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**NETWORK CONNECTION SPECIFICATION
FOR CONNECTION OF
CUSTOMER PREMISES EQUIPMENT (CPE)
TO THE PUBLIC TELECOMMUNICATIONS
NETWORK (PTN) IN HONG KONG
USING ISDN PRIMARY RATE ACCESS (PRA)
AT 1544 kbit/s
BASED ON ITU-T RECOMMENDATIONS**



**TELECOMMUNICATIONS AUTHORITY
HONG KONG**

FOREWORD

1. This specification is issued pursuant to Section 32D of the Telecommunications Ordinance (Cap. 106). This specification sets out the technical requirements of customer premises equipment (CPE) which uses Primary Rate Access (PRA) at the transmission rate of 1544 kbit/s and is to be connected to Integrated Services Digital Network (ISDN) based on International Telecommunication Union – Telecommunication (ITU-T) recommendations.
2. The following services are classified as basic services and transparent communication of ISDN terminal equipment connected to different ISDNs is supported:
 - (a) basic voice and data communications by using the B channels;
 - (b) Calling Line Identification Presentation;
 - (c) Calling Line Identification Restriction;
 - (d) Multiple Subscriber Number;
 - (e) Subaddressing; and
 - (f) Group 4 fax transmission.

The three services (a), (b) and (c) above are the minimum services which must be included by the operators offering ISDN services in their portfolio. For ISDN services other than the basic services, they will be offered by individual operators at their own discretion.

3. ISDN services may be provided by any one of the Fixed Telecommunications Network Services (FTNS) operators in Hong Kong. CPE should comply with this specification for connection to the ITU-T based PRA ISDN line provided by the FTNS operators. Supplementary information on network characteristics and services of the FTNS networks may be obtained direct from the operators. Contact information of the FTNS operators can be found in the information note OFTA I 412.
4. At present, the Office of the Telecommunications Authority (OFTA) operates a **Hong Kong Telecommunications Equipment Evaluation and Certification (“HKTEC”)** scheme. Details of the scheme can be found in the information note OFTA I 421. Under the scheme, suppliers or manufacturers may apply to OFTA for certification of their customer premises equipment against this specification. The application procedures for certification of customer premises equipment can be found in the information note OFTA I 412. A prescribed label may be affixed to the equipment which has been certified by the Telecommunications Authority (TA). Details of the labelling arrangement can be found in the Standardisation Guide HKTA 3211.
5. The TA may amend any part of this specification as and when he deems necessary.
6. In case of doubt about the interpretation of this specification, the methods of carrying out the test and the validity of statements made by the manufacturers of the equipment, the decision of the TA shall be final.
7. The TA accepts no responsibility for the satisfactory performance of the CPE connected to the public telecommunications networks. The CPE is not normally evaluated against performance, reliability or quality-of-service parameters.

8. The HKTA specifications and information notes issued by the TA can be obtained through one of the following methods:-
- Downloading direct through the OFTA's Internet Home Page. The Home Page address is <http://www.ofta.gov.hk>;
 - Making a request for hard copies to:-

Senior Telecommunications Engineer
Standards Section
Office of the Telecommunications Authority
29/F Wu Chung House
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Wanchai
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Fax: +852 2838 5004
Email: standards@ofta.gov.hk

9. Enquiries about this specification may be directed to:-

Senior Telecommunications Engineer
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AMENDMENT TABLE

Item	Issue No.	Paragraph	Descriptions
1.	Issue 2	Foreword Para. 4	Update contact information for FTNS operators.
2.	Issue 2	Foreword Para. 6-7	Add information for HKTEC Scheme and classify the CPE under CCS Cat. I.
3.	Issue 2	Section I - 3	The electrical safety requirement is referred to HKTA 2001.
4.	Issue 3	Foreword	Certification and labelling arrangements are updated.
5.	Issue 4	Clause 3.1 of Part E, in Section II	The description on CND function is modified.
6.	Issue 5	Clause 9	ITU-T Recommendation E.163 is removed from the list of reference documents as E.163 has been withdrawn with its content incorporated in E.164.

CONTENTS

SECTION I - INTRODUCTION

1. Scope
2. Organisation of Document
3. Electrical Safety
4. Interconnect Point
5. Definition
6. Summary of Capabilities
7. Digital Network - General Requirements
8. Propagation Delay
9. Reference Documents

SECTION II - TECHNICAL SPECIFICATIONS

- Part A ISDN Primary Rate User-Network Interface Layer 1 Specification
Compliance To ITU-T Recommendation I.431
- Part B ISDN User-Network Interface Data Link Layer General Aspects (Primary Rate Access)
Compliance To ITU-T Recommendation Q.920 (I.440)
- Part C ISDN User-Network Interface Data Link Layer Specification (Primary Rate Access)
Compliance To ITU-T Recommendation Q.921 (I.441)
- Part D ISDN User-Network Interface Layer 3 General Aspects (Primary Rate Access)
Compliance To ITU-T Recommendation Q.930 (I.450)
- Part E ISDN User-Network Interface Layer 3 Specification for Basic Call Control
(Primary Rate Access)
Compliance To ITU-T Recommendation Q.931 (I.451)

Appendix A Usage of Cause Values

SECTION I - INTRODUCTION

1. SCOPE

This Network Connection Specification defines the requirements for the access protocol for interconnection between the FTNS operators' network and user's equipment (eg a PABX or network terminal adapter) using Primary Rate Access (PRA) of Integrated Services Digital Network (ISDN) at the transmission rate of 1544 kbit/s. The protocol shall be applied to T reference point as defined in the ITU-T Rec. I.430. ISDN terminal equipment intended to be connected to the ISDN by PRA in Hong Kong based on ITU-T recommendations shall comply with this specification.

The layered protocol defined is based on the ITU-T I-Series Recommendations I.431, I.440 (Q.920), I.441 (Q.921), I.450 (Q.930) and I.451 (Q.931). All definitions and descriptions contained in these Recommendations apply, except for where contradicted by this and associated documents.

This Specification only stipulates the technical requirements on the physical layer, data link layer and network layer protocols for a user to access to the ISDN using PRA at the transmission rate of 1544 kbit/s.

2. ORGANIZATION OF THIS DOCUMENT

This Specification is organised into 2 sections. Section I is an introduction. Section II contains five parts covering the technical requirements for layers 1, 2 and 3 respectively. Appendix A describes the usage of cause values. The ISDN primary rate access protocol is based on related ITU-T Recommendations including:

Part A - I.431 "Primary Rate User-Network Interface Layer 1 Specification"

Part B - Q.920 (I.440) "ISDN User-Network Interface Data Link Layer General Aspects"

Part C - Q.921 (I.441) "ISDN User-Network Interface Data Link Layer Specification"

Part D - Q.930 (I.450) "ISDN User-Network Interface Layer 3 General Aspects"

Part E - Q.931 (I.451) "ISDN User-Network Interface Layer 3 Specification For Basic Call Control"

Appendix A - Usage of Cause Value

3. **ELECTRICAL SAFETY**

3.1 **PRINCIPLE OF PROTECTION**

In order to safeguard operating personnel, users, and plant, it is essential to prevent the transmission of excessive voltages from the CPE into the public telecommunication network in Hong Kong.

3.2 **SAFETY REQUIREMENTS**

The CPE shall comply with specification HKTA 2001 titled “Compliance Test Specification – Safety and Electrical Protection Requirements for Subscriber Equipment Connected to the Public Telecommunications Networks in Hong Kong” issued by the Telecommunications Authority (TA).

4. **INTERCONNECT POINT**

4.1 Provision of the ISDN PRA service at 1544 kbit/s will require the installation of the Fixed Telecommunications Network Services (FTNS) operators' equipment and internal cabling in customer premises. A normal office air-conditional environment is required as well as a maintained power supply. Either a mains power supply at 220 Vrms \pm 10% taken from the same point in the building distribution as the CPE or a suitable power supply at -48 Vdc \pm 10% should be provided by the customer.

4.2 The interconnect point marks the division of responsibility between the network service provider and the customer (please see Figure 1 below).

4.3 The network operator will provide socket for connection, disconnection or re-connection of the equipment to the interconnect point. The customer will be responsible for connection and disconnection of CPE at the interconnect point. However, when more than four 1544 kbit/s links are provided to a single location, other methods (e.g. connection panel, MDF) are used instead of sockets.

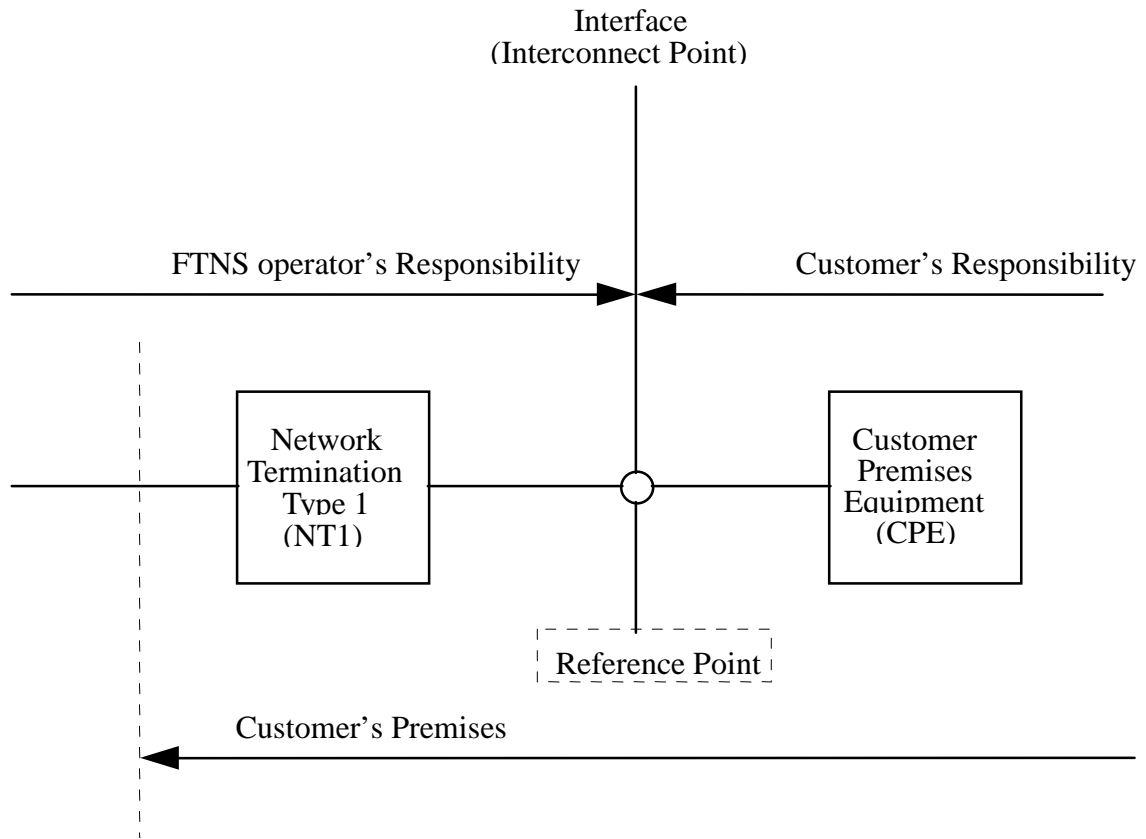


Figure 1 Interconnection of 1544 kbit/s CPE to FTNS operator's ISDN at the Interconnect Point

