

INTERNATIONAL TELECOMMUNICATION UNION



M.665

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

MAINTENANCE: INTERNATIONAL TELEPHONE CIRCUITS

TESTING OF ECHO CANCELLERS

ITU-T Recommendation M.665

(Extract from the Blue Book)

NOTES

1 ITU-T Recommendation M.665 was published in Fascicle IV.1 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.

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TESTING OF ECHO CANCELLERS

This Recommendation applies to all echo cancellers specified in accordance with Recommendation G.165 [1], which are located either in international or national networks and which are used for international calls.

1 Periodicity of routine tests

Echo cancellers should be tested every six months.

2 Cancellers which are permanently associated with international circuits

Administrations should choose one of the following methods of canceller testing.

2.1 Tests using the Echo Canceller Test System (ECTS) or Automatic Transmission Measuring Equipment (ATME) with ECTS facilities

If the Administrations at each end of a circuit have an ECTS or ECTS facilities specified in accordance with Recommendation 0.22 [2], these should be used for in-circuit canceller testing. The following Recommendations should be referred to: Recommendations M.605, M.610 and M.620.

2.2 Tests using an In-Station-Echo canceller Tester (ISET)

The following pass/fail tests should be made and where a faulty canceller is identified, it should undergo the tests, including those of tone disabling, which are specified in Recommendation G.165 [1].

Note 1 – If the echo canceller interface is digital (for example 8448, 2048 or 1544 kbit/s) the levels prescribed for the various tests are coded in corresponding bit sequences.

Note 2 – Modern digital techniques may allow the tests listed below to be carried out continuously without using any disturbance to the traffic on the circuit (in-built test system).

Note 3 – The specification of an in-station echo canceller tester is given in Recommendation O.27 [3].

These tests can be made on an echo canceller while in-circuit, such that the adaptation and the non-linear processing are activated. Access to the echo canceller to be tested will be on a 4-wire basis and the tests will be made by applying test signals to the "receive-in" and the "send-in" ports of the echo canceller. The signals level at the "send-out" port will be measured.

The pass/fail tests consist of the following items:

- steady state residual and returned echo level test;
- convergence test;
- performance under conditions of double-talk-A;
- performance under conditions of double-talk-B;
- infinite return loss convergence test;
- tone disabler control signal detection sensitivity, DIS S;
- tone disabler control signal detection sensitivity, DIS R.

(This list is provisional and is the subject of further study.)

3 Cancellers permanently associated with national circuits

Administrations should choose one of the following methods of canceller testing:

- the use of ECTS or ECTS facilities as part of an ATME-type equipment (where this equipment is provided at both ends of a circuit); or
- the use of an in-station tester. Tests to be performed are listed in § 2.2.

4 Testing of pooled cancellers

When echo cancellers are not permanently associated with circuits, Administrations should use an in-station tester. Tests to be performed are listed in § 2.2.

5 Use of group-diagnostics

This method of testing is under study. It comprises self-diagnostics which are shared between cancellers on a per rack or per shelf basis and which perform tests similar to those of an in-station tester. The advantages of using this method are that tests can be made very frequently, thus obviating the need for routine testing, and that a failure can be very quickly brought to the attention of maintenance staff.

References

- [1] CCITT Recommendation *Echo cancellers*, Vol. III, Rec. G.165.
- [2] CCITT Recommendation *CCITT automatic transmission measuring and signalling testing equipment ATME No.* 2, Vol. IV, Rec. 0.22.
- [3] CCITT Recommendation *In-station echo canceller tester*, Vol. IV, Rec. 0.27.