



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.163

SPECIFICATIONS OF SIGNALLING SYSTEM No. 5

MANUAL TESTING

ITU-T Recommendation Q.163

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.163 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.

4.3 MANUAL TESTING

4.3.1 *Functional testing of signalling arrangements*

Functional tests from one end of the circuit to the other can be made in the following three ways:

- a) The first method consists of a rapid verification of satisfactory signal transmission by ensuring that a seizing signal is followed by the return of a proceed-to-end signal, that a clear-forward signal is followed by the return of a release-guard signal.
- b) The second method consists of verification of satisfactory signal transmission by initiating a test call:
 1. to technical personnel at the distant-end international exchange; or
 2. to a test call signal testing and answering device, if such equipment is available at the distant-end international exchange.
- c) The third method consists of complete verification of satisfactory line and register signal transmission. The verification consists of a check of ability to:
 1. generate and receive line and register signals;
 2. transmit the appropriate acknowledgement signals;
 3. provide required duration and spacing of MF signals;
 4. complete terminal and transit¹⁾ calls.

4.3.2 *First method: rapid test*

1. Verification of satisfactory signal transmission:
 - a) Initiate a seizing signal and verify the receipt and recognition of the proceed-to-send signal from the distant end.

Note - Absence of numerical information following termination of the seizing signal may result in receipt of a busy-flash signal provided by some Administrations from the distant-end equipment.
 - b) Initiate a clear-forward signal and verify the receipt and recognition of the release-guard signal from the distant end.
2. Failure to complete the seizing/proceed-to-end signalling sequence or the clear-forward/release-guard signalling sequence should result in the automatic termination of the frequencies being transmitted within 10-20 seconds/4-9 seconds (see Recommendation Q.141, § 2.1.3.1 e).
3. In the event of a failure, appropriate steps should be taken to locate and correct the trouble.
4. The above tests are short, simple, and should be performed at least monthly from each end of the circuit as appropriate. This minimum periodicity should be increased to as often as daily if the incidence of trouble encountered is unsatisfactory.

4.3.3 *Second method: test calls*

1. Verification of satisfactory transmission of signals involved in completion of test calls (manual method):
 - a) Place a call to the technical personnel at the distant international exchange.
 - b) On completion of connection:
 - i) the audible ringing tone should be heard;
 - ii) the answer signal should be received when the call is answered at the distant end.

¹⁾ See the note to § 4.3.4.3.

- c) Request distant end to initiate a clear-back signal, followed by an answer signal.
 - d) A clear-back signal should be received and recognized when the distant end hangs up and a second answer signal should be received and recognized when the distant end re-answers the call.
 - e) Initiate a forward-transfer signal which should result in bringing in the assistance operator at the distant end.
 - f) Terminate the call and observe that the circuit restores to the idle condition.
2. Verification of satisfactory transmission of signals involved in completion of test calls (semi-automatic method).

If test call signal testing and answering devices are available at the distant international exchange, the signal verification tests should be made using this equipment to the extent that the applicable features indicated in 1 above are available.

3. The above tests should be made from each end of the circuit. They should be made monthly when the manual testing methods prescribed in I are used.

They may be made daily when semi-automatic test arrangements are available.

4.3.4 *Third method: comprehensive tests; terminal and transit test calls*

1. Verification of satisfactory signal transmission (frequency, level, duration, etc.) involved in terminal and transit calls.
 - a) These tests are made in conjunction with:
 - verification and location of faults;
 - ensuring that new circuits are satisfactory in operation before being brought into service.
 - b) When establishing new circuits all of the tests outlined in 4.2.3 should have been completed at both terminals. New circuits assigned to Time Assignment Speech Interpolation (TASI) equipment should be patched as non-TASI for the duration of these tests.
2. Terminal calls

Initiate a call to the distant end test centre. Coordinate this test with the distant end so that appropriate test equipment is connected prior to establishing the call. Check the following:

- a) At the originating end check that a seizing signal is following by the receipt and recognition of the proceed-to-send signal from the distant end. Check that the proceed-to-send signal persists until the seizing signal ceases.
- b) At the distant end check the following:

	<i>Duration of transmitted signal</i>
1. Interval between termination of seizing signal and start of KP signal	80 ± 20 ms
2. KP signal duration	100 ± 10 ms
3. Digital and ST signal duration	55 ± 5 ms
4. Interval between all signals	55 ± 5 ms
- c) Check that the audible ringing tone is heard at the originating end.
- d) At the originating end check that the answer signal is received, recognized and acknowledged. Check that the acknowledgement signal persists until the clear-back signal ceases.

- e) At the distant end initiate a clear-back signal.
- f) At the originating end check that a clear-back signal is received, recognized and acknowledged. Check that the acknowledgement signal persists until the clear-back signal ceases.
- g) At the originating end initiate a forward-transfer signal.
- h) At the distant end check the receipt of the forward-transfer signal. The transmitted duration of this signal should be 850 ± 200 ms. This signal may be subject to TASI clipping.
- i) At the distant end arrange to transmit a succession of clear-back and answer signals; first at a slow rate, then at a rate which is faster than the system is capable of following.
- j) At the originating end check during the slow transmission of the switch-hook flashes that each clear-back and answer signal is received and properly recognized. Verify that after the fast transmission of switch-hook flashes the equipment indicates the final position of the switch-hook.
- k) At the originating end release the circuit and check that the clear-forward signal is followed by the receipt and recognition of the release-guard signal from the distant end. Check that the release-guard signal ceases after the clear-forward signal ceases. Check that the circuit restores to the idle condition.
- l) At the originating end check that the clear-forward signal sent to the incoming equipment in the idle condition results in the return of the release-guard signal and that the equipment restores to the idle condition.
- m) At the originating end check that the busy-flash signal is received, recognized and acknowledged. Check that the acknowledgement ceases after the busy-flash signal ceases. (Some Administrations at the incoming end may find it convenient to provide a test call device which prompts the return of a busy-flash signal.)

In normal service the receipt of a busy-flash signal causes (after the acknowledgement) a clear-forward signal to be sent automatically from the international exchange originating the call. On a test call procedure some Administrations may prefer to avoid this process. In this case, the release of the connection is controlled by the personnel at the terminal originating the test call.

Note on items a) to m) - As part of the comprehensive tests it may, in certain circumstances such as fault localization, be desirable to test the frequency, level, and duration of received signals. Normally, however, it may be assumed that each Administration has verified the accuracy of its signal transmission locally as covered in § 4.2.3.

3. Transit calls²⁾

- a) After securing the cooperation of a third international exchange initiate a transit call to this exchange through the international exchange covered in 2 above.
- b) With the assistance of technical personnel at the third international exchange repeat steps 2 c) to 2 k) except that in step 2 h) measurement of the duration of the forward-transfer signal need not be made.

Note - Detailed tests of certain transit features such as that of the transmission of the answer signal on an overlap basis at the transit point should be performed locally.

²⁾ When making transit test calls it is not the intention to check the performance or the quality of the circuit beyond the transit exchange, this being completely the responsibility of the Administration concerned. However, it is important that in principle the transit operations can be checked.