INTERNATIONAL TELECOMMUNICATION UNION

CCIR

INTERNATIONAL
RADIO CONSULTATIVE
COMMITTEE

RECOMMENDATIONS AND REPORTS OF THE CCIR, 1982

(ALSO QUESTIONS, STUDY PROGRAMMES, RESOLUTIONS, OPINIONS AND DECISIONS)

XVth PLENARY ASSEMBLY
GENEVA, 1982

VOLUME XIII

VOCABULARY (CMV)

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PLAN OF VOLUMES I TO XIV
XVTH PLENARY ASSEMBLY OF THE CCIR

(Geneva, 1982)

VOLUME I	Spectrum utilization and monitoring.
VOLUME II	Space research and radioastronomy.
VOLUME III	Fixed service at frequencies below about 30 MHz.
VOLUME IV-1	Fixed-satellite service.
VOLUME IV/IX-2	Frequency sharing and coordination between systems in the fixed-satellite service and radio-relay systems.
VOLUME V	Propagation in non-ionized media.
VOLUME VI	Propagation in ionized media.
VOLUME VII	Standard frequencies and time signals.
VOLUME VIII	Mobile services.
VOLUME IX-1	Fixed service using radio-relay systems.
VOLUME X-1	Broadcasting service (sound).
VOLUME X/XI-2	Broadcasting-satellite service (sound and television).
VOLUME XI-1	Broadcasting service (television).
VOLUME XII	Transmission of sound broadcasting and television signals over long distances (CMTT).
VOLUME XIII	Vocabulary (CMV).
VOLUME XIV-1	Information concerning the XVth Plenary Assembly: Minutes of the Plenary Sessions. Administrative texts. Structure of the CCIR. Lists of CCIR texts.
VOLUME XIV-2	Alphabetical index of technical terms appearing in Volumes I to XIII.

All references within the texts to CCIR Recommendations, Reports, Resolutions, Opinions, Decisions, Questions and Study Programmes refer to the 1982 edition, unless otherwise noted; i.e., only the basic number is shown.

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DISTRIBUTION OF TEXTS OF THE XVTH PLENARY ASSEMBLY OF THE CCIR IN VOLUMES I TO XIV

Volumes I to XIV, XVth Plenary Assembly, contain all the valid texts of the CCIR and succeed those of the XIVth Plenary Assembly, Kyoto, 1978.

1. Recommendations, Reports, Resolutions, Opinions, Decisions

1.1 *Numbering of these texts*

Recommendations, Reports, Resolutions and Opinions are numbered according to the system in force since the Xth Plenary Assembly.

In conformity with the decisions of the XIth Plenary Assembly, when one of these texts is modified, it retains its number to which is added a dash and a figure indicating how many revisions have been made. For example: Recommendation 253 indicates the original text is still current; Recommendation 253-1 indicates that the current text has been once modified from the original. Recommendation 253-2 indicates that there have been two successive modifications of the original text, and so on. Within the text of Recommendations, Reports, Resolutions, Opinions and Decisions, however, reference is made only to the basic number (for example Recommendation 253). Such a reference should be interpreted as a reference to the latest version of the text, unless otherwise indicated.

The tables which follow show only the original numbering of the current texts, without any indication of successive modifications that may have occurred. For further information about this numbering scheme, please refer to Volume XIV-1.

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(1) Published separately.

1.3.1 *Note concerning Reports*

The individual footnote "Adopted unanimously" has been dropped from each Report. Reports in this volume have been adopted unanimously except in cases where reservations have been made which will appear as individual footnotes.

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6	VI	33	XI-1	51	X/XI-2
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21	VI	43, 44	X/XI-2	56	I
27	I	45	III		

1.6.1 *Note concerning Decisions*

Since Decisions were adopted by Study Groups, use was made of the expression "Study Group..., Considering" and the expression "Unanimously decides", replaced by "Decides".

2. Questions and Study Programmes

2.1 *Text numbering*

2.1.1 *Questions*

Questions are numbered in a different series for each Study Group: where applicable a dash and a figure added after the number of the Question indicate successive modifications. The number of a Question is completed by an *Arabic figure indicating the relevant Study Group.* For example:

— Question 1/10 would indicate a Question of Study Group 10 with its text in the original state;

— Question 1-1/10 would indicate a Question of Study Group 10, whose text has been once modified from the original: Question 1-2/10 would be a Question of Study Group 10, whose text has had two successive modifications.

2.1.2 *Study Programmes*

Study Programmes are numbered to indicate the Question from which they are derived if any, the number being completed by a capital letter which is used to distinguish several Study Programmes which derive from the same Question. The part of the Study Programme number which indicates the Question from which it is derived makes no mention of any possible revision of that Question, but refers to the current text of the Question as printed in this Volume.

Examples:

— Study Programme 1A/10, which would indicate that the current text is the original version of the text of the first Study Programme deriving from Question 1/10;

— Study Programme 1C/10, which would indicate that the current text is the original version of the text of the third Study Programme deriving from Question 1/10;

— Study Programme 1A-1/10, would indicate that the current text has been once modified from the original, and that it is the first Study Programme of those deriving from Question 1/10.

It should be noted that a Study Programme may be adopted without it having been derived from a Question; in such a case it is simply given a sequential number analogous to those of other Study Programmes of the Study Group, except that on reference to the list of relevant Questions it will be found that no Question exists corresponding to that number.

References to Questions and Study Programmes within the text are made to the basic number as well as for other CCIR texts.

2.2 *Arrangement of Questions and Study Programmes*

The plan shown on page II indicates the Volume in which the texts of each Study Group are to be found, and so reference to this information will enable the text of any desired Question or Study Programme to be located.

VOLUME XIII

VOCABULARY
CMV

Joint CCIR/CCITT Study Group for Vocabulary

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NUMERICAL INDEX OF TEXTS

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CMV

(CCIR/CCITT Joint Study Group for Vocabulary and related subjects)

Terms of reference:

1. Vocabulary

1.1 To coordinate the terminology work within the CCIs and to seek agreement among all other Study Groups concerned to ensure acceptability of the definitions. In particular, to assist both CCIs in arriving at mutually acceptable definitions of technical terms of common interest.

1.2 To ensure liaison with other organizations dealing with terminology work in the telecommunication field, namely with the International Electrotechnical Commission (IEC) by means of the "CCI-IEC Joint Coordinating Group for Vocabulary" (JCG).

2. Related subjects

2.1 To collect the needs of the other Study Groups concerning graphical symbols (to be used in diagrams or on equipment), and to ensure liaison with the "CCI-IEC Joint Working Group for Graphical Symbols and Diagrams" (JWG).

2.2 To study the needs of the other Study Groups concerning letter symbols and other means of expression, systematic classification, units of measurement, etc., in cooperation with the relevant IEC Technical Committee (Technical Committee No. 25) and with the International Organization for Standardization (IS0).

1978-1982	*Chairman:*	M. THUÉ (France)
	Vice-Chairmen:	S. J. ARIES (United Kingdom) M. DUCOMMUN (Switzerland) B. A. DURÁN (Spain)
1982-1986	*Chairman:*	M. THUÉ (France)
	Vice-Chairmen:	S. J. ARIES (United Kingdom) M. DUCOMMUN (Switzerland) J. M. PARDO HORNO (Spain)

INTRODUCTION BY THE CHAIRMAN OF THE CMV

1. Foreword

The Joint Study Group for Vocabulary (CMV) is a joint CCIR/CCITT Study Group, administered by the CCIR, with the terms of reference given above.

The main function of the CMV relates to telecommunications terminology and, more particularly with respect to the CCIR, radiocommunication terminology. The choice of terms and definitions is usually left to the competent Study Groups and the CMV simply coordinates the work undertaken by them, bearing in mind the activities of the Groups of Experts of the CCI/IEC Joint Coordination Group for Vocabulary (JCG). The CMV proposes definitions only for the general terms used by several Study Groups.

Regarding the "related subjects" (namely: graphical symbols; quantities, units and their symbols; logarithmic quantities and units; letter symbols, abbreviations and initials; systematic classification and documentary language), the CMV normally confines itself to ensuring liaison with standardization bodies working in more general fields, chiefly the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO). In these areas the CMV deals only with those aspects which relate specifically to telecommunications, such as the nomenclature of frequency bands, the use of the decibel or the abbreviations of telecommunication terms.

2. The work of the CMV

During the period 1978-1982, the CMV held two meetings, in June 1980 and in October 1981 (see Annex I).

The June 1980 meeting was an interim meeting for the CCIR, but a final meeting for the CCITT, which held its VIIth Plenary Assembly in November 1980. All the texts of interest to both CCIs were examined and adopted by that Plenary Assembly and were published in the CCITT Yellow Book (Volume I, Recommendations of the A and B Series, see Annex II).

The October 1981 meeting was a final meeting for the CCIR. The texts drafted at the interim meeting were either confirmed or revised and a number of new ones were prepared. All these were submitted for approval by the XVth CCIR Plenary Assembly. The texts at present in force are listed in the table of contents of this Volume. The aim of this introduction is to present these texts and to make some comments on them, beginning with the Recommendations and Reports.

3. Section CMV A: Terminology

3.1 Terminological texts are drawn up in collaboration with the two CCIs' Study Groups; there is also cooperation with the IEC through the Joint Coordination Group (JCG) and its Groups of Experts (see § 7.1).

3.2 *Terminology specific to the CCIR*

Recommendation 573 "Radiocommunication vocabulary", which assembles the definitions of terms used by several CCIR Study Groups, was revised and amplified in the light of the comments made by the Study Groups as well as the definitions given in Article 1 of the Radio Regulations (RR). As far as possible, the CMV maintained in that Recommendation the definitions contained in the Radio Regulations or in the texts of the Study Groups. It was felt, however, that a number of definitions in the Radio Regulations were too administrative while various definitions formulated by the Study Groups were too specifically related to a particular technique. In those cases the CMV drew up definitions which were more technical or more general, taking particular account of the work of the JCG Groups of Experts. Comments on the terms and definitions given in Recommendation 573 appear in Annex III.

An *alphabetical list* of all the terms defined in the CCIR texts is added to this Recommendation along with the equivalent terms in the other working languages, together with a reference to the volume or text in which the definition appears.

3.3. *Terminology common to the CCIR and the CCITT*

At its June 1980 meeting, the CMV undertook to study the definitions of some general terms common to the CCIR and the CCITT, particularly those whose examination was called for in a number of WARC-79 Resolutions: Resolution No. 68 concerning the terms "telegraphy" and "telephony" and other technical terms; Resolution No. 67 concerning the English term "channel" (Spanish: canal; French: canal or voie); and the terms "frequency band" and "bandwidth", which had given rise to confusion.

At the October 1981 meeting, in view of the progress made by the Group of Experts JCG-A (General terms), the available results of which were sent to administrations in the preparatory documentation for the meeting, the CMV drew up a provisional vocabulary of general terms common to the CCIR and the CCITT, containing the terms and definitions studied in 1980. This text is the subject of Report 971 which is submitted to all Study Groups for comment, with a view to the preparation of a Recommendation. Report 971 gives the definitions of approximately fifty terms, both old terms whose meaning is generally understood but some of which might give rise to confusion, and terms denoting new concepts which, together with their definitions, are proposed provisionally and submitted to the Study Groups concerned for possible revision. Annex IV contains a number of comments on the terms and definitions given in Report 971.

During the period 1978-1982 the text adopted in 1976 of CCITT Recommendation G.702, containing the definitions of terms used in digital transmission, was transmitted to the CCIR Study Groups which use that technique. In the light of the interest shown by those Study Groups, the revised version of Recommendation G.702 adopted in 1980 is included in the fascicle of CMV texts in the form of an Appendix to Report 971.

4. Section CMV B: Graphical symbols and diagrams

4.1 This question is also the subject of cooperation with the IEC (Technical Committee No. 3) in the framework of a *Joint Working Group (JWG)* (see § 7.2). The CMV approved the extension of the JWG's terms of reference to include symbols that can be used on equipment (in addition to the symbols that can be used in diagrams and the rules for preparing diagrams) and the JWG's new title: "Joint CCI/IEC Working Group for Graphical Symbols and Diagrams".

4.2 The CMV revised Recommendation 461 advocating the *use of graphical symbols* (in diagrams or on equipment) and the rules for the preparation of diagrams published by the IEC on the proposal of the JWG.

5. Section CMV C: Other related subjects

5.1 The CMV revised Recommendation 430 advocating the use of the units and symbols of the *international system of units* (SI).

5.2 At the request of IEC Technical Committee No. 25, the CMV prepared Recommendation 607 on terms and abbreviations for information quantities in telecommunications, specifying that the symbols bit and Bd should be used to denote the binary digit and the baud, the modulation rate unit, respectively. No symbol was proposed for the shannon, the byte or the octet.

5.3 New Recommendation 608 was also prepared advocating the use of the *letter symbols* recommended by ISO and IEC.

5.4 Recommendation 431 concerning the *nomenclature of frequency bands* was revised in the light of the amendments made in the Radio Regulations and of proposals to extend the nomenclature to cover bands above and below those given in the Radio Regulations.

5.5 Lastly, the CMV revised Recommendation 574 on *logarithmic quantities and units*, in particular in relation to the use of the "decibel". The amendments consist mainly in the addition of paragraphs on the "relative power level" and the "zero relative level point" in the case of audio-frequency signals and noise, with additions corresponding to the list of special notations, such as dBm0s and dBq. A reference to CCITT Recommendation B.4 on the use of the "neper" was added.

6. **Work programme** (Questions and Study Programmes)

6.1 *Terminology*

Question 1/CMV is a standing one and clarifies the most important part of the CMV's terms of reference, namely, the study of terms and definitions.

Study Programme 1A/CMV concerns the revision of *technical terms and definitions appearing in the Radio Regulations or the Convention*; as regards the Radio Regulations, this revision was requested in Recommendation No. 72 of WARC-79.

Study Programme 1B/CMV concerns the *use of certain terms linked with physical quantities*, such as quotient, ratio, coefficient, factor, index, constant, rate, etc. Annex V explains how these terms are used in French. The administrations which work in English or Spanish are asked to send contributions explaining how they use the corresponding terms.

6.2 *Graphical symbols and diagrams*

Question 2/CMV is also a standing one and concerns the *graphical symbols* (used in diagrams and on equipment) and the rules to be followed in the preparation of diagrams, the study of which is made by the CCI/IEC Joint Working Group with a view to achieving international standardization.

6.3 *Other related subjects*

Question 3/CMV concerns the physical quantities, units of measurement and letter symbols used in telecommunications.

Question 4/CMV concerns a new study undertaken by the CMV and concerning abbreviations and initials representing telecommunication terms (particularly modulation systems).

7. **Organization of work** (Resolutions, Opinions, Decisions)

7.1 *Terminology*

Resolution 66 defines procedures for cooperation between the CMV and other Study Groups of both CCIs, on the one hand, and with the Groups of Experts of the Joint Coordination Group (JCG), on the other. It essentially recommends that each Study Group should constitute a small standing terminology working group under a "*Special Rapporteur for Terminology*". The new text does not differ greatly from that adopted in 1978; a number of clarifications were made at the CMV meetings and by the VIIth CCITT Plenary Assembly. The Annex to Resolution 66, virtually unchanged since 1978, recommends a working method for the Special Rapporteur and the Terminology Working Group of each Study Group of both CCIs. The CMV maintained unchanged the text of *Decision 19*, defining the terms of reference of Working Party CMV/1 composed of the Special Rapporteurs for Terminology of all the Study Groups and a number of national representatives. Working Party CMV/1 enables information to be circulated on the terminology studies conducted by the Study Groups and the JCG Groups of Experts, in order to keep all the Special Rapporteurs informed and to provide for the necessary coordination among the Rapporteurs and with the JCG Groups of Experts. Annex VI lists the members of the JCG and Annex I to Decision 19 gives the membership of Working Party CMV/1.

Resolution 78 recommends that all the texts relating to terminology, as well as giving the term and its definition in the main language of the text, should indicate the equivalent terms in the two other working languages.

7.2 *Graphical symbols and diagrams*

Resolution 23 establishes the pattern of cooperation between the CCIs and IEC in the "CCI/IEC Joint Working Group for Graphical Symbols and Diagrams" (JWG) which should result in a publication by IEC. Annex VII lists the members of the Joint Working Group.

7.3 *Other related subjects*

The question whether the CMV should undertake work on the "*systematic classification*" item in its terms of reference was discussed. This subject is at present of particular interest because the ITU General Secretariat has convened a Working Group to study the establishment of an "ITU Documentation Centre" in accordance with Resolution No. 47 of the 1973 Plenipotentiary Conference and the Group has recommended the use of a thesaurus to index all ITU documents and facilitate documentary research.

The CMV considered that, if the project were accepted by the next Plenipotentiary Conference, it should be associated with the compilation and updating of a telecommunications thesaurus, and it drew up in this regard *Opinion 76.*

8. Action taken on the Resolutions and Recommendations of WARC-79 for the study of which the CMV is responsible

Resolution No. 68: concerning the definition of the terms "telegraphy" and "telephony" and associated terms.

Report 971 contains technical definitions for the terms "telegraphy" and "telephony". Moreover, the VIIth CCITT Plenary Assembly confirmed that those terms should not be used to define the CCITT's terms of reference (CCITT Opinion No. 9).

Recommendation No. 67: concerning the definition of the terms "coverage area" and "service area".

Recommendation 573 contains definitions for the term "coverage area" in the case of space stations and terrestrial transmitting stations. The term "capture area" is proposed for the corresponding concept in the case of terrestrial receiving stations. These definitions are accompanied by notes, one of which gives the technical explanation of the definition of "service area".

Recommendation No. 72: concerning the revision of the terms and definitions contained in Article 1 of the Radio Regulations.

Recommendation 573 contains definitions for a number of terms defined in Article 1 which differ from those given in the Radio Regulations, for example, through the addition of notes to prevent confusion or ambiguity. The terms is question are as follows:

6 (1.4)	Radio waves
132 (6.2)	Emission
141 (6.11)	Assigned frequency band
153 (6.23)	Carrier power
164 (7.5)	Protection ratio

Report 971 also contains a few definitions which differ from those given in the Radio Regulations for the following terms:

111	Telegraphy
116	Facsimile
117	Telephony
119	Simplex
120	Duplex
122	Television
125	Telemetry
128	Telecommand

A proposal was submitted to the CMV to amend the definition of Number 88 (4.31) "Emergency Position-Indicating Radiobeacon Station" in Article 1 of the Radio Regulations to include a specific reference to cases in which emissions from such stations are relayed by satellite. However, as this is a technical question concerning specifically the operation of the mobile services, and as it had not been discussed in the competent Study Group (Study Group 8 of the CCIR), the CMV felt that it was not in a position to discuss the proposal during the final meeting. Administrations are invited to submit their proposals directly to the World Administrative Radio Conference for the Mobile Services, planned for 1983, since in principle Study Group 8 is not due to meet before this Conference.

Recommendation No. 73: concerning the use of the English term "channel".

Report 971 contains definitions of the terms "(transmission) channel" and "(frequency) channel".

Recommendation 573 contains the definition of the term "(radio frequency) channel".

9. Texts of special importance for the developing countries

The CMV draws the attention of the developing countries to the following texts aimed at facilitating understanding of all the texts on telecommunications, particularly those of the CCIR and the CCITT:

Recommendation 573: Radiocommunication vocabulary.

Report 971: General telecommunications terminology.

Recommendation 461: Graphical symbols and rules for preparation of diagrams in telecommunications.

Recommendation 430: Use of the international system of units (SI).

Recommendation 607: Terms and abbreviations for information quantities in telecommunications.

Recommendation 608: Letter symbols for telecommunications.

Recommendation 431: Nomenclature of the frequency and wavelength bands used in telecommunications.

Recommendation 574: Logarithmic quantities and units. Use of the decibel.

ANNEX I

ORGANIZATION OF THE WORK OF THE CMV

During the two meetings of the CMV mentioned in § 2 above, work was conducted within four Working Groups:

CMV A: Organization of work on terminology (Chairman: Mr. S. J. Aries, United Kingdom)

CMV B: Terminology common to the CCIR and the CCITT (Chairman: Mr. J. Lalou, France)

CMV C: Terminology specific to the CCIR (Chairman: Mr. V. Quintas, Spain)

CMV D: Graphical symbols and other means of expression (Chairman: Mr. M. Ducommun, Switzerland)

Mr. P. Guillot, the CCIR engineer responsible for following the work of the CMV, prepared for each meeting temporary documents assembling the proposals concerning the radiocommunication vocabulary.

During the meetings the Secretariat for the plenary meeting was provided by Mr. J. Schwob (France) and all the texts were examined by an Editorial Group composed of Mr. S. J. Aries (United Kingdom), Mr. V. Quintas (Spain) and Mr. J. Schwob (France).

Mr. B. Durán (Spain), Vice-Chairman appointed by the XIVth Plenary Assembly, was unable to attend the two meetings and was only in a position to participate in the work of the CMV by correspondence. Mr. V. Quintas acted as the Spanish-speaking Vice-Chairman for both meetings. It is with deep regret that the participants in the work of the CMV learnt of his sudden death in January 1982. His absence was very much felt during the XVth Plenary Assembly.

Outside the meetings work on terminology was conducted mainly by correspondence within the framework of Working Party CMV/1, the terms of reference and membership of which are given in Decision 19 and its Annex I.

ANNEX II

TEXTS SUBMITTED BY THE CMV AND APPROVED BY THE VIIth CCITT PLENARY ASSEMBLY

(Geneva, November 1980)

These texts are published in Volume I of the CCITT Yellow Book (Geneva, 1981). (The following is an excerpt from the Table of Contents of Volume I of the Yellow Book).

SERIES A RECOMMENDATIONS

Organization of the work of the CCITT

Recommendation No.	*Title*	*CCIR equivalent*
A.10	Terms and definitions	Res. 66
A.12	Collaboration with the International Electrotechnical Commission on the subject of definitions for telecommunications	–
A.13	Collaboration with the International Electrotechnical Commission on graphical symbols and diagrams used in telecommunications	Res. 23
A.14	Publication of definitions	–
A.16	Presentation of texts on terminology	Res. 78

SERIES B RECOMMENDATIONS

Means of expression

Recommendation No.	*Short title*	
B.1	Letter symbols for telecommunications	Rec. 608
B.3	Use of the international system of units (SI)	Rec. 430
B.4	Transmission units	Rec. 574 Annex I, Appendix III
B.10	Graphical symbols and rules for the preparation of diagrams in telecommunications	Rec. 461
B.12	Logarithmic quantities and units	Rec. 574

ANNEX III

REMARKS ON THE TERMS AND DEFINITIONS IN RECOMMENDATION 573 "RADIOCOMMUNICATION VOCABULARY"

Section A – Stations and links – General comments

The definitions of services have not been included in this section, since they are regarded as being administrative in nature. However, a number of definitions of services are given in a note when they are considered necessary for clarifying the definitions of stations.

With regard to the various categories of radio station, confusion should be avoided between the following terms:

- "terrestrial station" (A 09) designates a station located on Earth (including in the Earth's atmosphere) intended for communication with a station of the same kind without recourse to space objects;
- "Earth station" (A 06) designates a station located on Earth (including in the Earth's atmosphere) intended for communication either with a station located on a space object or with a station of the same kind but by means of one or more space objects;
- "land station" (A 11) designates a terrestrial station located at a fixed point and intended for communication with mobile stations;

It should also be noted that the term "fixed station" applies only to stations in the "fixed service".

Study Group 8 (mobile services) requested that the definitions of mobile service stations should appear in Recommendation 573; the CMV feels, however, that these definitions fall within the province of Study Group 8 and included them in Appendix A to Recommendation 573.

Links (A 21 to A 23)

It would be advisable to define the terms "point-to-point link" and "point-to-multipoint distribution link" (see Recommendation 592, Volume IX) and "point-to-area link"; the definition of the last term should make it easier to understand the concept of "coverage area" (A 51a, A 51b, A 52).

Satellite link and associated terms (A 31 to A 36)

The term "feeder link" has been excluded for the time being, the definition given in the Radio Regulations being of an administrative nature. It would be advisable to formulate a technical definition.

A "feeder link" is a radiolink intended for communication between an Earth station and a station located on board a satellite or other space object, in order to allow the said space object to fulfil its specific mission. A feeder link may be an up-link (in the case of broadcasting satellites) or a down-link (case of earth exploration satellites) or even a two-way link (in the case of satellites in the mobile-satellite service).

Transmission loss (A 41 to A 47)

The CMV has reproduced in full all the 7 terms and definitions, together with numerous notes, which were adopted by Study Group 5, since they should all be of use to a number of other Study Groups. However, it would be desirable at a later stage to reduce the number of notes, some of which might appear in the texts of Study Group 5 only, along with two or three of the terms at the end of the list, given the needs of the Study Groups concerned. A general definition of the term "loss" might be added at the beginning.

Coverage area, capture area (A 51a, A 51b, A 52)

The definitions proposed constitute a provisional response to Recommendation No. 67 of WARC-79. In June 1980 the CMV proposed a single term "coverage area" for all types of station, both transmitting and receiving, and submitted a definition to the Study Groups concerned. The proposal was accepted in respect of space stations, but a number of Study Groups dealing with terrestrial radiocommunications considered that the term "coverage area" should be used in connection with transmitting stations. The term "capture area" was proposed provisionally to convey the same concept as "coverage area" in connection with terrestrial receiving stations. Since these are new terms and definitions, a number of notes were added for the sake of clarity; it would be desirable for these to be reduced in number at a later stage. One of the notes gives the technical bases for the definition of the term "service area" as called for in Recommendation No. 67 of WARC-79.

Section B – Frequencies and bandwidths

(Radio frequency) channel

This definition, along with those of "(transmission) channel" and "(frequency) channel" in Report 971, constitute a response to Recommendation No. 73 of WARC-79.

Section E – Power and radiated power

Antenna gain

This definition, taken from the Radio Regulations, could be supplemented by the definition of "antenna directivity" being studied by Study Group 5, on the basis of recent work by the IEEE and the JCG. Directivity in a given direction is the ratio of the radiation intensity (power per steradian) in that direction to the mean radiation intensity in all directions (see Annex I to Recommendation 341, Volume I)).

Section F – Receivers, noise and interference

Noise temperature

The CMV defined two associated terms, the first being "noise temperature" characterizing the noise power added by a two-port (quadripole) device when inserted in a transmission chain, the second being "overall noise temperature" (often also called "noise temperature") characterizing the noise power produced at the terminals of a one-port (dipole) device such as a generator, an antenna or a receiver including the antenna. Where there is ambiguity, any doubt should be dispelled by the context.

"Equivalent satellite link noise temperature" (term and definition taken from the Radio Regulations) is in fact an "overall noise temperature". The term "noise temperature" tends to be used in all frequency ranges because it is proportional to the noise power and therefore additive.

Protection ratio

The CMV noted that the term "unwanted signals", which appears in this definition taken from the Radio Regulations, is not itself defined. It would be a good idea to define it. Unwanted signals may include interfering signals and noise.

Section H – Space radiocommunications

Deep space

Study Group 2 has undertaken to classify the distances of spacecraft from the Earth. Pending the results of this study, only the term "deep space" has been included in Recommendation 573 along with its definition taken from the Radio Regulations.

ANNEX IV

COMMENTS ON THE TERMS AND DEFINITIONS IN REPORT 971 "GENERAL TELECOMMUNICATIONS TERMINOLOGY"

Section 1 – Forms of telecommunication

The definitions of several terms employ the term "*information*" which is not defined. The CMV considers that the present ISO definition is not entirely suitable for telecommunications, but was not able to prepare a satisfactory definition at its meeting in October 1981.

Since then, JCG Group A has proposed the following definition which might be discussed by the CMV:

"*Information:* Intelligence or knowledge capable of being represented in forms suitable for communication, storage or processing".

– *1.05 Telephony and 1.06 Telegraphy*

These purely technical definitions partially answer Resolution No. 44 of the 1973 Plenipotentiary Conference and Recommendation No. 68 of WARC-79.

– *1.08 Data communication*

This definition differs from the present ISO definition, which is not suitable for telecommunications.

– *1.11 Still-picture television and 1.13 Still-picture videophone*

The definitions, with some drafting amendments, are those proposed by CCIR Study Group 11 and CCITT Study Group XV, but two notes appearing in the texts of these Study Groups were considered too specific to be reproduced in the Report of the CMV.

– *1.14 Telematics (services)*

This term was used by the CCITT at its VIIth Plenary Assembly (November 1980). The definition is proposed provisionally; CCITT Study Group I has begun further studies on the subject.

– *1.15 Videography; 1.16 Broadcast videography; 1.17 Interactive videography*

These terms were proposed by the Joint CCIR/CCITT ad hoc Working Group on the teletext and videotext systems. The aim of the proposal was to provide a general term which could be used for both systems and at the same time to give a synonym for the term "teletext", which might be confused with the term "Teletex" (see 1.18). The definitions were prepared by the JCG and amended by CCIR Study Group 11 and CCITT Study Group I.

– *1.18 Teletex*

The CMV proposes this definition, prepared by the JCG Group of Experts M (Telegraphy), to prevent confusion with "teletext" (1.16).

– *1.20 Telewriting, Telescript*

The CMV proposes the new term "telescript", which is identical in all three working languages and could possibly replace the term "telewriting" used provisionally by the CCITT VIIth Plenary Assembly. This proposal is submitted for study to CCITT Study Groups I and VIII. However, some administrations indicated at the XVth CCIR Plenary Assembly that they could not agree to the term "telescript".

– *1.25 (Radio) broadcasting*

The note draws attention to the difference in meaning between the terms "radiodiffusion" in French, "radiodifusión" in Spanish and the English term "radio broadcasting". It should be noted that the CCIR frequently uses the term "broadcasting" in the sense of "radio broadcasting". At the XVth CCIR Plenary Assembly, several English-speaking delegates expressed the wish that the definition of the English term be revised to take account of the definition of the "broadcasting service".

Section 2 – Channels, circuits and networks

– *2.01 (Transmission) channel; 2.02 (Frequency) channel*

These definitions, together with that of "(radio) channel" given in Recommendation 573, provide a response to Recommendation No. 73 of WARC-79.

Section 3 – Use and operation of circuits and networks

– *3.05*

The terms "communication" in French and "comunicación" in Spanish have a different meaning here from the general one given in definition 1.03. The English term "call" has a different meaning here from that given in definition 3.04.

The terms "communication" in French and "comunicación" in Spanish may also have the meaning given in definition 3.02, e.g. in "communication fictive de reférence" (in English "hypothetical reference connection", see CCITT Recommendation G.103).

ANNEX V

USE OF CERTAIN TERMS LINKED WITH PHYSICAL QUANTITIES

Extracts from Doc. CMV/71 (France)

A. General considerations

(a) ITU technical texts contain a number of terms expressing a relationship between quantities, such as quotient, ratio, coefficient, factor, index, constant, rate, etc., but their meaning is liable to cause confusion owing to a lack of consistency.

(b) The situation is particularly confused owing to the existence of three working languages, as can be seen from such texts as the Provisional Glossary of Telecommunications Terms published by the ITU in 1979.

(c) Attempts at standardization have been made in certain countries and in vocabularies recently prepared by IEC and the JCG; in particular, in its guidelines for the preparation of the International Electrotechnical Vocabulary, Document 1 (Central Office) 10-29 of May 1972, IEC states that the following rules are applicable in French and English: "The word 'factor' shall be used for a number or a ratio of two quantities of the same kind only. The word 'coefficient' shall be used for any expression representing a quotient of two quantities of different kinds".

B. Use of French terms

The general use of the French terms "quotient", "rapport", "coefficient", "facteur", "indice", "constante" and "taux" must obey the following rules where they express a relationship between physical quantities or serve to designate a physical quantity.

1. The French term "quotient" expresses the result of a division.

Example: quotient de *A* par *B*.

2. The French term "coefficient" expresses a quantity having dimensions and in particular the quotient of two quantities of different dimensions.

Example: coefficient de température.

Note. – The term "coefficient" is also used in mathematics to denote the multiplier of the value of an algebraic quantity, and in statistics. Examples: coefficient d'une équation; coefficients de corrélation et de variation, but "niveau de confiance" (see International Standard ISO 3534: Statistics – Vocabulary and symbols).

3. The French term "facteur" refers to a non-dimensional quantity and in particular the quotient of two quantities of the same dimensions.

Example: facteur de réflexion; facteur multiplicatif du rayon terrestre; facteur de bruit; facteur de qualité.

Note. – In mathematics, the term "facteur" designates each component of a product.

4. The French term "rapport", like "facteur", denotes the quotient of two quantities of the same dimensions.

Examples: rapport de la largeur à la hauteur d'une image; rapport d'onde stationnaire; rapport signal sur bruit.

5. The French term "taux" denotes a factor usually expressed as a percentage or in hundredths or as a smaller decimal fraction such as thousands or millionths. It does not always correspond to the English word "rate"; in particular, it should not be used to designate any quantity per unit time.

