

Recommendation T/CS 49-05 (Vienna 1982, revised in Montpellier 1984)**SYSTEM L1 MULTIFREQUENCY PUSH-BUTTON UNIDIRECTIONAL CALL 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 multifrequency push-button (MFPB) subscribers' line signalling may provide faster call set-up than decadic pulsing signalling,
- that equipment located at subscribers' premises and used in private networks more and more employs MFPB signalling techniques,
- that MFPB interregister signals as specified in Recommendation T/CS 49-04 [1] may be used either in the forward direction only or in both the forward and the backward direction,

recommends

to the members that the call control signalling procedures specified below are used, when MFPB interregister signalling is applied in the forward direction only (unidirectional) between private automatic branch exchanges (PABXs), in different countries."

1. **GENERAL**

1.1. **Field of application**

In the System L1 MFPB unidirectional call control signalling procedures, MFPB interregister signals are only used in the forward direction of call set-up, e.g. the MFPB character set of the 12-button array according to Recommendation T/CS 46-02 [2] is used for address signalling and service control. The signalling procedures specified in this Recommendation cover the standard call set-up and call clear-down. Enhancements providing the interchange of additional information are given as options, e.g. for recall and intrusion.

1.2. **Signals**

On international leased lines, System L1 MFPB unidirectional, in accordance with Recommendation T/CS 49-04 [1], is used in conjunction with System L1 line signalling as specified in Recommendation T/CS 49-01 [3].

The signals actually used with System L1 MFPB call control procedures contained in this Recommendation are given in Table 1 (T/CS 49-05). The meanings of the signals comply with Recommendation T/CS 41-01 [4]. The requirements for the transmission of the signals are set-out in Recommendations T/CS 49-01 [3], T/CS 49-02 [5] and T/CS 49-04 [1].

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), then option 3 must be applied.

The four recall signals represent option 6.

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

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

Signals	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 49-04
Clear-request	M	T/CS 49-01
Address-complete	2	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
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
Intrusion	5	T/CS 49-01
End-of-intrusion	5	T/CS 49-01
Forward-service-request-recall	6	T/CS 49-01
Backward-service-request-recall	6	T/CS 49-01
Backward-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: option 1, 2, 3, 4, 5, 6. M: Mandatory.

Table 1 (T/CS 49-05). Signals used in System L1 MFPB unidirectional call control signalling.

Note 1: If option is provided, the seizing-acknowledgement procedure must be used instead of the proceed-to-send procedure.

2. SIGNALLING PROCEDURES

2.1. General

2.1.1. The signalling procedures are described by means of SDL diagrams in accordance with CCITT Recommendations Z.101 [7], Z.102 [8] and Z.104 [9], and narrative comments. Table 4 in Recommendation T/CS 49-04 [1] 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.

Where a service demand requires inter-PABX MFPB signalling, the request is handled by the responding PABX on an accept or reject basis, depending upon the availability of the service at that PABX.

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

2.2.1. Figures 1, 2 and 9 (T/CS 49-05) show the signalling sequences at the outgoing and incoming PABX line interfaces for set-up and clear-down of standard calls.

Following the proceed-to-send signal, the register of the outgoing PABX sends the address signals.

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 concluded by the address-complete signal sent backwards from the destination PABX by address information analysis or internal time-out. The address-complete signal releases the registers in the terminating PABX 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 options 3 or 3 and 4) may take place and cause transition to another state. For the SDL diagrams, this state is called *post-dialling state*.

2.3. Register-recall

When option 5, register-recall, is provided, Figures 3 to 6 (T/CS 49-05) apply.

In the case of a service-request recall, no address-complete signal will be returned. Subsequently, the signalling process reverts to the appropriate post-dialling state.

2.4. Intrusion

The procedure for intrusion requires the provision of options 3 and 4. Figures 7 and 8 (T/CS 49-05) apply.

