65.08.078).

Current Amplification. The current amplification of a transducer is the scalar ratio of the current in a specified load impedance to the current in the transducer input circuit (ANSI C42.65.08.084).

NOTE: If more than one component is involved in the input or output, the particular components used must be specified.

By extension of the term decibel this ratio may be expressed in decibels by multiplying its common logarithm by 20.

Voltage Amplification (Voltage Gain). The voltage amplification of a transducer is the scalar ratio of the voltage across a specific load impedance to the voltage across the transducer input (ANSI C42.65.08.081).

NOTE: If more than one component is involved in the input or output, the particular components used must be specified.

By extension of the term decibel this ratio may be expressed in decibels by multiplying its common logarithm by 20.

Amplifier. An amplifier is a device which, by enabling a received wave to control a local source of power, is capable of delivering an enlarged reproduction of the essential characteristics of the wave (ANSI C42.65.06.105).

NOTE: The amplifying element may be any of various devices such as an electron tube, a transistor, a magnetic circuit, etc.

Balanced (Push-Pull) Amplifier. An amplifier circuit in which there are two identifical signal branches connected so as to operate in phase opposition and with input and output connections each balanced to ground (IEEE No. 182, p. 487).

Balanced Amplifier (Push-Pull Amplifier). A balanced amplifier is an amplifier circuit in which there are two identical signal branches connected so as to operate in phase opposition and with input and output connections each balanced to ground (ANSI C42.65.06.128).

Buffer Amplifier. An amplifier designed to isolate a preceding circuit from the effects of a following circuit (IEEE No. 182, p. 487).

Buffer Amplifier (Buffer). A buffer amplifier is an amplifier designed to isolate a preceding circuit from the effects of a following circuit (ANSI C42.65.06.109).

Class A Amplifier. A class A amplifier in which the grid bias and alternating grid voltages are such that plate current in a specific tube flows at all times (ANSI C42.65.06.112).

NOTE: To denote that grid current does not flow during any part of the input cycle, the suffix 1 may be added to the letter identification. The suffix 2 may be used to denote that grid current flows during some part of the cycle.

Class AB Amplifier. A class AB amplifier is an amplifier in which the grid bias and alternating grid voltages are such that plate current in a specific tube flows for appreciably more than half but less than the entire electrical cycle (ANSI C42.65.06.114).

NOTE: See Note under 65.06.112.

Class B Amplifier. A class B amplifier is an amplifier in which the grid bias is approximately equal to the cutoff value so that the plate current is approximately zero when no exciting grid voltage is applied, and so that plate current in a specific tube flows for approximately one-half of each cycle when an alternating grid voltage is applied (ANSI C42.65.06.113).

NOTE: See Note under 65.06.112.

Class C Amplifier. A class C amplifier is an amplifier in which the grid bias is appreciably greater than the cutoff value so that the plate current in each tube is zero when no alternating grid voltage is applied, and so that plate current flows in a specific tube for appreciably less than one-half of each cycle when an alternating grid voltage is applied (ANSI C42.65.06.115).

NOTE: See Note under 65.06.112.

Direct-Current Amplifier (D-C Amplifier). A direct-current amplifier is an amplifier capable of amplifying direct voltages. It generally employs between stages either resistive coupling alone or resistive coupling combined with other forms of coupling (ANSI C42.65.06.140).

Double-Tuned Amplifier. A double-tuned amplifier is an amplifier of one or more stages in which each stage utilizes coupled circuits having two frequencies of resonance, for the purpose of obtaining wider bands than those obtainable with single tuning (ANSI C42.65.06.120).

Grounded-Cathode Amplifier. A grounded-cathode amplifier is an electron tube amplifier with cathode at ground potential at the operating frequency, with input applied between control-grid and ground and the output load connected between plate and ground (ANSI C42.65.06.123).

Grounded-Grid Amplifier. A grounded-grid amplifier is an electron-tube amplifier circuit in which the control gird is at ground potential at the operating frequency, with input applied between cathode and ground, and output load connected between plate and ground (ANSI C42.65.06.124).

Modulated Amplifier. A modulated amplifier is an amplifier stage in which the carrier is modulated by introduction of a modulating signal (ANSI C42.65.06.131).

Preamplifier. A preamplifier is an amplifier used ahead of a main amplifier (ANSI C42.65.06.107).

Single-Ended Amplifier (Single-Sided Amplifier). A single-ended amplifier is an amplifier in which each stage normally employs only one tube or, if more than one tube is used they are connected in parallel so that operation is asymmetric with respect to ground (ANSI C42.65.06.127).

Single-Tuned Amplifier. A single-tuned amplifier is an amplifier characterized by resonance at a single frequency (ANSI C42.65.06.118).

Stagger-Tuned Amplifier. A stagger-tuned amplifier is an amplifier consisting of two or more single-tuned stages which are tuned to different frequencies (ANSI C42.65.06.119).

Volume-Limiting Amplifier. A volume-limiting amplifier is an amplifier containing an automatic device which maintains the output volume substantially constant when the input volume exceeds a predetermined level (ANSI C42.65.06.137).

Driver. In communication practice, a driver is an electronic circuit which supplies input to another electronic circuit (ANSI C42.65.06.307).

Excitation (Drive). In electron-tube circuits, excitation is a signal voltage applied to a control electrode of an electron tube (ANSI C42.65.06.305).

Motorboating. In communication practice, the term motorboating signifies self-oscillation, usually of a pulse type, in an amplifier at a sub-audio or low audio frequency (ANSI C42.65.08.300).

Repeater. A repeater is a combination of apparatus for receiving either one-way or two-way communication signals and delivering corresponding signals which are either amplified or reshaped or both. A repeater for one-way communication signals is termed a one-way repeater and one for two-way communiation signals a two-way repeater (ANSI C42.65.02.201).

Stage. In communication practice, a stage is one step, especially if part of a multi-step process, or the apparatus employed in such a step. The term is usually applied to an amplifier (ANSI C42.65.02. (ANSI C42.65.02.336).

Stage Efficiency. Stage efficiency is the ratio of useful power delivered to the load (alternating current), to the plate power input (direct current) (ANSI C42.65.06.152).

Transistor (Transfer Resistor). An active semiconductor device having three or more electrodes. The three main electrodes used are the emitter, collector, and base. Conduction is by means of electrons and carriers of holes. Germanium and silicon are the materials most often used as the semiconductor material. Transistors can perform practically all functions of vacuum tubes, including amplification and rectification (APCO Specs. 8-71, Glossary).

BAND

Frequency Band. A continuous range of frequencies extending between two limiting frequencies (IEEE No. 182, p. 487).

Frequency Band of Emission. The frequency band of emission is the frequency band required for a given type of transmission and speed of signaling (ANSI C42.65.42.087).

Guard Band (Interference Guard Band). A guard band is a frequency band left vacant between two channels to give a margin of safety against mutual interference (ANSI C42.65.42.093).

Guard Band. A frequency band between two channels which gives a margin of safety against mutual interference (Mil-Std-188C, p. 3).

Service Band. A band of frequencies allocated to a given class of radio service (IEEE No. 182, p. 487).

Service Band. A service band is a band of frequencies allocated to a given class of radio service (ANSI C42.65.42.090).

Band Spreading. Band spreading is (1) the spreading of tuning indications over a wide scale range to facilitate tuning in a crowded band of frequencies; or (2) the method of double sideband transmission in which the frequency band of the modulating wave is shifted upward in frequency so that the sidebands produced by modulation are separated in frequency from the carrier by an amount at least equal to the bandwidth of the original modulating wave, and second order distortion products may be filtered from the demodulator output (ANSI C42.65.42.195).

Band Switch. A band switch is a switch used to select any one of the frequency bands in which an electric transmission apparatus may operate (ANSI C42.65.06.594).

Bandwidth. Bandwidth is the difference between the limiting frequencies of a continuous frequency band.

The bandwidth of a device is the difference between the limiting frequencies within which performance in respect to some characteristic falls within specified limits (ANSI C42.65.02.030).

Bandwidth. (1) The width of a band of frequencies used for a particular purpose. Thus, the bandwidth of a television station is 6 MHz. (2) The range of frequencies within which a performance characteristic of a device is above specified limits. For filters, attenuators, and amplifiers these limits are generally taken to be 3 decibels below the average level. Half power points are also used as limits. (APCO Specs. 8-71, Glossary).

Bandwidth Occupied by an Emission. The width of the frequency band containing those frequencies upon which a total of 99 percent of the radiated power appears, extended to include any discrete frequency upon which the power is at least 0.25 percent of the total radiated power (FCC definition) (APCO Specs. 8-71, Glossary).

Occupied Bandwidth (For a Transmitter). The frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission. In some cases, for example, multichannel frequency division systems, the percentage of 0.5 percent may lead to certain difficulties in the practical application of the definition of occupied and necessary bandwidth; in such cases a different percentage may prove useful (Mil-Std-188C, p. 3).

RF Bandwidth (For a Transmitter). The difference between the highest and the lowest emission frequencies, in the region of the carrier or principle carrier frequency. NOTE: In practice the region of the carrier or principle carrier frequency beyond which the amplitude of any frequency resulting from modulation by signal and or subcarrier frequencies and their distortion products is less than 5 percent (-26 dB) of the rated peak output amplitude of:

a. The carrier or a single-tone sideband, whichever is greater, for single-channel emission; or

b. Any subcarrier or a single-tone sideband thereof, whichever is greater, for multiplex emission (Mil-Std-188C, p. 3).

Modulation Acceptance Bandwidth. The selectivity characteristic of a receiver that limits the maximum permissible modulation deviation of the radio-frequency input signal that a receiver can accept, without degradation of the 12-decibel SINAD, when the radio-frequency input signal is 6 decibels greater than the reference sensitivity level (IEEE No. 184, p. 4).

Modulation Acceptance Bandwidth. The modulation acceptance bandwidth of a receiver is a measure of the deviation that the receiver will accept at an RF signal level 6 db above the measured usable sensitivity (EIA RS-204, p. 4).

Necessary Bandwidth. For a given class of emission, the minimum value of the occupied bandwidth sufficient to insure the transmission of information at the rate and with the quality required for the system employed, under specified conditions. Emissions useful for the good functioning of the receiving equipment as, for example, the emission corresponding to the carrier of reduced carrier systems, shall be included in the necessary bandwidth. This is used for frequency assignment purposes (Mil-Std-188C, p. 3).

Nominal Bandwidth. The maximum band of frequencies, inclusive of guard bands, assigned to a channel (not to be confused with the term radio frequency emission) (Mil-Std-188C, p. 3).

CABLE

Cable. A cable is an assembly of one or more conductors, usually within an enveloping protective sheath, in such structural arrangement of the individual conductors as will permit of their use separately or in groups (ANSI C42.65.04.145).

Coaxial (Coaxial Line) (Concentric Line) (Coaxial Pair). A coaxial is a transmission line formed by two coaxial conductors (ANSI C42.65.04.165).

Coaxial Cable. A coaxial cable is a cable containing one or more coaxials (ANSI C42.65.04.180).

CAPACITOR

Blocking Capacitor (Blocking Condenser). A blocking capacitor is a capacitor which introduces a comparatively high series impedance for limiting the current flow of low-frequency alternating current or direct current without materially affecting the flow of high-frequency alternating current (ANSI C42.65.06.399).

By-Pass Capacitor (By-Pass Condenser). A by-pass capacitor is a capacitor for providing an alternating-current path of comparatively low impedance around some circuit element (ANSI C42.65.06.395).

Trimmer Capacitor. A trimmer capacitor is a small variable capacitor associated with another capacitor and used for fine adjustment of the total capacitance (ANSI C42.65.06.397).

CARRIER

Carrier. (1) A wave having at least one characteristic which may be varied from a known reference value by modulation. (2) That part of the modulated wave that corresponds in a specified manner to the unmodulated wave (IEEE No. 170, p. 5).

Carrier (Carrier Wave). A carrier is a wave suitable for being modulated (ANSI C42.65.16.012).

NOTE: Examples of carriers are a sine wave and a recurring series of pulses.

Carrier. (1) A wave suitable for modulation by the intelligence to be transmitted over a communication system. The carrier can be a sinuosoidal wave or a recurring series of pulses. See also sub-carrier. (2) An unmodulated emission (Mil-Std-188C, p. 5).

Carrier. An electromagnetic wave at a specific frequency (APCO Specs. 8-71, Glossary).

Controlled Carrier (Variable Carrier) (Floating Carrier). A system of compound modulation wherein the carrier is amplitude modulated by the signal frequencies in any conventional manner; and in addition, the carrier is simultaneously amplitude modulated in accordance with the rectified and filtered modulating signal so that the percentage of modulation, or modulation factor, remains approximately constant regardless of the amplitude of the signal (IEEE No. 182A, p. 3).

Controlled Carrier (Variable Carrier) (Floating Carrier). Controlled carrier is a system of modulation wherein the carrier is amplitude modulated by the signal frequencies and in addition the carrier is amplitude modulated in accordance with the envelope of the signal, so that the modulation factor remains constant regardless of the amplitude of the signal.

Carrier Frequency. The frequency of an unmodulated electromagnetic wave (APCO Specs. 8-71, Glossary).

Exalted-Carrier Reception. A method of receiving either amplitude or phase modulated signals in which the carrier is separated from the sidebands, filtered and amplified, and then combined with the sidebands against a higher level prior to demodulation (Mil-Std-188C, p. 38).

Carrier Noise Level. The noise level produced by undesired variations of a carrier in the absence of any intended modulation (Mil-Std-188C, p. 26).

Carrier-to-Noise Ratio. The ratio of specified measures of the carrier and the noise after specified band limiting and before any non-linear process such as amplitude limiting and detection (IEEE No. 170, p. 5).

NOTE: This ratio is expressed in many different ways, for example, in terms of peak values in the case of impulse noise and in terms of mean-square or root-mean-square values for other types of noise.

Carrier-to-Noise Ratio. The carrier-to-noise ratio is the ratio of the magnitude of the carrier to that of the noise after selection and before any nonlinear process such as amplitude limiting and detection (ANSI C42.65.16.222).

Carrier Power (Radio Transmitter). The average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle under conditions of no modulation. This definition does not apply to pulse modulated emissions or FSK (Mil-Std-188C, p. 36).

Subcarrier. A carrier used to generate a modulated wave which is applied, in turn, as a modulating wave to modulate another carrier (IEEE No. 170, p. 8).

Subcarrier. A subcarrier is a carrier which is applied as a modulating wave to modulate another carrier (ANSI C42.65.16.021).

Subcarrier. A carrier which is applied as modulation on another carrier, or on an intermediate subcarrier. See also CARRIER (Mil-Std-188C, p. 46).

Supressed-Carrier Operation. Suppressed-carrier operation is that form of AM carrier transmission in which the carrier wave is suppressed (ANSI C42.65.16.091).

Transmitted-Carrier Operation. Transmitted-carrier operation is that form of AM carrier transmission in which the carrier wave is transmitted (ANSI C42.65.16.090).

CHANNEL

Channel. In electric communication, a channel is (1) a single path for transmitting electric signals, usually in distinction from other parallel paths, or (2) a band of frequencies (ANSI C42.65.02.159).

NOTE: The word path is to be interpreted in a broad sense to include separation by frequency division or time division. The term channel may signify either a one-way path, providing transmission in one direction only, or a two-way path, providing transmission in two directions.

Channel. The term channel may signify either a one-way path providing transmission in one direction only, or a two-way path providing transmission in two directions. The word "path" is to be interpreted in a broad sense to include separation by frequency division or time division (Mil-Std-188C, p. 6).

Multi-Channel System. A radio system which uses more than one radio channel. Also known as multi-frequency system (APCO Specs. 8-71, Glossary).

Radio Channel. A radio channel is a channel suitable for the transmission of radio signals (ANSI C42.65.02.174).

Radio Channel. An assigned band of frequencies of sufficient width to permit its use for radio communication. The necessary width of a channel depends on the type of transmission and the tolerance for the frequency of emission (APCO Specs. B-71, Glossary).

Communication (Telecommunication). In electrical practice, communication is the transmission of information from one point to another by means of electromagnetic waves (ANSI C42.65.02.001).

NOTE: While there is no sharp line of distinction between the terms communication and telecommunication, the latter is usually applied where substantial distances are involved.

CIRCUIT

Circuit. The complete electrical path between end-terminal instruments over which two-way telecommunications are provided (Mil-Std-188C, p. 7).

Balanced. Electrically symmetrical with respect to ground (Mil-Std-188C, p. 3).

Balanced. In communication practice, the term balanced signifies (1) electrically alike and symmetrical with respect to ground, or (2) arranged to provide conjugacy between certain sets of terminals (ANSI C42.65.02.377).

Longitudinal Balance. The electrical symmetry of the two wires of a pair with respect to ground. See BALANCED (Mil-Std-188C, p. 3).

Unbalance. Unbalance is a differential mutual impedance or mutual admittance between two circuits which ideally would have no coupling (ANSI C42.65.02.280).

Unbalanced. Unbalanced means lacking the conditions for balance. Frequently it is used to mean having one side grounded. (ANSI C42.65.02.378).

Bootstrap Circuit. A single-stage electron-tube amplifier circuit in which the output load is connected between cathode and ground or other common return, the signal voltage being applied between the grid and the cathode (IEEE No. 182A, p. 3).

NOTE: The name bootstrap arises from the fact that a change in grid voltage changes the potential of the input source with respect to ground by an amount equal to the output signal.

Bootstrap Circuit. A bootstrap circuit is a single-stage circuit in which the output load is connected between cathode and ground or other common return, the signal voltage being applied between the grid and the cathode (ANSI C42.65.06.279).

NOTE: The name bootstrap arises from the fact that a change in grid voltage changes the potential of the input source with respect to ground by an amount equal to the otput signal.

Breadboard Construction. In communication practice, breadboard construction is an arrangement in which components are fastened temporarily to a board for experimental work (ANSI C42.65.02.402).

Cathode Follower. A common-plate amplifier; i.e. one in which the input is applied between the control grid and ground (or other common return) and the output is derived from an impedance between cathode and ground (IEEE No. 182A, p. 3).

NOTE: The circuit has a high input impedance and a low output impedance and provides negative feedback.

Cathode Follower. A cathode follower is an electron tube circuit in which the input is applied between the control grid and ground and the output is derived from an impedance between cathode and ground which provides negative feedback. The circuit has a high input impedance and a low output impedance (ANSI C42.65.06.276).

Clamping Circuit (Clamper) (Clamp). A clamping circuit is a circuit which adds a fixed bias to a wave at each occurrence of some predetermined feature of the wave so that the voltage or current of the feature is held at or clamped to some specified level. The level may be fixed or variable (ANSI C42.65.06.258).

Clipper (Peak Chopper). A clipper is a device which automatically limits the instantaneous value of the output to a predetermined maximum value (ANSI C42.65.06.226).

NOTE: The term is usually applied to devices which transmit only portions of an input wave lying on one side of an amplitude boundary.

Clipping. In a voice-operated telephone circuit, clipping is the loss of initial or final parts of words or syllables due to non-ideal operation of the voice-operated devices (ANSI C42.65.08.357).

Compressor. A compressor is a transducer which for a given amplitude range of input voltages produces a smaller range of output voltages. One important type of compressor employs the envelope of speech signals to reduce their volume range (ANSI C42.65.06.245).

Converter (Frequency Converter). In heterodyne reception, a converter is the portion of the receiver which converts the incoming signal to the intermediate frequency (ANSI C42.65.06.076).

Counter (Counting Circuit). A counter is a circuit which counts input pulses. One specific type is a circuit which produces one output pulse each time it receives some predetermined number of input pulses. The same term may also be applied to several such circuits connected in cascade to provide digital counting (ANSI C42.65.06.097).

Circuit Element. A circuit element is a basic constituent part of a circuit, exclusiv of interconnections (ANSI C42.65.06.002).

Ground-Return Circuit. A ground return circuit is a circuit which has a conductor (or two or more in parallel) between two points and which is completed through the ground or earth (Mil-Std-188C, p. 7).

Input. Input means (1) the current, voltage, power, or driving force applied to a circuit or device; (2) the terminals or other places where current, voltage, power, or driving force may be applied to a circuit or device (ANSI C42.65.02.366).

Metallic Circuit. A metallic circuit is a circuit of which the ground or earth forms no part (ANSI C42.65.04.050).

Metallic Circuit. A metallic circuit is a circuit of which the ground or earth forms no part (Mil-Std-188C, p. 7).

Mixer. A mixer is (1) in a sound transmission, recording or reproducing system, a device having two or more inputs, usually adjustable, and a common output, which operates to combine linearly in a desired proportion the separate input signals to produce an output signal; (2) the stage in a heterodyne receiver in which the incoming signal is modulated with the signal from the local oscillator to produce the intermediate-frequency signal (ANSI C42.65.06.074).

Multiple. (1) A multiple is a group of terminals arranged to make a circuit or group of circuits accessible at a number of points at any one of which connection can be made. (2) To multiple is (1) to connect in paralle, or (2) to render a circuit accessible at a number of points at any one of which connection can be made (ANSI C42.65.02.390).

Output. Output means (1) the current, voltage, power, or driving force delivered by a circuit or device; (2) the terminals or other places where current, voltage, power or driving force may be delivered by a circuit or device (ANSI C42.65.02.367).

Peaking Circuit. A peaking circuit is a circuit capable of converting an input wave into a peaked waveform (ANSI C42.65.06.284).

Push-Pull Circuit. A push-pull circuit is one containing two like elements which operate in 180-degree phase relationship to produce additive output components of the desired wave, with cancellation of certain unwanted products (ANSI C42.65.06.270).

NOTE: Push-pull amplifiers and push-pull oscillators are examples.

Push-Push Circuit. A push-push circuit is a circuit comprising two electron tubes, with the two grids operating in 180-degree phase relationship and the two plates in parallel (ANSI C42.65.06.271).