Examples: taux d'erreur; taux d'harmoniques; taux de modulation; taux d'intermodulation; taux d'occupation; taux d'ionisation.

Note. – Other terms should be used to express a quantity per unit time. Examples: fréquence d'échantillonnage; fréquence de répetition d'impulsions; cadence d'évanouissement; intensité de précipitation. Common exception: taux de défaillance.

6. The French term "constante" denotes a number or an invariant quantity.

Examples: constante mathématique (such as pi); constantes physiques universelles (such as the Planck and Boltzmann constants) and constantes électrique et magnétique.

Note. – The term "constante" does sometimes refer to a characteristic quantity of a system or substance but it is preferable to use the term "coefficient" or a specific term of quantity. Examples:

Deprecated term	*Correct term*
———	Constante de temps
Constante diélectrique	Permittivité
Constante de propagation	Exposant linéique de propagation
Constante d'affaiblissement	Affaiblissement linéique
Constante de phase	Déphasage linéique
Constantes du sol	Caractéristiques du sol

7. The French term "indice" is sometimes used as an equivalent of "facteur".

Examples: indice de réfraction; indice de modulation.

It also denotes a quantity which is not clearly defined or one which is identifiable rather than measurable.

Examples: indice d'intelligibilité de la parole; indice d'activité solaire.

ANNEX VI

JOINT CCI/IEC COORDINATION GROUP FOR VOCABULARY (JCG)

The purpose of the JCG, set up in 1969 by agreement between the CCIR, the CCITT and IEC, is to prepare and update an international telecommunication vocabulary for publication by IEC, in collaboration with the CCIs, as the "telecommunications" part of the "International Electrotechnical Vocabulary" (IEV).

The Steering Committee of the JCG consists of twelve members, six representing IEC and six the CCIs. The Chairman of the JCG is the Chairman of the CMV, while the Secretary of the JCG is also Secretary of IEC Technical Committee No. 1 (Terminology).

On 1 March 1982, the membership of the JCG is as follows:

Chairman:

M. THUÉ, CMV Chairman (France)	CCI

Secretary:

P. FEINTUCH, Secretary IEC/Technical Committee No. 1 (France)	IEC
Mrs. HUE	

Members:

L. ALGOTSSON (Sweden)	IEC
S. J. ARIES (United Kingdom)	CCI
P. BIRD (Sweden)	CCI
M. DUCOMMUN (Switzerland)	CCI
A. DUNN (Canada)	IEC
J. LOCHARD (France)	IEC
... (Spain) *	CCI
J. READING (United Kingdom)	IEC
H. WAHL (Germany, Federal Republic of)	IEC
G. WALLENSTEIN (United States of America)	CCI

The "telecommunications" part of the IEV has been divided into chapters which constitute the "700 Series" of the IEV. Groups of Experts have been set up to prepare these chapters. The Groups operating on 1 March 1982 are listed below.

* Mr. V. Quintas (Spain), who died in January 1982, was a member of the JCG.

JCG WORKING GROUPS – SUBJECTS DEALT WITH – GROUP LEADERS

(The IEV chapter numbers are given in brackets)

Group A	– General terms (701-702)	J. READING (United Kingdom)
Group C	– Transmission (704)	G. BENNET (United Kingdom)
Group D	– Propagation (705)	L. BOITHIAS (France)
Group F	– Antennas (712)	E. GILLESPIE (United States of America)
Group G/K	– Radiocommunications (713-716)	J. LOCHARD (France)
Group H	– Switching (714)	P. FONTOLLIET (Switzerland)
Group J	– Operation (715)	G. LANGER (France)
Group M	– Telegraphy (721)	R. DAUDE (France)
Group N	– Telephony (722)	R. ASSENS (France)
Group O	– Optical fibres (728)	C. J. LILLY (United Kingdom)
Group R	– Broadcasting (723)	S. LACHARNAY (France)
Group T	– Space radiocommunications (725)	D. J. WITHERS (United Kingdom)
Group W	– Waveguides (726)	J. LOCHARD (France)
Group Y	– Reliability and availability (191)	K. STRANDBERG (Sweden)

Two chapters (725 and 726) are being published. Four draft chapters (701, 714, 721 and 722) have been circulated for comment and three draft chapters (704, 705 and 712) are to be circulated in the near future.

Note. – The terms of reference and membership of Working Party CMV/1, are given in Decision 19 and Annex I thereto.

ANNEX VII

JOINT CCI/IEC WORKING GROUP FOR GRAPHICAL SYMBOLS AND DIAGRAMS (JWG)

The *purpose of the JWG* (see Resolution 23) is to prepare in the field of telecommunications at international level, with a view to publication by IEC:

"– approved lists of graphical symbols for diagrams and for use on equipment;

– approved rules for the preparation of diagrams, charts and tables and for item designation."

The membership of the JWG on 1 March 1982 is as follows:

Chairman:

S. J. ARIES (United Kingdom)	CCI

Secretary:

J. DUBRAY (France)	IEC

Members:

E. ABEL (Germany (Federal Republic of))	CCI
B. AKERBERG (Sweden)	IEC
W. AMMAN (Germany (Federal Republic of))	IEC
D. C. L. CHILTON (United Kingdom)	CCI
H. HAY (Norway)	IEC
R. MAUDUECH (France)	CCI
J. de MESQUITA (Brazil)	CCI
C. R. MULLER (United States of America)	IEC
... (Spain) *	CCI
J. READING (United Kingdom)	IEC
P. D. C. REEFMAN (Netherlands)	CCI
Miss. A. M. SCHWAB (France)	IEC

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* Mr. V. Quintas (Spain) who died in January 1982, was a member of the JWG.

SECTION CMV A: TERMINOLOGY

Recommendation and Report

RECOMMENDATION 573-1

RADIOCOMMUNICATION VOCABULARY *

(Question 1/CMV and Study Programme 1A/CMV)

(1978-1982)

The CCIR,

CONSIDERING

(a) that Article 1 of the Radio Regulations contains the definitions of terms for regulatory purposes;

(b) that the CCIR Study Groups have a need to establish new and amended definitions for technical terms that do not appear in Article 1 or that are so defined as to be unsuitable for CCIR Study Group purposes;

(c) that it would be desirable for some of these terms and definitions established by the Study Groups to be more widely used within the CCIR,

UNANIMOUSLY RECOMMENDS

that the terms listed in Article 1 of the Radio Regulations and in Annex I below should be used as far as possible with the meaning ascribed to them in the corresponding definition.

Note 1. – Study Groups are invited, where there is a difficulty in using any of the terms with the meaning given in the corresponding definition, to forward to the CMV a proposal for revision or alternative application, accompanied by substantiating argument.

Note 2. – A number of terms in this Recommendation appear also in Article 1 of the Radio Regulations with a different definition. These terms are identified by (RR . . ., MOD) or (RR . . .(MOD)) if the modifications consist only of editorial changes. Modifications are proposed for two reasons:

- some Radio Regulations definitions only take into account regulatory aspects, while the CMV proposes definitions of a technical nature;
- some Radio Regulations definitions give rise to difficulties of interpretation, in these cases, modifications or additions proposed by the CMV may be useful later for draft revisions of the Radio Regulations definitions in accordance with Recommendation No. 72 of WARC-79 and Study Programme 1A/CMV.

Note 3. – At the request of Study Group 8, in Appendix A to this Recommendation, definitions (extracted from the Radio Regulations) have been listed of those categories of stations in mobile services, which are most useful for Study Group 8 work.

Note 4. – The present Recommendation is completed by an alphabetical list of terms defined in CCIR texts, giving for each term the corresponding terms in the other two working languages and the reference to the corresponding text and Volume in which the definition is found.

ANNEX I

The terms and definitions in this Annex are arranged according to subject as follows:

A Stations and links
- A1 – General terms and stations
- A2 – Links
- A3 – Space radiocommunications links
- A4 – Terms concerning attenuations for a link
- A5 – Coverage area and associated terms

B Frequencies and bandwidths

C Radiation and emission

D Transmitters and classes of emission

* See Annex III to the Introduction by the Chairman of the CMV.

E Power and radiated power

- E0 – Power and radiation
- E1 – Polarization

F Receivers, noise and interference

- F0 – Noise
- F1 – Interference
- F2 – Signal to interference ratio, protection ratio
- F3 – Field strength and power flux density

G Propagation

- G0 – Tropospheric propagation
- G1 – Ionospheric propagation
- G2 – Application to radiocommunications

H Space radiocommunications

- H0 – General terms
- H1 – Type of satellites
- H2 – Geostationary satellite
- H3 – Space research – Earth exploration
- H4 – Broadcasting

J Standard frequencies and time signals

In cases where the definition of a term is identical to that appearing in another text (International telecommunication convention, Annex 2 –CONV–, Article 1 of the Radio Regulations –RR–, CCIR Recommendation or Report, –Rec. or Rep.–) the reference to the other text concerned is given in brackets after the definition. If the reference definition has been modified, the symbol MOD is added to the reference.

SECTION A – STATIONS AND LINKS

Sub-section A1 – General terms and stations

A01 (CONV) (RR 7)

Radiocommunication, *Radiocommunication, Radiocomunicación*

Telecommunication by means of radio waves.

Note. – The definition of term "Telecommunication" is included in the Report dealing with general terms (Report 971).

A02 (RR 6, MOD)

Radio waves, Hertzian waves; *Ondes radioélectriques, Ondes hertziennes; Ondas radioeléctricas, Ondas hertzianas*

Electromagnetic waves of frequencies arbitrarily lower than 3000 GHz propagated in space without artificial guide.

Note. – From the technical point of view, the frequency band around 3000 GHz may be considered as belonging to radio waves and to optical waves.

A03 (CONV, MOD) (RR 5, MOD)

Radio, *Radio, Radio*

Pertaining to the use of radio waves.

Note. – In French and in Spanish "radio" is always a prefix.

A04 (RR 58(MOD))

(Radio) station, *Station (radioélectrique), Estación (radioeléctrica)*

One or more transmitters or receivers of a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radiocommunication service, or the radioastronomy service.

Note 1. – In the Radio Regulations, each station shall be classified by the service in which it operates permanently or temporarily.

Note 2. – **Radiocommunication service,** *Service de radiocommunication, Servicio de radiocomunicación* (RR 20(MOD))

A service as defined in the Radio Regulations involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes.

A05 (RR 61) **Space station,** *Station spatiale, Estación espacial*

A station located on an object which is beyond, is intended to go beyond, or has been beyond, the major portion of the Earth's atmosphere.

A06 (RR 60) **Earth station,** *Station terrienne, Estación terrena*

A station located either on the Earth's surface or within the major portion of the Earth's atmosphere and intended for communication:

- with one or more space stations; or
- with one or more stations of the same kind by means of one or more reflecting satellites or other objects in space.

A07 (RR 9) **Space radiocommunication,** *Radiocommunication spatiale, Radiocomunicación espacial*

Any radiocommunication involving the use of one or more space stations or the use of one or more reflecting satellites or other objects in space.

A08 (RR 8) **Terrestrial radiocommunication,** *Radiocommunication de terre, Radiocomunicación terrenal*

Any radiocommunication other than space radiocommunication or radioastronomy.

A09 (RR 59, MOD) **Terrestrial station,** *Station de terre, Estación terrenal*

A station effecting terrestrial radiocommunication.

A10 (RR 65) **Mobile station,** *Station mobile, Estación móvil*

A station in the mobile service intended to be used while in motion or during halts at unspecified points.

Note 1. – **Mobile service,** *Service mobile, Servicio móvil* (CONV) (RR 26) A radiocommunication service between mobile and land stations, or between mobile stations.

Note 2. – The definitions of those categories of stations in mobile services, which are most useful for Study Group 8 work are given in Appendix A to this Recommendation.

A11 (RR 67) **Land station,** *Station terrestre, Estación terrestre*

A station in the mobile service not intended to be used while in motion.

Sub-section A2 – Links

A21 **Radiolink,** *Liaison radioélectrique, Radioenlace*

A telecommunication facility of specified characteristics between two points provided by means of radio waves.

A22 (Rec. 592, Vol. IX) **Radio-relay system,** *Faisceau Hertzien, Sistema de relevadores radioeléctricos*

Radiocommunication system between specified fixed points operating at frequencies above about 30 MHz which uses tropospheric propagation and which normally includes one or more intermediate stations.

A23 (Rec. 592, Vol. IX) **Transhorizon radio-relay system,** *Faisceau hertzien transhorizon, Sistema de relevadores radioeléctricos transhorizonte*

Radio-relay system using transhorizon tropospheric propagation, chiefly forward scatter.

Sub-section A3 – Space communication links (see also Sub-section H0)

A31 (RR 107) **Satellite link,** *Liaison par satellite, Enlace por satélite*

A radio link between a transmitting earth station and a receiving earth station through one satellite.

A satellite link comprises one up-link and one down-link.

A31a (RR 107, MOD)

Up link, *Liaison montante, Enlace ascendente*

A radio link between a transmitting earth station and a receiving space station.

A31b (RR 107, MOD)

Down link, *Liaison descendante, Enlace descendente*

A radio link between a transmitting space station and a receiving earth station.

A32 (RR 108)

Multi-satellite link, *Liaison multisatellite, Enlace multisatélite*

A radio link between a transmitting earth station and a receiving earth station through two or more satellites, without any intermediate earth station.

A multi-satellite link comprises one up link, one or more satellite-to-satellite links and one down link.

A33

Inter-satellite link, *Liaison intersatellite, Enlace intersatélite*

A radio link between a transmitting space station and a receiving space station without an intermediate earth station.

A34 (RR 105)

Satellite system, *Système à satellite, Sistema de satélites*

A space system using one or more artificial earth satellites.

A35 (RR 104)

Space system, *Système spatial, Sistema espacial*

Any group of cooperating earth stations and/or space stations employing space radio communication for specific purposes.

A36 (RR 106)

Satellite network, *Réseau à satellite, Red de satélites*

A satellite system or a part of a satellite system, consisting of only one satellite and the cooperating earth stations.

Sub-section A4 – Terms concerning attenuations for a link *

A41 (Rec. 341, Vol. V)

Total loss (of a radio link) *Affaiblissement global (d'une liaison radioélectrique), Pérdida total (de un enlace radioeléctrico)*

(Symbol: L_l or A_l)

The ratio, usually expressed in decibels, between the power supplied by the transmitter of a radio link and the power supplied to the corresponding receiver in real installation, propagation and operational conditions.

Note. – It is necessary to specify in each case the points at which the power supplied by the transmitter and the power supplied to the receiver are determined, for example:

- before or after the radio frequency filters or multiplexers that may be employed at the sending or the receiving end,
- at the input or at the output of the transmitting and receiving antennas' feed lines.

* A graphical depiction of these terms is given in Fig. 1.

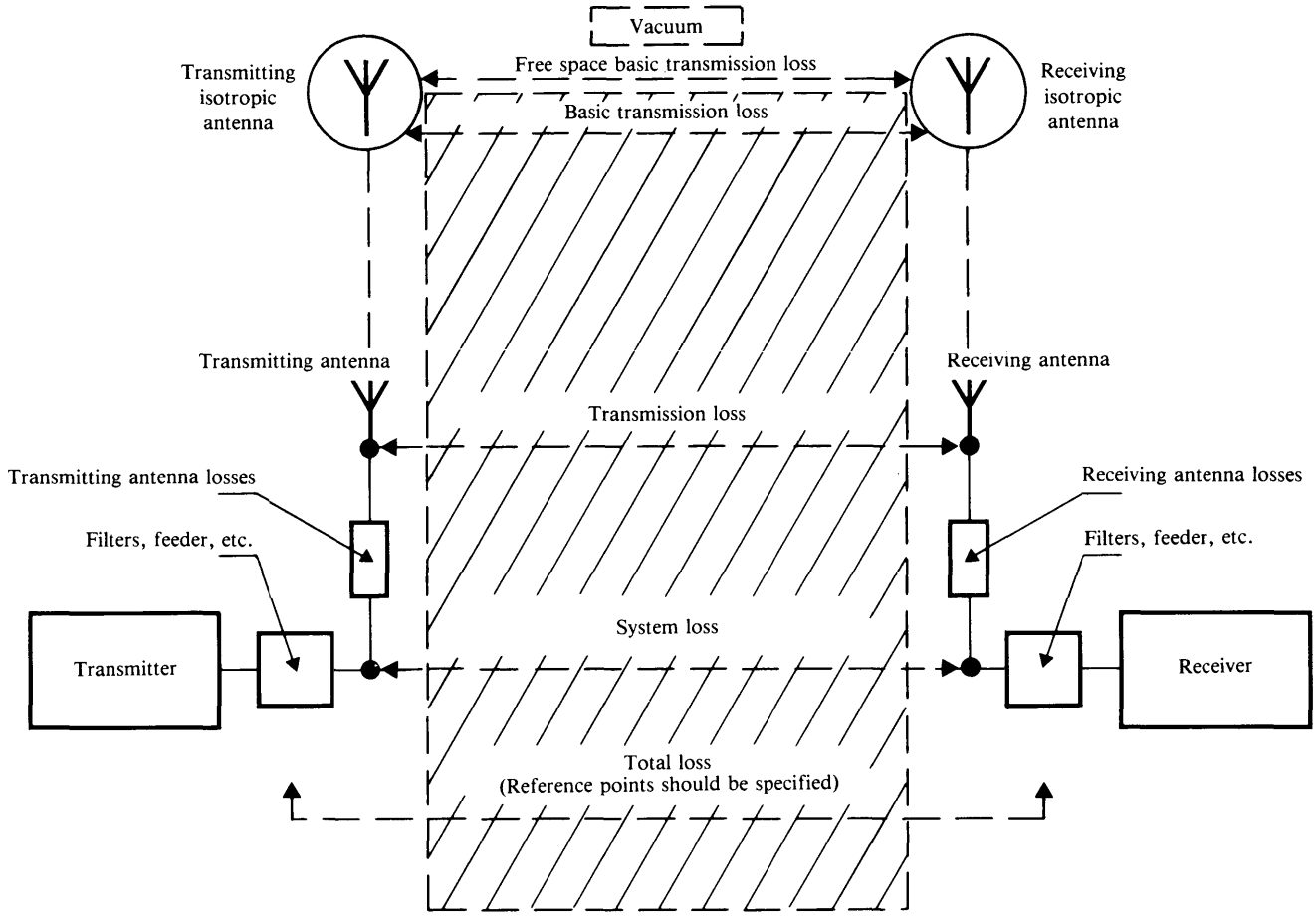

FIGURE 1 – *Graphical depiction of terms used in the transmission loss concept*

A42
(Rec. 341, Vol. V)

System loss, *Affaiblissement entre bandes d'antennes, Affaiblissement du système; Pérdida del sistema*

(Symbol: L_s or A_s)

The ratio, usually expressed in decibels, for a radio link, of the radio frequency power input to the terminals of the transmitting antenna, p_t, and the resultant radio frequency signal power available at the terminals of the receiving antenna, p_a.

Note 1. – The available power is the power which would be delivered to the load if the impedances were conjugately matched.

Note 2. – The system loss may be expressed by:

$$L_s = 10 \log (p_t/p_a) = P_t - P_a \quad (1)$$

Note 3. – The system loss, as defined above, excludes any transmitting or receiving antenna transmission line losses. On the other hand, the system loss includes all of the losses in the transmitting and receiving antenna circuits, including not only the transmission loss due to radiation from the transmitting antenna and re-radiation from the receiving antenna, but also any ground losses, dielectric losses, antenna loading coil losses, terminating resistor losses in antennas, etc.

A43 (Rec. 341, Vol. V)

Transmission loss (of a radio link), *Affaiblissement de transmission (d'une liaison radioélectrique), Pérdida de transmision (de un enlace radioeléctrico)*

(Symbol: L or A)

The ratio, usually expressed in decibels, for a radio link between the power radiated by the transmitting antenna and the power that would be available at the receiving antenna output if there were no loss in the radio frequency circuits, it being assumed that the antenna radiation diagrams are retained.

Note. – The transmission loss may be expressed by:

$$L = L_s - L_{tc} - L_{rc} \tag{2}$$

where L_{tc} and L_{rc} are the losses, expressed in decibels, in the transmitting and receiving antenna circuits respectively, excluding the dissipation associated with the antennas radiation, i.e., the definitions of L_{tc} and L_{rc} are 10 log (r'/r), where r' is the resistive component of the antenna circuit and r is the radiation resistance.

A44 (Rec. 341, Vol. V)

Basic transmission loss (of a radio link); *Affaiblissement de propagation d'une liaison radioélectrique), Affaiblement entre antennes isotropes (d'une liaison radioélectrique); Pérdida básica de transmisión (de un enlace radioeléctrico)*

(Symbol: L_b or A_i)

The transmission loss that would occur if the antennas were replaced by isotropic antennas with the same polarization as the real antennas, the propagation path being retained, but the effects of obstacles close to the antennas being disregarded.

Note 1. – The basic transmission loss is equal to the ratio of the equivalent isotropically radiated power of the transmitter system to the power, available from an isotropic receiving antenna.

Note 2. – Any local features, such as the ground or nearby structures (e.g. the vehicle itself in the case of mobile terminals) which affect the gain and directivity of the antenna, but which do not affect the overall propagation path, are assumed to be removed.

The effect of the local ground is included in computing the antenna gain, but not in L_b. For instance, in the case of ionospheric propagation using an antenna near the ground, which has a strong influence on the effective gain for the sky-wave path, the ground is removed for the calculation of L_b, so as to maintain the gain in the desired direction; but in the case of a tropospheric link involving diffraction over a distant obstacle, that obstacle is not removed in estimating L_b.

A45 (Rec. 341, Vol. V)

Free space basic transmission loss, *Affaiblissement en espace libre (d'une liaison radioélectrique), Pérdida básica de transmisión en el espacio libre*

(Symbol: L_{bf} or A_0)

The transmission loss that would occur if the antennas were replaced by isotropic antennas located in a perfectly dielectric, homogeneous, isotropic and unlimited environment, the distance between the antennas being retained.

Note. – If the distance d between the antennas is much greater than the wavelength λ, the free space attenuation in decibels will be:

$$L_{bf} = 20 \log \left(\frac{4 \pi d}{\lambda} \right) \tag{3}$$

A46 (Rec. 341, Vol. V)

Ray path transmission loss, *Affaiblissement de transmission pour un trajet, Pérdida de transmisión en el trayecto de un rayo*

(Symbol: L_t or A_t)

The transmission loss for a particular ray propagation path, taking account of the transmitting and receiving antenna gains in the ray path directions.

Note. – The ray path transmission loss may be expressed by:

$$L_t = L_b - G_t - G_r \quad (4)$$

where G_t and G_r are the plane-wave directive gains * of the transmitting and receiving antennas for the directions of propagation and polarization considered.

A47
(Rec. 341, Vol. V)

Loss relative to free space, *Affaiblissement par rapport à l'espace libre (d'une liaison radioélectrique), Pérdida relativa al espacio libre*

(Symbol: L_m or A_m)

The difference, between the basic transmission loss and the free space basic transmission loss, expressed in decibels.

Note 1. – The loss relative to free space may be expressed by:

$$L_m = L_b - L_{bf} \quad (5)$$

Note 2. – Loss relative to free space (L_m) may be divided into losses of different types, such as

- *absorption loss* (ionospheric, atmospheric gases or precipitation);
- *effective reflection or scattering loss,* including the results of any focusing or defocusing due to curvature of a reflecting layer, as in the ionospheric case; or loss due to the limited area of the reflecting surface;
- *polarization coupling loss,* this can arise from any polarization mismatch between the antennas for the particular ray path considered;
- *aperture-to-medium coupling loss* or antenna gain degradation, which may be due to the phase front being non-planar at a receiving antenna which may be due to the presence of substantial scatter phenomena on the path;
- *effect of wave interference between the direct ray and rays reflected* from the ground, other obstacles or atmospheric layers at locations distant from the antennas, when such rays are important with the antennas being used in the system.

Sub-section A5 – Coverage area and associated terms

A51a

Coverage area (of a space station), *Zone de couverture (d'une station spatiale), Zona de cobertura (de una estación espacial)*

Area associated with a space station for a given service and a specified frequency within which, under specified technical conditions, it is feasible for radiocommunications to be established with one or several earth stations, either for reception or transmission or both.

Note 1. – Several coverage areas may be associated with one and the same station, for example, a satellite with several antenna beams.

Note 2. – The technical conditions include the following: charcteristics of the equipment used both at the transmitting and receiving stations, how it is installed, quality of transmission desired, e.g., protection ratios and operating conditions.

Note 3. – The following may be distinguishable:

- interference free coverage area, i.e., that limited solely by natural or artificial noise;
- the nominal coverage area: it is defined, when establishing a frequency plan, by taking into account the foreseen transmitters;
- the actual coverage area, i.e., with allowance made for the noise and interference which exist in practice.

Note 4. – The concept of "coverage area" does not simply apply to a space station on board a non-geostationary satellite for which further study is necessary.

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* See Introduction by the Chairman of the CMV, Annex III (Section E).

Note 5. – Furthermore, the term "service area" should have the same technical basis as for "coverage area", but also include administrative aspects.

The following text has been suggested as an example:

Service area, *Zone de service, Zona de servicio*

Area associated with a station for a given service and a specified frequency under specified technical conditions where radiocommunications may be established with existing or projected stations and within which the protection afforded by a frequency assignment or allotment plan or by any other agreement must be respected.

Note 1. – Several service areas separate as regards both transmission and reception may be associated with one and the same station.

Note 2. – The technical conditions include the following: characteristics of the equipment used both at the transmitting and receiving stations, how it is installed, quality of transmission desired and operating conditions.

A51b **Coverage area (of a terrestrial transmitting station),** *Zone de couverture (d'une station d'émission de Terre), Zona de cobertura (de una estación transmisora terrenal)*

Area associated with a transmitting station for given service and a specified frequency within which, under specified technical conditions, radiocommunications may be established with one or several receiving stations.

Note 1. – Several coverage areas may be associated with one and the same station.

Note 2. – The technical conditions include the following: characteristics of the equipment used both at the transmitting and receiving stations, how it is installed, quality of tranmission desired, e.g., protection ratios and operating conditions.

Note 3. – The following may be distinguishable:

- interference-free coverage area, i.e., that limited solely by natural or artificial noise;
- the nominal coverage area: it is defined, when establishing a frequency plan by taking into account the foreseen transmitters;
- the actual coverage area, i.e., with allowance made for the noise and interference which exists in practice.

Note 4. – Furthermore, the term "service area" should have the same technical basis as for "coverage area", but also include administrative aspects.

A52 **Capture area (of a terrestrial receiving station),** *Zone de captage (d'une station de réception de terre), Zona de captación (de una estación receptora terrenal)*

Area associated with a receiving station for a given service and a specified frequency within which, under specified technical conditions, radiocommunications may be established with one or several transmitting stations.

Note. – The notes concerning the coverage area (of a transmitting station) are valuable also, *mutatis mutandis*, for the capture area.

SECTION B – FREQUENCIES AND BANDWIDTHS

B01 **(Radio frequency) channel (RF channel);** *Canal radioélectrique, radiocanal, canal RF; Radiocanal, (Canal radioeléctrico)*

Part of the radio spectrum intended to be used for an emission and which may be defined by two specified limits, or by its centre frequency and the associated bandwidth, or by any equivalent indication.

Note 1. – Usually the specified part of the radio spectrum is that which corresponds to the assigned frequency band.

Note 2. – A radio frequency channel may be time-shared in order to allow radiocommunication in both directions by simplex operation.

Note 3. – In some countries and certain texts of the existing Radio Regulations, the term "channel" (F and S: canal) is also used to denote a radio frequency circuit or, in other words, two associated radio frequency channels within the meaning of the proposed definition, each of which is used for one of the two directions of transmission.

Note 4. – Report 971 defines the general term "frequency channel" (Term 2.02).

B02 (RR 146) **Necessary bandwidth,** *Largeur de bande nécessaire, Anchura de banda necesaria*

For a given class of emission, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.

B03 (RR 141, MOD) **Assigned frequency band,** *Bande de fréquence assignée, Banda de frecuencias asignada*

The frequency band within which the emission of a station is authorized; the width of the band equals the necessary bandwidth plus twice the absolute value of the frequency tolerance. Where space stations are concerned, the assigned frequency band includes twice the maximum Doppler shift that may occur in relation to any point of the Earth's surface.

Note 1. – For certain services, the term "Assigned channel" is equivalent.

Note 2. – For the definition of "Frequency tolerance" see § D. (Term D.02)

B04 (RR 147) **Occupied bandwidth,** *Largeur de bande occupée, Anchura de banda ocupada*

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage $\beta/2$ of the total mean power of a given emission.

Unless otherwise specified by the CCIR for the appropriate class of emission, the value of $\beta/2$ should be taken as 0.5%.

B05 **Occupied band,** *Bande occupée, Banda ocupada*

The frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage $\beta/2$ of the total mean power of a given emission. Unless otherwise specified by the CCIR, for the appropriate class of emission, the value of $\beta/2$ should be taken as 0.5%.

SECTION C – RADIATION AND EMISSION

C01 (RR 131) **Radiation,** *Rayonnement (radioélectrique), Radiación*

The outward flow of energy from any source in the form of radio waves.

C02 (RR 132, MOD) **Emission,** *Emission, Emisión*

Radiation produced, or the production of radiation, by a radio transmitting station.

Note 1. – For example, the energy radiated by the local oscillator of a radio receiver would not be an emission but a radiation.

Note 2. – The definition of the term emission is that adopted by the Radio Regulations. It should be noted that in French this term applies only to intentional radiation.

Note 3. – Individual emissions are considered to be single emissions if the modulating signal and the other characteristics are the same for every transmitter of the radio transmitting system and the spacing between antennas is not more than a few wave lengths.

C03 (RR 138) **Out-of-band emission,** *Emission hors bande, Emisión fuera de banda*

Emission on a frequency or frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

C04 (RR 139) **Spurious emission,** *Rayonnement non essentiel, Emisión no esencial*

Emission on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

C05 (RR 140(MOD)) **Unwanted emissions,** *Rayonnements non désirés, Emisiones no deseadas*

Emissions consisting of spurious emissions and out-of-band emissions.

C06 (Rec. 329, Vol. I) **Harmonic emission,** *Rayonnement harmonique, Radiación armónica*

Spurious emissions at frequencies which are whole multiples of those contained in the band occupied by an emission.

C07 (Rec. 326, Vol. I) **Intermodulation products (of a transmitting station),** *Produits d'intermodulation (d'une station émettrice), Productos de intermodulación (de una estación transmisora)*

Radiation on frequencies of the form

$$f = pf_1 + qf_2 + rf_3 \ldots$$

where p, q, r are positive, negative or nil integers and where f_1, f_2 ... are the frequencies of the various oscillations existing in a transmitting station, such as the carrier frequencies of the different transmitters, the sub-carrier or local oscillation frequencies, the frequencies of sidebands due to modulation, etc., where the sum $|p| + |q| + |r| + \ldots$ is the order of an individual intermodulation product.

SECTION D – TRANSMITTERS AND CLASSES OF EMISSION

D01 **(Radio) Transmitter,** *Emetteur (radioélectrique), Transmisor (radioeléctrico)*

Apparatus producing radiofrequency energy for the purpose of radiocommunication.

D02 (RR 145(MOD)) **Frequency tolerance,** *Tolérance de fréquence, Tolerancia de frecuencia*

The maximum permissible departure by the centre frequency of the frequency band occupied by an emission from the assigned frequency or, by the characteristic frequency of an emission from the reference frequency.

Note. – The frequency tolerance is expressed in parts in 10^6 or in hertz.

D03 (RR 133) **Class of emission,** *Classe d'émission, Clase de emisión*

The set of characteristics of an emission, designated by standard symbols, e.g. type of modulation of the main carrier, modulating signal, type of information to be transmitted, and also if appropriate, any additional signal characteristics.

D04 (RR 134) **Single sideband emission, SSB emission,** *Emission à bande latérale unique, émission BLU, Emisión de banda lateral única, emisión BLU*

An amplitude modulated emission with one sideband only.

D05 **Full carrier emission,** *Emission à porteuse complète, Emisión de onda portadora completa*

An amplitude modulated emission where the power level of the carrier is 6 dB or less below peak envelope power.

Note 1. – Double-sideband amplitude-modulated emissions normally comprise a full carrier with a power level exactly 6 dB below the peak envelope power at 100% modulation.

Note 2. – In single-sideband full-carrier emissions, a carrier at a power level of 6 dB below the peak envelope power is emitted, to enable the use of a receiver designed for double-sideband full-carrier operation.

D06 **Reduced carrier emission,** *Emission à porteuse réduite, Emisión de onda portadora reducida*

An amplitude modulated emission where the level of the carrier power in the emission is reduced by more than 6 dB below the peak envelope power, but where the degree of reduction allows the carrier to be reconstituted and used for demodulation.

Note 1. – The level of the reduced carrier is normally between 6 dB and 32 dB and preferably between 16 dB and 26 dB below the peak envelope power of the emission.

