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Technical Specification

3rd Generation Partnership Project; Technical Specification Group Terminals; Characteristics of the USIM application (Release 7)



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Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

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- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

The present document defines the Universal Subscriber Identity Module (USIM) application. This application resides on the UICC, an IC card specified in TS 31.101 [11]. In particular, TS 31.101 [11] specifies the application independent properties of the UICC/terminal interface such as the physical characteristics and the logical structure.

TS 31.101 [11] is one of the core documents for this specification and is therefore referenced in many places in the present document.

1 Scope

The present document defines the USIM application for 3G telecom network operation.

The present document specifies:

- specific command parameters;
- file structures;
- contents of EFs (Elementary Files);
- security functions;
- application protocol to be used on the interface between UICC (USIM) and ME.

This is to ensure interoperability between a USIM and an ME independently of the respective manufacturer, card issuer or operator.

The present document does not define any aspects related to the administrative management phase of the USIM. Any internal technical realisation of either the USIM or the ME is only specified where these are reflected over the interface. The present document does not specify any of the security algorithms which may be used.

2 References

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

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

[1] 3GPP TS 21.111: "USIM and IC Card Requirements".

[2] 3GPP TS 22.011: "Service accessibility".

[3] 3GPP TS 22.024: "Description of Charge Advice Information (CAI)".

[4] 3GPP TS 22.030: "Man-Machine Interface (MMI) of the User Equipment (UE)".

[5] 3GPP TS 23.038: "Alphabets and language".

[6] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[7] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[8] 3GPP TS 22.067: "enhanced Multi Level Precedence and Pre-emption service (eMLPP) - Stage 1".

[9] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[10] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[11] 3GPP TS 31.101: "UICC-Terminal Interface, Physical and Logical Characteristics".

[12] 3GPP TS 31.111: "USIM Application Toolkit (USAT)".

[13] 3GPP TS 33.102: "3GPP Security; Security Architecture".

[14] 3GPP TS 33.103: "3GPP Security; Integration Guidelines".

[15] 3GPP TS 22.086: "Advice of charge (AoC) Supplementary Services - Stage 1".

[16] 3GPP TS 23.041: "Technical realization of Cell Broadcast (CB)".

[17] 3GPP TS 02.07: "Mobile Stations (MS) features".

[18] 3GPP TS 51.011 Release 4: "Specification of the Subscriber Identity Module – Mobile Equipment (SIM – ME) interface".

[19] ISO 639 (1988): "Code for the representation of names of languages".

[20] ISO/IEC 7816-4 (1995): "Identification cards - Integrated circuit(s) cards with contacts, Part 4: Interindustry commands for interchange".

[21] ISO/IEC 7816-5 (1994): "Identification cards - Integrated circuit(s) cards with contacts, Part 5: Numbering system and registration procedure for application identifiers".

[22] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[23] 3GPP TS 23.073: "Support of Localised Service Area (SoLSA); Stage 2".

[24] 3GPP TS 22.101: "Service aspects; service principles".

[25] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[26] ISO/IEC 7816-9 (2000): "Identification cards - Integrated circuit(s) cards with contacts, Part 9: Additional Interindustry commands and security attributes".

[27] 3GPP TS 22.022: "Personalisation of Mobile Equipment (ME); Mobile functionality specification".

[28] 3GPP TS 44.018 "Mobile Interface Layer3 Specification, Radio Resource control protocol"

[29] 3GPP TS 23.022: "Functions related to Mobile Station (MS) in idle mode and group receive mode".

[30] 3GPP TS 23.057: "Mobile Execution Environment (MExE);Functional description; Stage 2".

[31] 3GPP TS 23.122: "NAS Functions related to Mobile Station (MS) in idle mode"

[32] ISO/IEC 7816-6 (1996): "Identification cards -- Integrated circuit(s) cards with contacts -- Part 6: Interindustry data elements".

[33] 3GPP TS 25.101: "UE Radio Transmission and Reception (FDD)"

[34] 3GPP TS 45.005: "Radio Transmission and Reception"

[35] ISO/IEC 8825 (1990): "Information technology; Open Systems Interconnection; Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)"

[36] 3GPP TS 23.097: "Multiple Subscriber Profile (MSP)"

[37] Void.

[38] 3GPP TS 23.140: “Multimedia Messaging Service (MMS); Functional description; stage 2”.

[39] ETSI TS 102 222 Release 6:"Administrative commands for telecommunications applications "

[40] 3GPP TS 24.234: “3GPP System to WLAN Interworking; UE to Network protocols;Stage 3”

[41] 3GPP TS 33.234: "3G Security; Wireless Local Area Network (WLAN) interworking security"

[42] 3GPP TS 33.220: "Generic Authentication Architecture (GAA); Generic bootstrapping architecture"

[43] 3GPP TS 33.246: "Security of Multimedia Broadcast/Multicast Service"

[44] 3GPP TS 43.020: "Technical Specification Group Services and system Aspects; Security related network functions"

[45] X.S0016-000-A v1.0: "3GPP2 Multimedia Messaging System MMS Specification Overview, Revision A"

[46] 3GPP TS 43.068: "Technical Specification Group Core Network; Voice Group Call Service (VGCS); Stage 2"

3 Definitions, symbols, abbreviations and coding conventions

3.1 Definitions

For the purposes of the present document, the following definition applies.

