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CHARGING AND ACCOUNTING IN INTERNATIONAL TELECOMMUNICATIONS SERVICES

DETERMINATION OF ACCOUNTING RATE SHARES IN TELEPHONE RELATIONS BETWEEN COUNTRIES IN EUROPE AND THE MEDITERRANEAN BASIN

Recommendation D.300 R

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is the permanent organ of the International Telecommunication Union (ITU). CCITT is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation D.300 R has been revised twice during the study period 1988-1992 by Study Group III and last revision was approved under the Resolution No. 2 procedure on the 1st of October 1992.

CCITT NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized private operating agency.

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Recommendation D.300 R

DETERMINATION OF ACCOUNTING RATE SHARES IN TELEPHONE RELATIONS BETWEEN COUNTRIES IN EUROPE AND THE MEDITERRANEAN BASIN[1) 2) 3)]

(revised in 1991 and 1992)

Introduction

When, in full exercise of their sovereignty, the Administrations of the countries of Europe and the Mediterranean Basin negotiate among themselves agreements for determining the accounting rate shares to be applied in their telephone relations, it is recommended that they take into consideration:

- for the determination of accounting rate shares and accounting rates, the provisions of § 2 (Determination of accounting rates) of this Recommendation and the provisions of Recommendation D.307 R;
- for fixing tariffs for frontier relations, the provisions contained in § 4 of this Recommendation.

1 Explanation of some of the terms used in this Recommendation

An explanation of some of the terms used in this Recommendation is given in Recommendation D.000.

2 Determination of accounting rate share in telephone relations between countries in Europe and the Mediterranean Basin

2.1 *General*

2.1.1 Since the setting up of any international call involves both the international network and the national networks of the terminal countries, the accounting rate share due to each country is derived from three basic elements, to which separate standard rates are applied:

- the *line* (transmission) part of the international network, which includes the various transmission systems used and is a function of the distance;
- the international exchange, i.e. the *switching* part of the international circuit, plus the terminal transmission equipment;
- the *national extension*, which covers the cost of the national exchanges and trunk transmission means for the delivery of international calls.

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1) Countries in the Mediterranean Basin are countries not belonging to Europe but bordering the Mediterranean Sea.

2) Standard rates given in this Recommendation are to be considered as interim and will be in force until the results of a new cost study are available and accepted.

3) The standard rates given in this Recommendation are expressed in the monetary unit of the International Monetary Fund (IMF), the special drawing right (SDR). In accordance with the international Telecommunication Regulations, the gold franc is equivalent to 1/3.061 SDR.

2.1.2 In special cases where the *line* (transmission) part of an international connection is:

— a tropospheric scatter link; or

— a radio link,

the provisions of this Recommendation with regard to the determination of an accounting rate share in relation to the length of the international circuit are not applicable and accounting rate shares should be agreed upon between the Administrations concerned.

Cases in which the *line* (transmission) part of a connection is a satellite link are dealt with in Annex B.

2.2 *Charging zones*

For calculating accounting rate shares, each country may be divided into charging zones. If need be, different charging zones may be fixed in a given country for traffic exchanged with different countries.

It is desirable that the number of charging zones for international traffic, in any one country, should be reduced to a minimum. As a general rule, in services between non-adjacent countries, each country should constitute one single zone.

2.3 *Calculation of distances (line part)*

2.3.1 *Distances to be taken into consideration*

2.3.1.1 *General case*

2.3.1.1.1 In determining the share payable to a country for the use of international circuits, the distance to be taken into consideration is:

in a terminal country

— the *crowflight distance* between:

a) the point at which the international circuit crosses the frontier; and

b) the international exchange at which the circuit terminates;

in a transit country

— the *crowflight distance* between the two frontier points at which the international circuit enters and leaves the country in question.

2.3.1.1.2 The same provisions apply to the determination of crowflight distances for groups, supergroups, mastergroups and supermastergroups.

The above provisions for the calculation of distances apply to international circuits both on land cables and on radio-relay links.

