



INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

G.701

(11/1988)

SERIES G: TRANSMISSION SYSTEMS AND MEDIA,
DIGITAL SYSTEMS AND NETWORKS

General aspects of digital transmission systems; terminal
equipments

General

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

Reedition of CCITT Recommendation G.701 published in
the Blue Book, Fascicle III.4 (1988)

NOTES

- 1 CCITT Recommendation G.701 was published in Fascicle III.4 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).
- 2 In this Recommendation, the expression “Administration” is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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
- 2.2 Digital signals
- 2.3 Digital transmission
- 2.4 Digital multiplexing
- 2.5 Frame alignment
- 2.6 Timing
- 2.7 Synchronization
- 2.8 Pulse code modulation
- 2.9 Codes

Annex A – Alphabetical List

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 analógica

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: transmisión

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 transmisión

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: télécommunication

S: telecomunicación

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: *dígito 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 discrete 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:

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

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 línea [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 numérique

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 décision, instant de décision d'un signal numérique

S: instante de decisión instante de decisión 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 décision

S: circuito de decisión

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

2021 **regeneration**

F: régénération

S: regeneración

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: régénérateur

S: regenerador

A device that performs regeneration.

2023 **regenerative repeater**

F: répéteur régénérateur

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 [proporción 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

$$n \cdot 10^{-p}$$

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: multiplicación 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.

3007 **digital section¹⁾**

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 élémentaire de câble [section (élémentaire) d'amplification]

S: sección elemental de cable [sección con amplificación]

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.

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

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 section²⁾**

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]²⁾**

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 section²⁾**

F: section radioélectrique numérique

S: sección radiodigital

A digital section implemented on a radio-relay system.

3017 **digital radio link [digital radio path]²⁾**

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.

²⁾ Figure 1/G.701 gives examples of digital sections, digital links, digital line sections, etc.

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 indicación 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 défaillance en amont