5. DEFINITION

D-channel-	A 64 kbit/s channel carrying signalling (refer to ITU-T Rec. I.412)
B-channel-	A 64 kbit/s channel that carries user information such as circuit switched data, etc. (refer to ITU-T Rec. I.412)
USER	- User equipment, e.g. terminal.
NT	- Network Termination, is used to indicate network terminating aspects of NT1 functional group.
NT1	- Network Termination 1, includes functions broadly equivalent to layer 1 (physical) of the OSI reference model.
NT2	- Network Termination 2, includes functions broadly equivalent to layer 1 and higher layers of the ITU-T Recommendation X.200 reference model.
TE	- Terminal Equipment, is used to indicate terminal terminating aspects of TE1 or TE2 functional group which includes functions broadly belonging to layer 1 and higher layers of the ITU-T Recommendation X.200 reference model.
TE1	- Terminal Equipment Type 1, has an interface that complies with the ITU-T ISDN user-network interface Recommendations.
TE2	- Terminal Equipment Type 2, has an interface that complies with interface Recommendations other than the ITU-T ISDN interface Recommendation (e.g. the V- or X-series interface Recommendations) or has interfaces not included in ITU-T Recommendation.
TEI	- Terminal Endpoint Identifier, is used to identify a specific connection endpoint within a service access point.
TA	- Terminal Adapter, is used to allow a TE2 terminal to be served by an ISDN user-network interface. It includes functions broadly belonging to layer 1 and higher layers of the ITU-T Recommendation X.200 reference model.
ET	- Exchange Termination, is used to indicate exchange terminating functional group which includes at least the layer 2 (Q.920/Q921) and layer 3 (Q.930/Q.931) network side functions.

6. SUMMARY OF CAPABILITIES

6.1 SERVICE FEATURE CHARACTERISTICS

6.1.1 Circuit mode bearer services are supported over the T reference point of the primary rate access interface:

Circuit mode: 64 kbps, 8 kHz structured, on demand

- 3.1 kHz audio
- speech
- unrestricted digital

6.1.2 Channels can be set to bi-directional or unidirectional (either incoming or outgoing) operation on a per interface basis.

6.1.3 Non-associated signalling without D channel backup procedures is supported.

6.1.4 H0 and H1 channel capabilities are not supported.

- 6.1.5 Rate Adaptation is not performed in the network.
- 6.1.6 In band tones/announcements from Customer Premises Equipment (e.g. PABX) prior to the reception of answer signal (i.e. CONNECT message) is not allowed.

6.2 SUMMARY OF CAPABILITIES FOR LAYER 1

- 6.2.1 Only interface for 1,544 kbit/s primary rate is supported.
- 6.2.2 The primary rate access supports only the point-to-point configuration.
- 6.2.3 The interface is active at all times.
- 6.2.4 User/customer should provide power to the FTNS operators NT1 equipment in customer premises.

6.3 SUMMARY OF CAPABILITIES FOR LAYER 2

- 6.3.1 Only acknowledged operation is supported in primary rate access.
- 6.3.2 The optional procedures for Retransmission of REJ response frame is not supported.
- 6.3.3 Data link layer monitor function is supported in the network side.
- 6.3.4 Only permanent data link connection is supported.
- 6.3.5 The activation and deactivation services for physical layer are not supported.
- 6.3.6 Default parameter values:

- SAPI = 0 for signalling
- SAPI = 16 for D-channel packet communication is not supported
- TEI = 0
- N200 = 3
- N201 = 260 octets
- T200 = 1 second for point-to-point connection
- T203 = 10 seconds
- k = 7 for a service access point supporting primary rate access signalling

6.4 SUMMARY OF CAPABILITIES FOR LAYER 3

- 6.4.1 For circuit switched connection, both overlap and enbloc sending modes are supported.
- 6.4.2 For circuit switched connection, only enbloc receiving mode is supported.
- 6.4.3 Only μ -law is used for coding of analogue signals by Pulse Code Modulation.
- 6.4.4 User-to-user signalling is not supported initially.

6.4.5 Temporary signalling connection is not supported.

6.4.6 The following messages are not supported:

SEGMENT
CONGESTION CONTROL
FACILITY
USER INFORMATION

6.4.7 The following information elements are not supported:-

More Data	End-to-End Transit Delay
Congestion Level	Transit Delay Selection & Indication
Repeat Indicator	Packet Layer Window Size
Segmented Message	Packet Size
Facility	Redirecting Number
Network Specific Facilities	Transit Network Selection
Date/Time	User-user
Switchhook	Calling Party Subaddress
Information Rate	Called Party Subaddress

6.4.8 The following timers in the network side are not supported:-

T304
T314
T320

6.4.9 Packet Mode Services are not supported.

7. **DIGITAL NETWORK - GENERAL REQUIREMENTS**

7.1 CODING OF ANALOGUE SIGNALS BY PULSE CODE MODULATION

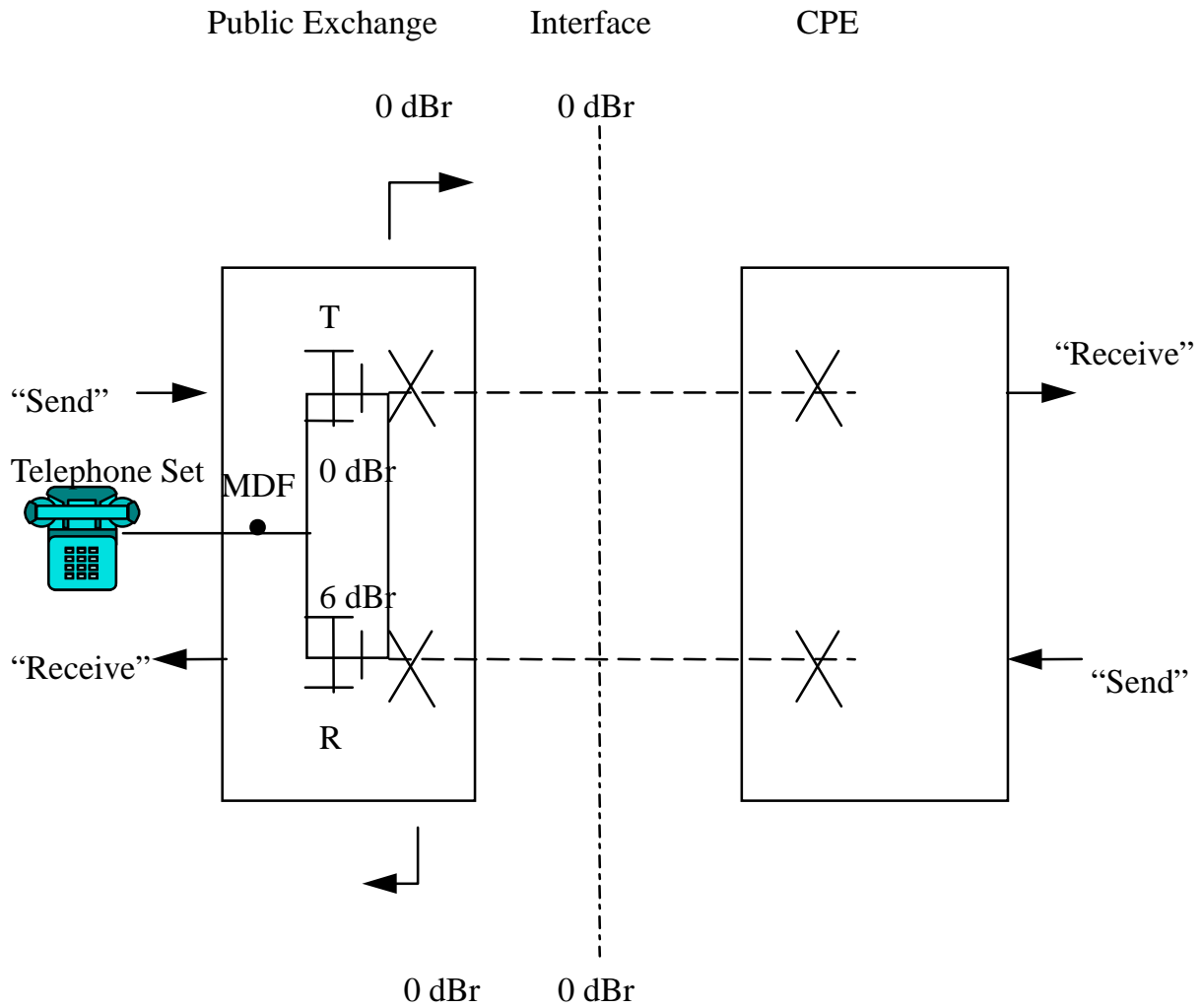
All analogue signals are encoded and decoded in accordance with the μ -law defined in Section 3.2 of ITU-T Recommendation G.711 "Pulse Code Modulation (PCM) of Voice Frequencies".

7.2 PAD SETTINGS FOR TRANSMISSION PATHS

Figure 2 shows the pad settings for the "Send" path and the "Receive" path on the public exchange side. CPE should be capable of interworking with the public exchange when the following requirements are taken into consideration:

7.2.1 Send Loudness Ratings (SLRs) and Receive Loudness Ratings (RLRs) measured at the interface (i.e. 0 dBr points) are in accordance with the short-term and/or long-term objectives given in ITU-T Recommendation G.121 "Loudness Ratings (Lrs) of National Systems".

7.2.2 “Stability” and “echo” semi-loop losses meet the requirements of ITU-T Recommendation G.122 “Influence of National Systems on Stability, Talker Echo, and Listener Echo in International Connections”.



Legend :

- Analogue Transmission
- - - Digital Transmission
- |— A/D or D/A Coder or Decoder
- - X - - Digital Switching
- |— Analogue Pad (with T or R Loss)

Figure 2 Pad Settings for Transmission Paths

7.3 NETWORK SYNCHRONIZATION

7.3.1 General

Network synchronization is required in a digital network. Reliable synchronization of CPE clocks (treated as stratum 4 entities) depends entirely on receiving a time reference that is phase-locked to an equal or higher quality clock. To increase the availability of a timing reference, the CPE clocks are preferred to be capable of accepting more than a single synchronization reference source (e.g., one primary and one or more secondaries). An automatic means is desirable to switch over from a facility carrying the primary reference source to another facility carrying the secondary reference.

