All drawings appearing in this Recommendation have been done in Autocad.

Recommendation Q.511

EXCHANGE INTERFACES TOWARDS OTHER EXCHANGES

1 General

This Recommendation applies to digital local, combined, transit and international exchanges for telephony in Integrated Digital Networks (IDN) and mixed (analogue/digital) networks, and also to local, combined, transit and international exchanges in an Integrated Services Digital Network (ISDN).

The field of application of this Recommendation is more fully defined in Recommendation Q.500.

2 Scope of Recommendation

This Recommendation is not intended to define any systems or equipment in or connected to, a digital exchange via these interfaces. Therefore only the characteristics of the interfaces are described.

The exchange interfaces described in this Recommendation are used to connect these exchanges to transmission facilities towards other exchanges.

All interfaces that have been studied in detail are described, and illustrated in Figure 1/Q.511 but it is not intended to specify every interface. Other interfaces are for further study (e.g., those for broadband facilities).

3 Characteristics of digital interfaces towards other exchanges

3.1 *Interface A*

3.1.1 *General*

Interface A is a digital interface to allow interconnection at the first level of a digital transmission hierarchy towards other exchanges.

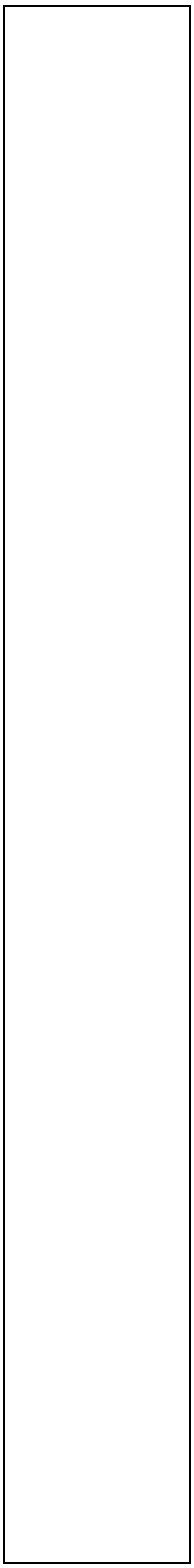
3.1.2 *Electrical characteristics*

The electrical characteristics of interface A are described in Recommendation G.703.

The frame structure at interface A should be identical to that of the first order multiplexes described in Recommendations G.704 and G.705.

Timing in the transmitting direction will be derived within the digital exchange.

Figure 1/Q.511 - T1115680-88



3.1.3 *Channel types, channel allocation and signalling*:

— number of channel timeslots per frame: 32/24, numbered 0—31/1—24;

— additional channel timeslots may be utilized for common channel signalling when more signalling capacity is required between exchanges. For 2048 kbit/s systems, they should be selected from the channel timeslots allocated in PCM multiplexes for data purposes according to Recommendation G.735. When no such channel timeslots are allocated or available, additional channel timeslots may be selected from channel timeslots allocated for voice channels.

For 2048 kbit/s systems:

— channel timeslot 16 is primarily intended for signalling but should be switchable. On systems between exchanges (not involving PCM primary muldex) when channel 16 is not assigned to carry signalling it may be allocated to speech or other srvices;

— channel timeslot 0 is used for frame alignment, alarm indication, network synchronization and other purposes;

— although no specific application is at present foreseen for switching timeslot 0, it is recommended that the possibility of read and write access to this timeslot should be retained as a safeguard for future requirements. Such access would allow processing of some or all of the information contained in this timeslot, in particular those bits reserved for national and international use. The need to switch channel timeslot 0 as a normal channel, without special access, requires further study. In any case the incoming frame alignment signal will not be passed through the exchange to an outgoing system.

3.1.4 *Functional characteristics*

The use of the Cyclic Redundancy Check (CRC) procedures described in Recommendation G.704 is recommended for interfaces which carry ISDN traffic and optional for other applications. The frame alignment, CRC multiframe alignment and CRC monitoring functions are in accordance with Recommendation G.706.

3.2 *Interface B*

3.2.1 *General*

Interface B is a digital interface to allow interconnection at the second level of a digital transmission hierarchy towards other exchanges.

3.2.2 *Electrical characteristics*

The electrical characteristics of interface B are described in Recommendation G.703.

The frame structure at interface B should be identical to that of the second order multiplexes described in Recommendations G.704 and G.705.

Timing in the transmitting direction will be derived within the digital exchange.

3.2.3 *Channel types, channel allocation and signalling:*

— number of channels: 132/98 numbered 0—131/1—98.

For 8448 kbit/s systems:

— where signalling capacity is required between exchanges, timeslots 67, 68, 69 and 70 can be utilized for signalling in this order of descending priority. Those channels not used for signalling can be used for speech or other purposes. If a channel timeslot is reserved for service purposes within the switch, it shall be channel timeslot 1;

— it is left for mutual agreement whether or not channel timeslot 1 will carry traffic;

— 128 of the channel timeslots may carry traffic through the exchange.

For 6312 kbit/s systems:

— the multiplex structure contains 5 bits and 98 channel timeslots, numbered 1—98, each of 64 kbit/s, of which 96 may carry traffic through the exchange;

— five bits per frame are assigned for a frame alignment signal and for other signals. Timeslots 97 and 98 are assigned to signalling between exchanges.

3.2.4 *Functional characteristics*

The use of the Cyclic Redundancy Check (CRC) procedures described in Recommendation G.704, is recommended for interfaces which carry ISDN traffic and optional for other applications. The frame alignment, CRC multiframe alignment and CRC monitoring functions are in accordance with Recommendation G.706.

4 Characteristics of analogue interfaces towards other exchanges

4.1 *Interface C*

4.1.1 *General*

Interface C is a 2—wire or a 4—wire analogue interface, used where direct interconnection analogue facilities is required. This implies that a PCM codec, associated with this interface, is incorporated in the digital exchange. The equipment on the exchange side of interface C may include a muldex within the exchange termination functions. Differences in circuit configurations with respect to transmission parameters are likely to result in the need to specify a number of different C interfaces, depending on the application environment. This is likely to reduce the flexibility in interconnection possibilities. These C interfaces are specified in Recommendation Q.551. The transmission characteristics of 2—wire interface C2 are described in Recommendation Q.552 and of 4—wire interface C1 in Recommendation Q.553.

4.1.2 *Channel types, channel allocation and signalling*

The signalling characteristics of interface C vary considerably from country to country, and therefore it is not intended that this interface should be the subject of CCITT Recommendations beyond those aspects covered in Recommendations Q.552 and Q.553.