ADM: access condition to an EF which is under the control of the authority which creates this file

EHPLMN: represents the Equivalent HPLMNs for network selection purposes. The behaviour of EHPLMNs is defined in TS 22.011 [2].

3.2 Symbols

For the purposes of the present document, the following symbols apply:

||	Concatenation
⊕	Exclusive OR
f1	Message authentication function used to compute MAC
f1*	A message authentication code (MAC) function with the property that no valuable information can be inferred from the function values of f1* about those of f1, ..., f5 and vice versa
f2	Message authentication function used to compute RES and XRES
f3	Key generating function used to compute CK
f4	Key generating function used to compute IK
f5	Key generating function used to compute AK

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3GPP	3rd Generation Partnership Project
AC	Access Condition
ACL	APN Control List
ADF	Application Dedicated File
AID	Application IDentifier
AK	Anonymity key
ALW	ALWays
AMF	Authentication Management Field
AoC	Advice of Charge
APN	Access Point Name
ASN.1	Abstract Syntax Notation One
AuC	Authentication Centre
AUTN	Authentication token
BDN	Barred Dialling Number
BER-TLV	Basic Encoding Rule - TLV
B-TID	Bootstrapping Transaction IDentifier
CCP	Capability Configuration Parameter

CK	Cipher key
CLI	Calling Line Identifier
CNL	Co-operative Network List
CPBCCH	COMPACT Packet BCCH
CS	Circuit switched
DCK	Depersonalisation Control Keys
DF	Dedicated File
DO	Data Object
EF	Elementary File
FCP	File Control Parameters
FFS	For Further Study
GSM	Global System for Mobile communications
HE	Home Environment
ICC	Integrated Circuit Card
ICI	Incoming Call Information
ICT	Incoming Call Timer
ID	IDentifier
IEI	Information Element Identifier
IK	Integrity key
IMSI	International Mobile Subscriber Identity
K	USIM Individual key
K_C	Cryptographic key used by the cipher A5
KSI	Key Set Identifier
LI	Language Indication
LSB	Least Significant Bit
MAC	Message authentication code
MAC-A	MAC used for authentication and key agreement
MAC-I	MAC used for data integrity of signalling messages
MBMS	Multimedia Broadcast/Multicast Service
MCC	Mobile Country Code
MExE	Mobile Execution Environment
MF	Master File
MGV-F	MTK Generation and Validation Function
MIKEY	Multimedia Internet KEYing
MM	Multimedia Message
MMI	Man Machine Interface
MMS	Multimedia Messaging Service
MNC	Mobile Network Code
MODE	Indication packet switched/circuit switched mode
MSB	Most Significant Bit
MSK	MBMS Service Key
MTK	MBMS Traffic Key
MUK	MBMS User Key
NEV	NEVer
NPI	Numbering Plan Identifier
OCI	Outgoing Call Information
OCT	Outgoing Call Timer
PBID	Phonebook Identifier
PIN	Personal Identification Number
PL	Preferred Languages
PS	Packet switched
PS_DO	PIN Status Data Object
RAND	Random challenge
$RAND_{MS}$	Random challenge stored in the USIM
RES	User response
RFU	Reserved for Future Use
RST	Reset
SDN	Service dialling number
SE	Security Environment
SEQs	Sequence number for MGV-F
SEQp	Sequence number for MGV-F stored in the USIM
SFI	Short EF Identifier

SGSN	Serving GPRS Support Node
SN	Serving Network
SQN	Sequence number
SRES	Signed RESponse calculated by a USIM
SW	Status Word
TLV	Tag Length Value
USAT	USIM Application Toolkit
USIM	Universal Subscriber Identity Module
VLR	Visitor Location Register
XRES	Expected user RESponse

3.4 Coding Conventions

The following coding conventions apply to the present document.

All lengths are presented in bytes, unless otherwise stated. Each byte is represented by bits b8 to b1, where b8 is the most significant bit (MSB) and b1 is the least significant bit (LSB). In each representation, the leftmost bit is the MSB.

The coding of Data Objects in the present document is according to ISO/IEC 7816-6 [32].

'XX': Single quotes indicate hexadecimal values. Valid elements for hexadecimal values are the numbers '0' to '9' and 'A' to 'F'.

4 Contents of the Files

This clause specifies the EFs for the 3GPP session defining access conditions, data items and coding. A data item is a part of an EF which represents a complete logical entity, e.g. the alpha tag in an EF_{ADN} record.

A file is associated with attributes that depending of the file type indicates how data is to be accessed e.g. file size, record length etc. Although in the present document some files and data items stored in a file are indicated as having a fixed length; when reading such structures the terminal shall derive the length of the data item from the attributes provided in the file information i.e. not use the fixed value specified for the file in the present document. Although the terminal is able to read the entire structure it should only use those elements in the data item which is recognised by the terminal.