Note 2. – The reduced carrier may also be used to achieve automatic frequency control and/or gain control at the receiver.

D07 **Suppressed carrier emission,** *Emission à porteuse supprimée, Emisión de onda portadora suprimida*

An amplitude modulated emission where the carrier power in the emission is suppressed to a level where it generally cannot be reconstituted and used for demodulation.

Note. – A carrier is regarded as being supressed when its level is at least 32 dB and preferably 40 dB or more below the peak envelope power of the emission.

D08 **Vestigial-sideband emission,** *Emission à bande latérale résiduelle, Emisión con banda lateral residual*

A system of emission in which one complete sideband and its complementary vestigial sideband are utilized.

Note. – **Vestigial sideband,** *Bande latérale résiduelle, Banda lateral residual* A sideband in which some of the spectral components, in general those corresponding to the highest frequency in the modulating signals, are greatly attenuated.

SECTION E – POWER AND RADIATED POWER

Sub-section E0 – Power and radiation

E01 (RR 151) **Peak envelope power (of a radio transmitter),** *Puissance en crête (d'un émetteur radioélectrique), Potencia en la cresta de la envolvente de un transmisor radioeléctrico)*

The average power supplied to the antenna transmission line by a transmitter during one radio-frequency cycle at the crest of the modulation envelope, taken under normal operating conditions.

E02 (RR 152) **Mean power (of a radio transmitter),** *Puissance moyenne (d'un émetteur radioélectrique), Potencia media (de un transmisor radioeléctrico)*

The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.

E03 (RR 153, MOD) **Carrier power (of a radio transmitter),** *Puissance de la porteuse (d'un émetteur radioélectrique), Potencia de la portadora (de un transmisor radioeléctrico)*

The average power supplied to the antenna transmission line by a transmitter during one radio-frequency cycle taken under the condition of no modulation.

Note. – With some types of modulating signals the concept of carrier power is meaningless.

E04 (RR 154) **Antenna gain,** *Gain d'une antenne, Ganancia de una antena*

The ratio, usually expressed in decibels, of the power required at the input of a loss free reference antenna to the power supplied to the input of a given antenna to produce, in a given direction, the same field strength of the same power flux-density at the same distance. When not specified otherwise, the gain refers to the direction of maximum radiation. The gain may be considered for a specified polarization.

Depending on the choice of the reference antenna, a distinction is made between:

(a) absolute or isotropic gain (G_i), when the reference antenna is an isotropic antenna isolated in space;

(b) gain relative to a half-wave dipole (G_d), when the reference antenna is a half-wave dipole isolated in space whose equatorial plane contains the given direction;

(c) gain relative to a short vertical antenna (G_v), when the reference antenna is a linear conductor, much shorter than one quarter of the wavelength, normal to the surface of a perfectly conducting plane which contains the given direction.

E05 (Rec. 561, Vol. X) **Cymomotive force (c.m.f.) (in a given direction),** *Force cymomotrice, Fuerza cimomotriz*

The product formed by multiplying the electric field strength at a given point in space, due to a transmitting station, by a distance of the point from the antenna. This distance must be sufficient for the reactive components of the field to be negligible; moreover, the finite conductivity of the ground is supposed to have no effect on propagation.

Note 1. – The cymomotive force (c.m.f.) is a vector; when necessary it may be expressed in terms of components along axes perpendicular to the direction of propagation.

Note 2. – The c.m.f. is expressed in volts; it corresponds numerically to the field strength in mV/m at a distance of 1 km.

E06 **Antenna directivity diagram,** *Diagramme de directivité d'antenne, Diagrama de directividad de antena*

A curve representing in polar or cartesian coordinates, a quantity proportional to the gain of antenna in the various directions in a particular plane or cone.

E06a **Horizontal directivity pattern,** *Diagramme de directivité horizontal, Diagrama de directividad horizontal*

An antenna directivity diagram in the horizontal plane.

E06b **Vertical directivity pattern,** *Diagramme de directivité vertical, Diagrama de directividad vertical*

An antenna directivity diagram in a specified vertical plane.

E07 (RR 155) **Equivalent isotropic radiated power (e.i.r.p.),** *Puissance isotrope rayonée équivalente, Potencia isótropa radiada equivalente*

The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain).

E08 (RR 156) **Effective radiated power (e.r.p.) (in a given direction),** *Puissance apparente rayonée, Potencia radiada aparente*

The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction.

E09 (RR 157) **Effective monopole radiated power (e.m.r.p.) (in a given direction),** *Puissance apparente rayonée sur une antenne verticale courte, Potencia radiada aparente referida a una antena vertical corta*

The product of the power supplied to the antenna and its gain relative to a short vertical antenna in a given direction.

Sub-section E1 – Polarization

E11 (RR 148) **Right-hand (or clockwise)-polarized wave,** *Onde à polarisation dextrogyre, Onda de polarización dextrógira*

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

E12 (RR 149) **Left-hand (or anti-clockwise)-polarized wave,** *Onde à polarisation lévogyre, Onda de polarización levógira*

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

SECTION F – RECEIVERS, NOISE AND INTERFERENCE

Sub-section F0 – Noise

F01 **Noise figure,** *Facteur de bruit, Factor de ruido*

The ratio of noise power measured at the output of the device such as a receiver or an amplifier to the noise power which would be present at the output if the thermal noise due to the resistive component of the source impedance were the only source of noise in the system; both noise powers are determined at an absolute temperature of the source equal to $T = 293$ K.

Note. – In English, the term "Noise factor" is usually employed when the ratio is expressed arithmetically, and "Noise figure" when the ratio is expressed logarithmically (dB).

F02a **Noise temperature,** *Température de bruit, Temperatura de ruido*

For a two-port device, such as an amplifier, the value by which the temperature of the resistive component of the source impedance should be increased, if it were the only source of noise, to cause the noise power at the output of the device to be the same as the real case.

Note. – This noise temperature T of a device is proportional to the noise power ΔP added by this device, and related to the noise factor F: $\Delta P = kTB = kT_0 (F-1)B$, where B is the frequency band, k the Boltzmann constant and $T_0 = 293$ K.

F02b **Overall noise temperature,** *Température de bruit globale, Temperatura de ruido global*

For an antenna, or a receiving system including the antenna, the value to which the temperature of the resistive component of the source impedance should be brought, if it were the only source of noise, to cause the noise power at the output of the receiver to be the same as in the real case.

Note. – This noise temperature T is proportional to the noise power P at the input of the receiver: $P = kTB$ where B is the frequency band and k the Boltzmann constant.

F03 (RR 168) **Equivalent satellite link noise temperature,** *Température de bruit equivalente d'une liaison par satellite, Temperatura de ruido equivalente de un enlace por satélite*

The noise temperature referred to the output of the receiving antenna of the earth station corresponding to the radio frequency noise power which produces the total observed noise at the output of the satellite link excluding noise due to interference coming from satellite links using other satellites and from terrestrial systems.

Sub-section F1 – Interference

F11 **Interference,** *Brouillage, Interferencia*

The disturbing effect of unwanted energy on the reception of a wanted signal, including the effects of other signals, spurious emissions and man-made noise; natural noise is generally excluded.

Note 1. – Often man-made noise is not included in interference.

Note 2. – Various levels of interference are defined for administrative purposes in the Radio Regulations viz. "permissible interference" (RR 161), "accepted interference" (RR 162) and "harmful interference" (RR 163). The first term describes a level of interference which in the given conditions involves degradation of reception quality to an extent considered insignificant, but which must be taken into account in the planning of systems. The level of

permissible interference is usually laid down in CCIR Recommendations and/or other international agreements. The second term describes a higher level of interference involving a moderate degradation of reception quality which in given conditions is deemed to be acceptable by the administrations concerned. The third term describes a level of interference which "seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service".

F12 **Interfering source,** *Source de brouillage, Fuente interferente*

An emission, radiation, or induction which is determined to be a cause of interference in a radiocommunication system.

Sub-section F2 – Signal to interference ratio, protection ratio

F21 (Rec. 447, MOD, Vol. X) **RF signal to interference ratio,** *Rapport signal/brouillage RF, Relación señal/interferencia RF*

The ratio, usually expressed in decibels, of the wanted-to-unwanted signal, measured under specified conditions at the radio-frequency input of the receiver.

F22 (RR 164, MOD) **Protection ratio (RF),** *Rapport de protection, Relación de protección*

The minimum value of the wanted-to-unwanted signal ratio, usually expressed in decibels, at the receiver input, determined under specified conditions such that a specified reception quality of the wanted signal is achieved at the receiver output.

Note 1. – This minimum value is usually laid down in the CCIR Recommendations and/or other international agreements.

Note 2. – The specified conditions comprise *inter alia*:

- the nature and characteristics of the wanted signal
- the nature and characteristics of the unwanted signal
- the characteristics of the receiver
- the propagation conditions.

Note 3. – For more specific applications, see the definitions which appear in different volumes of the CCIR, for example, Recommendation 447 (Vol. X) for sound broadcasting.

Note 4. – The expression "unwanted signal" may describe the total interfering energy and noise.

F23 (Rec. 447, MOD, Vol. X) **AF signal to interference ratio,** *Rapport signal/brouillage AF, Relación señal/interferencia AF*

The ratio, usually expressed in decibels, of the wanted-to-unwanted signal, measured under specified conditions at the audio-frequency output of the receiver.

F24 (Rec. 447, MOD, Vol. X) **AF protection ratio,** *Rapport de protection AF, Relación de protección AF*

The minimum value of the ratio, usually expressed in decibels, of the wanted-to-unwanted signal measured under specified conditions at the audio-frequency output of the receiver considered necessary to achieve a subjectively defined reception quality.

Sub-section F3 – Field strength and power flux-density

F31 **Minimum usable field-strength** (E_{min}), **Minimum usable power flux-density** (P_{min}); *Champ minimal utilisable* (E_{min}), *Puissance surfacique minimale utilisable* (P_{min}); *Intensidad de campo mínima utilizable* (E_{min}), *Densidad de flujo de potencia mínima utilizable* (P_{min})

Minimum value of the field-strength (minimum value of the power flux-density) necessary to permit a desired reception quality, under specified receiving conditions, in the presence of natural and man-made noise, but in the absence of interference from other transmitters.

Note 1. – The desired quality is determined in particular by the protection ratio against noise, and for fluctuating noise, by the percentage of time during which this protection ratio must be ensured.

Note 2. – The receiving conditions include, *inter alia*:

– the type of transmission, and frequency band used;

– the receiving equipment characteristics (antenna gain, receiver characteristics, siting, etc.);

– receiver operating conditions, particularly the geographical zone, the time and the season.

Note 3. – Where there is no ambiguity, the term "minimum field-strength" ("minimum power flux-density") may be used.

Note 4. – The term "minimum usable field-strength" corresponds to the term "minimum field-strength to be protected" which appears in many ITU texts.

F32 **Usable field-strength** (E_u), **Usable power flux-density** (P_u); *Champ utilisable* (E_u), *Puissance surfacique utilisable* (P_u); *Intensidad de campo utilizable* (E_u), *Densidad de flujo de potencia utilizable* (P_u)

Minimum value of the field-strength (minimum value of the power flux-density) necessary to permit a desired reception quality, under specified receiving conditions, in the presence of natural and man-made noise and of interference, either in an existing situation or as determined by agreements or frequency plans.

Note 1. – The desired quality is determined in particular by the protection ratios against noise and interference and in the case of fluctuating noise or interference, by the percentage of time during which the required quality must be ensured.

Note 2. – The receiving conditions include, *inter alia*:

– the type of transmission and frequency band used;

– the receiving equipment characteristics (antenna gain, receiver characteristics, siting, etc.);

– receiver operating conditions, particularly the geographical zone, the time and the season, or the fact that, if the receiver is mobile, a median field strength for multipath propagation must be considered.

Note 3. – The term "usable field-strength" corresponds to the term "necessary field-strength" which appears in many ITU texts.

F33 **Reference usable field-strength** (E_{ref}), **Reference usable power flux-density** (P_{ref}); *Champ utilisable de référence* (E_{ref}), *Puissance surfacique utilisable de référence* (P_{ref}); *Intensidad de campo de referencia utilizable* (E_{ref}), *Densidad de flujo de potencia utilizable de referencia* (P_{ref})

The agreed value of the usable field-strength (the agreed value of the usable power flux-density) that can serve as a reference or basis for frequency planning.

Note 1. – Depending on the receiving conditions and the quality required, there may be several reference usable field-strength (reference usable power flux-density) values for the same service.

Note 2. – Where there is no ambiguity, the term "reference field-strength" ("reference power flux-density") may be used.

SECTION G – PROPAGATION

Sub-section G0 – Tropospheric propagation

G01 (Rec. 310, Vol. V) **Troposphere,** *Troposphère, Troposfera*

The lower part of the Earth's atmosphere extending upwards from the Earth's surface, in which temperature decreases with height except in local layers of temperature inversion. This part of the atmosphere extends to an altitude of about 9 km at the Earth's poles and 17 km at the equator.

G02 **Tropospheric propagation,** *Propagation troposphérique, Propagación troposférica*

Propagation of a radio wave within the troposphere and by extension, propagation beneath the ionosphere, when not influenced by the ionosphere.

G03 (Rec. 310, Vol. V) **Radio horizon,** *Horizon radioélectrique, Horizonte radioeléctrico*

The locus of points at which direct rays from the antenna become tangential to the Earth's surface, taking into account the curvature due to refraction.

G04 (Rec. 310, Vol. V) **Tropospheric duct,** *Conduit troposphérique, Conducto troposférico*

A quasi-horizontal stratification in the high troposphere within which radio energy of a sufficient high frequency is substantially confined and propagated with abnormally low attenuation.

G05 (Rec. 310, Vol. V) **Trapped mode tropospheric propagation,** *Propagation (troposphérique) par mode guidé, Propagación troposférica guiada (modo guiado)*

A mode of propagation within a tropospheric duct. At sufficiently high frequencies several such modes may exist (as in a wave-guide).

G06 (Rec. 310, Vol. V) **Transhorizon tropospheric propagation,** *Propagation (troposphérique) transhorizon, Propagación troposférica transhorizonte*

Propagation over paths extending beyond the normal radio-horizon. It may include a variety of mechanisms such as diffraction, forward scatter, specular and diffuse reflection and ducting.

G07 (Rec. 310, Vol. V) **Tropospheric scatter propagation,** *Propagation par diffusion troposphérique, Propagación por dispersión troposférica*

Propagation by scattering from many inhomogeneities and/or discontinuities in the refractive index of the atmosphere.

G08 (Rec. 310, Vol. V) **Precipitation scatter propagation,** *Propagation par diffusion sur les précipitations, Propagación por dispersión debida a las precipitaciones*

Propagation by scattering from precipitation particles.

G09 (Rec. 310, Vol. V) **Multipath propagation,** *Propagation par trajets multiples, Propagación por trayectos múltiples*

Propagation by way of a number of separate transmission paths existing simultaneously.

Sub-section G1 – Ionospheric propagation

G11 **Ionosphere,** *Ionosphère, Ionosfera*

That part of the upper atmosphere characterized by the presence of ions and free electrons mainly arising from photo-ionization, the electron density being sufficient to reflect, refract, absorb or otherwise affect the propagation of radio waves in certain frequency bands.

Note. – The Earth's ionosphere extends from a height of about 50 km to a height of several hundreds of kilometres.

G12 **Ionospheric propagation,** *Propagation ionosphérique, Propagación ionosférica*

Radio propagation involving the ionosphere.

G13 **Ionospheric (reflection) propagation,** *Propagation (par réflexion) ionosphérique, Propagación (por reflexión) ionosférica*

Propagation between two points located on the Earth's surface, or within the troposphere, by means of ionospheric reflection and possibly reflection on the Earth's surface.

G14 **Trans-ionospheric propagation,** *Propagation transionosphérique, Propagación transionosférica*

Radio propagation between two points situated on opposite side of the ionosphere.

G15 (RR 159(MOD)) **Ionospheric scatter propagation,** *Propagation par diffusion ionosphérique, Propagación por dispersión ionosférica*

The propagation of radio waves by scattering as a result of irregularities or discontinuities in the ionization of the ionosphere.

G16 **Ionospheric reflection,** *Réflexion ionosphérique, Reflexión ionosférica*

The change in the direction of propagation of an incident wave subject to progressive refraction in an ionospheric layer which, when considered from a sufficiently large distance, may be considered as equivalent to reflection from a hypothetical surface.

G17 **Ground-wave,** *Onde de sol, Onda de superficie*

A radio wave which propagates close to the ground, its propagation depending essentially on the physical properties of the ground.

G18 **Ionospheric wave,** *Onde ionosphérique, Onda ionosférica*

A radio wave returned to the Earth by ionospheric reflection.

G19 **Hop (Ionospheric propagation),** *Bond (Saut), Salto*

A transmission path between two points on the surface of the Earth, comprising one or more ionospheric reflections but without intermediate reflection by the ground.

Sub-section G2 – Application to radiocommunications

G21 (Rec. 373, Vol. VI) **Basic MUF,** *MUF de référence, MUF básica*

The highest frequency at which a radio wave can propagate between given terminals, on a specified occasion, by ionospheric refraction alone.

Note. – See Note of term G22 "Operational MUF".

G22 (Rec. 373, Vol. VI) **Operational MUF,** *MUF d'exploitation, MUF de explotación*

The highest frequency that would permit acceptable operation of a radio service between given terminals at a given time under specified working conditions (such as antenna types, transmitter power, class of emission, information rate and required signal-to-noise ratio).

Note. – The term MUF is the abbreviation of "maximum usable frequency". Used alone, it means: "Operational MUF".

G23 **LUF (Lowest usable frequency),** *LUF (Fréquence minimale utilisable), LUF (Frecuencia mínima utilizable)*

The lowest frequency that permits acceptable operation of a radio link by ionospheric propagation in the presence of ionospheric absorption under specified operating conditions between two points on the surface of the Earth at a given time.

Note. – Important operating conditions include the class of emission, transmitter and receiver characteristics, and noise and interference level.

SECTION H – SPACE RADIOCOMMUNICATIONS

Sub-section H0 – General terms * (See also Sub-section A3)

H01 (RR 170) (Rep. 204, Vol. IV) **Spacecraft,** *Engin spatial, Vehículo espacial*

A man-made vehicle which is intended to go beyond the major part of the Earth's atmosphere.

H02 (RR 169) (Rep. 204, Vol. IV) **Deep space,** *Espace lointain, Espacio lejano*

Space at distances from the Earth approximately equal to, or greater than, the distance between the Earth and the Moon.

* The terms of celestial mechanics, relating to orbits, used in these definitions are defined in Report 204 (Vol. IV).

H03 (Rep. 204, Vol. IV)

Space probe, *Sonde spatiale, Sonda espacial*

A spacecraft designed for making observations or measurements in space.

H04 (RR 171 + Note) (Rep. 204, Vol. IV)

Satellite, *Satellite, Satélite*

A body which revolves around another body of preponderant mass and which has a motion primarily and permanently determined by the force of attraction of that other body.

Note. – A body so defined which revolves around the Sun is called a planet or planetoid.

H05 (Rep. 204, Vol. IV)

Orbit, *Orbite, Órbita*

1. The path, relative to a specified frame of reference, described by the centre mass of a satellite or other object in space, subjected solely to forces of natural origin, mainly the force of gravity;

2. by extension, the path described by the centre of mass of a body in space subjected to forces of natural origin and occasional low-energy corrective forces exerted by a propulsive device in order to achieve and maintain a desired path.

Note. – In the Radio Regulations, the above two definitions are combined in the following form (Radio Regulations No. 176):

"The path, relative to a specified frame of reference, described by the centre of mass of a satellite or other object in space subjected primarily to natural forces, mainly the force of gravity."

H06 (RR 177, MOD) (Rep. 204, Vol. IV)

Inclination (of a satellite orbit), *Inclinasion (d'une orbite de satellite), Inclinación (de una órbita de satélite)*

The angle between the plane of the orbit of a satellite and the principal reference plane.

Note. – By convention, the inclination of a direct orbit of a satellite is an acute angle and the inclination of a retrograde orbit is an obtuse angle.

H07 (RR 178) (Rep. 204, MOD, Vol. IV)

Period (of a satellite), *Période, Periodo*

The time elapsing between two consecutive passages of a satellite through a characteristic point on its orbit.

H08 (RR 179) (Rep. 204, Vol. IV)

Altitude of the apogee or perigee, *Altitude de l'apogée, du périgée, Altitud del apogeo o del perigeo*

The altitude of the apogee or perigee above a specified reference surface serving to represent the surface of the Earth.

Sub-section H1 – Types of satellites

H11 (RR 172) (Rep. 204, Vol. IV)

Active satellite, *Satellite actif, Satélite activo*

A satellite carrying a station intended to transmit or retransmit radiocommunication signals.

H12 (RR 173(MOD)) (Rep. 204, Vol. IV)

Reflecting satellite, *Satellite réflecteur, Satélite reflector*

A satellite intended to reflect radiocommunication signals.

H13 (Rep. 204, Vol. IV)

Station-keeping satellite, *Satellite maintenu en position, Satélite de posición controlada*

A satellite, the position of the centre of mass of which is controlled to follow a specified law, either in relation to the positions of other satellites belonging to the same space system or in relation to a point on Earth which is fixed or moves in a specified way.

H14 (Rep. 204, Vol. IV) **Synchronized satellite, Phased satellite (deprecated),** *Satellite synchronisé, Satélite sincronizado*

A satellite controlled so as to have an anomalistic period or a nodal period equal to that of another satellite or planet, or to the period of a given phenomenon, and to pass a characteristic point in its orbit at specified instants.

H15 (Rep. 204, Vol. IV) **Attitude-stabilized satellite,** *Satellite à commande d'orientation, Satélite de actitud estabilizada*

A satellite with at least one axis maintained in a specified direction, e.g. toward the centre of the Earth, the Sun or a specified point in space.

H16 (Rep. 204, Vol. IV) **Synchronous satellite,** *Satellite synchrone, Satélite sincrónico*

A satellite for which the mean sidereal period is equal to the sidereal period of rotation of the primary body about its own axis; by extension, a satellite for which the mean sidereal period of revolution is approximately equal to the sidereal period of rotation of the primary body.

H17 (Rep. 204, Vol. IV) **Geosynchronous satellite,** *Satellite géosynchrone, Satélite geosincrónico*

A synchronous Earth satellite.

Note. – The sidereal period of rotation of the Earth is about 23 hours 56 minutes.

H18 (Rep. 204, Vol. IV) **Sub-synchronous (super-synchronous) satellite,** *Satellite sous-synchrone (super-synchrone), Satélite subsicrónico (supersincrónico)*

A satellite for which the mean sidereal period of revolution about the primary body is a sub-multiple (an integral multiple) of the sidereal period of rotation of the primary body about its own axis.

H19 (Rep. 204, Vol. IV) **Stationary satellite,** *Satellite stationnaire, Satélite estacionario*

A satellite which remains fixed in relation to the surface of the primary body; by extension, a satellite which remains approximately fixed in relation to the surface of the primary body.

Note. – A stationary satellite is a synchronous satellite with an orbit which is equatorial, circular and direct.

Sub-section H2 – Geostationary satellite

H21 (Rep. 204, Vol. IV) **Geostationary satellite,** *Satellite géostationnaire, Satélite geoestacionario*

A stationary satellite having the Earth as its primary body.

Note. – A geostationary satellite remains approximately fixed relative to the Earth (RR 181).

H22 (Rep. 204, Vol. IV) **Geostationary satellite orbit,** *Orbite des satellites géostationnaires, Órbita de los satélites geoestacionarios*

The unique orbit of all geostationary satellites.

H23 (Rep. 204, Vol. IV) **Visible arc,** *Arc de visibilité, Arco visible*

The common part of the arc of the geostationary satellite over which the space station is visible above the local horizon from each associated earth station in the service area.

H24 (Rep. 204, Vol. IV) **Service arc,** *Arc de service, Arco de servicio*

The arc of the geostationary satellite orbit within which the space station could provide the required service (the required service depends upon the system characteristics and user requirements) to all of its associated earth stations in the service area.

H25 (Rep. 204, Vol. IV) **Frequency re-use satellite network,** *Réseau à satellite à réutilisation de fréquence, Red de satélites con reutilización de frecuencias*

A satellite network in which the satellite utilizes the same frequency band more than once, by means of antenna polarization discrimination, or by multiple antenna beams, or both.

Sub-section H3 – Space research – Earth exploration

H31 (RR 174) **Active sensor,** *Détecteur actif, Sensor activo*

A measuring instrument in the earth exploration-satellite service or in the space research service by means of which information is obtained by transmission and reception of radio waves.

H32 (RR 175) **Passive sensor,** *Détecteur passif, Sensor pasivo*

A measuring instrument in the earth exploration-satellite service or in the space research service by means of which information is obtained by reception of radio waves of natural origin.

Sub-section H4 – Broadcasting

H41 (RR 123) **Individual reception (in the broadcasting-satellite service),** *Réception individuelle, Recepción individual*

The reception of emissions from a space station in the broadcasting-satellite service by simple domestic installations and in particular those possessing small antennas.

H42 (RR 124) **Community reception (in the broadcasting-satellite service),** *Reception communautaire, Recepción comunal*

The reception of emissions from a space station in the broadcasting-satellite service by receiving equipment, which in some cases may be complex and have antennas larger than those used for individual reception, and intended for use:

– by a group of the general public at one location; or

– through a distribution system covering a limiting area.

H43 (Rec. 566(MOD) Vol. XI) **Direct distribution,** *Distribution directe, Distribución directa*

Use of a satellite link of the fixed-satellite service to relay broadcasting programmes from one or more points of origin, directly to terrestrial broadcasting stations without any intermediate distribution stages (possibly including other signals necessary for their operation).

H44 (Rec. 566(MOD) Vol. XI) **Indirect distribution,** *Distribution indirecte, Distribución indirecta*

Use of a satellite link of the fixed-satellite service to relay broadcasting programmes from one or more points of origin to various earth stations for further distribution to the terrestrial broadcasting stations (possibly including other signals necessary for their operation).

SECTION J – STANDARD FREQUENCIES AND TIME SIGNALS

J01 (Rep. 730, Vol. VII) **Frequency standard,** *Etalon de fréquence, Patrón de frecuencia*

A generator, the output of which is used as a precise frequency reference.

J02 (Rep. 730, Vol. VII) **Standard frequency,** *Fréquence étalon, Frecuencia patrón*

A frequency with a known relationship to a frequency standard.

Note. – The term standard frequency is often used for the signal whose frequency is a standard frequency.

J03 (Rep. 730, Vol. VII) **Standard-time-signal emission,** *Emission de signaux horaires, Emisión de señales horarias*

An emission which disseminates a sequence of time signals at regular intervals with a specified accuracy.

J04 (Rep. 730, Vol. VII) **International atomic time (TAI),** *Temps atomique international (TAI), Tiempo atómico internacional (TAI)*

The time scale established by the Bureau international de l'heure (BIH) on the basis of data from atomic clocks operating in several establishments conforming to the definition of the second, the unit of time of the International System of Units (SI).

J05 (Rec. 460, Vol. VII) **Universal time (UT),** *Temps universel (UT), Tiempo universal (UT)*

Time scale in relation to the rotation of the Earth.

In applications in which an imprecision of a few hundredths of a second cannot be tolerated, it is necessary to specify the form of UT which should be used:

- UT0 is the mean solar time of the prime meridian obtained from direct astronomical observation;
- UT1 is UT0 corrected for the effects of small movements of the Earth relative to the axis of rotation (polar variation);
- UT2 is UT1 corrected for the effects of a small seasonal fluctuation in the rate of rotation of the Earth.

Note. – UT1 is used in the texts of Volume VII "Standard frequencies and time signals", since it corresponds directly with the angular position of the Earth around its axis of diurnal rotation.

J06 (Rep. 730, Vol. VII) **Coordinated universal time (UTC),** *Temps universel coordonné (UTC), Tiempo universal coordinado (UTC)*

The time scale, maintained by the BIH which forms the basis of a coordinated dissemination of standard frequencies and time signals. It corresponds exactly in rate with TAI, but differs from it by an integral number of seconds.

The UTC scale is adjusted by the insertion or deletion of seconds (positive or negative leap seconds) to ensure approximate agreement with UT1.

APPENDIX A TO RECOMMENDATION 573-1

STATIONS IN MOBILE SERVICES

See in Section A of Recommendation 573:

A10 Mobile station (RR 65)

A11 Land station (RR 67)

A10a (RR 69) **Land mobile station,** *Station mobile terrestre, Estación móvil terrestre*

A *mobile station* in the *land mobile service* capable of surface movement within the geographical limits of a country or continent.

A11a (RR 68) **Base station,** *Station de base, Estación de base*

A *land station* in the *land mobile service.*

A10b (RR 72) **Ship station,** *Station de navire, Estación de barco*

A *mobile station* in the *maritime mobile service* located on board a vessel which is not permanently moored, other than a *survival craft station.*

A11b (RR 70)

Coast station, *Station côtière, Estación costera*

A *land station* in the *maritime mobile service.*

A10c (RR 78)

Aircraft station, *Station d'aéronef, Estación de aeronave*

A *mobile station* in the *aeronautical mobile service*, other than a *survival craft station*, located on board an aircraft.

A11c (RR 76(MOD))

Aeronautical station, *Station aéronautique, Estación aeronáutica*

A *land station* in the *aeronautical mobile service.*

Note. – In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.

A10d (RR 62)

Survival craft station, *Station d'engin de sauvetage, Estación de embarcación o dispositivo de salvamento*

A mobile station in the maritime mobile service or the aeronautical mobile service intended solely for survival purposes and located on any lifeboat, life-raft or other survival equipment.

A10e (RR 97)

Radar beacon (racon), *Balise radar (racon), Baliza de radar (racon)*

A transmitter-receiver associated with a fixed navigational mark which, when triggered by a *radar*, automatically returns a distinctive signal which can appear on the display of the triggering *radar*, providing range, bearing and identification information.

A10f (RR 88)

Emergency position-indicating radiobeacon station, *Station de radiobalise de localisation des sinistres, Estación de radiobaliza de localización de siniestros*

A *station* in the *mobile service* the *emissions* of which are intended to facilitate search and rescue operations.

Note. – The extension of this definition in the case of stations the emissions of which are intended to be relayed by satellite, needs further study.

COMPLEMENT TO RECOMMENDATION 573-1

ALPHABETICAL LIST OF TERMS DEFINED IN CCIR TEXTS

This list comprises for each term:

1st column: the term in the working language of the document and below, the term in the two other CCIR working languages;

2nd column: the kind and number of the text;

3rd column: the number of the Volume.

