

RECOMMENDATION ITU-R F.592-3*

Vocabulary of terms for the fixed service**

(1982-1986-1990-2002)

The ITU Radiocommunication Assembly,

considering

that there is a need for clear definition of terminology, used in ITU-R Recommendations and other texts, in order to use them in an unambiguous way,

noting

that Recommendation ITU-R F.1399 also contains vocabulary of terms for wireless access (WA),

recommends

that the following definitions be used in the texts relating to the fixed service:

1 Terms relating to radio transmission

1.1 Fixed wireless system (FWS)

F: *Système hertzien fixe*

S: *Sistemas inalámbricos fijos*

Telecommunication systems operating in the fixed service including, for example, radio-relay systems, HF systems, and systems using high altitude platform stations (HAPS), and which support a range of applications such as access and core transport (see Note 1).

NOTE 1 – The Radio Regulations (RR) indicate that the fixed service uses electromagnetic waves arbitrarily limited up to 3 000 GHz; however it is anticipated that the term “fixed wireless system” could also include the use of optical signals without artificial guide.

1.2 Radio-relay system

F: *Faisceau hertzien*

S: *Sistema de radioenlaces*

Radiocommunication system in the fixed service operating at frequencies above about 30 MHz which uses propagation in the atmosphere and which may include one or more intermediate stations (see Note 1).

NOTE 1 – The term “radio-relay system”, found in a number of ITU-R Recommendations, can refer, in certain cases, to both radio-relay systems, as defined above, and other types of systems in the fixed service. The more general term of fixed wireless system (FWS) as given in *recommends* 1.1 will be used in future. The process to amend, where appropriate, the terminology in ITU-R Recommendations will be undertaken in an evolutionary manner.

* This Recommendation should be brought to the attention of the Coordination Committee for Vocabulary (CCV).

** Other terms, together with their definitions, relating to radiocommunications and telecommunications in general, are contained in Recommendations ITU-R V.573 and ITU-R V.662.

1.3 High-density applications in the fixed service (HDFS)

F: Applications haute densité dans le service fixe (HDFS)

S: Aplicaciones de alta densidad en el servicio fijo (HDFS)

A significant level of deployment of point-to-point (P-P) and/or multipoint (MP) systems within a given area.

NOTE 1 – These systems are generally intended to support broadband applications.

NOTE 2 – MP systems cover either point-to-multipoint (P-MP) or multipoint-to-multipoint (MP-MP) systems.

1.4 High altitude platform station (HAPS)

F: Station placée sur une plate-forme à haute altitude (HAPS)

S: Estación en plataforma a gran altitud (HAPS)

A station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth.

(See RR No. 1.66A.)

1.5 Fixed wireless access (FWA)

F: Accès hertzien fixe (AHF)

S: Acceso inalámbrico fijo (FWA)

Fixed wireless system application in which the location of the *end-user termination* and the network access point to be connected to the end-user are fixed.

(See Recommendation ITU-R F.1399.)

1.6 Trans-horizon radio-relay system

F: Faisceau hertzien transhorizon

S: Sistema de radioenlaces transhorizonte

Radio-relay system using *trans-horizon* tropospheric *propagation*, mainly forward scatter.

NOTE 1 – Recommendation ITU-R P.310 gives a definition for *trans-horizon* (tropospheric) *propagation*.

1.7 Point-to-point communication

F: Communication point à point

S: Comunicación punto a punto

Communication provided by a single connection, for example, a radio-relay link between two stations located at specified fixed points or multiple cascaded links made by a number of intermediate repeaters with or without partial payload drop-insert.

1.7.1 Terminal station (point-to-point)

F: Station terminale (point à point)

S: Estación terminal (punto a punto)

A station where the payload is assembled (disassembled) with (from) radio-system specific control and service channels and sent on a single or multiple channel radio connection. The connection can be unprotected or protected by a radio channel protection switching on a 1:1 or n:m basis.

1.7.2 Repeater station (point-to-point)

F: Station de répéteur (point à point)

S: Estación repetidora (punto a punto)

A station where the payload is passed through mainly transparently.

