5i’

FASCICLE III.4

Recommendations G.700 to G.795

GENERAL ASPECTS OF DIGITAL TRANSMISSION SYSTEMS;

TERMINAL EQUIPMENTS

Blanc

MONTAGE: PAGE 2 = PAGE BLANCHE

SECTION 7

GENERAL ASPECTS OF DIGITAL TRANSMISSION SYSTEMS;

TERMINAL EQUIPMENTS

7.0 General

Recommendation G.700

FRAMEWORK OF THE SERIES G.700, G.800 AND G.900 RECOMMENDATIONS

(former Recommendation G.701 of Volume III of the Yellow Book)

SECTION 7 — *General aspects of digital transmission systems; terminal equipments*

7.0 General

G.700 Framework of the series G.700, G.800 and G.900 Recommendations

G.701 Vocabulary of digital transmission and multiplexing, and pulse code modulation (PCM) terms

G.702 Digital hierarchy bit rates

G.703 Physical/electrical characteristics of hierarchical digital interfaces

G.704 Functional characteristics of interfaces associated with network nodes

G.705 Characteristics required to terminate digital links on a digital exchange

G.706 Frame alignement and cyclic redundancy check (CRC) procedures relating to basic frame structures defined in Recommendation G.704

G.707 Synchronous digital hierarcy bit rates

G.708 Network node interface for the synchronous digital hierarchy

G.709 Synchronous multiplexing structure

7.1 Coding of analogue signals by pulse code modulation

G.711 Pulse code modulation (PCM) of voice frequencies

G.712 Performance characteristics of PCM channels between 4-wire interfaces at voice frequencies

G.713 Performance characteristics of PCM channels between 2-wire interfaces at voice frequencies

G.714 Separate performance characteristics for the encoding and decoding sides of PCM channels applicable to 4-wire voice-frequency interfaces

G.715 Separate performance characteristics for the encoding and decoding side of PCM channels applicable to 2-wire interfaces

7.2 Coding of analogue signals by methods other than PCM

G.721 32 kbit/s adaptive differential pulse code modulation (ADPCM)

G.722 7 kHz audio-coding within 64 kbit/s

G.723 Extensions of Recommendation G.721 ADPCM to 24 and 40 kbit/s for DCME application

G.724 Characteristics of a 48-channel low bit rate encoding primary multiplex operating at 1544 kbit/s

G.725 System aspects for the use of the 7 kHz audio codec within 64 kbit/s

7.3 Principal characteristics of primary multiplex equipment

G.731 Primary PCM multiplex equipment for voice frequencies

G.732 Characteristics of primary PCM multiplex equipment operating at 2048 kbit/s

G.733 Characteristics of primary PCM multiplex equipment operating at 1544 kbit/s

G.734 Characteristics of synchronous digital multiplex equipment operating at 1544 kbit/s

G.735 Characteristics of primary PCM multiplex equipment operating at 2048 kbit/s and offering synchronous digital access at 384 kbit/s and/or 64 kbit/s

G.736 Characteristics of a synchronous digital multiplex equipment operating at 2048 kbit/s

G.737 Characteristics of an external access equipment operating at 2048 kbit/s offering synchronous digital access at 384 kbit/s and/or 64 kbit/s

G.738 Characteristics of primary PCM multiplex equipment operating at 2048 kbit/s and offering synchronous digital access at 320 kbit/s and/or 64 kbit/s

G.739 Characteristics of an external access equipment operating at 2048 kbit/s offering synchronous digital access at 320 kbit/s and/or 64 kbit/s

7.4 Principal characteristics of second order multiplex equipments

G.741 General considerations on second order multiplex equipments

G.742 Second order digital multiplex equipment operating at 8448 kbit/s and using positive justification

G.743 Second order digital multiplex equipment operating at 6312 kbit/s and using positive justification

G.744 Second order PCM multiplex equipment operating at 8448 kbit/s

G.745 Second order digital multiplex equipment operating at 8448 kbit/s and using positive/zero/negative justification

G.746 Characteristics of second order PCM multiplex equipment operating at 6312 kbit/s

G.747 Second order digital multiplex equipment operating at 6312 kbit/s and multiplexing three tributaries at 2048 kbit/s

7.5 Principal characteristics of higher order multiplex equipments

G.751 Digital multiplex equipments operating at the third order bit rate of 34 | 68 kbit/s and the fourth order bit rate of 139 | 64 kbit/s and using positive justification

G.752 Characteristics of digital multiplex equipments based on a second order bit rate of 6312 kbit/s and using positive justification

G.753 Third order digital multiplex equipment operating at 34 | 68 kbit/s and using positive/zero/negative justification

G.754 Fourth order digital multiplex equipment operating at 139 | 64 kbit/s and using positive/zero/negative justification

G.755 Digital multiplex equipment operating at 139 | 64 kbit/s and multiplexing three tributaries at 44736 kbit/s

7.6 Principal characteristics of transcoder and digital circuit multiplication equipments

G.761 General characteristics of a 60-channel transcoder equipment

G.762 General characteristics of a 48-channel transcoder equipment

G.763 Digital circuit multiplication equipment using 32 kbit/s ADPCM and digital speech interpolation

7.7 Operations administration and maintenance features of transmission equipments

G.771 Q-interfaces and associated protocols for transmission equipment in the telecommunications management network (TMN)

G.772 Digital protocol monitoring points

7.9 Other terminal equipments

G.791 General considerations on transmultiplexing equipments

G.792 Characteristics common to all transmultiplexing equipments

G.793 Characteristics of 60-channel transmultiplexing equipments

G.794 Characteristics of 24-channel transmultiplexing equipments

G.795 Characteristics of codecs for FDM assemblies

SECTION 8 — *Digital networks*

8.0 General aspects of digital networks

G.801 Digital transmission models

G.802 Interconnection between networks based on different digital hierarchies and speech encoding laws

8.1 Design objectives for digital networks

G.810 Considerations on timing and synchronization issues

G.811 Timing requirements at the outputs of primary reference clocks suitable for plesiochronous operation of international digital links

G.812 Timing requirements at the outputs of slave clocks suitable for plesiochronous operation of international digital links

8.2 Quality and availability targets

G.821 Error performance of an international digital connection forming part of an integrated services digital network

G.822 Controlled slip rate objectives on an international digital connection

G.823 The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy

G.824 The control of jitter and wander within digital networks which are based on the 1544 kbit/s hierarchy

SECTION 9 — *Digital sections and digital line systems*

9.0 General

G.901 General considerations on digital sections and digital line systems

9.1 Digital line sections at hierarchical bit rates based on a rate of 1544 kbit/s

Recommendations G.911 to G.915 have been deleted

9.2 Digital sections at hierarchical bit rates based on a primary bit rate of 2048 kbit/s

G.921 Digital sections based on the 2048 kbit/s hierarchy

9.3 Digital line transmission systems on cable at non-hierarchical bit rates

G.931 Digital line sections at 3152 kbit/s

9.4 Digital line systems provided by FDM transmission bearers

G.941 Digital line systems provided by FDM transmission bearers

9.5 Digital line systems

G.950 General considerations on digital line systems

G.951 Digital line systems based on the 1544 kbit/s hierarchy on symmetric pair cables

G.952 Digital line systems based on the 2048 kbit/s hierarchy on symmetric pair cables

G.953 Digital line systems based on the 1544 kbit/s hierarchy on coaxial pair cables

G.954 Digital line systems based on the 2048 kbit/s hierarchy on coaxial pair cables

G.955 Digital line systems based on the 1544 kbit/s hierarchy on optical fibre cables

G.956 Digital line systems based on the 2048 kbit/s hierarchy on optical fibre cables

9.6 Digital section and digital transmission systems for ISDN customer access

G.960 Digital section for ISDN basic rate access

G.961 Digital transmission system on metallic local lines for ISDN basic rate access

(H.T.=OUI) **TAB.???** FICHIER: H.T. = **(34.TA.341.E)** (SANS FORMULES)

Tableaux: 2 — Tabulateurs: 1

d)

Formules: 0 — Tabulateurs: 0

TEXTE (tabulateurs)

E: D. 2 NF01/006 = OPM: 02

Primary group A D. 2 NF01/039 = OPM: 02

— D. 2 NF01/039 = OPM: 02

hetero D. 3 NF01/004 = OPM: 03

(cs,1) Disk 2 NF01/054 (OPM = 02)

(BT10) Disk 2 NF01/028 (OPM = 02)

(BT20) Disk 2 NF01/051 (OPM = 02)

(34.TE.01.E)

(A1.23e) / [26e] **FOLIOS: 7 — 44 (DO PRC.COSY.2)**

MEP **[PA1]** : OK= [1]

Saisie diskette 17.11.89 YB

ID + V´erif. + diskette MAJ + laser 19.12.89 KJ

Corr. LASER (1re ´epreuve) = 3eme

Espaces r´eserv´es + Transfert + Impr.

