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DSS1 Generic keypad protocol

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FOREWORD

The following sections give the requirements to the generic keypad protocol for the support of supplementary services to be implemented for ISDN services in Telenor's network. The requirements stated here are the requirements to the network side of the user-network interface.

This specification is an application document to ETSI EN 300 122-1 (4) and selects which options in EN 300 122-1 (4) are applicable in Telenor's network.

In addition, this specification contains some clarifications to certain clauses of EN 300 122-1 (4), where this is felt to be necessary. Where clarifying text is provided, the relevant clause in EN 300 122-1 (4) shall be considered as being "Applicable" taking into consideration the additional text provided in that clause. If a clause is not mentioned it shall be interpreted as "Applicable".

The requirements stated in this document are generic in nature and do not provide the details related to the supplementary services that are provided by Telenor. These details are specified in Telenor Nett Specification A44-4 (3).

The basis for this specification is the Nordic specification (NT/SIG-SPEC-2-1, issue date 92-06-01), with the necessary adaptations to Telenor's network. Equipment conforming to the NT/SIG-SPEC-2-1 specification should equally well conform to this specification.

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1 Scope

This specification is an application document to ETSI EN 300 122-1 (4), dated 1998. This specification makes reference to EN 300 122-1 (4). The text in clause 6 of EN 300 122-1 (4) is replaced in its entirety in clause 6 of this specification in order to improve readability.

In no event shall Telenor be liable to other parties for any direct, indirect, special, incidental, or consequential damages resulting from errors or defects in these specifications.

2 Normative references

- (1): Telenor Nett Specification A41-3, "Specification of the network side of the user-network interface for ISDN Basic Access (BA); Network Layer (layer 3) - Basic Call Control".
- (2): Telenor Nett Specification A42-3, "Specification of the network side of the user-network interface for ISDN Primary Rate Access (PRA); Network Layer (layer 3) - Basic Call Control".
- (3): Telenor Nett Specification A44-4, "Supplementary services defined by Telenor and supported in the public ISDN of Telenor; Basic Access (BA) and Primary Rate Access (PRA)".
- (4): EN 300 122-1 (1998), "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Generic keypad protocol for the support of supplementary services".

Note: References enclosed in square brackets ("[]") refer to the references defined by EN 300 122-1 (4).

3 Definitions

- Service code:** Consists of two and in exceptional cases, three digits that identify the supplementary service which is requested.
- Basic service indicator:** Consists of one or two digits that identify which basic service a supplementary service request is related to.
- All numbers indicator:** Consists of one digit that indicates that a supplementary service control request shall be applied to all numbers assigned to that access.

4 Abbreviations

- TOA Tones and/or announcements
- UDI-TA Unrestricted digital information with tones/announcements

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5 Coexistence with other supplementary service protocols

5.1 Support of the various generic protocols

ETSI is standardising supplementary services based on the functional protocol. For some of these supplementary services both the keypad protocol and the functional protocol may be used in coexistence on the same user-network interfaces. The individual supplementary service specifications indicate whether the keypad protocol or the functional protocol or both protocols are applicable to that particular supplementary service. For a number of supplementary services that are not standardised by ETSI but are to be made available for ISDN users, only the keypad protocol will be used. This is specified in relation to the relevant supplementary services for which it applies.

5.2 Coexistence of generic protocols

Generally, the functional protocol shall be used at the remote user's interface even though the keypad protocol was used at the requesting user's interface. However, the keypad protocol (i.e. the Display information element) may be used at the remote user's interface for some supplementary services also in coexistence with the functional protocol.

5.3 Arrangements by which coexistence of protocols may be supported by a network

If the network supports the keypad protocol, then the network shall support both the functional and the keypad protocol independent of the type of access (i.e. Basic or Primary Rate access).

At the remote user's interface, the functional protocol shall in general be used in the network-to-user direction. However, the keypad protocol (i.e. the Display information element) may be used at the remote user's interface for some supplementary services also in coexistence with the functional protocol.

6 Procedures for the keypad protocol

The text in this clause shall replace the text in clause 6 of EN 300 122-1 (4) in its entirety.

The following text is written with the same clause numbering as in CCITT Recommendation Q.932 clause 4 [3].

The keypad protocol is based on the use of the Keypad facility and Display information elements. The Keypad facility information element may be included in the SETUP and INFORMATION messages. The Display information element may be included in any message sent by the network to the user according to EN 300 403-1 [2].

Where a reference is made to CCITT Recommendation Q.931 [4], the equivalent clause in EN 300 403-1 [2] shall be used.

Where a reference is made to CCITT Recommendation Q.932 [3], EN 300 196-1 [7] shall be used.

The procedures specified in CCITT Recommendation Q.932 [3] clause 4 shall apply with the following clarifications:

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4 *KEYPAD PROTOCOL*

The service codes used for the control of individual supplementary services are defined in Telenor Nett Specification A44-4 (3).

The interpretation and use of the basic services are defined in Annex 2 to this document.

The general principles for the use of the Display information element are defined in Annex 3 to this document.

4.1 General

In case of Bearer capability "speech", "3.1 kHz audio" or "UDI-TA", an in-band tone and/or announcement may be sent to the local user together with the Display information element. This is specified in Telenor Nett Specification A44-4 (3) in relation to each supplementary service, when applicable.

Text related to the Feature key management protocol shall be ignored.

The Keypad facility information element sent in the network-to-user direction is not applicable.

4.2 Messages used in the keypad protocol

Applicable.

4.3 Coding of the Keypad facility information element

The coding of the Keypad facility information element shall be as defined in Telenor Nett Specification A41-3 (1) and A42-3 (2), clause 4.5.17.

The service codes used for the control of individual supplementary services are defined in Telenor Nett Specification A44-4 (3).

The formats and coding of the information within the Keypad facility information element shall follow the coding scheme given below.

The following description uses a notation based on Backus-Naur form to define the coding scheme. Table 1 shows the guidelines that apply to this notation form.

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Table 1: Guidelines for the Backus-Naur notation form

- 1) A sequence of characters enclosed in the brackets < > is a description of an entity e.g. <KEYPAD INFORMATION>;
- 2) Braces { } are used to enclose a repeated item. The item may be repeated zero or more times (if the item is repeated zero times it is absent);
- 3) Square brackets [] indicate that the enclosed item is optional;
- 4) The character ::= means "is defined as";
- 5) The character | means "or";
- 6) Any other character not enclosed in the brackets < > represent itself.

Using the above notation the KEYPAD INFORMATION within the Keypad information field of a Keypad information element is defined as shown in table 2.

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Table 2: Coding of the KEYPAD INFORMATION

<KEYPAD INFORMATION> ::= <FACILITY INFORMATION STRING>

<FACILITY INFORMATION STRING> ::=

<* | # | * #> <SERVICE CODE> { <*> | <*> <PARAMETER> } <#>

or

<* *> <PARAMETER> Note

Note: This facility information string is only applicable to the Abbreviated Dialling supplementary service using the Prefix method.

