Recommendation T/CS 54-02 (Stockholm 1977, revised in Cannes 1983)

MAINTENANCE OF SIGNALLING SYSTEM R2; USE OF SIMPLIFIED TEST EQUIPMENT

Recommendation proposed by Working Group T/WG 11 "Switching and Signalling" (CS)

Revised text of the Recommendation adopted by the "Telecommunication" Commission:

"The European Conference of Postal and Telecommunications Administrations,

considering

— the extended use of Signalling System R2;

— that circuits operated with System R2 require rapid and simple testing of transmission and signalling in addition to the use of the ATME No. 2 method specified by CCITT [1].

recommends

that members of the CEPT should use with Signalling System R2, test equipment and procedures hereafter described, and provide a sufficient number of simplified responding equipment in their exchanges to avoid congestion on test calls."

1. **GENERAL**

   Generally speaking, the arrangements for automatic testing comprise outgoing test equipment connected at the outgoing end of the circuit and incoming test equipment (responding equipment) accessible at the incoming end. The procedures consist, in principle, of the setting-up of a call between the outgoing and the incoming test equipments. In addition to this functional signalling test, a check of the transmission on the circuit is achieved.

2. **NUMBERING OF ACCESS TO SIMPLIFIED TEST EQUIPMENT**

2.1. In international working, to set-up a call to maintenance equipment via circuits operated with System R2, the following multifrequency signals must be sent:
   — I-13 (replacing the language digit, in accordance with CCITT Recommendation Q.133 [2]);
   — I-13;
   — two digits "XY" which will be associated with the type of test equipment and the procedure for testing to be employed. For access to the simplified test equipment XY = 90;
   — I-15 (if requested by the incoming test equipment).

   Provision is made for repetition of signal I-13 to avoid complications in the incoming R2 register in the country of destination. The second signal I-13 is stored in the place where the first digit of the routing information is normally recorded. In this way, access to the test equipment requires no analysis, for routing purposes, of the signal which takes the place of the language digit.

2.2. When calls are set-up to the test equipment, it is desirable to avoid repetition of the request for the access code or for any other digit. This is because the calls may come from equipment which is not normally designed to interpret signals A-2, A-7 or A-8.

   Interregister signalling on calls to simplified test equipment must be terminated as follows:
   — the address-complete signal A-6 alone or A-3 followed by B-6 is sent when the incoming test equipment is free;
   — the congestion signal A-4, or the address-complete signal A-3 followed by B-3 or B-4 is sent when the incoming test equipment is engaged.

   In international working, the outgoing R2 register, after having recognized signal A-3, must send signal II-7 (subscriber) in response.

   Note: In national working, or in international working where the language digit is omitted by bilateral agreement, the following multifrequency signals must be sent:
   — I-13;
   — two digits XY = 90;
   — I-15 (if necessary).

3. **TEST SEQUENCE**

3.1. The test sequence is as follows:

(a) seizing of the automatic incoming test equipment;

(b) sending backward of the seizing acknowledgement signal when the digital version of the line signaling is employed [4];

(c) transition to answer condition;

(d) sending backward a composite identification signal 1020 + 1140 Hz; this signal will be acknowledged in a compelled manner by the signal mentioned under (e);

(e) recognition of a composite acknowledgement signal 1380 + 1980 Hz sent in the forward direction;

(f) on the disappearance of the acknowledgement signal, the incoming test equipment passes to the clear-back state;

(g) on recognition of the clear-back signal, the outgoing equipment will send the clear-forward signal in a normal manner, which will clear the connection and release the incoming test equipment. After release of the incoming line circuit, the release-guard signal will be sent in the normal way.

3.2. Detection of failure of the test sequence is made by timing-out in the outgoing equipment.

3.3. The frequencies mentioned under (d) and (e) are those used for System R2 interregister signalling. Transmission and reception of these frequencies in the incoming test equipment must be in accordance with Section 4 (multifrequency signalling equipment) of the CCITT Signalling System R2 Specifications [3].

3.4. Attenuation pads should be inserted in the send and receive paths of the outgoing test equipment in order to shift the receive level at the input of the multifrequency receivers of the outgoing and incoming test equipment toward the lower operational limit. This makes it possible to diagnose abnormal losses on the circuit under test from defective multifrequency signal exchange between outgoing and incoming test equipment. For testing international System R2 circuits, the additional attenuation produced by the pads should be 10 ± 1 dB.

References

[1] CCITT Recommendation O.22. *Specification for the CCITT automatic transmission measuring and signalling testing equipment ATME No. 2.*

[2] CCITT Recommendation Q.133. *Numbering for access to automatic measuring and testing devices.*

[3] CCITT Recommendations Q.440-458. *Interregister signalling.*

[4] Recommendation T/CS 42-03. *System R2 line signalling digital version.*