AJOUTER (PA1) (CL1,0,0,0) pour MEP

MEP + LASER 20.02.90 GH/PC

Corr. MEP

Insertion des tableaux (tabulateurs .)

BAT 5.04.90   PM

MAJ s/disquettes

Recommendation G.701

VOCABULARY OF DIGITAL TRANSMISSION AND MULTIPLEXING, AND PULSE CODE MODULATION (PCM) TERMS

1 Introduction

This Recommendation provides a vocabulary of terms and definitions that are appropriate to digital and pulse code modulation multiplexing and transmission systems.

A small number of the terms in the Recommendation are duplicated in Recommendation I.112. References to these definitions are given in parenthesis as an aid to ensuring consistency between the two Recommendations in the event of future amendments.

According to the conventions applied in this Recommendation any term in common usage, but whose use is deprecated in the sense defined, is shown after the recommended term as in the following example: ‘‘2026 controlled slip [slip]’’.

Where a truncated term is widely used in an understood context the complete term is quoted following the colloquial form, for example: ‘‘1007 circuit, telecommunication circuit’’.

Furthermore, any term which is in general use in addition to the principal term is shown after the principal term as in the following example: ‘‘6002 timing recovery (timing extraction)’’.

In the interest of standardization in the drafting of documents the following abbreviations are recommended:

kbit/s,

Mbit/s,

Gbit/s.

To avoid misinterpretation of the use of the point (.) and the comma (,) in different languages to separate the whole and decimal parts, it is recommended that the use of decimals should be avoided wherever possible. For example, ‘‘2048 kbit/s’’ is preferred to ‘‘2.048 Mbit/s’’ or ‘‘2,048 Mbit/s.

Annex A to this Recommendation contains an alphabetical list of all of the terms defined in this Recommendation.

2 Vocabulary of digital transmission and multiplexing and pulse code modulation terms (PCM)

CONTENTS

2.1 *General*

1001 **signal** [102]

F: signal

S: señal

A physical phenomenon one or more of whose characteristics may vary to represent information.

1002 **analogue signal** [103]

F: signal analogique

S: señal anal´ogica

A signal one of whose characteristic quantities follows continuously the variations of another physical quantity representing information.

1003 **discretely-timed signal** [104]

F: signal (temporel) discret

S: señal discretamente temporizada

A signal composed of successive elements in time, each element having one or more characteristics which can convey information, for example, its duration, its waveform and its amplitude.

1004 **transmission** [106]

F: transmission

S: transmisi´on

The action of conveying signals from one point to one or more other points.

Note 1 — Transmission can be effected directly or indirectly, with or without intermediate storage.

Note 2 — The use of the English word ‘‘transmission’’ in the sense of ‘‘emission’’ is deprecated.

1005 **channel, transmission channel** [108]

F: voie, voie de transmission

S: canal, canal de transmisi´on

A means of unidirectional transmission of signals between two points.

Note 1 — Several channels may share a common path; for example each channel may be allocated a particular frequency band or a particular time slot.

Note 2 — The term may be qualified by the nature of the transmitted signals, by the bandwidth, by the digit rate, or by an arbitrary designation.

Note 3 — See also Recommendation I.112, Term 414, access channel.

1006 **telecommunication** [110]

F: t´el´ecommunication

S: telecomunicaci´on

Any transmission and/or emission and reception of signals representing signs, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems.

1007 **circuit, telecommunication circuit** [111]

F: circuit, circuit de télécommunications

S: circuito, circuito de telecomunicación

A combination of two transmission channels permitting bidirectional transmission of signals between two points, to support a single communication.

Note 1 — If the telecommunication is by nature unidirectional (for example: long distance television transmission), the term ‘‘circuit’’ is sometimes used to designate the single channel providing the facility.

Note 2 — In a telecommunication network, the use of the term ‘‘circuit’’ is generally limited to a telecommunication circuit directly connecting two switching devices or exchanges, together with associated terminating equipment.

Note 3 — A telecommunication circuit may permit transmission in both directions simultaneously (duplex), or not simultaneously (simplex).

Note 4 — A telecommunication circuit that is used for transmission in one direction only is sometimes referred to as a unidirectional telecommunication circuit. A telecommunication circuit that is used for transmission in both directions (whether simultaneously or not) is sometimes referred to as a bidirectional telecommunication circuit.

1008 **interface** [408]

F: *jonction* (interface)

S: *interfaz*

The common boundary between two associated systems.

2.2 *Digital signals*

2001 **digit**

F: *élément numérique*

S: *dígito*

A member selected from a finite set.

Note 1 — In digital transmission, a digit may be represented by a signal element, being characterized by the dynamic nature, discrete condition and discrete timing of the element, for example it may be represented as a pulse of specified amplitude and duration.

Note 2 — In equipment used in digital transmission, a digit may be represented by a stored condition being characterized by a specified physical condition, for example it may be represented as a binary magnetic condition of a ferrite core.

Note 3 — The context of the use of the term should be such as to indicate the radix of notation. (The meaning of ''digit'' in Notes 1, 2 and 3 translates into French as ''élément numérique''.)

Note 4 — In telephone subscriber numbering, a digit is any of the numbers 1, 2, 3 . | | 9 or 0 forming the elements of a telephone number (Recommendation Q.10 [1]). (This meaning of ''digit'' translates into French as ''chiffre''.)

2002 **binary figure**

F: *chiffre binaire*

S: *cifra binaria*

One of the two figures (that is, 0 or 1) used in the representation of numbers in binary notation.

2003 **binary digit** (bit)

F: *élément binaire*

S: *d´igito binario* (bit)

A member selected from a binary set.

Note 1 — Bit is an abbreviation for binary digit.

Note 2 — In the interest of clarity, it is recommended that the term ‘‘bit’’ should not be used in two-condition start-stop modulation instead of ‘‘unit element’’.

2004 **octet**

F: *octet*

S: *octeto*

A group of eight binary digits or eight signal elements representing binary digits operated upon as an entity.

2005 **code word [character signal]**

F: mot de code [signal de caractère]

S: palabra de código [señal de carácter]

A set of signal elements representing the quantized value of a sample in PCM.

Note — In PCM, the term ‘‘PCM word’’ may be used in this sense.

2006 **digital signal** [105]

F: signal numérique

S: señal digital

A discretely timed signal in which information is represented by a number of well-defined discrete values that one of its characteristic quantities may take in time.

Note — The term may be qualified to indicate the digit rate, for example: ‘‘140 Mbit/s digital signal’’.

2007 **signal element**

F: élément de signal

S: elemento de señal

A part of a digital signal, characterized by its discrete timing and its discrete value, and used to represent a digit.

2008 **digit position**

F: position d’un élément de signal; position d’un élément numérique

S: posición de dígito

The position in time or space into which a representation of a digit may be placed.

2009 **n-ary digital signal**

F: signal numérique n-aire

S: señal digital n-aria

A digital signal in which each signal element has one of n permitted discrete values.

2010 **redundant digital signal**

F: signal numérique redondant

S: señal digital redundante

The signal that is produced by encoding a given signal in accordance with a redundant line code.

2011 redundant n-ary signal

F: signal n-aire redondant

S: señal n-aria redundante

A digital signal whose elements can assume n | iscrete states where the average equivalent binary content per signal element is less than $\log_2 n$.

Note — The relative redundancy R , of an n -ary digital signal, is given by:

$$R = 1 - \frac{r_e}{r_d \times \log_2 n} = \left[1 - \frac{r_e}{r_d \times \log_2 n} \right] \times 100\%$$

where r_d is the symbol rate of the n -ary signal and r_e is the equivalent bit rate.

This may also be expressed in terms of the number of binary digits which can be transmitted by an element of a particular line code. Examples are:

AMI (37% redundant), 1 binary digit per element;

4B3T (16% redundant), 1.33 binary digit per element.

2012 **pseudo n-ary signal**

F: *signal pseudo n-aire*

S: *señal seudo n-aria*

A redundant *n* -ary digital signal that is derived from a *m* -ary digital signal without change of the line digit rate.

Note — An alternate mark inversion signal is an example of a pseudo-ternary signal, i.e. $n = 3$, $m = 2$.

2013 **digit rate**

F : *débit numérique*

S: *velocidad digital*

The number of digits per unit time.

Note 1 — An appropriate adjective may precede the word ‘‘digit’’, for example, binary digit rate.

Note 2 — In the interests of clarity it is recommended that this term should not be used to express the symbol rate on the line.

2014 **line digit rate [symbol rate]**

F: *débit numérique en ligne [débit de symboles]*

S: *velocidad digital de linea [velocidad de símbolos]*

The number of signal elements of the line signal transmitted per unit time.

