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FFFIS for GSM-R SIM Cards

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EVOLUTION SHEET

Version	Date	Author	MODIFICATION
1	14/03/00	PMT	First Issue
2a	18/07/00	PMT	Updated version after meeting 6/7/00
2c	18/07/00	Arcor	Corrections and remarks
2d	28/07/00	SAGEM	Corrections
2e	03/08/00	SAGEM	Additional corrections
2	11/08/00	PMT	Second issue
3	12/12/03	OG & IG	Third issue
3.01 to 3.0.9	13/06/05	OG&IG	Draft versions
3.9b	02/06/06	SAGEM	Final issue for UIC submission
3.9c	11/12/06	SAGEM	New release after UIC comments
3.9d	24/01/07	SAGEM	Update after UIC/IG meeting in January 2007
4	29/01/07	OG & IG	Fourth Issue
4.1	05/10/09	GP & RS	Update after insertion of CR 9130-2.0
4.2.0.1	11/04/11	GP	First draft version of 4.2 Includes CR9155, CR9158, CR9154 & CR9138
4.2.0.2	19/05/11	SIM-CARD WG	Second draft of 4.2 after review of the WG.
4.2.0.3	09/06/11	SIM-CARD WG	Third draft of 4.2 after review of the WG
4.2.0.4	14/06/11	SIM-CARD WG	Cancelled note at page 45.
4.2.0.5	14/09/11	SIM-CARD WG	Specified possible formats for Network Name: page 45 & page 71 updated
4.2.0.6	11/11/11	SIM-CARD WG	Network name format based on N-9018
4.2.0.7	09/10/13	SIM-CARD WG	Network name format based on N-9018 v.2.0 Approved by OG & IG
4.2.1	27/04/14	UIC	Change reference to EIRENE as MR4 and mark as prerelease.
4.2	7/05/14	UIC	Final document. Technical Content Identical to pre-release 4.2.1

5.0.1	01/04/15	UIC	Draft Introduction of clause numbering and assignment of MI/M/O by the OG SIM WG. Yellow marked text in this document are still under review by the SIM WG. Green marked text are action point for TIG and OG.
5.0.2	19/05/15	UIC	Update by the OG SIM WG
5.0.3	04/06/15	UIC	Review by OG in meeting OG#57
5.0.4	29/07/15	UIC	Update by WG based on receive comments from TIG on O-3249 and general review.
5.0.5	20/10/15	UIC	Update by OG, approved by OG.
5.0.6	26/11/15	UIC	Final clean version, ready for approval.
5.0.7	06/12/15	UIC	1.1 updated with versions for all documents 6.1.4: deleted, including table 5. 6.1.5: missing line for LND added; AND changed to AND. 6.7.2.5 wording changed (related to CR9236) 6.12.12: table name changed 7.1.7 clause added (ref to chapter 8) 7.2.10.2: wording changed (file is FN) 7.4.21 – 26: wording changed and classification changed to M when IMEI in implemented Other minor textual changes (type errors and format changes)
5.0.8	17/12/15	UIC	Other minor textual changes (type errors and format changes) in §2.6, §4,8, §7.1.4 Add GPRS in Table 5.5.1 and VBS (MI) in §6.1.5
5.0	18/12/15	UIC	Approved version

TABLE OF CONTENTS

1. REFERENCE

1.1. Documentation

[1] EIRENE, System Requirement Specification, version 16.0.0
[2] EIRENE, Functional Requirements Specification, version 8.0.0
[3] ETSI TS 102 281 3.0.0
[4] Deleted
[5] MORANE, FFFS for confirmation of high priority calls, F 10 T 6002 5
[6] MORANE, FFFS for functional addressing, E 10 T6001 4.1
[7] Deleted
[8] Deleted
[9] MORANE, FFFS for Presentation of Functional Numbers to called and calling parties, F10 T 6003 4
[10] ETSI EN 301 515 v2.3.0
[11] Network Management Group (NMG) document N-9018 latest update related to "GSM-R Network Names and Codes table"
[12] Deleted
[13] Deleted
[14] 3GPP TS 22.030 v3.3.0
[15] ETSI TS 124 008 v3.20.0

1.2. Abbreviation / Acronyms

A3	Authentication algorithm; Used for authenticating the subscriber
A5	Cipher algorithm; Used for enciphering/deciphering data
A8	Algorithm used to generate Kc given in input to A5
ASCI	Advanced Speech Calls Items
AC	Access Conditions
ADN	Abbreviated Dialling Number
BCCH	Broadcast Control Channel
CBMI	Cell Broadcast Message Identifier
CHV	Card Holder Verification information
COMP128	Name of standard A3/A8 MoU algorithm
DF	Dedicated File
DSD	Driver Safety Device.
EDOR	ETCS Data Only Radio
EF	Elementary Files
EMLPP	enhanced Multi-Level Pre-emption and Priority
EMS	EIRENE Mobile Station
ETCS	European Train Control System
FDN	Fixed Dialling Number
FN	Functional Number
GID	Group call Identifier
GSM	Global System for Mobile communications
GSM-R	Global System for Railway Mobile communications
GSM-R MS	GSM-R Mobile Station
GSM-R PLMN	GSM-R Public Land Mobile Network
HPLMN	Home PLMN
IC	International Code

ICCID	Integrated Circuit(s) Card Identification
IMEI	International Mobile station Equipment Identity
IMSI	International Mobile Subscriber Identity
MF	Master File
MMI	Man Machine Interface
MS	Mobile Station
MSISDN	Mobile Station International ISDN Number
PIN	Personal Identification Number
PLMN	Public Lands Mobile Network
SIM	Subscriber Identity Module
SMS	Short Message Service
SMSCB	Short Message Service Cell Broadcast
SMS-SC	Short Message Service - Service Centre
SMS/PP	Short Message Service/Point-to-Point
VBS	Voice Broadcast Service
VGCS	Voice Group Call Service

2. GENERAL

2.1 The statements made in the specification are assigned to one of four categories: [I]

- **Mandatory for Interoperability** (indicated by '[MI]' at the end of the paragraph). These are the requirements, **with respect to the authorisation in the EU according to the TSI,** that are considered in the European Directives to be relevant for interoperability as **fulfilling the essential requirements for the Control-Command and Signalling subsystem** related to safety and technical compatibility which must be met by the rail system, the subsystems, and the interoperability constituents, including interfaces according to the corresponding conditions set out in Annex III of the Directive 2008/57/EC. It is mandatory that each railway subsystem in the EU meets these requirements on lines under the scope of the Directive to ensure technical compatibility between Member States and safe integration between train and track.
- **Mandatory for the System** (indicated by '[M]' at the end of the paragraph). These requirements must be complied with together with the "Mandatory for Interoperability [MI]" requirements in order to deliver an EIRENE compliant system. The M requirements ensure additional level of system technical integration and compliance to existing standards; they allow that the technical characteristics of the network and fixed terminal system are compatible with each other and with those on board the trains to be used on the rail system.
- **Optional** (indicated by '[O]' at the end of the paragraph). These requirements allow the selection (or non-selection) of a set of requirements on a national basis and shall not be used as a precondition for the acceptance of roaming mobile equipment on GSM-R networks. When an option is selected, the method defined in the SRS and FRS by which such features are implemented becomes mandatory [M], both to provide a consistent service and to present a recognised and agreed standard to manufacturers in order to obtain economies of scale in development and manufacture.
- **Information** (indicated by '[I]' at the end of the paragraph). These are statements intended to provide explanatory notes.
- Note: NA is used to indicate that a particular service is not applicable and will therefore not need to be provided.

2.2 This document provides a specification for GSM-R SIM cards for use in Cab Radio, General purpose radio (GPH), Operational radio (OPH), Shunting radio (OPS) and ETCS data only radio (EDOR) in order to fulfil the EIRENE requirements. [I]

2.3 The EIRENE requirements are described in documents [1] and [2]. [I]

2.4 This document assumes that the specified GSM-R SIM card is inserted in GSM-R mobile stations. [I]

2.5 The GSM-R specific data is stored in a way that these GSM-R SIM cards may also be used when inserted into standard public mobiles without any side effects upon the normal operation of standard GSM mobile terminal. [I]

2.6 This document presents the following topics [I]:

- Chapter 3 provides a brief overview of the SIM card, as an introduction to the various SIM card topics,
- Chapter 4 introduces the generic requirements which define the minimum configuration required for any given GSM-R SIM card including SIM capacity and file structure.
- Chapters 5, 6, 7 and 8 define the various mandatory and optional files required for each card type [in some cases the contents are defined per type]

3. SIM CARD OVERVIEW

3.1 This chapter aims to provide general information concerning SIM cards. [I]

3.2 The purpose of the SIM card in GSM is to personalise the mobile with subscription data. [I]

3.3 The first generation of SIM cards (phase 1 and phase 2) only stored information without further processing. This information is stored within the so called Elementary Files (EF), organised in a tree structure on the SIM card. The data stored within the SIM card is relevant for the GSM operator and the subscriber [I]:

- The GSM operator: uses basic GSM data for subscription and security, additional facilities are available according to operator's operational requirements.
- The subscriber: currently uses mainly it for phone books and short messages.

3.4 The phase 2+ generation of SIM cards offers new functionality. In addition to the functionality of the previous SIM card generations, the phase 2+ SIM card is now able to initiate certain actions providing new functionality. [I]

3.5 This new functionality is called « SIM tool kit ». [I]

3.6 GSM phase 2+ ASCI functionality requires new specific files within the SIM card. These new file definitions are part of a new generation phase2+ SIM card release. [I]

3.7 Information within the SIM card may be accessed by the following: [I]

- the network,
- the user through the MMI,
- AT commands

3.8 The AT commands can [I]:

- directly access most EFs by commands defined in the standard GSM specifications,
- access the EF through the address of the EF in the SIM card (in this case, the EF shall be managed as a linear set of bytes because there is restricted SIM access +CRSM command, see document [10]).

3.9 The following diagram illustrates the use and environment of GSM-R SIM cards [I].

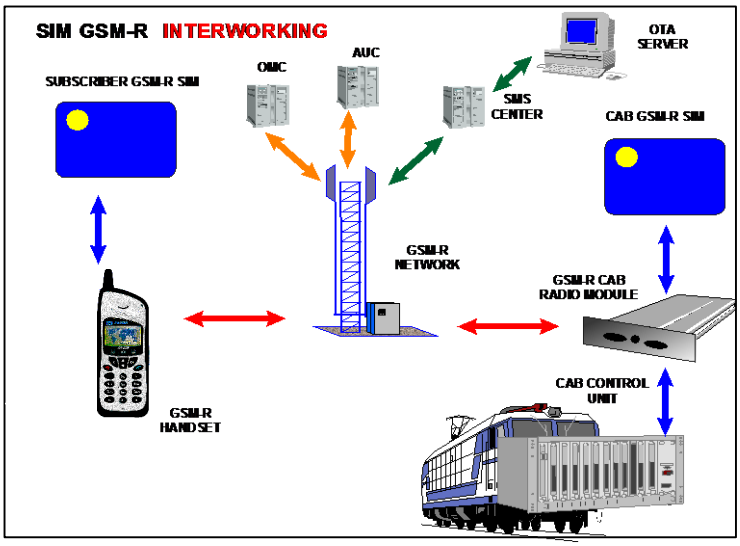

Figure 1 : SIM GSM-R interworking

4. GENERIC REQUIREMENTS

4.1 This chapter presents the generic requirements for GSM-R SIM cards. The contents of the GSM-R SIM card are examined in the following chapters. [I]

4.2 The EIRENE specification supports the ASCI features VBS, VGCS and eMLPP. These features are part of GSM phase 2+ specification. [I]

4.3 The GSM-R SIM cards shall be compliant to phase2+ SIM standard [3] unless otherwise stated in this document;

i) Cab Radio / EDOR SIM Cards [MI]

ii) All other SIM Cards [M]

4.4 The GSM-R SIM card memory shall have a minimum of 16Kbytes;

i) Cab Radio / EDOR SIM Cards [MI]

ii) All other SIM Cards [M]

4.5 The capacity of the SIM card may be increased following the requirements of the railway operators for additional information (national implementations). [I]

4.6 The absence and / or presence of any EF specified as optional or not present in this specification shall not lead to any unspecified behaviour of the mobile terminal. [MI]

4.7 The GSM-R SIM card life cycle requirement is a minimum of 10 years. This life cycle is dependent on the number of read/write cycles of the MT on the SIM card. [I]

4.8 There are 3 classes of elementary files on the GSM-R SIM card [I]:

i. Common mandatory ETSI GSM files, which are on the SIM card simply because the GSM-R system is also based upon the GSM standard. [see chapter 5]

ii. Optional ETSI GSM files which are required for GSM-R operation in order to fulfil the EIRENE requirements. [See chapter 6]

iii. Specific EIRENE files which are EFs that are required for GSM-R operation. [see chapter 7]

4.9 The following diagram illustrates the distinction between the exiting GSM directory files and the EIRENE directory file : [I]

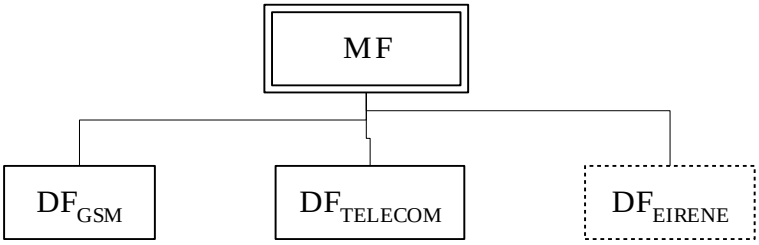

Figure 2: Structure of DF system

4.10 The presence and / or content of EFs can be application specific. This is shown in the tables in the following sections. [I]

4.11 In this specification ETSI tables are used to define the structure of the Elementary Files. The designation of M and O within these tables define the presence of bytes. [I]

4.12 The maximum number of records, record length and file size should be in accordance with [3]. For example the maximum number of records of a linear file is 254. [I]

5. COMMON MANDATORY GSM FILES

5.1 Table 1 and Table 2 provide the list of the common mandatory files for GSM SIM Cards that are required for GSM-R SIM cards. The reference document [3] contains a complete description. [I]

The dedicated **MF**, (address '3F00') which contains:

