BSS

Broadcasting Satellite Service. Typically used to refer to a range of frequencies intended for direct reception of satellite television and entertainment services. These frequencies are subject to internationally-agreed regulations that govern their use and are designed to ensure that all countries are able to offer services of this nature. In Europe, the BSS downlink frequency range is 11.7 - 12.5 GHz.

C/(N+I)

Carrier-to-Noise-plus-Interference-Ratio. A measure of the quality of a signal at the receiver input. It is the ratio of the power of the carrier to the combined power of noise and man-made interference, measured within a specified bandwidth (usually the modulated carrier's bandwidth). It is usually expressed in decibels. The higher the ratio, the better quality of the received signal.

C/I

Carrier-to-Interference-Ratio. A measure of the quality of a signal at the receiver input. It is the ratio of the power of the carrier to the power of interference arising from man-made sources, measured within a specified bandwidth (usually the modulated carrier's bandwidth). It is usually expressed in decibels. The higher the ratio, the better quality of the received signal.

C/N

Carrier-to-Noise-Ratio. A measure of the quality of a modulated carrier at the receiver input. It is the ratio of the power of the carrier to the power of the noise introduced in the transmission medium, measured within a specified bandwidth (usually the modulated carrier's bandwidth). It is usually expressed in decibels. The higher the ratio, the better quality of the received carrier.

Capacity

A proportion of the satellite's bandwidth and power which is used to establish one or more communication channel.

Channel

A band of radio frequencies assigned for a particular purpose, usually for the establishment of one complete communication link, or a path for an electrical signal. This term is often used interchangeably with Transponder, but in general the channel bandwidth is less than the transponder bandwidth.

Circular Polarisation

A circularly-polarised wave, in which the electric field vector, observed in any fixed plane normal to the direction of propagation, rotates with time and traces a circle in the plane of observation. Unlike linear polarisation, circular polarisation does not require alignment of earth station and satellite antennas with the polarisation of the radio waves.

Clarke Belt

The circular orbit at approximately 35,800 km above the equator, where the satellites travel at the same speed as the earth's rotation (Geostationary Orbit) and thus appear to be stationary to an observer on Earth. Named after Arthur C. Clarke who first postulated the idea of geostationary communication satellites.

Colocated

Two or more satellites occupying approximately the same geostationary orbital position such that the angular separation between them is very small when viewed from the ground. The satellites appear to be exactly collocated to a small receiving antenna. In reality, the satellites are kept several kilometres apart in space to avoid collisions. An example of a collocated satellite system is the HOTBIRD system located at the 13º East geostationary orbital position.

Community Reception

The reception of satellite television and entertainment services for distribution to a group of the general public at one location (e.g. in a block of flats), or through a distribution system covering a limited area (e.g. a local cable network). The receiving system is usually more complex with a larger antenna than that used for individual (Direct-To-Home) reception.

Conditional Access (CA)

A system for restricting access to a particular service to authorised users only (e.g. subscribers to a particular digital bouquet, purchasers of individual pay-per-view events), by means of encryption and authorised decoding.

Coverage

The geographical area in which satellite signals can be transmitted or received with sufficient quality when using appropriately sized earth stations. Satellite coverages are usually communicated in the form of footprints displaying satellite G/T, EIRP or other quantity, such as the antenna size required for good quality reception of a particular service.

Cross Modulation

Interference caused by the modulation of one carrier affecting another signal. It is usually due to nonlinear device operation, which can be caused by overloading an amplifier, and is worsened by signal power level imbalances (e.g. at the receiver input in the head-end of a cable distribution network).

Cross-Polar

Used to refer to a signal that has the opposite (orthogonal) polarisation to a given signal.

Cross-Polar Discrimination (XPD)

The ratio of the signal power received (or transmitted) by an antenna on one polarisation (the polarisation of the desired signal) to the signal power received (transmitted) on the opposite polarisation. This ratio is usually expressed in decibels. It is a measure of the ability of the antenna to detect (emit) signals on one polarisation and to reject signals at the same frequency having the opposite polarisation.

Cross-Polar Isolation (XPI)

The ratio of the signal power received (or transmitted) by an earth station on one polarisation (the desired signal) to the signal power received (transmitted) on the same polarisation but originating from a cross-polar signal. This ratio is usually expressed in decibels. It is a measure of interference from cross-polar signals into the desired signal, which occurs in all practical systems that exploit both orthogonal polarisation. Strictly speaking, the terms "cross-polar isolation" and "cross-polar discrimination" have different meanings but are often used interchangeably.