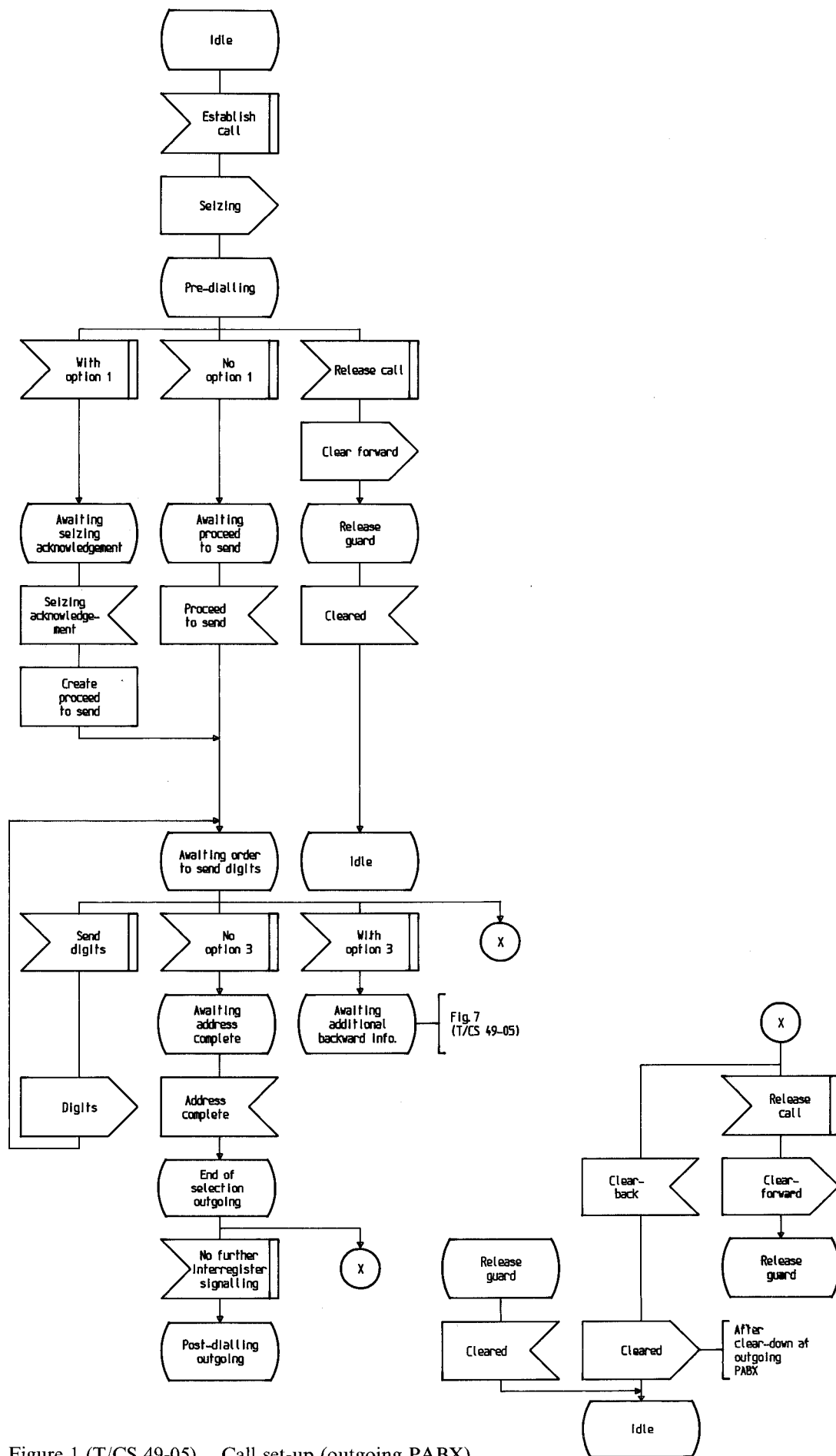


Figure 1 (T/CS 49-05). Call set-up (outgoing PABX).