For any EF, when the SFI is not indicated in the description of the file it is not allowed to assign an SFI. If in the description of the file an SFI value is indicated the file shall support SFI. The SFI value shall be assigned by the card issuer. It is mandatory for EFs stating an SFI value ('YY') in the description of their structure to provide an SFI. For files where in the file description the SFI is indicated as 'Optional' the file may support an SFI.

For an overview containing all files see figures 4.1 and 4.2.

4.1 Contents of the EFs at the MF level

There are four EFs at the Master File (MF) level. These EFs are specified in TS 31.101 [11].

The information in EF_{PL} may be used by the ME for MMI purposes.

This information may also be used for the screening of Cell Broadcast messages in a preferred language, as follows.

When the CB Message Identifier capability is available, the ME selects only those CB messages the language of which corresponds to an entry in this EF or in EF_{LI} whichever of these EFs is used (see clause 5.1.1). The CB message language is defined by the Data Coding Scheme (see TS 23.038 [5]) received with the CB message. The ME shall be responsible for translating the language coding indicated in the Data Coding Scheme for the Cell Broadcast Service (as defined in TS 23.038 [5]) to the language coding as defined in ISO 639 [19] if it is necessary to check the language coding in EF_{PL}.

4.2 Contents of files at the USIM ADF (Application DF) level

The EFs in the USIM ADF contain service and network related information.

The File IDs '6F1X' (for EFs), '5F1X' and '5F2X' (for DFs) with X ranging from '0' to 'F' are reserved under the USIM ADF for administrative use by the card issuer.

4.2.1 EF_{LI} (Language Indication)

This EF contains the codes for one or more languages. This information, determined by the user/operator, defines the preferred languages of the user in order of priority. This information may be used by the ME for MMI purposes. This information may also be used for the screening of Cell Broadcast messages in a preferred language, as follows.

When the CB Message Identifier capability is available, the ME selects only those CB messages the language of which corresponds to an entry in this EF or in EF_{PL}, whichever of these EFs is used (see clause 5.1.1). The CB message language is defined by the Data Coding Scheme (DCS: see TS 23.038 [5]) received with the CB message. The ME shall be responsible for translating the language coding indicated in the Data Coding Scheme for the Cell Broadcast Service (as defined in TS 23.038 [5]) to the language coding as defined in ISO 639 [19] if it is necessary to check the language coding in EF_{PL}.

Identifier: '6F 05'	Structure: transparent	Optional
SFI: '02'		
File size: 2n bytes	Update activity: low	

Access Conditions:

READ	ALW
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 2	1st language code (highest priority).	M	2 bytes
3 to 4	2nd language code	O	2 bytes
2n-1 to 2n	Nth language code (lowest priority).	O	2 bytes

Coding:

each language code is a pair of alpha-numeric characters, defined in ISO 639 [19]. Each alpha-numeric character shall be coded on one byte using the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0.

Unused language entries shall be set to 'FF FF'.

4.2.2 EF_{IMSI} (IMSI)

This EF contains the International Mobile Subscriber Identity (IMSI).

Identifier: '6F07'	Structure: transparent	Mandatory
SFI: '07'		
File size: 9 bytes	Update activity: low	

Access Conditions:

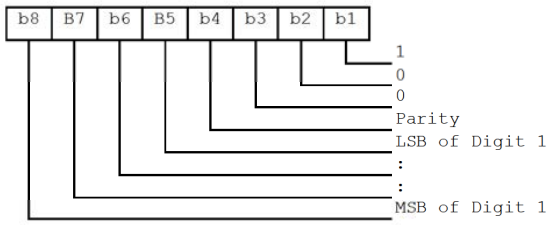
READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Length of IMSI	M	1 byte
2 to 9	IMSI	M	8 bytes

- Length of IMSI
  Contents:
  - the length indicator refers to the number of significant bytes, not including this length byte, required for the IMSI.
  Coding:
  - according to TS 24.008 [9].

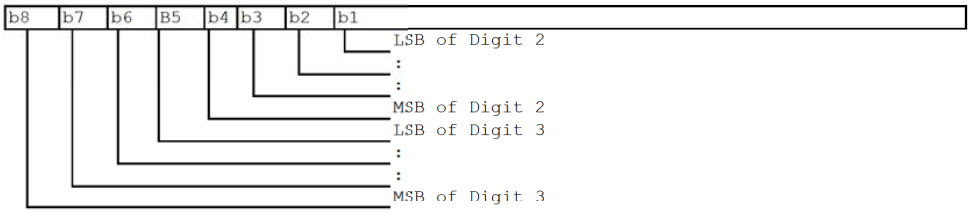
- IMSI
  Contents:
  - International Mobile Subscriber Identity.
  Coding:
  - this information element is of variable length. If a network operator chooses an IMSI of less than 15 digits, unused nibbles shall be set to 'F'.

Byte 2:



For the parity bit, see TS 24.008 [9].