7.3.2 Basic Requirements on CPE Synchronization Equipment

(a) Synchronization Method

The CPE must be able to synchronize (as a slave) to the digital exchange using master-slave synchronization method.

(b) Capability of External Synchronization

It is preferable that the CPE clock should be capable of external synchronization via a feedback mechanism from at least two external PCM links under a multi-link configuration. The CPE should be able to select and extract the timing signal from the incoming bit stream of a normal traffic-carrying link, and preferably be able to select between the primary and secondary links under a multi-link configuration (see Figure 3).

(c) Clock Requirements

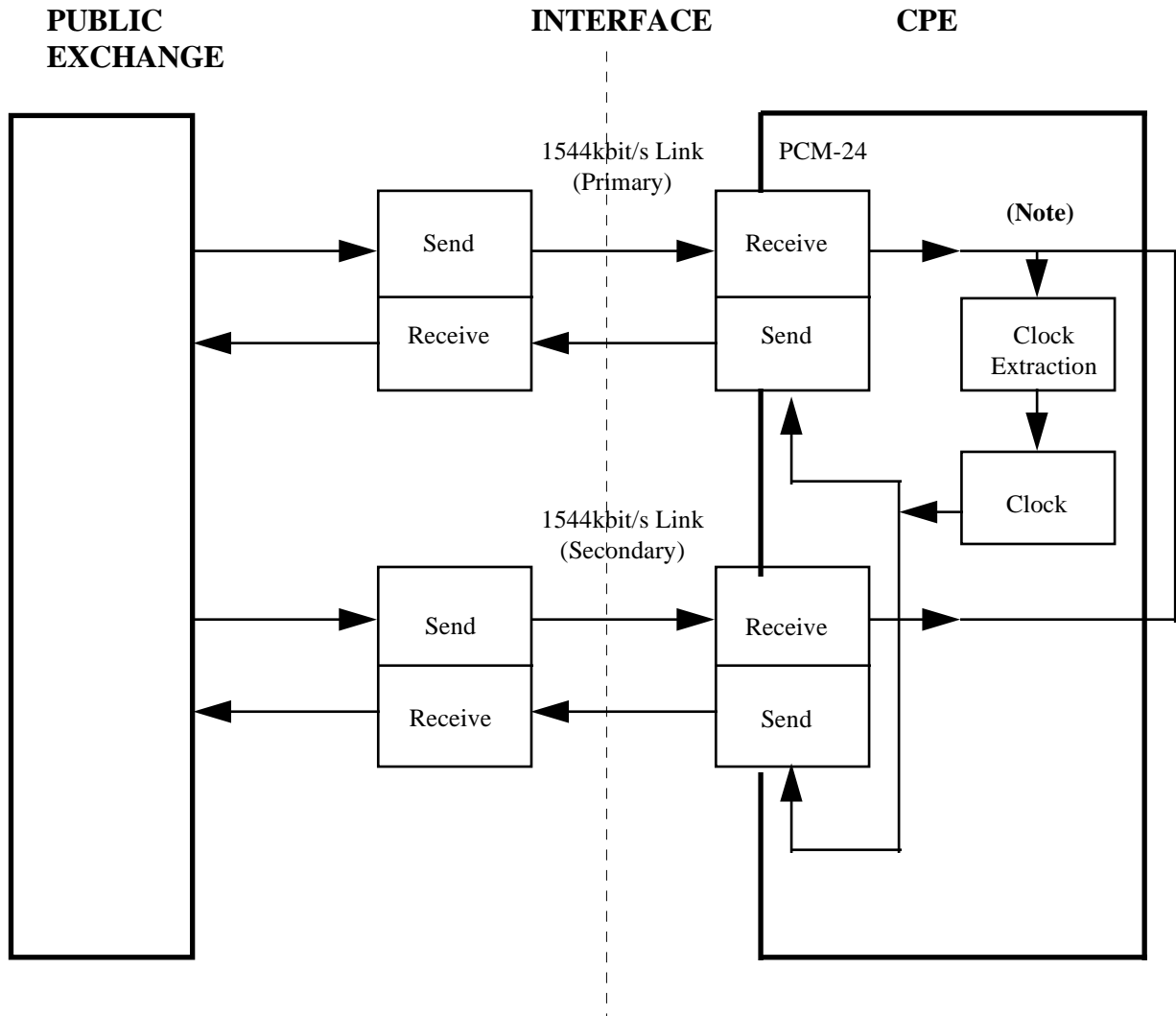
The clocks are receivers of timing and must meet the following requirements.

Item Description	Note	Requirement of CPE Clock
Minimum Accuracy	1	+/- 3.2×10^{-5}
Minimum Stability (Per 24 Hours)	2	+/- 3.7×10^{-7}
Pull-In Range	3	Must be capable of synchronizing to clock with accuracy of +/- 3.2×10^{-5}

Note 1 : Minimum accuracy represents the maximum long-term (e.g., 20 years) deviation from the nominal frequency with no external frequency reference.

Note 2 : Minimum stability or drift rate represents the maximum rate of change of the clock frequency with respect to time upon loss of all frequency references.

Note 3 : Pull-in range is a measure of the maximum input frequency deviation from the nominal clock rate that can be overcome by a clock to pull itself into synchronization with another clock.



Note : The CPE should be able to select and extract the timing signal from the incoming bit stream of a normal traffic-carrying link, and preferably be able to switch between the primary and secondary links under a multi-link configuration.

Figure 3 Preferred Synchronisation Method between Public Exchange and CPE

8. PROPAGATION DELAY

Because of various types of connection media being used in the FTNS operator's network and international network, propagation delay varies significantly depending on media used, e.g. satellite, cable, etc. In order to adapt to delay caused by different media, CPE should be able to perform handshaking for propagation delay up to 800 ms. Capability of the CPE to handle extra delay which could occur in long distance calls will be desirable.

9. REFERENCES DOCUMENTS

- [1] ITU-T Recommendation I.431 Primary rate user-network interface layer 1 specification
- [2] ITU-T Recommendation Q.920 (I.440) ISDN user-network interface data link layer - General aspects
- [3] ITU-T Recommendation Q.921 (I.441) ISDN user-network interface data link layer specification
- [4] ITU-T Recommendation Q.930 (I.450) ISDN user-network interface layer 3 - General aspects
- [5] ITU-T Recommendation Q.931 (I.451) ISDN user-network interface layer 3 specification for basic call control
- [6] ITU-T Recommendation I.23X - Bearer services
- [7] ITU-T Recommendation I.24X - Teleservices
- [8] ITU-T Recommendation I.251.1 - Direct-Dialing-In (DDI)
- [9] ITU-T Recommendation I.320 - ISDN protocol reference model
- [10] ITU-T Recommendation I.33X - Numbering, addressing and routing
- [11] ITU-T Recommendation I.41X - ISDN user-network interfaces
- [12] ITU-T Recommendation G.703 - Physical/electrical characteristics of hierarchical digital interfaces
- [13] ITU-T Recommendation G.704 - Functional characteristics of interfaces associated with network nodes
- [14] ITU-T Recommendation G.711 - Pulse code modulation (PCM) of voice frequencies
- [15] ITU-T Recommendation X.21 - Interface between data terminal equipment (DTE) and data circuit terminating equipment (DCE) for synchronous operation on public data networks
- [16] ITU-T Recommendation X.121 - International numbering plan for public networks
- [17] ITU-T Recommendation E.164 - The international public telecommunication numbering plan
- [18] ITU-T Recommendation F.69 - Plan for telex destination codes
- [19] ITU-T Recommendation T.62 - Control procedures for Teletex and Group 4 facsimile services
- [20] ISO 3309 Data communication - High-level data link control procedures - Frame structure

SECTION II
PART A

ISDN PRIMARY RATE USER-NETWORK INTERFACE
LAYER 1 SPECIFICATION

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
1.			O				<p><u>INTRODUCTION</u> Interface for 1,544 kbit/s primary rate is supported. Interface for 2,048 kbit/s primary rate is not supported.</p>
2.	O						<p><u>TYPE OF CONFIGURATION</u></p>
2.1	O						<p><u>Point-to-point</u></p>
2.2			O				<p><u>Location of Interfaces</u> Interface for 2,048 kbit/s is not supported</p>
3.							<p><u>FUNCTIONAL CHARACTERISTICS</u></p>
3.1			O				<p><u>Summary of Functions (Layer 1)</u> H0 and H1 channel capabilities are not supported.</p>
3.2			O				<p><u>Interchange Circuits</u> An additional interchange circuit is used for power feeding from user side via the interface.</p>
3.3	O						<p><u>Activation/Deactivation</u></p>
3.4	O						<p><u>Operational Functions</u> Term NT (or “network side”) is used to indicate NT1, LT & ET functional groups at the T reference point and the term TE (or “user side”) is used to indicate terminal terminating layer 1 aspects of NT2 functional group at the T reference point.</p>
3.4.1			O				<p><u>Definition of signals at the interface</u> The information related only to 2,048 kbit/s system within all signals is not supported. CRC error information in normal operational frame is not generated by network side.</p>
3.4.2	O						<p><u>Definitions of state tables at network and user sides</u></p>
3.4.3		O					<p><u>Layer 1 states on the user side of the interface</u> The layer 1 states under this section may exist on the user side of the interface State F5 is identical to state F2</p>
3.4.4	O						<p><u>Layer 1 states at the network side of the interface</u> State G5 follows state G2</p>
3.4.5	O						<p><u>Definition of primitive</u></p>
3.4.6	O						<p><u>State tables</u> The layer 1 states at the user side of the interface may conform to Table 2/I.431.</p>

Compliance With ITU-T Recommendation I.431

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.							<u>INTERFACE AT 1,544 KBIT/S</u>
4.1							<u>Electrical Characteristics</u>
4.1.1	O						<u>Bit rate</u>
4.1.2	O						<u>Interchange circuit medium</u>
4.1.3	O						<u>Code</u>
4.1.4							<u>Specifications at the output ports</u>
4.1.4.1	O						<u>Test load</u>
4.1.4.2			O				<u>Pulse mask</u> The pulse mask will follow ITU-T Rec. G.703 Figure 10/G.703 initially instead of I.431 Figure I-1/I.431.
4.1.4.3			O				<u>Voltage of zero</u> The pulse mask will follow ITU-T Rec. G.703 Figure 10/G.703 initially instead of I.431 Figure I-1/I.431
4.1.5	O						<u>Specifications at the input ports</u>
4.2	O						<u>Frame Structure</u>
4.3	O						<u>Timing Considerations</u>
4.4	O						<u>Time Slot Assignment</u>
4.5							<u>Timing Jitter</u>
4.5.1							<u>Jitter</u>
4.5.1.1			O				<u>Tolerable Jitter at TE Output</u> The input jitter will follow ITU-T Rec. G.824 Figure 3/G.824 initially instead of I.431 Figure 5/I.431
4.5.1.2	O						<u>TE Output Jitter</u>
4.5.2							<u>Wander</u>
4.5.2.1	O						<u>Signal from the network side</u>
4.5.2.2	O						<u>Signal from the user side</u>
4.6							<u>Interface Procedures</u>
4.6.1		O					<u>Codes for idle channels and idle slots</u> The idle pattern transmitted by network side is "01111111".
4.6.2	O						<u>Interframe (layer 2) timefill</u>
4.6.3	O						<u>Frame alignment and CRC-6 procedure</u>
4.7							<u>Maintenance</u>
4.7.1					O		<u>General introduction</u>
4.7.2	O						<u>Maintenance functions</u>
4.7.3	O						<u>Definitions of maintenance signals at the interface</u>
4.7.4	O						<u>CRC-6 in-service performance monitoring and reporting</u>

