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INTERNATIONAL TELECOMMUNICATION UNION

CCIR

INTERNATIONAL
RADIO CONSULTATIVE
COMMITTEE

RECOMMENDATIONS AND REPORTS OF THE CCIR, 1986

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

XVIth PLENARY ASSEMBLY
DUBROVNIK, 1986

VOLUME XIII

VOCABULARY (CMV)



Geneva, 1986

CCIR

1. The International Radio Consultative Committee (CCIR) is the permanent organ of the International Telecommunication Union responsible under the International Telecommunication Convention "... to study technical and operating questions relating specifically to radiocommunications without limit of frequency range, and to issue recommendations on them..." (International Telecommunication Convention, Nairobi 1982, First Part, Chapter I, Art. 11, No. 83).

2. The objectives of the CCIR are in particular:

- a) to provide the technical bases for use by administrative radio conferences and radiocommunication services for efficient utilization of the radio-frequency spectrum and the geostationary-satellite orbit, bearing in mind the needs of the various radio services;
- b) to recommend performance standards for radio systems and technical arrangements which assure their effective and compatible interworking in international telecommunications;
- c) to collect, exchange, analyze and disseminate technical information resulting from studies by the CCIR, and other information available, for the development, planning and operation of radio systems, including any necessary special measures required to facilitate the use of such information in developing countries.



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**PLAN OF VOLUMES I TO XIV
XVITH PLENARY ASSEMBLY OF THE CCIR**

(Dubrovnik, 1986)

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.
VOLUMES 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-1	Land mobile service. Amateur service. Amateur-satellite service.
VOLUME VIII-2	Maritime mobile service.
VOLUME VIII-3	Mobile satellite services (aeronautical, land, maritime, mobile and radiodetermination). Aeronautical mobile service.
VOLUME IX-1	Fixed service using radio-relay systems.
VOLUME X-1	Broadcasting service (sound).
VOLUMES X/XI-2	Broadcasting-satellite service (sound and television).
VOLUMES X/XI-3	Sound and television recording.
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 XVIth 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 1986 edition, unless otherwise noted; i.e., only the basic number is shown.

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

Volumes I to XIV, XVIth Plenary Assembly, contain all the valid texts of the CCIR and succeed those of the XVth Plenary Assembly, Geneva, 1982.

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.

1.2 Recommendations

Number	Volume	Number	Volume	Number	Volume
48	X-1	367	II	478	VIII-1
80	X-1	368-370	V	479	II
106	III	371-373	VI	480	III
139	X-1	374-376	VII	481-484	IV-1
162	III	377, 378	I	485, 486	VII
182	I	380-393	IX-1	487-493	VIII-2
205	X-1	395-405	IX-1	494	VIII-1
215, 216	X-1	406	IV/IX-2	496	VIII-3
218, 219	VIII-2	407, 408	X/XI-3	497	IX-1
239	I	410-412	X-1	498	X-1
240	III	414, 415	X-1	500	XI-1
246	III	417	XI-1	501	X/XI-3
257	VIII-2	419	XI-1	502, 503	XII
265	X/XI-3	428	VIII-2	505	XII
266	XI-1	430, 431	XIII	508	I
268	IX-1	433	I	509, 510	II
270	IX-1	434, 435	VI	513-517	II
275, 276	IX-1	436	III	518-520	III
283	IX-1	439	VIII-2	521-524	IV-1
290	IX-1	441	VIII-3	525-530	V
302	IX-1	443	I	531-534	VI
305, 306	IX-1	444	IX-1	535-538	VII
310, 311	V	446	IV-1	539	VIII-1
313	VI	450	X-1	540-542	VIII-2
314	II	452, 453	V	546-550	VIII-3
326	I	454-456	III	552, 553	VIII-3
328, 329	I	457, 458	VII	555-557	IX-1
331, 332	I	460	VII	558	IV/IX-2
335, 336	III	461	XIII	559-562	X-1
337	I	463	IX-1	564	X/XI-3
338, 339	III	464-466	IV-1	565	XI-1
341	V	467, 468	X-1	566	X/XI-2
342-349	III	469	X/XI-3	567-572	XII
352-354	IV-1	470-472	XI-1	573, 574	XIII
355-359	IV/IX-2	473, 474	XII	575	I
362-364	II	475, 476	VIII-2	576-578	II

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1.2 *Recommendations (cont.)*

Number	Volume	Number	Volume	Number	Volume
579-580	IV-1	607, 608	XIII	642	X-1 + XII
581	V	609-611	II	643-644	X-1
582, 583	VII	612, 613	III	645	X-1 + XII
584	VIII-1	614	IV-1	646-647	X-1
589	VIII-2	615	IV/IX-2	648, 649	X/XI-3
591	VIII-3	616-620	V	650-652	X/XI-2
592-596	IX-1	621	VI	653-656	XI-1
597-599	X-1	622-624	VIII-1	657	X/XI-3
600	X/XI-2	625-631	VIII-2	658-661	XII
601	XI-1	632-633	VIII-3	662-666	XIII
602	X/XI-3	634-637	IX		
603-606	XII	638-641	X-1		

1.3 *Reports*

Number	Volume	Number	Volume	Number	Volume
19	III	319	VIII-1	491	XII
32	X-1	322	VI (¹)	493	XII
109	III	324	I	496, 497	XII
111	III	327	III	499	VIII-1
122	XI-1	336	V	500-501	VIII-2
137	IX-1	338	V	509	VIII-3
176, 177	III	340	VI (¹)	516	X-1
181	I	342	VI	518	VII
183	III	345	III	519-522	I
184	I	347	III	524-526	I
195	III	349	III	528	I
197	III	354-357	III	530	I
200	III	358	VIII-1	533, 534	I
203	III	363, 364	VII	535, 536	II
204, 205	IV-1	371, 372	I	536-541	II
208	IV-1	374-376	IX-1	542	VIII-1
209	IV/IX-2	378-380	IX-1	543	II
212	IV-1	382	IV/IX-2	546	II
214	IV-1	383-385	IV-1	548	II
215	X/XI-2	386-388	IV/IX-2	549-551	III
222	II	390, 391	IV-1	552-561	IV-1
224	II	393	IV/IX-2	562-565	V
226	II	395, 396	II	567	V
227-229	V	401	X-1	569	V
236	V	404, 405	XI-1	571	VI
238, 239	V	409	XI-1	574, 575	VI
249-251	VI	411, 412	XII	576-580	VII
252	VI (¹)	420	I	584, 585	VIII-2
253-255	VI	430-432	VI	588	VIII-2
258-260	VI	434-437	III	607	IX-1
262, 263	VI	439	VII	610	IX-1
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284, 285	IX-1	461	X-1	630	X/XI-3
287-289	IX-1	463-465	X-1	631-634	X/XI-2
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294	X/XI-3	472	X-1	639	XII
300	X-1	473	X/XI-2	642, 643	XII
302-304	X-1	476-478	XI-1	646-648	XII
311-313	XI-1	481-485	XI-1	651	I
314	XII	488	XII	653-657	I

(¹) Published separately.

1.3 *Reports (cont.)*

Number	Volume	Number	Volume	Number	Volume
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670, 671	I	797-799	X-1	950	X/XI-3
672-685	II	800	X/XI-3	951-955	X/XI-2
687	II	801, 802	XI-1	956	XI-1
692-697	II	803	X/XI-3	958, 959	XI-1
699, 700	II	804, 805	XI-1	961, 962	XI-1
701-704	III	807-812	X/XI-2	963, 964	X/XI-3
706, 707	IV-1	814	X/XI-2	965-970	XII
710-713	IV-1	815-823	XII	972-979	I
714-724	V	826-842	I	980-988	II
725-729	VI	843-854	II	989-996	III
730-732	VII	857	III	997-1004	IV-1
735, 736	VII	859-865	III	1005-1006	IV/IX-2
738	VII	867-875	IV-1	1007-1010	V
739-742	VIII-1	876, 877	IV/IX-2	1011-1015	VI
743, 744	VIII-2	879-880	V	1016, 1017	VII
747-749	VIII-2	882-885	V	1018-1025	VIII
751	VIII-3	886-895	VI	1026-1044	VIII-2
760-766	VIII-3	896-898	VII	1045-1051	VIII-3
768	VIII-3	899-906	VIII-1	1052-1057	IX-1
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774, 775	VIII-2	917-923	VIII-3	1073-1076	X/XI-2
778	VIII-1	925-929	VIII-3	1077-1089	XI-1
779-789	IX-1	930-934	IX-1	1090-1096	XII
790-793	IV/IX-2	936-942	IX-1		

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.

1.4 *Resolutions*

Number	Volume	Number	Volume	Number	Volume
4	VI	61	XIV-1	76	X-1
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15	I	63	VI	79-83	XIV-1
20	VIII-1	64	X-1	86, 87	XIV-1
23	XIII	66	XIII	88	I
24	XIV-1	71	I	89	XIII
26, 27	XIV-1	72, 73	V	90-95	XIV-1
33	XIV-1	74	VI	96	XI-1
39	XIV-1				

1.5 *Opinions*

Number	Volume	Number	Volume	Number	Volume
2	I	43	VIII-2	70-72	VII
11	I	45, 46	VI	73	VIII-1
14	IX-1	49	VIII-1	74	X-1
15	X-1	50	IX-1	75	XI-1
16	X/XI-3	51	X-1	77	XIV-1
22, 23	VI	56	IV-1	79-81	XIV-1
26-28	VII	59	X-1	82	VI
32	I	63	XIV-1	83	XI-1
35	I	64	I	84	XIV-1
38	XI-1	65	XIV-1	85	VI
40	XI-1	66	III	86	XIII
42	VIII-1	67-69	VI		

VI

1.6 Decisions

Number	Volume	Number	Volume	Number	Volume
2	IV-1	45	III	61	II
3-5	V	50	V	63	III
6	VI	51	X/XI-2	64	IV-1
9-11	VI	52	X-1	65	VII
18	XII	53, 54	I	66	XI-1
19	XIII	56	I	67, 68	XII
27	I	57	VI	69	VIII-1
32	VIII-3	58	XI-1	70	IV-1
42	XI-1	59	X/XI-3	71	VIII-3 + X-1
43	X/XI-2	60	XI-1	72	X-1 + XI-1

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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Note. — Questions, Study Programmes, Resolutions, Opinions and Decisions which already appear in numerical order in the table of contents, are not reproduced in this index.

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CONTAINING INFORMATION OF INTEREST
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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 (ISO).

1982-1986	<i>Chairman:</i>	M. THUÉ (France)
	<i>Vice-Chairmen:</i>	S. J. ARIES (United Kingdom)
		M. DUCOMMUN (Switzerland)
		J. M. PARDO HORNO (Spain)
1986-1990	<i>Chairman:</i>	M. THUÉ (France)
	<i>Vice-Chairmen:</i>	M. DUCOMMUN (Switzerland)
		V. MIRALLES MORA (Spain)
		T. MYLES (United Kingdom)

INTRODUCTION BY THE CHAIRMAN OF THE CMV

1. General

The Joint Study Group for Vocabulary (CMV) is a joint CCIR/CCITT Study Group, administered by the CCIR, and with the functions given below:

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.

XIV

2. The work of the CMV

During the period 1982-1986, the CMV held two meetings, in June 1984 and in November 1985 (see Annex I).

The June 1984 meeting was an Interim Meeting for the CCIR, but a Final Meeting for the CCITT, which held its VIIIth Plenary Assembly in November 1984. All the texts of interest to both CCIs were examined and adopted by that Plenary Assembly and were published in the CCITT Red Book (Volume I, Recommendations of the A and B Series, see Annex II).

The November 1985 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 the new or revised texts were approved by the XVth Plenary Assembly, subject to amendments in the case of Recommendations 607 and 662. The Plenary Assembly also adopted a new Opinion submitted directly to it (Opinion 86, see § 9.1). The list of current texts is given in the Table of Contents of this Volume. The purpose of this Introduction is to present the texts and briefly comment on them.

3. Terminology common to the CCIR and the CCITT (Section A)

3.1 At its June 1984 meeting, the CMV prepared Recommendation 662 which recommends that use should be made as far as possible of the terms defined in the "Telecommunications" (Series 700) chapters of the International Electrotechnical Vocabulary (IEV) with the meaning given in the definitions appearing in those chapters. Appendix I of this Recommendation gives a list of the chapters indicating which have been or which are being published. These chapters of the IEV were prepared by joint Groups of Experts within the framework of the CCI/IEC Joint Coordination Group for Vocabulary (JCG) (see § 9.1). It should be noted that two of the chapters of the IEV which the JCG is helping to prepare — i.e., Chapters 161 (Electromagnetic compatibility) and 191 (Reliability and maintainability) — will not be published in the 700 series but in the 100 (general) series since they go beyond the scope of telecommunications. The main terms defined in the 100 series are being published by the IEC in the form of a handbook*. Appendix II contains definitions of the most currently used general terms common to the CCIR and the CCITT; most of these terms are extracted from Chapters 701 (Telecommunications, channels and networks) or 702 (Oscillations and signals) of the IEV and the definitions are in principle identical to those of the IEV except in a few cases where they have been adapted to CCI requirements. The text of Appendix II comes from the former Report 971 (Geneva, 1982), amended or supplemented at Interim and Final Meetings to take account of the proposals of Study Groups or the progress made in the work of the Groups of Experts of the JCG; in particular, § 5 "Oscillations and waves" containing a number of definitions taken from the new Chapter 702 of the IEV was added at the Final Meeting and the XVth Plenary Assembly also added another section relating to availability and dependability and containing a number of terms and definitions taken from CCITT Recommendation G.106 prepared by the former Joint Study Group on Noise and Availability (CMBD).

3.2 New Recommendation 663 deals with the use of various terms linked with physical quantities such as "coefficient" and "factor". As usage often varies in the different working languages of the ITU, the Recommendation is mainly concerned with giving guidelines for each working language, at the same time giving the usage in the other two working languages.

4. Terminology specific to the CCIR — Radiocommunication Vocabulary (Section A)

The CMV revised Recommendation 573 taking into account contributions from the CCIR Study Groups and the work of various Groups of Experts of the JCG. The main modifications or additions are as follows:

4.1 In sub-section A3 (Space communication links), a definition for the term "*feeder-link*" has been added. This definition concerns several Study Groups (in particular 2, 4, 8, 10 and 11) and was discussed during the Interim Meetings without any agreement being reached. The aim was to extend the definition to links between a transportable earth station and a satellite — the present definition in the Radio Regulations (RR 109) concerns solely links between a fixed earth station and a satellite. In the case of a transportable station the problem of possible coordination before bringing into service arises; a solution was proposed by IWP 4/1 (Mr. D. Withers) with a text indicating that the location of the earth station may be either at a specified fixed point or within an area for which the necessary coordination has been previously carried out. This solution was accepted by Study Group 4 and then by Working Party 10-11S subject to the reference to coordination being contained in a note rather than in the definition itself (CMV definitions have to remain technical) and finally, after some hesitation,

* Note by the Secretariat: the handbook has been published by the IEC with the title "Vocabulary of Fundamental Concepts".

by Study Group 8 during the Final Meeting of the CMV thanks to the efforts of Mr. A. Sophianopoulos (Special Rapporteur for Terminology for Study Groups 1 and 4) and Mr. F. L. Rose (Special Rapporteur for Terminology, Study Group 8). The final text which appears in Recommendation 662 should be acceptable to all the Study Groups concerned and may be used as a basis for the revision of the present definition in the Radio Regulations at a future competent conference.

4.2 The definitions in sub-section A4 (Attenuations for a link) were revised taking into account the revision of Recommendation 310 by Study Group 5; the definition of the term "spreading loss" (F: *affaiblissement géométrique*; S: *pérdida geométrica*), which is independent of frequency, was added; it is specified because the English term "space loss" may have a different meaning involving frequency.

4.3 The definitions in sub-section A5 (Coverage area) have not been modified; they are compatible with the more specific definitions adopted by certain Study Groups. These definitions may be proposed to a forthcoming competent administrative conference for inclusion in the Radio Regulations in response to Recommendation No. 67 of the WARC-79 (see § 10.1).

4.4 A new sub-section B1 has been added; it contains terms relating to given sets of *radio channels* and their relative position in the frequency spectrum. A difficulty arose because of the use by Study Group 9 of the English term "interleaved" (Recommendation 592; F: *alterné*; S: *alternada*) to designate an arrangement of radio channels in which two adjacent channels are cross-polarized whereas the other Study Groups, particularly Study Groups 8, 10 and 11, use the same English term "interleaved" (F: *intercalé*; S: *intercalada*) to designate the addition of supplementary channels between the channels; in the latter case the term advocated by Study Group 9 was "interspersed", which might give rise to some confusion. The attention of Study Group 9 was drawn to this possible source of confusion and a generally acceptable solution was proposed to the Plenary Assembly to the effect that the term "interleaved" should be used by all the Study Groups.

4.5 A number of definitions in section C (Radiation and emission) have been modified to take account of the work of Group of Experts JCG-A and the Terminology Group of the CISPR (IEV 161) in whose work the JCG participates.

4.6 Section D (Transmitters and classes of emission) has not been modified with the exception of an editorial amendment proposed by Study Group 11.

4.7 In section E (Power and radiated power) the only change involves the addition of notes linking the radiated field strength and the radiated power. Sub-section E1 (Polarization) has been transferred to section G (Propagation).

4.8 In sub-section F0 (Noise) the definitions have been revised to take into account the more rigorous definitions established by Group of Experts JCG-A.

4.9 In sub-section F1 (Interference) use has been made of the recent work of the Terminology Group of the CISPR (IEV 161) reviewed by Group of Experts JCG-A.

4.10 The definitions in sub-section F2 (Signal/interference ratio) have been supplemented on the basis of proposals made by Study Groups 10 and 11.

4.11 Section G (Propagation) has been supplemented by the addition of a number of terms and definitions provided by Study Group 5 and by the addition of a sub-section on general terms relating to radio waves including terms from former sub-section E1 (Polarization) as well as various terms from Study Group 5. In addition, a number of definitions from the sub-section "Ionospheric propagation" into which the sub-section "Application to radiocommunications" has been incorporated, have been modified in the light of the work of Group of Experts JCG-D and the proposals of Study Group 6.

4.12 In sub-section H0 (Space radiocommunications – General terms), the definition of the term "deep space" has been modified in agreement with Study Group 2 to take account of technical developments. In agreement with Study Group 4, definitions of the angles associated with the position of spacecraft in relation to the Earth have been added.

4.13 Sub-section H3 (Space research – Earth exploration) has been supplemented by the definition of various types of satellite used for Earth exploration and a number of definitions have been modified to extend remote sensing to all electromagnetic waves (and not only radio waves).

4.14 In section J (Standard frequencies and time signals) an editorial amendment has been made in connection with the definition of universal time, in agreement with Study Group 7.

4.15 It was considered useful to retain Appendix A to Recommendation 573 which contains definitions of mobile service stations taken from the Radio Regulations.

4.16 The Complement to Recommendation 573, which gives an alphabetical list of all terms defined in CCIR texts indicating the source of each definition, has been updated following the XVIth Plenary Assembly.

5. Graphical symbols and diagrams (Section B)

5.1 Recommendation 461, which recommends the use of the graphical symbols and rules for the preparation of diagrams given in the publications of the IEC, has not been amended but the references to IEC publications have been updated particularly taking account of IEC Publication 617.

5.2 As regards the diagrams used for the specification and description of complex telecommunication systems, the CMV has prepared, in line with a Swedish proposal, a new Recommendation 664, which recommends the use of the Specification and Description Language (SDL). The SDL language is specified by the CCITT (Recommendations Z.100 to Z.104 and Annexes, Fascicles VI.10 and VI.11 of the Red Book) and it is desirable that it should be used whenever necessary by the Study Groups of both CCIs as well as by the relevant Technical Committees of the IEC and the ISO, to which this Recommendation has been transmitted.

6. Letter symbols, units and associated symbols (Section C)

6.1 The CMV has not modified Recommendation 430 relating to the use of the international system of units (SI) recommended by the ISO and the IEC or Recommendation 608 relating to the use of the letter symbols appearing in the relevant publication of the ISO and the IEC but the references to the publications of the two bodies have been updated. Attention is drawn in particular to the publication of two handbooks which are extremely useful for engineers: ISO Standards Handbook 2 – “Units of measurement”, 1982 and IEC Handbook “Letter symbols including conventions”, 1983.

6.2 Recommendation 607 concerning units relating to information quantities (bit, baud, etc.) has been slightly modified by the addition of the symbol Sh for shannon, recently adopted by IEC Technical Committee No. 25 and the inclusion of a new meaning for the English term byte (F: octet; S: octeto) adopted by ISO. In line with a French proposal, a new Recommendation 665 was prepared in agreement with CCITT Study Group II and in accordance with CCITT Recommendation E.600 with a view to defining the erlang, the unit of traffic intensity, and its symbol E.

6.3 Recommendation 431 on the nomenclature of frequency bands has been only slightly modified so as to refer to the use of Roman numerals by broadcasting organizations to designate the bands used for FM sound broadcasting and television bands (Bands I to V). Another note advises against the use of letters to designate certain frequency bands given the lack of standardization and the existence of a number of incompatible systems.

6.4 Recommendation 574 on the use of the decibel and the neper has been only slightly modified; a few amendments have been introduced to take account of various proposals, and in particular the conditions governing the use of the decibel to express voltage levels has been specified, in agreement with Study Group 10.

6.5 The CMV has prepared a new Recommendation 666 concerning the use of abbreviations in texts relating to telecommunications. It is recommended that abbreviations should not be used excessively and that the full meaning should be given the first time an abbreviation is used in a particular text. There are also two appendices: one contains a list of the abbreviations most commonly used in telecommunications together with their meaning, and the correspondence between the three working languages; the other gives a list of texts defining certain specific abbreviations (frequency bands, codes, etc.).

7. Documentary language

No specific action has been taken by the CMV in this connection; Opinion 76 was deleted by the Plenary Assembly as the Nairobi Plenipotentiary Conference (1982) did not approve the plan for an ITU Documentation Centre. The CMV would like the Secretariats of the CCIR and the CCITT to cooperate with the Languages Division and the General Secretariat with a view to updating the Glossary of Terms Used in Telecommunications and to advise the IEC in connection with the telecommunications part of the thesaurus on which Technical Committee No. 1 and the Central Office of the IEC have now started work.

8. Programme of work

The CMV does not propose any change in the text of the four Questions defining its work programme which concern the following topics:

- terms and definitions (Question 1/CMV),
- graphical symbols and diagrams (Question 2/CMV),
- units and letter symbols (Question 3/CMV),
- abbreviations and initials (Question 4/CMV).

Study Programme 1A/CMV (Technical terms in the Regulations and the Convention) has been slightly amended to include a reference to Resolution No. 11 of the Nairobi Plenipotentiary Conference.

9. Organization of work

9.1 Terminology

No change is proposed in Resolution 66 which defines the conditions governing cooperation with the Study Groups of both CCIs (particularly designation of a Special Rapporteur for Terminology for each Study Group) as well as cooperation with the IEC within the Joint CCI/IEC Coordination Group for Vocabulary (JCG) (see Annex III which gives further information on the JCG as well as its current membership).

Similarly, no change has been made to the text of Decision 19, which defines the terms of reference of Working Party CMV/1. This Working Party is made up of all the Special Rapporteurs for Terminology of the Study Groups of the two CCIs in addition to a few national collaborators; only Annex I listing members has been updated.

With regard to publication of the “Telecommunications” (Series 700) chapters of the International Electrotechnical Vocabulary (IEV), a number of suggested changes in presentation put forward by the JCG to make the IEV easier to use were not adopted by IEC Technical Committee No. 1 (Terminology), in particular proposals concerning the inclusion of “associated” terms and the possibility of using a distinctive typescript for the terms defined elsewhere (“underlined terms”). An opinion for submission to the IEC (Opinion 86) was adopted by the XVth Plenary Assembly on this subject.

Resolution 78 on the presentation of texts on terminology (with equivalents in the two other working languages) was maintained subject to deletion of the two existing Annexes (examples taken from the texts of each of the two CCIs), now considered unnecessary.

In line with a Spanish proposal, the CMV studied an initial version (which could be completed later) of Guidelines for the selection of terms and preparation of definitions. These Guidelines, which are based on general principles established by the ISO and the IEC, give information on the preparation of CCI texts on terminology and are contained in the new Resolution 89.

9.2 Graphical symbols and diagrams

No change has been made to Resolution 23 which defines the conditions governing cooperation with the IEC within the CCI/IEC Joint Working Group for Graphical Symbols and Diagrams (JWG). In liaison with IEC Technical Committee No. 3, the JWG prepares, for telecommunications, graphical symbols for diagrams and for use on equipment as well as rules for the preparation of diagrams. Administrations are invited to nominate representatives for the JWG to fill the vacant positions for CCI representatives.

9.3 Other means of expression

For work on letter symbols and units, the CMV cooperates with IEC Technical Committee No. 25 but is particularly concerned with the problems specific to telecommunications (frequencies, information quantities, logarithmic units). Account is also taken of ISO standards.

As regards documentary language, a study should be carried out concerning a telecommunications thesaurus in cooperation with IEC Technical Committee No. 1 (see § 7).

10. Preparation of Administrative Conferences

10.1 *World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and on the Planning of Space Services Utilizing it, Second Session (WARC ORB (2)).*

Within the framework of Study Programme 1A/CMV, the CMV compiled terms and definitions on space radiocommunications with a view to possible modification or additions to Article 1 of the Radio Regulations (Recommendation No. 72 of the WARC-79).

XVIII

The Special Rapporteurs for Terminology of the Study Groups concerned (mainly Study Groups 2, 4, 8, 10 and 11) are invited to comment on the CMV definitions in the CCIR meetings preparatory to the Conference.

10.2 *World Administrative Telegraph and Telephone Conference* (TT-88)

CCITT Study Groups I, II, III (and also VII and XVIII) are mainly concerned with the preparation of this Conference. The Special Rapporteurs for Terminology of these Study Groups are invited to coordinate their proposals on terminology within the framework of the Preparatory Committee (PC) for the Conference. A number of comments on the definition of services have been transmitted to Study Group 1 by the CMV with a view to the preparation of the WATTC.

It should be remembered that, in accordance with Resolution No. 11 of the Nairobi Plenipotentiary Conference, proposals for additions or changes which it might be desirable to make in the definitions contained in Annex 2 to the International Telecommunication Convention may be submitted to the WATTC for transmission by the ITU Administrative Council to the next Plenipotentiary Conference.

ANNEX I

ORGANIZATION OF THE WORK OF THE CMV

During the two meetings of the CMV mentioned in § 2 above, work was carried out in three Working Groups:

CMV A: Organization of terminology; terminology common to the CCIR and the CCITT (Chairman in 1984: Mr. S. J. Aries (United Kingdom); in 1985, Mr. T. Myles (United Kingdom)).

CMV B: Terminology specific to the CCIR: Radiocommunication Vocabulary (Chairman in 1984, Mr. J. Garrido Salles (Spain); in 1985, *ad interim* Mr. J. Schwob (France)).

CMV C: Related subjects: graphical symbols, letter symbols and abbreviations, quantities, units and associated symbols (Chairman: Mr. Ducommun (Switzerland)).

Mr. J. Schwob (France) was responsible for the secretariat of the Plenary Meetings. All texts were revised by an Editorial Group made up of Mr. S. J. Aries (1984) or Mr. T. Myles (1985) (United Kingdom), Mr. J. Garrido Salles and Mr. A. Prieto (Spain), Mr. J. Schwob and Mr. S. Lacharnay (France) and Mr. L. Casado-Tarancón (CCIR).

Mr. B. Vérove and Mr. L. Casado-Tarancón, Engineers in the Editorial Department of the CCIR Secretariat, were responsible for following the activities of the CMV. Outside meeting periods, liaison between experts was maintained by correspondence within Working Party CMV/1 whose terms of reference and composition are given in Decision 19 and its Annex I.

ANNEX II

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

(Málaga-Torremolinos, November 1984)

These texts are published in Volume I of the CCITT Red Book (Geneva, 1985).

SERIES A RECOMMENDATIONS

Organization of the work of the CCITT

<i>Recommendation No.</i>	<i>Title</i>	<i>CCIR equivalent</i>
A.10	Terms and definitions	Res. 66, D.19
A.12	Collaboration with the International Electrotechnical Commission on the subject of definitions for telecommunications	Res. 66
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

Recommendations relating to means of expression

<i>Recommendation No.</i>	<i>Abbreviated title</i>	<i>CCIR equivalent</i>
B.1	Letter symbols for telecommunications	Rec. 608
B.3	Use of the international system of units (SI)	Rec. 430
B.10	Graphical symbols and rules for the preparation of diagrams in telecommunications	Rec. 461
B.12	Use of the decibel and the neper	Rec. 574
B.13	Terms and definitions	Rec. 662
B.14	Terms and definitions* for information quantities in telecommunications . .	Rec. 607
B.15	Nomenclature of the frequency and wavelength bands used in telecommunications	Rec. 431
Suppl. No. 1	Abbreviations and initials of terms used in telecommunications	App. I to Rec. 666

ANNEX III

CCI/IEC JOINT COORDINATION GROUP FOR VOCABULARY

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

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

On 25 May 1986, the composition of the JCG was as follows:

Chairman:

M. THUÉ, Chairman of the CMV (France) CCI

Secretariat:

P. FEINTUCH, Secretary of IEC Technical Committee No. 1 (France) IEC
C. BRINTET, Assistant Secretary

*Members:***

L. ALGOTSSON (Sweden) IEC
P. BIRD (Sweden) CCI
M. DUCOMMUN (Switzerland) CCI
A. DUNN (Canada) IEC
J. GOETZ (United States of America) IEC
J. LOCHARD (France) IEC
V. MIRALLES MORA (Spain) CCI
T. MYLES (United Kingdom) CCI
J. SCHWOB (France) CCI
H. WAHL (Germany (Federal Republic of)) IEC

The "Telecommunications" part of the IEV was divided into a number of chapters constituting "Series 700" of the IEV. Groups of Experts were set up to prepare the various chapters. A list of the Groups operating in May 1986 is given below.

* During the XVIth Plenary Assembly "definitions" was replaced by "symbols".

** *Note by the Secretariat* — Since the XVIth Plenary Assembly, Mr. R. ZAPUTOWICZ (United States of America) has been appointed as member for the CCIs (in place of Mr. G. WALLENSTEIN (retired in 1987)) and Mr. H. WAHL (Germany (Federal Republic of)) has been replaced by Mr. H. WEVER.

JCG WORKING GROUPS – SUBJECTS DEALT WITH – RESPONSIBLE OFFICERS

(The IEV chapter numbers are shown in parentheses)

Group A	– Telecommunications, channels and networks (701)	T. MYLES (United Kingdom)	(2)
	– Oscillations, signals and related devices (702)		(3)
Group C	– Integrated services digital networks (716)	K. HARRISON (United Kingdom)	(2)
Group D	– Radio wave propagation (705)	L. BOITHIAS (France)	(4)
Group F	– Antennas (712)	E. GILLESPIE (United States of America)	(2)
Group G/K *	– Radiocommunications: Transmitters, receivers, networks and operation (713-716)		(5)
Group H	– Switching (714)		(2)
Group J	– Teletraffic trunking and operating (715)	G. LANGER (France)	(3)
Group M	– Telegraphy and data communication (721)	R. DAUDE (France)	(2)
Group N	– Telephony (722)		(2)
Group O	– Optical communications (728)	H. S. V. REEVES (United Kingdom)	(4)
Group R	– Broadcasting (723)	S. LACHARNAY (France)	(4)
Group T	– Space radiocommunications (725)	D. J. WITHERS (United Kingdom)	(1) (4)
Group W	– Transmission lines and waveguides (726)		(1) (5)
Group Y	– Reliability, maintainability and quality of service (191)	K. STRANDBERG (Sweden)	(3)
Group P	– Teleprocessing and telematics	R. E. BRETT** (Canada)	(5)

Status of IEV chapter:

- (1) Published
- (2) Being published
- (3) In the process of approval
- (4) In preparation
- (5) Group being established

* *Note by the Secretariat.* – At the JCG meeting in October 1986, Mr. P. GUILLOT (France) was appointed as Secretary of Group G/K (radiocommunications).

** Acting member.

SECTION CMV A: TERMINOLOGY

Recommendations

RECOMMENDATION 573-2

RADIOCOMMUNICATION VOCABULARY

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

(1978-1982-1986)

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.

Only terms and definitions contained in the Radio Regulations should be used when applying the Regulations.

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 (also an alphanumeric reference), for the terms of this Recommendation.

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 attenuation in a radio link
- A5 — Coverage area and associated terms

B Frequencies and bandwidths

- B0 — Frequency bands
- B1 — Arrangement of radio channels

- C Radiation and emission
- D Transmitters and classes of emission
- E Power and radiated power
- 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 – Terms related to radio waves
 - G1 – Tropospheric propagation
 - G2 – Ionospheric propagation
- H Space radiocommunications
 - H0 – General terms
 - H1 – Types 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 **radiocommunication**; *radiocommunication*; *radiocomunicación*
(CONV, MOD)
(RR 7, MOD) Telecommunication by means of radio waves.
Note. – The definition of the term “telecommunication” is included in Appendix II of Recommendation 662 dealing with general terms.
- A02 **radio waves, hertzian waves**; *ondes radioélectriques, ondes hertziennes; ondas radioeléctricas, ondas hertzianas*
(RR 6, MOD)

An electromagnetic wave propagated in space without artificial guide and having by convention a frequency lower than 3000 GHz.
Note. – The electromagnetic waves having frequencies around 3000 GHz may be regarded either as radio waves or optical waves.
- A03 **radio**; *radio, radioélectrique; radio*
(CONV, MOD)
(RR 5, MOD) Pertaining to the use of radio waves.
Note. – In French and in Spanish “radio” is always a prefix.
- A04 **(radio) station**; *station (radioélectrique); estación (radioeléctrica)*
(RR 58 (MOD))

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 **satellite link** ; *liaison par satellite; enlace por satélite*
(RR 107)

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 **up link** ; *liaison montante; enlace ascendente*
(RR 107, MOD)

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

A31b **down link** ; *liaison descendante; enlace descendente*
(RR 107, MOD)

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

A31c **feeder link** * ; *liaison de connexion; enlace de conexión*
(RR 109, MOD)

A radio link from an earth station at a given location to a space station, or *vice versa*, conveying information for a space radiocommunication service other than for the fixed-satellite service.

