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

Recommendation Q.522

DIGITAL EXCHANGE CONNECTIONS, SIGNALLING AND ANCILLARY FUNCTIONS

1 General

This Recommendation applies to digital local, combined, transit and international exchanges for telephony in Integrated Digital Networks (IDN) 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 Connections through an exchange

2.1 *General*

The characteristics of the connections detailed in this section refer to an established connection when it is made available to the users.

An exchange must be able to provide originating, terminating and internal exchange connections between input and output interfaces for telephony and other services as required. It may also provide transit connections:

— A connection (if any) between an incoming and an outgoing circuit at interfaces to other exchanges/networks is called a transit connection.

— A connection between channel(s) of a calling subscriber line at an interface for subscriber access and an outgoing circuit at an interface to other exchange/networks is called an originating connection.

— A connection between an incoming circuit at an interface to other exchange/networks and channel(s) of a called subscriber line at an interface for subscriber access is called a terminating connection.

— A connection between channels of two subscriber lines at interfaces for subscriber access is called an internal connection.

An exchange must be able to provide bidirectional connections between input and output interfaces for telephony and other services as required.

Also unidirectional connections may be required.

2.2 *Basic exchange connections*

2.2.1 *General*

The requirements in this section primarily apply to digital local or combined exchanges. Applicability to digital transit or international exchanges requires further study.

Four types of exchange connection have been identified to show the basic forms of connection and their associated information flows that a digital local or combined exchange may be required to handle in an ISDN. They have been based on originating/terminating connections established via interfaces for subscriber access as described in Recommendation Q.512 to/from locations external to the exchange. Calls may be set up in either direction, i.e., subscriber to network or network to subscriber.

These diagrams are functional and not intended to represent any particular implementation. They illustrate the options which may be available for handling a given information type or service within a digital local or combined exchange. Although this approach leads to some duplication between the individual diagrams when considered from the connection point of view, the approach is a logical basis for the further consideration of the more detailed issues arising from the impact of the ISDN on a digital local or combined exchange.

It is not intended to imply that every digital local or combined exchange should necessarily have the capability to handle all these types of connection.

Other types of connection and variants of these basic exchange connections may be feasible in an ISDN and are the subject of further study.

The signalling and control aspects of these connections are covered in §§ 3 and 5 of this Recommendation.

2.2.2 *Explanatory information on the exchange connection diagrams*

The functions associated with the groupings shown on the types I—IV exchanges connection diagrams are covered in § 3.

Key

⌈ ———————— information other than separate signalling
⌇
⌊— — — — — — separate signalling(s)

Information flows

— p_1: packet data information different from customer—originated packetized data;

— s_1, s_2, s_4, s_5: signalling information different from the signalling associated with customer terminals;

— packet switching interworking functions may be provided at other exchanges in an ISDN or at the point of access to a separate packet switched network.

2.2.3 *Type 1 exchange connection* (Figure 1/Q.522)

This connection is sued to transport telephony and associated voice services.

This connection is characterized by (see Table 2/I.340, A 4, A 5, A 7 and A 8):

— *Information transfer attributes*

mode: circuit

rate: 64 kbit/s

capability: speech — 3.1 kHz audio

establishment: switched — semi—permanent

symmetry: bidirectional — symmetric

configuration: point—to—point uniform

structure: 8 kHz integrity

— *Access attributes* (Table 1/Q.522)

TABLE 1/Q.522

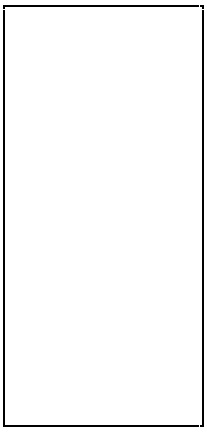
Access attributes	User access	Network access
Access channel and rate		
Information	B/64	Digital circuit with access to analogue/digital switched network
Signalling	D/16—64	Digital circuit (s_1)
Access protocol [a)]		
Layer 1	For further study	Q.702, others
Layer 2	I.441	Q.703, others
Layer 3	I.451	Q.704, Q.714, Q.764, others

a) Only for switched services.

— *Other attributes*

For further study.

