3GPP TSG CN Plenary **Tdoc NP-010046**
Meeting #11, Palm Springs, U.S.A
14th - 16th March 2001

Source: **TSG_CN WG 3**

Title: **CRs to REL-4 Work Item "RT Facsimile"**

Agenda item: **8.5**

Document for: **APPROVAL**

Introduction:

This document contains **4** CRs on **REL-4** Work Item **" RT Facsimile"**, that have been agreed by **TSG_CN WG3**, and are forwarded to TSG CN Plenary meeting **#11** for approval.

Doc-2nd-Level	Spec	CR	Rev	Cat	Subject	Phase	Version-Current	Workitem
N3-010157	27.001	048	1	C	Removal of FAX NT in GSM from REL-4	REL-4	4.2.0	RT Facsimile
N3-010077	27.003	008		C	Removal of FAX NT in GSM from REL-4	REL-4	4.0.0	RT Facsimile
N3-010152	29.007	038		C	Removal of FAX NT in GSM from REL-4	REL-4	4.1.0	RT Facsimile
N3-010076	43.010	003		C	Removal of FAX NT in GSM from REL-4	REL-4	4.0.0	RT Facsimile

3GPP TSG CN WG3 Meeting #15
Beijing, China. 15th – 19th January 2001

Tdoc N3-010076

CR-Form-v3

CHANGE REQUEST

⌘ **43.010** **CR** **003** ⌘ **rev** **-** ⌘ **Current vers** **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☒

Title:	⌘	Removal of Fax NT for GSM
Source:	⌘	TSG_CN WG3
Work item code:	⌘	NT Facsimile
Date:	⌘	09.01.01
Category:	⌘	**C**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The Teleservice Facsimile non-transparent was removed in GSM
Summary of change:	⌘	Removal of Fax NT related text and protocol models in figures 6 and 7 and table 5.
Consequences if not approved:	⌘	43.010 is not consistent with 22.003.

Clauses affected:	⌘	1, 6.4, 6.5, 7.5		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	3GPP TS 27.001, 3GPP TS 27.003
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

1 Scope

A GSM PLMN may be described by a limited set of access interfaces (refer to 3GPP TS 04.02 and 22.001) and a limited set of GSM PLMN connection types to support the telecommunication services described in the 3GPP 22-series of specifications. This Global System for Mobile communications Technical Specification (TS) identifies and defines these connection types in so far as they relate to the particular network capabilities for a GSM PLMN.

The basic lower layer capabilities of a GSM PLMN are represented by a set of GSM PLMN connection types. The definition of a set of GSM PLMN connection types provides the necessary input to identify network capabilities of a GSM PLMN. In addition to describing network capabilities of a GSM PLMN, the identification of connection types facilitates the specification of network-to-network interfaces. It may also assist in the allocation of network performance parameters.

This specification should be considered in conjunction with other 3GPP specifications with particular reference to 3GPP TS 01.02, 22.001, 22.002, 22.003, 03.01, 23.002, 04.02 and 04.03.

This specification provides a bridge between the service specification in the 3GPP TS 22-series of specifications and the more detailed specifications such as the 3GPP TS 03, 04, 23, 24, 27 and 29 series. As such, it establishes a framework for the specification and understanding of the more detailed specifications. It is therefore not a specification against which detailed conformance testing can be performed. However, it shall be considered mandatory for the understanding of the more detailed specifications and used to resolve issues of conflict in these specifications.

From R99 onwards the following services are no longer required by a PLMN:

- the dual Bearer Services “alternate speech/data” and “speech followed by data”
- the dedicated services for PAD and Packet access
- the single asynchronous and synchronous Bearer Services (BS 21..26, BS 31..34)

From ~~R00~~ Rel-4 onwards the following service<u>s are</u>~~ is~~ no longer required by a PLMN:

- the synchronous Bearer Service non-transparent (BS 30 NT)
- <u>the Teleservice Facsimile non-transparent (TS 61/62 NT).</u>

If a PLMN network still provides these services it has to fulfil the specification of ~~GSM R98~~<u>former releases</u>.

Next section modified

6.4 Limited set of GSM PLMN connection types (all channel codings excluding TCH/F14.4)

From the two connection elements defined in subclause 6.2, the list of attributes and their possible values given in subclause 6.3, and from the service requirements defined in 3GPP TS 22.002 and 02.03, a limited set of GSM PLMN connection types have been identified (see also table 5 and table 6 for the relationship between connection elements and telecommunication services).

Figure 6 gives the information transfer protocol models for the identified set of GSM PLMN connection types. The S bits correspond to status bits and the D bits to data bits (3GPP TS 04.21); S* indicates that S bits are used only when 3.1 kHz audio ex PLMN. D' bits corresponds to user bits passed in the place of status bits in the non transparent case Moreover, it should be noted that the RLP rate of 6 and 12 kbit/s correspond to the 8 and 16 Kbit/s intermediate rate in the transparent case.

Protocol Models 1 a and b are the models for asynchronous data transmission in the transparent mode. Models 1d and 1e are for multislot transparent asynchronous data configurations.

Protocol Models 2 a and b are the models for synchronous data transmission in the transparent mode. Models 2d and 2e are for multislot transparent synchronous data.

Protocol Models 3 a and b are the models for character "asynchronous" mode data transmission in the non-transparent mode. In this case, L2RCOP represents the protocol used between the Layer 2 Relay functions (L2R) to convey characters between the MS and the IWF (see 3GPP TS 27.002). The data compression function is located in the L2R COP function. Models 3d and 3e are for multislot character "asynchronous" data transmission in the non-transparent mode.

In all the above models, the a, d and b, e variants indicate alternative access arrangements at the MS, i.e. access at the S interface or at the R interface. The c and f variants indicate a further alternative access arrangement where rate adaptation at the S interface is performed by flag stuffing as defined in ITU-T Recommendation X.31.

Protocol Model 5a is the model for the transparent support of group 3 facsimile transmission. Model 5b is for transparent support of group 3 facsimile transmission in multislot data configurations.

Protocol Models 6 a and b are the models for speech transmission. As in models 1-4, the a and b variants indicate alternative access arrangements at the MS, i.e. access at the S interface or direct access of the telephony teleservice.

~~Protocol model 7 a is the model for the non-transparent support of group 3 facsimile transmission. Model 7b is for non-transparent support of group 3 facsimile transmission in multislot data configurations.~~

In the multislot-data models the data is split into parallel substreams between the Split/Combine-functions (S/C). These substreams are transmitted through parallel TCH/Fs which are treated as independent channels. Between the S/C-functions parallel RA- and FEC-functions are used.

For all the models, only the minimum functionality of the IWF is shown. Additional functions will be required for various interworking situations. These additional functions are described in specification 3GPP TS 29.007.

It should be noted that, in Figure 6, the representation of the transcoding and rate adaptation from the intermediate rate on the radio interface to the 64 kbit/s rate required by the MSC is not intended to indicate a particular implementation. The annex B to 3GPP TS 03.10 identifies alternative arrangements.

6.5 Limited set of GSM PLMN connection types (for TCH/F14.4 channel coding)

Figure 7 provides the information transfer protocol models for the identified set of GSM PLMN connection types for support of TCH/F14.4. The description of models given in subclause 6.4 applies also to figure 7.

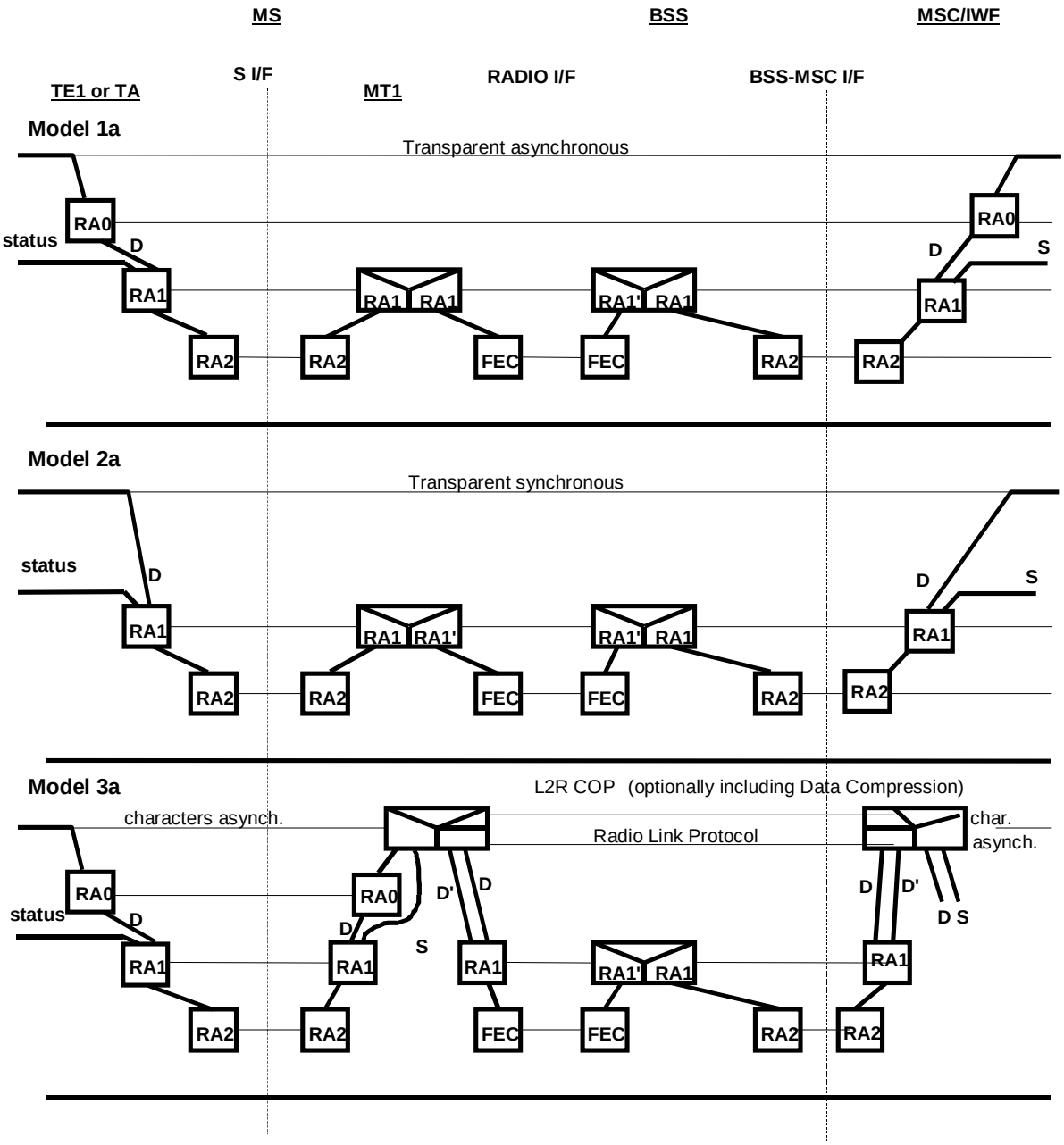


Figure 6: Information transfer protocol models for GSM PLMN connections

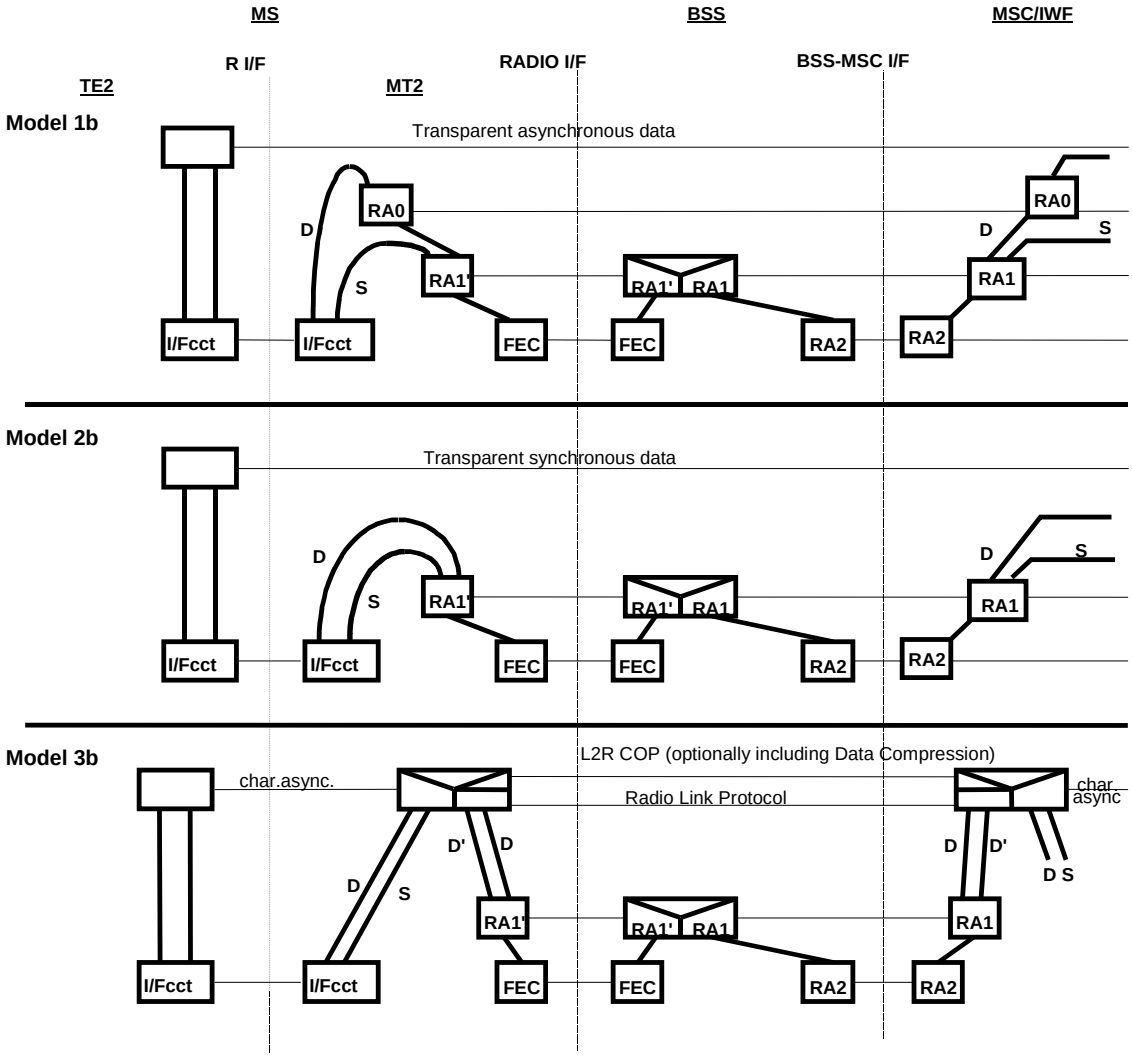


Figure 6 (continued): Information transfer protocol models for GSM PLMN connections

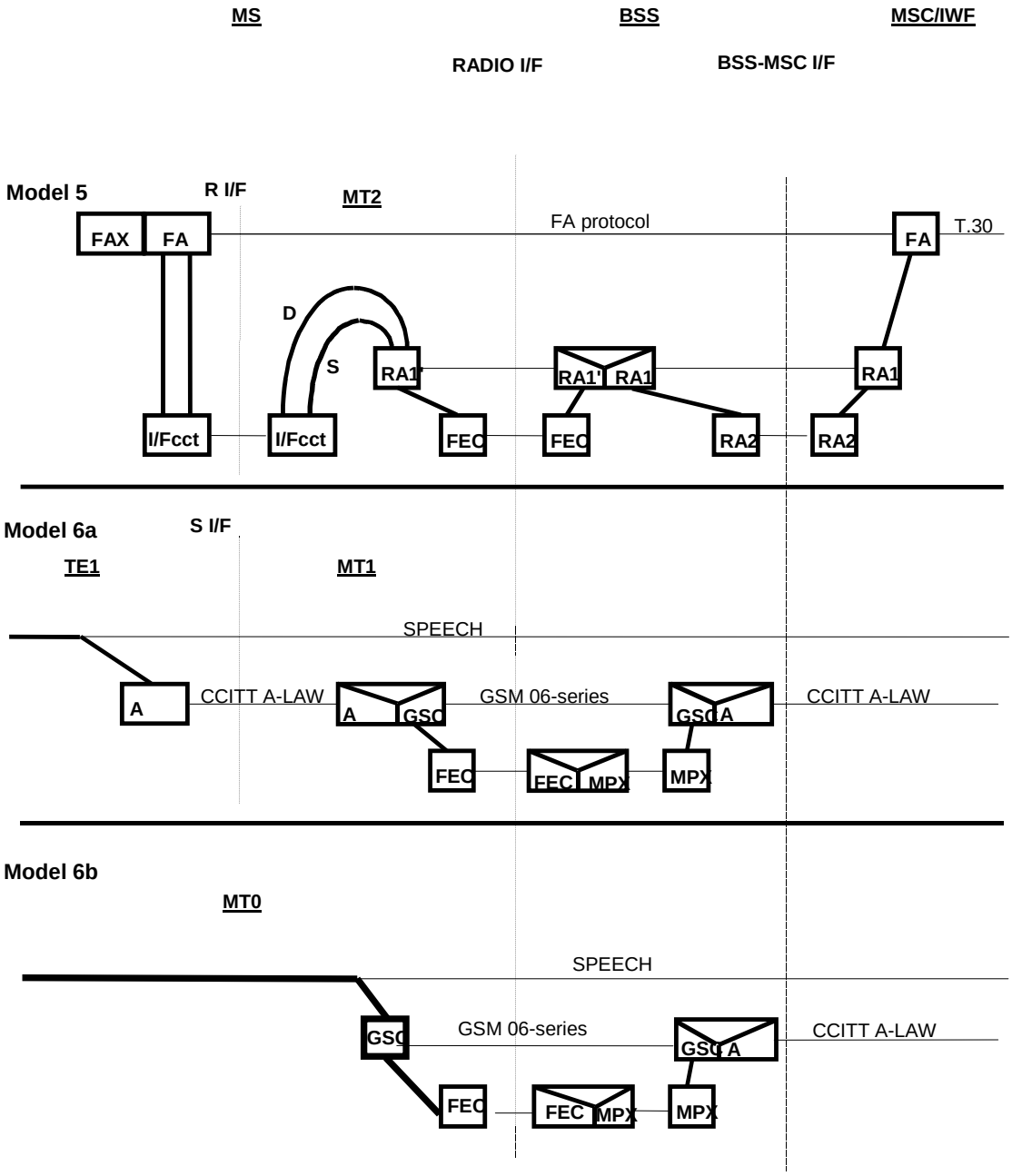
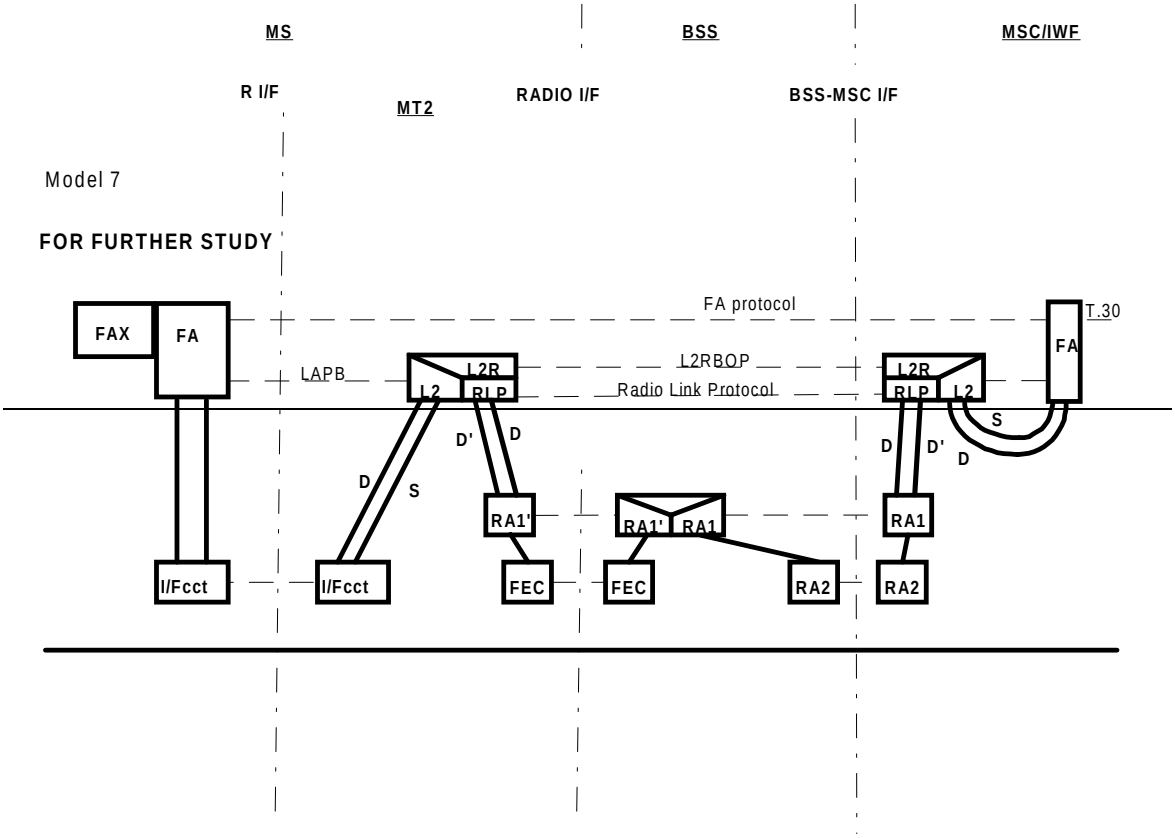


Figure 6 (continued): Information transfer protocol models for GSM PLMN connections



~~Figure 6 (continued): Information transfer protocol models for GSM PLMN connections~~

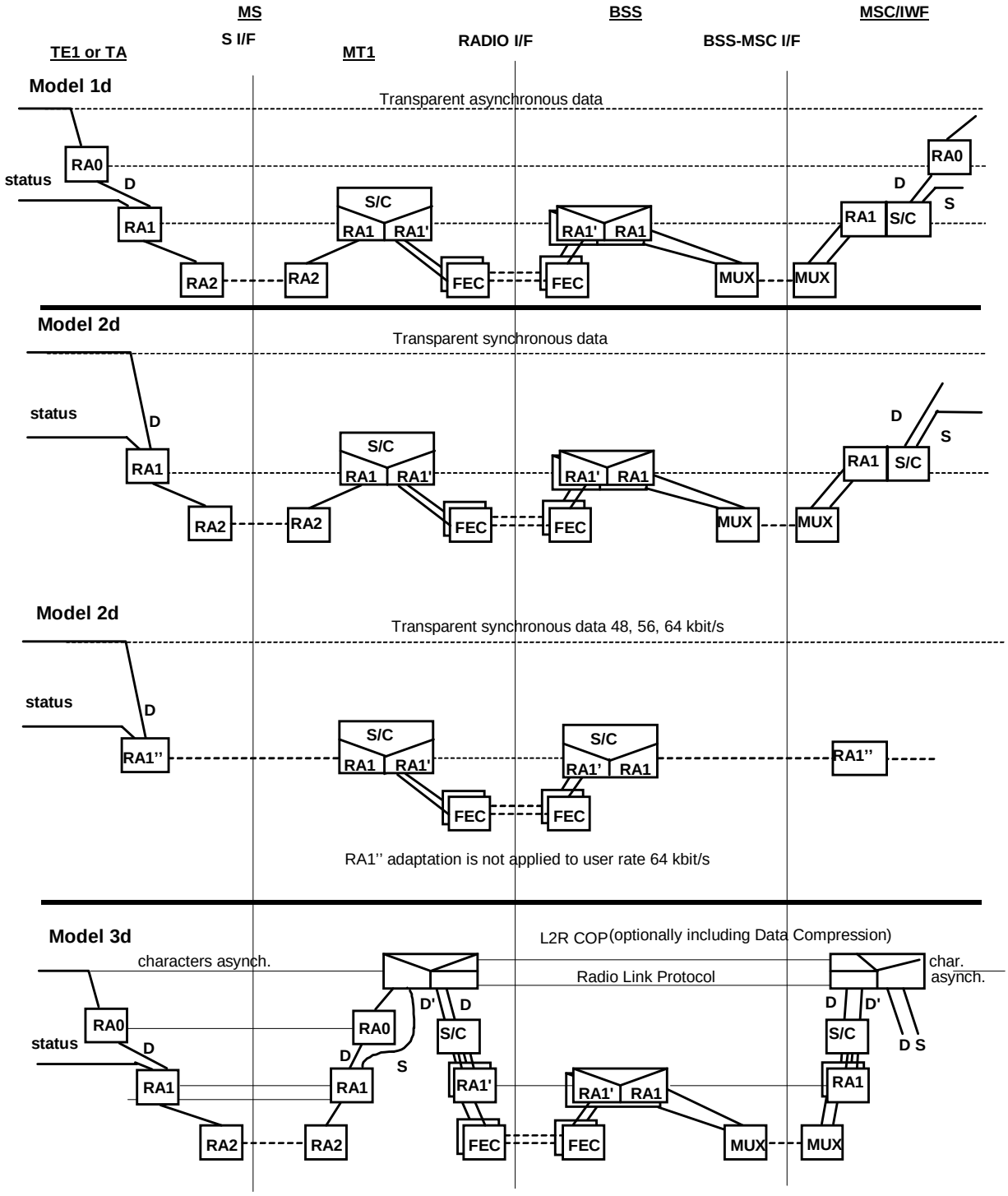


Figure 6 (continued): Information transfer protocol models for GSM PLMN connections