Note 1 — The baud is usually used to quantify this, one baud being equal to one single element per second.

Note 2 — Modulation rate is the term used in telegraphy and data communication; it is the reciprocal of the duration of the unit interval.

2015 **equivalent binary content**

F: *contenu binaire équivalent*

S: *contenido binario equivalente*

The number of binary digits strictly necessary to convey the same information as a defined number of signal elements in a given digital signal.

2016 **equivalent bit rate**

F: *débit binaire équivalent*

S: *velocidad binaria equivalente*

The value of the bit rate strictly necessary to convey the same information in the same time as a given digital signal at a given digit rate.

2017 **significant instant, significant instant of a digital signal**

F: instant significatif, instant significatif d’un signal num´erique

S: instante significativo, instante significativo de una señal digital

The instant at which a signal element commences in a discretely-timed signal.

2018 **unit interval**

F: intervalle unitaire

S: intervalo unitario (o intervalo unidad)

The nominal difference in time between consecutive significant instants of an isochronous signal.

2019 **decision instant, decision instant of a digital signal**

F: instant de d´ecision, instant de d´ecision d'un signal num´erique

S: instante de decisi´on instante de decisi´on de una señal digital

The instant at which a decision is taken as to the probable value of signal element of a received digital signal.

2020 **decision circuit**

F: circuit de d´ecision

S: circuito de decisi´on

A circuit that decides the probable value of a signal element of a received digital signal.

2021 **regeneration**

F: r´eg´en´eration

S: regeneraci´on

The process of receiving and reconstructing a digital signal so that the amplitudes, waveforms and timing of its signal elements are constrained within specified limits.

2022 **regenerator**

F: r´eg´en´erateur

S: regenerador

A device that performs regeneration.

2023 **regenerative repeater**

F: r´ep´eteur r´eg´en´erateur

S: repetidor regenerativo

A repeater that regenerates digital signals.

Note 1 — A regenerative repeater may operate in one or both directions of transmission, and the term may be qualified by ''unidirectional'' or ''bidirectional'' as appropriate.

Note 2 — Repeater is defined in Recommendation G.601.

2024 **jitter**

F: gigue

S: fluctuación de fase

Short-term non-cumulative variations of the significant instants of a digital signal from their ideal positions in time.

2025 **wander**

F: dérapage

S: fluctuación lenta de fase

Long term non-cumulative variations of the significant instants of a digital signal from their ideal positions in time.

2026 **controlled slip [slip]**

F: glissement commandé [saut]

S: deslizamiento controlado [deslizamiento]

The irretrievable loss or gain of a set of consecutive digit positions in a digital signal, in which both the magnitude and instant of that loss or gain are controlled, to enable the signal to accord with a rate different from its own.

Note — Where appropriate the term may be qualified, for example: controlled octet slip, controlled frame slip.

2027 **uncontrolled slip**

F: glissement non commandé

S: deslizamiento incontrolado

The loss or gain of a digit position or a set of consecutive digit positions in a digital signal resulting from an aberration of the timing processes associated with transmission or switching of a digital signal, and in which either the magnitude or the instant of that loss or gain is not controlled.

2028 **scrambler**

F: embrouilleur

S: aleatorizador

A device that converts a digital signal into a pseudo-random digital signal having the same meaning and the same digit rate.

2029 **descrambler**

F: désembrouilleur

S: desaleatorizador

A device that performs the complementary operation to that of a scrambler.

2030 **error, digital error**

F: erreur, erreur numérique

S: error, error digital

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

2031 **error ratio [error rate]**

F: taux d’erreur [rapport d’erreur]

S: *tasa de errores [proporci´on de errores]*

The ratio of the number of digital errors received in a specified period to the total number of digits received in the same period.

Note 1 — Numerical values of error ratio should be expressed in the form

$$n \ | \ (\mathrm{mu} \ |_{p} 0^{D} \mathit{lF261}$$

where p is a positive integer.

Note 2 — Error ratio may be qualified, for example by the term ‘‘bit’’ or ‘‘block’’.

2032 **error multiplication**

F: *multiplication d’erreurs*

S: *multiplicaci´on de errores*

The property of an apparatus whereby a single digital error in the input signal presented to it results in more than one digital error in the output signal.

Note — Line code converters and descramblers are examples of apparatus that may cause error multiplication.

2033 **error multiplication factor**

F: facteur de multiplication d’erreurs

S: factor de multiplicación de errores

The ratio of the number of digital errors in the output signal to the number of digital errors in the input signal.

Note — The error multiplication factor may be expressed as either an average or maximum value.

2034 **error spread**

F: étalement d’erreurs [répartition des erreurs]

S: dispersión de errores

The number of consecutive digits of the output signal over which digital errors are distributed when a single digital error in the input signal causes error multiplication.

2.3 *Digital transmission*

3001 **digital transmission** [107]

F: transmission numérique

S: transmisión digital

The transmission of digital signals by means of a channel or channels that may assume in time any one of a defined set of discrete states.

3002 **digital channel, digital transmission channel** [109]

F: voie numérique, voie de transmission numérique

S: canal digital, canal de transmisión digital

The means of unidirectional digital transmission of digital signals between two points.

3003 **digital circuit, digital telecommunication circuit** [112]

F: circuit numérique, circuit numérique de télécommunications

S: circuitó digital, circuito de telecomunicación digital

A combination of two digital transmission channels permitting bidirectional digital transmission in both directions between two points, to support a single communication.

Note 1 — If the telecommunication is by nature unidirectional (for example, long-distance television transmission), the term ‘‘digital circuit’’ is sometimes used to designate the single digital channel providing the facility.

Note 2 — In a telecommunication network, use of the term ''digital circuit'' is generally limited to a digital telecommunication circuit directly connecting two switching devices or exchanges, together with associated terminating equipment.

Note 3 — A digital telecommunication circuit may permit transmission in both directions simultaneously (duplex), or not simultaneously (simplex).

Note 4 — A digital telecommunication circuit that is used for transmission in one direction only is sometimes referred to as a unidirectional digital telecommunication circuit. A digital telecommunication circuit that is used for transmission in both directions (whether simultaneously or not) is sometimes referred to as a bidirectional digital telecommunication circuit.

3004 **digital connection** [310]

F: connexion numérique

S: conexión digital

A concatenation of digital transmission channels or digital telecommunication circuits, switching and other functional units set up to provide for the transfer of digital signals between two or more points in a telecommunication network, to support a single communication.

3005 **digital link, digital transmission link [digital path]** [302]

F: *liaison numérique, liaison de transmission numérique [conduit numérique]*

S: *enlace digital, enlace de transmisión digital [trayecto digital]*

The whole of the means of digital transmission of a digital signal of specified rate between two digital distribution frames (or equivalent).

Note 1 — A digital link comprises one or more digital sections and may include multiplexing and/or demultiplexing, but not switching.

Note 2 — The term may be qualified to indicate the transmission medium used, for example, ‘‘digital satellite link’’.

Note 3 — The term always applies to the combination of ‘‘go’’ and ‘‘return’’ directions of transmission, unless stated otherwise.

Note 4 — The term ‘‘digital path’’ is sometimes used to describe one or more digital links connected in tandem, especially between equipments at which the signals of the specified rate originate and terminate.

3006 **digital distribution frame**

F: *répartiteur numérique*

S: *repartidor digital*

A structure that provides flexibility of semipermanent interconnection of digital channels or digital circuits.

Note — Digital sections and digital links normally terminate at digital distribution frames.

Figure 1/G.701 gives examples of digital sections, digital links, digital line sections, etc.

3007 **digital section**

F: *section numérique*

S: *sección digital*

The whole of the means of digital transmission of a digital signal of specified rate between two consecutive digital distribution frames or equivalent.

Note 1 — A digital section forms either a part or the whole of a digital link, and includes terminating equipments at both ends, but excludes multiplexers.

Note 2 — Where appropriate, the digital rate or multiplex order should qualify the title.

Note 3 — The definition applies to the combination of ‘‘go’’ and ‘‘return’’ directions of transmission, unless stated otherwise.

3008 **section termination**

F: *extrémité de section*

S: *extremo de sección*

A connectional interface selected to be the boundary between a physical transmission medium and its associated equipment.

Note — This point will usually be the connectors at the input and output of an equipment.

3009 **elementary cable section [repeater section]**

F: section ´el´ementaire de c | ble [section (´el´ementaire) d'amplification]

S: secci´on elemental de cable [secci´on con amplificaci´on]

The whole of the physical transmission medium between the section termination at the output of one equipment and the section termination at the input of the following equipment.

Note 1 — An elementary cable section usually consists of several factory lengths of cable connected together and any associated accessories (such as flexible cables) necessary to connect it to the section terminals.

Note 2 — Examples of the physical transmission media are a coaxial or symmetric pair, and optical fibre.