Radio Circuit. A radio circuit is a means for carrying out one radio communication at a time in either or both directions between two points (ANSI C42.65.42.006).

Reflex Circuit. A reflex circuit is a circuit through which the signal passes for amplification both before and after a change in its frequency (ANSI C42.65.06.172).

Open Wire. An open wire is a conductor separately supported above the surface of the ground (ANSI C42.65.04.225).

NOTE: An open wire is usually a conductor of a pole line.

Open-Wire Circuit. An open-wire circuit is a circuit made up of conductors separately supported on insulators (ANSI C42.65.04.230).

NOTE: The conductors are usually bare wire, but they may be insulated by some form of continuous insulation. The insulators are usually supported by crossarms or brackets on poles.

Two-Wire Circuit. A two-wire circuit is a metallic circuit formed by two conductors insulated from each other (Mil-Std-188C, p. 7).

NOTE: The term is also used in contrast with four-wire circuit to indicate a circuit using one line or channel for transmission of electric waves in both directions.

Two-Wire Circuit. A two-wire circuit is a metallic circuit formed by two conductors insulated from each other (ANSI C42.65.04.060).

NOTE: The term is also used in contrast with four-wire circuit to indicate a circuit using one line or channel for transmission of electric waves in both directions.

Balanced Wire Circuit. A balanced wire circuit is one whose two sides are electrically alike and symmetrical with respect to ground and other conductors. The term is commonly used to indicate a circuit whose two sides differ only by chance.

Balanced Wire Circuit. A balanced wire circuit is one whose two sides are electrically alike and symmetrical with respect to ground and other conductors. The term is commonly used to indicate a circuit whose two sides differ only by chance (Mil-Std-188C, p. 7).

Unbalanced Wire Circuit. An unbalanced wire circuit is one whose two sides are inherently electrically unlike (ANSI C42.65.04.042).

Unbalanced Wire Circuit. An unbalanced wire circuit is one whose two sides are inherently electrically unlike (Mil-Std-188C, p. 7).

COUPLING

Coupling. Coupling is the association of two or more circuits or systems in such a way that power may be transferred from one to another (ANSI C42.65.02.267).

Capacitive Coupling. Capacitive coupling is the association of two or more circuits with one another by means of capacitance mutual to the circuits (ANSI C42.65.02.270).

Coupling Coefficient (Coefficient of Coupling). The coupling coefficient is a measure of the degree of coupling that exists between two circuits. It is equal to the ratio of the mutual impedance to the square root of the product of the total self impedances of the coupled circuits, all impedances being of the same kind (ANSI C42.65.08.246).

Critical Coupling. Critical coupling is that degree of coupling between two circuits independently resonant to the same frequency which results in maximum transfer of energy at the resonant frequency (ANSI C42.65.08.237).

Direct Coupling. Direct coupling is the association of two or more circuits by means of a self-inductance, capacitance, resistance or a combination of these which is common to the circuits (ANSI C42.65.02.276).

Inductive Coupling. (1) In communication circuits, inductive coupling is the association of two or more circuits with one another by means of inductance mutual to the circuits.

NOTE: This term, when used without modifying words, is commonly used for coupling by means of mutual inductance, whereas coupling by means of self-inductance common to the circuits is called direct inductive coupling.

(2) In inductive coordination practice, inductive coupling is the interrelation of neighboring electric supply and communication circuits by electric or magnetic induction or both (ANSI C42.65.02.279).

RC Coupling. RC coupling is coupling between two or more circuits, usually amplifier stages, by means of a combination of resistive and capacitive elements (ANSI C42.65.02.282).

Resistive Coupling. Resistive coupling is the association of two or more circuits with one another by means of resistance mutual to the circuits (ANSI C42.65.02.273).

CROSSTALK

Crosstalk. Crosstalk is the unwanted sound reproduced by an electroacoustic receiver associated with a given transmission channel resulting from cross coupling to another transmission channel carrying sound-controlled electric waves or, by extension, the electric waves in the disturbed channel which result in such sound (ANSI C42.65.08.252).

NOTE: In practice, crosstalk may be measured either by the volume of the overheard sounds or by the magnitude of the coupling between the disturbed and disturbing channels. In the latter case, to specify the volume of the overheard sounds, the volume in the disturbing channel must also be given.

Crosstalk. The phenomenon in which a signal transmitted on one circuit or channel of a transmission system is detectable in another circuit or channel (Mil-Std-188C, p. 10).

Crosstalk Coupling Loss (Between a Disturbing and a Disturbed Circuit). The ratio of the power in the disturbing circuit to the induced power in the disturbed circuit observed at definite points of the circuits under specified terminal conditions; expressed in dB (Mil-Std-188C, p. 27).

Far-End Crosstalk. Far end crosstalk which is propagated in a disturbed communication channel in the same direction as the propagation in the disturbing channel. The terminals of the disturbed channel and the energized terminal of the disturbing channel are usually remote from each other (Mil-Std-188C, p. 10).

Near-End Crosstalk. Near-end crosstalk is crosstalk which is propagated in a disturbed channel in the direction opposite to the direction of propagation of the current in the disturbing channel. The terminal of the disturbed channel at which the near-end crosstalk is present is ordinarily near or coincides with the energized terminal of the disturbing channel (Mil-Std-188C, p. 10).

CRYSTAL

Crystal. In communication practice the word crystal signifies one of the following: (1) A piezoelectric crystal. (2) A piezoelectric crystal plate. (3) A crystal rectifier (ANSI C42.65.06.416).

Piezoelectric Crystal Element. A piezoelectric crystal element is a piece of piezoelectric material cut and finished to a specified geometrical shape and orientation with respect to the crystallographic axes of the material (ANSI C42.65.06.417).

Piezoelectric Crystal Plate. A piezoelectric crystal plate is a piece of piezoelectric material cut and finished to specified dimensions and orientation with respect to the crystallographic axes of the material, and having two major surfaces which are essentially parallel (ANSI C42.65.06.418).

Piezoelectric Crystal Unit. A piezoelectric crystal unit is a complete assembly, comprising a piezoelectric crystal element mounted, housed, and adjusted to the desired frequency, with means provided for connecting it in an electric circuit. Such a device is commonly employed for purposes of frequency control, frequency measurement, electric wave filtering, or interconversion of electric waves and elastic waves (ANSI C42.65.06.420).

NOTE: Sometimes a piezoelectric crystal unit may be an assembly having in it more than one piezoelectric crystal plate. Such an assembly is called a multiple crystal unit.

Type of Piezoelectric Crystal Cut. The type of piezoelectric cut identifies the orientation of a piezoelectric crystal plate with respect to the axes of the crystal. It is usually designated by symbols. For example, GT, AT, BT, CT and DT identify certain quartz crystal cuts having very low temperature coefficients (ANSI C42.65.06.430).

Fundamental Type Piezoelectric Crystal Unit. A fundamental type piezoelectric crystal unit is a unit designed to utilize the lowest frequency of resonance for a particular mode of vibration (ANSI C42.65.06.428).

Mode of Vibration. The mode of vibration of a vibratory body, such as a piezoelectric crystal unit, is a pattern of motion of the individual particles due to (a) stresses applied to the body, (b) its properties, and (c) the boundary conditions. Three common modes of vibration are (a) flexural, (b) extensional, and (c) shear (ANSI C42.65.06.424).

Overtone Type Piezoelectric Crystal Unit. An overtone type piezoelectric crystal unit is a unit designed to utilize an overtone of the lowest frequency of resonance for a particular mode of vibration (ANSI C42.65.06.429).

Resonant Frequency of a Crystal Unit. The resonant frequency of a crystal unit is the frequency for a particular mode of vibration to which, discounting dissipation, the effective impedance of the crystal unit is zero (ANSI C42.65.06.426).

Anti-Resonant Frequency of a Crystal Unit. The anti-resonant frequency of a crystal unit is the frequency for a particular mode of vibration at which, neglecting dissipation, the effective impedance of the crystal unit is infinite (ANSI C42.65.06.427).

Decibel (dB). The decibel, commonly used for expressing transmission gains, losses, levels and similar quantities, is a division of the logarithmic scale such that the number of decibels is equal to 10 times the logarithm to the base 10 of the power ratio (ANSI C42.65.08.006).

NOTE: With P_1 and P_2 designating two values of power and n the number of decibels denoting their ratio:

$$n = 10 \log_{10} (P_1/P_2) \text{ dB}$$

When the conditions are such that scalar ratios of currents or voltages (or analogous quantities in other fields) are the square roots of the corresponding power ratios, the number of decibels by which the corresponding powers differ may be expressed by the following formulas:

$$n = 20 \log_{10} (I_1/I_2) \text{ dB}$$

$$n = 20 \log_{10} (V_1/V_2) \text{ dB}$$

where I_1/I_2 and V_1/V_2 are the given current and voltage ratios, respectively.

By extension, these relations between numbers of decibels and scalar ratios of currents or voltages are sometimes applied where these ratios are not the square roots of the corresponding power ratios; to avoid confusion, such usage should be accompanied by a specific statement of this application. Such extensions of the term decibel should preferably be avoided by using the term decilog.

The decibel is also applied to acoustical quantities such as sound intensity ratio (using 10 $\log_{10}$), sound pressure ratio (using 20 $\log_{10}$) and sound particle velocity ratio (using 20 $\log_{10}$).

The decibel was formerly called a transmission unit. It was originally defined as one-tenth of a bel, the number of bels being equal to the logarithm to base 10 of the power ratio. However, the term bel is not in common use.

Decibel (dB). The standard unit for expressing transmission gain or loss and relative power ratios. The decibel is one-tenth the size of a Bel which is too large a unit for convenient use. Both units are expressed in terms of the logarithm to the base 10 of a power ratio, the deicbel formula being:

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

Power ratios may be expressed in terms of voltage or current. If the resistances for both the power measurements are the same, they cancel out in the power ratio so the formulas in terms of voltage or current become as follows:

$$dB = 10 \log \frac{E_1^2}{R_1} \Big/ \frac{E_2^2}{R_2} = 10 \text{ Log } \frac{I_1^2 R_1}{I_2^2 R_2}$$

$$dB = 10 \log \frac{E_1^2}{E_2^2} = 10 \log \frac{I_1^2}{I_2^2}$$

$$dB = 20 \log \frac{E_1}{E_2} = 20 \log \frac{I_1}{I_2} \text{ where } R_1 = R_2$$

(Mil-Std-188C, p. 11).

DBm. (1) DB referred to one milliwatt; employed in communication work as a measure of absolute power values. Zero dBm equals one milliwatt. (2)

(2) In noise power measurement, noise power in dB referred to one milliwatt (Mil-Std-188C, p. 12).

NOTE: In American practice unweighted measurement is normally understood, appliable to a certain bandwidth which must be stated or implied. In European practice, psophometric weighting may be implied as indicated by context; equivalent to dBmOp, which is preferred (Mil-Std-188C, p. 12).

Decibel (dB). A unit which expresses the level of a power value relative to a reference power value. Specifically, the level of a power value P relative to a reference value PR in decibels is defined as 10 $\log_{10}$ (P/PR) (APCO Specs. 8-71, Glossary).

Demodulation. The process of recovering the modulating function from a modulated wave (IEEE No. 170, p. 5).

Demodulation. Demodulation is a modulation process wherein a wave resulting from previous modulation is employed to derive a wave having substantially the characteristics of the original modulating wave (ANSI C42.65.16.057).

NOTE: The term is sometimes used to describe the action of a frequency converter or mixer, but this practice is deprecated.

Demodulation. A process wherein a wave resulting from previous modulation is employed to derive a wave having substantially the characteristics of the original modulating wave (Mil-Std-188C, p. 13).

Demodulator. A demodulator is a device for effecting the process of demodulation (ANSI C42.65.16.060).

Demodulator. A device to effect the process of demodulation (IEEE No. 170, p. 5).

Detection. (1) Determination of the presence of a signal. (2) Demodulation (IEEE No. 170, p. 5).

Detection. Detection is the process by which a wave corresponding to the modulating wave is obtained in response to a modulated wave (ANSI C42.65.16.063).

Linear Detection. Linear detection is that form of detection in which the output voltage is substantially proportional, over the useful range of the detecting device, to the voltage of the input wave (ANSI C42.65.16.066).

Power Detection. Power detection is that form of detection in which the power output of the detecting device is used to supply a substantial amount of power directly to a device such as a loudspeaker or recorder (ANSI C42.65.16.072).

Square Law Detection. Square law detection is that form of detection in which the output voltage is substantially proportional, over the useful range of the detecting device, to the square of the voltage of the input wave (ANSI C42.65.16.069).

Detector. A device to effect the process of detection (IEEE No. 170, p. 5).

Detector. A detector is a device to effect the process of detection (ANSI C42.65.06.340).

Grid-Leak Detector. A grid-leak detector is a triode or multielectrode tube in which rectification occurs because of electron current to the grid. The voltage associated with this flow through a high resistance in the grid circuit appears in amplified form in the plate circuit (ANSI C42.65.16.201).

Plate-Circuit Detector. A plate-circuit detector is a detector functioning by virtue of a nonlinearity in its plate-circuit characteristic (ANSI C42.65.16.204).

Crystal Diode. A crystal diode is a rectifying element comprising a semiconducting crystal having two terminals designed for use in circuits in a manner analogous to that of electron-tube diodes (ANSI C42.65.06.313).

Discrimination. The discrimination of any system or transducer is the difference between the losses at specified frequencies, with the system or transducer terminated in specified impedances (ANSI C42.65.08.153).

Discriminator. A discriminator is a device in which amplitude variations are derived in response to frequency or phase variations (ANSI C42.65.06.585).

NOTE: The device is termed a frequency discriminator or phase discriminator according to whether it responds to variations of frequency or phase.

Discriminator. A device in which amplitude variations are derived in response to frequency variations (IEEE No. 170, p. 5).

NOTE: In common usage this term refers particularly to those devices comprising frequency-selective networks followed by amplitude demodulators.

Capture Effect. The effect occurring in a transducer (usually a demodulator) whereby the input wave having the largest magnitude controls the output (IEEE No. 170, p. 5).

DEVIATION

Frequency Deviation. In angle modulation, the peak difference between the instantaneous frequency of the modulated wave and the carrier frequency (IEEE No. 170, p. 6).

Frequency Deviation. Frequency deviation, in frequency modulation, is the peak difference between the instantaneous frequency of the modulated wave and the carrier frequency (ANSI C42.65.16.141).

Frequency Deviation. Frequency deviation of an FM signal is the change in the carrier frequency produced by the modulating signal. The frequency deviation is proportional to the instantaneous amplitude of the modulating signal (APCO Specs. 8-71, Glossary).

Phase Deviation. In angle modulation, the peak difference between the instantaneous angle of the modulated wave and the angle of the carrier (IEEE No. 170, p. 7).

NOTE: In the case of a sinusoidal modulating function, the value of the phase deviation, expressed in radians, is equal to the modulation index.

Phase Deviation. Phase deviation, in phase modulation, is the peak difference between the instantaneous angle of the modulated wave and the angle of the carrier (ANSI C42.65.16.129).

Maximum System Deviation. In frequency modulation, the maximum system deviation is the greatest deviation in frequency permissible in the operation of the system (ANSI C42.65.42.106).

Rated System Deviation. The specified maximum permissible carrier frequency deviation. Nominal values for mobile communications systems are ±15 kilohertz or ±5 kilohertz (IEEE No. 184, p. 3).

Deviation Ratio. In a frequency modulation system, the ratio of the maximum design frequency deviation to the maximum design modulating frequency of the system (IEEE No. 170, p. 5).

Deviation Ratio. In a frequency modulation system, the deviation ratio is the ratio of the maximum frequency deviation to the maximum modulating frequency of the system under specified conditions (ANSI C42.65.16.147).

DISTORTION

Distortion. Distortion is an undesired change in wave form. The principal sources of distortion are: (1) A nonlinear relation between input and output at a given frequency, (2) Non-uniform transmission at different frequencies, and (3) Phase shift not proportional to frequency (ANSI C42.65.08.321).

Distortion. Unfaithful reproduction of audio or video signals due to changes occurring in the wave form of the original signal, somewhere in the course it takes through the transmitting and receiving system (APCO Specs. 8-71, Glossary).

Amplitude Distortion. Amplitude distortion is distortion occurring in an amplifier or other device when the amplitude of the output is not a linear function of the input amplitude (ANSI C42.65.08.336).

NOTE: Amplitude distortion is measured with the system operating under steady-state conditions with a sinusoidal input signal. When other frequencies are present, the term amplitude refers to that of the fundamental only.

This term is sometimes used when nonlinear distortion is intended.

Amplitude VS Frequency Distortion (Of a Transmission System). That distortion caused by the nonuniform attenuation, or gain, of the system with respect to frequency under specified terminal conditions (Mil-Std-188C, p. 14).

Deviation Distortion. Deviation distortion is distortion in an FM receiver due to inadequate bandwidth and inadequate amplitude-modulation rejection or to inadequate discriminator linearity (ANSI C42.65.08.341).

Envelope-Delay Distortion. Envelope-delay distortion is the maximum difference of the envelope delay characteristic in a band between any two specified frequencies. Refer to Delay Distortion in Appendix B for detailed explanation (Mil-Std-188C, p. 15).

Equalization. The process of reducing frequency and/or phase distortion of a circuit by the introduction of networks to compensate for the difference in attenuation and/or time delay at the various frequencies in the transmission band (Mil-Std-188C, p. 19).

Harmonic Distortion. Harmonic distortion is the production of harmonic frequencies at the output by the nonlinearity of a transducer when a sinusoidal voltage is applied to the input. The amplitude of distortion is usually a function of the amplitude of the input signal (ANSI C42.65.08.328).

Audio Frequency Harmonic Distortion. The audio frequency harmonic distortion is the change in harmonic content of the input signal as a result of passing through the audio and rf circuits of the transmitter (EIA RS-152-B, p. 8).

Accumulated Audio Harmonic Distortion. The system audio harmonic distortion is the change in harmonic content of the modulating signal as a result of passing through the system (EIA RS-237, p. 5).

Single-Harmonic Distortion. The ratio of the power at the fundamental frequency, measured at the output of the transmission system considered, to the power of any single harmonic observed at the output of the system because of its nonlinearity, when a single frequency signal of specified power is applied to the input of the system; expressed in dB (Mil-Std-188C, p. 16).

Total Harmonic Distortion. The ratio of the power at the fundamental frequency, measured at the output of the transmission system considered, to the power of all harmonics observed at the output of the system because of its nonlinearity, when a single frequency signal of specified power is applied to the input of the system; expressed in dB (Mil-Std-188C, p. 16).

Intermodulation. The modulation of the components of a complex wave by each other in a nonlinear system (IEEE No. 170, p. 6).

Intermodulation. Intermodulation is the production, in a nonlinear transducer element, of frequencies corresponding to the sums and differences of the fundamentals and harmonics of two or more frequencies which are transmitted through the transducer (ANSI C42.65.08.234).

Intermodulation Distortion. Intermodulation distortion is that form of distortion which results from intermodulation (ANSI C42.65.08.339).

Intermodulation Distortion. Nonlinear distortion characterized by the appearance of frequencies in the output, equal to the sums and differences of integral multiples of the component frequencies present in the input (Mil-Std-188C, p. 16).

NOTE: Harmonic components also present in the output are usually not included as part of the intermodulation distortion. When harmonics are included, a statement to that effect should be made.

Audio Intermodulation Distortion. Audio intermodulation distortion is that distortion resulting from sum and difference frequencies present in the output, when more than 1 frequency is applied simultaneously to the input of the system (EIA RS-237, p. 6).

Linearity. A constant relationship between signal processing devices' input and output characteristics such as frequency, amplitude, phase and time, over a designated range. See NONLINEAR DISTORTION (Mil-Std-188C, p. 26).

Nonlinear Distortion. Nonlinear distortion is that form of distortion which occurs in a circuit or system when the ratio of instantaneous voltage to current therein (or analogous quantities in other fields) is a function of the magnitude of either (ANSI C42.65.08.327).

Nonlinear Distortion. Distortion caused by a deviation from a linear relationship between the input and output of a system or component (Mil-Std-188C, p. 16).

Phase Distortion. Phase distortion is either (1) lack of direct proportionality of phase shift to frequency over the frequency range required for transmission, or (2) the effect of such departure on a transmitted signal (ANSI C42.65.08.330).

Maximum Undistorted Output. The maximum undistorted output is the maximum power delivered under specified conditions with a total harmonic not exceeding a specified percentage (ANSI C42.65.08.046).

DIVERSITY

Diversity. That method of transmission and/or reception, whereby, in order to reduce the effects of fading, a single received information signal is derived from a combination of, or selection from, a plurality of signals containing the same information. Improvement gained shall be expressed in dB (Mil-Std-188C, p. 16).

Dual Diversity. The term applied to the simultaneous combining of, or selection from, two signals and their detection through the use of space, frequency, angle, or polarization characteristics (Mil-Std-188C, p. 16).

Frequency Diversity. Any method of transmission and reception wherein the same information signal is transmitted and received simultaneously on two or more distinct frequencies (Mil-Std-188C, p. 17).

Polarization Diversity. A method of transmission and/or reception of information accomplished by the use of separate vertically and horizontally polarized antennas (Mil-Std-188C, p. 17).

Quadruple Diversity. The term applied to the simultaneous combining of, or selection from, four signals and their detection through the use of space, frequency, angle, or polarization characteristics or combinations thereof (Mil-Std-188C, p. 17).

Space Diversity. Any method of transmission and/or reception which employs antennas having spatial separation (Mil-Std-188C, p. 17).

Doppler Effect. The phenomenon evidenced by the change in the observed frequency of a wave in a transmission system caused by a time rate of change in the effective length of the path of travel between the source and the point of observation (Mil-Std-188C, p. 17).

EMPHASIS

De-Emphasis. A process complementary to pre-emphasis (IEEE No. 170, p. 5).