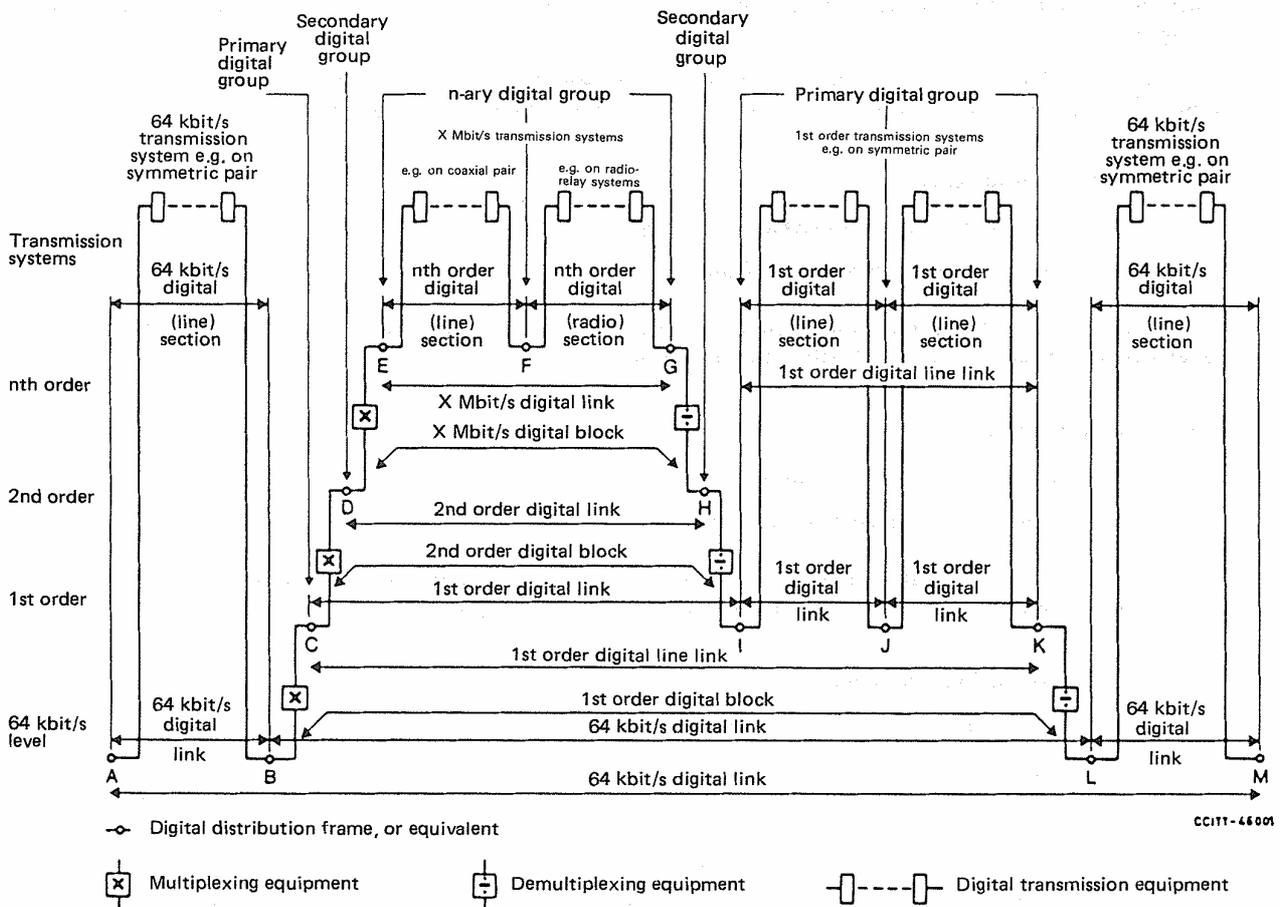
S: indicación de fallo atrás

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.

F: éléments numériques de service

S: dígitos 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.



- Note 1 — Digital line and radio sections may be at digit rates which are either hierarchical or non-hierarchical.
- Note 2 — A-B is a 64 kbit/s digital link consisting of a single 64 kbit/s digital section.
- Note 3 — A-M is a 64 kbit/s digital link which contains six 64 kbit/s digital sections, A-B, E-F, F-G, I-J, J-K and L-M.
- Note 4 — F-G is an X Mbit/s digital radio section which forms part of an X Mbit/s digital link E-G.
- Note 5 — G-I is a 1st order digital link which contains a 2nd order digital link D-H.
- Note 6 — I-K is an example of a digital line link.

FIGURE 1/G.701

Examples of digital link, digital section, digital line section, etc.

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: hiérarchie de multiplexage numérique

S: jerarquía de los múltiplex 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 numérique 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 numérique 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 parallèle/série

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 série/parallèle

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 répartition dans le temps]

S: multiplexación por división en el tiempo

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

4013 **digital multiplexing**

F: multiplexage numérique

S: multiplexación 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: justificación [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: justificación 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 négative

S: justificación 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/négative

S: justificación 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: élément numérique de justification

S: dígito de justificación [dígito 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: élément numérique de service de justification

S: dígito de servicio de justificación [dígito de servicio de relleno]

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

4029 **justification rate [stuffing rate]**

F: débit de justification

S: velocidad de justificación [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: débit nominal de justification

S: velocidad nominal de justificación [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: débit maximal de justification

S: velocidad máxima de justificación [velocidad máxima 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: relación de justificación [relación 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: relación nominal de justificación [relación 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 alignment³⁾**

F: verrouillage de trame

S: alineación de trama

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

³⁾ Similar definitions are applicable to multiframe alignment.

5002 **frame alignment signal⁴⁾**

F: signal de verrouillage de trame

S: señal de alineación 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 signal⁴⁾**

F: signal de verrouillage de trame concentré

S: señal de alineación de trama concentrada

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

5004 **distributed frame alignment signal⁴⁾**

F: signal de verrouillage de trame réparti [signal de verrouillage de trame distribué]

S: señal de alineación de trama distribuida

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

5005 **frame alignment recovery time⁴⁾**

F: temps de reprise du verrouillage de trame

S: tiempo de recuperación de la alineación 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 time⁴⁾**

F: durée de perte du verrouillage de trame

S: duración de la pérdida de la alineación 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 temporización

A cyclic signal used to control the timing of operations.

