INTERNATIONAL TELECOMMUNICATION UNION

ITU-T B.18

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(03/93)

MEANS OF EXPRESSION

TRAFFIC INTENSITY UNIT

ITU-T Recommendation B.18

(Previously "CCITT Recommendation")

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T 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 World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation B.18 was revised by the ITU-T Study Group II (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

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

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Recommendation B.18

TRAFFIC INTENSITY UNIT

(Melbourne, 1988; revised Helsinki, 1993)

The CCITT,

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 variable "traffic intensity" and its unit "erlang" are defined in Recommendation E.600 and reproduced below,

recommends

that for telecommunication purposes, the following definitions should be used:

traffic intensity: The instantaneous traffic intensity in a pool of resources is the number of busy resources at a given instant of time.

NOTES

1 Statistical moments may be calculated for a given period of time, for instance the mean traffic intensity $\overline{A}(t_1, t_2)$ is related to the instantaneous traffic intensity $A(t)$ as:

$$\overline{A}(t_1, t_2) = \frac{1}{t_2 - t_1} \int_{t_1}^{t_2} A(t)\, \mathrm{d}t$$

In applications, the term traffic intensity usually has this meaning of mean traffic intensity.

2 Traffic intensity is equivalent to the product of arrival rate and mean holding time.

3 The unit usually used for traffic intensity is the erlang (symbol: E).

erlang: Unit of traffic intensity (symbol: E). 1 erlang is the traffic intensity in a pool of resources when just one of the resources is busy.

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.