De-Emphasis. De-emphasis is the introduction of a frequency response characteristic which is complementary to that introduced in pre-emphasis (ANSI C42.65.06.563).

Pre-Emphasis. A process in a system to emphasize the magnitude of some frequency components with respect to the magnitude of others (IEEE No. 170, p. 7).

NOTE: Pre-emphasis at the transmitting end of a system, in conjunction with de-emphasis at the receiving end, is applied for the purpose of improving signal-to-noise ratio.

Pre-Emphasis. Pre-emphasis is the intentional alteration of the frequency-amplitude characteristic of a signal wave to reduce adverse effects, such as noise, in subsequent parts of the system, after which de-emphasis is employed (ANSI C42.65.06.562).

FADING

Fading. The fluctuation in intensity and/or relative phase of any or all frequency components of the received radio signal due to change in the characteristic of the propagation path (Mil-Std-188C, p. 20).

Flat Fading. That type of fading in which all frequency components of the received radio signal fluctuate in the same proportion simultaneously (Mil-Std-188C, p. 20).

Selective Fading. That type of fading in which the various frequency components of the received radio signal fluctuate independently (Mil-Std-188C, p. 20).

FEEDBACK

Feedback. In a transmission system or a section thereof, the returning of a fraction of the output to the input (IEEE No. 182, p. 487).

Feedback. Feedback in a transmission system or section thereof is the returning of a fraction of the output to the input (ANSI C42.65.02.300).

Negative Feedback (Degeneration) (Stabilized Feedback). Negative feedback is the process by which a part of the power in the output circuit of an amplifying device reacts upon the input circuit in such a manner as to reduce the initial power, thereby decreasing the amplication (ANSI C42.65.02.306).

Positive Feedback (Regeneration). Positive feedback is the process by which a part of the power in the output circuit of an amplifying device reacts upon the input circuit in such a manner as to reinforce the initial power, thereby increasing the amplification (ANSI C42.65.02.303).

FILTER

Filter Attenuation Band (Filter Stop Band). A filter attenuation band is a frequency band of attenuation; that is, a frequency band in which, if dissipation is neglected, the attenuation constant is not zero (ANSI C42.65.08.150).

Filter-Transmission Band (Filter Pass Band). A filter transmission band is a frequency band of free transmission; that is, a frequency band in which, if dissipation is neglected, the attenuation constant is zero (ANSI C42.65.08.147).

Band-Elimination Filter. A band-elimination filter is a wave filter which has a single attenuation band, neither of the cutoff frequencies being zero or infinite (ANSI C42.65.06.535).

Band-Pass Filter. A band-pass filter is a wave filter which has a single transmission band, neither of the cutoff frequencies being zero or infinite (ANSI C42.65.06.534).

High-Pass Filter. A high-pass filter is a wave filter having a single transmission band extending from some critical or cutoff frequency, not zero, up to infinite frequency (ANSI C42.65.06.533).

Low-Pass Filter. A low-pass filter is a wave filter having a single transmission band extending from zero frequency up to some cutoff frequency, not infinite (ANSI C42.65.06.532).

Electric Wave Filter (Electric Filter). An electric wave filter is a wave filter designed to separate electric waves of different frequencies (ANSI C42.65.06.527).

NOTE: An electric wave filter may be classified in terms of the reactive elements which it includes, for example, inductors and capacitors, piezoelectric crystal units, coaxial lines, resonant cavities, etc.

Mechanical Wave Filter (Mechanical Filter). A mechanical wave filter is a wave filter designed to separate mechanical waves of different frequencies (ANSI C42.65.06.528).

NOTE: Through electromechanical transducers such a filter may be associated with electric circuits.

FREQUENCY

Frequency. The number of complete cycles per unit of time. When the unit of time is one second, the measurement unit is Hertz (cycles per second) (Mil-Std-188C, p. 21).

Frequency. The number of cycles per second; the reciprocal of the period (APCO Specs. 8-71, Glossary).

Assigned Frequency. The frequency of the center of the radiated bandwidth shall be designated the assigned frequency. (The frequency of the RF carrier, whether suppressed or radiated, shall be referred to in parentheses following the assigned frequency and shall be the frequency appearing in the dial settings of RF equipment intended for a single sideband or independent sideband.) (Mil-Std-188C, p. 21).

NOTE: The frequency of the RF carrier is usually referred to in this standard as f_o and the assigned frequency as f_c.

Audio. Audio means pertaining to frequencies corresponding to a normally audible sound wave (ANSI C42.65.02.008).

NOTE: These frequencies range roughly from 15 cycles per second to 20,000 cycles per second.

Frequency Band. A frequency band is a continuous range of frequencies extending between two limiting frequencies (ANSI C42.65.02.027).

Beating. Beating is the combination of two or more frequencies to produce beats (ANSI C42.65.02.294).

Carrier Frequency. The carrier frequency of a periodic carrier is the reciprocal of its period (ANSI C42.65.16.018).

NOTE: The frequency of a periodic pulse carrier is often called the pulse repetition frequency (PRF).

Carrier Frequency. The frequency of the unmodulated carrier (Mil-Std-188C, p. 21).

Center Frequency. In frequency modulation, the center frequency is the average frequency of the emitted wave when modulated by a symmetrical signal (ANSI C42.65.16.135).

Characteristic Frequency. A frequency which can be easily identified and measured in a given emission (Mil-Std-188C, p. 21).

Automatic Frequency Control (AFC). An automatic frequency control is an arrangement whereby the frequency of an oscillator is automatically maintained within specified limits (ANSI C42.65.06.202).

Automatic Frequency Control. An arrangement whereby the frequency of an oscillator or the tuning of a circuit is automatically maintained within specified limits with respect to a reference frequency (IEEE No. 182, p. 487).

Cutoff Frequency (Cutoff). A cutoff frequency of an electric structure may be either a theoretical cutoff frequency or an effective cutoff frequency (ANSI C42.65.08.156).

Frequency Departure. Frequency departure is the amount of variation of a carrier frequency or center frequency from its assigned value (ANSI C42.65.42.105).

NOTE: This concept was formerly described as frequency deviation, a usuage which is now deprecated because of the currency of a different meaning in phase and frequency modulation.

Frequency Divider. A frequency divider is a device for delivering an output wave whose frequency is a proper fraction, usually a submultiple, of the input frequency (ANSI C42.65.06.067).

ee-Running Frequency. The free-running frequency is the frequency at which a normally driven oscillator operates in the absence of a driving signal (ANSI C42.65.02.335).

Fundamental Frequency (Fundamental). The fundamental frequency of a periodic quantity is the frequency of a sinusoidal quantity having the same period as the periodic quantity (ANSI C42.65.02.036).

Harmonic. A harmonic is a sinusoidal quantity having a frequency which is an integral multiple of the fundamental frequency of a periodic quantity to which it is related. For example, a wave the frequency of which is twice the fundamental frequency is called the second harmonic (ANSI C42.65.02.039).

Subharmonic. A subharmonic is a sinusoidal quantity having a frequency which is an integral submultiple of the fundamental frequency of a periodic quantity to which it is related. For example, a wave the frequency of which is half the fundamental frequency of another wave is called the second subharmonic of that wave (ANSI C42.65.02.042).

Image Frequency. In heterodyne frequency converters in which one of the two sidebands produced by beating is selected, the image frequency is an undesired input frequency capable of producing the selected frequency by the same process. The word image implies the mirror-like symmetry of signal and image frequencies about the beating oscillator

frequency or the intermediate frequency, whichever is the higher (ANSI C42.65.42.180).

Intermediate Frequency (IF). An intermediate frequency is a frequency to which a signal wave is shifted locally as an intermediate step in transmission or reception (ANSI C42.65.02.021).

Microwave. A term applied to radio waves in the frequency range of 1,000 megahertz and upward. Generally defines operations in the region where distributed-constant circuits enclosed by conducting boundaries are used instead of conventional lumped-constant circuit components (APCO Specs. 8-71, Glossary).

Frequency Monitor. A frequency monitor is an instrument for indicating the deviation of a frequency from its assigned value (ANSI C42.65.06.588).

Frequency Multiplier. A frequency multiplier is a device for delivering an output wave whose frequency is a multiple of the input frequency. Frequency doublers and triplers are special cases of frequency multipliers (ANSI C42.65.06.065).

Octave. In electric communication, an octave is the interval between two frequencies having a ratio of 2 to 1 (ANSI C42.65.02.033).

Frequency Pulling. Frequency pulling of an oscillator is the change of the generated frequency caused by a change of load impedance (ANSI C42.65.38.080).

Radio Frequency (RF). A radio frequency is a frequency useful for radio transmission (ANSI C42.65.02.018).

NOTE: The present practicable limits of radio frequency are roughly 10 kilocycles per second to 100,000 megacycles per second.

Frequency Range. A frequency range is a specifically designated part of the frequency spectrum (ANSI C42.65.02.026).

Reference Frequency. A frequency having a fixed and specified position with respect to the assigned frequency. The displacement of this frequency with respect to the assigned frequency has the same absolute value and sign that the displacement of the characteristic frequency has with respect to the center of the frequency band occupied by the emission (Mil-Std-188C, p. 22).

Frequency-Shift, Keying, Frequency-Shift Signaling (FSK). A frequency-change signaling method in which the frequency or frequencies are varied in accordance with the signals to be transmitted and characterized by continuity of phase during the transition from one signaling condition to another (Mil-Std-188C, p. 25).

Side Frequency. One of the frequencies of a sideband (IEEE No. 170, p. 8).

Spectrum. The spectrum of a wave is the distribution of the amplitude (and sometimes phase) of the components of the wave as a function of frequency. Spectrum is also used to signify a continuous range of frequencies, usually wide in extent, within which waves have some specified common characteristic (ANSI C42.65.02.024).

Spectrum. Any series of radiant energies arranged in order of wavelength or frequency. The entire range of electromagnetic radiation extending from the longest known radio waves to the shortest known cosmic rays (APCO Specs. 8-71, Glossary).

Frequency-Spectrum Designation. A method of referring to a range or band of communication frequencies. In American practice the designator is a two or three letter abbreviation of the name. In ITU practice the designator is a numeric. These ranges, or bands are:

American Band	Frequency	ITU Band
ELF	Below 300 Hz	2
ILF	300 - 3000 Hz	3
VLF	3 - 30 kHz	4
LF	30 - 300 kHz	5
MF	300 - 3000 kHz	6
HF	3 - 30 MHz	7
VHF	30 - 300 MHz	8
UHF	300 - 3000 MHz	9
SHF	3 - 30 GHz	10
EHF	30 - 300 GHz	11

Carrier Frequency Stability. The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency (EIA RS-152-B, p. 11).

Frequency Stabilization. Frequency stabilization is the process of controlling the center or carrier frequency so that it differs from that of a reference source by not more than a prescribed amount (ANSI C42.65.16.138).

Frequency Swing. In frequency modulation, a term loosely used to describe the change in frequency resulting from the modulation. Various usages exist, so that the intended meaning must be specified (IEEE No. 170, p. 6).

Frequency Swing. In frequency modulation, frequency swing is the peak difference between the maximum and the minimum values of the instantaneous frequency (ANSI C42.65.16.144).

NOTE: The term frequency swing is sometimes used to describe the maximum swing permissible under specified conditions. Such usage should preferably include a specific statement of the conditions.

Frequency System. A frequency system is defined as one which depends primarily upon frequency as the means of conveying the desired information (EIA TR-120, p. 6).

Frequency Tolerance. The maximum permissible departure of the center frequency of the frequency band occupied by an emission from the assigned frequency or of the characteristic frequency of an emission from the referene frequency. The frequency tolerance is expressed in parts in 10^n, in Hertz, or in percentages (Mil-Std-188C, p. 22).

Voice Frequency (VF). A voice frequency is a frequency lying within that part of the audio range which is employed for the transmission of speech (ANSI C42.65.02.009).

NOTE: Voice frequencies used for commercial transmission of speech usually lie within the range 200 to 3500 cycles per second.

Continuous Waves (CW). Continuous waves are waves the successive sinusoidal oscillations of which are identical under steady-state conditions (ANSI C42.65.02.117).

Interrupted Continuous Waves (ICW). Interrupted continuous waves are continuous waves that are interrupted at a constant audio-frequency rate (ANSI C42.65.02.120).

Modulated Continuous Wave (MCW). A modulated continuous wave is a wave in which the carrier is modulated by a constant audio-frequency tone. In telegraphic service it is understood that the carrier is keyed (ANSI C42.65.02.123).

Gain (Transmission Gain). Gain and transmission gain are general terms used to denote an increase in signal power in transmission from one point to another. Gain is usually expressed in deicbels and is widely used to denote transducer gain (ANSI C42.65.08.057).

Gain. The action by which, or the result in which, the power of an electrical signal is increased; expressed in dB (Mil-Std-188C, p.23).

Automatic Gain Control (AGC). Automatic gain control is a method of automatically obtaining a substantially constant output of some amplitude characteristic of the signal over a range of variation of that characteristic at the input. The term is also applied to a device for accomplishing this result (ANSI C42.65.06.198).

Insertion Gain. The insertion gain resulting from the insertion of a transducer in a transmission system is the ratio of the power delivered to that part of the system following the transducer, to the power delivered to that same part before insertion (ANSI C42.65.08.090).

NOTE: If more than one component is involved in the input or output, the particular components used must be specified.

This ratio is usually expressed in decibels.

Insertion Gain. The insertion gain of a transmission system (or component thereof) inserted between two impedances Z_e (transmitter) and Z_r (receiver) is the ratio of the power measured at the receiver Z_r, after insertion of the transmission system considered, to the power measured before insertion; expressed in dB. If the resulting number in dB thus obtained is negative, an insertion loss is indicated (Mil-Std-188C, p. 23).

Power Gain (Power Amplification).* The power gain of an amplifying device is the ratio of the power delivered to a specified load impedance to the power absorbed by its input (ANSI C42.65.08.066).

NOTE: If more than one component is involved in the input or output, the particular components used must be specified.

This ratio is usually expressed in decibels.

See 65.36.237.

*Deprecated.

Ground-Return Circuit. A ground-return circuit is a circuit which has a conductor (or two or more in parallel) between two points and which is completed through the ground or earth (ANSI C42.65.04.055).

Ground-Return Current (Line Residual Current). The ground-return current of an electric supply line is the vector sum of the currents in all conductors on the electric supply line (ANSI C42.65.12.048).

NOTE: Actually the ground-return current in this sense may include components returning to the source in wires on other pole lines, but from the inductive coordination standpoint these components are substantially equivalent to components in the ground.

IMPEDANCE

Characteristic Impedance (Surge Impedance). The characteristic impedance of a transmission line is the driving-point impedance which the line would have if it were of infinite length (ANSI C42.65.08.381).

NOTE: It is recommended that this term be applied only to lines having approximate electrical uniformity. For other lines or structures the corresponding term is iterative impedance.

Input Impedance. The input impedance of a device is the impedance presented by the device to the source (ANSI C42.65.08.399).

Input Impedance. Tone input impedance of a selective signalling unit is the impedance presented at the input terminals at the signalling frequency. If more than one tone is used in the signalling system, the input impedance shall be defined at each frequency. Speech input impedance of a selective signalling unit is the average impedance over the range of frequencies from 300 to 3000 cycles (EIA TR-120, p. 2).

Load Impedance. The load impedance is the impedance presented by the load (ANSI C42.65.08.405).

Plate Load Impedance (Anode Load Impedance). Plate load impedance is the total impedance between anode and cathode exclusive of the electron stream (ANSI C42.65.06.149).

Loaded Impedance. The loaded impedance of a transducer is the impedance at the input of the transducer when the output is connected to its normal load (ANSI C42.65.08.417).

Impedance Matching. Impedance matching is the connection, across a source impedance, of an impedance having the same magnitude and the same phase angle (ANSI C42.65.08.408).

NOTE: If the source is a transmission line, reflection is thereby avoided.

Mutual Impedance. The mutual impedance between any two pairs of terminals of a network is the ratio of the open-circuit potential difference between either pair of terminals, to the current applied at the other pair of terminals, all other terminals being open (ANSI C42.65.08.369).

NOTE: Mutual impedance may have either of two signs depending upon the assumed directions of input current and output voltage; the negative of the above ratio is usually employed. Mutual impedance is

ordinarily additive if two coils of a transformer are connected in series or in parallel aiding, and is subtractive if two coils of a transformer are in series or in parallel opposing.

Open-Circuit Impedance. The open-circuit impedance of a line or four-terminal network is the driving-point impedance when the far-end is open (ANSI C42.65.08.385).

Output Impedance. The output impedance of a device is the impedance presented by the device to the load (ANSI C42.65.08.402).

Self-Impedance. The self-impedance at any pair of terminals of a network is the ratio of an applied potential difference to the resultant current at these terminals, all other terminals being open (ANSI C42.65.08.366).

Sending-End Impedance. The sending-end impedance of a line is the ratio of an applied potential difference to the resultant current at the point where the potential difference is applied. The sending-end impedance of a line is synonymous with the driving-point impedance of the line (ANSI C42.65.08.378).

NOTE: For an infinite uniform line the sending-end impedance and the characteristic impedance are the same; and for an infinite periodic line the sending-end impedance and the iterative impedance are the same.

Short-Circuit Impedance. The short-circuit impedance of a line or four-terminal network is the driving-point impedance when the far-end is short-circuited (ANSI C42.65.08.386).

Source Impedance. The source impedance is the impedance presented by a source of energy to the input terminals of a device (ANSI C42.65.08.396).

Terminal Impedance. The complex impedance as seen at the unloaded output terminals of a transmission equipment or line which is otherwise in normal operating condition (Mil-Std-188C, p. 24).

Inductor. An inductor is a device for introducing inductance into an electric circuit (ANSI C42.65.06.344).

Reactor. A reactor is a device for introducing reactance into an electric circuit (ANSI C42.65.06.342).

Varistor. A varistor is a two-terminal resistive element, composed of an electronic semi-conductor and suitable contacts, which has a markely nonlinear volt-ampere characteristic (ANSI C42.65.06.410).

NOTE: Varistors may be divided into two groups, symmetrical and non-symmetrical, based on the symmetry or lack of symmetry of the volt-ampere curve.

INTERFERENCE

Disturbance. In communication practice, a disturbance is any irregular phenomenon associated with transmission which tends to limit or interfere with the interchange of intelligence (ANSI C42.65.08.224).

Interference. Interference in a signal transmission path is either extraneous power which tends to interfere with the reception of the desired signals or the disturbance of signals which results (ANSI C42.65.08.186).

Adjacent-Channel Interference. Adjacent-channel interference is interference caused in one communication channel by a transmitter operating in adjacent channel (ANSI C42.65.42.174).

Alternate-Channel Interference (Second-Channel Interference). Alternate-channel interference is interference caused in one communication channel by a transmitter operating in a channel next beyond an adjacent channel (ANSI C42.65.42.177).

Co-Channel Interference. Co-channel interference is interference caused in one communication channel by a transmitter operating in the same channel (ANSI C42.65.42.171).

Interchannel Interference. The interference in a given channel resulting from signals in one or more other channels (IEEE No. 170, p. 6).

Inductive Coordination. Inductive coordination is the location, design, construction, operation and maintenance of electric supply and communication systems in conformity with harmoniously adjusted methods which will prevent inductive interference (ANSI C42.65.12.003).

Inductive Influence. Inductive influence comprises those characteristics of an electric supply circuit with its associated apparatus that determine the character and intensity of the inductive field which it produces (ANSI C42.65.12.021).

Inductive Interference. Inductive interference is an effect, arising from the characteristics and inductive relations of electric supply and communication systems, of such character and magnitude as would prevent the communication circuits from rendering service satisfactorily and economically if methods of inductive coordination were not applied (ANSI C42.65.12.012).

Radio Interference. Undesired disturbance of radio reception. Man-made interference is generated by electric devices, with the resulting interference signals either being radiated through space as electromagnetic waves or traveling over power lines or other conducting media. Radiated interference is also due to natural sources such as

atmospheric phenomena (lightning). Radio transmitters themselves may interfere with each other (APCO Specs. 8-71, Glossary).

System Interference Rejection. System interference rejection is a measure of the ability of a system to prevent greater than a , db reduction in the 12 dB SINAD ratio under standard test conditions, when a single undesired signal is introduced into the system (EIA RS-237, p. 14).

System Intermodulation Interference Rejection. System intermodulation interference rejection is a measure of the ability of a system to prevent greater than a 6 dB reduction in the 12 dB SINAD ratio under standard test conditions when two or more undesired signals are introduced into the system (EIA RS-237, p. 16).

LEVEL

Level. The level of a quantity is its magnitude, especially when considered in relation to an arbitrary reference value. Level may be stated in the units in which the quantity itself is measured (for example, volts, ohms, etc.) or in units (for example, db) expressing the ratio to a reference value (ANSI C42.65.08.030).

NOTE: (See, for example, blanking level, transmission level, etc.)

Overload Level. The overload level of a system, component, etc., is that level at which operation ceases to be satisfactory as a result of signal distortion, overheating, damage, etc. (ANSI C42.65.08.048).

Transmission Level. The transmission level of the signal power at any point in a transmission system is the ratio of the power at that point to the power at some point in the system chosen as a reference point. This ratio is usually expressed in decibels. The transmission level at the transmitting switchboard is frequently taken as the zero reference point (ANSI C42.65.08.039).

Voltage Level. The voltage level at any point in a transmission system is the ratio of the voltage existing at that point to an arbitrary value of voltage used as a reference. Specifically, in systems such as television systems, where wave shapes are not sinusoidal or symmetrical about a zero axis and where the arithmetical sum of the maximum p- itive and negative excursions of the wave is impc tant in system pei formance the voltage level is the ratio of the peak-to-peak voltage existing at any point in the transmission system to an arbitrary peak-to-peak voltage used as a reference. This ratio is usually expressed in dbv, signifying decibels referred to one volt peak-to-peak (ANSI C42.65.08.036).

