

Recommendation T/CS 49-03 (Vienna 1982, revised in Montpellier 1984)

SYSTEM L1 DECADIC PULSING CONTROL SIGNALLING PROCEDURES

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

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

"The European Conference of Postal and Telecommunications Administrations,

considering

- that decadic pulsing interregister signalling may be employed on exchange links connecting private automatic branch exchanges;
- that various forms of decadic pulsing call control signalling procedures are widely used in private national networks and on extension lines,

recommends

that members use the System L1 signalling procedures specified below, if decadic pulsing interregister signalling is applied between private automatic branch exchanges (PABXs) in different countries."

1. GENERAL

1.1. Field of application

The signalling procedures specified in this Recommendation cover the standard call set-up and call clear-down. Enhancements such as additional functions for recall and intrusion are included. Arrangements for routing a multi-link connection are also specified. In this case the link-by-link operation inherent to System L1 is used.

1.2. Signals

System L1 decadic pulsing interregister signalling in accordance with Recommendation T/CS 49-02 [1] is used in conjunction with System L1 line signalling as specified in Recommendation T/CS 49-01 [2].

Table 1 (T/CS 49-03) shows all the signals used for the recommended decadic pulsing signalling procedures. The meanings of the signals comply with Recommendation T/CS 41-01 [3]. The requirements for the transmission of the signals are set out in Recommendations T/CS 49-01 [2] and T/CS 49-02 [1].

Option 1 provides for the use of the seizing-acknowledgement signal of the proceed-to-send signal.

The use of the address-complete signal and the answer signal is subject to options 2 and 3 respectively. The three signals address-complete, extension-free; address-complete, extension-busy and busy-extension-changed-to-free may be chosen instead of the address-complete signal (option 4). If the signals, intrusion and end-of-intrusion are used (option 5), option 4 must be applied. The four recall signals represent option 6.

All options 2 to 6 must be mutually agreed upon by the parties involved.

Signal	Option	Recommendation
Seizing	M	T/CS 49-01
Proceed-to-send	M	T/CS 49-02
Seizing-acknowledgement	1	T/CS 49-01
Address	M	T/CS 49-02
Clear-request	M	T/CS 49-02
Address-complete	2	T/CS 49-02
Address-complete, extension-free	4	T/CS 49-02
Address-complete, extension-busy	4	T/CS 49-02
Busy-extension-changed-to-free	4	T/CS 49-02
Answer	3	T/CS 49-01
Clear-forward	M	T/CS 49-01
Clear-back	M	T/CS 49-01
Cleared	M	T/CS 49-01
Intrusion	5	T/CS 49-01
End-of-intrusion	5	T/CS 49-01
Service-request-recall	6	T/CS 49-01
Link-recall	6	T/CS 49-01
Proceed-to-send on recall	6	T/CS 49-02
Reconnect	6	T/CS 49-02

Legend: 1, 2, 3, 4, 5, 6: options 1, 2, 3, 4, 5, 6. M: Mandatory.

Table 1 (T/CS 49-03). Signals used in L1 decadic pulsing call control signalling procedures.

2. SIGNALLING PROCEDURES

2.1. General

When, under option 1, the seizing-acknowledgement signal is used, premature sending of address signals is prevented either by the detection of dial tone or by means of a pre-sending pause. The length of the pre-sending pause should be determined by mutual agreement. When using the proceed-to-send signal, transmission of the address signals is withheld until the proceed-to-send signal has been received. The recommended signalling procedures do not specify actions to be taken in the case of double seizure.

The signalling procedures are described by means of SDL diagrams in accordance with CCITT Recommendations Z.101 [4], Z.102 [5] and Z.104 [6], and narrative comments. Table 4 in Recommendation T/CS 49-04 [7] includes abbreviations used in the SDL diagrams.

Note: The SDL diagrams are included in this Recommendation to assist in the understanding of the technical text and must only be used in association with the text.

2.2. Set-up and clear-down of standard calls

Figures 1, 2 and 9 in Recommendation T/CS 49-05 [8] apply. They show the signalling sequence at the outgoing and incoming PABX line interface for set-up and clear-down of standard calls.

In the case of multi-link calls, the address signals are transferred link-by-link. The registers in the transit switches should preferably work in an overlap mode of operation.

The selection phase is terminated with the transmission of the address-complete signal from the incoming to the outgoing PABX, by address information analysis or by an internal time-out.

The address-complete signal releases the registers in the terminating PABXs and transit switches, initiates through-connection of the speech path and causes the transition to the *end-of-selection state* at the reference interfaces. In the end-of-selection state an additional signal interchange e.g. covering option 4 or 4 + 5 may take place and cause transition to another state. In the SDL diagrams this state is called *post-dialling state*.

2.3. Intrusion

The procedures for intrusion require the provision of options 4 and 5. Figures 7 and 8 in Recommendation T/CS 49-05 [8] apply.

2.4. Recall procedures

When option 6, register-recall, is provided, Figures 3 to 6 of Recommendation T/CS 49-05 [8] apply.

2.5. **Clear-request on non-receipt of address information**

When, after recognition of a seizing signal, no address information or incomplete address information is received, the PABX shall time-out and dissociate the inter-PABX circuit from any common equipment.

Under these conditions the incoming PABX shall:

- (a) apply the clear-request signal;
- (b) bar access to the inter-PABX circuit for outgoing calls until a clear-forward signal is recognised.

2.6. **Clear-request on encountering congestion or an engaged extension**

This procedure is optional. When an incoming PABX encounters congestion or an engaged extension, it may release the switching equipment, apply the clear-request signal and perform the procedures specified in §2.5. (b) above.

2.7. **Audible indications**

Provision must be made by the parties involved to ensure that the correct audible indications are returned to the caller when Sections 2.5. or 2.6. above apply.

REFERENCES

- [1] Recommendation T/CS 49-02. *System L1 decadic pulsing interregister signalling.*
- [2] Recommendation T/CS 49-01. *System L1 line signalling over international inter-private automatic branch exchange lines.*
- [3] Recommendation T/CS 41-01. *Signal and signalling message names and meanings.*
- [4] CCITT Recommendation Z.101. *General explanation of the specification and description language (SDL).*
- [5] CCITT Recommendation Z.102. *Symbols and rules.*
- [6] CCITT Recommendation Z.104. *Semantics.*
- [7] Recommendation T/CS 49-04. *System L1 multifrequency push-button interregister signalling.*
- [8] Recommendation T/CS 49-05. *System L1 multifrequency push-button unidirectional call control signalling procedures.*