Byte 3:



etc.

4.2.3 EF_{Keys} (Ciphering and Integrity Keys)

This EF contains the ciphering key CK, the integrity key IK and the key set identifier KSI.

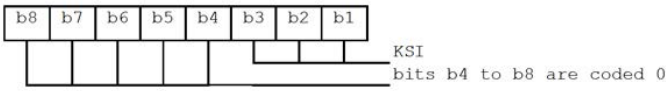
Identifier: '6F08'	Structure: transparent	Mandatory
SFI: '08'		
File size: 33 bytes	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Key set identifier KSI	M	1 byte
2 to 17	Ciphering key CK	M	16 bytes
18 to 33	Integrity key IK	M	16 bytes

- Key Set Identifier KSI.
  Coding.



- Ciphering key CK.
  Coding:
  - the least significant bit of CK is the least significant bit of the 17th byte. The most significant bit of CK is the most significant bit of the 2nd byte.

- Integrity key IK.
  Coding:
  - the least significant bit of IK is the least significant bit of the 33rd byte. The most significant bit of IK is the most significant bit of the 18th byte.

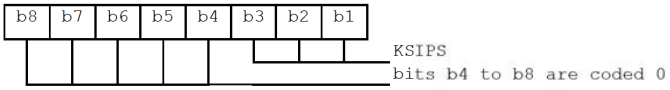
4.2.4 EF_{KeysPS} (Ciphering and Integrity Keys for Packet Switched domain)

This EF contains the ciphering key CKPS, the integrity key IKPS and the key set identifier KSIPS for the packet switched (PS) domain.

Identifier: '6F09'	Structure: transparent	Mandatory
SFI: '09'		
File size: 33 bytes	Update activity: high	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1	Key set identifier KSIPS	M	1 byte
2 to 17	Ciphering key CKPS	M	16 bytes
18 to 33	Integrity key IKPS	M	16 bytes

- Key Set Identifier KSIPS.
  Coding:



- Ciphering key CKPS.
  Coding:
  - the least significant bit of CKPS is the least significant bit of the 17th byte. The most significant bit of CKPS is the most significant bit of the 2nd byte.
- Integrity key IKPS.
  Coding:
  - the least significant bit of IKPS is the least significant bit of the 33rd byte. The most significant bit of IKPS is the most significant bit of the 18th byte.

4.2.5 $EF_{PLMNwAcT}$ (User controlled PLMN selector with Access Technology)

This EF contains the coding for n PLMNs, where n is at least eight. This information is determined by the user and defines the preferred PLMNs of the user in priority order. The first record indicates the highest priority and the nth record indicates the lowest. The EF also contains the Access Technologies for each PLMN in this list. (see TS 23.122 [31])

Identifier: '6F60'	Structure: transparent	Optional
SFI: '0A'		
File size: 5n (where n ≥8 bytes)	Update activity: low	

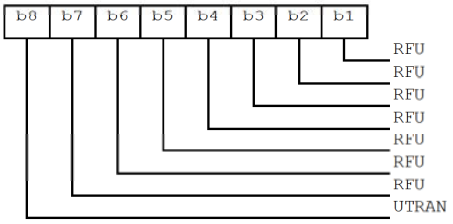
Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

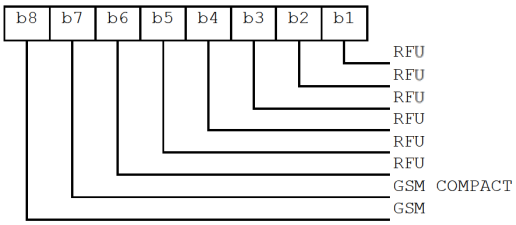
Bytes	Description	M/O	Length
1 to 3	1st PLMN (highest priority)	M	3 bytes
4 to 5	1st PLMN Access Technology Identifier	M	2 bytes
6 to 8	2nd PLMN	M	3 bytes
9 to 10	2nd PLMN Access Technology Identifier	M	2 bytes
:	:		
36 to 38	8th PLMN	M	3 bytes
39 to 40	8th PLMN Access Technology Identifier	M	2 bytes
41 to 43	9th PLMN	O	3 bytes
44 to 45	9th PLMN Access Technology Identifier	O	2 bytes
:	:		
(5n-4) to (5n-2)	Nth PLMN (lowest priority)	O	3 bytes
(5n-1) to 5n	Nth PLMN Access Technology Identifier	O	2 bytes

- PLMN
  Contents:
  - Mobile Country Code (MCC) followed by the Mobile Network Code (MNC).
  Coding:
  - according to TS 24.008 [9].
- Access Technology Identifier:
  Coding:
  - 2 bytes are used to select the access technology where the meaning of each bit is as follows:
    - bit = 1: access technology selected;
    - bit = 0: access technology not selected.

Byte5n-1:



Byte 5n:



4.2.6 EF_{HPPLMN} (Higher Priority PLMN search period)

This EF contains the interval of time between searches for a higher priority PLMN (see TS 22.011 [2]).