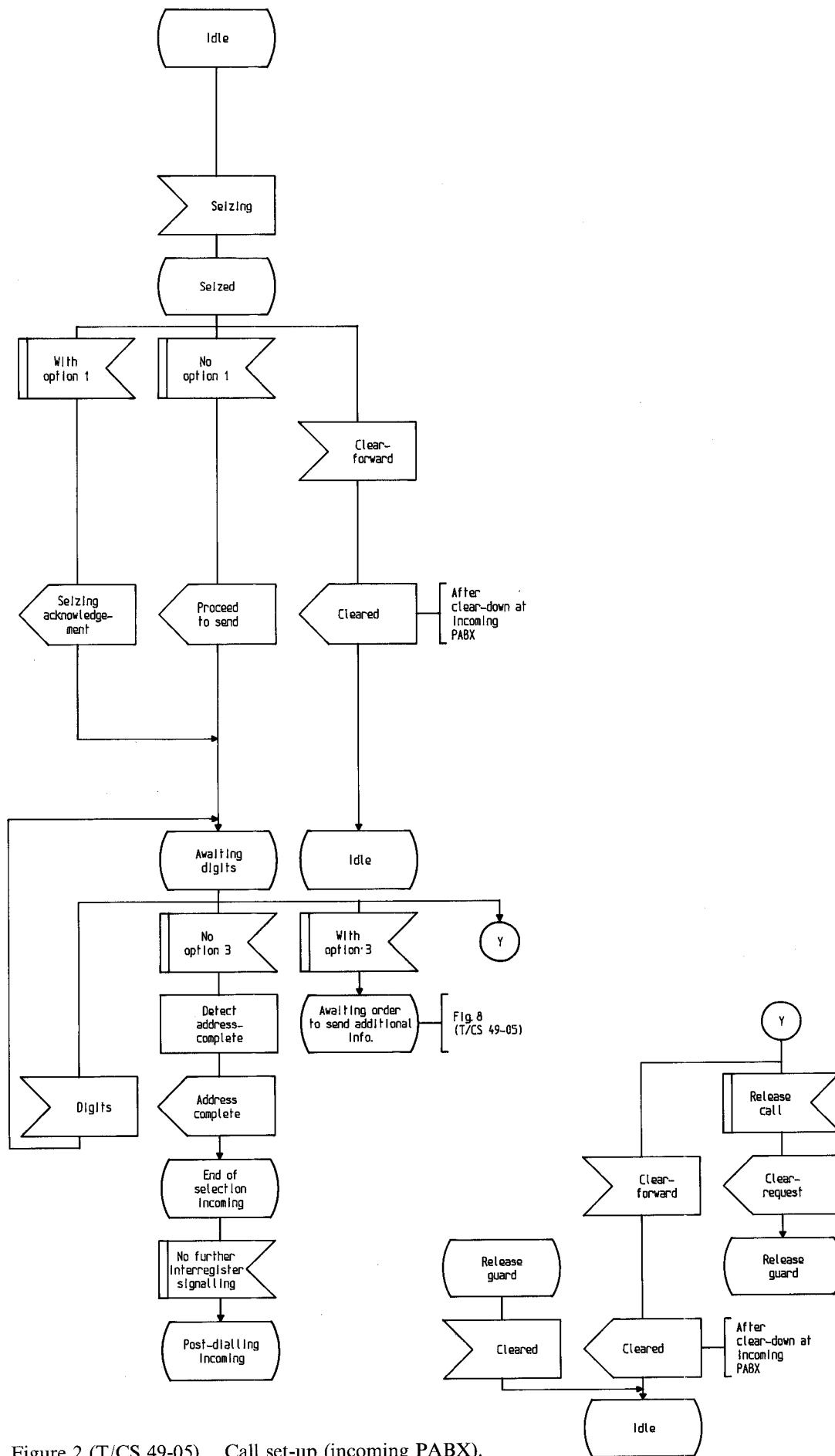


Figure 2 (T/CS 49-05). Call set-up (incoming PABX).