3010 **elementary repeater section**

F: section élémentaire amplifiée

S: sección elemental de repetición

In a given direction of transmission, an elementary cable section together with the immediately following analogue repeater.

3011 **elementary regenerator section [regenerator section]**

F: section élémentaire régénérée [section de régénération]

S: sección elemental de regeneración [sección de regeneración]

In a given direction of transmission, an elementary cable section together with the immediately following regenerative repeater.

3012 **digital line section**

F: section de ligne numérique

S: sección de línea digital

A digital section implemented on a single type of manufactured transmission medium, such as symmetric pair, coaxial pair, or optical fibre.

Note — A digital line section includes line terminating equipments at both ends, and regenerative repeaters if needed, but excludes multiplexers.

3013 **digital line link [digital line path]**

F: liaison de ligne numérique [conduit de ligne numérique]

S: enlace de línea digital [trayecto de línea digital]

A digital link that comprises a digital line section or a number of tandem-connected digital line sections.

3014 **digital transmission system**

F: système de transmission numérique

S: sistema de transmisión digital

A specific means of providing a digital section.

3015 **digital line system**

F: système de ligne numérique

S: sistema de línea digital

A digital transmission system that provides a digital line section.

3016 **digital radio section**

F: section radioélectrique numérique

S: sección radiodigital

A digital section implemented on a radio-relay system.

3017 **digital radio link [digital radio path]**

F: liaison radioélectrique numérique [conduit radioélectrique numérique]

S: enlace radiodigital, [trayecto radiodigital]

A digital link that comprises a digital radio section or a number of tandem-connected digital radio sections.

3018 **digital radio system**

F: système radioélectrique numérique

S: sistema radiodigital

A digital transmission system that provides a digital radio section.

3019 **bit sequence independence**

F: indépendance de la séquence des bits

S: independencia de la secuencia de bits

The property of a binary transmission channel, telecommunication circuit or connection, that permits all sequences of binary signal elements to be conveyed over it at its specified bit rate, without change to the value of any signal elements.

Note — Practical transmission systems that are not completely bit sequence independent may be described as quasi bit sequence independent. In such cases the limitations should be clearly stated.

3020 **digit sequence integrity**

F: intégrité de la suite des éléments numériques

S: integridad de la secuencia de dígitos

The property of a digital transmission channel, telecommunication circuit or connection, that permits a digital signal to be conveyed over it without change to the order of any signal elements.

3021 **octet sequence integrity**

F: intégrité de la suite des octets

S: integridad de la secuencia de octetos

The property of a digital transmission channel, telecommunication circuit or connection that permits a digital signal to be conveyed over it without change to the order of any octets.

3022 **transparency, digital transparency**

F: transparence, transparence numérique

S: transparencia, transparencia digital

The property of a digital transmission channel, telecommunication circuit or connection, that permits any digital signal to be conveyed over it without change to the value or order of any signal elements.

Note — The digital transmission channel, telecommunication circuit or connection concerned may introduce delay, and may contain reversible code conversion functions.

3023 **alarm indication signal (AIS)**

F: *signal d’indication d’alarme (SIA)*

S: *señal de indicaci´on de alarma (SIA)*

A signal that replaces the normal traffic signal when a maintenance alarm indication has been activated.

3024 **upstream failure indication**

F: *indication de d´efaillance en amont*

S: *indicaci´on de fallo atr´as*

An indication provided by a digital multiplexer, line section or a radio section, that a signal applied at its input port is outside its prescribed maintenance limit.

3025 **service digits [housekeeping digits]**

F: ´el´ements num´eriques de service

S: d´igitos de servicio

Digits that are added, to a digital signal at the sending end of a digital link, normally at regular intervals and removed at the receiving end of that link and used to provide ancillary facilities.

Figure 1/G.701, p.

2.4 *Digital multiplexing*

4001 **highway (American: bus)**

F: bus (jonction multiplex interne) [canal]

S: arteria (bus)

A common path within an apparatus or station over which pass signals from a number of channels identified by time division.

4002 **channel gate**

F: porte de canal

S: puerta de canal

A device for connecting a channel to a highway, or a highway to a channel, at specified times.

4003 **digital multiplex hierarchy**

F: hi´erarchie de multiplexage num´erique

S: jerarqu´ia de los m´ulitplex digitales

A series of digital multiplexers graded according to capability so that multiplexing at one level combines a defined number of digital signals, each having the digit rate prescribed for a lower order, into a digital signal having a prescribed digit rate which is then available for further combination with other digital signals of the same rate in a digital multiplexer of the next higher order.

4004 **primary digital group**

F: groupe num´erique primaire

S: grupo digital primario

An assembly, by digital multiplexing, of digital signals occupying a specified number of channel time-slots to form a composite signal having a digit rate of 2048 kbit/s or 1544 kbit/s.

Note — Normally each channel time-slot has eight digit time-slots and an effective digit rate of 64 kbit/s.

4005 **primary PCM group [primary block] (American: digroup)**

F: groupe primaire MIC [bloc primaire]

S: grupo primario MIC [bloque primario]

An assembly, by digital multiplexing, of PCM signals occupying a specified number of channel time-slots to form a composite signal having a digit rate of 1544 kbit/s or 2048 kbit/s, in both directions of transmission.

Note — The following conventions could be useful:

Primary group µ — a basic group of PCM signals derived from 1544-kbit/s PCM multiplex equipment.

Primary group A — a basic group of PCM signals derived from 2048-kbit/s PCM multiplex equipment.

4006 **n-ary digital group**

F: groupe num´erique n-aire

S: grupo digital n-ario

A number of primary digital or pcm groups assembled by digital multiplexing to form a composite signal of specified digit rate, in both directions of transmission.

Note 1 — A secondary digital group may comprise four primary digital or pcm groups to form a composite signal having a digit rate of 8448 or 6312 kbit/s.

Note 2 — A tertiary digital group may comprise four 8448 kbit/s secondary digital groups or five or seven 6312 kbit/s secondary digital groups to form a composite signal having a digit rate of 34368, 32064 or 44736 kbit/s.

Note 3 — A quaternary digital group may comprise four 34368 kbit/s tertiary digital groups to form a composite signal having a digit rate of 139264 kbit/s.

4007 **frame**

F: *trame*

S: *trama*

A cyclic set of consecutive time slots in which the relative position of each time slot can be identified.

4008 **multiframe**

F: *multitrame*

S: *multitrama*

A cyclic set of consecutive frames in which the relative position of each frame can be identified.

4009 **subframe**

F: *sous-trame, secteur de trame*

S: *subtrama*

A sequence of noncontiguous time-slots within a frame, each occurring at n times the frame repetition rate where n is an integer >1.

4010 **parallel to serial converter (American: serializer) [dynamicizer]**

F: *convertisseur parall`ele/s´erie*

S: *convertidor paralelo/serie*

A device that converts a group of signal elements, all of which are presented simultaneously, into a corresponding sequence of consecutive signal elements.

4011 **serial to parallel converter (American: deserializer) [staticizer]**

F: *convertisseur s´erie/parall`ele*

S: *convertidor serie/paralelo*

A device that converts a sequence of consecutive signal elements into a corresponding group of signal elements all of which are presented simultaneously.

4012 **time-division multiplexing**

F: *multiplexage temporel [multiplexage par r´epartition dans le temps]*

S: *multiplexaci´on por divisi´on en el tiempo*

Multiplexing in which several signals are interleaved in time for transmission over a common channel.

4013 **digital multiplexing**

F: *multiplexage num´erique*

S: *multiplexaci´on digital*

A form of time division multiplexing applied to digital channels which convey digital signals.

4014 **digital multiplexer**

F: multiplexeur numérique

S: multiplexor digital

Equipment that combines by time-division multiplexing several digital signals into a single composite digital signal.

4015 **digital demultiplexing**

F: démultiplexage numérique

S: demultiplexación digital

The separation of a composite digital signal into its component digital signals.

4016 **digital demultiplexer**

F: démultiplexeur numérique

S: demultiplexor digital

Equipment that separates a composite digital signal into its component digital signals.

4017 **digital multiplex equipment**

F: équipement de multiplexage numérique

S: equipo múltiplex digital

The combination of a digital multiplexer and a digital demultiplexer at the same location, operating in opposite directions of transmission.

4018 **PCM multiplex equipment**

F: équipement de multiplexage MIC

S: equipo múltiplex MIC

Equipment that derives a single digital signal at a defined digit rate from several voice frequency channels by a combination of pulse code modulation and time division multiplexing, and that also carries out the complementary functions in the opposite direction of transmission.

4019 **digital block**

F: bloc numérique

S: bloque digital

The combination of a digital link and associated digital multiplex equipments.

Note — The bit rate of the digital link should form part of the title.