Identifier: '6F31'	Structure: transparent	Mandatory
SFI: '12'		
File size: 1 byte	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Time interval	M	1 byte

- Time interval.
  Contents:
  the time interval between two searches.
  Coding:
  the time interval is coded in integer multiples of n minutes. The range is from n minutes to a maximum value. The value '00' indicates that no attempts shall be made to search for any higher priority PLMN. The encoding is:

  - '00': No higher priority PLMN search attempts;
  - '01': n minutes;
  - '02': 2n minutes;
  - : :
  - 'YZ': (16Y+Z)n minutes (maximum value).

- All other values shall be interpreted by the ME as a default period.

For specification of the integer timer interval n, the maximum value and the default period refer to TS 22.011 [2].

4.2.7 EF_{ACMmax} (ACM maximum value)

This EF contains the maximum value of the accumulated call meter. This EF shall always be allocated if EF_{ACM} is allocated.

Identifier: '6F37'	Structure: transparent	Optional
File size: 3 bytes	Update activity: low	

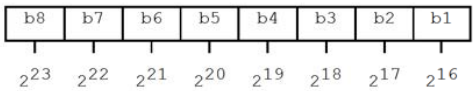
Access Conditions:

READ	PIN
UPDATE	PIN/PIN2 (fixed during administrative management)
DEACTIVATE	ADM
ACTIVATE	ADM

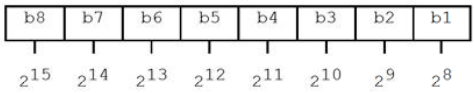
Bytes	Description	M/O	Length
1 to 3	Maximum value	M	3 bytes

- Maximum value.
  Contents:
  - maximum value of the Accumulated Call Meter (ACM).
  Coding:

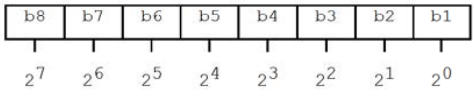
First byte:



Second byte:



Third byte:



For instance, '00' '00' '30' represents 2^5+2^4.

All ACM data is stored in the USIM and transmitted over the USIM/ME interface as binary.

ACMmax is not valid, as defined in TS 22.024 [3], if it is coded '000000'.

If a GSM application is present on the UICC and the ACMmax value is to be shared between the GSM and the USIM application this file shall be shared between the two applications.

4.2.8 EF_{UST} (USIM Service Table)

This EF indicates which services are available. If a service is not indicated as available in the USIM, the ME shall not select this service.

Identifier: '6F38'	Structure: transparent	Mandatory
SFI: '04'		
File size: X bytes, X >= 1	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Services n°1 to n°8	M	1 byte
2	Services n°9 to n°16	O	1 byte
3	Services n°17 to n°24	O	1 byte
4	Services n°25 to n°32	O	1 byte
etc.			
X	Services n°(8X-7) to n°(8X)	O	1 byte

-Services

Contents:		
	Service n°1:	Local Phone Book
	Service n°2:	Fixed Dialling Numbers (FDN)
	Service n°3:	Extension 2
	Service n°4:	Service Dialling Numbers (SDN)
	Service n°5:	Extension3
	Service n°6:	Barred Dialling Numbers (BDN)
	Service n°7:	Extension4
	Service n°8:	Outgoing Call Information (OCI and OCT)
	Service n°9:	Incoming Call Information (ICI and ICT)
	Service n°10:	Short Message Storage (SMS)
	Service n°11:	Short Message Status Reports (SMSR)
	Service n°12:	Short Message Service Parameters (SMSP)
	Service n°13:	Advice of Charge (AoC)
	Service n°14:	Capability Configuration Parameters (CCP)
	Service n°15:	Cell Broadcast Message Identifier
	Service n°16:	Cell Broadcast Message Identifier Ranges
	Service n°17:	Group Identifier Level 1
	Service n°18:	Group Identifier Level 2
	Service n°19:	Service Provider Name
	Service n°20:	User controlled PLMN selector with Access Technology
	Service n°21:	MSISDN
	Service n°22:	Image (IMG)
	Service n°23:	Support of Localised Service Areas (SoLSA)
	Service n°24:	Enhanced Multi-Level Precedence and Pre-emption Service
	Service n°25:	Automatic Answer for eMLPP
	Service n°26:	RFU
	Service n°27:	GSM Access
	Service n°28:	Data download via SMS-PP
	Service n°29:	Data download via SMS-CB
	Service n°30:	Call Control by USIM
	Service n°31:	MO-SMS Control by USIM
	Service n°32:	RUN AT COMMAND command
	Service n°33:	shall be set to '1'
	Service n°34:	Enabled Services Table
	Service n°35:	APN Control List (ACL)
	Service n°36:	Depersonalisation Control Keys
	Service n°37:	Co-operative Network List
	Service n°38:	GSM security context
	Service n°39:	CPBCCH Information
	Service n°40:	Investigation Scan
	Service n°41:	MExE
	Service n°42:	Operator controlled PLMN selector with Access Technology
	Service n°43:	HPLMN selector with Access Technology
	Service n°44:	Extension 5
	Service n°45:	PLMN Network Name
	Service n°46:	Operator PLMN List
	Service n°47:	Mailbox Dialling Numbers
	Service n°48:	Message Waiting Indication Status
	Service n°49:	Call Forwarding Indication Status
	Service n°50:	Reserved and shall be ignored
	Service n°51:	Service Provider Display Information
	Service n°52	Multimedia Messaging Service (MMS)
	Service n°53	Extension 8
	Service n°54	Call control on GPRS by USIM
	Service n°55	MMS User Connectivity Parameters
	Service n°56	Network's indication of alerting in the MS (NIA)
	Service n°57	VGCS Group Identifier List (EF_{VGCS} and EF_{VGCSS})
	Service n°58	VBS Group Identifier List (EF_{VBS} and EF_{VBSS})
	Service n°59	Pseudonym
	Service n°60	User Controlled PLMN selector for WLAN access
	Service n°61	Operator Controlled PLMN selector for WLAN access
	Service n°62	User controlled WSID list
	Service n°63	Operator controlled WSID list
	Service n°64	VGCS security
	Service n°65	VBS security
	Service n°66	WLAN Reauthentication Identity
	Service n°67	Multimedia Messages Storage
	Service n°68	Generic Bootstrapping Architecture (GBA)