Figure 1/Q.522 - CCITT59641



2.2.4 *Type II exchange connection* (Figure 2/Q.522)

This connection is used to transport circuit switched services such as data, telephony, multiple subrate information streams multiplexed into 64 kbit/s by the user, transparent access to a PSPDN (see § 5.2.2).

This connection is characterized by:

— *Information transfer attributes* (see Table 2/I.340, A 1 and A 2)

mode:	circuit
rate:	64 kbit/s
capability:	unrestricted digital information
establishment:	switched — semi—permanent
symmetry:	bidirectional — symmetric
configuration:	point—to—point uniform
structure:	8 kHz integrity

— *Access attributes* (Table 2/Q.522)

TABLE 2/Q.522

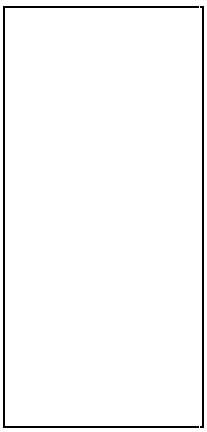
Access attributes	User access	Network access
Access channel and rate		
Information	B/64	Digital circuit with access to analogue/digital switched network
Signalling	D/16—64	Digital circuit (s_1)
Access protocol	See type I (For signalling only) [a]	See type I (For signalling access to digital switched network) [a]

[a] Further study is required for information transfer protocol or access to PSPDN.

— *Other attributes*

For further study.

Figure 2/Q.522 - CCITT 59651



2.2.5 *Type III exchange connection* (Figure 3/Q.522)

This is a connection used to transport packetized data information between an information channel on a digital subscriber access and a 64 kbit/s digital circuit which has an access to:

a) a remote ISDN Packet Handling Functional Grouping;

b) a remote ISDN Packet Switching Interworking Functional Grouping;

c) a public packet network (see § 5.2.3).

This connection is characterized by:

— Information transfer attributes (see Table 3/Q.522)

(see Table 2/I.340, A 10 and A 11)

TABLE 3/Q.522

Access attributes	Option a)	Options b) and c)
Mode	Circuit	Packet
Rate	64 kbit/s (further study)	64 kbit/s (further study)
Capability	Unrestricted digital information	Unrestricted digital information
Establishment	Switched — semi—permanent	Switched — semi—permanent
Symmetry	Bidirectional symmetric	Bidirectional symmetric
Configuration	Point—to—point	Point—to—point
Structure	8 kHz	Service data unit integrity

— *Access attributes* (Table 4/Q.522)

TABLE 4/Q.522

Access attributes	User access	Network access
Access channel and rate		
Information		
Options a), b), c)	B/Further study	64 kbit/s digital circuit [a)]
Signalling a), b), c)	D/16—64	64 kbit/s digital circuit [a)]
Access protocol		
Options a), b)	For further study	For further study
Option c)	For further study	X.75 — X.25

[a)] Information and signalling may be carried by the same circuit (in—band signalling).

— *Other attributes*

For further study.

Figure 3a/Q.522 - T1102800-86

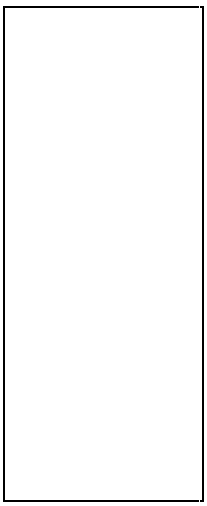


Figure 3b/Q.522 - T1102811-87

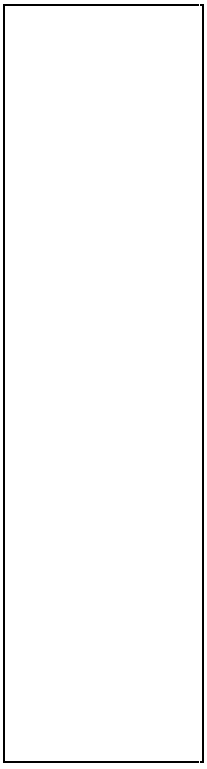
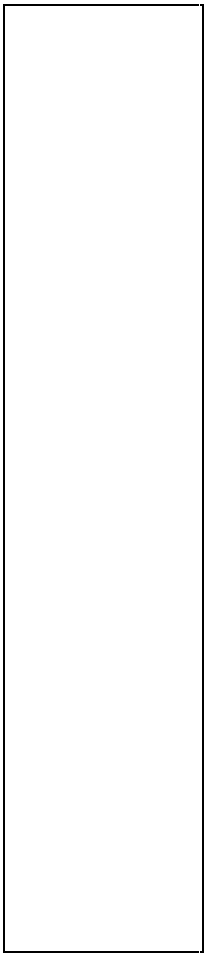