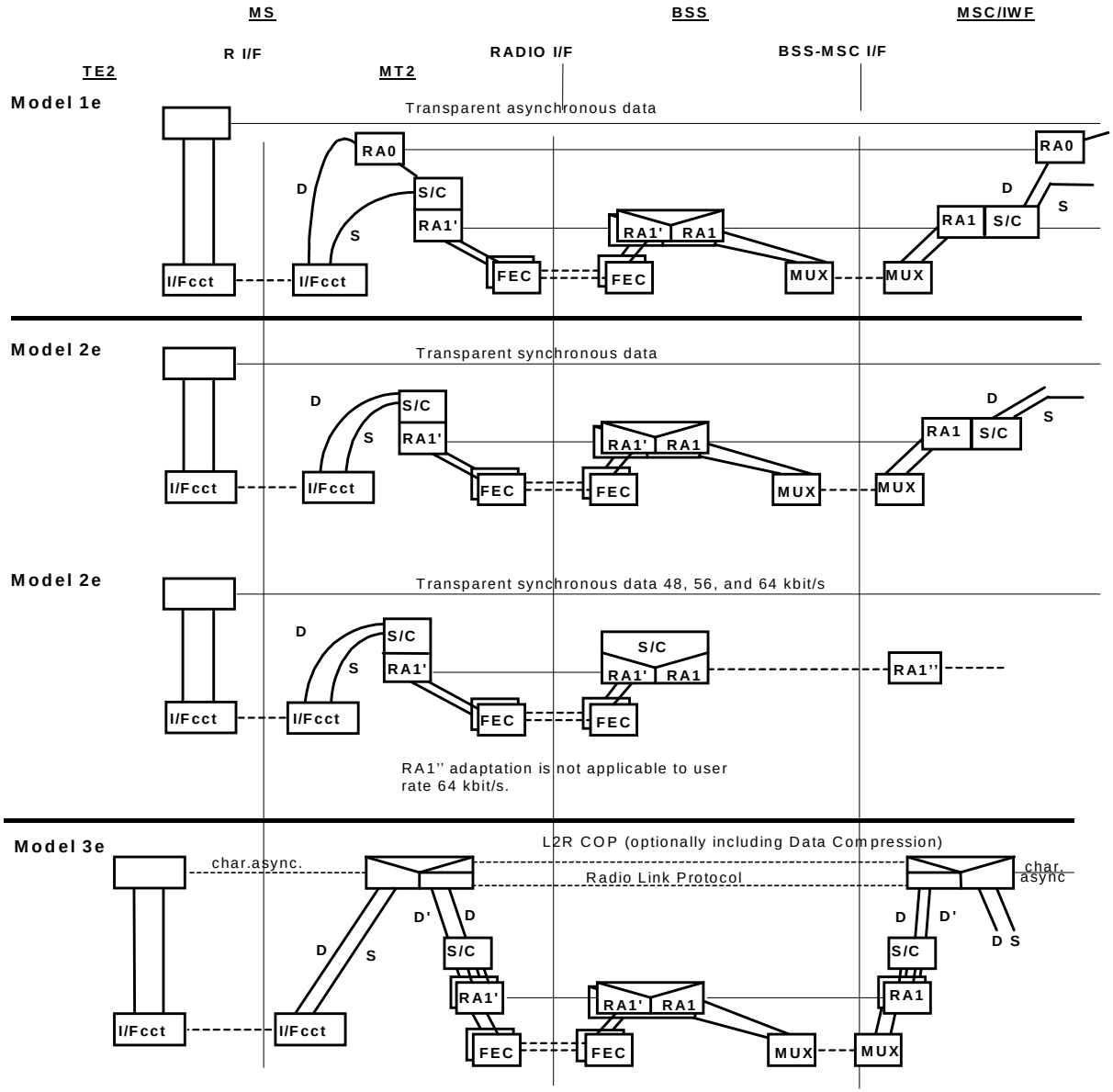
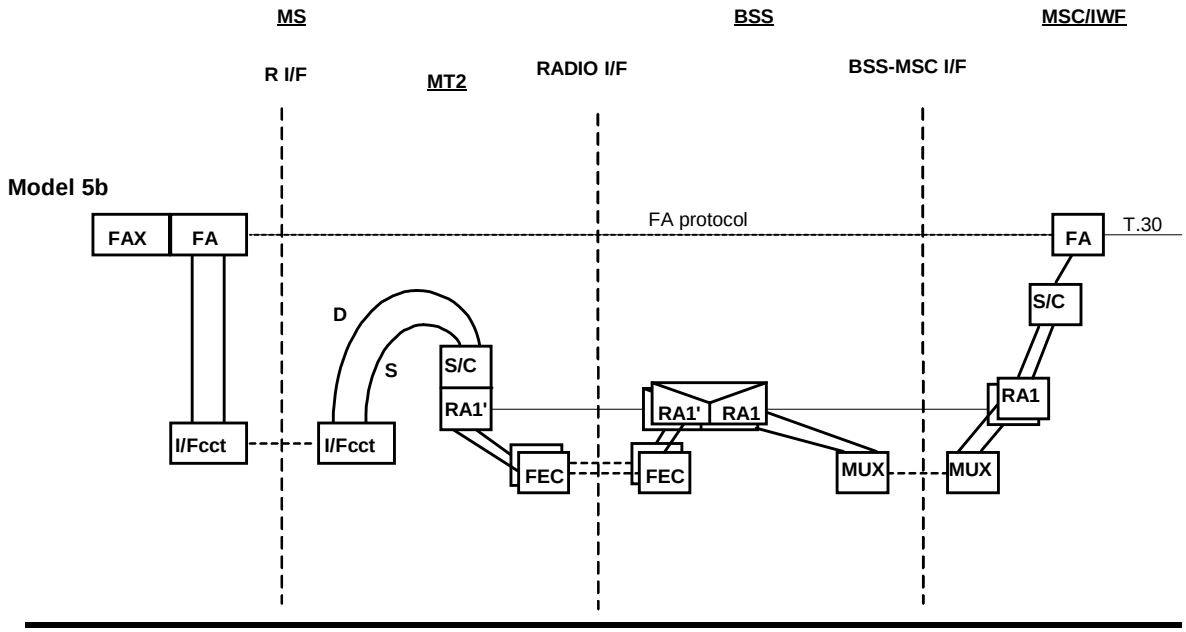


Figure 6 (continued): Information transfer protocol models for GSM PLMN connections



~~Figure 6 (continued): Information transfer protocol models for GSM PLMN connections~~

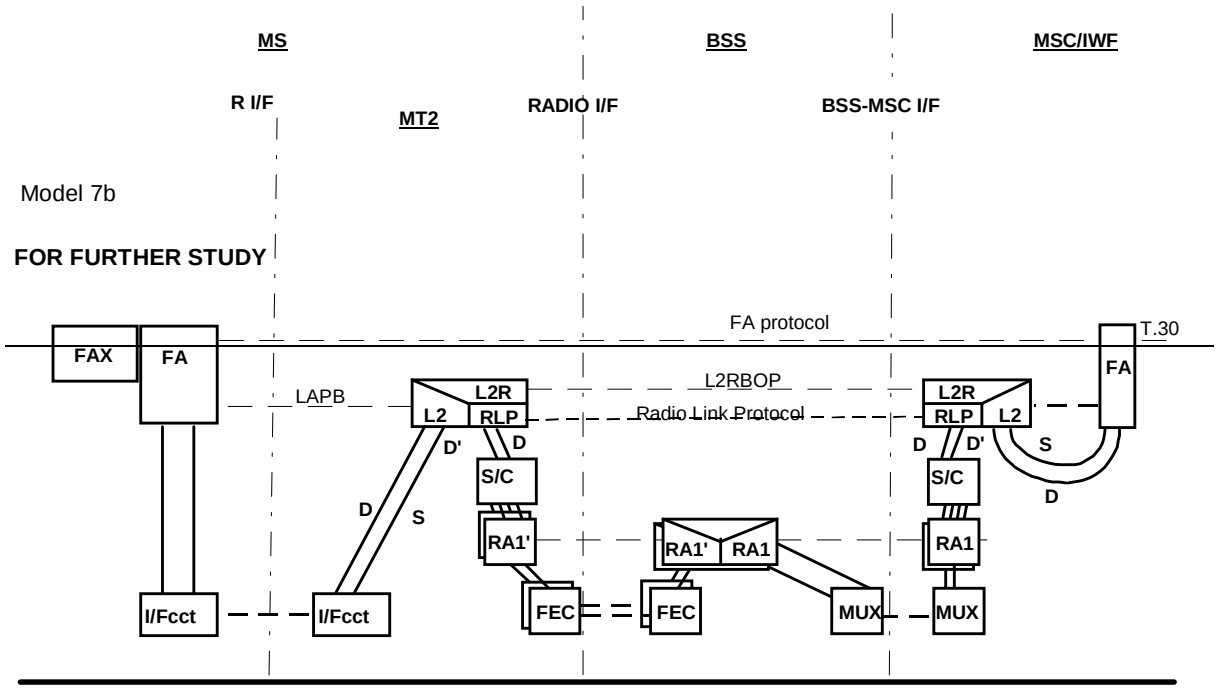


Figure 6 (concluded): Information transfer protocol models for GSM PLMN connections

Legend	to Figure 6:
FA	= Fax Adaptor
GSC	= GSM Speech Codec
FEC	= Forward Error Correction
MPX	= Multiplex/Demultiplex
MUX	= Multiplex/Demultiplex
S/C	= Split/ Combine

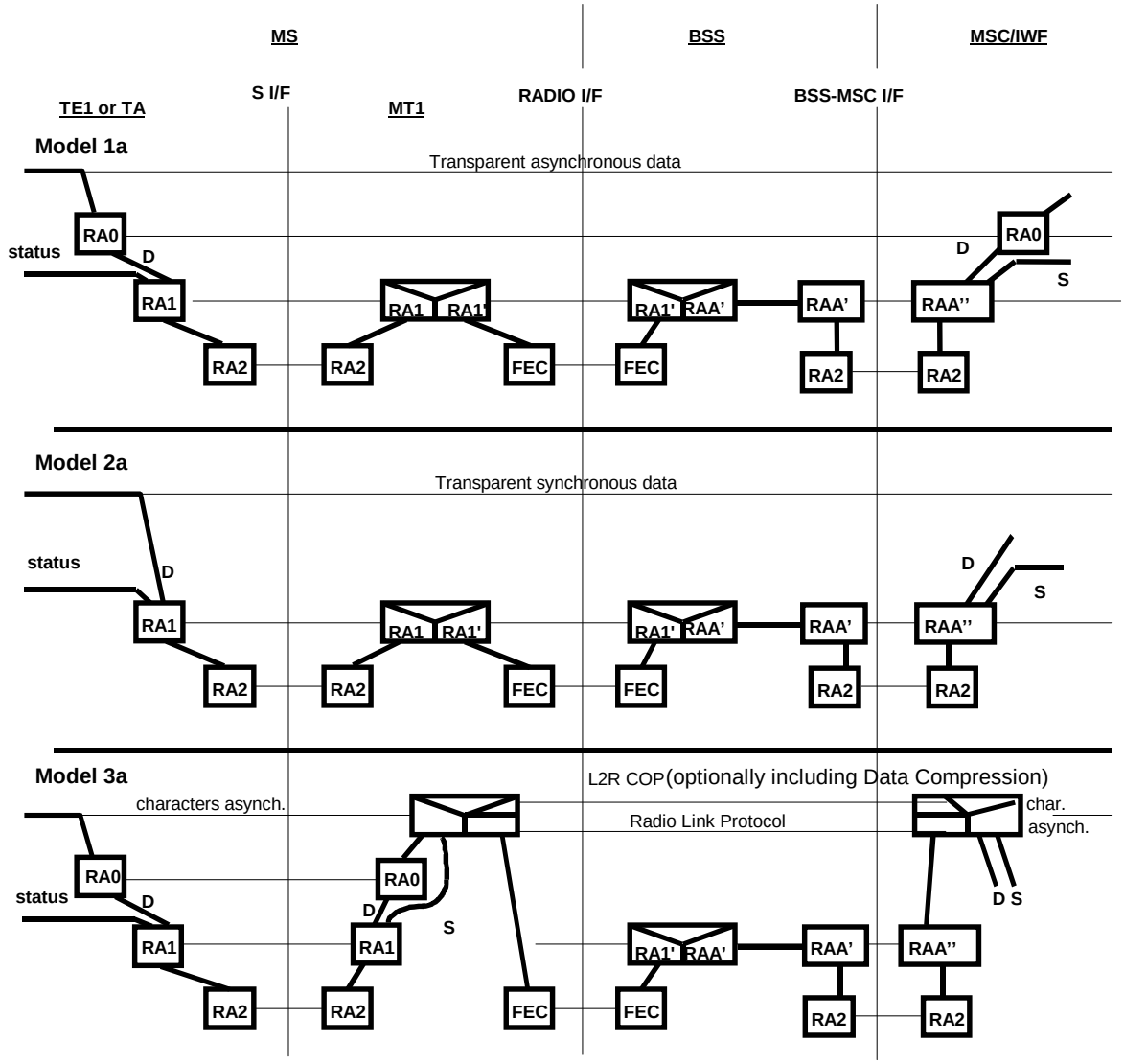


Figure 7: Information transfer protocol models for GSM PLMN connections using 14.4 channels

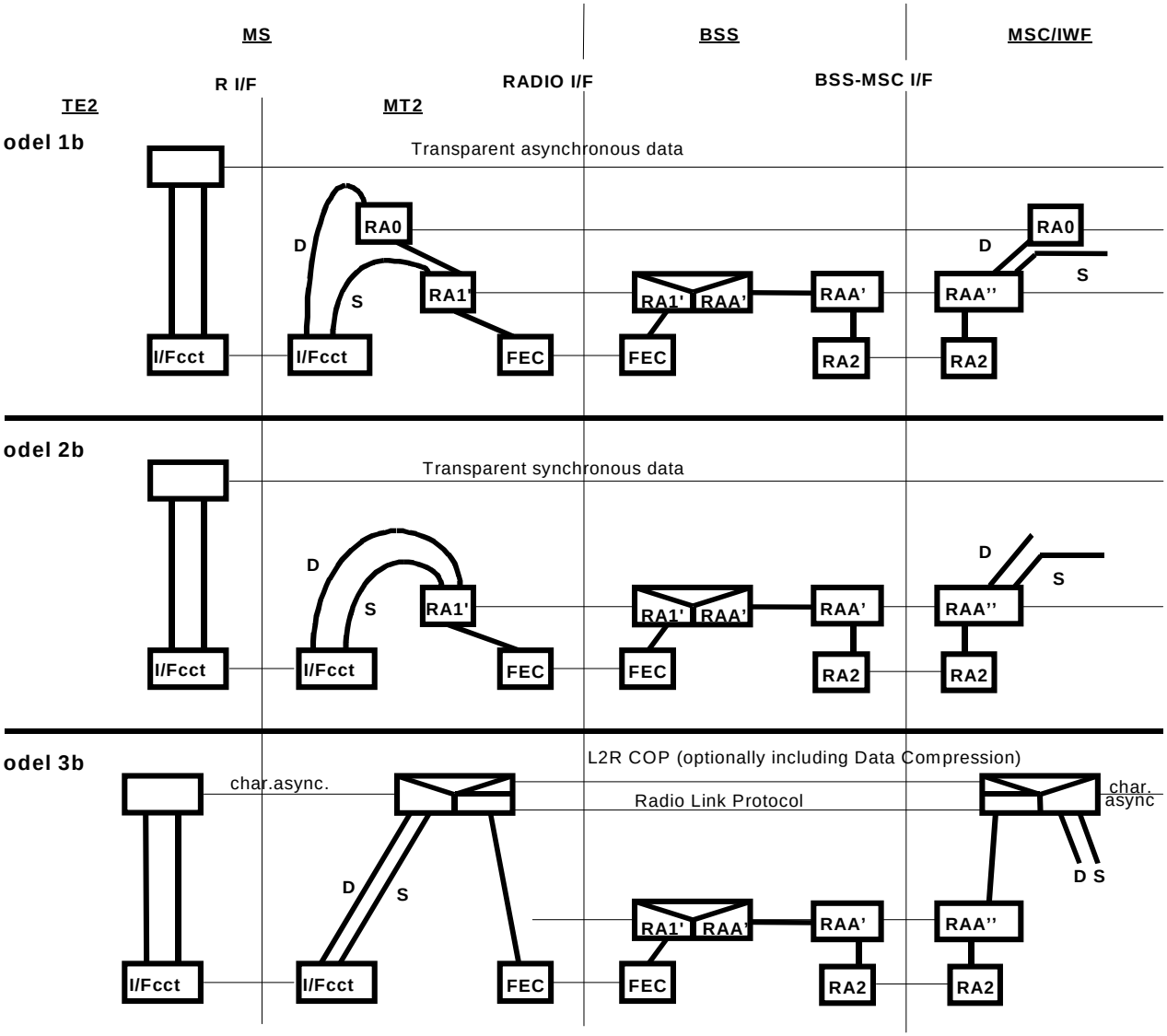


Figure 7 (continued) : Information transfer protocol models for GSM PLMN connections using 14.4 channels

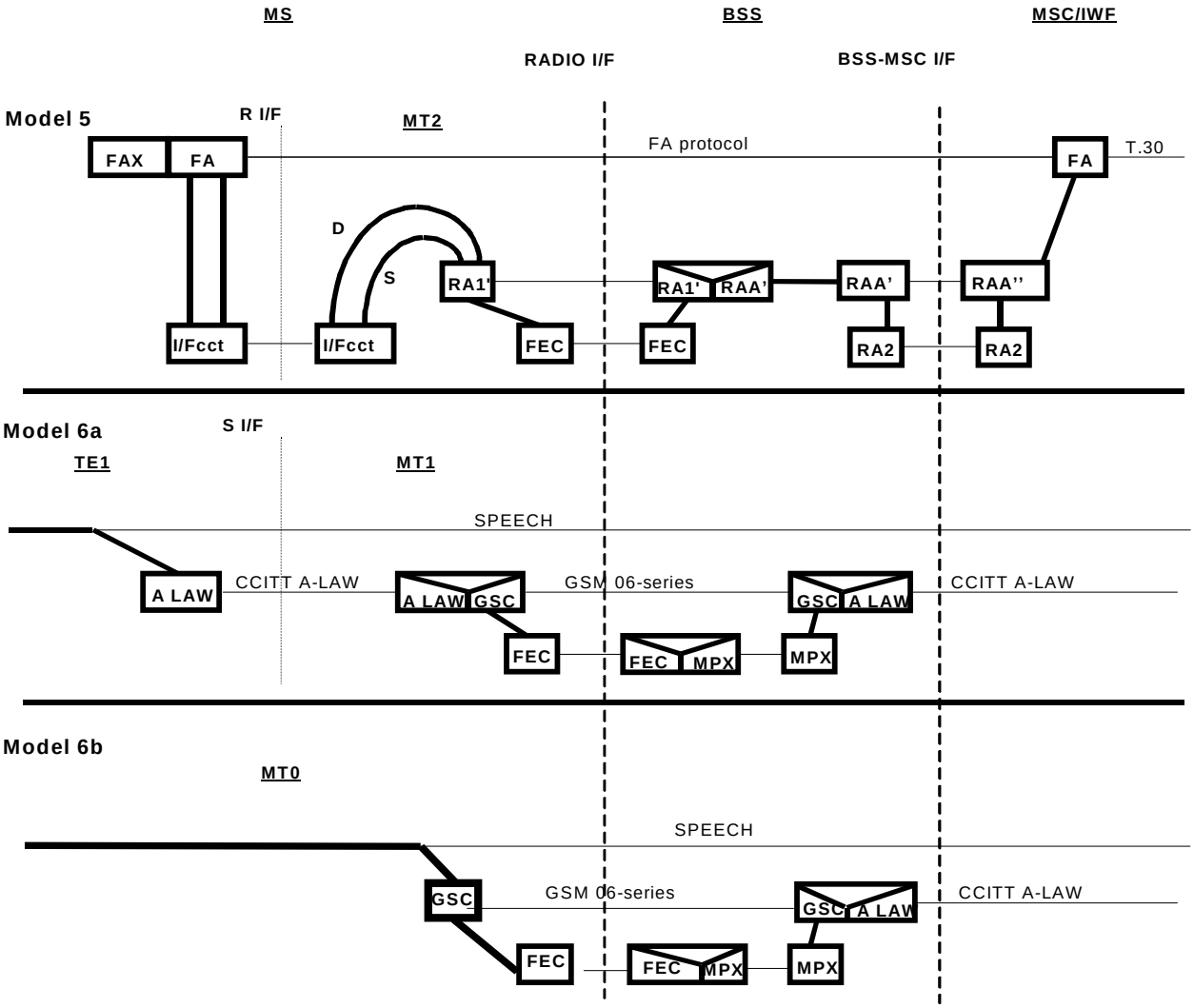
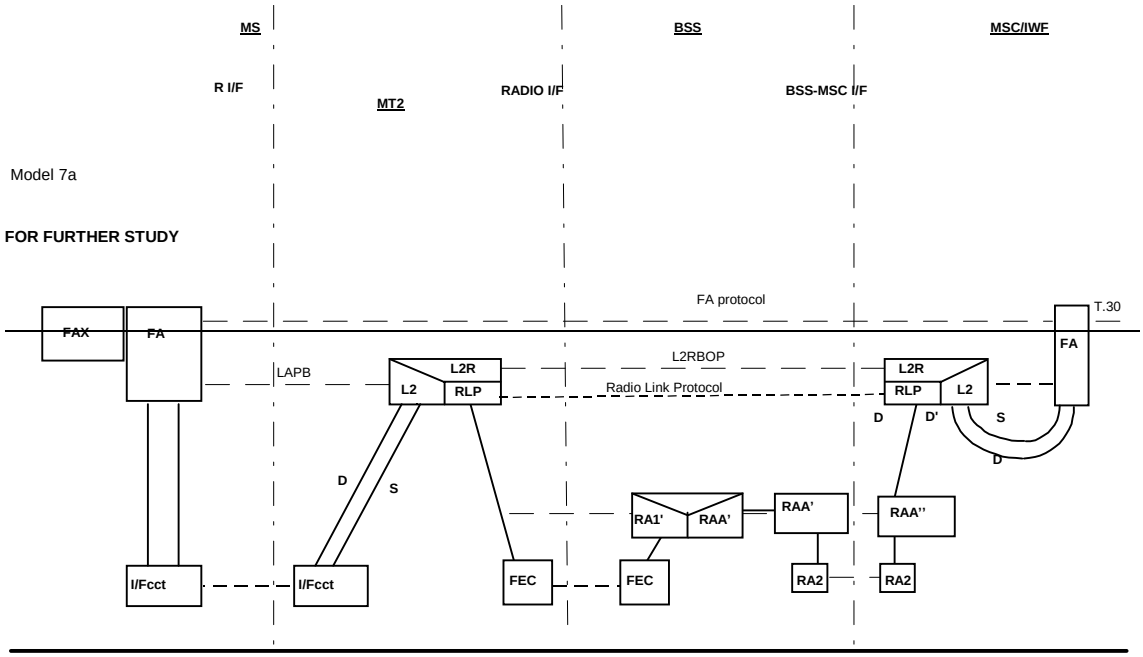


Figure 7 (continued) : Information transfer protocol models for GSM PLMN connections using 14.4 channels



~~Figure 7 (continued) : Information transfer protocol models for GSM PLMN connections using 14.4 channels~~

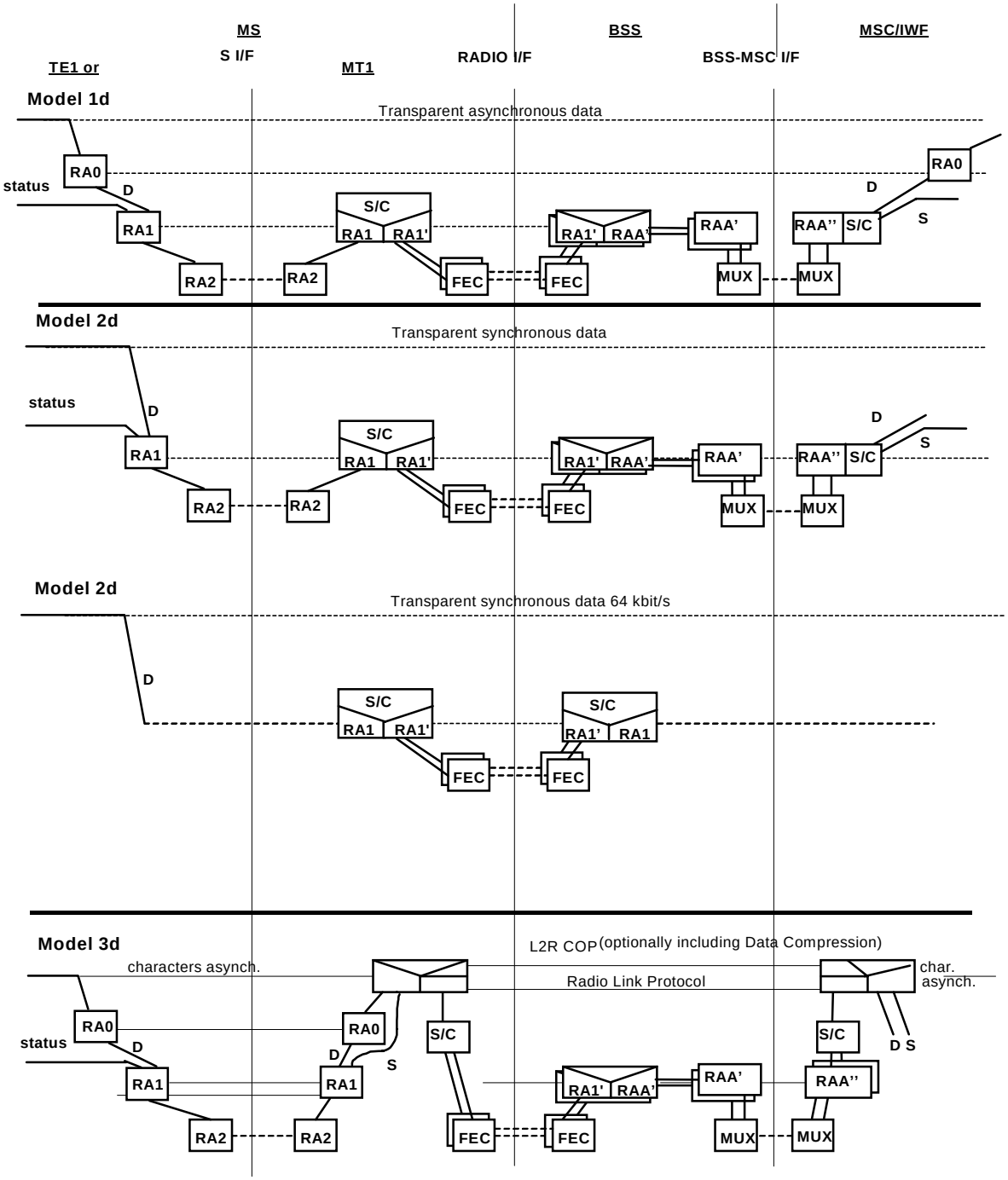


Figure 7 (continued) : Information transfer protocol models for GSM PLMN connections using 14.4 channels