4020 **transmultiplexer**

F: transmultiplexeur

S: transmultiplexor

An equipment that transforms a frequency-division multiplexed signal (such as group or supergroup) into a corresponding time-division multiplexed signal that has the same structure as if it had been derived from PCM multiplex equipment, and that also carries out the complementary function in the opposite direction of transmission.

4021 **digital filling [digital padding]**

F: remplissage numérique

S: relleno digital [complementación digital]

The addition of signal elements at regular intervals to a digital signal to change the digit rate from its original value to a predetermined higher value.

Note — The added digits are not normally used to transmit information.

4022 **justification [stuffing, pulse stuffing]**

F: justification

S: justificaci´on [relleno de impulsos]

The process of changing the digit rate of a digital signal in a controlled manner so that it can accord with a digit rate different from its own inherent rate, usually without loss of information.

4023 **positive justification [positive stuffing, positive pulse stuffing]**

F: justification positive

S: justificaci´on positiva [relleno positivo de impulsos]

A method of justification in which the digit time-slots used to convey a digital signal have a digit rate that is always higher than the digit rate of that original signal.

Note 1 — Positive justification is usually achieved by the provision of a fixed number of digit time-slots (justifiable digit time-slots) per frame in the resultant signal which may be used to transmit either information from the original signal, or no information, according to the relative digit rates of the resultant signal and the original signal.

Note 2 — Information which indicates whether the justifiable digit time-slots contain information digits or justifying digits is conveyed by means of the justification service digits.

4024 **negative justification [negative stuffing, negative pulse stuffing]**

F: justification n´egative

S: justificaci´on negativa [relleno negativo, relleno negativo de impulsos]

A method of justification in which the digit time-slots used to convey a digital signal have a digit rate that is always lower than the digit rate of that original signal.

Note 1 — The deleted digits are conveyed by separate means.

Note 2 — Information which facilitates the recovery of the deleted digits is conveyed by means of the justification service digits.

4025 **positive/zero/negative justification [positive/zero/negative stuffing, positive/zero/negative pulse stuffing]**

F: justification positive/nulle/n´egative

S: justificati´on positiva/nula/negativa [relleno positivo/nulo/negativo de impulsos]

A method of justification in which the digit time-slots used to convey a digital signal have a digit rate that may be higher than, the same as, or lower than the digit rate of the original signal.

Note 1 — Justifiable digit time-slots are provided in accordance with Note 1 of 4023 above.

Note 2 — Separate means of transmitting deleted digits are provided in accordance with Note 2 of 4024 above.

Note 3 — Information which facilitates the recovery of the original digits, which are conveyed by means of the justification service digits.

Note 4 — Usually the digit time-slots used to convey a digital signal have the same nominal digit rate as the original signal.

4026 **justifiable digit time-slot [stuffable digit time-slot]**

F: créneau temporel élémentaire justifiable

S: intervalo de tiempo de dígito justificable [intervalo de tiempo de dígito rellenable]

A digit time-slot that is provided for the purpose of justification and which may contain either an information digit or a justifying digit.

4027 **justifying digit [stuffing digit]**

F: ´el´ement num´erique de justification

S: d´igito de justificaci´on [d´igito de relleno]

A digit inserted in a justifiable digit time-slot when that time slot is not required for an information digit.

4028 **justification service digit [stuffing service digit]**

F: ´el´ement num´erique de service de justification

S: d´igito de servicio de justificaci´on [d´igito de servicio de relleno]

A digit that transmits information concerning the status of a justifiable digit time-slot.

4029 **justification rate [stuffing rate]**

F: d´ebit de justification

S: velocidad de justificaci´on [velocidad de relleno]

The rate at which justifying digits are inserted, or at which information digits are transmitted by other means.

4030 **nominal justification rate [nominal stuffing rate]**

F: d´ebit nominal de justification

S: velocidad nominal de justificaci´on [velocidad nominal de relleno]

The justification rate that occurs when the digit rates of both the original signal and the justified signal are at their nominal values.

4031 **maximum justification rate [maximum stuffing rate]**

F: d´ebit maximal de justification

S: velocidad m´axima de justificaci´on [velocidad m´axima de relleno]

The maximum possible justification rate that can be accommodated by a justification process.

Note — In practice the tolerance limits of the original signal and of the system used to convey the justified signal might be such that the maximum justification rate is never realized.

4032 **justification ratio [stuffing ratio]**

F: taux de justification

S: relaci´on de justificaci´on [relaci´on de relleno]

The ratio of the actual justification rate to the maximum justification rate.

4033 **nominal justification ratio [nominal stuffing ratio]**

F: taux nominal de justification

S: relaci´on nominal de justificaci´on [relaci´on nominal de relleno]

The ratio of the nominal justification rate to the maximum justification rate.

2.5 *Frame alignment*

Similar definitions are applicable to multiframe alignment.

5001 **frame alignment**

F: verrouillage de trame

S: alineaci´on de trama

The state in which the frame of the receiving equipment is synchronized with that of the received signal.

5002 **frame alignment signal**

F: signal de verrouillage de trame

S: señal de alineaci´on de trama

The distinctive signal inserted in every frame or once in every *n* frames, always occupying the same relative position within the frame, and used to establish and maintain frame alignment.

5003 **bunched frame alignment signal**

F: signal de verrouillage de trame concentr´e

S: señal de alineaci´on de trama concentrada

A frame alignment signal whose signal elements occupy consecutive digit time slots.

5004 **distributed frame alignment signal**

F: signal de verrouillage de trame r´eparti [signal de verrouillage de trame distribu´e]

S: señal de alineaci´on de trama distribuida

A frame alignment signal whose signal elements occupy non-consecutive digit time slots.

5005 **frame alignment recovery time**

F: temps de reprise du verrouillage de trame

S: tiempo de recuperaci´on de la alineaci´on de trama

The time that elapses between a valid frame alignment signal being available at the receive terminal equipment and frame alignment being established.

Note — The frame alignment recovery time includes the time required for replicated verification of the validity of the frame alignment signal.

5006 **out-of-frame alignment time**

F: dur´ee de perte du verrouillage de trame

S: duraci´on de la p´erdida de la alineaci´on de trama

The time during which frame alignment is effectively lost.

Note — That time includes the time to detect loss of frame alignment and the frame alignment recovery time.

2.6 *Timing*

6001 **timing signal**

F: signal de rythme

S: señal de temporizaci´on

A cyclic signal used to control the timing of operations.

6002 **timing recovery [timing extraction]**

F: r´ecup´eration du rythme

S: recuperaci´on de la temporizaci´on [extracci´on de la temporizaci´on]

The derivation of a timing signal from a received signal.

6003 **retiming**

F: réajustement du rythme

S: reajuste de la temporización

Adjustment of the intervals between the significant instants of a digital signal, by reference to a timing signal.

6004 **time-slot**

F: créneau temporel [intervalle de temps]

S: intervalo de tiempo [sector de tiempo, celda de tiempo]

Any cyclic time interval that can be recognized and defined uniquely.

6005 **digit time-slot**

F: créneau temporel élémentaire [intervalle de temps élémentaire]

S: intervalo de tiempo de dígito

A time slot allocated to a single digit.

6006 **channel time-slot**

F: créneau temporel de voie

S: intervalo de tiempo de canal

A time slot occupying a specific position in a frame and allocated to a particular time-derived channel.

Note 1 — Where appropriate a description may be added, for example ‘‘telephone channel time slot’’.

Note 2 — In addition to its main function of transmitting a character signal, a channel time slot may also be used for in-slot signalling or for transmitting other information.

6007 **signalling time-slot**

F: créneau temporel de signalisation

S: intervalo de tiempo de señalización

A time slot occupying a specific position in a frame and allocated to the transmission of signalling.

6008 **frame alignment time-slot**

F: créneau temporel de verrouillage de trame

S: intervalo de tiempo de alineación de trama

A time slot occupying the same relative position in every frame and used to transmit the frame alignment signal.

6009 **clock**

F: *horloge*

S: *reloj*

Equipment that provides a timing signal.

Note — Where replicated sources are used for security reasons, the assembly of these is regarded as single clock.

6010 **reference clock**

F: *horloge de r´ef´erence*

S: *reloj de referencia*

A clock of very high stability and accuracy that may be completely autonomous and whose frequency serves as a basis of comparison for the frequency of other clocks.

6011 **master clock**

F: *horloge ma* **|** *tresse*

S: *reloj maestro*

A clock that is used to control the frequency of other clocks.

6012 **time interval error**

F: *d´erive temporelle*

S: *error de intervalo de tiempo*

The total difference over a specified interval of time in the significant instants of a digital signal from their ideal positions in time.

6013 **relative time interval error**

F: *d´erive temporelle relative*

S: *error de intervalo de tiempo relativo*

The total difference over a specified interval of time in the corresponding significant instants of two digital signals.