Repeaters could be “non-regenerative” when the signal is only filtered and amplified, with or without down and up conversions (e.g. in some analogue FDM systems) or “regenerative” when, in digital applications, the signal is demodulated and re-modulated before transmission to the next radio hop.

Passive repeaters implemented without any active radio component (e.g. two-directional antenna connected back-to-back, reflector, etc.) are also utilized.

1.7.3 Drop-insert (of a payload)

F: Extraction-insertion (d'une charge utile)

S: Extracción-inserción (de una carga útil)

A functionality provided in analogue and digital repeaters, where only radio-system specific control and service channels and possibly part of the payload is made available for local traffic and system management and maintenance.

1.8 Point-to-multipoint communication

F: Communication point à multipoint

S: Comunicación punto a multipunto

Communication provided by multiple links in the same geographical area, for example, radio links between a single station located at a specified fixed point and a number of stations located at fixed points within the coverage area of the central station.

1.8.1 Digital radio concentrator (system)

F: Concentrateur en radiocommunications numériques (système)

S: Sistema concentrador de radiocomunicaciones digitales

Point-to-multipoint radio systems using multiple access techniques between a central station and several remote stations, in which the central station allocates the resources (e.g. time, frequencies and codes) to be shared among terminal stations on demand.

1.8.2 Central station

See Recommendation ITU-R F.1399.

1.8.3 Terminal station (point-to-multipoint)

See Recommendation ITU-R F.1399.

1.8.4 Repeater station (point-to-multipoint)

See Recommendation ITU-R F.1399.

1.9 Terms related to channel arrangements

1.9.1 (Orthogonal) co-channel

F: *Cocanal (orthogonal), cofréquence (orthogonale)*

S: *Cocanal (ortogonal)*

Refers to an arrangement of radio channels in a radio link in which the same nominal centre frequency is used on two orthogonal polarizations for the transmission of two signals, which may or may not be independent. See also Recommendation ITU-R F.746.

1.9.2 Alternated

F: *Alternée*

S: *Alternada*

Refers to an arrangement of radio channels in a radio link in which two adjacent channels are cross-polarized. See also Recommendation ITU-R F.746.

1.9.3 Interleaved

F: *Intercalée*

S: *Intercalada*

Refers to an arrangement of radio channels in a radio link in which additional channels are inserted between the principal channels, the centre frequencies of the additional channels being shifted by a specified value, which is a significant proportion, such as a half, of the channel bandwidth from the centre frequencies of the principal channels. See also Recommendation ITU-R F.746.

1.10 Terms related to diversity

1.10.1 Diversity reception

F: *Réception en diversité*

S: *Recepción por diversidad*

A reception method in which one resultant signal is obtained from several received radio signals which convey the same information but for which the radio path or the transmission channel differs by at least one characteristic such as frequency, polarization, position or angle of antennas.

NOTE 1 – The quality of the resultant signal can be higher than that of the individual signals, due to the partial decorrelation of propagation conditions over the different radio paths or transmission channels.

NOTE 2 – The term “time diversity” is sometimes used to refer to the repetition of a signal or part of a signal over a single radio path or transmission channel.

1.10.2 Order of diversity

F: *Ordre de diversité*

S: *Orden de diversidad*

The number of different radio signals used for diversity reception. For two signals, reception is said to be “double diversity”, and so on.

1.10.3 Space diversity reception

F: *Réception en diversité d'espace*

S: *Recepción con diversidad de espacio*

Diversity reception in which several antennas and associated receivers are used at appropriate distances from each other in a radio station.

NOTE 1 – For line-of-sight radio-relay systems, separation is generally vertical, whereas for trans-horizon radio-relay systems, it is generally horizontal.

1.10.4 Frequency diversity reception

F: *Réception en diversité de fréquence*

S: *Recepción con diversidad de frecuencia*

Diversity reception in which several radio channels are used with appropriate frequency separations.

NOTE 1 – If the channels are situated in different frequency bands, the frequency diversity is said to be “cross-band diversity”.

1.11 Cross polarization interference canceller (XPIC) (circuit)

F: *(Circuit) annuleur de brouillage de transpolarisation (XPIC)*

S: *Circuito cancelador de la interferencia de transpolarización (XPIC)*

Adaptive coupling circuit between two orthogonal co-frequency channels or two alternated adjacent channels, on the same link, used to reduce cross-polar interference, during adverse propagation conditions.