<SERVICE CODE> ::= <ALPHA-NUMERIC CHARACTER SEQUENCE>

<PARAMETER> ::= <ALPHA-NUMERIC CHARACTER SEQUENCE>

<ALPHA-NUMERIC CHARACTER SEQUENCE> ::=

<ALPHA-NUMERIC CHARACTER> { <ALPHA-NUMERIC CHARACTER> }

<ALPHA-NUMERIC CHARACTER> ::= <NUMERIC CHARACTER> | <ALPHA CHARACTER>

<NUMERIC CHARACTER> ::= 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

<ALPHA CHARACTER> ::=

a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w | x | y | z

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

Note: Both numeric and alpha characters are encoded in accordance with the IA5 table.

<*> ::= <IA5 character 2/10>

<#> ::= <IA5 character 2/3>

Regarding the first character(s) in the facility information string the rules given below shall apply. When the first character(s) is:

- <*> - it indicates that the remaining part of the facility information string is related to an activation, invocation or registration request;
- <#> - it indicates that the remaining part of the facility information string is related to a deactivation or cancellation request; and,
- <* #> - it indicates that the remaining part of the facility information string is related to an interrogation request.
- <* *> - it indicates that the remaining part of the facility information string is related to an invocation of the Abbreviated Dialling supplementary service using the Prefix method.

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The combinations <# #> and <# *>, providing they are the first two characters in a facility information string, are invalid and consequently the remaining part of the facility information string is also invalid.

One or more of the parameters in a facility information string may be optional parameters. For any given request the optional parameters may or may not be present.

The parameters (if any) shall be discriminated by the separator character <*>. If an optional parameter is not present in a facility information string, this shall be indicated in one of the following ways:

- 1) The parameter(s) can be left out if it(they) is(are) the last part of a facility information string sequence; or,
- 2) for all other cases a sequence of <# *> indicates that the associated optional parameter is not included.

4.4 Elements of procedure

4.4.1 General

Item 1 through 4 are an application to the same clause of CCITT Recommendation Q.932 [3], while item 5 through 7 are additional requirements.

1. A supplementary service request can either be:
 - a) Related to the registration, cancellation, activation, deactivation or interrogation of a supplementary service independent of an active call to a remote user; or,
 - b) Related to an active call to a remote user only when the requested supplementary service will have an impact on that call.
2. The procedures to be used in case the network shall prompt the user for further information, are defined in the specifications for those individual supplementary services where such functions are required.
3. The number of possible stages is supplementary service specific and is therefore defined in the specifications for those individual supplementary services where prompting is necessary.
4. Only one keypad supplementary service control procedure (i.e. activation, deactivation, invocation, interrogation, cancellation or registration) can be performed per request. However, a combination of a keypad and functional supplementary service control procedure is possible within the same message.
5. For all supplementary services except for the invocation of the Abbreviated Dialling supplementary service using the Prefix method, the <#> character is mandatory as the last character in the facility information string.

When the <#> character is received by the network as the third or subsequent character in the facility information string, it shall be interpreted as the "sending complete indication".

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If the network receives the Sending complete information element, the network shall not interpret the Sending complete information element as being related to supplementary service control.

6. Item 7 is only applicable to the control of a supplementary service independent of an active call to a remote user. The same principles shall as far as possible apply for the functionality of the keypad protocol as for the functional protocol - i.e. the functionality regarding activation, deactivation, interrogation, registration and cancellation shall be the same regarding the capability to indicate served user identity, basic service, etc.
- 7.1 If a specific supplementary service allows that the user may indicate the served user identity in the supplementary service control procedure, the following information can be used (given in a prioritised sequence, with a) as the highest):
 - a) Served user number (SUN), provided in the Keypad facility information element; or,
 - b) Calling party number information element; or,
 - c) If neither of the above is present, then the network shall use the default number assigned to that access.

If the served user number is present in the Keypad facility information element the network shall screen this information for validity. If the served user number is valid for that access, the network shall use this information in the further processing of the supplementary service control procedure. If the served user number is invalid, the network shall reject the supplementary service control procedure and ignore the possible presence of the Calling party number information element.

If the Keypad facility information element does not include the served user number, the network shall use the contents of the Calling party number information element, if present. The network shall screen the information contained in the Calling party number information element for validity. If the calling party number is valid for that access, the network shall use this information in the further processing of the supplementary service control procedure. If the calling party number is invalid, the network shall use the default number assigned to that access for the further processing of the supplementary service control procedure.

Only S12: In the case that the served user number, received in the Keypad facility information element, is coded as "0" the network shall assume that the supplementary service control procedure shall be applied to all numbers assigned to that access.

- 7.2 If a specific supplementary service allows that the user may indicate a basic service in the supplementary service control procedure, the basic service can be

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indicated by including the Basic service indicator in the Keypad facility information element.

If the Basic service indicator is set to "all services" or the Basic service indicator is not included, it represents a "short-hand" method for the user to indicate that a certain supplementary service control procedure shall be applied to all basic services which is subscribed to at that particular time. Any subsequent change in the subscribed basic services shall not impact any previously performed supplementary service control actions. Furthermore, a user may for instance indicate the basic service value "all services" when activating a specific supplementary service, and later deactivate this supplementary service related to only one of the basic services.

If the Basic service indicator contains an invalid value, the network shall reject the supplementary service control procedure.

Note: If the Bearer capability information element is not included in the SETUP message, it shall be treated as a mandatory information element error according to clause 5.8.6 of Telenor Nett Specification A41-3 (1) and A42-3 (2).

The relationship between basic service and the Basic service indicator is shown in Annex 2.

7.3 If a request for a specific supplementary service allows that the "called party" subaddress information can be included, the subaddress shall in this case be indicated as part of the information included in the Keypad facility information element. Any information contained in the Called party subaddress information element shall be ignored. The subaddress information included in the Keypad facility information element shall be interpreted as "IA5 characters". In this case, a maximum of 19 IA5 characters can be received.

7.4 If a request for a specific supplementary service requires that the called party identity shall be included, then the user shall include this information only as part of the facility information string in the Keypad facility information element.

If a request for a supplementary service also includes information in the Called party number information element, then the network shall treat this call as specified in clause 4.5.2.3.

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4.5 Procedures at the invocation interface

Annex 1 contains SDL diagrams for én-bloc and overlap sending of information.

4.5.1 User procedures

Applicable.

4.5.1.1 Én-bloc sending of access codes

When the <#> character is received by the network as the third or subsequent character in the facility information string, it shall be interpreted as the "sending complete indication".

If the network receives the Sending complete information element, the network shall not interpret the Sending complete information element as being related to supplementary service control.

4.5.1.2 Overlap sending of access codes

Generally, the network shall only provide dial tone when the Bearer capability information element indicates "speech", "3.1 kHz audio", or "UDI-TA".

Dial tone shall be applied when no called party digits are included in the SETUP message, i.e. irrespective of any information contained in the Keypad facility information element.

The SETUP ACKNOWLEDGE message shall be sent as a response to a SETUP message when the received called party number information (if any) is not complete.

Dial tone shall be removed (if applied previously) when the first INFORMATION message is received containing either keypad information or called party number information.

