INTERNATIONAL TELECOMMUNICATION UNION

ITU-T   Q.605

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

INTERWORKING OF SIGNALLING SYSTEMS

INTERWORKING OF SIGNALLING SYSTEMS - DRAWING CONVENTIONS

ITU-T Recommendation Q.605

(Extract from the *Blue Book*)

NOTES

1   ITU-T Recommendation Q.605 was published in Fascicle VI.6 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.

Recommendation Q.605

5   DRAWING CONVENTIONS

In addition to Recommendations Z.101 to Z.104, the following rules apply to the logic procedures of the interworking specifications.

5.1   *Inputs and outputs*

In accordance with the basic concepts of SDL, *internal* inputs and outputs are used for logic procedures that do not go beyond the functional block involved. In addition, some SPITEs are used as *internal* inputs to describe the information flow at the interface between the signalling and switching procedures.

All other inputs and outputs, including FITEs and BITEs as well as signals, which pass from one functional block to another are considered as being *external.*

The *external* inputs and outputs point in the direction of the data flow between the three functional blocks as shown in Figure 2/Q.602.

A multiple input (i.e. a group of signals) which leads to one and the same procedure can be represented by one standard symbol including that group of signals, if possible.
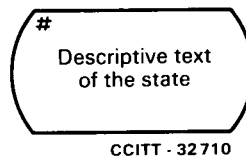
5.2   *States*

State symbols shall contain

- the state number, and
- the descriptive text of the state.

Most frequently the state indicates the input being waited for.

The layout of the state symbol to be used for the interworking specifications is given in Figure 3/Q.605.

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State number

FIGURE 3/Q.605

State symbol

5.3   *Connectors*

Connectors are represented by a circle. The in-connector labels (within the connector symbol) shall be unique within the same interworking diagram.

The designations used within the connector symbols are as follows (see Figure 4/Q.605):

a)   arabic numerals, where the vertical line of flow of the procedure is to be interrupted. Subscripts outside the connector indicate the sheet numbers on which the associated connectors appear;

b)   capital letters, where the horizontal line of a multiple branching of the process is to be interrupted. Subscripts outside the connectors indicate the sheet numbers, on which the associated connectors appear;

c)   "P_i" to indicate that the procedures are not completed (e.g. a subroutine or another detailed procedure). The connector symbol will then be non-subscripted with sheet numbers but be provided with the comment "to be completed" associated with a reference to the Recommendation concerned, if any.

The connector reference is always shown in the left-hand column of each sheet of the interworking diagrams.
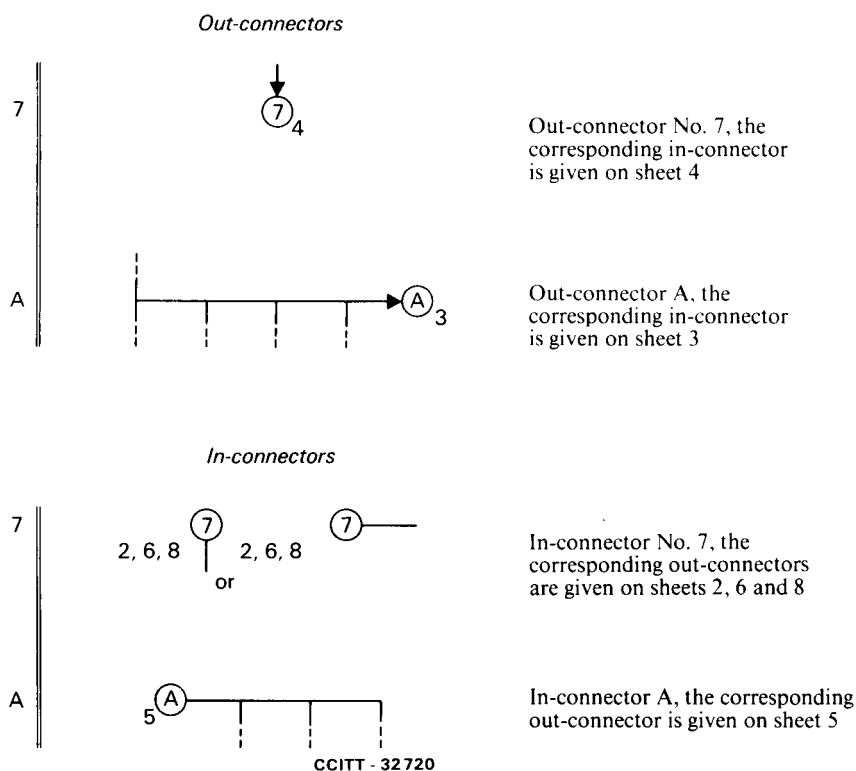
Out-connectors

Out-connector No. 7, the corresponding in-connector is given on sheet 4

Out-connector A, the corresponding in-connector is given on sheet 3

In-connectors

In-connector No. 7, the corresponding out-connectors are given on sheets 2, 6 and 8

In-connector A, the corresponding out-connector is given on sheet 5

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FIGURE 4/Q.605

Examples of how to use connectors

5.4   *Procedures not presented*

In general, possible signals which are not shown as inputs in a given state are to be considered as consumed but discarded, i.e. ignored. A special treatment may be required in the following cases:

a)   electrical conditions not recognized as regular signals (e.g. 1 out of 6 frequencies in the case of MFC signalling);

b)   regular signals, but not relevant to interworking (e.g. blocking, identification);

c)   any other regular signal recognized as an abnormality (e.g. out of sequence).