6002 **timing recovery [timing extraction]**

F: récupération du rythme

S: recuperación de la temporización [extracción de la temporización]

The derivation of a timing signal from a received signal.

⁴⁾ Similar definitions are applicable to multiframe alignment.

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 référence

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 maîtresse

S: reloj maestro

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

6012 **time interval error**

F: dérive 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: dérive 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: isócrono

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: anisócrono

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 [mésochrone]

S: sincrono [mesócrono]

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: homócrono

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/hétérochrone]

S: no-síncrono [asícrono/heterócrono]

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: plésiochrone

S: plesióchrono

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: hétérochrone

S: heterócrono

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 centralisée

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: sincronización

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

7002 **timing information**

F: information de rythme

S: información de temporización

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

7003 **synchronization information**

F: information de synchronisation

S: información de sincronización

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: nœud de synchronisation

S: nodo de sincronización

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 sincronización

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

7007 **synchronization network**

F: réseau de synchronisation

S: red de sincronización

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 unilatérale]

S: sincronización 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 bilatérale]

S: sincronización 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 unilatérale [commande unilatérale]

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 bilatérale [commande bilatérale]

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 analógico

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 linéaire [mode analogique linéaire]

S: control analógico 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 quantifiée [mode à quantification d'amplitude]

S: control por cuantificación 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: réseau non synchronisé

S: red no sincronizada

A network in which signals need not be synchronous.

7018 **mutually synchronized network**

F: réseau 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: réseau démocratique, réseau à synchronisation mutuelle démocratique

S: red democrática, red democrática 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 **hierarchical network, hierarchical synchronized network**

F: réseau hiérarchisé, réseau à synchronisation hiérarchisée

S: red jerárquica, red con sincronización jerárquica

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 **hierarchical mutually synchronized network**

F: réseau hiérarchisé à synchronisation mutuelle

S: red jerárquica 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: réseau despotique, réseau à synchronisation despotique

S: red despótica, red con sincronización despótica [red monárquica, red con sincronización monárquica]

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

7023 **oligarchic network, oligarchic synchronized network**

F: réseau oligarchique, réseau à synchronisation oligarchique

S: red oligárquica, red con sincronización oligárquica

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: modulación 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: cuantificación

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: cuantificación 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: cuantificación 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: cuantificación 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 cuantificación

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

8016 **decision value**

F: valeur de décision [amplitude de décision]

S: valor de decisión

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 décision [amplitude virtuelle de décision]

S: valor virtual de decisión

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 quantifiée [amplitude quantifiée]

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: capacité 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: écrêtage

S: limitación de cresta (en cuantificación)

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: distorsión de cuantificación

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 distorsión de cuantificación

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: codificación [codificación 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: codificación uniforme

The generation of code words to represent uniformly quantized values.

8026 **non-uniform encoding**

F: codage non uniforme

S: codificación 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 codificación

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 codificación 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: décodage

S: decodificación

The generation of reconstructed samples.

8030 **decoder**

F: décodeur

S: decodificador

A device that performs decoding.

8031 **reconstructed sample**

F: échantillon reconstitué

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: códec

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-analógico

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-analógico

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.