A

Absolute gain (of an antenna) (G_i); Isotropic gain (of an antenna) (G_i) *Gain absolu (d'une antenne)* (G_i); *Gain isotrope (d'une antenne)* (G_i), Ganancia absoluta (de una antena) (G_i); Ganancia isótropa (de una antena) (G_i)	Rec. 341 Rec. 573	V XIII
Accepted interference *Brouillage accepté*, Interferencia aceptada	Rec. 573	XIII
Accuracy *Exactitude*, Exactitud	Rep. 730	VII
Accuracy See: Precision, Uncertainty		
Active satellite *Satellite actif*, Satélite activo	Rep. 204 Rec. 573	IV XIII
Active sensor *Détecteur actif*, Sensor activo	Rec. 573	XIII
Actual coverage area See: Coverage area		
All-ones level (data signal in television) *Niveau un*, Nivel todos unos	Rep. 956	XI
All-zeros level (data signal in television) *Niveau zéro*, Nivel todos ceros	Rep. 956	XI
Alphanumeric graphic element (for teletext) *Elément graphique alphanumérique*, Elemento gráfico alfanumérico	Rep. 957	XI
Altitude of the apogee (perigee) *Altitude de l'apogée (du périgée)*, Altitud del apogeo (del perigeo)	Rep. 204 Rec. 573	IV XIII
Anomalistic period *Période anomalistique*, Periodo anomalístico	Rep. 204	IV
Antenna See: Directivity, Economic standard antenna, Gain, Interference sector (I) (of a directional antenna), Minimum standard antenna, Service sector (S) (of a directional antenna)		
Antenna directivity diagram *Diagramme de directivité d'antenne*, Diagrama de directividad de antena	Rec. 573	XIII
Antenna directivity factor (M) *Coefficient de directivité de l'antenne* (M), Factor de directividad de la antena (M)	Rec. 162 S.P. 1B/CMV	III XIII
Antenna gain See: Gain of an antenna		
Apoastron *Apoastre*, Apoastro	Rep. 204	IV
Apogee *Apogée*, Apogeo	Rep. 204	IV
Area See: Capture Area, Coverage Area, Interference-free coverage area, Nominal coverage area, Actual coverage area, Service area		
Ascending (descending) node *Nœud ascendant (descendant)*, Nodo ascendente (descendente)	Rep. 204	IV
Assigned frequency *Fréquence assignée*, Frecuencia asignada	Rec. 328	I

Assigned frequency band *Bande de fréquences assignée*, Banda de frecuencia asignada	Rec. 328	I
Atomic time scale *Echelle de temps atomique*, Escala de tiempo atómico	Rep. 730	VII
Attenuation-slope (of the passband) *Pente aux frontières (de la bande passante)*, Pendiente en los límites (de una banda de paso)	Rec. 332	I
Attitude-stabilized satellite *Satellite à commande d'orientation*, Satélite de actitud estabilizada	Rep. 204 Rec. 573	IV XIII
Audio-frequency (AF) protection ratio *Rapport de protection en audiofréquence*, Relación de protección en audiofrecuencia	Rec. 573	XIII
Audio-frequency (AF) protection ratio (for sound broadcasting) *Rapport de protection en audiofréquence (AF) (pour la radiodiffusion sonore)*, Relación de protección en audiofrecuencia (AF) (para la radiodifusión sonora)	Rec. 447	X
Audio-frequency (AF) signal-to-interference ratio *Rapport signal/brouillage en audiofréquence*, Relación señal/interferencia en audiofrecuencia	Rec. 573	XIII
Audio-frequency (AF) signal-to-interference ratio (for sound broadcasting) *Rapport signal/brouillage en audiofréquence (AF) (pour la radiodiffusion sonore)*, Relación señal/interferencia en audiofrecuencia (AF) (para la radiodifusión sonora)	Rec. 447	X
Automatic switching for television circuits *Commutation automatique pour circuits de télévision*, Conmutación automática para circuitos de televisión	S.P. 15B/CMTT	XII

B

Band See: Assigned frequency band, Baseband, Frequency band, Occupied band		
Bandwidth *Largeur de bande*, Anchura de banda	Rep. 971	XIII
Bandwidth See: Baseband bandwidth, Modulation acceptance bandwidth, Necessary bandwidth, Occupied bandwidth, Width of the effective overall noise band x dB bandwidth		
Bandwidth expansion ratio *Rapport d'étalement de la largeur de bande*, Relación de expansión de la anchura de banda	Rec. 328 S.P. 1B/CMV	I XIII
Baseband *Bande de base*, Banda de base	Rec. 328 Rep. 971	I XIII
Baseband bandwidth *Largeur de la bande de base*, Anchura de banda de la banda de base	Rec. 328	I
Basic amplitude (data signal in television) *Amplitude de base*, Amplitud de base	Rep. 956	XI
Basic MUF *MUF de référence*, MUF básica	Rec. 373 Rec. 573	VI XIII
Basic transmission loss (of a radio link) (L_b or A_i) *Affaiblissement de propagation (d'une liaison radioélectrique)*, *Affaiblissement entre antennes isotropes (d'une liaison radioélectrique)*, Pérdida básica de transmisión (de un enlace radioeléctrico)	Rec. 341 Rec. 573	V XIII
Beam area (for broadcasting satellite service) *Empreinte d'un faisceau (pour le service de radiodiffusion par satellite)*, Zona del haz (para el servicio de radiodifusión por satélite)	Rec. 566	XI
Bidirectional *Bilatéral, Bidirectionnel*, Bilateral, Bidireccional	Rep. 971	XIII
Broadcast videography, Teletext *Vidéographie diffusée, Teletext*, Videografía radiodifundida, Teletexto	Rep. 971	XIII
Broadcasting *Télédiffusion*, Teledifusión	Rep. 971	XIII
Broadcasting See: (Radio) broadcasting, Sound broadcasting, (Television) broadcasting, Wired broadcasting		
Broadcasting-satellite service *Service de radiodiffusion par satellite*, Servicio de radiodifusión por satélite	Rec. 566	XI

C

Coordinate time — Rep. 730 — VII
Temps-coordonnée, Tiempo coordenada

Coordinated time scale — Rep. 730 — VII
Echelle de temps coordonnée, Escala de tiempo coordinada

Coordinated Universal Time (UTC) — Rep. 730 — VII; Rec. 460 — VII; Rec. 573 — XIII
Temps universel coordonné (UTC), Tiempo universal coordinado (UTC)

Coverage area (for the broadcasting-satellite service) — Rec. 566 — XI
Zone de couverture (pour le service de radiodiffusion par satellite), Zona de cobertura (para el servicio de radiodifusión por satélite)

Coverage area (of a broadcasting transmitter in a given broadcasting band) — Rec. 499 — X
Zone de couverture (d'un émetteur de radiodiffusion dans une bande de radiodiffusion donnée), Zona de cobertura (de un transmisor de radiodifusión en una banda de radiodifusión determinada)

Coverage area (of a space station) — Rec. 573 — XIII
Zone de couverture (d'une station spatiale), Zona de cobertura (de una estación espacial)

The following may be distinguishable:

- **Interference-free coverage area** — Rec. 573 — XIII
  Zone de couverture en l'absence de brouillage, Zona de cobertura sin interferencias
- **Nominal coverage area** — Rec. 573 — XIII
  Zone de couverture nominale, Zona de cobertura nominal
- **Actual coverage area** — Rec. 573 — XIII
  Zone de couverture réelle, Zona de cobertura real

Coverage area (of a transmitting terrestrial station) — Rec. 573 — XIII
Zone de couverture (d'une station d'émission de Terre), Zona de cobertura (de una estación transmisora terrenal)

The following may be distinguishable:

- **Interference-free coverage area** — Rec.573 — XIII
  Zone de couverture en l'absence de brouillage, Zona de cobertura sin interferencias
- **Nominal coverage area** — Rec 573 — XIII
  Zone de couverture nominale, Zona de cobertura nominal
- **Actual coverage area** — Rec. 573 — XIII
  Zone de couverture réelle, Zona de cobertura real

Coverage factor (case of sound broadcasting in band 6 (MF)) — Rec. 598 — X; S.P. 1B/CMV — XIII
Facteur de couverture, Factor de cobertura

Cross-modulation noise (case of compandors for sound-programme circuits) — Rep. 493 — XII
Bruit de transmodulation (cas de compresseurs-extenseurs pour circuits de transmissions radiophoniques), Ruido diafónico (caso de compresores-expansores para circuitos de transmisiones radiofónicas)

Cymomotive force (c.m.f.) (in a given direction) — Rec. 561 — X; Rec. 573 — XIII
Force cymomotrice (f.c.m.) (dans une direction donnée), Fuerza cimomotriz (f.c.m.) (en una dirección dada)

D

Data — Rep. 971 — XIII
Données, Datos

Data communication, Data transmission (deprecated in this sense) — Rep. 971 — XIII
Communication de données, Transmission de données (terme déconseillé dans ce sens), Comunicación de datos, Transmisión de datos (desaconsejado en este sentido)

Data group (for teletext) — Rep. 957 — XI
Groupe de données, Grupo de datos

Data line (for teletext) — Rep. 957 — XI
Ligne de données, Línea de datos

Data packet (for teletext) — Rep. 957 — XI
Paquet de données, Paquete de datos

Data signal in television
See: All ones level, All zeros level, Basic amplitude, Decoding marging, Decoding threshold, Eye height, Eye width, Mid-level, Ones overshoot, Zeros overshoot, Peak-to-peak amplitude, Proportional jitter

Data unit (for teletext) *Unité de données*, Unidad de datos	Rep. 957	XI
Date *Date*, Fecha	Rep. 730	VII
Decoding marging (data signal in television) *Marge de décodage*, Margen de decodificación	Rep. 956	XI
Decoding threshold *Seuil de décodage (signal de données en télévision)* Umbral de decodificación	Rep. 956	XI
Deep space *Espace lointain*, Espacio lejano	Rep. 204	IV
Deep space probe *Sonde spatiale lointaine*, Sonda del espacio lejano	Rep. 204	IV
Digital radio path *Conduit hertzien numérique*, Trayecto radiodigital	Rec. G.702 Mentioned in Rec. 390	(CCITT) IX
Digital radio section *Section hertzienne numérique*, Sección radiodigital	Rec. G.702 Mentioned in Rec. 390	(CCITT) IX
Direct distribution (of broadcasting programmes) *Distribution directe (de programmes de radiodiffusion)*, Distribución directa (de programas de radiodifusión)	Rec. 566 Rec. 573	XI XIII
Direct (retrograde) orbit (of a satellite) *Orbite directe (rétrograde) (d'un satellite)*, Órbita directa (retrógrada) (de un satélite)	Rep. 204	IV
Directive gain (in a given direction) (see also: Directivity), (of a directional antenna in the bands 4 to 28 MHz) *Gain de directivité (dans une direction donnée)*, Ganancia directiva (en una dirección dada)	Rec. 162	III
Directivity *Directivité*, Directividad	Rec. 341	V
Directivity See: Antenna directivity factor, Antenna directivity diagram, Directive gain (in a given direction), Horizontal directivity pattern, Vertical directivity pattern		
Display attribute (for teletext) *Attribut de visualisation*, Atributo de visualización	Rep 957	XI
Distribution See: Direct distribution (of broadcasting programmes) Indirect distribution (of broadcasting programmes)		
Down link See: Satellite link		
Duct See: Elevated duct, Ground-based duct (Surface duct), Tropospheric radio duct		
Duct height *Hauteur du conduit*, Altura del conducto	Rec. 310	V
Duct thickness *Epaisseur du conduit*, Espesor del conducto	Rec. 310	V
Ducting layer *Couche de guidage*, Capa de propagación	Rec. 310	V
Duplex, Full duplex *Duplex*, Dúplex	Rep. 971	XIII
DUT1 *DUT1*, DUT1	Rep. 730	VII

E

Earth station *Station terrienne*, Estación terrena	Rec. 573	XIII
Economic standard antenna, (case of a directional antenna in the bands 4 to 28 MHz) *Antenne normale économique*, Antena normal económica	Rec. 162	III
Effective monopole-radiated power (e.m.r.p.) *Puissance apparente rayonnée sur antenne verticale courte (p.a.r.v.)*, Potencia radiada aparente referida a una antena vertical corta (p.r.a.v.)	Rec. 561 Rec. 573	X XIII
Effective radiated power (e.r.p.) *Puissance apparente rayonnée (p.a.r.)* Potencia radiada aparente (p.r.a.)	Rec. 445 Rec. 573	I XIII
Effective radius of the Earth *Rayon terrestre équivalent*, Radio ficticio de la Tierra	Rec. 310	V

Effective selectivity (for the purpose of studying the selectivity in the non-linear region with two or more input signals) *Sélectivité effective d'un récepteur (pour l'étude de la sélectivité dans la région non linéaire, c'est-à-dire dans le cas de deux ou plusieurs signaux à l'entrée)*, Selectividad efectiva de un receptor (para estudiar la selectividad en la región no lineal, es decir, en el caso de dos o más señales a la entrada)	Rec. 332	I
Elevated duct *Conduit élevé*, Conducto elevado	Rec. 310	V
Elliptical orbit (of a satellite) *Orbite elliptique (d'un satellite)*, Órbita elíptica (de un satélite)	Rep. 204	IV
Emission (in radiocommunication) *Emission (en radiocommunication)*, Emisión (en radiocomunicación)	Rec. 573	XIII
Emission (in radiocommunication) See: Radiation (in radiocommunication), Harmonic emission, Out-of-band emission, Parasitic emissions, Spurious emission, Unwanted emission, Full carrier emission, Reduced carrier emission, Suppressed carrier emission, Single-sideband emission, Vestigial-sideband emission, Standard frequency emission, Standard time signal emission		
Emission of a transmitter, optimum from the standpoint of spectrum economy *Emission optimale du point de vue de l'économie du spectre*, Emisión óptima de un transmisor desde el punto de vista de la economía del espectro	Rec. 328	I
Equatorial orbit (of a satellite) *Orbite équatoriale (d'un satellite)*, Órbita ecuatorial (de un satélite)	Rep. 204	IV
Equivalent isotropically radiated power (e.i.r.p.) *Puissance isotrope rayonnée équivalente (p.i.r.e.)*, Potencia isótropa radiada equivalente (p.i.r.e.)	Rec. 445 Rec. 573	I XIII
Equivalent satellite link noise temperature *Température de bruit équivalente d'une liaison par satellite*, Temperatura de ruido equivalente de un enlace por satélite	Rec. 573	XIII
Error (time measurements) *Erreur (mesures du temps)*, Error (mediciones de tiempo)	Rep. 730	VII
Eye height (data signal in television) *Hauteur de l'œil*, Altura del diagrama en ojo	Rep. 956	XI
Eye width (data signal in television) *Largeur de l'œil*, Anchura del diagrama en ojo	Rep. 956	XI

F

Facsimile *Télécopie*, Facsímil	Rep. 971	XIII
Field strength See: Minimum usable field strength (E_{min}), Nominal usable field strength (E_{nom}), Usable field strength (E_u)		
FOT See: Optimum working frequency		
Free space transmission loss (L_{bf} or A_0) *Affaiblissement d'espace libre (d'une liaison radioélectrique)*, Pérdida básica de transmisión en el espacio libre	Rec. 341 Rec. 573	V XIII
Frequency *Fréquence*, Frecuencia	Rep. 730	VII
Frequency (Characteristics of emissions) See: Assigned frequency, Carrier frequency, Characteristic frequency, Reference frequency		
Frequency (ionospheric propagation) See: FOT, Optimum working frequency, LUF, Lowest usable frequency, MUF, Maximum usable frequency, Basic MUF, Operational MUF, OWF, Optimum working frequency		
Frequency band *Bande de fréquences*, Banda de frecuencias	Rep. 971	XIII
(Frequency) channel *Canal (de fréquences)*, Canal (de frecuencias)	Rep. 971	XIII
Frequency departure *Ecart de fréquence*, Desajuste de frecuencia	Rep. 730	VII
Frequency difference *Différence de fréquence*, Diferencia de frecuencia	Rep. 730	VII
Frequency drift *Dérive de fréquence*, Deriva de frecuencia	Rep. 730	VII

G

H

Homogeneous section (telephony) *Section homogène (téléphonie)*, Sección homogénea (para la telefonía)	Rec. 390	IX
Hop (in ionospheric propagation) *Bond, saut*, Salto	Rec. 573	XIII
Horizontal directivity pattern *Diagramme de directivité horizontal*, Diagrama de directividad horizontal	Rec. 573	XIII
Hypothetical reference circuit for systems using analogue transmission in the fixed-satellite service (telephone and television networks) *Circuit fictif de référence pour les systèmes utilisant la transmission analogique dans le service fixe par satellite (réseaux de téléphonie et de télévision)*, Circuito ficticio de referencia para los sistemas que utilizan la transmisión analógica en el servicio fijo por satélite (redes telefónicas y de televisión)	Rec. 352	IV
Hypothetical reference circuit (in the fixed-satellite service) (Television) *Circuit fictif de référence (pour le service fixe par satellite) (Télévision)*, Circuito ficticio de referencia (en el servicio fijo por satélite) (Televisión)	Rec. 567	XII
Hypothetical reference circuit * (general term) *Circuit fictif de référence * (généralité)* Circuito ficticio de referencia * (generalidad)	Rec. 390	IX
Hypothetical reference circuit for sound-programme transmissions (Terrestrial systems) *Circuit fictif de référence pour transmissions radiophoniques (systèmes de Terre)*, Circuito ficticio de referencia para circuitos radiofónicos (sistemas terrenales)	Rec. 502	XII
Hypothetical reference circuit for sound-programme transmissions (systems in the fixed-satellite service) *Circuit fictif de référence pour transmissions radiophoniques (systèmes du service fixe par satellite)*, Circuito ficticio de referencia para transmisiones radiofónicas (sistemas del servicio fijo por satélite)	Rec. 502	XII
Hypothetical reference circuit (for telephony) *Circuit fictif de référence (pour la téléphonie)*, Circuito ficticio de referencia (para la telefonía)	Rec. 390	IX
Hypothetical reference circuit for telephony on line-of-sight or near line-of-sight radio-relay systems (using frequency division multiplex (with a capacity of 12 to 60 telephone channels)) *Circuit fictif de référence pour la téléphonie sur les faisceaux hertziens à visibilité directe ou s'approchant de la visibilité directe (à multiplexage par répartition en fréquence (ayant une capacité de 12 à 60 voies téléphoniques))*, Circuito ficticio de referencia para la telefonía por sistemas de relevadores radioeléctricos con visibilidad directa o casi directa (multicanal con distribución de frecuencia (con capacidad de 12 a 60 canales telefónicos))	Rec. 391	IX
Hypothetical reference circuit for telephony on line-of-sight or near line-of-sight radio-relay systems (using frequency-division multiplex (for more than 60 telephone channels)) *Circuit fictif de référence pour la téléphonie sur les faisceaux hertziens à visibilité directe ou s'approchant de la visibilité directe (ayant une capacité de plus de 60 voies téléphoniques)*, Circuito ficticio de referencia para la telefonía por sistemas de relevadores radioeléctricos con visibilidad directa o casi directa (con capacidad para más de 60 canales telefónicos)	Rec. 392	IX
Hypothetical reference circuit on trans-horizon radio-relay systems (using frequency-division multiplex) *Circuit fictif de référence pour la téléphonie sur faisceaux hertziens transhorizon (à multiplexage par répartition en fréquence)*, Circuito ficticio de referencia por sistemas de relevadores radioeléctricos transhorizonte (multicanal con distribución de frecuencia)	Rec. 396	IX
Hypothetical reference circuit See: Terrestrial hypothetical reference circuit (Television)		
Hypothetical reference digital path *Conduit numérique fictif de référence*, Trayecto digital ficticio de referencia	Rec. G.721 Mentioned in Rec. 390	(CCITT) IX

I

Image-rejection ratio (of a receiver) *Affaiblissement sur la fréquence conjuguée (d'un récepteur)*, Atenuación para la frecuencia imagen (de un receptor)	Rec. 332	I
Impulse rate *Taux d'impulsions*, Frecuencia de los impulsos	Rep. 358	VIII

* See for general definitions, CCITT Recommendation G.212

Impulsive noise tolerance *Tolérance de bruit impulsif*, Tolerancia al ruido impulsivo	Rep. 358	VIII
Inclination (of a satellite orbit) *Inclinaison (d'une orbite de satellite)*, Inclinación (de una órbita de satélite)	Rep. 204 Rec. 573	IV XIII
Inclined orbit (of a satellite) *Orbite inclinée (d'un satellite)*, Órbita inclinada (de un satélite)	Rep. 204	IV
Index of cooperation *Module de coopération*, Índice de cooperación	Rep. 588	VIII
Indirect distribution (of broadcasting programmes) *Distribution indirecte (de programmes de radiodiffusion)*, Distribución indirecta (de programas de radiodifusión)	Rec. 566 Rec. 573	XI XIII
Individual reception (in the broadcasting-satellite service) *Réception individuelle (dans le service de radiodiffusion par satellite)*, Recepción individual (en el servicio de radiodifusión por satélite)	Rec. 566 Rec. 573	XI XIII
Instant *Instant*, Instante	Rep. 730	VII
Interactive videography, Videotex *Vidéographie interactive, Vidéotex*, Videografía interactiva, Videotex	Rep. 971	XIII
Interference *Brouillage*, Interferencia	Rec. 573	XIII
Interference See: Accepted interference, Harmful interference, Permissible interference, Quasi-impulsive interference		
Interference-free coverage area See: Coverage area		
Interference sector (*I*) (of a directional antenna in the bands 4 to 28 MHz) *Secteur de brouillage* (*I*), Sector de interferencia (*I*)	Rec. 162	III
Interfering source *Source de brouillage*, Fuente interferente	Rec. 573	XIII
Intermediate-frequency rejection ratio (of a receiver) *Affaiblissement sur la fréquence intermédiaire (d'un récepteur)*, Atenuación para la frecuencia intermedia (de un receptor)	Rec. 332	I
Intermodulation component (in a radio transmitter for amplitude-modulated emissions) *Oscillation d'intermodulation (dans un émetteur radioélectrique à modulation d'amplitude)*, Oscilación de intermodulación (en un transmisor radioeléctrico de modulación de amplitud)	Rec. 326	I
Intermodulation products (of a transmitting station) *Produits d'intermodulation (d'une station émettrice)*, Productos de intermodulación (de una estación transmisora)	Rec. 326 Rec. 573	I XIII
International Atomic Time (TAI) *Temps atomique international (TAI)*, Tiempo atómico internacional (TAI)	Rep. 730	VII
International television connection *Communication télévisuelle internationale*, Conexión internacional de televisión	Rec. 567	XII
Inter-satellite link *Liaison intersatellite*, Enlace intersatélite	Rec. 573	XIII
Ionosphere *Ionosphère*, Ionosfera	Rec. 573	XIII
Ionospheric propagation *Propagation ionosphérique*, Propagación ionosférica	Rec. 573	XIII
Ionospheric reflection *Réflexion ionosphérique*, Reflexión ionosférica	Rec. 573	XIII
Ionospheric (reflection) propagation *Propagation (par réflexion) ionosphérique*, Propagación (por reflexión) ionosférica	Rec. 573	XIII
Ionospheric scatter propagation *Propagation par diffusion ionosphérique*, Propagación por dispersión ionosférica	Rec. 573	XIII
Ionospheric wave *Onde ionosphérique*, Onda ionosférica	Rec. 573	XIII
Isotropic gain (of an antenna (G_i); Absolute gain (of an antenna (G_i) *Gain isotrope d'une antenne* (G_i); *Gain absolu d'une antenne* (G_i), Ganancia isótropa (de una antena) (G_i); Ganancia absoluta (de una antena) (G_i)	Rec. 341 Rec. 573	V XIII

J

Julian Date — Rep. 730 — VII
Date julienne, Fecha juliana

Julian Date
See: Modified Julian Date

Julian day number — Rep. 730 — VII
Numéro de jour julien, Número de día juliano

L

Land station — Rec. 573 — XIII
Station terrestre, Estación terrestre

Leap second — Rep. 730 — VII
Seconde intercalaire, Segundo intercalar

Left-hand polarized wave — Rec. 573 — XIII
Onde à polarisation lévogyre (sens inverse des aiguilles d'une montre), Onda de polarización levógira

Linear receiver — Rec. 331 — I
Récepteur linéaire, Receptor lineal

Link — Rep. 971 — XIII
Liaison, Enlace

Link
See: Radio link, Satellite link, inter-satellite link, multi-satellite link, unidirectional, bidirectional

Loss
See: Total loss, System loss, Transmission loss, Basic transmission loss, Free space transmission loss, Ray path transmission loss, Loss relative to free space

Loss relative to free space (L_m or A_m) — Rec. 341, Rec. 573 — V, XIII
Affaiblissement par rapport à l'espace libre (d'une liaison radioélectrique), Pérdida relativa al espacio libre

Lowest usable frequency (LUF) — Rec. 573 — XIII
Fréquence minimale utilisable (LUF), Frecuencia mínima utilizable (LUF)

Low orbit (of a satellite) — Rep. 548 — II
Orbite basse (d'un satellite), Órbita baja (de un satélite)

Low power flux-density (in the broadcasting-satellite service) — Rec. 566 — XI
Puissance surfacique limitée (pour le service de radiodiffusion par satellite), Pequeña densidad de flujo de potencia (para el servicio de radiodifusión por satélite)

M

Maximum sensitivity (for sound broadcast and television receivers) — Rec. 331 — I
Sensibilité maximale (cas des récepteurs de radiodiffusion sonore ou visuelle (télévision)), Sensibilidad máxima (para los receptores de radiodifusión sonora o visual (televisión))

Maximum usable frequency (MUF) — Rec. 573 — XIII
Fréquence maximale utilisable (MUF), Frecuencia máxima utilizable (MUF)
See: MUF, Operational MUF, Basic MUF

Maximum usable (gain-limited) sensitivity — Rec. 331 — I
Sensibilité maximale utilisable limitée par l'amplification, Sensibilidad máxima utilizable limitada por la amplificación

Maximum usable (noise-limited) sensitivity — Rec. 331 — I
Sensibilité maximale utilisable limitée par le bruit, Sensibilidad máxima utilizable limitada por el ruido

Maximum usable sensitivity (for radiotelegraph receivers for aural reception) — Rec. 331 — I
Sensibilité maximale utilisable (cas des récepteurs de radiotélégraphie pour réception auditive), Sensibilidad máxima utilizable (para los receptores radiotelegráficos para recepción auditiva)

Maximum usable sensitivity (for receivers for single channel frequency-modulation for telephony (class of emission F3) other than those used for sound broadcasting) — Rec. 331 — I
Sensibilité maximale utilisable (cas des récepteurs de téléphonie à une seule voie de modulation (classe d'émission F3) autres que ceux utilisés pour la radiodiffusion sonore), Sensibilidad máxima utilizable (para los receptores radiotelefónicos de un solo canal de modulación (clase de emisión F3) distintos de los utilizados para la radiodifusión sonora)

Maximum usable sensitivity, including the reproducing equipment (for radiotelegraph receivers for aural reception) *Sensibilité maximale utilisable, y compris l'équipement de reproduction (cas de récepteurs de radiotélégraphie pour réception auditive)*, Sensibilidad máxima utilizable incluido el equipo reproductor (para los receptores radiotelegráficos para recepción auditiva)	Rec. 331	I
Mean power of a radio transmitter *Puissance moyenne d'un émetteur radioélectrique*, Potencia media de un transmisor radioeléctrico	Rec. 326 Rec. 573	I XIII
Medium power flux-density (in the broadcasting-satellite service) *Puissance surfacique moyenne (pour le service de radiodiffusion par satellite)*, Densidad intermedia de flujo de potencia (para el servicio de radiodifusión por satélite)	Rec. 566	XI
Mid-level (data signal in television) *Niveau moyen*, Nivel medio	Rep. 956	XI
Minimum standard antenna, (case of a directional antenna in the bands 4 and 28 MHz) *Antenne normale minimale*, Antena normal mínima	Rec. 162	III
Minimum usable field strength (E_{min}) *Champ minimal utilisable (E_{min})*, Intensidad de campo mínima utilizable (E_{min})	Rec. 573	XIII
Minimum usable field strength (E_{min}), (case of sound broadcasting in bands 5 (LF), 6 (MF), 7 (MF) and 8 (VHF)) *Champ minimal utilisable (E_{min})*, Intensidad de campo mínima utilizable (E_{min})	Rec. 499	X
Minimum usable power flux-density (P_{min}) *Puissance surfacique minimale utilisable (P_{min})*, Densidad espectral de potencia mínima utilizable (P_{min})	Rec. 573	XIII
Mixing ratio *Rapport de mélange*, Relación de mezcla	Rec. 310 S.P. 1B/CMV	V XIII
Mobile service *Service mobile*, Servicio móvil	Rec. 573	XIII
Mobile station *Station mobile*, Estación móvil	Rec. 573	XIII
Modified Julian Date (MJD) *Date julienne modifiée (DJM)*, Fecha Modificada del Calendario Juliano (FMCJ)	Rep. 730	VII
Modified refractive index *Indice de réfraction modifié*, Índice de refracción modificado	Rec. 310	V
Modulation *Modulation*, Modulación	Rep. 971	XIII
Modulation acceptance bandwidth of a receiver other than those used for broadcast reception, for frequency- or phase-modulated signals *Bande passante correspondant à la déviation de fréquence maximale admissible pour un récepteur autre que la radiodiffusion, pour des signaux modulés en fréquence ou en phase*, Anchura de banda correspondiente a la desviación de frecuencia máxima admisible por un receptor que no sea de radiodifusión, para las señales con modulación de frecuencia o de fase	Rec. 332	I
MUF	Rec. 373 Rec. 573	VI XIII
MUF See: Maximum usable frequency, Operational MUF		
Multipath propagation *Propagation par trajets multiples*, Propagación por trayectos múltiples	Rec. 310	V
Multi-satellite link *Liaison multisatellite*, Enlace multisatélite	Rec. 573	XIII
***M*-unit (of a refractive modulus)** *Unité M (d'un module de réfraction)*, Unidad *M* (de un módulo de refracción)	Rec. 310	V

N

***N* (refractivity)** *Coïndice (N)*, Coíndice (*N*)	Rec. 310	V
Near-Earth space *Espace proche de la Terre*, Espacio próximo a la Tierra	Rep. 548	II
Necessary bandwidth *Largeur de bande nécessaire*, Anchura de banda necesaria	Rec. 328 Rec. 573	I XIII
Nodal period *Période nodale*, Periodo nodal	Rep. 204	IV

Noise amplitude distribution *Courbe de répartition de l'amplitude du bruit*, Distribución de la amplitud del ruido	Rep. 358	VIII
Noise factor (Noise figure) *Facteur de bruit*, Factor de ruido	Rec. 573 S.P. 1B/CMV	XIII XIII
Noise figure See: Noise factor		
Noise temperature *Température du bruit*, Temperatura de ruido	Rec. 573	XIII
Noise See: Cross-modulation noise (case of compandors for sound-programme circuits), Trailing noise (case of compandors for sound-programme circuits), Impulsive noise tolerance		
Noise temperature See: Equivalent satellite link noise temperature, Overall noise temperature		
Nominal coverage area See: Coverage area		
Nominal orbital position *Position nominale sur l'orbite*, Posición orbital nominal	Rec. 566	XI
Nominal value *Valeur nominale*, Valor nominal	Rep. 730	VII
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Normalized frequency difference *Différence de fréquence normée*, Diferencia de frecuencia normalizada	Rep. 730	VII
Normalized frequency drift *Dérive de fréquence normée*, Deriva normalizada de frecuencia	Rep. 730	VII

O

Occupied band *Bande occupée*, Banda ocupada	Rec. 573	XIII
Occupied bandwidth *Largeur de bande occupée*, Anchura de banda ocupada	Rec. 328 Rec. 573	I XIII
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Ones overshoot *Suroscillation des uns (signal de données de télévision)*, Sobreoscilación de los unos	Rep. 956	XI
Operational MUF *MUF d'exploitation*, MUF de explotación	Rec. 373 Rec. 573	VI XIII
Optimum working frequency (OWF or FOT) *Fréquence optimale de travail (FOT)*, Frecuencia óptima de trabajo (FOT)	Rec. 373	VI
Orbit *Orbite*, Órbita	Rep. 204 Rec. 573	IV XIII
Orbit See: Circular orbit, Direct (retrograde) orbit, Elliptical orbit, Equatorial orbit, Geostationary-satellite orbit, Inclined orbit, Low orbit, Polar orbit, Unperturbed orbit		
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REPORT 971 *

GENERAL TERMINOLOGY OF TELECOMMUNICATIONS

(Terms common to CCIR and CCITT)

(Question 1/CMV and Study Programme 1A/CMV)

(1982)

In order to assure that telecommunication terms employed by the CCIs have the same meaning, CMV has collected general terms used in the texts of different Study Groups together with their definitions.

Note. – These terms and definitions have been arranged according to subject as follows:

1. Forms of telecommunications.
2. Channels, circuits and networks.
3. Use and operation of circuits and networks.
4. Frequencies and bandwidths.

Administrations and Study Groups are invited to comment on these terms and definitions, and particularly, to forward to CMV their proposals for revision or for alternative applications, accompanied by appropriate justifications, with a view to the preparation of a Recommendation.

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* See Annex IV to the Introduction by the Chairman of the CMV.

When examining these definitions, the following should be considered:

(a) that Resolution No. 44 of the Plenipotentiary Conference of the ITU (Malaga-Torremolinos, 1973) instructed the CCITT and the CCIR to study within CMV the definitions of the terms "telegraphy" and "telephony";

(b) that the VIth CCITT Plenary Assembly (Geneva, 1976) adopted Opinion No. 9 dissociating the terms of reference of the CCITT from these definitions, which therefore assume a purely technical character;

(c) that Resolution No. 68 and Recommendation No. 72 of the World Administrative Radio Conference (Geneva, 1979) call upon the CCIR and the CCITT to re-examine the definitions of "telegraphy", "telephony" and other technical terms;

(d) that the Joint CCI/IEC Coordination Group for Vocabulary (GMC), at its Montreux meeting in June 1981, examined a draft text of definitions of general terms prepared by its Experts Group A (draft IEV Chapter 701) and, after some amendments, has submitted it to the CMV which considered it for the preparation of this Report;

(e) that Recommendation 573 on radiocommunication vocabulary contains terms relating more specifically to the CCIR.

The following Notes should also be taken into account:

Note 1. – Definitions given in this Report are general; their purpose is that all Study Groups should use general terms with the same meaning. They may be in certain cases slightly different from more complete definitions prepared or being prepared by some Study Groups for their specific needs, but they are not in contradiction with the latter.

Note 2. – A number of terms in this Report appear also in Article 1 of the Radio Regulations with a different definition. These terms are identified by (RR . . ., MOD). Modifications are proposed for two reasons:

(a) Some Radio Regulations definitions only take into account regulatory aspects, while the CMV proposes definitions of a technical nature;

(b) Some Radio Regulations definitions give rise to difficulties of interpretation, in these cases, modifications or additions proposed by the CMV may be useful later for draft revisions of the Radio Regulations definitions in accordance with Recommendation No. 72 of WARC-79 and Study Programme 1A/CMV.