2 Terms relating to availability and error performance for digital paths and connections (See ITU-T Recommendations G.821, G.826, G.827 and G.828)

2.1 Availability performance

Availability performance: The ability of an item to be in the state to perform a required function at a given instant of time or at any instant of time within a given time interval, assuming that the external resources, if required, are provided.

Unavailable time: A period of unavailable time begins at the onset of ten consecutive severely errored second (SES) events. These ten seconds are considered to be part of unavailable time.

Available time: A new period of available time begins at the onset of ten consecutive non-SES events. These ten seconds are considered to be part of available time.

NOTE 1 – A bidirectional path (connection) is available if, and only if, both directions are available.

Availability ratio (symbol: AR): The proportion of time that is in the available state during an observation period. AR is calculated by dividing the total available time during the observation period by the duration of the observation period.

Unavailability ratio (symbol: UR) (converse of AR): The proportion of time that a path (connection) is in the unavailable state during an observation period. UR is calculated by dividing the total unavailable time during the observation period by the duration of the observation period.

Mean time between digital path outages (symbol: Mo): For a digital path portion is the average duration of any continuous interval during which the portion is available. Consecutive intervals of planned available time are concatenated.

Outage intensity (symbol: OI): The reciprocal of Mo.

2.2 Error performance

Errored bit

An inconsistency between a bit in a transmitted digital signal and the corresponding bit in the received digital signal.

Bit error ratio (symbol: BER)

F: Taux d'erreur binaire (symbole: TEB)

S: Proporción de bits erróneos (símbolo: BER)

For a binary digital signal, the ratio of the number of errored bits received to the total number of bits received over a given time interval.

Defect

A defect is a limited interruption of the ability of an item to perform a required function. It may or may not lead to maintenance action depending on the results of additional analysis.

2.2.1 Terms relating to international digital connections at a bit rate below the primary rate

Events

Residual bit error ratio (symbol: RBER)

F: Taux d'erreur binaire résiduel (symbole: TBER)

S: Proporción de bits erróneos residual (símbolo: RBER)

Bit error ratio in the absence of fading, including allowance for system-inherent errors, environment, aging effects and long-term interference.

Errored second (symbol: ES)

F: *Seconde avec erreurs, seconde entachée d'erreurs (symbole: SE)*

S: *Segundo con errores (símbolo: ES)*

A one-second period with one or more bits in error or at least one defect. Time interval of one second during which a given digital signal is received with one or more errors.

NOTE 1 – According to ITU-T Recommendations, an errored second is defined for each direction of a 64 kbit/s circuit-switched connection.

Severely errored second (symbol: SES)

F: *Seconde gravement entachée d'erreurs (symbole: SGE)*

S: *Segundo con muchos errores (símbolo: SES)*

A one-second period which has a bit error ratio $\geq 1 \times 10^{-3}$ or at least one defect.

Time interval of one second during which a given digital is received with an error ratio greater than 1×10^{-3} .

Degraded minute (symbol: DM)¹

F: *Minute dégradée (symbole: MD)*

S: *Minuto degradado (símbolo: MD)*

Time interval comprising m seconds, 60 of them being not severely errored seconds but for which the error ratio is greater than a specified value.

NOTE 1 – According to the former ITU-T Recommendation G.821 (year prior to 1996), a degraded minute is defined for each direction of a 64 kbit/s circuit-switched connection and the specified BER value is 1×10^{-6} . If the time interval includes n severely errored seconds, $m = 60 n$.

*Parameters***Errored second ratio (symbol: ESR)**

The ratio of ES to total seconds in available time during a fixed measurement interval.

Severely errored second ratio (symbol: SESR)

The ratio of SES to total seconds in available time during a fixed measurement interval.

2.2.2 Terms relating to international digital paths at a bit rate at or above the primary rate*Events***Errored block (symbol: EB)**

A block in which one or more bits are in error.

¹ This term has been deleted from ITU-T Recommendations and is no longer supported by ITU-R, but has been maintained in the present Recommendation because of possible reference.