Figure 3c/Q.522 - T1102820-86



2.2.6 *Type IV exchange connection* (Figure 4/Q.522)

This connection is used to transport message type data, for example packetized data messages or teleaction information messages (see § 5.2.4).

It consists of a message/packet type connection via a D channel on a digital subscriber access to an access port to either:

a) a remote ISDN Interworking Functional Grouping; or

b) a public packet network.

This connection is characterized by:

— Information transfer attributes

(see Table 2/I.340).

See type III, options b) and c).

— *Access attributes* (Table 5/Q.522).

TABLE 5/Q.522

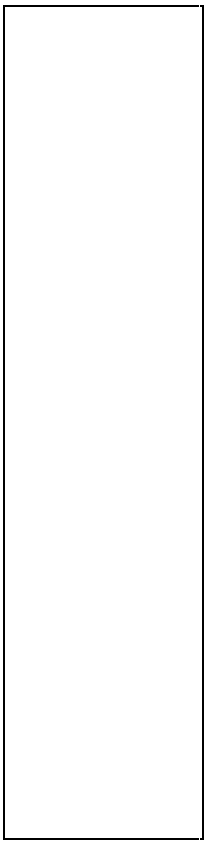
Access attributes	User access	Network access
Access channel and rate Information and signalling Options a) and b)	D/For further study [a]	64 kbit/s digital circuit [b]
Access protocol Option a)	For further study	For further study
Option a)	For further study	X.75 — X.25

[a] Signalling in—band or out—band.
[b] Signalling in—band or out—band for option a), or in—band for option b).

— Other attributes

For further study.

Figure 4/Q.522 - T1108870-87



2.3 *Functions associated with attributes shown in § 2.2*

The following information is to clarify which functions may be associated with the attributes shown on the types I—IV exchange connection diagrams described in § 2.2.

2.3.1 *Layer 1 functions* (see Note in § 2.3.4)

This functional grouping includes:

— digital line/exchange termination interface functions.

2.3.2 *Layer 2 functions* (see Note in § 2.3.4)

This functional grouping includes:

— layer 2 D—channel protocol handling (LAP D)

2.3.3 *64 kbit/s circuit switching functions*

This functional grouping includes:

— 64 kbit/s switching stage(s).

2.3.4 *Signalling handling and exchange control functions*

This functional grouping may include:

— layer 3 D—channel protocol for signalling (see Note);

— functions related to circuit switched connection control;

— signalling functions for common channel signalling;

— signalling interfaces with “packet handling function”;

— functions related to packet switched connections;

— signalling interface with “packet switching interworking function”.

Note — The term “layer” refers to Open Systems Interconnection as applied to CCITT signalling systems as defined by Recommendations X.200 and I.112.

2.3.5 *Packet switching interworking functions*

This functional grouping may include:

— signalling interface with “packet handling function” and “signalling handling and exchange control function” allowing call packets to be routed to/from the appropriate subscriber terminals;

— routing functions;

— functions such as compatibility checking;

— protocol conversion;

— numbering interworking;

— control function (see Note in § 2.3.6).

2.3.6 *Packets handling function*

This functional grouping may include:

— layer 3 D—channel protocol for packet calls;

— packet level multiplexing for outgoing calls;

— packet level demultiplexing for incoming calls;

— signalling interface with the “signalling handling function” and subscriber terminals via layer 1 and 2 functional block;

— control functions for packet switched connections (see Note);

— some or all the functions associated with packet switching (e.g., internal packet calls).

Note — Clarification of control function would need further study.