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
5.				O			<u>INTERFACE AT 2,048 KBIT/S</u> Interface for 2048 kbit/s is not supported.
6.		O					<u>CONNECTOR</u> Permanent wiring connection between NT and TE is supported
7.		O					<u>INTERFACE WIRING</u> The symmetrical wiring is supported. Coaxial interface is not supported.
8.							<u>POWER FEEDING</u>
8.1	O						<u>Provision of power</u>
8.2		O					<u>Power available at the NT</u> The power feeding to the NT supplied by the user via the user-network interface shall be at least 50 watts and 100 VA for DC and AC respectively.
8.3		O					<u>Feeding voltage</u> For DC provision, the feeding voltage for the NT shall be in the range of -42 to -56 volts. For AC provision, the feeding voltage for the NT shall be 220 ± 10% volts.
8.4		O					<u>Safety requirements</u> The CPE should conform to relevant safety standards of the International Electrotechnical Commission (IEC), British Standards Institution (BSI), Underwriters Laboratories Inc (UL) or equivalent so that the network facilities are protected from any possible source of hazardous voltages owing to connection of the CPE.

SECTION II
PART B

ISDN USER-NETWORK INTERFACE
DATA LINK LAYER GENERAL ASPECTS
(PRIMARY RATE ACCESS)

Compliance With ITU-T Recommendation I.440 (Q.920)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
1.						O	<u>GENERAL</u>
2.						O	<u>CONCEPTS AND TERMINOLOGY</u>
3.							<u>OVERVIEW DESCRIPTION OF LAPD FUNCTIONS & PROCEDURES</u>
3.1			O				<u>General</u> 1. LAPD will support point-to-point data link connection and multiple layer 3 entities only and includes function for the provision of a permanent data link connection on a D-channel. 2. Information transfer via broadcast data link connections is not supported.
3.2				O			<u>Unacknowledged Operation</u> It is not supported.
3.3	O						<u>Acknowledged Operation</u>
3.4							<u>Establishment of Information Transfer Modes</u>
3.4.1		O					<u>Data link connection identification</u> TEI value of "0" is assigned by the network and should be assigned by the user.
3.4.2			O				<u>Data link states</u> "TEI-unassigned state" is not supported.
3.4.3				O			<u>TEI administration</u> It is not supported.
3.4.4	O						<u>Establishment of multiple frame operation</u>
4.							<u>SERVICE CHARACTERISTICS</u>
4.1						O	<u>General</u>
4.2			O				<u>Services Provided to Layer 3</u> Unacknowledged information transfer service is not supported.
4.2.1				O			<u>Unacknowledged information transfer service</u> It is not supported.
4.2.2	O						<u>Acknowledged information transfer service</u>

A : Complied with ITU-T

B : Complied with ITU-T with additional notes

C : Partially complied with ITU-T

D : Not supported

E : Under study

F : Descriptive text only

B/1

Compliance With ITU-T Recommendation I.440 (Q.920)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.3				O			<u>Services Provided to Layer Management</u> It is not supported.
4.4			O				<u>Administrative Services</u> Only "Notification of Error" with MDL-ERROR-RESPONSE primitive is supported.
4.5							<u>Model of the Data Link Service</u>
4.5.1			O				<u>General</u> 1. Unacknowledged point-to-point information transfer mode is not supported. 2. Broadcast data link connection is not supported.
4.5.2					O		<u>Data link layer representation as seen by layer 3</u>
4.5.2.1	O						<u>Data link connection endpoint states</u>
4.5.2.2				O			<u>Broadcast data link layer connection services</u> It is not supported.
4.5.2.3			O				<u>Point-to-point data link connection endpoint services</u> Unacknowledged information transfer service is not supported.
4.5.2.4	O						<u>Sequences of primitives at one point-to-point data link connection endpoint</u>
4.6			O				<u>Services Required from the Physical Layer</u> 1. The interface shall be active at all times. 2. PH-ACTIVATE-REQUEST primitive is not supported.
5.			O				<u>DATA LINK LAYER - MANAGEMENT STRUCTURE</u> 1. The functions provided by Layer Management Entity (LME) for the management of resources are not supported. 2. The function of parameter initialization by automatic negotiation of Connection Management Entity (CME) is not supported.
5.1	O						<u>Data Link Procedure</u>
5.2	O						<u>Multiplex Procedure</u>
5.3			O				<u>Structure of the Data Link Procedure</u> Broadcast connection is not supported.

A : Complied with ITU-T

B : Complied with ITU-T with additional notes

C : Partially complied with ITU-T

D : Not supported

E : Under study

F : Descriptive text only

B/2

SECTION II
PART C

ISDN USER-NETWORK INTERFACE
DATA LINK LAYER SPECIFICATION
(PRIMARY RATE ACCESS)

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
1.						O	<u>GENERAL</u>
2.							<u>FRAME STRUCTURE FOR PEER-TO-PEER COMMUNICATION</u>
2.1	O						<u>General</u>
2.2	O						<u>Flag Sequence</u>
2.3	O						<u>Address Field</u>
2.4	O						<u>Control Field</u>
2.5	O						<u>Information Field</u>
2.6	O						<u>Transparency</u>
2.7	O						<u>Frame Check Sequence (FCS) Field</u>
2.8	O						<u>Format Convention</u>
2.9	O						<u>Invalid Frames</u>
2.10	O						<u>Frame Abort</u>
3.							<u>ELEMENTS OF PROCEDURES AND FORMATS OF FIELDS FOR DATA LINK LAYER PEER-TO-PEER COMMUNICATION</u>
3.1	O						<u>General</u>
3.2	O						<u>Address Field Format</u>
3.3							<u>Address Field Variables</u>
3.3.1	O						<u>Address field extension bit (EA)</u>
3.3.2	O						<u>Command/response field bit (C/R)</u>
3.3.3			O				<u>Service access point identifier (SAPI)</u> Only SAPI = 0 is supported and should be assigned by network-side and user-side.
3.3.4			O				<u>Terminal endpoint identifier (TEI)</u> Only TEI for point-to-point data link connection is supported.
3.3.4.1				O			<u>TEI for broadcast data link connection</u> It is not supported.
3.3.4.2			O				<u>TEI for point-to-point data link connection</u> Only TEI = 0 shall be assigned for network-side and user-side.

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
3.4							<u>Control Field Formats</u>
3.4.1	O						<u>Information transfer (I) format</u>
3.4.2	O						<u>Supervisory (S) format</u>
3.4.3			O				<u>Unnumbered (U) format</u> Unnumbered information transfer for unacknowledged operation is not supported.
3.5						O	<u>Control Field Parameters and Associated State Variables</u>
3.5.1	O						<u>Poll/Final (P/F) bit</u>
3.5.2							<u>Multiple frame operation - variables and sequence numbers</u>
3.5.2.1	O						<u>Modulus</u>
3.5.2.2	O						<u>Send state variable V(S)</u>
3.5.2.3	O						<u>Acknowledge state variable V(A)</u>
3.5.2.4	O						<u>Send sequence number N(S)</u>
3.5.2.5	O						<u>Receive state variable V(R)</u>
3.5.2.6	O						<u>Receive sequence number N(R)</u>
3.5.3				O			<u>Unacknowledged operation - variables and parameters</u> It is not supported.
3.6							<u>Frame Types</u>
3.6.1	O						<u>Commands and responses</u> Exchange Identification (XID) frame is not supported.
3.6.2	O						<u>Information (I) command</u>
3.6.3	O						<u>Set asynchronous balanced mode extended (SABME) command</u>
3.6.4	O						<u>Disconnect (DISC) command</u>
3.6.5					O		<u>Unnumbered information (UI) command</u> It is not supported.
3.6.6	O						<u>Receive ready (RR) command/response</u>
3.6.7		O					<u>Reject (REJ) command/response</u> The optional procedure for the retransmission of REJ response frame described in Appendix I of ITU-T Recommendation Q.921 is not supported.
3.6.8	O						<u>Receive not ready (RNR) command/response</u>
3.6.9	O						<u>Unnumbered acknowledgment (UA) response</u>
3.6.10	O						<u>Disconnected mode (DM) response</u>
3.6.11	O						<u>Frame reject (FRMR) response</u>
3.6.12				O			<u>Exchange Identification (XID) Command/Response</u> It is not supported.

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.							<u>ELEMENTS FOR LAYER-TO-LAYER COMMUNICATION</u>
4.1						O	<u>General</u>
4.1.1						O	<u>Generic Names</u>
4.1.1.1	O						<u>DL-ESTABLISH</u>
4.1.1.2	O						<u>DL-RELEASE</u>
4.1.1.3	O						<u>DL-DATA</u>
4.1.1.4				O			<u>DL-UNIT DATA</u> It is not supported.
4.1.1.5				O			<u>MDL-ASSIGN</u> It is not supported.
4.1.1.6				O			<u>MDL-REMOVE</u> It is not supported.
4.1.1.7	O						<u>MDL-ERROR</u>
4.1.1.8				O			<u>MDL-UNIT DATA</u> It is not supported.
4.1.1.9				O			<u>MDL-XID</u> It is not supported.
4.1.1.10	O						<u>PH-DATA</u>
4.1.1.11			O				<u>PH-ACTIVATE</u> PH-ACTIVATE-REQUEST primitive is not supported.
4.1.1.12	O						<u>PH-DEACTIVATE</u>
4.1.1.13	O						<u>MPH-ACTIVATE</u>
4.1.1.14				O			<u>MPH-DEACTIVATE</u> It is not supported.
4.1.1.15				O			<u>MPH-INFORMATION</u> It is not supported.
4.1.1.16			O				<u>MPH-ERROR</u> This primitive is used to indicate to connection management entity that an error has occurred.