EF name	Identifier	Type	Contents
ICCID	2FE2	transparent	ICC Identification

Table 1: Dedicated MF

The dedicated **GSM**, (address '7F20') which contains:

EF name	Identifier	Type	Contents
LP	6F05	transparent	Language Preference
IMSI	6F07	transparent	IMSI
KC	6F20	transparent	Ciphering Key Kc
HPLMN	6F31	transparent	HPLMN search period
SST	6F38	transparent	SIM service table
BCCH	6F74	transparent	Broadcast control channel
ACC	6F78	transparent	Access control class
FPLMN	6F7B	transparent	Forbidden PLMN
LOCI	6F7E	transparent	Location information[1]
AD	6FAD	transparent	Administrative data
PHASE	6FAE	transparent	Phase identification

Table 2: Dedicated GSM

5.2 According to [3], the dedicated TELECOM (address '7F10') does not contain any mandatory EF for GSM SIM-Cards. [I]

5.3 The mandatory GSM EFs listed in Table 3 shall be present on the GSM-R SIM cards based on their usage.

EF name	Cab Radio	General Purpose Radio	Operational Radio	Shunting Radio	ETCS Data Only Radio
ICCID	MI	M	M	M	MI
LP	MI	M	M	M	MI
IMSI	MI	M	M	M	MI
KC	MI	M	M	M	MI
HPLMN	MI	M	M	M	MI
SST	MI	M	M	M	MI
BCCH	MI	M	M	M	MI
ACC	MI	M	M	M	MI
FPLMN	MI	M	M	M	MI
LOCI	MI	M	M	M	MI
AD	MI	M	M	M	MI
PHASE	MI	M	M	M	MI

Table 3: Mandatory GSM EFs per radio type

5.4 The following section specifies the content and usage of the EFs identified in Table 5. Where clauses are classified as "MI / M" then the applicability shall be as per Table 5. [I]

[1] Location Information contains : Temporary Mobile Subscriber Identity (TMSI), Location Area Information (LAI), TMSI TIME and Location update status

5.5 EF_{SST}: SIM Service Table

5.5.1 Table 4 identifies the mandatory service allocation and activation requirements for the SIM Service Table by SIM type. An empty field denotes that the configuration state is not mandated. [MI / M]

		Cab Radio [MI]		**GPH / OPH [M]**		**Shunting Radio [M]**		**ETCS Data Only Radio [MI]**	
#	Description	Allocated	Activated	Allocated	Activated	Allocated	Activated	Allocated	Activated
1	CHV1 disable function	Yes	Yes					Yes	Yes
2	Abbreviated Dialling Numbers (ADN)	Yes	Yes	Yes	Yes	Yes	Yes		
3	Fixed Dialling Numbers (FDN)								
4	Short Message Storage (SMS)	Yes	Yes	Yes	Yes	Yes	Yes		
5	Advice of Charge (AoC)								
6	Capability Configuration Parameters								
7	PLMN selector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	RFU								
9	MSISDN	Yes	Yes	Yes	Yes	Yes	Yes		
10	Extension1	Yes	Yes	Yes	Yes	Yes	Yes		
11	Extension2								
12	SMS Parameters	Yes	Yes	Yes	Yes	Yes	Yes		
13	Last Number Dialled (LND)								
14	Cell Broadcast Message Identifier	Yes	Yes	Yes	Yes	Yes	Yes		
15	Group Identifier Level 1								
16	Group Identifier Level 2								
17	Service Provider Name								
18	Service Dialling Numbers (SDN)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	Extension3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	RFU								
21	VGCS Group Identifier List	Yes	Yes	Yes	Yes	Yes	Yes	No	No
22	VBS Group Identifier List	Yes	Yes	Yes	Yes	Yes	Yes	No	No
23	eMLPP Service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	Automatic Answer for eMLPP	Yes	Yes	Yes	Yes	Yes	Yes		
25	Data download via SMS-CB								
26	Data download via SMS-PP								
27	Menu selection								
28	Call control								
29	Proactive SIM								
30	Cell Broadcast Message Identifier Ranges	Yes	Yes	Yes	Yes	Yes	Yes		
31	Barred Dialling Numbers (BDN)	Yes	Yes	Yes	Yes	Yes	Yes		
32	Extension4	Yes	Yes	Yes	Yes	Yes	Yes		
33	De-personalization Control Keys								
34	Co-operative Network List								
35	Short Message Status Reports								
36	Network's indication of alerting in the MS								
37	Mobile Originated SMS control by SIM								
38	GPRS							Yes	Yes
39	Image (IMG)								

		Cab Radio [MI]		GPH / OPH [M]		Shunting Radio [M]		ETCS Data Only Radio [MI]	
#	Description	Allocated	Activated	Allocated	Activated	Allocated	Activated	Allocated	Activated
40	SoLSA (Support of Local Service Area)								
41	USSD string data object supported in Call Control								
42	RUN AT COMMAND command								
43	User controlled PLMN Selector with Access Technology								
44	Operator controlled PLMN Selector with Access Technology								
45	HPLMN Selector with Access Technology								
46	CPBCCH Information								
47	Investigation Scan								
48	Extended Capability Configuration Parameters								
49	MExE								
50	Reserved and shall be ignored								

Table 4: SIM Service Table Configuration

5.6 EF_{ACC} : Access Control Class

5.6.1 GSM-R SIM Cards shall use Access Control Class in the range 0-9. [MI / M]

6. OPTIONAL GSM FILES MANDATED FOR GSM-R

6.1. Introduction

6.1.1 For GSM-R SIM cards some of the GSM EFs that are optional for GSM shall be required for GSM-R in order to fulfil EIRENE requirements.[I]

6.1.2 The purpose of this chapter is to identify those EFs, to justify why they are required for GSM-R and how they shall be used within the GSM-R environment. [I]

6.1.3 The definition and the structure is already established within the GSM-standard (see document [3]). However in this document, the minimum sizing of these files is redefined for GSM-R. [I]

6.1.5 The optional GSM EFs listed in Table 5 shall be present on the GSM-R SIM cards based on their usage.

EF name	Cab Radio	General Purpose Radio	Operational Radio	Shunting Radio	ETCS Data Only Radio
PLMNsel	O*	O*	O*	O*	O*
CBMI	MI	M	M	M	N/A
VGCS	MI	M	M	M	N/A
VGCSS	MI	M	M	M	N/A
VBS	MI	M	M	M	N/A
VBSS	M	M	M	M	N/A
EMLPP	MI	M	M	M	MI
AAeM	MI	M	M	M	MI
ADN	MI	M	M	M	N/A
SMS	MI	M	M	M	N/A
SMSS	MI	M	M	M	N/A
SMSP	MI	M	M	M	N/A
MSISDN	MI	M	M	M	N/A
LND	M	M	M	M	N/A
SDN	MI	M	M	M	MI

Table 5: Optional GSM EFs per radio type

* - this fields may be required to support ER-GSM band operation.

6.1.7 The following sections specify the content, usage and "MI / M" classification of the EFs identified in Table 5. [I]

6.2. $EF_{PLMNsel}$: PLMN selector

6.2.1 EIRENE requires that, in case of network selection, authorised networks that are available shall be listed or automatically selected in the following order of priority [I]

1. home EIRENE network;
2. "foreign" EIRENE networks;
3. non-EIRENE networks (with order of priority predetermined by virtue of international subscriptions and roaming agreements).

6.2.2 The standard GSM specification allows only a list of preferred PLMNs without further classification. This is not fulfilling the railway needs. [I]

6.2.3 Owing to the fact that a distinction between the three groups could not be performed using the $EF_{PLMNsel}$ field, this specification defines an EIRENE specific file called $EF_{GsmrPLMN}$ (see chapter 7.7for details). The GSM file $EF_{PLMNsel}$ shall not be used by EIRENE compliant GSM-R terminals, unless a non GSM-R SIM Card is inserted in the terminals. On the other hand $EF_{PLMNsel}$ can be used by those mobiles not EIRENE compliant which are able to work on the GSM-R band.2 [I]

6.3. EF_{CBMI}: Cell broadcast message identifier selection

6.3.1 The EIRENE specification requires support for the SMS-CB messages. This EF contains message identifier parameters of the type of cell broadcast messages to accept. [I]

6.3.2 Sizing of GSM-R takes into consideration a maximum amount of 10 CB message identifier records. [MI / M]

6.3.3 Structure description and access rights are described in document [3]. This EF is included in the DF_{GSM}. [I]

6.4. EF_{VGCS} and EF_{VGCSS}: VGCS service

6.4.1 The EIRENE specification requires support for VGCS. The EFs for VGCS contain the subscribed GIDs of group calls and the status of each group call. [I]

6.4.2 Each GID is described using 4 bytes in EF_{VGCS}. An empty field 'FF FF FF FF' means 'GID not present'. [I]

6.4.3 Empty fields shall not lead to a malfunction of mobile terminals. [MI / M]

6.4.4 50 GID values are supported. This is the maximum allowed by the ETSI specification. The size of VGCS Status file is fixed. [MI / M]

6.4.5 The EF_{VGCS} file shall contain all the VGCS GIDs subscribed to the user. [MI / M]

6.4.6 The structure description and access rights are described in document [3]. This EF is included in the DF_{GSM}. [I]

6.4.7 The access right for UPDATE (set to ADM in [3]) of the status field (EF_{VGCSS}) shall be set by the operator to CHV1 to allow the user to activate or deactivate any Group ID. Any access restrictions to specific GIDs are provided by the application reading EIRENE specific EFs. [MI / M]

6.4.8 A SIM to be inserted in the Cab Radio shall include, as a minimum configuration, train emergency GID, high priority group call between drivers in the same area GID, operational group call to drivers in the same area GID and shunting GIDs (common, emergency and dedicated shunting GIDs). [MI]

6.4.9 Table 6 shows an example given for information of EF_{VGCS} configuration for a SIM to be installed in a Cab Radio: [I]

[2] As far as network selection is concerned, if a GSM-R Operator wishes to have non EIRENE compliant terminals behaving like EIRENE ones, then $EF_{PLMNsel}$ content has to have the same network selection order as $EF_{GsmrPLMN}$.

GID List		EF_{VGCS} contents	
299	599	1st to 8th byte	92 F9 FF FF 95 F9 FF FF
200	500	9th to 16th byte	02 F0 FF FF 05 F0 FF FF
501	502	17th to 24th byte	05 F1 FF FF 05 F2 FF FF
…	…	…	…
527	528	121st to 128th byte	25 F7 FF FF 25 F8 FF FF
529	555	129th to 136th byte	25 F9 55 F5 FF FF FF FF
…	…	…	…
(no group)	*(no group)*	393rd to 400 byte	FF FF FF FF FF FF FF FF

Table 6: Example of EF_{VGCS} content for a Cab Radio

6.4.10 The relevant EF_{VGCSS} for this example has to be configured according to Table 7 [I]:

1st Byte:

299	Active	1
599	Inactive	0
200	Active	1
500	Inactive	0
501	Inactive	0
502	Inactive	0
503	Inactive	0
504	Inactive	0

"05"

2nd Byte:

505	Inactive	0
506	Inactive	0
507	Inactive	0
508	Inactive	0
509	Inactive	0
510	Inactive	0
511	Inactive	0
512	Inactive	0

"00"

3rd Byte:

513	Inactive	0	"00"
514	Inactive	0	
515	Inactive	0	
516	Inactive	0	
517	Inactive	0	
518	Inactive	0	
519	Inactive	0	
520	Inactive	0	

4th Byte:

521	Inactive	0	"00"
522	Inactive	0	
523	Inactive	0	
524	Inactive	0	
525	Inactive	0	
526	Inactive	0	
527	Inactive	0	
528	Inactive	0	

5th Byte:

529	Inactive	0	"02"
555	Active	1	
(no group)	Inactive	0	
(no group)	Inactive	0	
(no group)	Inactive	0	
(no group)	Inactive	0	
(no group)	Inactive	0	
(no group)	Inactive	0	

6th Byte:

(no group)	Inactive	0	"00"
(no group)	Inactive	0	
(no group)	Inactive	0	
(no group)	Inactive	0	
(no group)	Inactive	0	
(no group)	Inactive	0	
(no group)	Inactive	0	
(no group)	Inactive	0	

7th Byte:

(no group)	Inactive	0	"FC"
(no group)	Inactive	0	
	Fixed by [3]	1	
	Fixed by [3]	1	
	Fixed by [3]	1	
	Fixed by [3]	1	
	Fixed by [3]	1	
	Fixed by [3]	1	

Table 7: Example of EF_{VGCS} content for a Cab Radio (Hex coding)

6.5. EF_{VBS} and EF_{VBSS}: VBS service

6.5.1 The EIRENE specification requires support for VBS. The EFs for VBS contain the subscribed GIDs of broadcast calls and the status of each broadcast call. [I]

6.5.2 Each GID is described using 4 bytes in EF_{VBS}. An empty field 'FF FF FF FF' means 'GID not present'. [I]

6.5.3 50 GID values are supported. This is the maximum allowed by the ETSI specification. The size of VBS Status file is fixed. [I]

6.5.4 The structure description and access rights are described in document [3] and follows the same rules as for EF_{VGCS} and EF_{VGCSS}. These EFs are included in the DF_{GSM}. [MI]

6.5.5 The access right for UPDATE (set to ADM in [3]) of the status field (EF_{VBSS}) shall be set by the operator to CHV1 to allow the user to activate or deactivate any Group ID. Any access restrictions to specific GIDs are provided by the application reading GSM-R specific EFs. [I]

6.6. EF_{eMLPP} : eMLPP service

6.6.1 The EIRENE specification requires support for eMLPP. [I]

6.6.2 The EF_{eMLPP} contains the data for priority levels subscription and the Fast call set-up conditions. [I]

6.6.3 The structure description and access rights are given in Table 8 and described in details in document [3]. This EF is included in the DF_{GSM}. [I]

Identifier: '6FB5'	Structure: transparent	
file length: 2 bytes	Update activity: low	
Access Conditions: READ CHV1 UPDATE ADM INVALIDATE ADM REHABILITATE ADM		

Bytes	Description	M/O	Length
1	Priority levels	M	1 byte
2	Fast call set-up conditions	M	1 byte