In the case where the packet switching interworking function is not present in the local exchange, the local exchange contains the minimum functions necessary to enable it to communicate with the packet switching interworking function. The protocols to carry out this minimum function require further study.

2.4 *Bit rate of a connection through an exchange*

2.4.1 *Basic bit rate for circuit switched connections*

The exchange should be able to make circuit switched connections between channel timeslots with the basic bit rate of 64 kbit/s. The channel timeslots to be connected are contained in primary or higher order frame structures appearing at the digital interfaces of the exchange or derived from analogue channels appearing at the analogue interfaces, or from individual digital interfaces for subscriber access.

Switching at rates other than 64 kbit/s is for further study.

2.4.2 *Basic bit rate for message/packet switched connections Type IV*

The bit rate of a message/packet connection Type IV will depend on a number of factors including the bit rate of the subscriber terminal equipment, the bit rate of the D channel and the bit rate capacity of the connection to the appropriate network.

2.5 *Services offered at bit rates less than 64 kbit/s*

Services requiring less than 64 kbit/s for a connection should be switched as 64 kbit/s connections.

2.6 *Services offered at bit rates greater than 64 kbit/s*

2.6.1 *General*

Services requiring more than 64 kbit/s for a connection are through—connected as a multiple of 64 kbit/s connections. They are called multi—slot connections.

The exchange may be required to establish the following types of multi—slot connections (see Recommendation I.340):

— 2×64 kbit/s connections;

— 6×64 kbit/s connections to provide a H_0 channel;

— 24×64 kbit/s connections to provide a H_{11} channel;

— 30×64 kbit/s connections to provide a H_{12} channel.

It should be noted that an $n \times 64$ kbit/s connection can seriously affect the blocking probability of an exchange and the network, particularly if all n timeslots are routed in a defined order in the same multiplex. The ability to handle multi—slot traffic will be influenced by the traffic loading of the exchange at any instant and the number of circuits available on the required route.

2.6.2 *2 × 64 kbit/s connections*

This connection type is characterized by the following attributes (see Recommendation I.340).

The attributes are for further study.

A 2×64 kbit/s connection is established in response to signalling information received on the subscriber line or on an inter—exchange link.

The exchange should maintain restricted differential time delay between the two timeslots involved in the connection. The precise definition of ”restricted differential time delay” is still to be formulated, but the intention is to ensure that the time delay between the individual slots forming a 2×64 kbit/s connection is not excessive, for example as could occur if the two channels were routed out of the exchange on diverse physical routings.

The exchange aspects of meeting this requirement require further study, but will include the need for the exchange to be capable of recognizing the signalling information on incoming inter—exchange circuits/subscriber accesses which indicates that there is an association between two incoming 64 kbit/s channels and to ensure that the two channels are handled by the exchange in a uniform manner.

2.6.3 *Switching of 6 × 64 kbit/s connections (H_0 channel)*

The 64 kbit/s timeslots which form an H_0 channel are transmitted over the same primary multiplex system within the same frame. This is valid for both the subscriber line and the inter—exchange links.

The requirement for 6 × 64 kbit/s connections can be satisfied by establishing 6 separate 64 kbit/s semi-permanent connections, each of which would be set up to preserve the sequence with the other slots forming the 6 × 64 kbit/s connection.

2.6.4 *Switching of 24 or 30 × 64 kbit/s connection (H_1 channels)*

This is for further study.

2.7 *Mode of establishment*

2.7.1 *Circuit switched connections, Type I, Type II and Type III option a)*

Circuit switched connections are set up at any time on demand in response to signalling information received from subscribers, other exchanges or other networks.

2.7.2 *Packet switched connections, Type III options b) and c)*

For further study.

2.7.3 *Message/packet switched connections, Type IV*

These connections are set up on demand subject to any D channel priority/flow control restrictions that may be applicable.

2.7.4 *Semi—permanent connections*

The exchange should have the capability of establishing semi—permanent connections which pass through the exchange switching network.

Other features of semi—permanent connections, e.g. grade of service, the need for an out—slot signalling channel associated with the connection, etc. are for further study.

2.8 *Bit sequence independence*

See Recommendation Q.554.