2.3.1.2 *Special cases*

2.3.1.2.1 *Radio-relay links crossing the sea or a third country*

When a frontier is crossed by a radio-relay section of an international circuit passing over a third country or over the sea, without an intermediate relay station, the frontier point for measuring the circuit length shall be the point midway between the two relay stations on either side of the frontier.

2.3.1.2.2 *Submarine cables*

With regard to international circuits which are routed in submarine cables, the distance to be used for accounting will be calculated as follows:

a) for the land section of the circuit to the submarine cable station, the distance shall be calculated in accordance with the general principles (i.e. the crowflight distance), it being assumed that the point at which the circuit crosses the frontier is the cable station;

b) for the submarine cable section, the distance used shall be the actual route distance between the submarine cable stations as determined and agreed by the joint owners of the cable; the distance will be divided appropriately (normally 50/50) between the countries at the extremities of the cable.

2.3.1.2.3 *Special itineraries*

In exceptional circumstances, multiplication factors may be applied to the crowflight distance, from which the terminal and transit shares are calculated, to take account of special itineraries. For example, in the case of a direct transit country, the crowflight distance between the points on the frontier at which the circuit enters and leaves the country may (in exceptional circumstances) be replaced by a length representing the sum of two crowflight segments making up a broken line, etc.

2.3.2 *Possibility of weighting distances*

For calculation of the crowflight distances for the international section, a weighting according to the number of circuits is normally applied in a given relation to simplify accounting:

— when there are several international arteries with different itineraries terminating at an international exchange;

— when there are several international exchanges in a country for the relation concerned.

This weighting serves to determine a length (crowflight distance) for fixing the accounting rate share relating to the international section and it would remain in force as long as the structure of the network was not significantly changed. This length of the international section would then be used to fix the international section element for the charges for international telephone and telegraph circuits, groups, supergroups, mastergroups and supermastergroups.

2.3.3 *Rounding off distances*

2.3.3.1 Distances less than 50 km shall be rounded up to 50 km.

Example: distance of 24 km rounded up to 50 km.

2.3.3.2 Other distances shall be rounded to the nearest multiple of 50 km.

Examples

— distance of 72 km rounded to 50 km;

— distance of 126 km rounded to 150 km;

— distance of 175 km rounded to 200 km.

2.3.3.3 This rounding rule applies to the distances in each of the terminal countries and in each of the transit countries and is applied to the total distance calculated for any one country. It is applicable to the remuneration of Administrations both on the basis of a flat-rate price for the facilities made available and on the basis of traffic units.

2.3.3.4 When distances are weighted in accordance with the provisions of § 2.3.2 above, the rounding shall be applied only after the weighted distance has been calculated.

2.3.4 *Existence of several routes in a given relation*

When in a given relation there are several routes traversing different countries, these transit countries shall in all cases receive the share or flat-rate price normally due to them for the distance between the points of entry and exit; any cost of equalizing collection charges in a relation comprising different routes shall be borne solely by the administration of the country of origin and no deduction shall be made from the remuneration due to the transit countries.

2.4 *Standard rates to be applied for international accounting*[4)]

For international accounting purposes, there are two methods of remuneration for the facilities made available by Administrations:

— on the basis of traffic units;

— on the basis of a flat-rate price for the facilities made available.

2.4.1 *Remuneration on the basis of traffic units*

2.4.1.1 Considering that increasing use is being made of digital systems and channels in the operation of telephone relations between countries in Europe and the Mediterranean Basin, standard per-minute rates have been calculated for automatic traffic, taking into account the results of the former Recommendation D.300 R *(Red Book)* referring to only analogue system and from digital cost analyses carried out in 1990.

2.4.1.2 Since the degree of digitization varies from country to country and over time, the method of determining accounting rate shares in this Recommendation uses a simplified division into categories to better reflect differences in cost structures among Administrations.

2.4.1.3 In order to reflect the actual costs a degree of digitization is applied to all three network components (national extension, international exchange and international transmission) relevant for establishing an accounting rate.