6014 **isochronous**

F: *isochrone*

S: *is´ocrono*

The essential characteristic of a time-scale or a signal such that the time intervals between consecutive significant instants either have the same duration or durations that are integral multiples of the shortest duration.

Note — In practice, variations in the time intervals are constrained within specified limits.

6015 **anisochronous**

F: *anisochrone*

S: *anis´ocrono*

The essential characteristic of a time-scale or a signal such that the time intervals between consecutive significant instants do not necessarily have the same duration or durations that are integral multiples of the shortest duration.

6016 **synchronous [mesochronous]**

F: synchrone [m´esochrone]

S: s´incrono [mes´ocrono]

The essential characteristic of time-scales or signals such that their corresponding significant instants occur at precisely the same average rate.

Note — The timing relationship between corresponding significant instants usually varies between specified limits.

6017 **homochronous**

F: homochrone

S: hom´ocrono

The essential characteristic of time-scales or signals such that their corresponding significant instants have a constant, but uncontrolled, time relationship with each other.

6018 **non-synchronous [asynchronous/heterochronous]**

F: nonsynchrone [asynchrone/h´et´erochrone]

S: no-s´incrono [as´icrono/heter´ocrono]

The essential characteristic of time-scales or signals such that their corresponding significant instants do not necessarily occur at the same average rate.

6019 **plesiochronous**

F: pl´esiochrone

S: plesi´ochrono

The essential characteristic of time-scales or signals such that their corresponding significant instants occur at nominally the same rate, any variation in rate being constrained within specified limits.

Note 1 — Two signals having the same nominal digit rate, but not stemming from the same clock or homochronous clocks, are usually plesiochronous.

Note 2 — There is no limit to the time relationship between corresponding significant instants.

6020 **heterochronous**

F: h´et´erochrone

S: heter´ocrono

The essential characteristic of time-scales or signals such that their corresponding significant instants occur at different nominal rates.

Note 1 — Two signals having different nominal digit rates, and not stemming from the same clock or from homochronous clocks are usually heterochronous.

Note 2 — Terms 6015 to 6020 are based on the following Greek roots:

iso = equal

homo = same

plesio = near

hetero = different

6021 **codirectional interface**

F: interface codirectionnelle

S: interfaz codireccional

An interface across which the signals to be transferred and their associated timing signals are transmitted in the same direction.

6022 **centralized-clock interface**

F: *interface à horloge centralis´ee*

S: *interfaz de reloj centralizado*

An interface across which, for both directions of transmission of the signals to be transferred, the associated timing signals of both the exchange terminal on the line side and the exchange terminal on the service side are supplied from a centralized clock.

Note — The timing of the centralized clock may be derived from a nominated incoming line signal.

6023 **contradirectional interface**

F: *interface contradirectionnelle*

S: *interfaz contradireccional*

An interface across which the timing signals associated with both directions of transmission of the signals to be transferred, are directed towards the same side of the interface.

2.7 *Synchronization*

7001 **synchronization**

F: synchronisation

S: sincronizaci´on

The process of adjusting the corresponding significant instants of signals to make them synchronous.

7002 **timing information**

F: information de rythme

S: informaci´on de temporizaci´on

Information contained in a signal relating to the timing of another signal.

7003 **synchronization information**

F: information de synchronisation

S: informaci´on de sincronizaci´on

Information that indicates the relationship between the timing of two or more signals.

7004 **clock control signal**

F: signal de commande d'horloge

S: señal de control de reloj

A signal that directly controls the phase or frequency of a clock.

7005 **synchronization node**

F: noeud de synchronisation

S: nodo de sincronizaci´on

A point in a synchronized network at which synchronization information is derived, sent or received.

7006 **synchronization link**

F: liaison de synchronisation

S: enlace de sincronizaci´on

A link between two synchronization nodes over which synchronization information is transmitted.

7007 **synchronization network**

F: r´eseau de synchronisation

S: red de sincronizaci´on

An arrangement of synchronization nodes and synchronization links provided in order to synchronize the clocks at, or connected to, those nodes.

7008 **single-ended synchronization**

F: synchronisation locale [synchronisation unilat´erale]

S: sincronizaci´on uniterminal

A method of synchronizing a specified synchronization node with respect to another synchronization node in which synchronization information at the specified node is derived from the phase difference between the local clock and the incoming digital signal from the other node.

7009 **double-ended synchronization**

F: synchronisation locale et distante [synchronisation bilat´erale]

S: sincronizaci´on biterminal

A method of synchronizing a specified synchronization node with respect to another synchronization node in which synchronization information at the specified node is derived by comparing the phase difference between the local clock and the incoming digital signal from the other node, with the phase difference at the other node between its local clock and the digital signal incoming from the specified node.

7010 **unilateral control**

F: synchronisation unilat´erale [commande unilat´erale]

S: control unilateral

Control between two synchronization nodes such that the frequency of the clock of only one of these nodes is influenced by timing information derived from the clock of the other node.

7011 **bilateral control**

F: synchronisation bilat´erale [commande bilat´erale]

S: control bilateral

Control between two synchronization nodes such that the frequency of the clock of each of these nodes is influenced by timing information derived from the clock of the other node.

7012 **analogue control**

F: synchronisation analogique [mode analogique]

S: control anal´ogico

A method of controlling clocks in which the clock control signal is a continuous (monotonic) function of the phase difference between clocks, at least over a limited range.

7013 **linear analogue control**

F: synchronisation analogique lin´eaire [mode analogique lin´eaire]

S: control anal´ogico lineal

Analogue control in which the clock control signal is proportional to the phase difference between clocks, at least over a limited range.

7014 **amplitude quantized control**

F: synchronisation quantifi´ee [mode à quantification d'amplitude]

S: control por cuantificaci´on de amplitud

A method of controlling clocks in which the clock control signal is a quantized function of the phase difference between clocks.

Note — In practice this implies that the working range of phase errors is divided into a finite number of subranges and that a unique signal is derived for each subrange whenever the error falls within a subrange.

7015 **time quantized control**

F: synchronisation échantillonnée [mode à quantification temporelle]

S: control por cuantificación temporal

A method of controlling clocks in which each clock control signal is derived or utilized only at a number of discrete instants, which may or may not be equally separated in time.

7016 **synchronized network [synchronous network]**

F: réseau synchronisé [réseau synchrone]

S: red sincronizada [red sincrona]

A network in which the corresponding significant instants of nominated signals are adjusted to make them synchronous.

7017 **non-synchronized network**

F: r´eseau non synchronis´e

S: red no sincronizada

A network in which signals need not be synchronous.

7018 **mutually synchronized network**

F: r´eseau à synchronisation mutuelle

S: red mutuamente sincronizada

A synchronized network in which each clock exerts a degree of control on all others.

7019 **democratic network, democratic mutually synchronized network**

F: r´eseau d´emocratique, r´eseau à synchronisation mutuelle d´emocratique

S: red democr´atica, red democr´atica mutuamente sincronizada

A mutually synchronized network in which all clocks are of equal status and exert equal amounts of control on the others; the network operating frequency (digit rate) being the mean of the natural (uncontrolled) frequencies of all the clocks.

7020 **hierarchic network, hierarchic synchronized network**

F: r´eseau hi´erarchis´e, r´eseau à synchronisation hi´erarchis´ee

S: red jer´arquica, red con sincronizaci´on jer´arquica

A synchronized network in which each clock is assigned a particular status which determines the degree of control it exerts over the other clocks.

7021 **hierarchic mutually synchronized network**

F: r´eseau hi´erarchis´e à synchronisation mutuelle

S: red jer´arquica mutuamente sincronizada

A mutually synchronized network in which each clock is assigned a particular status which determines the degree of control it exerts over other clocks; the network operating frequency being a weighted mean of the natural frequencies of all the clocks.

7022 **monarchic network, monarchic synchronized network [despotic network, despotic synchronized network]**

F: r´eseau despotique, r´eseau à synchronisation despotique

S: red desp´otica, red con sincronizaci´on desp´otica [red mon´arquica, red con sincronizaci´on mon´arquica]

A synchronized network in which a single clock exerts control over all the other clocks.

7023 **oligarchic network, oligarchic synchronized network**

F: r´eseau oligarchique, r´eseau à synchronisation oligarchique

S: red olig´arquica, red con sincronizaci´on olig´arquica

A synchronized network in which a few selected clocks are mutually synchronized and exert control over all the other clocks.

2.8 *Pulse Code Modulation*

8001 **pulse code modulation (PCM)**

F: modulation par impulsions et codage (MIC)

S: modulaci´on por impulsos codificados (MIC)

A process in which a signal is sampled, and each sample is quantized independently of other samples and converted by encoding to a digital signal.