Service n°69	MBMS security
Service n°70	Data download via USSD and USSD application mode
Service n°71	Equivalent HPLMN
Service n°72	Additional TERMINAL PROFILE after UICC activation

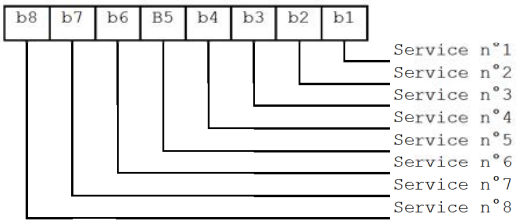
The EF shall contain at least one byte. Further bytes may be included, but if the EF includes an optional byte, then it is mandatory for the EF to also contain all bytes before that byte. Other services are possible in the future and will be coded on further bytes in the EF. The coding falls under the responsibility of the 3GPP.

Coding:

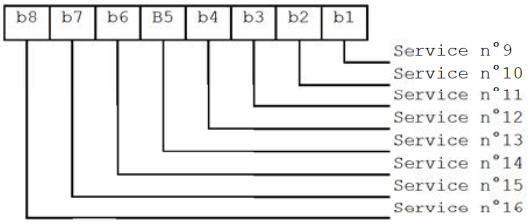
1 bit is used to code each service:
bit = 1: service available;
bit = 0: service not available.

- Service available means that the USIM has the capability to support the service and that the service is available for the user of the USIM unless the service is identified as "disabled" in EF_{EST}.
  Service not available means that the service shall not be used by the USIM user, even if the USIM has the capability to support the service.

First byte:



Second byte:



etc.

4.2.9 EF_{ACM} (Accumulated Call Meter)

This EF contains the total number of units for both the current call and the preceding calls.

NOTE: The information may be used to provide an indication to the user for advice or as a basis for the calculation of the monetary cost of calls (see TS 22.086 [15]).

Identifier: '6F39'	Structure: cyclic	Optional
SFI: Optional		
Record length: 3 bytes	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN/PIN2 (fixed during administrative management)
INCREASE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	Accumulated count of units	M	3 bytes

NOTE: If a SFI is assigned, the recommended value is '1C'. However cards may exist that indicate another value. Therefore the terminal shall be able to handle other values.

- Accumulated count of units
  Contents:
  value of the ACM.
  Coding:
  see the coding of EF_{ACMmax}.

If a GSM application is present on the UICC and the ACM value is to be shared between the GSM and the USIM application this file shall be shared between the two applications.

4.2.10 EF_{GID1} (Group Identifier Level 1)

This EF contains identifiers for particular USIM-ME associations. It can be used to identify a group of USIMs for a particular application.

Identifier: '6F3E'	Structure: transparent	Optional
File size: 1-n bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to n	USIM group identifier(s)	O	n bytes

4.2.11 EF_{GID2} (Group Identifier Level 2)

This EF contains identifiers for particular USIM-ME associations. It can be used to identify a group of USIMs for a particular application.

Identifier: '6F3F'	Structure: transparent	Optional
File size: 1-n bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to n	USIM group identifier(s)	O	n bytes

NOTE: The structure of EF_{GID1} and EF_{GID2} is identical. They are provided to allow the network operator to enforce different levels of security dependant on an application.

4.2.12 EF_{SPN} (Service Provider Name)

This EF contains the service provider name and appropriate requirements for the display by the ME.