Errorred second (symbol: ES)

A one-second period with one or more errored blocks or at least one defect.

Severely errored second (symbol: SES)

A one-second period which contains $\geq 30\%$ (see Note 1) errored blocks or at least one defect. SES is a subset of ES.

NOTE 1 – SES threshold for STM-0 and STM-1 multiplex sections is 15% (see ITU-T Recommendation G.829)

Background block error (symbol: BBE)

An errored block not occurring as part of an SES.

*Parameters***Errorred second ratio (symbol: ESR)**

The ratio of ES to total seconds in available time during a fixed measurement interval.

Severely errored second ratio (symbol: SESR)

The ratio of SES to total seconds in available time during a fixed measurement interval.

Background block error ratio (symbol: BBER)

The ratio of background block errors (BBE) to total blocks in available time during a fixed measurement interval. The count of total blocks excludes all blocks during SESs.

3 Terms relating to data transmission on analogue radio-relay systems**3.1 Data under voice (transmission) (symbol: DUV)**

F: (Transmission de) données infravocales (symbole: DUV)

S: (Transmisión de) datos en la parte inferior de la banda de base (símbolo: DUV)

A method of data transmission consisting of transmitting data within the base band of an analogue radio system, under the frequency band occupied by a frequency division multiplex signal.

3.2 Data above voice (transmission) (symbol: DAV)

F: (Transmission de) données supravocales (symbole: DAV)

S: (Transmisión de) datos en la parte superior de la banda de base (símbolo: DAV)

A method of data transmission consisting of transmitting data within the base band of an analogue radio system above the frequency band occupied by a frequency division multiplex signal.

NOTE 1 – Transmission is generally carried out by modulating a sub-carrier.

4 Terms relating to digital modulation

4.1 *n*-state quadrature amplitude modulation (symbol: *n*-QAM)

F: Modulation d'amplitude en quadrature à *n* états (symbole: MAQ-*n*)

S: Modulación de amplitud en cuadratura de *n* estados (símbolo: MAQ-*n*)

A type of modulation in which two carriers in phase quadrature are amplitude modulated by a digital signal, with a finite number of amplitude levels, and subsequently added to each other, the modulation effect being represented by a scatter of *n* points in an amplitude/phase diagram.

NOTE 1 – In many applications, *n* is equal to 2^{2p} , *p* being an integer.

4.2 Simple modulation

F: Modulation simple

S: Modulación simple

A digital modulation in which the RF signal can assume four or fewer values of frequency or phase or amplitude at the symbol sampling point.

4.3 Multi-level modulation

F: Modulation multiniveaux

S: Modulación multiniveles

A digital modulation in which the RF signal can assume more than four values of frequency or phase or amplitude at the symbol sampling point.

NOTE 1 – When the term “high level modulation” or “low level modulation” is used, it refers not to a modulation scheme but to the power level of the signal at the modulator input.

4.4 Multi-state modulation

F: Modulation multiétats

S: Modulación multiestados

A digital modulation in which the RF signal can assume more than four states of phase and amplitude at the symbol sampling point.

5 Acronyms and abbreviations

BER	Bit error ratio
BBE	Background block error
BBER	Background block error ratio
CATV	Community antenna television
DAV	Data above voice
DM	Degraded minute
DUV	Data under voice
ES	Errored second

ESR	Errored second ratio
FWA	Fixed wireless access
FWS	Fixed wireless system
HAPS	High altitude platform stations
HDFS	High density applications in the fixed service
ISDN	Integrated services digital network
LAN	Local area network
Mo	Mean time between digital path outage
MP	Multipoint systems (includes P-MP and MP-MP)
MP-MP	Multipoint-to-multipoint
<i>n</i> -QAM	<i>n</i> -state quadrature amplitude modulation
OI	Outage intensity
PLMN	Public land mobile network
P-MP	Point-to-multipoint
P-P	Point-to-point
PSDN	Public switched data network
PSTN	Public switched telephone network
RBER	Residual bit error ratio
SES	Severely errored second
SESR	Severely errored second ratio
UR	Unavailability ratio
WAN	Wide area network