8002 **differential pulse code modulation (DPCM)**

F: modulation par impulsions et codage différentiel (MICD)

S: modulación por impulsos codificados diferencial (MICD)

A process in which a signal is sampled, and the difference between each sample of this signal and its estimated value is quantized and converted by encoding to a digital signal.

Note — The estimated values of the signal are calculated by a predictor from the quantized difference signal.

8003 **delta modulation**

F: modulation delta

S: modulación delta

A form of differential pulse code modulation in which only the sign of the difference between each sample and its predicted value is detected and encoded by a single bit.

8004 **adaptive differential pulse code modulation (ADPCM)**

F: modulation par impulsions et codage différentiel adaptatif (MICDA)

S: modulación por impulsos y código diferencial adaptativo (MICDA)

A form of differential pulse code modulation that uses adaptive quantizing.

Note 1 — The predictor may be either fixed (time invariant) or variable.

Note 2 — When the predictor is adaptive, the adaption of its coefficients is made from the quantized difference signal.

8005 **predictor**

F: prédicteur

S: predictor

A device that provides an estimated value of a sampled signal derived from previous samples of the same signal or from a quantized version of those samples.

8006 **adaptive predictor**

F: prédicteur adaptatif

S: predictor adaptativo

A predictor whose estimating function is made variable according to the short term spectral characteristics of the sampled signal.

8007 **sample**

F: *échantillon*

S: *muestra*

A representative value of a signal at a chosen instant, derived from a portion of that signal.

8008 **sampling**

F: *échantillonnage*

S: *muestreo*

The process of taking samples of a signal, usually at equal time intervals.

8009 **sampling rate**

F: *fréquence d'échantillonnage [taux d'échantillonnage]*

S: *velocidad de muestreo [frecuencia de muestreo]*

The number of samples taken of a signal per unit time.

8010 **working range**

F: plage de fonctionnement [gamme de fonctionnement]

S: gama de funcionamiento

The range of values of an input signal over which an equipment is designed to operate with a specified performance. (See Figure 2/G.701.)

8011 **quantizing**

F: quantification

S: cuantificaci´on

A process in which a continuous range of values is divided into a number of adjacent intervals, and any value within a given interval is represented by a single predetermined value within the interval. (See Figure 2/G.701.)

8012 **adaptive quantizing**

F: quantification adaptative

S: cuantificaci´on adaptativa

Quantizing in which some parameters are made variable according to the short term statistical characteristics of the quantized signal.

8013 **uniform quantizing**

F: quantification uniforme

S: cuantificaci´on uniforme

Quantizing in which all the quantizing intervals lying entirely with the working range are equal. (See Figure 2/G.701.)

8014 **non-uniform quantizing**

F: quantification non uniforme

S: cuantificaci´on no uniforme

Quantizing in which not all the quantizing intervals lying entirely with the working range are equal. (See Figure 2/G.701.)

8015 **quantizing interval**

F: intervalle de quantification

S: intervalo de cuantificaci´on

One of the intervals used in quantizing. (See Figure 2/G.701.)

8016 **decision value**

F: valeur de d´ecision [amplitude de d´ecision]

S: valor de decisi´on

A value defining the boundary between adjacent quantizing intervals. (See Figures 2/G.701 and 4/G.701.)

8017 **virtual decision value**

F: valeur virtuelle de d´ecision [amplitude virtuelle de d´ecision]

S: valor virtual de decisi´on

Each of the two defined values, that provide conventional bounds for the working range in quantizing. (See Figure 2/G.701.)

Note — These values are taken to represent hypothetical outer bounds for the two extreme quantizing intervals of the quantizing law.

8018 **quantized value**

F: valeur quantifi´ee [amplitude quantifi´ee]

S: valor cuantificado

The single discrete value used to represent any value in a particular quantizing interval. (See Figure 2/G.701.)

8019 **load capacity [overload point]**

F: capacit´e de charge [point de surcharge]

S: capacidad de carga [punto de sobrecarga]

The level of a sinusoidal signal whose positive and negative peaks coincide with the virtual decision values.

8020 **peak limiting, peak limiting in quantizing**

F: ´ecr | tage

S: limitaci´on de cresta (en cuantificaci´on)

The effect whereby any value to be quantized lying outside the working range is replaced by the nearest quantized value. (See Figure 2/G.701.)

8021 **quantizing distortion**

F: distorsion de quantification

S: distorsi´on de cuantificaci´on

The distortion resulting from the process of quantizing samples within the working range.

8022 **quantizing distortion power**

F: puissance de distorsion de quantification

S: potencia de la distorsi´on de cuantificaci´on

The power of the distortion component of the output signal resulting from the process of quantizing.

8023 **encoding [coding, coding in PCM]**

F: codage

S: codificaci´on [codificaci´on en MIC]

The generation of a code word to represent a quantized value.

8024 **encoder [coder]**

F: *codeur*

S: *codificador*

A device that performs encoding.

8025 **uniform encoding**

F: *codage uniforme*

S: *codificaci´on uniforme*

The generation of code words to represent uniformly quantized values.

8026 **non-uniform encoding**

F: *codage non uniforme*

S: *codificaci´on no uniforme*

The generation of code words to represent non-uniformly quantized values. (See Figure 3/G.701.)

8027 **encoding law**

F: loi de quantification [loi de codage]

S: ley de codificaci´on

The law defining the relative values of the quantizing intervals used in quantizing and encoding. (See Figure 4/G.701.)

8028 **segmented encoding law**

F: loi de quantification à segments [loi de codage à segments]

S: ley de codificaci´on por segmentos

An encoding law in which an approximation to a smooth law is obtained by a number of linear segments. (See Figures 3a/G.701 and 3b/G.701.)

8029 **decoding**

F: d´ecodage

S: decodificaci´on

The generation of reconstructed samples.

8030 **decoder**

F: d´ecodeur

S: decodificador

A device that performs decoding.

8031 **reconstructed sample**

F: ´echantillon reconstitu´e

S: muestra reconstruida

The signal generated at the output of a decoder when a specified digital signal representing a quantized value is applied to its input.

8032 **codec**

F: codec

S: c´odec

A combination of an encoder and a decoder operating in opposite directions of transmission in the same equipment.

Note — When used to describe an equipment the function of the equipment should qualify the title, for example: supergroup codec, hypergroup codec.

8033 **digilogue channel**

F: voie digilogue

S: canal digi-anal´ogico

A channel in which information is represented by a digital signal at one end and the same information is represented by the corresponding analogue signal at the other end.

Note — The term may be qualified by ‘‘A to D’’ or ‘‘D to A’’ to indicate whether encoding or decoding is being performed.

8034 **digilogue circuit**

F: circuit digilogue

S: circuito digi-anal´ogico

A circuit in which transmission is provided in one direction by an A to D digilogue channel and in the other direction by a D to A digilogue channel.

Note — Because the digital interface is inherently 4-wire, the term may be qualified by ‘‘2-W’’ or ‘‘4-W’’ to indicate whether the analogue interface is 2-wire or 4-wire.

Figure 2/G.701, p.

Figure 3/G.701, p.

Figure 4/G.701, p.

2.9 *Codes*

9001 **pulse code**

F: code d'impulsions (code de modulation d'impulsions)

S: código de impulsos

A set of rules giving the equivalence between each quantized value and its corresponding code word.

9002 **line code**

F: code en ligne

S: código de línea, código en línea

A code chosen to suit the characteristics of a channel, that defines the equivalence between sets of digits presented for transmission and the corresponding sequence of signal elements transmitted over that channel.

9003 **redundant line code**

F: code en ligne redondant

S: código de línea redundante

A line code that uses more encoded signal elements than strictly necessary to represent groups of digits of the original signal.

9004 **alternate mark inversion code (AMI code)**

F: code bipolaire [code bipolaire alternant, code bipolaire strict]

S: codigo de inversi´on de marcas alternada (codigo AMI) [c´odigo bipolar]

A line code that employs a ternary signal to convey binary digits, in which successive binary ones are represented by signal elements that are normally of alternating, positive and negative polarity but equal in amplitude, and in which binary zeros are represented by signal elements that have zero amplitude.

9005 **modified alternate mark inversion code**

F: code bipolaire alternant modifi´e

S: c´odigo de inversi´on de marcas alternada modificado

A line code that is based on an alternate mark inversion code, in which alternate mark inversion violations occur in accordance with a defined set of rules.

9006 **alternate mark inversion signal [bipolar signal]**

F: signal bipolaire [signal bipolaire alternant]

S: señal de inversi´on de marcas alternada [señal bipolar]

The encoded signal produced by alternate mark inversion code.

9007 **alternate mark inversion violation [bipolar violation]**

F: violation de bipolarit´e

S: violaci´on de inversi´on de marcas alternada [violaci´on bipolar]

A non-zero signal element in an alternate mark inversion signal that has the same polarity as the previous non-zero signal element.