LIMITER

Limiter. A limiter is (1) a device in which some characteristic of the output is automatically prevented from exceeding a predetermined value; (2) more specifically, a transducer in which the output amplitude is substantially linear with regard to the input up to a predetermined value and substantially constant thereafter (ANSI C42.65.06.222).

NOTE: For waves having both positive and negative values, the predetermined value is usually independent of sign.

Limiter. A device which reduces the power of an electrical signal when it exceeds a specified value. The amount of reduction or compression increases with increase of the input power (Mil-Std-188C, p. 26).

Peak Limiter. A peak limiter is a device which automatically limits the peak output to a predetermined maximum value (ANSI C42.65.06.225).

NOTE: The term is frequently applied to a device whose gain is quickly reduced and slowly restored when the instantaneous peak power of the input exceeds a predetermined value.

LOAD

Artificial Load. An artificial load is a dissipative but essentially non-radiating device having the impedance characteristics of an antenna, transmission line or other practical utilization circuit (ANSI C42.65.06.509).

Load Circuit. A load circuit is the complete circuit required to transfer power from a source such as an electron tube to a load (ANSI C42.65.06.150).

Load Circuit Efficiency. Load circuit efficiency is the ratio between useful power delivered by the load circuit to the load and the load (anode) and circuit power input (ANSI C42.65.06.153).

Mismatch. Mismatch is the condition in which the impedance of a load does not match the impedance of the source to which it is connected (ANSI C42.65.08.409).

Terminating. Terminating is the closing of the circuit at either end of a line or transducer by the connection of some device thereto. Terminating does not imply any special condition, such as the elimination of reflection (ANSI C42.65.08.411).

LOSS

Insertion Loss. The insertion loss resulting from the insertion of a transducer in a transmission system is the ratio of the power delivered before the insertion to that part of the system following the transducer, to the power delivered to that same part after the insertion (ANSI C42.65.08.087).

NOTE: If more than one component is involved in the input or output, the particular components used must be specified.

This ratio is usually expressed in decibels.

Insertion Loss. The insertion loss of a transmission system (or component thereof) inserted between two impedances Z_e (transmitter) and Z_r (receiver) is the ratio of the power measured at the receiver Z_r before insertion of the transmission system considered, to the power measured after insertion; expressed in dB. If the resulting number in dB thus obtained is negative, an insertion gain is indicated (Mil-Std-188C, p. 27).

Net Loss (Gain). Net loss or gain is the loss or gain overall of a transmission circuit. It is measured by applying a test signal of some convenient power at the beginning of the circuit and measuring the power delivered at the other end. The ratio of these powers expressed in dB is the net gain or loss of the circuit under observation (Mil-Std-188C, p. 27).

Return Loss. The return loss at the junction of a transmission line and a terminating impedance is the ratio, expressed in dB, of the reflected wave to the incident wave. More broadly, the return loss is a measure of the dissimilarity between two impedances, being equal to the number of decibels which corresponds to the scalar value of the reciprocal of the reflection coefficient, and hence being expressed by the formula:

$$20 \log_{10} \left| \frac{Z_2 + Z_1}{Z_2 - Z_1} \right| \text{ dB}$$

where Z_1 and Z_2 are the two impedances (Mil-Std-188C, p. 28).

System RF Loss. The system RF loss expressed in dB is the ratio of the power delivered by the transmitter to its transmission line, to the power required at the receiver input terminals to produce a SINAD ratio of 12 dB, under standard test conditions (EIA RS-237, p. 3).

Transmission Loss. In communication, transmission loss (frequency abbreviated loss) is a general term used to denote a decrease in power in transmission from one point to another. Transmission loss is usually expressed in decibels (ANSI C42.65.08.060).

NOTE: See 65.08.069.

LOUDSPEAKER

Loudspeaker (Speaker). A loudspeaker is an electroacoustic transducer usually intended to radiate acoustic power effectively at a distance in air (ANSI C42.65.14.105).

Moving-Coil Loudspeaker (Dynamic Loudspeaker). A moving-coil loudspeaker is a moving-conductor loudspeaker in which the moving conductor is in the form of a coil conductively connected to the source of electric energy (ANSI C42.65.14.129).

Permanent-Magnet Loudspeaker. A permanent-magnet loudspeaker is a moving-conductor loudspeaker in which the steady field is produced by means of a permanent magnet (ANSI C42.65.14.138).

Loudspeaker Voice Coil. A loudspeaker voice coil is the moving coil of a moving-coil loudspeaker (ANSI C42.65.14.132).

MICROPHONE

Microphone. A microphone is an electroacoustic transducer which responds to sound waves and delivers essentially equivalent electric waves (ANSI C42.65.14.006).

Carbon Microphone. A carbon microphone is a microphone which depends for its operation upon the variation in resistance of carbon contacts (ANSI C42.65.14.030).

Close-Talking Microphone. A close-talking microphone is a microphone designed particularly for use close to the mouth of the speaker (ANSI C42.65.14.066).

Crystal Microphone (Piezoelectric Microphone). A crystal microphone is a microphone which depends for its operation on the generation of an electric charge by the deformation of a body (usually crystalline) having piezoelectric properties (ANSI C42.65.14.036).

Directional Microphone. A directional microphone is a microphone the response of which varies significantly with the direction of sound incidence (ANSI C42.65.14.027).

Lapel Microphone. A lapel microphone is a microphone adapted to positioning on the clothing of the user (ANSI C42.65.14.069).

Lip Microphone. A lip microphone is a microphone adapted for use in contact with the lip (ANSI C42.65.14.072).

Moving-Coil Microphone (Dynamic Microphone). A moving-coil microphone is a moving-conductor microphone in which the movable conductor is in the form of a coil (ANSI C42.65.14.048).

Omnidirectional Microphone (Nondirectional Microphone). An omnidirectional microphone is a microphone the response of which is essentially independent of the direction of sound incidence (ANSI C42.65.14.024).

Pressure Microphone. A pressure microphone is a microphone in which the electric output substantially corresponds to the instantaneous sound pressure of the impressed sound waves (ANSI C42.65.14.009).

Throat Microphone. A throat microphone is a microphone normally actuated by mechanical contact with the throat (ANSI C42.65.14.075).

Variable-Reluctance Microphone (Magnetic Microphone). A variable-reluctance microphone is a microphone which depends for its operation on variations in the reluctance of a magnetic circuit (ANSI C42.65.14.042).

MOBILE

Mobile Station. A two-way radio station in the mobile service intended to be used while in motion or during halts at unspecified points (APCO Specs. 8-71, Glossary).

Mobile Relay Station. A base station established for the automatic re-transmission of mobile service radio communications which originate on the transmitting frequency of the mobile stations and which are re-transmitted on the receiving frequency of the mobile stations (APCO Specs. 8-71, Glossary).

Mobile Unit. A two-way radio equipped vehicle or person. Also, sometimes the two-way radio itself, when associated with a vehicle or person (APCO Specs. 8-71, Glossary).

Modem. Acronym for modulator-demodulator.

Modulated Amplifier. An amplifier stage in which the carrier is modulated by introduction of a modulating signal (IEEE No. 182A, p. 4).

Modulated Wave. A modulated wave is a wave some characteristic of which varies in accordance with the value of a modulating wave (ANSI C42.65.16.009).

Modulated Wave. A wave, some characteristic of which varies in accordance with the value of a modulating function (IEEE No. 170, p. 6).

Modulating Wave. A modulating wave is a wave which causes a variation of some characteristic of a carrier (ANSI C42.65.16.006).

Modulation. Modulation is the process or the result of the process whereby some characteristic of one wave is varied in accordance with some characteristic of another wave (ANSI C42.65.16.003).

Modulation. A process whereby certain characteristics of a wave, often called the carrier, are varied or selected in accordance with a modulating function; or the result of such a process (IEEE No. 170, p. 6).

Modulation. The process of varying some characteristics of the carrier wave in accordance with the instantaneous value of samples of the intelligence to be transmitted. See CARRIER (Mil-Std-188C, p. 29).

Modulation. The process of modifying some characteristic of an electromagnetic wave (called a carrier) so that it varies in step with the instantaneous value of another wave (called a modulating wave or signal). The carrier can be a direct current, an alternating current (providing its frequency is above the highest frequency component in the modulating wave), or a series of regularly repeating, uniform pulses called a pulse chain (providing their repetition rate is at least twice that of the highest frequency to be transmitted) (APCO Specs. 8-71, Glossary).

Modulation Acceptance Bandwidth. The modulation acceptance bandwidth of a receiver is a measure of the deviation that the receiver will accept at an RF signal level of 6 dB above the measured usable or radiation sensitivity (EIA RS-316, p. 14).

Amplitude Modulation (AM). Modulation in which the amplitude of a carrier is the characteristic varied (IEEE No. 170, p. 5).

Amplitude Modulation (AM). The form of modulation in which the amplitude of the carrier is varied in accordance with the instantaneous value of the modulating signal (Mil-Std-188C, p. 29).

Amplitude Modulation (AM). Amplitude modulation is modulation in which the amplitude of a wave is the characteristic varied (ANSI C42.65.16.087).

Angle Modulation. Modulation in which the angle of a carrier is the characteristic varied from its reference value (IEEE No. 170, p. 5).

NOTE 1: Frequency modulation and phase modulation are particular forms of angle modulation; however, the term FM is often used to designate various forms of angle modulation.

NOTE 2: The reference value is usually taken to be the angle of the unmodulated wave.

Angle Modulation. Angle modulation is modulation in which the angle of a sine wave carrier is the characteristic varied (ANSI C42.65.16.123).

NOTE: Phase and frequency modulation are particular forms of angle modulation.

Amplitude-Modulated Transmitter. A transmitter which transmits an amplitude-modulated wave (IEEE No. 182, p. 487).

Frequency-Modulated Transmitter. One which transmits a frequency-modulated wave (IEEE No. 182, p. 487).

Phase-Modulated Transmitter. A transmitter which transmits a phase-modulated wave (IEEE No. 182, p. 487).

Modulation Capability. The modulation capability of a transmitter is the maximum percentage modulation that can be obtained without exceeding a given distortion figure (ANSI C42.65.16.111).

Modulation Capability. The modulation capability of the transmitter is the maximum frequency deviation of which the transmitter is capable, under the test conditions without exceeding 10% distortion (Canadian RSS 121, p. 7).

Cathode Modulation. Amplitude modulation accomplished by application of the modulating voltage between cathode and ground (IEEE No. 182A, p. 3).

NOTE: Modulation in which the cathode voltage contains externally generated pulses is called cathode pulse modulation.

Cathode Modulation. Cathode modulation is modulation produced by application of the modulating voltage to the cathode of any electron tube in which the carrier is present (ANSI C42.65.16.186).

NOTE: Modulation in which the cathode voltage contains externally generated pulses is called cathode pulse modulation.

Constant-Current (Heising) Modulation. A method of amplitude modulation in which a constant-current source supplies a radio-frequency generator (or amplifier) and a modulation amplifier in parallel, the variations in the current taken by the latter causing equal and opposite variations in the former, resulting in corresponding modulation of the carrier output (IEEE No. 182A, p. 3).

Constant-Current Modulation (Heising Modulation). Constant-current modulation is a method of amplitude modulation in which a constant-current source supplies a radio-frequency generator and a modulation amplifier in parallel, the variations in the current taken by the latter causing equal and opposite variations in the former, resulting in corresponding modulation of the carrier output (ANSI C42.65.16.117).

Cross Modulation. Intermodulation of a desired signal with an undesired signal (IEEE No. 182A, p. 3).

Downward Modulation. Downward modulation is modulation in which the instantaneous amplitude of a carrier is always less than the unmodulated carrier amplitude (ANSI C42.65.16.109).

Modulation Factor. The ratio of (1) the maximum departure, in either sense, of the amplitude of the modulated signal from its average amplitude to (2) its average amplitude (IEEE No. 182A, p. 4).

NOTE: For modulating functions having unequal positive and negative peaks, both the positive and negative modulation factors are defined, respectively, in terms of the positive or negative peak variations.

Modulation Factor. In an amplitude-modulated wave, the ratio (usually expressed in percent) of the peak variation of the envelope from its reference value, to the reference value (IEEE No. 170, p. 6).

NOTE 1: For modulating functions having unequal positive and negative peaks, both positive and negative modulation factors are defined, respectively, in terms of the positive or negative peak variations.

NOTE 2: The reference value is usually taken to be the amplitude of the unmodulated wave.

Modulation Factor. In an amplitude modulated wave, the modulation factor is the ratio to the carrier amplitude of the maximum departure of the modulation envelope from the carrier level (ANSI C42.65.16.108).

NOTE: For modulating waves having unequal positive and negative peak values, positive and negative modulation factors must be given separately.

Frequency Modulation. A method of modulating a carrier-frequency signal by causing the frequency to vary above and below the unmodulated value in accordance with the intelligence signal to be transmitted. The amount of deviation in frequency above and below the resting frequency is at each instant proportional to the amplitude of the intelligence signal being transmitted. The number of complete deviations per second above and below the resting frequency correspondence at each instant to the frequency of the intelligence signal being transmitted (APCO Specs. 8-71, Glossary).

Frequency Modulation (FM). Angle modulation of a sinusoidal carrier in which the instantaneous frequency of the modulated wave differs from the carrier frequency by an amount proportional to the instantaneous value of the modulating wave (IEEE No. 170, p. 6).

NOTE: Other forms of angle modulation are also commonly referred to as "FM."

Frequency Modulation (FM). Frequency modulation is angle modulation in which the instantaneous frequency of a sine-wave carrier is caused to depart from the carrier frequency by an amount proportional to the instantaneous value of the modulating wave (ANSI C42.65.16.132).

Frequency Modulation (FM). The form of modulation in which the instantaneous frequency of a sine wave carrier is caused to depart from the carrier frequency by an amount proportional to the instantaneous value of the modulating signal (Mil-Std-188C, p. 29).

Grid Modulation. Grid modulation is modulation produced by the application of the modulating voltage to the control grid of any tube in which the carrier is present (ANSI C42.65.16.180).

High-Level Modulation. Modulation produced at a point in a system where the power level approximates that at the output of the system (IEEE No. 182, p. 487).

High-Level Modulation. High-level modulation is modulation produced at a point in a system where the power level approximates that at the output of the system (ANSI C42.65.16.192).

Low-Level Modulation. Low-level modulation is the modulation produced at a point in a system where the power level is low compared with the

power level at the output of the system (ANSI C42.65.16.195).

Low-Level Modulation. Modulation produced at a point in a system where the power level is low compared with the power level at the output of the system (IEEE No. 182, p. 487).

Modulation Index. In angle modulation with a sinusoidal modulating wave, the ratio of the frequency deviation to the frequency of the modulating wave (IEEE No. 182, p. 487).

Modulation Index. In angle modulation with a sinusoidal modulating function, the ratio of the frequency deviation of the modulated wave to the frequency of the modulating function (IEEE No. 170, p. 6).

NOTE: The modulation index is numerically equal to the phase deviation expressed in radians.

Modulation Index. In angle modulation with a sinusoidal modulating wave, the modulation index is the ratio of the frequency deviation to the frequency of the modulating wave (ANSI C42.65.16.150).

Isochronous Modulation. Modulation (or demodulation) in which the time interval separating any two significant instants is theoretically equal to the unit interval or to a multiple of this (Mil-Std-188C, p. 29).

Modulation Limiting. Modulation limiting refers to the ability of the transmitter circuits to prevent the transmitter from producing deviations due to modulation in excess of a rated system deviation (EIA RS-152-B, p. 11).

Modulation and Noise Spectrum. The modulation and noise spectrum is that region of spurious emissions inherent to radio frequency power generation and modulation on a frequency or frequencies outside an occupied band sufficient to insure transmission of information of required quality for the class of communication desired (EIA RS-316, p. 16).

Percentage Modulation. (1) In amplitude modulation, the modulation factor expressed in percent. (2) In angle modulation, the fraction of a specified reference modulation, expressed in percent (IEEE No. 182A, p. 4).

NOTE: It is sometimes convenient to express percentage modulation in decibels below 100 percent modulation.

Percentage Modulation. The modulation factor expressed as a percentage (IEEE No. 170, p. 7).

Percentage Modulation. In amplitude modulation, percentage modulation is the modulation factor expressed in percent (ANSI C42.65.16.102).

NOTE: It is sometimes convenient to express percentage modulation in decibels below 100 percent modulation.

Effective Percentage Modulation. The effective percentage modulation for a single sinusoidal input component is the ratio of the peak value of the fundamental component of the envelope to the average amplitude of the modulated wave expressed in percent (ANSI C42.65.16.105).

Phase Modulation (PM). The form of modulation in which the angle relative to the unmodulated carrier angle is varied in accordance with the instantaneous value of the amplitude of the modulating signal (Mil-Std-188C, p. 29).

Phase Modulation (PM). Angle modulation in which the angle of a carrier is caused to depart from its reference value by an amount proportional to the instantaneous value of the modulating function (IEEE No. 170, p. 7).

NOTE: A wave phase modulated by a given function can be regarded as a wave frequency modulated by the time derivative of that function.

Phase Modulation (PM). Phase modulation is angle modulation in which the angle of a sine-wave carrier is caused to depart from the carrier angle by an amount proportional to the instantaneous value of the modulating wave (ANSI C42.65.16.126).

Plate (Anode) Modulation. Modulation produced by application of the modulating voltage between the plate (anode) and the cathode of any tube in which the carrier is present (IEEE No. 182A, p. 4).

Plate Modulation (Anode Modulation). Plate modulation is modulation produced by application of the modulating voltage to the plate of any tube in which the carrier is present (ANSI C42.65.16.183).

Pulse-Amplitude Modulation (PAM). The form of modulation in which the amplitude of the pulse carrier is varied in accordance with successive samples of the modulating signal (Mil-Std-188C, p. 29).

Pulse Code Modulation (PCM). The form of modulation in which the modulating signal is sampled, and the sample quantized and coded so that each element of information consists of different kinds and/or numbers of pulses and spaces (Mil-Std-188C, p. 29).

Pulse Frequency Modulation (PFM). The form of modulation in which the pulse repetition frequency of the carrier is varied in accordance

with successive samples of the modulating signal (Mil-Std-188C, p. 30).

Pulse Time Modulation (PTM). The form of modulation in which the time of occurrence of some characteristics of the pulse carrier is varied in accordance with successive samples of the modulating signal. (This includes pulse position and pulse duration or pulse width modulation) (Mil-Std-188C, p. 30).

Screen-Grid Modulation. Modulation produced by application of a modulating voltage between the screen grid and the cathode of any multigrid tube in which the carrier is present (IEEE No. 182A, p. 4).

Screen-Grid Modulation. Screen-grid modulation is modulation produced by application of the modulating voltage to the screen grid of any multigrid tube in which the carrier is present (ANSI C42.65.16.189).

Series Modulation. Series modulation is modulation in which the plate circuits of a modulating tube and a modulated amplifier tube are in series with the same plate voltage supply (ANSI C42.65.16.118).

Single-Sideband Modulation (SSB). Modulation whereby the spectrum of the modulating function is translated in frequency by a specified amount either with or without inversion (IEEE No. 170, p. 8).

Single Sideband Modulation. Single sideband modulation is modulation whereby the spectrum of the modulating wave is translated in frequency by a specified amount, either with or without inversion (ANSI C42.65.16.093).

Standard Test Modulation. Sixty percent of the rated system deviation at a frequency of 1 kilohertz (IEEE No. 184, p. 3).

Suppressed-Carrier Modulation. Modulation in which the carrier is suppressed (IEEE No. 170, p. 8).

NOTE: The second meaning in the definition of carrier is intended.

Vestigial Sideband Modulation. A modulation process involving a prescribed partial suppression of one of the two sidebands (IEEE No. 170, p. 8).

Modulator. A device to effect the process of modulation (IEEE No. 170, p. 6).

Modulator. A modulator is a device to effect the process of modulation. In radar, a modulator is a device for generating a succession of short pulses of energy which cause a transmitter tube to oscillate during each pulse (ANSI C42.65.16.036).

Balanced Modulator. A balanced modulator is a modulator in which certain classes of modulation components are suppressed by a balanced arrangement of elements (ANSI C42.65.16.039).

Class A Modulator. A class A modulator is a class A amplifier which is used specifically for the purpose of supplying the necessary signal power to modulate a carrier (ANSI C42.65.16.045).

Class A Modulator. A class A amplifier which is used specifically for the purpose of supplying the necessary signal power to modulate a carrier (IEEE No. 182, p. 487).

Class B Modulator. A class B modulator is a class B amplifier which is used specifically for the purpose of supplying the necessary signal power to modulate a carrier (ANSI C42.65.16.048).

NOTE: In such a modulator the class B amplifier is normally connected in push-pull.

Class B Modulator. A class B amplifier which is used specifically for the purpose of supplying the necessary signal power to modulate a carrier (IEEE No. 182, p. 487).

Linear Modulator. A linear modulator is a modulator in which, for a given magnitude of carrier, the modulated characteristic of the output wave bears a substantially linear relation to the modulating wave (ANSI C42.65.16.042).

Product Modulator. A product modulator is a modulator whose modulated output is substantially equal to the product of the carrier and the modulating wave (ANSI C42.65.16.054).

NOTE: The term implies a device in which intermodulation between components of the modulating wave does not occur.

Reactance Modulator. A reactance modulator is a device, used for the purpose of modulation, whose reactance may be varied in accordance with the instantaneous amplitude of the modulating wave applied thereto. Electron tubes are widely used in this manner to effect phase or frequency modulation (ANSI C42.65.16.051).

Reactance Modulator. A device, used for the purpose of modulation, whose reactance varies in accordance with the instantaneous value of the modulating wave (IEEE No. 182A, p. 4).

NOTE: Such a device is commonly used to effect phase or frequency modulation.

MULTIPLEXING

Multiplex Operation. Multiplex operation is simultaneous transmission of two or more messages in either or both directions over the same transmission path (ANSI C42.65.02.189).