2.9 *Bit integrity*

See Recommendation Q.554.

2.10 *Octet sequence integrity*

See Recommendation Q.9.

2.11 *8 kHz (structure) integrity*

See Recommendation I.140.

2.12 *Bit patterns generated by the exchange in idle channel timeslots*

At interfaces A and B, the following patterns are recommended for the idle condition, where the left—most digit is the polarity digit.

01111111 for 1544 kbit/s systems

01010100 for 2048 and 8448 kbit/s systems.

At other interfaces the bit pattern generated in idle channel timeslots is for further study.

The patterns should not be used as an indication of the idle or barred conditions of a channel since this information should be derived from the control or signalling functions.

Note — These patterns are slightly different from the quiet code produced by external test equipment and used as an auxiliary signal for noise and crosstalk measurements on digital exchanges (see Recommendations Q.551, § 1.2.3.1, Q.552, §§ 2, 2.2.3, 3.1.4 and Q.553, §§ 2.1.1.2, 3.1.4).

2.13 *Error performance*

See Recommendation Q.554.

2.14 *In—call rearrangement*

In—call rearrangement is the rearrangement by the exchange of the established connections across the switchblock in a more efficient manner.

When it is provided, it is essential that the requirements for error performance, Quality of Service, etc. be met (see Recommendation Q.543).

2.15 *Transmission performance characteristics*

See Recommendations Q.551 to Q.554.

3 Signalling and D—channel handling

3.1 *General*

The exchange should be capable of interworking with other exchanges using signalling systems indicated in Recommendation Q.7, and for local or combined exchanges with user equipment on digital access lines (e.g., terminals and PABXs) using the signalling procedures in Recommendations I.430, I.431, and Q.920 (I.440), Q.930 (I.450)—Series of Recommendations.

For a local or combined exchange interworking with user terminals or analogue subscriber access lines should be accomplished using nationally recommended signalling procedures.

64 kbit/s signalling channels entering the exchange via a multiplex structure may be connected through the exchange as semi—permanent channels.

3.2 *Signalling associated with exchange connections Types I—IV*

This section applies to local or combined exchanges only.

3.2.1 *General*

Details of the exchange connections Types I—IV are given in § 5.

For internal and originating connections, the call set up signalling information will be received from the subscriber.

For terminating and transit connections, the call set up signalling information will be received from the appropriate network or separate signalling network.

Note — Receipt of call set up signalling information may be affected by the involvement of supplementary services.

3.2.2 *Basic connections including Type I exchange connection*

The exchange should carry out the functions defined in the following signalling systems.

3.2.2.1 *On the subscribers side:*

a) analogue line signalling systems as defined nationally; and

b) the defined digital subscriber access signalling system(s) if digital subscriber accesses are provided (see Recommendations I.430 and Q.920, Q.930—Series of Recommendations).

3.2.2.2 *On the network side*

One or more of the signalling systems are defined in Recommendation Q.7.

3.2.3 *Type II exchange connection*

The exchange should carry out the functions defined in the following signalling systems.

3.2.3.1 *On the subscriber side*

The defined digital subscriber access signalling system(s) (see Recommendations I.430 and Q.920, Q.930-Series of Recommendations).

3.2.3.2 *On the network side*

One or more of the signalling systems defined in Recommendation Q.7.

Note — Further study is required for information transfer protocol or access to PSPDN.

3.2.4 *Type III exchange connection*

3.2.4.1 *On the subscriber side*

For further study.

3.2.4.2 *On the network side*

The signalling associated with the messages/packets may be:

a) contained in the individual message/packets; or

b) transported separately, in accordance with one or more of the signalling systems defined in Recommendation Q.7.

A local exchange which supports such services must contain a function that is capable of either interpreting them and routing them appropriately, or of sending them directly to an appropriate interworking function.

3.2.5 *Type IV exchange connection*

On the subscriber side:

The signalling associated with the messages/packets may be:

a) contained in the individual message/packet, or

b) transported separately as s—information (see Recommendations I.430 and Q.920, and Q.930—Series of Recommendations).

