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SECTION 3

INTERWORKING BETWEEN DIGITAL SUBSCRIBER SIGNALLING

SYSTEM No. 1 AND SIGNALLING SYSTEM No. 7

Recommendation Q.699

INTERWORKING BETWEEN THE DIGITAL SUBSCRIBER SIGNALLING SYSTEM LAYER 3 PROTOCOL AND THE SIGNALLING SYSTEM No. 7

ISDN USER PART

1 General

1.1 *Introduction*

This Recommendation defines the interworking relationship between the layer 3 functions and protocol of Digital Subscriber Signalling System No. 1 (DSS 1) and the ISDN User Part functions and protocol of Signalling System No. 7.

The interworking between the above two signalling protocols typically may occur in an ISDN local exchange and is specified in the context of a typical call in a pure ISDN or mixed ISDN/non-ISDN environment.

1.2 *Purpose*

The purpose of the Recommendation is:

a) to define how the layer 3 protocol of DSS 1 and Signalling System No. 7 ISDN User Part protocol should be used in combination with call control functions, to support the basic bearer service;

b) to provide a logical bridge between the abstract signalling information flows, which are used in the description of ISDN services, and the corresponding messages and elements of procedure of the ISDN User-Network Interface User Part protocols.

1.3 *Scope*

This Recommendation is aimed at defining the interworking relationship between the call control protocol of the Digital Subscriber Signalling System No. 1 and the ISDN User Part of Signalling System No. 7.

The Recommendation defines in detail the relationship between signalling information conveyed via the Digital Subscriber Signalling System No. 1 protocol and similar signalling information conveyed via the ISDN User Part of Signalling System No. 7. The above relationship is described within the context of supporting the provision of basic bearer service for a call within an ISDN or mixed ISDN/non-ISDN environment.

1.4 *Relationship to other Recommendations*

This Recommendation forms part of a set of interlocking ISDN service and signalling Recommendations. Other members of this set include the following:

— the operation of basic ISDN telephony teleservice and 64 kbitB/Fs bearer service, which is supported in part via the interworking of the ISDN signalling systems described herein, is defined in detail in Recommendation Q.71 (basic service stage 2 description);

— the signalling messages and elements of procedure of layer of the Digital Subscriber Signalling System No. 1 and the ISDN User Part of Signalling System No. 7 are defined in Recommendations Q.930/931 (I.450/451) and Recommendations Q.761-Q.764 and Q.766, respectively.

2 Methodology

2.1 *General*

This chapter describes the methodology used to model and define interworking between the ISDN User Part and layer 3 of Digital Subscriber Signalling System No. 1. The methodology is based on the layer service concepts prescribed by the Reference Model of Open System Interconnection (OSI) for CCITT Applications (Recommendation X.200) and uses the terms and conventions defined in Recommendation X.210 (OSI Layer Service Definition Conventions).

The methodology used is for description purposes only. It does not imply that this type of layering is essential in a real implementation.

The interworking model is described in § 2.2. Subsequent sections identify and review the diagrams and tables utilized in describing the model, its functions and the signalling information transfers between the call control functional entities.

2.2 *Interworking model*

The interworking model encompasses 3 functional entities, including call control, the incoming signalling system and the outgoing signalling system, where incoming or outgoing refers to the direction of call set-up. The signalling system entities may represent either the ISDN User Part of the User Network Interface Protocol.

The call control entity acts as an intermediary between the ISDN access and network signalling protocols. It typically invokes local call processing decisions/actions as a result of receiving a primitive from one signalling system (e.g. incoming access). As a result of that processing, it may send a primitive to the same signalling system and/or another signalling system (e.g. outgoing network). Local call processing decisions/actions (e.g. routing and through connection) are independent of the type of signalling system used by call control entities to communicate with each other.

