INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.139

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SPECIFICATIONS OF SIGNALLING SYSTEM No. 4

MANUAL TESTING

ITU-T Recommendation Q.139

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.139 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.

5.7 MANUAL TESTING

5.7.1 *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 unsatisfactory signal transmission by ensuring that a seizing signal is followed by the return of a proceed-to-send signal, that a clear-forward signal is followed by the return of a release-guard signal and that the circuit is clear.

b) The second method consists of verification of satisfactory signal transmission by initiating a test call:

   1) to technical personnel at 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 will consist of a 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) complete terminal and transit calls.[1)]

5.7.2 *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;

   b) Initiate a clear-forward signal and verify the receipt and recognition of the release-guard signal from the distant end.

   In the event of a failure, appropriate steps should be taken to locate and correct the trouble.

3. 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.

5.7.3 *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:

      1. the audible ringing tone should be heard;

      2. the answer signal should be received when the call is answered at the distant end.

   c) Request distant end to initiate a clear-back signal, followed by an answer signal.

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1) Transit test calls are not intended to check the performance or the quality of the circuit beyond the transit exchange; this being entirely the responsibility of the Administration concerned. However, it is important that in principle the transit operations can be checked.

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 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 test should be made using this equipment to the extent that the applicable features indicated in 1 above are available.

3. The tests should be made monthly when the manual testing methods prescribed in § 5.7.3.1 are used.

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

5.7.4 *Third method: comprehensive tests; terminal and transit 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 § 5.2.3 should have been completed at both terminals.

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. The tests shall proceed as follows:

a) at the originating end, check that a terminal seizing signal is followed by the receipt of a terminal proceed-to-send signal from the distant end;

b) at the distant end, check that the individual signal elements are correctly received and that each digit is acknowledged correctly;

c) at the originating end, check that the number received signal is received;

d) check that the audible ringing tone is heard at the originating end:

e) at the distant end, initiate an answer signal;

f) at the originating end, check that the answer signal is received and recognized;

g) at the distant end, initiate a clear-back signal;

h) at the originating end, check that the clear-back signal is received and recognized;

i) at the originating end, initiate a forward-transfer signal;

j) at the distant end, check the receipt of the forward-transfer signal;

k) 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;

l) 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 transmission of the fast switch-hook flashes, the equipment indicates the final position of the switch-hook;

m) at the originating end, initiate the release of the circuit;

n) at the distant end, check that the clear-forward signal is received and recognized and that the circuit releases;

o) at the originating end, check that the release-guard signal is received and recognized and that the circuit releases;

p) at the originating end, set up a call to a busy line or to a test call device which provokes the return of a busy-flash signal and check that the busy-flash signal is received and recognized;

q) at the originating end, after receipt of the busy-flash signal, initiate a release of the connection and check that the equipment releases correctly;

r) at the distant end, after sending the busy-flash signal, check that the clear-forward signal releases the equipment;

s) at the distant end, initiate the transmission of a blocking signal;

t) at the originating end, check that the blocking signal busies the circuit;

u) at the distant end, initiate the transmission of an unblocking signal;

v) at the originating end, check that the unblocking signal restores the circuit to normal;

w) at the distant end, connect in turn a continuous *x* tone, a continuous *y* tone, a continuous $x + y$ tone, with the circuit in the idle state in each case;

x) at the originating end, check that the receipt of a continuous *x* tone, or a continuous *y* tone, or a continuous $x + y$ tone busies the circuit;

y) 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;

z) at the originating end, check the presence of a transmission test loop with the circuit in an idle condition and then check that within 35 ms of receipt of a seizure signal, the loop is removed.

3. *Transit calls* (System No. 4 to System No. 4)

After securing the cooperation of a third international centre, initiate a transit call to this centre through the international centre, covered in § 2 above, which thus becomes the transit centre. Check the following sequence:

a) at the originating end, check that a transit seizure signal is followed by the receipt of a transit proceed-to-send signal from the transit centre;

b) at the transit centre, check that the necessary routing digits are received and acknowledged correctly and that a circuit to the terminal centre is selected;

c) at the originating end, check that a terminal proceed-to-send signal is received and that the correct digital information is sent to the terminal centre;

d) with the assistance of technical personnel at the terminal centre, check that the number received, answer, clear-back, forward transfer, busy-flash, clear-forward and release-guard are correctly interpreted.