On the trunk side:

The signalling associated with the messages/packets may be:

a) contained in the individual message/packet (p_1); or

b) transported separately (s_1 information), in accordance with one or more of the signalling systems defined in Recommendation Q.7.

A local exchange which supports such services must contain a function that is capable of either interpreting them and routing appropriately, or of sending them directly to an appropriate interworking function.

3.3 *Digital subscriber access — D channel and protocol handling layers 1, 2 and 3*

The following text refers to handling the D—channel protocol on the exchange side of the interfaces U and V_1.

The functions associated with handling the D—channel protocol are defined in the parts of Recommendations I.430, Q.920 and Q.930—Series of Recommendations relating to call establishment for subscribers connected to the U or V_1 interfaces. Exchange functions for D—channel signalling procedures for users connected via a primary rate multiple access are also given in I.431, Q.920 and Q.930—Series of Recommendations.

3.4 *User—to—user signalling*

The exchange may receive signals from the user (e.g., from a PABX) for transport across the network. It must be capable of receiving this information, verifying its acceptability, and if the service is permitted to the requesting user, send it via the inter—exchange signalling or other network to the distant exchange. Similarly the

exchange may receive information from the signalling network for transmission to the subscriber. This capability may not be provided on all types of connection.

Where user—to—user signalling involves network inter—exchange facilities, it may be necessary for the originating local exchange to process this signalling information before sending it to the network, to ensure that it is compatible with signalling, charging and flow control requirements of the originating exchange and network.

4 Ancillary functions

4.1 *Connection of ancillary equipment*

Ancillary equipment may be connected in the following way:

i) Serially. This may require more than one connection through the exchange. Examples of serially connected equipment include:

- echo control devices,
- encoding law converters,
- manual board access equipment (for operator controlled traffic).

ii) As terminal connected equipment usually requiring one connection through the exchange. Examples of such equipment include:

- recorded announcements,
- manual board terminations,
- speech codecs,
- data terminal facilities,
- test equipment (such as a test call sender),
- tone generators,
- signalling receivers.

The interface between the exchange and the items of equipment listed above may be left to the national designers. However, the use of internationally standardized interfaces is preferred.

Note — In some cases it may be necessary to establish more than one connection to one timeslot at the same time.

4.2 *Digitally generated tones and frequencies*

When tones and frequencies are digitally generated the following minimum requirements apply on a provisional basis.

4.2.1 *Service tones*

Digitally generated tones should meet the recommended limits specified in Recommendation Q.35 when decoded.

4.2.2 *Signalling frequencies*

Digitally generated signalling frequencies should be such that they can be detected after decoding by any analogue receivers designed to CCITT Recommendations.

4.3 *Echo control devices*

The exchange should be able to be equipped with echo control devices (echo suppressors/echo cancellers conforming to Recommendations G.164 and G.165 respectively). When required the exchange should be able to control such devices to meet the requirements of Recommendation Q.115. The means of control by the exchange is for further study.

(*Note* — It is recognized that there is a need for an internationally agreed method of disabling and enabling echo control devices for the purposes of making end—to—end circuit transmission maintenance measurements, e.g. as recommended in Recommendation V.25.)

5 Control functions associated with call handling

5.1 *Basic control functions*

The requirements for the basic control functions are implicit in the requirements recommended for the other functions of the exchange. However recommendation of a number of new requirements for the control functions associated with the handling of digital subscriber lines and the use of a digital local exchange within an ISDN, may be necessary.

The exchange should provide the capability to avoid fraudulent use of the connection. Such capabilities may be based on the use of digital pads or an asymmetrical through—connect procedure.

An originating local exchange should be capable of supporting either symmetric or asymmetric through—connect procedures. The choice of procedure may be determined on the basis of service.

Terminating and transit exchange need only support symmetric through—connect procedure.

This subject is for further study.

5.2 *Exchange connections Types I—IV, general control aspects*

5.2.1 *Type I*

These connections will be set up between the accesses associated with network addresses specified in response to the signalling information received. Voice—associated facilities, e.g. tones, should be provided where appropriate and telephony supplementary services may be invoked if provided.