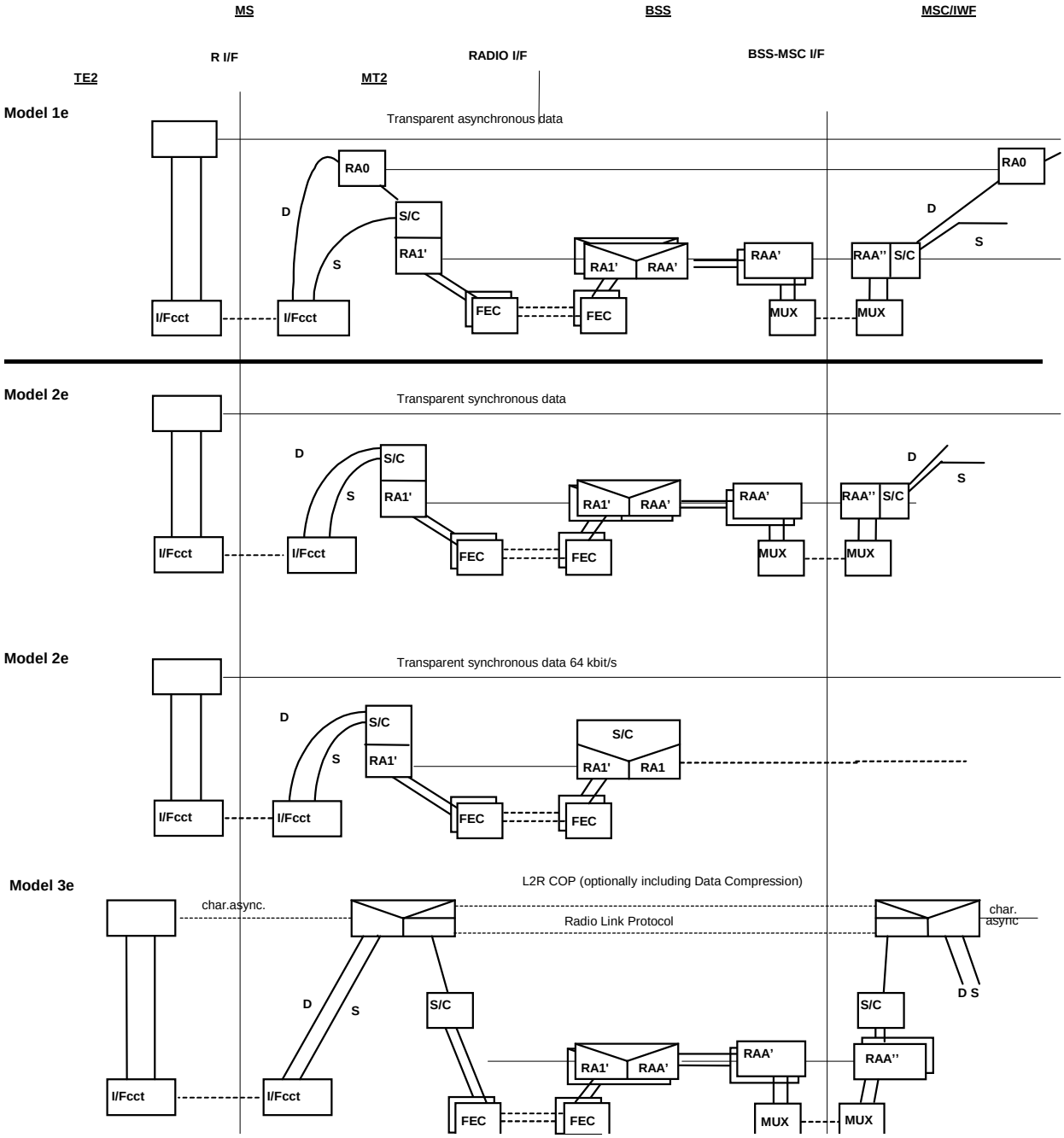
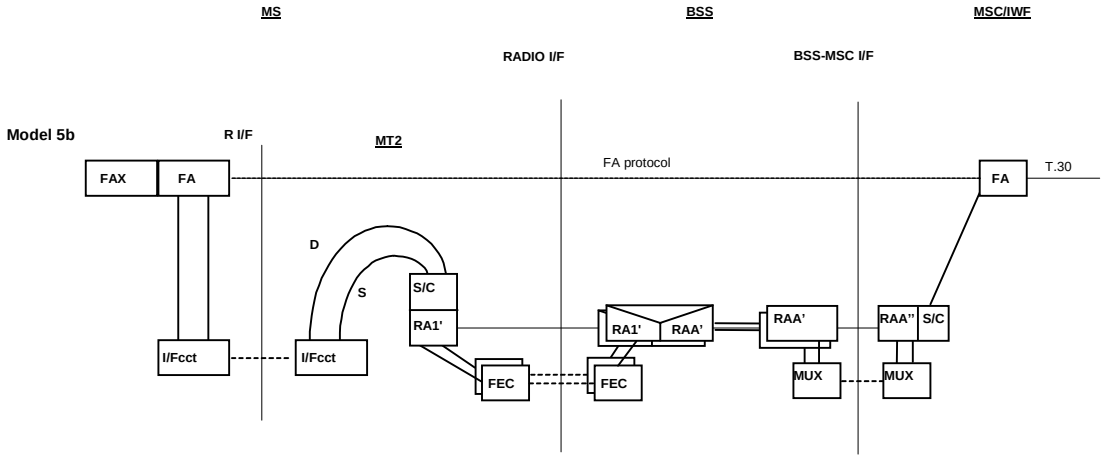


Figure 7 (continued) : Information transfer protocol models for GSM PLMN connections using 14.4 channels



~~Figure 7 (continued) : Information transfer protocol models for GSM PLMN connections using 14.4 channels~~

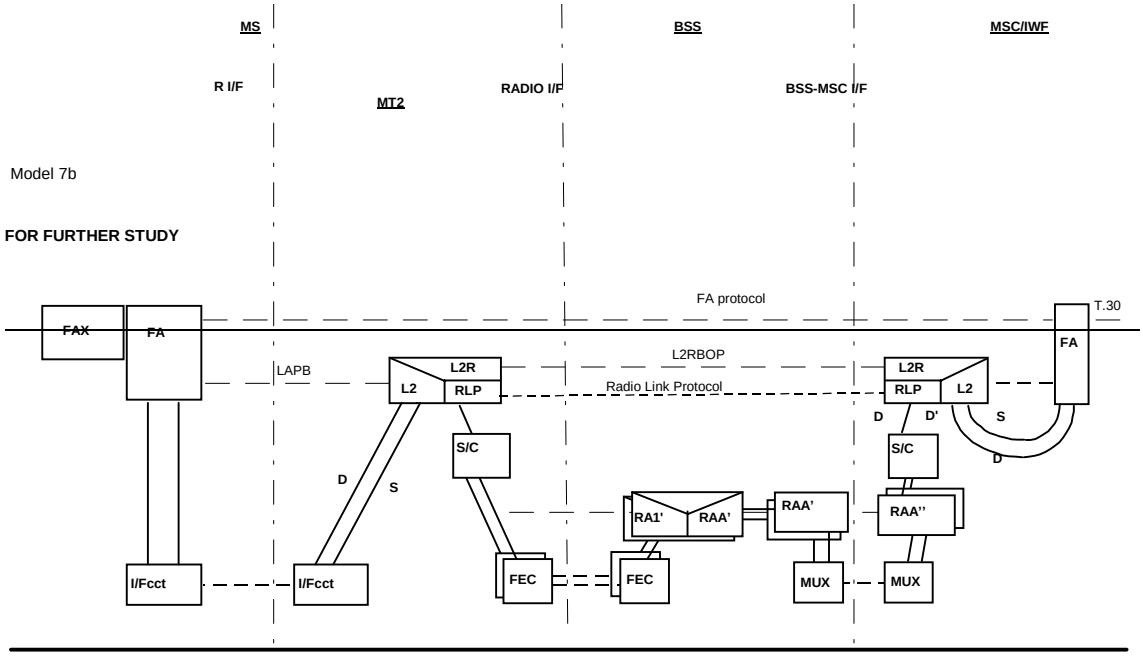


Figure 7 (concluded) : Information transfer protocol models for GSM PLMN connections using 14.4 channels

Legend	to Figure 7:
FA	= Fax Adaptor
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MPX	= Multiplex/Demultiplex
MUX	= Multiplex/Demultiplex
S/C	= Split/ Combine

Next section modified

7.5 Network capability to support channel mode modification

Specification 3GPP TS 03.45 (Technical Realization of the Group 3 Facsimile Teleservice) identifies a need for a GSM PLMN to support channel mode modification within the facsimile phase of the alternate speech and facsimile group 3 service. The network capability to support channel modification is described in 3GPP TS 24.008. Channel mode modification is not possible for other services. A channel mode modification results in a change of connection element over the radio interface with resultant change in access at the mobile station.

Table 5: Relationship between Bearer services and GSM PLMN Connection elements

Connection description	**Bearer service user data rate**	**Radio interface connection element**	**Intermediate rate at the BSS-MSC interface**	**BSS-MSC connection element**	**Protocol model in figure 6, 7 or 8**
Circuit mode unstructured with unrestricted digital capability transparent.	Data circuit duplex async n × 4 800 (n ≤ 4) or n × 9 600 bit/s (n ≤ 4). Data circuit duplex sync n × 4 800 (n ≤ 4) or n × 9 600 bit/s (n ≤ 5) or n × 1 1200 bit/s (n = 5 or 6).	cct mode unstructured unrestricted n × 6 kbit/s (n ≤ 4) or n × 12 kbit/s (n ≤ 6) on n full rate channels.	8 or 16 kbit/s per TCH/F. For data connections using 5 or 6 TCH/Fs no intermediate rate(s) .	cct mode unstructured unrestricted 64 kbit/s.	Fig 6 :1 d, 1 e, 2 d, 2 e
	Data circuit duplex async n × 14 400 bit/s (n ≤ 3). Data circuit duplex sync n × 14 400 bit/s (n ≤ 5)	cct mode unstructured unrestricted n x 14.5 kbit/s (n ≤ 5) on n full rate channels	16 kbit/s per TCH/F.	cct mode unstructured unrestricted 64 kbit/s.	Fig 7 : 1 d, 1 e, 2 d, 2 e
	Data circuit duplex async 28 800 bit/s. Data circuit duplex sync 28 800 bit/s Data circuit duplex Sync 32 000 bit/s Data circuit duplex sync 64 000 bit/s	cct mode unstructured unrestricted 29.0 kbit/s on full rate channel cct mode unstructured unrestricted 32 kbit/s on full rate channel cct mode unstructured unrestricted 2 x 32.0 kbit/s on full rate channels	16 kbit/s per TCH/F. 32 kbit/s No intermediate rate for the 64 000 bit/s rate	cct mode unstructured unrestricted 64 kbit/s.	Fig 8 : 1 a, 1 b, 2 a, 2 b None
	Data circuit duplex async 14 400 bit/s Data circuit duplex sync 14 400 bit/s	cct mode unstructured unrestricted 14.5 kbit/s on full rate Channel	16 kbit/s	cct mode unstructured unrestricted 64 kbit/s.	Fig 7 : 1 a, 1 b 2 a, 2 b
	Data circuit duplex async 9 600 bit/s. Data circuit duplex sync 9 600 bit/s.	cct mode unstructured unrestricted 12 kbit/s on full rate channel.	16 kbit/s.	cct mode unstructured unrestricted 64 kbits/s.	Fig 6 :1 a, 1 b Fig 6 2 a, 2 b
	Data circuit duplex async 4 800 bit/s. Data circuit duplex sync 4 800 bit/s.	cct mode unstructured unrestricted 6 kbit/s on full rate channel and half rate channel.	8 kbit/s.	cct mode unstructured unrestricted 64 kbits/s.	Fig 6 1 a, 1 b Fig 6 2 a, 2 b
	Data circuit duplex async 300. Data circuit duplex async 1 200. Data circuit duplex async 2 400. Data circuit duplex sync 1 200. Data circuit duplex sync 2 400.	cct mode unstructured unrestricted 3.6 kbit/s on full rate channel and half rate channel.	8 kbit/s.	cct mode unstructured unrestricted 64 kbits/s.	Fig 6 : 1 a, 1 b Fig 6 1 a, 1 b Fig 6 1 a, 1 b Fig 6 2 a, 2 b Fig 6

					2 a, 2 b

Connection description	**Bearer service user data rate**	**Radio interface connection element**	**Intermediate rate at the BSS-MSC interface**	**BSS-MSC connection element**	**Protocol model in figure 6, 7 or 8**
Circuit mode unstructured with unrestricted digital capability non transparent.	Data circuit duplex async n × 4 800 (n ≤ 4) or n × 9 600 bit/s (n ≤ 4).	cct mode SDU unrestricted n × 6 kbit/s (n ≤ 4) or n × 12 kbit/s (n ≤ 4) on full rate channels.	8 or 16 kbit/s per TCH/F.	cct mode unstructured unrestricted 64 kbit/s.	Fig 6 3 d, 3 e
	Data circuit duplex async n × 14 400 bit/s (n ≤ 4).	cct mode SDU unrestricted n × 14.5 kbit/s (n ≤ 4) on full rate channels.	16 kbit/s	cct mode unstructured unrestricted 64 kbit/s.	Fig 7 : 3 d, 3e
	Data circuit duplex async n x 28 800 bit/s (n ≤ 2). Data circuit duplex async 43 200 bit/s	cct mode SDU unrestricted n × 29.0 kbit/s (n ≤ 2) on full rate channels. cct mode SDU unrestricted 43.5 kbit/s on a full rate channel.	16 kbit/s per TCH/F. 16 kbit/s per TCH/F.	cct mode unstructured unrestricted 64 kbit/s.	Fig 8 : 3a, 3 b
	Data circuit duplex async 14 400 bit/s	cct mode SDUunrestricted 14.5 kbit/s on full rate channel	16 kbit/s	cct mode unstructured unrestricted 64 kbit/s.	Fig 7 : 3 a, 3 b
	Data circuit duplex async 9 600 bit/s.	cct mode SDU unrestricted 12 kbit/s on full rate channel.	16 kbit/s.	cct mode unstructured unrestricted 64 kbits/s.	Fig 6 : 3 a, 3 b
	Data circuit duplex async 4 800 bit/s.	cct mode SDU unrestricted full rate channel, 12 kbit/s or half rate channel, 6 kbit/s.	16 kbit/s FR 8 kbit/s HR.	cct mode unstructured unrestricted 64 kbits/s.	Fig 6 : 3 a, 3 b
	Data circuit duplex async 300. Data circuit duplex async 1 200. Data circuit duplex async 2 400.	cct mode SDU unrestricted full rate channel, 12 kbit/s or half rate channel, 6 kbit/s.	16 kbit/s FR 8 kbit/s HR.	cct mode unstructured unrestricted 64 kbits/s.	Fig 6: 3 a, 3 b Fig 6 : 3 a, 3 b Fig 6 3 a, 3 b

Connection description	Bearer service user data rate	Radio interface connection element	Intermediate rate at the BSS-MSC interface	BSS-MSC connection element	Protocol model in figure 6, 7 or 8
Circuit mode unstructured with 3.1 kHz audio ex PLMN transparent.	Data circuit duplex async n × 4 800 bit/s (n ≤ 4) or n × 9 600 bit/s (n ≤ 3). Data circuit duplex sync n × 4 800 bit/s (n ≤ 4) or n × 9 600 bit/s (n ≤ 3).	cct mode unstructured unrestricted n × 6 kbit/s (n ≤ 4) or n × 12 kbit/s (n ≤ 3) on n full rate channels.	8 or 16 kbit/s TCH/F.	cct mode unstructured unrestricted 64 kbit/s.	Fig 6 : 1 d, 1 e, 2 d, 2 e
	Data circuit duplex async n × 14 400 bit/s (n ≤ 2). Data circuit duplex sync n × 14 400 bit/s (n ≤ 2)	cct mode unstructured unrestricted x 14.5 kbit/s (n ≤ 2) on n full rate channels	16 kbit/s per TCH/F	cct mode unstructured unrestricted 64 kbit/s.	Fig 7 : 1 d, 1 e, 2 d, 2e
	Data circuit duplex async 28 800 bit/s. Data circuit duplex sync 28 800 bit/s	cct mode unstructured unrestricted 29.0 kbit/s on a full rate channel	16 kbit/s per TCH/F.	cct mode unstructured unrestricted 64 kbit/s.	Fig 8 : 1 a, 1 b, 2 a, 2 b
	Data circuit duplex asynch 14 400 bit/s synch 14 400 bit/s	cct mode unstructured unrestricted 14.5 kbit/s on full rate channels	16 kbit/s	cct mode unstructured unrestricted 64 kbit/s.	Fig 7 : 1 a, 1 b for async Fig 7 2 a 2 b for synch
	Data circuit duplex async 9.6 kbit/s sync 9.6 kbit/s.	cct mode unstructured unrestricted 12 kbit/s full rate channel.	16 kbit/s.	cct mode unstructured unrestricted 64 kbit/s.	Fig 6 : 1 a, 1 b for asynch. Fig 6 : 2 a, 2 b for synch.
	Data circuit duplex async 4.8 kbit/s sync 4.8 kbit/s.	cct mode unstructured unrestricted 6 kbit/s full and half rate channel.	8 kbit/s.		
	Data circuit duplex async ≤ 2 400 sync ≤ 2 400.	cct mode unstructured unrestricted 3.6 kbit/s full and half rate channel.	8 kbit/s.		

Connection description	Bearer service user data rate	Radio interface connection element	Intermediate rate at the BSS-MSC interface	BSS-MSC connection element	Protocol model in figure 6, 7 or 8
Circuit mode unstructured with 3.1 kHz audio ex PLMN non transparent.	Data circuit duplex async n × 4 800 (n ≤ 4) or n × 9 600 (n ≤ 4) bit/s.	cct mode SDU unrestricted n × 6 kbit/s (n ≤ 4) or n × 12 kbit/s (n ≤ 4) on full rate channels.	8 or 16 kbit/s per TCH/F.	cct mode unstructured unrestricted 64 kbits/s.	Fig 6 : 3 d, 3 e for async.
	Data circuit duplex async n × 14 400 bit/s (n ≤ 4).	cct mode SDU unrestricted n x 14.5 kbit/s (n ≤ 4) on n full rate channels	16 kbit/s per TCH/F	cct mode unstructured unrestricted 64 kbits/s.	Fig 7 : 3 d, 3 e for asynch
	Data circuit duplex async 28 800 bit/s. Data circuit duplex async 43 200 bit/s	cct mode SDU unrestricted 29.0 kbit/s on a full rate channel. cct mode SDU unrestricted 43.5 kbit/s on a full rate channel.	16 kbit/s per TCH/F. 16 kbit/s per TCH/F.	cct mode unstructured unrestricted 64 kbits/s.	Fig 8 : 3a, 3 b
	Data circuit duplex asynch 14 400 bit/s	cct mode SDU unrestricted 14.5 kbit/s full rate channel	16 kbit/s	cct mode unstructured unrestricted 64 kbits/s.	Fig 7 : 3a, 3b for asynch
	Data circuit duplex async 9.6 kbit/s sync 9.6 kbit/s.	cct mode SDU unrestricted 12 kbit/s full rate channel.	16 kbit/s.	cct mode unstructured unrestricted 64 kbit/s.	Fig 6 : 3 a, 3 b for asynch.
	Data circuit duplex async 4.8 kbit/s	cct mode SDU unrestricted half rate channel, 6 kbit/s or full rate channel, 12 kbit/s.	16 kbit/s FR 8 kbit/s HR.		
	Data circuit duplex async ≤ 2 400 sync ≤ 2 400.	cct mode SDU unrestricted half rate channel, 6 kbit/s or full rate channel, 12 kbit/s.			

Table 5 (continued): Relationship between Bearer services and GSM PLMN Connection elements

Connection description	Bearer service user data rate	Radio interface connection element	Intermediate rate at the BSS-MSC interface	BSS-MSC connection element	Protocol model in figure 6, 7 or 8
Packet services basic access transparent.	Data circuit duplex sync n × 4 800 (n ≤ 4) or n × 9 600 bit/s (n ≤ 5) or n × 11200 bit/s (n = 5 or 6).	cct mode unstructured unrestricted n × 6 kbit/s (n ≤ 4) or n × 12 kbit/s (n ≤ 6) on n full rate channels.	8 or 16 kbit/s per TCH/F. For data connections using 5 or 6 TCH/Fs no intermediate rate(s).	cct mode unstructured unrestricted 64 kbit/s.	Fig 6 : 2 d, 2 e
	Data circuit duplex sync n × 14 400 bit/s (n ≤ 5)	cct mode unstructured unrestricted n × 14.5 kbit/s (n ≤ 5) on n full rate channels.	16 kbit/s per TCH/F	cct mode unstructured unrestricted 64 kbits/s.	Fig 7 : 2 d, 2 e
	Data circuit duplex synch 14 400 bit/s	cct mode unstructured unrestricted 14.5 kbit/s on full rate channel.	16 kbit/s.	cct mode unstructured unrestricted 64 kbit/s.	Fig 7 : 2 a, 2 b
	Data circuit duplex sync 9 600 bit/s.	cct mode unstructured unrestricted 12 kbit/s on full rate channel.	16 kbit/s.	cct mode unstructured unrestricted 64 kbit/s.	Fig 6 : 2 a, 2 b
	Data circuit duplex sync 4 800 bit/s.	cct mode unstructured unrestricted 6 kbit/s on full rate channel and half rate channel.	8 kbit/s.	cct mode unstructured unrestricted 64 kbit/s.	Fig 6 : 2 a, 2 b
	Data circuit duplex sync 2 400 bit/s.	cct mode unstructured unrestricted 3.6 kbit/s on full rate channel and half rate channel.	8 kbit/s.	cct mode unstructured unrestricted 64 kbit/s.	Fig 6 : 2 a, 2 b

Table 6: Relationship between Teleservices and GSM PLMN connection types

Teleservice in GSM PLMN	**Access at mobile station**	**Radio interface connection element**	**Intermediate rate at the BSS-MSC interface**	**BSS-MSC connection element**	**Protocol model in figure 6 or 7**
Telephony.		cct mode speech.	NA.	cct mode structured 64 kbit/s speech.	Fig 6 : 6 a or 6 b
Emergency calls.		cct mode speech.	NA.	cct mode structured 64 kbit/s speech.	Fig 6 : 6 a or 6 b
Alternate Speech/ Facsimile Group 3.	Data cct duplex synchronous access alternate speech/ group 3 fax.	cct mode speech alternating with unstructured unrestricted 3.6 or 6 or 12 kbit/s or n × 6 kbit/s (n ≤ 3) or n × 12 kbit/s (n ≤ 2) on FR transparent.	Speech NA 8 or 16 kbit/s per TCH/F.	cct mode structured 64 kbit/s alternate speech/unrestricted.	Fig 6 : 5, 5b and 6 a or 6 b
		cct mode speech alternating with unstructured unrestricted 14.5 kbit/s or n × 14.5 kbit/s (n ≤ 2) on FR transparent	Speech NA 16 kbit/s per TCH/F.		Fig 7 : 5 and 5 b and 6 a or 6 b
Automatic Facsimile Group 3.	Data cct duplex synchronous access group 3 fax.	cct mode unstructured unrestricted 3.6 or 6 or 12 kbit/s or n × 6 kbit/s (n ≤ 3) or n × 12 kbit/s (n ≤ 2) on FR transparent.	8 or 16 kbit/s per TCH/F.	cct mode structured 64 kbit/s unrestricted.	Fig 6 : 5, 5b
		cct mode unstructured unrestricted 14.5 kbit/s or n × 14.5 kbit/s (n ≤ 2) on FR transparent	16 kbit/s per TCH/F.		
~~Alternate speech/ Facsimile Group 3.~~	~~Data cct duplex synchronous access alternate speech/ group 3 fax.~~	~~cct mode speech alternating with SDU unrestricted 6 or 12 kbit/s or n × 6 kbit/s (n ≤ 3) or n × 12 kbit/s (n ≤ 2) on FR non transparent.~~	~~Speech NA 8 or 16 kbit/s per TCH/F.~~	~~cct mode structured 64 kbit/s alternate speech/unrestricted.~~	~~Fig 6 : 6 a or 6 b, 7 a and 7 b~~
		~~cct mode speech alternating with SDU unrestricted 14.5 kbit/s or n × 14.5 kbit/s (n ≤ 2) on FR non transparent.~~	~~16 kbit/s per TCH/F.~~		~~Fig 7 : 6 a or 6 b and 7 a and 7 b~~
~~Automatic Facsimile Group 3.~~	~~Data cct duplex synchronous access group 3 fax.~~	~~cct mode SDUunrestricted 6 or 12 kbit/s or n × 6 kbit/s (n ≤ 3) or n × 12 kbit/s (n ≤ 2) on FR non transparent.~~	~~8 or 16 kbit/s per TCH/F.~~	~~cct mode structured 64 kbit/s unrestricted.~~	~~Fig 6 : 7 a and 7 b~~
		~~cct mode SDU unrestricted 14.5 kbit/s or n × 14.5 kbit/s (n ≤ 2) on FR non transparent.~~	~~16 kbit/s per TCH/F.~~		~~Fig 7 : 7 a and 7 b~~

NA: Not Applicable

NOTE: The multislot data connections and the connections using TCH/F14.4 coding belong to the General Bearer Services (Classes 20 and 30 in 3GPP TS 22.002).

n3GPP TSG CN WG3 Meeting #15 ***Tdoc N3-010077***
Beijing, China. 15th – 19th January 2001

CR-Form-v3

CHANGE REQUEST

⌘ **27.003** **CR** **008** ⌘ **rev** **-** ⌘ **Current vers** **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Deletion of NT Fax in GSM from Release 4
Source:	⌘	TSG_CN WG3
Work item code:	⌘	RT Facsimile
Date:	⌘	2001-01-15
Category:	⌘	**C**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Correction following a decision by TSG CN#10 to delete NT Fax in GSM from REL-4 and onwards.
Summary of change:	⌘	Deletion of L2RBOP and some editorial changes.
Consequences if not approved:	⌘	Indication of available service that is no longer supported in GSM.