For regulatory applications, only the terms and definitions in the Radio Regulations may be used.

Note 3. – Considering the interest shown by the CCIR Study Groups which use digital techniques, CCITT Recommendation G.702 on terminology of digital techniques, is reproduced as Appendix A to this Report.

1. FORMS OF TELECOMMUNICATIONS

1.01 **Transmission,** *Transmission, Transmisión*

The action of conveying from one point to one or more other points, signs, symbols, documents, pictures, sounds, or information of any nature, by means of signals.

Note. – Transmission can be effected directly or indirectly, with or without intermediate recording.

1.02 **Signal,** *Signal, Señal*

A physical phenomenon or characteristic quantity of such a phenomenon whose time variations represent information.

1.03 **Communication,** *Communication (1), Comunicación (1)*

Information transfer according to agreed conventions.

Note. – The French term "communication" and the Spanish term "comunicación" have the current meaning given in this definition, but they also acquire a more specific meaning in telecommunication (see 3.05 and 3.02).

1.04 (RR 4) **Telecommunication,** *Télécommunication, Telecomunicación*

Any transmission, emission or reception of signs, signal, writing, images and sound or intelligence of any nature by wire, radio, optical or other electromagnetic systems.

Note. – This is the definition given in the International Telecommunication Convention.

1.05 (RR 117, MOD)

Telephony, *Téléphonie, Telefonía*

A form of telecommunication primarily intended for the exchange of information in the form of speech.

Note. – This definition differs from that given in the Convention.

1.06 (RR 111, MOD)

Telegraphy, *Télégraphie, Telegrafía*

A form of telecommunication in which the transmitted information is intended to be recorded on arrival as a graphic document; the transmitted information may sometimes be presented in an alternative form or may be stored for subsequent use.

Note 1. – A graphic document records information in a permanent form and is capable of being filed and consulted; for example, it may take the form of written or printed matter or of a fixed image.

Note 2. – This definition differs from that given in the Convention.

Note 3. – Moreover, in the Convention and in the RR, the following restriction is given:

"For the purpose of the Radio Regulations, unless otherwise specified therein, telegraphy shall mean a form of telecommunication for the transmission of written matter by the use of a signal code" (RR 111, extract).

1.07

Data, *Données, Datos*

* Information represented in a manner suitable for automatic processing.

1.08

Data communication, *Communication de données, Comunicación de datos*

* A form of telecommunication intended for the transfer of information in the form of data.

Note. – The term "data transmission" shall not be used in this sense.

1.09

Remote data processing, Teleinformatics; *Téléinformatique; Teleinformática*

* The association of telecommunication and data processing techniques to process information at a distance.

1.10 (RR 122, MOD)

Television, *Télévision, Televisión*

A form of telecommunication for the transmission of signals representing scenes which can contain movement, images of the scenes being reproduced on a screen immediately upon reception or after recording.

Note. – This technique finds major application in television broadcasting, but is also used for industrial, scientific, medical and other applications.

1.11

Still picture television (SPTV), *Télévision à images fixes, Televisión de imágenes fijas*

Television in which the time interval between a displayed picture and the display of either an updated version of the same picture, or a new picture forming part of a sequence, exceeds (generally by an appreciable factor) the usual time interval between pictures.

Note. – The question as to whether still-picture television includes certain modes in broadcast videography, teletext (see 1.16), is still under study.

1.12

Videophony; *Visiophonie, Vidéophonie (term deprecated in this meaning); Videofonía*

An association of telephony and television which allows both users to see each other during their telephone conversation.

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* This definition is proposed provisionally by the CMV and will be further studied by CCITT Study Group I.

1.13 **Still picture videophony,** *Visiophonie à images fixes, Videofonía de imagenes fijas*

Videophony in which the time interval between a displayed picture and the display of either an updated version of the same picture, or a new picture forming part of a sequence, exceeds (generally by an appreciable factor) the usual time interval between pictures.

1.14 **Telematics (Services),** *Télématique (Services de), Telemática (servicios de)*

* Telecommunication services other than the conventional telegraphic or telephonic services, which may be provided for the users of a telecommunication network. These services which often use teleinformatic techniques permit the sending or reception of public or private information, including file consultation, reservations, commercial or banking operations.

Examples of telematics services: facsimile, teletex, videography, telewriting (or telescript).

1.15 **Videography,** *Vidéographie, Videografía*

A form of telecommunication in which information generally in the form of digital data is transmitted to a user in order primarily to permit the selection and display of textual or pictorial information on a visual display unit, for instance on the screen of a television receiver.

Note. – Teletex and other forms of telegraphy are not forms of videography.

1.16 **Broadcast videography, Teletext;** *Vidéographie diffusée, Télétexte; Videografía radiodifundida, Teletexto*

Videography in which information is broadcast in a structured sequence within the framework of a television signal, and the desired part of this information is selected by the user.

Note 1. – Information may be transmitted simultaneously with normal television pictures.

Note 2. – The terms "teletext" and "teletex" (see 1.18) refer to two different concepts.

1.17 **Videotex, Interactive videography;** *Videotex, Vidéographie interactive; Videotex, Videografía interactiva*

Videographic service in which telecommunication networks are used for transmission of the user's requirements as well as the answers to his requests.

1.18 **Teletex,** *Télétex, Teletex*

* A text transmission service by telegraphy offering additional facilities to the telex service and in particular various typewriters' functions and remote text processing facilities.

Note. – The terms "teletex" and "teletext" (broadcast videography) (see 1.16) refer to two different concepts.

1.19 (RR 116, MOD) **Facsimile,** *Télécopie, Facsímil*

A form of telecommunication in which one terminal transmits a graphic document to a distant terminal where a similar document to the original is reproduced.

Note 1. – See Note 1 to term 1.06 – Telegraphy.

Note 2. – Reproduction may be in the form of two levels of optical density known generally as black and white or in the form of half-tones or colours.

* This definition is proposed provisionally by the CMV and will be studied further by CCITT Study Group I.

1.20 **Telewriting, Telescript;** *Téléécriture, Téléscript; Teleescritura, Telescript*

* Telecommunication for the purpose of transmitting graphical information as it is being manually traced and for simultaneously generating a reproduction of the tracing at the distant terminal either on a screen or in some other form.

Note 1. – In cases where this takes the form of telegraphy with documentary reproduction, the term "téléautographie" is also employed in French.

Note 2. – The term "telescript" is proposed to replace possibly the term "telewriting" which is presently being used on a provisional basis. The proposed new term is to be submitted to the CCITT for consideration. **

1.21 (RR 125, MOD) **Telemetry, Telemetering;** *Télémesure; Telemedida*

The use of telecommunication for automatically indicating or recording measurements at a distance.

1.22 (RR 128, MOD) **Telecommand,** *Télécommande, Telemando*

The use of telecommunication for the transmission of signals to initiate, modify or terminate functions of equipment at a distance.

1.23 **Telecontrol,** *Téléconduite, Telecontrol*

The control of operational equipment at a distance using direct connection of metering equipments and command facilities to decision making units by telecommunications.

1.24 **Broadcasting,** *Télédiffusion, Teledifusión*

A unilateral form of telecommunication intended for all users having appropriate receiving facilities, and carried out by means of radio or by cable or optical fibre networks.

Examples: Sound or television broadcasting, time signals and navigational warning broadcasting, broadcast videography, broadcasting from press agencies.

1.25 **(Radio) Broadcasting,** *Radiodiffusion, Radiodifusión*

Broadcasting by radio waves.

Note 1. – This concept is different from that of "Broadcasting Service" (RR 36).

Note 2. – In French and Spanish this term applies only to radiocommunication intended for direct reception by the general public; these transmissions may include sound programmes, television programmes or other types of transmission. ***

1.26 **Sound broadcasting,** *Radiodiffusion sonore, Radiodifusión sonora*

Broadcasting limited to sound programmes.

Note. – The English term "sound broadcasting" includes distribution over cable networks and is therefore not equivalent to the French and Spanish terms.

1.27 **Television (broadcasting);** *Radiodiffusion visuelle, (Radiodiffusion de) télévision; (Radiodifusión de) televisión*

The broadcasting of visual programmes with associated sounds.

Note. – The English term "television broadcasting" includes distribution over cable networks and is therefore not equivalent to the French and Spanish terms.

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* This definition is proposed provisionally by the CMV and will be studied further by CCITT Study Group I.

** The term "telescript" is not accepted by some administrations.

*** The English definition should be revised to take into account the definition of "Broadcasting Service" (RR 36).

1.28 **Wired broadcasting;** *Télédistribution, Câblodistribution (Canada); Teledistribución*

A form of telecommunication for the distribution of television and sound programmes over a network of cables or optical fibres to a large number of receiving points.

Note. – Some systems may transmit other signals and/or provide a return transmission channel.

2. CHANNELS, CIRCUITS AND NETWORKS

2.01 **(Transmission) channel,** *Voie (de transmission), Canal (de transmisión)*

* A means of transmission of signals in one direction between two points.

Note 1. – Several channels may share a common carrier as in frequency and time division systems; in these cases each channel is allocated a particular frequency band or a particular periodically repeated time slot which is reserved for it.

Note 2. – In some countries the term "communication channel" or its abbreviation "channel" is also used to mean "telecommunication circuit", i.e. to encompass the two directions of transmission. This usage is deprecated.

Note 3. – A transmission channel may be qualified by the nature of the transmitted signals, or by its bandwidth, or by its bit rate. *Examples:* telephone channel, telegraph channel, data channel, 10 MHz channel, 34 Mbit/s channel.

2.02 **(Frequency) channel,** *Canal (de fréquences), Canal (de frecuencias)*

Part of the frequency spectrum intended to be used for a transmission of signals and which may be defined by two specified limits, or by its centre frequency and the associated bandwidth, or by any equivalent indication.

Note 1. – A frequency channel may be time-shared in order to allow communication in both directions by simplex operation.

Note 2. – The use of the term "channel" to mean circuit is deprecated.

Note 3. – The term "radiofrequency channel" used in radiocommunication is defined in Recommendation 573.

2.03 **Telephone-type channel,** *Voie de type téléphonique, Canal de tipo telefónico*

A transmission channel suitable for the transmission of speech and which may be used for other purposes.

2.04 **Telecommunication circuit,** *Circuit de télécommunication, Circuito de telecomunicación*

* A combination of two transmission channels permitting transmission in both directions between two points.

Note 1. – If the telecommunication is by nature unilateral, the term "circuit" may be used to describe the single transmission channel which is used.

Note 2. – In telephony, the use of the term "telephone circuit" is generally limited to a telecommunication circuit directly connecting two switching centres.

2.05 **Telephone-type circuit,** *Circuit de type téléphonique, Circuito de tipo telefónico*

A pair of associated telephone-type transmission channels permitting transmission in both directions between two points.

2.06 **... link,** *Liaison ..., Enlace ...*

A telecommunication facility with specified characteristics between two points.

Note. – The type of the transmission path or the capacity is normally indicated, e.g. "radio link", "coaxial link", "broadband link".

2.07 **Telecommunication network,** *Réseau de télécommunication, Red de telecomunicación*

All the lines and equipment providing the telecommunication facilities between a number of locations.

Note. – The locations may be terminals for serving the users or interconnecting points designated as nodes of the network.

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* See Note 1 at the beginning of this Report.

2.08 **Transmission path,** *Trajet de transmission, Trayecto de transmisión*

The continuous course taken by a signal during its transmission between two points.

3. USE AND OPERATION OF CIRCUITS AND NETWORKS

3.01 **Connection,** *Chaîne de connexion, Cadena de conexión*

* An association of transmission channels or circuits, switching and other functional units set up to provide a means for a transfer of information between two or more points in a telecommunication network.

3.02 **(Complete) connection;** *Chaîne de connexion complète, (Chemin de) communication (3); Cadena de conexión completa, (Camino de) comunicación (3)*

An association of transmission channels or circuits, switching and other functional units set up to provide means for a transfer of information between terminals in a telecommunication network.

3.03 **(Circuit) switching,** *Commutation (de circuits), Conmutación (de circuitos)*

The establishment of a temporary connection between desired terminals or circuits.

3.04 **Call (attempt) (1) (by a user),** *(Tentative d') appel (par un usager), (Tentativa de) llamada (por un usuario)*

* The sequence of operations made by a user of a telecommunication network to obtain another party or a service.

Note 1. – Several call attempts may be required to establish a call.

Note 2. – This definition differs slightly from the definition of the term "call attempt" denoting a call attempt by a caller/device which appears in Supplement No. 7 to the Fascicle II.3 of the CCITT (section 715.11 – Calls). This Supplement contains terms and definitions specific to teletraffic.

3.05 **Call (2),** *Communication (2), Comunicación (2)*

* The use, or the possible use, of a complete connection set up between a calling party and the called party or service.

3.06 **Modulation,** *Modulation, Modulación*

A process by which a quantity which characterizes an oscillation or wave, usually periodic, is constrained to follow the variations of another oscillation, wave or signal.

3.07 **Carrier,** *Porteuse, Portadora*

1. An oscillation or wave, usually periodic, which is intended to be combined by modulation to another oscillation wave or signal.

2. In a modulated oscillation or wave, the spectral component having the frequency of the periodic unmodulated oscillation or wave.

3.08 (RR 119, MOD) **Simplex;** *Simplex, A l'alternat; Simplex*

Designating or pertaining to a mode of operation or the equipment concerned by which information can be transmitted in either direction, but not simultaneously, between two points.

3.09 (RR 120, MOD) **Duplex, Full duplex;** *Duplex; Dúplex*

Designating or pertaining to a mode of operation or the equipment concerned by which information can be transmitted in both directions simultaneously between two points.

* See Note 1 at the beginning of this Report.

3.10 **Unidirectional;** *Unilatéral, Unidirectionel; Unilateral, Unidireccional*

* Pertaining to a link where the transfer of user's information occurs in one preassigned direction.

3.11 **Bidirectional;** *Bilatéral, Bidirectionnel; Bilateral, Bidireccional*

* Pertaining to a link where the transfer of user's information occurs simultaneously in both directions between two points, the channel capacity and signalling rate being not necessarily the same in both directions.

3.12 **One-way . . .,** *. . . à sens unique, . . . de sentido único*

* Pertaining to an operation mode where the call set-ups always occur in one direction.

3.13 **Both-way . . .,** *. . . à double sens, . . . de doble sentido*

* Pertaining to an operation mode where the call set-ups occur in both directions, the amount of traffic flowing being not necessarily the same in both directions.

4. FREQUENCIES AND BANDWIDTHS

4.01 **Frequency band,** *Bande de fréquences, Banda de frequencias*

A portion of the frequency spectrum lying between two specified limiting frequencies.

4.02 **Bandwidth,** *Largeur de bande, Anchura de banda*

The numerical difference between the frequencies at the extremes of a portion of the frequency spectrum.

Note 1. – This term is usually associated with a qualification, for example:

- baseband bandwidth;
- necessary bandwidth;
- receiver bandwidth, etc.

Note 2. – A clear distinction must be drawn between:

(a) the frequency band, which occupies a clearly defined position in the frequency spectrum, and which is characterized by two values, namely its upper and lower limits, or by any similar means;

(b) the bandwidth, which is expressed only by a single value. This value is the difference between the limits of a band, but these limits may have any position in the spectrum, with a constant difference.

4.03 **Baseband,** *Bande de base, Banda de base*

The frequency band occupied by one signal, or by a number of multiplexed signals which have to be carried by a radio transmission system or a line transmission system.

Note. – In the case of radiocommunication, the baseband signal constitutes the signal modulating the transmitter.

4.04 *x* **dB bandwidth,** *Largeur de bande «à x dB», Anchura de banda entre puntos a «x dB»*

The width of a frequency band such that beyond its lower and upper limits any discrete spectrum component or continuous spectral power density is at least *x* dB lower than a predetermined zero dB reference level.

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* See Note 1 at the beginning of this Report.

APPENDIX "A" TO REPORT 971

TERMINOLOGY OF DIGITAL TECHNIQUES

Several of the CCIR Study Groups use pulse code modulation (PCM) and digital transmission. In consequence, the CMV considered it useful to reproduce below the latest version of the text of Recommendation G.702 established by CCITT Study Group XVIII and approved by the VIIth Plenary Assembly of the CCITT in November 1980.

Administrations and Study Groups are invited to notify their comments on these terms and definitions either directly to CCITT Study Group XVIII, or to the CMV for Synthesis and transmission to Study Group XVIII.

"Recommendation G.702

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

(Geneva, 1972; amended at Geneva, 1976 and 1980)

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

Some of the terms contained in the vocabulary already appear in the ITU *List of Definitions of Essential Telecommunication Terms* [1] and references to this List are given together with proposed new definitions where appropriate [1].

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 this should be avoided wherever possible. As an example, 2048 kbit/s is preferred to 2.048 (2,048) Mbit/s.

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

CONTENTS

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[1] According to the conventions applied in this *List*, any term used, but not advised, is shown between square brackets, thus [ ].

Example: 3007 Parallel to serial converter [Dynamicizer].

Furthermore, any term which is in general use in addition to the principal term is shown between parentheses, thus ( ).

Example: 5010 Timing recovery (Timing extraction).

2.1 *General*

1001 **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 the magnitude of each sample is quantized independently of other samples and converted by encoding to a digital signal.

1002 **differential pulse code modulation (DPCM)**

F: modulation différentielle par impulsions et codage (MDIC)

S: modulación por impulsos codificados diferencial (MICD)

A process in which a signal is sampled, and the difference between the actual value of each sample and its predicted value derived from the previous sample(s) is quantized and converted by encoding to a digital signal.

1003 **delta modulation**

F: modulation delta

S: modulación delta

A form of DPCM in which the magnitude of the difference between the predicted value and the actual value is encoded by one bit only, i.e. where only the sign of that difference is detected and transmitted.

1004 **sample**

F: échantillon

S: muestra

The value of a particular characteristic of a signal at a chosen instant.

1005 **sampling**

F: échantillonnage

S: muestreo

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

1006 **sampling rate**

F: taux d'échantillonnage

S: velocidad de muestreo

The number of samples per unit time.

1007 **working range**

F: plage de fonctionnement [gamme de fonctionnement]

S: gama de funcionamiento

The permitted range of values of an analogue signal over which a transmitting or other processing equipment can operate (see Figure 1/G.702).

1008 **quantizing**

F: quantification

S: cuantificación

A process in which the magnitude of a sample is classified into one of a number of adjacent intervals. Any sample magnitude falling within a given interval is represented by a single value.

1009 **uniform quantizing**

F: quantification uniforme

S: cuantificación uniforme

Quantizing in which all the intervals are equal.

1010 **nonuniform quantizing**

F: quantification non uniforme

S: cuantificación no uniforme

Quantizing in which the intervals are not all equal.

1011 **reconstructed sample**

F: échantillon reconstitué

S: muestra reconstruida

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

1012 **encoding; coding (in PCM)**

F: codage

S: codificación (en MIC)

The generation of character signals in accordance with a defined pulse code.

1013 **encoder; coder**

F: codeur

S: codificador

A device for encoding signal samples.

1014 **uniform encoding**

F: codage uniforme

S: codificación uniforme

The generation of character signals representing uniformly quantized samples.

1015 **nonuniform encoding**

F: codage non uniforme

S: codificación no uniforme

The generation of character signals representing nonuniformly quantized samples (see Figure 2/G.702).

1016 **decoding**

F: décodage

S: decodificación

The generation of reconstructed samples according to a pulse code.

1017 **decoder**

F: décodeur

S: decodificador

A device for decoding character signals.

1018 **codec**

F: codec

S: codec

A contraction of encoder-decoder. The term may be used when the encoder and decoder are associated in the same equipment.

Note – When used to describe an equipment the function of the equipment should qualify the title, e.g. supergroup codec, hypergroup codec.

1019 **decision value**

F: amplitude de décision

S: valor de decisión

A reference value defining the boundary between adjacent intervals in quantizing or encoding (see Figures 1/G.702 and 3/G.702).

1020 **virtual decision values**

F: amplitudes virtuelles de décision

S: valores virtuales de decisión

Two hypothetical decision values, used in quantizing or encoding, located at the ends of the working range used, and obtained by extrapolation from the real decision values (see Figure 1/G.702).

1021 **encoding law**

F: loi de codage

S: ley de codificación

The law defining the relative values of the quantum steps used in quantizing and encoding (see Figures 1/G.702 and 3/G.702).

1022 **segmented encoding law**

F: loi de codage à segments

S: ley de codificación por segmentos

An encoding law in which an approximation to a smooth law (see Figure 2*a)*/G.702) is obtained by a number of linear segments (see Figure 2*b)*/G.702).

1023 **quantizing interval**

F: intervalle de quantification

S: intervalo de cuantificación

The interval between two adjacent decision values.

2.2 *Digital Signals*

2001 **digit** [replaces 53.02 [2)]]

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, e.g. it may be represented as a pulse of specified amplitude and duration.

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2) Such numbers refer to the *List of Definitions of Essential Telecommunication Terms* [2]. Numbers 51.01 et seq. are to be found in [3].

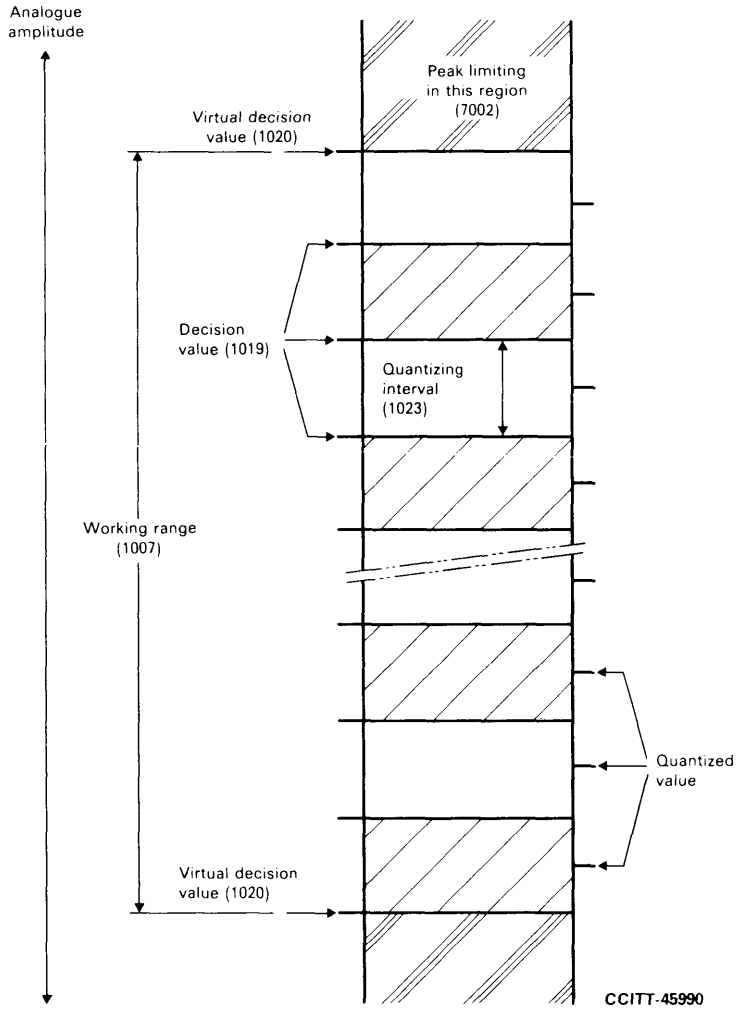
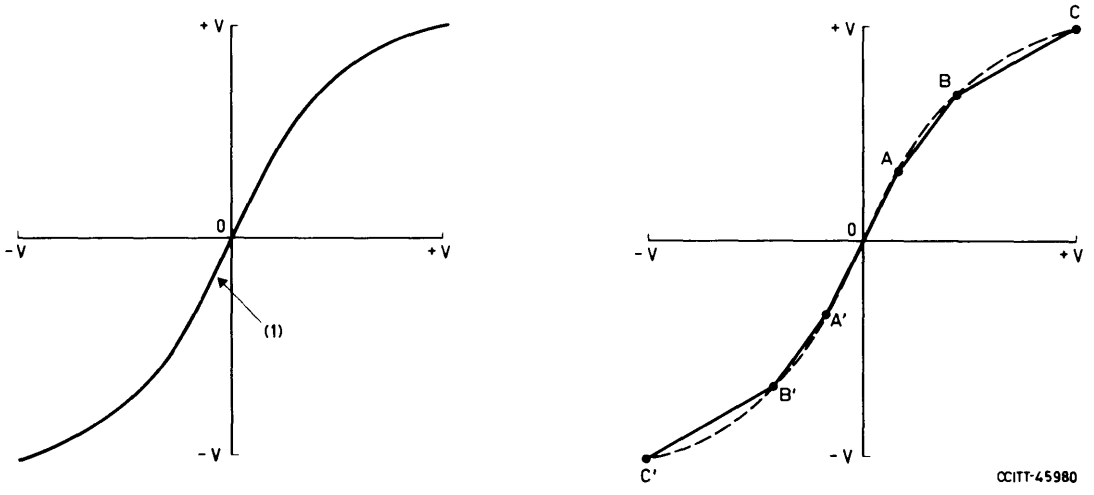


FIGURE 1/G.702

Illustration of terms associated with quantizing (1008)



a) Smooth characteristic

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

b) Segmented characteristic

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

FIGURE 2/G.702

Non-uniform encoding laws

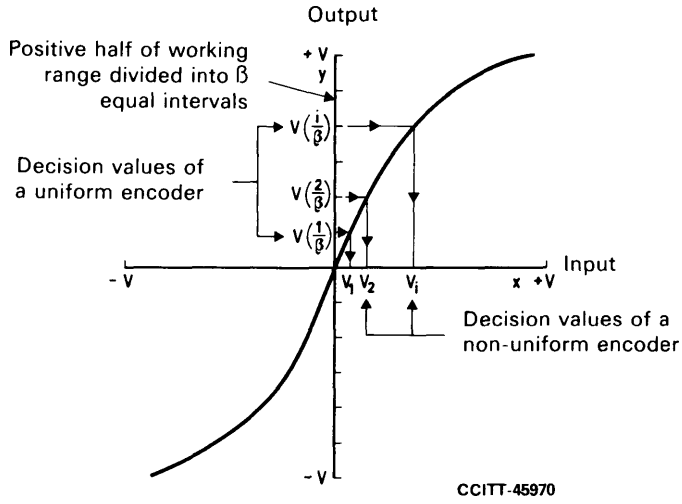


FIGURE 3/G.702

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

Note 2 – In equipment used in digital transmission, a digit may be represented by a stored condition being characterized by a specified physical condition, e.g. 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 [4]). (This meaning of "digit" translates into French as "chiffre".)

2002 **digital signal**

F: signal numérique

S: señal digital

A signal constrained to have a discontinuous characteristic in time and a set of permitted discrete values.

2003 **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.

2004 ***n*-ary digital signals**

F: signal numérique n-*aire*

S: señales digitales n-*arias*

Digital signals in which a signal element may assume *n* discrete states.

2005 **pseudo-ternary signal**

F: signal pseudo ternaire

S: señal seudoternaria

A redundant ternary signal which is derived from a binary signal without change of the symbol rate.

2006 **binary figure**

F: chiffre binaire

S: cifra binaria

One of the two figures (i.e. 0 or 1) used in the representation of numbers in binary notation.

2007 **binary digit** [replaces 53.01 [2)]]

F: élément binaire

S: dígito binario

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".

2008 **equivalent bit rate**

F: débit binaire équivalent

S: velocidad de bits equivalente

In a line coded signal, the number of binary digits that can be transmitted in a unit of time.

Note – The point to which the equivalent bit rate is referred may be either real or hypothetical.

2009 **octet**

F: octet

S: octeto

A group of 8 binary digits operated upon as an entity.

2010 **character signal**

F: signal de caractère

S: señal de carácter

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

Note – In PCM, the term "PCM word" may be used in this sense.

2011 **significant instants of a digital signal**

F: instants significatifs d'un signal numérique

S: instantes significativos de una señal digital

The instants at which successive significant conditions of a digital signal are recognized by an appropriate device.

2012 **decision instant of a digital signal**

F: instant de décision d'un signal numérique

S: instante de decisión de una señal digital

The instant at which a decision is taken by a receiving device as to the probable value of a signal element.

2013 **digit rate**

F: débit numérique

S: velocidad digital

The number of digits per unit time.

Note 1 – An appropriate adjective should precede the word "digit", for example, binary digit rate. (This may be abbreviated to "bit rate".)

[2)] Such numbers refer to the *List of Definitions of Essential Telecommunication Terms* [2]. Numbers 51.01 et seq. are to be found in [3].

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 **digital error**

F: erreur numérique

S: error digital

A single digit inconsistency between the transmitted and received signals.

2015 **error ratio [error rate]**

F: taux d'erreur [rapport d'erreur]

S: tasa de errores [proporción de errores]

The proportion of the number of digital errors to the total number of digits. Numerical values of error ratio should be expressed as follows:

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

2016 **error spread**

F: répartition des erreurs

S: dispersión de errores

The number of unit intervals over which errors in the equivalent binary content of the output signal are distributed when a single digital error is present in the input signal to an apparatus that causes error multiplication.

2017 **error multiplication**

F: multiplication d'erreurs

S: multiplicación de errores

A characteristic property of an apparatus whereby a single digital error in the signal presented to its input port results in more than one error in the digital output signal.

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

2018 **error multiplication factor**

F: coefficient de multiplication d'erreurs

S: factor de multiplicación de errores

The ratio of digital errors in the output signal to a single error in the input signal to an apparatus that produces error multiplication.

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

2019 **controlled slip [slip]**

F: glissement commandé [saut]

S: deslizamiento controlado [deslizamiento]

The controlled irretrievable loss or gain of a set of consecutive digit positions in a digital signal to enable the signal to accord with a rate different from its own.

Note – Where appropriate the term may be qualified, e.g. controlled octet slip, controlled frame slip.

2020 **uncontrolled slip**

F: glissement non commandé

S: deslizamiento incontrolado

The uncontrolled loss or gain of a digit position or a set of consecutive digit positions resulting from an aberration of the timing processes associated with transmission or switching of a digital signal.

2021 **jitter**

F: gigue

S: fluctuación de fase

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

2022 **regeneration**

F: régénération

S: regeneración

The process of recognizing and reconstructing a digital signal so that the amplitude, waveform and timing are constrained within stated limits.

2023 **regenerator**

F: régénérateur

S: regenerador

A device which performs signal regeneration.

2024 **regenerative repeater**

F: répéteur régénérateur

S: repetidor regenerativo

A device that performs signal regeneration together with ancillary functions.

2025 **decision circuit**

F: circuit de décision

S: circuito de decisión

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

2026 **equivalent binary content**

F: contenu binaire équivalent

S: contenido binario equivalente

The content, expressed in binary terms, of a signal generated by a digital source.

Note – The point to which the equivalent binary content is referred may be either real or hypothetical.

2027 **redundant *n*-ary signal**

F: signal n-*aire redondant*

S: señal n-*aria redundante*

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

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

$$[1 - r_e/(r_d \cdot \log_2 n)] \cdot 100$$

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.

2028 **symbol rate**

F: débit de symboles

S: velocidad de símbolos

The reciprocal of the unit interval. This rate is expressed in bauds, if the unit internal is measured in seconds.

Note – Modulation rate is the term used in telegraphy.

2029 **scrambler**

F: embrouilleur

S: aleatorizador

In a digital system a device used to convert a digital signal into a pseudo-random digital signal without changing the bit rate.

2030 **descrambler**

F: désembrouilleur

S: desaleatorizador

A device for performing the complementary operation to that of a scrambler.

2031 **alarm indication signal**

F: signal d'indication d'alarme (SIA)

S: señal de indicación de alarma

A signal that is used to replace the normal traffic signal when a maintenance alarm indication has been activated.

2032 **upstream failure indication**

F: indication de défaillance en amont

S: indicación de fallo detrás

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.

2.3 *Multiplexing in PCM*

3001 **highway (American: bus)**

F: canal

S: canal principal

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

3002 **channel gate**

F: porte de voie

S: puerta de canal

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

3003 **primary block (American: digroup)**

F: bloc primaire

S: bloque primario

A basic group of PCM channels assembled by time division multiplexing.

Note – The following conventions could be useful:

Primary block μ – a basic group of PCM channels derived from 1544-kbit/s PCM multiplex equipment.

Primary block A – a basic group of PCM channels derived from 2048-kbit/s PCM multiplex equipment.

3004 **frame**

F: trame

S: trama

A set of consecutive digit time slots in which the position of each digit time slot can be identified by reference to a frame alignment signal.

The frame alignment signal does not necessarily occur, in whole or in part, in each frame.

3005 **multiframe**

F: multitrame [groupe de trame]

S: multitrama

A set of consecutive frames in which the position of each frame can be identified by reference to a multiframe alignment signal.