2.4.1.4 Accounting rates between two parties in a bilateral relation can be calculated from the rates detailed in the table at § 2.4.1.5 below.

2.4.1.5 *Standard accounting rate shares components in SDRs per minute*

Category % digitization	National extension	International exchange	I trans
0-30%	0.1026	0.0324	
31-60%	0.0924	0.0228	
61-100%	0.0762	0.0129	

2.4.1.6 The accounting rates between two parties should be based on the more conservative, i.e. the lower degree of digitization for each of the network components.

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4) *Use of charged time for international accounting instead of conversation*

According to their equipment, some Administrations may have to use charged time data for international accounts instead of conversation time, the charged time being given, for example, by the operator's ticket. In such a case, the Administration of origin will consult the Administration of destination and, when necessary, the Administration of transit countries, to see whether it is necessary to adjust the number of minutes entered in the international accounts to make allowance for the small difference which may exist between the charged time they use and the conversation time they should use for accounting according to Recommendation D.150 and the present Recommendation.

2.4.1.7 A worked example is shown below:

In this example, the degree of digitization for the three network components is given for two countries (half of the international circuit being 100 km).

	National extension	International exchange	International transmission
Country A	26%	82%	58%
Country B	35%	70%	58%

Accounting rate share = 0.1026 + 0.0129 + 0.0044 × 1 = 0.1199 SDR

2.4.1.8 A possible method on how to establish the degree of digitization for each of the components is shown in Annex A.

2.4.1.9 The accounting rate shares shown in the table at § 2.4.1.5 constitute a standard per category. Administrations may agree on lower rates. For instance, this could be the case where the limits of the category are approached.

2.4.1.10 To determine accounting rate shares components (in SDR/minute) due to transit countries can be calculated from the table shown below.

Category % digitization	Transit exchange	International transmission/100 km
0-30%	0.0468	0.0054
31-60%	0.0324	0.0044
61-100%	0.0177	0.0033

2.4.1.11 To determine the accounting rate shares due to destination and transit countries in manual operation, the following standard rates, *per minute of conversation time*, are recommended:

	SDR
– Per *100 km* of international circuit (excluding any national circuit required for connecting the international exchange to the national exchange serving the subscriber)	0.013
– For the manual international exchange in the country of destination	0.653
– For a manual international exchange in a transit country	0.653
– National extension	0.114

2.4.1.12 a) The standard rates shown under §§ 2.4.1.5, 2.4.1.10 and 2.4.1.11 for the *line* element per 100 km of circuit and per minute may not be appropriate to some small capacity submarine cables. In these cases the rates should be fixed by agreement among the parties concerned.

b) The standard rates for the exchange component under §§ 2.4.1.5, 2.4.1.10 and 2.4.1.11 include the cost of the transmission equipments for one extremity in terminal operation and for two extremities in transit operation.

2.4.2 *Remuneration on the basis of a flat-rate price for the facilities made available*

2.4.2.1 *Remuneration of a direct transit country*

2.4.2.1.1 To determine the flat-rate price for remuneration for the analogue transmission facilities made available by Administrations, the following standard rates are recommended.

	SDR
	Per year and per 100 km of crowflight distance (*line* part, component *B*) [a]
— for a telephone circuit [b], [c]	392
— for a group [b], [c]	3 920
— for a supergroup [b], [c]	16 335
— for a mastergroup [c]	65 338
— for a supermastergroup [c]	179 680

[a] The cost of international telecommunication circuits should be expressed in the form:

$$A + B \times \textbf{Error!}$$

where *A* represents all costs relating to terminal transmission equipment *for one end of the international circuit*; *B* represents the costs per 100 km (crowflight distance) of circuit.

[b] to allow for the small capacity of some submarine cables, a correction factor may be applied to these rates.

[c] Including the use of modulation and demodulation equipments or through band filters in the direct transit country, when the transit transmission facilities are given by complete unit.

2.4.2.1.2 When digital facilities are made available, they should be remunerated according to the standard rates given in Recommendation D.307 R.