Table 8: EF_{EMLPP} structure

6.6.4 1st byte: Priority levels

6.6.4.1 Contents: The eMLPP priority levels subscribed to. [I]

6.6.4.2 Coding: each eMLPP priority level is coded on one bit. Priority levels subscribed to, have their corresponding bits set to 1. Priority levels not subscribed to, have their corresponding bits set to 0. Bit b8 is reserved and set to 0. [I]

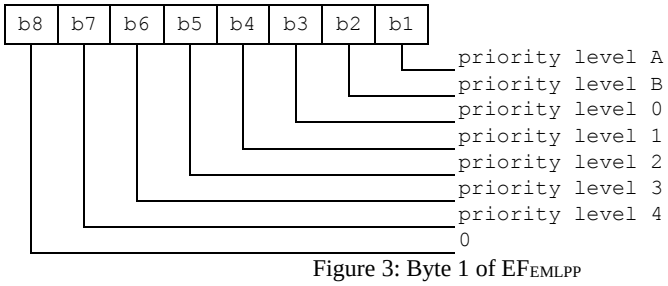

Figure 3: Byte 1 of EF_{EMLPP}

6.6.4.3 Priority levels A and B cannot be subscribed to. [I]

6.6.4.4 As an example: If priority levels 0 to 4 are subscribed to, EF_{eMLPP} shall be coded '7C'. [I]

6.6.4.5 Cab Radio SIM cards shall be subscribed to priorities 0, 2, 3 and 4. [MI]

6.6.4.6 OPS SIM cards shall be subscribed to priorities 0, 2, 3 and 4. [M]

6.6.4.7 ETCS data only radio SIM card shall be subscribed to priority 1. [MI]

6.6.4.8 For GPH and OPH SIM cards the setting of the priority is optional depending on the usage. [I]

6.6.5 2nd byte: Fast call set-up conditions

6.6.5.1 Contents: for each eMLPP priority level, the capability to use a fast call set-up procedure. [I]

6.6.5.2 Coding: each eMLPP priority level is coded on one bit. Priority levels for which fast call set-up is allowed have their corresponding bits set to 1. Priority levels for which fast call set-up is not allowed have their corresponding bits set to 0. Bit b8 is reserved and set to 0. [I]

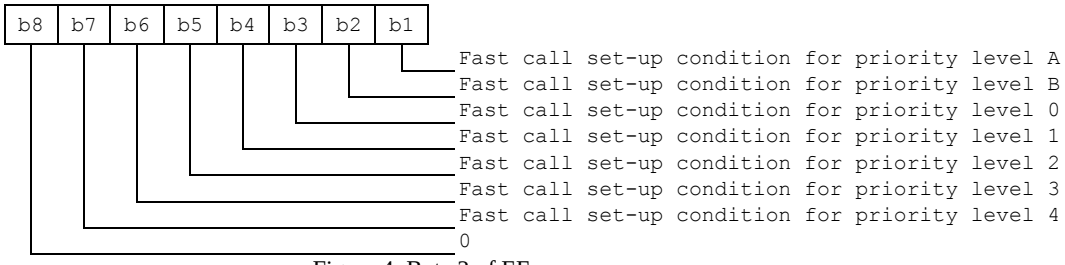

Figure 4: Byte 2 of EF_{EMLPP}

6.6.5.3 For example: If fast call set-up is allowed only for priority level 0, then byte 2 of EF_{eMLPP} is coded '04'. [I]

6.6.5.4 Cab Radio SIM cards shall allow fast call setup for priority level 0. [MI]

6.6.5.5 OPS SIM cards shall allow fast call setup for priority level 0. [M]

6.6.5.6 For ETCS data only radio SIM cards no fast call setup subscription is required. [I]

6.6.5.7 For GPH and OPH SIM cards the use of fast call setup is optional based on usage. [I]

6.7. EF_{AAeM}: Automatic Answer for eMLPP Service

6.7.1 EF_{AAeM} contains those priority levels (of the Multi Level Pre-emption and Priority service) for which the mobile station shall answer incoming calls automatically. [I]

Identifier: '6FB6'	Structure: transparent	
file length: 1 bytes	Update activity: low	

Access Conditions:

READ	CHV1
UPDATE	CHV1
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1	Automatic answer priority levels	M	1 byte

Figure 5: EF_{AAeM} structure

6.7.2 Automatic answer priority levels

6.7.2.1 Contents: for each eMLPP priority level, the capability for the mobile station to answer incoming calls automatically (with the corresponding eMLPP priority level). [I]

6.7.2.2 Coding: each eMLPP priority level is coded on one bit. Priority levels allowing an automatic answer from the mobile station have their corresponding bits set to 1. Priority levels not allowing an automatic answer from the mobile station have their corresponding bits set to 0. Bit b8 is reserved and set to 0. [I]

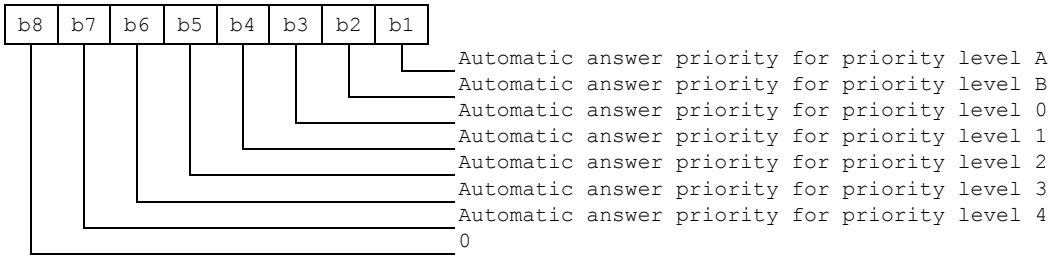

Figure 6: Byte 1 of EF_{AAeM}

6.7.2.2 For example: If automatic answer is allowed for incoming calls with priority levels 0, 1 and 2, then EF_{AAeM} is coded '1C'. [I]

6.7.2.3 Cab Radio SIM cards shall be subscribed to automatic answer priority levels 0 to 3. [MI]

6.7.2.4 OPS SIM cards shall be subscribed to automatic answer priority levels 0 to 3. [M]

6.7.2.5 For an EDOR SIM card subscription to automatic answer is not applicable. [I]

6.7.2.6 For GPH and OPH SIM cards the setting of the automatic answer priority level is optional depending on the usage. [I]

6.8. EF_{ADN}: Abbreviated Dialling Numbers

6.8.1 The EIRENE specification requires the ability to store a list of names & frequently used numbers. This field should be used to store these numbers. [I]

6.8.2 This EF shall be capable of storing a minimum of 100 numbers. [M]

6.8.3 The length of the name associated with each number stored in this file shall be a minimum of 14 characters. [MI / M]

i. numbers = 100 numbers x 14 bytes
ii. names = 100 names x 14 characters

6.8.4 The structure description and access rights are described in document [3]. This EF is included in the $DF_{TELECOM}$. [I]

6.9. EF_{SMS} , EF_{SMSP} and EF_{SMSS}: Short Messages

6.9.1 The EIRENE specification requires support for SMS services. [I]

6.9.2 These fields contain the short message information. [I]

6.9.3 Structure description and access right are described in document [3]. These EFs are included in the $DF_{TELECOM}$. [I]

6.10. EF_{MSISDN}: MSISDN for speech, data and fax

6.10.1 The EIRENE specification requires being able to store MSISDN used within the SIM card. [I]

6.10.2 This EF contains the MSISDN used for speech, data and fax. [I]

6.10.3 Structure description and access rights are described in document [3]. This EF is included in the $DF_{TELECOM}$. [I]

Identifier: '6F40'	Structure: linear fixed	
Record length: X+14 bytes	Update activity: low	

Access Conditions:

READ	CHV1
UPDATE	CHV1 **but ADM is recommended (see 6.10.4)**
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier	O	X bytes
X+1	Length of BCD number/SCC contents	M	1 byte
X+2	TON and NPI	M	1 byte
X+3 to X+12	Dialling Number/SCC String	M	10 bytes
X+13	Capability/Configuration Identifier	M	1 byte
X+14	Extension1 Record Identifier	M	1 byte

Figure 7: EF_{MSISDN} structure

6.10.4 GSM-R terminals use EF_{MSISDN} during the interrogation and forced deregistration procedures: if the content of this field is incorrectly filled, then the above procedures will not work properly. Hence, it is highly recommended to prevent the possibility that the user, via MMI, accidentally modifies the content of this field: this is achieved by setting EF Update Access Condition to ADM. It shall be a GSM-R operator responsibility to fill the content of EF_{MSISDN}. [I]

6.10.5 For contents and coding of all data items see the respective data items of EF_{ADN} defined in [3]. [I]

6.10.6 Please note that this file has to be set individually for each SIM card. No pre-set value is possible. [I]

6.10.7 As EIRENE does not support multi-numbering capability the subscriber shall use the same MSISDN number for voice, for fax and for data terminated calls. [MI]

6.10.8 For example: The EF_{MSISDN} content in case of Alpha Identifier =”Own number” and associated MSISDN number =”+393138123456” shall be: [I]

- “4F 77 6E 20 6E 75 6D 62 65 72 FF FF FF FF”: Alpha Identifier (X = 14) coded using SMS default 7-bit coded alphabet as defined in with bit 8 set to 0.
- “07”: Length of BCD number/SCC contents = 7 bytes
- “91”: TON = International and NPI = ISDN/Telephony numbering plan
- “93 13 83 21 43 65 FF FF FF FF”: Dialling Number/SCC String written in nibble format
- “FF”: Capability/Configuration Identifier
- “FF”: Extension1 Record Identifier

6.11. EF_{LND} : Last Number Dialled

6.11.1 The EIRENE specification requires support for a set of Last Number Dialled. The SIM card files EF_{LND} can support this list. [I]

6.11.2 However, the last dialled number could be stored directly in the mobile, and not in the SIM card. [I]

6.12. EF_{SDN}: Service Dialling Numbers

6.12.1 The EIRENE specification requires direct access to following numbers. These numbers are mainly directly associated to a MMI function (e.g. Cab Radio priority access). [I]

6.12.2 The number of EF_{SDN} records is GSM-R Operator’s specific. The minimum number of records shall be 10. [MI / M]

6.12.3 The use of this file within the GSM-R environment is to store short codes. [MI / M]

i. services numbers = 10 x 14 bytes
ii. services names = 10 x n characters (where n>=3)

6.12.4 The ”Services numbers” field contains fixed dialling numbers and/or supplementary service control strings (SSC). [I]

6.12.5 The service name shall be an N characters string, where N is equal or bigger than 3. [MI / M].

6.12.6 The field length of the name tag can be chosen by the operator with a minimum length of 3 characters. A usual length is the same as for EF_{ADN}. [I]

6.12.7 Also VGCS and VBS tele-services (including priority) could be initiated using this concept. [I]

6.12.8 SIM-Cards to be used for voice & non safety critical data radios shall have EF_{SDN} records 1 to 5 and 7 configured as according to Table 9. [MI / M]

6.12.9 In case where DSD is implemented, then record 10 has also according to Table 9. [MI / M]

6.12.10 SIM-Cards to be used for ETCS data only radios shall have EF_{SDN} record 6 configured as according to Table 9. [MI]

6.12.11 SIM-Cards to be inserted in GPH, OPH or OPS can use a different configuration for service names and record content, provided that if train & shunting emergency GID are subscribed in the SIM, then the relevant invoke values occupy the1st and the 2nd record in EF_{SDN}. [I]

6.12.12 The contents of this file shall be according to Table 9, depending on the type: [MI / M]

Record	Service names	Service description	For e.g. : invoke values
1	ETE	(train) emergency call	*SC[3]*<priority[4]>#<GID[5]>
2	ESE	(shunting) emergency call	*SC*<priority>#<GID>
3	PPC	Primary train controller	*<priority>#<short codes>
4	PSC	Secondary train Controller	*<priority>#<short codes>
5	PEC	Electrical power supply controller	*<priority>#<short codes>
6	RBC	Radio Block Centre for ETCS	*<priority>#<short codes>
7	PDA	Other drivers in area	*SC*<priority>#<GID>
8	Reserved for future use	Reserved for future use	
9	Reserved for future use	Reserved for future use	
10	DSD	Driver Safety Device	*<priority>#<short codes>

Table 9: EF_{SDN} configuration

6.12.13 Structure description and access rights are described in document [3]. This EF is included in the $DF_{TELECOM}$. [I]

6.12.14 SC is Service Code described in GSM 02.30: [I]

- SC = "17" for VGCS calls
- SC = "18" for VBS calls

6.12.15 Priority is coded on 3 digits as described in GSM 02.30: [I]

- Priority = "750" for priority level 0
- Priority = "751" for priority level 1
- Priority = "752" for priority level 2
- Priority = "753" for priority level 3

[3] SC is Service Code described in [14]
[4] coded on 3 digits as described in [14]
[5] as defined in the document [1]

- Priority = “754” for priority level 4

6.12.16 Structure description and access rights are described in document [3]. This EF is included in the $DF_{TELECOM}$. [I]

6.12.17 Empty records shall be filled with FF FF … . [MI / M]

7. EIRENE FILES

7.1. Introduction

7.1.1 The EIRENE specification has specific requirements not covered by the standard GSM phase 2+. Owing to these requirements, the EIRENE specific files are defined in the following table. The purpose of this table is to specify these files and to define their structure. [I]

7.1.2 The EIRENE EFs are not part of the GSM standard. They shall be included into a Dedicated File. [MI / M]

7.1.3 EIRENE specific data shall be stored into the new dedicated DF_{EIRENE}. This DF_{EIRENE} is situated at the root of the GSM-R SIM card file system. [MI / M]

7.1.4 The advantages are of a dedicated EIRENE file are: [I]

- GSM-R SIM cards may be used in a standard GSM MS, without any corruption of specific EIRENE information,
- The consequence is that only GSM-R mobiles are able to manage information in this DF.