Multiplexing. The combining of two or more signals into a single wave (the multiplex wave) from which the signals can be individually recovered (IEEE No. 170, p. 7).

Frequency-Division Multiplexing. The process of combining two or more signals into a single wave in which a different frequency band is used for each signal (IEEE No. 170, p. 6).

Frequency Division Multiplexing. Frequency division multiplexing is the process of transmitting two or more signals over a common path by using a different frequency band for each signal (ANSI C42.65.16.078).

Time-Division Multiplexing. The process of combining two or more signals into a single wave in which a separate set of time intervals is used for each signal (IEEE No. 170, p. 8).

Time Division Multiplexing. Time division multiplexing is the process of transmitting two or more signals over a common path by using different time intervals for different signals (ANSI C42.65.16.081).

NETWORK

C Network. A C network is a network composed of three impedance branches in series, the free ends being connected to one pair of terminals, and the junction points being connected to another pair of terminals (ANSI C42.65.06.483).

H Network. An H network is a network composed of five impedance branches, two connected in series between an input terminal and an output terminal, two connected in series between another input terminal and another output terminal, and the fifth connected from the junction point of the first two branches to the junction point of the second two branches (ANSI C42.65.06.485).

L Network. An L network is a network composed of two impedance branches in series, the free ends being connected to one pair of terminals and the junction point and one free end being connected to another pair of terminals (ANSI C42.65.06.482).

Pi (π) Network. A pi (π) network is a network composed of three impedance branches connected in delta, that is, connected in series with each other to form a closed circuit, the three junction points forming an input terminal, an output terminal, and a common input and output terminal, respectively (ANSI C42.65.06.486).

T Network. A T network is a network composed of three impedance branches connected in star, that is, one end of each branch is connected to a common point, while the three remaining ends are connected to an input terminal, an output terminal, and a common input and output terminal, respectively (ANSI C42.65.06.484).

Bridged-T Network. A bridged-T network is a network comprising a T network with the two series impedances of the T bridged by a fourth impedance (ANSI C42.65.06.494).

Parallel-T Network. (Twin-T Network). A parallel-T network is a network composed of separate T networks with their terminals connected in parallel (ANSI C42.65.06.496).

NEUTRALIZATION

Neutralization. The reduction of the effect of undesired feedback in an amplifying device (IEEE No. 182A, p. 4).

NOTE: Its principal use is in preventing oscillations, e.g. in an electron-tube amplifier by introducing current (or voltage) into the input equal in magnitude but opposite in phase to the feedback through the interelectrode capacitance.

Neutralization. Neutralization is the method of modifying the effect of spurious feedback in an amplifier (ANSI C42.65.02.309).

Cross-Neutralization. A method of neutralization used in push-pull electron-tube amplifiers whereby a portion of the plate-to-cathode alternating voltage of each tube is applied between grid and cathode of the other tube (IEEE No. 182A, p. 3).

Cross Neutralization. Cross neutralization is a method of neutralization used in push-pull amplifiers whereby a portion of the plate-cathode alternating voltage of each tube is applied to the grid-cathode circuit of the other tube through a neutralizing capacitor (ANSI C42.65.02.321).

Plate (Anode) Neutralization. A method of neutralizing an amplifier in which a portion of the plate-to-cathode alternating voltage is shifted 180 degrees and applied to the grid-cathode circuit through a neutralizing capacitor (IEEE No. 182A, p. 4).

Plate Neutralization. Plate neutralization is the method of neutralizing an amplifier in which the necessary 180-degree phase shift is obtained by an inverting network in the plate circuit (ANSI C42.65.02.318).

Grid Neutralization. Grid neutralization is the method of neutralizing an amplifier in which the necessary 180-degree phase shift is obtained by an inverting network in the grid circuit (ANSI C42.65.02.312).

Inductive Neutralization (Shunt Neutralization) (Coil Neutralization). Inductive neutralization is a method of neutralizing an amplifier whereby the feedback susceptance due to an interelement capacitance is cancelled by the equal and opposite susceptance of an inductor (ANSI C42.65.02.315).

NOISE

Noise. Noise is any undesired sound. By extension, noise is any unwanted disturbance within a useful frequency band, such as undesired electric waves in any transmission channel or device (ANSI C42.65.08.192).

Noise. Interference characterized by undesirable random voltages caused by an internal circuit defect or from some external source (APCO Specs. 8-71, Glossary).

Ambient Noise (Room Noise). Ambient noise is acoustic noise existing in a room or other location. Magnitudes of ambient noise are usually measured with a sound level meter (ANSI C42.65.08.213).

NOTE: The term room noise is commonly used to designate ambient noise at a telephone station.

Amplitude-Modulation Noise. The noise produced by undesired amplitude variations of a radio-frequency signal (IEEE No. 182A, p. 3).

Amplitude-Modulation Noise. Amplitude-modulation noise is the noise produced by undesired amplitude variations of a radio-frequency signal (ANSI C42.65.42.117).

Background Noise. Background noise is the total system noise independent of the presence or absence of a signal. The signal is not to be included as part of the noise (ANSI C42.65.08.217).

Carrier Noise (Residual Modulation). Carrier noise is the noise produced by undesired variations of a radio-frequency signal in the absence of any intended modulation (ANSI C42.65.42.114).

Noise Figure (Noise Factor). The noise figure of a transducer is the ratio of (1) the output-noise power to (2) the portion thereof attributable to thermal noise in the input termination at standard noise temperature (290°K). The noise figure is thus the ratio of actual output noise to that which would remain if the transducer itself were made noiseless (ANSI C42.65.08.183).

NOTE: In heterodyne systems, output noise power (1) includes spurious contributions from image-frequency transformations, but portion (2) includes only that which appears in the output via the principal frequency transformation of the system and excludes that which appears via the image frequency transformation.

The term noise figure is sometimes used synonymously with average noise figure, and sometimes synonymously with spot noise figure.

Since the noise figure is a function of both the magnitude and phase

of the output impedance of the input circuit, and of the frequency, a complete specification requires that these conditions be stated.

A transducer developing no noise within itself has a noise figure of unity (zero db). Increasing the internally generated noise increases the noise figure.

Impulse Noise. Impulse noise is noise characterized by nonoverlapping transient disturbances (ANSI C42.65.08.231).

NOTE: The same source may produce impulse noise in one system and random noise in a different system.

Intermodulation Noise. In a transmission path or device, that noise which is contingent upon modulation and results from any non-linear characteristic in the path or device (Mil-Std-188C, p. 31).

Noise Level. Noise level is the value of noise integrated over a specified frequency range with a specified frequency weighting and integration time. It is expressed in decibels relative to a specified reference (ANSI C42.65.08.195).

AM Hum and Noise. The AM hum and noise level on the carrier is the ratio of the peak AC voltage to the DC voltage detected from the carrier (EIA RS-152-B, p. 14).

F.M. Hum and Noise Level. The term "F.M. Hum and Noise Level" denotes the ratio of residual frequency modulation to standard test modulation measured on the standard test receiver (EIA RS-152-B, p. 10).

Transmitter Hum and Noise Level. The hum and noise level of the transmitter is the residual hum and noise modulation of the carrier with no modulation applied (Canadian RSS-121, p. 7).

Hum and Noise Ratio. Hum and noise ratio denotes the ratio of residual receiver audio output to rated audio output (EIA RS-204, p. 7).

Reference Audio Noise Power Output. The average audio noise power present at the output of an unsquelched receiver having no radio-frequency signal input in which the audio gain has been adjusted for the reference audio power output (IEEE No. 184, p. 3).

Noise Power (Radio Transmitter). The mean power supplied to the antenna transmission line by a transmitter when loaded with white noise having a Gaussian amplitude distribution (Mil-Std-188C, p. 36).

Single Sideband Noise-Power Ratio (NPR) (SSB). NPR (SSB) is the ratio of the mean noise powers measured in the notch filter bandwidth for the notch in and the notch out conditions with total system mean noise power output equal for both conditions (Mil-Std-188C, p. 31).

Random Noise (Fluctuation Noise). Random noise is noise which comprises transient disturbances occurring at random. The term is most frequently applied to the limiting case where the number of transient disturbances per unit time is large so that the spectral characteristics are the same as those of thermal noise. Thermal noise and shot noise are special cases of random noise (ANSI C42 65 08.228).

Static (Atmospherics). Static is interference caused by natural electric disturbances in the atmosphere, or the electromagnetic phenomena capable of causing such interference (ANSI C42.65.08.222).

Thermal Noise (Resistance Noise). Thermal noise is random noise in a circuit associated with the thermodynamic interchange of energy necessary to maintain thermal equilibrium between the circuit and its surroundings (ANSI C42.65.08.225).

NOTE: The average square of the open-circuit voltage across the terminals of a passive two-terminal network of uniform temperature, due to thermal agitation, is given by:

$$V_T^2 = 4kT\int R(f)df$$

where T is the absolute temperature in degrees Centigrade, R is the resistance component in ohms of the network impedance at the frequency f measured in cycles, and k is the Boltzmann constant, 1.38×10^{-23}.

Balanced Oscillator (Push-Pull). Any oscillator in which, at the oscillator frequency, the impedance center of the tank circuit is at ground potential and the voltages between either end and ground are equal in magnitude and opposite in phase (IEEE No. 182A, p. 3).

Balanced Oscillator. A balanced oscillator is an oscillator in which at the oscillator frequency the impedance centers of the tank circuit are at ground potential and the voltages between either end and their centers are equal in magnitude and opposite in phase (ANSI C42.65.06.009).

Colpitts Oscillator. An oscillator which includes a parallel-tuned tank circuit, the capacitance of which is divided to obtain the proper feedback (IEEE No. 182A, p. 3).

NOTE: In an electron-tube oscillator when the two voltage-dividing capacitances are the plate-to-cathode and the grid-to-cathode capacitances of the tube, the circuit has be n known as the ultra-audion oscillator.

Colpitts Oscillator. A Colpitts oscillator is an electron-tube oscillator in which a parallel-tuned tank circuit is connected between grid and plate, with the tank capacitance containing two voltage-dividing capacitors in series, with their common connection at cathode potential. When the two voltage-dividing capacitances are the plate-to-cathode and the grid-to-cathode capacitances of the tube, the circuit is known as the ultra-audion oscillator (ANSI C42.65.06.028).

Crystal Oscillator (Crystal-Controlled Oscillator). An oscillator in which the principal frequency determining factor is the mechanical resonance of a piezoelectric crystal (IEEE No. 182A, p. 3).

Crystal Oscillator (Crystal-Controlled Oscillator). A crystal oscillator is an oscillator whose frequency of oscillation is controlled by a piezoelectric crystal unit (ANSI C42.65.06.038).

Crystal-Controlled Oscillator. An oscillator in which the frequency of oscillation is controlled by a piezoelectric crystal (APCO Specs. 8-71, Glossary).

Electron-Coupled Oscillator. An oscillator employing a multigrid tube in which the cathode and two grids operate in any conventional manner as an oscillator and in which the load is in the plate circuit (IEEE No. 182, p. 487).

Electron-Coupled Oscillator. An electron-coupled oscillator is an oscillator employing a multi-grid tube with the cathode and two grids

operating as an oscillator in any conventional manner, and in which the plate circuit load is coupled to the oscillator through the electron stream (ANSI C42.65.06.052).

Feedback Oscillator. A feedback oscillator is an amplifier in which the output is coupled back to the input, the oscillation being maintained at a frequency determined by the parameters of the amplifier and the feedback circuits (ANSI C42.65.06.018).

Hartley Oscillator. An oscillator which includes a parallel-tuned tank circuit, the inductance of which is tapped to obtain the proper feedback (IEEE No. 182A, p. 4).

Hartley Oscillator. A Hartley oscillator is an electron-tube oscillator in which a parallel tuned tank circuit is connected between grid and plate, the inductive element of the tank having an intermediate tap at cathode potential (ANSI C42.65.06.030).

Local Oscillator (Beating Oscillator). A local oscillator is an oscillator in a superheterodyne circuit whose output is mixed with the received signal to produce a sum or difference frequency equal to the intermediate frequency of the receiver (ANSI C42.65.06.072).

Locking-In. Locking-in is the shifting and automatic holding of one or both of the frequencies of two oscillating systems which are coupled together, so that the two frequencies have the ratio of two integral numbers (ANSI C42.65.02.334).

Master Oscillator. An oscillator so arranged as to establish the carrier frequency of the output of an amplifier (IEEE No. 182, p. 487).

Master Oscillator. A master oscillator is an oscillator so arranged as to establish the carrier frequency of the output of an amplifier (ANSI C42.65.06.006).

Meissner Oscillator. An oscillator in which the input and output circuits of the amplifying device are inductively coupled to a tank circuit (IEEE No. 182A, p. 4).

Meissner Oscillator. A Meissner oscillator is an electron-tube oscillator in which the grid and plate circuits are inductively coupled through an independent resonant circuit which determines the frequency (ANSI C42.65.06.032).

Multivibrator. A multivibrator is a form of relaxation oscillator which comprises two stages so coupled that the input of each one is derived from the output of the other (ANSI C42.65.06.080).

NOTE: A multivibrator is termed free-running or driven, according to whether its frequency is determined by its own circuit constants

or by an external synchronizing voltage.

The name multivibrator was originally given to the free-running multivibrator, having been suggested by the large number of harmonics produced.

Negative-Resistance Oscillator. An oscillator comprising a resonant circuit and a two-terminal negative resistance device (IEEE No. 182A, p. 4).

NOTE: Dynatron and tunnel-diode oscillators as well as arc converters are examples.

Negative-Resistance Oscillator. A negative-resistance oscillator is an oscillator produced by connecting a resonant circuit to a two-te terminal negative-resistance device (ANSI C42.65.06.046).

NOTE: A dynatron oscillator and an arc converter are examples.

Phase-Shift Oscillator. A phase-shift oscillator is an oscillator produced by connecting, between the output and the input of an amplifier, a network having a phase shift of an odd multiple of 180 degrees per amplifier stage at the frequency of oscillation (ANSI C42.65.06.035).

Pierce Oscillator. An oscillator in which a piezoelectric crystal is connected between the plate and the grid of an electron tube, in what is basically a Colpitts oscillator with voltage division provided by the grid-to-cathode and the plate-to-cathode capacitances of the circuit (IEEE No. 182A, p. 4).

Pierce Oscillator. A Pierce oscillator is an oscillator in which a piezoelectric crystal unit is connected between the grid and the plate of an electron tube, in what is basically a Colpitts oscillator with voltage division provided by the grid-cathode and plate-cathode capacitances of the circuit (ANSI C42.65.06.034).

RC Oscillator. Any oscillator in which the principal frequency-determining elements are resistors and capacitors (IEEE No. 182A, p. 4).

RC Oscillator. An RC oscillator is an oscillator in which the frequency is determined by resistance and capacitance elements (ANSI C42.65.06.036).

Relaxation Oscillator. A relaxation oscillator is a device which generates a non-sinusoidal wave by gradually charging and quickly discharging a capacitor or an inductor through a resistor. The frequency of a relaxation oscillator may be self-determined or determined by a synchronizing voltage derived from an external source (ANSI C42.65.06.061).

Resonant Line-Oscillator. An oscillator in which the principal frequency-determining elements are resonant transmission lines (IEEE No. 182A, p. 4).

Resonant-Line Oscillator. A resonant-line oscillator is an oscillator in which one or more sections of transmission line are employed as resonant elements (ANSI C42.65.06.042).

Ring Oscillator. An arrangement of two or more pairs of tubes operating as push-pull oscillators around a ring, usually with alternate successive pairs of grids and plates connected to tank circuits. Adjacent tubes around the ring operate in phase opposition. The load is supplied by coupling to the plate circuits (IEEE No. 182, p. 487).

Tuned-Grid Oscillator. A tuned-grid oscillator is an oscillator whose frequency is determined by a parallel-resonant circuit in the grid circuit coupled to the plate to provide the required feedback (ANSI C42.65.06.021).

Tuned-Plate Oscillator. A tuned-plate oscillator is an oscillator whose frequency is determined by a parallel-resonant circuit in the plate circuit coupled to the grid to provide the required feedback (ANSI C42.65.06.022).

Tuned-Grid Tuned-Plate Oscillator. A tuned-grid tuned-plate oscillator is an oscillator having parallel-resonant circuits in both plate and grid circuits, the necessary feedback being obtained by the plate-to-grid interelectrode capacitance (ANSI C42.65.06.023).

Wien Bridge Oscillator. A Wien bridge oscillator is an oscillator whose frequency of oscillation is controlled by a Wien bridge (ANSI C42.65.06.044).

Oscillatory Circuit. An oscillatory circuit is a circuit containing inductance and/or capacitance and resistance, so arranged or connected that a voltage impulse will produce a current which periodically reverses (ANSI C42.65.06.003).

Parasitic Oscillations (Parasitics). Parasitic oscillations are unintended self-sustaining oscillations (ANSI C42.65.08.303).

Parasitic Oscillations (Parasitics). Unintended self-sustaining oscillations (IEEE No. 182A, p. 4).

Superregeneration. Superregeneration is a form of regenerative amplification, frequently used in radio receiver detecting circuits, in which oscillations are alternately allowed to build up and are quenched at a superaudible rate (ANSI C42.65.42.156).

PHASE

Angle or Phase of a Wave. The measure of the progression of the wave in time or space from a chosen instant or position or both (IEEE No. 170, p. 5).

NOTE 1: In the expression for a sine wave, the angle or phase is the value of the entire argument of the sine function.

NOTE 2: In the representation of a sine wave by a phasor or rotating vector, the angle or phase is the angle through which the vector has progressed.

Phase Constant (Wavelength Constant). The phase constant is the imaginary component of the propagation constant (ANSI C42.65.08.441).

Phase Inverter. A phase inverter is a stage whose chief function is to change the phase of a signal by 180 degrees, usually for feeding one side of a following push-pull amplifier (ANSI C42.65.06.273).

Phase Shift. Phase shift is a change in the phase of a periodic quantity (ANSI C42.65.08.444).

Phase Shifter. A phase shifter is a device for altering the phase of a wave (ANSI C42.65.06.516).

Phase Splitter (Phase Splitting Circuit). A phase splitter is a device which produces, from a single input wave, two or more output waves which differ in phase from one another (ANSI C42.65.06.518).

CONTINUED

1 OF 2

Audio Input. Audio input is the power applied to the audio input terminals of the system (EIA RS-237, p. 5).

Audio Output. Audio output is the power delivered by the system to a standard load under standard test conditions (EIA RS-237, p. 5).

Audio Power Output. The measure of the audio-frequency energy dissipated in a specified output load (IEEE No. 184, p. 4).

Audio Power Output. Audio power output denotes the power that the receiver will deliver to a standard load under standard test conditions (EIA RS-204, p. 6).

Audio Power Output. The audio power output of a receiver is the power it will deliver to the standard output termination without exceeding a specified distortion level (Canadian RSS-121, p. 9).

Reference Audio Power Output. The manufacturers rated audio-frequency power available at the output of a properly terminated receiver, when responding to a standard test modulated radio-frequency input signal at a -80 dBW level (IEEE No. 184, p. 3).

Available Power. The available power of a linear source of electric energy is the mean square of the open circuit terminal voltage of the source, divided by four times the resistive component of the impedance of the source (ANSI C42.65.08.177).

Bleeder. A bleeder is a resistor connected across a power source to improve voltage regulation, to drain off the charge remaining in capacitors when the power is turned off, or to protect equipment from excessive voltages if the load is removed or substantially reduced (ANSI C42.65.06.405).

Carrier Power Output. The carrier power output of a transmitter is the power available to a standard external RF output load under standard test conditions (EIA RS-316, p. 16).

Carrier-Power Output Rating. The carrier power output rating of a transmitter for this service is the power available at the output terminals of the transmitter when the output terminals are connected to the normal load circuit or to a circuit equivalent thereto under the conditions given in 3.3 (EIA RS-152-B, p. 6).

Filament Power Supply. The filament power supply for an electron tube is the means for supplying power to the filament (ANSI C42.65.06.166).

Available-Power Gain. The available-power gain of an electric transducer is the ratio of the available power from the output terminals of the transducer, under specified input termination conditions, to the available power from the driving generator (ANSI C42.65.08.178).

NOTE: The maximum available-power gain is obtained when the admittance of the input termination is the conjugate of the driving-point impedance at the input terminals of the transducer.

Power Level. The power level at any point in a transmission system is the ratio of the power at that point to some arbitrary amount of power chosen as a reference. This ratio is usually expressed either in decibels referred to one milliwatt, abbreviated dbm, or in decibels referred to one watt, abbreviated dbw (ANSI C42.65.08.033).

Power Loss (Power Attenuation). The power loss of a transducer is the ratio of the power absorbed by its input to the power delivered to a specified load impedance (ANSI C42.65.08.063).

NOTE: If more than one component is involved in the input or output, the particular components used must be specified.

This ratio is usually expressed in decibels.

Mean Power (Radio Transmitter). The power supplied to the antenna transmission line by a transmitter during normal operation, averaged over a time sufficiently long compared with the period of the lowest frequency encountered in the modulation. A time of 1/10 second during which the mean power is greatest will be selected normally (Mil-Std-188C, p. 36).

Transmitter Power Output and Power Output Rating. The power output is the rf power produced in the standard output termination under the rated duty cycle as selected by the applicant for approval (Canadian RSS-121, p. 4).

Power Pack. A power pack is a unit for converting power from an alternating-current or direct-current supply into alternating-current or direct-current power at voltages suitable for supplying an electronic device (ANSI C42.65.06.160).

Peak. The maximum instantaneous value of a quantity (APCO Specs. 8-71, Glossary).

Peak Envelope Power (PEP) (Radio Transmitter). The power supplied to the antenna transmission line by a transmitter during one radio frequency cycle at the highest crest of the modulation envelope, taken under conditions of normal operation (Mil-Std-188C, p. 36).

