SECTION 2 - BASIC SERVICES

Contents of Recommendation Q.71

ISDN 64 kbit/s circuit mode switched bearer service

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SECTION 2 - BASIC SERVICES

FIGURE 2-9/Q.71 (Sheet 16 of 19)

CC Functional Entity (r1-r1) cont.

FIGURE 2-9/Q.71 (Sheet 17 of 19)

CC Functional Entity (r1-r1) cont.

FIGURE 2-9/Q.71 (Sheet 18 of 19)

CC Functional Entity (r1-r1) cont.

FIGURE 2-9/Q.71 (Sheet 19 of 19)

CC Functional Entity (r1-r1) cont.

	Reference	
	Number	Action
451		Disconnect

- Recognize user DISCONNECT.req

- Formulate DISCONNECT req.ind

- Disconnect resources

452   Release Resources

- Receive and react to RELEASE req.ind

- Release resources - both directions

- Formulate RELEASE resp.conf

2.5   Additional FEAs required for digit-by-digit call setup cases:

	Reference	
Number		Action

212   Process Attempt

- Interact with user to obtain call address

- Formulate messages to send address information to CC

- Determine end of dialling and so indicate to CC
  (if required)

213   Process Attempt

- Interact with user to obtain call address

- Formulate messages to send address information to CC

226   Perform Originating Screening

- Receive and react to SETUP indication

- Analyze service request

- Identify calling user, terminal characteristics and   user priority level

- Verify user's authorization, capabilities and   availability of appropriate
resources

- Establish call reference

- Formulate ACKNOWLEDGE req.ind

227   Process Attempt

- Reserve incoming resources

- Analyze information (called number, routing   requirements, etc.)
- Determine connection elements type, outgoing resource   (or virtual circuit), other resources (echo control,   pads, etc.), charging treatment, network management   controls in effect and any other elements involved in   call setup

- Select resources

- Select path through entity

- Reserve outgoing resource and any other required   resources

- Formulate appropriate SETUP, ADDL ADDR and ADDR END
    req.inds

- Start call control timing, as required

233   Process Attempt

- Receive and analyze SETUP, ADDL ADDR and ADDR END
    req.inds, as required

- Establish call reference

- Reserve incoming resources

- Analyze called number, routing information, network
    management and/or priority information

- Determine connection elements type, outgoing   resource, need for other resources

- Select and reserve outgoing resource, other resources   as required and path through the entity

- Formulate SETUP, ADDL ADDR and ADDR END req.inds as
    required

Through Connect

- Establish through connection as required (see Note 1   to Figures 2-2/Q.71 to 2-6/Q.71).

2.6   Allocation of functions to physical entities

The functional model relates to functions involved in handling a single call or call attempt. The scenarios in

Table 2-2/Q.71 identify the roles a physical device (e.g., exchange, NT2, terminal equipment, etc.) may play in handling that call or call attempt. A specific physical device may fulfill different roles in different scenarios, e.g., a local exchange may provide both CCA and CC capabilities. (See scenario D.)

TABLE 2-2/Q.71

<u>Physical allocation of functions</u>

Legend: Entities connected by dashed line are the same physical entity

TE = Terminal Equipment   LE = Local Exchange
NT2 = Network Termination 2   TR = Transit Exchange

<u>Note 1</u> - In scenario B, the NT2 provides the CC function of the TE and appears to be a CCA to the LE (e.g., when the NT2 is a PABX).

3. In call modification procedures for alternate speech/unrestricted   information transfer service

3.1 Introduction

This § contains information on in-call modification procedures that are required for alternate speech/unrestricted information transfer service. Call setup and clearing procedures are basically the same as those for speech,
3.1 kHz audio and unrestricted information transfer services. Thus, the call setup and clearing procedures described in §§ 1 and 2 apply to this service also.

However, once a connection has been established, the change of use of the bearer service from speech to unrestricted information transfer or vice versa, may require the removal/addition of resources or functions from/to the connection (e.g., echo or loss control). Also, user terminals may be single mode or multiple mode types. Single mode terminals require that the user/network access resource be transferred from one terminal to another during the modification process.

