SIGNALLING DATA LINK

CONTENTS

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LIST OF FIGURES

SIGNALLING DATA LINK

1. GENERAL

1.1 A "signalling data link" is a bidirectional transmission path for signalling, comprising two "data channels" operating together, in opposite directions, at the same data rate. It constitutes the lowest functional level (level 1) in the Signalling System No. 7 functional hierarchy.
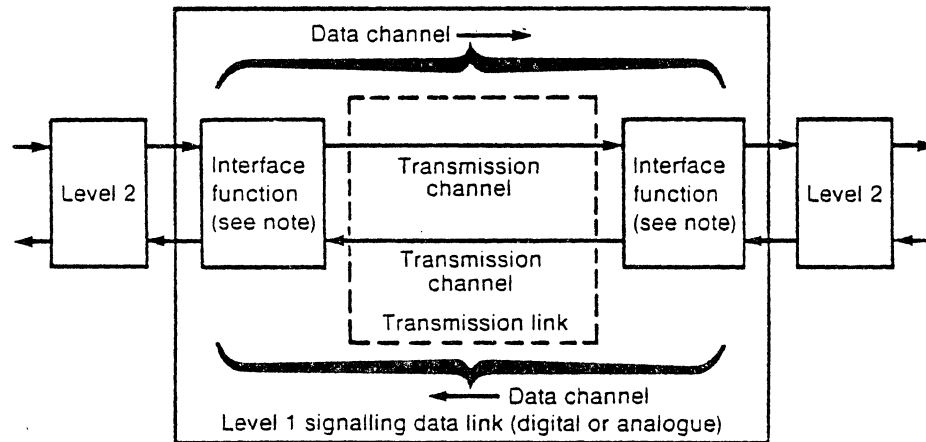
1.2 Functional configuration of a signalling data link is shown in Figure 1 Q.702.
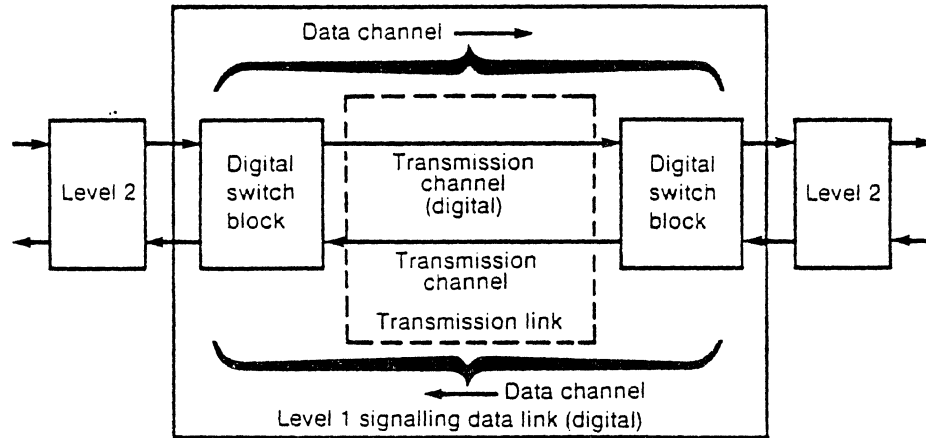
a) Example 1 - Digital signalling data link via digital switch block

NOTE - The interface function is provided, for example, by a modem in an analog signalling data link. A data circuit terminating equipment (DCE) or a time slot access equipment in a digital signalling data link.

b) Example 2 - Signalling data link (digital or analog) via interface equipment

Figure 1/Q.702 - Functional configuration of a signalling data link

1.3 A digital signalling data link is made up of digital "transmission channels"[1] and digital switches or their terminating equipment. providing an interface to signalling terminals. The digital transmission channels may be derived from a digital stream having a frame structure as specified for exchanges and for pulse code modulation multiplex equipment as follows:

— Recommendations G.733[1] and G.736[2]. and   *

— References [6]. [7], [8]. [9]. [10]. [11]. [12].   *

1.4 An analog signalling data link is made up of voice-frequency analog transmission channels either 4 kHz or 3 kHz spaced. and modems (not currently planned for BOC networks).   *

1.5 Signalling System No. 7 is capable of operating over both terrestrial and satellite transmission links (see footnote 1). (Satellite links are not currently planned for BOC networks.)   *

1.6 The operational signalling data link shall be exclusively dedicated to the use of a Signalling System No. 7 signalling link between two signalling points. No other information should be carried by the same channel with the signalling information.