Plate Efficiency (Anode Efficiency). Plate efficiency is the ratio of load circuit power (alternating current) to the plate power input (direct current) (ANSI C42.65.06.151).

Plate Power Input (Anode Power Input). Plate power input is the direct-current power delivered to the plate (anode) of a vacuum tube by the source of supply. It is the product of the mean anode voltage and the mean anode current (ANSI C42.65.06.148).

Anode Power Supply (Plate Power Supply). The anode power supply of an electron tube is the means for supplying power to the plate at a voltage which is usually positive with respect to the cathode (ANSI C42.65.06.167).

Average Radiated Power. The average radiated power of a licensed device is the equivalent power required, when delivered to a half-wave dipole antenna, to produce at a distant point, the same average received power as produced by the licensed device (EIA RS-316, p. 5).

Effective Radiated Power (ERP). The power supplied to the antenna multipled by the relative gain of the antenna in a given direction (Mil-Std-188C, p. 36).

Incidental Radiation or Conducted Power. Radio-frequency energy generated or amplified by the receiver, which is detectable outside the receiver (IEEE No. 184, p. 4).

Undesired Conducted Power. Radio-frequency power that is present at the antenna, power terminals, or any other interfacing terminals (IEEE No. 184, p. 4).

Undesired Radiated Power. Undesired radiated power is that electromagnetic energy generated and/or amplified in a receiver and radiated by the antenna and/or all power, control and audio leads normally connected to the receiver (EIA RS-204, p. 8).

Undesired Radiated Power. Radio-frequency power radiated from the receiver that can be measured outside a specified area (IEEE No. 184, p. 4).

Radio Frequency Power. The power associated with any signal consisting of electromagnetic radiation which is used for telecommunication (APCO Specs. 8-71, Glossary).

Rated Power Supply. The rated power supply of the selective signalling equipment includes all voltages necessary to meet the operating requirements of these standards (EIA TR-120, p. 2).

Minimum Power Supply Life. The minimum power supply (or battery) life is defined as the number of days, or portion thereof, that the

equipment will operate under the standard duty cycle on a single complement of batteries before the battery end point has been reached. One day of life is 8 hours of operation at standard duty cycle per day (EIA RS-316, p. 5).

Power Requirements. The power requirements for a selective signalling equipment are defined in terms of the currents drawn at the several voltages required (EIA TR-120, p. 3).

Power Supply Voltage Range. The power supply voltage range is the range of voltages applied at the input end of the power cables normally supplied or specified over which the equipment will operate satisfactorily (EIA TR-120, p. 3).

Power-Supply Voltage Range. The power supply voltage range is the range of primary voltage over which the transmitter will operate with a specified performance (EIA RS-152-B, p. 11).

Power Supply Voltage Range. Power supply voltage range is the range of primary voltage applied to the input end of the primary power cable normally supplied with the receiver, over which the receiver will operate with a specified performance (EIA RS-204, p. 7).

Power Supply Voltage Range. The power supply voltage range is the range of primary voltage over which the equipment will operate with specified performance (EIA RS-316, p. 13).

PW (Picowatt. Equal to 10^{-12} watt, or = -90 dBm.). A unit of absolute power commonly used for both weighted and unweighted noise. Context must be observed (Mil-Std-188C, p. 37).

PROPAGATION

Propagation. In electrical practice, propagation is the travel of waves through or along a medium (ANSI C42.65.02.046).

Propagation Constant. (1) The propagation constant per unit length of a unitform line is the natural logarithm of the ratio of the current at a point of the line, to the current at a second point, at unit distance from the first point along the line in the direction of transmission, when the line is infinite in length or is terminated in its characteristic impedance. (2) The propagation constant per section of a periodic line is the natural logarithm of the ratio of the current entering a section, to the current leaving the same section, when the periodic line is infinite in length or is terminated in its iterative impedance. (3) The propagation constant of an electric transducer is the natural logarithm of the ratio of the current entering the transducer, to the current leaving the transducer, when the transducer is terminated in its iterative impedance (ANSI C42.65.08.435).

Pulse. A pulse is that portion of the transmitted intelligence which registers one count or which performs one function of activation of the system (EIA TR-120, p. 4).

Pulse Code. A pulse code comprises one or more pulse digits peculiar to a particular selection (EIA TR-120, p. 5).

Pulse Counting System. A pulse counting system is defined as one which depends primarily upon a counting operation as a means of conveying the desired information (EIA TR-120, p. 4).

Pulse Digit. A pulse digit is an element of a code comprising the immediately associated train of pulses (EIA TR-120, p. 5).

Pulse Digit Spacing. Pulse digit spacing is the time interval between the end of one pulse digit and the start of the next (EIA TR-120, p. 5).

Pulse Rate. Pulse rate is the number of pulses per second (EIA TR-120, p. 5).

Pulse Ratio. Pulse ratio is the ratio of the marking time to the complete pulse period expressed as a percentage (EIA TR-120, p. 5).

Q (Quality Factor). Q is a measure of the relationship between stored energy and rate of dissipation in certain types of electric elements, structures or materials.

The Q of an inductor at any frequency is the magnitude of the ratio of its reactance to its effective series resistance at that frequency.

The Q of a capacitor at any frequency is the magnitude of the ratio of its susceptance to its effective shunt conductance at that frequency.

The Q of a simple resonant circuit comprising an inductor and a capacitor is given by:

$$Q = \frac{Q_L\, Q_C}{Q_L\, Q_C}$$

where Q_L and Q_C are the Q's of the inductor and capacitor, respectively, at the resonant frequency. If the resonant circuit comprises an inductance L and a capacitance C in series with an effective resistance R, the value of Q is:

$$Q = \frac{1}{R}\sqrt{\frac{L}{C}}$$

An approximately equivalent definition, which can be applied to other types of resonant structures, is that the Q is the ratio of the resonant frequency to the bandwidth between those frequencies on o opposite sides of the resonant frequency (known as half-power points) where the response of the resonant structure differs by 3 dB from that at resonance.

The Q of a magnetic or dielectric material at any frequency is equal to 2π times the ratio of the maximum stored energy to the energy dissipated in the material per cycle (ANSI C42.65.08.426).

Loaded Q (Working Q). The loaded Q of an electric impedance is the value of Q of such impedance when coupled or connected under working conditions (ANSI C42.65.08.432).

Non-Loaded Q (Basic Q). The non-loaded Q of an electric impedance is the value of Q of such impedance without external coupling or connection (ANSI C42.65.08.429).

RADIATION

Incidental and Restricted Radiation. Incidental and Restricted Radiation is radio frequency radiation from devices excluding licensed devices (EIA RS-316, p. 8).

Leakage Radiation. In a radio transmitting system, leakage radiation is radiation from anything other than the intended radiating system (ANSI C42.65.42.111).

Reradiation. Reradiation is (1) the scattering of incident radiation, or (2) the radiation of signals amplified in a radio receiver (ANSI C42.65.42.186).

Spurious Radiation. Spurious radiation is any emission from a radio transmitter at frequencies outside its communication band (ANSI C42.65.42.108).

RADIO

Radio. The transmission and reception of signals by means of electromagnetic waves without a connecting wire (APCO Specs. 8-71, Glossary).

Personal Radio. A small portable radio intended to be carried by hand or on the person of the user (APCO Speds. 8-71, Glossary).

Portable Radio. A completely self-contained radio which may be moved from one position to another (APCO Specs. 8-71, Glossary).

Radio Relay System (Radio Relay). A radio relay system is a point-to-point radio transmission system in which the signals are received and retransmitted by one or more intermediate radio stations (ANSI C42.65.42.015).

Radio Station. A radio station is a complete assemblage of equipment for radio transmission or reception, or both (ANSI C42.65.42.009).

Station Radio. A fixed installation or mobile unit which is equipped to transmit and receive radio signals (APCO Specs. 8-71, Glossary).

Two-Way Radio. A radio which is able to both transmit and receive (APCO Specs. 8-71, Glossary).

Walkie-Talkie. A walkie-talkie is a two-way radio communication set designed to be carried by one person, usually strapped over the back, and capable of operation while in motion (ANSI C42.65.42.136).

RECEIVER

Earphone (Receiver). An earphone is an electroacoustic transducer intended to be closely coupled acoustically to the ear (ANSI C42.65.14.084).

Head Receiver. A head receiver is an earphone designed to be held to the ear by a headband (ANSI C42.65.14.093).

NOTE: One or a pair (one for each ear) of head receivers with associated headband and connecting cord is known as a headset.

Radio Receiver. A radio receiver is a device for converting radio waves into perceptible signals (ANSI C42.65.42.141).

Receiver Audio Power Output. Audio power output is the power that the receiver will deliver to a standard load under standard test conditions (EIA RS-316, p. 10).

Receiver Hum and Noise Level. Hum and Noise Level is the ratio of residual receiver audio output to rated audio output (EIA RS-316, p. 11).

Radio Receiver. An instrument which amplifies radio-frequency (RF) signals, separates the intelligence signal from the RF carrier, amplifies the intelligence signal additionally in most cases, then converts the intelligence signal back into its original form (APCO Specs. 8-71, Glossary).

Monitoring Radio Receiver. A monitoring radio receiver is a radio receiver arranged to permit a check to be made on the operation of a transmitting station (ANSI C42.65.42.144).

Telephone Receiver. A telephone receiver is an earphone for use in a telephone system (ANSI C42.65.14.087).

RECEPTION

Diversity Reception. Diversity reception is that method of radio reception whereby, in order to minimize the effects of fading, a resultant signal is obtained by combination or selection, or both, of two or more sources of received-signal energy which carry the same modulation or intelligence, but which may differ in strength or signal-to-noise ratio at any given instant (ANSI C42.65.42.162).

Heterodyne Reception (Beat Reception). Heterodyne reception is the process of reception in which a received high-frequency wave is combined in a nonlinear device with a locally generated wave, with the result that in the output there are frequencies equal to the sum and difference of the combining frequencies. If the received waves are continuous waves of constant amplitude, as in telegraphy, it is customary to adjust the locally generated frequency so that the difference frequency is audible. If the received waves are modulated the locally generated frequency is generally such that the different frequency is superaudible and an additional operation is necessary to reproduce the original signal wave (ANSI C42.65.16.213).

See 65.42.150.

Reconditioned Carrier Reception (Exalted Carrier Reception). Reconditioned carrier reception is the method of reception in which the carrier is separated from the sidebands for the purpose of eliminating amplitude variations and noise, and then added at increased level to the sideband for the purpose of obtaining a relatively undistorted output. This method is frequently employed, for example, when a reduced-carrier single-sideband transmitter is used (ANSI C42.65.42.159).

Superheterodyne Reception. Superheterodyne reception is a method of receiving radio waves in which the process of heterodyne reception is used to convert the voltage of the received wave into a voltage of an intermediate, but usually superaudible, frequency, which is then detected (ANSI C42.65.42.150).

Double Superheterodyne Reception (Triple Detection). Double superheterodyne reception is the method of reception in which two frequency converters are employed before final detection (ANSI C42.65.42.153).

RECTIFIER

Bridge Rectifier. A bridge rectifier is a full-wave rectifier with four elements connected in a bridge circuit so that direct voltage is obtained from one pair of opposite junctions when alternating voltage is applied to the other pair (ANSI C42.65.06.327).

Contact Rectifier. A contact rectifier is a rectifier consisting of two materials in contact, in which rectification is due to greater conductivity across the contact in one direction than in the other (ANSI C42.65.06.312).

Forward Current. Forward current is current which flows upon application of forward voltage (ANSI C42.65.06.315).

Reverse Current. Reverse current is current which flows upon application of reverse voltage (ANSI C42.65.06.317).

N-Type Crystal Rectifier. An n-type crystal rectifier is a crystal rectifier in which forward current flows when the semi-conductor is negative with respect to the metal (ANSI C42.65.06.319).

P-Type Crystal Rectifier. A p-type crystal rectifier is a crystal rectifier in which forward current flows when the semi-conductor is positive with respect to the metal (ANSI C42.65.06.318).

Full-Wave Rectifier. A full-wave rectifier is a rectifier which utilizes both half-cycles of an alternating current to produce a direct current (ANSI C42.65.06.323).

Half-Wave Rectifier. A half-wave rectifier is a rectifier which changes alternating current into pulsating current, utilizing only one-half of each cycle (ANSI C42.65.06.325).

Linear Rectifier. A rectifier, the output current or voltage of which contains a wave having a form identifcal with that of the envelope of an impressed signal wave (IEEE No. 182, p. 487).

Linear Rectifier. A linear rectifier is a rectifier the output current or voltage of which contains a wave having a form identical with that of the envelope of an impressed signal wave (ANSI C42.65.06.329).

REFLECTION

Reflection Coefficient. (1) The reflection coefficient at the junction of a uniform transmission line and a mismatched terminating impedance is the vector ratio of the electric field associated with the reflected wave, to that associated with the incident wave.

(2) By extension, the reflection coefficient at any specified plane in a uniform transmission medium is the vector ratio of the electric field associated with the reflected wave, to that associated with the incident wave.

(3) At any specified plane in a uniform transmission line between a source of power and an absorber of power, the reflection coefficient is the vector ratio of the electric field associated with the reflected wave, to that associated with the incident wave. It is given by the formula $(Z_2 - Z_1)/(Z_2 + Z_1)$, where Z_1 is the impedance of the source and Z_2 is the impedance of the load (ANSI C42.65.08.456).

NOTE: Reflection coefficients computed in accordance with the above refer to incident and reflected voltage wave (electric field) relationships. If comparable reflection coefficients for incident and reflected currents (magnetic fields) are desired, they will be the negative of the above values.

Reflection Coefficient. (1) The reflection coefficient at the junction of a uniform transmission line and a mismatched terminating impedance is the vector ratio of the electric field associated with the reflected wave to that associated with the incident wave.

(2) At any specified plane in a uniform transmission line between a source of power and an absorber of power, the reflection coefficient is the vector ratio of the electric field associated with the reflected wave to that associated with the incident wave. It is given by the formula

$$(Z_2 - Z_1) \;/\; (Z_2 + Z_1) \text{ or } (SWR - 1) \;/\; (SWR + 1)$$

where Z_1 is the impedance of the source and Z_2 is the impedance of the load (Mil-Std-188C, p. 9).

RESONANCE

Parallel Resonance. Parallel resonance is the steady-state condition which exists in a circuit cimprising inductance and capacitance connected in parallel, when the current entering the circuit from the supply line is in phase with the voltage across the circuit (ANSI C42.65.02.291).

Series Resonance. Series resonance is the steady-state condition which exists in a circuit comprising inductance and capacitance connected in series, when the current in the circuit is in phase with the voltage across the circuit (ANSI C42.65.02.288).

RESPONSE

Response. The response of a device or system is a quantitative expression of the output as a function of the input under conditions which must be explicitly stated. The response characteristic, often presented graphically, gives the response as a functionof some independent variable such as frequency or direction (ANSI C42.65.08.135).

Amplitude-Frequency Response Characteristic (Frequency Response). The amplitude-frequency response characteristic of a device or a system is the variation with frequency of its transmission gain or loss (ANSI C42.65.08.138).

Audio-Frequency Response. The measure of the relative departure of all audio-frequency signal levels within a specified bandwidth, from a specified reference frequency signal power level (IEEE No. 184, p.4).

Audio Frequency Response. The term "audio frequency response" denotes the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic (EIA RS-152-B, p.8).

Audio Frequency Response. Audio frequency response denotes the degree of closeness to which the audio output of a receiver follows a 6 dB per octave de-emphasis curve with constant frequency deviation over a given continuous frequency range (EIA RS-204, p. 6).

Audio Frequency Response. System audio frequency response denotes the degree of closeness of the system output to the system input amplitude audio frequency characteristic under standard test conditions (EIA RS-237, p. 5).

Receiver Audio Frequency Response. Audio frequency response denotes the degree of closeness to which the audio output of a receiver follows a 6 dB octave de-emphasis curve with constant frequency deviation over a given continuous frequency range (EIA RS-316, p. 10).

Audio Frequency Response Transmitter. The audio frequency response is the degree to which the frequency deviation of the transmitter follows a 6 dB per octave pre-emphasis characteristic with constant amplitude audio frequency input over a specified continuous frequency range (Canadian RSS-121, p. 6).

Image Response. Image response is response of a superheterodyne receiver to the image frequency, as compared to the response to the desired frequency (ANSI C42.65.42.183).

Intermediate Frequency Response Ratio (Intermediate Interference Ratio). In a heterodyne receiver, the intermediate frequency response ratio is the ratio of the intermediate frequency signal input at the antenna

to the desired signal input for identical outputs (ANSI C42.65.08.575).

Spurious Response. A spurious response is any response, other than the desired response, of an electric transducer or device (ANSI C42.65.08.141).

Spurious Response Attenuation. A receiver's spurious response attenuation is a measure of its ability to discriminate between a desired signal to which it is resonant and an undesired signal at any other frequency to which it is also responsive (EIA RS-204, p. 5).

SELECTIVITY

Adjacent Channel Selectivity and Desensitization. The adjacent channel selectivity and desensitization of a receiver is a measure of its ability to differentiate between a desired modulated signal and modulated signals which differ in frequency from the desired signal by the width of one channel (EIA RS-204, p. 4).

Adjacent Channel Selectivity and Desensitization. The adjacent channel selectivity and desensitization of a receiver is a measure of its ability to differentiate between a desired modulated signal and modulated signals which differ in frequency from the desired signal by the spacing between channels (EIA RS-316, p. 15).

Adjacent Channel Selectivity and Desensitization (Receiver). The adjacent channel selectivity and desensitization characteristic of a receiver is a measure of its ability to receive intelligibly a desired signal in the presence of an undesired signal which differs in frequency from the desired signal by the width of one channel (Canadian RSS-121, p. 9).

Frequency Selectivity (Selectivity). Frequency selectivity is a characteristic of an electric circuit or apparatus in virtue of which electric currents or voltages of different frequencies are transmitted with different attenuation.

More specifically, frequency selectivity is the degree to which a transducer is capable of differentiating between the desired signal and signals or interference at other frequencies (ANSI C42.65.08.165).

Preselector. A preselector is (1) a device placed ahead of a frequency converter or other device, which passes signals of desired frequencies and reduces others, or (2) in automatic switching, a device which performs its selecting operation before seizing an idle trunk (ANSI C42.65.06.541).

Two-Signal Selectivity. The characteristic that determines the extent to which the receiver is capable of differentiating between the desired signal and disturbances of signals at other frequencies. It is expressed as the amplitude ratio of the modulated desired signal and the unmodulated disturbing signal when the reference sensitivity SINAD of the desired signal is degraded 6 decibels (IEEE No. 184, p. 4).

System Undesired Signal Rejection. Undesired signal rejection is the ability of a system to prevent audible or functional outputs due to external signals, in the absence of the desired signal (EIA RS-237, p. 16).

SENSITIVITY

Sensitivity. The sensitivity of a radio receiver or similar device is taken as the minimum input signal required to produce a specified output signal having a specified signal-to-noise ratio. This signal input may be expressed as power or as voltage, with input network impedance stipulated (ANSI C42.65.08.168).

Sensitivity. Sensitivity of a Selective Signalling Unit is the minimum power input at the tone calling frequency which results in positive operation. Sensitivity of a selective signalling equipment is the minimum carrier input to the radio receiver (in series with the specified dummy antenna) which results in positive operation (EIA TR-120, p. 1).

Quieting Sensitivity. The quieting sensitivity is the minimum signal input to an FM receiver which is required to give a specified output signal-to-noise ratio under specified conditions (ANSI C42.65.42.202).

Quieting Sensitivity. (Applies only to receivers using one or more limiters and a discriminator). The quieting sensitivity of a receiver is the minimum amount of signal from an unmodulated Standard Input Signal Source that is required to produce 20 decibels of noise quieting measured at the receiver audio output (EIA RS-204, p. 3).

Quieting Sensitivity. (Applies only to receivers using one or more limiters and a discriminator, provided with external RF signal source). The quieting sensitivity of a receiver is the minimum amount of signal from an unmodulated standard input signal source that is required to produce 20 decibels of noise quieting measured at the receiver audio output (EIA RS-316, p. 14).

Average Radiation Sensitivity. The average radiation sensitivity of a receiver is the voltage received by a half-wave dipole, referred to 50 ohms. This voltage when modulated with standard test modulation and radiated from a distance will produce output with 12 db SINAD ratio (EIA RS-316, p. 7).

Receiver Sensitivity. The sensitivity of a receiver is the minimum value of input signal with standard modulation which will produce at least 50% of the receiver's rated audio power output with a SINAD ratio of at least 12 dB (Canadian RSS-121, p. 9).

Radio Receiver Sensitivity. The minimum input signal required in a radio receiver to produce a specified output signal-to-noise radio. This signal input may be expressed as power or voltage at a stipulated input network impedance (APCO Specs. 8-71, Glossary).

Receiver Operational Sensitivity and Stability Performance. Operational Sensitivity and Stability Performance refers to the ability of the receiver to operate with no more than a specified amount of degradation in performance under any condition of the extremes of supply voltage and temperature (Canadian RSS-121, p. 12).

Reference Sensitivity. The level of a radio-frequency signal with standard test modulation which provides a 12-decibel SINAD with at least 50 percent reference audio power output (IEEE No. 184, p. 3).

Usable Sensitivity. The usable sensitivity of a receiver is the minimum value of the standard test input signal from a standard input signal source which when modulated at standard test modulation, will produce at least 50% of the receiver's rated uadio power output with 12 db signal + noise + distortion to noise + distortion ratio. The receiver is to be tested under standard test conditions (EIA RS-204, p. 2).

Usable Sensitivity. The usable sensitivity of a receiver is the minimum value RF input signal under standard test conditions that will produce at least 50% of the receiver's rated audio power output with 12 db SINAD ratio (EIA RS-316, p. 13).

SIDEBAND

Sidebands. (1) The frequency band or bands on one or both sides of the carrier frequency within which fall the frequencies of the wave produced by the process of modulation.