Thus, upon receipt of a request from either the calling or called user, the network effects the procedures needed to condition the connection for the alternate use. The procedure for changing terminals, if necessary (as in the case of single mode terminals), can be accomplished by either of two methods:

a)   the user temporarily suspends service, manually transfers the access resource to another terminal and then resumes use of the service;

b)   the user requests the network to transfer the access resource to another terminal and the network responds by placing the original connection on "hold" and then initiates a SETUP to another terminal at the same location. After SETUP to the second terminal is confirmed, the connection to the first terminal is released.

3.2 Functional model

The functional model for the alternate speech/unrestricted information transfer service is the same as shown in § 2.1.

However, in the description of in-call modification procedures, CCAs are added, as in Figure 2-7/Q.71.

FIGURE 2-7/Q.71

Functional model used to illustrate alternate speech/unrestricted
information transfer service modification procedures

The Call Control Agents (CCAs) at locations 1, 2, 6 and 7 provide access to/from the user/ISDN access resources for user terminals. They have the capabilities and characteristics required to interact with the network. They may be associated with either the originating or terminating ends of the bearer service call.

The Call Control entity (CC) at location 3 is the Call Control entity at which the in-call modification request is received from the user. The CC at location 4 represents other network entities through which the bearer service connection passes. The CC at location 5 is the Call Control entity that interfaces the CCA serving the user terminal at the other end of the call.

r_1 and r_2 are relationships between the functional entities wherein information flows occur in order to process the in-call modification requests.

3.3 Information flows for in-call modification

3.3.1 Information flow diagrams for in-call modification procedures

Figure 2-8/Q.71 - Procedures where both terminals have multiple mode   capability

Figure 2-9/Q.71 - Procedures where single mode terminals are involved   and terminal transfer is accomplished manually by   the users

Figure 2-10/Q.71 - Procedures where the user requesting the alternate   use has a single mode terminal and requests the   network to connect to an alternate terminal

Figure 2-11/Q.71 - Procedures where the user not requesting the   alternate use requests the network to connect to an   alternate terminal

3.3.2 Definition of information flows needed for in-call modification   procedures (in addition to those in § 2.2.2)

3.3.2.1   HOLD req.ind is used to request that a user access resource be placed in a "hold" condition (reserved) while other actions are occurring. This is a confirmed information flow and appears within the r_1 relationship.

The HOLD request itself is the main item of information conveyed in the HOLD req.ind information flow.

3.3.2.2   MODIFY req.ind is used to request the modification of service characteristics by removing/inserting functions as required. This is used in connection with in-call modification for alternate service use of a bearer connection. This is a confirmed information flow within the relationship of r_1 and r_2.

The main item of information conveyed in the MODIFY req.ind is the request for modification of the connection and of terminal(s) as required.

3.3.2.3   RESUME req.ind and resp.conf is an information flow that undoes a "suspend" state of a call. It is a confirmed information flow within the r_1 relationship.

The main item of information conveyed in the RESUME req.ind/resp.conf is the information that use of the connection by the users may be resumed and the process of modification can proceed.

3.3.2.4   SUSPEND req.ind and resp.conf is a type of "hold" procedure that allows a user to transfer terminals on his user access without disconnecting the call. It is a confirmed information flow within the r_1 relationship.

The main item of information conveyed in the SUSPEND req.ind/resp.conf is that use of the connection will be suspended while terminal changes are made.

3.4   SDL diagrams

SDLs that describe in-call modification procedures have still to be developed.

Notes for Figures 2-8/Q.71 through 2-11/Q.71

Note 1 - Through connection is dependent on the physical location of the functional entity:

      a)   Originating Local Exchange

              i) for 3.1 kHz audio bearer service, speech and telephony services, backwards only or both directions, depending on the approach adopted by the administration or RPOA;

              ii) for 64 kbit/s unrestricted information transfer, backwards only, except for own-exchange calls, which may be either backwards only or in both directions at the discretion of the administration or RPOA.

      b)   Transit exchange - both directions.

      c)   Terminating local exchange - no through connection at this stage of call setup, except as a national option for certain classes of users, e.g., PABXs.

      d)   NT2 - may through connect as required.

Note 2 - If not already done, complete the through connection in both directions.

Note 3 - The method of initiating and stopping charging will depend on the administration's method of charging for service (e.g., pulse metering, recording call detail and billing, etc.). The charging function may be performed at different entities at the discretion of the administration and/or RPOA.