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.1.2	O						<u>Primitive types</u>
4.1.2.1	O						<u>REQUEST</u>
4.1.2.2	O						<u>INDICATION</u>
4.1.2.3	O						<u>RESPONSE</u>
4.1.2.4	O						<u>CONFIRM</u>
4.1.3							<u>Parameter definition</u>
4.1.3.1	O						<u>Priority indicator</u> As only SAPI value of 0 is supported, no contention will exist.
4.1.3.2			O				<u>Message unit</u> The use of DL-UNIT-DATA primitive is not supported.
4.2							<u>Primitive Procedures</u>
4.2.1					O		<u>General</u>
4.2.2			O				<u>Layer 3 - Data Link Layer Interactions</u> Broadcast data link connection is not supported.
5.			O				<u>DEFINITION OF THE PEER-TO-PEER PROCEDURES OF THE DATA LINK LAYER</u> Unacknowledged information transfer and Connection Management Entity information transfer (through XID) are not supported.
5.1							<u>Procedure for the Use of the P/F Bit</u>
5.1.1				O			<u>Unacknowledged information transfer</u> It is not supported.
5.1.2	O						<u>Acknowledged multiple frame information transfer</u>
5.2				O			<u>Procedures for Unacknowledged Information Transfer</u> It is not supported.
5.3				O			<u>Terminal Endpoint Identifier (TEI) Management Procedures</u> It is not supported.
5.4				O			<u>Automatic Negotiation of Data Link Layer Parameters</u> It is not supported.

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
5.5							<u>Procedures for Establishment and Release of Multiple Frame Operation</u>
5.5.1	O						<u>Establishment of multiple frame operation</u>
5.5.1.1	O						<u>General</u>
5.5.1.2		O					<u>Establishment procedures</u> 1. A data link layer entity at network side will initiate a request for the multiple frame operation to be sent by transmitting the SABME command continuously. 2. Timer T203 is supported.
5.5.1.3	O						<u>Procedure on expiry of timer T200</u>
5.5.2			O				<u>Information transfer</u> The network will discard the received UI command frame.
5.5.3							<u>Termination of multiple frame operation</u>
5.5.3.1	O						<u>General</u>
5.5.3.2	O						<u>Release procedure</u>
5.5.3.3	O						<u>Procedure on expiry of timer T200</u>
5.5.4			O				<u>TEI-assigned state</u> 1. The data link layer entity at network side will initiate the establishment procedure by transmitting the SABME command continuously. 2. The network will discard the received UI command frame. 3. On receipt of any unsolicited UA response, a MDL-ERROR-INDICATION primitive will be issued.
5.5.5							<u>Collision of unnumbered commands and responses</u>
5.5.5.1	O						<u>Identical transmitted and received commands</u>
5.5.5.2	O						<u>Different transmitted and received commands</u>
5.5.6	O						<u>Unsolicited DM response and SABME or DISC command</u>

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
5.6						O	<u>Procedures for Information Transfer in Multiple Frame Operation</u>
5.6.1		O					<u>Transmitting I frames</u> When the network side is in the own receiver busy condition, it will still transmit I frames, provided that a peer receiver busy condition does not exist.
5.6.2	O						<u>Receiving I frames</u>
5.6.2.1	O						<u>P bit set to 1</u>
5.6.2.2	O						<u>P bit set to 0</u>
5.6.3							<u>Sending and receiving acknowledgments</u>
5.6.3.1	O						<u>Sending acknowledgments</u>
5.6.3.2	O						<u>Receiving acknowledgements</u>
5.6.4		O					<u>Receiving REJ frames</u> Timer T203 is supported.
5.6.5	O						<u>Receiving RNR frames</u>
5.6.6	O						<u>Data link layer own receiver busy condition</u>
5.6.7		O					<u>Waiting acknowledgement</u> In case of the value of the transmission count variable being less than N200, network will restart timer T200 and transmit an appropriate supervisory command with P bit set to 1.
5.7							<u>Re-establishment of Multiple Frame Operation</u>
5.7.1	O						<u>Criteria for re-establishment</u>
5.7.2	O						<u>Procedures</u>
5.8	O						<u>Exception Condition Reporting and Recovery</u>
5.8.1		O					<u>N(S) sequence error</u> The optional procedure for the retransmission of REJ response frame described in Appendix I of ITU-T Q.921 is not supported.
5.8.2	O						<u>N(R) sequence error</u>
5.8.3	O						<u>Timer recovery condition</u>
5.8.4	O						<u>Invalid frame condition</u>
5.8.5	O						<u>Frame rejection condition</u>
5.8.6	O						<u>Receipt of FRMR response frame</u>
5.8.7		O					<u>Unsolicited response frame</u> The data link layer at network side will assume illegal TEI assignment on the receipt of an unsolicited UA response and inform layer management.
5.8.8			O				<u>Multiple assignment of a TEI value</u> After assuming illegal TEI assignment, the data link layer at network side will inform the connection management entity by means of the MDL-ERROR-INDICATION primitive.

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
5.9			O				<u>List of System Parameters</u> Negotiation of these parameters is not supported.
5.9.1		O					<u>Timer T200</u> The timer value is 1 second.
5.9.2	O						<u>Maximum number of retransmissions (N200)</u>
5.9.3	O						<u>Maximum number of octets in an information field (N201)</u>
5.9.4				O			<u>Maximum number of transmissions of the TEI Identity request message (N202)</u> It is not supported.
5.9.5			O				<u>Maximum number of outstanding I frames (k)</u> Only k = 7 is supported for an SAP supporting primary rate (64 kbit/s) signalling.
5.9.6				O			<u>Timer T201</u> It is not supported.
5.9.7				O			<u>Timer T202</u> It is not supported.
5.9.8	O						<u>Timer T203</u>
5.10							<u>Data Link Layer Monitoring Function</u>
5.10.1	O						<u>General</u>
5.10.2	O						<u>Data link layer supervision in the multiple-frame-established state</u> The implementation of procedure for data link layer resource supervision is optional in the user side.
5.10.3							<u>Connection verification procedures</u>
5.10.3.1	O						<u>Start timer T203</u>
5.10.3.2	O						<u>Stop timer T203</u>
5.10.3.3	O						<u>Expiry of timer T203</u>

SECTION II
PART D

ISDN USER-NETWORK INTERFACE
LAYER 3 GENERAL ASPECTS
(PRIMARY RATE ACCESS)

Compliance With ITU-T Recommendation I.450 (Q.930)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
1.							<u>GENERAL</u>
1.1						O	<u>Introduction</u>
1.2			O				<u>Connection Control by the User of an ISDN</u> Packet-switched connection is not supported.
1.3	O						<u>Services Provided by the Data Link Layer</u>
1.4				O			<u>Symmetry of the Layer 3 Protocol</u> Symmetry of the layer 3 protocol is not within the scope of this specification.
2.							<u>STRUCTURE OF LAYER 3</u>
2.1			O				<u>Categories of Functions</u> 1. Re-routing of signalling messages on an alternate D-channel in the event of D-channel failure is not supported. 2. Message segmenting/reassembly is not supported.
2.2			O				<u>Layer 3 Functions</u> Packet-switched connections are not supported. The following functions are performed at network side of the user-network interface and may also be applicable at user side of the interface. a) processing of primitives for communicating with the data link layer; b) generation and interpretation of layer 3 messages for peer-level communication; c) administration of timers and logical entities used in the call control procedure; d) administration of access resources including B-channels; e) checking to ensure that services provided are consistent with user requirements (e.g. as expressed by bearer capability, addresses). Note that the checking of lower and higher layers compatibility is only applicable at the user side. The following general functions will also be performed by layer 3: a) routing and relaying (optional) b) network connection control (network side only) c) conveying user-to-network and network-to-user information; d) network connection multiplexing; (network side only) e) segmenting and reassembly; (not supported) f) error detection; g) error recovery; h) sequencing; i) congestion control (user data flow control is not supported); and j) restart.

A : Complied with ITU-T

B : Complied with ITU-T with additional notes

C : Partially complied with ITU-T

D : Not supported

E : Under study

F : Descriptive text only

D/1

Compliance With ITU-T Recommendation I.450 (Q.930)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
2.2.1	O						<u>Routing and relaying</u>
2.2.2	O						<u>Network connection control</u>
2.2.3				O			<u>Conveying user information</u> It is not supported.
2.2.4	O						<u>Network connection multiplexing</u>
2.2.5				O			<u>Segmenting and reassembly</u> It is not supported.
2.2.6	O						<u>Error detection</u>
2.2.7	O						<u>Error recovery</u>
2.2.8			O				<u>Sequencing</u> Layer 3 only ensures the delivery of information in the same sequence as submitted by the user.
2.2.9			O				<u>Congestion control and user data flow control</u> 1. Rejection or unsuccessful indication for connection establish requests to control congestion within a network will not be indicated by layer 3. Congestion condition will be handled by the switching system. (Congestion Control messages are not supported) 2. Flow control for the user-to-user signalling message is not supported.
2.2.10	O						<u>Restart</u>
3.					O		<u>STRUCTURE OF LAYER 3 RECOMMENDATIONS</u>
4.					O		<u>INTERFACE BETWEEN LAYER 3 AND THE ADJACENT LAYERS</u>
4.1							<u>Overview of the Interfaces</u>
4.2	O						<u>Interface between Layer 3 and Data Link Layer</u>
4.3				O			<u>Interface between Layer 3 and Upper Layer</u> It is left for ITU-T-T further study.

A : Complied with ITU-T

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SECTION II
PART E

ISDN USER-NETWORK INTERFACE
LAYER 3 SPECIFICATION FOR BASIC CALL CONTROL
(PRIMARY RATE ACCESS)

Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
1.						O	<u>GENERAL</u>
1.1						O	<u>Scope of the Recommendation</u>
1.2		O					Packet-switched connection is not supported
							<u>Application to Interface Structure</u>
							The unacknowledged information transfer service of layer 2 to provide point-to-multipoint operation is not supported.
2.			O				<u>OVERVIEW OF CALL CONTROL</u>
							1. Packet-switched connection is not supported
							2. Detailed descriptions of the procedures for circuit switched call control are given in 5).
							3. H-channels are not supported
2.1			O				<u>Circuit Switched Calls</u>
							Symmetric signalling protocols described in Q.931 are not within the scope of this specification.
2.1.1		O					<u>Call states at the user side of the interface</u>
							The call states under this section are subject to user implementation.
2.1.1.1		O					<u>Null (U0)</u>
2.1.1.2		O					<u>Call Initiated (U1)</u>
2.1.1.3		O					<u>Overlap Sending (U2)</u>
2.1.1.4		O					<u>Outgoing Call Proceeding (U3)</u>
2.1.1.5		O					<u>Call Delivered (U4)</u>
2.1.1.6		O					<u>Call Present (U6)</u>
2.1.1.7		O					<u>Call Received (U7)</u>
2.1.1.8		O					<u>Connect Request (U8)</u>
2.1.1.9		O					<u>Incoming Call Proceeding (U9)</u>
2.1.1.10		O					<u>Active (U10)</u>
2.1.1.11		O					<u>Disconnect Request (U11)</u>
2.1.1.12		O					<u>Disconnect Indication (U12)</u>
2.1.1.13		O					<u>Suspend Request (U15)</u>
2.1.1.14		O					<u>Resume Request (U17)</u>
2.1.1.15		O					<u>Release Request (U19)</u>
2.1.1.16				O			<u>Overlap Receiving (U25)</u>
2.1.2	O						<u>Network Call States</u>
2.1.2.1	O						<u>Null (N0)</u>
2.1.2.2	O						<u>Call Initiated (N1)</u>