4.5.2 Network procedures

4.5.2.1 Network responses to user requests

2. When the network has received the first digit of the called party number, no further keypad information relevant for the call setup shall be accepted in INFORMATION messages in the call establishment phase, if sent by the user. The network shall send a CALL PROCEEDING message to the user after having received the "complete" called party number, if the received keypad information is accepted.
3. In the case the request is related to a registration, cancellation, activation, deactivation or interrogation of a supplementary service (independent of an active call to a remote user) and the network accepts the request, a DISCONNECT message shall be sent to the calling user with cause #31 "normal, unspecified". The Display information element shall be included

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containing the appropriate response to the supplementary service request. In addition, if the Bearer capability information element included in the SETUP message received from the calling user indicates "speech", "3.1 kHz audio" or "UDI-TA", an announcement or acknowledgement tone may be applied. This is specified in relation to the specific supplementary service.

4. The procedures to prompt the user for further information are defined in the specifications for those individual supplementary services where such functions are required.
5. If the network receives a SETUP message containing keypad information only and the keypad information cannot be accepted (i.e. cannot be related to a specific supplementary service), the keypad information shall be discarded. In addition, the network shall send a SETUP ACKNOWLEDGE message and apply dial tone if the Bearer capability information element included in the SETUP message indicates "speech", "3.1 kHz audio" or "UDI-TA". A Display information element containing Display GEN1 "facility request not accepted" shall be included to indicate to the calling user that the received keypad information has been discarded.

4.5.2.2 Network prompting and in-band tone/announcement control

Annex B of CCITT Recommendation Q.932 [3] is outside the scope of this standard.

The conditions under which the network will prompt for additional information, are defined in the specifications for those individual supplementary services where such functions are required.

If no appropriate call control message is to be sent by the network at the time that tones and/or announcements shall be applied, the network shall always send a PROGRESS message containing the Progress indicator #8.

The Signal information element shall not be used by the network.

4.5.2.3 Error conditions and treatment

The following text shall replace entirely the text in CCITT Recommendation Q.932 [3] clause 4.5.2.3.

An error condition exists in the following circumstances:

- a) Timer T302 expires and the complete information has not been received. The network shall handle this error situation as described in clause 4.5.2.3.1 i) or ii).
- b) Keypad information received in the SETUP message is indicated as being "complete" (i.e. a <#> character is received by the network as the third or subsequent character) but the network determines the information to be invalid (i.e. it cannot be related to a specific supplementary service) and no called

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party number information is included. The network shall handle this error situation as described in clause 4.5.2.3.1 iii) or iv).

- c) Called party number information received by the network (complete or incomplete) is invalid. The network shall ignore any received keypad information and clear the call according to the basic call procedures.
- d) If the user attempts to invoke a call-related supplementary service to which the user has not subscribed or to which the user is not allowed access or if the keypad information cannot be accepted by the specific supplementary service, then the network shall determine whether the call can continue or whether it shall be released. This is specified in relation to the specific supplementary service.

If the call shall be released, the network shall handle this error situation as described in clause 4.5.2.3.1 i) or ii).

In the case the call is allowed to continue, the keypad information shall be discarded. The information sent to the calling user is specified in relation to the specific supplementary service.

- e) If the network receives a request to establish a connection to a called user (i.e. containing a valid called party number) and a valid request for activation, deactivation, interrogation, registration or cancellation of a supplementary service using the same call reference but not related to the call attempt, the network shall reject the supplementary service request, discard the received keypad information and continue to establish the call according to Telenor Nett Specification A41-3 (1) and A42-3 (2), clause 5. A Display information element containing Display GEN1 "facility request not accepted" shall be included in the CALL PROCEEDING message sent to the calling user to indicate that the keypad information has been discarded. No tone or announcement shall be applied.
- f) If the request is related to a registration, cancellation, activation, deactivation or interrogation of a supplementary service (i.e. not related to a call) and the network rejects the request, the network shall use the error procedures as defined in clause 4.5.2.3.1 i) or ii).
- g) If the network determines the called party number to be "complete" while the keypad information is determined to be incomplete (i.e. a <#> character has not been received by the network as the third or subsequent character), the network shall continue to handle the call according to Telenor Nett Specification A41-3 (1) and A42-3 (2) clause 5 and discard the incomplete keypad information. A Display information element containing Display GEN1 "facility request not accepted" shall be included in the CALL PROCEEDING message to indicate that the keypad information has been discarded. No tone or announcement shall be sent to the calling user.

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4.5.2.3.1 Supplementary service being invoked during call establishment

The following text shall replace entirely the text in CCITT Recommendation Q.932 [3] clause 4.5.2.3.1.

The network shall take one of the following actions:

i) In-band tones or announcements are applied, and the call is released

If a SETUP ACKNOWLEDGE message has not already been sent, the network shall send a CALL PROCEEDING message to the calling user, indicating the B-channel to be used. Subsequently, the DISCONNECT message shall be sent to the calling user including the Progress indicator information element with progress descriptor #8, "In-band information or appropriate pattern is now available" and normal clearing procedures as described in clause 5.3 of Telenor Nett Specification A41-3 (1) and A42-3 (2) shall be followed.

The cause value to be used shall be one of the following:

- Service not implemented : Cause #69
- Service not subscribed : Cause #50
- Service not available : Cause #47 or #63
- Facility rejected : Cause #29

Cause #29 "facility rejected" shall be used also in the case a syntax fault is detected in the facility information string. This may be one of the following cases:

- a) <# #> or <# *> received as the first two characters in the facility information string.
- b) One or more mandatory parameters missing.
- c) One or more parameters containing a value which is outside the range of the defined value.
- d) Too many parameters.

The relevant parameter(s) are specified in relation to the specific supplementary services.

In the cases above, if the call is released due to reasons determined by a specific supplementary service, the display information and/or in-band information is specified in relation to the specific supplementary service. If the call is released due to general reasons, the DISCONNECT message shall include a Display information element containing Display GEN1 "facility request not accepted". TOA GEN1 information may in addition be sent in-band if the Bearer capability information element indicates "speech", "3.1kHz Audio" or "UDI-TA".

ii) No in-band tones or announcements are to be applied, and the call is released

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If a SETUP ACKNOWLEDGE message has not already been sent, the network shall send a RELEASE COMPLETE message to the calling user and complete the clearing procedures as specified in clause 5.3 of Telenor Nett Specification A41-3 (1) and A42-3 (2).

If a SETUP ACKNOWLEDGE message has already been sent, the network shall send a DISCONNECT message to the calling user and complete the clearing procedures as specified in clause 5.3 of Telenor Nett Specification A41-3 (1) and A42-3 (2).

The cause to be used shall be as defined in clause 4.5.2.3.1 i).

iii) *In-band tones or announcements are applied, received keypad information is discarded and the call is continued*

The network shall:

- send a SETUP ACKNOWLEDGE message to the calling user, including the Progress indicator information element with progress descriptor #8, "In-band information or appropriate pattern is now available";
- discard the received keypad information;
- apply dial tone; and,
- enter the Overlap Sending state (N2).

The Display information element containing Display GEN1 "facility request not accepted" shall be included to indicate that the keypad information has been discarded.

iv) *No in-band tones or announcements are to be applied, received keypad information is discarded and the call is continued*

The network shall:

- send a SETUP ACKNOWLEDGE message to the calling user;
- discard the received keypad information; and,
- enter the Overlap Sending state (N2).

The Display information element containing Display GEN1 "facility request not accepted" shall be included to indicate that the keypad information has been discarded.