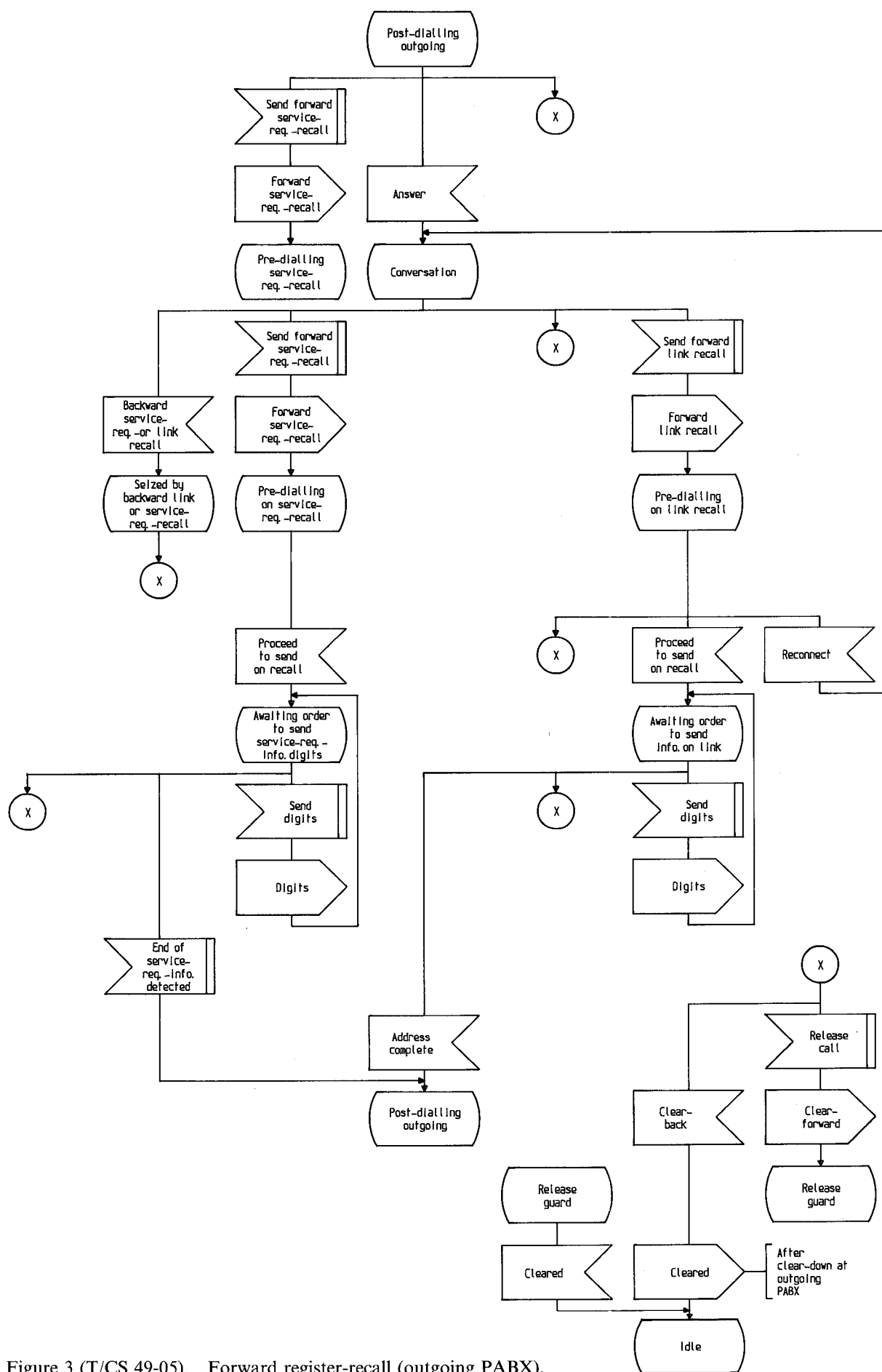


Figure 3 (T/CS 49-05). Forward register-recall (outgoing PABX).

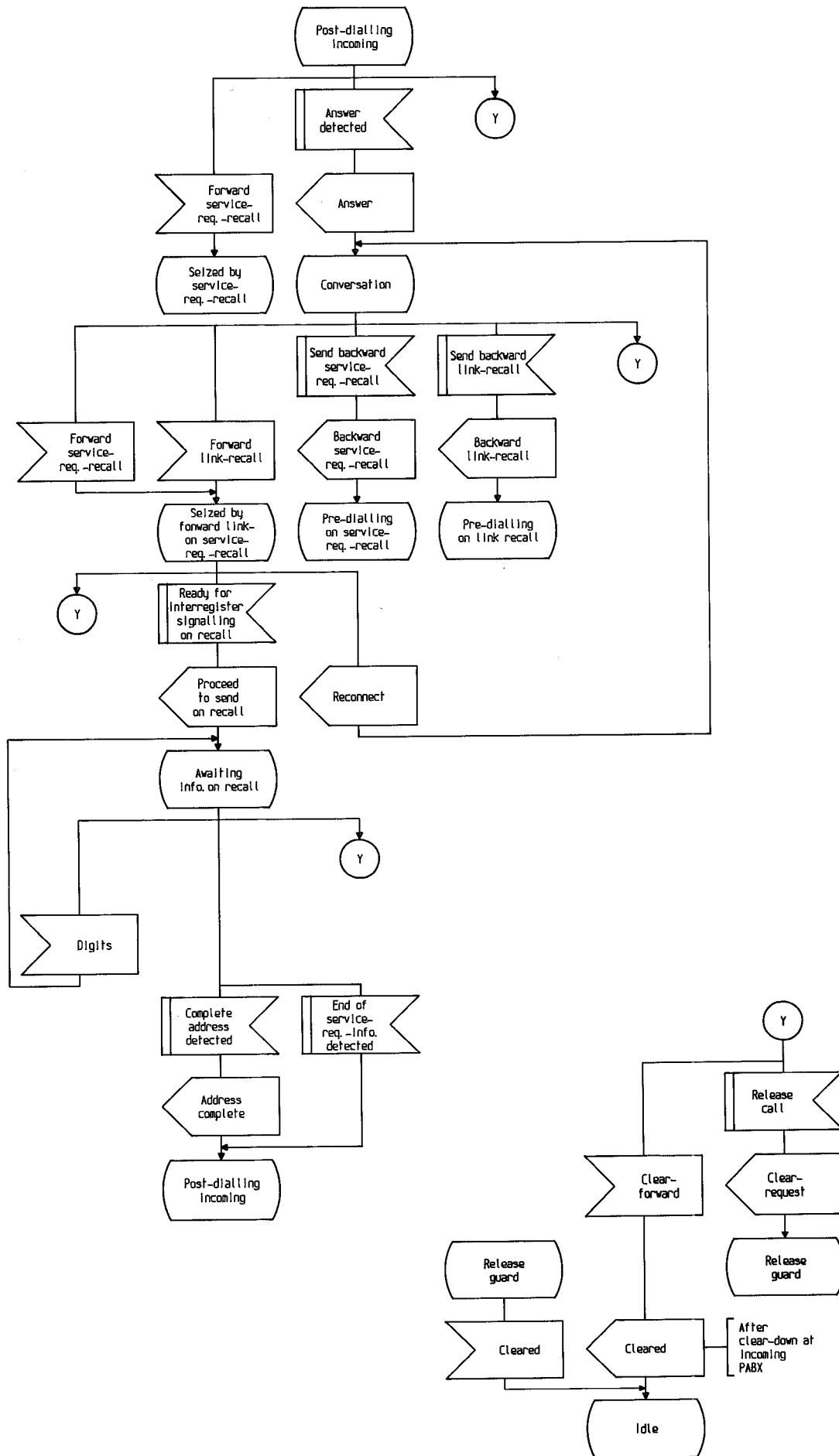


Figure 4 (T/CS 49-05). Forward register-recall (incoming PABX).