(2) The wave components lying within such bands (IEEE No. 170, p. 8).

NOTE: In the case of amplitude modulation of a sinusoidal carrier, the upper sideband comprises the components of the sum (carrier plus modulating) frequencies; the lower sideband comprises the difference (carrier minus modulating) frequencies.

Sidebands. Sidebands are (1) the frequency bands on both sides of the carrier frequency within which fall the frequencies of the waves produced by the process of modulation, or (2) the wave components lying within such bands (ANSI C42.65.16.030).

NOTE: In the process of amplitude modulation with a sinewave carrier, the upper sideband includes the sum (carrier plus modulating) frequencies; the lower sideband includes the difference (carrier minus modulating) frequencies.

Sidebands. The spectral energy distributed above and below a carrier resulting from a modulation process (Mil-Std-188C, p. 41).

Sideband Transmission. When a carrier frequency is modulated by a modulating signal, the band of frequencies produced on either side of the carrier frequency include components whose frequencies are, respectively the sum or difference of the carrier and the modulating frequencies. The sum frequencies form the "upper sideband," and the difference frequencies form the "lower sideband." Several forms of sideband transmission are also defined (Mil-Std-188C, p. 50).

Compatible Sideband Transmission. That method of transmission in which the carrier is deliberately reinserted at a lower level after its normal suppression to permit reception by conventional amplitude modulation receivers. This method of transmission is often referred to as Compatible SSB or Amplitude Modulation Equivalent (AME). The normal method of transmitting compatible SSB or AME is the carrier plus upper-sideband (Mil-Std-188C, p. 51).

Double Sideband Transmission. In double sideband transmission both the upper and lower sidebands and the carrier are transmitted without reduction or suppression (Mil-Std-188C, p. 51).

Double Sideband Transmission (Reduced or Suppressed Carrier). That method of double sideband transmission in which the carrier may be reduced or suppressed (Mil-Std-188C, p. 51).

Independent Sideband Transmission. In independent sideband transmission the modulation products in the upper and lower sidebands are not related to each other, but represent two or more separate sets of modulating signals. The carrier frequency may be either transmitted fully, reduced or suppressed (Mil-Std-188C, p. 51).

Single Sideband Transmission. In single sideband transmission only one of the sidebands are transmitted. The other sideband is suppressed to the maximum extent possible. The carrier may be transmitted fully, reduced or suppressed (Mil-Std-188C, p. 51).

Single-Sideband Equipment Reference Level. (Voice Frequency Input Power to a Transmitter, One Sideband Only.) The power of one of two equal tones which together cause the transmitter to develop its full rated peak-power output (Mil-Std-188C, p. 26).

Vestigial Sideband. In AM transmission, the vestigial sideband is the transmitted portion of one sideband which has been largely suppressed by a transducer having a gradual cut-off in the neighborhood of the carrier frequency (ANSI C42.65.16.096).

Vestigial-Sideband Transmission. Vestigial-sideband transmission is that method of signal transmission in which one normal sideband and the corresponding vestigial sideband are utilized (ANSI C42.65.16.099).

Vestigial Sideband Transmission. In vestigial sideband transmission, partial transmission of one sideband (the "vestigial sideband") in the neighborhood of the carrier is exactly compensated by partial suppression of the corresponding part of the other sideband (the "transmitted sideband"). The carrier may be transmitted fully or reduced, or it may be suppressed (Mil-Std-188C, p. 51).

Blanking. Blanking is the process of making a channel or device non-effective for a desired interval.

In television, blanking is the substitution for the picture signal, during prescribed intervals, of a signal whose instantaneous amplitude is such as to make the return trace invisible (ANSI C42.65.02.365).

Signal. The physical embodiment of a message (IEEE No. 170, p. 8).

Signal. A signal is (1) a visual, audible or other indication used to convey information; (2) the intelligence or message to be conveyed over a communication system; (3) a signal wave (ANSI C42.65.02.003).

Signal. The form or variation of a wave with time, serving to convey the information, message, effect, or other desired intelligence in communications (APCO Specs. 8-71, Glossary).

Analog Signal. A nominally continuous electrical signal that varies in some direct correlation to a signal impressed on a transducer. The electrical signal may vary its frequency or amplitude, for instance, in response to change in phenomena or characteristics such as sound, light, heat, position, or pressure (Mil-Std-188C, p. 41).

Digital Signal. A nominally discontinuous electrical signal that changes from one state to another in discrete steps. The electrical signal could change its amplitude or polarity, for instance, in response to outputs from computers, teletypewriters, etc. Analog signals may be converted to a digital form by quantizing (Mil-Std-188C, p. 41).

Inband Signaling. Signaling which utilizes frequencies within the voice or intelligence band of a channel (Mil-Std-188C, p. 43).

Out-Of-Band Signaling. Signaling which utilizes frequencies within the guard band between channels or bits other than information bits in a digital system. This term is also used to indicate the use of a portion of the channel bandwidth provided by the medium such as the carrier channel, but denied to the speech or intelligence path by filters. It results in a reduction of the effective available bandwidth (Mil-Std-188C, p. 43).

Signal-to-Noise Ratio (Signal-Noise Ratio). The signal-to-noise ratio is the ratio of the magnitude of the signal to that of the noise. This ratio is often expressed in decibels (ANSI C42.65.08.174).

NOTE: This ratio is expressed in many different ways, for example, in terms of peak values in the case of impulse noise and in terms of root-mean-square values in the case of random noise, the signal being assumed sinusoidal. In special cases other measures of signal and noise may be used if clearly stated.

For signal-to-noise ratio in television, see 65.32.190.

Available Signal-to-Noise Ratio. The available signal-to-noise ratio at a point in a circuit is the ratio of the available signal power at that point to the available random noise power (ANSI C42.65.08.180).

Signal-Plus-Noise To Noise Ratio. The signal plus noise to noise is a ratio of the signal plus noise arriving at a location in a transmission path to the noise normally present when the signal is removed at the sending end and replaced by a termination (Mil-Std-188C, p. 32).

Signal-to-Internal Noise Ratio. The system signal-to-internal noise ratio denotes the ratio of signal under the conditions of standard test modulation to the noise in the absence of modulation, both measured at the output of the receiver (EIA RS-237, p. 6).

Signal-to-Noise Ratio of a Selective Signalling System. Signal-to-Noise Ratio of a selective signalling system is that signal-to-noise ratio present in the speech channel of the radio receiver on the weakest carrier input which results in positive response of the selective signalling equipment, unless otherwise specified (EIA TR-120, p. 1).

Standard Signal-to-Noise Ratio. The system output performance criteria shall be determined with reference to the Signal + Noise + Distortion to Noise + Distortion ratio. This ratio is abgreviated SINAD. A 12 dB SINAD ratio represents the minimum acceptable signal quality for the purpose of this standard (EIA RS-237, p. 3).

SINAD. An acronym for "signal plus noise plus distortion to noise plus distortion ratio" expressed in decibels where the "signal plus noise plus distortion" is the audio power recovered from a modulated radio-frequency carrier, and the "noise plus distortion" is the residual audio power that is present after the audio signal is removed. This ratio is a measure of audio output signal quality, for a given receiver audio power output level (IEEE No. 184, p. 3).

Simplex Operation of a Radio System. A method of operation in which communication between two stations takes place in one direction at a time (IEEE No. 182, p. 487).

NOTE: This includes ordinary transmit-receive operation, press-to-talk operation, voice-operated carrier and other forms of manual or automatic switching from transmit to receive.

SPURIOUS

Spurious Emission (Transmitter). Emission at a frequency, or frequencies outside the band necessary to ensure the transmission of information. Spurious emission includes harmonic emissions, parasitic emissions and unwanted intermodulation products (Canadian RSS-121, p. 5).

Conducted Spurious Emissions. Conducted spurious emissions are emissions at the antenna terminals on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted (EIA RS-152-B, p. 6).

Conducted Spurious Emissions. Conducted spurious emissions are emissions on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of those spurious emissions will not effect the quality of the information being transmitted (EIA RS-316, p. 16).

Spurious Emissions From Licensed Devices. Spurious emissions are emissions on a frequency or frequencies, which are outside an occupied band, sufficient to ensure transmission of information of required quality for the class of communication desired. Reduction in the level of those spurious emissions will not affect the quality of the information being transmitted (EIA RS-237, p. 7).

Radiated Spurious Emissions. Radiated spurious emissions are emissions from the equipment when loaded into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted (EIA RS-152-B, p. 7).

Spurious Radiation. Spurious radiation is radiation on any frequency which is outside an occupied band sufficient to insure transmission of information of required quality for the class of communication desired. Reduction in the level of the spurious radiation will not affect the quality of the information being transmitted (EIA RS-316, p. 6).

Spurious Output Signals (Receiver). Spurious output signals are rf voltages generated within the receiver which appear at the antenna terminals (Canadian RSS-121, p. 11).

Spurious Transmitter Output. Any part of the radio-frequency output which is not implied by the type of modulation (AM, FM, etc.) and specified bandwidth (IEEE No. 182, p. 487).

Spurious Transmitter Output Conducted. Any spurious output of a radio transmitter conducted over a tangible transmission path (IEEE No. 182, p. 487).

NOTE: Power lines, control leads, radio frequency transmission lines and waveguides are all considered as tangible paths in the foregoing definition. Radiation is not considered a tangible path in this definition.

Spurious Transmitter Output Extraband. Spurious output of a transmitter outside of its specified band of transmission (IEEE No. 182, p. 487).

Spurious Transmitter Output Inband. Spurious output of a transmitter within its specified band of transmission (IEEE No. 182, p. 487).

Spurious Transmitter Output Radiated. Any spurious output radiated from a radio transmitter (IEEE No. 182, p. 487).

NOTE: The radio transmitter does not include the associated antenna and transmission lines.

Spurious Response. Any receiver response that occurs because of frequency conversions other than the desired frequency translations in the receiver (IEEE No. 184, p. 4).

Spurious Response Attenuation. A receiver's spurious response attenuation is a measure of its ability to discriminate between a desired signal to which it is resonant and an undesired signal at any other frequency to which it is also responsive (EIA RS-316, p. 15).

Spurious Response Attenuation. Spurious response attenuation is the ratio between a receiver's sensitivity to the desired signal and its sensitivity to any other signal (Canadian RSS-121, p. 10).

Intermodulation Spurious Response. The response resulting from the mixing of two or more undesired frequencies in the nonlinear elements of the receiver in which a resultant frequency is generated that falls within the receiver passband (IEEE No. 184, p. 4).

Intermodulation Spurious Response Attenuation. A receiver's intermodulation spurious response attenuation is a measure of its ability to discriminate between a desired signal to which it is resonant and certain combinations of two or more undesired signals at other frequencies to which it is also responsive (EIA RS-316, p. 15).

Receiver Intermodulation Spurious Response Attenuation. A receiver's intermodulation spurious response attenuation is a measure of its ability to receive intelligibly a desired signal at the operating frequency in the presence of two undesired signals so separated from the desired signal and from each other that n^{th} order mixing

of the two undesired signals may occur in the non-linear elements of the receiver, producing a third signal whose frequency is within the receiver's pass band. This standard concerns itself only with the extreme case of adjacent and alternate channel mixing (Canadian RSS-121, p. 11).

Image Ratio. In a heterodyne receiver, the image ratio is the ratio of the image frequency signal input at the antenna to the desired signal input for identical outputs (ANSI C42.65.08.570).

SQUELCH

Squelch. A circuit function that acts to suppress the audio output of a receiver when noise power that exceeds a predetermined level is present (IEEE No. 184, p. 3).

Standard Squelch Adjustment. Standard squelch adjustment for carrier operated systems shall be that setting which reduces the audible or functional output of the system by 30 dB or more when a signal is applied, which is modulated at rated system deviation, and with an R.F. amplitude which is 3 db less than the 12 dB SINAD ratio sensitivity. With an R.F. amplitude equal to the standard sensitivity, the audio or functional output shall not be affected (EIA RS-237, p. 3).

Reference Threshold Squelch Adjustment. The minimum adjustment position of the squelch control required to reduce the reference audio noise power output by at least 40 decibels (IEEE No. 184, p. 3).

Squelch Circuit. A squelch circuit is a circuit for preventing a radio receiver from producing audio-frequency output in the absence of a signal having predetermined characteristics. A squelch circuit may be operated by signal energy in the receiver pass band, by noise quieting, or by a combination of the two (ratio squelch). It may also be operated by a signal having special modulation characteristics (selective squelch) (ANSI C42.65.06.255).

Squelch Clamping. The characteristic of the receiver, when receiving a normal signal, in which the squelch circuit under certain conditions of modulation will cause suppression of the audio output (IEEE No. 184, p. 4).

Squelch Selectivity. The characteristic that permits the receiver to remain squelched when a radio-frequency signal not on the receiver's tuned frequency is present at the input (IEEE No. 184, p. 4).

Squelch Sensitivity. The minimum radio-frequency signal input level, with standard test modulation required to increase the audio power output from the reference threshold squelch adjustment condition to within 6 decibels of the reference audio power output (IEEE No. 184, p. 4).

Audio Squelch Sensitivity. The audio squelch sensitivity of a receiver is the minimum value of the standard test input signal source, which, when modulated at standard test modulation, will open the receiver squelch (EIA RS-204, p. 3).

Audio Squelch Sensitivity. The audio squelch sensitivity of a receiver is the minimum value of the standard test input signal source, which, will open the receiver squelch (EIA RS-316, p. 14).

Amplitude Suppression Ratio. In frequency modulation, the amplitude suppression ratio is the ratio of the undesired output to the desired output of an FM receiver when the applied signal has simultaneous amplitude modulation and frequency modulation (ANSI C42.65,16.151).

NOTE: This ratio is generally measured with an applied signal that is amplitude modulated 30 percent at a 400-cycle rate and is frequency modulated 30 percent of maximum system deviation at a 1000-cycle rate.

Standing Wave Ratio. The standing wave ratio is the ratio of the amplitude of a standing wave at an anti-node to the amplitude at a node (ANSI C42.65.08.459).

NOTE: The standing wave ratio in a uniform transmission line is:

$$\frac{1 + p}{1 - p}$$

where p is the reflection coefficient.

SYSTEMS

Definition of System. A system is defined as (1) a radio transmitter including an associated transmission line and an antenna and (2) a radio receiver with an associated transmission line and an antenna; said transmitter and receiver being separated geographically and arranged to be operated as a communication channel (EIA RS-237, p.1).

Privacy System. In radio transmission, a privacy system is a system designed to make unauthorized reception difficult (ANSI C42.65.42.201).

System Operation Delay and Recovery Time. System operating delay includes the time required for the transmitter to provide rated R.F. output after activation of the local control (P.T.T.) Push-to-Talk and Press-to-Talk plus the time required for the system receiver to provide useful output (EIA RS-237, p. 6).

Positive Operation. Positive operation denotes definite and dependable functioning (EIA TR-120, p. 3).

Control Console. A desk mounted enclosed panel which contains a number of controls used to operate a radio station (APCO Specs. 8-71, Glossary).

Remote Control Equipment. The apparatus used for performing monitoring, controlling, supervising, or a combination of these, a prescribed function or functions at a distance by electrical means (Mil-Std-188C, p. 10).

Facility. A communication facility is anything used or available for use in the furnishing of communication service (ANSI C42.65.02.158).

Design Objective. An electrical (or mechanical) performance characteristic for communication circuits and equipments which is based on engineering judgment of performance desired but which for a number of reasons it is not considered feasible to establish as a STANDARD at the time this standard is written. Examples of reasons for designating a performance characteristic as a (DO) rather than as an (S) are: It may be bordering on, an advancement in state-of-the-art; the requirement may not have been fully confirmed by measurement or experience with operating circuits; it may not have been demonstrated that it can be met considering other constraints such as cost and size, etc. A (DO) shall be considered as guidance for Department of Defense Agencies in preparation of specifications for development or procurement of new equipment or systems which shall be used if technically and economically practicable at the time such specifications are written (Mil-Std-188C, p. 32). See also SYSTEM STANDARDS.

Interface. A concept involving the specification of the interconnection

between two equipments or systems. The specification includes the type, quantity and function of the interconnection circuits and the type and form of signals to be interchanged via those circuits (Mil-Std-188C, p. 25).

Mobile Radio Service. Mobile radio service is radio service between a radio station at a fixed location and one or more mobile stations, or betwen mobile stations (ANSI C42.65.42.012).

Point-To-Point Radio Communication. Point-to-point radio communication is radio communication between two fixed stations (ANSI C42.65.42.013).

Portable/Personal Communications Equipments. Portable/personal communications equipments are radio transmitters, receivers or combinations of both, which can be hand-carried or worn on the person, and which are operated from their own portable power sources and antenna. Personal equipment is further defined as that which is capable of being worn within the clothing, and is, therefore, subject to less severe environments than other classifications of portable equipment (EIA RS-316, p. 3).

Coding Capacity. Coding capacities are the maximum number of codes which can be provided by a given selective signalling system (EIA TR-120, p. 4).

Clearing or Restoring Signal. A clearing or restoring signal is that signal which restores the selective signalling units to normal and readies them for a new calling operation (EIA TR-120, p. 2).

Telecommunication. Any transmission, emission, or reception of signs, signals, writings, images and sounds or information of any nature by wire, radio, visual or other electromagnetic means (Mil-Std-188C, p. 48).

System Standards. (1) The minimum required electrical performance characteristics of communication circuits which are based on measured performance of developed circuits under the various operating conditions for which the circuits were designed.

(2) The specified characteristics not dictated by electrical performance requirements but necessary in order to permit interoperation (Mil-Std-188C, p. 45).

Standard Test Conditions. Standard test conditions signify the normal values for all operating conditions used in determining the performance characteristics (EIA TR-120, p. 3).

Standard Test Conditions. Standard test conditions are those conditions which shall apply to a transmitter while it is being tested for minimum requirements. These conditions apply unless otherwise specified (EIA RS-152-B, p. 1).

Standard Test Conditions. Standard test conditions are those conditions which apply to a portable/personal communication equipment while it is being tested for minimum requirements, unless different conditions are specified in the section dealing with a particular test (EIA RS-316, p. 3).

Standard Test Conditions (Transceiver). Standard Test Conditions are those conditions under which the transceiver shall be operated while it is being tested for minimum requirements. These conditions shall apply at all times unless otherwise specified (Canadian RSS-121, p.2).

System Stability. System Stability is the variation in System R.F. Loss due to the effects of environmental conditions (EIA RS-237, p. 4).

Transmitter Operational Stability Performance. Operational Stability Performance refers to the ability of the transmitter to operate with no more than a specified amount of degradation in performance under any condition of the extremes of supply voltage and temperature (Canadian RSS-121, p. 7).

High Humidity. The term "high humidity" denotes the relative humidity at which a transmitter will operate with no more than a specified amount of degradation in overall performance (EIA RS-152-B, p. 13).

High Humidity. The term "high humidity" denotes the relative humidity at which the transmitter and/or receiver will operate with no more than a specified amount of degradation in overall performance (EIA RS-316, p. 12).

Shock Stability. Shock stability is the ability of the equipment to maintain specified mechanical and electrical performance after being shocked (EIA RS-152-B, p. 14).

Shock Stability. Shock stability is the ability of the mobile equipment to maintain specified mechanical and electrical performance after being shocked (EIA RS-204, p. 9).

Shock Stability. Shock stability is the ability of the equipment to maintain specified mechanical and electrical performance after being shocked (EIA RS-316, p. 13).

Temperature Range. The term "temperature range" refers to the range of ambient temperature over which a transmitter will operate with no more than a specified amount of degradation in overall performance (EIA RS-152-B, p. 12).

Temperature Range. Temperature range is the range of ambient temperature over which personal/portable transmitters and/or receivers will operate with no more than a specified maximum amount of degradation in overall performance (EIA RS-316, p. 11).

Temperature and Humidity Range. The term temperature and humidity range, applied to selective signalling equipment, denotes the continuous range of these variables over which positive operation may be maintained (EIA TR-120, p. 3).

Vibration. The term vibration as applied to selective signalling equipment denotes the range and magnitude of vibration over which satisfactory operation can be maintained (EIA TR-120, p. 4).

Vibration Stability. Vibration stability is the ability of the equipment to maintain specified mechanical and electrical performance during and after being vibrated (EIA RS-152-B, p.13).

Vibration Stability. Vibration stability is the ability of the mobile equipment to maintain specified mechanical and electrical performance during and after being vibrated (EIA RS-204, p. 9).

Vibration Stability. Vibration stability is the ability of the equipment to maintain specified mechanical and electrical performance after being vibrated (EIA RS-316, p. 13).

Tone. Tone as applied to a selective signalling system is an audio or carrier frequency of controlled amplitude and frequency (EIA TR-120, p. 2).

Tone Code. Tone code specifies the character of the transmitted signal required to effect a particular selection (EIA TR-120, p. 7).

Tone Control. A tone control is a device for emphasizing a part of the frequency range in an audio-frequency amplifier (ANSI C42.65.06.595).

Tone Control. A tone control is a means for altering the frequency response at the audio-frequency output of a circuit, particularly of a radio receiver or hearing aid, for the purpose of obtaining a quality more pleasing to the listener (ANSI C42.65.42.192).

Tone Digit Period. Tone digit period is defined as the period of time, expressed in seconds, for which the tone or tones, comprising a single element of the code, are applied (EIA TR-120, p. 6).

Tone Digit Spacing. Tone digit spacing is the time interval between the end of one tone digit period and the start of the next tone digit period (EIA TR-120, p. 7).

Tone Frequency. Tone, as applied to a selective signalling system, is an audio or carrier frequency of controlled amplitude and frequency (EIA TR-120, p. 6).

Tone Frequency Tolerance. Tone frequency tolerance is the stability of the tone frequencies required to permit positive operation (EIA TR-120, p. 6).