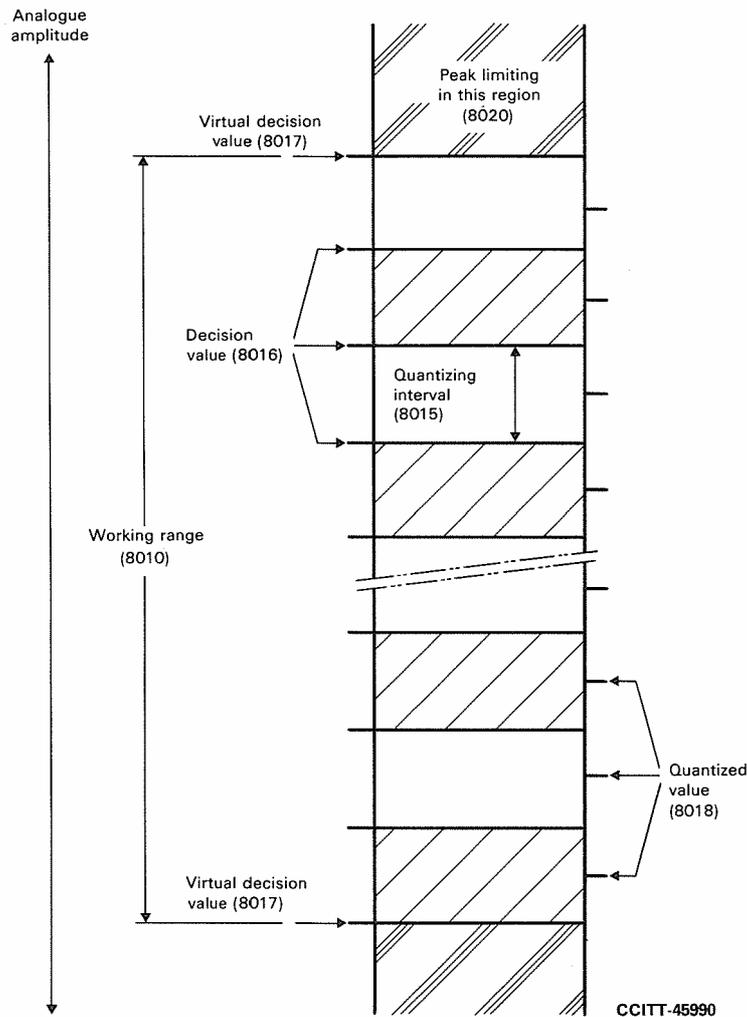
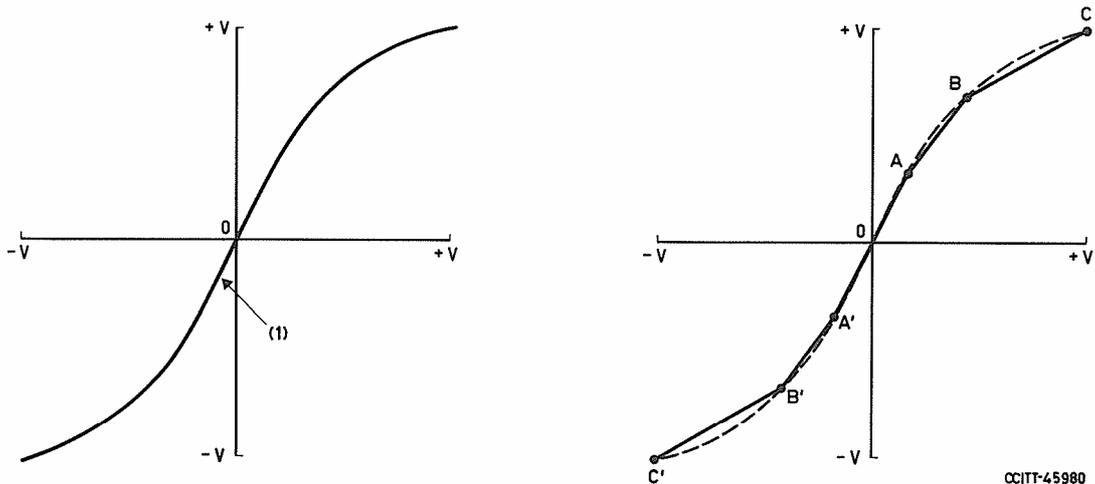


FIGURE 2/G.701

Illustration of terms associated with quantizing (8011)



a) Smooth characteristic

b) Segmented characteristic

Note – A central linear section (1), if present, must tangentially join on to the curved end-section.

Note – This particular characteristic has 5 linear segments: C'B', B'A', A'A, AB, BC.