7.1.5 The identifier of DF_{EIRENE} shall be: '7FE0'. [MI / M]

7.1.6 Table 10 lists the GSM EFs relevant to GSM-R SIM cards: [I]

DF name	EF name	Identifier	Type	Contents
EIRENE	FN	6FF1	Linear Fixed	Functional numbers
EIRENE	CallconfC	6FF2	Transparent	Call Confirmation of emergency calls Configuration
EIRENE	CallconfI	6FF3	Linear Fixed	Call Confirmation of emergency calls Information
EIRENE	Shunting	6FF4	Transparent	Shunting
EIRENE	GsmrPLMN	6FF5	Linear Fixed	GSM-R network selection
EIRENE	IC	6F8D	Linear Fixed	International Code
EIRENE	NW	6F80	Linear Fixed	Network name

Table 10: EIRENE GSM EFs

7.1.7 The GSM-R SIM cards also contain EFs that are used for the supporting of the numbering plan. These EFs are specified in chapter 8. [I]

7.1.8 The GSM EFs listed in Table 11 shall be present on the GSM-R SIM cards based on their usage.

EF name	Cab Radio	General Purpose Radio	Operational Radio	Shunting Radio	ETCS Data Only Radio
FN	MI	M	M	M	N/A
CallconfC	MI	M	M	M	N/A
CallconfI	MI	M	M	M	N/A
Shunting	MI	N/A	N/A	M	N/A
GsmrPLMN	MI	M	M	M	MI
IC	MI	M	M	M	N/A
NW	MI	M	M	M	N/A

Table 11: EIRENE GSM EFs per radio type

7.1.9 The following rule applies to all BCD coded values in this chapter: [I]

- Digit 1 of a BCD coded value shall be the most significant digit.
- In this chapter, some values are strings. The alphabet used by those strings shall follow CCITT Recommendation T.50: "International Alphabet No. 5". (ISO 646: 1983, "Information processing - ISO 7-bits coded characters set for information interchange".) The alphabet is also known as SMS default 7-bit coded alphabet.

7.1.10 The following sections specify the content, usage and “MI / M” classification of the EFs identified in Table 11. [I]

7.2. EF_{FN}: Functional Numbers

7.2.1 GSM-R Mobile stations shall store Functional Numbers on the SIM card that have been previously registered successfully in the GSM-R network (see document [6]). [I]

7.2.2 The file EF_{FN} is used to support the storage of Functional Numbers. [I]

7.2.3 The storage dimensioning is based on the usage of the SIM card. The GSM-R network operator should define the appropriate number of records required. The following clauses give an example of the dimensioning. [I]

7.2.4 As an example for a Cab Radio, the sizing of FNs that a GSM-R SIM card requires to allow having simultaneously: [I]

- 2 train numbers
- 1 engine number (or coach number)
- 1 FN for shunting mode.

7.2.5 As an example for a Cab Radio, assuming a maximum of 15 Function Codes allocated per train number and 5 Function Codes associated with engine/coach number, this leads to a total of 36 = (15*2TN+5*1EN+1) functional numbers which that SIM shall support as a minimum. [I]

7.2.6 Additionally, Functional Numbers stored in the SIM card have to be split into 2 types: [I]

- Permanent Functional Number : the engine number or the coach number
- Temporary Functional Number : the other Functional Numbers

7.2.7 The following clauses relate to the de-registration process which is controlled by the Cab Radio, OPH and GPH. They are included here for information purposes only [I]

7.2.8 The temporary FN can be de-registered in addition to user action by the application program when one of the following events occurs. [I]

- MS is switched off

- Invalid functional number after interrogation
- External de-registration of FN (for e.g. forced FN de-registration).

7.2.9 The EF_{FN} file supports the current functional address of the GSM-R Mobile stations. The structure of EF_{FN} is according to Table 12: [MI / M]

Identifier: '6FF1'	Structure: linear fixed	
file length: 9*n bytes (n<=36)	Update activity: high	
Access Conditions: READ CHV1 UPDATE CHV1 INVALIDATE ADM REHABILITATE ADM		

Bytes	Description	M/O	Length
1 to 8	Functional Number and type	M	8 bytes
9	List Number	M	1 byte
:	:	:	:
9*(n-1)+1 to 9*(n-1)+8	Functional Number and type	O	8 bytes
9*n	List Number	O	1 byte

Table 12: EF_{FN} structure

7.2.10 Functional Number and type

7.2.10.1 The field ”Functional Number and type” contains the FN [I].

7.2.10.2 The Functional Number size is up to 15 digits, coded in BCD [MI / M].

7.2.10.3 The FN shall be stored in the format defined in [9], and the IC is included. [MI / M]

7.2.10.4 The structure of this field is according to Table 13: [MI / M]

B8	B7	B6	B5	B4	B3	B2	B1	
Digit 2				Digit 1				Byte 1
Digit 4				Digit 3				Byte 2
Digit 6				Digit 5				Byte 3
Digit 8				Digit 7				Byte 4
digit 10				Digit 9				Byte 5
digit 12				Digit 11				Byte 6
digit 14				Digit 13				Byte 7
0/1	0/1	Spare		Digit 15				Byte 8

Table 13: Functional Number and type structure

7.2.10.5 The value ‘F’ is used for an empty digit. [MI / M]

7.2.10.6 The last byte of the field is according to Table 14: [MI / M]

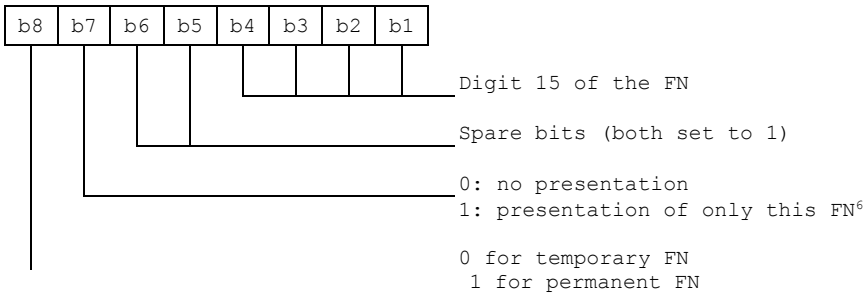

Table 14: structure of last byte of Functional Number and type

7.2.10.7 The field ”List number” contains the serial number of the FN. [MI / M]

- The field is coded in binary.
- The empty value is ‘0’.

7.2.11.8 This field is managed automatically by the MS to sort FN registration. The following rules shall be applied :

- When the first FN is registered, then the serial number is ‘1’.
- When the MS is switched on, then the serial number is the maximum value stored in the set of the field ”List number”.
- When a FN is registered, the serial number is automatically incremented by the MS application. The increment is ‘1’. Then the serial number increases until it reaches the value ‘255’.
- When a FN is de-registered, the serial number is temporarily ”lost”. The field “List number” is set to the empty value ‘0’.
- When this serial number reaches the maximum value ‘255’, then the list of serial numbers may be of a discontinuous order. Then the list of serial number is rearranged from 1 to the amount of registered FN (up to 36) and all fields ‘List number’ are updated. The application is in charge of updating the value in all the ‘List number’ fields.

7.2.10.9 The default value for those records reserved for “temporary” functional numbers, in case no functional number is stored in the SIM-Card, is ‘FF FF FF FF FF FF FF 3F 00’. [MI / M]

7.3. $EF_{CallConfC}$ $EF_{CallConfI}$: Call Confirmation of emergency calls

7.3.1 The EIRENE specification requires confirmation of sending or receipt of Railways Emergency Calls. This function requires the storing of the following: [MI / M]

- PL_CONF, the priority level of call confirmation,
- CONF_NR, the phone number of the Acknowledgement Centre,
- MAX_RAND, the maximum value (in sec) of a random range of confirmation call,

[6] When the subscriber is registered to more than one FN, this bit is used to indicate the current FN displayed on the screen and sent to the network in the User to User Information Element field.

- N_ACK_MAX, the number of confirmation trials until a success,
- PL_ACK, Priority level over which a confirmation is needed,
- N_NESTED_MAX, the maximum number of pending confirmation calls (currently 10).
- Train Emergency GID, the position of GID=299 into EFVGCS
- Shunting emergency GID, the position of GID=599 into EFVGCS

7.3.2 The Call structure set is dedicated to one call and contains: [MI / M]

- T_DURs, the duration of the call to confirm,
- T_RELCALC, the time stamp to calculate T_REL,
- PL_CALL, the priority level of the received call,
- CAUSE, the cause of the end of call,
- GCR, the Group Call Reference of the call,
- FNR, the Functional Number of the MS when the call is received,

7.3.3 It should be noted that in the above call structure set, no field is foreseen to store the information whether the Call Confirmation sender was the originator or the recipient of a Railways Emergency Call. [I]

7.3.4 The general confirmation parameters could be configured by the railway Operator to optimise the network load. [I]

7.4. $EF_{CallconfC}$: Call Confirmation Configuration

7.4.1 Table 15: $EF_{CallConfC}$ structureTable 15 defines the structure of the Call Confirmation EF. [MI / M]

Identifier: '6FF2'	Structure: transparent	
file length: 24 bytes	Update activity: low	

Access Conditions:

READ	CHV1
UPDATE	CHV1
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1	PL_CONF	M	1 byte
2-9	CONF_NR	M	8 bytes
10	MAX_RAND	M	1 byte
11-12	N_ACK_MAX	M	2 bytes
13	PL_ACK	M	1 byte
14	N_NESTED_MAX	M	1 byte
15	Train Emergency GID	M	1 byte
16	Shunting Emergency GID	M	1 byte
17-24	IMEI	M	8 bytes

Table 15: $EF_{CallConfC}$ structure

7.4.2 The field ”PL_CONF” contains the configuration of the priority of the call confirmation according to Figure 8. [MI / M]

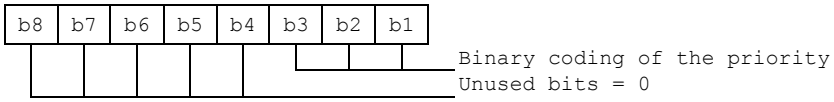

Figure 8: structure of PL_CONF

7.4.3 The binary coding of the priorities is according to Table 16: [MI / M]

0	No priority
1	Priority 4
2	Priority 3
3	Priority 2
4	Priority 1
5	Priority 0

Table 16: structure of binary coding

7.4.4 The priority level of a call confirmation shall be set according E-SRS chapter 13.5.5. [MI / M]

7.4.5 For priority 4 call confirmation, “PL_CONF” should be set to ’01’. [I]

7.4.6 The field ”CONF_NR” contains the phone number of the call confirmation centre. The configuration is according to Table 17. This phone number is coded in BCD. It has a maximum of 16 digits. ‘F’ is an empty digit. [MI / M]

B8	B7	B6	B5	B4	B3	B2	B1	
Digit 2				Digit 1				Byte 1
Digit 4				Digit 3				Byte 2
Digit 6				Digit 5				Byte 3
Digit 8				Digit 7				Byte 4
digit 10				Digit 9				Byte 5
digit 12				Digit 11				Byte 6
digit 14				Digit 13				Byte 7
Digit 16				Digit 15				Byte 8

Table 17: Structure of CONF_NR

7.4.7 The EIRENE numbering plan specifies short code =”1612” for call confirmation address, so CONF_NR should be set to ‘61 21 FF FF FF FF FF FF’. [MI / M]

7.4.8 The field ”MAX_RAND” contains the hexadecimal maximum value (in seconds) for the random timer used to establish the call confirmation call. The values of MAX_RAND are defined in [5]. As an example, if the mobile is required to send confirmation within 30 seconds from the end of the emergency call, then MAX RAND has to be set to ‘1E’. [MI / M]

7.4.9 The field ”N_ACK_MAX” contains the maximum number of trials to send confirmation. This value is coded in binary. The values are defined in [5]. [MI / M]

7.4.10 The field ”PL_ACK” contains the threshold above which a confirmation is required. [I]

7.4.11 Calls that do not exceed this priority level will not be stored in the $EF_{CallConfI}$ file. [I]

7.4.12 The coding of field PL_ACK shall be in accordance with Table 18 and Table 19. [MI / M]

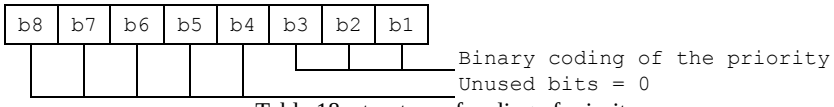

Table 18: structure of coding of priority

7.4.13 The binary coding of the priorities is according to Table 19. [MI / M]

0	No priority
1	Priority 4
2	Priority 3
3	Priority 2
4	Priority 1
5	Priority 0
6	Priority B
7	Priority A

Table 19: structure of priority

7.4.14 The values for priority within Table 19 are independent of the subscribed priority EF_{eMLPP}. [I]

7.4.15 The configuration of PL_ACK shall be according the definition of CHPC as defined in [5] [MI / M]

7.4.16 The field ”N_NESTED_MAX” contains the maximum number of element of the $EF_{CallConfI}$. The coding is in binary. The value N_NESTED_MAX shall be equal to the number of records of $EF_{CallConfI}$. [MI / M]

7.4.17 The field ”Train Emergency GID” contains an index pointing to the Train Emergency GID in the EF_{VGCS}. This value is coded in binary and is in the range [1, 507]. This field shall be put in relation with the Train Emergency Call GID given in the EF_{SDN}. If no Train Emergency GID is defined in EF_{VGCS}, then the field has to be configured to “FF”. [MI / M]

7.4.18 For example, if Train Emergency GID is the first GID in the EF_{VGCS} this field is set to ‘01’. [I]

7.4.19 The field ”Shunting Emergency GID” contains an index pointing to the Shunting Emergency GID in the EF_{VGCS}. This value is coded in binary and is in the range [1 to 50]. This field shall be put in relation with the Shunting Emergency Call given in the EF_{SDN}. If no Shunting Emergency GID is defined in EF_{VGCS} then the field has to be configured to “FF”. [MI / M]

7.4.20 For example, if Shunting Emergency GID is the second GID in the EF_{VGCS} this field is set to ‘02’. [I]

7.4.21 As an option the field IMEI could contain the IMEI of the MS. [O]

7.4.22 If the IMEI option is implemented, this IMEI is coded in BCD. It has a maximum of 15 digits. ‘F’ is an empty digit. This field shall be pre-set by the operator with 'F' for all digits. [M]

7.4.23 If the IMEI option is implemented on the terminals, they shall write their own IMEI into this field. [M]

7.4.24 If the field IMEI is implemented, in case where the IMEI stored in the SIM card is different from the IMEI of the MS either because the SIM card has been replaced or the IMEI field has been modified by an OTA-Update, then the Mobile or Cab Radio shall read or re-read all fields of the recently inserted or updated SIM card. The terminal shall subsequently re-write its IMEI on the SIM card. [M]