Clauses affected:	⌘	1 Scope, 2.1 Abbreviations, Annex A		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	3GPP TS 27.001, 3GPP TS 43.010
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

First modified section

1 Scope

The present document defines Terminal Adaptation Functions (TAF) which are integrated in a Mobile Termination (MT) and which enable the use of synchronous bearer services in the PLMN and the attachment of Synchronous synchronous Terminals terminals to an MT (see 3GPP TS 24.002 [3]). For the case where asynchronous terminals are attached to the TAF when using synchronous bearer services in the PLMN, the reader is referred to 3GPP TS 27.002 [36] for the asynchronous MT-TAF interface specifics and to the present document for synchronous bearer service specifics on the TAF-IWF interface. The general aspects of Terminal Adaptation Functions are contained in specification 3GPP TS 27.001 [9]. The present document covers support of synchronous data services (see 3GPP TS 22.002 [6]) for the following interfaces and procedures:

- V.22 [15] DTE/DCE Interface;
- V.22 bis [16] DTE/DCE Interface;
- V.26 ter [19] DTE/DCE Interface;
- X.21 bis [24] DTE/DCE Interface;
- X.32 [30] Procedure;
- V.25 bis [18] Procedure;

~~LAPB is the only synchronous non-transparent protocol which is considered in the present document.~~

NOTE: From R99 onwards the support of the following services are no longer required by a PLMN:

- the dual Bearer Services "alternate speech/data" and "speech followed by data";
- the dedicated services for PAD and Packet access;
- BS 21 ... 26 and BS 31 ... 34.

From ~~R00~~ REL-4 onwards the support of the following service is no longer required by a PLMN:

- the synchronous Bearer Service non-transparent (BS 30 NT).
- the Teleservice Facsimile non-transparent (TS 61/62 NT) for GSM.
-

The support of these services is still optional. The specification of these services is not within the scope of the present document. For that, the reader is referred to GSM R98 or R99 respectively.

End of modified section

Next modified section

2.1 Abbreviations

In addition to the abbreviations listed below, the present document also uses termslisted in 3GPP TR 21.905 [10] and 3GPP TS 01.04 [1].

~~AU~~	~~Access Unit~~
~~BORE~~	~~Bit Oriented Relay Entity~~
EDGE	Enhanced Data for Global Evolution
~~FFS~~	~~For further studies~~
IrDA	Infrared Data Association
IrPHY	InfraredPHYsical layer
ITU-T	ITU-Telecommunication Standardization Sector
MUX	Multiplexer
PCMCIA	Personal Computer Memory Card Association
PC	Personal Computer

End of modified section

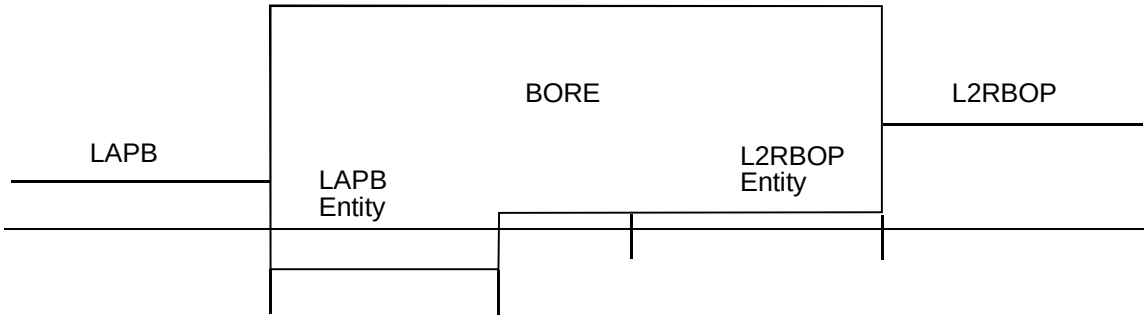
Next modified section

Annex A (normative): L2R Functionality

Void

A.1 Introduction

This annex describes the Layer 2 Relay (L2R) functionality required to support LAPB non-transparently. The general aspects of L2Rs are described in specification 3GPP TS 27.001 [9]. Figure 1 shows the three sub-functions of the L2R.



LAPB Link Access Protocol Balanced
BORE Bit Oriented Relay Entity
L2RBOP L2R Bot Oriented Protocol

Figure 1: Sub-functions of the L2R

Clause 2 describes the L2R Bit Oriented Protocol (L2RBOP) and clause 3 describes the use of the L2RBOP to transport LAPB information fields.

A.2 L2RBOP

The LAPB user information fields and interface status changes are transferred between L2Rs using the services of the radio link. The L2RBOP entity segments and reassembles the LAPB user information fields to fit into the service data units (SDUs) handled by the radio link. I.e. segments of LAPB user information fields and interface status changes are transferred between L2Rs in n octet Protocol Data Units (PDUs). This corresponds to the fixed length of the RLP frame information field. The octets within the L2RBOP PDU are numbered 0 to n-1, octet 0 is transmitted first. The value of n depends on the negotiated RLP version and frame type (3GPP TS 24.002 [8]). The bits within the octets are numbered 1 to 8, bit 1 is transmitted first.

The RLP version value 2 indicates RLP multi-link operation. The RLP version value 0 or 1 indicates RLP single-link operation.

The L2RBOP also provides facilities for transferring LAPB connection control information between L2Rs. This LAPB connection control information allows concatenated LAPB connections to be established, reset and released.

The L2RBOP PDUs are coded as follows:

- each octet contains a status octet, 1 - 8 bits of user information, control information or fill;

- octet 0 shall always contain a status octet in case at least one status octet is transportet in the L2RBOP PDU. In RLP versions 0 and 1 a PDU always carries at least one status octet. In RLP version 2 a PDU carries status octet(s) only if actual status change(s) has taken place within the period represented by the PDU. Here the L2R status flag in the RLP version 2 header is set to 1 when status octet(s) is carried in the PDU;

- status octets contain 3 status bits and 5 address bits. In cases where two status octets within the PDU are separated by more than 23 octets, the first status octet in octet m is followed by a pointer octet in octet m+1 forming a two-octet status field. The pointer octet contains one reserved bit and seven address bits indicating the number of characters between the status field and the second status octet;

- the 3 status bits are used to convey the interface conditions that are conveyed by the S and X bits in ITU-T recommendations V.110 [22]. In the case of ITU-T V series interfaces the 3 status bits correspond to SA, SB and X bits specified in ITU-T V.110 [22]. The ITU-T V series SA, SB and X bits use bit positions 8, 7 and 6 respectively in the status octets. The ITU-T X series S and X bits use bit positions 7 and 6 respectively, in this case bit position 8 is unused;

- LAPB user information is carried in L2RBOP PDU information octets such that the first LAPB user information bit, in any consecutive group of 8, received or transmitted corresponds to bit position 1 in the octet. The second to bit position 2, etc.;

- information octets are inserted into the L2RBOP PDU in order of arrival in octets 1 to n-1 for RLP single link operation, in octets 1 to n-1 for RLP multi-link operation with status octet transportation and in octets 0 to n-1 for multi-link operation with no status octet transportation;

- the address field in the status octets indicates the position of the next status octet within the L2RBOP PDU. This indicates the number of information octets between status octets. Thus if two status octets are inserted into an L2RBOP PDU at offsets l and m the address field value for the status octet at offset 1 shall be defined by m-l-1 (m>l+1). The low order bit of the address corresponds to bit 1 of the octet and the high order bit to bit 5;

- status octets are inserted in the information stream whenever a status change needs to be transmitted;

- only address values 1 to n-2 (n-2 ≤ 23) in the address field of status octets are used for addressing purposes. The implication of not allowing address value 0 to be used for addressing is that two status octets can not be sent after each other. The remaining codes are used to indicate:

  - last status change, remainder of L2RBOP PDU is empty. Address field value is 31;

  - last status change, remainder of L2RBOP PDU full of information octets. Address field value is 30;

  - end of a LAPB user information field. Address field value is 29. This is used to delimit LAPB user information fields. In this case the 3 status bits do not have their usual meaning. They are used to indicate the number of information bits in the previous information octet. A binary number in the range 0 to 7 is contained in bit positions 8, 7 and 6, bit 6 is the low order bit. The values 1-7 indicates the number of information bits used, value 0 indicates all bits used. If this octet is not on the last position in a L2RBOP PDU another status octet follows (e.g. an End of LAPB user information field in octet 0 is followed by a status octet in octet 1);

  - abort a LAPB user information field transfer. The address field value is 28. This is used to abort the transmission of a LAPB user information field after sending one or more segments in L2RBOP PDUs. If this octet is not on the last position in a L2RBOP PDU another status octet is following (e.g. an Abort a LAPB user information field transfer in octet 0 is followed by a status octet in octet 1);

  - L2RBOP PDU contains at least two status octets which are separated by more than 23 characters; the address field value in the first octet of the two-octet status field is 27 and the address bits in the pointer octet of the status field indicate the number of characters between the two-octet status field and the next status octet.

- address field values from n-1 to 26 are reserved. In case of a PDU more than 25 octets in length, address field values from 24 to 26 are reserved. When it is necessary to insert a status octet into the information stream when no status change has occurred, e.g. to indicate that the remainder of an L2RBOP PDU is empty or to indicate end of a LAPB user information field, the current status shall be repeated;

- in case when 64 data octets are carried by a 66-octet PDU, a status octet is carried in octet 0 and another status octet within the first 24 data octets. (The first status octet gives the address of the second status octet, which carries value 30 in its address field);

- LAPB connection control information is transferred between L2Rs by use of a connection control PDU. Connection control PDUs consists of an L2RBOP PDU with the status octet in octet 0 containing address field value 0. The coding of the remainder of the L2RBOP connection control PDU is as follows:

  - octet 1 contains the connection number, always 0 for LAPB. Other values are reserved for future use;

  - octet 2 contains the connection control information. The connection control information values are 1 for Connect, 2 for Reset, 3 for Disconnect and 4 for loss of LAPB interframe fill. This octet is coded as a binary number with the low order bit corresponding to bit 1;

  - the use of octets 3 to n-1 is reserved.

- LAPB exchange identification frames (XID) are transferred between L2Rs by use of exchange identification PDUs. These PDUs consist of L2RBOP PDUs with the status octet in octet 0 containing address field values 0. The coding of the remainder of the PDU is as follows:

  - octet 1 contains the connection number, always 0 for LAPB. Other values are reserved for future use;

  - octet 2 contains the exchange identification indication. The values are 5 for an Exchange Identification Request and 6 for an Exchange Identification Acknowledge. The values 7 to 255 are reserved. This octet is coded as a binary number with the low order bit corresponding to bit 1;

  - the octet 3 contains a normal status octet. The rest of the PDU and of the following PDUs, if any, is used to transfer the XID information and it is treated like normal user data information PDUs as far as the coding is concerned.

A.3 Use of the L2RBOP

The L2R function required to support LAPB non-transparently consists conceptually of the three sub-functions shown in figure 1, i.e. the LAPB entity, the BORE and the L2RBOP entity. These perform the following functions:

- LAPB entity - This terminates the LAPB protocol from the terminal or the network. The service provided by the LAPB entity to the BORE is described in ISO DIS 8886.2 [32] - OSI Data link service definition;

- L2RBOP entity - This uses the services provided by the radio link, see specification 3GPP TS 24.022 [8]. The service provided by the LAPB entity to the BORE;

- BORE - This concatenates the data link services provided by the use of the L2RBOP and LAPB.

The functions are described in more detail in the following subclauses.

A.3.1 Radio Link Connection Control

The L2RBOP entity uses the services of the radio link to establish, reset and release the connection to its peer L2RBOP entity. The radio link connection shall be established and released as a result of indications from the signalling mechanisms when the supporting circuit switched connection is established.

After an RLP reset or RLP disconnect the L2RBOP entities shall assume that the remote LAPB connection is in disconnected state. No data can therefore be transported between the L2RBOP entities before an exchange of the connection control PDU "Connect" has taken place. All connection control PDUs transferred before the RLP reset are no longer valid and must not be acknowledged. All PDUs (except XID) received by the L2RBOP entities after an RLP reset or disconnect and before a new connection control PDU "Connect" has been received shall be discarded by the L2RBOP entity.

A.3.2 Status transfer

The L2RBOP entity transfers interface status information between L2Rs via the status octets in the L2RBOP PDUs. The meaning of the bits is exactly the same as that defined in ITU-T recommendation V.110 [22]. Status changes are inserted in the L2RBOP PDU in the position corresponding to the position in the information stream at the DTE/DCE interface that the interface status change occurred. When the RLP is established or reset a L2RBOP PDU with the current status octet shall be sent.

A.3.3 LAPB connection control

The L2RBOP entity transfers LAPB connection control information between L2Rs via the L2RBOP connection control PDUs. This allows a LAPB connection to be established, reset and released when the remote LAPB connection is established, reset and released or vice versa. L2RBOP connection control PDUs containing connect or reset requests shall be acknowledged by a similarly coded L2RBOP connection control PDU in the reverse direction. Data transfer between L2Rs is not allowed until the connection control acknowledge PDU is received.

In the case of requests crossing they shall each be treated as acknowledgements of the other.

A.3.4 LAPB exchange identification

The L2RBOP entity transfers a LAPB exchange identification request/acknowledge between L2Rs via the L2RBOP exchange identification PDUs. This allows transfer of identification information prior to link establishment and/or during the link (especially with respect to ISO 8885 [31]/DADI). A L2RBOP exchange identification request PDU shall be answered by an associated exchange identification acknowledge PDU. In case of crossing of two requests each request shall be answered individually. A LAPB exchange identification request with identification information shall be acknowledged by the LAPB entity from L2R only when the acknowledge from the remote LAPB connection is indicated by an exchange identification acknowledge PDU sent by the remote L2RBOP entity.

A.3.5 Data Transfer

The L2RBOP entity assembles and disassembles L2RBOP PDUs by segmenting and reassembling the LAPB user information fields.

A.3.6 Flow control

Flow control information is transferred between L2Rs in two ways, these are:

- back pressure caused by L2R buffer conditions;
- use of the X bit in the status octet;
- X = 1 flow control active;
- X = 0 flow control inactive.

End of last modified section

3GPP TSG CN WG3 Meeting #16
Sophia, France. 26th Feb - 2nd March 2001

Tdoc N3-010152

CR-Form-v3

CHANGE REQUEST

⌘ **29.007** **CR** **038** ⌘ **rev** **-** ⌘ **Current vers** **4.1.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☒

Title:	⌘	Removal of Fax NT in GSM from Rel-4
Source:	⌘	TSG_CN WG3
Work item code:	⌘	RT Facsimile
Date:	⌘	27.02.2001
Category:	⌘	**C**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	SA1 has removed the services BS 30 NT, the basic packet access and recently the Fax NT service in GSM.
Summary of change:	⌘	Removal of text referring to those services.
Consequences if not approved:	⌘	Specification is inconsistent and contains misleading information.

Clauses affected:	⌘	Clauses 1 and 9.2.4.5 and 10.2.4.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

1 Scope

The present document identifies the Mobile-services Switching Centre/Interworking Functions (MSC/IWFs) and requirements to support interworking between:

a) PLMN and PSTN;

b) PLMN and ISDN;

for circuit switched services in the PLMN. It is not possible to treat ISDN and PSTN as one type of network, even when both ISDN and PSTN subscribers are served by the same exchange because of the limitations of the PSTN subscribers access i.e. analogue connection without D-channel signalling.

Within the present document, the requirements for voice and non-voice (data) calls are considered separately.

From R99 onwards the following services are no longer required by a PLMN:

- the dual Bearer Services "alternate speech/data" (BS 61) and "speech followed by data" (BS 81);
- the dedicated services for PAD (BS 4x) and Packet access (BS 5x);
- the single asynchronous and synchronous Bearer Services (BS 21..26, BS 31..34).

From ~~R00~~ Rel-4 onwards the following service~~s~~ ~~is~~ are no longer required by a PLMN:

- the synchronous Bearer Service non-transparent (BS 30 NT)
- the Basic Packet access
- Non-transparent facsimile (TS 61/62 NT) for GSM.

If a PLMN ~~network~~ still provides these services it shall fulfil the specification of former releases~~GSM R98 or R99, respectively~~.

The present document is valid for a 2nd generation PLMN (GSM) as well as for a 3rd generation PLMN (UMTS). If text applies only for one of these systems it is explicitly mentioned by using the terms "GSM" and "UMTS". If text applies to both of the systems, but a distinction between the ISDN/PSTN and the PLMN is necessary, the term "PLMN" is used.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.

[1] ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[2] ITU-T Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".

[3] ITU-T Recommendation I.464: "Multiplexing, rate adaption and support of existing interfaces for restricted 64 kbit/s transfer capability".

[4] ITU-T Recommendation Q.922 (1992): "DSS 1 Data link layer: ISDN data link layer specification for frame mode bearer services".

[5] ITU-T Recommendation Q.931 (05/98): "DSS 1 - ISDN user network interface layer 3 specification for basic call control".

[6] ITU-T Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[7] ITU-T Recommendation V.24: "List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)".

[8] ITU-T Recommendation V.25: "Automatic answering equipment and/or parallel automatic calling equipment on the general switched telephone network including procedures for disabling of echo control devices for both manually and automatically established calls".

[9] ITU-T Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[10] ITU-T Recommendation V.32bis: "A duplex modem operating at data signalling rates of up to 14 400 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits"

[11] ITU-T Recommendation V.34: "A modem operating at data signalling rates of up to 33 600 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits".

[12] ITU-T Recommendation V.42: "Error-correcting procedures for DCEs using asynchronous-to-synchronous conversion".

[13] ITU-T Recommendation V.42bis: "Data Compression for Data Circuit Terminating Equipment (DCE) using Error Correction Procedures".

[14] ITU-T Recommendation V.90: "A digital modem and analogue modem pair for use on the Public Switched Telephone Network (PSTN) at data signalling rates of up to 56 000 bit/s downstream and up to 33 600 bit/s upstream".

[15] ITU-T Recommendation V.110: "Support of data terminal equipments (DTEs) with V-Series interfaces by an integrated services digital network".

[16] ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[17] ETSI ETR 018: "Integrated Services Digital Network (ISDN); Application of the Bearer Capability (BC), High Layer Compatibility (HLC) and Low Layer Compatibility (LLC) information elements by terminals supporting ISDN services".

[18] ETSI ETS 300 102-1 Edition 1 (1990): "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".

[19] ETSI EN 300 403-1 V1.2.2 (1998-04): "Integrated Services Digital Network (ISDN); Digital Sunscriber Signalling System No. One (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification".

[20] 3GPP TS 41.001: "Digital cellular telecommunication system (Phase 2+); GSM Release 1999 Specifications".

[21] 3GPP TS 41.004: "Digital cellular telecommunication system (Phase 2+); Abbreviations and acronyms".

[22] 3GPP TS 42.001: "Digital cellular telecommunication system (Phase 2+); Principles of telecommunication services supported by a GSM Public Land Mobile Network (PLMN)".

[23] 3GPP TS 42.003: "Digital cellular telecommunications system (Phase 2+); Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[24] 3GPP TR 43.010: "Digital cellular telecommunications system (Phase 2+); GSM PLMN Connection types".

[25] 3GPP TS 43.045: "Digital cellular telecommunications system (Phase 2+); Technical realization of facsimile group 3 transparent".

[26] 3GPP TS 43.050: "Digital cellular telecommunications system (Phase 2+); Transmission planning aspects of the speech service in the GSM Public Land Mobile Network (PLMN) system".

[27] 3GPP TS 44.021: "Digital cellular telecommunications system (Phase 2+); Rate adaption on the Mobile Station - Base Station System (MS - BSS) interface".

[28] 3GPP TS 48.020: "Digital cellular telecommunication system (Phase 2+); Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".

[29] 3GPP TS 48.060: "Digital cellular telecommunications system (Phase 2+); Inband control of remote transcoders and rate adaptors for Enhanced Full Rate (EFR) and full rate traffic channels".

[30] 3GPP TS 49.002 : "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification".

[31] 3GPP TS 49.003: "Digital cellular telecommunication system (Phase 2+); Signalling requirements on interworking between the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) and the Public Land Mobile Network (PLMN)".

[32] 3GPP TS 21.101: "3rd Generation Partnership Project; Technical Specification Group: Release 1999 Specifications".

[33] 3GPP TS 22.002: "Circuit Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[34] 3GPP TS 22.004: "General on supplementary services".

[35] 3GPP TS 23.003: "Numbering, addressing and identification".

[36] 3GPP TS 23.008: "Organization of subscriber data".

[37] 3GPP TS 23.011: "Technical realization of supplementary services".

[38] 3GPP TS 23.146: "Technical realization of facsimile group 3 non-transparent".

[39] 3GPP TS 23.054: "Description for the use of a Shared Inter Working Function in a GSM PLMN; Stage 2".

[40] 3GPP TS 24.008: "Mobile radio interface layer 3 specification".

[41] 3GPP TS 24.022: "Radio Link Protocol (RLP) for circuit switched Bearer and Teleservices ".

[42] 3GPP TS 25.415: "Iu Interface CN-UTRAN User Plane Protocols".

[43] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[44] 3GPP TS 27.002: "Terminal Adaptation Functions (TAF) for services using asynchronous bearer capabilities".

[45] 3GPP TS 27.003: "Terminal Adaptation Functions (TAF) for services using synchronous bearer capabilities".

[46] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[47] 3GPP TS 24.002: " GSM - UMTS Public Land Mobile Network (PLMN) access reference configuration ".~~Void.~~

[48] ISO/IEC 3309: "Telecommunications and information exchange between systems - High-level data link control (HDLC) procedures - Frame structure".

[49] IETF RFC 1662: "PPP in HDLC-like framing".

[50] Mobile Internet Access Forum: "PIAFS Specification Ver. 1.1, 2.1".

[51] ITU-T Recommendation V.8: "Procedures for starting sessions of data transmission over the public switched telephone network".

[52] 3GPP TS 26.111: "Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324".

[53] 3GPP TR 23.910: " Circuit Switched Data Bearer Services".

[54] ITU-T Recommendation H.223: "Multiplexing protocol for low bit rate multimedia communication".

[55] ITU-T Recommendation H.223, Annex A: "Multiplexing protocol for low bit rate multimedia communication over low error-prone channels".

[56] ITU-T Recommendation H.223, Annex B: "Multiplexing protocol for low bit rate multimedia communication over moderate error-prone channels".

[57] ITU-T Recommendation H.223, Annex C: "Multiplexing protocol for low bit rate multimedia communication over highly error-prone channels".

[58] ITU-T Recommendation H.324: "Terminal for low bit-rate multimedia communication".

[59] ITU-T Recommendation H.221: “Frame structure for a 64 to 1920 kbit/s channel in audiovisual teleservices”.

[60] ITU-T Recommendation H.242: “System for establishing communication between audiovisual terminals using digital channels up to 2 Mbit/s”.

[61] ITU-T Recommendation H.245: “Control protocol for multimedia communication”.

[62] ITU-T Recommendation V.8 bis: “Procedures for the identification and selection of common modes of operation between data circuit-terminating equipments (DCEs) and between data terminal equipments (DTEs) over the public switched telephone network and on leased point-to-point telephone-type circuits”.

[63] ITU-T Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".

[64] ITU-T Recommendation V.22bis (1988): "2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[65] ITU-T Recommendation V.23: “600/1200-baud modem standardized for use in the general switched telephone network”.

[66] ITU-T Recommendation V.26: “2400 bits per second modem standardized for use on 4-wire leased telephone-type circuits”.

[67] ITU-T Recommendation V.26 bis: “2400/1200 bits per second modem standardized for use in the general switched telephone network”.

[68] ITU-T Recommendation V.26 ter: "2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[69] ITU-T Recommendation V.27: “4800 bits per second modem with manual equalizer standardized for use on leased telephone-type circuits”.

[70] ITU-T Recommendation V.27 bis: “4800/2400 bits per second modem with automatic equalizer standardized for use on leased telephone-type circuits”.

[71] ITU-T Recommendation V.29: "9 600 bits per second modem standardized for use on point-to-point 4-wire leased telephone-type circuits".

[72] ITU-T Recommendation Q.921: “ISDN user-network interface - Data link layer specification”.

[73] ITU-T Recommendation X.21: “Interface between Data Terminal Equipment and Data Circuit-terminating Equipment for synchronous operation on public data networks”.

[74] ITU-T Recommendation X.25: "Interface between data terminal equipment (DTE) and data circuit - terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".

[75] ITU-T Recommendation X.28: "DTE/DCE interface for a start-stop mode Data Terminal Equipment accessing the Packet Assembly/Disassembly facility (PAD) in a public data network situated in the same country".

[76] ITU-T Recommendation X.31: “Support of packet mode terminal equipment by an ISDN”.

[77] ITU-T Recommendation X.75: “Packet-switched signalling system between public networks providing data transmission services”.

[78] ISO 2110: "Data communication - 25-pole DTE/DCE interface connector and contact number assignments".

[79] ISO/IEC 6429: "Information technology - Control functions for coded character sets".

*** Next section modified ***

3.1 Abbreviations

In addition to the following, abbreviations used in the present document are listed in 3GPP TS 41.004 [21].

ADPCM	Adaptive Differential Pulse Coded Modulation
BS	Bearer Service
DP	Dial Pulse
DSS1	Digital Subscriber Signalling 1
FTM	Frame Tunnelling Mode
ITC	Information Transfer Capability
LE	Local Exchange
NT	Network Termination
NT	non-transparent
PABX	Private Automatic Branch Exchange
PIAFS	PHS Internet Access Forum Standard
PPP	Point to Point Protocol
SPC	Stored Program Control
SS No.7	Signalling System No.7
T	transparent
TE	Terminal Equipment
TA	Terminal Adaptor
TS	Teleservice
TS	Technical Specification
TUP	Telephone User Part (of Signalling System No.7)
UNI	User Network Interface

*** Next section modified ***

6.1 Key Characteristics of Networks Concerned

Table 1: Key Characteristics of Networks Concerned

Characteristic	PLMN	ISDN	PSTN
Subscriber Interface	Digital	Digital	Analogue
User-network signalling	3GPP TS 24.008	DSS1, other UNIs	loop-disconnect and DTMF
User-terminal equipment supported	~~for GSM~~ see 3GPP TS ~~04.02~~24.002 ~~for UMTS see 3GPP TS 27.001~~	Digital TE (ISDN NT, TE1 or TE2+TA) see e.g. I.411	Analogue TE (e.g. dial pulse telephones PABXs modem equipped DTEs)
Inter-exchange signalling	SS No.7 ISUP TUP+, MAP	SS No.7 ISUP TUP+, TUP, NUP	Channel associated (e.g. R2, No.4, No.5) or common channel (e.g. No.6)
Transmission facilities	Digital	Digital	Analogue
Exchange types	Digital	Digital	Analogue/digital
Information transfer mode	Circuit	Circuit	Circuit
Information transfer capability	Speech, digital unrestricted, alternate speech/ group 3 fax etc.	Speech, digital unrestricted, 3,1 kHz audio, video etc.	3,1 kHz audio (voice/voice- band data)

*** Next section modified ***

7.2 Network interworking

Network interworking is required whenever a PLMN and a non-PLMN together are involved to provide an end to end connection and may be required in instances of PLMN to PLMN connections.