Note 4 - Further study is required on the possible inclusion of an entity from/to which information is passed and on the information flows themselves. The "Notify" information may or may not be sent to the user terminal and/or user depending on the terminals involved.

Note 5 - The intended use of the service (transfer capability required, e.g., speech, 3.1 kHz audio, unrestricted or alternate speech/unrestricted information transfer) must be indicated as an element of the call SETUP information flow from the CCA to the CC.

Note 6 - Tones are used with speech and 3.1 kHz bearer services and telephony. The use of disconnect tone is a national option.

Note 7 - This is the CC at which the MODIFY request is received from the CCA (may be either the originating or the terminating local exchange with respect to the direction of the speech/unrestricted information transfer call setup).

3.5   Functional entity actions required for in-call modification procedures

Reference
Number   Action

   611   Process Attempt

              -   Receive and react to SETUP req.ind

              -   Send SETUP.ind to user

              -   Formulate alerting REPORT req.ind

   621   Process/Reserve

              -   Receive and react to MODIFY req.ind

              -   Verify that call is alternate speech/unrestricted   -   information transfer

              -   Reserve resources as required

              -   Formulate MODIFY req.ind

              -   Start timer

   622   Connect or Disconnect Resources

              -   Receive and react to MODIFY resp.conf

              -   Connect or disconnect resources, as required

              -   Formulate MODIFY resp.conf

   623   Suspend

              -   Receive and react to SUSPEND req.ind

              -   Formulate SUSPEND resp.conf and REPORT req.ind

   624   Resume

              -   Receive and react to RESUME req.ind

              -   Formulate RESUME resp.conf and REPORT req.ind

   625   Hold Resources

              -   Receive and react to MODIFY req.ind

              -   Recognize that a different user terminal is required

- Formulate HOLD req.ind and REPORT req.ind

626   <u>SETUP</u>

- Receive and react to HOLD resp.conf

- Initiate SETUP req.ind and REPORT req.ind

627   Apply Ring Tone (Note 6)

      - Receive and react to alerting REPORT req.ind

      - Formulate REPORT req.ind

      - Apply Ring Tone to circuit toward distant user

628   Process/Reserve

      - Receive and react to SETUP resp.conf

      - Reserve resources as required

      - Formulate MODIFY req.ind

Remove Tone

      - Remove ring tone, if it was applied

629   Connect or Disconnect Resources

      - Receive and react to MODIFY resp.conf

      - Connect or disconnect resources, as required

      - Formulate MODIFY resp.conf

      - Initiate disconnect procedures for Terminal 1

631   Process/Reserve

      - Receive and react to MODIFY req.ind

      - Reserve resources as required

      - Formulate MODIFY req.ind

632   Connect or Disconnect Resources

      - Receive and react to MODIFY resp.conf

      - Connect or disconnect resources, as required

      - Formulate MODIFY resp.conf

641   Process/Reserve

      - Receive and react to MODIFY req.ind

      - Reserve resources as required

- Formulate MODIFY req.ind

642   <u>Connect or Disconnect Resources</u>

- Receive and react to MODIFY resp.conf

- Connect or disconnect resources, as required

- Formulate MODIFY resp.conf

643   Suspend

- Receive and react to SUSPEND req.ind

- Formulate SUSPEND resp.conf and REPORT req.ind

644   Resume

- Receive and react to RESUME req.ind

- Formulate RESUME resp.conf and REPORT req.ind

645   Hold Resources

- Receive and react to MODIFY (w/change) resp.conf

- Formulate HOLD req.ind and REPORT req.ind

646   Setup

- Receive and react to HOLD resp.conf

- Initiate SETUP req.ind

647   Apply Ring Tone (Note 6)

- Receive and react to alerting indication

- Formulate REPORT req.ind

- Apply ring tone to circuit toward distant user

648   Remove Tone

- Receive and react to SETUP resp.conf

- If applied, remove ring tone

Connect or Disconnect Resources

- Connect or disconnect resources as required

- Formulate MODIFY resp.conf

- Initiate disconnect procedures for Terminal Y

651   Process Attempt

- Receive and react to SETUP req.ind

- Send SETUP.ind to Terminal Z

- Formulate alerting REPORT req.ind