7.4.25 When an OTA change is made, the IMEI field in Elementary File CallconfC shall be set to “FF FF FF FF FF FF FF FF”. [M]

7.4.26 As an example, EFCallconfC could be configured as follows: [I]

“01 <u>61 21 FF FF FF FF FF FF</u> 1E 00 03 04 0A 01 02 FF FF FF FF FF FF FF FF“

[7] in binary : from 1 [Hexa] to 32 [Hexa]

7.5. $EF_{CallConfI}$: Call Confirmation Information

7.5.1 Table 20 defines the structure of the Call Confirmation Information EF [MI / M]

Identifier: '6FF3'	Structure: linear	
file length: 21 * n bytes (n<=10)	Update activity: high	
Access Conditions: READ CHV1 UPDATE CHV1 INVALIDATE ADM REHABILITATE ADM		

Bytes	Description	M/O	Length
1 to 3	T_DUR	M	3 bytes
4 to 7	T_RELCALC	M	4 bytes
8	PL_CALL	M	1 byte
9	CAUSE	M	1 byte
10 to 13	GCR	M	4 bytes
14 to 21	FNR	M	8 bytes
:	:	:	:
21*(n-1)+1 to 21*(n-1)+3	T_DUR	O	3 bytes
21*(n-1)+4 to 21*(n-1)+7	T_RELCALC	O	4 bytes
21*(n-1)+8	PL_CALL	O	1 byte
21*(n-1)+9	CAUSE	O	1 byte
21*(n-1)+10 to 21*(n-1)+13	GCR	O	4 bytes
21*(n-1)+14 to 21*(n-1)+21	FNR	O	8 bytes

Table 20: structure of $EF_{CallConfI}$

7.5.2 The field ”T_DUR” contains the call duration (in seconds). The value is coded in binary. [MI / M]

7.5.3 The field ”T_RELCALC” contains the timestamp needed by the MS to calculate “T_REL” parameter, which is one of the timers to be sent to the Acknowledgement Centre. T_REL corresponds to the delay between the end of the call and the sending of the confirmation. [MI / M]

7.5.4 The field ”PL_CALL” contains the priority of the call received according to Table 21. [MI / M]

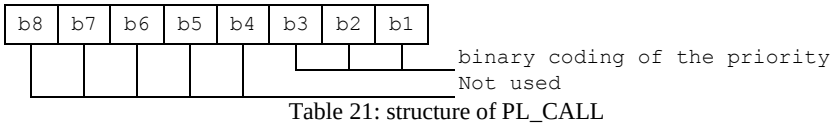

Table 21: structure of PL_CALL

7.5.5 The decimal coding of the priorities is according to Table 22. [MI / M]

0	No priority
1	Priority 4
2	Priority 3
3	Priority 2
4	Priority 1

5	Priority 0
6	Priority B
7	Priority A

Table 22: structure of priority

7.5.6 The field ”CAUSE” contains the value of the cause of the termination according to the below specification and according to Table 23. [MI / M]

- ‘00’ is regular call termination
- otherwise, a bit to ‘1’ indicates an error :

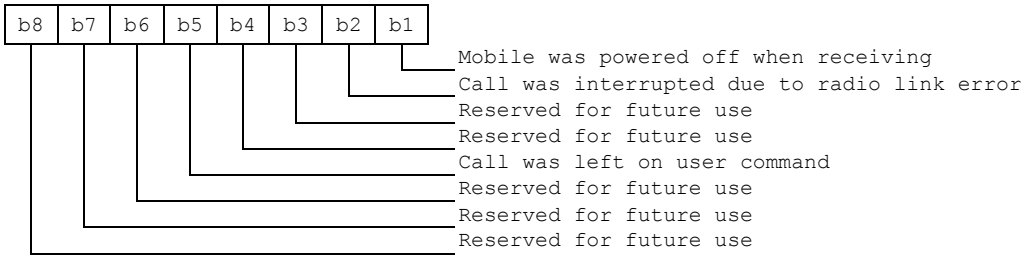

Table 23: structure of CAUSE

7.5.7 The field ”GCR” contains the group call reference. This value has a maximum of 8 digits and is coded in BCD according to Table 24. The value ‘F’ is used for an empty digit. [MI / M]

B8	B7	B6	B5	B4	B3	B2	B1	
Digit 2				Digit 1				Byte 1
Digit 4				Digit 3				Byte 2
Digit 6				Digit 5				Byte 3
Digit 8				Digit 7				Byte 4

Table 24: structure of GCR

7.5.10 The field ”FNR” contains the default Functional Number of the MS which was set to be presented by the MS when the emergency call was received. This value has a maximum of 15 digits and is coded in BCD according to Table 25. The value ‘F’ is used for an empty digit. The FN shall be stored following [9]. [MI / M]

B8	B7	B6	B5	B4	B3	B2	B1	
digit 2				Digit 1				Byte 1
digit 4				Digit 3				Byte 2
digit 6				Digit 5				Byte 3
digit 8				Digit 7				Byte 4
Digit 10				Digit 9				Byte 5
Digit 12				Digit 11				Byte 6
Digit 14				Digit 13				Byte 7
‘F’				Digit 15				Byte 8

Table 25: structure of FNR

7.5.11 The default value when there is no call to confirm is ‘FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF’. [MI / M]

7.6. $EF_{Shunting}$: Shunting

7.6.1 For some types of MS the EIRENE specification requires shunting functionality. In this case, GSM-R SIM card has to store information. Identified information to store is : [I]

- the common shunting GID, one of the GIDs subscribed in the EF_{VGCS},
- the list of shunting GIDs. A shunting GID has to be a subscribed GID. The list of subscribed GIDs is in the EF_{VGCS}.

7.6.2 The structure definition used for Shunting ($EF_{Shunting}$) is according to Table 26. [MI / M]

Identifier: ‘6FF4’	Structure: transparent	
file length: 8 bytes	Update activity: low	
Access Conditions: READ CHV1 UPDATE ADM INVALIDATE ADM REHABILITATE ADM		

Bytes	Description	M/O	Length
1	Common GID	M	1 byte
2 to 8	Shunting GID	M	7 bytes

Table 26: structure of $EF_{Shunting}$

7.6.3 The field ”Common GID” contains a value coded in binary. This value is in the range [1 to 50]. This number is an index pointing to the Common Shunting GID in the EF_{VGCS}. If no common shunting GID is available in EF_{VGCS}, the value shall be set to 'FF'. [MI / M]

7.6.4 The field ”Shunting GID” contains the indication concerning the GID subscribed in the EF_{VGCS} which are shunting GID. A bit is set to ‘1’ if the corresponding GID in the record of EF is a shunting GID. Otherwise, the bit is set to ‘0’. If GID 500 and 599 are present, the equivalent bits in the following table have to be set to 1. [MI / M]

7.6.5 Table 27 specifies for each bit of the field the record number of the EF_{VGCS}. [MI / M]

B8	B7	B6	B5	B4	B3	B2	B1	
8	7	6	5	4	3	2	1	Byte 1
16	15	14	13	12	11	10	9	Byte 2
24	23	22	21	20	19	18	17	Byte 3
32	31	30	29	28	27	26	25	Byte 4
40	39	38	37	36	35	34	33	Byte 5
48	47	46	45	44	43	42	41	Byte 6
Unused bits = 0						50	49	Byte 7

Table 27: coding of $EF_{Shunting}$

7.6.5 Table 27 allows identification management of the shunting GID in the EF_{VGCS} and the rights to activate or de-activate those GIDs in the EF_{VGCSS}. [MI / M]

7.6.6 Procedures and rules for shunting are described within [2]. Subscription checking for GIDs and priority levels are not performed by the SIM card. [I]

7.6.7 If no shunting GIDs are subscribed in EF_{VGCS}, the default configuration for $EF_{Shunting}$ shall be: "FF 00 00 00 00 00 00 00". The configuration for the example reported at § 6.4.10 shall be "04 FA FF FF FF 01 00 00". [MI / M]

7.7. $EF_{GsmrPLMN}$: GSM-R network selection

7.7.1 EIRENE requires a network selection mechanism according to the following: [I]

1. home EIRENE network;
2. "foreign" EIRENE networks;
3. non-EIRENE networks (with order of priority predetermined by virtue of international subscriptions and roaming agreements).

7.7.2 The required priority of the networks is coded in the order Table 28. [MI / M]

Identifier: '6FF5'	Structure: linear fixed	
file length: 9*n bytes (n<=50)	Update activity: low	
Access Conditions: READ CHV1 UPDATE ADM INVALIDATE ADM REHABILITATE ADM		

Bytes	Description	M/O	Length
1 to 3	PLMN 1	M	3 bytes
4	Class of network 1	M	1 byte
5 to 6	IC-Incoming reference table 1	M	2 bytes
7 to 8	Outgoing reference table 1	M	2 bytes
9	IC table reference 1	M	1 byte
:	:	:	:
9*(n-1)+1 to 9*(n-1)+3	PLMN n	O	3 bytes
9*(n-1)+4	Class of network n	O	1 byte
9*(n-1)+5 to 9*(n-1)+6	IC-Incoming reference table n	O	2 bytes
9*(n-1)+7 to 9*(n-1)+8	Outgoing reference table n	O	2 bytes
9*(n-1)+9	IC table reference n	O	1 byte

Table 28: structure of $EF_{GsmrPLMN}$

7.7.3 The field "PLMN" contains the Mobile Country Code (MCC) followed by the Mobile Network Code (MNC). The coding of this field is the same as described in the $EF_{PLMNsel}$ in the document [3]. [MI / M]

7.7.4 The Mobile Country Code (MCC) is followed by the Mobile Network Code (MNC). [MI / M]

7.7.5 Coding is according to [15]. If storage for fewer than the maximum possible number n is required, the excess bytes shall be set to 'FF'. [MI / M]

7.7.6 For instance, using 246 for the MCC and 81 for the MNC and if this is the first and only PLMN, the contents reads according to Table 29: [I]

Bytes 1-3:	'42' 'F6' '18'
Byte 4:	'F8'
Byte 5-6:	'6F8D'
Byte 7-8:	'6F8E'
Byte 9:	'01'

Table 29: example of $EF_{GsmrPLMN}$

7.7.7 The ”Class of network” field has the structure according to Table 30: [MI / M]

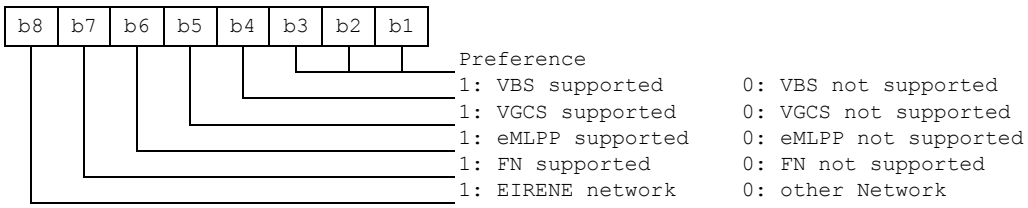

Table 30: structure of Class_of_network

7.7.8 The “Preference” parameter is a binary value. ‘0’ is the highest priority and ‘7’ is the lowest priority. The LSB is b1 the MSB is b3. [MI / M]

7.7.9 The bits b8 to b4 indicate the features supported by the network. [I]

- VBS : Indicates whether the network supports VBS
- VGCS : Indicates whether the network supports VGCS
- eMLPP : Indicates whether the network supports eMLPP.
- FN : Indicates whether the network supports Functional Numbering.
- EIRENE network : Indicates whether the network supports the EIRENE numbering plan.

7.7.10 The field ”IC-Incoming reference table” is a BCD value. This field contains the address of the Elementary File in the DF_{EIRENE} which is the root file of the numbering plan tree to analyse a Functional Numbers for incoming calls. Hence, the content of this field has to be set to “6F 8D”, which is the EF_{IC} address in the DF_{EIRENE}. [MI / M]

7.7.11 The field ”Outgoing reference table” is the address of the Elementary File in the DF_{EIRENE} which is the root file of the Numbering Plan tree to construct a Functional Number. Hence, the content of this field has to be set to “6F 8E”, which is the EF_{CT} address in the DF_{EIRENE}. [MI / M]

7.7.12 The field ”Outgoing reference table” shall be filled with “FFFF” if the MS is operated in a network that does not support the EIRENE numbering plan. [MI / M]

7.7.13 The ”IC table reference” is a 1 byte not swapped BCD value where digit 1 is reserved for Most Significant Byte and digit 2 for Less Significant Byte (see Table 31). It is a record number in a EIRENE SIM card file where the IC value and the reference to the network name are stored. This file shall be a mandatory file described in the paragraph of the numbering plan (see chapter 8). The reference of the IC file is in the field ”IC-Incoming reference table”. [MI / M]

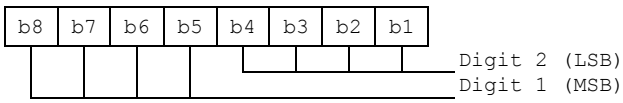

Table 31: structure of IC table reference

7.7.14 The value ‘FF’ shall be used to indicate an empty table. In this case, there is no numbering plan information available for this PLMN. [MI / M]

7.7.15 Please note that the Home PLMN shall be included in the $EF_{GsmrPLMN}$ and shall be the first entry. [I]

7.7.16 All the empty records shall be at the end of the EF and filled with ‘FF FF FF FF FF FF FF FF’. [MI / M]

7.8. EF_{IC}: International Code

7.8.1 Tables of “IC” values

7.8.1.1 This type of table provides relevant information to decide which branch of the decision table to select for the given number. [I]

7.8.1.2 The table for IC values consists of a number of records. Each record length is defined to be 7 bytes with the following structure: [MI / M]

1	1 byte	Next table type indicator : This byte defines the type of the next table or indicates to the application program that the end of the decision tree is reached.
2	2 bytes	Next table pointer : These bytes refer to the next Elementary File of the decision tree.
3	2 bytes	IC Value : These bytes define the number of digits (1 to 4) that are relevant to read from the dialled/matched number string for a switching decision. The switching decision will define the selected branch of the decision tree.
4	2 bytes	Network String Table Index : A binary reference to an alphanumerical string which identifies the network name. This string is displayed to the user to indicate the network name. These strings shall be stored on the SIM (EF_{NW}).