The concept of Bearer Services was developed for the ISDN and has been extended to the PLMN. A bearer service is defined (in 3GPP TS 42.001) as.

A type of telecommunication service that provides the capability for the transmission of signals between user-network interfaces.

Bearer services are described by a number of attributes, where an attribute is defined as a specified characteristic of an object or element whose values distinguish that object or element from others.

For the purpose of the present document, a PSTN is assumed to provide a bearer service which equates to an ISDN 3,1 kHz audio bearer service.

Refer to 3GPP TS 22.002 for complete list of bearer services. Refer to 3GPP TS 24.008 for coding of Bearer Capabilities. Refer to 3GPP TS 27.001 for the allowed combinations of parameter value settings.

Table 3: Bearer Service Interworking

Bearer service category in PLMN	Bearer Service in PLMN	Bearer service in ISDN	Service in PSTN
Circuit mode unstructured with unrestricted digital capability Transparent and Non-transparent	Asynchronous Data general	Cct mode structured 64 kbit/s unrestricted	Not Applicable
Circuit mode unstructured with unrestricted digital capability Transparent	Synchronous Data general		
3,1 kHz Audio Ex PLMN Transparent and Non-transparent	Asynchronous Data general	Cct Mode 3,1 kHz Audio	Cct Mode 3,1 kHz Audio
3,1 kHz Audio Ex PLMN Transparent	Synchronous Data general		

Table 4: Network interworking of Teleservices

Teleservice in PLMN	Lower layer capabilities addressed in the PLMN Bearer Capabilities IE	Bearer service in ISDN	Service in PSTN
Telephony	Unstructured with speech capability	Speech or Cct mode 3,1 kHz audio	Cct Mode 3,1 kHz audio
Emergency calls	Unstructured with speech capability		
Alternate speech/ facsimile group 3	Data Cct duplex synchronous (GSM) / asynchronous (UMTS) access alternate speech group 3 fax	Cct mode 3,1 kHz audio	Cct mode 3,1 kHz audio
Automatic Facsimile group 3	Data Cct duplex synchronous (GSM) / asynchronous (UMTS) access group 3 fax	Cct mode 3,1 kHz audio	

This table does not identify any relationship between Teleservices in the PLMN with those in the ISDN/PSTN, it is merely to identify the interworking of the lower network layers of that teleservice with the network layers i.e. bearer service in the ISDN/PSTN.

*** Next section modified ***

9.2.1.2 Modem Selection

In general terms the indication of the bearer capability parameter "Information Transfer Capability" will be utilized in the call set-up message to determine when the modem should be selected in the call.

In case of single calls, the modem function shall operate in the calling mode in case of mobile originated calls and in the answering mode in case of mobile terminated calls.

In case of dual data calls (alternate speech/facsimile group 3) the operation mode of the modem (working in calling or answering mode) depend on the initial call setup direction and on the optional parameter "Reverse Call Setup Direction" information element of the MODIFY message. If this information element is omitted the direction is derived from the initial call setup direction, i.e. the mode is the same as in case of single calls.

For the attribute value "3,1 kHz audio Ex PLMN" and "facsimile group 3", the modem will be selected immediately. The line procedure according to V.25 will then be carried out using the appropriate modem functions.

For the Teleservice 61 "Alternate speech/facsimile group 3", (if speech is selected as the first service), the modem is made available but not selected until the subscriber indicates the change of service request (see subclause 9.3).

For "alternate speech/facsimile group 3" calls refer to 3GPP TS 43.045 ~~and 03.46~~ (GSM) and 3GPP TS 23.146 (UMTS).

*** Next section modified ***

9.2.4.5 In band signalling mapping flow control

This entails the L2R function providing the means of controlling and responding to flow control functions of the modem plus any synchronization requirements related to flow control. For ~~synchronous services flow control is covered by the protocol indicated, whereas for~~ asynchronous services a specific rule applies for flow control (see 3GPP TS 27.001).

The flow control function chosen will be dependent upon the information contained or not contained in the "user information layer 2" information element of the PLMN BC received from the MS.

If flow control is provided, irrespective of the type used the L2R function shall:

(a) provide immediate indication of flow control to the fixed network on receipt of flow control request from the MS; and/or

(b) provide immediate indication of flow control to the MS on receipt of flow control request from the fixed network i.e. in the next available L2R status octet to be transmitted.

Where in-band (X-on/X-off) flow control is in use, then the X-on/X-off characters will not be passed across the radio interface.

For outband flow control refer to subclause 9.2.4.9.

If no flow control is provided, the involved end systems are responsible for performing in-band flow control on their own by taking into account the buffer capacity of the MSC/IWF stated below.

*** Next section modified ***

9.3 Interworking Alternate Speech / Facsimile Group 3 Calls

9.3.1 General

The procedure for the alternate speech/facsimile group 3 services is invoked at MS-MSC link during the call set-up phase. This service is invoked by indication of repeated bearer capability information elements in the setup message and/or call confirmed message respectively (preceded by a repeat indicator "circular"), one indicating speech and the other indicating facsimile group 3. The facsimile service requested will be indicated by the information transfer capability "facsimile group 3", as for a normal single call. The bearer capability first indicated i.e. speech or facsimile group 3 determines the first selection required of the network by the subscriber. Depending on the type of service requested and direction of call establishment (M0/MT, see relevant clauses of 3GPP TS 27 series) low layer and high layer capabilities may also be included. The MSC/IWF will perform both compatibility checking and subscription checking on both sets of capabilities as for normal data calls. If either the subscription check or the compatibility check fails then the call will be rejected. The only exception to this is when TS61/TS62 negotiation takes place, see 3GPP TS 27.001.

The applicable rules for provision of supplementary services are laid down in 3GPP TS 22.004.

The "speech" phase of the call, when invoked is handled by the transcoder and will utilize normal telephony teleservice interworking requirements and mobile network capabilities. This includes any requirements for echo cancellers etc. as indicated in subclause 9.1. The "facsimile group 3" phase of the call, when invoked, ~~will~~ shall utilize the appropriate data interworking capability (IWF including modem) and ~~may use~~ shall use ~~either~~ the transparent mobile network capability in GSM or the non-transparent mobile network capability in UMTS~~the case of GSM. In UMTS only the non-transparent service is applicable~~.

The network shall provide, for service and operational reasons, a rapid and reliable changeover of capability upon request from the mobile user. This changeover may involve the disabling, by-passing or introduction of particular

network functions (e.g. speech coder, modem etc.) and change of the channel configuration on the radio interface. This changeover is initiated on the receipt of the "MODIFY" message (see 3GPP TS 24.008) from the MS. The network itself will not initiate a changeover.

*** Next section modified ***

10.2 Data Calls

In this case it is assumed that the ISDN bearer service 3,1 kHz audio shall only be interworked by means of a modem pool in the PLMN. If a network operator provides this facility, then the MSC/IWF operation will be similar to that described for interworking to the PSTN.

Where the bearer capability information indicates that the call is a circuit switched unrestricted digital call, then the MSC/IWF shall select the appropriate rate adapted ISDN and PLMN bearer services.

~~The mobile network offers only Bm channel access for the packet mode service. The ISDN offers both B and D channel access for the packet mode service. The interworking of mobile packet service calls is described in 3GPP TS 29.006.~~

*** Next section modified ***

10.2.4.5 In band signalling mapping flow control

This entails the L2R function providing the means of controlling and responding to flow control function of the modem (or in the rate adapted frame) plus any synchronizations requirements related to flow control. For ~~synchronous services flow control is covered by the protocol indicated whereas for~~ asynchronous services a specific rule applies for flow control (see 3GPP TS 27.001).

In case of interworking to the ISDN "3,1kHz audio" bearer service the flow control process is as for the PSTN interworking case (see subclause 9.2.4.5). In case of interworking to the ISDN unrestricted digital bearer service the following procedures apply:

The flow control function chosen will be dependent upon the availability of the "user information layer 2" information element of the ~~GSM~~ PLMN BC and if available its value.

For V.110 interworking, outband flow control will be by means of the "X" bit in the V.110 frame to the ISDN.

For V.120 interworking, outband flow control shall be as follows. In Multiple frame acknowledged mode the functions of the data link control sublayer (send RNR or withhold update of the sequence state variable V(R)) shall be used. In Unacknowledged mode the RR bit in the Control State octet shall be used.

For PIAFS interworking, outband flow control shall be as follows. The functions of the data link control sublayer (withhold update of the frame number) shall be used.

If flow control is provided irrespective of the type used, the L2R function shall:

a) provide immediate indication of flow control to the fixed network on receipt of flow control request from the MS; and/or

b) provide immediate indication of flow control to the MS on receipt of flow control request from the fixed network i.e. in the next available L2R status octet to be transmitted.

Where in band (X-on/X-off) flow control is in use, then the X-on/X-off characters will not be passed across the radio interface.

If no flow control is provided the involved end systems are responsible for performing in-band flow control on their own by taking into account the buffer capacity of the MSC/IWF as stated below.

*** Next section modified ***

10.3 Interworking Alternate speech facsimile group 3 calls

10.3.1 Alternate speech data bearer interworking

10.3.1.1 General

The procedure for the alternate speech/facsimile group 3 service is invoked at the MS-MSC link during the call set-up phase. This service is invoked by indication of repeated bearer capability information elements in the setup message and/or call confirmed message, respectively (preceded by a repeat indicator "circular"), one indicating speech and the other indicating "facsimile group 3" plus user rate etc., as for normal single calls. The bearer capability first indicated i.e. speech or facsimile determines the first selection required of the network by the subscriber. Depending on the type of service requested and direction of call establishment (M0/MT, see relevant clauses of the 3GPP TS 27 series) low layer and high layer capabilities may also be included. The MSC/IWF will perform both compatibility checking and subscription checking for mobile originated calls and optionally for mobile terminated calls (single numbering scheme) on both sets of capabilities as for normal data calls. If either the subscription check or the compatibility check fails then the call shall be rejected. The only exception to this is when TS61/TS62 negotiation takes place, see 3GPP TS 27.001.

As regards the supplementary services the application rules are laid down in 3GPP TS 22.004.

The speech phase of the call, when invoked, is handled by the transcoder and will utilize the normal telephony teleservice interworking requirements and mobile network capabilities. The Facsimile group 3 phase of the call, when invoked, ~~will~~ shall utilize the appropriate data interworking capability (e.g. IWF) and ~~may use~~ shall use ~~either~~ the transparent mobile network capability in GSM or the non-transparent mobile network capability in UMTS~~the case of GSM. In UMTS only the non-transparent service is applicable~~.

The network shall provide, for service and operational reasons, a rapid and reliable changeover of capability upon request from the mobile user. This changeover may involve the disabling, by-passing or introduction of particular network functions (e.g. speech coder, modem etc.) and change of the channel configuration on the radio interface. This changeover is initiated on the receipt of the "MODIFY" message (see 3GPP TS 24.008) from the MS. The network itself will not initiate a changeover.

3GPP TSG CN WG3 Meeting #16 **N3-010157**
Sophia, France 26th Feb - 2nd March, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **27.001** **CR** **048r1** ⌘ rev **-** ⌘ Current version: **4.2.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Deletion of NT Fax in GSM from Release 4.
Source:	⌘	TSG_CN WG3
Work item code:	⌘	RT Facsimile
Date:	⌘	28-02-2001
Category:	⌘	**C**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Correction following a decision by TSG CN#10 to delete NT Fax in GSM from REL-4 and onwards.
Summary of change:	⌘	Removed path for NT Fax for GSM in B.1.10.2 and deleted code point X.25 throughout the specification and in the flowdiagrams. Note: Modifications of the flow diagrams are indicated as follows: New diagrams are highlighted with Green colour Deleted diagrams are highlighted with Blue colour
Consequences if not approved:	⌘	Indication of available service that is no longer supported in GSM.

Clauses affected:	⌘	1, 2, Annex A (User Information Layer 2 Protocol), Annex B (UIL2P), B.1.2.1, B.1.2.2, B1.2.3, B.1.2.4, B.1.3.1.1, B.1.3.1.3, B.1.3.1.4, B.1.3.1.5, B.1.3.1.6, B.1.3.2.1, B.1.3.2.3, B.1.8, B.1.10.2, B.1.10.3, B.2.3.1, B.2.3.2
Other specs affected:	⌘	☐ Other core specifications ⌘ 3GPP TS 27.003 ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

First modified section

1 Scope

The present document is based on the principles of terminal adaptor functions presented in the ITU-T I-series of recommendations (I.460 to I.463).

The PLMN supports a wide range of voice and non-voice services in the same network. In order to enable non-voice traffic in the PLMN there is a need to connect various kinds of terminal equipment to the Mobile Termination (MT). The target of the present document is to outline the functions needed for the terminal adaptation.

In the 3GPP TS 22.002 the bearer services are described. The general network configuration is described in 3GPP TS 23.002 and the GSM PLMN access reference configuration is defined in 3GPP TS 04.02. The various connection types used in the GSM PLMN are presented in 3GPP TS 43.010. Terminology used in the present document is presented in 3GPP TS 01.04, 3GPP TR 21.905 and 3GPP TS 29.990. For support of data services between a PLMN and other networks see 3GPP TS 29.007.

The present document is valid for a 2nd generation PLMN (GSM) as well as for a 3rd generation PLMN (UMTS). If text applies only for one of these systems it is explicitly mentioned by using the terms "GSM" and "UMTS". If text applies to both of the systems, but a distinction between the ISDN/PSTN and the PLMN is necessary, the term "PLMN" is used.

NOTE: From R99 onwards the following services are no longer required by a PLMN:

- the dual Bearer Services "alternate speech/data" and "speech followed by data";
- the dedicated services for PAD and Packet access;
- BS 21 ... 26 and BS 31 ... 34.

From ~~R00~~ REL-4 onwards the following services are no longer required by a PLMN:

- ~~—~~the synchronous Bearer Service non-transparent (BS 30 NT).
- Non-transparent facsimile (TS 61/62 NT) for GSM.

The support of these services is still optional. The specification of these services is not within the scope of the present document. For that, the reader is referred to ~~GSM Release 98~~former releases.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3GPP TS 01.04: "Digital cellular telecommunication system (Phase 2+); Abbreviations and acronyms".

[2] 3GPP TS 22.002: "Digital cellular telecommunication system (Phase 2+); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[3] 3GPP TS 02.03: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Circuit Teleservices supported by a Public Land Mobile Network (PLMN).

[4] 3GPP TS 23.002: "Network architecture".

[5] 3GPP TS 43.010: "3rd Generation Partnership Project; Technical Specification Group TSGN; GSM - UMTS Public Land Mobile Network (PLMN) access reference configuration ".

[6] 3GPP TS 24.002: "3rd Generation Partnership Project; Technical Specification Group TSGN; GSM - UMTS Public Land Mobile Network (PLMN) access reference configuration ".

[7] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network Protocols -Stage 3".

[8] 3GPP TS 44.021: "Digital cellular telecommunication system (Phase 2+); Rate adaption on the Mobile Station - Base Station System (MS - BSS) interface".

[9] 3GPP TS 24.022: "Radio Link Protocol (RLP) for Circuit Switched Bearer and Teleservices".

[10] 3GPP TS 05.05: "Digital cellular telecommunication system (Phase 2+); Radio transmission and reception".

[11] 3GPP TS 27.002: "Terminal Adaptation Functions (TAF) for services using asynchronous bearer capabilities".

[12] 3GPP TS 27.003: "Terminal Adaptation Functions (TAF) for services using synchronous bearer capabilities".

[13] Void.

[14] Void.

[15] Void.

[16] Void.

[17] Void.

[18] Void.

[19] Void.

[20] Void.

[21] 3GPP TS 29.007: "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[22] Void.

[23] Void.

[24] Void.

[25] Void.

[26] ITU-T Series V Recommendations: "Data communication over the Telephone network".

[27] Void.

[28] ITU-T Series X Recommendations: "Data Communication networks".

[29] ~~ITU-T Recommendation X.25: "Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".~~

Void

[30] ITU-T Recommendation X.150: "Data Communication Networks: Transmission, Signalling and Switching, Network Aspects, Maintenance and Administrative Arrangements".

[31] Void.

[32] ITU-T Recommendation V.250: "Serial asynchronous automatic dialling and control".

[33] ITU-T Recommendation V.54: "Loop Test Devices for Modems".

[34] ITU-T Recommendation V.110: "Support of data terminal equipments (DTEs) with V-Series interfaces by an integrated services digital network".

[35] ITU-T Recommendation I.460-I.463: "ISDN Overall Network Aspects and Functions, User Network Interfaces".

[36] ITU-T Recommendation Q.931 (05/98): "DSS 1 - ISDN user network interface layer 3 specification for basic call control".

[37] ETR 018: "Integrated Services Digital Network (ISDN), Application of the BC-, HLC-, LLC-Information elements by terminals supporting ISDN services".

[38] ISO/IEC 6429: "Information technology - Control functions for coded character sets".

[39] Void.

[40] Void.

[41] Void.

[42] ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[43] 3GPP TS 23.034:" 3rd Generation Partnership Project; Technical Specification Group Core Network; High Speed Circuit Switched Data (HSCSD) - Stage 2 "..

[44] Void.

[45] Void.

[46] 3GPP TR 21.905: "3G Vocabulary".

[47] 3GPP TS 25.990: "Vocabulary for UTRAN".

[48] 3GPP TS 25.322: "Radio Link Control (RLC) Protocol Specification".

[49] Void.

[50] Mobile Internet Access Forum: "PIAFS Specification Ver. 1.1, 2.1".

[51] ITU-T Recommendation V.80: "In-band DCE control and synchronous data modes for asynchronous DTE".

[52] 3GPP TS 03.45 " Digital cellular telecommunications system (Phase 2+);Technical realization of facsimile group 3 transparent”.

[53] 3GPP TS 05.01 " 3rd Generation Partnership Project; Technical Specification Group GERAN;Digital cellular telecommunications system (Phase 2+); Physical layer on the radio path; General description”.

[54] 3GPP TS 22.034 " 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; High Speed Circuit Switched Data (HSCSD); Stage 1”.

[55] 3GPP TS 23.107 " 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; QoS Concept and Architecture”.

[56] 3GPP TS 08.20 " Digital cellular telecommunications system (Phase 2+); Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface ”.

[57] 3GPP TS 22.001" Digital cellular telecommunications system (Phase 2+); Technical Specification Group Services and System Aspects; Principles of circuit telecommunication services supported by a Public Land Mobile Network (PLMN)".

[58] ITU-T Recommendation I.440 " (see ITU-T Rec. Q.920) ".

[59] ITU-T Recommendation I.450 " (see ITU-T Rec. Q.930) ".

[60] ITU-T Recommendation H.223 " Multiplexing protocol for low bit rate multimedia communication".

[61] ITU-T Recommendation H.245 " Control protocol for multimedia communication ".

[62] ITU-T Recommendation V.21 " 300 bits per second duplex modem standardized for use in the general switched telephone network ".

[63] ITU-T Recommendation V.22 " 1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[64] ITU-T Recommendation V.22bis" 2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits ".

[65] ITU-T Recommendation V.26ter" 2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[66] ITU-T Recommendation V.31" Electrical characteristics for single-current interchange circuits using optocouplers".

[67] ITU-T Recommendation V.32" A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits ".

[68] ITU-T Recommendation V.34" A modem operating at data signalling rates of up to 33 600 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits ".

[69] ITU-T Recommendation V.42" Error-correcting procedures for DCEs using asynchronous-to-synchronous conversion".

[70] ITU-T Recommendation X.30" Support of X.21, X.21 bis and X.20 bis based Data Terminal Equipments (DTEs) by an Integrated Services Digital Network (ISDN)".

[71] ITU-T Recommendation Q.920" ISDN user-network interface data link layer - General aspects ".

[72] ITU-T Recommendation Q.930" ISDN user-network interface layer 3 - General aspects ".

Annex A (informative): List of Bearer Capability Elements

This annex lists the PLMN Bearer Capability Elements which need to be provided to support Terminal adaptation function to Interworking control procedures. Some parameters are ignored in UMTS although present in the BC-IE. The validity of parameter values may also differ from GSM to UMTS. The ignored parameters and the difference of parameter value validity in GSM and UMTS are listed in table B.5a in annex B.

Elements and their Values:

Information Transfer Capability:

This element is relevant between the IWF and the fixed network.

Values: - Speech
- Unrestricted Digital
- Group 3 Facsimile (note 1)
- 3,1 kHz Ex PLMN (note 2)
- Restricted Digital (note 3)

NOTE 1: Used for facsimile transmission, unrestricted digital between MT and IWF and 3,1 kHz audio from IWF towards the fixed network.

NOTE 2: Unrestricted digital between MT and IWF and 3,1 kHz audio from IWF towards the fixed network.

NOTE 3: Unrestricted digital between MT and IWF and restricted digital information from IWF towards the fixed network; this value is signalled in the "Other ITC" element, due to a lack of further code points in the "ITC" element.

Transfer Mode:

This element is relevant between MT and IWF

Values: - Circuit

Structure:

This element is relevant between MT and IWF.

Values: - Service Data Unit Integrity (note 4)
- Unstructured (note 5)

NOTE 4: Applicable for connection element "non transparent".

NOTE 5: Applicable for connection element "transparent".

Configuration:

This element is relevant for a PLMN connection.

Values: - Point to point

Establishment:

This element is relevant for a PLMN connection.

Values: - Demand

Sync/Async:

This element is relevant between TE/TA and MT and between IWF and the fixed network.

Values: - Synchronous
- Asynchronous

Negotiation:

This element is relevant between MT and IWF.

Values: - In band negotiation not possible

User Rate:

This element is relevant between TE/TA and MT and between IWF and the fixed network, except in case the parameter FNUR is present.

Values: - 0.3 kbit/s
- 1.2 kbit/s
- 2.4 kbit/s
- 4.8 kbit/s

- 9.6 kbit/s
- 19.2 kbit/s (see note 6)

NOTE 6: This value cannot be signalled between MT and IWF, but it can be used according to the rules in 3GPP TS 29.007 (table 7A, 7B) for such connections.

Intermediate Rate:

This element is relevant between MT and BSS and BSS and IWF

Values:
- 8 kbit/s
- 16 kbit/s

Network Independent Clock on Tx:

This element is relevant between TE/TA and MT in the transmit direction.

Values:
- Not required
- Required

Network Independent Clock on Rx:

This element is relevant between TE/TA and MT in the receive direction.

Values:
- Not accepted
- accepted

Number of Stop Bits:

This element is relevant between the TE/TA and MT and between IWF and fixed network in case of asynchronous transmission.

Values:
- 1 bit
- 2 bit

Number of Data Bits Excluding Parity If Present:

This element is relevant between TE/TA and MT and between IWF and the fixed network in case of a character oriented mode of transmission.

Values:
- 7 bit
- 8 bit

Parity Information:

This element is relevant between TE/TA and MT and between IWF and the fixed network for a character oriented mode of transmission.

Values:
- Odd
- Even
- None
- Forced to 0
- Forced to 1

Duplex Mode:

This element is relevant between MT and IWF.

Values:
- Full Duplex

Modem Type:

This element is relevant between the IWF and the fixed network in case of 3,1 kHz audio ex-PLMN information transfer capability.

Values:
- V.21
- V.22
- V.22 bis
- V.26 ter
- V.32
- autobauding type 1
- none

Radio Channel Requirement:

This element is relevant between MT and BSS

Values:
- Full Rate support only Mobile Station
- Dual Rate support Mobile Station/Half Rate preferred
- Dual Rate support Mobile Station/Full Rate preferred

Connection Element:

This element is relevant between MT and IWF

Values:
- Transparent
- Non Transparent
- both, Transparent preferred
- both, Non transparent preferred

User Information Layer 2 Protocol:

This element is relevant between TE/TA and MT and between IWF and the fixed network.

Values:
- ISO 6429
- ~~X.25~~
- Character oriented Protocol with no Flow Control mechanism

Signalling Access Protocol:

This element is relevant between TE/TA and MT.

Values:
- I.440/450

Rate Adaptation:

This element is relevant between IWF and the fixed network.

Values:
- V.110/X.30
- X.31 flagstuffing
- no rate adaptation
- V.120 (note 7)
- PIAFS (note 7)
- H.223 and H.245 (note 7)

NOTE 7: This value is signalled in the "Other Rate Adaption" element, due to a lack of further code points in the "Rate Adaption" element.

Coding Standard:

This element refers to the structure of the BC-IE defined in 3GPP TS 24.008.

Values:
- GSM

User Information Layer 1 Protocol:

This element characterize the layer 1 protocol to be used between MT and BSS (Um interface) according to 3GPP TS 05.01, or between the MT and the RNC (Uu interface).

Values: - default

Negotiation of Intermediate Rate requested:

This element is relevant between MT and BSS and BSS and IWF.

Values: - no meaning associated
- 6 kbit/s radio interface is requested for a full rate channel with a user rate up to and including 4,8 kbit/s, non transparent service

Compression:

This element is relevant between MT and IWF.

Values: - compression possible/allowed
- compression not possible/allowed

Rate adaption header / no header:

This element is relevant between IWF and the fixed network. It is only applicable for ITU-T V.120 rate adaptation.

Values: - Rate adaption header not included
- Rate adaption header included

Multiple frame establishment support in data link:

This element is relevant between IWF and the fixed network. It is only applicable for ITU-T V.120 rate adaptation.

Values: - Multiple frame establishment not supported. Only UI frames allowed.
- Multiple frame establishment supported.