2.4.2.1.3 When a circuit leased to a private user passes through a direct transit country, the Administration of this country will be remunerated by the Administrations of the terminal countries with a flat-rate price on the same basis as if the circuit were an ordinary public service circuit.

2.4.2.2 *Remuneration of a country of destination*

To determine the flat-rate price for remuneration of countries of destination for facilities made available by Administrations, the following standard rates are recommended:

1) *For the transmission channel* (*line* part, component *B*): see § 2.4.2.1.

2) *For the international exchange* (including the terminal transmission equipment)

— per year and per international circuit connected:

Manual operation (analogue exchange) [a]	Automatic operation	
	Analogue exchange [a]	Digital exchange [b]
19590 SDR	2340 SDR	270 SDR

[a] The remuneration for analogue terminal transmission equipment (element *A*) has been included in the above rates based on annual costs per extremity of:
— 425 SDR for a circuit;
— 1045 SDR for a group;
— 2189 SDR for a supergroup;
— 5227 SDR for a mastergroup;
— 9800 SDR for a supermastergroup;

[b] The remuneration for digital terminal transmission equipment (element *A*) has been included in the above rates in accordance with Table 2/D.307 R.

3) *For the national extension*

– per year and per international circuit connected:

– manual operation (analogue)

  – 3420 SDR

– automatic operation (analogue/digital)

Category % digitization	SDR per year
0-30%	7952
31-60%	6930
61-100%	6287

2.5 *Remuneration for facilities made available for the extension of intercontinental circuits*

In principle the rates mentioned in § 2 above apply also to the remuneration of facilities made available for the extension of intercontinental cable or satellite circuits.

3 Collection charges in telephone relations between countries in Europe and the Mediterranean Basin

3.1 *General*

3.1.1 The establishment of the collection charge is a national matter. However, the level of the tariff levied on the user should be cost-oriented having due regard to the universal nature of the telephone service.

3.1.2 In considering the collection charges for a relation in which automatic and semi-automatic working both exist, each Administration should decide to fix its charges, either

— by establishing different charges for each method of operation; or

— by establishing a single collection charge weighted according to the volume of each type of traffic.

3.1.3 To recover the costs of operator assistance, Administrations may levy additional charges per call, the level of which is a national matter.

3.2 *Charging zones*

For fixing collection charges each country may be divided into charging zones. If need be, different charging zones may be fixed in a given country for traffic exchanged with different countries.

It is desirable that the number of charging zones for international traffic, in any one country, should be reduced to a minimum. As a general rule, in services between non-adjacent countries, each country should constitute one single zone.

The fixing of zones for collection charges does not imply the same for zones for accounting rate shares which can be weighted appropriately to make allowances for a zonal structure. Similarly, the fixing of zones for accounting rate shares (see § 2.2) does not imply any requirement for fixing zones for collection charges.

4 Frontier relations between countries in Europe and the Mediterranean Basin

The conditions governing the establishment and operation of frontier relations depend largely on the structure of the national networks in the frontier areas. These conditions tend to alter, particularly as a result of network automation, which leads in turn to automation of frontier relations. Consequently, the collection charges applied to these relations are tending to become increasingly subject to limitations imposed by the automatic charging equipments used.

Whenever the situation permits, there should be no exchange of international accounts for frontier calls, the entire charge being retained by the Administration which collects it. The latter should, however, supply all frontier traffic information required to the Administration of the country of destination.

ANNEX A

(to Recommendation D.300 R)

Guidelines for determining the degree of digitization

A.1 *National extension*

The national extension consists of a number of network elements. International traffic, incoming as well as outgoing, is routed via these network elements from the international exchange to the subscriber line and vice versa. For each network element a different degree of digitization may be found. This is the result of the national network evolution-plan towards a digitized network. To deal with this complicated network situation in a practical way, the following simple method is proposed for determining an "all-in" degree of digitization for the national extension.

(The figures used are an example and should be replaced by figures applicable to your own circuit-switched network.)