Table 32:structure of records of the EF_{IC}

7.8.2 “IC” table structure

7.8.2.1 The structure definition used for IC table (EF_{IC}) is according to Table 33. [MI / M]

Identifier: 6F8D	Structure: linear fixed	
Record length: 7n bytes (n<=50)	Update activity: low	

Access Conditions:

READ	CHV1
UPDATE	ADM
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1	Next Table Type 1	M	1 byte
2-3	Identifier of the next table 1	M	2 bytes
4-5	IC decision value 1	M	2 bytes
6-7	Network String table Index 1	M	2 bytes
:	:	:	:
7*(n-1)+1	Next Table Type n	O	1 byte
7*(n-1)+2 to 7*(n-1)+3	Identifier of the next table n	O	2 bytes
7*(n-1)+4 to 7*(n-1)+5	IC decision value n	O	2 bytes
7*(n-1)+6 7*(n-1)+7	Network String table Index n	O	2 bytes

Table 33: structure of EF_{IC}

7.8.2.2 The fields ”Next Table Type” as well as the ”Identifier of the next table” follow the same format as specified for the switching table structure. [add ref to chp 8] [MI / M]

7.8.2.3 The field ”IC decision value” contains the International Code (IC), 1 to 3 digits. This field is coded in BCD. Digits not relevant are coded as ‘F’. The relevant digits (not ”F”) shall be situated beginning with the MSB of the decision value field. [MI / M]

7.8.2.4 ”FFFF” as a decision value is not allowed. [MI / M]

7.8.2.5 The coding of the ”Decision value” (2 bytes) is according to Table 34 and Table 35. [MI / M]

First byte :

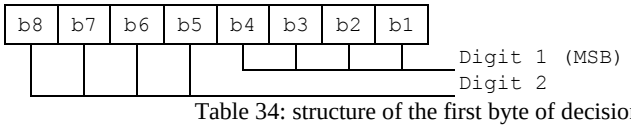

Table 34: structure of the first byte of decision value

Second byte :

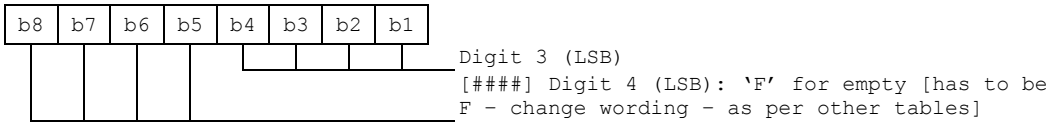

Table 35: structure of the second byte of decision value

7.8.2.6 The field ”Network String Table Index” contains a value from ‘1’ up to ‘65535’. The Network string table is stored in an EF_{NW} on the SIM. The coding of the ”Network String Table index” (2 bytes) is in binary coding with: [MI / M]

a) The first byte is the MSB,

b) the second byte is the LSB.

7.8.2.7 All the empty records shall be at the end of the EF and filled with ‘FF FF FF FF FF FF FF’. [MI / M]

7.9. EF_{NW}: Network name

7.9.1 An Elementary File in the GSM-R SIM card shall contain the network names. This file will be referred to the IC table [need x-ref to chp8 as EF_{IC} is not included in chapter 7]. [MI /M]

7.9.2 The EF_{NW} is defined in the DF_{EIRENE}. [MI /M]

7.9.2.1 The structure definition used for NW table (EF_{NW}) is according to Table 36. [MI / M]

Identifier: '6F80'	Structure: linear fixed	
file length: 8*n bytes (n<=50)	Update activity: low	
Access Conditions: READ CHV1 UPDATE ADM INVALIDATE ADM REHABILITATE ADM		

Bytes	Description	M/O	Length
1 to 8	Network name 1	M	8 bytes
:	:	:	:
8*(n-1)+1 to 8*(n-1)+8	Network name n	O	8 bytes

Table 36: structure of EF_{NW}

7.9.3 The field “Network name” is a string, which represents the short network name. The string is formatted based on the short format alphanumeric option described in AT+COPS command of document [3]. [MI / M]

7.9.4 In order to guarantee the usage of the same network names on Cab-Radio MMI, on driver handbook and on GSM-R Network signs along the tracks at borders, Cab-Radio SIM-Cards Network names shall be configured according to “GSM-R Network Codes table” included in [11]. [MI / M]

7.9.5 All the empty records shall be at the end of the EF and filled with ‘FF FF FF FF FF FF FF FF’. [MI / M]

8 EIRENE FILES SUPPORTING NUMBERING PLAN

8.1 Introduction

8.1.1 All EFs in this chapter shall be present on the SIM card to support the EIRENE numbering plan. The structure of the EFs shall be in accordance with the following sections. [MI]

8.1.2 The entries of the EF_{CT}, EF_{SC}, EF_{FC}, $EF_{Fct\ team}$, $EF_{Controller}$, $EF_{Gateway}$ can be selected based of national rules. [O]

8.1.3 The EIRENE specification has specific requirements not covered by the standard GSM phase 2+. Owing to these requirements, the EIRENE specific files are defined in the following table. The purpose of this chapter is to specify these files and to define their structure. The EFs in this chapter have the purpose of supporting the number plan. [I]

8.1.4 The EIRENE EFs are not part of the GSM standard. They shall be included into a Dedicated File. [MI / M]

8.1.5 EIRENE specific data shall be stored into the new dedicated DF_{EIRENE}. This DF_{EIRENE} is situated at the root of the GSM-R SIM card file system.[MI / M]

8.1.6 The identifier of DF_{EIRENE} shall be: '7FE0'. [MI / M]

8.1.7 Table 37 lists the GSM EFs relevant to GSM-R SIM cards. [I]

DF name	EF name	Identifier	Type	Contents
EIRENE	CT	6F8E	Linear Fixed	Call Type
EIRENE	SC	6F8F	Linear Fixed	Short Code
EIRENE	5to8digits	6F81	Transparent	Call Type 2 User Identity Number length
EIRENE	2digits	6F82	Transparent	2 digits input
EIRENE	8digits	6F83	Transparent	8 digits input
EIRENE	9digits	6F84	Transparent	9 digits input
EIRENE	SSSSS	6F85	Transparent	Group call area input
EIRENE	LLLLL	6F86	Transparent	Location number Call Type 6
EIRENE	Location	6F91	Transparent	Location number Call Type 7
EIRENE	FreeNumber	6F87	Transparent	Free Number Call Type 0 and 8
EIRENE	FC	6F88	Linear Fixed	Function Code
EIRENE	Service	6F89	Linear Fixed	VGCS/VBS Service Code
EIRENE	Call	6F8A	Linear Fixed	First digit of the group ID
EIRENE	FctTeam	6F8B	Linear Fixed	Call Type 6 Team Type + Team member function
EIRENE	Controller	6F92	Linear Fixed	Call Type 7 Controller function code
EIRENE	Gateway	6F8C	Linear Fixed	Access to external networks

Table 37: EIRENE GSM EFs for the supporting of the number plan

8.1.8 The GSM EFs listed in Table 38 shall be present on the GSM-R SIM cards based on their usage.

EF name	Cab Radio	General Purpose Radio	Operational Radio	Shunting Radio	ETCS Data Only Radio
CT	MI	M	M	M	N/A
SC	MI	M	M	M	M
5to8digits	MI	M	M	M	N/A

2digits	MI	M	M	M	N/A
8digits	MI	M	M	M	N/A
9digits	MI	M	M	M	N/A
SSSSS	MI	M	M	M	N/A
LLLLL	MI	M	M	M	N/A
Location	MI	M	M	M	N/A
FreeNumber	MI	M	M	M	N/A
FC	MI	M	M	M	N/A
Service	MI	M	M	M	N/A
Call	MI	M	M	M	N/A
FctTeam	MI	M	M	M	N/A
Controller	MI	M	M	M	N/A
Gateway	MI	M	M	M	N/A

Table 38: EIRENE GSM EFs for the supporting of the number plan, per radio type

8.1.9 The EIRENE specification requires accommodating different requirements of individual railways concerning the functional numbering. The MS has to be the most independent of the numbering plan. [I]

8.1.10 The storage in SIM card of numbering plan structure will give to MS a maximum flexibility in numbering arrangements. [I]

8.1.11 The definition of the numbering plan on the SIM shall not interfere with standard GSM requirements on European Emergency Call Number (112). [M]

8.1.12 The GSM Numbering Plan defines the structure of the phone numbers. Typically, this Numbering Plan is supported by the network, especially by the switch (Local Exchange, National Exchange or International Exchange). Each subscriber has an easy knowledge of the dialled number in order to contact the called party; he has to know the number and the prefix for the local area, for national STDs (Subscribers Trunk Dialling) and ISD (International Subscribers Dialling). [I]

8.1.13 The EIRENE Numbering Plan provides a more complete phone number structure in order to respond to the Railways professional needs. It is then no longer possible to expect the subscriber to keep in mind the structure of this Numbering Plan. It is for this reason that the subscriber needs a support in order to dial numbers in accordance with the numbering plan structure. [I]

8.1.14 For this purpose, the best way should be to store a complete application within the SIM card in order to construct a phone number in accordance with EIRENE requirements. The terminal could be fully independent of the numbering plan chosen by the Operator. [I]

8.1.15 The implementation should be as follows in order to provide a maximum flexibility and independence with regards to the values (digits or terms used) and with regards to national choices:

i. to store the ”building principles” of the structure of the numbering plan in the MS, that is to say the running application, [I]

ii. and to store all the elements and values of the numbering plan needed to build this structure in the SIM card. [I]

8.2 Brief numbering plan analysis

8.2.1 An analysis of the numbering plan retains those principles for any EIRENE number: [I]

1. The first digit (the Call Type) defines the type of the call.
2. Based on this value, the subscriber has to construct a number with a grouping of the following:
   a) either several digits to dial (the train number, the coach number, the engine number, the shunting team number, mobile subscriber number, a PSTN access number)
   b) or to select predefined numbers corresponding to an identified function (a Function Code (FC), an International Code (IC), a specific value corresponding to a specific usage).

8.2.2 The EIRENE numbers may be different for incoming and outgoing calls: in the case of incoming calls, the calling party FN starts with IC, while in case of outgoing calls the number may or may not start with "900+IC". [I]

8.3 SIM card Elementary Files structure

8.3.1 The SIM card shall contain structure information of the Numbering Plan. This structure will be stored in different files, organised like a tree, provided that some sub-trees could be common. [I]

8.3.2 There are three types of EF structures used to build up the tree. This is shown in Table 39. In the table is also shown how this EF is used. [I]

EF name	Switching	Predefined	Dialled
5to8digits			X
2digits			X
8digits			X
9digits			X
SSSSS			X
LLLLL			X
FreeNumber			X
FC		X	
Service		X	
Call		X	
FctTeam		X	
Gateway		X	
IC			
CT	X		
SC	X		
Location			X
Controller		X	

Table 39: EFs for the number plan tree

8.4 "Switching" Type EFs

8.4.1 This type of table provides the relevant information to decide which branch of the decision table to select for the given dialled number. [I]

8.4.2 The table for switching values consists of a number of records. Each record shall have a length of 6 bytes according to Table 40. [MI / M]

1	1 byte	Next table type indicator : This byte defines the type of the next table or indicates to the application program that the end of the decision tree is reached.
2	2 bytes	Next table pointer : These bytes refer to the next Elementary File of the decision tree.
3	2 bytes	Decision Value : These bytes define the number of digits (1 to 3) that are relevant to read from the dialled/matched number string for a switching decision. The switching decision will define the selected branch of the decision tree.
4	1 byte	String Table Index : A binary reference to an alphanumerical string which defines the meaning of the selected value. This string is displayed to the user to indicate the selected choice. These strings shall be stored in the mobile equipment (not on the SIM) and are displayed in the language corresponding to the user selection.

Table 40: Switching table record structure

8.4.3 EF_{CT} and EF_{SC} are the only EFs structured as a table of switching values. [I]

8.4.4 The definition of the structure used for decision is according to Table 41. [MI / M]

Identifier: 6F8E	Structure: linear fixed	
Record length: 6n bytes (n<=10)	Update activity: low	

Access Conditions:

READ	CHV1
UPDATE	ADM
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1	Next Table Type	M	1 byte
2 to 3	Identifier of the next table	M	2 bytes
4 to 5	Decision value 1	M	2 bytes
6	String table Index 1	M	1 byte
:	:	:	:
6*(n-1)+1	Next Table Type	O	1 byte
6*(n-1)+2 to 6*(n-1)+3	Identifier of the next table	O	2 bytes
6*(n-1)+4 to 6*(n-1)+5	Decision value n	O	2 bytes
6*(n-1)+6	String table Index n	O	1 byte

Table 41: structure of EFs used for switching

8.4.5 The field ”Next Table Type” shall contain the type of structure of the next table, according to the next list. [MI / M]

1. ‘F0’, for a ”decision” table which contains decision values.
2. ‘F1’, for a ”pre-defined values” table.
3. ‘F2’, for a ”number of dialled digits” table.
4. ‘F3’, for the ”IC” table.
5. ‘FF’, for an empty next table. End of the decision tree.

8.4.6 The field ”Identifier of the next table” is the address of another Elementary File in the decision tree. These EF are contained in the subdirectory file of DF_{EIRENE}. The value ‘FFFF’ is used for an empty next table and marks the end of the decision tree. [MI / M]

8.4.7 The field ”Decision value” contains 1 to 4 digits and is coded in BCD. Non-relevant digits shall be coded as ‘F’. The relevant digits (not ”F”) shall be situated beginning with the MSB of the decision value field. [MI / M]

8.4.8 The amount of relevant digits is fixed for all records within one decision table. [MI / M]

8.4.9 ”FFFF” as a decision value is not allowed. [MI / M]

8.4.10 The coding of the ”Decision value” (2 bytes) is according to Table 42 and Table 43: [MI / M]

First byte :

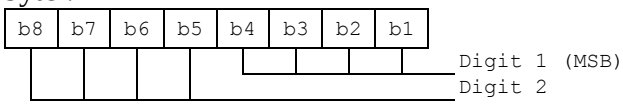

Table 42: structure of the first byte of decision value

Second byte :

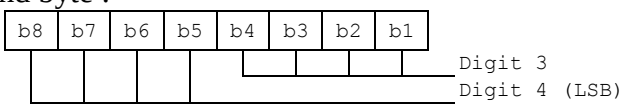

Table 43: structure of the second byte of decision value

8.4.11 The field ”String table Index” contains a value from ‘0’ to ‘254’. The value ‘255’ (‘FF’) means a nil pointer (no alphanumerical string available). The table of string is described in Table 54. [MI / M]

8.5 “Predefined” type EFs

8.5.1 This type of table is used wherever a combination of digits has a predefined meaning. E.g. 01 equals ”leading driver”. Note that the table refers only to a certain string. The string itself is not stored on the SIM. [I]

8.5.2 The table of predefined values consists of a number of records. The record length is defined to be 3 bytes. [MI / M]

8.5.3 The first record of the table serves as a header and is structured according to Table 44. [MI / M]

1	1 byte	Next table type indicator : This byte defines the type of the next table or indicates to the application program that the end of the decision tree is reached.
2	2 bytes	Next table pointer : These bytes refer to the next Elementary File of the decision tree.