There are 4 types of primitives:

a) Request: A primitive issued by a call control entity to invoke a signalling procedure and thereby transfer information to a peer entity.

b) Indication: A primitive issued by the signalling protocol to invoke a call control procedure or indicate that procedure has been invoked by the peer call control entity.

c) Response: A primitive issued by call control (if required), to indicate completion of a procedure previously invoked by an indication.

d) Confirm: A primitive issued by the signalling protocol to call control (if required) to indicate completion of a procedure previously invoked by a request from the same call control entity.

The descriptions of the incoming and outgoing signalling system functional entities are not part of this Recommendation but are provided in Recommendation Q.931 for Digital Subscriber Signalling System and in Recommendations Q.761-Q.764 and Q.766 for the ISDN User Part.

Figure 1/Q.699, p. 1

2.3 *Time sequence diagrams*

Time sequence or ‘‘arrow’’ diagrams are provided to show the permitted temporal relationships between primitives and between primitives and signalling messages, and the time sequence of these relationships during the process of executing a call control procedure. The general format of an arrow diagram is shown in Figure 2/Q.699.

Due to the multiplicity of optional possibilities in both the ISDN User Part and the Digital Subscriber Signalling System protocols not all possible cases are shown in the arrow diagrams. The diagrams which are included represent a sample of typical situations.

Sequences of interactions are shown along vertical lines which represent increasing time in the downward direction.

Broken line arrows represent individual primitives and indicate their direction of propagation, i.e. to or from call control.

Solid line arrows represent signalling messages and indicate their direction of propagation, i.e. to or from the incoming or outgoing signalling system.

Wavy line arrows ( ), if present, represent tones or announcements sent inband.

For call control the following symbols are used between vertical lines to indicate the relationship between the incoming and outgoing primitives (e.g. between B indication and B response) and possibly a call control action taken, where it is necessary to indicate clearly a particular function that is invoked by a received primitive.

Solid line ( ): the incoming and outgoing primitives are unconditionally related, i.e. the incoming primitive always triggers the sending of the outgoing primitive independent of the service context in which the incoming primitive is received.

Broken line ( ): the incoming and outgoing primitives are related only in the service context considered. In a different service context this relationship may not exist.

Squiggly line ( ): the reception of the incoming primitive and the transmission of the outgoing primitive are unrelated. This is to indicate that although these primitives are shown as adjacent in the arrow diagram, the generation of the outgoing primitive is unrelated to the receipt of the incoming primitive.

Figure, p. 2

Where it is necessary to indicate the signalling system function performed on transmission or reception of a signalling message, the following symbols are shown below the concerned message:

Figure, p. 3

Figure 2/Q.699, p. 4

2.4 *Mapping tables*

Mapping tables are provided to define the relationship between User-Network Interface Protocol messages and information elements on the one hand and ISDN User Part messages and parameters on the other hand.

One table is provided for each User-Network Interface Protocol message that maps onto an ISDN User Part message. The same table also specifies the mapping of elements of information which are carried by the concerned messages.

Elements of information that are of local significance only, i.e. are not mapped onto elements of information in the other signalling system, are not shown.

3 Interworking specification for successful call set-up procedures

3.1 *Arrow diagrams*

This section contains the interworking arrow diagrams for the successful call set-up procedures.

3.1.1 *Enbloc, non-automatic answering terminal, sending of address complete independent of access*

Figure 3/Q.699 shows the sequence of messages for successful call set-up where enbloc address signalling is used, the Address Complete Message (ACM) is sent by the network independent of access indications, and the called party is not an automatic answering terminal.

3.1.2 *Enbloc, automatic answering terminal, sending of address complete independent of access*

Figure 4/Q.699 shows the sequence of messages for successful call set-up where enbloc address signalling is used, the address complete Message is sent independent of access indications, and the called party is an automatic answer terminal (fast connect scenario).

3.1.3 *Enbloc, non-automatic answering terminal*

Figure 5/Q.699 shows the sequence of messages for successful call set-up where enbloc address signalling is used, the Address Complete Message is delayed until receipt of alerting indication from the access, and the called party is not an automatic answering terminal.

3.1.4 *Enbloc, automatic answering terminal*

Figure 6/Q.699 shows successful call set-up with enbloc address signalling, and the address complete indication delayed until receipt of connect indication from an automatic answering terminal. In this case the address complete indication and connect indication are combined in the Connect message in the network.

