INTERNATIONAL TELECOMMUNICATION UNION

ITU-T 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.

Recommendation M.665

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 O.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. O.22.

[3] CCITT Recommendation *In-station echo canceller tester*, Vol. IV, Rec. O.27.