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4.5.2.3.2 Supplementary service being invoked from the Active state or during the call clearing phase

The procedures to prompt the user for further information, are defined in the specifications for those specific supplementary services where such functions are required.

4.6 Procedures at the remote interface

Generally, the functional protocol shall be used at the remote user's interface even though the keypad protocol was used at the requesting user's interface.

For some supplementary services, the Display information element may be used to notify the remote user, also in coexistence with the functional protocol at the remote user's interface.

The network shall not use the Signal information element.

7 Coding requirements

Applicable.

Annex A (informative) Example use of the keypad protocol

The examples illustrated in CCITT Recommendation Q.932 [3] Appendix I.2 are applicable with the following comment:

The network shall not use the Signal information element.

The example given in figure I-2 (and the associated text) is not applicable.

Annex B (informative) Functional reference model for the operation of supplementary services

Applicable (i.e. the functional reference model illustrated in CCITT Recommendation Q.932 [3] Appendix II is applicable with the exception that the feature key management protocol is not applicable).

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8 HISTORY

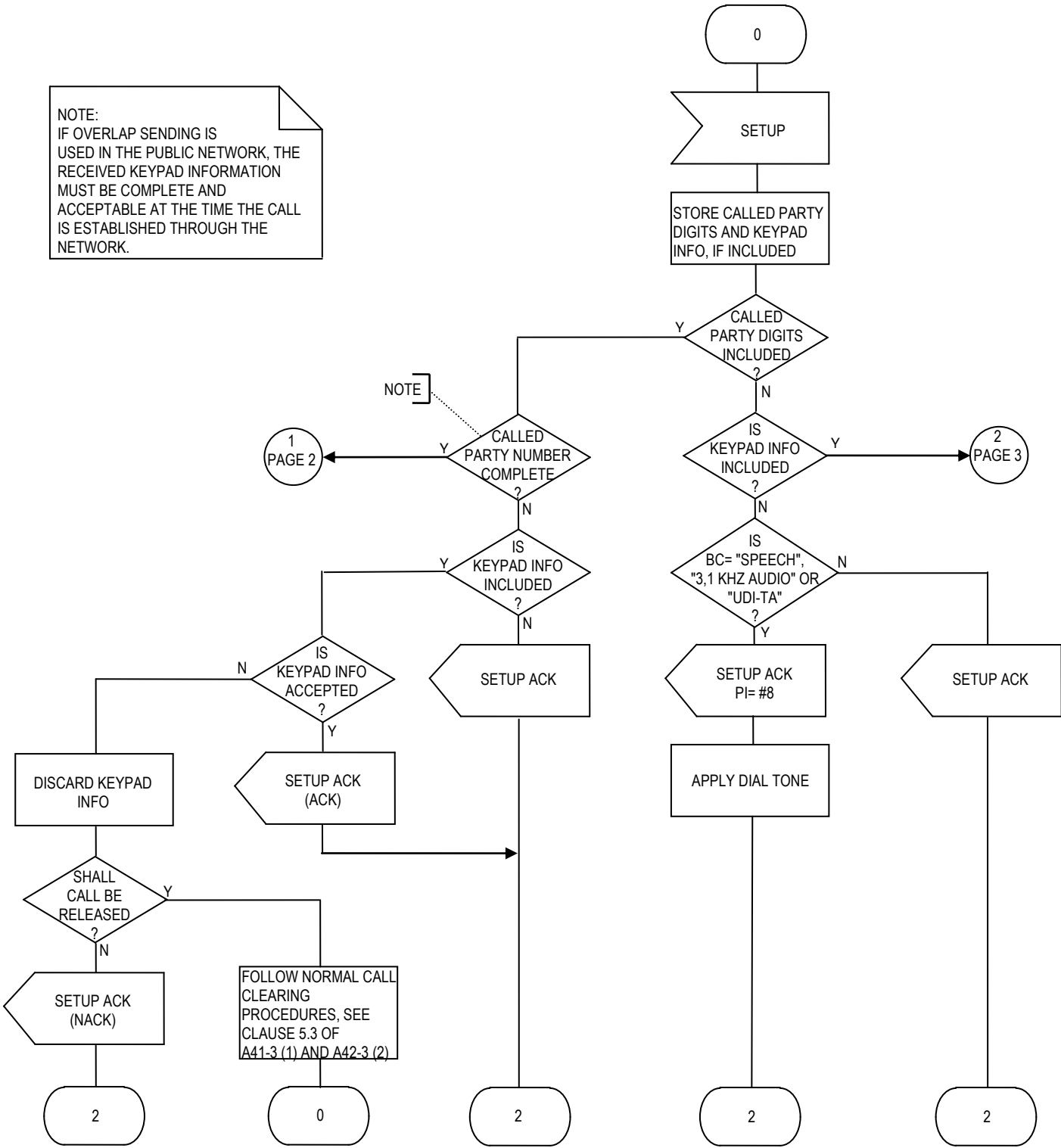
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1.0	25.06.1999	First stable version
2.0	15.12.2010	Template/header/footer updates



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ANNEX 1: SDL diagrams for én-bloc/overlap sending

NOTE:
IF OVERLAP SENDING IS USED IN THE PUBLIC NETWORK, THE RECEIVED KEYPAD INFORMATION MUST BE COMPLETE AND ACCEPTABLE AT THE TIME THE CALL IS ESTABLISHED THROUGH THE NETWORK.