3.1.5 *Overlap addressing, originating access only, non-automatic answering terminal*

Figure 7/Q.699 shows the sequence of messages when overlap addressing is used between the calling party and the originating local exchange, and enbloc addressing is used within the network. An independent ACM and non-automatic answering terminal is assumed in this case. Variations are possible as in Figures 3/Q.699-6/Q.699.

3.1.6 *Overlap addressing, originating access and network, non-automatic answering terminal*

Figure 8/Q.699 shows the sequence of messages when overlap addressing is used at the originating access and within the network. In this case the ACM through the network informs the originating local exchange that enough address information has been received, and the exchange can therefore indicate CALL PROCeeding to the calling party.

3.1.7 *Overlap addressing, both accesses and network, address complete cannot be determined by number analysis*

In Figure 9/Q.699, overlap addressing is used at both accesses and in the network. An example is a call made to an ISDN PABX, where determination of address complete may only be made as a result of an indication, e.g. alerting, from the called access. In this case, the ALERTing message from the called access allows the sending of an ACM in the network, which since it carries the ‘‘subscriber free’’ indication is mapped to ALERTing at the calling access.

3.1.8 *Overlap addressing, originating access and network, address complete determined by number analysis*

In Figure 10/Q.699, overlap addressing is used to reduce the post-dialing delay by allowing connection set-up to be in parallel with the entering of digits by the calling party. In this case, proceeding indications can be independently derived from number analysis. The diagram assumes independent ACM sending, however alternative cases are possible as in Figures 3/Q.699-6/Q.699.

3.1.9 *ISDN to analogue subscriber*

Figure 12/Q.699 shows the sequence of messages for a call from an ISDN subscriber to an analogue subscriber. The arrows between the local exchange and non-ISDN user indicate signals that may vary with the access protocol.

3.1.10 *Analogue subscriber to ISDN*

Figure 13/Q.699 shows the sequence of messages for a call from an analogue subscriber to an ISDN subscriber. Again, the arrows between non-ISDN user and local exchange indicate signals that may vary with the access protocol. Procedures for ACM and ANM may vary as in Figures 3/Q.699-6/Q.699. Overlap addressing may also be used in this case. Interworking then follows the message flows shown in Figures 8/Q.699 and 10/Q.699.

3.1.11 *ISDN-PSTN interworking*

Figure 14/Q.699 shows the interworking between ISDN and PSTN, in the case where the PSTN does not provide an out-of-band address complete indication. More detailed interworking between ISDN and PSTN is given in the Q.600 Recommendations.

3.1.12 *PSTN-ISDN interworking*

Figure 15/Q.699 shows interworking in a call originating in the PSTN, where the PSTN does not provide an out-of-band address complete indication. Overlap addressing may also be used in this case. Interworking then follows the message flows shown in Figures 8/Q.699 and 10/Q.699.

3.1.13 *ISDN-PSTN interworking, PSTN support out-of-band address complete indication*

Figure 16/Q.699 shows interworking where the PSTN provides an out-of-band address complete indication. As noted, the primitive and ACM indicators may differ depending on whether or not the PSTN provides call progress indications. More detailed interworking between ISDN and PSTN is given in the Q.600 Recommendations.

3.1.14 *PSTN-ISDN interworking, PSTN supports out-of-band address complete indication*

Figure 17/Q.699 shows interworking for a call originating in the PSTN, where the PSTN provides out-of-band address complete indications.

3.1.15 *User-generated PROGress message, sending of address complete independent of access*

Figure 18/Q.699 shows the case where the PROGress message in Q.931 is used to indicate interworking outside of the public network. In order to support user-generated in-band information, the terminating exchange may optionally through-connect in the backwards direction on receipt of the PROGress message (see Annex O of Recommendation Q.931).

3.1.16 *User-generated PROGress message*

Figure 19/Q.699 shows the corresponding case when the address complete indication is delayed until an indication is received from the access, and the PROGress message maps to an Address Complete Message.