       (Clarification) The term "signalling information." in this context. refers to all information   *
       transferred over Signalling System No. 7 using its protocol.   *

1.7 Equipment such as echo suppressors. digital pads. or A/μ law converters attached to the transmission link must be disabled in order to assure full duplex operation and bit integrity of the transmitted data stream.

1.8 56 kbit/s. evolving to 64 kbit/s. digital signalling channels entering a digital exchange via a multiplex   *
structure shall be switchable as semi-permanent channels in the exchange.   *

2. SIGNALLING BIT RATE[2]

2.1 General

2.1.1 The standard bit rate on a digital bearer will be 56 kbit/s. The standard bit rate will evolve to 64   *
kbit/s when 64 kbit/s links are made available.   *

2.1.2 Lower bit rates may be adopted for each application. taking into account the User Part requirements
and the capability of available transmission links (not currently planned for BOC networks).   *

2.1.3 The minimum signalling bit rate for telephone call control applications will be 4.8 kbit/s. For other
applications. . . (not specified for U.S. Networks).   *

2.2 Use of Bit Rates Lower than 56/64 kbit/s   *

2.2.1 For national telephone call control applications. use of Signalling System No. 7 at bit rates lower
than 56/164 kbit/s shall take account of the requirement to minimize the answer signal delay when in-band
line signalling systems are involved (Recommendation Q.27 [13]).

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[1] The terms "transmission channel" and "transmission link" are used in Signalling System No. 7 instead of "transfer channel" and "transfer link" as used in Signalling System No. 6.

[2] The performance requirements of Q.706 assume the use of 56/64 kbit/s signalling links. The use of lower bit rate links is not preferred.

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2.2.2 Signalling System No. 7 can be. . . (not specified for U.S. Networks).

2.2.3 The possible use of Signalling System No. 7 can be. . . (not specified for U.S. Networks).

3. ERROR CHARACTERISTICS AND AVAILABILITY

Error characteristics and availability requirements will conform to relevant Recommendations: for example, Recommendation G.821 [3] on digital circuits.

No additional characteristics or requirements will be specified in the Recommendation.

4. INTERFACE SPECIFICATION POINTS

4.1 Interface requirements may be specified at one of three points: A, B or C in Figure 2/Q.702. The appropriate point depends on the nature of the transmission links used and the approach toward the implementation of interface equipment adopted by each Administration.
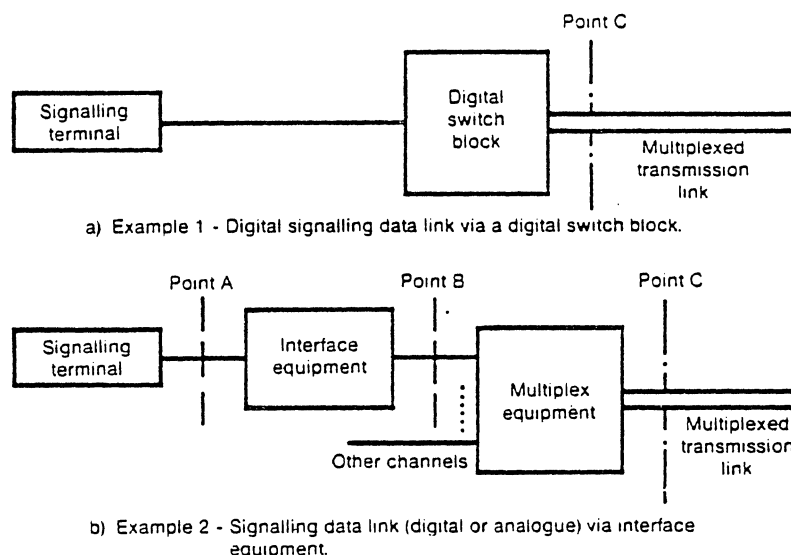
Point C

```
┌──────────┐                    ┌──────────┐
│Signalling│                    │ Digital  │
│ terminal │────────────────────│  switch  │
│          │                    │  block   │──────────
└──────────┘                    └──────────┘  Multiplexed
                                               transmission
                                               link
```

a) Example 1 - Digital signalling data link via a digital switch block.

Point A   Point B   Point C

```
┌──────────┐      ┌──────────┐      ┌──────────┐
│Signalling│      │Interface │      │          │
│ terminal │──────│equipment │──────│ Multiplex│
│          │      │          │      │equipment │──────────
└──────────┘      └──────────┘      │          │  Multiplexed
                              Other  │          │  transmission
                             channels└──────────┘  link
```

b) Example 2 - Signalling data link (digital or analogue) via interface equipment.

Figure 2/Q.702 -
Interface specification points

4.2 For the national/international application, interface requirements at either Point B or Point C will apply.

4.3 Interface requirements for a/an national/international digital signalling data link will be specified at Point C in accordance with the specific multiplex structure used (see Section 5).