DBS

Direct Broadcast Satellite. A general term that is commonly used to describe satellites and satellite systems that broadcast information directly to individual end-users.

Direct-to-Home (DTH)

The process of delivering satellite signals directly to individual households, or receiving satellite signals directly in the home via an individual reception system (dish).

Downlink

The part of a satellite communications link that involves signal (re-) transmission from the satellite and reception on the ground. See also Uplink.

DVB

Digital Video Broadcasting. A coherent set of European standards for transmission and reception of digital television signals via satellite, cable or terrestrial means, developed under the auspices of the Digital Video Broadcasting project and formalised by the European Telecommunication Standards Institute (ETSI). Although European, the standards have been adopted in many countries worldwide. There are many standards within the DVB family, including specifications for satellite (DVB-S), cable (DVB-C) and terrestrial (DVB-T) transmission and reception.

Earth Station

An installation (antenna and associated equipment) located on the earth's surface and intended for communication with one or more satellites. The term is usually understood to refer to the ensemble of equipment that is needed to effect communications via satellite.

Eclipse

The total or partial obscuring of one celestial body by another. The events that most affect satellites are eclipses of the Sun by the Earth or the Moon, which deprive the satellite of its usual source of power (solar energy) and cause it to cool down rapidly because it is no longer heated by the Sun. The satellite is designed to cope with such extreme events. Normally, there is no effect on the communications services provided by the satellite during eclipse.

EIRP

Effective Isotropic Radiated Power. A measure of the signal strength that a satellite transmits towards the earth, or an earth station towards a satellite, expressed in dBW.

Elevation

The angle measured in the local vertical plane between the satellite and the local horizon. It is the vertical co-ordinate that is used to align a satellite antenna. See also Azimuth.

EPG

Electronic Programme Guide. A graphical user interface generated by a digital satellite receiver and displayed on the user's television screen. It provides information on the timing and content of television programmes, which is conveyed in the digital signals received from the satellite. Its primary purpose is to help the user to rapidly identify and select programmes of interest, but it may also support other interactive services.

Figure of Merit

The ratio of the maximum gain of a receiving antenna to the receiving system's equivalent noise temperature. This value is usually expressed in dB/K. It is a measure of the ability of an earth station to receive a satellite signal with good quality (high carrier-to-noise ratio). In general, the G/T increases with increasing antenna diameter.

Fixed Assignment

The assignment of fixed amounts of satellite capacity to particular earth stations regardless of their traffic requirements, which may fluctuate over a period of time. See also On-Demand Assignment.

Frequency Reuse

A technique for utilising a specified range of frequencies more than once within the same satellite system so that the total capacity of the system is increased without increasing its allocated bandwidth. Frequency reuse schemes require sufficient isolation between the signals that use the same frequencies so that mutual interference between them is controlled to an acceptable level. Frequency reuse is achieved by using orthogonal polarisation states (horizontal/vertical for linear, or LHC/RHC for circular) for transmission and/or by using satellite antenna (spot) beams that serve separate, non-overlapping geographic regions.

FSS

Fixed Satellite Service. In general, this refers to any satellite communication service between earth stations located at fixed geographic positions. However, this term is often used to refer to the "unplanned" frequency bands that are not subject to the internationally-agreed regulations that govern the use of the BSS frequencies. The downlink FSS frequencies in Europe are 10.7 - 11.7 GHz and 12.5 - 12.75 GHz.

G/T

See Figure of Merit.

Gain (Antenna)

A measure of the amplifying or focussing power of an antenna when transmitting to, or receiving from, a particular direction in space. The gain of an antenna is the ratio of the power radiated (or received) per unit solid angle by the antenna in a given direction to the power radiated (or received) per unit solid angle by an isotropic antenna fed with the same power. The gain is usually expressed in dBi.

Geostationary

An object orbiting the earth at such speed that it appears to remain stationary with respect to the earth's surface. See also Clarke Belt.

Geostationary Orbit

The orbit of a geosynchronous satellite whose orbit lies in the plane of the earth's equator.

Geostationary Satellite

A satellite that appears to be located at a fixed point in space when viewed from the earth's surface.

Geosynchronous

An object orbiting the earth at the earth's rotational speed and with the same direction of rotation. The object will appear at the same position in the sky at a particular time each day, but will not appear stationary if not orbiting in the equatorial plane.