— To determine the average digitization degree of (local and trunk) exchanges (Dexch%) in your national extension:

	Number	%	
— number of switched 4 kHz circuits	= 1000	33.3%	
— number of switched 64 kbit/s circuits	= 2000	66.7%	(Dexch%)

— To determine the average digitization degree of the transmission part (Dtrans%) in your national extension on the basis of km circuits:

	Number	%	
— total length of 4 kHz circuits	= 10 000	40%	
— total length of 64 kbit/s circuits	= 15 000	60%	(Dtrans%)

— To obtain an average degree of digitization of the national extension calculate an arithmetic mean of these two values:

Error! = D%

Example with figures:

Error! = 63.35%

A.2 *International exchange*

According to the proportion of 4 kHz analogue (incoming plus outgoing) circuits and 64 kbit/s timeslots (within 2 Mbit/s systems) in use on the international exchange in a given bilateral relation.

A.3 *International transmission*

According to the proportion of 4 kHz analogue circuits and 64 kbit/s timeslots (within 2 Mbit/s systems) in use for routing telephone-type traffic between the two countries in a bilateral relation.

ANNEX B

(to Recommendation D.300 R)

Remuneration for the facilities used to set up telephone-type (4 kHz analogue circuits and 64 kbit/s bearer) satellite circuits (INTELSAT system) via an earth station in Europe and the Mediterranean Basin

B.1 *Flat-rate charges for the provision of telephone-type (4 kHz analogue circuits and 64 kbit/s bearer) circuits set up via a foreign European earth station*

Preliminary note

The charges are the same, whether the circuit is used in an intra-European or an intercontinental relation.

When an Administration operates a direct satellite circuit set up via a foreign European earth station, the following standard rates are recommended for the remuneration of the facilities provided by the country operating the earth station:

B.1.1 For the remuneration of the international circuit section between the border of the outgoing terminal country and the international exchange of the country operating the earth station[5] :

— 392 SDR per 100 km of transmission channel (*line* part) per annum, or the standard rates set out in Recommendation D.307 R when a digital circuit is used;

— where appropriate, the amount laid down in § 2.4.2.2, 2), a), to pay for the terminal equipment (component *A*) in the international exchange.

B.1.2 For the remuneration of the earth station and the national extension from the international exchange mentioned in § B.1.1 above, to that station:

— 9000 SDR per circuit and per annum.

B.1.3 For the remuneration of the *space segment*, the amount fixed by INTELSAT and usually payable directly to that organization.

B.2 *Traffic unit price applicable in telephone relations between countries of Europe and the Mediterranean Basin, for traffic routed via satellite links*

Preliminary note

The same standard rates are used to determine the accounting rate shares payable to terminal and transit (switched transit) countries.

B.2.1 *Routing via satellite links only*

When, in a given relation, all traffic is routed using international satellite links, the terrestrial distance between the respective international terminal or transit exchanges is disregarded. The costs to be taken into account for determining the terminal or transit shares relating to the use of the link are:

— the cost of the earth station and the national terrestrial extension to the international exchange in the same country (including a component *A* in the exchange);

— the cost of the space segment.

The accounting rate shares applicable per minute are as follows:

— for the earth station and the national terrestrial extension to the international exchange in the same country (including a component *A* in the exchange): 0.116 SDR;

— for the space segment: 0.047 SDR.

B.2.2 *Routing via satellite and terrestrial links*

When, in a given relation, international traffic is routed via both satellite and terrestrial links, account should be taken of the provisions of § 2.3 concerning the calculation of terrestrial circuit distances, as well as of the cost elements involved in satellite routing specified in § B.2.1 above. When these two components have been calculated separately, a weighting factor based on the number of circuits set up on each transmission medium is applied to determine the transmission (*line* part) element of the accounting rate.

Note — To take account of the relatively low utilization factor of certain earth stations, a correction factor may be applied to the standard rates given in the present Annex B by the Administrations owning the stations concerned.

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[5] Part of the circuits provided at the expense of the Administration operating the earth station.