The multiframe alignment signal does not necessarily occur, in whole or in part, in each multiframe.

3006 **subframe**

F: secteur de trame; sous-trame

S: subtrama

A sequence of noncontiguous sets of digits assembled within a frame, each set occurring at n times the frame repetition rate where n is an integer > 1.

3007 **parallel to serial converter (American: serializer) [dynamicizer]**

F: convertisseur parallèle/série

S: convertidor paralelo/serie

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

3008 **serial to parallel converter (American: deserializer) [staticizer]**

F: convertisseur série/parallèle

S: convertidor serie/paralelo

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

3009 **PCM multiplex equipment**

F: équipement de multiplexage MIC

S: equipo múltiplex MIC

Equipment for deriving a single digital signal at a defined digit rate from two or more analogue channels by a combination of pulse code modulation and time division multiplexing (multiplexer) and also for carrying out the inverse function (demultiplexer).

The description should be preceded by the relevant equivalent binary digit rate, e.g. 2048-kbit/s PCM multiplex equipment.

3010 **time-division multiplexing**

F: multiplexage par répartition dans le temps

S: multiplexación por división en el tiempo

Multiplexing in which two or more channels are interleaved in time for transmission over a common channel.

3011 **digital multiplexer**

F: multiplexeur numérique

S: multiplexor digital

Equipment for combining by time-division multiplexing two or more tributary digital signals into a single composite digital signal.

3012 **digital demultiplexer**

F: démultiplexeur numérique

S: demultiplexor digital

Equipment for separating a composite digital signal into its component tributary signals.

3013 **muldex**

F: muldex

S: múldex

A contraction of multiplexer – demultiplexer. The term may be used when the multiplexer and demultiplexer are associated in the same equipment.

Note – When used to describe an equipment, the function of the equipment should qualify the title e.g. PCM muldex, data muldex, digital muldex.

3014 **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.

3015 **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.

3016 **service digits (housekeeping digits)** [replaces 53.23 [2)]]

F: éléments numériques de service

S: dígitos de servicio

Digits that are added, normally at regular time intervals to a digital signal to enable the equipment associated with that digital signal to function correctly, and possibly to provide ancillary facilities.

3017 **digital filling**

F: remplissage numérique

S: complementación digital

The addition of a fixed number of digits to a digital signal to change the digit rate from its existing nominal value to a higher predetermined nominal value.

Note – The added digits will not be used to transmit information.

3018 **justification (pulse stuffing)**

F: justification

S: justificación (relleno de impulsos)

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

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2) Such numbers refer to the *List of Definitions of Essential Telecommunication Terms* [2]. Numbers 51.01 et seq. are to be found in [3].

3019 **positive justification (positive pulse stuffing)**

F: justification positive

S: justificación positiva (relleno positivo de impulsos)

In digital multiplexing the provision of a fixed number of dedicated time slots (normally at regular intervals) in the output digital signal, these time slots being used to transmit either information from the tributaries, or no information, according to the relative digit rates of the individual tributaries and the output digital signal.

3020 **negative justification (negative pulse stuffing)**

F: justification négative

S: justificación negativa (relleno negativo de impulsos)

In digital multiplexing, the controlled deletion of digits from the tributary digital signal so that the digit rates of the individual tributaries correspond to a rate determined by the multiplex equipment. The deleted information is transmitted via a separate low-capacity time slot.

3021 **positive/zero/negative justification**

F: justification positive/nulle/négative

S: justificación positiva/nula/negativa (relleno positivo/nulo/negativo de impulsos)

A combination of positive and negative justification in which the two justification states are separately indicated by unique signals and the state of no (zero) justification is indicated by an additional signal.

3022 **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 does not contain an information digit.

3023 **justifiable digit time slot (stuffable digit time slot)**

F: intervalle de temps pour élément numérique justifiable

S: intervalo de tiempo de dígito justificable (intervalo de tiempo de dígito rellenable)

A digit time slot that may contain either an information digit or a justifying digit.

3024 **justification service digits (stuffing service digits)**

F: éléments numériques de service de justification

S: dígitos de servicio de justificación (dígitos de servicio de relleno)

Digits that transmit information concerning the status of the justifiable digit time slots.

3025 **nominal justification rate (nominal stuffing rate)**

F: débit nominal de justification

S: velocidad nominal de justificación (velocidad nominal de relleno)

The rate at which justifying digits are inserted (or deleted) when both the tributary and the multiplex digit rates are at their nominal values.

3026 **maximum justification rate (maximum stuffing rate)**

F: débit maximal de justification

S: velocidad máxima de justificación (velocidad máxima de relleno)

The maximum rate at which justifying digits can be inserted (or deleted).

3027 **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.

3028 **transmultiplexer**

F: transmultiplexeur

S: transmultiplexor

An equipment that transforms frequency-division multiplexed signals (such as group or supergroup) into corresponding time-division multiplexed signals that have the same structure as those derived from PCM multiplex equipment. The equipment also carries out the inverse function.

2.4 *Frame Alignment* [3)]

4001 **frame alignment**

F: verrouillage de trame

S: alineación de trama

The state in which the frame of the receiving equipment is correctly phased with respect to that of the received signal.

4002 **frame alignment signal**

F: signal de verrouillage de trame

S: señal de alineación de trama

The distinctive signal used to secure frame alignment; this signal does not necessarily occur, in whole or in part, in each frame.

4003 **bunched frame alignment signal**

F: signal de verrouillage de trame concentré

S: señal de alineación de trama concentrada

A frame alignment signal in which the signal elements occupy consecutive digit time slots.

4004 **distributed frame alignment signal**

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

S: señal de alineación de trama distribuida

A frame alignment signal in which the signal elements occupy nonconsecutive digit time slots.

4005 **frame alignment recovery time**

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.

4006 **out-of-frame alignment time**

F: durée de perte du verrouillage de trame

S: duración de la pérdida de alineación de trama

The time during which frame alignment is effectively lost. That time will include the time to detect loss of frame alignment and the alignment recovery time.

[3)] Similar definitions are applicable to multiframe alignment.

2.5 *Timing*

5001 **timing signal**

F: signal de rythme

S: señal de temporización

A cyclic signal used to control the timing of operations.

5002 **reference clock**

F: horloge de référence

S: reloj de referencia

A clock [4] of high stability and accuracy that is used to govern the frequency of clocks of lower stability. The failure of such a clock does not necessarily cause loss of synchronism.

5003 **master clock**

F: horloge maîtresse

S: reloj maestro

A clock [4] that generates accurate timing signals for the control of other clocks and possibly other equipments.

5004 **time slot**

F: intervalle de temps

S: intervalo de tiempo

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

5005 **channel time slot**

F: intervalle de temps de voie

S: intervalo de tiempo de canal

A time slot starting at a particular phase in a frame and allocated to a channel for transmitting a character signal and possibly in-slot signalling or other information.

Note – Where appropriate a description may be added, for example "telephone channel time slot".

5006 **signalling time slot**

F: intervalle de temps de signalisation

S: intervalo de tiempo de señalización

A time slot starting at a particular phase in each frame and allocated to the transmission of signalling.

5007 **frame alignment time slot**

F: intervalle de temps de verrouillage de trame

S: intervalo de tiempo de alineación de trama

A time slot starting at a particular phase in each frame and allocated to the transmission of a frame alignment signal.

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[4] In these definitions "clock" is taken with the general meaning of Definition 51.10 and it is assumed that where replicated soures are used for security reasons, the assembly of these is regarded as being a single clock.

For information, Definition 51.10 is reproduced below:

51.10 **clock**

F: générateur de rythme/horloge

S: reloj

Equipment providing a time base used in a transmission system to control the timing of certain functions such as the control of the duration of signal elements, the sampling, etc.

5008 **digit time slot**

F: intervalle de temps pour élément numérique

S: intervalo de tiempo de dígito

A time slot allocated to a single digit.

5009 **retiming**

F: réajustement de rythme

S: reajuste de la temporización

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

5010 **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.

5011 **isochronous**

F: isochrone

S: isócrono

A signal [5] is isochronous if the time interval separating any two significant instants is theoretically equal to the unit interval or to an integral multiple of the unit interval.

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

5012 **anisochronous**

F: anisochrone

S: anisócrono

A signal [5] is anisochronous if the time interval separating any two significant instants is not necessarily related to the time interval separating any other two significant instants.

5013 **synchronous**

F: synchrone

S: síncrono

Signals [5] are synchronous if their corresponding significant instants have a desired constant phase relationship with each other.

5014 **synchronization**

F: synchronisation

S: sincronización

The process of adjusting the corresponding significant instants of signals [5] to make them synchronous.

5015 **homochronous**

F: homochrone

S: homócrono

Signals [5] are homochronous if their corresponding significant instants have a constant, but uncontrolled, phase relationship with each other.

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[5] In these definitions "signal" is taken with the general meaning of Definition 02.27 [5].

5016 **mesochronous**

F: mésochrone

S: mesócrono

Signals [5] are mesochronous if their corresponding significant instants occur at the same average rate.

Note – The phase relationship between corresponding significant instants usually varies between specified limits.

5017 **plesiochronous**

F: plésiochrone

S: plesiócrono

Signals [5] are plesiochronous if 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 [4] or homochronous clocks, are usually plesiochronous.

Note 2 – There is no limit to the phase relationship between corresponding significant instants.

5018 **heterochronous**

F: hétérochrone

S: heterócrono

Signals [5] are heterochronous if their corresponding significant instants do not necessarily occur at the same rate.

Note 1 – Two signals having different nominal digit rates, and not stemming from the same clock or from homochronous clocks [4] are usually heterochronous.

Note 2 – Terms 5011 to 5018 are based on the following Greek roots:

iso = equal
syn = together
homo = same
meso = middle
plesio = near
hetero = different

2.6 *Signalling in PCM*

6001 **signalling**

F: signalisation

S: señalización

The exchange of electrical information (other than by speech) specifically concerned with the establishment and control of connections, and management, in a communication network.

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[4] In these definitions "clock" is taken with the general meaning of Definition 51.10 and it is assumed that where replicated soures are used for security reasons, the assembly of these is regarded as being a single clock.

For information, Definition 51.10 is reproduced below:

51.10 **clock**

F: générateur de rythme/horloge

S: reloj

Equipment providing a time base used in a transmission system to control the timing of certain functions such as the control of the duration of signal elements, the sampling, etc.

[5] In these definitions "signal" is taken with the general meaning of Definition 02.27 [5].

6002 **speech digit signalling**

F: signalisation par éléments numériques vocaux

S: señalización por dígitos de conversación

A type of channel-associated signalling in which digit time slots primarily used for the transmission of encoded speech are periodically used for signalling.

6003 **in-slot signalling**

F: signalisation dans l'intervalle de temps

S: señalización dentro del intervalo

Signalling associated with a channel and transmitted in a digit time slot permanently (or periodically) allocated in the channel time slot.

6004 **out-slot signalling**

F: signalisation hors intervalle de temps

S: señalización fuera del intervalo

Signalling associated with a channel but transmitted in one or more separate digit time slots not within the channel time slot.

6005 **common channel signalling**

F: signalisation sur voie commune; signalisation par canal sémaphore

S: señalización por canal común

A signalling technique in which signalling information relating to a multiplicity of circuits, and other information such as that used for network management, is conveyed over a single channel by addressed messages.

6006 **channel associated signalling**

F: signalisation voie par voie

S: señalización asociada al canal

A signalling method in which the signals necessary for the traffic carried by a single channel are transmitted in the channel itself or in a signalling channel permanently associated with it.

2.7 *Audio performance*

7001 **load capacity (overload point)**

F: capacité de charge [point de surcharge]

S: nivel de sobrecarga (punto de sobrecarga) [capacidad de carga]

In PCM, the level expressed in dBm0, of a sinusoidal signal the positive and negative peaks of which coincide with the positive and negative virtual decision values of the encoder.

7002 **peak limiting**

F: limitation de crête

S: limitación de cresta

In PCM, the effect caused by the application to an encoder of an input signal whose value exceeds the virtual decision values of the encoder (see Figure 1/G.702).

7003 **quantizing distortion**

F: distorsion de quantification

S: distorsión de cuantificación

The distortion resulting from the process of quantizing.

7004 **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.

2.8 *Codes*

8001 **pulse code**

F: code de modulation d'impulsions

S: código de impulsos

A code giving the equivalence between the quantized value of a sample and the corresponding character signal.

8002 **line code**

F: code en ligne

S: código en línea

A code chosen to suit the transmission medium and giving the equivalence between a set of digits generated in a terminal or other processing equipment and the pulses chosen to represent that set of digits for line transmission.

8003 **alternate mark inversion signal (AMI) (bipolar signal)**

F: signal bipolaire (alternant); signal bipolaire (strict)

S: señal AMI (señal de inversión de marcas alternada) [señal bipolar]

A pseudo-ternary signal, conveying binary digits, in which successive "marks" are normally of alternating, positive and negative polarity but equal in amplitude, and in which "space" is of zero amplitude.

8004 **alternate mark inversion violation (bipolar violation)**

F: violation de la règle de bipolarité; violation de l'alternance des polarités

S: violación AMI [violación bipolar]

A "mark" which has the same polarity as the previous "mark" in the transmission of AMI signals.

8005 **modified alternate mark inversion**

F: signal bipolaire modifié

S: señal AMI modificada

An AMI signal that does not strictly conform with alternate mark inversion but includes violations in accordance with a defined set of rules.

Examples of such signals are HDB, B6ZS.

8006 **disparity**

F: disparité

S: disparidad

The digital sum of a set of n signal elements.

8007 **digital sum**

F: somme numérique

S: suma digital

In a multilevel code, the algebraic sum of positive and negative pulse amplitudes. The sum is taken from an arbitrary time origin to the last transmitted pulse at the time considered and the amplitude units are chosen with reference to the mean d.c. level in such a way that adjacent levels differ by one unit.

8008 **digital sum variation**

F: variation de la somme numérique

S: variación de la suma digital

The difference between the maximum and the minimum possible digital sum in any coded sequence of a given code.

8009 **balanced code**

F: code à somme bornée

S: código equilibrado

A code that has no d.c. component in its frequency spectrum.

8010 **paired-disparity code (alternative code) (alternating code)**

F: code à disparité compensée

S: código con disparidad compensada

A code in which some or all of the digits or characters are represented by two assemblies of digits, of opposite disparity, which are used in a sequence so as to minimize the total disparity of a longer sequence of digits.

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

8011 **PCM binary code**

F: code binaire MIC

S: código binario MIC

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

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

8012 **symmetrical binary code**

F: code binaire symétrique

S: código binario simétrico

A pulse code derived from a binary code in which the sign of the quantized value positive or negative, is represented by one digit and in which the remaining digits 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.

8013 **code conversion**

F: transcodage

S: conversión de código

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

2.9 *Digital networks*

9001 **digital distribution frame**

F: répartiteur numérique

S: repartidor digital

A frame at which interconnections are made between the digital outputs of equipments and the digital inputs of other equipments.

9002 **section termination**

F: extrémité de section

S: extremo de sección

Point selected to be the interface 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.

9003 **elementary cable section [repeater section]**

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

S: sección elemental de cable [sección con amplificación]

All of the transmission media between the section terminations at the output of one equipment and the section terminations at the input of the following equipment.

Note 1 – An elementary cable section will usually consist of several factory lengths of cable connected together and any media (such as flexible cables) necessary to connect it to the section terminals.

Note 2 – Examples of the transmission media are a coaxial or symmetric pair, an optical fibre and a waveguide.

9004 **elementary repeater section**

F: section élémentaire amplifiée

S: sección elemental de repetición

An *elementary cable section* together with its following repeater.

9005 **elementary regenerator section [regenerator section]**

F: section élémentaire régénérée [section de régénération]

S: sección elemental de regeneración [sección de regeneración]

An *elementary cable section* together with its following regenerative repeater.

9006 **digital section** [6]

F: section numérique

S: sección digital

The whole of the means of transmitting and receiving between two consecutive digital distribution frames (or equivalent) a digital signal of specified rate.

Note 1 – A digital section forms either a part or the whole of a digital path.

Note 2 – Where appropriate, the bit rate should qualify the title.

Note 3 – The description always applies to the combination of "go" and "return" directions of transmission, unless stated otherwise.

9007 **digital path**

F: conduit numérique

S: trayecto digital

The whole of the means of transmitting and receiving a digital signal of specified rate between those two digital distribution frames (or equivalent) at which terminal equipments or switches will be connected. Terminal equipments are those at which signals at the specified bit rate originate or terminate.

Note 1 – A digital path comprises one or more digital sections.

Note 2 – Where appropriate, the bit rate should qualify the title.

Note 3 – The description always applies to the combination of "go" and "return" directions of transmission, unless stated otherwise.

Note 4 – Digital paths interconnected by digital switches form a digital connection.

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[6] Figure 4/G.702 gives examples of digital sections, digital paths, digital line sections, etc.

9008 **bit sequence independence**

F: indépendance de la séquence des bits

S: independencia de la secuencia de bits

A digital path or digital section is bit sequence independent at its specified bit rate when its design objectives permit any sequence of bits at that rate, or their equivalent, to be transmitted.

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.

9009 **digit sequence integrity**

F: intégrité de la séquence des éléments numériques

S: integridad de la secuencia de dígitos

A condition in which any selected sequence of digits is the same at each end of a digital connection.

9010 **digital switching**

F: commutation numérique

S: conmutación digital

A process in which connections are established by operations on digital signals without converting them to analogue signals.

9011 **integrated digital network**

F: réseau numérique intégré

S: red digital integrada

A network in which connections established by digital switching are used for the transmission of digital signals, for a single service, for example telephony.

9012 **integrated services digital network**

F: réseau numérique avec intégration des services

S: red digital de servicios integrados

An integrated digital network in which the same digital switches and digital paths are used to establish connections for different services, for example, telephony, data, etc.

9013 **unilateral control**

F: commande unilatérale

S: control unilateral

Control between two synchronization nodes such that the frequency of the clock [4)] of only one of these nodes is influenced by timing information derived from the clock of the other node.

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4) In these definitions "clock" is taken with the general meaning of Definition 51.10 and it is assumed that where replicated soures are used for security reasons, the assembly of these is regarded as being a single clock.

For information, Definition 51.10 is reproduced below:

51.10 **clock**

F: générateur de rythme/horloge

S: reloj

Equipment providing a time base used in a transmission system to control the timing of certain functions such as the control of the duration of signal elements, the sampling, etc.

9014 **bilateral control**

F: commande bilatérale

S: control bilateral

Control between two synchronization nodes such that the frequency of the clock [4] of each of these nodes is influenced by timing information derived from the clock of the other node.

9015 **single-ended synchronization**

F: 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 [4] and the incoming digital signal from the other node.

9016 **double-ended synchronization**

F: 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 [4] 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.

9017 **analogue control**

F: mode analogique

S: control analógico

Synchronization control in which the relationship between the actual phase error between clocks [4] and the error signal device is a continuous function, at least over a limited range.

9018 **linear analogue control**

F: mode analogique linéaire

S: control analógico lineal

An analogue system in which the functional relationships are of simple proportionality.

9019 **amplitude quantized control**

F: mode à quantification d'amplitude

S: control por cuantificación de amplitud

Synchronization control in which the functional relationship between actual phase error and derived error signal includes discontinuities.

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.

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[4] In these definitions "clock" is taken with the general meaning of Definition 51.10 and it is assumed that where replicated soures are used for security reasons, the assembly of these is regarded as being a single clock.

For information, Definition 51.10 is reproduced below:

51.10 **clock**

F: générateur de rythme/horloge

S: reloj

Equipment providing a time base used in a transmission system to control the timing of certain functions such as the control of the duration of signal elements, the sampling, etc.

9020 **time quantized control**

F: mode à quantification temporelle

S: control por cuantificación temporal

Synchronization control in which the error signal is derived or utilized only at a number of discrete instants, which may or may not be equally spaced in time.

9021 **synchronized network [synchronous network]**

F: réseau synchronisé [réseau synchrone]

S: red sincronizada [red síncrona]

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

Note – Ideally the signals are synchronous, but they may be mesochronous in practice. By common usage such mesochronous networks are frequently described as synchronized.

9022 **nonsynchronized network**

F: réseau non synchronisé

S: red no sincronizada

A network in which the corresponding significant instants of signals need not be synchronized or mesochronous.

9023 **mutually synchronized network**

F: réseau à synchronisation mutuelle

S: red mutuamente sincronizada

A synchronized network in which each clock [4] exerts a degree of control on all others.

9024 **democratic (mutually synchronized) network**

F: réseau démocratique (à synchronisation mutuelle)

S: red democrática (mutuamente sincronizada)

A mutually synchronized network in which all clocks [4] 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 the population of clocks.

9025 **hierarchic (mutually synchronized) network**

F: réseau hiérarchisé (à synchronisation mutuelle)

S: red jerárquica (mutuamente sincronizada)

A mutually synchronized network in which some clocks [4] exert more control than others, the network operating frequency being a weighted mean of the natural frequencies of the population of clocks.

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[4] In these definitions "clock" is taken with the general meaning of Definition 51.10 and it is assumed that where replicated soures are used for security reasons, the assembly of these is regarded as being a single clock.

For information, Definition 51.10 is reproduced below:

51.10 **clock**

F: générateur de rythme/horloge

S: reloj

Equipment providing a time base used in a transmission system to control the timing of certain functions such as the control of the duration of signal elements, the sampling, etc.

9026 **despotic (synchronized) network**

F: réseau (à synchronisation) despotique

S: red despótica (sincronizada)

A synchronized network in which a unique master clock [4] exists with full power of control of all other clocks.

9027 **oligarchic (synchronized) network**

F: réseau (à synchronisation) oligarchique

S: red oligárquica (sincronizada)

A synchronized network in which control is exercised by a few selected clocks [4], the remainder being controlled by these.

9028 **digital line section**

F: section de ligne numérique

S: sección de línea digital

Two consecutive line terminal equipments, their interconnecting transmission medium and the in-station cabling between them and their adjacent digital distribution frames (or equivalents), which together provide the whole of the means of transmitting and receiving between two consecutive digital distribution frames (or equivalents) a digital signal of specified rate.

Note 1 – Line terminal equipments may include the following:

- regenerators
- code converters
- scramblers
- remote power feeding
- fault location
- supervision.

Note 2 – A digital line section is a particular case of a digital section.

9029 **digital line system**

F: système de ligne numérique

S: sistema de línea digital

A specific means of providing a digital line section.

9030 **digital block**

F: bloc numérique

S: bloque digital

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

Note – The bit rate of the digital path should form part of the title.

9031 **digital line path**

F: conduit de ligne numérique

S: trayecto de línea digital

Two or more digital line sections interconnected in tandem in such a way that the specified rate of the digital signal transmitted and received is the same over the whole length of the line path between the two terminal digital distribution frames (or equivalents).

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[4] In these definitions "clock" is taken with the general meaning of Definition 51.10 and it is assumed that where replicated soures are used for security reasons, the assembly of these is regarded as being a single clock.

For information, Definition 51.10 is reproduced below:

51.10 **clock**

F: générateur de rythme/horloge

S: reloj

Equipment providing a time base used in a transmission system to control the timing of certain functions such as the control of the duration of signal elements, the sampling, etc.

9032 **digital radio section**

F: section hertzienne numérique

S: sección radiodigital

Two consecutive radio terminal equipments and their interconnecting transmission medium which together provide the whole of the means of transmitting and receiving, between two consecutive digital distribution frames (or equivalents), a digital signal of specified rate.

Note 1 – The description always applies to the combination of "go" and "return" directions of transmission, unless stated otherwise.

Note 2 – A digital radio section is a particular case of a digital section.

9033 **digital radio system**

F: système hertzien numérique

S: sistema radiodigital

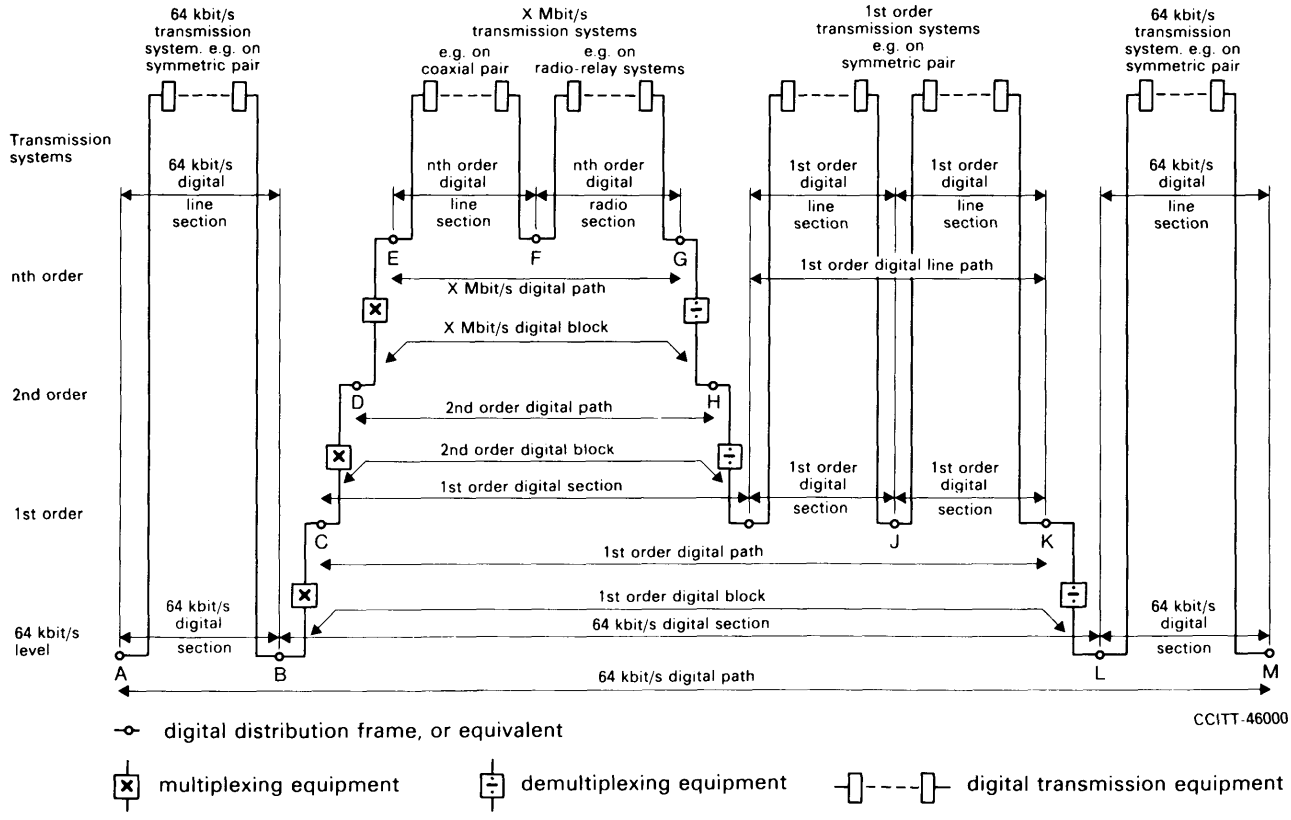
A specific means of providing a digital radio section.

9034 **digital radio path**

F: conduit hertzien numérique

S: trayecto radiodigital

Two or more digital radio sections interconnected in tandem in such a way that the specified rate of the digital signal transmitted and received is the same over the whole length of the radio path between the two terminal digital distribution frames (or equivalents).



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 line section, which is a particular case of a 64 kbit/s digital section.
Note 3 — A-M is a 64 kbit/s digital path which comprises three 64 kbit/s digital sections, A-B, B-L and L-M.
Note 4 — F-G is an X Mbit/s digital radio section which forms part of an X Mbit/s digital path E-G.
Note 5 — C-I is a 1st order digital section which contains a 2nd order digital path D-H.
Note 6 — I-K is an example of a digital line path.

FIGURE 4/G.702

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

Alphabetical list of definitions contained in this Recommendation

2031 Alarm indication signal
8010 (Alternative code)
8010 (Alternating code)
8005 Alternate mark inversion (modified)
8003 Alternate mark inversion signal (AMI)
8004 Alternate mark inversion violation
9019 Amplitude quantized control
9017 Analogue control
5012 Anisochronous
8009 Balanced code
9014 Bilateral control
2007 Binary digit
2006 Binary figure
8003 (Bipolar signal)
8004 (Bipolar violation)
9008 Bit sequence independence
4003 Bunched frame alignment signal
3001 (Bus: American)
6006 Channel associated signalling
3002 Channel gate
5005 Channel time slot
2010 Character signal
8013 Code conversion
1018 Codec
1013 Coder
1012 Coding
6005 Common channel signalling
2019 Controlled slip
1019 Decision value
2025 Decision circuit
2012 Decision instant of a digital signal
1017 Decoder
1016 Decoding
1003 Delta modulation
9024 Democratic (mutually synchronized) network
2030 Descrambler
3008 (Deserializer: American)
9026 Despotic (synchronized) network
1002 Differential pulse code modulation (DPCM)
2001 Digit
2003 Digit position
2013 Digit rate
9009 Digit sequence integrity
5008 Digit time slot
9030 Digital block
3012 Digital demultiplexer
9001 Digital distribution frame
2014 Digital error
3017 Digital filling
9031 Digital line path
9028 Digital line section
9029 Digital line system
3011 Digital multiplexer
3014 Digital multiplex equipment
3015 Digital multiplex hierarchy
9007 Digital path
9034 Digital radio path
9032 Digital radio section
9033 Digital radio system
9006 Digital section
2002 Digital signal
8007 Digital sum
8008 Digital sum variation
9010 Digital switching
3003 (Digroup: American)
8006 Disparity
4004 Distributed frame alignment signal
9016 Double-ended synchronization
3007 [Dynamicizer]
9003 Elementary cable section
9005 Elementary regenerator section
9004 Elementary repeater section
2017 Error multiplication
2018 Error multiplication factor
2015 [Error rate]
2015 Error ratio
2016 Error spread
1013 Encoder
1012 Encoding
1021 Encoding law
2026 Equivalent binary content
2008 Equivalent bit rate
3004 Frame
4001 Frame alignment
4002 Frame alignment signal
4005 Frame alignment recovery time
5007 Frame alignment time slot
5018 Heterochronous
9025 Hierarchic (mutually synchronized) network
3001 Highway
5015 Homochronous
3016 (Housekeeping digits)
6003 In-slot signalling
9011 Integrated digital network
9012 Integrated services digital network
5011 Isochronous
2021 Jitter
3023 Justifiable digit time slot
3018 Justification
3027 Justification ratio
3024 Justification service digits
3022 Justifying digit
8002 Line code
9028 Line section digital
9018 Linear analogue control
7001 Load capacity
5003 Master clock
3026 Maximum justification rate
3026 (Maximum stuffing rate)
5016 Mesochronous

8005 Modified alternate mark inversion
3013 Muldex
3005 Multiframe
9023 Mutually synchronized network
2004 *n*-ary digital signals
3020 Negative justification
3020 (Negative pulse stuffing)
3025 Nominal justification rate
3025 (Nominal stuffing rate)
9022 Non-synchronized network
1015 Nonuniform encoding
1010 Nonuniform quantizing
2009 Octet
9027 Oligarchic (synchronized) network
4006 Out-of-frame alignment time
6004 Out-slot signalling
7001 (Overload point)
8010 Paired-disparity code
3007 Parallel to serial converter
8011 PCM binary code
3009 PCM multiplex equipment
7002 Peak limiting
5017 Plesiochronous
3019 Positive justification
3019 (Positive pulse stuffing)
3021 Positive/zero/negative justification
3003 Primary block
2005 Pseudo ternary signal
8001 Pulse code
1001 Pulse code modulation (PCM)
3018 (Pulse stuffing)
1008 Quantizing
7003 Quantizing distortion
7004 Quantizing distortion power
1023 Quantizing interval
1011 Reconstructed sample
2027 Redundant *n*-ary signal
5002 Reference clock
2022 Regeneration
2024 Regenerative repeater
2023 Regenerator
9005 [Regenerator section]
9003 [Repeater section]
5009 Retiming
1004 Sample
1005 Sampling
1006 Sampling rate
2029 Scrambler
9002 Section termination
1022 Segmented encoding law
3008 Serial to parallel converter
3007 (Serializer: American)
3016 Service digits
6001 Signalling
5006 Signalling time slot
2011 Significant instants of a digital signal
9015 Single-ended synchronization
2019 [Slip]
6002 Speech digit signalling
3008 [Staticizer]
3023 (Stuffable digit time slot)
3018 (Stuffing)
3022 (Stuffing digit)
3027 (Stuffing ratio)
3024 (Stuffing service digits)
3006 Subframe
2028 Symbol rate
8012 Symmetrical binary code
5014 Synchronization
5013 Synchronous
9021 Synchronized network
9021 [Synchronous network]
2004 Signal (*n*-ary digital)
3010 Time-division multiplexing
9020 Time quantized control
5004 Time slot
5010 (Timing extraction)
5001 Timing signal
5010 Timing recovery
3028 Transmultiplexer
2020 Uncontrolled slip
1014 Uniform encoding
1009 Uniform quantizing
9013 Unilateral control
2032 Upstream failure indication
1020 Virtual decision value
1007 Working range

References

[1] *List of Definitions of Essential Telecommunication Terms*, 2nd edition, ITU, Geneva, 1961.