3.1.17 *Overlap addressing, both accesses and within network, transfer of address complete indication via call proceeding*

Figure 11/Q.699 shows the case where the indication that complete address information has been received is transferred by the terminating access in the proceeding primitive.

3.1.18 *Notes relative to Figures 3/Q.699 to 19/Q.699*

The following notes apply to all interworking diagrams in this section:

— If continuity check occurs in the network, the SET-UP request primitive in the terminating local exchange is not passed until continuity is verified.

— Through-connection for specific cases may vary from the examples shown, e.g. for different PSTN signalling systems. More detailed information can be found in Recommendation Q.764, §§ 2.1.1.1 and 2.1.2.1.

The remaining notes apply where referenced in particular figures:

Note 1 — This message may be sent by the user to achieve symmetrical working or to avoid timer expiry on response to SET-UP (see Recommendation Q.931 § 5.2.5.1).

Note 2 — This message may be sent by the user to achieve symmetrical working (see Recommendation Q.931 § 5.1.8).

Note 3 — Called line status = no indication; ISDN access indicator = ISDN access.

Note 4 — Called line status = subscriber free; ISDN access indicator = ISDN access.

Note 5 — The number of INFORMATION messages and primitives shown is for example only. In practice the number may be zero or more; of zero, the Set-up request and Proc request primitives may be originated on expiry of timer T302 (see § 5.1.5.2 of Recommendation Q.931).

Note 6 — Progress indicator = 2 — destination address is non-ISDN.

Note 7 — Called line status = subscriber free; ISDN User Part indicator = ISDN User Part used all-the-way; ISDN access indicator = non-ISDN Access.

Note 8 — ISDN User Part indicator = ISDN User Part used all-the-way; ISDN access indicator = non-ISDN Access.

Note 9 — Conditional on type of access.

Note 10 — Progress indicator = 3 — origination address is non-ISDN.

Note 11 — Completion of transmission path timing is described in § 2.1.9.1 of Recommendation Q.764.

Note 12 — Called line status = no indication; ISDN User Part indicator = ISDN User Part not used all-the-way; ISDN access indicator = non-ISDN access.

Note 13 — ISDN User Part indicator = ISDN User Part not used all-the-way; ISDN access indicator = non-ISDN access.

Note 14 — Primitive is either Progress or Alerting, depending on the PSTN indication. If the PSTN indicates Alerting (subscriber free), then an ALERTing message replaces the PROGress message at the originating Q.931 interface.

Note 15 — Called line status depends on PSTN indication; ISDN User Part indicator = ISDN User Part not used all-the-way; ISDN access indicator = non-ISDN access.

Note 16 — Progress indicator = 1 — Call is not end-to-end ISDN, further information available inband.

Note 17 — Called line status = no indication; Access transport parameter contains Progress information element.

Note 18 — The set-up message may in some cases contain sufficient information. If user equipment can determine immediately that address information is complete, both SET-UP ACK and the sequence of INFO messages are omitted. Alternatively, the SET-UP ACK may be sent, followed by CALL PROC, which maps to ACM.

Figure 3/Q.699, p. 5

Figure 4/Q.699, p. 6

Figure 5/Q.699, p. 7

Figure 6/Q.699, p. 8

Figure 7/Q.699, p. 9

Figure 8/Q.699, p. 10

Figure 9/Q.699, p. 11

Figure 10/Q.699, p. 12

Figure 11/Q.699, p. 13

Figure 12/Q.699, p. 14

Figure 13/Q.699, p. 15

Figure 14/Q.699, p. 16

Figure 15/Q.699, p. 17

Figure 16/Q.699, p. 18

Figure 17/Q.699, p. 19

Figure 18/Q.699, p. 20

Figure 19/Q.699, p. 21

3.2 *Mapping of Parameters*

This section contains the mapping tables of successful call set-up messages and associated parameters and information elements.