Note 1. — The given location may be at a specified fixed point, or within specified areas, coordinated according to the Radio Regulations.

Note 2. — Examples of feeder links:

- an up link for a broadcasting satellite;
- a down link for a data collection or Earth exploration satellite;
- an up link and down link between a coast earth station and a satellite in the maritime mobile-satellite service.

A32 **multi-satellite link** ; *liaison multisatellite; enlace multisatélite*
(RR 108)

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 entre satélites*

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

A34 **satellite system** ; *système à satellite; sistema de satélites*
(RR 105, MOD)

A space system using one or more artificial satellites.

Note. — If the primary body of the satellite or satellites of a specific system is not the Earth, it should be identified.

A35 **space system** ; *système spatial; sistema espacial*
(RR 104)

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

A36 **satellite network** ; *réseau à satellite; red de satélite*
(RR 106)

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

* The above proposed definition should be brought to the attention of Study Groups 2, 4, 8, 9, 10 and 11.

Sub-section A4 – Terms concerning attenuation in a radio link *

A41 **total loss** (of a radio link); *affaiblissement global (d'une liaison radioélectrique); pérdida total (de un enlace radioeléctrico)**

(Symbol: L_t or A_t)

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 antenna feed lines.

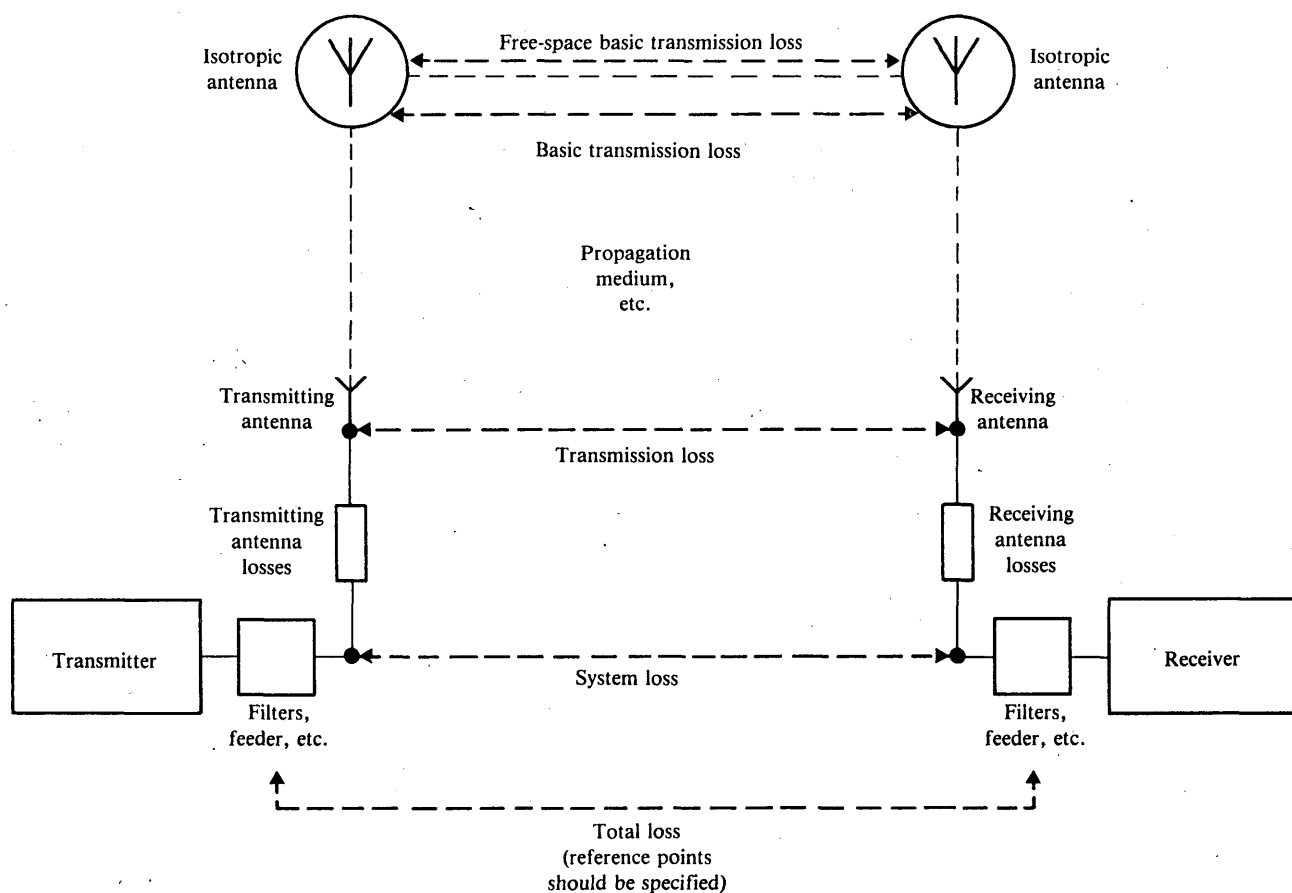


FIGURE 1 – Graphical depiction of terms used in the transmission loss concept

A42 **system loss**; *affaiblissement entre bornes 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 and the resultant radio frequency signal power available at the terminals of the receiving antenna.

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

Note 1. — The available power is the maximum real power which a source can deliver to a load i.e. the power which would be delivered to the load if the impedances were conjugately matched.

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

$$L_s = 10 \lg (p_i/p_a) = P_i - P_a \quad \text{dB} \quad (1)$$

where:

p_i : radio frequency power input to the terminals of the transmitting antenna;

p_a : resultant radio frequency signal power available at the terminals of the receiving antenna.

Note 3. — The system loss excludes losses in feeder lines but includes all losses in radio-frequency circuits associated with the antenna, such as ground losses, dielectric losses, antenna loading coil losses and terminating resistor losses.

A43
(Rec. 341, Vol. V)

transmission loss (of a radio link); *affaiblissement de transmission (d'une liaison radioélectrique); pérdida de transmisión (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, assuming that the antenna directivity characteristics are retained.

Note 1. — Transmission loss is equal to system loss minus the loss in the radio-frequency circuits associated with the antennas.

Note 2. — The transmission loss may be expressed by:

$$L = L_s - L_{tc} - L_{rc} \quad \text{dB} \quad (2)$$

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 $10 \lg (r'/r)$, 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); affaiblissement 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 and the power, available from an isotropic receiving antenna.

Note 2. — The effect of the local ground close to the antenna is included in computing the antenna gain, but not in the basic transmission loss.

A45
(Rec. 341, Vol. V)

free space basic transmission loss; *affaiblissement d'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:

$$L_{bf} = 20 \lg \left(\frac{4\pi d}{\lambda} \right) \quad \text{dB} \quad (3)$$

A46 **ray path transmission loss; affaiblissement de transmission pour un trajet radioélectrique; pérdida de transmisión en el trayecto de un rayo**
(Rec. 341, Vol. V)

(Symbol: L_t or A_t)

The transmission loss for a particular ray propagation path, equal to the basic transmission loss minus the transmitting and receiving antenna gains in the ray path directions.

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

$$L_t = L_b - G_t - G_r \quad \text{dB} \quad (4)$$

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 **loss relative to free space; affaiblissement par rapport à l'espace libre (d'une liaison radioélectrique); pérdida relativa al espacio libre**
(Rec. 341, Vol. V)

(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:

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

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);
- *diffraction loss* as for ground waves;
- *effective reflection or scattering loss*, as in the ionospheric case including the results of any focusing or defocusing due to curvature of a reflecting layer;
- *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 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.

A48 **spreading loss; affaiblissement géométrique, atténuation géométrique; pérdida geométrica**

The attenuation of an electromagnetic wave due uniquely to the fact that with increasing distance the energy is distributed over a wider area.

Note. — In a homogeneous and isotropic medium, the spreading loss is characterized by a decrease of the power flux-density in proportion to the reciprocal of the square of the distance to the source.

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: characteristics 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” cannot be simply applied to a space station on board a non-geostationary satellite for which further study is necessary.

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 separate service areas involving both reception and/or transmission, may be associated with 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 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 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

Sub-section B0 – Frequency bands

B01 (radio frequency) **channel, RF channel**; *canal radioélectrique, radiocanal, canal RF; radio-canal, canal radioeléctrico, canal RF*

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. – Recommendation 662 defines the general term “frequency channel” (Term 2.05).

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 fréquences 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 D02)

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%.

Sub-section B1 – Arrangement of radio channels

In the definitions which follow, the expression “given set of radio channels” may be considered to refer to similar phrases used by several Study Groups, for example:

- Study Group 9: Arrangement of radio channels;
- Study Groups 4, 8, 10, 11: Frequency plan;
- Study Group 2: Channel plan.

The term “characteristic frequency” refers to RR 143, “A frequency which can be easily identified and measured in a given emission”. In some Study Groups, the term “characteristic frequency” may, for example, also refer to “centre frequency” or “carrier frequency”.

B11 **adjacent channel ; *canal adjacent; canal adyacente***

In a given set of radio channels, the RF channel whose characteristic frequency is situated next above or next below that of a given channel.

Note 1. — The adjacent channel situated above the given channel is known as the “upper adjacent channel” and the one below it as the “lower adjacent channel”.

Note 2. — Two adjacent channels may have part of the frequency spectrum in common and this may be referred to as frequency overlap.

B12 **second adjacent channel ; *deuxième canal adjacent; segundo canal adyacente***

In a given set of radio channels, the RF channel whose characteristic frequency is situated next above that of the upper adjacent channel or next below that of the lower adjacent channel.

B13 **co-channel ; *cocanal, cofréquence; cocanal***

Refers to the use of the same RF channel by two or more emissions.

B14 **orthogonal co-channel ; *cocanal (orthogonal); cocanal (ortogonal)***

Refers to the use of the same RF channel by two emissions with orthogonal polarizations, for the transmission of two independent signals.

B15 **channel spacing ; *espacement entre canaux; separación de canales***

In a given set of radio channels, the difference in frequency between the characteristic frequencies of two adjacent channels.

B16 **offset ; *décalé; desplazado***

In a given set of radio channels, this term refers to a change of the characteristic frequency of a radio-frequency channel in relation to its nominal frequency, by a specified value which is generally small compared to the channel spacing.

B17 **interleaved ; *intercalé; intercalado***

In a given set of radio channels, this term refers to the insertion of additional channels between the main channels (or each RF channel and its adjacent channels), the characteristic frequencies of the additional channels being different from those of the main channels by a specified value, generally a significant portion (e.g. one half) of the nominal channel spacing.

B18 **alternated (polarization) ; *(à polarisation) alternée; (con polarización) alternada***

In a given set of radio channels, this term refers to an arrangement of channels in which two adjacent channels have orthogonal polarizations.

SECTION C — RADIATION AND EMISSION

C01 **radio-frequency radiation ; *rayonnement (radioélectrique); radiación (radioeléctrica)***
(RR 131, MOD)

1. The phenomenon by which energy in the form of electromagnetic waves, in the radio-frequency range, emanates from a source into space.
2. Energy transferred through space in the form of electromagnetic waves in the radio-frequency range.

Note. — By extension the term “radio-frequency radiation” sometimes also covers induction phenomena.

- C02
(RR 132, MOD) **emission**; *emission*; *emisión*
1. Radiation in the case where the source is a radio transmitter.
 2. Radio waves or signals produced by a radio transmitting station.
- Note 1.* — The energy from the local oscillator of a radio receiver if transferred to external space, is a radiation and not an emission.
- Note 2.* — In radiocommunication, the French term «émission» applies only to intentional radiation.
- C03
(RR 138) **out-of-band emission**; *émission 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*; *emisión 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
- $$f = pf_1 + qf_2 + rf_3 \dots$$
- 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 $|p| + |q| + |r| + \dots$ is the order of an individual intermodulation product.

SECTION D – TRANSMITTERS AND CLASSES OF EMISSION

- D01 **(radio) transmitter**; *émetteur (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 **single sideband emission, SSB emission; *émission à bande latérale unique, émission BLU; emisión de banda lateral única, emisión BLU***
(RR 134)

An amplitude modulated emission with one sideband only.

D05 **full carrier emission; *émission 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; *émission 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; *émission 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 suppressed 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; *émission à bande latérale résiduelle; emisión con banda lateral residual***

An emission, usually amplitude-modulated, containing the complete sideband on one side of the carrier and a vestigial sideband on the other.

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

E01 **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)***
(RR 151)

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 **mean power (of a radio transmitter); *puissance moyenne (d'un émetteur radioélectrique); potencia media (de un transmisor radioeléctrico)***
(RR 152)

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 **carrier power** (of a radio transmitter); *puissance (de la) porteuse (d'un émetteur radio-électrique)*; *potencia de la portadora (de un transmisor radioeléctrico)*
(RR 153, MOD)

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 **antenna gain**; *gain d'une antenne*; *ganancia de una antena*
(RR 154)

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 **cymomotive force (c.m.f.)** (in a given direction); *force cymomotrice (f.c.m.) (dans une direction donnée)*; *fuerza cimomotriz (f.c.m.) (en una dirección dada)*
(Rec. 561, Vol. X)

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 una 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 **equivalent isotropically radiated power (e.i.r.p.)**; *puissance isotrope rayonnée équivalente (p.i.r.e.)*; *potencia isotropa radiada equivalente (p.i.r.e.)*
(RR 155, MOD)

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).

Note. — The isotropic antenna, when fed with a power of 1 kW, is considered to provide an e.i.r.p. of 1 kW in all directions and to produce a field strength of 173 mV/m at 1 km distance.

E08 **effective radiated power (e.r.p.)** (in a given direction); *puissance apparente rayonnée (p.a.r.)* (RR 156, MOD) (*dans une direction donnée*); *potencia radiada aparente (p.r.a.)* (*en una dirección dada*)

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

Note. — The reference antenna, when fed with a power of 1 kW, is considered to radiate an e.r.p. of 1 kW in any direction in the equatorial plane and produces a field strength of 222 mV/m at 1 km distance.

E09 **effective monopole radiated power (e.m.r.p.)** (in a given direction); *puissance apparente rayonnée sur une antenne verticale courte (p.a.r.v.)* (RR 157, MOD) (*dans une direction donnée*); *potencia radiada aparente referida a una antena vertical corta (p.r.a.v.)* (*en una dirección dada*)

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

Note. — The reference antenna, when fed with a power of 1 kW, is considered to radiate an e.m.r.p. of 1 kW in any direction in the perfectly conducting plane and produces a field strength of 300 mV/m at 1 km distance (equivalent to a c.m.f. of 300 V).

SECTION F — RECEIVERS, NOISE AND INTERFERENCE

Sub-section F0 — Noise

F01 **noise temperature** (of a one-port network); *température de bruit (d'un monoporte)*; *temperatura de ruido (de una red con una sola puerta)*

The available noise power in a specified frequency band at the terminals of a given one-port network, divided by the product of Boltzmann's constant and the bandwidth.

Note 1. — If the one-port network has an impedance with a positive real part, its noise temperature equals the thermodynamic temperature to which a resistor equal in value to this real part should be brought in order to obtain the same available noise power.

Note 2. — A receiving antenna, or an antenna together with a receiver, can, when viewed from the output, be considered as a one-port network.

F02 **(equivalent) noise temperature** (of a linear two-port network); *température (équivalent) de bruit (d'un biporte linéaire)*; *temperatura (equivalente) de ruido (de una red lineal con dos puertas)*

The amount by which the noise temperature of a one-port network connected to the input of a given two-port network would have to be increased, if the thermal noise due to this one-port network were the only source of noise, in order to cause the noise power in a specified frequency band to be the same at the output of the two-port network.

F03 **noise factor, noise figure** (of a linear two-port network); *facteur de bruit (d'un biporte linéaire)*; *factor de ruido (de una red lineal con dos puertas)*

For a given two-port network, the quantity F defined by the formula:

$$F = 1 + T/T_0$$

where T is the equivalent noise temperature of the two-port network in a specified frequency band, and T_0 the reference temperature (by convention $T_0 = 290$ K).

Note 1. — If the equivalent noise temperature of the two-port network is, in practice, independent of frequency, over the specified frequency band, F is the ratio of the noise power at the output of the network to the noise which would be present at the output if the only source of noise was a one-port network connected to the input.

Note 2. — The value of the ratio F may be expressed in decibels. In English, the term "noise factor" is generally employed when the ratio is expressed arithmetically, and "noise figure" is employed when the ratio is expressed in decibels.

Sub-section F1 – Interference

F11a **radio (frequency) noise; *bruit radioélectrique; ruido radioeléctrico***

A time-varying electromagnetic phenomenon having components in the radio-frequency range, apparently not conveying information and which may be superimposed on, or combined with, a wanted signal.

Note 1. – In certain cases a radio-frequency noise may convey information on some characteristics of its source, for example its nature and location.

Note 2. – An aggregate of unwanted signals may appear as radio-frequency noise, when they are not separately identifiable.

F11b **radio-frequency disturbance; *perturbation radioélectrique, parasite (radioélectrique); perturbación electromagnética, parásito (electromagnético)***

Any electromagnetic phenomenon having components in the radio-frequency range, which may degrade the performance of a device, equipment or system, or affect adversely living or inert matter.

Note. – A radio-frequency disturbance may be a radio-frequency noise, an unwanted signal or a change in the propagation medium itself.

F11c **radio-frequency interference (RFI); *brouillage (radioélectrique); interferencia (radioeléctrica)***

Degradation of the reception of a wanted signal caused by a radio-frequency disturbance.

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”.

Note 3. – The English words “interference” and “disturbance” are often used indiscriminately; the expression “radio-frequency interference” is also commonly applied to a radio-frequency disturbance or to an unwanted signal.

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 **signal-to-interference ratio; *rapport signal sur brouillage, rapport signal/brouillage; relación señal/interferencia***

The ratio of the wanted signal to the interfering signals and noise measured under specified conditions and at a specified point.

Note 1. – A distinction is made, for example, between:

- at the receiver input, the RF signal-to-interference ratio;
- at the receiver output, the AF signal-to-interference ratio and the VF signal-to-interference ratio.

Note 2. – In each individual case, the noise and interfering signals taken into account should be specified.

Note 3. – The term “signal-to-disturbance ratio” or its abbreviated form “signal/disturbance ratio”, which is already used for electromagnetic compatibility, may be used as a synonym.

F22

protection ratio ; rapport de protection ; relación de protección

The minimum value of the signal-to-interference ratio required to obtain a specified reception quality under specified conditions and at a specified point.

Note 1. — Various CCIR Recommendations contain definitions for specific applications. The minimum value is usually laid down in these Recommendations and in 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 radio-frequency disturbance or the noise and interfering signals;
- the receiver and antenna characteristics;
- the propagation conditions.

Note 3. — A distinction is made for example between:

- the RF protection ratio;
- the VF protection ratio;
- the AF protection ratio.

F23

protection margin ; marge de protection ; margen de protección

The difference between the signal-to-interference ratio and the protection ratio, these ratios being expressed in logarithmic form.

Note 1. — Generally, care is taken to ensure that the difference between the ratios is positive to ensure reliability of communication.

Note 2. — Various Recommendations contain definitions for specific applications (e.g. Recommendation 566).

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

F31

minimum usable field-strength, [minimum usable power flux-density]; champ minimal utilisable, [puissance surfacique minimale utilisable]; intensidad de campo mínima utilizable, [densidad de flujo de potencia mínima utilizable]

(Symbols: E_{min} and 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, [usable power flux-density]; champ utilisable, [puissance surfacique utilisable]; intensidad de campo utilizable, [densidad de flujo de potencia utilizable]

(Symbols: E_u and 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, [reference usable power flux-density];** *champ utilisable de référence, [puissance surfacique utilisable de référence]; intensidad de campo de referencia utilizable, [densidad de flujo de potencia de referencia utilizable]*

(Symbols: E_{ref} and 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 — Terms related to radio waves

G01 **cross-polarization; transpolarisation; transpolarización, polarización cruzada**

The appearance, in the course of propagation, of a polarization component which is orthogonal to the expected polarization.

G02 **cross-polarization discrimination; discrimination de polarisation, découplage de polarisation; discriminación por polarización**

For a radio wave transmitted with a given polarization, the ratio at the reception point of the power received with the expected polarization to the power received with the orthogonal polarization.

Note. — The cross polarization discrimination depends both on the characteristics of the antennas and on the propagation medium.

G03 **cross-polarization isolation; isolement de polarisation; aislamiento por polarización**

For two radio waves transmitted with the same power and orthogonal polarization, the ratio at the reception point, of the power received from one of the waves to the power from the other wave, in the expected polarization of the first wave.

Note. — The cross-polarization isolation depends both on the characteristics of the antennas and on the propagation medium.

G04 **depolarization; dépolarisation; despolarización**

A phenomenon by virtue of which all or part of the power of a radio wave transmitted with a defined polarization may no longer have a defined polarization after propagation.

G05 **right-hand (clockwise)-polarized wave; onde à polarisation dextrorsum, onde à polarisation dextrogyre; onda de polarización dextrógira (en el sentido de las agujas del reloj)**

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.

- G06 **left-hand (anti-clockwise)-polarized wave**; *onde à polarisation sinestrorsum, onde à polarisation lévogyre; onda de polarización levógira (en el sentido contrario de las agujas del reloj)*

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.

Sub-section G1 – Tropospheric propagation

- G11 **free-space propagation**; *propagation en espace libre; propagación en espacio libre*
(Rec. 310, Vol. V)

Propagation of an electromagnetic wave in a homogeneous ideal dielectric medium which may be considered of infinite extent in all directions.

Note. – For propagation in free space at a relatively great distance from the source, the magnitude of each vector of the electromagnetic field decreases in any given direction in proportion to the reciprocal of the distance from the source.

- G12 **line-of-sight propagation**; *propagation en visibilité directe; propagación con visibilidad directa*
(Rec. 310, Vol. V)

Propagation between two points for which the direct ray is sufficiently clear of obstacles for diffraction to be of negligible effect.

- G13 **troposphere**; *troposphère; troposfera*
(Rec. 310, Vol. V)

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.

- G14 **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.

- G15 **radio horizon**; *horizon radioélectrique; horizonte radioeléctrico*
(Rec. 310, Vol. V)

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

- G16 **trans-horizon propagation**; *propagation (troposphérique) transhorizon; propagación (troposférica) transhorizonte*
(Rec. 310, Vol. V)

Tropospheric propagation between points close to the ground, the reception point being beyond the radio horizon of the transmission point.

Note. – Trans-horizon propagation may be due to a variety of tropospheric mechanisms, such as diffraction, scattering, reflection from tropospheric layers. However ducting is not included because in a duct there is no radio horizon.

- G17 **tropospheric radio-duct**; *conduit troposphérique; conducto radioeléctrico troposférico*
(Rec. 310, Vol. V)

A quasi-horizontal stratification in the troposphere within which radio energy of a sufficiently high frequency is substantially confined and propagates with much lower attenuation, than would be obtained in a homogeneous atmosphere.

- G18 **ducting**; *propagation troposphérique guidée; propagación troposférica guiada (por conducto)*
(Rec. 310, Vol. V)

Guided propagation of radio waves inside a tropospheric radio-duct.

- G19 **tropospheric-scatter propagation**; *propagation par diffusion troposphérique; propagación por dispersión troposférica*
(Rec. 310, Vol. V)

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

G19a **precipitation-scatter (propagation);** *propagation par diffusion sur les précipitations; propagación por dispersión debida a las precipitaciones*
(Rec. 310, Vol. V)

Tropospheric propagation due to scattering caused by hydrometeor particles, mainly rain.

G19b **multipath propagation;** *propagation par trajets multiples; propagación por trayectos múltiples*
(Rec. 310, Vol. V)

Simultaneous propagation by way of a number of transmission paths.

G19c **ground wave;** *onde de sol; onda de superficie*

A radio wave which propagates in the troposphere and which is mainly due to diffraction around the Earth, basically determined by the properties of the ground.

Sub-section G2 — Ionospheric propagation

G21 **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 produce significant modification of the propagation of radio waves in certain frequency bands.

Note. — The Earth's ionosphere extends from a height of about 50 km to 2000 km.

G22 **ionospheric propagation;** *propagation ionosphérique; propagación ionosférica*

Radio propagation involving the ionosphere.

G23 **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.

G24 **trans-ionospheric propagation;** *propagation transionosphérique; propagación transionosférica*

Radio propagation between two points situated below and above the height of the maximum electron density of the ionosphere.

G25 **ionospheric scatter propagation;** *propagation par diffusion ionosphérique; propagación por dispersión ionosférica*

Ionospheric propagation involving scatter from irregularities in the electron density in the ionosphere.

G26 **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.

G27 **ionospheric wave;** *onde ionosphérique; onda ionosférica*

A radio wave returned to the Earth by ionospheric reflection.

G28 **hop (ionospheric propagation);** *bond (saut) (en propagation ionosphérique); salto (en propagación ionosférica)*

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.

G29 **basic MUF; *MUF de référence; MUF básica***

(Rec. 373, MOD,
Vol. VI)

The highest frequency at which a radio wave can propagate between given terminals on or near the surface of the Earth on a specified occasion, by ionospheric refraction alone.

Note. — See Note of term G30 “operational MUF”.

G30 **operational MUF; *MUF d'exploitation; MUF de explotación***

(Rec. 373, MOD,
Vol. VI)

The highest frequency that would permit acceptable operation of a radio service by ionospheric propagation, between given terminals on or near the surface of the Earth at a given time, under specified working conditions (such as antenna types, transmitter power, class of emission, information rate and required signal-to-noise ratios).

Note. — The term MUF is the abbreviation of “maximum usable frequency”. Used alone, it means: “operational MUF”.

G31 **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 under specified operating conditions between two points on or near the surface of the Earth at a given time.

Note. — The most important operating conditions are the class of emission, transmitter, receiver, and antenna characteristics, and noise intensity.

SECTION H — SPACE RADIOCOMMUNICATIONS

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

H01 **spacecraft; *engin spatial; vehículo espacial***

(RR 170)

(Rep. 204, Vol. IV)

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

H02 **deep space; *espace lointain; espacio lejano***

(RR 169, MOD)

Space at distances from the Earth equal to, or greater than 2×10^6 km.

Note. — In 1963, the term “deep space” was defined as follows:

“Space at distances from the Earth approximately equal to, or greater than, the distance between the Earth and the Moon” (RR 169).

In order to take account of technical progress, and to ensure a better use of frequencies, it was proposed that the original definition be changed. The new definition should be proposed for a forthcoming revision of Article 1 of the Radio Regulations.

H03 **space probe; *sonde spatiale; sonda espacial***

(Rep. 204, Vol. IV)

A spacecraft designed for making observations or measurements in space.

H04 **satellite; *satellite; satellite***

(RR 171 + Note)

(Rep. 204, Vol. IV)

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.

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

- 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 (RR 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); *inclinaison (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 (d'un satellite)*; *periodo (de un satélite)*
- 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 [perigee]**; *altitude de l'apogée [du périgée]*; *altitud del apogeo [del perigeo]*
- The altitude of the apogee [perigee] above a specified hypothetical reference surface serving to represent the surface of the Earth.
- H09a
(Rep. 204, Vol. IV) **geocentric angle**; *angle géocentrique*; *ángulo geocéntrico*
- The angle formed by imaginary straight lines that join any two points with the centre of the Earth.
- H09b
(Rep. 204, Vol. IV) **topocentric angle**; *angle topocentrique*; *ángulo topocéntrico*
- The angle formed by imaginary straight lines that join any two points in space with a specific point on the surface of the Earth.
- H09c
(Rep. 204, Vol. IV) **exocentric angle**; *angle exocentrique*; *ángulo exocéntrico*
- The angle formed by imaginary straight lines that join any two points with a specific point in space.
- 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 **synchronized satellite, phased satellite** (deprecated); *satellite synchronisé, satellite en phase* (deprecated); *satélite sincronizado, satélite en fase* (deprecated)

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 **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 **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 **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 **sub-synchronous [super-synchronous] satellite**; *satellite sous-synchrone [super-synchrone]; satélite subsincrónico [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 **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 **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 **geostationary satellite orbit**; *orbite des satellites géostationnaires; órbita de los satélites geoestacionarios*

The unique orbit of all geostationary satellites.

- H23 **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 **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 **frequency re-use satellite network**; *réseau à satellite à réutilisation de fréquence*; *red de satélites con reutilización de frecuencias*
(Rep. 204, Vol. IV)

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 **active sensor**; *détecteur actif, capteur actif; sensor activo*
(RR 174, MOD)

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 electromagnetic waves.

Note. – The definitions given in RR 174 and 175 are modified by changing the phrase “radio waves” to “electromagnetic waves”. From a technical point of view, the change is necessary because some remote sensors make measurements at wavelengths that correspond to frequencies above the upper limit of radio waves, conventionally fixed at 3000 GHz.

H32 **passive sensor**; *détecteur passif, capteur passif; sensor pasivo*
(RR 175, MOD)

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 electromagnetic waves of natural origin.

Note. – See Note for term H31.

H33 **data relay satellite**; *satellite relais de données; satélite de retransmisión de datos*

A satellite whose main purpose is the relay of data from one or more mission satellites or space probes to one or more earth stations. It may also provide for communication in the other direction. Additionally, it may be used as a relay for the space operation service.

Note. – Data relay satellites are generally geostationary.

H34 **data collection satellite**; *satellite de collecte de données; satélite de adquisición de datos*

A satellite whose main purpose is the collection of data from stations on the Earth or in the atmosphere of the Earth, and subsequent forwarding of those data to one or more earth stations. It may also provide for communication in the other direction.

H35 **remote sensing satellite**; *satellite de télédétection; satélite de teledetección*

A satellite whose purpose is remote observation by reception of electromagnetic waves using active or passive sensors (these two types of sensors are defined in this Recommendation 573 – H31 and H32).

Sub-section H4 – Broadcasting

H41 **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)*
(RR 123)

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 **community reception** (in the broadcasting-satellite service); *reception communautaire (dans le service de radiodiffusion par satellite)*; *recepción comunal (en el servicio de radiodifusión por satélite)*
(RR 124)

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 limited area.

H43 direct distribution ; *distribution directe; distribución directa*(Rec. 566 (MOD),
Vol. XI)

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 indirect distribution ; *distribution indirecte; distribución indirecta*(Rec. 566 (MOD),
Vol. XI)

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 frequency standard ; *étalon de fréquence; patrón de frecuencia***

(Rep. 730, Vol. VII)

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

J02 standard frequency ; *fréquence étalon; frecuencia patrón*

(Rep. 730, Vol. VII)

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 standard-time-signal emission ; *émission des signaux horaires; emisión de señales horarias*

(Rep. 730, Vol. VII)

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

J04 international atomic time (TAI) ; *temps atomique international (TAI); tiempo atómico internacional (TAI)*

(Rep. 730, Vol. VII)

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 universal time (UT) ; *temps universel (UT); tiempo universal (UT)*

(Rep. 730, Vol. VII)

Designation of time scales based on 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 coordinated universal time (UTC) ; *temps universel coordonné (UTC); tiempo universal coordinado (UTC)*

(Rep. 730, Vol. VII)

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 573-2
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 573-2

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: asterisk indicating that the term has not been explicitly defined in a CCIR text;
 3rd column: the kind and number of the text;
 4th column: the reference in the text, if necessary (An.: Annex; Ap.: Appendix; P.: Part);
 5th column: the number of the Volume.