[2] *Ibid.*, Part I.

[3] *Ibid.*, 2nd Supplement, *Data Transmission*.

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

[5] CCITT Definition *Signal (general sense)*, Vol. X, Fascicle X.1 (Terms and Definitions)."

SECTION CMV B: GRAPHICAL SYMBOLS

Recommendation

RECOMMENDATION 461-3 *

GRAPHICAL SYMBOLS AND RULES FOR THE PREPARATION OF DIAGRAMS IN TELECOMMUNICATIONS

(Question 2/CMV)

(1970-1974-1978-1982)

The CCIR

which cooperates in the work of the CCI/IEC Joint Working Group set up for the purpose of establishing internationally agreed graphical symbols and rules for the preparation of diagrams, charts and tables and for item designations (see CCITT Recommendation A.13 or CCIR Resolution 23),

UNANIMOUSLY RECOMMENDS

that, on diagrams for international use concerning telecommunications, the administrations and recognized private operating agencies of the CCIs and CCI Secretariats should use the graphical symbols for diagrams given in IEC Series 117 publications and should observe the rules for the preparation of diagrams, charts and tables and for item designation laid down in IEC Series 113 publications (IEC Publication 117 is under revision and will eventually be replaced by a new Series numbered 617).

Administrations wishing to use symbols on equipment are recommended to refer to IEC Publication 417.

Note 1. – See Resolution 23.

Note 2. – References of relevant publications:

IEC Publication 113: "Diagrams, charts, tables"

This Publication comprises of seven parts:

113-1 (Definitions and classification)
113-2 (Item designation)
113-3 (General recommendations for the preparation of diagrams)
113-4 (Recommendations for the preparation of circuit diagrams)
113-5 (Preparation of interconnection diagrams and tables)
113-6 (Preparation of unit wiring diagrams and tables)
113-7 (Preparation of logic diagrams)

* The text of this Recommendation is analogous to that of Recommendation B.10 of the CCITT.

IEC Publication 117: "Recommended graphical symbols"

Parts of Publication 117 of greatest interest for telecommunications:

117-0 (General Index)
117-1 (Comprising circuit elements)
117-6 (Variability, resistors, electronic tubes)
117-7 (Semiconductor devices, capacitors)
117-9 (Telephony, telegraphy and transducers)
117-10 (Aerials (antennas) and radio stations)
117-11 (Microwave technology)
117-12 (Frequency spectrum diagrams)
117-13 (Transmission and miscellaneous applications; qualifying symbols, e.g. amplifiers, modulators, demodulators and discriminators, etc.)
117-14 (Telecommunication lines and accessories)
117-15 (Binary logic elements)

IEC Publication 417: "Graphical symbols for use on equipment"

IEC Publication 617:

Part 10 deals with telecommunications and its title will be:

"Graphical symbols for diagrams, Part 10: Telecommunications – Transmission and transmission devices – Microwave technology – Miscellaneous block symbols – Frequency spectrum diagrams"

SECTION CMV C: OTHER MEANS OF EXPRESSION

Recommendations

RECOMMENDATION 430-2 *

USE OF THE INTERNATIONAL SYSTEM OF UNITS (SI)

(Question 3/CMV)

(1953-1963-1978-1982)

The CCIR

UNANIMOUSLY RECOMMENDS

that the various ITU organs, as well as administrations and recognized private operating agencies should use in their mutual relations:

- the units of the international system of units (SI) adopted by the General Conference of Weights and Measures (CGPM) and supported by the International Organization for Standardization (ISO); this system is based on the rationalized form of electromagnetic and electrotechnical relations;
- the letter symbols adopted in the SI system;
- rules similar to those of the SI system when it is necessary to form names of other units and their symbols in the field of telecommunications.

Note. – References of relevant publications.

BIPM publications: "BIPM Publication: Le système international d'unités" (SI). **

Norme ISO 31: "General principles concerning the quantities, units and symbols"

Parts of Norme ISO 31 of greatest interest for the telecommunications:

0 (General principles)
1 (Quantities and units of space and time)
2 (Quantities and units of periodic and related phenomena)
5 (Quantities and units of electricity and magnetism)
6 (Quantities and units of light and related electromagnetic radiations)
7 (Quantities and units acoustics)

Norme ISO 1000: "SI units and recommendations for the use of their multiples and of certain other units"

IEC Publication 27: "Letter symbols to be used in electrical technology"

Parts of Publication 27 of greatest interest for the telecommunications:

27-1 (General)
27-2 (Telecommunications and electronics)
27-2A (First supplement)

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* The text of this Recommendation is analogous to that of Recommendation B.3 of the CCITT.

** The English translation of this Document is published under the title: "The International System of Units", Her Majesty's Stationery Office, London, 1970, and "The International System of Units", U.S. National Bureau of Standards, Special Publication 330, U.S. Government Printing Office, Washington, DC, 1970.

RECOMMENDATION 607 *

TERMS AND ABBREVIATIONS FOR INFORMATION QUANTITIES IN TELECOMMUNICATIONS **

(Question 3/CMV)

(1982)

The CCIR,

CONSIDERING

(a) that in telecommunications data transmission is more and more widely used;

(b) that the ISO is the international organization concerned with standardization in the field of data processing;

(c) that IEC Technical Committee No. 26 has requested the CMV to assist with the definition of letter symbols for terms and units used in data communication,

UNANIMOUSLY DECIDES

1. that the CCIs should use the terms "bit", "baud", "shannon", "byte" and "octet" with the definitions established by the ISO and the ITU and appearing in Annex I;

2. that the term "bit" is synonymous with "binary digit" and is also used in the letter symbol for this quantity; the term being an abbreviation of the English term "binary digit" and being adopted also in French and Spanish; for multiples of this unit and for derived quantities the letter symbols kbit, Mbit, kbit/s should be used;

3. that the term "baud" should have as its letter symbol Bd with possible multiples of kBd and MBd;

4. that for the terms "shannon", "byte" and "octet" it is the task of the ISO to provide the letter symbols it judges to be necessary. In the meantime these terms and their multiples should be written in full in the documents and texts of the CCIs. For example 10 kilo-octets, 1 megaoctet. The terms "multiplet" in French and "multibit" in Spanish have no multiples.

ANNEX I

binary digit, bit; *élément binaire, bit; elemento binario, bit*

A member selected from a binary set.

Note. – In the interest of clarity, it is recommended that the term "bit" shall not be used in two-condition start-stop modulation instead of "unit-element".

baud, *baud, baudio*

The unit of modulation rate. It corresponds to a rate of one unit interval per second.

Example: If the duration of the unit interval is 20 milliseconds, the modulation rate is 50 bauds.

shannon, *shannon, shannon*

A unit of logarithmic measure of information equal to the decision content of a set of two mutually exclusive events expressed as a logarithm to base two.

Example: The decision content of a character set of eight characters equals 3 shannons ($\log_2 8 = 3$).

byte ***, *multiplet, multibit*

A group of a given number of binary digits operated upon as an entity.

Note. – This definition is compatible with the definition of 04.10.07 of ISO.

octet ***, *octet, octeto*

A group of 8 binary digits operated as an entity.

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* A similar text will be submitted to the CCITT as draft of new Recommendation.

** The Director is invited to submit this Recommendation to the IEC.

*** The term "byte" is often used in the sense of "octet".

RECOMMENDATION 608 *

LETTER SYMBOLS FOR TELECOMMUNICATIONS

(Question 3/CMV)

(1982)

The CCIR,

CONSIDERING

(a) that in order to simplify the reading of documents dealing with telecommunication technique, it is essential to use simple notations in a homogeneous system and having well-defined meaning; that, moreover, it is an advantage, wherever possible, to have notations that have been universally adopted;

(b) that CMV is collaborating with Technical Committee No. 25 of the IEC,

UNANIMOUSLY RECOMMENDS

that in their mutual relations the ITU and its permanent organs and administrations and recognized private operating agencies use in all languages, wherever possible, the letter symbols and the notations recommended by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) to represent the physical quantities and the mathematical operations.

Note. – References of relevant publications.

Norme ISO 31: "General principles concerning the quantities, units and symbols"

Parts of Norme ISO 31 of greatest interest for telecommunications:

0 (General principles)
1 (Quantities and units of space and time)
2 (Quantities and units of periodic and related phenomena)
5 (Quantities and units of electricity and magnetism)
6 (Quantities and units of light and related electromagnetic radiations)
7 (Quantities and units of acoustics)
11 (Mathematical signs and symbols)

IEC Publication 27: "Letter symbols to be used in electrical technology"

Parts of Publication of greatest interest for telecommunications:

27-1 (General)
27-1A (First supplement: Clause 4A: Time-dependent quantities)
27-2 (Telecommunications and electronics)
27-2A (First supplement)

RECOMMENDATION 431-4

NOMENCLATURE OF THE FREQUENCY AND WAVELENGTH BANDS USED IN TELECOMMUNICATIONS

(Question 3/CMV)

(1953-1956-1959-1963-1966-1974-1978-1982)

The CCIR,

CONSIDERING

(a) that the merits of Heinrich Hertz (1857-1897), as a research worker on the basic phenomena of radio waves, are universally recognized, as was confirmed at the centenary of his birth; and that as early as 1937 the IEC adopted the hertz (symbol: Hz) as a name for the unit of frequency (see *inter alia*, Publication 27);

(b) that the nomenclature in this Recommendation should be as synoptic as possible and that the designation of frequency bands should be as concise as possible,

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* The text of this Recommendation is analogous to that of Recommendation B.1 of the CCITT.

UNANIMOUSLY RECOMMENDS

1. that the hertz (Hz) be accepted for use in publications of the ITU, as the name for the unit of frequency in accordance with Recommendation 430 on the use of the international system of units (SI);

2. that administrations should always use the nomenclature of the frequency and wavelength bands given in Annex I:

- Table I and Notes 1 and 2, which take account of No. 208 of the Radio Regulations, and
- Note 3, which contains the proposal of the International Union of Radio Sciences (URSI),

except in those cases where this would inevitably cause very serious difficulties.

ANNEX I

TABLE I

Band number	Symbols	Frequency range (lower limit exclusive, upper limit inclusive)	Corresponding metric subdivision	Metric abbreviations for the bands
3		300 to 3000 Hz	Hectokilometric waves	B.hkm
4	VLF	3 to 30 kHz	Myriametric waves	B.Mam
5	LF	30 to 300 kHz	Kilometric waves	B.km
6	MF	300 to 3000 kHz	Hectometric waves	B.hm
7	HF	3 to 30 MHz	Decametric waves	B.dam
8	VHF	30 to 300 MHz	Metric waves	B.m
9	UHF	300 to 3000 MHz	Decimetric waves	B.dm
10	SHF	3 to 30 GHz	Centimetric waves	B.cm
11	EHF	30 to 300 GHz	Millimetric waves	B.mm
12		300 to 3000 GHz	Decimillimetric waves	B.dmm
13		3 to 30 THz	Centimillimetric waves	B.cmm
14		30 to 300 THz	Micrometric waves	B.μm
15		300 to 3000 THz	Decimicrometric waves	B.dμm

Note 1. – "Band number N" extends from 0.3×10^N to 3×10^N Hz.

Note 2. – Symbols: Hz: hertz,
k: kilo (10^3), M: mega (10^6), G: giga (10^9), T: tera (10^{12}),
μ: micro (10^{-6}), m: milli (10^{-3}), c: centi (10^{-2}), d: deci (10^{-1}),
da: deca (10), h: hecto (10^2), Ma: myria (10^4).

Note 3. – This nomenclature, used for designating frequencies in the field of telecommunications, may be extended to cover the ranges shown below, as is proposed by the International Union of Radio Science (URSI).

TABLE II

Band number	Symbols	Frequency range (lower limit exclusive, upper limit inclusive)	Corresponding metric subdivision	Metric abbreviations for the bands
−1		0.03 to 0.3 Hz	Gigametric waves	B.Gm
0		0.3 to 3 Hz	Hectomegametric waves	B.hMm
1		3 to 30 Hz	Decamegametric waves	B.daMm
2		30 to 300 Hz	Megametric waves	B.Mm

RECOMMENDATION 574-1 *

LOGARITHMIC QUANTITIES AND UNITS **

(Question 3/CMV)

(1978-1982)

The CCIR,

CONSIDERING

(a) the frequent use by the CCIR and CCITT of logarithmic units for expressing quantities;

(b) the IEC Publication 27-3 (1974) on logarithmic quantities and units;

(c) the collaboration of CMV with Technical Committee No. 25 of the IEC which permits coordination with a view to establishing further Recommendations;

(d) the need, within the ITU, to publish a guide on this subject without delay,

UNANIMOUSLY RECOMMENDS

that symbols for logarithmic units used for such quantities that directly or indirectly refer to power should be chosen with the guidance of Annex I.

ANNEX I

USE OF THE "DECIBEL"

1. The "decibel" is used to express a power ratio, and also the ratios of currents and voltages or analogous quantities in other branches (such as electric fields or acoustic pressures) when the conditions are such that scalar ratios of these quantities are the square roots of the corresponding power ratios.

This implies that the symbol dB without additional indication should be used to indicate a difference in levels, or the logarithm of a ratio of two powers, power densities, or two other quantities clearly connected with power; and that the symbol dB followed by additional information within parentheses can be used to express an absolute level of power, of power density or another quantity clearly connected with power, in relation to a reference value within the parentheses.

Furthermore, because of usage and for practical reasons some special notations with dB (some examples of which are shown under § 2.10) may be used.

It should be observed that, as a result of some calculations on complex quantities, a real part in nepers and an imaginary part in radians are obtained. The expressions in nepers and in radians can be converted into decibels and degrees by using conversion factors (see Appendix III).

It should further be observed that the value of some logarithmic quantities may be impedance-dependent and that therefore, the value of such quantities without adequate information about impedance can be meaningless or misleading.

In the case of loss or gain, the exact designation must be given (e.g. image-attenuation coefficient, insertion loss, antenna gain) which in fact refers to the precise definitions of the ratio in question (terminal impedances, reference conditions, etc.).

1.1 *Transmission loss* (Ref. Recommendation 341, Vol. V)

This is the ratio, expressed in decibels, of the transmitted power (P_t) to the received power (P_r):

$$L = 10 \log (P_t / P_r) \qquad \text{dB}$$

1.2 *Antenna gain* (Ref. Radio Regulations, Article 1, No. 154)

This is "the ratio, usually expressed in decibels of the power required at the input of a loss free reference antenna (P_0) to the power supplied to the input of the given antenna (P_a) to produce, in a given direction, the same field strength or the same power flux-density at the same distance."

$$G = 10 \log (P_0 / P_a) \qquad \text{dB}$$

* The text of this Recommendation is analogous to Recommendation B.12 of the CCITT.

** In Annex I the notation log has been used throughout. The notation lg is also recommended for use by the ISO, and is used by the IEC.

1.3 *Signal-to-noise ratio*

This is either the ratio of the signal power (P_s) to the noise power (P_n), or the ratio of the signal voltage (U_s) to the noise voltage (U_n) measured at a given point with specified conditions. It is, expressed in decibels:

$$R = 10 \log (P_s/P_n) \quad \text{dB} \qquad \text{or} \qquad R = 20 \log (U_s/U_n) \quad \text{dB}$$

The ratio of the wanted signal to the unwanted signal is expressed in the same way.

1.4 *Protection ratio*

This is either the ratio of the wanted signal power (P_w) to the maximum permissible interfering signal power (P_i), or the ratio of the wanted signal field-strength (E_w) to the maximum permissible interfering signal field-strength (E_i). It is expressed in decibels:

$$A = 10 \log (P_w/P_i) \quad \text{dB} \qquad \text{or} \qquad \text{A} = 20 \log (E_w/E_i) \quad \text{dB}$$

2. In many cases, the comparison of a quantity, here called x, with a specified reference quantity of the same kind (and dimension), x_{ref} is expressed by the logarithm of the ratio x/x_{ref}. This logarithmic quantity is often called "the level of x (with respect to x_{ref})" or "the x-level (with respect to x_{ref})". With the general letter symbol for level L, the level of the quantity x may be indicated L_x.

Other names and other symbols exist and can be used. x may in itself be a single quantity, e.g. power P, or a ratio, e.g. P/A, where A is area, x_{ref} is here supposed to have a fixed value, e.g. 1 mW, 1 W, 1 μW/m^2, 20 μPa, 1 μV/m.

The level representing the quantity x with reference quantity x_{ref} may be indicated by the quantity symbol: L_x (with respect to x_{ref}), and may be expressed in decibels, when the reference quantity is a power, or a quantity linked to power, in a well defined way.

Example:

The statement that the level of a certain power, P, is 15 dB above the level corresponding to 1 W can be written:

$$L_P \text{ (with respect to 1 W)} = 15 \text{ dB, which means } 10 \log (P/1 \text{ W}) = 15 \text{ (*)}$$

$$\text{or } 10 \log P \text{ (in watts)} = 15$$

In many cases it is found practical to use a condensed notation based only on the unit, which in this case would be:

$$L_P = 15 \text{ dB(1 W)}$$

The number "1" in the expression of the reference quantity can be omitted, but this is not recommended in cases where confusion may occur. (Such omission has been made in some of the examples below.) In other words, where no number is shown, the number 1 is to be understood.

There exist condensed notations for special cases, such as dBW, dBm, dBm0. See further § 2.10.

Below are given some examples in which the reference level is expressed after the unit in a condensed form. It must be observed that the condensed notation is often insufficient for characterizing a quantity, and that then a clear definition or another appropriate description of the quantity must be given.

2.1 *Power*

The logarithmic quantity "absolute power level" corresponds to the ratio of P and a reference power, e.g. 1 W.

If P = 100 W and the reference power 1 W, we obtain:

$$\begin{aligned} L_P &= 10 \log (P/1 \text{ W}) \quad \text{dB} \\ &= 10 \log (100 \text{ W}/1 \text{ W}) \quad \text{dB} \\ &= 20 \text{ dB} \end{aligned}$$

with the condensed notation 20 dB(1 W) or 20 dBW, dBW being the abbreviation for: dB(1 W). With the reference power 1 mW and P = 100 W we obtain 50 dB(1 mW), or with the special notation mentioned earlier, 50 dBm, being the abbreviation for: dB(1 mW). The notations dBW and dBm are currently used in the CCIR and the CCITT. See further § 2.10.

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* In the ratio (P/1 W), it is evident that both powers must be expressed in the same units.

2.2 *Power spectral density (with respect to bandwidth)*

The logarithmic quantity corresponds to the ratio of $P/\Delta f$ (where Δf denotes a frequency band) and a reference quantity, e.g. 1 mW/kHz. P may be a noise power. The logarithm will in this case, as in all other cases, be taken of a pure number.

An example with a condensed notation is 7 dB(mW/kHz) or that which is the same thing: 7 dB(W/MHz) or 7 dB(μW/Hz).

2.3 *Power flux-density (with respect to area)*

The logarithmic quantity corresponds to the ratio of P/A, where A is area, and a reference power density, e.g. 1 W/m^2. A notation in a certain case can be:

-40 dB(W/m^2)

or -10 dB(mW/m^2).

2.4 *Power density with respect to temperature*

The logarithmic quantity corresponds to the ratio of P/T, where T is temperature, and a reference power density, e.g. 1 mW/K, where K is kelvin.

An example is 45 dB(mW/K)
or 15 dB(W/K).

2.5 *Spectral power-flux density (power density with respect to area and frequency band)*

The logarithmic quantity corresponds to the ratio of $P/(A \cdot \Delta f)$ and a reference density e.g. 1 W/(m^2 · Hz).

An example is -18 dB(W/(m^2 · Hz))
or -18 dB(W · m^{-2} · Hz^{-1}).

A variant sometimes used is, dB(W/(m^2 · 4 kHz)).

2.6 *Absolute level of an electromagnetic field*

The strength of an electromagnetic field can be expressed by a power density (P/A), by an electric field-strength E or by a magnetic field-strength H. The field-strength level L_E is the logarithm of the ratio of E and a reference field-strength, usually 1 μV/m.

An example with a condensed notation is:

$L_E = 5$ dB(μV/m).

As the power carried by an electromagnetic field is linked to the square of the field strength, this notation means:

$20 \log E\,(\mu V/m) = 5$.

2.7 *Sound pressure level*

The level corresponds to the ratio of sound pressure and a reference pressure, often 20 μPa.

Example: 15 dB(20 μPa).

As acoustic power is linked to the square of sound pressure, this means:

$20 \log (p/20\ \mu Pa) = 15$ (*)

2.8 *Carrier to spectral noise density ratio (C/N_0)*

This is the ratio $P_c/(P_n/\Delta f)$ – where P_c is the carrier power, P_n the noise power, Δf the corresponding frequency bandwidth. This ratio is homogenous with a frequency, it cannot be expressed without caution in terms of decibels, for power is not linked with frequency on a well-defined basis.

This ratio could be expressed in relation with a reference quantity such as 1 W/(W/Hz) which clearly indicates the origin of the result.

For example, with $P_c = 2$ W, $P_n = 20$ mW, and $\Delta f = 1$ MHz, for the logarithmic quantity corresponding to C/N_0 we have:

$$10 \log \frac{P_c}{P_n/\Delta f} = 50 \text{ dB (W/(W/kHz))}$$

This expression is abbreviated to read 50 dB(kHz) which should however be avoided if it is liable to give rise to any misunderstanding.

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* In the ratio ($p/20$ μPa), it is evident that both sound pressures must be expressed in the same units.

2.9 *Figure of merit (M)*

The figure of merit (M) characterizing a receiving radio station is a logarithmic quantity which is related to the antenna power gain G (in decibels) and the absolute temperature T (in kelvins) in the following way:

$$M = \left[G - 10 \log \frac{T}{1\text{K}}\right] \quad \text{dB(W/(W·K))}$$

The decibel notation may be abbreviated to read $\text{dB}(\text{K}^{-1})$ which should however be avoided if it is liable to give rise to misunderstanding.

2.10 Examples of special notations, the use of which may be continued. These notations are often made in addition to other notations.

For absolute power level (See Appendix I)

dBW: absolute power level with respect to 1 watt, expressed in decibels

dBm: absolute power level with respect to 1 milliwatt, expressed in decibels

dBm0: absolute power level with respect to 1 milliwatt, expressed in decibels, referred to a point of zero relative level

dBm0p: absolute psophometric power level (weighted for telephony) with respect to 1 milliwatt, expressed in decibels, referred to a point of zero relative level

dBm0s: absolute power level with respect to 1 milliwatt, expressed in decibels, referred to a point of zero relative level in sound programme transmission

dBm0ps: absolute psophometric power level (weighted for sound programme transmission) with respect to 1 milliwatt, expressed in decibels, referred to a point of zero relative level in sound programme transmission.

For absolute audio-frequency noise level (see Appendix I, § 2.4):

dBq: absolute voltage level with respect to a reference voltage described in § 2.6 of Recommendation 468 measured with a quasi-peak noise meter without a weighting network and expressed in decibels

dBq0s: absolute voltage level with respect to a reference voltage described in § 2.6 of Recommendation 468 measured with a quasi-peak noise meter without a weighting network and expressed in decibels referred to a point of zero relative level in sound programme transmission

dBqp: absolute voltage level with respect to a reference voltage described in § 2.6 of Recommendation 468 measured with a quasi-peak noise meter (weighted for sound programme transmission) and expressed in decibels;

dBq0ps : absolute psophometric voltage level with respect to a reference voltage described in § 2.6 of Recommendation 468 measured with a quasi-peak noise meter (weighted for sound programme transmission) and expressed in decibels, referred to a point of zero relative level in sound programme transmission.

For relative power level (See Appendix I)

dBr: decibels (relative)

dBrs: relative power level expressed in decibels, referred to another point in sound programme transmission.

For absolute acoustic pressure level

dBA (or dBB, dBC): weighted acoustic pressure level with respect to 20 μPa, mentioning the weighting curve used (curves A, B or C, see IEC Publication 123).

For antenna gain in relation to an isotropic antenna

dBi.

Note 1. – In the case of the ratio "energy per bit to spectral noise density", E/N_0, which is used in digital transmission, the ratio is made between two quantities homogeneous with spectral power density, and this ratio may normally be expressed in decibels, like power ratios (see § 1 above). However, it is necessary to ensure that the units used for the expression of both terms in the ratio are equivalent; for example, joule (J) for energy and watts per hertz (W/Hz) for spectral noise density.

Note 2. – In Appendix I are given the principles of "use of the term decibels in telecommunications" taken from the "Conclusions of the Interim Meeting of the Interim Study Group on Vocabulary (CIV)" (Geneva, 1972).

The examples given in the present Recommendation are illustrations of these principles.

Note 3. – In Appendix II is given the principle of the notation recommended by the IEC for expressing the level of a quantity with respect to a specified reference. The notations used in the present Recommendation are applications of this principle.

APPENDIX I

USE OF THE TERM DECIBEL IN TELECOMMUNICATION

1. Use of the decibel for ratios of quantities directly connected with the concept of power

1.1 *Ratio of two powers*

The ratio of two powers is generally expressed as a logarithmic difference, usually in decibels, for which the symbol is dB. By definition, if P_1 and P_2 are two power values, their logarithmic difference is given in decibels by:

$$N = 10 \log \left(\frac{P_1}{P_2}\right)$$

Note. – Originally a decibel was simply one-tenth of the real unit, the bel (B), the number n of bels being itself defined by:

$$n = \log \left(\frac{P_1}{P_2}\right)$$

However, it is the practice nowadays to use only the decibel (dB).

1.2 *Absolute power level*

Definition: Expression as a logarithmic difference, generally in decibels, of the ratio between the power of a signal at a point in a transmission channel and the reference power, e.g. one watt or milliwatt.

Note. – It is necessary for the reference power to be indicated by a symbol:

1.2.1 When the reference power is one watt, the absolute power level is expressed in "decibels relative to one watt" and the symbol "dBW" is used.

1.2.2 When the reference power is one milliwatt, the absolute power level is expressed in "decibels relative to one milliwatt" and the symbol "dBm" is used.

1.3 *Relative power level and related concepts*

1.3.1 *Definition of relative power level*

It is defined by the expression 10 log (P/P_0), where P respresents the power of a sinusoidal test signal (at 800 or 1000 Hz) at the point concerned and P_0 the power of that signal at the tramission reference point.

1.3.2 *Transmission reference point*

In the old transmission plan, the CCITT had defined "the zero relative-level point" as being the two-wire origin of a long distance circuit (point 0 of Fig. 1).

In the presently recommended transmission plan the relative level should be -3.5 dBr at the virtual switching point on the sending side of a four-wire international circuit (point V of Fig. 2). The "transmission reference point" or "zero relative level point" (point T of Fig. 2) is a virtual two-wire point which would be connected to V through a hybrid transformer having a loss of 3.5 dB. The conventional load used for the computation of noise on multi-channel carrier systems corresponds to an absolute mean power level of -15 dBm at point T.

1.3.3 *Meaning of "dBm0"*

If a measuring signal with an absolute power level L_M (in dBm) is applied at point T, the absolute power level of signal appearing at a point X, where the relative level is L_{XR} (in dBr), will be $L_M + L_{XR}$ (in dBm).

Conversely, if a signal at X has an absolute power level L_{XA} (in dBm), it is often convenient to "refer it to a zero relative level point" by computing L_0 (in dBm0) by the formula:

$$L_0 = L_{XA} - L_{XR}$$

This formula may be used, not only for signals, but also for noise (weighted or unweighted), which helps in the computation of a signal-to-noise ratio.

1.3.4 *Case of sound-programme transmission*

The zero relative level point (point A of Fig. 3) is the origin of the international sound programme connection, chosen somewhere in the originating studio. When the relative level at the output of an amplifier (point C of Fig. 3) is fixed for example at 6 dBrs, this means that if a 800 Hz sine-wave signal with an r.m.s. voltage of 0.775 V, which represent the absolute zero voltage level, is applied at point A, this will result at point C in an absolute voltage level of +6 dB (0.775 V), i.e. an r.m.s. voltage of 1.55 V.

During the transmission, it should be checked that the peaks at point A very rarely exceed 3.1 V, which corresponds to an r.m.s. voltage of 2.2 V for a sine-wave i.e. 9 dB above the reference voltage (0.775 V) at point A or +9 dBm0s.

Noise is measured, according to CCIR Recommendation 468, with a quasi-peak instrument (then in dBq), with or without a weighting network, and can be referred to point A.

Note. – More detailed explanations are given in the following Recommendations published in Volume III of the CCITT:

- G.101 (division E) and G.223 for § 1.3.1 and 1.3.2 above,
- J.13 (Fig. 3) and J.14 for § 1.3.4.

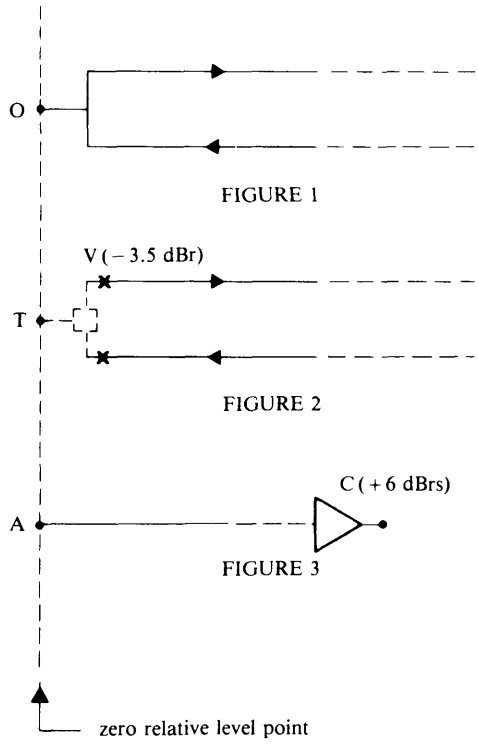

FIGURE 1

FIGURE 2

FIGURE 3

1.4 *Power density*

Definition: Quotient of a power by another quantity, for example, an area, a frequency band, a temperature.

Note 1. – The quotient of a power by an area is called "*power flux-density*" ("puissance surfacique") and is commonly expressed in "watts per square metre" (symbol: $W \cdot m^{-2}$ or W/m^2).

The quotient of a power by a frequency bandwidth is called "*power spectral density*" and can be expressed in "watts per hertz" (symbol: $W \cdot Hz^{-1}$ or W/Hz). It can also be expressed with a unit involving a bandwidth characteristic of the technique concerned, for example, 1 kHz or 4 kHz in analogue telephony, 1 MHz in digital transmission or in television; the power spectral density is then expressed in "watts per kilohertz" (W/kHz) or in "watts per 4 kHz" (W/4 kHz) or even in "watts per megahertz" (W/MHz).

The quotient of a power by a temperature, used particularly in the case of noise powers, has no specific name. It is usually expressed as "watts per kelvin" (symbol: $W \cdot K^{-1}$ or W/K).

Note 2. – In some cases a combination of several types of power densities can be used, for example a "spectral power flux-density" which is expressed as "watts per square metre and per hertz" (symbol: $W \cdot m^{-2} \cdot Hz^{-1}$ or $W/(m^2 \cdot Hz)$).

1.5 *Absolute power density level*

Definition: Expression as a logarithmic difference, usually in decibels, of the ratio between the power density at a given point and a reference power density.

Note. – For example, if one watt per square metre is chosen as the reference power flux-density, the absolute power flux-density levels are expressed as "decibels with respect to one watt per square metre" (symbol: $dB(W/m^2)$).

Similarly, if one watt per hertz is chosen as the spectral reference power density, the absolute spectral power density levels are expressed as "decibels with respect to one watt per hertz" (symbol: dB(W/Hz)).

If one watt per kelvin is chosen as the reference for power density per unit temperature, the absolute power density levels per temperature unit are expressed as "decibels with respect to one watt per kelvin" (symbol: dB(W/K)).

This notation can easily be extended to combined densities. For example, the absolute spectral density levels of the flux-density are expressed as "decibels with respect to one watt per square metre and per hertz" for which the symbol is: $dB(W/(m^2 \cdot Hz))$.

2. Use of the decibel for ratios of quantities indirectly connected with the concept of power

Current practice has led to an extension of the use of the term decibel to ratios of quantities which are only indirectly connected with the concept of power or which are linked to it through the medium of a third quantity. In these various cases, the decibel should be used with the utmost precaution and should always be accompanied by a note indicating the conventions adopted and the sphere of validity of this usage.