In the cases a) and c), the appropriate actions to be taken are not specified in the existing Recommendations. Further study is required.

The reactions in case of signals out of sequence can be shown by means of a state/signal matrix as auxiliary documentation. The interpretation of the diagrams will then be unambiguous.

5.5 *Presentation of time supervision*

The method of time supervision presentation to be used is shown in Figure 5/Q.605.

If two timers are running in a state such that the longer timer can never mature, the input "time release" should nevertheless be shown for both timers in order that no misunderstanding can result. The meaning of start t_1 also includes the possibility of restart t_1, $\bar{t}_1$ means the expiry of t_1,
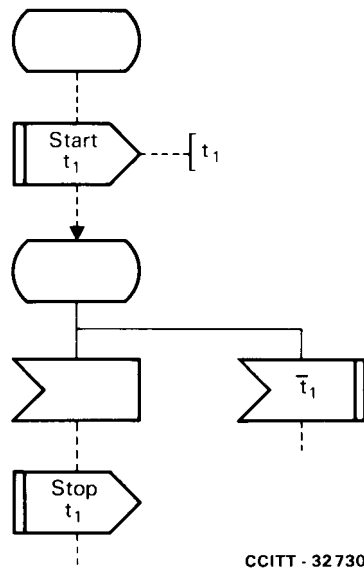

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FIGURE 5/Q.605

Method of time supervision presentation

5.6 *Storage of inputs*

During the method of register function activation, all inputs are implicitly stored and the sequence of FITEs is also recorded. When the register function is not activated, inputs must explicitly be stored if required in a later state transition.

5.7 *Method of changing the order of signals*

In several interworking situations, the order in which signals are received is not necessarily the order of their utilization. Therefore, a rearrangement of the order is necessary. To change the signalling sequence in the interworking diagrams, the method indicated in Figure 6/Q.605 should be applied. Figure 6/Q.605 shows how such a situation can be coped with by SDL.

5.8 *Multiple sending of FITEs 1 or digits*

The case of multiple sending of FITEs 1 or digits often occurs in the logic procedures: in the former case in the incoming or interworking procedures, and in the latter case in the outgoing procedures of the en-bloc Signalling Systems No. 5 and R1. The presentation of Figure 7/Q.605 should be used. *a)* of Figure 7/Q.605 is used for multiple FITEs 1, while *b)* of Figure 7/Q.605 is used for outgoing Signalling Systems No. 5 or R1. In *b)* of Figure 7/Q.605 the outgoing logic has already received all the FITEs 1 and has established the "ST condition" prior to the logic sequence shown.
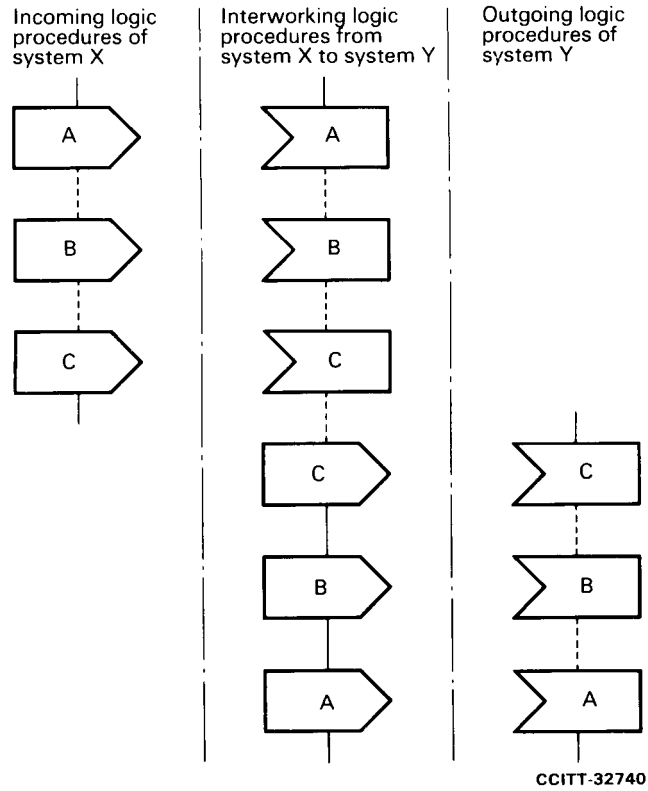
Incoming logic procedures of system X | Interworking logic procedures from system X to system Y | Outgoing logic procedures of system Y