Mode of operation:

This element is relevant between IWF and the fixed network. It is only applicable for ITU-T V.120 rate adaptation.

Values: - Bit transparent mode of operation
- Protocol sensitive mode of operation

Logical link identifier negotiation:

This element is relevant between IWF and the fixed network. It is only applicable for ITU-T V.120 rate adaptation.

Values: - Default, LLI=256 only
- Full protocol negotiation (note 8)

NOTE 8: A connection over which protocol negotiation is executed as indicated in the "In-band / out-band negotiation" parameter.

Assignor / assignee:

This element is relevant between IWF and the fixed network. It is only applicable for ITU-T V.120 rate adaptation.

Values: - Message originator is „default assignee"
- Message originator is „assignor only"

In-band / out-band negotiation:

This element is relevant between IWF and the fixed network. It is only applicable for ITU-T V.120 rate adaptation.

Values: - Negotiation is done with USER INFORMATION messages on a temporary signalling connection
- Negotiation is done in-band using logical link zero.

Fixed network user rate, FNUR (Note 12)

This element is relevant between the IWF and the fixed network.

Values
- Fixed network user rate not applicable (note 9)
- 9,6 kbit/s
- 14,4 kbit/s
- 19,2 kbit/s
- 28,8 kbit/s
- 32,0 kbit/s
- 38,4 kbit/s
- 48,0 kbit/s
- 56,0 kbit/s
- 64,0 kbit/s

NOTE 9: Not used by currently specified services.

Wanted air interface user rate, WAIUR (note 12)

This element is relevant between the MT and the IWF

Values
- Air interface user rate not applicable
- 9,6 kbit/s
- 14,4 kbit/s
- 19,2 kbit/s
- 28,8 kbit/s
- 38,4 kbit/s
- 43,2 kbit/s
- 57,6 kbit/s
- interpreted by the network as 38,4 kbit/s (note 10)

NOTE 10: Certain code points, if used, are interpreted by the network as 38.4 kbit/s in this version of the protocol, ref 3GPP TS 24.008.

Acceptable channel codings, ACC (note 12)

This element is relevant between the MT and the IWF.

Value:
- TCH/F4.8 acceptable
- TCH/F9.6 acceptable
- TCH/F14.4 acceptable
- TCH/F28.8 acceptable
- TCH/F32.0 acceptable (Applicable to multimedia 32, 56 and 64 kbit/s and synchronous transparent 56 and 64 kbit/s services only)
- TCH/F43.2 acceptable (Applicable to non-transparent services only.)

Maximum number of traffic channels, MaxNumTCH (Note 12)

This element is relevant between the MT and the IWF.

Value:
- 1 TCH
- 2 TCH
- 3 TCH
- 4 TCH
- 5 TCH
- 6 TCH
- 7 TCH (note 11)
- 8 TCH (note 11)

NOTE11: Not used by currently specified services.

Other modem type, OMT (Note 12)

This element is relevant between the IWF and the fixed network in case of 3,1 kHz audio ex-PLMN

Values:
- no other modem type specified in this field
- V.34

User initiated modification indication, UIMI (Note 12)

This element is relevant between the MT and the IWF.

Values:
- user initiated modification not requested
- user initiated modification upto 1 TCH requested
- user initiated modification upto 2 TCH requested
- user initiated modification upto 3 TCH requested
- user initiated modification upto 4 TCH requested

Asymmetry preference indication (Note 12)

This element is relevant between the MT and the BSS.

Value:
- no preference
- up link biased asymmetry preference
- down link biased asymmetry preference

NOTE 12: These GBS-related parameters are optional.

For a multislot configuration, the following applies to the parameters contained in the BC-IE:

- Half rate channels are not supported. The MS shall code the radio channel requirement as "Full rate support only MS" or "Dual rate support MS, full rate preferred'. In the second case, the network shall assign full rate channel(s) only.

- The 'fixed network user rate' and 'other modem type' (ref. table B.4a) takes precedence over the 'user rate' and 'modem type'.

- The ACC indicates which channel coding is acceptable and supported by the MS. In case of CE:NT the TCH/F4.8 and TCH/F9.6 acceptable is equivalent to the support of NIRR. If TCH/F4.8 acceptable only or TCH/F9.6 acceptable only or TCH/F14.4 acceptable only is indicated, the assigned channel type which can be chosen by the network is TCH/F4.8 or TCH/F9.6 or TCH/F14.4, respectively.

- The 'intermediate rate' parameter is overridden. The intermediate rate used per each TCH/F is derived from the chosen channel type:

channel type	**IR per TCH/F**
TCH/F4.8	8 kbit/s
TCH/F9.6	16 kbit/s
TCH/F14.4	intermediate rate is to be defined

- The user rate per TCH is derived from the chosen channel type:

channel type	**user rate per TCH**
TCH/F4.8	4.8 kbit/s
TCH/F9.6	9.6 kbit/s

For CE:T, the padding procedure described in 3GPP TS 44.021 can be applied.

Annex B (normative): Setting of Bearer Capability, Low Layer Compatibility and High Layer Compatibility Information Element for PLMN Bearer Services and PLMN TeleServices

Table B.5: BC parameter setting (part 1)

Abbreviations for Parameters and Values:		common setting of field values	default setting of field values (NA)
ITC...Information Transfer Capability:	- Speech - UDI..Unrestricted Digital - FAX3..Group 3 Facsimile - 3,1 kHz..3,1 kHz Ex PLMN - RDI..Restricted Digital		
TM....Transfer Mode:	- ci..Circuit	X	X
S.....Structure:	- SDU..Service Data Unit Integrity - Unstructured	X	
C.....Configuration:	- pp..Point to point	X	X
E.....Establishment:	- de..Demand	X	X
SA....Sync/Async:	- S..Synchronous - A..Asynchronous		
N.....Negotiation	- ibn..in band negotiation not possible	X	X
UR....User Rate:	- 0.3..0.3 kbit/s - 1.2..1.2 kbit/s - 2.4..2.4 kbit/s - 4.8..4.8 kbit/s - 9.6..9.6 kbit/s		
IR....Intermediate Rate:	- 4.. 4 kbit/s - 8.. 8 kbit/s - 16.. 16 kbit/s - not_used..not used		
NICT..Network Independent Clock on Tx:	- not_required.. Not required - required	X	X
NICR..Network Independent Clock on Rx:	- not_accepted..not accepted - accepted	X	X
NSB...Number of Stop Bits:	- 1..1 bit - 2..2 bit	X	
NDB...Number of Data Bits Excluding Parity If Present:	- 7.. 7 bit - 8.. 8 bit	X	
NPB...Parity Information:	- Odd - Even - None - 0.. Forced to 0 - 1.. Forced to 1	X	
UIL1P.User Information Layer 1 Protocol	- def..default layer 1 protocol	X	X

Table B.5: BC parameter setting (part 2)

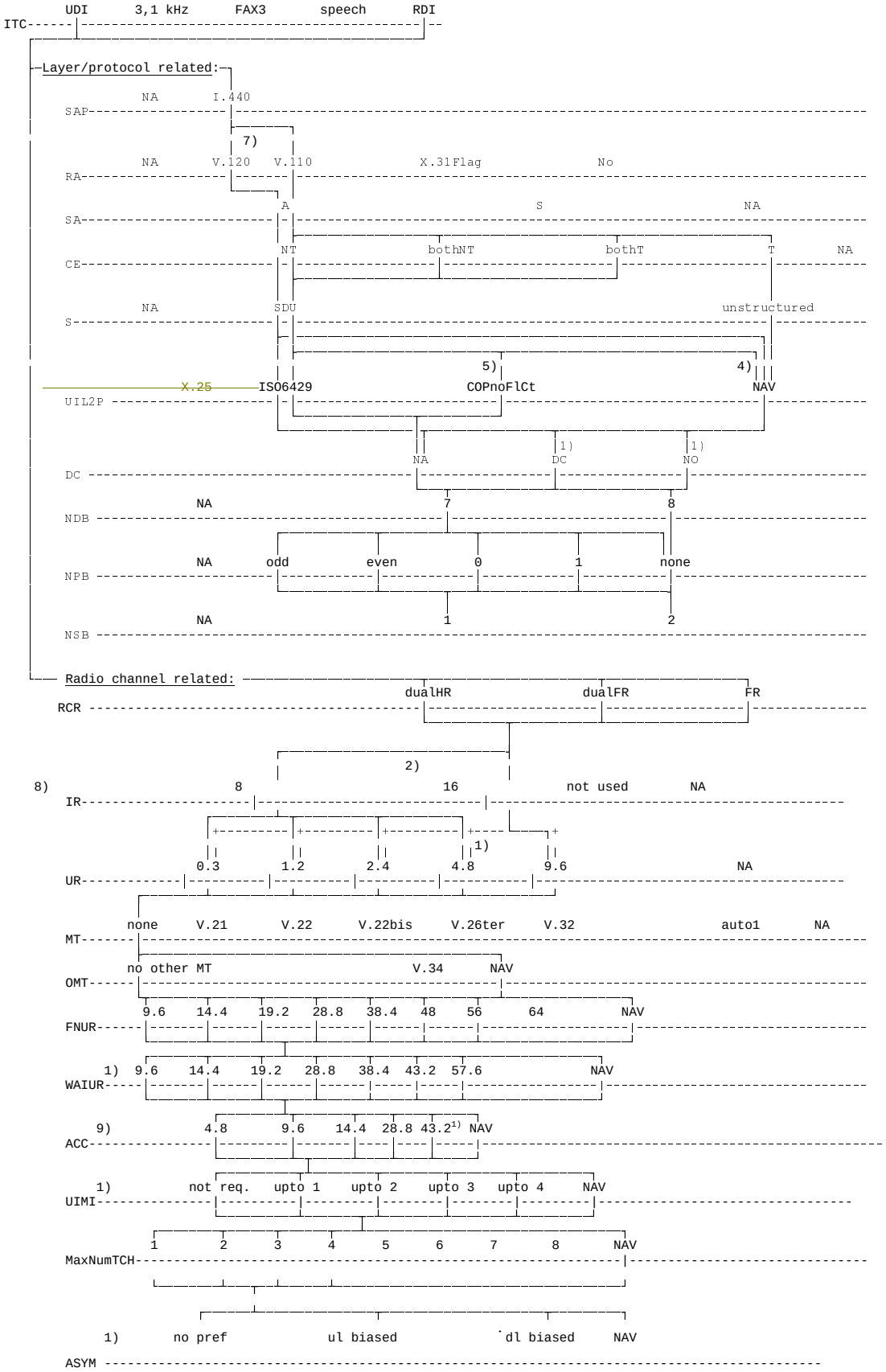
Abbreviations for Parameters and Values		common setting of field values	default setting of field values (NA)
DM....Duplex Mode:	-		
	- fd.. Full Duplex	X	X
MT....Modem Type:	- V.21		
	- V.22		
	- V.22 bis		
	- V.26 ter		
	- V.32		
	- auto1.. autobauding type 1		
	- none	X	
RCR...Radio Channel Requirement:	- FR Full Rate support only Mobile Station		
	- dual HR Dual Rate support Mobile Station/ Half Rate preferred		
	- dual FR Dual Rate support Mobile Station/ Full Rate preferred		
CE....Connection Element:	- T.. Transparent		
	- NT.. Non Transparent		
	- bothT both transparent preferred		
	- bothNT both non Transparent preferred		
UIL2P.User Information Layer 2 Protocol:	- ISO6429..ISO6429,codeset 0,DC1/DC3		
	- ~~X.25~~		
	- COPnoFlCt..Character oriented protocol with no flow control mechanism		
SAP...Signalling Access Protocol:	- I.440.. I.440/450	X	
RA....Rate Adaptation:	- V.110.. V.110/X.30		
	- X.31Flag.. X.31 flagstuffing		
	- NO.. no rate adaptation	X	
	- V.120		
	- PIAFS		
	- H.223 and H.245		
CS....Coding Standard:	- GSM	X	X
NIRR..Negotiation of Intermediate Rate Requested:	NM..No Meaning associated with this value	X	
	6kbit/s..6kbit/s radio interface rate requested		
DC....Data Compression	- DC.. compression possible/allowed		
	- NO.. compression not possible/allowed	X	

Table B.5: BC parameter setting (part 3)

Abbreviations for Parameters and Values		common setting of field values	default setting of field values (NA)
FNUR...Fixed Network User Rate	- FNUR not applicable		
	- 9.6.. 9.6 kbit/s		
	- 14.4.. 14.4 kbit/s		
	- 19.2.. 19.2 kbit/s		
	- 28.8.. 28.8 kbit/s		
	- 32.0.. 32.0 kbit/s		
	- 33.6.. 33.6 kbit/s		
	- 38.4.. 38.4 kbit/s		
	- 48.0.. 48.0 kbit/s		
	- 56.0.. 56.0 kbit/s		
	- 64.0.. 64.0 kbit/s		
WAIUR...Wanted Air Interface User Rate	- WAIUR not applicable		
	- 9.6.. 9.6 kbit/s	X	
	- 14.4.. 14.4 kbit/s		
	- 19.2.. 19.2 kbit/s		
	- 28.8.. 28.8 kbit/s		
	- 38.4.. 38.4 kbit/s		
	- 43.2.. 43.2 kbit/s		
	- 57.6.. 57.6 kbit/s		
	- int 38.4.. interpreted by the network as 38.4 kbit/s		
ACC.....Acceptable channel codings	- 4.8.. TCH/F4.8 acceptable		
	- 9.6.. TCH/F9.6 acceptable		
	- 14.4..TCH/F14.4 acceptable		
	- 28.8..TCH/F28.8 acceptable		
	- 32.0..TCH/F32.0 acceptable		
	- 43.2..TCH/F28.8 acceptable		
	- none..No channel coding (defined by selecting none of the above		
MaxNumTCH...Maximum Number of Traffic Channels			
	- 1.. 1 TCH		
	- 2.. 2 TCH		
	- 3.. 3 TCH		
	- 4.. 4 TCH		
	- 5.. 5 TCH		
	- 6.. 6 TCH		
	- 7.. 7 TCH		
	- 8.. 8 TCH		
OMT...Other modem type	- no other MT.. no other modem type		
	- V.34.. V.34		
User initiated modification indication	- not req.. user initiated modification not required	X	
	- upto 1 TCH.. user initiated modification upto 1 TCH may be requested		
	- upto 2 TCH.. user initiated modification upto 2 TCH may be requested		
	- upto 3 TCH.. user initiated modification upto 3 TCH may be requested		
	- upto 4 TCH.. user initiated modification upto 4 TCH may be requested		
Asymmetry preference indication	- 00 no preference		
	- 01 up link biased asymmetry preferred		
	- 10 down link biased asymmetry preferred		

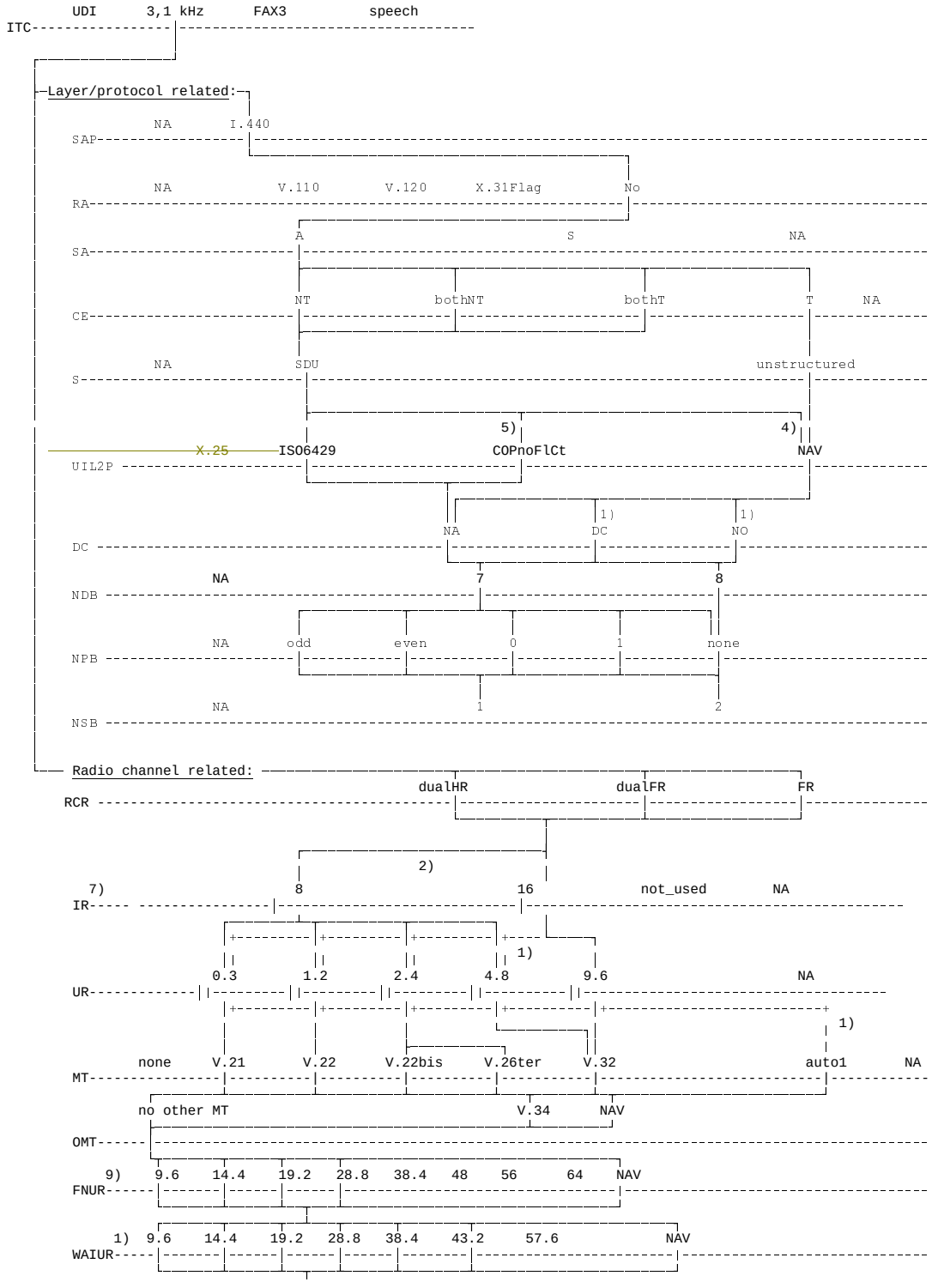
B.1.2 Bearer Service 20, Data Circuit Duplex Asynchronous

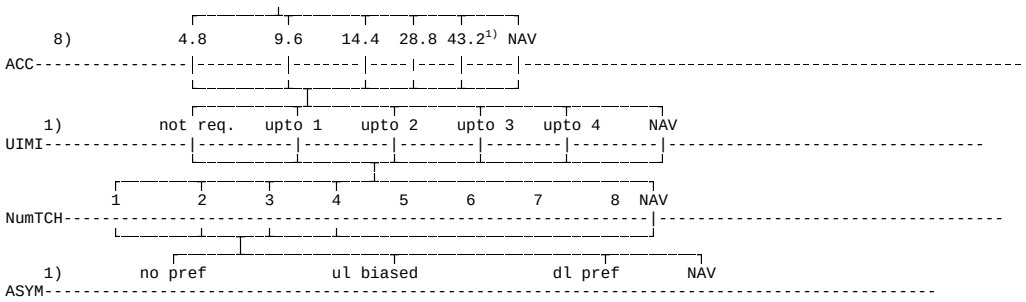
B.1.2.1 Unrestricted / restricted digital information transfer capability



1) for CE:NT or "both";
2) for CE:T only or CE:NT and NIRR:6kb/s (not for the SETUP message);
3) Void;
4) for MT CALLS in the SETUP message or MO/MT CALLS with "out-band" flow control requested;
5) for MO/MT CALLS with no flow control requested;
6) Void;
7) the V.120 relevant BC parameters (octet 5b) shall be set according to the LLC (see clause B.2);
8) IR and UR are overridden if FNUR, ACC and MaxNumTCH are available;
9) ACC may have several values simultaneously (bit map coding).

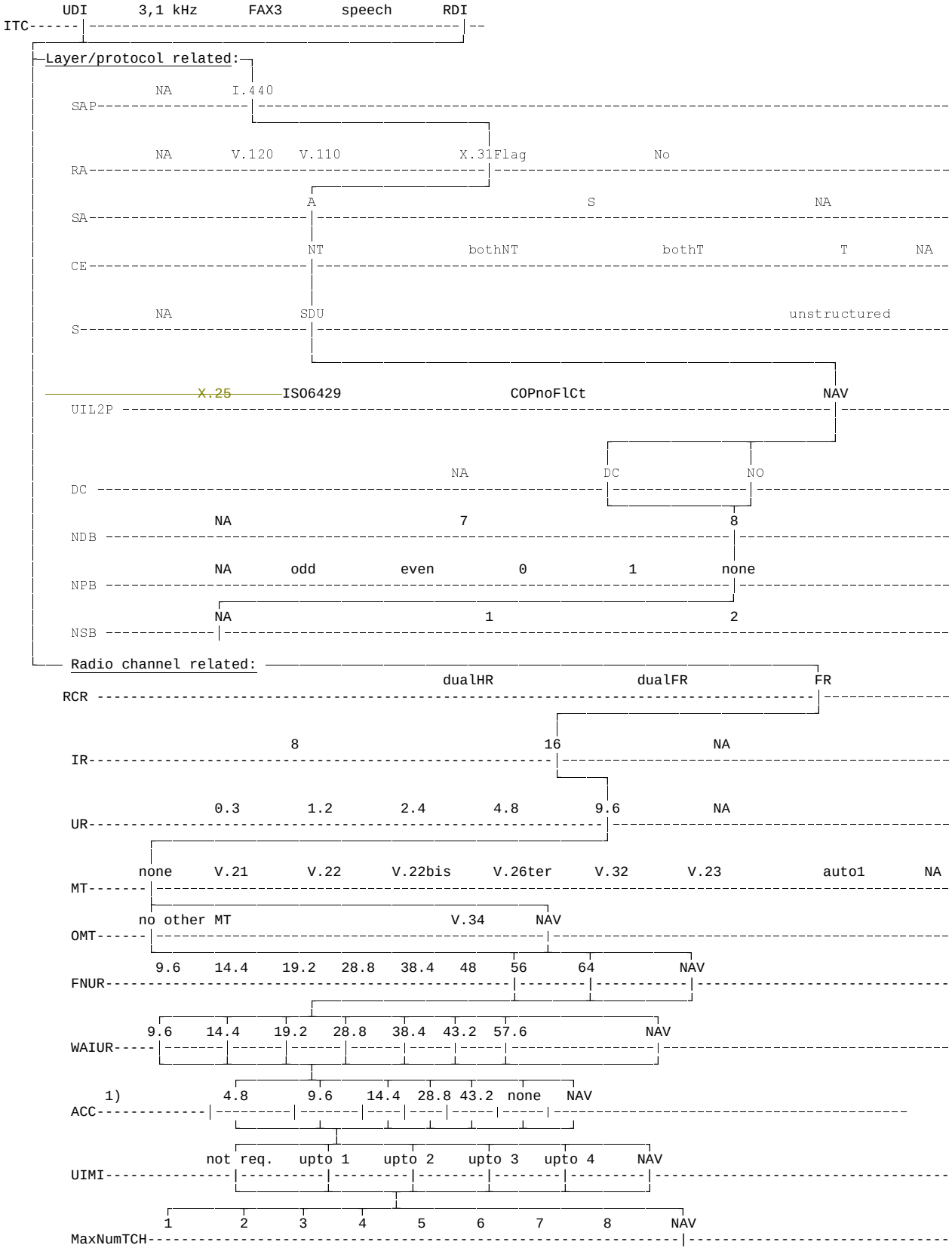
B.1.2.2 3,1 kHz audio ex-PLMN information transfer capability





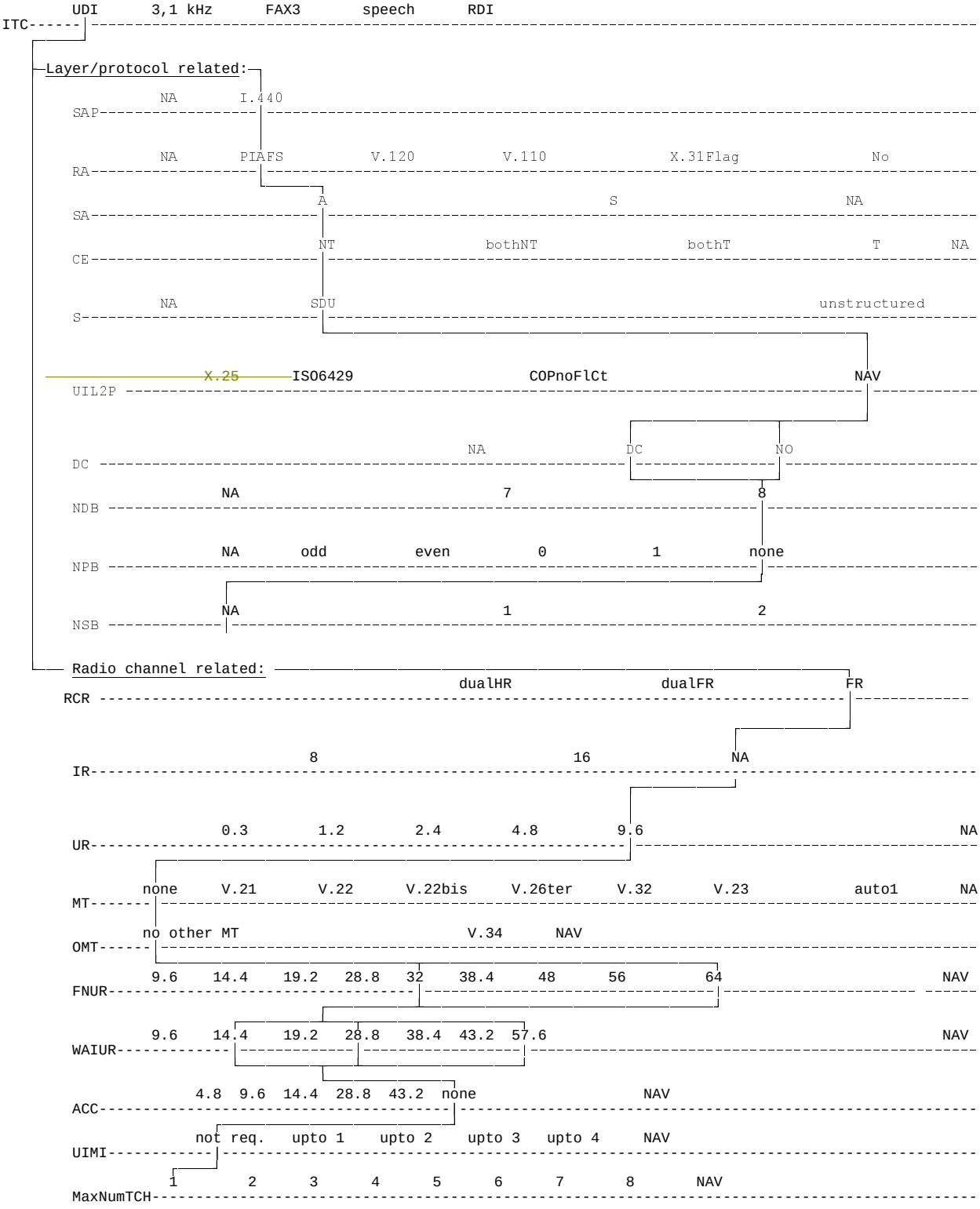
1) for CE:NT or "both";
2) for CE:T only or CE:NT and NIRR:6kb/s (not for the SETUP message);
3) Void;
4) for MT CALLS in the SETUP message or MO/MT CALLS with "out-band" flow control requested (not for V.21 modem type);
5) for MO/MT CALLS with no flow control requested;
6) Void;
7) IR and UR are overridden if FNUR, ACC and MaxNumTCH are available.
8) ACC may have several values simultaneously (bit map coding).
in case of MT = auto1 the value of FNUR has no meaning.