A

absolute gain (of an antenna) (G_i), isotropic gain (of an antenna) (G_i) <i>F: gain absolu (d'une antenne) (G_i), gain isotrope (d'une antenne) (G_i)</i> <i>S: ganancia absoluta (de una antena) (G_i), ganancia isotropa (de una antena) (G_i)</i>	*	Rec. 341	An. I § 2	V
	*	Rec. 573	No. E04a	XIII
accepted interference <i>F: brouillage accepté</i> <i>S: interferencia aceptada</i>	*	Rec. 573	No. F11c (Note 2)	XIII
accuracy <i>F: exactitude</i> <i>S: exactitud</i>		Rep. 730	§ 0.1	VII
accuracy see: precision, uncertainty				
active satellite <i>F: satellite actif</i> <i>S: satélite activo</i>		Rep. 204 Rec. 573	No. H11	IV-1 XIII
active sensor <i>F: détecteur actif</i> <i>S: sensor activo</i>		Rec. 573	No. H31	XIII
actual coverage area see: coverage area				
adjacent channel <i>F: canal adjacente</i> <i>S: canal adyacente</i>		Rec. 566 Rec. 573	§ 4.4 No. B11	X/XI-2 XIII
aeronautical station <i>F: station aéronautique</i> <i>S: estación aeronáutica</i>		Rec. 573	Ap. No. 11c	XIII
aerosols <i>F: aérosols</i> <i>S: aerosoles</i>		Rec. 310	No. C27	V
aircraft station <i>F: station d'aéronef</i> <i>S: estación de aeronave</i>		Rep. 573	Ap. No. 10c	XIII
alternated (arrangement of radio channels) <i>F: alternée (disposition)</i> <i>S: alternada (disposición)</i>	*	Rec. 592	§ 7	IX-1
alternated (polarization) <i>F: alternée (à polarisation)</i> <i>S: alternada (con polarización)</i>		Rec. 573	No. B18	XIII
altitude of the apogee (perigee) <i>F: altitude de l'apogée (du périgée)</i> <i>S: altitud del apogeo (del perigeo)</i>		Rep. 204 Rec. 573	No. H08	IV-1 XIII

anomalistic period <i>F: période anomalistique</i> <i>S: periodo anomalístico</i>	Rep. 204		IV-1
antenna see: directivity, economic standard antenna, gain, interference sector (<i>I</i>) (of a directional antenna), minimum standard antenna, service sector (<i>S</i>) (of a directional antenna)			
antenna butterfly <i>F: papillon (d'une antenne)</i> <i>S: mariposa (de una antena)</i>	* Rep. 682	§ 3	II
antenna directivity diagram <i>F: diagramme de directivité d'antenne</i> <i>S: diagrama de directividad de antena</i>	Rec. 573	No. E06	XIII
antenna directivity factor (<i>M</i>) <i>F: coefficient de directivité de l'antenne (<i>M</i>)</i> <i>S: factor de directividad de la antena (<i>M</i>)</i>	Rec. 162	§ 1.6	III
antenna gain see: gain of an antenna			
antenna-to-medium coupling loss see: gain degradation			
apoastron <i>F: apoastre</i> <i>S: apoastro</i>	Rep. 204		IV-1
apogee <i>F: apogée</i> <i>S: apogeo</i>	Rep. 204		IV-1
area see: actual coverage area, capture area, coverage area, feeder-link service area, interference-free coverage area, nominal coverage area, service area			
articulation index <i>F: indice de netteté</i> <i>S: indice de nitidez</i>	* Rep. 526	§ 3	I
articulation score <i>F: appréciation de la netteté (note)</i> <i>S: apreciación de la nitidez (nota)</i>	* Rep. 526	§ 2	I
ascending (descending) node <i>F: nœud ascendant (descendant)</i> <i>S: nodo ascendente (descendente)</i>	Rep. 204		IV-1
assigned frequency <i>F: fréquence assignée</i> <i>S: frecuencia asignada</i>	Rec. 328	§ 1.16	I
assigned frequency band <i>F: bande de fréquences assignée</i> <i>S: banda de frecuencia asignada</i>	Rec. 328 Rec. 573	§ 1.15 No. B03	I XIII
atomic time scale <i>F: échelle de temps atomique</i> <i>S: escala de tiempo atómico</i>	Rep. 730	§ 3.2	VII
attenuation coefficient <i>F: affaiblissement linéique</i> <i>S: coeficiente de atenuación</i>	Rec. 662	Ap. II, No. 5.04	XIII
attenuation loss <i>F: affaiblissement, atténuation</i> <i>S: atenuación, pérdida</i>	Rec. 662	Ap. II, No. 5.01	XIII
attenuation-slope (of the passband) <i>F: pente aux frontières (de la bande passante)</i> <i>S: pendiente en los límites (de una banda de paso)</i>	* Rec. 332	§ 4.3	I
attitude-stabilized satellite <i>F: satellite à commande d'orientation</i> <i>S: satélite de actitud estabilizada</i>	Rep. 204 Rec. 573	No. H15	IV-1 XIII
audioconference <i>F: audioconférence</i> <i>S: audioconferencia</i>	Rec. 662	Ap. II, No. 1.26	XIII
audio-frequency (AF) protection ratio <i>F: rapport de protection en audiofréquence</i> <i>S: relación de protección en audiofrecuencia</i>	* Rec. 573 Rec. 638	No. F22 (Note 3) § 1.2	XIII X-1

audio-frequency (AF) signal-to-interference ratio*F: rapport signal/brouillage en audiofréquence**S: relación señal/interferencia en audiofrecuencia***audiography***F: audiographie**S: audiografía***automatic switching for television circuits***F: commutation automatique pour circuits de télévision**S: conmutación automática para circuitos de televisión***avoidance angle***F: angle d'évitement**S: ángulo de evitación***B****band**

see: assigned frequency band, baseband, frequency band, occupied band

bandwidth*F: largeur de bande**S: anchura de banda***bandwidth**

see: baseband bandwidth, modulation acceptance bandwidth, necessary bandwidth, occupied bandwidth, width of the effective overall noise band, x dB bandwidth

bandwidth expansion ratio*F: rapport d'étalement de la largeur de bande**S: relación de expansión de la anchura de banda***base-station***F: station de base**S: estación de base***base station area***F: zone de la station de base**S: zona de la estación de base***baseband***F: bande de base**S: banda de base***baseband bandwidth***F: largeur de la bande de base**S: anchura de banda de la banda de base***basic amplitude (data signal in television)***F: amplitude de base (signal de données en télévision)**S: amplitud de base (señal de datos en televisión)***basic MUF***F: MUF de référence**S: MUF básica***basic transmission loss (of a radio link)***F: affaiblissement de propagation (d'une liaison radioélectrique),**affaiblissement entre antennes isotropes (d'une liaison radioélectrique)**S: pérdida básica de transmisión (de un enlace radioeléctrico)***beam area (for broadcasting-satellite service)***F: empreinte d'un faisceau (pour le service de radiodiffusion par satellite)**S: zona del haz (para el servicio de radiodifusión por satélite)***bidirectional***F: bilatéral, bidirectionnel**S: bilateral, bidireccional***broadcast videography, teletext***F: vidéographie diffusée, teletext**S: videografía radiodifundida, teletexto***broadcasting***F: télédiffusion**S: teledifusión***broadcasting**

see: (radio) broadcasting, sound broadcasting, television (broadcasting)

*	Rec. 573	No. F21 (Note 1)	XIII
	Rec. 638	§ 1.1	X-1
*	Rep. 802	§ 3.25	XI-1
*	S.P. 15B/ CMTT	Note 1	XII
*	Rep. 448	An. I	IV/IX-2
	Rec. 662	Ap. II, No. 4.02	XIII
	Rec. 328	§ 1.4	I
	Rec. 573	Ap. No. 11a	XIII
	Rec. 624	An. I, § 6	VIII-1
	Rec. 328	§ 1.1	I
	Rec. 662	Ap. II, No. H03	XIII
	Rec. 328	§ 1.2	I
*	Rep. 956	Ap. I, P. I, § 4	XI-1
	Rec. 373	§ 2	VI
	Rec. 573	No. G29	XIII
	Rec. 341	§ 4	V
	Rec. 573	No. A44	XIII
	Rec. 566	§ 3.3	X/XI-2
	Rec. 662	Ap. 11, No. 3.21	XIII
	Rec. 662	Ap. II, No. 1.20	XIII
	Rec. 662	Ap. II, No. 1.34	XIII

broadcasting-satellite service*F: service de radiodiffusion par satellite**S: servicio de radiodifusión por satélite***broadcasting-satellite space station***F: station spatiale de radiodiffusion par satellite**S: estación espacial de radiodifusión por satélite***build-up time of a telegraph signal***F: temps d'établissement d'un signal télégraphique**S: tiempo de establecimiento de una señal telegráfica***build-up time of a telegraph signal**

see: relative build-up time of a telegraph signal

butterfly

see: antenna butterfly

C**cabled distribution***F: télédistribution, câblodistribution**S: teledistribución por cable, teledistribución***calibration***F: étalonnage**S: calibración***call***F: communication**S: comunicación***call (attempt) (by a user)***F: tentative d'appel (par un usager)**S: (tentativa de) llamada (por un usuario)***capture area (of a terrestrial receiving station)***F: zone de captage (d'une station de réception de Terre)**S: zona de captación (de una estación receptora terrenal)***carrier***F: porteuse**S: portadora***carrier (component)***F: (composante) porteuse**S: portadora (componente)***carrier frequency***F: fréquence porteuse**S: frecuencia portadora***carrier power (of a radio transmitter)***F: puissance de la porteuse (d'un émetteur radioélectrique)**S: potencia de la portadora (de un transmisor radioeléctrico)***cell***F: cellule**S: célula***channel**

see: (frequency) channel, radio-frequency channel; RF channel, telephone-type channel, (transmission) channel

channel spacing*F: espacement entre canaux**S: separación de canales***characteristic frequency***F: fréquence caractéristique**S: frecuencia característica***circuit**

see: hypothetical reference circuit, telecommunication circuit, telephone-type circuit

see also: path

circular orbit (of a satellite)*F: orbite circulaire (d'un satellite)**S: órbita circular (de un satélite)***class of emission***F: classe d'émission**S: clase de emisión*

Rec. 566	§ 1.1.1	X/XI-2
Rec. 566	§ 1.2	X/XI-2
Rec. 328	§ 1.20	I
Rec. 662	Ap. II, No. 1.38	XIII
Rep. 730	§ 0.9	VII
Rec. 662	Ap. II, No. 3.05	XIII
Rec. 662	Ap. II, No. 3.04	XIII
Rec. 573	No. A52	XIII
Rec. 662	Ap. II, No. 3.09	XIII
Rec. 662	Ap. II, No. 3.10	XIII
Rep. 730	§ 1.2	VII
Rec. 573	No. E03	XIII
Rec. 624	§ 5	VIII-1
Rec. 573	No. B15	XIII
Rec. 328	§ 1.17	I
Rep. 204		IV-1
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clock <i>F: horloge</i> <i>S: reloj</i>	Rep. 730	§ 3.23C	VII
clock time difference <i>F: différence entre temps d'horloge</i> <i>S: diferencia de tiempo de reloj</i>	Rep. 730	§ 4.1	VII
coast station <i>F: station côtière</i> <i>S: estación costera</i>	Rec. 573	Ap. No. 11b	XIII
co-channel <i>F: cocanal, cofréquence</i> <i>S: cocanal</i>	Rec. 573	No. B13	XIII
co-channel (orthogonal) <i>F: cocanal orthogonal</i> <i>S: cocanal (orthogonal)</i>	Rec. 662	Ap. II, No. B14	XIII
code <i>F: code</i> <i>S: código</i>	Rec. 662	Ap. II, No. 3.07	XIII
code division <i>F: répartition en code</i> <i>S: división por código</i>	Rec. 662	Ap. II, § 3.17	XIII
coherence of frequency <i>F: cohérence de fréquence</i> <i>S: coherencia de frecuencia</i>	Rep. 730	§ 2.4	VII
coherence of phase <i>F: cohérence de phase</i> <i>S: coherencia de fase</i>	Rep. 730	§ 2.3	VII
communication <i>F: communication</i> <i>S: comunicación</i>	Rec. 662	Ap. II, No. 1.05	XIII
community reception (in the broadcasting-satellite service) <i>F: réception communautaire (dans le service de radiodiffusion par satellite)</i> <i>S: recepción comunal (en el servicio de radiodifusión por satélite)</i>	Rec. 566 Rec. 573	§ 1.3.2 No. H42	X/XI-2 XIII
(complete) connection <i>F: chaîne de connexion complète, (chemin de) communication</i> <i>S: cadena de conexión completa, (camino de) comunicación</i>	Rec. 662	Ap. II, No. 3.02	XIII
conditional access control <i>F: commande de l'accès conditionnel</i> <i>S: control de acceso condicional</i>	* Rep. 1079	An. I	XI-1
connection <i>F: chaîne de connexion</i> <i>S: cadena de conexión</i>	Rec. 662	Ap. II, No. 3.01	XIII
continuous multiplexing <i>F: multiplexage continu</i> <i>S: multiplexaje continuo</i>	* Rep. 954	§ 4.1	X/XI-2
controlled slip <i>F: glissement maîtrisable</i> <i>S: deslizamiento controlado</i>	Rep. 967	§ 5.2	XII
conversation (in telecommunication) <i>F: conversation (en télécommunication)</i> <i>S: conversación (en telecomunicación)</i>	Rec. 662	Ap. II, No. 3.06	XIII
coordinate clock <i>F: horloge coordonnée</i> <i>S: reloj coordinado</i>	Rep. 730	§ 4.2	VII
coordinate time <i>F: temps-coordonnée</i> <i>S: tiempo coordinada</i>	Rep. 730	§ 3.6	VII
coordinated time scale <i>F: échelle de temps coordonnée</i> <i>S: escala de tiempo coordinada</i>	Rep. 730	§ 3.5	VII
coordinated universal time (UTC) <i>F: temps universel coordonné (UTC)</i> <i>S: tiempo universal coordinado (UTC)</i>	Rep. 730 Rec. 460 Rec. 573	§ 3.4 An. I, A No. J06	VII VII XIII

coordination: distance, contour, area*F: coordination: distance, contour, zone**S: coordinación: distancia, contorno, zona***coverage area (of a broadcasting transmitter in a given broadcasting band)***F: zone de couverture (d'un émetteur de radiodiffusion dans une bande de radiodiffusion donnée)**S: zona de cobertura (de un transmisor de radiodifusión en una banda de radiodifusión determinada)***coverage area (of a space station)***F: zone de couverture (d'une station spatiale)**S: zona de cobertura (de una estación espacial)*

The following may be distinguishable:

actual coverage area*F: zone de couverture réelle**S: zona de cobertura real***interference-free coverage area***F: zone de couverture en l'absence de brouillage**S: zona de cobertura sin interferencias***nominal coverage area***F: zone de couverture nominale**S: zona de cobertura nominal***coverage area (of a transmitting terrestrial station)***F: zone de couverture (d'une station d'émission de Terre)**S: zona de cobertura (de una estación transmisora terrenal)*

The following may be distinguishable:

actual coverage area*F: zone de couverture réelle**S: zona de cobertura real***interference-free coverage area***F: zone de couverture en l'absence de brouillage**S: zona de cobertura sin interferencias***nominal coverage area***F: zone de couverture nominale**S: zona de cobertura nominal***coverage area (for the broadcasting-satellite service)***F: zone de couverture (pour le service de radiodiffusion par satellite)**S: zona de cobertura (para el servicio de radiodifusión por satélite)***coverage factor (case of sound broadcasting in band 6 (MF))***F: facteur de couverture (cas de radiodiffusion sonore en ondes hectométriques)**S: factor de cobertura (para la radiodifusión sonora en ondas hectométricas)***cross-modulation noise (case of compandors for sound-programme circuits)***F: bruit de transmodulation (cas de compresseurs-extenseurs pour circuits de transmissions radiophoniques)**S: ruido diafónico (caso de compresores-expansores para circuitos de transmisiones radiofónicas)***cross polarization***F: transpolarisation**S: polarización cruzada (o transpolarización)***cross-polarization discrimination***F: discrimination de polarisation**S: discriminación por polarización cruzada***cross-polarization isolation***F: isolement de polarisation**S: aislamiento por polarización cruzada***cymomotive force (c.m.f.) (in a given direction)***F: force cymomotrice (f.c.m.) (dans une direction donnée)**S: fuerza cimomotriz (f.c.m.) (en una dirección dada)*

*	Rep. 382	§ 1	IV/IX-2
	Rec. 638	§ 3	X-1
	Rec. 573	No. A51a	XIII
*	Rec. 573	Note 3	XIII
*	Rec. 573	Note 3	XIII
*	Rec. 573	Note 3	XIII
	Rec. 573	No. A51b	XIII
*	Rec. 573	Note 3	XIII
*	Rec. 573	Note 3	XIII
*	Rec. 573	Note 3	XIII
	Rec. 566	§ 3.2	X/XI-2
*	Rec. 598	An. I, § 2	X-1
	Rep. 493	§ 3	XII
	Rec. 310 Rec. 573	No. A1 No. G01	V XIII
	Rec. 310 Rec. 573	No. A2 No. G02	V XIII
	Rec. 310 Rec. 573	No. A3 No. G03	V XIII
	Rec. 561 Rec. 573	§ 1 No. E05	X-1 XIII

D

data

F: données
S: datos

data collection satellite

F: satellite de collecte de données
S: satélite de adquisición de datos

data communication, data transmission (deprecated in this sense)

F: communication de données, transmission de données (terme déconseillé dans ce sens)
S: comunicación de datos, transmisión de datos (desaconsejado en este sentido)

data group (for teletext)

F: groupe de données (pour télétexte)
S: grupo de datos (para teletexto)

data line (for teletext)

F: ligne de données
S: línea de datos

data packet (for teletext)

F: paquet de données
S: paquete de datos

data relay satellite

F: satellite relais de données
S: satélite de retransmisión de datos

data signal in television

see: basic amplitude, decoding margin, decoding threshold, eye height, eye width, mid-level, peak-to-peak amplitude, proportional jitter

data unit (for teletext)

F: unité de données
S: unidad de datos

date

F: date
S: fecha

decoding margin (data signal in television)

F: marge de décodage (signal de données en télévision)
S: margen de decodificación (señal de datos en televisión)

decoding threshold (data signal in television)

F: seuil de décodage (signal de données en télévision)
S: umbral de decodificación (señal de datos en televisión)

deep space

F: espace lointain
S: espacio lejano

demultiplexing

F: demultiplexage
S: demultiplaje

depolarization

F: depolarisation
S: despolarización

descrambling

F: désembrouillage
S: desaleatorización

diffuse reflection coefficient

F: coefficient de réflexion diffuse
S: coeficiente de reflexión difusa

digital radio path

F: conduit hertzien numérique
S: trayecto radiodigital

digital radio section

F: section hertzienne numérique
S: sección radiodigital

direct distribution (of broadcasting programmes)

F: distribution directe (de programmes de radiodiffusion)
S: distribución directa (de programas de radiodifusión)

	Rec. 662	Ap. II, No. 1.12	XIII
	Rep. 573	No. H34	XIII
	Rec. 662	Ap. II, No. 1.13	XIII
*	Rec. 653	§ 4.4	XI-1
*	Rec. 653	§ 4.1	XI-1
*	Rec. 653	§ 4.3	XI-1
	Rec. 573	No. H33	XIII
*	Rec. 653	§ 4.2	XI-1
	Rep. 730	§ 3.12	VII
*	Rep. 956	Ap. I, An. I, § 9	XI-1
*	Rep. 956	Ap. I, An. I, § 12	XI-1
*	Rec. 610	§ 1	II
*	Rep. 986	§ 5	II
	Rec. 573	No. H02 (Note)	XIII
	Rec. 662	Ap. II, No. 3.12	XIII
	Rec. 310	No. A4	V
	Rec. 573	No. G04	XIII
*	Rep. 1079	An. I	XI-1
	Rec. 310	No. B7	V
*	Rec. G.702 Mentioned in Rec. 390		CCITT IX-1
*	Rec. G.702 Mentioned in Rec. 390		CCITT IX-1
	Rec. 566 Rec. 573	§ 2.2 No. H43	X/XI-2 XIII

direct (retrograde) orbit (of a satellite)*F: orbite directe (rétrograde) (d'un satellite)**S: órbita directa (retrograda) (de un satélite)***direct sequence (DS) spread spectrum***F: étalement du spectre à sequence directe (SD)**S: espectro ensanchado por secuencia directa (DS)***directive gain (in a given direction) (see also: directivity), (of a directional antenna in the bands 4 to 28 MHz)***F: gain de directivité (dans une direction donnée)**S: ganancia directiva (en una dirección dada)***directivity***F: directivité**S: directividad***directivity**

see: antenna directivity diagram, antenna directivity factor, directive gain (in a given direction), horizontal directivity pattern, vertical directivity pattern

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*F: hauteur du conduit (troposphérique)**S: altura del conducto (troposférico)***duct thickness***F: épaisseur du conduit**S: espesor del conducto***ducting***F: propagation guidée (troposphérique)**S: propagación guiada (troposférica)***ducting layer***F: couche de guidage**S: capa de propagación***duplex, full duplex***F: duplex, bilatéral simultané**S: dúplex***DUTI***F: DUTI**S: DUTI***E****earth station***F: station terrestre**S: estación terrena***economic standard antenna (case of a directional antenna in the bands 4 to 28 MHz)***F: antenne normale économique**S: antena normal económica***effective Earth-radius factor (k)***F: facteur multiplicatif du rayon terrestre (k)**S: factor del radio ficticio de la Tierra (k)***effective monopole-radiated power (e.m.r.p.)***F: puissance apparente rayonnée sur antenne verticale courte (p.a.r.v.)**S: potencia radiada aparente referida a una antena vertical corta (p.r.a.v.)***effective radiated power (e.r.p.)***F: puissance apparente rayonnée (p.a.r.)**S: potencia radiada aparente (p.r.a.)***effective radius of the Earth***F: rayon terrestre équivalent**S: radio ficticio de la Tierra*

	Rep. 204		IV-1
*	Rep. 651	§ 2.1	I
	Rec. 162	§ 1.1	III
*	Rec. 341	An. I, § 1	V
	Rec. 310	No. C22	V
	Rec. 310	No. C21	V
	Rec. 310 Rec. 573	No. C23 No. G18	V XIII
	Rec. 310	No. C17	V
	Rec. 662	Ap. II, No. 3.19	XIII
	Rep. 730	§ 3.21	VII
	Rec. 573	No. A06	XIII
*	Rec. 162	§ 1.5	III
	Rec. 310	No. C16	V
	Rec. 561 Rec. 573	§ 2 No. E09	X-1 XIII
	Rec. 561 Rec. 573	§ 4 No. E08	X-1 XIII
	Rec. 310	No. C15	V

effective selectivity (for the purpose of studying the selectivity in the non-linear region with two or more input signals)

F: 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)

S: 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)

electronic news gathering (ENG)

F: reportages électroniques d'actualités (ENG)

S: (ENG) ("electronic news gathering")

elevated duct

F: conduit élevé (troposphérique)

S: conducto elevado

elliptical orbit (of a satellite)

F: orbite elliptique (d'un satellite)

S: órbita elíptica (de un satélite)

emergency position-indicating radiobeacon station

F: station de radiobalise de localisation des sinistres

S: estación de radiobaliza de localización de siniestros

emission

F: émission

S: emisión

emission of a transmitter, optimum from the standpoint of spectrum economy

F: émission optimale du point de vue de l'économie du spectre

S: emisión óptima de un transmisor desde el punto de vista de la economía del espectro

enhanced television

F: télévision améliorée

S: televisión mejorada

equatorial orbit (of a satellite)

F: orbite équatoriale (d'un satellite)

S: órbita ecuatorial (de un satélite)

equivalent isotropically radiated power (e.i.r.p.)

F: puissance isotrope rayonnée équivalente (p.i.r.e.)

S: potencia isotrópica radiada equivalente (p.i.r.e.)

(equivalent) noise temperature (of a linear two-port network)

F: température (équivalente) de bruit (d'un biporte linéaire)

S: temperatura (equivalente) de ruido (de una red lineal con dos puertas)

equivalent satellite link noise temperature

F: température de bruit équivalente d'une liaison par satellite

S: temperatura de ruido equivalente de un enlace por satélite

(error) concealment

F: dissimulation (d'erreurs)

S: ocultamiento (de errores)

(error) correction

F: correction (d'erreurs)

S: corrección (de errores)

error (time measurements)

F: erreur (mesures du temps)

S: error (mediciones de tiempo)

exocentric angle

F: angle excentrique

S: ángulo exocéntrico

extended definition television

F: télévision à résolution étendue

S: televisión de definición ampliada

eye height (data signal in television)

F: hauteur de l'œil (signal de données en télévision)

S: altura del diagrama en ojo (señal de datos en televisión)

eye width (data signal in television)

F: largeur de l'œil (signal de données en télévision)

S: anchura del diagrama en ojo (señal de datos en televisión)

*	Rec. 332	§ 6.1	I
*	Rep. 803	§ 1	X/XI-3
	Rec. 310	No. C20	V
	Rep. 204		IV-1
	Rec. 573	Ap., No. 10f	XIII
	Rec. 573	No. C02	XIII
	Rec. 328	§ 2	I
*	Rep. 1077	§ 2	XI-1
	Rep. 204		IV-1
	Rec. 561	§ 3	X-1
	Rec. 573	No. E07	XIII
	Rec. 573	No. F02	XIII
*	Rep. 871	§ 2.2	IV-1
*	Rep. 967	§ 4.4	XII
*	Rep. 967	§ 4.4	XII
	Rep. 730	§ 0.4	VII
	Rec. 204		IV-1
	Rec. 573	No. H09c	XIII
*	Rep. 1077	§ 2	XI-1
*	Rep. 956	Ap. I, P. I, § 8	XI-1
*	Rep. 956	Ap. I, P. I, § 10	XI-1

F

facsimile

F: *télécopie*S: *facsimil*

feeder link

F: *liaison de connexion*S: *enlace de conexión*

feeder-link beam area

F: *empreinte d'un faisceau de liaison de connexion*S: *zona del haz de un enlace de conexión*

feeder-link service area

F: *zone de service de liaison de connexion*S: *zona de servicio de un enlace de conexión*

field strength

see: minimum usable field strength (E_{min}), usable field strength (E_u)

figure of merit

F: *facteur de qualité*S: *factor de calidad*

FOT

see: optimum working frequency

free-space propagation

F: *propagation en espace libre*S: *propagación en el espacio libre*

free-space transmission loss

F: *affaiblissement en espace libre (d'une liaison radioélectrique)*S: *pérdida básica de transmisión en el espacio libre*

frequency

F: *fréquence*S: *frecuencia*

frequency (characteristics of emissions)

see: assigned frequency, carrier frequency, characteristic frequency, reference frequency

frequency (ionospheric propagation)

see: basic MUF, FOT, lowest usable frequency, LUF, maximum usable frequency, MUF, operational MUF, optimum working frequency, OWF

frequency band

F: *bande de fréquences*S: *banda de frecuencias*

(frequency) channel

F: *canal (de fréquences)*S: *canal (de frecuencias)*

frequency departure

F: *écart de fréquence*S: *desajuste de frecuencia*

frequency difference

F: *différence de fréquence*S: *diferencia de frecuencia*

frequency division

F: *répartition en fréquence, répartition fréquentielle*S: *división en frecuencia*

frequency drift

F: *dérive de fréquence*S: *deriva de frecuencia*

frequency-hopping (FH) spread spectrum

F: *étalement du spectre à sauts de fréquence (SF)*S: *espectro ensanchado por saltos de frecuencia (FH)*

frequency instability

F: *instabilité de fréquence*S: *inestabilidad de frecuencia*

frequency re-use satellite network

F: *réseau à satellite à réutilisation de fréquence*S: *red de satélites con reutilización de frecuencia*

	Rec. 662	Ap. II, No. 1.10	XIII
*	Rep. 573 Rec. 566	No. A31c § 4.1	XIII X/XI-2
	Rec. 566	§ 4.2	X/XI-2
	Rec. 566	§ 4.3	X/XI-2
*	Rep. 473	§ 2	X/XI-2
	Rec. 310 Rec. 573	No. B1 No. G11	V XIII
	Rec. 341 Rec. 573	§ 5 No. A45	V XIII
	Rep. 730	§ 1.1	VII
	Rec. 662	Ap. II, No. H01	XIII
	Rec. 662	Ap. II, No. 2.05	XIII
	Rep. 730 Rec. 662	§ 1.7 Ap. II, No. 4.05	VII XIII
	Rep. 730	§ 1.12	VII
	Rec. 662	Ap. II, No. 3.16	XIII
	Rep. 730	§ 1.10	VII
*	Rep. 651	§ 2.1	I
	Rep. 730	§ 0.5	VII
	Rep. 204 Rec. 573	No. H25	IV-1 XIII

frequency shift

F: déplacement de fréquence
S: desplazamiento de frecuencia

frequency standard

F: étalon de fréquence
S: patrón de frecuencia

frequency tolerance

F: tolérance de fréquence
S: tolerancia de frecuencia

full carrier emission

F: émission à porteuse complète
S: emisión de onda portadora completa

full duplex, duplex

F: duplex
S: duplex

G**gain**

F: gain
S: ganancia

gain degradation, antenna-to-medium coupling loss

F: dégradation du gain, perte par couplage antenne-milieu
S: degradación de la ganancia, pérdida por acoplamiento entre la antena y el medio

gain in relation to a half-wave dipole (G_d)

F: gain par rapport à un doublet demi-onde (G_d)
S: ganancia con relación a un dipolo de media onda (G_d)

gain in relation to a short vertical antenna (G_v)

F: gain par rapport à une antenne verticale courte (G_v)
S: ganancia con relación a una antena vertical corta (G_v)

gain of an antenna

F: gain d'une antenne
S: ganancia de una antena

gain of antenna

see: absolute gain (of an antenna), directive gain in a given direction, directivity, gain of an antenna, gain in relation to a half-wave dipole, gain in relation to a short vertical antenna, isotropic gain (of an antenna)

geocentric angle

F: angle géocentrique
S: ángulo geocéntrico

geostationary satellite

F: satellite géostationnaire
S: satélite geoestacionario

geostationary-satellite orbit

F: orbite des satellites géostationnaires
S: órbita de los satélites geoestacionarios

geosynchronous satellite

F: satellite géosynchrone
S: satélite geosincrónico

geosynchronous satellite orbit

F: orbite des satellites géosynchrones
S: órbita de los satélites geosincrónicos

ground-based duct (surface duct)

F: conduit au sol (conduit de surface) (troposphérique)
S: conducto sobre el suelo (conducto de superficie)

ground wave

F: onde de sol
S: onda de superficie

group delay

F: temps de propagation de groupe
S: retardo de grupo

	Rep. 730	§ 1.9	VII
	Rep. 730	§ 1.14	VII
	Rec. 573	No. J01	XIII
	Rec. 328	§ 1.19	I
	Rep. 785	§ 2	IX-1
	Rec. 573	No. D02	XIII
	Rec. 573	No. D05	XIII
	Rec. 662	An., No. 3.19	XIII
	Rec. 662	Ap. II, No. 5.02	XIII
	Rec. 310	No. C31	V
*	Rec. 341	An. I, § 2	V
*	Rec. 573	No. E04b	XIII
*	Rec. 341	An. I, § 2	V
*	Rec. 573	No. E04c	XIII
	Rec. 341	An. I, § 2	V
	Rec. 573	No. E04	XIII
	Rep. 204		IV-1
	Rec. 573	No. H09a	XIII
	Rep. 204		IV-1
	Rec. 573	No. H21	XIII
	Rep. 204		IV-1
	Rec. 573	No. H22	XIII
	Rep. 204		IV-1
	Rec. 573	No. H17	XIII
*	Rep. 548	§ 2.3.2	II
	Rec. 310	No. C19	V
	Rec. 573	No. G19c	XIII
	Rec. 662	Ap. II, § 5.07	XIII

H				
halo orbit <i>F: orbite halo</i> <i>S: órbita de halo</i>	*	Rep. 986	An. I, § 4	II
hand-off <i>F: transfert</i> <i>S: conmutación de llamada en curso</i>		Rec. 624	An. I, § 8	VIII-1
harmful interference <i>F: brouillage préjudiciable</i> <i>S: interferencia perjudicial</i>		Rec. 573	No. F11c (Note 2)	XIII
harmonic emissions <i>F: rayonnement harmonique</i> <i>S: radiación armónica</i>		Rec. 329 Rec. 573	§ 1.2 No. C06	I XIII
hertzian waves, radio waves <i>F: ondes hertziennes, ondes radioélectriques</i> <i>S: ondas hertzianas, ondas radioeléctricas</i>		Rec. 573	No. A02	XIII
high-definition television <i>F: télévision à haute définition</i> <i>S: televisión de alta definición</i>	*	Rep. 801	§ 1	XI-1
highly elliptical orbit <i>F: orbite très elliptique (par rapport à la Terre)</i> <i>S: órbita elíptica de gran excentricidad</i>	* *	Rep. 986 Rep. 548	An. I, § 3 § 2.3.3	II II
high power flux-density (in the broadcasting-satellite service) <i>F: puissance surfacique importante (pour le service de radiodiffusion par satellite)</i> <i>S: gran densidad de flujo de potencia (para el servicio de radiodifusión por satélite)</i>		Rec. 566	§ 1.5.1	X/XI-2
homogeneous section (telephony) <i>F: section homogène (téléphonie)</i> <i>S: sección homogénea (para la telefonía)</i>	*	Rec. 390	§ 1.3	IX-1
hop (in ionospheric propagation) <i>F: saut, bond</i> <i>S: salto</i>		Rec. 573	No. G28	XIII
horizontal directivity pattern <i>F: diagramme de directivité horizontal</i> <i>S: diagrama de directividad horizontal</i>		Rec. 573	No. E06a	XIII
hybrid spread spectrum <i>F: étalement du spectre hybride</i> <i>S: espectro ensanchado híbrido</i>	*	Rep. 651	§ 2.1	I
hydrometeors <i>F: hydrométéores</i> <i>S: hidrometeoros</i>		Rec. 310	No. C26	V
hypothetical reference circuit see: terrestrial hypothetical reference circuit (television)				
hypothetical reference circuit for sound-programme transmissions (systems in the fixed-satellite service) <i>F: circuit fictif de référence pour transmissions radiophoniques (systèmes du service fixe par satellite)</i> <i>S: circuito ficticio de referencia para transmisiones radiofónicas (sistemas del servicio fijo por satélite)</i>	*	Rec. 502		XII
hypothetical reference circuit for sound-programme transmissions (terrestrial systems) <i>F: circuit fictif de référence pour transmissions radiophoniques (systèmes de Terre)</i> <i>S: circuito ficticio de referencia para transmisiones radiofónicas (sistemas terrenales)</i>	*	Rec. 502		XII
hypothetical reference circuit for systems using analogue transmission in the fixed-satellite service (telephone and television networks) <i>F: circuit fictif de référence pour les systèmes utilisant la transmission analogique dans le service fixe par satellite (réseaux de téléphonie et de télévision)</i> <i>S: circuito ficticio de referencia para los sistemas que utilizan la transmisión analógica en el servicio fijo por satélite (redes telefónicas y de televisión)</i>	*	Rec. 352		IV-1
hypothetical reference circuit (for telephony) <i>F: circuit fictif de référence (pour la téléphonie)</i> <i>S: circuito ficticio de referencia (para la telefonía)</i>		Rec. 390	§ 1.2	IX-1

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))

F: 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 plus de 60 voies téléphoniques))

S: 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 para más de 60 canales telefónicos))

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))

F: 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))

S: 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))

hypothetical reference circuit (general term)

F: circuit fictif de référence (généralité)

S: circuito ficticio de referencia (en general)

Note. — See for general definitions, CCITT Recommendation G.212.

hypothetical reference circuit (in the fixed-satellite service) (Television)

F: circuit fictif de référence (pour le service fixe par satellite) (Télévision)

S: circuito ficticio de referencia (en el servicio fijo por satélite) (Televisión)

hypothetical reference circuit on trans-horizon radio-relay systems (using frequency-division multiplex)

F: circuit fictif de référence pour la téléphonie sur faisceaux hertziens transhorizon (à multiplexage par répartition en fréquence)

S: circuito ficticio de referencia por sistemas de relevadores radioeléctricos transhorizonte (multicanal con distribución de frecuencia)

hypothetical reference connection

F: communication fictive de référence

S: conexión ficticia de referencia

hypothetical reference digital link

F: liaison numérique fictive de référence

S: enlace digital ficticio de referencia

hypothetical reference digital path

F: conduit numérique fictif de référence

S: trayecto digital ficticio de referencia

hypothetical reference digital path (for radio-relay systems for telephony — systems with a capacity above the second hierarchical level)

F: conduit numérique fictif de référence (pour les faisceaux hertziens de téléphonie — systèmes ayant une capacité supérieure au deuxième niveau hiérarchique)

S: trayecto digital ficticio de referencia (para sistemas de relevadores radioeléctricos para telefonía — sistemas con una capacidad superior al segundo nivel jerárquico)

hypothetical reference digital section

F: section numérique fictive de référence

S: sección digital ficticia de referencia

I

image-rejection ratio (of a receiver)

F: affaiblissement sur la fréquence conjuguée (d'un récepteur)