A : Complied with ITU-T

B : Complied with ITU-T with additional notes

C : Partially complied with ITU-T

D : Not supported

E : Under study

F : Descriptive text only

E/1

Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
2.1.2.3	O						<u>Overlap Sending (N2)</u>
2.1.2.4	O						<u>Outgoing Call Proceeding (N3)</u>
2.1.2.5	O						<u>Call Delivered (N4)</u>
2.1.2.6	O						<u>Call Present (N6)</u>
2.1.2.7	O						<u>Call Received (N7)</u>
2.1.2.8	O						<u>Connect Request (N8)</u>
2.1.2.9	O						<u>Incoming Call Proceeding (N9)</u>
2.1.2.10	O						<u>Active (N10)</u>
2.1.2.11	O						<u>Disconnect Request (N11)</u>
2.1.2.12	O						<u>Disconnect Indication (N12)</u>
2.1.2.13	O						<u>Suspend Request (N15)</u>
2.1.2.14	O						<u>Resume Request (N17)</u>
2.1.2.15	O						<u>Release Request (N19)</u>
2.1.2.16	O						<u>Call Abort (N22)</u>
2.1.2.17				O			<u>Overlap Receiving (N25)</u> It is not supported.
2.2				O			<u>Packet Mode Access Connections</u> They are not supported.
2.3				O			<u>Temporary Signalling Connections</u> They are not supported.
2.4	O						<u>States Associated with the Global Call Reference</u>
2.4.1		O					<u>Call states at the user side of the interface</u> The call states under this section are subject to user implementation.
2.4.1.1		O					<u>Null (Rest 0)</u>
2.4.1.2		O					<u>Restart Request (Rest 1)</u>
2.4.1.3		O					<u>Restart (Reset 2)</u>
2.4.2	O						<u>Call states at the network side of the interface</u>
2.4.2.1	O						<u>Null (Rest 0)</u>
2.4.2.2	O						<u>Restart Request (Rest 1)</u>
2.4.2.3	O						<u>Restart (Rest 2)</u>

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Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
3.						O	<u>MESSAGE FUNCTIONAL DEFINITIONS AND CONTENT</u>
3.1			O				<p><u>Messages for Circuit Mode Connection Control</u> SEGMENT, CONGESTION CONTROL, FACILITY and all “call information phase” messages are not supported.</p> <p>For those messages supported:</p> <ol style="list-style-type: none"> 1. The length of Call reference information element is 3 octets. 2. The length of Channel identification information element is 6 to 8 octets. 3. The length of Display information element is 2 to 34 octets. 4. The length of Called party number information element is from 2 to 22 octets. 5. The provision of in-band information/patterns in the user to network direction is not supported. 6. The Calling party number information element in the network to user direction is supported. 7. The following information elements are not supported: <ul style="list-style-type: none"> - More data - Congestion level - Repeat indicator - Segmented message - Facility - Network-specific facilities - Date/Time - Switchhook - Information rate - End-to-end transit delay - Transit delay selection & indication - Packet layer binary parameters - Packet layer window size - Packet size - Redirecting number - Transit network selection - User-user - Calling party subaddress - Called party subaddress

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
3.1.1			O				<u>Alerting</u> 1. The Display, Signal, Feature Activation and Feature Indication information elements in this message are not supported. 2. Channel Identification information element in this message is supported only in the user-to-network direction.
3.1.2			O				<u>Call Proceeding</u> The Display information element in this message is not supported.
3.1.3				O			<u>Congestion Control</u> It is not supported.
3.1.4			O				<u>Connect</u> 1. The Signal, Feature Activation and Feature Indication information elements in this message are not supported. 2. Channel Identification information element in this message is supported only in the user-to-network direction. 3. The low layer compatibility information element will be transported by network from called user to the calling user.
3.1.5			O				<u>Connect Acknowledge</u> 1. The Display and Signal information elements in this message are not supported. 2. The support of this message in the user-to-network direction is optional.
3.1.6			O				<u>Disconnect</u> 1. The Progress Indicator is only supported from network to user direction and included by the network if in-band tones are provided. 2. The Signal and Feature Indication information elements in this message are not supported.
3.1.7				O			<u>Facility</u> It is not supported.
3.1.8			O				<u>Information</u> 1. The Signal information element in this message is not supported. 2. Called Party Number information element in this message is supported only in user-to-network direction and included by the user to convey called party number information or service information to the network during overlap sending. 3. The Sending Complete information element is included if user optionally indicates completion of overlap sending to the network. 4. The Information Request information element may be used for supplementary services.
3.1.9			O				<u>Notify</u> The Bearer capability and Display information elements in this message are not supported.
3.1.10			O				<u>Progress</u> 1. The Display information element in this message is not supported. 2. The Cause information element is supported only from network to user direction to provide additional information concerning the provision of in-hand information/patterns.

Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
3.1.11			O				<u>Release</u> The Display, Signal and Feature indication information elements in this message are not supported.
3.1.12			O				<u>Release Complete</u> The Display, Signal and Feature indication information elements in this message are not supported.
3.1.13		O					<u>Resume</u> Supported but NOTIFY message to the other user is not guarantee.
3.1.14	O						<u>Resume Acknowledge</u>
3.1.15	O						<u>Resume Reject</u>
3.1.16			O				<u>Setup</u> 1. The Display, Feature activation, and Feature indication information elements in this message are not supported. 2. The length of Keypad facility information element is 2 to 32 octets. 3. Called party number information element is included by the user to convey called party number information or service information to the network instead of Keypad facility information element.
3.1.17			O				<u>Setup Acknowledge</u> 1. The Signal information element in this message is not supported. 2. This message is supported only from network to calling user direction.
3.1.18			O				<u>Status</u> The Display information element in this message is not supported.
3.1.19			O				<u>Status Enquiry</u> The Display information element in this message is not supported.
3.1.20		O					<u>Suspend</u> Supported but NOTIFY message to the other user is not guarantee.
3.1.21	O						<u>Suspend Acknowledge</u>
3.1.22	O						<u>Suspend Reject</u>
3.1.23				O			<u>User Information</u> It is not supported.
3.2					O		<u>Messages for Packet Mode Access Connection Control</u> All messages for packet mode access connection control are not supported.

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
3.3					O		<u>Messages for User-to-User Signalling not Associated with Circuit Switched Calls</u> All these messages are not supported.
3.4							<u>Messages used with the Global Call Reference</u>
3.4.1			O				<u>Restart</u> 1. The Display information element in this message is not supported. 2. For the user to network direction, only the restart of particular channel(s) will be supported and the Channel Identification information element should be included.
3.4.2			O				<u>Restart Acknowledge</u> The Display information element in this message is not supported.
3.4.3			O				<u>Status</u> The Display information element in this message is not supported.
4.						O	<u>GENERAL MESSAGE FORMAT AND INFORMATION ELEMENTS CODING</u>
4.1	O						<u>Overview</u>
4.2		O					<u>Protocol Discriminator</u> The protocol discriminator is only allowed to be the first part of every message and only the coding "00001000" for Q.931 user-network call messages is supported.
4.3			O				<u>Call Reference</u> 1. The call reference value shall be of two octets long. 2. Dummy call reference is not supported.
4.4			O				<u>Message Type</u> 1. Escape to nationally specific message type is not supported. 2. All "Call information phase" messages and SEGMENT, CONGESTION CONTROL, FACILITY messages are not supported.
4.5							<u>Other Information Elements</u>

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.5.1			O				<p><u>Coding rules</u> The following information elements shall be supported :</p> <ul style="list-style-type: none"> - Shift - Sending complete - Bearer capability - Cause - Call state - Call identity - Channel identification - Progress indicator - Notification indicator - Display - Keypad facility - Information request - Signal - Feature activation - Feature indication - Calling party number - Called party number - Restart indicator - Low layer compatibility - High layer compatibility - Escape for extension <p>The others are not supported.</p> <p>Note that the network does not guarantee the end-to-end transport transparency of information elements between calling and called user side.</p>

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.5.2			O				<u>Extensions of codesets</u> Codesets 5, 6 and 7 are not supported.
4.5.3			O				<u>Locking shift procedure</u> Codesets 5, 6 and 7 are not supported.
4.5.4			O				<u>Non-locking shift procedure</u> Codesets 5, 6 and 7 are not supported.
4.5.5			O				<u>Bearer capability</u> The following codings for octets 3 to 5 are supported : 1. <u>Coding standard</u> 00 ITU-T standardized coding 2. <u>Information transfer capability</u> 00000 Speech 01000 unrestricted digital information 10000 3.1 kHz audio 3. <u>Transfer mode</u> 00 circuit mode 4. <u>Information transfer rate</u> 10000 64 kbit/s circuit mode 5. <u>Structure</u> 000 default 001 8 kHz integrity 6. <u>Configuration</u> 00 point-to-point 7. <u>Establishment</u> 00 demand 8. <u>Symmetry</u> 00 bi-directional symmetric 9. <u>In/band/out-band negotiation</u> 1 negotiation is done in-band using logical link zero.

Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.5.6	O						<u>Call identity</u> <u>Call state</u> 1. <u>Coding standard</u> Only ITU-T standardized coding is supported. 2. <u>Call state value</u> 011001 Overlap Receiving 3. <u>Global interface state value</u> All codings are supported. <u>Called party number</u> 1. <u>Type of number</u> All digits received will be treated as “unknown” type. 2. <u>Number plan identification</u> The numbering plan “unknown” will be supported. 3. <u>Number digits</u> The maximum number of number digits is 19. <u>Called party subaddress</u> It is not supported. <u>Calling party number</u> The maximum number of number digits is 15. <u>Calling party subaddress</u> It is not supported. <u>Cause</u> 1. <u>Coding standard</u> Only ITU-T standardized coding is supported. 2. <u>Location</u> All codings except the following are supported : 0011 Transit network 0111 International network 3. <u>Recommendation</u> Only ITU-T Recommendation Q.931 is supported. 4. <u>Cause value</u> See Appendix I of this Connection Reference. 5. <u>Diagnostics</u> Only the diagnostic field for Cause No. 22, 43, 96, 97, 99, 100, 101 and 102 may be generated by the network.
4.5.7			O				
4.5.8			O				
4.5.9				O			
4.5.10		O					
4.5.11				O			
4.5.12			O				

A : Complied with ITU-T

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F : Descriptive text only

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.5.13			O				<p><u>Channel Identification</u></p> <p>1. The following coding will be supported:</p> <p>1.1 <u>Interface identifier present</u> 0 interface implicitly identified 1 interface explicitly identified in octet 3.1</p> <p>1.2 <u>Interface type</u> 1 other interface</p> <p>1.3 <u>Preferred/Exclusive</u> 0 indicated channel is preferred 1 exclusive; only the indicated channel is acceptable</p> <p>1.4 <u>D-channel indicator</u> 0 the channel identified is not the D-channel</p> <p>1.5 <u>Information channel selection</u> 01 as indicated in following octets 11 any channel</p> <p>1.6 <u>Coding standard</u> 00 ITU-T standardized coding</p> <p>1.7 <u>Number/Map</u> 0 channel is indicated by the number in the following octet 1 channel is indicated by the slot map (Map) in the following octet(s) Note : The network will indicate the channel by Number.</p> <p>1.8 <u>Channel type/Map element type</u> 0011 B-channel units</p> <p>2. All other fields are supported as described in the ITU-T Rec. 3. This information element will not be repeated in a message.</p>

Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.5.14				O			<u>Congestion level</u> It is not supported.
4.5.15			O				<u>Display</u> The maximum length of this information element is 34 octets.
4.5.16			O				<u>High layer compatibility</u> Only ITU-T standardized coding is supported.
4.5.17	O						<u>Keypad facility</u>
4.5.18			O				<u>Low layer compatibility</u> 1. Only ITU-T standardized coding is supported. 2. Restricted digital information, 7kHz audio and video information transfer capability are not supported. 3. Packet mode transfer mode is not supported. 4. Only 64kbit/s information transfer rate is supported. 5. Only default '000' and '001' 8kHz integrity structure are supported. 6. Negotiation is done in-band using logical link zero.