Table 44: first record of predefined EFs

8.5.4 All following records of the table contain the predefined values and the string pointers according to Table 45. [MI / M]

1	2 bytes	Pre-defined value : Value of the pre-defined pattern of digits.
2	1 byte	String table Index : A binary reference to an alphanumerical string which defines the meaning of the call type. This string is displayed to the user to indicate the selected choice. These strings shall be stored in the mobile equipment (not on the SIM) and are displayed in the language corresponding to the user selection.

Table 45: all other records of predefined EFs

8.5.5 The file size for n predefined values is (3 + (3*n)) bytes of information. [I]

8.5.6 EFs structured as a table of predefined values are: EF_{FC}, $EF_{Service}$, EF_{Call}, $EF_{fctTeam}$, $EF_{Gateway}$ and $EF_{Controller}$, .[I]

8.5.7 The predefined values table structure will be defined according to Table 46. [MI / M]

Identifier: ----	Structure: linear fixed	
Record length: 3+(3*n) bytes (n<=99)	Update activity: low	
Access Conditions: READ CHV1 UPDATE ADM INVALIDATE ADM REHABILITATE ADM		

Bytes	Description	M/O	Length
1	Next Table Type	M	1 bytes
2 to 3	Identifier of the next table	M	2 bytes
4 to 5	Predefined value 1	M	2 bytes
6	String table Index 1	M	1 bytes
:	:	:	:
3+3*(n-1)+1 to 3+3*(n-1)+2	Predefined value n	O	2 bytes
3+3*(n-1)+3	String table Index n	O	1 bytes

Table 46: structure of EFs used for predefined

8.5.8 The fields ”Next Table Type” as well as the ”Identifier of the next table” follow the same format as specified for the switching table structure. [MI / M]

8.5.9 Followed by a set of: [MI / M]

i. 2 bytes up to 4 digits which are coded in BCD. The F is used for an empty or blank digit.

ii. 1 byte used as a decimal reference to an alphanumerical string which predefines the value (This will be displayed to the user to allow this choice to be stored in the mobile).

8.5.10 The field ”Predefined value” shall be according to Table 47 and Table 48: [MI / M]

First byte:

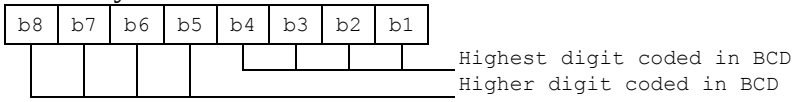

Table 47: structure of the first byte of predefined value

Second byte:

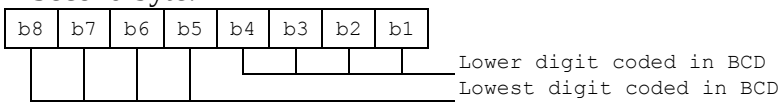

Table 48: structure of the second byte of predefined value

8.5.11 The value ‘F’ shall be used for an empty value. [MI / M]

8.5.12 The field ”String table Index” contains a value from ‘0’ to ‘254’. The value ‘255’ (‘FF’) shall indicate a nil pointer (no alphanumerical string available). The table of string is described below. [MI / M]

8.6 “Dialled” type EFs

8.6.1 This EF is composed of 4 bytes: the first three bytes of the table serves as a header and is structured according to Table 49. [MI / M]

1	1 byte	Next table type indicator : This byte defines the type of the next table or indicates to the application program that the end of the decision tree is reached.
2	2 bytes	Next table pointer : These bytes refer to the next Elementary File of the decision tree.

Table 49: first three bytes of dailled EFs

8.6.2 The fourth byte of the table contains the number of digits to be evaluated according to Table 50. [MI / M]

1	1 byte	Dialled Digit : This byte contains the max and min. number of digits to be evaluated.

Table 50: fourth byte of dailled EFs

8.6.3 EFs structured as a table of predefined values are: $EF_{5to8\ digits}$, $EF_{2digits}$, $EF_{8digits}$, $EF_{9digits}$, EF_{SSSSS}, EF_{LLLLL}, $EF_{FreeNumber}$ and $EF_{Location}$. [I]

8.6.4 The dialled values table structure will be defined according to . [MI / M]

Identifier: ----	Structure: transparent	
Record length: 4	Update activity: low	

Access Conditions:

READ	CHV1
UPDATE	ADM
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1	Next Table Type	M	1 byte
2-3	Identifier of the next table	M	2 bytes
4	Dialled Digits	M	1 byte

Table 51: structure of EFs used for dailled

8.6.5 The fields ”Next Table Type” as well as the ”Identifier of the next table” follow the same format as specified for the switching table structure. [MI / M]

8.6.6 The field ”Dialled Digits” define the digit amount limit (boundary) authorised for dialling according to Table 52. The most significant four bits B8 to B5 represents the

‘boundary B’, binary coded. The least significant four bits B4 to B1 represent the ‘boundary A’, binary coded. [MI / M]

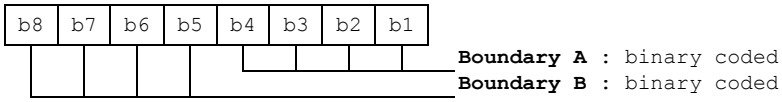

Table 52: structure of the dialled digit field

8.6.7 Depending on the ratio of these values three combinations are of relevance. [I]

8.6.8.1 A>B or A=B

a) In this case boundary A has the meaning of the maximum amount of digits to be dialled whereas boundary B has the meaning of the minimum amount of digits to be dialled. In the case that A and B are equal this is the value which has to be dialled exactly. [I]

b) The maximum (A) identifies the amount of digits that have to be evaluated. The range of this value shall be 1 to 15. [MI / M]

c) The minimum number (B) identifies the amount of digits that are requested to start the evaluation. The range of this value shall be 1 to 15 (the value 0 is not allowed). [MI / M]

d) If both values are set to 0 all remaining digits shall be evaluated up to the maximum allowed amount of digits (28 digits). [MI / M]

8.6.8.2 A<B

a) In this case boundary B defines the maximum amount of input digits entered by the user. Boundary A defines the amount of digits that have to be filled up with zeros in the case that the user entered less than value A digits. The value A=0 is not allowed. [MI / M]

8.6.8.3 The following example may clarify this definition [I];

- A=5, B=3: The minimum amount of digits required is 3 and at most 5 digits, all other inputs are rejected.

- A=4, B=4: The dialled string shall have exactly 4 digits, all other entries are rejected.

- A=5, B=8 : The mobile output string will be at least 5 digits (A=5) long: if the user dials a lower number of digits, the application will put zero digits in front of the number dialled to lengthen the string to 5 digits. The maximum allowed amount of digits is 8 (B=8). The user input must be processed according to Table 53.

User input		Output string
1 digit :	3	00003
2 digits :	12	00012
4 digits :	1234	01234
5 digits :	12345	12345

6 digits :	123456	123456
9 digits :	123456789	Rejected, user input exceeds value B.

Table 53: user input

8.7 Tables of strings for the numbering plan

8.7.1 This chapter defines a fixed relationship between the index used by the SIM card tables (switching and predefined values table) and the location of the text string stored outside the SIM. [I]

8.7.2 This information is used to harmonize the usage of functional numbers/functional identity's among the different Mobile Stations for both text display of called/calling party and dialling help. [I]

8.7.3 The text string length for the textual representation is not part of this specification and is implementation dependent. [I]

8.7.4 Each textual description allocates one of 255 possible indices. Table 54 defines the meaning of each of the 255 positions. The application on the MS side is in charge of displaying the appropriate string, taking into account the current language selected by the user. [I]

String index	Description
0	Description of Call Type 0 : e.g. Public
1	Description of Call Type 1 : e.g. Short coded
2	Description of Call Type 2 : e.g. Train
3	Description of Call Type 3 : e.g. Engine
4	Description of Call Type 4 : e.g. Coach
5	Description of Call Type 5 : e.g. group and broadcast
6	Description of Call Type 6 : e.g. Shunting and Maintenance
7	Description of Call Type 7 : e.g. Train Controller
8	Description of Call Type 8 : e.g. MSISDN
9	Description of Call Type 9 : e.g. Gateway
10	Shunting Team Leader
11	Shunting Team Member 1
12	Shunting Team Member 2
13	Shunting Team Member 3
14	Shunting Train Driver
15	Maintenance Team Leader
16	Maintenance Team Member 1
17	Maintenance Team Member 2
18	Maintenance Team Member 3
19	Maintenance Team Member 4
20	Other GSM-R (in case of CT 9)
21	Private railways (in case of CT 9)
30	Most appropriate primary controller (in case of CT 1)
31	Most appropriate secondary controller (in case of CT 1)
32	Power supply controller (in case of CT 1)

String index	Description
33	ERTMS/ETCS RBC (in case of CT 1)
34	Call confirmation centre (in case of CT 1)
…	…
40	
41	
42	Trains groups
43	Station and security staff group
44	*Reserved for national use*
45	Shunting groups
46	Track side maintenance group
47	Controller groups
…	…
50	All groups (VBS/VGCS)
51	Team number
52	Emergency call
…	…
60	Primary controller
61	Secondary controller
62	Power supply controller
…	…
100	Description of Function Code 00 : Spare alarm
101	Description of Function Code 01 : Leading Driver
102	Description of Function Code 02 : Driver 2
103	Description of Function Code 03 : Driver 3
104	Description of Function Code 04 : Driver 4
105	Description of Function Code 05 : Driver 5
106	Description of Function Code 06 : FAX
107	Description of Function Code 07 : Intercom
108	Description of Function Code 08 : Public Address
109	*Reserved for international use*
110	Description of Function Code 10 : Chief Conduct.
…	…
120	Description of Function Code 20 : Catering Chief
…	…
199	Description of Function Code 99 : Reserved for national use
200	Group Call (in case of CT 5)
201	Broadcast Call (in case of CT 5)
…	…
255	Empty string

Table 54: Strings Table

8.7.5 For ‘string index’ = 1 to 10 following description applies: The field description contains the representation of the call type usage foreseen by document [1]. [I]

8.8 SIM card application Tables for the EIRENE numbering plan

8.8.1 This section places a requirement on the Cab Radio / OPH / GPH and is included here for information only. [I]

8.8.2 Applicable mobile equipment [see table] shall use the following EFs to apply the EIRENE numbering plan, specifically to decode functional numbers into functional identities, provide a guided menu to assist with functional number registration and assist with dialling numbers (Dialling Help). [I]

8.8.3 The purpose of the following block diagram is to summarise the tree of the EIRENE numbering plan: [I]

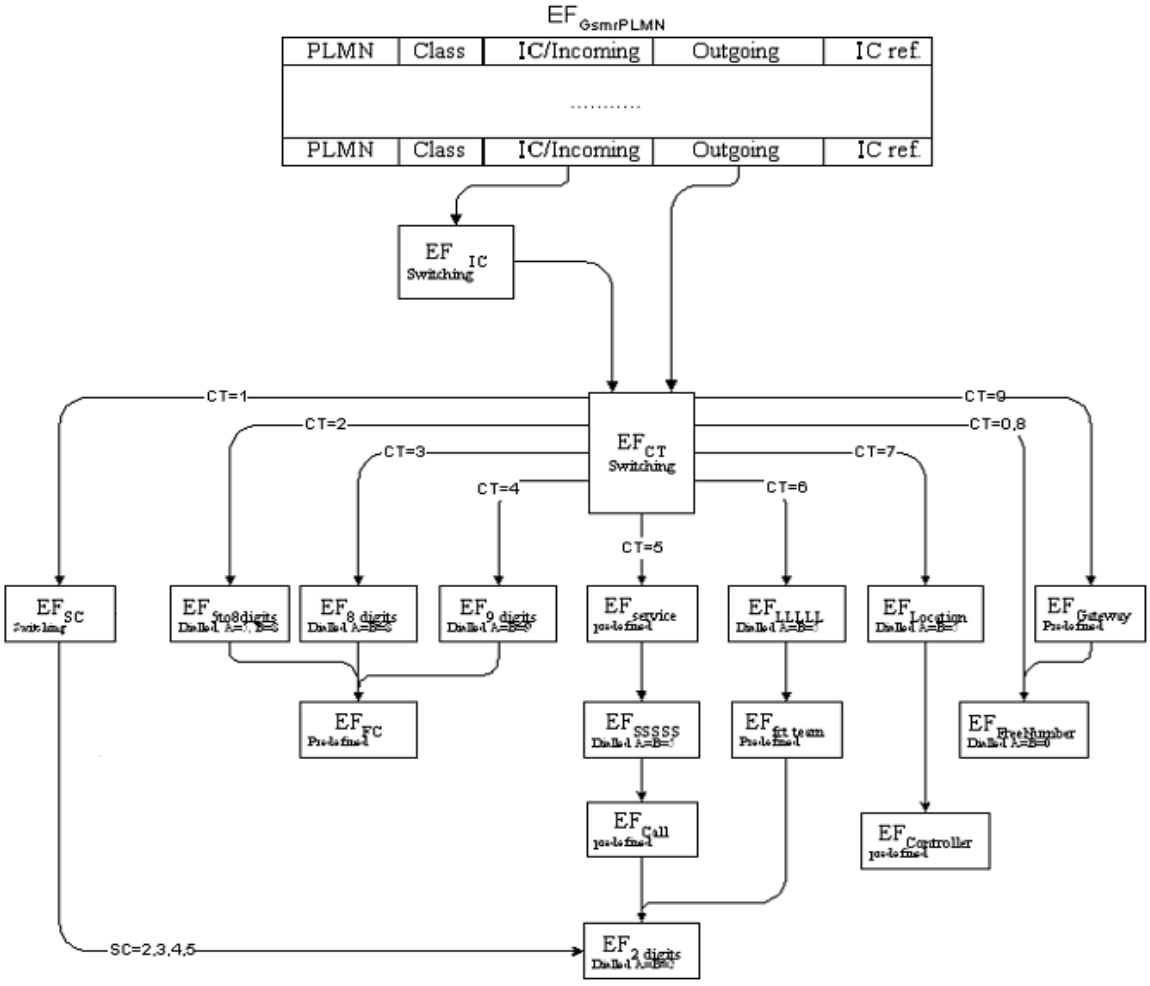

Figure 9: Numbering plan structure on SIM card

8.8.4 The following sections provide an example of how the EFs relating to Dialling Help can be implemented in order to meet the number plan requirements for an OPH. [I]