S: atenuación para la frecuencia imagen (de un receptor)

impulse rate

F: taux d'impulsions

S: frecuencia de los impulsos

impulsive noise tolerance

F: tolérance de bruit impulsif

S: tolerancia al ruido impulsivo

*	Rec. 392		IX-1
*	Rec. 391		IX-1
	Rec. 390	§ 1.1	IX-1
	Rec. 567	§ A1.3	XII
*	Rec. 396		IX-1
*	Rep. 817 Rec. G.801	§ 2.1	XII CCITT
*	Rep. 817 Rec. G.801	§ 2.2	XII CCITT
*	Rec. G.721 Mentioned in Rec. 390		CCITT IX-1
*	Rec. 556		IX-1
*	Rep. 817 Rec. G.801	§ 2.3	XII CCITT
*	Rec. 332	§ 4.4	I
	Rep. 358	§ 1.3.1.3	VIII-1
	Rep. 358	§ 1.3.1.4	VIII-1

inclination (of a satellite orbit) <i>F: inclinaison (d'une orbite de satellite)</i> <i>S: inclinación (de una órbita de satélite)</i>	Rep. 204 Rec. 573	No. H06	IV-1 XIII
inclined orbit (of a satellite) <i>F: orbite inclinée (d'un satellite)</i> <i>S: órbita inclinada (de un satélite)</i>	Rep. 204		IV-1
index of cooperation <i>F: module de coopération</i> <i>S: índice de cooperación</i>	* Rep. 588	§ 3.3	VIII-2
indirect distribution (of broadcasting programmes) <i>F: distribution indirecte (de programmes de radiodiffusion)</i> <i>S: distribución indirecta (de programas de radiodifusión)</i>	Rec. 566 Rec. 573	§ 2.1 No. H44	X/XI-2 XIII
individual reception (in the broadcasting-satellite service) <i>F: réception individuelle (dans le service de radiodiffusion par satellite)</i> <i>S: recepción individual (en el servicio de radiodifusión por satélite)</i>	Rec. 566 Rec. 573	§ 1.3.1 No. H41	X/XI-2 XIII
information <i>F: information</i> <i>S: información</i>	Rec. 662	Ap. II, No. 1.01	XIII
instant <i>F: instant</i> <i>S: instante</i>	Rep. 730	§ 4.3	VII
integrated services digital network (ISDN) <i>F: réseau numérique à intégration de services (RNIS)</i> <i>S: red digital de servicios integrados (RDSI)</i>	* Rep. 817	§ 6.1	XII
interface <i>F: interface</i> <i>S: interfaz</i>	Rec. 662	Ap. II, No. 2.15	XIII
interference <i>F: brouillage</i> <i>S: interferencia</i>	Rec. 573	No. F11c	XIII
interference see: accepted interference, harmful interference, permissible interference, quasi-impulsive interference			
interference canceller <i>F: annuleur (ou supprimeur) de brouillage</i> <i>S: cancelador (o supresor) de interferencia</i>	* Rep. 875 * Rep. 830	§ 2 § 1	IV-1 I
interference-free coverage area see: coverage area			
interference noise <i>F: bruit de brouillage</i> <i>S: ruido de interferencia</i>	* Rep. 828	§ 3	I
interference sector (I) (of a directional antenna in the bands 4 to 28 MHz) <i>F: secteur de brouillage (I)</i> <i>S: sector de interferencia (I)</i>	Rec. 162	§ 1.3	III
interference (to a wanted signal) <i>F: brouillage (d'un signal utile)</i> <i>S: interferencia (a una señal útil)</i>	Rec. 664	Ap. II, No. 5.09	XIII
interfering source <i>F: source de brouillage</i> <i>S: fuente interferente</i>	Rec. 573	No. F12	XIII
interleaved <i>F: intercalé</i> <i>S: intercalado</i>	* Rec. 573 Rec. 592	No. B17 § 8	XIII IX-1
intermediate-frequency rejection ratio (of a receiver) <i>F: affaiblissement sur la fréquence intermédiaire (d'un récepteur)</i> <i>S: atenuación para la frecuencia intermedia (de un receptor)</i>	* Rec. 332	§ 4.5	I
intermodulation component (in a radio transmitter for amplitude-modulated emissions) <i>F: oscillation d'intermodulation (dans un émetteur radioélectrique à modulation d'amplitude)</i> <i>S: oscilación de intermodulación (en un transmisor radioeléctrico de modulación de amplitud)</i>	* Rec. 326	§ 1.2	I
intermodulation products (of a transmitting station) <i>F: produits d'intermodulation (d'une station émettrice)</i> <i>S: productos de intermodulación (de una estación transmisora)</i>	Rec. 573	No. C07	XIII

international atomic time (TAI)*F: temps atomique international (TAI)**S: tiempo atómico internacional (TAI)***international television connection***F: communication télévisuelle internationale**S: conexión internacional de televisión***inter-satellite link***F: liaison intersatellite**S: enlace intersatélite***ionosphere***F: ionosphère**S: ionosfera***ionospheric propagation***F: propagation ionosphérique**S: propagación ionosférica***ionospheric reflection***F: réflexion ionosphérique**S: reflexión ionosférica***ionospheric (reflection) propagation***F: propagation (par réflexion) ionosphérique**S: propagación (por reflexión) ionosférica***ionospheric scatter propagation***F: propagation par diffusion ionosphérique**S: propagación por dispersión ionosférica***ionospheric wave***F: onde ionosphérique**S: onda ionosférica***isotropic gain (of an antenna) (G_i); absolute gain (of an antenna) (G_i)***F: gain isotrope d'une antenne (G_i); gain absolu d'une antenne (G_i)**S: ganancia isotropa (de una antena) (G_i); ganancia absoluta (de una antena) (G_i)***J****jitter: amplitude jitter, frequency jitter, phase jitter***F: gigue d'amplitude, de fréquence, de phase**S: fluctuación de amplitud, de frecuencia, de fase***julian date***F: date julienne**S: fecha juliana***julian date**

see: modified julian date

julian day number*F: numéro de jour julien**S: número de día juliano***K****keraunic level***F: niveau kéraunique**S: nivel cerámico***L****land mobile station***F: station mobile terrestre**S: estación móvil terrestre***land station***F: station terrestre**S: estación terrestre*

	Rec. 573 Rep. 730	No. J04 § 3.3	XIII VII
*	Rec. 567	A.1.1	XII
	Rec. 573	No. A33	XIII
	Rec. 573	No. G21	XIII
	Rec. 573	No. G22	XIII
	Rec. 573	No. G26	XIII
	Rec. 573	No. G23	XIII
	Rec. 573	No. G25	XIII
	Rec. 573	No. G27	XIII
*	Rec. 341	An. I, § 2	V
*	Rec. 573	No. E04a	XIII
*	Rep. 530	§ 2.1 and 2.2	I
	Rep. 730	§ 4.10	VII
	Rep. 730	§ 4.11	VII
*	Rep. 932	§ 2.2	IX-1
	Rec. 573	Ap. No. 10a	XIII
	Rec. 573	No. A11	XIII

leaky cables

F: câbles à fuite
S: cables con fuga

leap second

F: seconde intercalaire
S: segundo intercalar

left-hand polarized wave

*F: onde à polarisation sénestrorsum (sens inverse des aiguilles d'une montre),
 onde à polarisation lévogyre*
S: onda de polarización levógira

line-of-sight propagation

F: propagation en visibilité directe
S: propagación con visibilidad directa

linear receiver

F: récepteur linéaire
S: receptor lineal

link

F: liaison
S: enlace

link

see: bidirectional, inter-satellite link, multi-satellite link, radio link, satellite link, unidirectional

location area

F: zone de localisation
S: zona de localización

location register

F: enregistreur de positions
S: registro de localización

location registration

F: enregistrement de la position
S: registro de la posición

logatom

F: logatome
S: logatomo

loss

see: basic transmission loss, free-space transmission loss, loss relative to free-space, ray path transmission loss, system loss, total loss, transmission loss

loss relative to free space

F: affaiblissement par rapport à l'espace libre (d'une liaison radioélectrique)
S: pérdida relativa al espacio libre

lowest usable frequency (LUF)

F: fréquence minimale utilisable (LUF)
S: frecuencia mínima utilizable (LUF)

low orbit (of a satellite)

F: orbite basse (d'un satellite)
S: órbita baja (de un satélite)

low power flux-density (in the broadcasting-satellite service)

F: puissance surfacique limitée (pour le service de radiodiffusion par satellite)
S: pequeña densidad de flujo de potencia (para el servicio de radiodifusión por satélite)

LUF

see: lowest usable frequency

M**macrosegmentation (of the frequency bands)**

F: macrosegmentation (des bandes de fréquences)
S: macrosegmentación (de las bandas de frecuencias)

maximum sensitivity (for sound broadcast and television receivers)

F: sensibilité maximale (cas des récepteurs de radiodiffusion sonore ou visuelle (télévision))
S: sensibilidad máxima (para los receptores de radiodifusión sonora o visual (televisión))

*	Rep. 902	§ 1	VIII-1
	Rep. 730	§ 4.4	VII
	Rec. 573	No. G06	XIII
	Rec. 573 Rec. 310	No. 612 No. B2	XIII V
*	Rec. 331	§ 1	I
	Rec. 662	Ap. II, No. 2.06	XIII
	Rec. 624	An. I, § 3	VIII-1
*	Rec. 624	An. I, § 2	VIII-1
	Rec. 624	An. I, § 4	VIII-1
*	Rep. 751	§ 3.1.2	VIII-3
	Rec. 341 Rec. 573	§ 7 No. A47	V XIII
	Rec. 573	No. G31	XIII
	Rep. 548	§ 2.3.1	II
	Rec. 566	§ 1.5.3	X/XI-2
*	Rep. 1000	§ 2.1	IV-1
*	Rec. 331	§ 1.01	I

maximum usable frequency (MUF) <i>F: fréquence maximale utilisable (MUF)</i> <i>S: frecuencia máxima utilizable (MUF)</i>	Rec. 573	No. G30 (Note)	XIII
maximum usable frequency (MUF) see: basic MUF, MUF, operational MUF			
maximum usable (gain-limited) sensitivity <i>F: sensibilité maximale utilisable limitée par l'amplification</i> <i>S: sensibilidad máxima utilizable limitada por la amplificación</i>	* Rec. 331	§ 4.2	I
maximum usable (noise-limited) sensitivity <i>F: sensibilité maximale utilisable limitée par le bruit</i> <i>S: sensibilidad máxima utilizable limitada por el ruido</i>	* Rec. 331	§ 4.2	I
maximum usable sensitivity (distortion limited or mutilation limited) <i>F: sensibilité maximale utilisable (limité par la mutilation ou la distortion)</i> <i>S: sensibilidad máxima utilizable (limitada por la mutilación o la distorsión)</i>	* Rec. 331	§ 9.1	I
maximum usable sensitivity (for radiotelegraph receivers for aural reception) <i>F: sensibilité maximale utilisable (cas des récepteurs de radiotélégraphie pour réception auditive)</i> <i>S: sensibilidad máxima utilizable (para los receptores radiotelegráficos para recepción auditiva)</i>	* Rec. 331	§ 9.1	I
maximum usable sensitivity, including the reproducing equipment (for radiotelegraph receivers for aural reception) <i>F: sensibilité maximale utilisable, y compris l'équipement de reproduction (cas de récepteurs de radiotélégraphie pour réception auditive)</i> <i>S: sensibilidad máxima utilizable incluido el equipo reproductor (para los receptores radiotelegráficos para recepción auditiva)</i>	* Rec. 331	§ 9.2	I
mean power of a radio transmitter <i>F: puissance moyenne d'un émetteur radioélectrique</i> <i>S: potencia media de un transmisor radioeléctrico</i>	Rec. 573	No. E02	XIII
measurement of terrain irregularity Δh <i>F: mesure de l'irrégularité du terrain Δh</i> <i>S: medida de la irregularidad del terreno Δh</i>	Rec. 310	No. B8	V
medium power flux-density (in the broadcasting-satellite service) <i>F: puissance surfacique moyenne (pour le service de radiodiffusion par satellite)</i> <i>S: densidad intermedia de flujo de potencia (para el servicio de radiodifusión por satélite)</i>	Rec. 566	§ 1.5.2	X/XI-2
meteor burst see: meteor-burst propagation			
meteor-burst propagation <i>F: propagation (ionosphérique) par impulsions météoriques</i> <i>S: propagación (ionosférica) por impulsos meteóricos</i>	* Rep. 251	§ 1	VI
microsegmentation (of the frequency bands) <i>F: microsegmentation (des bandes de fréquences)</i> <i>S: microsegmentación (de las bandas de frecuencias)</i>	* Rep. 1000	§ 2.3	IV-1
mid-level (data signal in television) <i>F: niveau moyen (signal de données en télévision)</i> <i>S: nivel medio (señal de datos en televisión)</i>	* Rep. 956	Ap. I, An. I, § 3	XI-1
minimum interference threshold <i>F: seuil inférieur de brouillage</i> <i>S: umbral inferior de interferencia</i>	* Rep. 526	§ 4	I
minimum standard antenna (case of a directional antenna in the bands 4 and 28 MHz) <i>F: antenne normale minimale</i> <i>S: antena normal mínima</i>	* Rec. 162	§ 1.4	III
minimum usable field strength (E_{min}) <i>F: champ minimal utilisable (E_{min})</i> <i>S: intensidad de campo mínima utilizable (E_{min})</i>	Rec. 573 Rec. 638	No. F31 § 2.1	XIII X-1
minimum usable power flux-density (P_{min}) <i>F: puissance surfacique minimale utilisable (P_{min})</i> <i>S: densidad espectral de potencia mínima utilizable (P_{min})</i>	Rec. 573	No. F31	XIII
mixing ratio <i>F: rapport de mélange</i> <i>S: relación de mezcla</i>	Rec. 310	No. C3	V

mobile service

F: service mobile
S: servicio móvil

mobile services switching centre (MSC)

F: centre de commutation pour les services mobiles (CCM)
S: centro de conmutación de los servicios móviles (CCM)

mobile station

F: station mobile
S: estación móvil

modified julian date (MJD)

F: date julienne modifiée (DJM)
S: fecha modificada del calendario juliano (FMCJ)

modified refractive index

F: indice de réfraction modifié
S: índice de refracción modificado

modulation

F: modulation
S: modulación

modulation acceptance bandwidth of a receiver other than those used for broadcast reception, for frequency- or phase-modulated signals

F: 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
S: 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

MUF

see: maximum usable frequency, operational MUF

multipath propagation

F: propagation par trajets multiples
S: propagación por trayectos múltiples

multiple access

F: accès multiple
S: acceso múltiple

multiplexing

F: multiplexage
S: multiplaje

multi-satellite link

F: liaison multisatellite
S: enlace multisatélite

M-unit

F: unité M
S: unidad M

N**N (refractivity)**

see: refractivity, N

near-Earth space

F: espace proche de la Terre
S: espacio próximo a la Tierra

Note. — See also comments of the Chairman of Study Group 2 (Edition 1986) § 4, second paragraph.

necessary bandwidth

F: largeur de bande nécessaire
S: anchura de banda necesaria

nodal period

F: période nodale
S: periodo nodal

Rec. 573	No. A10 (Note 1)	XIII
Rec. 624	An. I, § 1	VIII-1
Rec. 573	No. A10	XIII
Rep. 730	§ 4.13	VII
Rec. 310	No. C7	V
Rec. 662	Ap. II, No. 3.08	XIII
* Rec. 332	§ 4.2	I
Rec. 310 Rec. 573	No. C29 No. G19b	V XIII
Rec. 662	Ap. II, No. 3.13	XIII
Rec. 662	Ap. II, No. 3.11	XIII
Rec. 573	No. A32	XIII
Rec. 310	No. C9	V
* Rep. 548	§ 1	II
Rec. 328 Rec. 573	§ 1.3 No. B02	I XIII
Rep. 204		IV-1

noise

see: cross-modulation noise (case of compandors for sound-programme circuits),
impulsive noise tolerance, trailing noise (case of compandors for
sound-programme circuits)

noise amplitude distribution

F: courbe de répartition de l'amplitude du bruit
S: distribución de la amplitud del ruido

noise factor (noise figure)

F: facteur de bruit'
S: factor de ruido

noise figure

see: noise factor

noise (in telecommunication)

F: bruit (en télécommunication)
S: ruido (en telecomunicación)

noise temperature

see: equivalent satellite link noise temperature

noise temperature (of a one-port network)

F: température du bruit (d'un monoporte)
S: temperatura de ruido (de una red con una sola puerta)

nominal coverage area

see: coverage area

nominal orbital position

F: position nominale sur l'orbite
S: posición orbital nominal

nominal value

F: valeur nominale
S: valor nominal

normalized frequency

F: fréquence normée
S: frecuencia normalizada

normalized frequency departure

F: écart de fréquence normé
S: desajuste de frecuencia normalizado

normalized frequency difference

F: différence de fréquence normée
S: diferencia de frecuencia normalizada

normalized frequency drift

F: dérive de fréquence normée
S: deriva normalizada de frecuencia

normalized offset

F: décalage normé
S: separación normalizada

normalized signal-to-noise ratio

F: rapport signal/bruit normalisé
S: relación señal/ruido normalizada

N-unit

F: unité N
S: unidad N

O**obstacle gain**

F: gain d'obstacle
S: ganancia de obstáculo

occupied band

F: bande occupée
S: banda ocupada

occupied bandwidth

F: largeur de bande occupée
S: anchura de banda ocupada

	Rep. 358	§ 1.3.1.1	VIII-1
	Rec. 573	No. F03	XIII
	Rec. 662	Ap. II, No. 5.08	XIII
	Rec. 573	No. F01	XIII
	Rec. 566	§ 3.4	X/XI-2
	Rep. 730	§ 0.10	VII
	Rep. 730	§ 1.3	VII
	Rep. 730	§ 1.8	VII
	Rep. 730	§ 1.13	VII
	Rep. 730	§ 1.12	VII
	Rep. 730	§ 0.12	VII
*	Rec. 331	§ 9.5	I
	Rec. 310	No. C6	V
	Rec. 310	No. B9	V
	Rec. 573	No. B05	XIII
	Rec. 328 Rec. 573	§ 1.13 No. B04	I XIII

offset <i>F: décalé (canal)</i> <i>S: separado (canal)</i>	Rec. 573	No. B16	XIII
offset (of frequency) <i>F: décalage (de fréquence)</i> <i>S: separación (de frecuencias)</i>	Rep. 730	§ 0.11	VII
operational MUF <i>F: MUF d'exploitation</i> <i>S: MUF de explotación</i>	Rec. 373 Rec. 573	§ 1 No. G30	VI XIII
optimum working frequency (OWF or FOT) <i>F: fréquence optimale de travail (FOT)</i> <i>S: frecuencia óptima de trabajo (FOT)</i>	Rec. 373	An. I, § 1	VI
orbit <i>F: orbite</i> <i>S: órbita</i>	Rep. 204 Rec. 573	No. H05	IV-1 XIII
orbit see: circular orbit, direct (retrograde) orbit, elliptical orbit, equatorial orbit, geostationary-satellite orbit, inclined orbit, low orbit, polar orbit, unperturbed orbit			
orbital see: nominal orbital position			
orbital elements (of a satellite or other object in space) <i>F: éléments d'une orbite (d'un satellite ou autre corps spatial)</i> <i>S: elementos de una órbita (de satélite u otro objeto espacial)</i>	Rep. 204		IV-1
orbital period (of a satellite), period of revolution (of a satellite) <i>F: période orbitale (d'un satellite), période de révolution (d'un satellite)</i> <i>S: periodo orbital (de un satélite), periodo de revolución (de un satélite)</i>	Rep. 204		IV-1
orbital plane (of a satellite) <i>F: plan de l'orbite (d'un satellite)</i> <i>S: plano de la órbita (de un satélite)</i>	Rep. 204		IV-1
orthogonal co-channel <i>F: cocanal (orthogonal)</i> <i>S: cocanal (ortogonal)</i>	Rec. 573	No. B14	XIII
out-of-band emission <i>F: émission hors bande</i> <i>S: emisión fuera de banda</i>	Rec. 328 Rec. 573	§ 1.6 No. C03	I XIII
out-of-band power (of an emission) <i>F: puissance hors bande (d'une émission)</i> <i>S: potencia fuera de banda (de una emisión)</i>	Rec. 328	§ 1.11	I
out-of-band spectrum (of an emission) <i>F: spectre hors bande (d'une émission)</i> <i>S: espectro fuera de banda (de una emisión)</i>	Rec. 328	§ 1.5	I
overall adjacent channel protection margin <i>F: marge de protection globale pour le canal adjacent</i> <i>S: margen de protección global para canal adyacente</i>	Rec. 566	§ 4.8	X/XI-2
overall carrier-to-interference ratio <i>F: rapport global porteuse/brouillage</i> <i>S: relación global portadora/interferencia</i>	Rec. 566	§ 4.6	X/XI-2
overall co-channel protection margin <i>F: marge de protection globale dans le même canal</i> <i>S: margen de protección, cocanal global</i>	Rec. 566	§ 4.7	X/XI-2
overall equivalent protection margin <i>F: marge de protection globale équivalente</i> <i>S: margen de protección global équivalente</i>	Rec. 566	§ 4.10	X/XI-2
overall second adjacent channel protection margin <i>F: marge de protection globale pour le canal deuxième adjacent</i> <i>S: margen de protección global para segundo canal adyacente</i>	Rec. 566	§ 4.9	X/XI-2
OWF see: optimum working frequency			

P

packet multiplexing

F: multiplexage par paquets

S: multiplaje por paquetes

parasitic emissions

F: rayonnement parasite

S: radiación parásita

passband (for amplitude-modulated signals)

F: bande passante (cas de signaux à modulation d'amplitude)

S: banda de paso (para las señales con modulación de amplitud)

passive sensor

F: détecteur passif

S: sensor pasivo

path

see: digital radio path, hypothetical reference digital path, transmission path

peak envelope power (of a radio transmitter)

F: puissance en crête (d'un émetteur radioélectrique)

S: potencia en la cresta de la envolvente (de un transmisor radioeléctrico)

peak-to-peak amplitude (data signal in television)

F: amplitude crête-à-crête (signal de données en télévision)

S: amplitud de cresta a cresta (señal de datos en televisión)

Pedersen ray

F: rayon de Pedersen

S: rayo de Pedersen

penetration depth

F: profondeur de pénétration (dans le sol)

S: propundidad de penetración (en el suelo)

periastron

F: périastre

S: periastro

perigee

F: périgée

S: perigeo

period (of a satellite)

F: période (d'un satellite)

S: periodo (de un satélite)

period of revolution (of a satellite), orbital period (of a satellite)

F: période de révolution (d'un satellite), période orbitale (d'un satellite)

S: periodo de revolución (de un satélite), periodo orbital (de un satélite)

permissible interference

F: brouillage admissible

S: interferencia admisible

permissible out-of-band power

F: puissance hors bande admissible

S: potencia fuera de banda admisible

permissible out-of-band spectrum (of an emission)

F: spectre hors bande admissible (d'une émission)

S: espectro fuera de banda admisible (de una emisión)

phase

F: phase

S: fase

phase change coefficient

F: déphasage linéique

S: coeficiente del desfasaje

phase delay

F: temps de propagation de phase

S: retardo de fase

phase shift

F: déphasage

S: desplazamiento de fase

point-to-area communication

F: communication point à zone

S: comunicación punto a zona

*	Rep. 954	§ 4.2	X/XI-2
	Rec. 329	§ 1.5	I
*	Rec. 332	§ 4.1	I
	Rec. 573	No. H32	XIII
	Rec. 573	No. E01	XIII
*	Rep. 956	Ap. I, P. I, § 7	XI-1
*	Rep. 250	§ 1 and 2	VI
	Rec. 310	No. B4	V
	Rep. 204		IV-1
	Rep. 204		IV-1
	Rec. 573	No. H07	XIII
	Rep. 204		IV-1
	Rec. 573	No. F11c (Note 2)	XIII
	Rec. 328	§ 1.12	I
	Rec. 328	§ 1.10	I
	Rep. 730	§ 2.1	VII
	Rec. 662	Ap. II, No. 5.05	XIII
	Rec. 662	Ap. II, § 5.06	XIII
	Rep. 730	§ 2.7	VII
	Rec. 592	§ 5	IX-1
	Rec. 662	Ap. II, No. 2.09	XIII

point-to-multipoint communication*F: communication point à multipoint**S: comunicación punto a multipunto***point-to-point communication***F: communication point à point**S: comunicación punto a punto***polar orbit (of a satellite)***F: orbite polaire (d'un satellite)**S: órbita polar (de un satélite)***polarized wave**

see: left-hand polarized wave, right-hand polarized wave

port (of a network)*F: accès (d'un réseau)**S: puerto (de una red)***power**

see: carrier power (of a radio transmitter), effective monopole-radiated power (e.m.r.p.), effective radiated power (e.r.p.), equivalent isotropically radiated power (e.i.r.p.), mean power of a radio transmitter, out-of-band power (of an emission), peak envelope power (of a radio transmitter), permissible out-of-band power

power flux-density

see: high power flux-density, low power flux-density, medium power flux-density

precipitation rate, rainfall rate*F: intensité de précipitation, intensité de pluie**S: intensidad de precipitación, índice de pluviosidad, intensidad de lluvia***precipitation-scatter propagation***F: propagation par diffusion par les précipitations**S: propagación por dispersión debida a las precipitaciones***precision***F: précision**S: precisión***precision**

see: accuracy, uncertainty

primary body (in relation to a satellite)*F: corps principal (pour un satellite)**S: cuerpo primario (para un satélite)***primary frequency standard***F: étalon primaire de fréquence**S: patrón primario de frecuencia***primary grade of reception quality (in the broadcasting-satellite service)***F: qualité primaire de réception (dans le service de radiodiffusion par satellite)**S: grado primario de calidad de recepción (en el servicio de radiodifusión por satélite)***primary time standard***F: étalon primaire de temps**S: patrón de tiempo primario***propagation****ionospheric propagation**

see: ionospheric (reflection) propagation, ionospheric scatter propagation, trans-ionospheric propagation

tropospheric propagation

see: multipath propagation, precipitation scatter propagation, trans-horizon propagation

propagation coefficient*F: exposant linéique de propagation**S: coeficiente de propagación***proper time***F: temps propre**S: tiempo propio***proportional jitter (data signal in television)***F: gigue proportionnelle**S: fluctuación de fase (o temblor) proporcional*

Rec. 592	§ 4	IX-1
Rec. 662	Ap. II, No. 2.08	XIII
Rec. 592	§ 3	IX-1
Rec. 662	Ap. II, No. 2.07	XIII
Rep. 204		IV-1
Rec. 662	Ap. II, No. 2.13	XIII
Rec. 310	No. C32	V
Rec. 310	No. C28	V
Rec. 573	No. G19a	XIII
Rep. 730	§ 0.2	VII
Rep. 204		IV-1
Rep. 730	§ 1.15	VII
Rec. 566	§ 1.4.1	X/XI-2
Rep. 730	§ 3.23A	VII
Rec. 662	Ap. II, No. 5.03	XIII
Rep. 730	§ 3.7	VII
* Rep. 956	Ap. I, An. I, § 11	XI-1

protection margin

F: marge de protection
S: margen de protección

protection ratio

F: rapport de protection
S: relación de protección

protection ratio

see: audio-frequency (AF) protection ratio, radio-frequency (RF) protection ratio, video-frequency (VF) protection ratio

Q**quasi-impulsive interference**

F: brouillage quasi impulsif
S: interferencia de carácter cuasi impulsivo

R**radiating cables**

see: leaky cables

radiation (in radiocommunication)

F: rayonnement (radioélectrique)
S: radiación (radioeléctrica)

radio

F: radio, radioélectrique
S: radio

(radio) broadcasting

F: radiodiffusion
S: radiodifusión

radiocommunication

F: radiocommunication
S: radiocomunicación

radiocommunication service

F: service de radiocommunication
S: servicio de radiocomunicación

radio-frequency channel, RF channel

F: canal radioélectrique, canal RF, radiocanal
S: radiocanal, canal radioeléctrico

radio-frequency disturbance

F: perturbation radioélectrique, parasite (radioélectrique)
S: perturbación electromagnética, parásito (electromagnético)

radio (frequency) noise

F: bruit radioélectrique
S: ruido radioeléctrico

radio-frequency (RF) protection ratio

F: rapport de protection en radiofréquence (RF)
S: relación de protección en radiofrecuencia (RF)

radio-frequency (RF) signal-to-interference ratio

F: rapport signal/brouillage en radiofréquence (RF)
S: relación señal/interferencia en radiofrecuencia (RF)

radio horizon

F: horizon radioélectrique
S: horizonte radioeléctrico

radio link

F: liaison radioélectrique
S: radioenlace

radio paging

F: radiorecherche
S: radiobúsqueda

radio-paging system

F: système radioélectrique d'appel unilatéral sans transmission de parole
(système de radiorecherche)
S: sistema de radiobúsqueda (radio-paging)

	Rec. 573	No. F23	XIII
	Rec. 573	No. F22	XIII
*	Rep. 183	§ 1	III
	Rec. 573	No. C01	XIII
	Rec. 573	No. A03	XIII
	Rec. 662	Ap. II, No. 1.3.5	XIII
	Rec. 573	No. A01	XIII
	Rec. 573	No. A04 (Note 2)	XIII
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	Rec. 573	No. F11b	XIII
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*	Rec. 573	No. F22 (Note 3)	XIII
	Rec. 655	§ 1	XI-1
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*	Rec. 573	No. F21 (Note 1)	XIII
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	Rec. 573	No. A21	XIII
*	Rec. 539		VIII-1
*	Rec. 584		VIII-1
*	Rep. 499		VIII-1

radio-relay system <i>F: faisceau hertzien</i> <i>S: sistema de relevadores radioeléctricos</i>	Rec. 592 Rec. 573	§ 1 No. A22	IX-1 XIII
radio-relay system see: trans-horizon radio-relay system			
radio station see: station			
(radio) transmitter <i>F: émetteur (radioélectrique)</i> <i>S: transmisor (radioeléctrico)</i>	Rec. 573	No. D01	XIII
radio waves, hertzian waves <i>F: ondes radioélectriques, ondes hertziennes</i> <i>S: ondas radioeléctricas, ondas hertzianas</i>	Rec. 573	No. A02	XIII
ray path transmission loss <i>F: affaiblissement de transmission pour un trajet radioélectrique</i> <i>S: pérdida de transmisión en el trayecto de un rayo</i>	Rec. 341 Rec. 573	§ 6 No. A46	V XIII
reception (in the broadcasting-satellite service) see: community reception, individual reception			
reciprocal mixing <i>F: mélange réciproque</i> <i>S: mezcla reciproca</i>	Rec. 612	An. I, § 1	III
reduced carrier emission <i>F: émission à porteuse réduite</i> <i>S: emisión de onda portadora reducida</i>	Rec. 573	No. D06	XIII
reference atmosphere for refraction <i>F: atmosphère de référence pour la réfraction</i> <i>S: atmósfera de referencia para la refracción</i>	Rec. 310 Rec. 369	No. C12	V V
reference frequency <i>F: fréquence de référence</i> <i>S: frecuencia de referencia</i>	Rec. 328	§ 1.18	I
reference sensitivity <i>F: sensibilité de référence</i> <i>S: sensibilidad de referencia</i>	* Rec. 331	§ 5	I
reference usable field strength (E_{ref}) <i>F: champ utilisable de référence (E_{ref})</i> <i>S: intensidad de campo de referencia utilizable (E_{ref})</i>	Rec. 573 Rec. 638	No. F33 § 2.3	XIII X-1
reference usable power flux-density (P_{ref}) <i>F: puissance surfacique utilisable de référence (P_{ref})</i> <i>S: densidad espectral de potencia de referencia utilizable (P_{ref})</i>	Rec. 573	No. F33	XIII
reflecting satellite <i>F: satellite réflecteur</i> <i>S: satélite reflector</i>	Rep. 204 Rec. 573	No. H12	IV-1 XIII
refraction see: M-unit, modified refractive index, reference atmosphere for refraction, refractive index (n), refractive modulus; M, sub-refraction, super refraction			
refractive index (n) <i>F: indice de réfraction (n)</i> <i>S: índice de refracción (n)</i>	Rec. 310	No. C14	V
refractive modulus; M <i>F: module de réfraction; M</i> <i>S: módulo de refracción; M</i>	Rec. 310	No. C8	V
refractivity, N <i>F: coindice, N</i> <i>S: coindice, N</i>	Rec. 310	No. C5	V
rejection ratio see: image-rejection ratio, intermediate-frequency rejection ratio, spurious-response rejection ratio			
relative build-up time of a telegraph signal <i>F: temps d'établissement relatif d'un signal télégraphique</i> <i>S: tiempo relativo de establecimiento de una señal telegráfica</i>	Rec. 328	§ 1.2.1	I
remote data processing [teleinformatics] <i>F: téléinformatique</i> <i>S: teleinformática</i>	Rec. 662	Ap. II, No. 1.15	XIII

reproducibility <i>F: reproductibilité</i> <i>S: reproductibilidad</i>	Rep. 730	§ 0.7	VII
remote alarm <i>F: téléalarme</i> <i>S: telealarma</i>	Rec. 662	Ap. II, No. 1.33	XIII
remote sensing satellite <i>F: satellite de télédétection</i> <i>S: satélite de teledetección</i>	Rec. 573	No. H35	XIII
resetability <i>F: défaut de fidélité</i> <i>S: reposicionabilidad</i>	Rep. 730	§ 0.8	VII
right-hand polarized wave <i>F: onde à polarisation dextrorsum (sens des aiguilles d'une montre), onde à polarisation dextrogyre</i> <i>S: onda de polarización dextrógira</i>	Rec. 573	No. G05	XIII
rough surface <i>F: surface rugueuse</i> <i>S: superficie rugosa</i>	Rec. 310	No. B6	V
S			
satellite <i>F: satellite</i> <i>S: satélite</i>	Rep. 204 Rec. 573	No. H04	IV-1 XIII
satellite see: active satellite, attitude-stabilized satellite, geostationary satellite, geosynchronous satellite, reflecting satellite, station-keeping satellite, stationary satellite, sub-synchronous satellite, synchronized satellite, synchronous satellite			
satellite link <i>F: liaison par satellite</i> <i>S: enlace por satélite</i>	Rec. 573	No. A.31	XIII
up link <i>F: liaison montante</i> <i>S: enlace ascendente</i>	Rec. 573	No. A.31.a	XIII
down link <i>F: liaison descendante</i> <i>S: enlace descendente</i>	Rec. 573	No. A.31.b	XIII
satellite link see: down link, inter-satellite link, multi-satellite link, up link			
satellite network <i>F: réseau à satellite</i> <i>S: red de satélite</i>	Rec. 573	No. A.36	XIII
satellite network see: frequency re-use satellite network			
satellite system <i>F: système à satellites</i> <i>S: sistema de satélites</i>	Rec. 573	No. A.34	XIII
scintillation <i>F: scintillation</i> <i>S: centelleo</i>	Rec. 320	No. C30	V
scrambling <i>F: embrouillage (en radiodiffusion)</i> <i>S: aleatorización</i>	* Rep. 1079	An. I	XI-1
second adjacent channel <i>F: canal deuxième adjacent</i> <i>S: segundo canal adyacente</i>	Rec. 566 Rec. 573	§ 4.5 No. B12	X/XI-2 XIII
secondary frequency standard <i>F: étalon secondaire de fréquence</i> <i>S: patrón secundario de frecuencia</i>	Rep. 730	§ 1.16	VII

secondary grade of reception quality (in the broadcasting-satellite service)
F: qualité secondaire de réception (dans le service de radiodiffusion par satellite)
S: grado secundario de calidad de recepción (en el servicio de radiodifusión por satélite)

secondary time standard
F: étalon secondaire de temps
S: patrón de tiempo secundario

selectivity of a receiver
F: sélectivité d'un récepteur
S: selectividad de un receptor

selectivity of a receiver
 see: effective selectivity

sending (in telecommunication)
F: émission (en télécommunication)
S: emisión (en telecomunicación)

sensitivity factor (earth station)
F: facteur de sensibilité (station terrestre)
S: factor de sensibilidad (estación terrena)

sensitivity of a receiver
F: sensibilité d'un récepteur
S: sensibilidad de un receptor

sensitivity of a receiver
 see: maximum sensitivity, maximum usable sensitivity (several definitions), reference sensitivity

sensor
 see: active sensor, passive sensor

service
 see: broadcasting-satellite service, mobile service, radiocommunication service, standard frequency satellite service, [teleinformatics], teletext service, time signal-satellite service

service arc
F: arc de service
S: arco de servicio

service area (for the broadcasting-satellite service)
F: zone de service (pour le service de radiodiffusion par satellite)
S: zona de servicio (para el servicio de radiodifusión por satélite)

service area (of a space station)
F: zone de service (d'une station spatiale)
S: zona de servicio (de una estación espacial)

service sector (S), (of a directional antenna in the bands 4 to 28 MHz)
F: secteur de service (S)
S: sector de servicio (S)

shaped-beam antenna
F: antenne à faisceau modelé
S: antena con bases conformados

ship station
F: station de navire
S: estación de barco

sidereal period of revolution (of a satellite)
F: période de révolution sidérale (d'un satellite)
S: periodo de revolución sideral (de un satélite)

sidereal period of rotation (of an object in space)
F: période de rotation sidérale (d'un objet spatial)
S: periodo de rotación sideral (de un objeto espacial)

signal
F: signal
S: señal

signal-to-interference ratio
F: rapport signal/brouillage
S: relación señal/interferencia