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E/11

Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.5.19				O			<u>More data</u> It is not supported.
4.5.20				O			<u>Network specific facilities</u> It is not supported.
4.5.21			O				<u>Notification indicator</u> The following codings are supported : <u>Notification description</u> 0000000 User suspended 0000001 User resumed
4.5.22			O				<u>Progress indicator</u> The following codings are supported : 1. <u>Coding standard</u> 00 ITU-T standardized coding 2. <u>Location</u> 0000 User 0001 Private network serving the local user 0010 Public network serving the local user 0100 Public network serving the remote user 0101 Private network serving the remote user 1010 Network beyond interworking point 3. <u>Progress description</u> 0000001 Call is not end-to-end ISDN, further call progress information may be available in-band 0000010 Destination address in non-ISDN 0000011 Origination address is non-ISDN 0000100 Call has returned to the ISDN 0001000 In-band information or appropriate pattern now available

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Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
4.5.23				O			<u>Repeat indicator</u> It is not supported.
4.5.24			O				<u>Restart indicator</u> The support of Class '111' - all interfaces is from network to user direction only.
4.5.25				O			<u>Segmented message</u> It is not supported.
4.5.26	O						<u>Sending complete</u>
4.5.27			O				<u>Signal</u> 1. The purpose of the Signal information element is to allow the network to optionally convey information to a user regarding alerting signals only. 2. This information element will not be repeated in a message.
4.5.28				O			<u>Transit network selection</u> It is not supported.
4.5.29				O			<u>User-user</u> It is not supported.
4.6							<u>Supplementary Services Information Elements</u>
4.6.1				O			<u>Date/Time</u> It is not supported.
4.6.2				O			<u>Facility</u> It is not supported.
4.6.3		O					<u>Feature Activation</u> The maximum length of this information element is 3 octets and bit 8 in octet 3 is set to 1. The identifier number for a one octet field range from 1 to 127.
4.6.4		O					<u>Feature Indication</u> The maximum length of this information element is 4 octets and bit 8 of octet 3 is set to 1. The identifier number for a one octet field range from 1 to 127.
4.6.5				O			<u>Switchhook</u> It is not supported.
8.2.5 of Q.932			O				<u>Information Request</u> 1. This information element may be used for supplementary services. 2. The authorization code (000001) and terminal identification (000011) in Type of information (octet 3) are not supported.
4.7				O			<u>Information Elements for Packet Communications</u> They are not supported.

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F : Descriptive text only

E/13

Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
5.						O	<u>CIRCUIT-SWITCHED CALL CONTROL PROCEDURES</u>
5.1	O						<u>Call Establishment at the Originating Interface</u>
5.1.1		O					<u>Call request</u> The called party number information shall be provided by the user in the Called party number information element.
5.1.2	O						<u>B-Channel selection - originating</u>
5.1.3		O					<u>Overlap sending</u> 1. The called party number information shall be provided by the user in the Called party number information element. 2. User should recognize the Setup Acknowledge message and reply by one or more Information messages. 3. The completion of information sending should contain either a “sending complete” indication or called number information that the network can determine to be complete.
5.1.4	O						<u>Invalid call information</u>
5.1.5							<u>Call Proceeding</u>
5.1.5.1			O				<u>Call proceeding, en-bloc sending</u> 1. The determination of en-bloc sending is by either inclusion of a “sending complete” indication or enough called number information appropriate to the dialing plan being used. 2. Cause No. 58 “bearer capability not presently available” is not supported.
5.1.5.2			O				<u>Call proceeding, overlap sending</u> 1. Cause No. 58 “bearer capability not presently available” is not supported. 2. At the expiration of timer T302, the network will: a) initiate call clearing in accordance with 5.3 with cause No.28 “invalid number format” (incomplete number) sent to the calling user, if the network determines that the call information is definitely incomplete; otherwise; b) send a Call Proceeding message and enter the outgoing call proceeding state.
5.1.6	O						<u>Notification of interworking at the originating interface</u>
5.1.7	O						<u>Call confirmation indication</u>
5.1.8	O						<u>Call connected</u>
5.1.9	O						<u>Call rejection</u>
5.1.10				O			<u>Transit network selection</u> It is not supported.

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Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
5.2			O				<u>Call Establishment at the Destination Interface</u> 1. Permanent data link connection is supported. 2. Only point-to-point data link is supported.
5.2.1							<u>Incoming call</u> 1. Only point-to-point configuration is supported. 2. Network only supports overlap sending and SETUP message will contain the Sending complete information element. 3. SETUP message will not be sent when no B-channel is idle. 4. If no response to the Setup message is received by the network before the expire of timer T303, the Setup message will be retransmitted and timer T303 restarted.
5.2.2		O					<u>Compatibility checking</u> SETUP message delivered via a broadcast data link is not supported.
5.2.3							<u>B-channel selection - destination</u>
5.2.3.1		O					<u>SETUP message delivered by point-to-point data link</u> SETUP message will only indicate "channel is indicated, any alternative is acceptable".
5.2.3.2				O			<u>SETUP message delivered by broadcast data link</u> It is not supported.
5.2.4				O			<u>Overlap receiving</u> It is not supported.
5.2.5							<u>Call confirmation</u>
5.2.5.1			O				<u>Response to en-bloc SETUP or completion of overlap receiving</u> 1. SETUP message delivered via a broadcast data link is not supported. 2. Overlap receiving procedure is not supported.
5.2.5.2			O				<u>Receipt of CALL PROCEEDING and ALERTING</u> 1. SETUP message delivered via a broadcast data link is not supported. 2. When the Setup message has been delivered on a point-to-point data link, the network will (at a minimum) associate the Incoming Call Received state with the called user that sends an Alerting message either as a first response to the Setup message or following a Call Proceeding message. 3. Overlap receiving procedure is not supported.
5.2.5.3			O				<u>Called user clearing during incoming call establishment</u> 1. SETUP message delivered via a broadcast data link is not supported. 2. Timer T304 is not supported.
5.2.5.4			O				<u>Call failure</u> Setup message delivered via a broadcast data link is not supported.

Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
5.2.6	O						<u>Notification of interworking at the terminating interface</u>
5.2.7	O						<u>Call accept</u>
5.2.8			O				<u>Active indication</u> 1. SETUP message delivered via a broadcast data link is not supported. 2. Timer T304 is not required.
5.2.9				O			<u>Non-selected user clearing</u> It is not supported.
5.3						O	<u>Call Clearing</u>
5.3.1						O	<u>Terminology</u>
5.3.2			O				<u>Exception conditions</u> Multipoint terminal configuration, temporary signalling connection, broadcast data link and timer T312 in network side are not supported.
5.3.3	O						<u>Clearing initiated by the user</u>
5.3.4	O						<u>Clearing initiated by the network</u>
5.3.4.1	O						<u>Clearing when tones/announcements provided</u>
5.3.4.2	O						<u>Clearing when tones/announcements not provided</u>
5.3.4.3	O						<u>Completion of clearing</u>
5.3.5	O						<u>Clear collision</u>
5.4	O						<u>In-Band Tones and Announcement</u>
5.5	O						<u>Restart Procedure</u>
5.5.1			O				<u>Sending RESTART</u> 1. User is only allowed to restart the specified channel(s). 2. The network will limit the number of consecutive unsuccessful restart attempts to two. When this limit is reached, the network will no further restart attempts. Then the network may make data link reestablishment attempts. Alternatively, an indication will be provided to the appropriate maintenance entity and maintenance action will be taken.
5.5.2			O				<u>Receipt of RESTART</u> The restart of the interface in the user to network direction is not supported.
5.6			O				<u>Call rearrangements</u> 1. The call rearrangement shall be controlled by the NT2 (e.g. ISPBX) and NOTIFY message sent by NT2 is relayed to remote user. 2. After receiving SUSPEND and RESUME messages from user, network does not guarantee NOTIFY message will be sent to the other user.
5.7		O					<u>Call Collisions</u> The requirement of the interface at reference point R is not within the scope of this specification.

Compliance With ITU-T Recommendation I.451 (Q.931)

Primary Rate Access

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
5.8	O						<u>Handling of Error Conditions</u>
5.8.1	O						<u>Protocol discrimination error</u>
5.8.2	O						<u>Message too short</u>
5.8.3							<u>Call reference error</u>
5.8.3.1	O						Invalid call reference format
5.8.3.2			O				<u>Call reference procedural errors</u> When a Release message is received that specified a call reference which is not recognized as relating to an active call or to a call in progress, the network may ignore the message or return a Release Complete message with cause No.81 specifying the call reference
5.8.4		O					<u>Message type or message sequence errors</u> Cause No. 97 and cause No.101 will be generated by the network but not cause No.98.
5.8.5		O					<u>General information element errors</u> 1. The general information element error procedures shall apply to information elements in codeset '0'. 2. The diagnostic field in Cause information element will be supported for causes No. 22, No. 43, No. 96, No. 97, No. 99, No. 100, No. 101 and No. 102.
5.8.5.1		O					<u>Information element out of sequence</u> 1. The network will transmit the information elements in sequence. 2. All out of sequence information elements will be ignored.
5.8.5.2	O						<u>Duplicated information elements</u>
5.8.6							<u>Mandatory information element errors</u>
5.8.6.1	O						<u>Mandatory information element missing</u>
5.8.6.2		O					<u>Mandatory information element content error</u> When a message other than Setup, Disconnect, Release or Release Complete is received which has one or more mandatory information elements with invalid content, no action will be taken on the message and no state change will occur. The network may ignore the message or return a Status message with cause No.100 "invalid information element contents".
5.8.7					O		<u>Non-mandatory information element errors</u>
5.8.7.1	O						<u>Unrecognized information element</u>
5.8.7.2		O					<u>Non-mandatory information element content error</u> Access information element with a length exceeding the maximum length shall be discarded and relevant cause values shall be sent to user.