Ground Segment

The ground segment consists of all the earth stations that are operating within a particular satellite system or network. These can be connected to the end-user's equipment directly or via a terrestrial network.

Ground Station

An alternative expression for Earth Station.

High band

The upper part of the Ku-band downlink frequency range, from 11.7 GHz to 12.75 GHz.

Horizontal Polarisation

Type of linear polarisation where the electric field is approximately aligned with the local horizontal plane at an on-ground transmission or reception point. See also frequency reuse.

HPA

High Power Amplifier. A device that accepts a relatively weak input signal and boosts it to a power level that is suitable for transmission over an earth-space link.

Inclination

The angle between the plane of the orbit of a satellite and the Equatorial plane. A orbit of a perfectly-geostationary satellite has an inclination of 0 degrees.

Inclined Orbit

An orbit that approximates the geostationary orbit but whose plane is tilted slightly with respect to the Equatorial plane, with the consequence that the satellite appears to move about its nominal position in a daily "figure-of-eight" motion when viewed from the ground. Satellites are often allowed to drift into an inclined orbit near the end of their nominal lifetime in order to conserve fuel on-board the satellite, which would otherwise be used to correct this natural drift caused by the gravitational pull of the Sun and the Moon.

Interference

Any undesired signal that tends to interfere with the reception of radio waves. It can be caused by transmissions within the same satellite system, by transmissions within other satellite systems that use the same frequencies, or from ground-based sources (e.g. point-to-point radio links, car ignition noise, etc.).

Intermodulation

Mutual interference between signals spaced apart in frequency after non-linear amplification by a common amplifier. In satellite communication systems the phenomenon of intermodulation is usually only significant after the high power amplifier in an earth station or a satellite transponder. It is controlled by means of the IBO/OBO of the amplifier.

IRD

Integrated Receiver-Decoder. A indoor device accepting signals from at least one LNB, which recovers the original signal from the signal delivered by the LNB. It includes a built-in decoder for reception of services that are protected by a Conditional Access system, subject to authorisation from the service provider. A plug-in "smart card" is often used for authorisation purposes.

Ka-Band

The range of frequencies that are available for use by satellite communication systems at around 30 GHz for the uplink and 20 GHz for the downlink. The Ka-band is used in particular for satellite internet services and regional broadcasting.

Ku-Band

The range of frequencies attributed to satellite communication systems, around 14 GHz or 18 GHz for the uplink, and 11 to 12 GHz for the downlink. The Ku-band is often used for television services via satellite and for VSAT networks.

LHC(P)

Left-hand polarised wave. An elliptically- or circularly-polarised wave, in which the electric field vector, observed in any fixed plane normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a left-hand or anticlockwise direction.

Linear Polarisation

Describes a wave in which the electric field vector, observed in any fixed plane normal to the direction of propagation, maintains a constant direction with time. With linear polarisation, the earth station and satellite antennas of a particular earth-space link must be precisely aligned so that their reference polarisation directions coincide, in order to obtain maximum reception quality.

Low Band

The lower part of the Ku-band downlink frequency range, from 10.7 GHz to 11.7 GHz.

Margin

The difference in decibels between the C/(N+I) achieved at the receiver input under clear sky conditions to the minimum C/(N+I) required for just acceptable transmission quality.

MCPC

Multiple Channel Per Carrier. Refers to the multiplexing of a number of digital channels (video programmes, audio programmes and data services) into a common digital bit stream, which is then used to modulate a single carrier that conveys all of the services to the end user. The single carrier supports multiple communication channels, hence the phase "multiple channel per carrier". The term MCPC is frequency used in the context of DVB systems, where the composite digital signal is referred to as a Transport Stream.

Multibeam

Generally refers to the use of multiple antenna beams on board the satellite to cover a contiguous geographical area, instead of a single wide-area beam. Multibeam architectures are often considered for satellites operating in the Ka-band, which is characterised by narrower beamwidths with respect to the Ku-band. Single, wide-area beams predominate in the latter.

Multicrypt

DVB conditional access option based on a detachable Conditional Access (CA) module, which is supplied by the service provider to each subscriber. The CA module is connected to the subscriber's IRD via a standardised interface (the DVB Common Interface). Multicrypt has the advantage that the same IRD can be used to receive services from providers using different and incompatible conditional access systems.