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H.T. [T1.699]

TABLE 1/Q.699

Mapping of set-up procedure parameters for ISDN call

	Originating User/Network	Network	Terminating User/Network
Message	SETUP	IAM	SETUP
Contents	Bearer capability	User service information	Bearer capability
	No mapping	Forward call indicator	No mapping
	Progress indicator	Access transport (Note 2)	Progress indicator
	{		
Calling party number (Note 6)			
}	{		
Calling party number (Note 3)			
}	Calling party number		
	Calling party subaddress	Access transport	Calling party subaddress
	Called party number (Note 4)	Called party number	Called party number
	Setup complete	ST digit (Note 5)	No mapping
	Called party subaddress	Access transport	Called party subaddress
	Transit network sel.	Transit network sel.	No mapping
	Low layer compatibility	Access transport	Low layer compatibility
	High layer compatibility	Access transport	
High layer compatibility			

Note 1 — The User Service Information parameter carries the customer's bearer service request unchanged through the network, and is mapped at the terminating exchange. Transmission Medium Requirements maps from the service request to a network connection type. It is not mapped at the terminating exchange in an ISDN call. For calls between networks (e.g. international gateways), the contents of the Bearer Capability information element carried within the User Service Information parameter may be changed, e.g. where A-law to mu-law conversion applies.

Note 2 — The access Transport parameter carries information elements transparently from one User/Network interface to the other User/Network interface.

Note 3 — The calling party number is recommended to be carried in the IAM, however it may optionally be delayed until a subsequent end-to-end request in the network. Number and subaddress should be carried in the same message.

Note 4 — The Keypad Facility information element may be used to carry called party number information in the user-to-network direction (described in § 5.1 of Recommendation Q.921) rather than the Called Party Number information element. This is then mapped to the Called Party Number parameter within the network.

Note 5 — The ST digit is an address signal carried within the Called Party Number parameter.

Note 6 — The calling party number may be provided solely to indicate calling line identity restriction.

Tableau 1/Q.699 [T1.699], p. 22

H.T. [T2.699]

TABLE 2/Q.699

Mapping of set-up parameters for PSTN-ISDN call

	Not Applicable	Network	Terminating User/Network
Message		IAM	SETUP
	{ Bearer capability Progress indicator	{ 	

Tableau 2/Q.699 [T2.699], p. 23

H.T. [T3.699]

TABLE 3/Q.699

Mapping of subsequent address information for overlap sending

	Originating User/Network	Network	Terminating User/Network
Message	INFO	SAM	INFO
Contents Called party number of Keypad (Note) } Called party number (Note)	{ Subsequent number		

Note — Sending complete may be included at both User/Network interfaces in the INFORMATION message.

Tableau 3/Q.699 [T3.699], p. 24

H.T. [T4.699]

TABLE 4/Q.699

Mapping of interworking with PSTN inband

	Originating User/Network	Network	Terminating User/Network
Message	PROGress (Note)	ACM	Not applicable
Contents Backward call indicator (interworking) }	Progress indicator	{	

Note — The ACM may also map to the CALL PROCEEDING message if this has not already been sent.

Tableau 4/Q.699 [T4.699], p. 25

H.T. [T5.699]

TABLE 5/Q.699

Mapping of alerting, independent ACM

	Originating User/Network	Network	Terminating User/Network
Message	ALERTing	CPG	ALERTing
Contents	alerting (implicit) Progress indicator	Event information (alerting) Access transport	alerting (implicit) Progress indicator

Tableau 5/Q.699 [T5.699], p. 26

H.T. [T6.699]

TABLE 6/Q.699

Mapping of alerting

	Originating User/Network	Network	Terminating User/Network
Message	ALERTing	ACM	ALERTing
Contents	alerting (implicit) alerting (implicit) Progress indicator	{ Access transport	 Progress indicator

Tableau 6/Q.699 [T6.699], p. 27

H.T. [T7.699]

TABLE 7/Q.699

Mapping of answer indication, non-automatic answering terminal

	Originating User/Network	Network	Terminating User/Network
Message	CONNect	ANM	CONNect
Contents	Progress indicator	Access transport	Progress indicator