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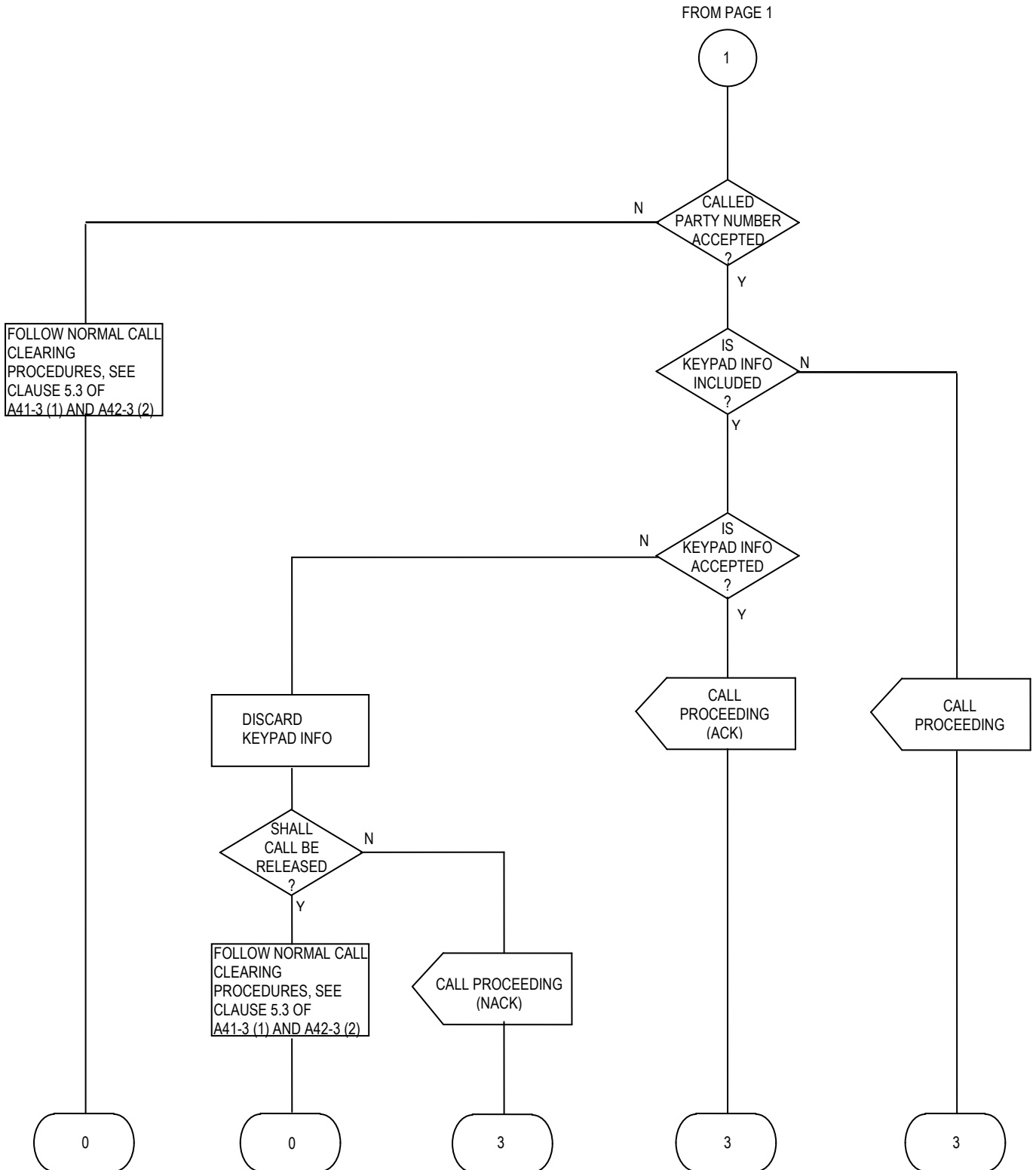
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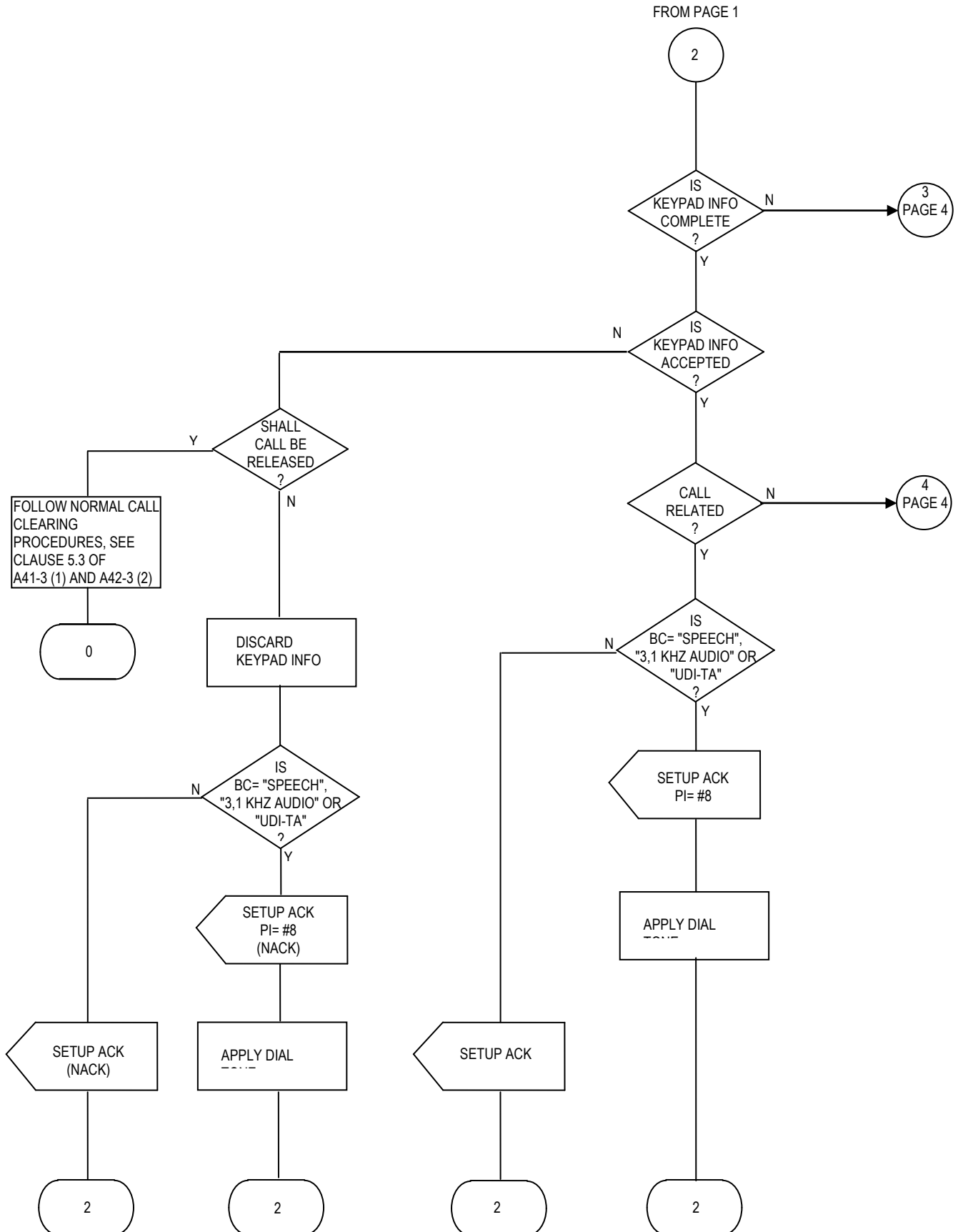
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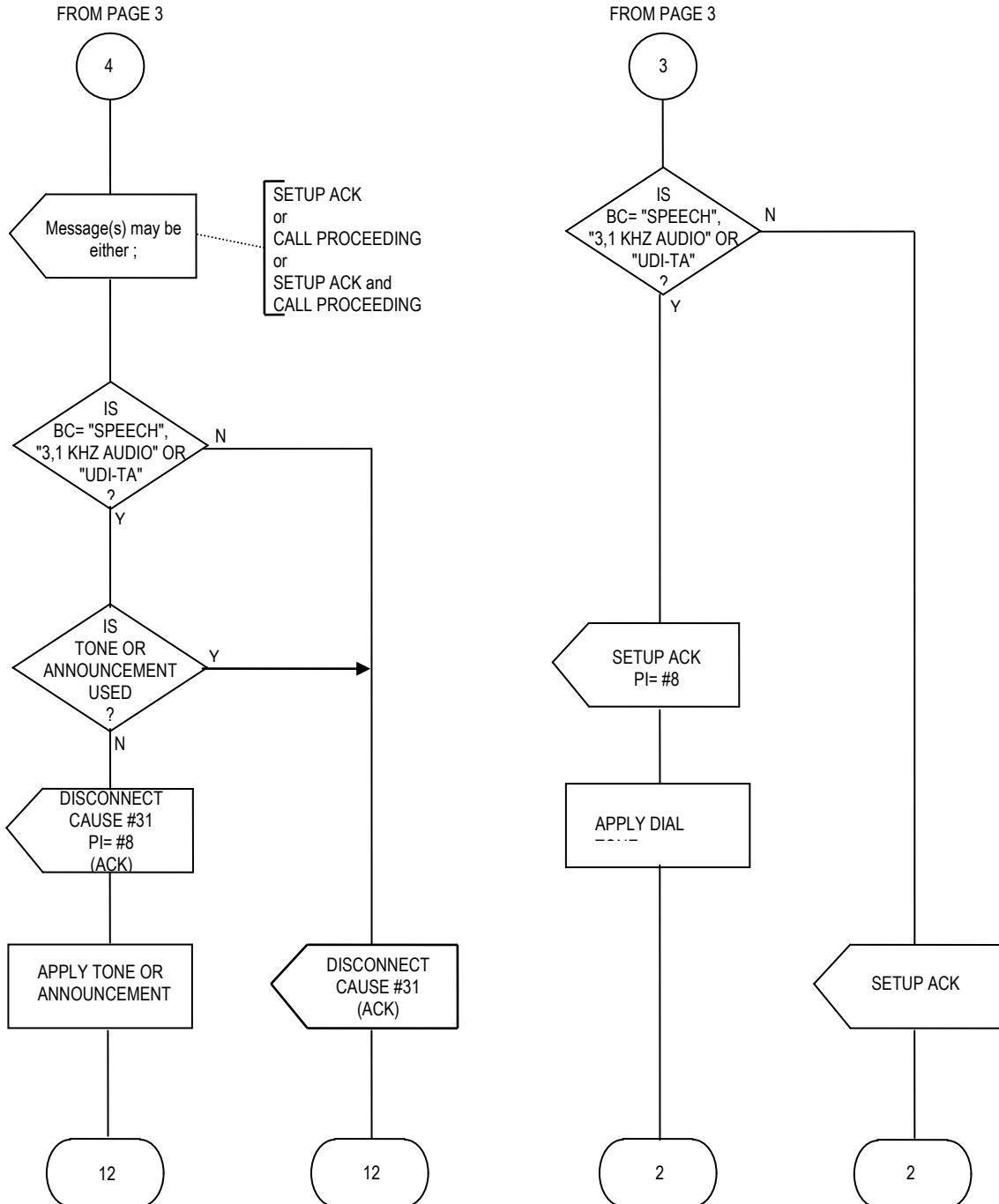