Noise

Any undesired electrical disturbance in a circuit or communication channel. When combined with a received signal, it affects the receiver's ability to correctly reproduce the original signal. Also known as Thermal Noise.

On-Demand Assignment

The assignment of variable amounts of satellite capacity to particular earth stations according to their fluctuating traffic requirements (according to demand). See also Fixed Assignment. On-demand assignment offers more efficient satellite capacity utilisation at the expense of system complexity.

Outage

An outage is said to occur when the quality of a telecommunication service or communications link falls below a specified minimum value for acceptable communications performance. See also Availability.

Out-of-Band Emission

Any emission on a frequency or frequencies outside the bandwidth of a signal which results from the modulation process. Out-of-band emissions are a potential source of interference to other services and need to be carefully controlled.

Payload (Satellite)

Refers to all equipment on-board a satellite that is dedicated to the reception, frequency conversion, processing and retransmission of communication signals, including the satellite antennas, but excluding support equipment such as the platform (physical structure), power supplies and thermal control equipment.

Pay-Per-View

The purchasing of programmes and services by a television viewer or service user on an individual basis (e.g. televised coverage of a sports event). Access to purchased material is controlled by means of a Conditional Access system.

Pointing Angles

The elevation and azimuth angles which specify the direction of a satellite from a point on the earth's surface.

Pointing Error (Antenna)

A value which quantifies the amount by which an antenna is misaligned with the satellite's position in space (see Alignment). This is either expressed as an angular error, or as a loss in signal strength with respect to the maximum that would be achieved with a perfectly aligned antenna.

Polarisation

The phenomenon in which radio waves are restricted to certain directions of electrical and magnetic field variations, where these directions are perpendicular to the direction of wave travel. By convention, the polarisation of a radio wave is defined by the direction of the electric field vector. Four senses of polarisation are used in satellite transmissions: horizontal (X) linear polarisation, vertical (Y) linear polarisation, right-hand circular polarisation and left-hand circular polarisation.

Repeater

A device that amplifies or augments incoming electrical signals and retransmits them towards the earth station(s) at a different frequency. In the satellite context, the term "repeater" usually refers to all Payload equipment, with the exception of the satellite antennas.

RHC(P)

Right-hand polarised wave. An elliptically- or circularly-polarised wave, in which the electric field vector, observed in any fixed plane normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a right-hand or clockwise direction.

S/N

Signal-to-Noise Ratio. A measure of the quality of an electrical signal, usually at the receiver output. It is the ratio of the signal level to the noise level, measured within a specified bandwidth (typically the bandwidth of the signal). It is usually expressed in decibels. The higher the ratio, the better quality of the signal. See also C/N.

Satellite Link

A radio link between a transmitting earth station and a receiving earth station through a communications satellite. A satellite link comprises one uplink and one downlink.

Saturation

The operation of a power amplifier, most often a satellite TWTA, at its maximum output power level ("saturated" power level).

SCPC

Single Channel Per Carrier. In SCPC systems, each communication signal is individually modulated onto its own carrier which is used to convey that signal to the end user. A number of similar carriers share a common satellite transponder and use a unique portion of its bandwidth. Each carrier supports a single communication channel only (e.g. one-half of a voice circuit), hence the phrase "single channel per carrier".

Shaped Beam

The radiation pattern of a satellite antenna that has been designed so that its footprint follows the boundary of a specified geographical area (the area of service provision) as closely as possible. Shaped beams maximise the antenna gain over the service area and reduce the likelihood of interference into systems serving other geographical areas.

Simulcast

Simultaneous transmission of an identical programme or service using two or more standards or transmission media. Used to refer to a technique pioneered by Eutelsat for transmitting one broadcast analogue FM television carrier and one digital television carrier in a single satellite transponder that would normally only support the FM TV carrier.

SMATV

Satellite Master Antenna TV. Collective television reception and distribution system serving a local population of users collocated in a block of flats, a hotel or other group-housing complex. SMATV systems use one or more high quality, centrally located antenna to receive the satellite signals, plus UHF and/or VHF antennas to receive local terrestrial broadcast services. The satellite and terrestrial signals are distributed to the end-users via a dedicated cable distribution network. Several different cable distribution architectures are possible.

Spot Beam

An antenna radiation pattern designed to serve a relatively small or isolated geographic area, usually with high gain. The radio frequency equivalent of a spotlight.

Spurious Emission