INTERNATIONAL TELECOMMUNICATION UNION

ITU-T E.261

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

TELEPHONE NETWORK AND ISDN

OPERATION, NUMBERING, ROUTING AND MOBILE SERVICE

DEVICES FOR MEASURING AND RECORDING CALL DURATIONS

ITU-T Recommendation E.261

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation E.261 was published in Fascicle II.2 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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

Recommendation E.261

DEVICES FOR MEASURING AND RECORDING CALL DURATIONS

There are three main methods used for measuring call duration:

1 Use of apparatus of the type which meters the quantity of electricity (ampere-hour meter or coulomb-meter)

This type of meter is permanently connected to the circuits or equipment under observation; for the measurements in question, the current strength in the meter is at all times proportional to the number of circuits or units of equipment in the speech position. With this type of apparatus the accuracy of the measurements depends on:

a) errors in the meter (shunt included) itself; in any case, in the absence of special arrangements, the accuracy of the latter is not so good for intensities which are only a small fraction of the nominal intensity for which the apparatus is designed;

b) the accuracy and possibly the variations with time of the resistors inserted in the circuits to be observed;

c) the ohmic resistance of the connections between the measuring equipment and the circuits to be observed;

d) voltage variations in the supply battery used.

Obviously, the longer the period of observation, the greater are the chances that partial compensations will occur between the various causes of error. With such apparatus it seems unlikely that more than a 2% accuracy of measurements can be obtained for measurements made over an adequate period of time which includes hours of varying load; measurements made only at times when there is very little traffic might involve a considerably greater error.

2 Use of pulse-counting meters

With this method, the circuits or equipment under observation are connected, for the duration of a call, to pulse-counting meters which receive pulses from a common timing mechanism at suitable intervals, for example every six seconds. The call duration is deduced from the meter readings.

3 Use of a device for periodically scanning circuits or equipment

These devices can be based on either the conventional type of equipment (relays, crossbar switch, etc.) or some form of electronic equipment.

4 Degree of accuracy of methods 2 and 3

With the two last-named methods, the degree of accuracy of measurements depends on:

– the average call duration and the statistical distribution of call durations;

– the number of calls observed;

– the interval between the sending of pulses (method 2) or the scanning interval (method 3).

It is also possible to assess mathematically, as a function of these factors, the anticipated degree of accuracy. Errors may also arise from the operation of the meter in method 3, or from accidental variations in the pulsing or scanning interval.

There is no doubt that if the number of calls observed is sufficiently high it is possible, using these methods and without reducing the pulse-sending interval or the scanning interval to such a small value that operation difficulties would arise with classic-type apparatus, to obtain greater accuracy than could be obtained with the method described in § 1 above.

5 Fault indication

It is recommended that provision should be made for indicating faults in the measuring and recording device. There are two possibilities:

a) to design the measuring and recording apparatus so that there is a permanent check on its operation, with an alarm system to indicate faults;

b) to provide special equipment to make a routine check of the operation of the measuring equipment.

6 Equipment design

The design of equipment for measuring and recording call durations is left to Administrations. Some information will be found in Annex A.

ANNEX A

(to Recommendation E.261)

Measuring call duration

A.1 The technique to be adopted for recording call durations of automatic traffic will depend on the accounting arrangements agreed between Administrations and particularly on whether recordings are to be made:

- by country of destination alone;
- by route and country of destination;
- by route, country of destination and charging zone.

In all cases it will be necessary to discriminate between automatic and semiautomatic traffic and possibly transit traffic.

A.2 Assuming that it is possible to identify automatic calls on the outgoing international circuit and that the circuits carry only terminal traffic, the measurement of call durations could be effected by connecting a measuring and recording device to each international circuit. The disadvantage of this scheme is the large number of recorders to be provided and read daily.

A single recorder could be made to serve a group of international circuits by arranging for the recorder to be connected to each circuit of a group in turn, say every six seconds, and for the recorder to operate each time that an international circuit in the answered condition is encountered. The recorder would then show then show the total call duration of the circuit group.

A.3 Where transit routings are involved and the recordings are required on the basis of route and country of destination, separate totals of call durations will be required for each country served by the route in question. In other words, it will be necessary to determine the destination of each call and record the call duration on the appropriate recorder.

This may be found to be a complicated process and it may be more convenient to connect the recorder at a point remote from the international circuit, for example at the register access relay set, where information in respect of the destination and routing of the call can be obtained from the outgoing international register. Figure A-1/E.261 illustrates an arrangement in which the selector A is positioned under the control of the register to connect the appropriate route and destination recorder to the register access relay set.

The recorder could be an ampere-hour meter or it could consist of a meter and a selector arranged to scan all the register access relay sets which have been connected to this particular route and destination recorder.

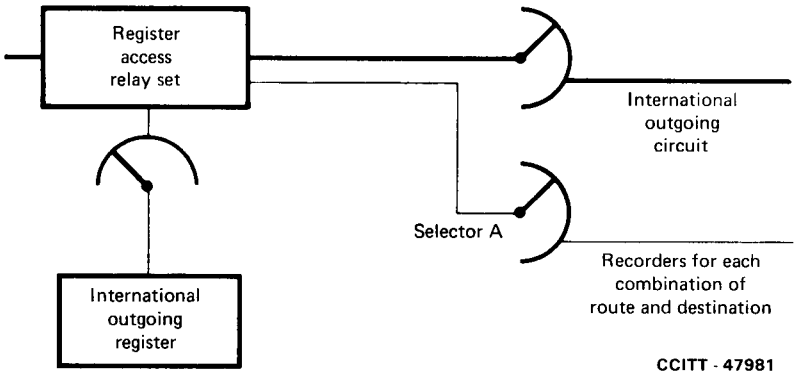

FIGURE A-1/E.261

A.4 A similar arrangement to Figure A-1/E.261 can be employed where recordings are required on the basis of route, country of destination and charging zone. The additional complications introduced in determining the charging zone mainly concern the outgoing register but it should be noted that a greater number of separate call duration recorders will then be needed.

A.5 The number of recorders or separate records of call durations is equal to the summation, for all destinations, of the product of number of routes by number of charging zones for each country of destination. The capacity of selector A in Figure A-1/E.261 must be sufficient to permit access to any recorder and the economics of this scheme will be determined by the number of separate recordings required and the total volume of international traffic originated at the exchange concerned.

A.6 For a large number of separate recordings, Administrations might consider whether it would be cheaper to use electronic methods for recording call durations. In this connection Administrations might take into account the possible future introduction of cheap rates which could double the number of separate records required.