Identifier: '6F46'	Structure: transparent	Optional
File Size: 17 bytes	Update activity: low	

Access Conditions:

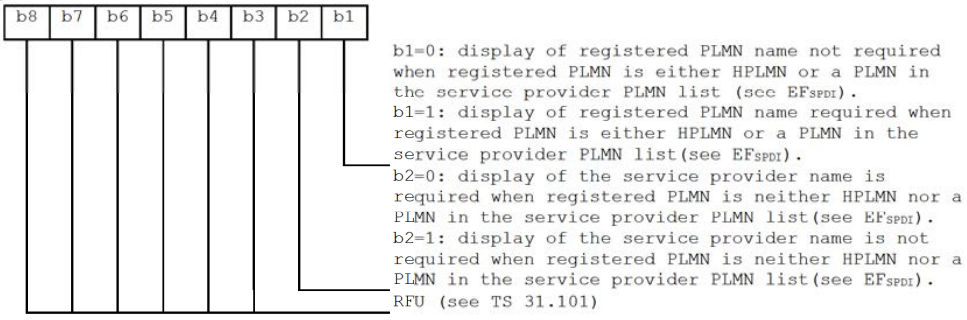
READ	ALWAYS
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Display Condition	M	1 byte
2 to 17	Service Provider Name	M	16 bytes

- Display Condition

  Contents: display condition for the service provider name in respect to the registered PLMN (see TS 22.101[24]).

  Coding:



- Service Provider Name

  Contents:

  service provider string

  Coding:

  the string shall use:

  - either the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0. The string shall be left justified. Unused bytes shall be set to 'FF'.
  - or one of the UCS2 code options defined in the annex of TS 31.101 [11].

4.2.13 EF_{PUCT} (Price per Unit and Currency Table)

This EF contains the Price per Unit and Currency Table (PUCT). The PUCT is Advice of Charge related information which may be used by the ME in conjunction with EF_{ACM} to compute the cost of calls in the currency chosen by the subscriber, as specified in TS 22.024 [3]. This EF shall always be allocated if EF_{ACM} is allocated.

Identifier: '6F41'	Structure: transparent	Optional
File size: 5 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN/PIN2 (fixed during administrative management)
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	Currency code	M	3 bytes
4 to 5	Price per unit	M	2 bytes

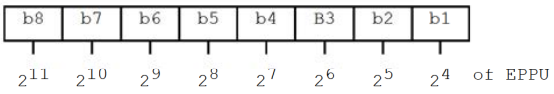
- Currency code
  Contents:
  the alpha-identifier of the currency code.

  Coding:
  bytes 1, 2 and 3 are the respective first, second and third character of the alpha identifier. This alpha-tagging shall use the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0.

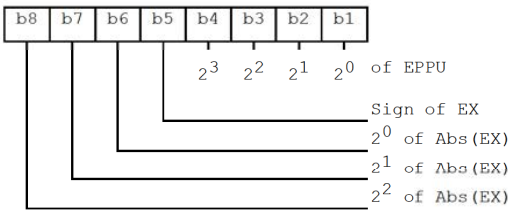
- Price per unit
  Contents:
  price per unit expressed in the currency coded by bytes 1-3.

  Coding:
  byte 4 and bits b1 to b4 of byte 5 represent the Elementary Price per Unit (EPPU) in the currency coded by bytes 1-3. Bits b5 to b8 of byte 5 are the decimal logarithm of the multiplicative factor represented by the absolute value of its decimal logarithm (EX) and the sign of EX, which is coded 0 for a positive sign and 1 for a negative sign.

Byte 4:



Byte 5:



- The computation of the price per unit value is made by the ME in compliance with TS 22.024 [3] by the following formula:

price per unit = EPPU * 10^{EX}.

- The price has to be understood as expressed in the coded currency.

If a GSM application is present on the UICC and the PUCT information is to be shared between the GSM and the USIM application, then this file shall be shared between the two applications.

4.2.14 EF_{CBMI} (Cell Broadcast Message identifier selection)

This EF contains the Message Identifier Parameters which specify the type of content of the cell broadcast messages that the subscriber wishes the UE to accept.

Any number of CB Message Identifier Parameters may be stored in the USIM. No order of priority is applicable.

Identifier: '6F45'	Structure: transparent	Optional
File size: 2 n bytes	Update activity: low	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1 to 2	CB Message Identifier 1	O	2 bytes
3 to 4	CB Message Identifier 2	O	2 bytes
2n-1 to 2n	CB Message Identifier n	O	2 bytes

- Cell Broadcast Message Identifier
  Coding:
  - as in TS 23.041 [16], "Message Format on BTS-MS Interface - Message Identifier";
  - values listed show the types of message which shall be accepted by the UE;
  - unused entries shall be set to 'FF FF'.

4.2.15 EF_{ACC} (Access Control Class)

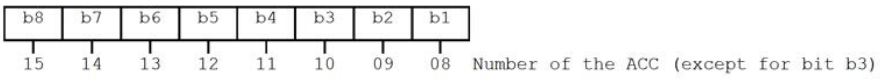
This EF contains the assigned access control class(es). The access control class is a parameter to control the access attempts. 15 classes are split into 10 classes randomly allocated to normal subscribers and 5 classes allocated to specific high priority users. For more information see TS 22.011 [2].