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	Rep. 730	§ 3.23B	VII
*	Rec. 332	§ a	I
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*	Rep. 382	§ 2.3.2	IV/IX-2
*	Rec. 331	§ a	I
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*	Rec. 566	§ 3.2 (Note 3)	X/XI-2
	Rec. 573	Ap. No. 10b	XIII
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	Rep. 204		IV-1
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*	Rec. 573	No. F21	XIII

signal-to-interference ratio

see: audio-frequency (AF) signal-to-interference ratio, radio-frequency (RF)
signal-to-interference ratio, video frequency (VF) signal-to-interference ratio

simplex

F: simplex, à l'alternat
S: simplex

single-sideband emission, SSB emission

F: émission à bande latérale unique, émission BLU
S: emisión de banda lateral única, emisión BLU

smooth surface

F: surface lisse
S: superficie lisa, especular

sound broadcasting

F: radiodiffusion sonore
S: radiodifusión sonora

spacecraft

F: engin spatial
S: vehículo espacial

space division

F: répartition spatiale
S: división espacial

space probe

F: sonde spatiale
S: sonda espacial

space radiocommunication

F: radiocommunication spatiale
S: radiocomunicación espacial

space station

F: station spatiale
S: estación espacial

space system

F: système spatial
S: sistema espacial

spectrum

see: out-of-band spectrum (of an emission), permissible out-of-band spectrum
(of an emission)

spectrum amplitude

F: amplitude du spectre
S: amplitud del espectro

spectrum efficiency

F: efficacité de l'emploi du spectre
S: eficacia de utilización del espectro

spread spectrum (SS) system

F: système à modulation avec étalement du spectre (MES)
S: sistema de modulación de espectro ensanchado (o sistema SS (spread spectrum system))

spreading loss

F: affaiblissement géométrique, atténuation géométrique
S: pérdida geométrica

spurious emissions

F: rayonnement non essentiel
S: radiación no esencial

spurious frequency conversion products

F: produits non essentiels de conversion de fréquence
S: productos no esenciales de conversión de frecuencia

spurious intermodulation products

F: produits d'intermodulation non essentiels
S: productos de intermodulación no esenciales

spurious-response rejection ratio (for a receiver)

F: affaiblissement sur la fréquence parasite (d'un récepteur)
S: atenuación para la frecuencia parásita (para un receptor)

standard frequency

F: fréquence étalon
S: frecuencia patrón

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	Rec. 662	Ap. II, No. 1.3.6	XIII
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	Rep. 358	§ 1.3.1.2	VIII-1
*	Rep. 662	§ 2.2	I
*	Rep. 651	§ 1	I
	Rec. 573	No. A48	XIII
	Rec. 329 Rec. 328 Rec. 573	§ 1.1 § 1.7 No. C04	I I XII
*	Rec. 329	§ 1.4	I
*	Rec. 329	§ 1.3	I
*	Rec. 332	§ 4.6	I
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standard frequency emission

F: émission de fréquences étalon
S: emisión de frecuencias patrón

standard frequency and/or time-signal station

F: station de fréquence étalon et/ou de signaux horaires
S: estación de frecuencias patrón y/o de señales horarias

standard frequency-satellite service

F: service des fréquences étalon par satellite
S: servicio de frecuencias patrón por satélite

standard radio atmosphere

F: atmosphère radioélectrique normale
S: atmósfera radioeléctrica normal

standard refractivity vertical gradient

F: gradient normal du coindice
S: gradiente normal del coindice

standard time-signal emission

F: émission de signaux horaires
S: emisión de señales horarias

station

F: station
S: estación

station

see: broadcasting-satellite space station, earth station, land station, mobile station, space station, standard frequency and/or time-signal station, terrestrial station

stationary satellite

F: satellite stationnaire
S: satélite estacionario

station-keeping satellite

F: satellite maintenu en position
S: satélite de posición relativa constante

still-picture television (SPTV)

F: télévision à images fixes
S: televisión de imágenes fijas

still-picture videophony

F: visiophonie à images fixes
S: videofonía de imágenes fijas

sub-refraction

F: infraréfraction
S: infrarrefracción

subscriber's line, subscriber's loop

F: ligne d'abonné, ligne de rattachement
S: línea de abonado, bucle de abonado

sub-synchronous (super-synchronous) satellite

F: satellite sous-synchrone (super-synchrone)
S: satélite subsincrónico (supersincrónico)

super refraction

F: superréfraction
S: superrefracción

suppressed carrier emission

F: émission à porteuse supprimée
S: emisión de onda portadora suprimida

survival craft station

F: station d'engin de sauvetage
S: estación de embarcación o dispositivo de salvamento

switching

see: automatic switching for television circuits

switching (in telecommunication)

F: commutation (en télécommunication)
S: conmutación (en telecomunicación)

synchronism

F: synchronisme
S: sincronismo

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Rec. 310	No. C13	V
Rec. 662	Ap. II, No. 2.12	XIII
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Rec. 310	No. C14	V
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Rec. 573	Ap. I, No. 10d	XIII
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synchronized satellite, phased satellite (deprecated)*F: satellite synchronisé, satellite en phase (déconseillé)**S: satélite sincronizado, satélite en fase (desaconsejado)***synchronous satellite***F: satellite synchrone**S: satélite sincrónico***synthesizer***F: synthétiseur**S: sintetizador***system loss***F: affaiblissement entre bornes d'antennes, affaiblissement du système**S: pérdida del sistema***T****TAI**

see: international atomic time

telecommand*F: télécommande**S: telemando***telecommunication***F: télécommunication**S: telecomunicación***telecommunication circuit***F: circuit de télécommunication**S: circuito de telecomunicación***telecommunication network***F: réseau de télécommunication**S: red de telecomunicación***teleconference***F: téléconférence**S: teleconferencia***telecontrol***F: téléconduite**S: telecontrol***telegraphy***F: télégraphie**S: telegrafia***teleguidance***F: téléguidage**S: teleguiaje***[teleinformatics], teleprocessing***F: téléinformatique**S: teleinformática (teleproceso)***telematics (services)***F: télématique (services de)**S: telemática (servicios de)***telemetry, telemetering***F: télémesure**S: telemedida***telemonitoring***F: télésurveillance**S: telesupervisión***telephone-type channel***F: voie de type téléphonique**S: canal de tipo telefónico***telephone-type circuit***F: circuit de type téléphonique**S: circuito de tipo telefónico***telephony***F: téléphonie**S: telefonía*

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* Rep. 530	§ 1.2, 2.6	I
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Rep. 662	Ap. II, No. 1.31	XIII
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Rep. 662	Ap. II, No. 2.04	XIII
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teletex F: <i>télétex</i> S: <i>teletex</i>	Rec. 662	Ap. II, No. 1.22	XIII
teletext, broadcast videography F: <i>télétexte, vidéographie diffusée</i> S: <i>teletexto, videografía radiodifundida</i>	Rec. 662	Ap. II, No. 1.20	XIII
teletext service F: <i>service de télétexte</i> S: <i>servicio de teletexto</i>	* Rep. 802 Rec. 653	§ 3.1 § 2	XI-1 XI-1
television F: <i>télévision</i> S: <i>televisión</i>	Rec. 662	No. 1.16	XIII
television (broadcasting) F: <i>radiodiffusion visuelle, (radiodiffusion de) télévision</i> S: <i>(radiodifusión de) televisión</i>	Rec. 662	Ap. II, No. 1.37	XIII
telewriting F: <i>téléécriture</i> S: <i>teleescritura</i>	Rec. 662	Ap. II, No. 1.11	XIII
telex (service) F: <i>(service) télex</i> S: <i>(servicio) télex</i>	Rec. 662	Ap. II, No. 1.09	XIII
temperature inversion F: <i>inversion de température</i> S: <i>inversión de temperatura</i>	Rec. 310	No. C2	V
terrain irregularity Δh see: measurement of terrain irregularity Δh			
terrestrial hypothetical reference circuit (television) F: <i>circuit fictif de référence pour système de Terre (télévision)</i> S: <i>circuito ficticio de referencia terrenal (televisión)</i>	* Rec. 567	§ A.1.2	XII
terrestrial radiocommunication F: <i>radiocommunication de Terre</i> S: <i>radiocomunicación terrenal</i>	Rec. 573	No. A07	XIII
terrestrial station F: <i>station de Terre</i> S: <i>estación terrenal</i>	Rec. 573	No. A09	XIII
time see: coordinated universal time (UTC), DUT1, international atomic time (TAI)			
time code F: <i>code horaire</i> S: <i>código horario</i>	Rep. 730	§ 4.8	VII
time comparison F: <i>comparaison de temps</i> S: <i>comparación de tiempo</i>	Rep. 730	§ 3.16	VII
time division F: <i>répartition temporelle</i> S: <i>división en el tiempo</i>	Rec. 662	Ap. II, No. 3.15	XII
time interval F: <i>intervalle de temps</i> S: <i>intervalo de tiempo</i>	Rep. 730	§ 4.9	VII
time marker F: <i>repère de temps</i> S: <i>marca de tiempo</i>	Rep. 730	§ 3.15	VII
time scale difference F: <i>différence entre échelles de temps</i> S: <i>diferencia entre escalas de tiempo</i>	Rep. 730	§ 3.14	VII
time scales in synchronism F: <i>échelles de temps en synchronisme</i> S: <i>escalas de tiempo en sincronismo</i>	Rep. 730	§ 3.17	VII
time scale reading F: <i>lecture d'une échelle de temps</i> S: <i>lectura de una escala de tiempo</i>	Rep. 730	§ 3.13	VII

time scale unit <i>F: unité d'une échelle de temps</i> <i>S: unidad de escala de tiempo</i>	Rep. 730	§ 3.18	VII
time signal-satellite service <i>F: service de signaux horaires par satellite</i> <i>S: servicio de señales horarias por satélite</i>	Rep. 730	§ 1.6B	VII
time standard <i>F: étalon de temps</i> <i>S: patrón de tiempo</i>	Rep. 730	§ 3.23	VII
time step <i>F: saut de temps</i> <i>S: salto de tiempo</i>	Rep. 730	§ 3.20	VII
topocentric angle <i>F: angle topocentrique</i> <i>S: ángulo topocéntrico</i>	Rep. 204 Rec. 573	No. H09b	IV-1 XIII
total loss (of a radio link) <i>F: affaiblissement global (d'une liaison radioélectrique)</i> <i>S: pérdida total (de un enlace radioeléctrico)</i>	Rec. 341 Rec. 573	§ 1 No. A41	V XIII
trailing noise (case of compandors for sound-programme circuits) <i>F: bruit de trainage (cas de compresseurs-extenseurs pour circuits de transmissions radiophoniques)</i> <i>S: ruido residual (caso de compresores-expansores para circuitos de transmisiones radiofónicas)</i>	Rep. 493	§ 3	XII
trans-horizon propagation <i>F: propagation transhorizon</i> <i>S: propagación transhorizonte</i>	Rec. 310 Rec. 573	No. C24 No. G16	V XIII
trans-horizon radio-relay system <i>F: faisceau hertzien transhorizon</i> <i>S: sistema de relevadores radioeléctricos transhorizonte</i>	Rec. 592 Rec. 573	§ 2 No. A23	IX-1 XIII
trans-ionospheric propagation <i>F: propagation transionosphérique</i> <i>S: propagación transionosférica</i>	Rec. 573	No. G24	XIII
transmission <i>F: transmission</i> <i>S: transmisión</i>	Rec. 662	Ap. II, No. 1.03	XIII
transmission bit slip <i>F: glissement de bits</i> <i>S: deslizamiento de bits en la transmisión</i>	Rep. 967	§ 5	XII
(transmission) channel <i>F: voie (de transmission)</i> <i>S: canal (de transmisión)</i>	Rec. 662	Ap. II, No. 2.01	XIII
transmission channel see: channel, circuit			
transmission loss (of a radio link) <i>F: affaiblissement de transmission (d'une liaison radioélectrique)</i> <i>S: pérdida de transmisión (de un enlace radioeléctrico)</i>	Rec. 341 Rec. 573	§ 3 No. A43	V XIII
transmission path <i>F: trajet de transmission</i> <i>S: trayecto de transmisión</i>	Rec. 662	Ap. II, No. 2.14	XIII
transmitter see: (radio) transmitter			
troposphere <i>F: troposphère</i> <i>S: troposfera</i>	Rec. 310 Rec. 573	No. C1 No. G13	V XIII
tropospheric propagation <i>F: propagation troposphérique</i> <i>S: propagación troposférica</i>	Rec. 573	No. 614	XIII
tropospheric radioduct <i>F: conduit troposphérique, guide troposphérique</i> <i>S: conducto troposférico</i>	Rec. 310 Rec. 573	No. C18 No. G17	V XIII
tropospheric-scatter propagation <i>F: propagation par diffusion troposphérique</i> <i>S: propagación por dispersión troposférica</i>	Rec. 310 Rec. 573	No. C25 No. G19	V XIII

U

uncertainty*F: incertitude**S: incertidumbre***uncertainty**

see: accuracy, precision

uncontrolled slip*F: glissement non maîtrisable**S: deslizamiento no controlado***unidirectional***F: unilatéral, unidirectionnel**S: unilateral, unidireccional***universal time (UT)***F: temps universel (UT)**S: tiempo universal (UT)***unperturbed orbit (of a satellite)***F: orbite non perturbée (d'un satellite)**S: órbita no perturbada (de un satélite)***unwanted emissions***F: rayonnements non désirés**S: emisiones no deseadas***up link**

see: satellite link

usable field strength (E_u)*F: champ utilisable (E_u)**S: intensidad de campo utilizable (E_u)***usable field strength**see: minimum usable field strength (E_{min}), reference usable field strength (E_{min})**usable power flux-density (P_u)***F: puissance surfacique utilisable (P_u)**S: densidad espectral de potencia utilizable (P_u)***usable power flux-density**see: minimum usable power flux-density (P_{min}), reference usable power flux-density (P_{ref})**UTC**

see: coordinated universal time

V

vertical directivity pattern*F: diagramme de directivité vertical**S: diagrama de directividad vertical***vestigial-sideband emission***F: émission à bande latérale résiduelle**S: emisión con banda lateral residual***video-frequency (VF) protection ratio***F: rapport de protection en vidéofréquence (VF)**S: relación de protección en videofrecuencia (VF)***video-frequency (VF) signal-to-interference ratio***F: rapport signal/brouillage en vidéofréquence (VF)**S: relación señal/interferencia en videofrecuencia (VF)***videography***F: vidéographie**S: videografía***videography**

see: broadcast videography, teletext, videotex; interactive videography

Rep. 730 § 0.3 VII

Rep. 967 § 5.1 XII

Rep. 971 Ap. II, No. 3.20 XIII

Rep. 730 § 3.9 VII
Rec. 460 An. I, § A VII
Rec. 573 No. J05 XIII

Rep. 204 IV-1

Rec. 328 § 1.8 I
Rec. 573 No. C05 XIII

Rec. 573 No. A31a XIII

Rec. 573 No. F32 XIII
Rec. 638 § 2.2 X-1

Rec. 573 No. F32 XIII

Rec. 573 No. E06b XIII

Rec. 573 No. D08 XIII

* Rec. 573 No. F22 XIII
(Note 3)* Rec. 573 No. F21 XIII
(Note 1)

Rec. 662 Ap. II, No. 1.19 XIII

videophonyF: *visiophonie; vidéophonie (terme déconseillé dans ce sens)*S: *videofonia***videophony**

see: still-picture videophony

videotex, interactive videographyF: *vidéotex, vidéographie interactive*S: *videotex, videografía interactiva***visible arc**F: *arc de visibilité*S: *arco visible***W****wave**

see: ground wave; hertzian waves, radio waves; ionospheric wave; radio waves, hertzian waves

way (operation mode call)— **one way**F: *à sens unique*S: *sentido único*— **both way**F: *à double sens*S: *doble sentido***whistler mode propagation**F: *propagation (ionosphérique) suivant le mode des sifflements*S: *propagación (ionosférica) según el «modo de silbidos»***width of the effective overall noise band**F: *largeur de bande effective globale de bruit*S: *anchura de banda efectiva global de ruido***worst month**F: *mois le plus défavorable*S: *mes más desfavorable***X****x dB bandwidth**F: *largeur de bande «à x dB» (d'un signal)*S: *anchura de banda entre puntos a «x dB»*

	Rec. 662	Ap. II, No. 1.23	XIII
	Rec. 662	Ap. II, No. 1.21	XIII
	Rep. 204 Rec. 573	No. H23	IV-1 XIII
	Rec. 662	Ap. II, Nos. 3.22, 3.23	XIII
*	Rep. 262	§ 1 and 2	VI
*	Rec. 331	§ 3	I
*	Rep. 723	§ 2	V
	Rec. 328 Rec. 662	§ 1.14 Ap. II, No. 4.04	I XIII

RECOMMENDATION 662 *

TERMS AND DEFINITIONS

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

(1986)

The CCIR,

CONSIDERING

- (a) that it is desirable to have, in addition to specific terminology texts produced by Study Groups, definitions of the general technical terms used in CCI texts;
- (b) that the CCIs are cooperating with the International Electrotechnical Commission (IEC) in the production of the International Electrotechnical Vocabulary (IEV) (see Resolution 66 and CCITT Recommendation A.12),

UNANIMOUSLY RECOMMENDS

1. that administrations and recognized private operating agencies who are members of the CCIs, as well as the CCI Secretariats, should use as far as possible, technical terms in the field of telecommunications with the meaning given in the IEV, the plan of which is given in Appendix I to this Recommendation;
2. that general terms common to several Study Groups should be used with the meaning given in Appendix II to this Recommendation, which is generally close to the meaning given in the IEV but adapted for CCI needs.

Note 1. — The definitions given in the IEV Chapters, like those included in Appendix II, are of a general nature; their purpose is that all Study Groups should use general terms with the same meaning. In certain cases they may be 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.

These definitions do not replace definitions contained in CCIR or CCITT Recommendations (or in the Radio Regulations, the Telegraph and Telephone Regulations or the ITU Convention) which are to be used in their respective fields of application.

APPENDIX I

"TELECOMMUNICATIONS" CHAPTERS OF THE
INTERNATIONAL ELECTROTECHNICAL VOCABULARY (IEV)

The IEV is IEC Publication No. 50; it comprises a great number of chapters, published in separate fascicles. Chapters of the 700 series deal with telecommunications and are prepared by Joint Working Groups in which CCI experts take part.

The series 700 chapters which are dealt with by Joint Working Groups are as follows (two chapters of a general nature will be published in the 100 series):

* The text of this Recommendation is similar to that of CCITT Recommendation B.13.

Chapters and Sections	Status in 1986
701 – <i>Telecommunications, channels and networks</i>	Being published
1 – Forms of telecommunications	
2 – Channels, circuits and networks	
3 – Use and operation of circuits and networks	
702 – <i>Oscillations, signals and related devices</i>	Being approved
1 – Frequencies	
2 – Oscillations and waves	
3 – Pulses	
4 – Signals; general terms	
5 – Discrete signals and digital signals; coding	
6 – Modulation and demodulation	
7 – Noise and interference	
8 – Transmission characteristics and performance; distortion	
9 – Linear and non-linear networks and devices	
704 – <i>Transmission</i>	Being approved
705 – <i>Radio waves propagation</i>	Being prepared (in course of approval)
712 – <i>Antennas</i>	Being approved
713 – <i>Radiocommunications: transmitters, receivers, networks and operation</i>	Being prepared
714 – <i>Switching</i>	Being published
715 – <i>Teletraffic, trunking and operating</i>	Being prepared (preparation of a draft)
716 – <i>Integrated services digital networks</i>	Being prepared (circulation of draft)
721 – <i>Telegraphy and data communication</i>	Being published
1 – Forms of telecommunications using discrete signals	
2 – Discrete signals and transmission using discrete signals	
3 – Telegraphy and data communication	
4 – Facsimile	
5 – Telegraph and data networks, switching, operation and sources	
722 – <i>Telephony</i>	Being published
– General terms	
– Telephone set components	
– Telephone set feeding and signalling	
– Telephone set types	
– Telephone set accessories	
– Telephone networks	
– Telephone exchanges	
– Private telephone systems	
– Telephone calls description	
– Local line networks	
– Telephone station usage	
– Transmission performance	
– Measuring apparatus	
– Telephony	
723 – <i>Broadcasting services: sound broadcasting and television</i>	*Being prepared (preparation of a draft)
725 – <i>Space radiocommunications</i>	Published in 1982 (Section 3 "Technical aspects" being prepared)
1 – Satellites and orbits	
2 – Space radiocommunication systems	

Chapters and Sections	Status in 1986
726 – <i>Transmission lines and waveguides</i> 1 – Transmission line, waveguide and cavity resonator configurations 2 – Propagation in transmission lines and waveguides 3 – Waveguide connections 4 – Waveguide components 5 – Non-reciprocal effects and devices 6 – Measurements on transmission lines	Published in 1982
731 – <i>Optical fibre communication</i>	Being prepared (synthesis of comments)
191 – <i>Reliability, maintainability and quality of service</i>	Being approved
161 – <i>Electromagnetic compatibility</i>	Being prepared (circulation of draft)

APPENDIX II

GENERAL TERMINOLOGY OF TELECOMMUNICATIONS

(Terms common to the CCIR and the CCITT)

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.

The terms and definitions in this Appendix 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.
5. Oscillators and waves.

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.

When examining these definitions, it should be borne in mind 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 of “forms of telecommunication” have been produced by the CMV in cooperation with the CCI-IEC Joint Coordination Group on Vocabulary (JCG), to be used by CCIR and CCITT Study Groups.

These definitions of “forms of telecommunication” are of a general nature and are not in contradiction with definitions of services presently specified by the CCITT and CCIR. Definitions of services are produced by the Study Group responsible for these services (mainly CCITT Study Groups I and II for telecommunication services and CCIR Study Groups 10 and 11 for broadcasting services).

Note 2. — A number of terms in the Recommendation 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. — Terms and definitions relating to reliability have not been included in this Recommendation because they usually have rather specific applications. However, certain terms extracted from CCITT Recommendation G.106 "Concepts, terms and definitions related to quality of service, availability and reliability", are given in Annex I.

1. FORMS OF TELECOMMUNICATIONS

1.01 **information** ; *information* ; *información*

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

Note. — Information may be represented for example by signs, symbols, pictures or sounds.

1.02 **signal** ; *signal* ; *señal*

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

Note. — The physical phenomenon may be for instance an electromagnetic wave or acoustic wave and the characteristic may be an electric field, a voltage or a sound pressure.

1.03 **transmission** ; *transmission* ; *transmisión*

The transfer of information from one point to one or more other points by means of signals.

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

Note 2. — The use of the English word "transmission" in the sense of "emission" in radiocommunication and of "sending" is deprecated.

1.04 **sending** (in telecommunication), **transmission** (deprecated in this sense); *émission* (*en télécommunication*); *emisión* (*en telecomunicación*)

The production of a signal at an input port of a transmission line or into a transmission medium.

Note. — In French the term "émission" has other meanings in radiocommunications, as given in Recommendation 573.

1.05 **communication** ; *communication* ; *comunicación*

Information transfer according to agreed conventions.

Note. — In French and Spanish the corresponding terms "communication" and "comunicación" have additional specific meanings in telecommunications (see 3.05 and 3.02).

1.06 **telecommunication** ; *télécommunication* ; *telecomunicación*

Communication by wire, radio, optical or other electromagnetic systems.

Note. — The following definition is given in the International Telecommunication Convention (Nairobi, 1982) (and RR 4):

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

1.07 **telephony** ; *téléphonie* ; *telefonía*

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

Note. — This is the definition given in the International Telecommunication Convention (Nairobi, 1982) (RR 117, MOD).

1.08 **telegraphy**; *télégraphie*; *telegrafia*

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 a fixed image.

Note 2. — This is the definition given in the International Telecommunication Convention (Nairobi, 1982) (RR 111, MOD).

Note 3. — Telegraph does not include television or videography.

Note 4. — Moreover, in the Convention and 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).

1.09 **telex (service)**; *(service) télex*; *(servicio) télex*

A telegraph service enabling subscribers to communicate directly and temporarily with each other by means of start-stop apparatus and circuits of a public telecommunication network.

1.10 **facsimile**; *télécopie*; *facsimil*

A form of telecommunication for the reproduction at a distance of graphic documents in the form of other graphic documents geometrically similar to the original.

1.11 **telewriting**; *téléécriture*; *teleescritura*

A form of telecommunication for the purpose of transmitting graphical information as it is being manually written or drawn and for simultaneously generating a reproduction at the distant terminal either on a screen or in some other form.

Note. — In cases where the reproduction at the receiving end is in the form of a graphic document, the term “téléautographie” can be employed in French.

1.12 **data**; *données*; *datos*

Information represented in a manner suitable for automatic processing.

1.13 **data communication, data transmission** (deprecated in this sense); *communication de données, transmission de données* (deprecated in this sense); *comunicación de datos, transmisión de datos* (deprecated in this sense)

A form of telecommunication intended for the transfer of information between data processing equipments.

1.14 **data transmission**; *transmission de données*; *transmisión de datos*

The conveying of data from one place to another by telecommunication.

Note. — The term “data transmission” is deprecated in the sense of “data communication”.

1.15 **teleprocessing, teleinformatics**; *téléinformatique, télétraitement*; *teleinformática, teleproceso*

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

1.16 **television**; *télévision*; *televisión*

A form of telecommunication for the transmission of signals representing scenes; images of the scenes being reproduced on a screen as they are received.

Note 1. — The received signals may be stored for subsequent display of the images on a screen.

Note 2. — This form of telecommunication finds major application in television broadcasting and the word “television” is often used without qualification to describe this application. The same technique is also used for industrial, scientific, medical and other applications; such applications are often referred to as “closed-circuit television”.

1.17 **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 teletext, broadcast videography (see 1.20), is still under study.

1.18 **telematics (services);** *télématique (services de); telemática (servicios de)*

Telecommunication services supplementing conventional telegraphic or telephonic services, generally using teleprocessing techniques to permit a user to receive or send public or private information, or to effect operations such as file consultation, reservations, commercial or banking transactions.

Examples of telematics services: facsimile, teletex, videography, telewriting.

Note. — Telematics services do not include broadcasting of sound or television program.

1.19 **videography;** *vidéographie; videografía*

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

Note. — The teletext service and various forms of telegraphy are not forms of videography.

1.20 **teletext, broadcast videography;** *vidéographie diffusée, télétexte; videografía radiodifundida, teletexto*

Videography in which information is broadcast utilizing the means of transmission used for normal television broadcasting and the desired part of this information may be selected by any user having suitable equipment.

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

Note 2. — The terms “teletext” and “teletex” refer to two different concepts.

Note by Secretariat. — In Report 802, § 3.1, CCIR Study Group 11 has provided the following definition for a teletext service:

“A digital data broadcasting service which may be transmitted either within the structure of an analogue television signal or by using digital modulation systems. The service is primarily intended to display text or pictorial material in two-dimensional form reconstructed from coded data on the screens of suitably equipped television receivers.”

1.21 **videotex, interactive videography;** *vidéotex, vidéographie interactive; videotex, videografía interactiva*

Videography in which a telecommunication network is used for transmission of the user's requirements as well as the answers to his requests.

1.22 **teletex (service);** *(service) télétexte; (servicio) teletex*

A telematics service for text transmission offering additional facilities to the telex service, in particular further typewriter functions and remote text processing facilities.

Note. — The terms “teletex” and “teletext” refer to two different concepts.

1.23 **video-telephony, viewphone, visual telephone;** *visiophonie, vidéophonie (deprecated); videofonía, videotelefonía*

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

1.24 **still-picture video-telephony;** *visiophonie à images fixes; videofonía de imágenes fijas*

Video-telephony 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.

1.25 **teleconference**; *téléconférence; teleconferencia*

A conference between more than two participants located in two or more different places and utilizing telecommunication facilities.

1.26 **audioconference**; *audioconférence; audioconferencia*

A teleconference in which participants are connected by telephone circuits; the transmission of other signals such as facsimile or telewriting signals may be possible in addition to speech signals.

1.27 **videoconference**; *visioconférence vidéoconférence; videoconferencia*

A teleconference in which participants are connected by television circuits providing for the transmission of images of participants in addition to that of speech and graphic documents.

1.28 **telemetry, telemetering**; *télémessure; telemedida*

A process in which measurements are made at some remote location and the results are transmitted by telecommunication.

1.29 **telecommand**; *télécommande; telemando*

The transmission of signals to initiate, modify or terminate functions of distant equipment.

1.30 **telecontrol**; *téléconduite; telecontrol*

The control of operational equipment at a distance using a combination of telemetry and telecommand.

1.31 **teleguidance**; *téleguidage; teleguiage*

The guidance and control of distant mobile craft by telecommunication.

1.32 **telemonitoring**; *télesurveillance; telesupervisión*

The observation at a distance by telecommunication of industrial processes, operational equipment, natural phenomena or individuals.

1.33 **remote alarm**; *téléalarme; telealarma*

The alerting of a central point by telecommunication to the occurrence of an unwanted situation or event.

1.34 **broadcasting**; *télédiffusion; teledifusión*

A form of unidirectional telecommunication intended for a large number of users having appropriate receiving facilities, and carried out by means of radio or by cable networks.

Note. — In English, it should be assumed that “broadcasting by radio waves” is intended where the word “broadcasting” is used without qualification, unless the context indicates the contrary.

Examples: Sound broadcasting or television broadcasting, teletext, the distribution of time signals and navigational warnings, the distribution of news from press agencies.

1.35 **broadcasting (service)**; *radiodiffusion; radiodifusión*

Radiocommunication in which transmissions are intended for direct reception by the general public; these may include sound transmissions, television transmissions and other types of transmission.

Note. — By common usage in French and Spanish the meaning of “radiodiffusion” and “radiodifusión” is frequently restricted to “sound broadcasting”.

1.36 **sound broadcasting (service)**; *radiodiffusion sonore; radiodifusión sonora*

A broadcasting service limited to sound programmes.

1.37 **television broadcasting (service)**; *radiodiffusion visuelle, (radiodiffusion de) télévision; (radiodifusión de) televisión*

A broadcasting service of visual programmes with associated sounds.

1.38 **cabled distribution**; *téledistribution, câblodistribution (Canada); distribución por cable*

A form of telecommunication for the distribution of television or sound programmes over networks of cables to a number of users.

Note. - Some systems may transmit other signals and provide return channels.

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 path; for example each channel is allocated a particular frequency band or a particular time slot.

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 digit rate; for example: telephone channel, telegraph channel, data channel, 10 MHz channel, 34 Mbit/s channel.

2.02 **telephone-type channel**; *voie de type téléphonique; canal de tipo telefónico*

A transmission channel suitable for the transmission of speech but which is used for the transmission of other signals.

2.03 **(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 unidirectional, e.g. long-distance television transmission, the term "circuit" is sometimes used to designate the single transmission channel providing the facility, but this usage is deprecated.

Note 2. - A telecommunication circuit may be qualified by the nature or characteristics of the transmitted signals; for example: telephone circuit, telegraph circuit, data circuit, digital circuit.

Note 3. - Such characteristics of the transmission channels as bandwidth, digit rate, may be different in the two directions of transmission.

Note 4. - In telephony, usage of the term "telephone circuit" is generally limited to a telecommunication circuit directly connecting two switching centres.

2.04 **telephone-type circuit**; *circuit de type téléphonique; circuito de tipo telefónico*

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

2.05 **(frequency) channel**; *canal (de fréquences); canal (de frecuencias)*

Part of the frequency spectrum intended to be used for the 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 "telecommunication circuit" is deprecated.