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FIGURE 6/Q.605

Method of changing the order of signals

Start t_1

04
Wait for
time release

$\overline{t}_1$

FITE 22

Busy flash

Only valid
for Signalling
System No. 5

FITE 1

Any
FITE 1
stored

Yes

No

Digit

ST digit

No

Yes

05
Wait for
answer

a) Normal method

*b) Method for outgoing
Signalling System R1 and No. 5*

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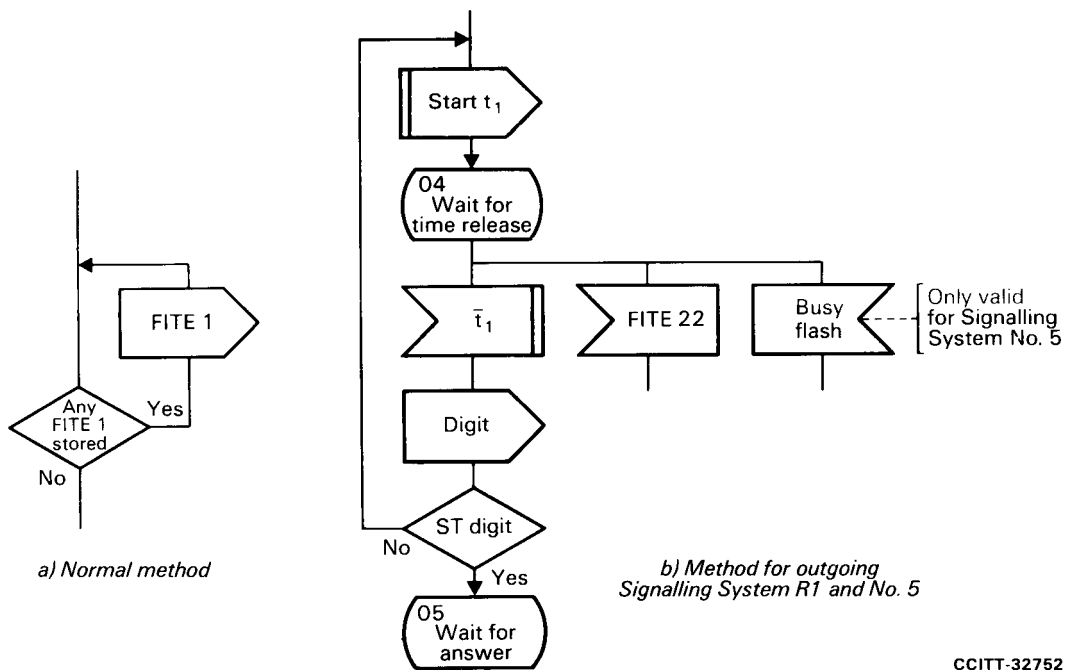
FIGURE 7/Q.605

Presentation method for multiple use of FITE 1

5.9 *Different signalling speeds*

In interworking cases where the signalling system at the outgoing end uses the overlap signalling mode with acknowledgements (Signalling Systems No. 4 and R2) or where the signalling speed of the system at the outgoing end is lower than that at the incoming end, the presentation method indicated in Figure 8/Q.605 should be used.
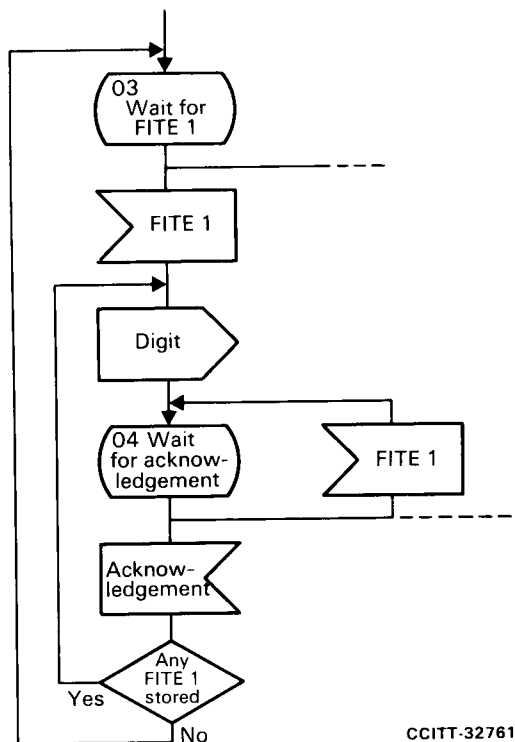

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FIGURE 8/Q.605

**Presentation method for cases where the signalling system
at the outgoing end uses the overlap signalling method**