Tone Frequency Tolerance. Tone frequency tolerance is the stability of the tone frequencies required to permit satisfactory operation of the selective signalling device within the limits described by these standards (EIA TR-120, p. 6).

Standard Test Tone. For use at the 600 ohms audio portions of a circuit; shall be one mW (0 dBm) with a frequency of 1000 Hz and shall be applied at a zero transmission level reference point (Mil-Std-188C, p. 49).

NOTE: The Standard Test Tone in CCITT (Comité Consultatiff International Télégraphe et Téléphone) recommendations is 800 Hz.

Threshold (in a modulation system). The smallest value of carrier-to-noise ratio at the input to the demodulator for all values above which a small percentage change in the input carrier-to-noise ratio produces a substantially equal or a smaller percentage change in the output signal-to-noise ratio (IEEE No. 170, p. 8).

NOTE: Where precision is required, the method of determining the value of the threshold must be specified.

Improvement Threshold. The improvement threshold is that value of carrier-to-noise ratio below which the signal-to-noise ratio decreases more rapidly than the carrier-to-noise ratio (ANSI C42.65.16.225).

TRANSDUCER

Transducer. A transducer is a device capable of being actuated by waves from one or more transmission systems or media and of supplying related waves to one or more other transmission systems or media (ANSI C42.65.06.450).

NOTE: The waves in the input and output may be of the same or different types (e.g., electric, acoustic or mechanical).

Electromechanical Transducer. An electromechanical transducer is a transducer for receiving waves from an electric system and delivering waves to a mechanical system, or vice versa (ANSI C42.65.06.469).

Ideal Transducer. An ideal transducer for connecting a specified source to a specified load is a hypothetical linear passive transducer which transfers the maximum possible power from the source to the load (ANSI C42.65.06.452).

NOTE: In linear transducers having only one input and one output, and for which the impedance concept applies, this is equivalent to a transducer which (a) dissipates no energy and (b) when connected to the specified source and load presents to each its conjugate impedance.

TRANSFORMER

Audio-Frequency Transformer. An audio-frequency transformer is a transformer for use with audio-frequency currents (ANSI C42.65.06.373).

Bank. A bank is an aggregation of similar devices (e.g., transformers, lamps, etc.) connected together and used in cooperation. In automatic switching, a bank is an assemblage of fixed contacts over which one or more wipers or brushes move in order to establish electric connections (ANSI C42.65.02.387).

Ideal Transformer. An ideal transformer is an imaginary transformer which neither stores nor dissipates energy. In other words, it is a transformer having self and mutual impedances which are pure inductances of infinitely great values and one which has a unity coefficient of coupling (ANSI C42.65.06.369).

Radio-Frequency Transformer (R-F Transformer). A radio-frequency transformer is a transformer for use with radio-frequency currents (ANSI C42.65.06.372).

Tuned Transformer. A tuned transformer is a transformer the associated circuit elements of which are adjusted as a whole to be resonant at the frequency of the alternating current supplied to the primary, thereby causing the secondary voltage to build up to higher values than would otherwise be obtained (ANSI C42.65.06.376).

TRANSMISSION

Bridging Connection. A bridging connection is a parallel connection by means of which some of the signal energy in a circuit may be withdrawn, frequently with imperceptible effect on the normal operation of the circuit (ANSI C42.65.06.591).

Broadcast Operation. That type of operation in which a transmitting point emits information which may be received by one or more stations (Mil-Std-188C, p. 32).

Cascade Connection (Cascade). A cascade connection is a tandem arrangement of two or more similar component devices in which the output of one is connected to the input of the next (ANSI C42.65.02.339).

Conference Operation. (1) In a telephone system, that type of operation in which more than two stations can carry on a conversation.

(2) In telegraph or data transmission, that form of simplex or half-duplex operation in which more than two stations may simultaneously exchange information, carry on conversations or pass messages among one another (Mil-Std-188C, p. 32).

NOTE: In radio systems, the stations receive simultaneously, but must transmit one at a time. The common modes are "push-to-talk" (telephone) and "push-to-type" (telegraph, data transmission).

Configuration. The configuration of a group of electric conductors is their geometrical arrangement, including the size of the wires and their relative positions with respect to other conductors and the earth (ANSI C42.65.12.024).

Electrically Connected. Electrically connected signifies connected by means of a conducting path or through a capacitor, as distinguished from connection merely through electromagnetic induction (ANSI C42.65.12.027).

Cord. A cord is one or a group of flexible insulated conductors, enclosed in a flexible insulating covering and equipped with terminals (ANSI C42.65.06.635).

Discontinuity. In inductive coordination, a discontinuity is an abrupt change at a point, in the physical relations of electric supply and communication circuits or in electrical parameters of either circuit, which would materially affect the coupling.

Although technically included in the definition, transpositions are not rated as discontinuities because of their application to coordination (ANSI C42.65.12.033).

Distributed. Distributed means spread out over an electrically significant length or area (ANSI C42.65.02.380).

Dynamic Range. The dynamic range of a transmission system is the difference in decibels between the noise level of the system and its overload level (ANSI C42.65.08.171).

Echo. The effect of a wave which, having been derived (for example by reflection) from a primary wave, arrives at either end of the same circuit with sufficient magnitude and delay to be distinctly recognized (Mil-Std-188C, p. 17).

Electrical Distance. Electrical distance is the distance measured in a unit based on the velocity of light (ANSI C42.65.02.051).

Electrical Length. Electrical length is the length expressed in wavelengths, radians, or degrees. When expressed in angular units, it is distance in wavelengths multipled by 2π to give radians, or by 360 to give degrees (ANSI C42.65.02.048).

Junction. A junction is (1) a connection between two or more conductors or two or more sections of transmission line, or (2) a contact between two dissimilar metals or materials, as in a rectifier or thermocouple (ANSI C42.65.02.384).

Transmission Line. A transmission line is a material structure forming a continuous path from one place to another, for directing the transmission of electromagnetic energy along this path (ANSI C42.65.04.005).

Transmission Line. A waveguide, coaxial line, or other system of conductors used to transfer signal energy efficiently from one location to another((APCO Specs. 8-71, Glossary).

Matched Transmission Line. A transmission line is said to be matched at any transverse section if there is no wave reflection at that section (ANSI C42.65.04.045).

Uniform Line. A uniform line is a line which has substantially identical electrical properties throughout its length (ANSI C42.65.04.010).

Link. A link is a channel or circuit designed to be connected in tandem with other channels or circuits.

In automatic switching, a link is a path between two units of switching apparatus within a central office (ANSI C42.65.02.183).

Link. (1) A portion of a communication circuit.

(2) A channel or circuit designed to be connected in tandem with

other channels or circuits.

(3) A radio path between two points. called a radio link; the resulting circuit may be unidirectional, half-duplex, or duplex (Mil-Std-188C, p. 27).

NOTE: The term "link" should be defined or qualified when used. It is generally accepted that the signals at each end of a link are in the same form.

Lumped. Lumped means effectively concentrated at a single point (ANSI C42.65.02.379).

Monitoring. In communication, monitoring is observation of the characteristics of transmitted signals (ANSI C42.65.02.364).

Diplex Operation. Diplex operation is the simultaneous transmission or reception of two messages using a specified common feature, such as a single antenna or a single carrier (ANSI C42.65.02.190).

Duplex Operation. Duplex operation is the operation of transmitting and receiving apparatus at one location in conjunction with associated transmitting and receiving equipment at another location, the processes of transmission and reception being simultaneous (ANSI C42.65.02.187).

Simplex Operation. Simplex operation is a method of operation in which communication between two stations takes place in one direction at a time (ANSI C42.65.02.186).

NOTE: This includes ordinary transmit-receive operation, press-to-talk operation, voice-operated carrier and other forms of manual or automatic switching from transmit to receive.

Pair. Pair is a term applied in electric transmission to two like conductors employed to form an electric circuit (ANSI C42.65.04.147).

Patch. To patch is to connect circuits together temporarily by means of a cord, known as a patch cord (ANSI C42.65.02.393).

Patch Board. A patch board is a board or apnel where circuits are terminated in jacks for patching (ANSI C42.65.02.396).

Jack. A jack is a connecting device, ordinarily designed for use in a fixed location, to which a wire or wires of a circuit may be attached and which is arranged for the insertion of a plug (ANSI C42.65.06.630).

Pin Jack. A pin jack is a single-conductor jack having an opening for the insertion of a plug of very small diameter (ANSI C42.65.06.631).

Plug. A plug is a device, usually associated with a cord, which by insertion in a jack or receptacle establishes connection between a conductor or conductors associated with the plug and a conductor or conductors connected to the jack or receptacle (ANSI C42.65.06.626).

Banana Plug. A banana plug is a single-conductor plug with a spring metal tip which somewhat resembles a banana in shape (ANSI C42.65.06.627).

Plug-In. A communication device is termed plug-in when it is so designed that connections to the device may be completed through pins, plugs, jacks, sockets, receptacles, or other forms of ready connectors (ANSI C42.65.02.399).

Quad. A quad is a structural unit employed in cable, consisting of four separately insulated conductors twisted together (ANSI C42.65.04.150).

Radio Transmission. Radio transmission is the transmission of signals by means of radiated electromagnetic waves other than light or heat waves (ANSI C42.65.42.003).

Relay Station. Radio stations that rebroadcast signals the instant they are received, so that the signal can be passed onto another station outside the range of the originating transmitter (APCO Specs. 8-71, Glossary).

Repeater Station. An operational fixed station established for the automatic retransmission of radio communications received from any station in the mobile service (APCO Specs. 8-71, Glossary).

Shield. A shield is a housing, screen, or other object, usually conducting, which substantially reduces the effect of electric or magnetic fields on one side thereof, upon devices or circuits on the other side (ANSI C42.65.02.381).

Telephone Sidetone. Telephone sidetone is the transmission and reproduction of sounds through a local path from transmitting transducer to the receiving transducer of the same telephone set in order that the talker may hear his voice in the receiver (Mil-Std-188C, p. 41).

Transmission System. In communication practice, a transmission system is an assembly of elements capable of functioning together to transmit signal waves (ANSI C42.65.02.135).

TRANSMITTER

Transmitter. A transmitter is a device for converting audio signals into required modulated radio frequency output signals. In this standard, the transmitter includes the antenna changeover device but does not include: (a) the antenna system; (b) the audio input transducer.

In those cases where transmitters are equipped with special function sub-systems, such as continuous tone coded squelch or selective signalling, the sub-systems shall be disabled. This standard does not provide for testing of transmitters which include sub-systems that cannot be disabled or by-passed.

This standard will be limited to measurements of single channel voice modulated transmitters, (non-multiplex). "Personal" portable type transmitters employing integral antennas and audio input devices are not included (EIA RS-152-B, p. 1).

Transmitter Audio Frequency Harmonic Distortion. The audio frequency harmonic distortion is the change in harmonic content of the input signal as a result of passing through the audio and RF circuits of the transmitter (EIA RS-316, p. 9).

Transmitter Audio Frequency Response. The term "audio frequency response" denotes the degree of closeness to which the frequency deviation of the transmitter follows a 6 db octave pre-emphasis characteristic from 300 to 3000 cps (EIA RS-316, p. 9).

Transmitter-Carrier Attack Time. Transmitter attack time is the time required to produce carrier power output after operation of the transmitter control switch (EIA RS-152-B, p. 17).

Carrier Frequency Range of a Transmitter. The carrier frequency range of a transmitter is the continuous range of frequencies within which the transmitter may be adjusted for normal operation. A transmitter may have more than one carrier frequency range (ANSI C42.65.42.096).

Carrier-Frequency Range of a Transmitter. The continuous range of frequencies within which the transmitter may be adjusted for normal operation. A transmitter may have more than one carrier-frequency range (IEEE No. 182, p. 487).

Carrier Frequency Stability of a Transmitter. The carrier frequency stability of a transmitter is a measure of the ability of the transmitter to maintain an assigned frequency (ANSI C42.65.42.102).

Transmitter Carrier Frequency Stability. The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency (EIA RS-316, p. 10).

Crystal-Controlled Transmitter. A crystal-controlled transmitter is a radio transmitter whose carrier frequency is directly controlled by a crystal oscillator (ANSI C42.65.42.060).

Crystal-Controlled Transmitter or Receiver. A radio transmitter or receiver in which the carrier frequency is controlled directly by a crystal oscillator (APCO Specs. 8-71, Glossary).

Crystal-Stabilized Transmitter. A crystal-stabilized transmitter is a radio transmitter employing automatic frequency control in which the reference frequency is that of a crystal oscillator (ANSI C42.65.42.063).

Fixed Transmitter. A fixed transmitter is a transmitter that is operated in a fixed or permanent location (ANSI C42.65.42.021).

Fixed Transmitter. A transmitter that is operated in a fixed or permanent location (IEEE No. 182, p. 487).

Fixed-Frequency Transmitter. A fixed-frequency transmitter is a transmitter designed for operation on a single carrier frequency (ANSI C42.65.42.078).

Fixed-Frequency Transmitter. A transmitter designed for operation on a single carrier frequency (IEEE No. 182, p. 487).

Frequency Tolerance of a Radio Transmitter. The frequency tolerance of a radio transmitter is the extent to which the carrier frequency of the transmitter may be permitted to depart from the frequency assigned (ANSI C42.65.42.099).

Transmitter AM Hum and Noise Level. The AM Hum and Noise Level on the carrier is the ratio of the peak AC voltage to the DC voltage detected from the carrier (EIA RS-316, p. 9).

Transmitter FM Hum and Noise Level. The term "FM Hum and Noise Level" is the ratio of residual frequency modulation to standard test modulation measured on the standard test receiver (EIA RS-316, p. 9).

Mobile Transmitter. A radio transmitter designed for installation in a vehicle and normally operated while in motion (IEEE No. 182A, p. 4).

Mobile Transmitter. A mobile transmitter is a radio transmitter designed for installation in a vessel, vehicle or aircraft and normally operated while in motion (ANSI C42.65.42.024).

Amplitude-Modulated Transmitter. An amplitude-modulated transmitter is a transmitter which transmits an amplitude-modulated wave (ANSI C42.65.42.039).

NOTE: In most amplitude-modulated transmitters the frequency is stabilized.

Frequency-Modulated Transmitter. A frequency-modulated transmitter is a transmitter which transmits a frequency-modulated wave (ANSI C42.65.42.054).

Phase-Modulated Transmitter. A phase-modulated transmitter is one which transmits a phase-modulated wave (ANSI C42.65.42.057).

Transmitter Modulation Limiting. Modulation limiting refers to the ability of the transmitter circuits to prevent the transmitter from producing deviations due to modulation in excess of rated system deviation (EIA RS-316, p. 9).

Multi-Channel Transmitter. A multi-channel transmitter is a radio transmitter having two or more complete radio-frequency portions capable of operating on different frequencies either individually or simultaneously (ANSI C42.65.42.084).

Multi-RF-Channel Transmitter. A radio transmitter having two or more complete radio-frequency portions capable of operating on different frequencies either individually or simultaneously (IEEE No. 182, p. 487).

Multi-Frequency Transmitter. A multi-frequency transmitter is a radio transmitter capable of operating on two or more selectable frequencies, one at a time, using pre-set adjustments of a single radio-frequency portion (ANSI C42.65.42.081).

Multi-Frequency Transmitter. A radio transmitter capable of operating on two or more selectable frequencies, one at a time, using preset adjustments of a single radio-frequency portion (IEEE No. 182, p.487).

Push-To-Talk Operation (PTT) (Press-To-Talk). In telephone systems, that method of communication over a speech circuit in which transmission occurs from only one station at a time, the talker being required to keep a switch operated while he is talking (Mil-Std-188C, p. 33).

Portable Transmitter. A portable transmitter is a transmitter which can be carried on a person and may or may not be operated while in motion (ANSI C42.65.42.027).

NOTE: A portable transmitter as defined above has been called a transportable transmitter, but the designation portable is preferred.

Portable Transmitter. A transmitter which can be carried on a person and may or may not be operated while in motion (IEEE No. 182A, p.4).

NOTE: This has been called a transportable transmitter, but the designation portable is preferred.

Average Power Output of an Amplitude-Modulated Transmitter. The average power output of an amplitude-modulated transmitter is the radio-frequency power delivered to the transmitter output terminals averaged over a modulation cycle (ANSI C42.65.42.051).

Radio Transmitter. A radio transmitter is a device for producing radio-frequency power, for purposes of radio transmission (ANSI C42.65.42.018).

Radio Transmitter. A radio-frequency power source which generates radio waves for transmission through space (APCO Specs. 8-71, Glossary).

Double-Sideband Transmitter. A double-sideband transmitter is a transmitter whose output contains both of the sidebands which result from the modulation of the carrier by the modulating signal. In most instances it also contains a larger carrier component (ANSI C42.65.42.042).

Double-Sideband Transmitter. A transmitter which emits sidebands whose amplitude and phase relationships are characteristic of amplitude modulation (IEEE No. 182A, p. 3).

Transmitter Sideband Spectrum. The term Transmitter Sideband Spectrum denotes the sideband energy produced at a discrete frequency separation from the carrier due to all sources of unwanted noise within the transmitter in a modulated condition (EIA RS-152-B, p. 15).

Telephone Transmitter. A telephone transmitter is a microphone for use in a telephone system (ANSI C42.65.14.078).

Carbon Telephone Transmitter. A carbon telephone transmitter is a telephone transmitter which depends for its operation upon the variation in resistance of carbon contacts (ANSI C42.65.14.081).

Transportable Transmitter. A transmitter designed to be readily carried or transported from place to place, but which is not normally operated while in motion (IEEE No. 182A, p. 4).

NOTE: This has been commonly called a portable transmitter but the term transportable transmitter is preferred.

Transportable Transmitter. A transportable transmitter is a transmitter designed to be readily carried or transported from place to place, but which is not normally operated while in motion (ANSI C42.65.42.030).

NOTE: This has been called a portable transmitter but the term transportable transmitter is preferred.

Transceiver. A transceiver is the combination of radio transmitting and receiving equipment in a common housing, usually for portable or mobile use, and employing common circuit components for both transmitting and receiving (ANSI C42.65.42.135).

TUNING

Alignment. In communication practice, alignment is the process of adjusting a plurality of components of a system for proper interrelationship. The term is applied especially to (1) the adjustment of the tuned circuits of an amplifier for desired frequency response, and (2) the synchronization of components of a system (ANSI C42.65.02.333).

Tuning. Tuning is the adjustment in relation to frequency of a circuit or system to secure optimum performance; commonly the adjustment of a circuit or circuits to resonance (ANSI C42.65.02.327).

Double-Tuned Circuit. A double-tuned circuit is one whose response is the same as that of two single-tuned circuits coupled together (ANSI C42.65.06.581).

Quiet Tuning. Quiet tuning is a circuit arrangement for silencing the output of a radio receiver except when the receiver is accurately tuned to an incoming carrier wave (ANSI C42.65.42.187).

Slug Tuning. Slug tuning is a means for varying the frequency of a resonant circuit by introducing a slug of material into either the electric or magnetic fields or both (ANSI C42.65.02.330).

Single-Tuned Circuit. A single-tuned circuit is one which may be represented by a single inductance and a single capacitance, together with associated resistances (ANSI C42.65.06.580).

Staggering. Staggering is the offsetting of two channels of different carrier systems from exact sideband frequency coincidence in order to avoid mutual interference (ANSI C42.65.08.270).

Tuner. A tuner is, in the broad sense, a device for tuning. Specifically, in radio receiver practice it is (1) a packaged unit capable of producing only the first portion of the functions of a receiver and delivering either RF, IF or demodulated information to some other equipment, or (2) that portion of a receiver which contains the circuits that are tuned to resonance at the received signal frequency and those which are tuned to local oscillator frequency (ANSI C42.65.06.309).

VOLTAGE

Voltage Divider. A voltage divider is a resistor or reactor connected across a voltage and tapped to make available a fixed or variable fraction of the applied voltage (ANSI C42.65.06.441).

NOTE: An adjustable voltage divider of the resistive type is frequently referred to as a potentiometer.

Voltage Doubler. A voltage doubler is a voltage multiplier which separately rectifies each half cycle of the applied alternating voltage and adds the two rectified voltages to produce a direct voltage whose amplitude is approximately twice the peak amplitude of the applied alternating voltage (ANSI C42.65.06.336).

Forward Voltage. Forward voltage is voltage of that polarity which produces the larger current (ANSI C42.65.06.314).

Grid Voltage Supply. The grid voltage supply of an electron tube is the means for supplying to the grid of the tube a potential which is usually negative with respect to the cathode (ANSI C42.65.06.168).

Bias. To bias is to influence or dispose to one direction, as, for example, with a direct voltage or with a spring (ANSI C42.65.02.369).

Automatic Grid Bias. Automatic grid bias is grid bias provided by the difference of potential across resistance in the grid or cathode circuit, due to grid or cathode current, or both (ANSI C42.65.06.265).

Voltage Multiplier. A voltage multiplier is a rectifying circuit which produces a direct voltage whose amplitude is approximately equal to an integral multiple of the peak amplitude of the applied alternating voltage (ANSI C42.65.06.335).

Reverse Voltage. Reverse voltage is voltage of that polarity which produces the smaller current (ANSI C42.65.06.316).

Ripple Voltage. The alternating-voltage component from a direct-current power supply arising from sources within the power supply (IEEE No. 182A, p. 4).

VOLUME

Automatic Volume Control (AVC). Automatic volume control is a method of automatically obtaining a substantially constant audio output volume over a range of variation of input volume. The term is also applied to a device for accomplishing this result (ANSI C42.65.06.200).

Volume Limiter. A volume limiter is a device which automatically limits the output volume of speech or music to a predetermined maximum value (ANSI C42.65.06.224).

Quiet AVC. Quiet avc is automatic volume control which is arranged to be operative only for signal strengths exceeding a certain value, so that noise or other weak signals encountered when tuning between strong signals are suppressed (ANSI C42.65.42.188).

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