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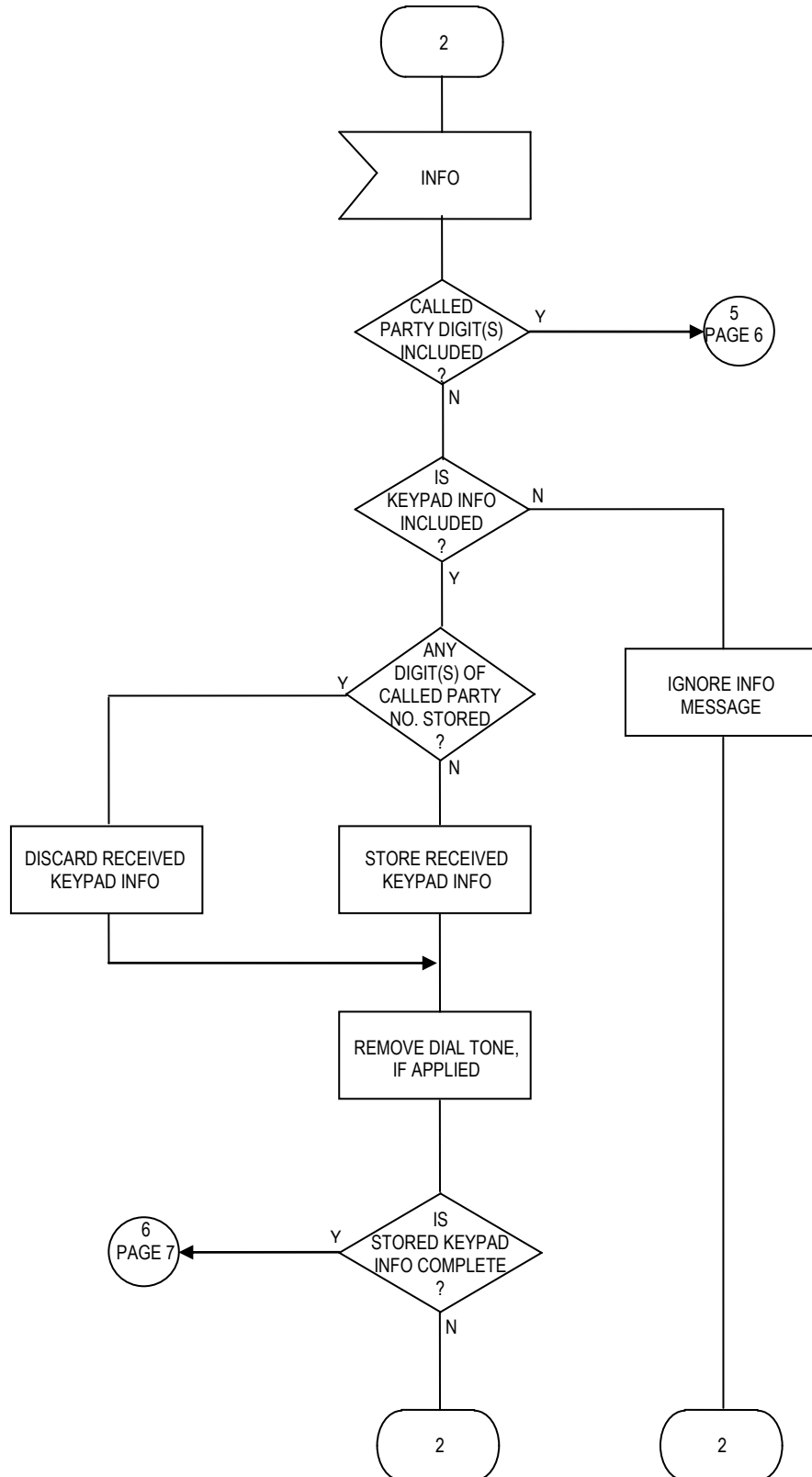
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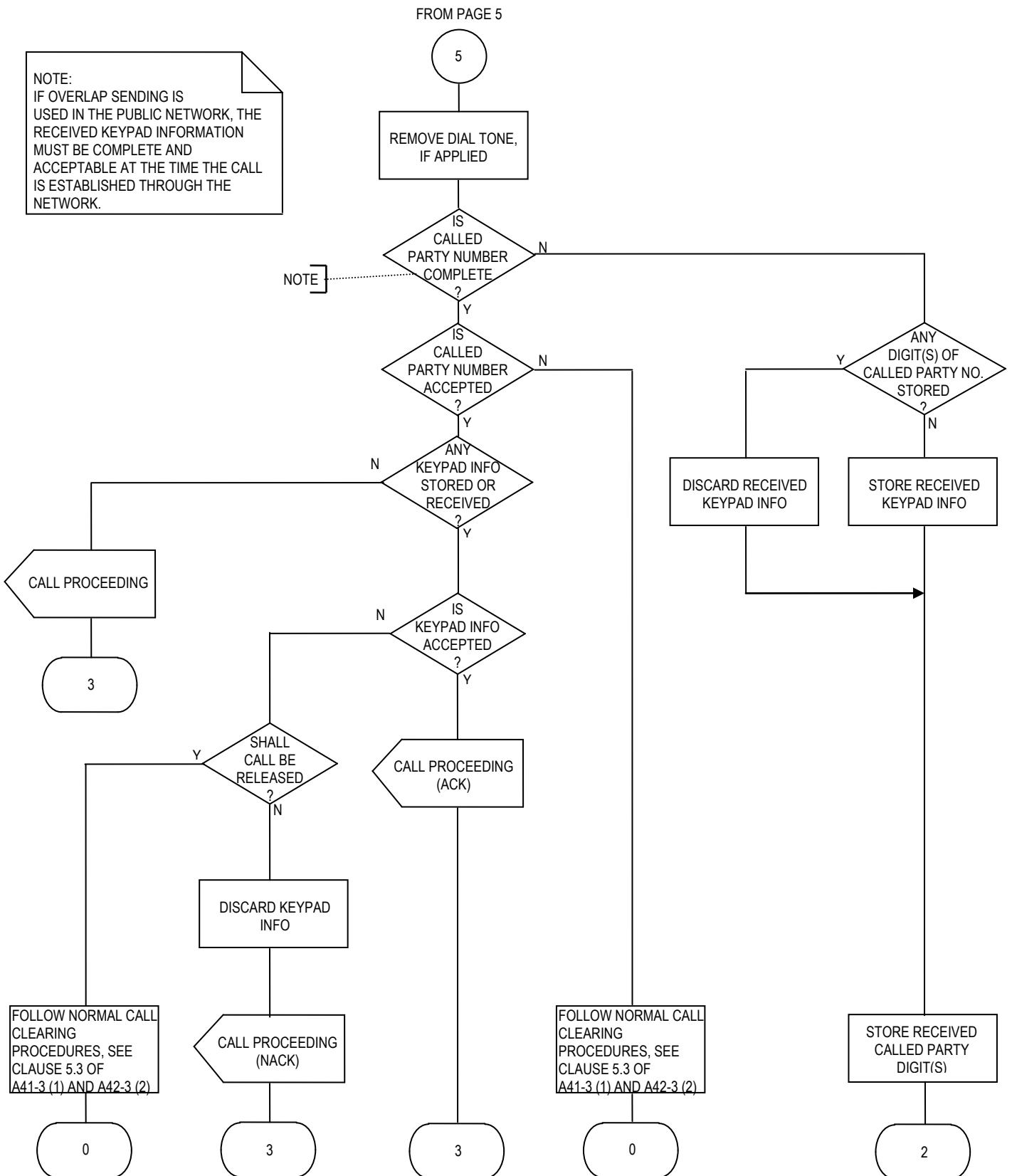
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NOTE:
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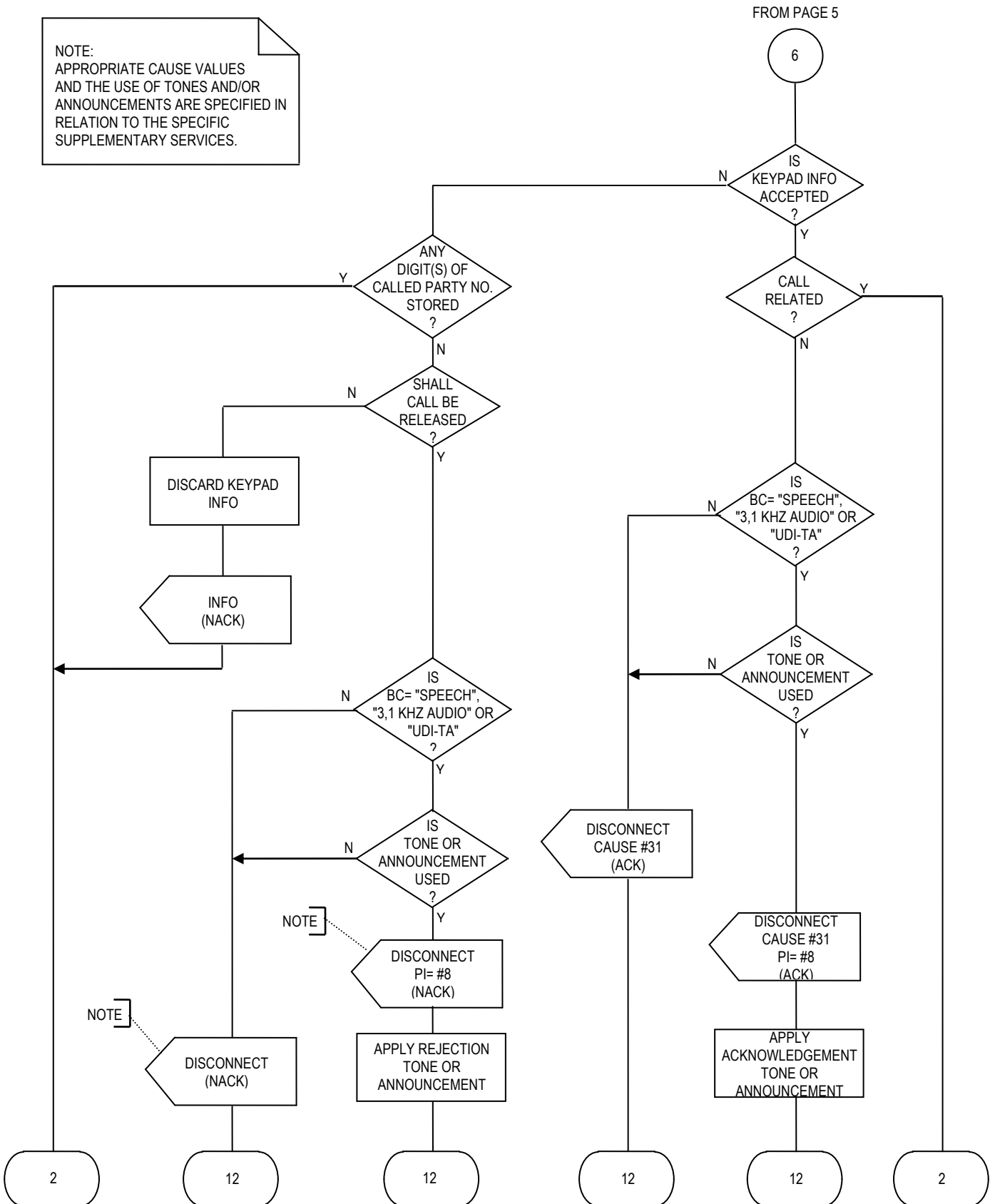
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NOTE:
APPROPRIATE CAUSE VALUES
AND THE USE OF TONES AND/OR
ANNOUNCEMENTS ARE SPECIFIED IN
RELATION TO THE SPECIFIC
SUPPLEMENTARY SERVICES.



