



INTERNATIONAL TELECOMMUNICATION UNION

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TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

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SPECIFICATIONS OF SIGNALLING SYSTEM No. 4

AUTOMATIC TESTING EQUIPMENT

ITU-T Recommendation Q.137

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.137 was published in Fascicle VI.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.

5.5 AUTOMATIC TESTING EQUIPMENT

The second method for rapid transmission tests consists of extending international circuit, by means of a special code, to an automatic testing equipment at the incoming exchange. For this method, there must be incoming testing equipment at the incoming international exchange and outgoing testing equipment at the outgoing international exchange. This equipment should be designed in accordance with the following conditions:

5.5.1 Incoming testing equipment

(1) Connection to incoming testing equipment:

The incoming testing equipment will normally be connected in the four-wire part of the circuit.

Access to this equipment from an outgoing international exchange will be obtained by sending successively on the international circuit, according to Recommendation Q.133:

- a) terminal seizing signal;
- b) code 13 replacing the language digit;
- c) code 12;
- d) three digits 000, the last two being the combination for access to the automatic testing equipment;
- e) end-of-pulsing signal (code 15).

If the incoming testing equipment is free, the answer signal will be sent 800 to 1200 ms after it is connected.

If the incoming testing apparatus is occupied, a busy-flash signal will be returned.

(2) Measuring condition:

When the answer signal has been sent, the incoming testing equipment will pass to the measuring condition, in which the level of the test signal by the outgoing testing apparatus will be measured. The passage to the measuring condition will be effected after a period of 600 to 900 ms calculated from the moment when the testing equipment prompts the sending of the answer signal. This delay is necessary to ensure that the noise which may be produced at the moment of the passage of the circuit to the speech conditions will not influence the measuring arrangement.

The measurement of the received signal will be made with an accuracy of ± 1 dB.

To provide time for the test signal to become stabilized, there should be a delay of 100 to 150 ms after the operation of the detector circuit, before indications on the level of the test signal are given.

The incoming testing equipment will determine whether the level of the test signals is within the prescribed limits; these limits will be predetermined by an adjustment of the equipment to specified values. These limits will provisionally be ± 4 dB with respect to the nominal level at which the test tone should be received.

(3) Passage to the sending condition:

If the received test signal is within the prescribed limits (deviation of ± 4 dB from the nominal value), the incoming testing equipment will send a test signal on the RETURN path of the circuit.

This test signal will have a frequency of 800¹⁾ Hz which is the same as the test frequency sent on the GO path of the circuit by the outgoing testing equipment. The frequency sent should be controlled within $\pm 3\%$. The test signal sent by the incoming testing equipment will give a power of 1 mW at a zero relative level point of the circuit. The sending level must be maintained to ± 0.5 dB.

¹⁾ For future equipments, the test frequency of 800 Hz will be replaced by 1020 Hz with a tolerance of +2 Hz and -7 Hz.

If, due to the non-reception of a clear-forward signal, the test signal is transmitted for a period of 1 to 2 m, the incoming testing equipment will stop transmitting this test signal and a clear-back signal will be sent. The release of the incoming testing equipment will then be carried out in accordance with the provisions of Recommendation Q.118, § 4.3.3.

- (4) Indication of unsatisfactory transmission of the GO path of the circuit:

If the level of the received test signal is outside the prescribed limits or if the incoming testing equipment does not receive the signal, a clear-back signal will be returned to the outgoing end. This clear-back signal will be sent 5 s after passing to the measuring position and will indicate to the testing officer at the outgoing exchange that the transmission quality of the GO path of the circuit is not up to standard.

5.5.2 *Outgoing testing equipment*

- (1) Connection to the outgoing testing equipment:

The outgoing testing equipment will be designed to send automatically the numerical information mentioned under (1) in § 5.5.1 above.

- (2) Sending condition:

The receipt of an answer signal sent by the incoming testing equipment will cause the sending of the test signal by the outgoing testing equipment. This test signal will be sent for a period of 500 to 800 ms. To allow the incoming testing equipment to pass into the measuring condition, this test signal should not be sent immediately after the answer signal but should be delayed for a period of at least 700 ms.

The test signal will be sent automatically or under the control of the officer making the tests. If the test signal is sent automatically, the delay in sending the test signal following the end of the receipt of the answer signal should be between 700 and 900 ms. If the test signal is sent under the control of the operator, the latter should operate quickly, because the clear-back signal can be returned by the incoming testing apparatus after a delay of 5 s.

The frequency of the test signal will be $800 \text{ Hz} \pm 3\%$.

The level of the sent test signal will be adjusted to give a power of 1 mW at a zero relative level point of the circuit. The sent level will be accurate to $\pm 0.5 \text{ dB}$.

- (3) Passage to the measuring condition:

As soon as the outgoing testing equipment has sent the test signal, it will pass automatically from the sending condition to the measuring condition. In this condition, the level measuring equipment will measure the level of the test signal received from the incoming end. The operator of the automatic device at the outgoing end will check that the level of the received signal is within the prescribed limits.