Note 3. - The term "radio-frequency channel" used in radiocommunication is defined in Recommendation 573.

2.06 **link**; *liaison; enlace*

A means of telecommunication 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 **point-to-point communication**; *communication point à point; comunicación punto a punto*

Communication provided by a link between two specified fixed points.

2.08 **point-to-multipoint communication**; *communication point à multipoint; comunicación punto a multipunto*

Communication provided by links between one specified fixed point and a number of specified fixed points.

2.09 **point-to-area communication**; *communication point à zone; comunicación punto a zona*

Communication provided by links between one specified fixed point and any number of non-specified points located in a given area.

Note. — When point-to-area communication involves unidirectional links from a single fixed point to a number of points, this type of communication is commonly referred to as “broadcasting” (see 1.34).

2.10 **telecommunication network, telecommunication system** (United States of America); *réseau de télécommunication; red de telecomunicación*

All the means of providing telecommunication services between a number of locations where equipment provides access to these services.

2.11 **(telecommunication) terminal**; *terminal (de télécommunication); terminal (de telecomunicación)*

An equipment connected to a telecommunication network to provide access to one or more specific services.

Note. — The term may be qualified to indicate the type of service or user, e.g. “data terminal”, “subscriber’s terminal”.

2.12 **subscriber’s line, subscriber loop**; *ligne d’abonné, ligne de rattachement; línea de abonado, bucle de abonado*

A link between equipment in a subscriber’s premises and the telecommunication centre providing the required services.

2.13 **port** (of a network); *accès (d’un réseau), porte (term not to be used in this sense); puerta (de una red)*

A termination through which signals can enter or leave a network.

2.14 **transmission path**; *trajet de transmission; trayecto de transmisión*

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

2.15 **interface**; *interface; interfaz*

A boundary between two systems or between two parts of the same system, defined by the specification of suitable characteristics, usually for the purpose of ensuring format, function, signal and interconnection compatibility at the boundary.

Note. — An interface may be defined, for example, at a plug and socket connection, at the aperture of an antenna or between layers of a hierarchical system.

3. **USE AND OPERATION OF CIRCUITS AND NETWORKS**

3.01 **connection**; *chaîne de connexion; cadena de conexión*

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

3.02 **(complete) connection**; *chaîne de connexion complète, (chemin de) communication; cadena de conexión completa, (camino de) comunicación*

A connection between users’ terminals.

Note. — In French and in Spanish, the terms “communication” and “comunicación”, have also a more general meaning (see 1.05).

3.03 **switching** (in telecommunication); *commutation (en télécommunication); conmutación (en telecomunicación)*

The process of temporarily associating functional units, transmission channels or telecommunication circuits for the purpose of providing a desired telecommunication facility.

- 3.04 **call attempt** (by a user); (*tentative d' appel (par un usager)*); (*tentativa de llamada (por un usuario)*)

A single sequence of operations made by a user of a telecommunication network trying to obtain the desired user, terminal or service.

Note. — This definition differs slightly from the definition of the same term which appears in CCITT Recommendation P.10 (§ 21 — Telephone calls description).

- 3.05 **call**; *communication*; *comunicación*

The establishment and use of a complete connection, following a call attempt.

Note. — In French and in Spanish, the terms “communication” and “comunicación”, have also a more general meaning (see 1.05).

- 3.06 **conversation** (in telecommunication); *conversation (en télécommunication)*; *conversación (en telecomunicación)*

An exchange of information between terminals.

- 3.07 **code**; *code*; *código*

A system of rules defining a one-to-one correspondence between information and its representation by characters, symbols or signal elements.

- 3.08 **modulation**; *modulation*; *modulación*

A process by which a quantity which characterizes an oscillation or wave is constrained to follow the values of a characteristic quantity of a signal or of another oscillation.

- 3.09 **carrier**; *porteuse*; *portadora*

An oscillation or wave, usually periodic, some characteristic of which is intended to be constrained by modulation to follow the values of a signal or of another oscillation.

- 3.10 **carrier (component)**; (*composante*) *porteuse*; *portadora (composante)*

In a modulated oscillation or wave, the spectral component having the frequency of the periodic oscillation or wave prior to modulation.

- 3.11 **multiplexing**; *multiplexage*; *multiplaje*

A reversible process for assembling signals from several separate sources into a single composite signal for transmission over a common transmission channel; this process is equivalent to dividing the common channel into distinct channels for transmitting independent signals in the same direction.

- 3.12 **demultiplexing**; *démultiplexage*; *desmultiplaje*

A process applied to a composite signal formed by multiplexing, for recovering the original independent signals or groups of these signals.

Note. — Demultiplexing may be partial, for instance for extracting a primary group from a supergroup of telephony channels.

- 3.13 **multiple access**; *accès multiple*; *acceso múltiple*

Any technique whereby a number of terminals are able to share the transmission capacity of a link in a predetermined manner or in accordance with traffic demand.

- 3.14 **space division**; *répartition spatiale*; *división espacial*

A technique whereby a separate individual transmission path is used for each transmission channel for example in multiplexing, switching or multiple access operations.

- 3.15 **time division**; *répartition temporelle*; *división en el tiempo*

A technique whereby a separate distinct recurrent time interval is used for each transmission channel, for example in multiplexing, switching or multiple access operations.

- 3.16 **frequency division**; *répartition en fréquence*, *répartition fréquentielle*; *división en frecuencia*

A technique whereby a separate distinct frequency band is used for each transmission channel, for example in multiplexing, switching or multiple access operations.

- 3.17 **code division**; *répartition en code*; *división por código*

A technique whereby orthogonal signals are used to provide distinct transmission channels, for example in multiplexing, switching or multiple access operations; such signals being distinguishable even when they share the same frequency bands and the same time intervals.

- 3.18 **simplex, half duplex** (deprecated); *simplex, à l'alternat, semi-duplex (deprecated in this sense); simplex, semiduplex*

Designating or pertaining to a method of operation in which information can be transmitted in either direction, but not simultaneously, between two points.

- 3.19 **duplex, full duplex** (deprecated); *duplex, bilatéral simultané; duple*

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

- 3.20 **unidirectional**; *unilatéral, unidirectionnel, simplex (term deprecated in this sense); unidireccional, unilateral*

Pertaining to a link where the transfer of users' information is possible in one preassigned direction only.

Note. — This term should not be used to describe the direction of call set-ups.

- 3.21 **bidirectional**; *bilatéral, bidirectionnel, duplex (term deprecated in this sense); bidireccional, bilateral*

Pertaining to a link where the transfer of users' information is possible simultaneously in both directions between two points.

Note 1. — The transmission channel capacity and signalling rate are not necessarily the same in both directions.

Note 2. — This term should not be used to describe the directions of call set-ups.

- 3.22 **one way**; *à sens unique, spécialisé (term deprecated in this sense); de sentido único*

Pertaining to an operational mode in which the call set-ups always occur in one direction.

Note. — This term should not be used to describe the direction of transfer of users' information.

- 3.23 **both-way**; *à double sens, mixte; de doble sentido*

Pertaining to an operational mode in which the call set-ups occur in both directions.

Note 1. — The amount of traffic flowing is not necessarily the same in both directions.

Note 2. — These terms should not be used to describe the direction of transfer of users' information.

Note 3. — The term "two-way" is sometimes used in English in place of "both-way"; this usage is not recommended.

4. FREQUENCIES AND BANDWIDTHS

- 4.01 **frequency band**; *bande de fréquences; banda de frecuencias*

A continuous set of frequencies lying between two specified limiting frequencies.

Note. — A frequency band is characterized by two values which define its position in the frequency spectrum, for example, its lower and upper limiting frequencies.

- 4.02 **frequency bandwidth**; *largeur de bande; anchura de banda*

The numerical difference between the limiting frequencies of a frequency band.

Note 1. — The term "bandwidth" is usually associated with a qualification, for example:

- baseband bandwidth;
- necessary bandwidth;
- bandwidth of an amplifier or other device.

Note 2. — A bandwidth is defined by a single value and is independent of the position of the band in the frequency spectrum.

- 4.03 **baseband**; *bande de base; banda de base*

1. The frequency band occupied by one signal, or by a number of multiplexed signals intended to be conveyed by a radio transmission system or a line transmission system.

Note 1. — In the case of radiocommunication, the baseband signal constitutes the signal modulating the transmitter.

Note 2. — The following definition proposed by the JCG in IEV Chapter 702, was also found to be acceptable.

2. That frequency band occupied by one signal or by a number of multiplexed signals at specified input and output points of a transmission system.

Note 1. — In the case of a radiocommunication, the baseband is that band which is occupied by the signal modulating the transmitter.

Note 2. — When the transmission involves multiple modulation, it is generally considered that the baseband is that band occupied by the signal which is applied to the first modulation stage and not the band occupied by an intermediate modulated signal.

4.04 **x dB bandwidth** (of a signal); *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 spectral line or any power spectral density of the spectrum of a signal is at least x dB lower than a 0 dB reference level specified for the type of signal considered.

4.05 **frequency departure**; *écart de fréquence, déviation de fréquence (term deprecated in this sense); desajuste de frecuencia*

An unintentional frequency separation from a stated frequency.

4.06 **frequency shift**; *déplacement de fréquence; desplazamiento de frecuencia*

An intentional frequency change produced by modulation, or an unintentional change due to a natural phenomenon.

4.07 **frequency drift**; *dérive de fréquence; deriva de frecuencia*

An undesired progressive change in frequency with time.

4.08 **frequency offset**; *décalage de fréquence; separación de la frecuencia*

A small intentional frequency separation for purposes other than that of modulation.

Note. — A frequency offset may be effected, for example, as a means of avoiding or minimizing interference.

5. OSCILLATIONS AND WAVES

5.01 **attenuation, loss**; *affaiblissement, atténuation; atenuación, pérdida*

1. A decrease between two points of an electric, electromagnetic or acoustic power.

2. The quantitative expression of a power decrease, generally in decibels; this decrease is expressed by the ratio of the values at two points of a power or of a quantity related to power in a well-defined manner.

Note 1. — By extension, the words “attenuation” or “loss” may represent the ratio of powers in a given situation and in a reference condition; for example “insertion loss”.

Note 2. — Although the term “loss” is not synonymous in English with “attenuation” in every context, it is used to express the ratio of two powers in certain specified conditions as for example in “insertion loss” and “return loss” equivalent in French to “affaiblissement d’insertion” and “facteur d’adaptation”.

Note 3. — Attenuation is expressed in decibels by a positive value. In some cases, attenuation could be used instead of gain, when the decibel value of a gain is negative.

5.02 **gain**; *gain; ganancia*

1. An increase between two points of an electric, electromagnetic, or acoustic power.

2. The quantitative expression of a power increase, generally in decibels; this increase is expressed by the ratio of the values at two points of a power or of a quantity related to power in a well-defined manner.

Note 1. — By extension, the word “gain” may represent the ratio of powers in a given situation and in a reference condition; for example the “gain of an antenna”.

Note 2. — Gain is expressed in decibels by a positive or negative value. When a gain has a negative value in decibels, attenuation may be used instead of gain.

5.03 **propagation coefficient, propagation constant** (deprecated term); *exposant linéique de propagation, constante de propagation (deprecated term); coeficiente de propagación, constante de propagación (deprecated term)*

(Symbol: γ)

Limit of the quotient of the natural logarithm of the ratio of values of a specified component of an electromagnetic field, at two points aligned in the direction of propagation of a guided or plane wave of given frequency, or of a wave practically plane in a limited space domain, by the distance of the two points when this distance tends to zero.

Note. — The propagation coefficient is usually a complex function of frequency and has the dimension of the reciprocal of a distance.

- 5.04 **attenuation coefficient, attenuation constant** (deprecated term); *affaiblissement linéique, constante d'affaiblissement (deprecated term); coeficiente de atenuación, constante de atenuación (deprecated term)*

(Symbol: α)

1. The real part of a propagation coefficient.
2. Limit of the quotient of attenuation between two points on the axis of a transmission line or waveguide by the distance between the points when this distance tends to zero.

- 5.05 **phase-change coefficient, phase constant** (deprecated term); *déphasage linéique, constante de phase (deprecated term); coeficiente del desfase, constante de fase (deprecated term)*

(Symbol: β)

1. The imaginary part of a propagation coefficient.
2. Limit of the quotient of the phase change of a field quantity between two points on the axis of a transmission line or waveguide by the distance between the points when this distance tends to zero.

- 5.06 **phase delay**; *temps de propagation de phase; retardo de fase*

The time taken by a mobile point, associated with a sinusoidal travelling wave and defined by a constant real phase of a field quantity, to move between two given points in a propagation medium.

Note. — The phase delay is the time between the instants when a wave front associated with a sinusoidal travelling wave and defined by a fixed real phase of a field quantity passes two given points in space.

- 5.07 **group delay**; *temps de propagation de groupe; retardo de grupo*

The propagation time between two points of a signal which may be ideally represented by two superimposed sinusoidal waves of equal amplitude and slightly different frequencies approaching a common limiting value.

Note. — In a homogeneous medium, the group delay is equal to the derivative with respect to the angular frequency of the difference, at the same time, of the real phases at the two points of the common limit wave.

- 5.08 **noise** (in telecommunication); *bruit (en télécommunication); ruido (en telecomunicación)*

Any variable physical phenomenon apparently not conveying information and which may be superimposed on, or combined with, a wanted signal.

Note. — The term "radio-frequency noise" is defined in Recommendation 573.

- 5.09 **interference** (to a wanted signal); *brouillage (d'un signal utile); interferencia (a una señal útil)*

Disturbance of the reception of a wanted signal caused by unwanted signals or noise.

Note. — The term "radio-frequency interference" is defined in Recommendation 573.

ANNEX I TO APPENDIX II

TERMS AND DEFINITIONS RELATED TO QUALITY OF SERVICE, AVAILABILITY AND RELIABILITY

Introduction to CCITT Recommendation G.106

The purpose of this Recommendation is to provide a systematic framework for organizing the concepts associated with the quality aspects of providing telecommunication services. The approach taken is intended to include these aspects as applied not only to individual units or items (e.g. a switching system or its subcomponents), but primarily to switched network services (e.g. the accessibility and retainability of a connection), and private line services (e.g. the availability and reliability of leased circuits).

The diagram in Figure 1/G.106 is intended to provide an overview of the factors which contribute collectively to the overall quality of service as perceived by the user of a telecommunication service. The terms in the diagram can be thought of as generally applying either to the quality of service levels actually achieved in practice, to objectives which represent quality of service goals to be achieved, or to requirements which reflect design specifications.

The diagram in Figure 1/G.106 is also structured to show that one quality of service factor can depend on a number of others. It is important to note — although it is not explicitly stated in each of the definitions to follow — that the value of a characteristic measure of a particular factor may depend directly on corresponding values of other factors which contribute to it. This necessitates, whenever the value of a measure is given, that all of the conditions having an impact on that value be clearly stated.

Extracts from Recommendation G.106

1001 item ; entity

F: entité; individu

S: elemento; entidad

Any part, device, subsystem, functional unit, equipment or system that can be individually considered.

Note 1 — An *item* may consist of hardware, software or both, and may also include people, e.g. operators in a telephone operator system.

Note 2 — In French, the term *entité* replaces the term *dispositif* previously used in this meaning, because the term *dispositif* is also the common equivalent for the English term “device”.

Note 3 — In French, the term *individu* is used mainly in statistics.

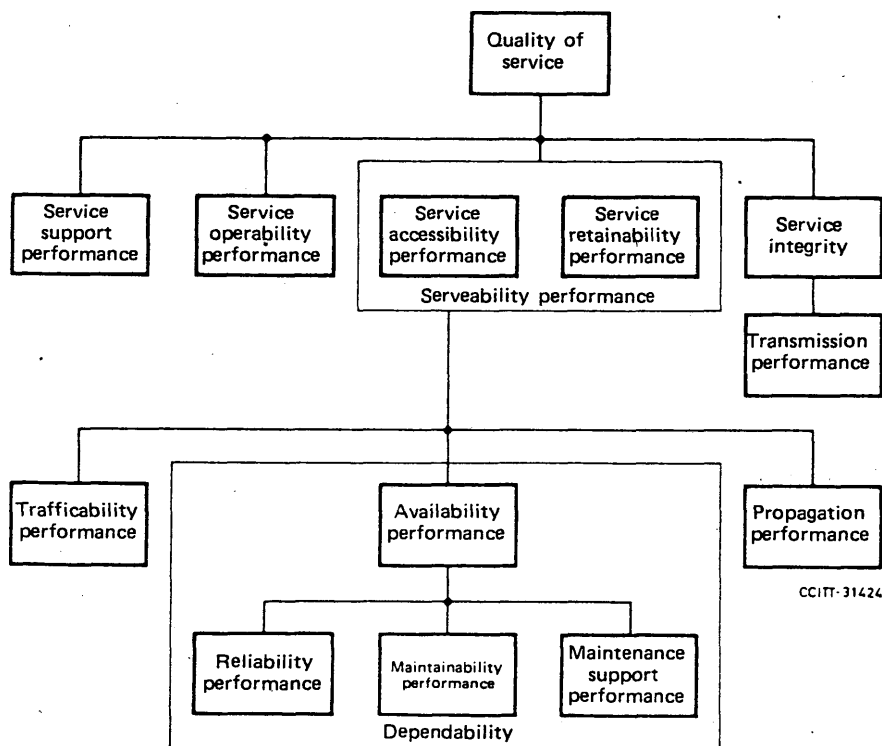


FIGURE 1/G.106

Performance concepts

2101 quality of service

F: qualité de service

S: calidad de servicio

The collective effect of service performances which determine the degree of satisfaction of a user of the service.

Note — The *quality of service* is characterized by the combined aspects of *service support performance*, *service operability performance*, *serveability performance*, *service integrity* and other factors specific to each *service*.

2102 serveability performance*F: servibilité (d'un service)**S: servibilidad (de un servicio)*

The ability of a *service* to be obtained — within specified tolerances and other given conditions — when requested by the user and continue to be provided for a requested *duration*.

Note — *Serveability performance* may be subdivided into the *service accessibility performance* and the *service retainability performance*.

2103 service accessibility performance*F: accessibilité (d'un service)**S: accesibilidad (de un servicio)*

The ability of a *service* to be obtained, within specified tolerances and other given conditions, when requested by the user.

Note — This takes into account the transmission tolerance and the combined aspects of *propagation performance*, *trafficability performance* and *availability performance* of the related systems.

6401 service accessibility ; service access probability*F: accessibilité (d'un service)**S: accesibilidad de un servicio; probabilidad de acceso a un servicio*

The *probability* that a *service* can be obtained within specified tolerances and other given operating conditions when requested by the user.

2104 service retainability performance*F: continuabilité (d'un service)**S: retenibilidad (de un servicio)*

The ability of a *service*, once obtained, to continue to be provided under given conditions for a requested *duration*.

Note — Generally this depends on the transmission tolerances, the propagation performance and reliability performance of the related systems. For some services, for example packet switching, this also depends on the trafficability performance and the availability performance of the related systems.

6501 service retainability*F: continuabilité (d'un service)**S: retenebilidad (de un servicio)*

The *probability* that a *service*, once obtained, will continue to be provided under given conditions for a given *time duration*.

2203 dependability*F: sûreté de fonctionnement**S: seguridad de funcionamiento*

The collective term used to describe the *availability performance* and its influencing factors: *reliability performance*, *maintainability performance* and *maintenance support performance*.

Note — Dependability is used only for general descriptions in non-quantitative terms.

2204 capability*F: capacité; capabilité (d'une entité)**S: capacidad*

The ability of an *item* to meet a demand of a given size under given internal conditions.

Note 1 — Internal conditions refer, for example, to any given combination of faulty and not faulty sub-items.

Note 2 — This is also called *trafficability performance*.

2205 **trafficability performance**

F: traficabilité; capacité d'écoulement du trafic

S: aptitud para cursar tráfico

The ability of an *item* to meet a traffic demand of a given size and other characteristics, under given internal conditions.

Note — Given internal conditions refer, for example, to any combination of faulty and not faulty sub-items.

2206 **availability (performance)**

F: disponibilité

S: disponibilidad

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

Note 1 — This ability depends on the combined aspects of the *reliability performance*, the *maintainability performance* and the *maintenance support performance* of an *item*.

Note 2 — In the definition of the *item* the external resources required must be delineated.

Note 3 — The term *availability* is used as an *availability performance measure*.

7101 **instantaneous availability; pointwise availability, A(t) (symbol)**

F: disponibilité (instantanée), A(t) (symbole)

S: disponibilidad instantánea, A(t) (símbolo)

The *probability* that an *item* is in an *up-state* at a given *instant of time, t*.

Note — In French the term *disponibilité* is also used to denote the performance quantified by this *probability*.

7102 **instantaneous unavailability; pointwise unavailability, U(t) (symbol)**

F: indisponibilité (instantanée), U(t) (symbole)

S: indisponibilidad instantánea, U(t) (símbolo)

The *probability* that an *item* is in a *down-state* at a given *instant of time, t*.

2207 **reliability (performance)**

F: fiabilité

S: fiabilidad

The ability of an *item* to perform a *required function* under given conditions for a given *time interval*.

Note 1 — It is generally assumed that the *item* is in a state to perform this *required function* at the beginning of the *time interval*.

Note 2 — The term *reliability* is used as a *measure of reliability performance*.

7201 **reliability, R (symbol)**

F: fiabilité, R (symbole)

S: fiabilidad, R (símbolo)

The *probability* that an *item* can perform a *required function* under stated conditions for a given *time interval*.

Note 1 — It is generally assumed that the *item* is in a state to perform this *required function* at the beginning of the *time interval*.

Note 2 — In French, the term *fiabilité* is also used to denote the performance quantified by this *probability*.

2208 **maintainability (performance)**

F: maintenabilité

S: mantenibilidad

The ability of an *item* under stated conditions of use, to be retained in, or restored to, a state in which it can perform a *required function*, when *maintenance* is performed under given conditions and using stated procedures and resources.

Note — The term *maintainability* is used as a *measure of maintainability performance*.

7301 **maintainability**F: *maintenabilité*S: *mantenibilidad*

The *probability* that a given active *maintenance action*, for an *item* under given conditions of use can be carried out within a stated *time interval*, when the *maintenance* is performed under stated conditions and using stated procedures and resources.

Note — In French the term *maintenabilité* is also to denote the performance quantified by this *probability*.

3101 **interruption; break (of service)**F: *interruption; coupure (d'un service)*S: *interrupción (de un servicio); corte (de un servicio)*

Temporary inability of a *service* to be provided persisting for more than a given *time duration*, characterized by a change beyond given limits in at least one parameter essential for the *service*.

Note 1 — An *interruption* of a *service* may be caused by *disabled states* of the *items* used for the *service* or by external reasons such as high service demand.

Note 2 — An *interruption* of a *service* is generally an *interruption* of the transmission, which may be characterized by an abnormal value of power level, noise level, signal distortion, *error* rate, etc.

3201 **defect**F: *défaut*S: *defecto*

Any departure of a characteristic of an *item* from requirements.

Note 1 — The requirements may or may not be expressed in the form of a specification.

Note 2 — A defect may or may not affect the ability of an *item* to perform a *required function*.

3301 **failure**F: *défaillance*S: *fallo*

The termination of the ability of an *item* to perform a *required function*.

Note — After *failure* the *item* has a fault.

7208 **mean time between failures (MTBF)**F: *moyenne des temps entre défaillances (MTBF)*S: *tiempo medio entre fallos (MTBF)*

The *expectation* of the *time between failures*.

3401 **fault**F: *panne; dérangement*S: *avería*

The inability of an *item* to perform a *required function*, excluding that inability due to *preventive maintenance*, lack of external resources or planned actions.

Note 1 — A *fault* is often the result of a *failure* of the *item* itself, but may exist without prior *failure*.

7310 **mean time to restoration; mean time to recovery (MTTR); mean time to repair (deprecated)**F: *durée moyenne de panne; moyenne des temps pour la tâche de réparation (MTTR)*S: *tiempo medio hasta el restablecimiento (MTTR)*

The *expectation* of the *time to restoration*.

RECOMMENDATION 663 *

USE OF CERTAIN TERMS LINKED WITH PHYSICAL QUANTITIES

(1986)

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, in vocabularies recently prepared by the IEC and the JCG and in ISO International Standards,

UNANIMOUSLY RECOMMENDS

1. that certain terms linked with physical quantities should be used by authors and translators of ITU texts, according to the guidelines annexed to this Recommendation;
2. that these guidelines should be used to ensure that the term chosen to denote a quantity, fully describes its nature;
3. that these guidelines should be followed when forming new terms or reviewing existing terms which deviate from the guidelines.

ANNEX I

GUIDELINES FOR THE USE IN ITU TEXTS OF CERTAIN TERMS
LINKED WITH PHYSICAL QUANTITIES IN FRENCH, ENGLISH AND SPANISH

1. Quotient

The term "quotient" is used to express the result of the division of two numbers or two quantities. For example: "The quotient of A divided by B".

This very general mathematical term is not used in the composition of the names of quantities, but does form part of the definition of some of them.

Example: velocity is the quotient of the distance covered divided by the time taken to cover that distance.

2. Coefficient and factor

The words "coefficient" and "factor" are used for expressions representing the quotient of two quantities. They are used to form terms expressing certain quantities.

2.1 Coefficient

The word "coefficient" is used when two quantities are of different kinds. A coefficient has therefore a dimension.

Examples:

E	F	S
Hall coefficient temperature coefficient coefficient of linear expansion	coefficient de Hall coefficient de température coefficient de dilatation linéique	coeficiente de Hall coeficiente de temperatura coeficiente de dilatación lineal

* A similar text will be submitted to the CCITT.

The word “coefficient” is also used in mathematics to express a number that multiplies the value of an algebraic quantity and in statistics (see ISO Standard 3534).

Examples:

E	F	S
coefficient of an equation coefficient of correlation coefficient of variation confidence coefficient (level)	coefficient d’une équation coefficient de corrélation coefficient de variation niveau de confiance	coeficiente de una ecuación coeficiente de correlación coeficiente de variación coeficiente (nivel) de confianza

2.2 Factor

The word “factor” is used when the two quantities are of the same kind. A factor is therefore dimensionless.

Examples:

E	F	S
reflection factor noise factor quality factor (<i>Q</i>) figure of merit (<i>M</i>)	facteur de réflexion facteur de bruit facteur de qualité (<i>Q</i>) facteur de qualité (<i>M</i>)	factor de reflexión factor de ruido factor de calidad (<i>Q</i>) factor de calidad (<i>M</i>)

3. Constant

The term “constant” should only be used to denote an invariable number or quantity.

Examples: mathematical constants such as π , universal physical constants.

E	F	S
Planck’s constant electric constant magnetic constant	constante de Planck constante électrique constante magnétique	constante de Planck constante eléctrica constante magnética

The word “constant” is sometimes used incorrectly, in conjunction with a qualifier, to indicate a variable characteristic quantity of a system or substance. In such cases, the use of the word is deprecated, and a specific term should be used (frequently the word “coefficient” suitably qualified) or in French, in the absence of such a term, the word “caractéristique”.

Deprecated term			Correct term		
E	F	S	E	F	S
dielectric constant	constante diélectrique	constante dieléctrica	permittivity	permittivité	permitividad
propagation constant	constante de propagation	constante de propagación	propagation coefficient	exposant linéique de propagation	exponente lineal de propagación
attenuation constant	constante d'affaiblissement	constante de atenuación	attenuation coefficient	affaiblissement linéique	coeficiente de atenuación
phase constant	constante de phase	constante de fase	phase coefficient	déphasage linéique	coeficiente de fase
—	constantes du sol	constantes del suelo	—	caractéristiques du sol	características del suelo

However, the term “time constant” (E), “constante de temps” (F), “constante de tiempo” (S) is acceptable, as it is in common use.

4. Index

In French and Spanish the term “indice” (F), “índice” (S) is sometimes used instead of “facteur” (F), “factor” (S). In English “index” is sometimes used instead of “ratio” in those cases where one of the two quantities is a reference quantity.

Examples:

E	F	S
refractive index modulation index	indice de réfraction indice de modulation	índice de refracción índice de modulación

The term also designates a quantity which is not clearly defined or which is identifiable rather than measurable.

Example:

E	F	S
ionospheric index	indice ionosphérique	índice ionosférico

In all the above cases extension of the usage of the term is not recommended. It should be replaced wherever possible by the terms coefficient, factor or (in English) ratio, or by a specific term of magnitude. Thus the French term “l'indice de force des sons” was replaced by “l'affaiblissement pour la sonie”, “loudness rating” (E), “coeficiente de sonoridad” (S).

5. Ratio

The term “ratio” is used to express the result of the division of two numbers or two quantities of the same kind. It may therefore be used in this case as an equivalent of the term “quotient”.

Examples:

- Attenuation is defined as the ratio of two powers.
- Ratio of A to B.
- Ratio of width to height (picture).

In English and in Spanish, the word “ratio” (“relación”) is also used to explicitly indicate the fractional expression of the relationship between two quantities before the division is performed, e.g. written as a fraction or a relationship as 5/21 or 5 : 21 rather than the resulting 0.238. The two quantities may or may not be the same, e.g. power/weight ratio, relación potencia/peso.

In French and in Spanish the term “rapport” (F) (“relación” (S)) should not be used when the two quantities are not the same physical kind, or when they are of a different mathematical kind, for example, to express the quotient of a vector or a tensor by a scalar number.

The word is also used to form terms for expressing dimensionless quantities.

Examples:

E	F	S
standing wave ratio	rapport d'onde stationnaire	relación de onda estacionaria
signal-to-noise ratio	rapport signal sur bruit	relación señal/ruido
protection ratio	rapport de protection	relación de protección
error ratio	taux d'erreur	proporción de errores

Note. — Error ratio is normally expressed as a decimal fraction, e.g. $4 \cdot 10^{-5}$.

6. Rate, ratio (E); Taux, débit (F); Tasa/proporción/frecuencia (S)

The term “taux” in French designates a factor usually expressed as a percentage or any decimal fraction such as a thousandth or a millionth. It does not always correspond with the English term “rate”. In particular, it should not be used to express the relationship of a quantity with a unit of time. In such cases, an appropriate term such as “débit” (F), “fréquence” (F), “vitesse” (F) should be used. An exception which has been established by usage is “failure rate” (E), “taux de défaillance” (F), “tasa de fallos” (S) in the field of reliability.

Although in English the term “rate” may be used to express the relationship between two quantities of the same kind, it is generally used to express the relationship of quantities of a different kind (particularly a quantity per unit of time). For expressing the proportion of errors in telecommunication however, the use of this term can be confusing and is deprecated. The term “ratio” should be used for this purpose.

In Spanish, the term “tasa” should not be used to express the relationship between a quantity and the unit of time. There are a number of different terms which should be used for this purpose depending on the quantity e.g. “velocidad” (S) for distance, “frecuencia” (S) for events, “caudal” (S) for volume flow, etc.

In Spanish, the term “tasa” is also frequently used incorrectly to indicate a factor or index usually expressed as a percentage or in hundredths or as a smaller decimal fraction such as a thousandth or millionth. The use of this term for this purpose in Spanish is deprecated and should be replaced by the term “proporción” (S).

Examples:

E	F	S
sampling rate	fréquence d'échantillonnage	frecuencia de muestreo
digit rate	débit numérique	velocidad digital
fading rate	cadence d'évanouissement	ritmo de desvanecimiento
rain rate	intensité de pluie	intensidad de lluvia
modulation rate	rapidité de modulation	velocidad de modulación
failure rate	taux de défaillance	tasa de fallos
error ratio *	taux d'erreur	proporción de errores
harmonic factor	taux d'harmoniques	proporción de armónicos
modulation factor	taux de modulation	factor de modulación

* In English, “error rate” is used to denote the number of errors/unit time. In this case in French “fréquence des erreurs” may be used.

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SECTION CMV B: GRAPHICAL SYMBOLS

Recommendations

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 617 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.

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 (updated in 1986):

IEC Publication 113: "Diagrams, charts, tables"

- 113-1 (1971) (Definitions and classification)
- 113-3 (1974) (General recommendations for the preparation of diagrams)
- 113-4 (1975) (Recommendations for the preparation of circuit diagrams)
- 113-5 (1975) (Preparation of interconnection diagrams and tables)
- 113-6 (1976 and
Amend. 1 1983) (Preparation of unit wiring diagrams and tables)
- 113-7 (1981) (Preparation of logic diagrams)
- 113-8 (1982 and
Amend. 1 1983) (Preparation of diagrams for system manuals)

IEC Publication 117: "Recommended graphical symbols" replaced by Publication 617

IEC Publication 416 (1972 and Amendment 1, 1978): "General principles for the formulation of graphical symbols"

IEC Publication 417 (1973 and 6 Supplements of 1974, 1975, 1977, 1978, 1980 and 1982): "Graphical symbols for use on equipment"

IEC Publication 617: "Graphical symbols for diagrams"

- 617-1 (1985) (General information, General Index. Cross-reference tables)
- 617-2 (1983) (Symbol elements, qualifying symbols and other symbols having general application)
- 617-3 (1983) (Conductors and connecting devices)
- 617-4 (1983) (Passive components)
- 617-5 (1983) (Semi-conductor and electron tubes)
- 617-6 (1983) (Production and conversion of electrical energy)

* The text of this Recommendation is analogous to that of Recommendation B.10 of the CCITT.

617-7 (1983)	(Switchgear, control gear and protective devices)
617-8 (1983)	(Measuring instruments, lamps and signalling devices)
617-9 (1983)	(Telecommunications: Switching and peripheral equipment)
617-10 (1983)	(Telecommunications: Transmission)
617-11 (1983)	(Architectural and topographical installation plans and diagrams)
617-12 (1983)	(Binary logic elements)
617-13 (1978)	(Analogue elements)

RECOMMENDATION 664 *

ADOPTION OF THE CCITT SPECIFICATION AND DESCRIPTION LANGUAGE (SDL) **

(1986)

The CCIR,

CONSIDERING

- (a) that there is a need for a common method or procedure for the unambiguous specification and description of the behaviour of telecommunication systems;
- (b) that a specification of a system is the description of its required behaviour;
- (c) that a description of a system is the description of its actual behaviour;
- (d) that a universal method for specification and description should bring economic benefits;
- (e) that the CCITT has adopted such a method called the Specification and Description Language (SDL) as described in CCITT Recommendations Z.100 to Z.104,

UNANIMOUSLY RECOMMENDS

1. the adoption within the CCIR of the CCITT Specification and Description Language (SDL) for unambiguous specification and description of telecommunication systems (see Annex I);
2. that the possibilities for application of SDL in areas of common interest for the purposes of standardization be brought to the attention of other international bodies (e.g. the IEC and ISO) for their consideration.