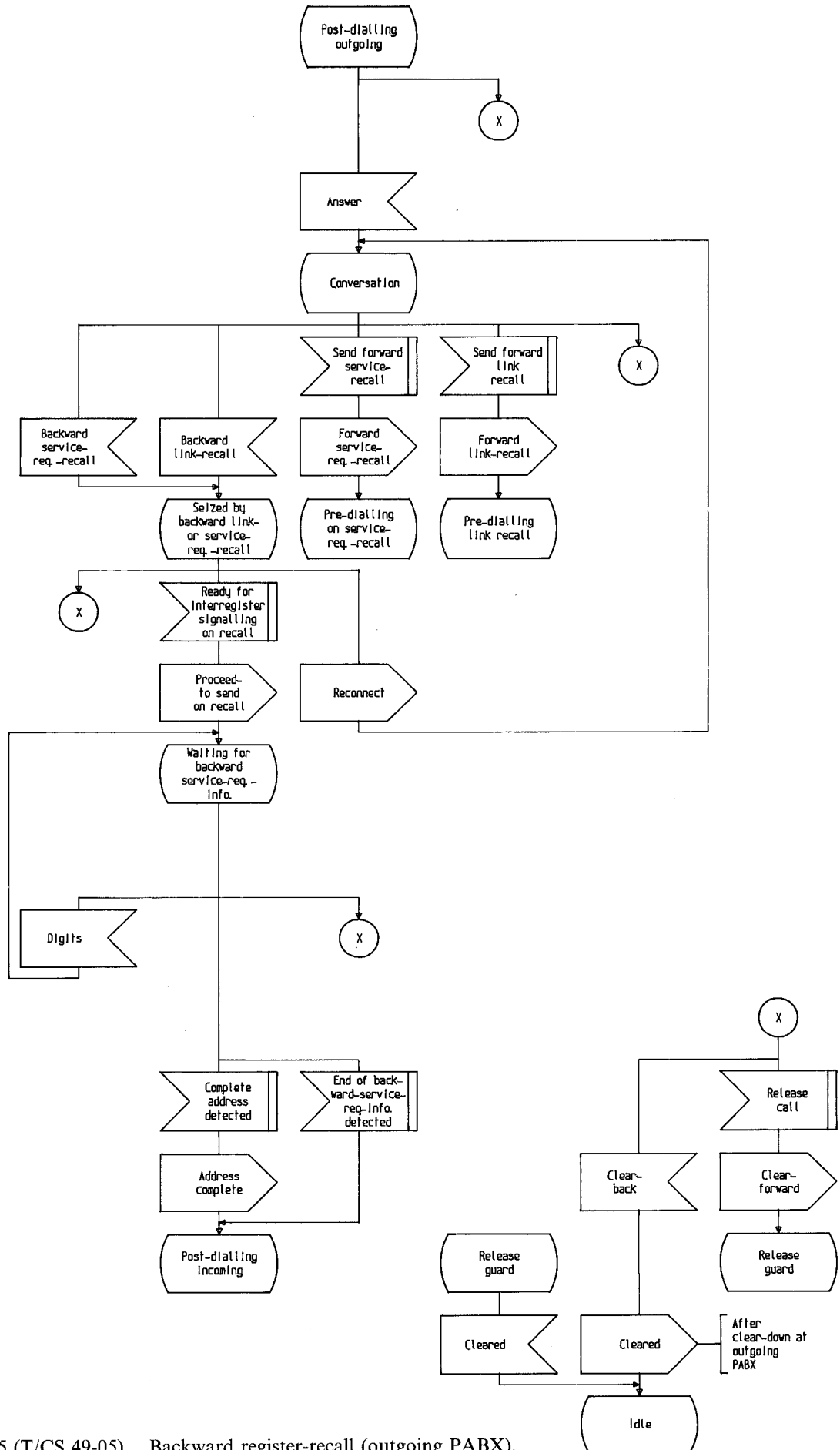


Figure 5 (T/CS 49-05). Backward register-recall (outgoing PABX).