5.2.2 *Type II*

Such connections will be set up between the accesses associated with network addresses specified in response to the signalling messages received. Compatibility checking may be provided before the connection is completely established (see § 2.3.1). Voice associated facilities (e.g. tones, pads) will be disabled in order to provide a transparent digital path, (the means of doing this is for further study). Data supplementary services may be invoked if provided.

5.2.3 *Type III*

Such connections will be set up between the accesses associated with network addresses specified in response to the signalling messages received. Compatibility checking may be provided before the connection is completely established (see § 2.3.1). Voice associated facilities (e.g. tones, pads) will be disabled in order to provide a transparent digital path (the means of doing this is for further study). Data supplementary services may be invoked if provided.

For option a) in the switched access case, originating calls will be set up over the B channel towards the 64 kbit/s digital circuit using the ISDN signalling procedures prior to starting X.25 layer 2 and layer 3 functions. The corresponding service requested in the Q.931 SET—UP message is ISDN packet mode bearer service. For calls originated by the network, the same consideration applies (see Recommendations X.31 and I.462).

The distant packet handling must be selected by the called address in the D—channel protocol when the terminal sets up the circuit switched connection.

Packet data communications, when using a switched B channel, will be established by separating the establishment phase of the B channel (carried out by the exchange) and the control phase of the virtual circuit using the X.25 link layer and packet layer protocol (carried out in the distant packet handling function).

For options b) and c) the same considerations as above apply except that the control phase of the virtual circuit is performed within the exchange.

5.2.4 *Type IV*

These connections will be of the message/packet type (e.g., virtual circuit). The “p—information handling function” and “packet switching interworking function” shown in Figure 4/Q.521 will implement procedures for control of the logical links on the D channel (e.g., flow control, error control) (see also § 3.2.5). Voice associated facilities (e.g., tones, pads) will be disabled in order to provide a transparent digital path.

The D channel provides a semi—permanent physical connection which enables the user terminal to access a packet handling function by establishing a link layer connection (with a specific SAPI) to that function which can then be used to support packet communications according to X.25 layer 3 procedures. The X.25 packet layer will use the acknowledged information service provided by LAP D (see Recommendation Q.920). X.25 layer 3 procedures are transferred transparently over the D Channel link.

A single or multiple LAP D link must support the multiplexing of logical channels at layer 3.

5.3 *Control functions associated with calls over a digital subscriber access via Interfaces U and V_1*

5.3.1 *Control of circuit switched calls Types I, II and III*

In response to s—information carried on the D channel and network signalling messages, the exchange must have the following capabilities.

a) *Setting up a call*

The exchange must receive address information (overlap sending or en bloc), establish the desired path (digital only or mixed) and send further (e.g., Signalling System No. 7) signalling, if necessary (e.g., address, calling line identity, service indicator) into the network.

The call set up procedure may include steps to verify compatibility based on the record in the exchange of the services permitted for the subscriber. The degree of compatibility checking provided by the exchange requires further study.

b) *During a call*

In addition to the basic functions of maintaining a call record, supervising the call, charging for the call, etc., the exchange must be able to handle in—call service/facility requests. These include for example transfer of a call to another terminal or conferencing.

If it is required that a terminal be moved from one location to another on the same access during a call, the exchange must be able to hold the call while the transfer is made and to re—establish communication on request by the user (including carrying out any compatibility checks). The exchange may limit the time allowed for moving a terminal. In addition, the user must send a signal to the exchange indicating that terminal movement is about to take place. Signalling procedures for terminal movement are given in Recommendation Q.931.

c) *Clearing a call*

The exchange will need to initiate call clearing on receipt of a clear request signal from the terminal or network.

d) *Without a call path*

The exchange may be required to handle signalling information without establishment of a call path (subscriber—network transactions).

5.3.2 *Control of message/packet calls over the D channel, Type IV*

Any messages carrying p—information on the D channel must be handled by the exchange in accordance with the applicable Recommendation for services (e.g., Recommendation X.25) requested by the user. It is not necessary that every digital local or combined exchange in an ISDN should be able to to carry out all the possible functions associated with handling this information. It is possible for example that the exchange may route such traffic to another node which has the appropriate handling facilities.

6 Control functions associated with maintenance and automatic supervision

See Recommendation Q.542.