Tableau 7/Q.699 [T7.699], p. 28

H.T. [T8.699]

TABLE 8/Q.699

Mapping of answer indication, automatic answering terminal

	Originating User/Network	Network	Terminating User/Network
Message	CONNect	CON	CONNect
Contents	Progress indicator	Access Transport	Progress indicator

Tableau 8/Q.699 [T8.699], p. 29

H.T. [T9.699]

TABLE 8a/Q.699

Mapping of progress indication

	Originating User/Network	Network	Terminating User/Network
Message	PROGress	CPG	PROGress
Contents	Progress (implicit) { Progress (implicit) Progress indicator	Access transport	Progress indicator

Tableau 8A/Q.699 [T9.699], p. 30

H.T. [T10.699]

TABLE 8b/Q.699

Mapping of progress indication

	Originating User/Network	Network	Terminating User/Network
Message	PROGress	ACM	PROGress
Contents	Progress (implicit) { Progress (implicit) Progress indicator	Access transport	Progress indicator

Tableau 8B/Q.699 [T10.699], p. 31

3.3 *Mapping of the parameter fields*

This section contains the mapping tables of parameter subfields and values for the Progress Indicator of Recommendation Q.931 and the associated fields in ISUP.

The following notes apply to all mapping tables in this attachment:

— The mapping of the Backward Call Indicator in the Answer Mesage only applies when this indicator is included in the Answer Message.

— For simplicity, these diagrams assume the case where the ACM is not sent independently, and a non-automatic answering terminal is the called party. Other configurations are possible as shown in the arrow diagrams, but do not affect parameter mapping rules.

3.3.1 *Scenario 1*

Figure, p. 32

H.T. [T11.699]
TABLE 9/Q.699
Parameter fields mapping for Q.931-ISUP-Q.931

	Originating User/Network	Network	Terminating User/Network
Message	SETUP	IAM	SETUP
Content Forward call ind. Bit D = 0, no interworking encountered **Bit** F = 1, ISUP used all the way **Bit** I = 1, originating access ISDN }	no Progress ind. no Progress ind.	{	
Message	ALERTing	ACM	ALERTing
Content Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN }	no Progress ind. no Progress ind.	{	
Message	CONNect	ANM	CONNect
Content Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN }	no Progress ind. no Progress ind.	{	

Tableau 9/Q.699 [T11.699], p. 33

3.3.2 *Scenario 2*

Figure, p. 34

H.T. [T12.699]
TABLE 10/Q.699
Parameter fields mapping for Q.931-ISUP-PSTN

	Originating User/Network	Network	Terminating User/Netw
Message	SETUP	IAM	N/A
Content Forward call ind. Bit D = 0, no interworking encountered **Bit** F = 1, ISUP used all the way **Bit** I = 1, originating access ISDN }	no Progress ind. no mapping applied	{	
Message	PROGress	ACM	N/A
Content Progress ind. progress description = ## 1, call is not end-to-end ISDN } Backward call ind. Bit I = 1, interworking encountered **Bit** K = 0, ISUP not used all the way **Bit** M = 0, terminating access ISDN }	{ { no mapping applied		
Message	CONNect	ANM	N/A
Content Progress ind. progress description = ## 1, call is not end-to-end ISDN } Backward call ind. Bit I = 1, interworking encountered **Bit** K = 0, ISUP not used all the way **Bit** M = 0, terminating access ISDN }	{ { no mapping applied		

Tableau 10/Q.699 [T12.699], p. 35

3.3.3 *Scenario 3*

Figure, p. 36

H.T. [T13.699]
TABLE 11/Q.699
Parameter fields mapping for PSTN-ISUP-Q.931

	Originating User/Network	Network	Terminating User/Network
Message	N/A	IAM	SETUP
Content Forward call ind. Bit D = 1, interworking encountered **Bit** F = 0, ISUP not used all the way **Bit** I = 0, originating access non-ISDN } Progress ind. progress description = ## 1, call is not end-to-end ISDN }	no mapping applied {	{	
Message	N/A	ACM	ALERTing
Content Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN }	no mapping applied no Progress ind.	{	
Message	N/A	ANM	CONNect
Content Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN }	no mapping applied no mapping applied	{	