B.1.2.3 Frame Tunnelling Mode



1) ACC may have several values simultaneously (bit map coding).

B.1.2.4 PIAFS

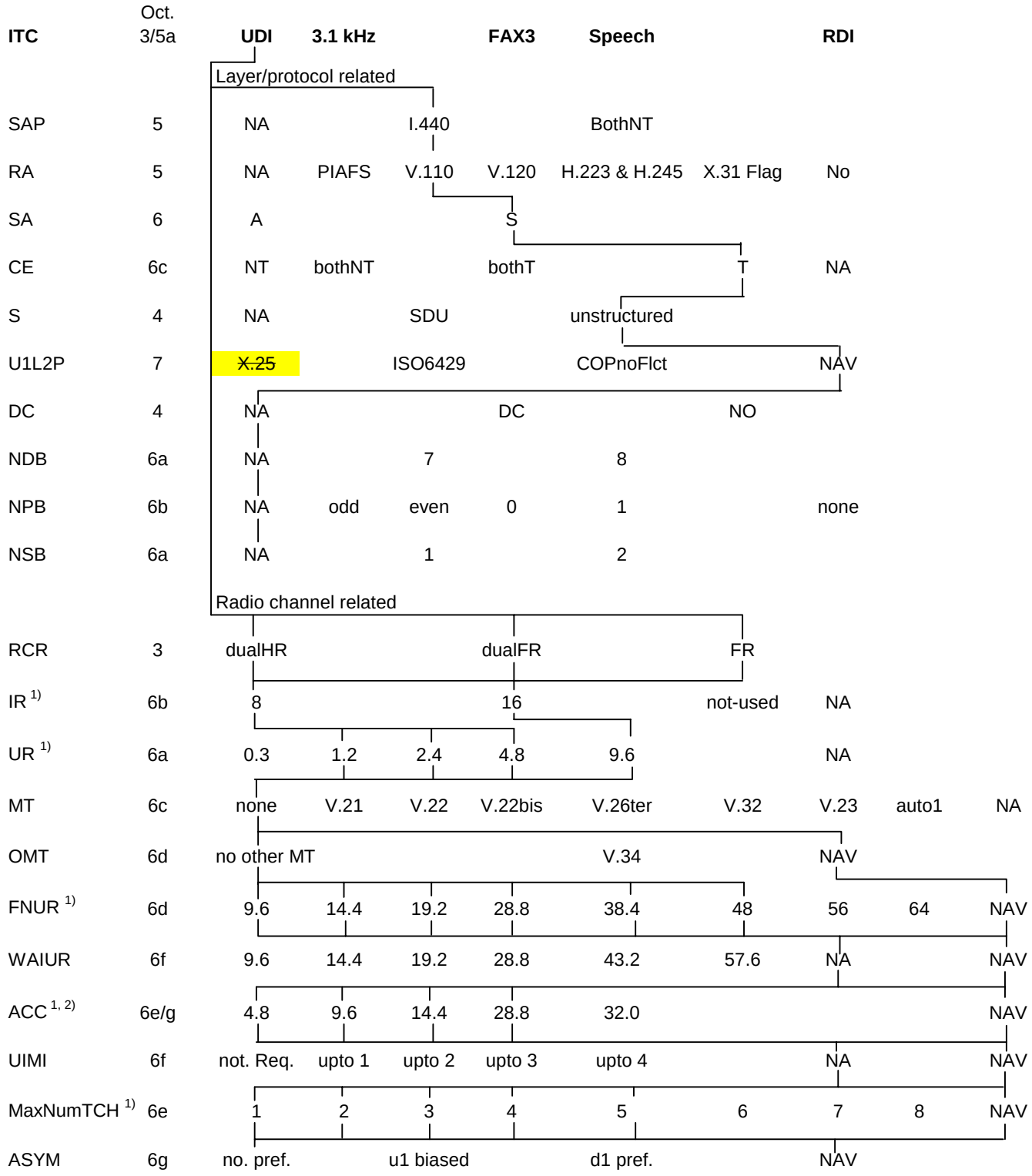

ITC
UDI
3,1 kHz
FAX3
speech
RDI
Layer/protocol related:
SAP
NA
I.440
RA
NA
PIAFS
V.120
V.110
X.31Flag
No
SA
A
S
NA
CE
NT
bothNT
bothT
T
NA
S
NA
SDU
unstructured
UIL2P
X.25
ISO6429
COPnoFlCt
NAV
DC
NA
DC
NO
NDB
NA
7
8
NPB
NA
odd
even
0
1
none
NSB
NA
1
2
Radio channel related:
RCR
dualHR
dualFR
FR
IR
8
16
NA
UR
0.3
1.2
2.4
4.8
9.6
NA
MT
none
V.21
V.22
V.22bis
V.26ter
V.32
V.23
auto1
NA
OMT
no other MT
V.34
NAV
FNUR
9.6
14.4
19.2
28.8
32
38.4
48
56
64
NAV
WAIUR
9.6
14.4
19.2
28.8
38.4
43.2
57.6
NAV
ACC
4.8
9.6
14.4
28.8
43.2
none
NAV
UIMI
not req.
upto 1
upto 2
upto 3
upto 4
NAV
MaxNumTCH
1
2
3
4
5
6
7
8
NAV

B.1.3 Bearer Service 30, Data Circuit Duplex Synchronous

B.1.3.1 Unrestricted/restricted digital information transfer capability

B.1.3.1.1 Transparent FNUR <= 48 kbit/s (TCH/F4.8, TCH/F9.6, TCH/14.4, TCH/F28.8)

Applies to GSM/GERAN only. No HO to/from UTRAN



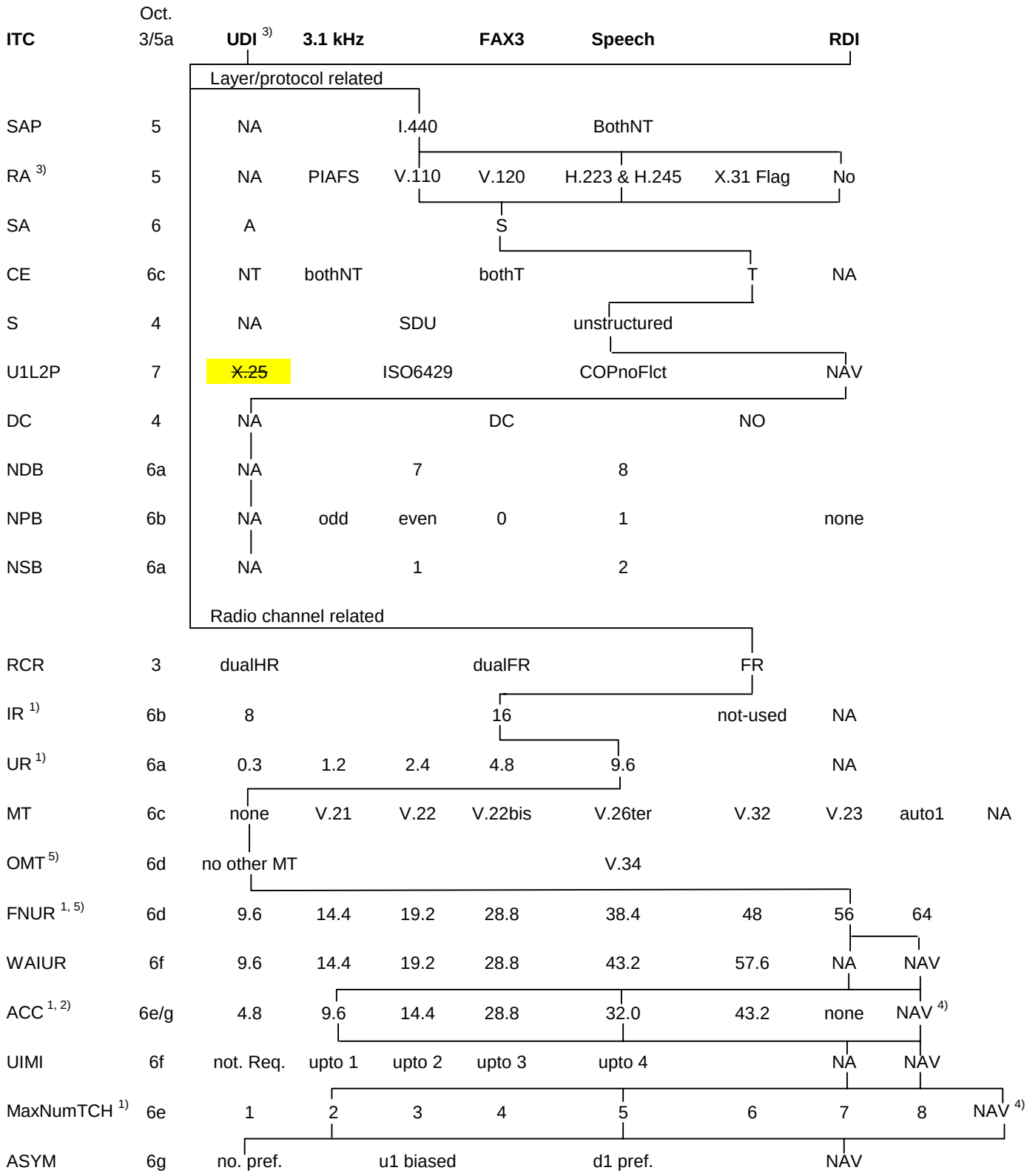
1) IR and UR are overridden if FNUR, ACC and MaxNumTCH are available

2) ACC may have several values simultaneously (bit map coding).

B.1.3.1.2 X.32 Case

Void.

B.1.3.1.3 Transparent FNUR=56 kbit/s, including 3G-H.324/M, (TCH/F9.6, TCH/F32.0, UTRAN)



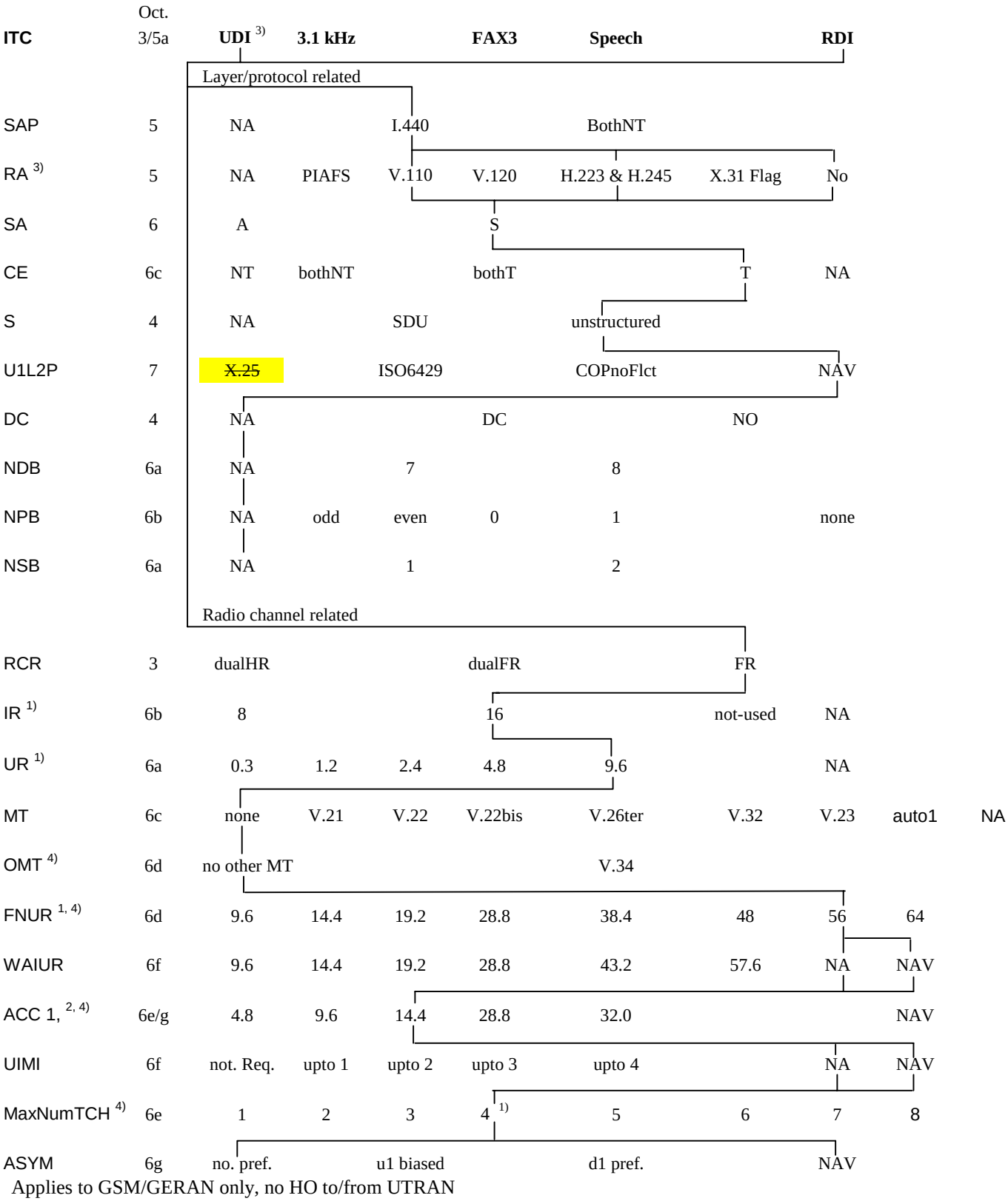
1) IR and UR are overridden by FNUR, ACC and MaxNumTCH if available.

2) ACC may have several values simultaneously (bit map coding). However, handover to/from UTRAN is not possible if the network assigns other traffic channels than TCH/F9.6 or TCH/F32.0.

3) In case ITC=UDI, RA shall be set to V.110 or H.223 & H245.

4) In case ACC and MaxNumTCH are not available operation is restricted to UTRAN.
5) The parameters FNUR and OMT are mandatory for this service.

B.1.3.1.4 Transparent FNUR = 56kbit/s, including 3G-H.324/M (TCH/F14.4)

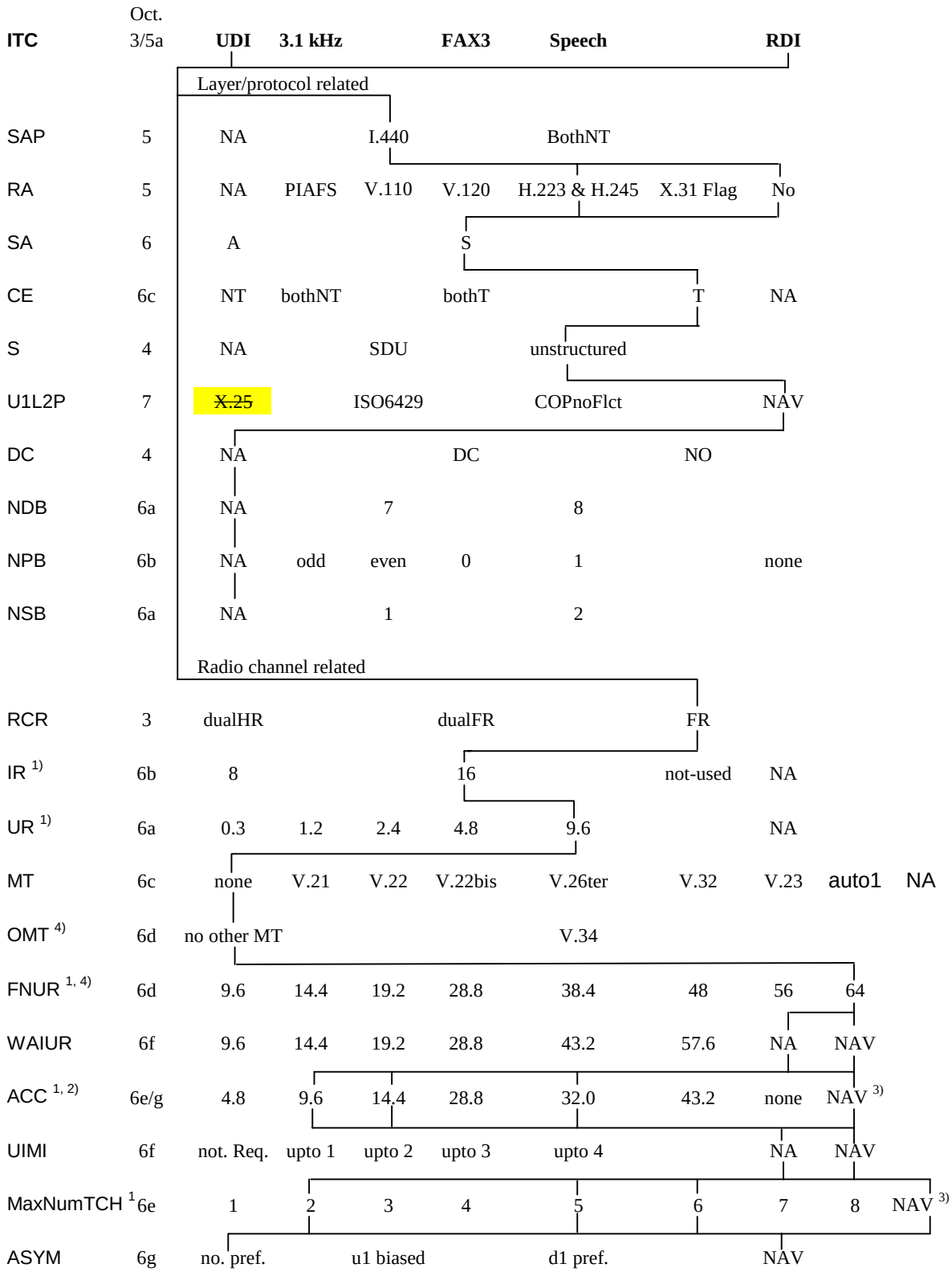


Applies to GSM/GERAN only, no HO to/from UTRAN

1) IR and UR are overridden by FNUR, ACC and MaxNumTCH are available.
2) ACC may have several values simultaneously (bit map coding).
3) In case ITC=UDI, RA shall be set to V.110 or H.223 & H.245.

4) The parameters FNUR, OMT, ACC and MaxNumTCH are mandatory for this service.

B.1.3.1.5 Transparent FNUR = 64kbit/s, including 3G-H.324/M (TCH/F9.6, TCH/F14.4, TCH/F32.0, UTRAN))



1) IR and UR are overridden by FNUR, ACC and MaxNumTCH if available.
2) ACC may have several values simultaneously (bit map coding).
3) If ACC and MaxNumTCH are not available operation is restricted to UTRAN.

4) The parameters FNUR and OMT are mandatory for this service.

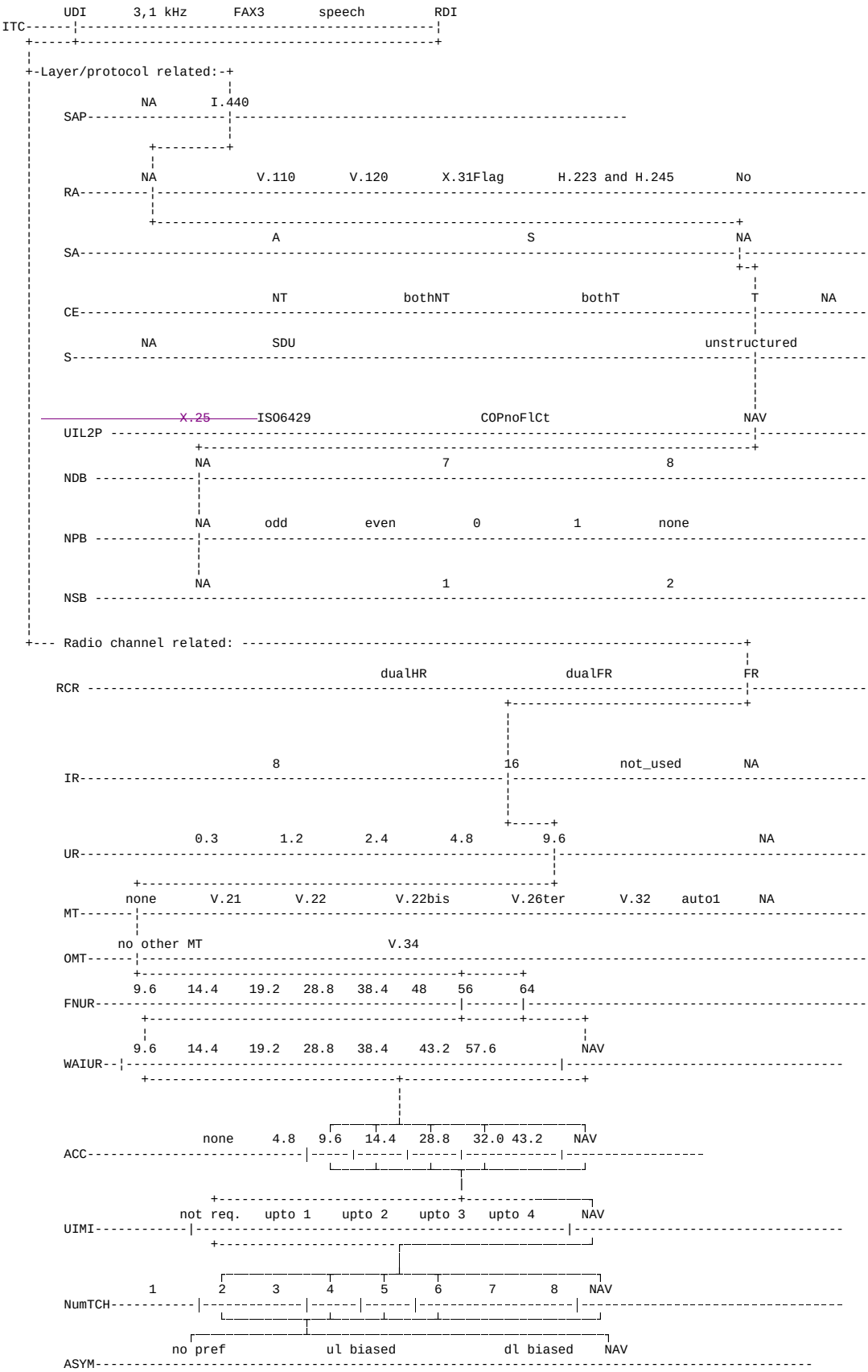
B.1.3.1.6 3G-H.324/M, FNUR=32.0 kbit/s (TCH/F32.0, UTRAN)

ITC	Oct. 3/5a	UDI	3.1 kHz		FAX3	Speech		RDI		
		Layer/protocol related								
SAP	5	NA		I.440		BothNT				
RA	5	NA	PIAFS	V.110	V.120	H.223 & H.245	X.31 Flag	No		
SA	6	A			S					
CE	6c	NT	bothNT		bothT		T	NA		
S	4	NA		SDU		unstructured				
U1L2P	7	~~X.25~~		ISO6429		COPnoFlct		NAV		
DC	4	NA			DC		NO			
NDB	6a	NA		7		8				
NPB	6b	NA	odd	even	0	1		none		
NSB	6a	NA		1		2				
		Radio channel related								
RCR	3	dualHR			dualFR		FR			
IR [3]	6b	8			16		not-used	NA		
UR [3]	6a	0.3	1.2	2.4	4.8	9.6		NA		
MT	6c	none	V.21	V.22	V.22bis	V.26ter	V.32	V.23	auto1	NA
OMT	6d	no other MT				V.34				
FNUR	6d	9.6	14.4	19.2	28.8	32.0	38.4	48	56	64
WAIUR	6f	9.6	14.4	19.2	28.8	43.2	57.6	NA	NAV	
ACC [1]	6e/g	4.8	9.6	14.4	28.8	32.0	43.2	none	NAV [2]	
UIMI	6f	not. Req.	upto 1	upto 2	upto 3	upto 4		NA	NAV [2]	
MaxNumTCH	6e	1	2	3	4	5	6	7	8	NAV [2]
ASYM	6g	no. pref.		u1 biased		d1 pref.		NAV [2]		

1) ACC may have several values simultaneously (bit map coding).

2) If ACC, UIMI, MaxNumTCH and ASYM are not available operation is restricted to UTRAN.