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ANNEX 2: Basic service indicator

For a number of reasons it may be necessary that the network unambiguously identifies the telecommunications service it shall handle. The service information may be applied, e.g.:

- when a service is subscribed to and registered;
- for charging purposes;
- in the case of service interworking;
- in the case of supplementary service management, because some of the supplementary services can be activated, deactivated, interrogated, and invoked individually per basic service (e.g., Diversion and Closed User Group supplementary services).

The following clauses define a number of tables to be used for activation, deactivation, interrogation and invocation of supplementary services in relation to a basic service.

Annex 2.1: Basic services to be recognised by the network on invocation of a supplementary service

A basic service is identified by a combination of values (code points) of the High layer compatibility and Bearer capability information elements.

Table 2.1 summarises the appropriate basic services to be recognised by the network on conditions of the High layer compatibility and the Bearer capability information element values.

Table 2.1 shall be used by the network to determine if a supplementary service is to be invoked, depending on the indicated basic service.

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Table 2.1: Basic services identified by BC/HLC values

High layer compatibility (octet 4)	Bearer capability (octet 3)				
	Speech "00000" Note 1	3.1 kHz Audio "10000" Note 1	Unrestricted digital inf. "01000" Note 1	UDI-TA "10001" Note 1	Other
Telephony ("000 0001")	Telephony 3.1 kHz (Note 5)	Audio 3.1 kHz	Unrestricted digital information	Telephony 7 kHz (Note 5)	Note 4
Facsimile Group 2/3 ("000 0100")	Speech	Telefax group2/3 (Note 5)	Unrestricted digital information	UDI-TA	Note 4
Facsimile Group 4 Class 1 ("010 0001")	Speech	Audio 3.1 kHz	Telefax Group 4 Class 1 (Note 5)	UDI-TA	Note 4
Teletex Basic mode ("011 0001")	Speech	Audio 3.1 kHz	Teletex (Note 5)	UDI-TA	Note 4
Videotex ("011 0010")	Speech	Audio 3.1 kHz	Videotex syntax based (Note 5)	UDI-TA	Note 4
Audiovisual ("110 0000")	Speech	Audio 3.1 kHz	Video telephony (Note 2, 5)	Video telephony (Note 3, 5)	Note 4
Other, or no HLC present	Speech	Audio 3.1 kHz	Unrestricted digital information	UDI-TA	Note 4

Note 1: In this case, octet 4 of the Bearer capability information element is encoded with "circuit-mode" and "64 kbit/s"

Note 2: Used for the second connection of the video telephony teleservice.

Note 3: Used for the first connection of the video telephony teleservice.

Note 4: The use of other information transfer capabilities shall be rejected.

Note 5: If the network does not support the indicated teleservice, then the basic service related to the bearer service shall apply.

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Annex 2.2: Interpretation of basic service in relation to the activation, deactivation or interrogation procedures

An activation, deactivation or interrogation request for a supplementary service may be related to a basic service. The user may indicate a specific basic service using either the Basic service indicator (BS) in the Keypad facility information element or by using the appropriate values in the Bearer capability and High layer compatibility information elements.

If the Basic service indicator (BS) is used, then the relationship between the basic service and the Basic service indicator value received in the Keypad information element shown in table 2.2 shall apply.

Table 2.2: Relationship between a basic service and the received Basic service indicator (BS)

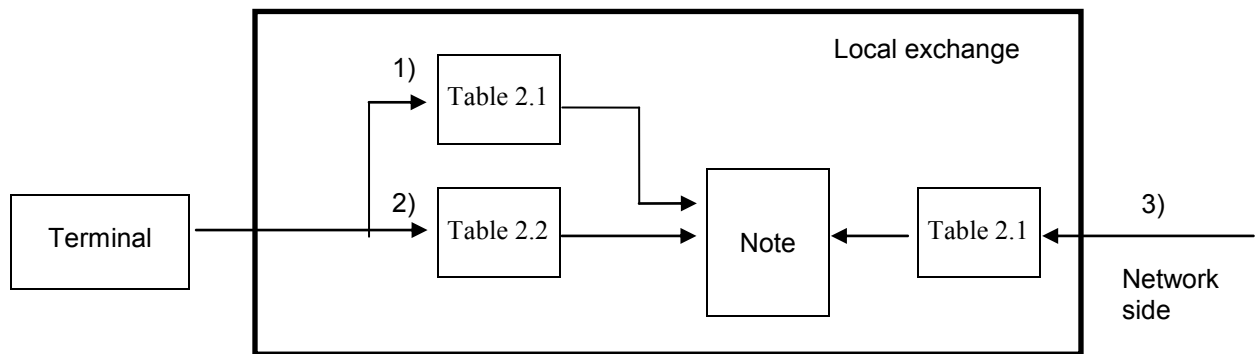
Basic service	Basic service indicator
All services	0
Speech	1
64 kBit/s unrestricted	2
3.1 kHz Audio	3
UDI-TA	4
Multirate	5
Telephony 3.1kHz	32 (Note)
Teletex	33
Telefax gr. 4	34
Videotex	35
Videotelephony	36
Telefax gr. 2/3	37
Telephony 7kHz	38 (Note)

Only S12: If BS= 32 or BS= 38 is indicated, the network shall interpret the request as if the user has indicated BS= 1, BS= 3, BS= 32 and BS= 38 independently, but related to the same supplementary service request.

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Annex 2.3: A schematic representation of the handling of basic service related to activation, deactivation, interrogation and invocation

Figure 2.1 shows which table is to be used when the input from the user side and the network side is managed.



Note: Specific supplementary service information, e.g., data record for activated call forwarding or for subscribed CUGs.

Figure 2.1: Schematic representation of the handling of the basic service

- 1) When a SETUP message is received by the network containing an invocation (e.g., CUG), the Bearer capability and High layer compatibility information elements shall be mapped to a basic service by the use of table 2.1. The identified basic service is used when the specific supplementary service information is checked.
- 2) When a SETUP message is received by the network containing keypad information (e.g., for activation of call forwarding) including a basic service indicated by the Basic service indicator parameter, table 2.2 shall be used. The identified basic service is used when creating the data record for the specific supplementary service.
- 3) When an incoming call is received by the network and a supplementary service is to be invoked in connection with that call (e.g., call forwarding), the network shall use table 2.1 to determine the relevant basic service based on the indicated bearer and high layer information received with the incoming call.

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ANNEX 3: General principles for the use of the Display information element

When stimulus procedures are used, the network may send information to the user in Display information elements containing IA5 characters.

The Display information elements will be delivered in appropriate messages as specified in relation to the relevant supplementary services for which they apply. However, the following principles apply for all services:

- a) The network will structure the display information for a display size of 2 lines each of 20 characters.
- b) Display information will be delivered in Display information elements each with a content of maximum 32 IA5 characters.
- c) For some applications (e.g. interrogation of the Call forwarding supplementary service), the network may provide more characters than can be shown by the display at one time. In this case the network will send a sequence of messages, each message containing display information.
- d) In some cases the Display information element is included in a message containing other information element(s) which also may result in a displayed message to the user. Examples are Cause, Notification indicator, Calling party number and Progress information elements. In such cases, the network will create information with a maximum length of 20 IA5 characters.
- e) The network will assume that the terminal is able to handle the following IA5 characters:
 - All graphic characters;
 - Also the "Nordic" letters: æ(7/11), Æ(5/11), ø(7/12), Ø(5/12), å(7/13) and Å(5/13);
 - The following format effectors of the control characters:
SP(2/0), LF(0/10), CR(0/13).