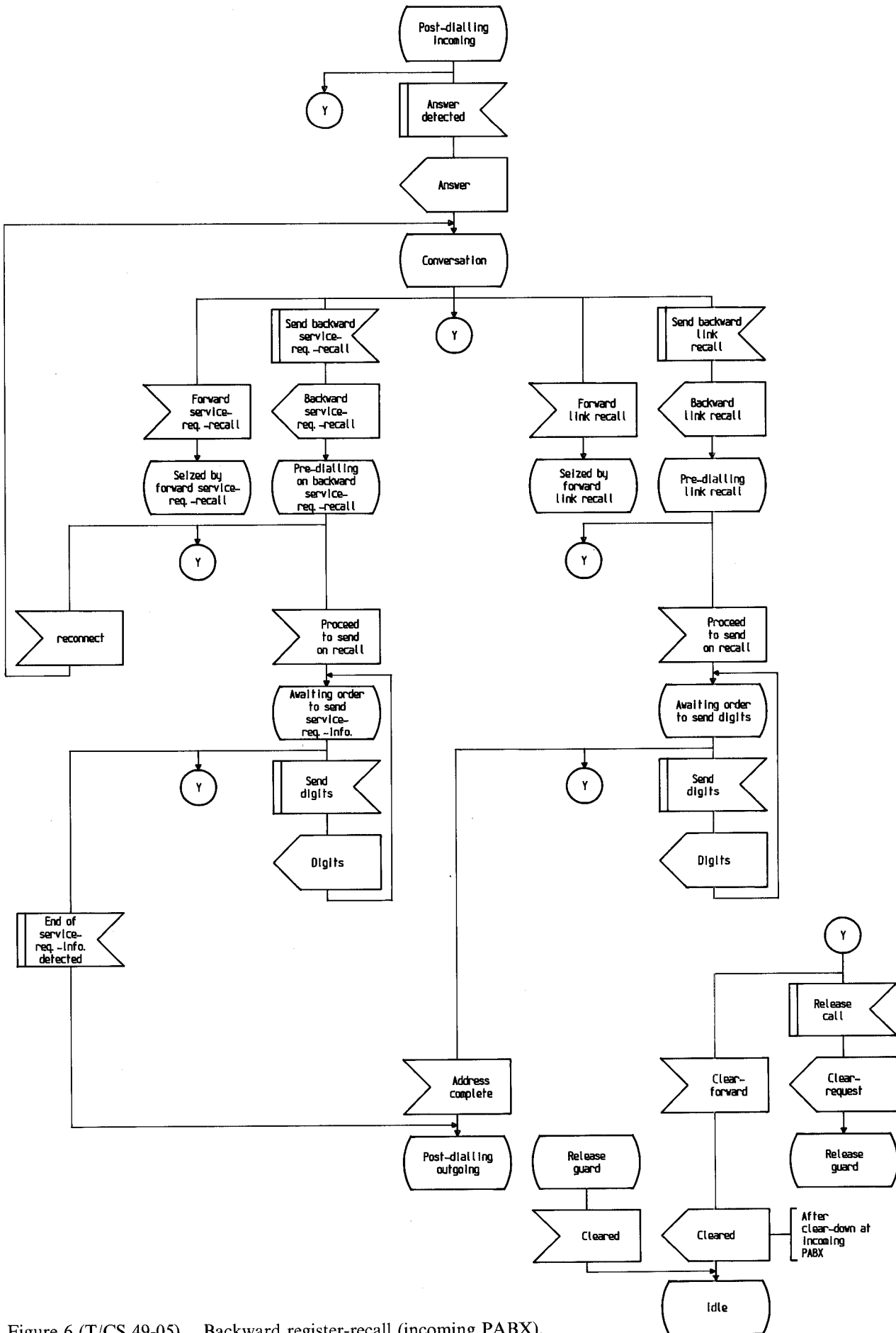


Figure 6 (T/CS 49-05). Backward register-recall (incoming PABX).