Tableau 11/Q.699 [T13.699], p. 37

3.3.4 *Scenario 4*

Figure, p. 38

H.T. [T14.699]
TABLE 12/Q.699
Parameter fields mapping for ISUP-Q.931-ANALOGUE

	Originating User/Network	Network	Terminating User/Network
Message	SETUP	IAM	N/A
Content Forward call ind. Bit D = 0, no interworking encountered **Bit** F = 1, ISUP used all the way **Bit** I = 1, originating access ISDN }	no Progress ind. no Progress ind.	{	
Message	ALERTing	ACM	N/A
Content Progress ind. progress description = ## 2, destination address is non-ISDN } Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access non-ISDN }	{ { no mapping applied		
Message	CONNect	ANM	N/A
Content Progress ind. progress description = ## 2, destination address is non-ISDN } Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access non-ISDN }	{ { no mapping applied		

Tableau 12/Q.699 [T14.699], p. 39

3.3.5 *Scenario 5*

Figure, p. 40

H.T. [T15.699]
TABLE 13/Q.699
Parameter fields mapping for ANALOGUE-ISUP-Q.931

	Originating User/Network	Network	Terminating User/Network
Message	N/A	IAM	SETUP
Content Forward call ind. Bit D = 0, no interworking encountered **Bit** F = 1, ISUP used all the way **Bit** I = 0, originating access non-ISDN } Progress ind. progress description = ## 3, originating address is non-ISDN }	no mapping applied {	{	
Message	N/A	ACM	ALERTing
Content Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN }	no mapping applied no Progress ind.	{	
Message	N/A	ANM	CONNect
Content Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN }	no mapping applied no Progress ind.	{	

Tableau 13/Q.699 [T15.699], p. 41

3.3.6 *Scenario 6*

Figure, p. 42

H.T. [T16.699]
TABLE 14/Q.699
Parameter fields mapping for ANALOGUE-Q.931-ISUP-Q.931

	Originating User/Network	Network	Terminating User/
Message	SETUP	IAM	SETUP
Content Progress ind. progress description = ## 3, originating address in non-ISDN location = private network } Forward call ind. Bit D = 0, no interworking encountered **Bit** F = 1, ISUP used all the way **Bit** I = 1, originating access ISDN Access transport carries Progress ind. } Progress ind. as received from the ATP }	{ { {		
Message	ALERTing	ACM	ALERTing
Content Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN }	no Progress ind. no Progress ind.	{ 	
Message	CONNect	ANM	CONNect
Content Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN }	no Progress ind. no Progress ind.	{ 	

Tableau 14/Q.699 [T16.699], p. 43

3.3.7 *Scenario 7*

Figure, p. 44

H.T. [T17.699]
TABLE 15/Q.699
Parameter fields mapping for Q.931-ISUP-Q.931-ANALOGUE

	Originating User/Network	Network	Terminating User/Netwo
Message	SETUP	IAM	SETUP
Content Forward call ind. Bit D = 0, no interworking encountered **Bit** F = 1, ISUP used all the way **Bit** I = 1, originating access ISDN }	no Progress ind. no Progress ind.	{	
Message	ALERTing	ACM	ALERTing
Content Progress ind. as received in the ATP } Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN ATP carries Progress indicator } Progress ind. progress description = ## 2, destination address in non-ISDN location = private network }	{ { {		
Message	CONNect	ANM	CONNect
Content Progress. ind. as received in the ATP } Backward call ind. Bit I = 0, no interworking encountered **Bit** K = 1, ISUP used all the way **Bit** M = 1, terminating access ISDN ATP carries Progress indicator } Progress ind. (Note) progress description = ## 2, destination address in non-ISDN location = private network }	{ { {		

Note — The Progress indicator is not necessarily repeated in the CONNECT message if it has already appeared in the ALERTING message.

Tableau 15/Q.699 [T17.699], p. 45