B.1.3.1.7 Bit transparent 56 kbit/s (RDI) and 64kbit/s (UDI) (UTRAN)

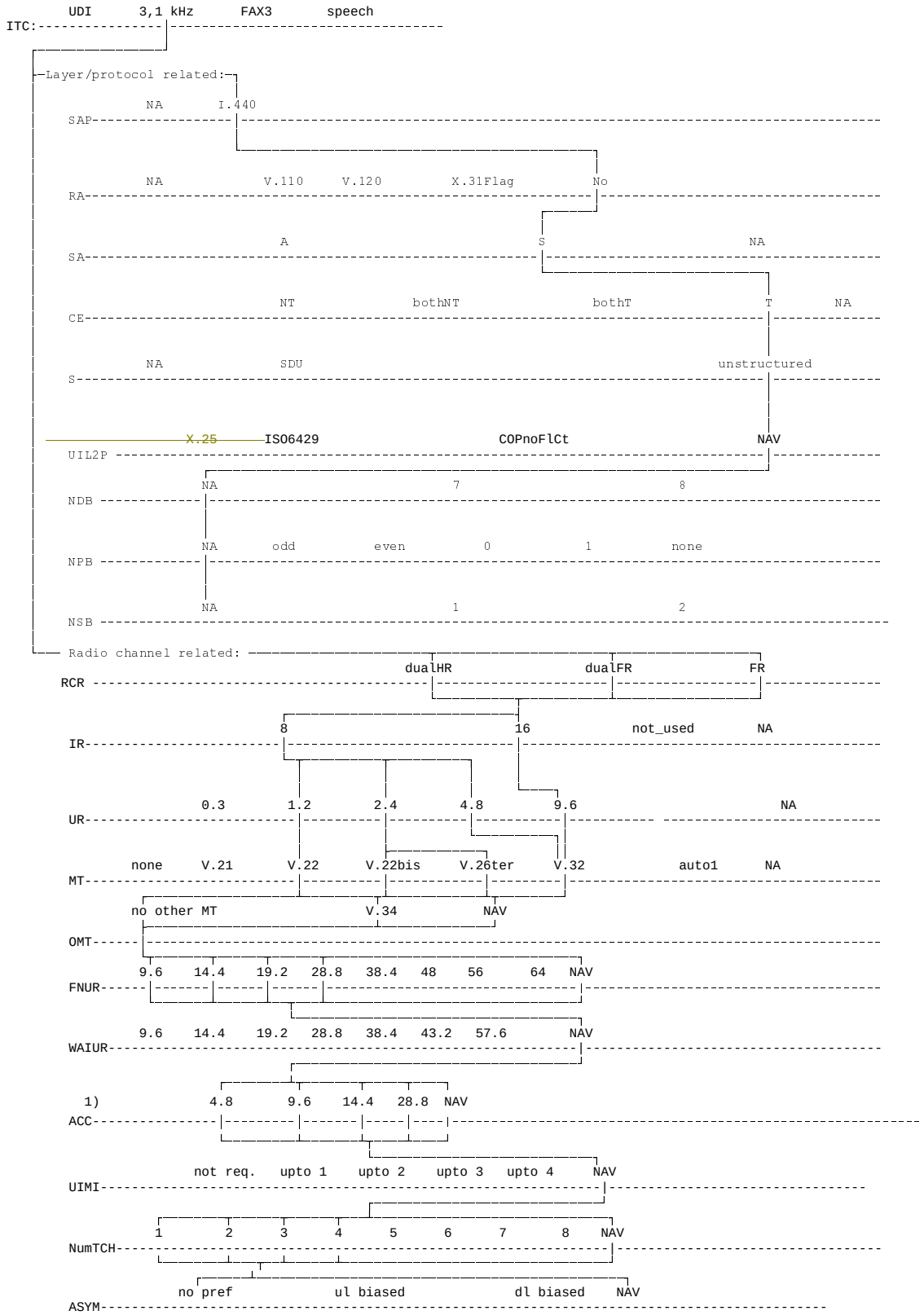


WAIUR, UIMI and ASYM shall be available only if the ACC includes TCH/F32.0.

ACC and NumTCH may be available in order to support handover to GSM.

B.1.3.2 3,1 kHz audio ex-PLMN information transfer capability

B.1.3.2.1 Non-X.32 Cases

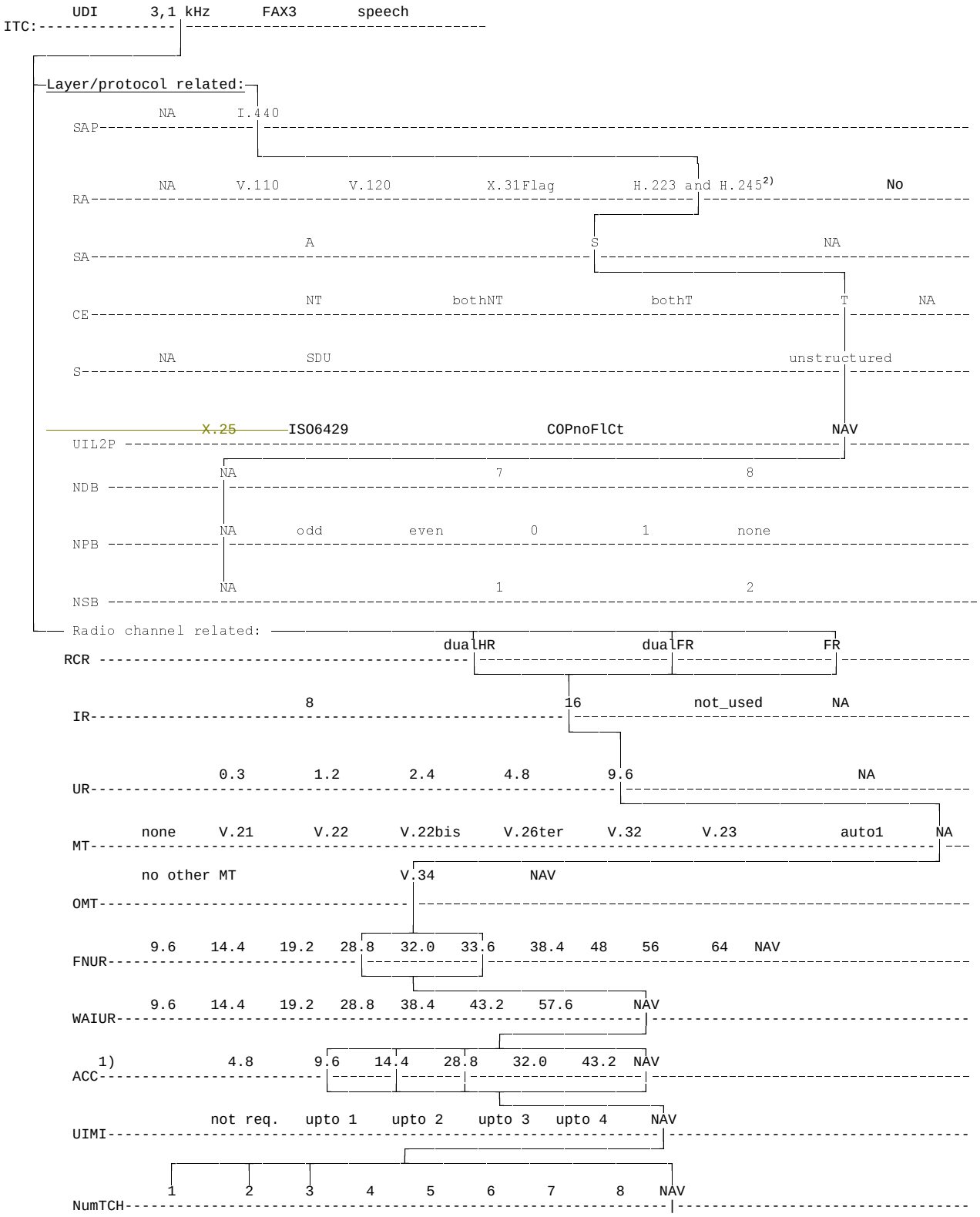


1) ACC may have several values simultaneously (bit map coding).

B.1.3.2.2 X.32 Case

Void.

B.1.3.2.3 3G-H.324/M Case



1) ACC may have several values simultaneously (bit map coding).

B.1.4 Bearer Service 40 ... 46, PAD Access Asynchronous

Void.

B.1.5 Bearer Service 50 ... 53 ,Data Packet Duplex Synchronous, Unrestricted digital information transfer capability

Void.

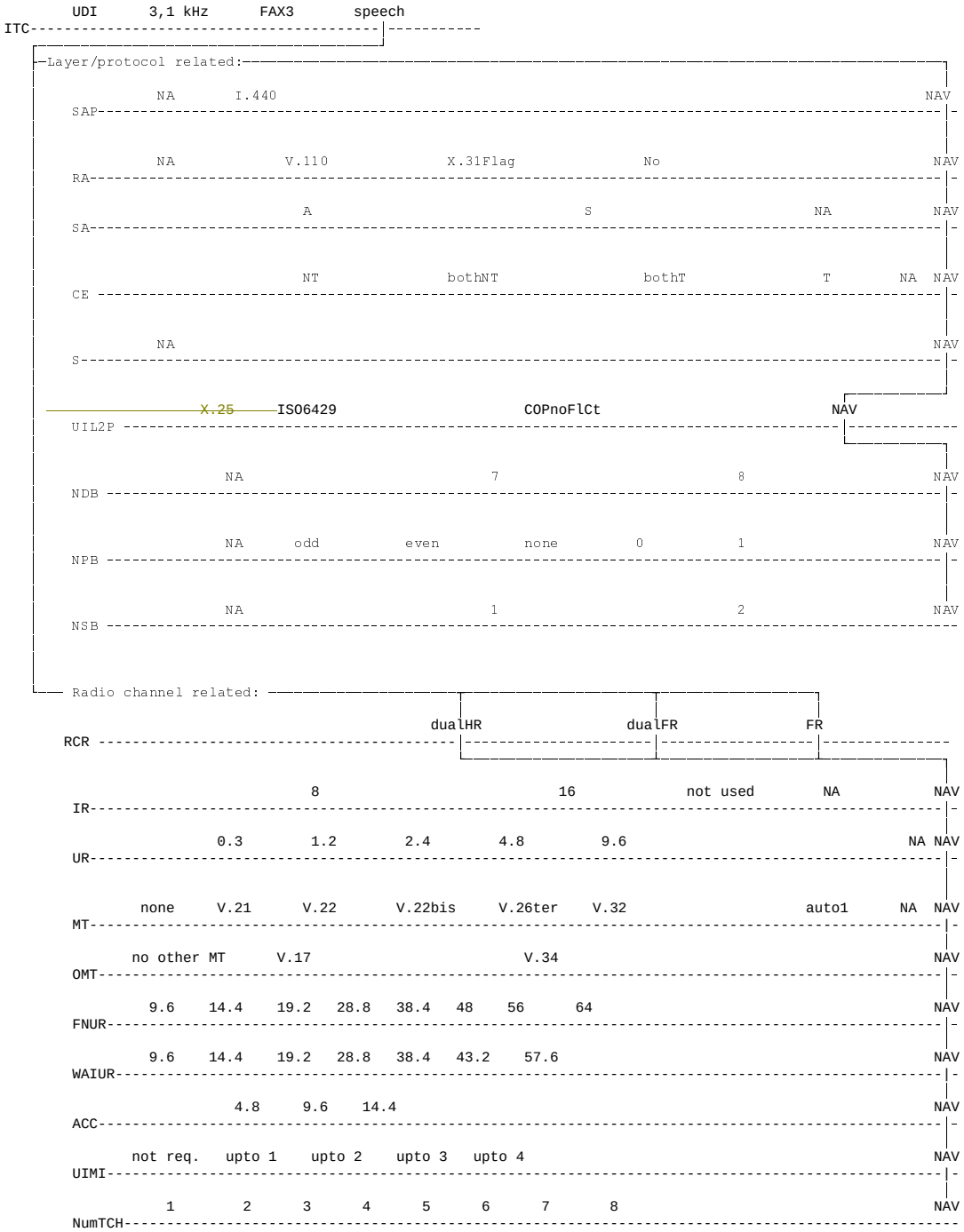
B.1.6 Bearer Service 61, Alternate Speech/Data

Void.

B.1.7 Bearer Service 81, Speech followed by Data

Void.

B.1.8 Teleservice 11 ... 12, Speech



B.1.9 Teleservice 21 ... 23, Short Message

Not applicable.

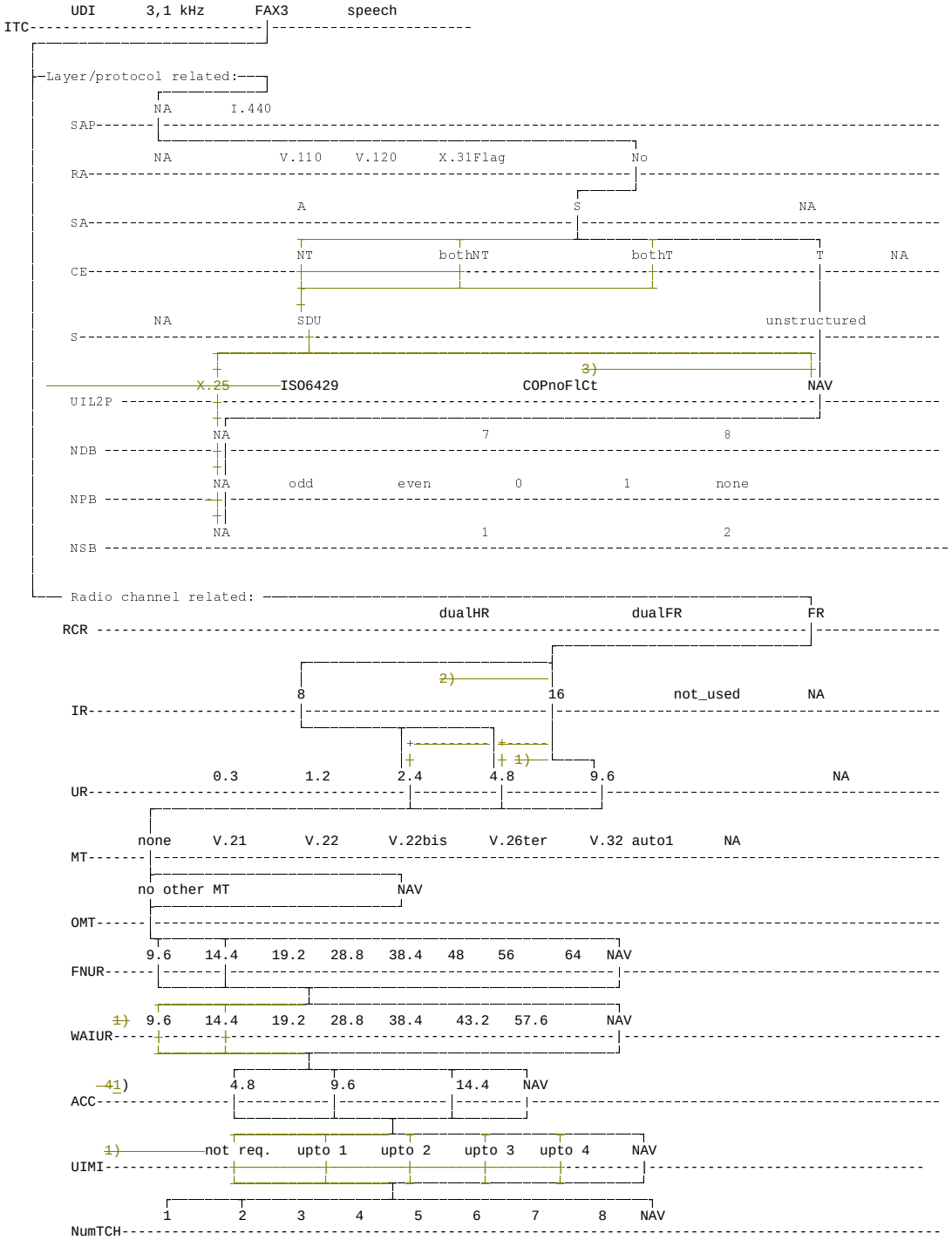
B.1.10 Teleservice 61, Alternate Speech and Facsimile group 3

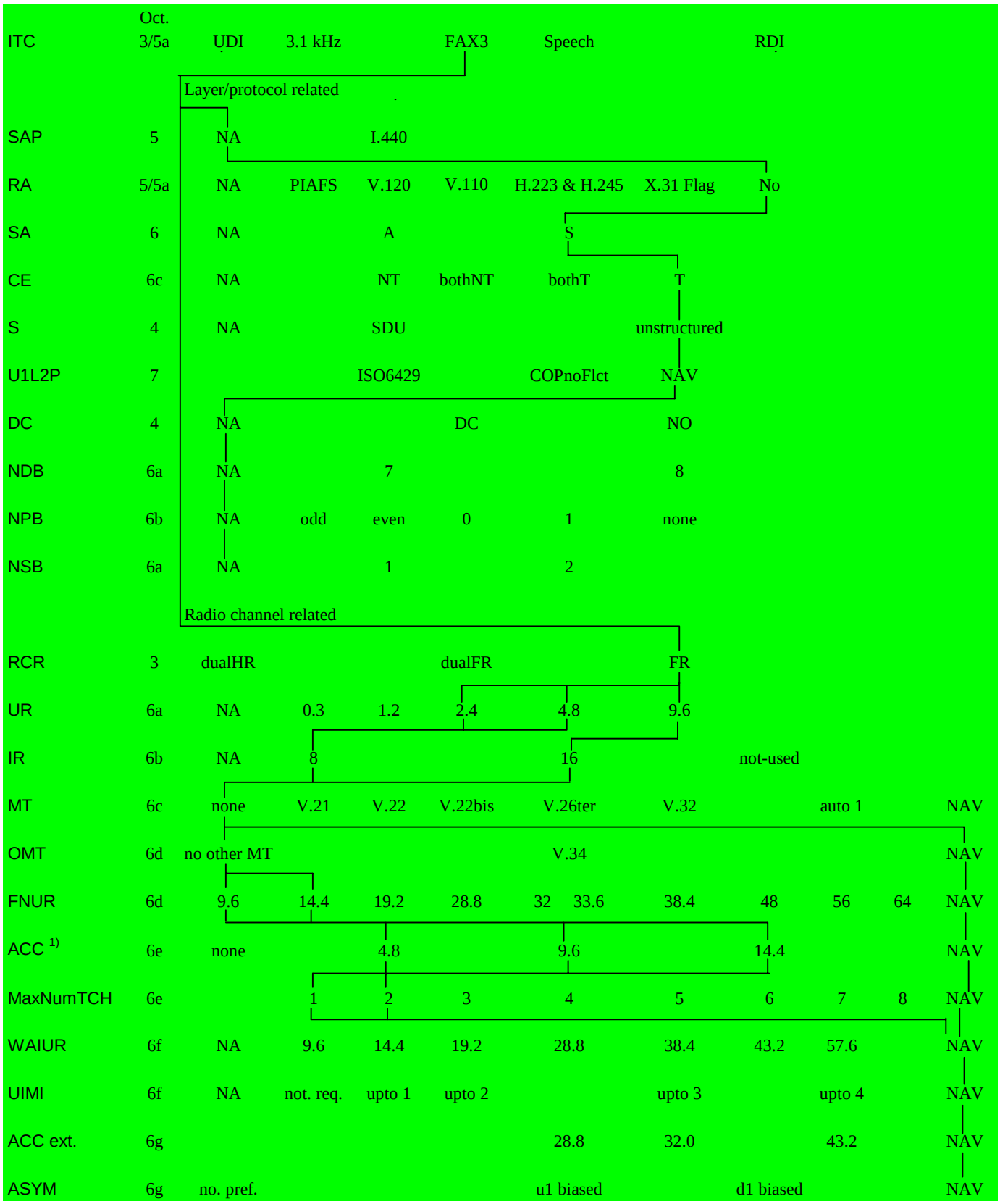
The information element of the "repeat indicator" is set to the value "circular for successive selection (alternate)".

B.1.10.1 Teleservice 61, Speech

Ref. subclause B.1.8.

B.1.10.2 Teleservice 61, Facsimile group 3 in GSM





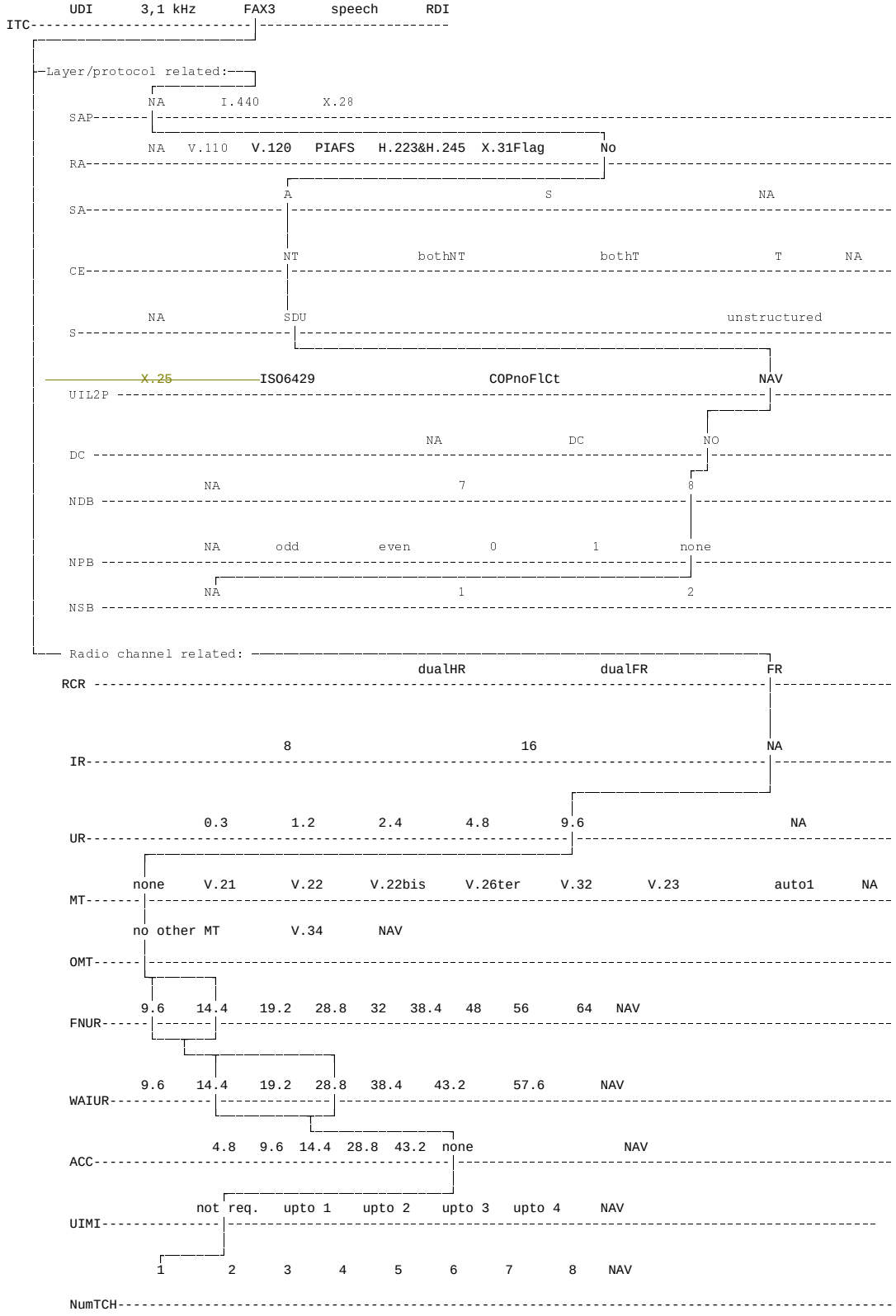
~~1) for CE:NT or "both";~~
~~2) for CE:T only;~~
~~3) for MT CALL in the SETUP message only;~~

~~4) ACC may have several values simultaneously (bit map coding).~~
1) ACC may have several values simultaneously (bit map coding).

End of modified section

Next modified section

B.1.10.3 Teleservice 61, Facsimile group 3 in UMTS



End of modified section

Next modified section

B.2.3 LLC Bearer Service 30

B.2.3.1 Unrestricted / restricted digital information transfer capability

Low layer compatibility information element:

Octet	Information element field	field value
3	Coding standard Information transfer capability	ITU-T { digital unrestricted | restricted digital }
4	Transfer mode Information transfer rate	circuit mode 64 kbit/s
5	User information layer 1 protocol	{ V.110/X.30 | X.31 flag stuffing | V.120 | H.223 and H.245 }
5a	Synchronous / asynchronous Negotiation User rate	synchronous in-band not possible { 0.3 | 1.2 | 2.4 | 4.8 | 9.6 | 1.2/0.075 | 14.4 | 19.2 | 28.8 | 32.0 | 38.4 | 48 | 56 } kbit/s
5b 2)	Intermediate rate NIC on Tx NIC on Rx Flow control on Tx Flow control on Rx	{ 8 | 16 } kbit/s { not required | required } { not accepted | accepted } ----- -----
5b 3)	Rate adaption header / no header Multiple frame establishment support Mode of operation Assignor / assignee In-band / out-band negotiation	Rate adaption header included Multiple frame establishment supported Protocol sensitive mode of operation ----- -----
5c 1)	Number of stop bits Number of data bits Parity	not relevant but cannot be omitted in order to have octet 5d
5d 1)	Duplex mode Modem type	[duplex] -----
~~6~~	~~User information layer 2 protocol~~	~~[X.25]~~
~~7~~	~~User information layer 3 protocol~~	~~[X.25]~~

1) If octet 5d is not specified, octet 5c may be omitted.
2) octet 5b for V.110/X.30.
3) octet 5b for V.120.

B.2.3.2 3,1 kHz audio ex-PLMN information transfer capability

Low layer compatibility information element:

Octet	Information element field	field value
3	Coding standard Information transfer capability	ITU-T 3.1kHz audio
4	Transfer mode Information transfer rate	circuit mode 64 kbit/s
5	User information layer 1 protocol	{G.711 A-law | G.711 u-law (PCS-1900)}
5a	Synchronous / asynchronous Negotiation User rate	(may be set depending on the user's requirement)
5b	Intermediate rate NIC on Tx NIC on Rx Flow control on Tx Flow control on Rx	 not relevant but cannot be omitted in order to have octet 5d
5c	Number of stop bits Number of data bits Parity	(may be set depending on the user's requirement)
5d	Duplex mode Modem type	[duplex] [{ V.22 | V.22bis | V.26ter | V.32 | V.34 }]
~~6~~	~~User information layer 2 protocol~~	~~[X.25]~~
~~7~~	~~User information layer 3 protocol~~	~~[X.25]~~

NOTE: If octet 5d is not specified, octets 5a..5d may be omitted.

End of last modified section