A : Complied with ITU-T

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F : Descriptive text only

E/17

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
5.8.8			O				<u>Data link reset</u> Overlap receiving procedure is not supported.
5.8.9			O				<u>Data link failure</u> 1. When informed of Layer 2 re-establishment by means of the DL-ESTABLISH-CONFIRM primitive, the network will stop timer T309 and may periodically send the Status Enquiry message for calls in Active state. 2. Packet mode access connection is not supported. 3. When informed of layer 2 re-establishment by means of the DL-ESTABLISH-CONFIRM primitive, Time T309 is stopped and optionally, for calls in the Active state, the network may periodically send the Status Enquiry message.
5.8.10			O				<u>Status enquiry procedure</u> 1. The network may periodically send Status Enquiry message in Active state. 2. If timer T322 expires and a Status message with cause No.97 “message type non-existent or not implemented” was received, the appropriate action (described in 5.8.11) shall be taken, based on the information in that Status message, relative to the current call state of the receiver. 3. If timer T322 expires, and no Status message was received, the Status Enquiry message may be retransmitted one (in case of network side) or more times until a response is received.
5.8.11		O					<u>Receiving a STATUS message</u> 1. On receipt of a Status message reporting an incompatible state, the receiving entity shall clear the call by sending the appropriate clearing message with cause No.101 “message not compatible with call state”. However, user side entity may take other actions which attempt to recover from a mismatch and which are an implementation option. 2. If a Status message, indicating the Null state, is received in any state except the Null state, the network may clear the call by sending a Release message with no Cause information element or release all resources and move into the Null state. 3. A Status message may be received indicating a compatible call state, in this case the network will clear the call with appropriate procedure defined in 5.3, using the cause specified in the received Status message or cause No.31 “normal, unspecified”.
5.9			O				<u>User Notification Procedure</u> The network will relay the Notify message for call suspension and resumption performed by NT2.

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
6.				O			<u>PACKET COMMUNICATIONS PROCEDURES</u> Packet communication is not supported.
7.				O			<u>USER-TO-USER SIGNALLING PROCEDURES</u>
7.1				O			<u>Procedures for User-to-user Signalling Associated with Circuit Switched Calls</u> It is not supported.
7.2		O					<u>Procedures for User-to-user Signalling not Associated with Circuit-Switched Calls</u> It is not supported.
8.	O						<u>APPLICATION OF CIRCUIT-SWITCHED SUPPLEMENTARY SERVICES TO TERMINALS USING STIMULUS PROCEDURES</u>
9.			O				<u>LIST OF SYSTEM PARAMETERS</u>
9.1			O				<u>Timers in the network side</u> 1. Timers T304, T312, T314, T320, and T321 are not supported. 2. Timer T301 minimum value is 2 minutes. 3. Timer T302 is 10 seconds. 4. At the first expiry of Timer T316, REST is retransmitted one time. At the second expiry of the timer, data link reestablishment is made or an indication is provided to the appropriate maintenance entity. 5. Timer T317 is 90 seconds.
9.2			O				6. At the first expiry of Timer T322, STAT ENQ will be re-transmitted one time. At the second expiry, the call will be cleared. <u>Timers in the user side</u> 1. The timers under this section are subject to user implementation. 2. Timers T302, T314, T321 are not recommended.

SECTION II
APPENDIX A

USAGE OF CAUSE VALUES

Table A-1 defines the key for the location of generation in Table A-2. For more precise usage of the location codes in the cause information element, see Annex G/Q.931.

TABLE A-1

Key for the location of the generation in Table A-2

LU : Local user
LN : Local network
RU : Remote user

Table A-2 indicates the usage of cause values within this Specification Part D (Q.930) and Part E (Q.931). Other usage may be provided within other ITU-T Recommendations, e.g. Q.700-Series and Q.699. Other causes may also be used by Q.931 entities where this is not precluded by the procedures defined elsewhere in this Specification.

The following abbreviations to message types are used in Table A-2.

DISC	DISCONNECT
REL	RELEASE
RES REJ	RESUME REJECT
STAT	STATUS
SUSP REJ	SUSPEND REJECT

When the Cause information element with or without diagnostic(s) field is specified by the user, this information element will be carried transparently by the network.

TABLE A-2 (1 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
1	000	0001	Unassigned (unallocated) number	Condition (Note)	5.1.4	LN		REL COM DISC
					5.2.4	RU	REL COM DISC	
2	000	0010	No route to specified transit network		Not generated			
3	000	0011	No route to destination	Condition (Note)	5.1.4	LN		DISC REL COM
					5.2.4	RU	REL COM DISC	DISC
6	000	0110	Channel unacceptable	-	5.2.3.1b 5.3.2	LN		REL
7	000	0111	Call awarded being delivered in an establish channel	-	Not generated			
16	001	0000	Normal call clearing	Condition		RU	DISC	DISC

TABLE A-2 (2 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
17	001	0001	User busy	-	5.2.5.1	RU	REL COM.	DISC
					No procedure	LN		DISC
18	001	0010	No user responding	-	5.2.5.3	LN		DISC
19	001	0011	User alerting No answer	-	5.2.5.3	LN		DISC
21	001	0101	Call rejected	Condition: user supplied diagnostic	5.2.5.1 5.2.5.4b	RU	REL COM.	DISC
22	001	0110	Number changed	New destination number	5.1.4	LN		DISC REL COM
					5.2.4	RU	REL COM DISC	DISC
26	001	1010	Non-selected user clearing	-	Not generated			
27	001	1011	Destination out of order	-	5.8.9	LN		DISC

TABLE A-2 (3 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
28	001	1100	Invalid number format (incomplete)		5.2.4	RU	DISC REL COM	DISC
					5.1.5.2	LN		DISC
					5.2.4	LN		DISC
					5.1.4	LN		DISC REL COM
29	001	1101	Facility rejected	Facility identification (Note)	No procedure	LN		REL COM DISC
						LN		DISC
						RU	REL COM DISC	
30	001	1110	Response to STATUS Enquiry	-	5.8.10	LU, LN		STAT
31	001	1111	Normal, unspecified	-	5.8.4	LN		REL COM DISC
34	010	0010	No circuit/channel available	-	5.1.1	LN		REL COM
					5.1.2			
					5.2.3.1b 5.2.3.1e 5.2.3.2	RU	REL COM.	DISC

TABLE A-2 (4 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
38	010	0110	Network out of order	-	No procedure			
41	010	1001	Temporary failure	-	5.8.8	LU, LN		DISC
					5.8.10	LN, RU	DISC	DISC
42	010	1010	Switching equipment congestion	-	No procedure			REL REL COM
43	010	1011	Access information discarded	Discarded info element identifier(s)	5.8.7.2	LN, LU		STAT
44	010	1100	Requested circuit/channel not available	-	5.1.2	LN		REL COM
					5.2.3.1e 5.2.3.2	RU	REL COM.	DISC
47	010	1111	Resource unavailable, unspecified	-	No procedure			
49	011	0001	Quality of Service unavailable	-	Not generated			
50	011	0010	Requested facility not subscribed	Facility identification (Note)	8	LN		DISC REL COM PROG

TABLE A-2 (5 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
57	011	1001	Bearer capability not authorized	Attributes of bearer capability (Note)	5.1.5.2	LN		DISC REL COM
58	011	1010	Bearer capability not presently available	-	Not generated	LN		
63	011	1111	Service or option not available, unspecified	-	5.1.5.2	LN		DISC REL COM
65	100	0001	Bearer capability not implemented	Attributes of bearer capability (Note)	5.1.5.2	LN		DISC REL COM
					6	LN		REL COM
66	100	0010	Channel type not implemented	Channel type	No procedure			
69	100	0101	Requested facility not implemented	Facility identification (Note)	8	LN		DISC REL COM PROG

TABLE A-2 (6 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
70	100	0110	Only restricted digital information bearer capability is available	-	Not generated			
79	100	1111	Service or option not implemented, unspecified	-	7.1	LN		STAT
					8	LN		DISC REL COM PROG
81	101	0001	Invalid call reference value	-	5.8.3.2a	LU, LN		REL REL COM
					5.8.3.2b	LU, LN		REL COM
					5.8.3.2f	LU, LN		STAT
82	101	0010	Identified channel does not exist	Channel identity (Note)	No procedure			REL COM
83	101	0011	A suspended call exists, but this call identity does not	-	5.6.3	LN		RES REJ

TABLE A-2 (7 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
84	101	0100	Call identity in use	-	5.6.5	LN		SISP REJ
85	101	0101	No call suspended	-	5.6.5	LN		RES REJ
86	101	0110	Call having the requested call identity has been cleared	-	5.6.5	LN		RES REJ
88	101	1000	Incompatible destination	Incompatible parameter	5.2.2 5.2.5.1 5.2.5.3a B.3.2 B.3.3	RU	REL COM.	DISC
91	101	1011	Invalid transit network selection	-	Not generated			
95	101	1111	Invalid message, unspecified	-	Not generated			

TABLE A-2 (8 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
96	110	0000	Mandatory information element is	Information element identifier(s)	5.8.6.1	LN, LU		REL REL COM STAT
					5.8.11	LN, LU		STAT
97	110	0001	Message type non-existent or not implemented	Message type	5.8.4 5.8.10 5.8.11	LU, LN		STAT
98	110	0010	Message not compatible with call state or message type non-existent or not implemented	-	Not generated			

TABLE A-2 (9 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
99	110	0011	Information element non-existent or not implemented	Information element identifier(s)	5.8.7.1 5.8.11	LU, LN		STAT
					5.8.7.1	LN		REL REL COM
100	110	0100	Invalid information element contents	Information element identifier(s) -	5.8.6.2	LU, LN		STAT REL REL COM
					5.8.7.2 5.8.11	LU, LN		STAT
101	110	0101	Message not compatible with call state	Message type	5.8.4	LN, LU		STAT
					5.8.11	LN, LU		DISC REL REL COM

TABLE A-2 (10 OF 10)
Usage of Cause Values

Cause No.	Class	Value	Cause Name	Diagnostics	Section cross-reference	Typical location of generation	Typical carrying message as identified by receiving side	
							At remote interface	At local interface
102	110	0110	Recovery on timer expiry	Timer number	5.2.4 5.2.5.3 5.6.5 5.4.1	LN		DISC
					5.3.3 5.3.4	LN		REL
					5.3.2f 5.3.3 5.6.5	LU		REL
111	110	1111	Protocol error, unspecified	-	5.8.4	LN		DISC
127	111	1111	Interworking unspecified	-	No explicit procedure			

Note - In the initial stage, the diagnostic field for this cause is not generated by the network.