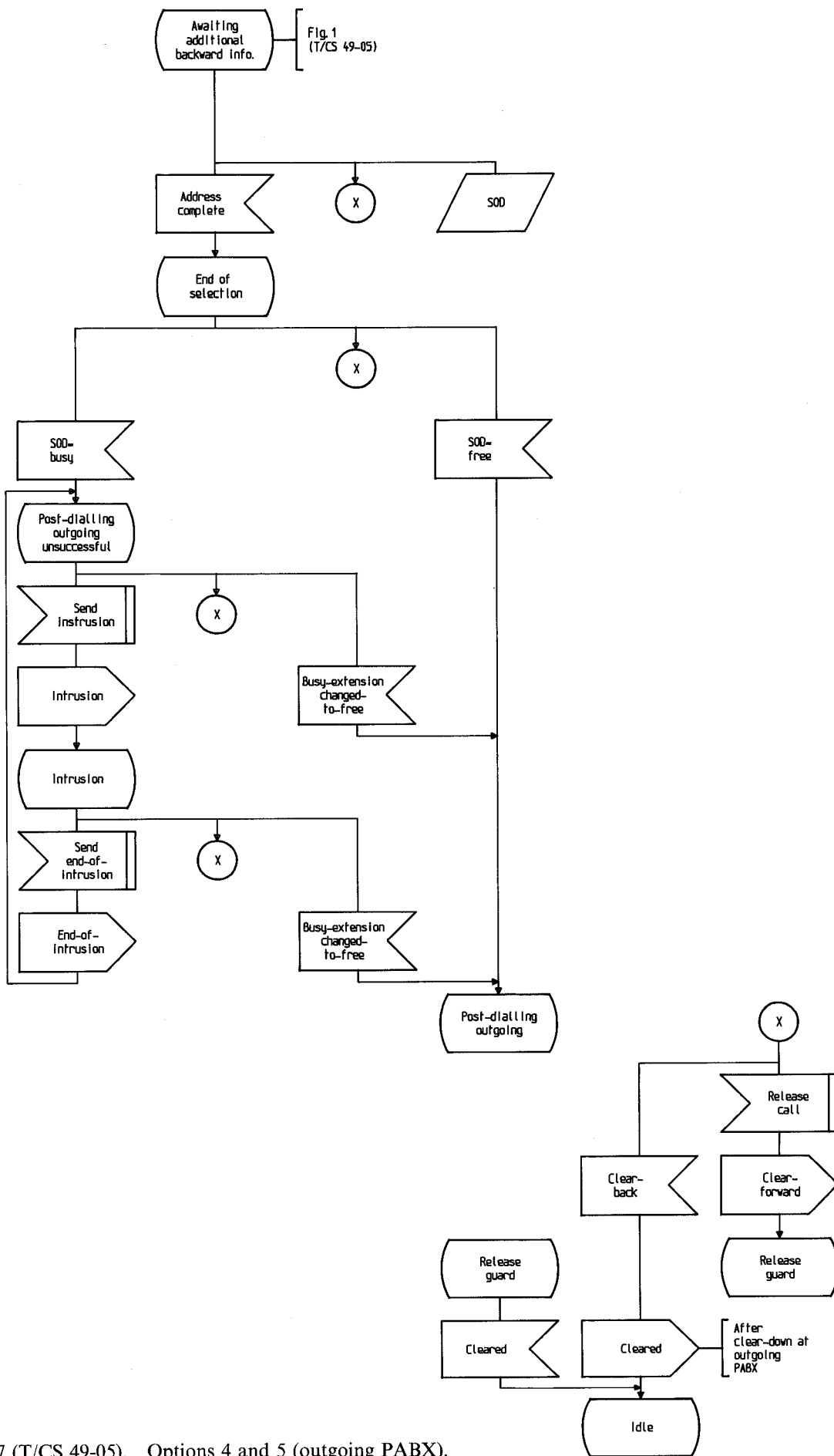


Figure 7 (T/CS 49-05). Options 4 and 5 (outgoing PABX).