A case extremely common in practice, is where the ratio of two powers P_1 and P_2 depends solely on the ratio of the values X_1 and X_2 of another quantity X by an equation in the form:

$$P_1 / P_2 = (X_1 / X_2)^{\alpha}$$

α being any real number. The corresponding number of decibels can then be *calculated* from the ratio:

X_1 / X_2 from the equation:

$$N = 10 \log (P_1 / P_2) = 10\ \alpha \log (X_1 / X_2) \qquad \text{dB}$$

It should be noted that a quantity X is not always associated with the same value of the number α, and therefore it is not possible, without some other indication, to express in decibels the ratio of two values of the quantity X.

Most often α is equal to 2, and then the expression in decibels of ratios of currents or voltages or other analogous quantities in other fields, is:

$$N = 20 \log (X_1 / X_2) \qquad \text{dB}$$

2.1 *Absolute level of the electromagnetic field*

The electromagnetic field set up by a transmitter is of concern to some services. At considerable distances from the antenna this field is generally defined by its electric component E, for which it is often convenient to use a logarithmic scale.

For a non-guided wave propagated in a vacuum, or in practice in the atmosphere, there is a clearly defined relationship between the electric field E and the power flux-density p:

$$E^2 = Z_0\ p$$

Z_0, which is the intrinsic impedance of the vacuum, having a fixed numerical value of 120 π ohms. In particular, a field of 1 microvolt per metre corresponds to a power flux-density of -145.8 $dB(W/m^2)$.

The absolute level of the electric field can then be defined by the equation:

$$N = 20 \log \left(\frac{E}{E_0}\right)$$

E_0 being a reference field, generally 1 microvolt per metre. In this case, N represents the absolute field level in "decibels with respect to 1 microvolt per metre", the symbol for which is "dB(μV/m)".

2.2 *Voltage ratios*

In certain spheres such as audio frequencies, the concept of voltage is sometimes more important than that of power. This is the case, for example, when low output- and high input-impedance quadripoles are associated in tandem. In this way a deliberate departure is made from the impedance matching conditions in order to simplify the formation of these quadripoles. When this is done, only the voltage ratios at different points in the link need to be taken into consideration.

It is then convenient to express these voltage ratios in a logarithmic scale, e.g. to the base 10, by defining the number N of corresponding units by means of the equation:

$$N = K \log \left(\frac{U_1}{U_2}\right)$$

In this equation the coefficient K is *a priori* arbitrary. However, by analogy with the operation:

$$N = 20 \log \left(\frac{U_1}{U_2}\right)$$

which expresses in decibels the ratio of the I^2R loss as in two equal resistances at the terminals of which the voltages U_1 and U_2 respectively, are applied, one is led to adopt the value 20 for the coefficient K. The number N then expresses in decibels the power ratios which would correspond to the voltage ratios, if the latter were applied to equal resistances, although in practice this is not generally the case.

2.3 *Absolute voltage level*

If U_2 is a reference voltage, the number N defined above becomes the measurement of an "absolute voltage level". A reference voltage with an r.m.s. of 0.775 volts is generally adopted which corresponds to a 1 milliwatt I^2R loss in a resistance of 600 ohms, since 600 ohms represents a rough approximation to the characteristic impedance of certain balanced telephone lines.

2.3.1 If the impedance at the terminals of which the voltage U_1 is measured, is in fact 600 ohms, the absolute voltage level thus defined, corresponds to the absolute power level with respect to 1 milliwatt, and so the number N exactly represents the level in decibels with respect to 1 milliwatt (dBm).

2.3.2 If the impedance at the terminals of which the voltage U_1 is measured, is R ohms, N equals the number of dBm increased by the quantity 10 log (R/600).

2.3.3 If the impedance at the terminals of which the voltage U_1 is measured is not specified, the corresponding power level cannot be calculated. In this case, if the term decibel * is used it is imperative to make it clear that it refers to an *absolute voltage level* (and not power level) to avoid confusion.

2.4 *Absolute audio-frequency noise level in broadcasting, sound recording or sound programme transmission*

Measurement of audio-frequency noise in broadcasting, sound recording or sound-programme transmission is made, normally through a weighting network and by following the quasi-peak value method of Recommendation 468 using a reference voltage of 0.775 volt at 1 kHz and a nominal impedance of 600 ohms and expressing the results normally in dBqp.

Note. – The two notations in "dBq" and "dBm" should not be used interchangeably. In sound-programme transmission the notation "dBq" is restricted to level measurements of noise with single or multiple tone bursts whereas the notation "dBm" only applies to sinusoidal signals used for lining up the circuit.

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* It would obviously be preferable to use another term but so far no proposal to that effect has been adopted.

APPENDIX II

NOTATION FOR EXPRESSING THE REFERENCE OF A LEVEL

(Part 5 of IEC Publication 27-3)

A level representing the quantity x with the reference quantity x_{ref} may be indicated by:

L_x (with respect to x_{ref}) or by L_x/x_{ref}.

Examples

The statement that a certain sound pressure level is 15 dB above the level corresponding to a reference pressure of 20 μPa can be written as:

$$L_p \text{ (re 20 μPa)} = 15 \text{ dB ou } L_{p/20\ \mu Pa} = 15 \text{ dB}$$

The statement that the level of a current is 10 Np below 1 ampere can be written as:

L_I (with respect to 1 A) = 10 Np.

The statement that a certain power level is 7 dB above 1 milliwatt can be written as:

L_p (with respect to 1 mW) = 7 dB.

The statement that a certain electric field-strength is 50 dB above 1 microvolt per metre can be written as:

L_E (with respect to 1 μV/m) = 50 dB.

In presenting data, particularly in tabular form or in graphical symbols, a condensed notation is often needed for identifying the reference value. Then, the following condensed form, illustrated by application to the above examples, may be used:

15 dB(20 μPa)
−10 Np(1 A)
7 dB(1 mW)
50 dB(1 μV/m).

The number 1 in the expression of a reference quantity is sometimes omitted. This is not recommended in cases when confusion may occur.

When a constant level reference is used repeatedly in a given context and explained in the context, it may be omitted. *

APPENDIX III

USE OF THE TERM NEPER

(See CCITT Recommendation B.4 stated below)

"Recommendation B.4

TRANSMISSION UNITS

(Mar del Plata, 1968)

The CCITT,

considering

that for the purposes of transmission measurements and the expression of the results of such measurements, two transmission units, namely, the neper and the bel, together with their submultiples were provisionally recommended on an equal footing by the 1926 Plenary Assembly of the Comité consultatif international des communications téléphoniques à grande distance, and that until now, the CCITT has continued to use these two units on an equal footing:

that now, as then, it would be convenient for international specification limits and for the exchange of information at international level concerning the results of transmission measurements to use only one transmission unit;

that although national administrations still differ in the transmission unit that they use within their own country, both the neper and the decibel are in common use, and sometimes both within one country;

that for radiocommunications, the decibel is the only unit used for expressing measurement results in transmission units,

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* The omission of the reference level, allowed by the IEC, is not allowed in CCIR and CCITT texts.

unanimously recommends

that countries can continue to use either the neper or the decibel for measurement purposes within their own territory;

that for the international exchange of information concerning line transmission measurement and related values and for the international specification of limits for such values the only transmission unit to be used should be the decibel;

that to avoid unnecessary conversion of values, countries which prefer to do so can continue to use the neper between themselves by bilateral agreement;

that for theoretical, scientific calculations, where ratios are expressed in terms of logarithms to the base "e", the neper will always be used, implicitly or explicitly."

QUESTIONS AND STUDY PROGRAMMES, RESOLUTIONS, OPINIONS AND DECISIONS *

QUESTION 1/CMV **

TERMS AND DEFINITIONS

(1982)

The CCIR,

CONSIDERING

(a) that it is essential for the work of the ITU and of the CCIs that terms should be used in a clearly defined and uniform manner;

(b) that the CCIs are collaborating with the IEC (Technical Committee No. 1) in preparing an international telecommunications vocabulary and that for this purpose they have established a Joint Coordination Group on Vocabulary (JCG), which has established joint working groups to draw up the corresponding draft chapters of the International Electrotechnical Vocabulary (IEV),

UNANIMOUSLY DECIDES that the following question should be studied:

1. what terms should be recommended to be used to designate the technical concepts employed in ITU texts, and how should these terms be defined? The choice of terms employed in CCI texts and the formulation of appropriate definitions fall within the province of the Study Group responsible for compiling these texts; the CMV should study terms and definitions in general use and ensure coordination between the Study Groups;

2. which terms and definitions should be recommended to be included in the international telecommunications vocabulary? The CMV must ensure that the terms and definitions formulated by the CCI Study Groups are passed on to the competent joint working groups of the JCG, and that the drafts prepared by these groups are acceptable to the Study Groups.

Note. – See Report 971, Recommendation 573, Resolution 66 and Decision 19.

STUDY PROGRAMME 1A/CMV ***

TECHNICAL TERMS IN THE REGULATIONS AND THE CONVENTION

(1982)

The CCIR,

CONSIDERING

(a) that, with the rapid changes in technology today, there is a need for new and amended terms and definitions to describe the current technology;

(b) that terms and definitions have also been established by Administrative Conferences of the Union and the Plenipotentiary Conference;

(c) that there is the possibility of conflict between technical terms and definitions as defined by Administrative Conferences and the Plenipotentiary Conference and their current usage to describe new and evolving radiocommunication technology within the CCIs;

(d) that the usage of technical terms having several meanings leads to confusion however to a large extent is unavoidable,

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* See the relevant Note of the table of contents, page VII.

** The text of this Question was approved by the CCITT at its VIIth Plenary Assembly, Geneva, 1980, under the reference: "Question 1/CMV" of the CCITT.

*** The text of this Study Programme was approved by the CCITT at its VIIth Plenary Assembly, Geneva, 1980, under the reference: "Question 1A/CMV" of the CCITT.

AND NOTING

Recommendation No. 72 of the World Administrative Radio Conference (Geneva, 1979),

UNANIMOUSLY DECIDES that the following studies should be carried out:

1. that the technical terms and their respective definitions arrived at by Administrative Conferences and the Plenipotentiary Conference be examined to determine their applicability for use by CCI Study Groups;

2. that where a conflict exists between such terms and definitions as described above and their current usage by the CCIs, a recommendation should be drafted for presentation at the relevant conference suggesting appropriate amendments.

Note. – See Report 971 and Recommendation 573.

STUDY PROGRAMME 1B/CMV *

USE OF CERTAIN TERMS LINKED WITH PHYSICAL QUANTITIES

(1982)

The CCIR,

CONSIDERING

(a) that ITU technical texts contain a number of terms expressing a relationship between quantities, such as quotient, ratio, coefficient, factor, index, constant, rate, etc., and that their meaning is liable to cause confusion owing to a lack of consistency;

(b) that the situation is particularly confused owing to the existence of three working languages, as can be seen from such texts as the Provisional Glossary of Telecommunications Terms published by the ITU in 1979;

(c) that attempts at standardization have been made in certain countries and in vocabularies recently prepared by the IEC and the JCG,

UNANIMOUSLY DECIDES that the following studies should be carried out:

1. what recommendations might be issued on the general use of the terms quotient, ratio, coefficient, factor, index, constant and rate, in the three working languages;

2. what recommendations might be issued on certain composite expressions based on the terms quotient, ratio, coefficient, factor, index, constant and rate, with a view to arriving at a well-defined, uniform terminology and systematic equivalent in the three working languages?

Note. – See Annex V of the Introduction by the Chairman of the CMV.

QUESTION 2/CMV **

GRAPHICAL SYMBOLS AND DIAGRAMS

(1982)

The CCIR,

CONSIDERING

(a) that it is essential that the graphical symbols used in telecommunication diagrams and on equipment be standardized as far as possible;

(b) that the rules and conventions used in the preparation of diagrams, charts and tables be standardized as far as possible;

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* The text of this Study Programme was approved by the CCITT at its VIIth Plenary Assembly, Geneva, 1980 under the reference "Question 1B/CMV" of the CCITT.

** The text of this Question was approved by the CCITT at its VIIth Plenary Assembly, Geneva, 1980, under the reference "Question 2/CMV" of the CCITT.

(c) that, together with the IEC (Technical Committee No. 3), the CCIs have set up a Joint Working Group (JWG) to draft publications for the international standardization of graphical symbols and drawing rules used in telecommunications;

(d) that the CCIs have recommended (CCITT Recommendation A.13, CCIR Recommendation 461) the use of the graphical symbols and drawing rules published by the IEC,

UNANIMOUSLY DECIDES that the following question should be studied:

which graphical symbols and rules for the preparation of diagrams should be studied by the CCI/IEC Joint Working Group, with a view to achieving international standardization?

Note. – See Recommendation 461 and Resolution 23.

QUESTION 3/CMV *

UNITS AND LETTER SYMBOLS

(1982)

The CCIR,

CONSIDERING

(a) that the IEC (in particular Technical Committee No. 25) publishes recommendations on electrical quantities, units of measurement and letter symbols;

(b) that it may be necessary to adapt or supplement these recommendations to meet the specific needs of telecommunications,

UNANIMOUSLY DECIDES that the following question should be studied:

1. which quantities, units and symbols should be recommended for telecommunication requirements;

2. what proposals should be made with a view to amending or supplementing IEC publications on quantities, units and symbols?

Note. – See Recommendations 430, 431, 574, 607 and 608.

QUESTION 4/CMV **

ABBREVIATIONS AND INITIALS FOR TERMS USED IN TELECOMMUNICATIONS

(1982)

The CCIR,

CONSIDERING

(a) that abbreviations and initials are being increasingly used in the technical literature and in the CCI texts to denote telecommunication systems, analogue and digital modulation methods and coding methods;

(b) that such abbreviations and initials offer a concise method of expressing concepts or terms made up of several words;

(c) that in many cases the abbreviations and initials are based on words in the language in which they are first used;

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* The text of this Question was approved by the CCITT at its VIIth Plenary Assembly, Geneva, 1980, under the reference "Question 3/CMV" of the CCITT.

** A similar text will be submitted to the CCITT as draft of new Question.

(d) that, there being no standardized method for the translation of such abbreviations and initials, their use leads to a loss of clarity and the harmonization of the texts in the various working languages suffers accordingly;

(e) that it would be useful for the CMV to draw up a list of abbreviations and initials to be updated in each study period, the various Study Groups of the CCIs using abbreviations and initials from the list and proposing new abbreviations to be incorporated in it,

UNANIMOUSLY DECIDES that the following question should be studied:

what abbreviations and initials may be recommended to designate some of the technical concepts, terms and systems referred to in the texts of the ITU with their versions in the three working languages?

RESOLUTION 66-1 *

TERMS AND DEFINITIONS

(Question 1/CMV)

(1978-1982)

The CCIR,

CONSIDERING

(a) that it is essential for the work of the ITU and in particular of the CCIs and for liaison with other interested organizations that terms and their definitions be standardized as far as possible;

(b) that the organization and conduct of vocabulary work have been the subjects of certain CCI Plenary Assembly texts;

(c) that the CCIs are collaborating with the International Electrotechnical Commission (IEC) (Technical Committee No. 1) in order to provide an internationally agreed vocabulary of telecommunication terms and that for this purpose a Joint Coordination Group (JCG) has been established. The Joint Coordination Group is composed of twelve members and the CCIs (itself represented by equal numbers of members of the CCIR and CCITT) is represented on an equal footing with the International Electrotechnical Commission, the Chairman being chosen from among the members of the CCIs, the Secretary being chosen from among the members of the International Electrotechnical Commission which also provides the Secretariat. The Joint Coordination Group has set up joint working groups of experts to collaborate in drafting the telecommunication chapters of the International Electrotechnical Vocabulary (IEV);

(d) that the ITU does not intend to re-issue, in its original form, Part I of the ITU List of Definitions of Essential Telecommunication Terms and that Part II of the List, relating to radiocommunication, will not be prepared;

(e) that the CCIs have published certain terms with their definitions included in the respective Plenary Assembly Books and that there is a continuing need for the publication of terms and definitions appropriate to the work of particular Study Groups;

(f) that unnecessary or duplicated work can be avoided by effective coordination of all work on vocabulary carried out by the CCI Study Groups;

(g) that the IEC has already published documents pertaining to telecommunication terms;

(h) that the long-term objective of this vocabulary work must be the preparation of a comprehensive vocabulary in the three working languages of the ITU,

UNANIMOUSLY DECIDES

1. that the CCIs, within their terms of reference, should continue their work on technical and operational terms and definitions which may be required for regulatory or administrative purposes and also on specialized terms and definitions required by Study Groups in the course of their work, these terms and definitions being published as appropriate by the CCIs;

2. that to facilitate appropriate publication, Study Group texts should assemble and present terms in logical order, families of related terms being grouped in separate Recommendations, insofar as practicable;

3. that Study Groups should endeavour to make the maximum use of terms and definitions already published in documents such as those of other CCI Study Groups or the International Electrotechnical Commission, and that proposals for the revision or different application of any such terms considered to require amendment should be forwarded to the CMV with supporting justification;

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* The text of this Resolution is analogous to that of Recommendation A.10 of the CCITT.

4. that each CCI Study Group should be requested to constitute a small permanent working group on terminology headed by a Special Rapporteur. Recommended terms of reference and working methods for these working groups are given in Annex I;

Note. – For some Study Groups it may only be necessary to nominate the Special Rapporteur;

5. that the CCIs and particularly their Study Groups should continue their cooperation in the work of the Joint Coordination Group and its vocabulary working groups and that the necessary coordination should be assured by the CMV;

6. that in order to facilitate cooperation between the Study Groups and the CMV, the Special Rapporteurs for terminology should make every effort to attend those meetings of the CMV, and the Working Groups set up by the JCG, at which terms and definitions of particular interest to their Study Groups are to be discussed;

7. that for general technological terminology, the member administrations and recognized private operating agencies of the CCIS should make use of the terms and definitions agreed upon by the CCIs and published in the revised telecommunication chapters of the IEV;

Note. – This applies to terms and definitions approved by CCI Study Groups which should be identified in the IEV.

8. that in order to avoid multiple definitions and duplication of work proposed terms and definitions considered to be of interest to a number of Study Groups should be forwarded by the Special Rapporteurs for terminology to the CMV for coordination and eventual publication.

ANNEX I

RECOMMENDED TERMS OF REFERENCE AND WORKING METHODS FOR TERMINOLOGY WORKING GROUPS IN CCI STUDY GROUPS

Preamble

It is assumed that each CCI Study Group has constituted a small permanent working group on terminology headed by a "Special Rapporteur".

1. Terms of reference

1.1 The working group on terminology (wgt) studies terminology matters referred to it by:

- Working Parties of the same Study Group,
- the Study Group as a whole,
- the Chairman of the Study Group,
- a Special Rapporteur for terminology of another CCI Study Group, or by
- the CMV.

1.2 The objective of the studies is to achieve full agreement on finalized terms and definitions, in the three working languages of the ITU. Agreement by the working group on terminology should be confirmed by the Study Group as a whole.

1.3 The Special Rapporteur is responsible for coordination of terminology within his own Study Group and with other Study Groups. He also represents his Study Group in CMV/1 *.

1.4 The Special Rapporteur has the responsibility for liaison between his Study Group and CMV/1 in respect of the joint CCI/IEC vocabulary activities and where necessary takes decisions in these matters of terminology on behalf of his Study Group.

Note. – Before each decision concerning terminology work relating to his Study Group the Special Rapporteur will consult his Study Group or its Working Group of terminology.

2. Working methods for cooperation between CCI Study Groups

2.1 The wgt works by correspondence, augmented by meetings which usually occur at Study Group meetings.

2.2 Membership of wgt should include three technical language specialists, one each for English, French and Spanish usage.

2.3 A list of items accepted for study by the Special Rapporteur should be published as a contribution of the Study Group.

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* See Decision 19.

2.4 All new terms and definitions agreed upon by a Study Group will normally be contained in a Report or Recommendation of the Study Group (CCIR) or in a separate section of the Report of the Study Group meeting (CCITT).

2.5 Terms and definitions agreed upon by the working group will be published as Study Group contributions by the relevant CCI Secretariat, which will transmit them to the Special Rapporteurs (IWP CMV/1) and to CMV Chairman and Vice-Chairmen for coordination.

2.6 Overlap or conflict among CCI Study Groups concerning terms or definitions should be resolved as far as possible through cooperative work within IWP CMV/1 between the appropriate CCI Special Rapporteurs on Terminology with the assistance as required of experts of the Study Groups concerned.

2.7 Graphic illustrations may be used as an integral part of the definitions.

2.8 Periodically the CCI Secretariats should prepare for publication up-to-date lists of terms and definitions which have been agreed by CCI Study Groups for information.

3. Working methods for the JCG vocabulary activities

3.1 The Special Rapporteur receives vocabulary drafts (in the form of IEC Secretariat documents) prepared by the JCG groups of experts, examines them and decides whether they should be circulated further, for example, to the members of his working group or Study Group.

3.2 The Special Rapporteur prepares a unified reply to the CMV Secretariat.

3.3 The Special Rapporteur receives the final drafts on vocabulary and indicates approval or disapproval of those terms and their definitions which are of concern to his particular Study Group.

DECISION 19-1

TERMS AND DEFINITIONS

(Question 1/CMV)

(1974-1978)

The CCIR/CCITT Joint Study Group for Vocabulary (CMV),

CONSIDERING

(a) that, according to Resolution 66, each CCITT or CCIR Study Group establishes a small working group on terminology headed by a "Special Rapporteur for Terminology";

(b) that the CMV has to coordinate the work of these CCI working groups on terminology and to ensure cooperation with the CCI/IEC Joint Coordination Group (JCG) and its groups of experts,

DECIDES

1. that, in order to fulfil effectively its coordination and cooperation functions, the CMV shall maintain Interim Working Party CMV/1 on a permanent basis;

2. that the composition of Working Party CMV/1 shall be (see Annex 1):

- the "Special Rapporteurs" appointed by the respective Chairmen of the Study Groups of the CCIs, one Special Rapporteur for each Study Group, according to Resolution 66;
- the "national collaborators", not more than one from each Administration which decides to actively participate in the work of Working Party CMV/1;

3. that the objective of Working Party CMV/1 should be:

- to act as overall coordinator of special terms and definitions prepared by the Study Groups of the CCIs, especially by ensuring that definitions prepared by each Study Group are circulated to all Special Rapporteurs for vocabulary;
- to achieve full agreement of the CCIs in drafts prepared by the groups of experts of the JCG;

4. that in order to ensure the publication of "Telecommunication" chapters of the IEV in a reasonable time, Working Party CMV/1 shall be empowered to take decisions regarding the provisional approval for publication of the IEC of the terms and definitions prepared by the groups of experts of the JCG.

ANNEX I

Composition of IWP CMV/1

Chairman: M. Thué
CNET
F-92131 Issy les Moulineaux (France)

Members: a) Special Rapporteurs for terminology
(List at 1st March 1982) *

CCITT/I	W. Glur (Switzerland)	CCIR/1	T. Myles (United States of America)
CCITT/II	G. Langer (France)	CCIR/2	N. De Groot (United States of America)
CCITT/III	G. Henter (Canada)	CCIR/3	T. De Haas (United States of America)
CCITT/IV	T. Sato (Japan)	CCIR/4	D. J. Withers (United Kingdom)
CCITT/V	G. Gratta (Italy)		J. P.Houssin (France)
CCITT/VI	D. J. Dekker (Netherlands)		M. Menchen (Spain)
CCITT/VII	S. J. Crossmann (Canada)	CCIR/5	L. Boithias (France)
CCITT/VIII	A. Dupont (France)		E. K. Smith (United States of America)
CCITT/IX	R. Daude (France)	CCIR/6	Mlle G. Pillet (France)
	B. Kubin (Czechoslovakia)		D. B. Ross (Canada)
	J. W. Rimington (United Kingdom)	CCIR/7	D. Sutcliffe (United Kingdom)
CCITT/XI	K. J. Bohren (Switzerland)	CCIR/8	F. L. Rose (United States of America)
CCITT/XII	J. Lalou (France)		J. Piponnier (France)
CCITT/XV	G. Wallenstein (United States of America)	CCIR/9	J. J. Dominguez-Sanz (Spain)
CCITT/XVI	G. Lajtha (Hungaria)	CCIR/10	S. Lacharnay (France)
CCITT/XVII	S. J. Crossmann (Canada)	CCIR/11	W. Anderson (United Kingdom)
CCITT/XVIII	P. G. Clarke (United Kingdom)	CMTT	R. Gardiner (United Kingdom)
CMBD	F. Riciniello (Italy)		J. Poncin (France)

b) National collaborators from the following Administrations:
Spain, France, United Kingdom, U.S.S.R.

RESOLUTION 78 **

PRESENTATION OF TEXTS ON TERMINOLOGY

(1982)

The CCIR,

CONSIDERING

(a) that it is essential that the terminology work done by the CCIs should be widely disseminated, as regards both terms and definitions;

(b) that users generally have ITU publications at their disposal in one language only but are often required to read or write technical texts in one of the other working languages;

(c) that texts on vocabulary and glossaries, such as the collection of terms and definitions in the Orange Book, are not as a rule directly available to users interested in a particular volume;

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* Study Groups are requested to notify the CCIR Secretariat of any modification to be made to this list.

** The text of this Resolution is analogous to that of Recommendation A.16 of the CCITT.

(d) that a terminological supplement to the Plenary Assembly Books does not cover all ITU terminology, nor even that of the publishing CCI, for example, as used in the handbooks,

UNANIMOUSLY DECIDES

1. that the texts on vocabulary and the parts of texts dealing specifically with definitions of terms, published by the CCIs in the Books resulting from their Plenary Assemblies, manuals or other publications, shall include the equivalents of all the terms defined in the other working languages of the ITU;

2. that the practical means of providing the equivalents of terms in addition to the full text of terms and definitions in one of the languages is left to the discretion of the CCI publishing the text concerned. (see examples given in Annexes I and II).

Note. – When an abbreviation (or initials) exists to represent a term, it should be given immediately after the term, in the three working languages.

ANNEX I

(Extracts from CCIR Report 730)

0.1 **Accuracy**, *Exactitude, Exactitud*

Generally equivalent to systematic uncertainty of a measured value. (See also Uncertainty (0.3).)

0.2 **Precision**, *Précision, Precisión*

Random uncertainty of a measured value, expressed by the standard deviation or by a multiple of the standard deviation. (See also Uncertainty (0.3).)

0.3 **Uncertainty**, *Incertitude, Incertidumbre*

The uncertainty of a measured value expresses the magnitude of a possible deviation of this value from the true value.

Frequently it is possible to distinguish two components, the systematic uncertainty and the random uncertainty.

The random uncertainty is expressed by the standard deviation or by a multiple of the standard deviation. The systematic uncertainty is generally estimated on the basis of the parameter characteristics.

The term "accuracy" is generally equivalent to "systematic uncertainty", whereas the term "precision" is equivalent to "random uncertainty". Similarly, the "total" accuracy of a measurement is equivalent to an "overall" uncertainty, comprising both parts, the systematic and the random.

0.4 **Error** *, *Erreur, Error*

An unintentional difference: measured value minus true value.

0.5 **Frequency instability**, *Instabilité de fréquence, Inestabilidad de frecuencia*

It is expressed by the frequency change within a given time interval τ. Generally one distinguishes between frequency drift effects (see 1.10) and stochastic frequency fluctuations. Special variances have been developed for the characterization of these fluctuations.

0.7 **Reproducibility**, *Reproductibilité, Reproductibilidad*

(a) With respect to a set of independent devices of the same design, is the standard deviation of the values produced by these devices.

(b) With respect to a single device put into operation repeatedly, is the standard deviation of the values produced by this device.

0.8 **Resettability** (1), *Défaut de fidélité, Reposicionabilidad*

It is the unavoidable deviation between values produced by a device, when specified parameters are independently adjusted under stated condition of use.

Note. – It is given by the estimate of the confidence limits (i.e. uncertainty of the observed values).

(1) This term replaces the previous term "repeatability", considered as not pertinent to frequency generators, but to measuring procedures.

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* These definitions differ from those in the IEV, but Study Group 7 is of the opinion that they are more appropriate for the standard-frequency and time-signal service.

0.9 **Calibration** *, *Etalonnage, Calibración*

The process of identifying and measuring errors in instruments and/or procedures.

Note. – In many cases, e.g. in a frequency generator, the calibration is related to the stability of the device and therefore its result is a function of time.

0.10 **Nominal value** *, *Valeur nominale, Valor nominal*

A specified or intended value independent of any uncertainty in its realization.

Note. – In a device, that realizes a physical quantity, it is the value of such a quantity specified by the manufacturer. Since it is an ideal value, it is free from tolerance.

0.11 **Offset** *, *Décalage, Separación*

An intentional difference between the realized value and the nominal value. (See also "Normalized offset".)

0.12 **Normalized offset**, *Décalage normé, Separación normalizada*

The offset divided by the nominal value.

Note. – Often also called relative offset. The term "fractional offset" is to be avoided.

ANNEX II

(Extract of CCITT Recommendation G.601)

TERMINOLOGY FOR CABLES

(Geneva, 1980)

1 General terms: repeaters, power feeding, etc.

1001 **repeater**

F: répéteur

S: repetidor

An equipment essentially including one or several amplifiers and/or *regenerators*, and associated devices, inserted at a point in a transmission medium.

Note – A repeater may operate in one or both directions of transmission.

1002 **analogue repeater; analog repeater**

F: répéteur analogique

S: repetidor analógico

A *repeater* for amplifying analogue signals or *digital signals* and capable of other functions, but excluding *regeneration* of *digital signals*.

1003 **regenerative repeater**

F: répéteur régénérateur

S: repetidor regenerativo

A *repeater* ensuring *regeneration* of *digital signals*, and capable of other functions.

Note – This definition is different from that given in Recommendation G.702 [1]. At the time when Recommendation G.702 was drafted, a suitable CCITT definition of *repeater* was not available. The ensemble of definitions given here makes it desirable to incorporate the *regenerative repeater* in the family of transmission systems, instead of defining it only as a device, as is the case in Recommendation G.702.

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* These definitions differ from those in the IEV, but Study Group 7 is of the opinion that they are more appropriate for the standard-frequency and time-signal service.

RESOLUTION 23-2 *

COLLABORATION WITH THE INTERNATIONAL ELECTROTECHNICAL COMMISSION ON GRAPHICAL SYMBOLS AND DIAGRAMS, USED IN TELECOMMUNICATIONS

(Question 2/CMV)

(1963-1978-1982)

The CCIR

UNANIMOUSLY DECIDES

that the CCIs should continue to cooperate in the work of the CCI/IEC Joint Working Group which has been set up to prepare, for international telecommunications:

- an approved list of graphical symbols for diagrams and for use on equipment;
- approved rules for the preparation of diagrams, charts and tables and for item designation,

IT BEING UNDERSTOOD THAT

within the Joint Working Group, the ITU (itself represented by equal numbers of members from the CCIR and CCITT) is represented on an equal footing with the IEC;

the Joint Working Group, while being fully representative, is as small as possible to be able to work effectively and quickly;

CCI members of the Joint Working Group are empowered to take decisions on questions relating to symbols and the rules referred to above, so that the publication of an approved list does not have to await formal approval by a following Plenary Assembly of the CCITT or CCIR.

OPINION 76 **

DOCUMENTARY LANGUAGE

(1982)

The CCIR,

CONSIDERING

(a) that the terms of reference of the CMV include "methodical classification" among the subjects allied to terminology;

(b) that further documentary languages have been developed to perform the same function as methodical classification, namely, the description of the subject of a document in such a way as to permit its retrieval;

(c) that the Working Party on the Telecommunications Documentation Centre set up under Resolution No. 47 of the Plenipotentiary Conference (Malaga-Torremolinos, 1973) recommended in its final Report to the Plenipotentiary Conference (Nairobi, 1982) that the system of documentation should be based on a thesaurus designed primarily to meet the specific requirements of the ITU, that the thesaurus should be multilingual (French, English, Spanish) and that its development should be the responsibility of the ITU;

(d) that the development and updating of a thesaurus are closely connected to the terminology work performed by the CMV, a thesaurus being a standardized vocabulary of terms arranged according to areas of knowledge,

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* The text of this Resolution is analogous to that of Recommendation A.13 of the CCITT.

** A similar text will be submitted to the CCITT as draft of new Opinion.

IS UNANIMOUSLY OF THE OPINION

that if the next Plenipotentiary Conference (Nairobi, 1982) gives the Secretary-General the task of establishing a documentation centre for telecommunications, representatives of the CMV should be invited to participate in the work of the Secretary-General related to the establishment of a thesaurus of telecommunications; the representatives should be given the tasks:

1. of ensuring that the Secretariat-General has at its disposal all the pertinent documents of the CCIs;

2. of making known to the Study Groups of the CCIs through the Special Rapporteurs for Terminology, members of Working Group CMV/1, work of interest to them and of returning their comments;

3. of reporting to the CMV of the progress of the project.

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ALPHABETICAL INDEX OF KEY WORDS AND TERMS OF VOLUME XIII (CMV)

(Note. – The alphabetical list of terms defined in CCIR Volumes appears already in the supplement to Recommendation 573 which is included in this Volume)

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