9008 **disparity**

F: disparit´e

S: disparidad

The algebraic sum of the values of the departure from notional zero level of one or more consecutive signal elements forming a defined group.

9009 **digital sum**

F: somme num´erique

S: suma digital

The algebraic sum of the disparities of a sequence of consecutive defined groups of signal elements.

9010 **digital sum variation**

F: variation de la somme num´erique

S: variaci´on de la suma digital

The difference between the maximum possible digital sum and the minimum possible digital sum of a specified number of groups of signal elements.

9011 **balanced code**

F: code à somme born´ee

S: c´odigo equilibrado

A code that generates only groups of signal elements that have zero digital sum.

9012 **paired-disparity code [alternate code, alternating code]**

F: code à disparit´e compens´ee

S: c´odigo con disparidad compensada [c´odigo alternado, c´odigo alternante]

A code in which some or all of the digits in the original signal are represented by two assemblies of digits, of opposite disparity, which are used in a sequence to minimize the digital sum of a longer sequence of digits.

Note — An alternate mark inversion signal is an example of a paired-disparity code.

9013 **PCM binary code**

F: *code binaire MIC*

S: *c´odigo binario MIC*

A pulse code in which all the quantized values are identified by binary numbers taken in order.

Note — This term should not be used for line transmission.

9014 **symmetrical binary code**

F: *code binaire sym´etrique*

S: *c´odigo binario sim´etrico*

A pulse code in which the sign of the quantized value, is represented by one digit, and in which the remaining digit constitute a binary number representing the magnitude.

Note 1 — In a particular symmetrical binary code, the order of the digits and the use made of the symbols 0 and 1 in the various digit positions must be specified.

Note 2 — This term should not be used for line transmission.

9015 **code conversion**

F: *transcodage*

S: *conversi´on de c´odigo*

The conversion of digital signals in one code to the corresponding signals in a different code.

ANNEX A

(to Recommendation G.701)

Alphabetical list of terms defined in this Recommendation

7014	amplitude quantized control
7012	analogue control
1002	analogue signal
6015	anisochronous
6018	[asynchronous/heterochronous]
9011	balanced code
7011	bilateral control
2003	binary digit
2002	binary figure
9006	[bipolar signal]
9007	[bipolar violation]
3019	bit sequence independence
5003	bunched frame alignment signal
4001	(bus: American)
6022	centralized-clock interface
1005	channel, transmission channel
4002	channel gate
6006	channel time-slot
2005	[character signal]
1007	circuit, telecommunication circuit
6009	clock
7004	clock control signal
2005	code word
8032	codec
8024	[coder]
8023	[coding, coding in PCM]
6021	codirectional interface
6023	contradirectional interface
2026	controlled slip
2020	decision circuit
2019	decision instant, decision instant of a digital signal
8016	decision value

4013	digital multiplexing
4021	[digital padding]
3005	[digital path]
3017	digital radio link
3017	[digital radio path]
3016	digital radio section
3018	digital radio system
3007	digital section
2006	digital signal
9009	digital sum
9010	digital sum variation
3003	digital telecommunication circuit
3001	digital transmission
3002	digital transmission channel
3005	digital transmission link
3014	digital transmission system
3022	digital transparency
4005	(digroup: American)
1003	discretely-timed signal
9008	disparity
5004	distributed frame alignment signal
7009	double-ended synchronization
4010	[dynamicizer]
3009	elementary cable section
3011	elementary regenerator section
3010	elementary repeater section
8024	encoder
8023	encoding
8027	encoding law
2015	equivalent binary content
2016	equivalent bit rate
2030	error, digital error

6016 [mesochronous]

9005 modified alternate mark inversion code

7022 monarchic network, monarchic synchronized network

4008 multiframe

7018 mutually synchronized network

4006 n-ary digital group

2009 n-ary digital signal

4024 negative justification

4024 [negative stuffing, negative pulse stuffing]

4030 nominal justification rate

4033 nominal justification ratio

4030 [nominal stuffing rate]

4033 [nominal stuffing ratio]

7017 non-synchronized network

6018 non-synchronous

8026 non-unifrom encoding

8014 non-uniform quantizing

2004 octet

3021 octet sequence integrity

7023 oligarchic network, oligarchic synchronized network

5006 out-of-frame alignment time

8019 [overload point]

9012 paired-disparity code

4010 parallel to serial converter

4018 PCM multiplex equipment

8020 peak limiting, peak limiting in quantizing

6019 plesiochronous

4023 positive justification

4023 [positive stuffing, positive pulse stuffing]

4025 positive/zero/negative justification

4025 [positive/zero/negative stuffing]

4025 positive/zero/negative pulse stuffing

4010 (serializer: American)

3025 service digits

1001 signal

2007 signal element

6007 signalling time-slot

2017 significant instant, significant instant of a digital signal

7008 single-ended synchronization

2026 [slip]

4011 [staticizer]

4026 [stuffable digit time-slot]

4022 [stuffing]

4027 [stuffing digit]

4029 [stuffing rate]

4032 [stuffing ratio]

4028 [stuffing service digit]

4009 subframe

2014 [symbol rate]

9014 symmetrical binary code

7001 synchronization

7003 synchronization information

7006 synchronization link

7005 synchronization node

7007 synchronization network

6016 synchronous

7016 synchronized network

7016 [synchronous network]

1006 telecommunication

1007 telecommunication circuit

4012 time-division multiplexing

6012 time interval error

7015 time quantized control

6004 time-slot

6002 [timing extraction]

7002 timing information

6001 timing signal

6002 timing recovery

1004 transmission

1005 tranmission channel

4020 transmultiplexer

3022 transparency, digital transparency

2027 uncontrolled slip

8025 uniform encoding

8013 uniform quantizing

7010 unilateral control

2018 unit interval

3024 upstream failure indication

8017 virtual decision value

2025 wander

8010 working range

Reference

[1] CCITT Recommendation *Definitions relating to national and international numbering plans* , Vol. VI, Rec. Q.10.

Recommendation G.702

DIGITAL HIERARCHY BIT RATES

(Malaga-Torremolinos, 1984; amended at Melbourne, 1988)

The CCITT,

considering

(a) that digital hierarchy bit rates are those bit rates which are or will be used as the basis for higher digital hierarchy levels if such levels exist (see Recommendation G.701, definition 4003);

(b) that the specification of hierarchical bit rates is necessary to prevent the proliferation of interface standards used in digital networks;

(c) that international interconnections of digital network components are preferably carried out at hierarchical bit rates;

(d) that when determining hierarchical bit rates a number of factors relating to services, transmission media and networking need to be taken into account, for example:

— characteristics of and suitable coding method for analogue source signals;

— bit rates of digital source signals;

— use of available transmission media;

— compatibility with analogue multiplex systems;

— modularity and flexibility in assembling and routing groups of source signals,

recommends

that the following bit rates should be used as hierarchical bit rates in digital networks:

Table [T1.702], p.

Figure 1/G.702 and Figure 2/G.702 show the recommended hierarchical bit rates only, including references to related Recommendations on network interfaces, multiplex equipments, digital sections/systems.

Recommendations on the following may also exist, but are not identified in Figure 1/G.702 and Figure 2/G.702:

— multiplex equipments operating between non-adjacent levels of the digital hierarchy;

— network interfaces, multiplex equipments and digital sections/systems at non-hierarchical bit rates.

Annex A to this Recommendation provides guidelines on usable bit rates available for services.

Figure 1/G.702, p.

Figure 2/G.702, p.

ANNEX A

(to Recommendation G.702)

Usable bit rates available for services

In the case of access to the ISDN for broadband services, bit rates up to the primary hierarchy level are specified in the I.200 series of Recommendations.

In general, with regard to bit rates available for transport of service signals, the following guidelines apply:

A.1 For the hierarchies based on the 1544 kbit/s primary rate, the principle has been established that some bits in the frame should be reserved, in particular to perform quality control of the digital paths when several digital sections in tandem are involved. Table A-1/G.702 provides the necessary information.

Table A-1/G.702 [T2.702], p.

A.2 In case of networks using 2048 kbit/s based hierarchy there is in principle no basic restriction on the use of full capacity of the digital path. However, it is recognized that compatibility with recommended frame structures at the various levels of the 2 Mbit/s hierarchy (e.g. the use of the same frame alignment pattern) could be a preferred solution since it offers the following advantages:

— use of the same framing devices for switched and non-switched applications;

— end-to-end quality control performed in a unique way by the network when the maintenance entity that terminates the service (e.g. the encoding device) does not belong to the network;

— possibility of performing additional network management functions that could be required, depending on the applications.

The preference for compatibility with recommended frame structures could be reconsidered for the applications where significant restrictions on the efficient use of the digital path capability can be identified.