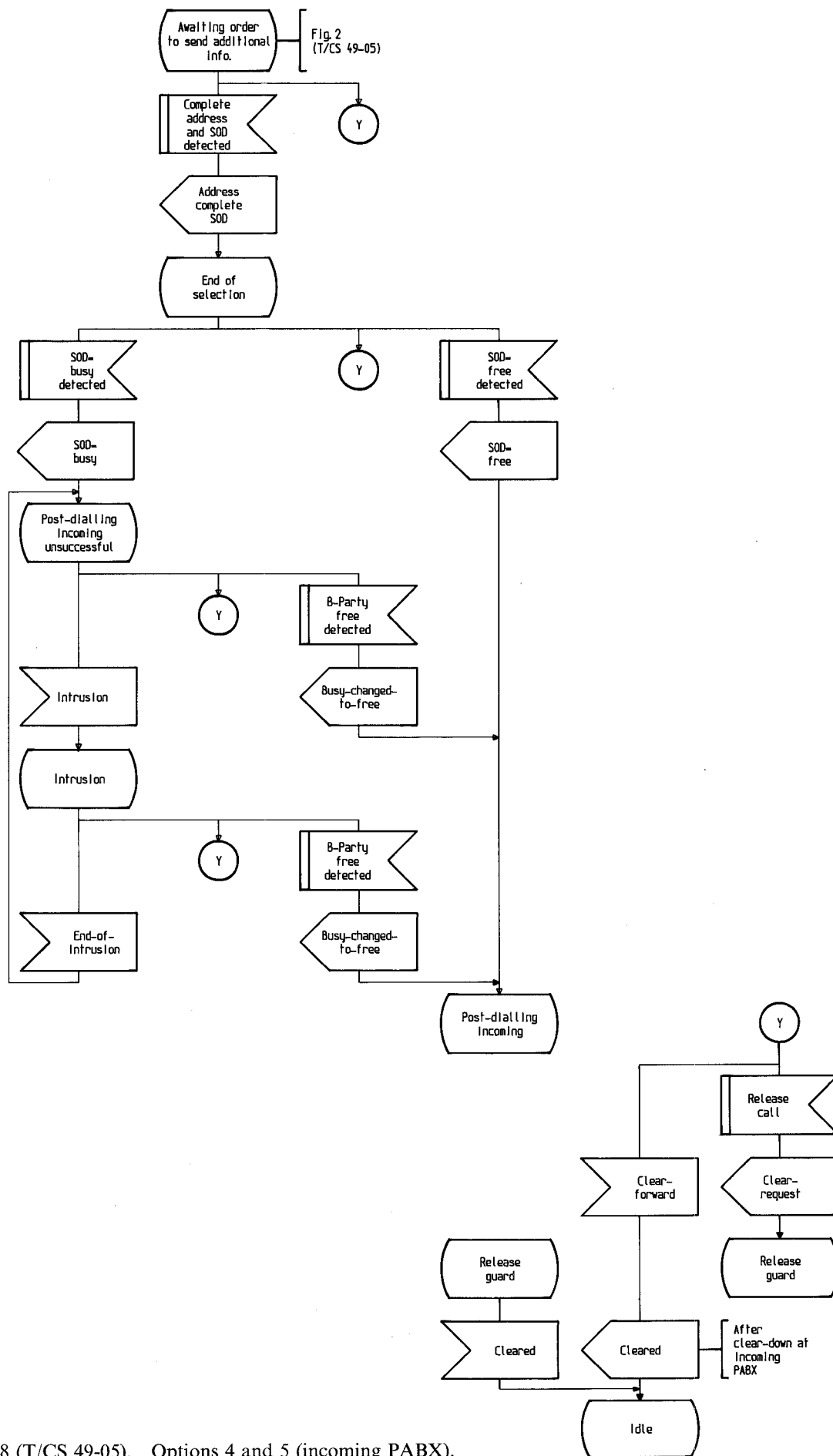


Figure 8 (T/CS 49-05). Options 4 and 5 (incoming PABX).

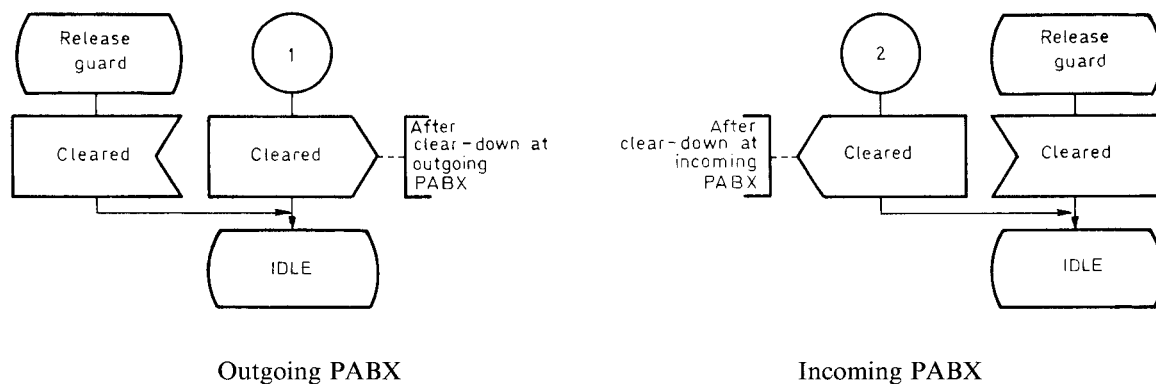


Figure 9 (T/CS 49-05). Call clear-down.

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

When after recognition of a seizing signal, no address or incomplete address or incomplete information is received, the incoming 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 recognized.

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).

2.7. **Audible indications**

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

REFERENCES

- [1] Recommendation T/CS 49-04. *System L1 multifrequency push-button interregister signalling.*
- [2] Recommendation T/CS 46-02. *Multifrequency signalling system to be used for push-button telephones.*
- [3] Recommendation T/CS 49-01. *System L1 line signalling over international inter-private automatic branch exchange lines.*
- [4] Recommendation T/CS 41-01. *Signal and signalling message names and meanings.*
- [5] Recommendation T/CS 49-02. *System L1 decadic pulsing interregister signalling.*
- [6] Recommendation T/CS 49-03. *System L1 decadic pulsing signalling procedures.*
- [7] CCITT Recommendation Z.101. *General explanation of the specification and description language (SDL).*
- [8] CCITT Recommendation Z.102. *Symbols and rules.*
- [9] CCITT Recommendation Z.104. *Semantics.*