ANNEX I

INTRODUCTION TO SDL

The purpose of recommending SDL is to provide a language for unambiguous *specification* and *description* of the behaviour of telecommunications *systems*. The *specifications* and *descriptions* using SDL are intended to be formal in the sense that it is possible to analyse and interpret them unambiguously.

The terms *specification* and *description* are used with the following meaning:

- a *specification* of a *system* is the description of its required *behaviour*, and
- a *description* of a *system* is the description of its actual *behaviour*.

SDL also provides structuring concepts which allow a *system* to be partitioned so that it can be defined, developed and understood one part at a time.

* A similar text will be submitted to the CCITT.

** The Director, CCIR, is requested to transmit this Recommendation to ISO and the IEC.

These concepts are of value both initially in specifying a *system*, when different aspects can be independently dealt with, and later in describing a *system*, when the description structures should match the *system* structure.

SDL gives a choice of the use of two different forms when representing SDL descriptions; a graphic representation (SDL/GR) and a textual phrase representation (SDL/PR). As they are both specific representations of the same SDL semantics, they are equivalent from a semantic point of view.

Objectives

The general objectives when defining SDL have been to provide a language that:

- is easy to learn, use and interpret in relation to the needs of an operating organization;
- provides unambiguous specifications and descriptions for ordering and tendering;
- may be extended to cover new developments;
- is able to support several methodologies of system specification and design, without assuming any one of these.

Scope

The main area of application for SDL is the description of the behaviour of aspects of telecommunications *systems*. Applications include:

- call processing (e.g. call handling, telephony signalling, metering) in stored programme control (SPC) switching systems;
- maintenance and fault treatment (e.g. alarms, automatic fault clearance, routine tests) in general telecommunications systems;
- system control (e.g. overload control, modification and extension procedures);
- data communication protocols.

SDL can of course also be used for the description of any behaviour capable of being described using a discrete model, i.e. communicating with its environment by discrete messages.

A description of SDL is given in CCITT Recommendations Z.100 to Z.104.

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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 (updated in 1986).

BIPM publications: “BIPM Publication: Le système international d’unités” (SI).**

International Standard ISO 31: “General principles concerning quantities, units and symbols”

Parts of International Standard ISO 31 of greatest interest for telecommunications:

- | | |
|-----|--|
| 0 | (General principles) |
| I | (Quantities and units of space and time) |
| II | (Quantities and units of periodic and related phenomena) |
| V | (Quantities and units of electricity and magnetism) |
| VI | (Quantities and units of light and related electromagnetic radiations) |
| VII | (Quantities and units of acoustics) |
| XI | (Mathematical signs and symbols) |

International Standard ISO 1000: “SI units and recommendations for the use of their multiples and of certain other units”

IEC Publication 27: see Recommendation 608.

See also ISO Standards Handbook 2 (1982) “Units of measurement”.

* The text of this Recommendation is analogous to that of Recommendation B.3 of the CCITT.

** The English translation of this publication is published under the title: “The International System of Units”, Her Majesty’s Stationary Office, London, 1970, and “The International System of Units”, US National Bureau of Standards, Special Publication 330, US Government Printing Office, Washington, DC, 1970.

RECOMMENDATION 607-1 *

TERMS AND SYMBOLS FOR INFORMATION QUANTITIES
IN TELECOMMUNICATIONS **

(Question 3/CMV)

(1982-1986)

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. 25 has requested the CMV to assist with the definition of letter symbols for terms and units used in data communication,

UNANIMOUSLY RECOMMENDS

1. that the CCIs should use the terms "bit", "baud", "shannon", "byte" and "N-bit byte" 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 as the letter symbol for this unit; 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 units the letter symbols kbit, Mbit, kbit/s should be used;
3. that the unit "baud" should have as its letter symbol Bd with possible multiples of kBd and MBd;
4. that the unit "shannon" should have as its letter symbol Sh;
5. that for the term "byte" it is the task of the ISO to provide the letter symbol it judges to be necessary. In the meantime this term and its multiples should be written in full in the documents and texts of the CCIs. For example 10 kilo-bytes, 1 mega-byte. The term "N-bit byte" has 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; octet; octeto (byte)

A group of 8 binary digits operated upon as an entity.

Note. — Until 1986 the term "octet" was used in English. Such usage is now deprecated.

* The text of this Recommendation is analogous to CCITT Recommendation B.14.

** The Director is invited to submit this Recommendation to the IEC.

N-bit 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 ISO (Data Processing — Vocabulary. Part 4: Data Organization).

RECOMMENDATION 665*
TRAFFIC INTENSITY UNIT**

(1986)

The CCIR,

CONSIDERING

- (a) that in CCITT texts concerning telephone operations and tariffs and in CCIR texts concerning radiotelephone transmissions (e.g. telephone radio-relay systems and the maritime mobile service radiotelephony), the quantity "traffic intensity" is used together with the unit in which it is expressed. With progress in telecommunications, increasing use will be made of this term and this unit;
- (b) that the unit of carried traffic intensity is defined in CCITT Recommendation E.600,

UNANIMOUSLY RECOMMENDS

- 1. that for telecommunications purposes, the unit of carried traffic intensity should be defined as follows:
Erlang: the unit of carried traffic intensity. The value in erlangs of the intensity of traffic carried by a pool of resources*** over a given period of time is equal to the average number of resources simultaneously busy during this period;
- 2. that the erlang should be represented by the symbol E.

Note. — The name "erlang" was given to the traffic unit in 1946 by the CCIF, in honour of the Danish mathematician, A. K. Erlang (1878-1929), who was the founder of traffic theory in telephony.

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 the CMV is collaborating with Technical Committee No. 25 of the IEC,

* A similar text will be submitted to the CCITT.

** The Director, CCIR, is requested to bring this Recommendation to the attention of the International Electrotechnical Commission (IEC; Technical Committee No. 25).

*** The term "resource" means any entity used for carrying traffic (circuit, switching equipment, subscriber line, etc.).

**** The text of this Recommendation is analogous to that of Recommendation B.1 of the CCITT.

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 (updated in 1986):

International Standard ISO 31: "General principles concerning quantities, units and symbols"

Parts of International Standard ISO 31 of greatest interest for telecommunications:

- 0 (General principles)
- I (Quantities and units of space and time)
- II (Quantities and units of periodic and related phenomena)
- V (Quantities and units of electricity and magnetism)
- VI (Quantities and units of light and related electromagnetic radiations)
- VII (Quantities and units of acoustics)
- XI (Mathematical signs and symbols)

IEC Publication 27: "Letter symbols to be used in electrical technology"

- 27-1 (General) (1971 5th Edition, with Amendment 1 (1974) and Amendment 2 (1977)). (1983 Amendment 4, including 1981 Amendment 3)
- 27-1A (1976) (Time-dependent quantities)
- 27-2 (1972) (Telecommunications and electronics)
- 27-2A (1975) (First supplement: Waveguide propagation; scattering matrix and transfer matrix; static convectors; automatic control science and technology)
- 27-2B (1980) (Second supplement: linear n-port networks)
- 27-3 (1974) (Logarithmic quantities and units) (see Recommendation 574)
- 27-4 (1985) (Quantities to be used for rotating electrical machines)

See also IEC Handbook "Letter Symbols" (1983).

RECOMMENDATION 431-5 *

NOMENCLATURE OF THE FREQUENCY AND WAVELENGTH BANDS
USED IN TELECOMMUNICATIONS

(Question 3/CMV)

(1953-1956-1959-1963-1966-1974-1978-1982-1986)

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,

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:
 - in Table I and Notes 1 and 2, which take account of No. 208 of the Radio Regulations, and
 - in Note 3 (Table II), which contains the proposal of the International Union of Radio Sciences (URSI), except in those cases where this would inevitably cause very serious difficulties.

* The text of this Recommendation is analogous to that of Recommendation B.15 of the CCITT.

ANNEX I

TABLE I

Band number	Symbols	Frequency range (lower limit exclusive, upper limit inclusive)	Corresponding metric subdivision	Metric abbreviations for the bands
3	ULF	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) (see Table II).

Note 4. — In most countries the frequency ranges used for FM sound broadcasting and television are designated by the Roman numerals I to V. The frequency ranges are indicated in Table III. It should be noted that these ranges are, in some cases, not exclusive to the broadcasting services.

Note 5. — Certain frequency bands are sometimes designated by letter other than the symbols and abbreviations recommended in Tables I and II. The symbols in question consist of capital letters which may be accompanied by an index (usually a small letter). There is at present no standard correspondence between the letters and the frequency bands concerned, and the same letter may be used to designate a number of different bands. It is not advisable to use these symbols in ITU publications. If, however, a letter symbol is used, reference should be made to the corresponding frequency band limits or at least to a frequency in the band, if that information is sufficient in itself, the first time the symbol appears in the text.

TABLE II

Band number	Symbols ⁽¹⁾	Frequency range (lower limit exclusive, upper limit inclusive)	Corresponding metric subdivision	Metric abbreviations for the bands
-1	ELF	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

⁽¹⁾ The symbol EBF is used in French.

TABLE III

Designation	Frequency range (MHz)		
	Region 1	Region 2	Region 3
I	47 - 68	54 - 68	47 - 68
II	87.5 - 108	88 - 108	87 - 108
III	174 - 230	174 - 216	174 - 230
IV	470 - 582	470 - 582	470 - 582
V	582 - 960	582 - 890	582 - 960

RECOMMENDATION 574-2 *

USE OF THE DECIBEL AND THE NEPER IN TELECOMMUNICATIONS **

(Question 3/CMV)

(1978-1982-1986)

The CCIR,

CONSIDERING

- (a) the frequent use by the CCIR and the CCITT of the decibel and the neper for expressing quantities;
- (b) the IEC Publication 27-3 (1974) on logarithmic quantities and units;
- (c) the collaboration of the CMV with Technical Committee No. 25 of the IEC which permits coordination with a view to establishing further Recommendations;
- (d) International Standard ISO 31;
- (e) the convenience of using only one unit to express in logarithmic form the numerical values of international specifications and the results of measurements in exchanges at international level;
- (f) the use in radiocommunications of the decibel alone to express the results of measurements in logarithmic form;
- (g) the need, within the ITU, to publish a guide on this subject,

UNANIMOUSLY RECOMMENDS

that symbols used for the logarithmic expression of quantities that directly or indirectly refer to power should be chosen with the guidance of Annex I.

* The text of this Recommendation is analogous to CCITT Recommendation B.12. The Director, CCIR, is requested to bring this Recommendation to the attention of the International Electrotechnical Commission (IEC, Technical Committee No. 25).

** In this Recommendation, the notation \lg is used for the decimal logarithm in accordance with ISO 31 (Part XI) and usage within the IEC (Publication 27-3). The notation \log_{10} is also used within ISO and the IEC.

ANNEX I

USE OF THE DECIBEL AND THE NEPER

1. Definition of the decibel

1.1 The *bel* (symbol B) expresses the ratio of two powers by the decimal logarithm of this ratio. This unit is not often used, having been replaced by the *decibel* (symbol dB) which is one-tenth of a bel.

1.2 The decibel may be used to express the ratio of two *field quantities*, such as voltage, current, sound pressure, electric field, charge velocity or density, the square of which in linear systems is proportional to power. To obtain the same numerical value as a power ratio, the logarithm of the field quantity ratio is multiplied by the factor 20, assuming that the impedances are equal.

The relationship between a current or voltage ratio and that of the corresponding power ratio is impedance dependent. Use of the decibel when the impedances are not equal is not appropriate unless adequate information is given concerning the impedances involved.

For example, if P_1 and P_2 are two powers, their ratio expressed in decibels is:

$$10 \lg \frac{P_1}{P_2}$$

If P_1 and P_2 represent the powers dissipated by currents I_1 and I_2 in resistances R_1 and R_2 :

$$10 \lg \frac{P_1}{P_2} = 10 \lg \frac{I_1^2 R_1}{I_2^2 R_2} = 20 \lg \frac{I_1}{I_2} + 10 \lg \frac{R_1}{R_2}$$

1.3 The decibel may also be used to express the ratio of two values of a quantity connected with power by a well-defined relationship. In this case, the logarithm of this ratio must be multiplied by a factor representing the relationship which connects the quantity with a power, and a term representing a multiplying factor may be added to it.

The corresponding formulae, together with an example, are given in § 2 of Appendix I.

2. Definition of the neper

The *neper* (symbol Np) expresses the ratio of two field quantities such as voltage or current, the square of which is proportional to power by the natural logarithm of this ratio. The value of a power ratio in nepers is one-half of the natural logarithm of the power ratio. The values in nepers of the ratio of two field quantities and of the corresponding powers are equal only if the impedances are equal.

One neper corresponds to the value of e of a field quantity ratio and to the value e^2 of a power quantity ratio.

Sub-multiples such as the decineper (dNp) are also used.

In some disciplines, nepers may be used to express the logarithm of a power ratio without the factor 1/2. An example is optical depth or attenuation in radiometry. Such usage is prohibited in telecommunications in order to prevent ambiguity. Under this definition, the neper would in fact be equal to 4.34 dB, instead of 8.68 dB as is traditionally the case.

3. Use of the decibel and neper

Countries can continue to use either the neper or the decibel for measurement purposes within their own territory and, to avoid conversion of values, countries which prefer to do so may continue to use the neper between themselves by bilateral agreement.

For the international exchange of information concerning transmission measurement and related values and for the international specification of limits for such values, the only logarithmic expression to be used is the decibel.

For theoretical or scientific calculations, where ratios are expressed in terms of Napierian logarithms, the neper will always be used, implicitly or explicitly.

As a result of some calculations on complex quantities, a real part in nepers and an imaginary part in radians are obtained. Factors may be applied for converting to decibels or degrees.

The conversion values between the neper and the decibel are as follows:

$$\begin{aligned} 1 \text{ Np} &= (20 \lg e) \text{ dB} \approx 8.686 \quad \text{dB} \\ 1 \text{ dB} &= (0.05 \ln 10) \text{ Np} \approx 0.1151 \quad \text{Np} \end{aligned}$$

4. Rules for the use of the symbols where dB is included

Concerning the symbols that include the symbol dB, the following rules should be used as far as possible:

4.1 The symbol dB without additional indication

The symbol dB without additional indication should be used to indicate a difference between two power levels or a ratio of two powers, two power densities, or two other quantities clearly connected with power.

4.2 The symbol dB followed by additional information within parenthesis

The symbol dB followed by additional information within parenthesis should be used to express an absolute level of power, power flux-density or any other quantity clearly connected with power, in relation to a reference value within the parenthesis. In some cases, however, common use may give rise to simplified symbols, such as dBm instead of dB(mW).

4.3 The symbol dB followed by additional information without parenthesis

The symbol dB followed by additional information without parenthesis should be used to express by convention, special conditions such as measurements through specified filters or at a specified point of a circuit.

5. Loss and gain

The *attenuation* or *loss* is a decrease between two points of an electric, electromagnetic or acoustic power. The attenuation is also the quantitative expression of a power decrease, generally in decibels; this decrease is expressed by the ratio of the values at two points of a power or of a quantity related to power in a well-defined manner.

The *gain* is the increase between two points of an electric, electromagnetic or acoustic power. The gain is also the quantitative expression of a power increase, generally in decibels; this increase is expressed by the ratio of the values at two points of a power or of a quantity related to power in a well-defined manner.

The exact designation of the loss or gain in question 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.).

5.1 Transmission loss (Refs. Recommendation 341, and Recommendation 573, term A43)

This is the ratio, expressed in decibels, of the transmitted power (P_t) to the received power (P_r):

$$L = 10 \lg (P_t / P_r) \quad \text{dB}$$

5.2 Antenna gain (Refs. Radio Regulations, Article 1, No. 154 and Recommendation 573, term E04)

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."

$$G = 10 \lg (P_0 / P_a) \quad \text{dB}$$

6. Levels

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 expression 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 written 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 $\mu\text{W}/\text{m}^2$, 20 μPa , 1 $\mu\text{V}/\text{m}$.

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:

$$L_P(\text{with respect to 1 W}) = 15 \text{ dB, which means } 10 \lg (P/1 \text{ W}) = 15^*$$

$$\text{or } 10 \lg P(\text{in watts}) = 15$$

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 § 8 below).

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.

6.1 Power

The "absolute power level" corresponds to the ratio of P and a reference power, e.g. 1 W.

If $P = 100 \text{ W}$ and the reference power 1 W, we obtain:

$$\begin{aligned} L_P &= 10 \lg (P/1 \text{ W}) && \text{dB} \\ &= 10 \lg (100 \text{ W}/1 \text{ W}) && \text{dB} \\ &= 20 \text{ dB} \end{aligned}$$

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 $P = 100 \text{ W}$ 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 § 8 below).

6.2 Power spectral density

The logarithmic expression corresponds to the ratio of $P/\Delta f$ (where Δf denotes a bandwidth) 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(μ W/Hz).

6.3 Power flux-density

The logarithmic expression corresponds to the ratio of P/A , where A is area, and a reference power density, e.g. 1 W/m². A notation in a certain case can be:

$$\begin{aligned} &-40 \text{ dB(W/m}^2\text{)} \\ \text{or} &-10 \text{ dB(mW/m}^2\text{)}. \end{aligned}$$

6.4 Power density with respect to temperature

The logarithmic expression 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.

$$\begin{aligned} \text{Example :} &45 \text{ dB(mW/K)} \\ &\text{or } 15 \text{ dB(W/K)}. \end{aligned}$$

* In the ratio $(P/1 \text{ W})$, it is evident that P must be expressed in watts.

6.5 Spectral power-flux-density

The logarithmic expression corresponds to the ratio of $P/(A \cdot \Delta f)$ and a reference density e.g. $1 \text{ W}/(\text{m}^2 \cdot \text{Hz})$.

Example : $-18 \text{ dB}(\text{W}/(\text{m}^2 \cdot \text{Hz}))$
or $-18 \text{ dB}(\text{W} \cdot \text{m}^{-2} \cdot \text{Hz}^{-1})$.

A variant sometimes used is, $\text{dB}(\text{W}/(\text{m}^2 \cdot 4 \text{ kHz}))$.

6.6 Absolute level of an electromagnetic field

The strength of an electromagnetic field can be expressed by a power flux-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 $1 \text{ } \mu\text{V}/\text{m}$.

An example with a condensed notation is:

$L_E = 5 \text{ dB}(\mu\text{V}/\text{m})$.

As the power carried by an electromagnetic field is linked to the square of the field strength, this notation means:

$$20 \lg E(\mu\text{V}/\text{m}) = 5$$

6.7 Sound pressure level

The level corresponds to the ratio of sound pressure and a reference pressure, often $20 \text{ } \mu\text{Pa}$.

Example: $15 \text{ dB}(20 \text{ } \mu\text{Pa})$.

As acoustic power is linked to the square of sound pressure, this means:

$$20 \lg (p/20 \text{ } \mu\text{Pa}) = 15^*$$

7. Ratios expressing transmission quality

7.1 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:

$$R = 10 \lg (P_s/P_n) \quad \text{dB} \quad \text{or} \quad R = 20 \lg (U_s/U_n) \quad \text{dB}$$

The ratio of the wanted signal to the unwanted signal is expressed in the same way.

7.2 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:

$$A = 10 \lg (P_w/P_i) \quad \text{dB} \quad \text{or} \quad A = 20 \lg (E_w/E_i) \quad \text{dB}$$

7.3 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 has a dimension of 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 $1 \text{ W}/(\text{W}/\text{Hz})$ which clearly indicates the origin of the result.

For example, with $P_c = 2 \text{ W}$, $P_n = 20 \text{ mW}$, and $\Delta f = 1 \text{ MHz}$, for the logarithmic expression corresponding to C/N_0 we have:

$$10 \lg \frac{P_c}{P_n/\Delta f} = 50 \text{ dB}(\text{W}/(\text{W}/\text{kHz}))$$

This expression is abbreviated to read $50 \text{ dB}(\text{kHz})$ which should however be avoided if it is liable to give rise to any misunderstanding.

* In the ratio $(p/20 \mu\text{Pa})$, it is evident that both sound pressures must be expressed in the same units.

7.4 Figure of merit (M)

The figure of merit (M) characterizing a receiving radio station is a logarithmic expression which is related to the antenna gain G (in decibels) and the overall noise temperature T (in kelvins) in the following way:

$$M = \left[G - 10 \lg \frac{T}{1\text{K}} \right] \text{ dB(W/(W·K))}$$

The decibel notation may be abbreviated to read dB(K⁻¹) which should however be avoided if it is liable to give rise to misunderstanding.

8. Special notations

Examples of special notations, the use of which may be continued, are given below. These notations are often made in addition to other notations.

For absolute power level (see Appendix I, § 1.1)

- 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 level of an electromagnetic field (see Appendix I, § 2.1)

- dB_μ or dBu: absolute level of the electromagnetic field with respect to 1 μV/m, expressed in decibels.

For absolute voltage level (see Appendix I, § 2.2)

- dBu: absolute voltage level with respect to 0.775 V, expressed in decibels.

For absolute audio-frequency noise level (see Appendix I, § 2.3)

- dBu0: absolute voltage level with respect to 0.775 V, referred to a point of zero relative level;
- dBu0s: absolute voltage level with respect to 0.775 V, referred to a point of zero relative level in sound-programme transmission;
- dBqps: absolute weighted voltage level measured according to Recommendation 468 in sound-programme transmission;
- dBq0ps: absolute weighted voltage level measured according to Recommendation 468 referred to a point of zero relative level in sound-programme transmission;
- dBq0s: absolute unweighted voltage level measured according to Recommendation 468 in sound-programme transmission with respect to 0.775 V referred to a point of zero relative level.

For relative power level (see Appendix I, § 1.2)

- dBr: decibels (relative);

For relative voltage level in sound-programme transmission (see Appendix I, § 2.4)

- dBr_s: relative voltage 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.

For antenna gain in relation to a half-wave dipole

- dBd.

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. — Appendix I gives the principles for the use of the term decibel in telecommunications.

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 TELECOMMUNICATIONS

1. Use of the decibel for ratios of quantities directly connected with power

1.1 Absolute power level

The absolute power level is the ratio, generally expressed in decibels, between the power of a signal at a point in a transmission channel and a specified reference power.

It should be specified in every case whether the power is real or apparent.

It is necessary for the reference power to be indicated by a symbol:

- 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;
- 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.

1.2 Relative power level and related concepts

1.2.1 Definition

The relative power level is the ratio, generally expressed in decibels, between the power of a signal at a point in a transmission channel and the same power at another point in the channel chosen as a reference point, generally at the origin of the channel.

It should be specified in every case whether the power is real or apparent.

Unless otherwise specified, the relative power level is the ratio of the power of a sinusoidal test signal (at 800 or 1000 Hz) at a point in the channel to the power of that reference signal at the transmission reference point.

1.2.2 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.

1.2.3 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).

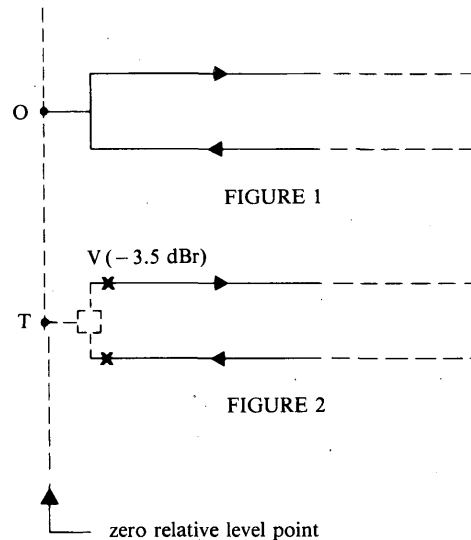
Conversely, if a signal at X has an absolute power level L_{XA} (in dBm), it is often convenient to “refer it to a zero relative level point” by computing L_0 (in dBm0) by the formula:

$$L_0 = L_{XA} - L_{XR}$$

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.

Note. — More detailed explanations are given in the following Recommendations published in Volume III of the CCITT:

- G.101, § 5 and G.223 for § 1.2.1 and 1.2.2 above.



1.3 Power density

Definition: Quotient of a power by another quantity, for example, an area, a bandwidth, 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 $W/(m^2 \cdot Hz)$).

1.4 Absolute power density level

Definition: Expression in logarithmic form, 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/(m² · Hz)).

2. Use of the decibel for ratios of quantities indirectly connected with 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 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:

$$N = 10 \lg (P_1/P_2) = 10 \alpha \lg (X_1/X_2) \quad \text{dB}$$

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:

$$N = 20 \lg (X_1/X_2) \quad \text{dB}$$

An example where α is other than 2 is the relationship between cross-polarization (XPD) and the co-polarized path attenuation (CPA) given by the empirical relationship (see Report 722):

$$XPD = U - V \lg (CPA) \quad \text{dB}$$

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 120π ohms. In particular, a field of 1 microvolt per metre corresponds to a power flux-density of -145.8 dB(W/m²).

The absolute level of the electric field can then be defined by the equation:

$$N = 20 \lg \left(\frac{E}{E_0} \right)$$

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)".

In accordance with International Standard ISO 2955, the symbol “dB(uV/m)” may be used when the character set employed does not comprise Greek letters. This symbol is sometimes further abbreviated to “dBu”. This symbol does however have another use which is defined in § 3.2.

2.2 *Absolute voltage level*

The absolute voltage level is the ratio, generally expressed in decibels, of the voltage of a signal at a point in a transmission channel to a specified reference voltage.

The nature of the voltage in question, e.g. r.m.s. value, should be specified in every case.

A reference voltage with an r.m.s. of 0.775 volt is generally adopted which corresponds to a 1 milliwatt power dissipated in a resistance of 600 ohms, since 600 ohms represents a rough approximation to the characteristic impedance of certain balanced telephone lines.

2.2.1 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).

2.2.2 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 $10 \lg (R/600)$.

2.3 *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.

2.4 *Relative voltage levels in sound-programme transmission*

The relative voltage level at a point in a sound-programme transmission chain is the ratio, expressed in dB, of the voltage level of a signal at that point relative to the voltage level of the same signal at the reference point. This ratio is expressed in “dBrs”, the “r” indicating “relative level” and “s” indicating that the ratio refers to levels in a “sound-programme” system. At the reference point (the point of zero relative level, 0 dBrs) a test signal at the alignment level (see Recommendation 645), has a level of 0 dBu. Note that in some broadcasting chains, there may be no point of zero relative level. However, points of measurements and interconnection may still be given a level (in dBrs) relative to a hypothetical reference point.

3. *Use of the decibel, by extension, for ratios of quantities not connected with power*

3.1 *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 two-port networks 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 networks. 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:

$$N = K \lg \left(\frac{U_1}{U_2} \right)$$

In this equation the coefficient K is *a priori* arbitrary. However, by analogy with the operation:

$$N = 20 \lg \left(\frac{U_1}{U_2} \right)$$

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.

3.2 Absolute voltage level

If the impedance at the terminals of which the voltage is measured is not specified, the corresponding power level cannot be calculated. However, a number N can be defined conventionally in accordance with § 3.1 with respect to a reference voltage and can be expressed in decibels. To avoid any confusion, it is essential to specify that an absolute voltage level is concerned and the symbol dBu must be used. The symbol dBu appears to create no confusion with the use defined in § 2.1 as the absolute level of the electromagnetic field referred to 1 microvolt per metre. If, however, there is any risk of confusion, the expression dB (775 mV) must be written, at least the first time.

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 μ Pa can be written as:

$$L_p (\text{re } 20 \mu\text{Pa}) = 15 \text{ dB or as } L_{p/20 \mu\text{Pa}} = 15 \text{ dB}$$

The statement that the level of a current is 10 Np below 1 ampere can be written as:

$$L_I (\text{with respect to } 1 \text{ A}) = -10 \text{ Np.}$$

The statement that a certain power level is 7 dB above 1 milliwatt can be written as:

$$L_p (\text{with respect to } 1 \text{ mW}) = 7 \text{ dB.}$$

The statement that a certain electric field-strength is 50 dB above 1 microvolt per metre can be written as:

$$L_E (\text{with respect to } 1 \mu\text{V/m}) = 50 \text{ dB.}$$

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 μ Pa)
 -10 Np(1 A)
 7 dB(1 mW)
 50 dB(1 μ V/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.*

* The omission of the reference level, permitted by the IEC, is not permitted in CCIR and CCITT texts.

RECOMMENDATION 666 *

ABBREVIATIONS AND INITIALS USED IN TELECOMMUNICATIONS

(Question 4/CMV)

(1986)

The CCIR,

CONSIDERING

- (a) the rapid increase in the number of abbreviations and initials used in CCIR texts;
- (b) that it is sometimes difficult to find the precise meaning of an abbreviation or acronym appearing in a CCIR text,

UNANIMOUSLY RECOMMENDS

1. that with the exception of abbreviations frequently used in telecommunications, abbreviations and acronyms should not be used in CCIR texts unless they make the text easier to read, i.e. when an abbreviation may be used several times in the same text;
2. that, with the exception of abbreviations frequently used in telecommunications, the first time an abbreviation is used in a particular text its full meaning should be given, either in the body of the text or in a footnote;
3. that at the end of each volume of CCIR Recommendations and Reports there should be an alphabetical list of the abbreviations used in that volume;
4. that for the abbreviations most frequently used in telecommunications, the administrations, CCIR Secretariat and other participants in the work of the CCIs should as far as possible use the abbreviations contained in Appendix I with the meaning indicated therein;
5. that for abbreviations specific to certain fields, the administrations, CCIR Secretariat and other participants in the work of the CCIs should use the abbreviations which appear in the publications listed in Appendix II.

APPENDIX I

ABBREVIATIONS AND INITIALS FOR TERMS COMMONLY
USED IN TELECOMMUNICATIONS

The abbreviations are those which are most frequently used in the texts of the CCIR and the CCITT and in the working languages of the ITU.

Annex I consists of the list of abbreviations, initials and terms in the three working languages. These are classified in the various fields of telecommunications and include a serial number for each term.

Annex II comprises a complete list of the abbreviations and initials in alphabetical order and the corresponding serial numbers given in Annex I.

Note. — A list of abbreviations and initials in general used by the CCITT are included in the Volume "Terms and definitions of the Recommendations of the CCITT".

* The text of this Recommendation will be submitted to the CCITT for approval. A first version of Appendix I is given in Supplement No. 1 to the CCITT Series B Recommendations (Volume I of the Red Book).

ANNEX I

LIST OF ABBREVIATIONS AND INITIALS CLASSIFIED BY TECHNICAL FIELD

Serial No.	Term	Abbreviations and initials		
		E	F	S
A	<i>Frequency-related terms</i>			
01	audio frequency audiofréquence audiofrecuencia	AF	AF	AF
02	radio frequency radiofréquence radiofrecuencia	RF	RF	RF
03	video frequency vidéofréquence videofrecuencia	VF *	VF	VF
04	intermediate frequency fréquence intermédiaire frecuencia intermedia	IF	FI	FI
05	pulse repetition frequency fréquence de répétition des impulsions frecuencia de repetición de impulsos	PRF	FRI	FRI
B	<i>Analogue modulation</i>			
01	continuous wave onde entretenue onda continua	CW		CW
02	amplitude modulation modulation d'amplitude modulación de amplitud	AM	MA	MA
03	double sideband double bande latérale doble banda lateral	DSB	DBL	DBL
04	single sideband bande latérale unique banda lateral única	SSB	BLU	BLU
05	independent sideband bandes latérales indépendantes banda lateral independiente	ISB	BLI	BLI
06	vestigial sideband bande latérale résiduelle banda lateral residual	VSB	BLR	BLR
07	upper sideband bande latérale supérieure banda lateral única superior	USB	BLsup	BLUS
08	lower sideband bande latérale inférieure banda lateral única inferior	LSB	BLinf	BLUI
09	quadrature amplitude modulation modulation d'amplitude en quadrature modulación de amplitud en cuadratura	QAM	MAQ	MAQ
10	frequency modulation modulation de fréquence modulación de frecuencia	FM	MF	MF
11	narrow band frequency modulation modulation de fréquence à bande étroite modulación de frecuencia de banda estrecha	NBFM	MFBE	MFBE

* VF is also used as an abbreviation for "voice frequency".