8.9 EFCT

8.9.1 For the numbering plan currently defined in EIRENE, the following EF_{CT} table is the root file to construct a Functional Number beginning by the Call Type: [MI / M]

Next table type	Next table Pointer	Decision Value (CT)	String reference in Table 54: Strings Table	String displayed
F2	<EF code>$_{\text{free number}}$	FFF0	0	Public
F0	<EF code>$_{\text{SC}}$	FFF1	1	Short code
F2	<EF code>$_{\text{5 to 8 digits}}$	FFF2	2	Train
F2	<EF code>$_{\text{8 digits}}$	FFF3	3	Engine
F2	<EF code>$_{\text{9 digits}}$	FFF4	4	Coach
F1	<EF code>$_{\text{Service}}$	FFF5	5	Group & Broadcast
F2	<EF code>$_{\text{LLLL}}$	FFF6	6	Shunt. & Maint.
F2	<EF code>$_{\text{Locationr}}$	FFF7	7	Train Controller
F2	<EF code>$_{\text{free number}}$	FFF8	8	MSISDN
F1	<EF code>$_{\text{Gateway}}$	FFF9	9	Gateway

8.9.2 All the empty records shall be at the end of the EF and filled with 'FF FF FF FF FF FF'. [MI / M]

8.9.3 An example of SIM card configuration for EF_{CT} ('6F 8E') is: [I]

1st byte	2nd and 3rd byte	4th and 5th byte	6th byte	String displayed
F2	6F 87	F0FF	00	Public
F0	6F 8F	F1FF	01	Short code
F2	6F 81	F2FF	02	Train
F2	6F 83	F3FF	03	Engine
F2	6F 84	F4FF	04	Coach
F1	6F 89	F5FF	05	Group & Broadcast
F2	6F 86	F6FF	06	Shunt. & Maint.
F2	6F 91	F7FF	07	Train Controller
F2	6F 87	F8FF	08	MSISDN
F1	6F 8C	F9FF	09	Gateway

8.10 EFSC

8.10.1 The following EF_{SC} table is the switching table used in the case of Call Type 1. This table is used to select the next digit after the Call Type: [MI / M]

Next table type	Reference of the next table	Decision Value	String reference in Table 54: Strings Table	String displayed
F2	<EF code>$_{\text{2 digits}}$	FFF2	30	Primary Controller
F2	<EF code>$_{\text{2 digits}}$	FFF3	31	Secondary Controller
F2	<EF code>$_{\text{2 digits}}$	FFF4	32	Power Supply Controller

8.10.2 An example of SIM configuration for EF_{SC} ('6F 8F'), is [I]:

1st byte	2nd and 3rd byte	4th and 5th byte	6th byte
F2	6F 82	F2 FF	1E
F2	6F 82	F3 FF	1F
F2	6F 82	F4 FF	20

8.11 EF5 to 8 digits

8.11.1 In order to allow a full interoperability between EIRENE networks, the $EF_{5\text{ to }8\text{ digits}}$ shall be configured as below: [MI / M]

Next table type	Reference of the next table	B	A
F1	<EF code>$_{FC}$	8	5

8.11.2 The example below shows the SIM card configuration for $EF_{5\ to\ 8\ digits}$ (‘6F 81’): [I]

1st byte	2nd and 3rd byte	4th byte
F1	6F 88	85

8.12 EF2 digits

8.12.1 The $EF_{2\ digits}$ shall be configured as follows: [MI / M]

Next table type	Reference of the next table	B	A
FF	FF FF	2	2

8.12.2 The example below shows the SIM card configuration for $EF_{2\ digits}$ (‘6F 82’): [I]

1st byte	2nd and 3rd byte	4th byte
FF	FF FF	22

8.13 EF8 digits

8.13.1 The $EF_{8\ digits}$ shall be configured as follows: [MI / M]

Next table type	Reference of the next table	B	A
F1	<EF code>$_{FC}$	8	8

8.13.2 The example below shows the SIM card configuration for $EF_{8\ digits}$ (‘6F 83’): [I]

1st byte	2nd and 3rd byte	4th byte
F1	6F 88	88

8.14 EF9 digits

8.14.1 The $EF_{9\ digits}$ shall be configured as follows: [MI / M]

Next table type	Reference of the next table	B	A
F1	<EF code>$_{FC}$	9	9

8.14.2 The example below shows the SIM card configuration for $EF_{9\ digits}$ (‘6F 84’): [I]

1st byte	2nd and 3rd byte	4th byte
F1	6F 88	99

8.15 EFSSSSS

8.15.1 The EF_{SSSSS} shall be configured as follows: [MI / M]

Next table type	Reference of the next table	B	A
F1	<EF code>$_{Call}$	5	5

8.15.2 The example below shows the SIM card configuration for EF_{SSSSS} (‘6F 85’): [I]

1st byte	2nd and 3rd byte	4th byte
F1	6F 8A	55

8.16 EFLLLLL

8.16.1 The EF_{LLLLL} shall be configured as follows: [MI / M]

Next table type	Reference of the next table	B	A
F1	<EF code>$_{fct\ team}$	5	5

8.16.2 The example below shows the SIM card configuration for EF_{LLLLL} ('6F 86'): [I]

1st byte	2nd and 3rd byte	4th byte
F1	6F 8B	55

8.17 EFLocation

8.17.1 The $EF_{Location}$ shall be configured as follows: [MI / M]

Next table type	Reference of the next table	B	A
F1	<EF code>$_{Controller}$	5	5

8.17.2 The example below shows the SIM card configuration for $EF_{Location}$ ('6F 91'): [I]

1st byte	2nd and 3rd byte	4th byte
F1	6F 92	55

8.18 EFFree number

8.18.1 The $EF_{free\ number}$ shall be configured as follows: [MI / M]

Next table type	Reference of the next table	B	A
FF	FFFF	0	0

8.18.2 The example below shows the SIM card configuration for $EF_{Freenumber}$ ('6F 87'): [I]

1st byte	2nd and 3rd byte	4th byte
FF	FF FF	00

8.19 EFFC

8.19.1 The EF_{FC} shall start with: [MI / M]

Next table type	Reference of the next table
FF	FFFF

8.19.2 And then followed by a list of records representing the Function Codes the user can select. If the following list of FCs is assumed to be used by the user: [MI / M]

FC	String reference in Table 54: Strings Table	String displayed
FF01	101	Leading Driver
FF02	102	Driver 2
FF03	103	Driver 3

FF04	104	Driver 4
FF05	105	Driver 5
FF06	106	Fax
FF07	107	Intercom
FF08	108	Public address
FF10	110	Chief Cond.
FF20	120	Catering
FF61	161	Passengers Info

8.19.3 Then the SIM configuration for EF_{FC} ('6F 88') will be: [MI / M]

	1st (and 2nd) byte	(2nd and) 3rd byte	String displayed
1st record	FF	FF FF	
2nd record	10 FF	65	Leading Driver
3rd record	20 FF	66	Driver 2
4th record	30 FF	67	Driver 3
5th record	40 FF	68	Driver 4
6th record	50 FF	69	Driver 5
7th record	60 FF	6A	Fax
8th record	70 FF	6B	Intercom
9th record	80 FF	6C	Public address
10th record	01 FF	6E	Chief Cond.
11st record	02 FF	78	Catering
12nd record	16 FF	A1	Passengers Info
Empty records	FF FF	FF	

8.19.4 Notes : The decimal reference of a Function Code shall be the function code value + 100. [I]

8.20 EFService

8.20.1 The $EF_{Service}$ shall contain the amount of digits allowed after the '5' (CT ='5'). It starts with: [MI / M]

Next table type	Reference of the next table
F2	<EF code>$_{sssss}$

8.20.2 And is followed by: [MI / M]

VGCS-VBS	String reference in Table 54: Strings Table	String displayed
FFF0	200	VGCS
FFF1	201	VBS

8.20.3 The example below shows the SIM card configuration for $EF_{Service}$ ('6F 89'): [I]

	1st (and 2nd) byte	(2nd and) 3rd byte	String displayed
1st record	F2	6F 85	
2nd record	F0 FF	C8	VGCS
3rd record	F1 FF	C9	VBS

8.21 EFCall

8.21.1 The EF_{Call} shall contain the digit of the group type. It will start with: [M]

Next table type	Reference of the next table

F2	<EF code>$_{2\ digit}$

8.21.2 And then be followed by: [MI / M]

Group type	String reference in Table 54: Strings Table	String displayed
FFF2	42	Train Groups
FFF3	43	Station and Security Staff Groups
FFF5	45	Shunting
FFF6	46	Track side Maintenance Groups
FFF7	47	Controller Groups

8.21.3 The example below shows the SIM configuration for EF_{Call} ('6F 8A'): [I]

	1st (and 2nd) byte	(2nd and) 3rd byte	String displayed
1st record	F2	6F 82	
2nd record	F2 FF	2A	Train Groups
3rd record	F3 FF	2B	Station and Security Staff Groups
4th record	F5 FF	2D	Shunting
5th record	F6 FF	2E	Track side Maintenance Groups
6th record	F7 FF	2F	Controller Groups
Empty records	FF FF	FF	

8.22 EFFct Team

8.22.1 The $EF_{Fct\ Team}$ shall contain the digit used to distinguish between "shunting team" (5) and "maintenance teams" + the digit of the "Team Member Function". It will start with: [MI / M]

Next table type	Reference of the next table
F2	<EF code>$_{2\ digit}$

8.22.2 And then followed by: [MI / M]

Team Type and Function	String reference in Table 54: Strings Table	String displayed
FF50	10	Sh Team Leader
FF51	11	Sh Team Member 1
FF52	12	Sh Team Member 2
FF53	13	Sh Team Member 3
FF54	14	Sh Train Driver
FF60	15	Maint. Team Leader
FF61	16	Maint. Team Member 1
FF62	17	Maint. Team Member 2
FF63	18	Maint. Team Member 3
FF64	19	Maint. Team Member 4

8.22.3 The example below shows the SIM card configuration for $EF_{Fct\ Team}$ ('6F 8B'): [I]

	1st (and 2nd) byte	(2nd and) 3rd byte	String displayed
1st record	F2	6F 82	
2nd record	05 FF	0A	Sh Team Leader
3rd record	15 FF	0B	Sh Team Member 1
4th record	25 FF	0C	Sh Team Member 2
5th record	35 FF	0D	Sh Team Member 3

6th record	45 FF	0E	Sh Train Driver
7th record	06 FF	0F	Maint. Team Leader
8th record	16 FF	10	Maint. Team Member 1
9th record	26 FF	11	Maint. Team Member 2
10th record	36 FF	12	Maint. Team Member 3
11th record	46 FF	13	Maint. Team Member 4

8.23 EFController

8.23.1 The $EF_{Controller}$ will contain the end code for the controller (Call Type 7). It will begin start with: [MI / M]

Next table type	Reference of the next table
FF	FFFF

8.23.2 And then be followed by: [MI / M]

	String reference in Table 54: Strings Table	String displayed
FF01	60	Primary controller
FF02	61	Secondary controller
FF03	62	Power supply controller

8.23.3 The example below shows the SIM configuration for $EF_{Controller}$ ('6F 92'): [I]

	1st (and 2nd) byte	(2nd and) 3rd byte	String displayed
1st record	FF	FF FF	
2nd record	10 FF	3C	Primary controller
3rd record	20 FF	3D	Secondary controller
4th record	30 FF	3E	Power supply controller

8.24 EFGateway

8.24.1 The $EF_{Gateway}$ shall contain the amount of digits to access to external networks. It will start with: [MI / M]

Next table type	Reference of the next table
F2	<EF code>$_{\text{free number}}$

8.24.2 And then be followed by : [MI / M]

	String reference in Table 54: Strings Table	String displayed
FF00	20	Other GSM-R
FF01 (*)	21	Private Railway

8.24.3 (*) According to EIRENE SRS and ERNST MoU, '901' has to be used as a breakout code to route the call to the railway fixed network in the case where this network uses the range '900' to '909' originally allocated to EIRENE network. [MI / M]

8.24.4 The example below shows the SIM configuration for $EF_{Gateway}$ ('6F 8C'): [I]

	1st (and 2nd) byte	(2nd and) 3rd byte	String displayed
1st record	F2	6F 87	
2nd record	00 FF	14	Other GSM-R
3rd record	10 FF	15	Private Railway

8.25 EFIC

8.25.1 For the numbering plan currently defined in EIRENE, the following EF_{IC} table is the root file to analyse the Functional Number beginning by the IC: [MI / M]

Type of next value	Reference of the next table	IC	Description
F0	<EF code>$_{CT}$	F039	Reference into EF_{NW}
F0	<EF code>$_{CT}$	F033	Reference into EF_{NW}
F0	<EF code>$_{CT}$	F049	Reference into EF_{NW}

8.25.2 This table is also the IC table, giving the relation between the IC value and the network name (see in description). [MI / M]

8.25.3 An example of SIM configuration for EFIC (‘6F 8D’), where the 1st record refers to HPLMN IC and is supposed to be =’039’ and 2nd and 3rd records refer to other EIRENE networks with IC respectively equal to ‘033’ and ‘049’, is: [I]

1st byte	2nd and 3rd byte	4th and 5th byte	6th and 7th byte
F0	6F 8E	30 F9	00 01
F0	6F 8E	30 F3	00 02
F0	6F 8E	40 F9	00 03