4.4 Interface requirements for an analog signalling data link will be specified at Point B on a single channel basis and, thus, are independent of multiplex equipment used (see Section 6).

4.5 Interface at Point A may or may not appear in particular implementations, as each Administration may adopt different approaches toward the implementation of interface equipment. If it does appear in implementations, then the interface requirements specified in Recommendation G.703 [4] (for 56 kbit/s interface) should be followed as appropriate.

4.6 Implementations that do not follow all the requirements in the relevant Recommendations cited above should nevertheless take into account those requirements specified for testing and maintenance actions that require communication between the two ends of a data link. Interface requirements for testing and maintenance are specified in Recommendation Q.707.

5. DIGITAL SIGNALLING DATA LINK

5.1 Signalling Data Link Derived from the 2048 kbit s Digital Path   *
(Not planned for implementation in U.S. Networks.)   *

5.2 Signalling Data Link Derived from the 8448 kbit s Digital Path   *
(Not planned for implementation in U.S. Networks.)   *

5.3 Signalling Data Link Derived from the 1544 kbit s Digital Path   *
When a signalling data link is to be derived from the 1544 kbit. s digital path, the following shall   *
apply.   *

a) The interface requirements specified at Point C in Figure 2/Q.702 should comply with   *
Recommendations G.703[4] for electrical characteristics, and G.733[1] and G.736[2] for other aspects — *
e.g. for the frame structure — or to References [10] and [11].   *

b) The signalling bit rate shall be 56 kbit/s evolving to 64 kbit/s at points A and B.   *

c) Any standard timeslot available for 56 kbit s evolving to 64 kbit s user transmission may be used for *
the signalling data link. (This is subject for further study.)   *

d) No bit inversion is performed.   *

5.4 Different Encoding Laws   *

(Not planned for implementation in U.S. Networks.)   *

5.5 Signalling Data Link Established Over Data Circuits   *

When a signalling data link is to be established over data circuits derived from a 1544 kbit s   *
digital stream, having a frame structure as specified in Recommendation G.736 [2], the interface at Point *
A in Figure 2 Q.702 shall be a Recommendation V.35 [5] interface.   *

6. ANALOG SIGNALLING DATA LINK

6.1 Signalling Bit Rate

6.1.1 Applications of the analog signalling data link must take account of the delay requirements described in Section 2.2.

6.1.2 For telephone call control applications, the signalling bit rate over an analog signalling data link shall be greater than or equal to 4.8 kbit/s.

6.2 Interface Requirements   *

(Not specified in U. S. Networks.)   *

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REFERENCES

[1] CCITT Recommendation, "Characteristics of primary PCM multiplex equipment operating at 1544 kbit/s." Vol. III, Fascicle III.3, Rec. G.733.

[2] CCITT Recommendation, "Characteristics of a digital multiplex equipment operating at 1544 kbit/s." Vol. III, Fascicle III.3, Rec. G.736.

[3] CCITT Recommendation, "Error performance on an international digital connection forming part of an integrated services digital network," Vol. III, Fascicle III.3, Rec. G.821.

[4] CCITT Recommendation, "General aspects of interfaces," Vol. III, Fascicle III.3, Rec. G.703.

[5] CCITT Recommendation, "Data transmission at 48 kilobits per second using 60-108 kHz group band circuits," Vol. VIII, Fascicle VIII.1, Rec. V.35.

[6] "The Digital Data System - Overall System Description," AT&T (provided to the USITA Network Planning Subcommittee). July 1973.

[7] Publication 41021: "Digital Data System - Channel Interface Specifications," Bell System Data Communications Technical Reference, March 1973.

[8] "Compatibility and Interface Specification at the Subscriber Cable Distribution (Baseband) Level," AT&T (provided to the USITA Network Planning Subcommittee), July 1973.

[9] Publication 41450: "Digital Data System - Data Service Unit Specifications," Bell System Data Communications Technical Reference, November 1981.

[10] AT&T Technical Advisory No. 34: "DSX-1 Compatibility Specification," AT&T, October 1979, Issue 3

[11] "Compatibility and Interface Specification at the Inter-Digital Serving Area DS-1 Level," AT&T (provided to USITA Network Planning Subcommittee), July 1973.

[12] AT&T Technical Advisory No. 68: "D3 and D4 56 KB Dataport Channel Unit Technical Reference and Compatibility Specification," April 1981, Issue 1.

[13] CCITT Recommendation, "Transmission of the answer signal," Vol. VI, Fascicle VI.1, Rec. Q.27.