Serial No.	Term	Abbreviations and initials		
		E	F	S
12	wideband frequency modulation modulation de fréquence à bande large modulación de frecuencia de banda ancha	WBFM	MFBL	MFBA
13	phase modulation modulation de phase modulación de fase	PM	[MP MΦ	MP
14	pulse amplitude modulation modulation d'impulsions en amplitude modulación de impulsos en amplitud	PAM	MIA	MIA
15	[pulse duration modulation pulse width modulation modulation d'impulsions en durée modulation d'impulsions en largeur modulación de impulsos en duración modulación de impulsos en anchura	[PDM PWM	MID	MID
16	pulse position modulation modulation d'impulsions en position modulación de impulsos en posición	PPM	MIP	MIP
17	pulse time modulation modulation d'impulsions dans le temps modulación de impulsos en tiempo	PTM	MIT	MIT
18	pulse frequency modulation modulation d'impulsions en fréquence modulación de impulsos en frecuencia	PFM	MIF	MIF
19	pulse interval modulation modulation des intervalles entre impulsions modulación del intervalo entre impulsos	PIM		
C	<i>Digital modulation</i>			
01	amplitude shift keying modulation par déplacement d'amplitude modulación por desplazamiento de amplitud	ASK	MDA	MDA
02	frequency-shift keying modulation par déplacement de fréquence modulación por desplazamiento de frecuencia	FSK	MDF	MDF
03	minimun shift keying modulation par déphasage minimal modulación por desplazamiento mínimo	MSK	MDM	MDM
04	phase-shift keying modulation par déplacement de phase modulación por desplazamiento de fase	PSK	MDP	MDP
05	differential phase-shift keying modulation par déplacement de phase différentielle modulación por desplazamiento de fase diferencial	DPSK	MDPD	MDPD
06	coherent phase-shift keying modulation par déplacement de phase cohérente modulación por desplazamiento de fase coherente	CPSK	MDPC	MDPC
07	differential coherent phase-shift keying modulation par déplacement de phase cohérente différentielle modulación diferencial por desplazamiento de fase coherente	DCPSK	MDPCD	MDPCD
08	binary phase-shift keying modulation par inversion de phase modulación por desplazamiento de fase binaria	[BPSK 2-PSK	MDP-2	MDP-2
09	quadrature phase shift keying modulation par quadrature de phase modulación por desplazamiento de fase cuaternaria	[QPSK 4-PSK 4φ-PSK	[MDP-4 MDPQ	MDP-4

Serial No.	Term	Abbreviations and initials		
		E	F	S
10	multiple phase-shift keying modulation par déplacement de phase à n états modulación por desplazamiento de fase múltiple de n -estados o n -aria	MPSK	MDP-n	MDP-n
11	spread spectrum phase-shift keying modulation par déplacement de phase à étalement du spectre modulación por desplazamiento de fase de espectro ensanchado	SSPSK		
12	amplitude phase keying modulation par déplacement d'amplitude et de phase modulación por desplazamiento de fase y de amplitud	APK	MDAP	MDPA
13	n -state quadrature amplitude modulation modulation d'amplitude en quadrature à n états modulación de amplitud en cuadratura de n estados o n -aria	n-QAM	MAQ-n	MAQ-n
D	<i>Conversion and coding</i>			
01	analogue to digital (conversion) (conversion) analogique/numérique (conversión) analógica-digital	A/D	A/N	A/D
02	digital to analogue (conversion) (conversion) numérique/analogique (conversión) digital-analógica	D/A	N/A	D/A
03	pulse-code modulation modulation par impulsions et codage modulación por impulsos codificados	PCM	MIC	MIC
04	differential pulse-code modulation modulation par impulsions et codage différentiel modulación por impulsos codificados diferencial	DPCM	MICD	MICD
05	adaptive differential pulse-code modulation modulation par impulsions et codage différentiel adaptatif modulación por impulsos codificados diferencial adaptable	ADPCM	MICDA	MICDA
06	delta modulation modulation delta modulación delta	$\begin{bmatrix} \text{DM} \\ \Delta M \end{bmatrix}$	$\begin{bmatrix} \text{MD} \\ M\Delta \end{bmatrix}$	$\begin{bmatrix} \text{MD} \\ M\Delta \end{bmatrix}$
07	companded delta modulation modulation delta avec compression et extension modulación delta con compansión	CDM		
08	single integration delta modulation modulation delta sigma modulación delta de integración única	SIDM	$M\Delta\Sigma$	
09	adaptive delta modulation modulation delta adaptive modulación delta adaptable	ADM	MDA	MDA
10	adaptive transform coding codage par transformation adaptatif codificación por transformación adaptable	ATC	CTA	CTA
11	adaptive predictive coding codage par prédiction adaptatif codificación por predicción adaptable	APC	CPA	CPA
12	sub-band coding codage de sous-bande codificación de sub-banda	SBC	CSB	CSB
13	multipulse excited coding codage actionné par impulsions multiples codificación por excitación multimpulso	MPEC	CAIM	CEMI
14	linear prediction coding codage par prédiction linéaire codificación por predicción lineal	LPC	CPL	CPL
15	residual excited linear prediction coding codage par prédiction linéaire actionné par les résidus codificación por predicción lineal con excitación residual	RELPC	PLAR	PLER

Serial No.	Term	Abbreviations and initials		
		E	F	S
16	voice excited linear coding codage linéaire actionné par la voix codificación lineal con excitación por voz	VELC	CLAV	CLEV
E	<i>Multiplexing and multiple access</i>			
01	frequency division multiplexing multiplexage (par répartition) en fréquence multiplex por división en frecuencia	FDM	MRF	MDF
02	time division multiplexing multiplexage par répartition dans le temps; multiplexage temporel multiplex por división en tiempo	TDM	MRT	MDT
03	code division multiplexing multiplexage par répartition en code multiplex por división de código	CDM	MRC	MDC
04	wavelength division multiplexing multiplexage par répartition en longueur d'onde multiplex por división en longitud de onda	WDM	MRL	MDL
05	frequency division multiple access accès multiple (par répartition) en fréquence acceso múltiple por división en frecuencia	FDMA	AMRF	AMDF
06	time division multiple access accès multiple (par répartition) dans le temps acceso múltiple por división en tiempo	TDMA	AMRT	AMDT
07	code division multiple access accès multiple par répartition en code acceso múltiple por división de código	CDMA	AMRC	AMDC
08	spread spectrum multiple access accès multiple par étalement du spectre acceso múltiple por ensanchamiento del espectro	SSMA	AMES	AMEE
09	demand assignment multiple access accès multiple avec assignation à la demande acceso múltiple por asignación según demanda	DAMA	AMAD	AMAD
10	pulse address multiple access accès multiple avec adressage par impulsions acceso múltiple por dirección de impulsos	PAMA	AMAI	AMDI
11	single channel per carrier ... monovoie (... à une seule voie par porteuse) un solo canal por portadora	SCPC	SCPC	SCPC
12	demand assignment signalling and switching signalisation et commutation avec assignation en fonction de la demande señalización y conmutación con asignación por demanda	DASS		
13	satellite switched commutation dans le satellite conmutación en el satélite	SS	CS	CS
14	digital speech interpolation concentration numérique des conversations interpolación digital de señales vocales	DSI	CNC	DSI
15	data above voice données supravocales datos por encima de la banda vocal	DAV	DSV	
16	data under voice données infravocales datos por debajo de la banda vocal	DUV	DIV	
17	time slot créneau temporel (intervalle de temps) intervalo de tiempo	TS	IT	IT

Serial No.	Term	Abbreviations and initials		
		E	F	S
F	<i>Encoding</i>			
01	alternate mark inversion bipolaire alternant (code de signal) inversiones de marcas alternadas	AMI		
02	code mark inversion code CMI inversión de marcas codificadas	CMI	CMI	
03	return to zero retour au zéro retorno a cero	RZ	RZ	RZ
04	non-return to zero non-retour au zéro sin retorno a cero	NRZ	NRZ	NRZ
05	high density bipolar bipolaire à haute densité bipolar de alta densidad	HDB	HDB	HDB
06	Bose Chaudhuri Hocquenghem code code de Bose Chaudhuri Hocquenghem código de Bose Chaudhuri Hocquenghem	BCH	BCH	BCH
07	error correction by automatic repetition correction d'erreur par détection et répétition corrección de errores por detección y repetición	ARQ	ARQ	ARQ
08	forward error correction correction d'erreur directe (sans voie de retour) corrección de errores sin canal de retorno	FEC	CED	FEC
09	bit error ratio (rate) taux d'erreur binaire proporción de bits erróneos	BER	TEB	BER
10	error-free second seconde sans erreur segundo sin error	EFS	SSE	SSE
11	character error ratio taux d'erreur sur les caractères proporción de caracteres erróneos	CER	TEC	PCE
12	error control device dispositif de protection contre les erreurs dispositivo de control de errores	ECD		
13	binary coded decimal décimal codé binaire decimal codificado en binario	BCD	DCB	BCD
G	<i>Quality and reliability</i>			
01	signal-to-noise ratio rapport signal/bruit relación señal/ruido	S/N	S/N	S/N
02	carrier-to-noise ratio rapport porteuse/bruit relación portadora/ruido	C/N	C/N	C/N
03	carrier-to-interference ratio rapport porteuse/brouillage relación portadora/interferencia	C/I	C/I	C/I
04	figure of merit facteur de qualité factor de calidad	$\left[\begin{matrix} M \\ G/T \end{matrix} \right]$	$\left[\begin{matrix} M \\ G/T \end{matrix} \right]$	$\left[\begin{matrix} M \\ G/T \end{matrix} \right]$
05	electromagnetic compatibility compatibilité électromagnétique compatibilidad electromagnética	EMC	CEM	CEM
06	industrial, scientific and medical (equipments) (appareils) industriels, scientifiques et médicaux (equipos) industriales, científicos y médicos	ISM	ISM	ISM

Serial No.	Term	Abbreviations and initials		
		E	F	S
07	modulated noise reference unit appareil de référence pour la production de bruit modulé unidad de referencia de ruido modulado	MNRU	ARBPM	URRM
08	transmitter intermodulation intermodulation dans l'émetteur intermodulación en el transmisor	TIM *		
09	receiver intermodulation intermodulation dans le récepteur intermodulación en el receptor	RIM		
10	mean time between failures moyenne des temps de bon fonctionnement tiempo medio entre fallos	MTBF	MTBF	MTBF
11	mean time to failure durée moyenne de fonctionnement avant défaillance tiempo medio de funcionamiento antes de fallo	MTTF	MTTF	MTTF
12	mean time to restore durée moyenne de panne tiempo medio de reparación	MTTR	MTTR	MTTR
H	<i>Power</i>			
01	effective radiated power puissance apparente rayonnée potencia radiada aparente	e.r.p.	p.a.r.	p.a.r.
02	equivalent isotropically radiated power puissance isotrope rayonnée équivalente potencia isotrópica radiada equivalente	e.i.r.p.	p.i.r.e.	p.i.r.e.
03	effective monopole radiated power puissance apparente rayonnée sur antenne verticale courte potencia radiada referida a una antena vertical corta	e.m.r.p.	p.a.r.v.	p.r.a.v.
04	cymomotive force force cymomotrice fuerza cimomotriz	c.m.f.	f.c.m.	f.c.m.
J	<i>Propagation</i>			
01	co-polar attenuation affaiblissement copolaire atenuación de la componente copolar	CPA	CPA	CPA
02	cross-polarization discrimination découplage de polarisation discriminación por polarización cruzada	XPD	XPD	XPD
03	cross-polar isolation isolement de polarisation aislamiento por polarización cruzada	XPI	XPI	XPI
11	maximum usable frequency fréquence maximale utilisable frecuencia máxima utilizable	MUF	MUF	MUF
12	lowest usable frequency fréquence minimale utilisable frecuencia mínima utilizable	LUF	LUF	LUF
13	optimum working frequency fréquence optimale de travail frecuencia óptima de trabajo	[OWF FOT	FOT	FOT
14	total electron content contenu électronique total contenido electrónico total	TEC	CET	CET

* TIM is also used as an abbreviation for terrestrial interface module.

Serial No.	Term	Abbreviations and initials		
		E	F	S
15	sudden ionospheric disturbance perturbation ionosphérique à début brusque perturbación ionosférica súbita	SID	PIDB	
K	<i>Space radiocommunications</i>			
01	geostationary-satellite orbit orbite des satellites géostationnaires órbita de los satélites geoestacionarios	GSO	OSG	OSG
02	tracking, telemetry and telecommand poursuite, télémessure et télécommande seguimiento, teledirigida y teledirigido	TTC	PTT *	STT
03	data relay satellite satellite relais de données satélite de retransmisión de datos	DRS	SRD	
04	search for extraterrestrial intelligence recherche de messages extraterrestres búsqueda de inteligencia extraterrestre	SETI	SETI	SETI
05	fixed-satellite service service fixe par satellite servicio fijo por satélite	FSS	SFS	SFS
06	mobile-satellite service service mobile par satellite servicio móvil por satélite	MSS	SMS	SMS
07	broadcasting-satellite service service de radiodiffusion par satellite servicio de radiodifusión por satélite	BSS	SRS	SRS
08	Earth exploration-satellite service service d'exploration de la Terre par satellite servicio de exploración de la Tierra por satélite	EESS	SETS	SETS
L	<i>Time</i>			
01	universal time temps universel tiempo universal	UT	UT	UT
02	coordinated universal time temps universel coordonné tiempo universal coordinado	UTC	UTC	UTC
03	international atomic time temps atomique international tiempo atómico internacional	TAI	TAI	TAI
M	<i>Networks</i>			
01	hypothetical reference digital path conduit numérique fictif de référence trayecto digital ficticio de referencia	HRDP	CNFR	TDFR
02	public switched telephone network réseau téléphonique public avec commutation red telefónica pública con conmutación	PSTN	RTPC	RTPC
03	public data network réseau public pour données red pública de datos	PDN	RPD	RPD
04	integrated digital network réseau numérique intégré red digital integrada	IDN	RNI	RDI
05	integrated services digital network réseau numérique à intégration de services red digital de servicios integrados	ISDN	RNIS	RDSI

* PTT is also used as an abbreviation for Posts and Telecommunication administrations.

Serial No.	Term	Abbreviations and initials		
		E	F	S
06	data terminal equipment équipement terminal de traitement de données equipo terminal de datos	DTE	ETTD	ETD
07	data circuit terminating equipment équipement de terminaison de circuit de données equipo de terminación de circuito de datos	DCE	ETCD	ETCD
08	digital radio concentrator system système numérique à concentration radioélectrique sistema digital concentrador radioeléctrico	DRCS	SNCR	SDCR
N	<i>Equipment</i>			
01	automatic frequency control commande automatique de fréquence control automático de frecuencia	AFC	CAF	CAF
02	automatic gain control commande automatique de gain control automático de ganancia	AGC	CAG	CAG
03	local oscillator oscillateur local oscilador local	LO	OL	OL
04	voltage controlled oscillator oscillateur commandé par tension oscilador controlado por tensión	VCO	OCT	VCO
05	field effect transistor transistor à effet de champ transistor de efecto de campo	FET	TEC	FET
06	travelling wave tube tube à ondes progressives tubo de ondas progresivas	TWT	TOP	TOP
O	<i>Terrestrial fixed service</i>			
01	fixed service service fixe servicio fijo	FS	SF	SF
02	point-to-multipoint point à multipoint punto a multipunto (comunicación)*	P-MP	P-MP	P-MP
03	multipoint distribution system système de distribution multipoint sistema de distribución multipunto	MDS	SDM	SDM
P	<i>Miscellaneous</i>			
01	specification description language langage de spécification et de description fonctionnelles lenguaje de especificación y descripción	SDL	LDS	LED
02	stored programme control commande par programme enregistré control por programa almacenado	SPC	SPC	SPC

ANNEX II

ALPHABETICAL LIST OF ABBREVIATIONS AND INITIALS

Abbreviations and initials		Serial No.
A		
A/D	E,S	D 01
ADM	E	D 09
ADPCM	E	D 05
AF	E,F,S	A 01
AFC	E	N 01
AGC	E	N 02
AM	E	B 02
AMAD	F,S	E 09
AMAI	F	E 10
AMDC	S	E 07
AMDF	S	E 05
AMDI	S	E 10
AMDT	S	E 06
AMEE	S	E 08
AMES	F	E 08
AMI	E	F 01
AMRC	F	E 07
AMRF	F	E 05
AMRT	F	E 06
A/N	F	D 01
APC	E	D 11
APK	E	C 12
ARBPM	F	G 07
ARQ	E,F,S	F 07
ASK	E	C 01
ATC	E	D 10
B		
BCD	E,S	F 13
BCH	E,F,S	F 06
BER	E,S	F 09
BLI	F,S	B 05
BLinf	F	B 08
BLR	F,S	B 06
BLsup	F	B 07
BLU	F,S	B 04
BLUI	S	B 08
BLUS	S	B 07
BPSK	E	C 08
BSS	E	K 07
C		
CAF	F,S	N 01
CAG	F,S	N 02

Abbreviations and initials		Serial No.
CAIM	F	D 13
CDM	E	D 07, E 03
CDMA	E	E 07
CED	F	F 08
CEM	F,S	G 05
CEMI	S	D 13
CER	E	F 11
CET	F,S	J 14
C/I	E,F,S	G 03
CLAV	F	D 16
CLEV	S	D 16
c.m.f.	E	H 04
CMI	E,F	F 02
C/N	E,F,S	G 02
CNC	F	E 14
CPA	F,S; E,F,S	D 11, J 01
CPL	F,S	D 14
CPSK	E	C 06
CS	F,S	E 13
CSB	F,S	D 12
CTA	F,S	D 10
CW	E,S	B 01
D		
D/A	E,S	D 02
DAMA	E	E 09
DASS	E	E 12
DAV	E	E 15
DBL	F,S	B 03
DCB	F	F 13
DCE	E	M 07
DCPSK	E	C 07
DIV	F	E 16
DM, ΔM	E	D 06
DPCM	E	D 04
DPSK	E	C 05
DRCS	E	M 08
DRS	E	K 03
DSB	E	B 03
DSI	E,S	E 14
DSV	F	E 15
DTE	E	M 06
DUV	E	E 16
E		
ECD	E	F 12
EESS	E	K 08
EFS	E	F 10
e.i.r.p.	E	H 02
EMC	E	G 05
e.m.r.p.	E	H 03
e.r.p.	E	H 01
ETCD	F,S	M 07
ETD	S	M 06
ETTD	F	M 06
F		
f.c.m.	F,S	H 04
FDM	E	E 01
FDMA	E	E 05
FEC	E,S	F 08
FET	E,S	N 05
FI	F,S	A 04
FM	E	B 10
FOT	E,F,S	J 13

Abbreviations and initials		Serial No.
FRI	F,S	A 05
FS	E	O 01
FSK	E	C 02
FSS	E	K 05
G		
GSO	E	K 01
G/T	E,F,S	G 04
H		
HDB	E,F,S	F 05
HRDP	E	M 01
I		
IDN	E	M 04
IF	E	A 04
ISB	E	B 05
ISDN	E	M 05
ISM	E,F,S	G 06
IT	F,S	E 17
L		
LDS	F	P 01
LED	S	P 01
LO	E	N 03
LPC	E	D 14
LSB	E	B 08
LUF	E,F,S	J 12
M		
M	E,F,S	G 04
MA	F,S	B 02
MAQ	F,S	B 09
MAQ-n	F,S	C 13
MD, MΔ	F,S	D 06
MDA	F,S	C 01, D 09
MDAP	F	C 12
MDC	S	E 03
MDF	F,S; S	C 02, E 01
MDL	S	E 04
MDM	F,S	C 03
MDP	F,S	C 04
MDPA	S	C 12
MDPC	F,S	C 06
MDPCD	F,S	C 07
MDPD	F,S	C 05
MDP-n	F,S	C 10
MDP-2	F,S	C 08
MDP-4	F,S	C 09
MDPQ	F	C 09
MΔΣ	F	D 08
MDS	E	O 03
MDT	S	E 02
MF	F,S	B 10
MFBA	S	B 12
MFBE	F,S	B 11
MFBL	F	B 12
MIA	F,S	B 14
MIC	F,S	D 03
MICD	F,S	D 04
MICDA	F,S	D 05
MID	F,S	B 15
MIF	F,S	B 18
MIP	F,S	B 16

Abbreviations and initials		Serial No.
MIT	F,S	B 17
MNRU	E	G 07
MP	F,S	B 13
MΦ	F	B 13
MPEC	E	D 13
MPSK	E	C 10
MRC	F	E 03
MRF	F	E 01
MRL	F	E 04
MRT	F	E 02
MSK	E	C 03
MSS	E	K 06
MTBF	E,F,S	G 10
MTTF	E,F,S	G 11
MTTR	E,F,S	G 12
MUF	E,F,S	J 11
N		
N/A	F	D 02
NBFM	E	B 11
n-QAM	E	C 13
NRZ	E,F,S	F 04
O		
OCT	F	N 04
OL	F,S	N 03
OSG	F,S	K 01
OWF	E	J 13
P		
PAM	E	B 14
PAMA	E	E 10
p.a.r.	F,S	H 01
p.a.r.v.	F	H 03
PCM	E	D 03
PDM	E	B 15
PDN	E	M 03
PFM	E	B 18
PIDB	F	J 15
PIM	E	B 19
p.i.r.e.	F,S	H 02
PLAR	F	D 15
PLER	S	D 15
PM	E	B 13
P-MP	E,F,S	O 02
PPM	E	B 16
p.r.a.v.	S	H 03
PRF	E	A 05
PSK	E	C 04
PSTN	E	M 02
PTM	E	B 17
PTT	F	K 02
PWM	E	B 15
Q		
QAM	E	B 09
QPSK	E	C 09
R		
RDI	S	M 04
RDSI	S	M 05
RELP	E	D 15
RF	E,F,S	A 02
RIM	E	G 09
RNI	F	M 04

Abbreviations and initials		Serial No.
RNIS	F	M 05
RPD	F,S	M 03
RTPC	F,S	M 02
RZ	E,F,S	F 03
S		
SBC	E	D 12
SCPC	E,F,S	E 11
SDCR	S	M 08
SDL	E	P 01
SDM	F,S	O 03
SETI	E,F,S	K 04
SETS	F,S	K 08
SF	F,S	O 01
SFS	F,S	K 05
SID	E	J 15
SIDM	E	D 08
SMS	F,S	K 06
S/N	E,F,S	G 01
SNCR	F	M 08
SPC	E,F,S	P 02
SRD	F	K 03
SRS	F,S	K 07
SS	E	E 13
SSB	E	B 04
SSE	F,S	F 10
SSMA	E	E 08
SSPSK	E	C 11
STT	S	K 02
T		
TAI	E,F,S	L 03
TDM	E	E 02
TDFR	S	M 01
TDMA	E	E 06
TEB	F	F 09
TEC	F; E; F	F 11; J 14; N 05
TIM	E	G 08
TOP	F,S	N 06
TS	E	E 17
TTC	E	K 02
TWT	E	N 06
U		
URRM	S	G 07
USB	E	B 07
UT	E,F,S	L 01
UTC	E,F,S	L 02
V		
VCO	E,S	N 04
VELC	E	D 16
VF	E,F,S	A 03
VSB	E	B 06
W		
WBFM	E	B 12
WDM	E	E 04
X		
XPD	E,F,S	J 02
XPI	E,F,S	J 03
2-PSK	E	C 08
4-PSK	E	C 09
4 ϕ -PSK	E	C 09
Δ M	E	D 06

APPENDIX II

REFERENCES TO LISTS OF SPECIFIC ABBREVIATIONS

1. Frequency and wavelength bands

See CCIR Recommendation 431 (CCITT Recommendation B.15).

2. Alphabets, codes, routing codes and identities

See the relevant CCITT Recommendations (Index of the Red Book, Fascicle X.2).

3. Codes contained in the Radio Regulations

3.1 Designation of emissions: Article 2.

3.2 Symbols for the various types of antenna: Appendix 2, Section III.

3.3 Q code, general section (QRA to QUZ): Appendix 13, Section I.

3.4 Miscellaneous abbreviations: Appendix 13, Section II.

3.5 SINPO and SINPFEMO codes: Appendix 15.

4. Abbreviations used by the ITU for the names of countries

See the Preface to the International Frequency List, Table I. (Different abbreviations have been approved by ISO.)

5. Acronyms of international organizations involved in telecommunications

See the ITU "List of Addresses", § 3.

6. Symbols and names for units

6.1 CCIR Recommendation 430 (CCITT Recommendation B.3) gives the sources to be used. This Recommendation refers to IEC Publication 27 and to ISO International Standards 31 and 1000.

6.2 CCIR Recommendation 607 (CCITT Recommendation B.14): Terms and symbols for information quantities in telecommunications.

6.3 CCIR Recommendation 665: Traffic intensity unit.

6.4 CCIR Recommendation 431, Note 2.

6.5 CCIR Recommendation 574 (CCITT Recommendation B.12): Use of the decibel and the neper in telecommunications.

7. Letter symbols

CCIR Recommendation 608 (CCITT Recommendation B.1) "Letter symbols for telecommunications" provides guidelines to be followed to simplify the reading of documents dealing with telecommunication technique and refers to IEC Publication 27 and to ISO International Standard 31 for letter symbols to represent physical quantities and mathematical operations.

8. Chemical symbols

See the table published by the International Union of Pure and Applied Chemistry (IUPAC).

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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 Recommendations 573 and 662, Resolution 66 and Decision 19.

STUDY PROGRAMME 1A-1/CMV***

TECHNICAL TERMS IN THE REGULATIONS AND THE ITU CONVENTION

(1982-1984-1986)

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,

* See the relevant Note of the table of contents, page VIII.

** The text of this Question was approved by the CCITT at its VIIIth Plenary Assembly, Malaga-Torremolinos, 1984, under the reference: "Question 1/CMV" of the CCITT.

*** Question 1A of the CCITT (1984).

AND NOTING

Recommendation No. 72 of the World Administrative Radio Conference (Geneva, 1979) and of Resolution No. 11 of the International Telecommunication Convention (Nairobi, 1982),

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 Recommendations 573 and 662.

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?

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;

* The text of this Study Programme was approved by the CCITT at its VIIIth Plenary Assembly, Malaga-Torremolinos, 1984, under the reference "Question 1B/CMV" of the CCITT.

** The text of this Question was approved by the CCITT at its VIIIth Plenary Assembly, Malaga-Torremolinos 1984, 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;

* The text of this Question was approved by the CCITT at its VIIIth Plenary Assembly, Malaga-Torremolinos, 1984, under the reference "Question 3/CMV" of the CCITT.

** The text of this Question was approved by the CCITT at its VIIIth Plenary Assembly, Malaga-Torremolinos, 1984, under the reference "Question 4/CMV" of the CCITT.

- (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 Groups should, in their texts, assemble and present terms in logical order, families of related terms being grouped in separate Recommendations, insofar as practicable;

* The text of this Resolution is analogous to that of Recommendation A.10 of the CCITT.

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;

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 the 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 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.

* See Decision 19.

2. Working methods for cooperation between CCI Study Groups

- 2.1 The working group on terminology works by correspondence, augmented by meetings which usually occur at Study Group meetings.
- 2.2 Membership of working group on terminology 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.
- 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,

* The text of this Decision is analogous to that of Annex I to CCITT Recommendation A.10.

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 1 January 1987)

CCITT/I	S. J. Crossman (Canada)	CCIR/1	A. Sophianopoulos (Canada)
CCITT/II	K. Strandberg (Sweden)	CCIR/2	N. De Groot (United States of America)
CCITT/III	K. H. Eisernitz (Germany) (Federal Republic of)	CCIR/3	J. P. Carneiro (India)
CCITT/IV	J. Shrimpton (United States of America)	CCIR/4	A. Sophianopoulos (Canada) M. Menchén (Spain)
CCITT/V	G. Gratta (Italy)	CCIR/5	L. Boithias (France) E. K. Smith (United States of America)
CCITT/VI	D. J. Dekker (Netherlands)	CCIR/6	Miss G. Pillet (France) D. B. Ross (Canada)
CCITT/VII	S. J. Crossmann (Canada)	CCIR/7	D. Sutcliffe (United Kingdom)
CCITT/VIII	T. G. Moore (Canada)	CCIR/8	F. L. Rose (United States of America)
CCITT/IX	B. Kubin (Czechoslovakia)	CCIR/9	L. Boithias (France)
CCITT/X	C. Carelli (Italy)	CCIR/10	A. L. Witham (United Kingdom) J. A. Prieto Tajeiro (Spain) A. Keller (France)
CCITT/XI	K. J. Bohren (Switzerland)	CCIR/11	G. J. Phillips (United Kingdom)
CCITT/XII	Miss Amara (France)	CMTT	W. G. Simpson (United Kingdom) Y. Angel (France)
CCITT/XV	H. S. V. Reeves (United Kingdom)		
CCITT/XVII	V. Allan (United Kingdom)		
CCITT/XVIII	R. F. Brett (Canada)		

- b) National collaborators from the following Administrations:
Brazil, Spain, France, United Kingdom, USSR.

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;
- (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 Recommendations 573 and 662).

Note. — When an abbreviation (or initials) exists to represent a term, it should be given immediately after the term, in the three working languages.

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,

* The text of this Resolution is analogous to that of Recommendation A.16 of the CCITT.

** The text of this Resolution is analogous to that of Recommendation A.13 of the CCITT.

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.

RESOLUTION 89*

**GUIDELINES FOR THE SELECTION OF TERMS
AND PREPARATION OF DEFINITIONS**

(1986)

The CCIR,

CONSIDERING

- (a) that the individual Study Groups of the CCIR and the CCITT have a responsibility for the selection of terms and preparation of definitions;
- (b) that there is sometimes a wide diversity of approach in the implementation of these procedures;
- (c) that there is a need for conformity in their implementation,

UNANIMOUSLY DECIDES

1. that when selecting terms and preparing definitions, the Study Groups of the CCIR and the CCITT should use the guidelines given in Annex I.

ANNEX I

**GUIDELINES FOR THE SELECTION OF TERMS
AND PREPARATION OF DEFINITIONS**

1. Introduction

Given below are guidelines for:

- selection of terms,
- preparation of definitions.

2. Terms**2.1 What is meant by a term?**

A term is a word or a group of words used to express a definite concept.

2.2 Conciseness of terms

The term should be selected to be as concise as possible, without impairing the understanding of the text containing the term.

When a term is used in more than one field in a general vocabulary, the field of application should be added between brackets, for example:

- coverage area (of a space station),
- coverage area (of a terrestrial transmitting station).

* A similar text will be submitted to the CCITT.

2.3 *Ambiguous terms*

The occurrence of terms with more than one meaning is occasionally inevitable. When one term has several meanings, confusion can arise in the following cases:

- the meanings are very similar,
- the terms appearing in the same text with different meanings (for instance when they are in the same field).

In such cases different terms should be found to express the different meanings of such ambiguous terms.

2.4 *Complex terms*

A complex term should reflect the combination of concepts included in the definition. However, it need not include every constituent of the combination of concepts shown in the definition.

Care should be taken to avoid the unnecessary proliferation of terms and definitions where an already-defined qualifying term, used in conjunction with a simpler term, would suffice.

3. **Definitions**

3.1 *What is meant by definition?*

To define, is to state clearly, accurately and precisely what is a concept. This should preferably be done in one sentence, expressing exactly the meaning of the term used to designate the concept.

A definition should describe the concept fully for the engineering expert and contain sufficient data for the concept to be perfectly understood and its limits properly identified. The definition must be simple, clear and relatively brief. If necessary, additional information should be in the form of notes.

3.2 *Use of terms in definitions*

The following general principles may be adopted for the terms used in a definition:

- all the technical terms which appear in a definition must either be well known or defined elsewhere in the text,
- the term or terms representing a concept to be defined should not appear in the definition,
- the meaning of a term must not be expressed using another term which is itself defined by means of the first term.

3.3 *Accuracy of definitions*

The degree of accuracy of definitions may depend on their intended use. Attempts to achieve greater accuracy may lengthen the text unnecessarily. This may involve the use of more specific and hence less familiar technical terms, thereby making the definition harder rather than easier to understand.

3.4 *Changes to, or limitation of, generally accepted terms*

No attempt should be made to modify or limit the established usage of a term, unless the use of the existing terms causes confusion or ambiguity. In this case the use of the term may be deprecated.

When certain general terms are used in a restricted sense in the telecommunications field, the definition should include an indication of this constraint.

3.5 *Formulation of definitions*

The wording of the definition should clearly indicate whether the term is a substantive noun, a verb or an adjective.

3.6 *Incomplete definitions*

Care should be taken not to omit the specific characteristics of a term in its definition. Such definitions are incomplete. The term and its definition should be interchangeable.

3.7 *Definitions with more than one term*

It sometimes occurs that more than one term may apply to the same concept. In such cases the alternative term should also be shown (separated by a semicolon).

3.8 *Definitions of limited application*

In general, the definitions which appear in ITU publications are of a limited application, i.e. are valid only in the particular publication or field concerned. However, in the case of definitions which are applicable in other Study Groups of the CCIs, the relevant experts are requested to prepare their definitions to allow them to be used in the widest possible field.

The ITU Convention and the Radio Regulations expressly state that the definitions therein "do not necessarily apply for other purposes". They serve to ensure that the reader correctly understands the meaning of the terms defined when they appear in the publications in question. The experts in the Study Groups prepare the definitions contained in the CCI Volumes with the same objectives (Resolution 66) and this should be stated in each Study Group vocabulary.

It should be noted that the CMV is required to assist Study Groups of both CCIs in arriving at mutually acceptable definitions for technical terms of common interest.

3.9 *Illustrations*

Illustrations can often be used to clarify or explain a definition. The type of illustration used will depend on each specific case; an example of a graphical depiction of terms used in the transmission loss concept can be seen in Recommendation 341 (see also Recommendation 573, sub-section A4).

3.10 *Further use of terms and definitions*

It should be borne in mind that it may be useful later to include a definition in a dictionary and, in this case, it would be valuable if the definition were fully comprehensible even when taken out of context. It could then be included in the dictionary without amendment.

4. **Presentation of terms and definitions**

4.1 For the presentation of terms and definitions, reference should be made to Resolution 78 which states that the terms, definitions and where necessary the abbreviations, should be published in the three working languages.

4.2 *Index of terms*

Should there be a need for an index, complex terms may be shown under one or other of the key words.

4.3 *Printing of terms*

Initial letters of terms should be printed in upper-case or lower-case letters as they would appear within a sentence according to the usage in each language.

5. **Further references**

For further and more specific guidance on the drafting of terms and definitions, reference may be made to ISO Recommendation R.704 and the IEC Guide for the Preparation of the International Electrotechnical Vocabulary published by the IEC in 1986.

OPINION 86*

PUBLICATION OF TELECOMMUNICATION VOCABULARY

(1986)

The CCIR,

CONSIDERING

- (a) that according to CCIR Resolution 66 (CCITT Recommendation A.10), experts from CCI Study Groups are cooperating with experts from IEC Technical Committees in order to prepare the "Telecommunications" Chapters of the International Electrotechnical Vocabulary (IEV) within Working Groups of the CCI/IEC Joint Coordination Group (JCG);
- (b) that these Chapters are published by the IEC, as are all IEV Chapters, according to procedures set out by IEC Technical Committee No. 1 (Terminology);
- (c) that it is desirable that these Chapters be circulated widely among telecommunication experts, particularly those participating in CCI work,

* This Opinion should be sent to the IEC (for the attention of Technical Committee No. 1.

IS UNANIMOUSLY OF THE OPINION

1. that the "Telecommunications" Chapters of the International Electrotechnical Vocabulary be presented in such a way that their consultation and reading be made easier so that the widest possible circulation is favoured; namely, that the changes proposed by the JCG be implemented as far as possible, that is to say:
 - 1.1 that the cover shall include a Spanish title, since definitions are also given in the Spanish language;
 - 1.2 that sections within a given Chapter be, where necessary, formed into "groups of sections" (however, sections will be numbered in a continuous manner, at the request of IEC (Technical Committee No. 1);
 - 1.3 that symbols representing certain terms appear after the term, preceded by the mention "symbol", and listed in an alphabetical index;
 - 1.4 that a term consisting of several words may appear in the alphabetical index under one of the words taken as a key word;
 - 1.5 that associated terms which have an obvious meaning may appear after the definition of a given term, and may appear in the alphabetical index;
 - 1.6 that a term used in a definition and defined elsewhere in the same Chapter be printed using a distinctive typescript.
-

ALPHABETICAL INDEX OF KEY WORDS AND TERMS OF VOLUME XIII

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