FIGURE 3/G.701

Non-uniform encoding laws

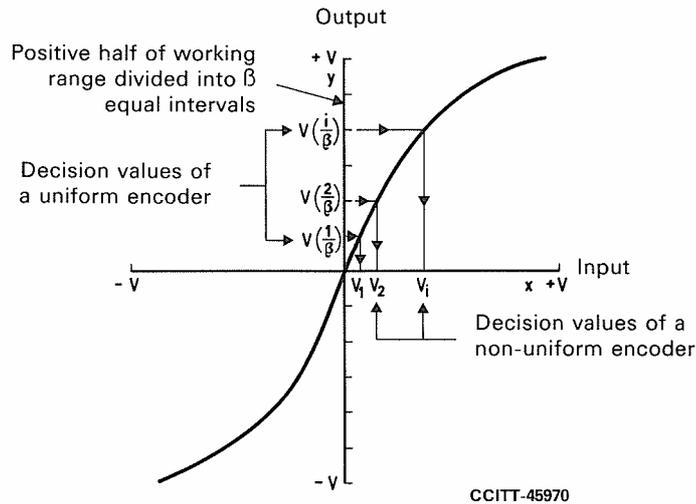


FIGURE 4/G.701

Relationship between the decision values of a uniform and a non-uniform encoding law

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: código de inversión de marcas alternada (codigo AMI) [código 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 modifié

S: código de inversión 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 inversión de marcas alternada [señal bipolar]

The encoded signal produced by alternate mark inversion code.

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

F: violation de bipolarité

S: violación de inversión de marcas alternada [violación 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: disparité

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 numérique

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 numérique

S: variación 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 bornée

S: código 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 disparité compensée

S: código con disparidad compensada [código alternado, código 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: código 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 symétrique

S: código binario simétrico

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: conversión de código

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

8004	adaptive differential pulse code modulation (ADPCM)	6022	centralized-clock interface
8006	adaptive predictor	1005	channel, transmission channel
8012	adaptive quantizing	4002	channel gate
3023	alarm indication signal (AIS)	6006	channel time-slot
9012	[alternate code]	2005	[character signal]
9004	alternate mark inversion code (AMI code)	1007	circuit, telecommunication circuit
9012	[alternating code]	6009	clock
9006	alternate mark inversion signal	7004	clock control signal
9007	alternate mark inversion violation	2005	code word
7014	amplitude quantized control	8032	codec
7012	analogue control	8024	[coder]
1002	analogue signal	8023	[coding, coding in PCM]
6015	anisochronous	6021	codirectional interface
6018	[asynchronous/heterochronous]	6023	contradirectional interface
9011	balanced code	2026	controlled slip
7011	bilateral control	2020	decision circuit
2003	binary digit	2019	decision instant, decision instant of a digital signal
2002	binary figure	8016	decision value
9006	[bipolar signal]	8030	decoder
9007	[bipolar violation]	8029	decoding
3019	bit sequence independence	8003	delta modulation
5003	bunched frame alignment signal	7019	democratic network, democratic mutually synchronized network
4001	(bus: American)	2029	descrambler

4011	(deserializer: American)	3009	elementary cable section
7022	[despotic network, despotic synchronized network]	3011	elementary regenerator section
8002	differential pulse code modulation (DPCM)	3010	elementary repeater section
8033	digilogue channel	8024	encoder
8034	digilogue circuit	8023	encoding
2001	digit	8027	encoding law
2008	digit position	2015	equivalent binary content
2013	digit rate	2016	equivalent bit rate
3020	digit sequence integrity	2030	error, digital error
6005	digit time-slot	2032	error multiplication
4019	digital block	2033	error multiplication factor
3002	digital channel, digital transmission channel	2031	[error rate]
3003	digital circuit, digital telecommunication circuit	2031	error ratio
3004	digital connection	2034	error spread
4016	digital demultiplexer	4007	frame
4015	digital demultiplexing	5001	frame alignment
3006	digital distribution frame	5002	frame alignment signal
2030	digital error	5005	frame alignment recovery time
4021	digital filling	6008	frame alignment time-slot
3013	digital line link	6020	heterochronous
3013	[digital line path]	7021	hierarchic mutually synchronized network
3012	digital line section	7020	hierarchic network, hierarchic synchronized network
3015	digital line system	4001	highway
3005	digital link, digital transmission link	6017	homochronous
4014	digital multiplexer	3025	[housekeeping digits]
4017	digital multiplex equipment	1008	interface
4003	digital multiplex hierarchy	6014	isochronous
4013	digital multiplexing	2024	jitter
4021	[digital padding]	4026	justifiable digit time-slot
3005	[digital path]	4022	justification
3017	digital radio link	4029	justification rate
3017	[digital radio path]	4032	justification ratio
3016	digital radio section	4028	justification service digit
3018	digital radio system	4027	justifying digit
3007	digital section	9002	line code
2006	digital signal	2014	line digit rate
9009	digital sum	7013	linear analogue control
9010	digital sum variation	8019	load capacity
3003	digital telecommunication circuit	6011	master clock
3001	digital transmission	4031	maximum justification rate
3002	digital transmission channel	4031	[maximum stuffing rate]
3005	digital transmission link	6016	[mesochronous]
3014	digital transmission system	9005	modified alternate mark inversion code
3022	digital transparency	7022	monarchic network, monarchic synchronized network
4005	(digroup: American)	4008	multiframe
1003	discretely-timed signal	7018	mutually synchronized network
9008	disparity	4006	n-ary digital group
5004	distributed frame alignment signal	2009	n-ary digital signal
7009	double-ended synchronization	4024	negative justification
4010	[dynamicizer]	4024	[negative stuffing, negative pulse stuffing]

4030	nominal justification rate	3008	section termination
4033	nominal justification ratio	8028	segmented encoding law
4030	[nominal stuffing rate]	4011	serial to parallel converter
4033	[nominal stuffing ratio]	4010	(serializer: American)
7017	non-synchronized network	3025	service digits
6018	non-synchronous	1001	signal
8026	non-uniform encoding	2007	signal element
8014	non-uniform quantizing	6007	signalling time-slot
2004	octet	2017	significant instant, significant instant of a digital signal
3021	octet sequence integrity		
7023	oligarchic network, oligarchic synchronized network	7008	single-ended synchronization
5006	out-of-frame alignment time	2026	[slip]
8019	[overload point]	4011	[staticizer]
9012	paired-disparity code	4026	[stuffable digit time-slot]
4010	parallel to serial converter	4022	[stuffing]
4018	PCM multiplex equipment	4027	[stuffing digit]
8020	peak limiting, peak limiting in quantizing	4029	[stuffing rate]
6019	plesiochronous	4032	[stuffing ratio]
4023	positive justification	4028	[stuffing service digit]
4023	[positive stuffing, positive pulse stuffing]	4009	subframe
4025	positive/zero/negative justification	2014	[symbol rate]
4025	[positive/zero/negative stuffing]	9014	symmetrical binary code
4025	positive/zero/negative pulse stuffing	7001	synchronization
8005	predictor	7003	synchronization information
4005	[primary block]	7006	synchronization link
4004	primary digital group	7005	synchronization node
4005	primary PCM group	7007	synchronization network
2012	psuedo n-ary signal	6016	synchronous
9001	pulse code	7016	synchronized network
8001	pulse code modulation (PCM)	7016	[synchronous network]
4022	[pulse stuffing]	1006	telecommunication
8018	quantized value	1007	telecommunication circuit
8011	quantizing	4012	time-division multiplexing
8021	quantizing distortion	6012	time interval error
8022	quantizing distortion power	7015	time quantized control
8015	quantizing interval	6004	time-slot
8031	reconstructed sample	6002	[timing extraction]
2010	redundant digital signal	7002	timing information
9003	redundant line code	6001	timing signal
2011	redundant n-ary signal	6002	timing recovery
6010	reference clock	1004	transmission
2021	regeneration	1005	transmission channel
2023	regenerative repeater	4020	transmultiplexer
2022	regenerator	3022	transparency, digital transparency
3011	[regenerator section]	2027	uncontrolled slip
3009	[repeater section]	8025	uniform encoding
6013	relative time interval error	8013	uniform quantizing
6003	retiming	7010	unilateral control
8007	sample	2018	unit interval
8008	sampling	3024	upstream failure indication
8009	sampling rate	8017	virtual decision value
2028	scrambler	2025	wander
		8010	working range

Reference

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

ITU-T RECOMMENDATIONS SERIES

Series A	Organization of the work of the ITU-T
Series B	Means of expression: definitions, symbols, classification
Series C	General telecommunication statistics
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks and open system communications
Series Y	Global information infrastructure and Internet protocol aspects
Series Z	Languages and general software aspects for telecommunication systems