Identifier: '6F78'	Structure: transparent	Mandatory
SFI: '06'		
File size: 2 bytes	Update activity: low	
Access Conditions: READ PIN UPDATE ADM DEACTIVATE ADM ACTIVATE ADM		

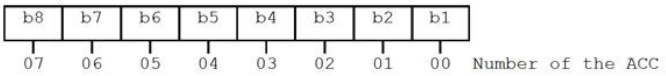
Bytes	Description	M/O	Length
1 to 2	Access control classes	M	2 bytes

- Access control classes
  Coding:
  - each ACC is coded on one bit. An ACC is "allocated" if the corresponding bit is set to 1 and "not allocated" if this bit is set to 0. Bit b3 of byte 1 is set to 0.

  Byte 1:



Byte 2:



4.2.16 EF_{FPLMN} (Forbidden PLMNs)

This EF contains the coding for n Forbidden PLMNs (FPLMN). It is read by the ME as part of the USIM initialization procedure and indicates PLMNs which the UE shall not automatically attempt to access.

A PLMN is written to the EF if a network rejects a Location Update with the cause "PLMN not allowed". The ME shall manage the list as follows.

When n FPLMNs are held in the EF, and rejection of a further PLMN is received by the ME from the network, the ME shall modify the EF using the UPDATE command. This new PLMN shall be stored in the n^{th} position, and the existing list "shifted" causing the previous contents of the first position to be lost.

When less than n FPLMNs exist in the EF, storage of an additional FPLMN shall not cause any existing FPLMN to be lost.

Dependent upon procedures used to manage storage and deletion of FPLMNs in the EF, it is possible, when less than n FPLMNs exist in the EF, for 'FFFFFF' to occur in any position. The ME shall analyse all the EF for FPLMNs in any position, and not regard 'FFFFFF' as a termination of valid data.

Identifier: '6F7B'	Structure: transparent	Mandatory
SFI: '0D'		
File size: n*3 bytes (n>3)	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	PLMN 1	M	3 bytes
4 to 6	PLMN 2	M	3 bytes
7 to 9	PLMN 3	M	3 bytes
10 to 12	PLMN 4	M	3 bytes
(3n-2) to 3n	PLMN n	O	3 bytes

- PLMN
  Contents:
  Mobile Country Code (MCC) followed by the Mobile Network Code (MNC).
  Coding:
  according to TS 24.008 [9].
  For instance, using 246 for the MCC and 81 for the MNC and if this is stored in PLMN 3 the contents is as follows:
  Bytes 7-9:'42' 'F6' '18'.
  If storage for fewer than n PLMNs is required, the unused bytes shall be set to 'FF'.

4.2.17 EF_{LOCI} (Location Information)

This EF contains the following Location Information:

- Temporary Mobile Subscriber Identity (TMSI);
- Location Area Information (LAI);
- Location update status.

See clause 5.2.5 for special requirements when updating EF_{LOCI}.

Identifier: '6F7E'	Structure: transparent	Mandatory
SFI: '0B'		
File size: 11 bytes	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 4	TMSI	M	4 bytes
5 to 9	LAI	M	5 bytes
10	RFU	M	1 byte
11	Location update status	M	1 byte

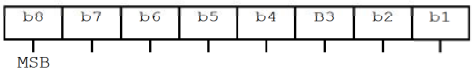
- TMSI

Contents:

Temporary Mobile Subscriber Identity.

Coding:

according to TS 24.008 [9].



- LAI

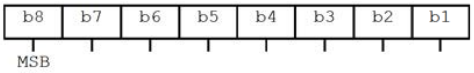
Contents:

Location Area Information.

Coding:

according to TS 24.008 [9].

Byte 5: first byte of LAI



- Location update status

Contents:

status of location update according to TS 24.008 [9].

Coding:

Byte 11:

Bits:

b3	b2	b1	
0	0	0	: updated.
0	0	1	: not updated.
0	1	0	: PLMN not allowed.
0	1	1	: Location Area not allowed.
1	1	1	: reserved.

Bits b4 to b8 are RFU (see TS 31.101 [11]).

4.2.18 EF_{AD} (Administrative Data)

This EF contains information concerning the mode of operation according to the type of USIM, such as normal (to be used by PLMN subscribers for 3G operations), type approval (to allow specific use of the ME during type approval procedures of e.g. the radio equipment), cell testing (to allow testing of a cell before commercial use of this cell), manufacturer specific (to allow the ME manufacturer to perform specific proprietary auto-test in its ME during e.g. maintenance phases).

It also provides an indication of whether some ME features should be activated during normal operation as well as information about the length of the MNC, which is part of the International Mobile Subscriber Identity (IMSI).

Identifier: '6FAD'	Structure: transparent	Mandatory
SFI: '03'		
File size: 4+X bytes	Update activity: low	

Access Conditions:

READ	ALW
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	UE operation mode	M	1 byte
2 to 3	Additional information	M	2 bytes
4	length of MNC in the IMSI	M	1 byte
5 to 4+X	RFU	O	X bytes

- UE operation mode:

Contents:

mode of operation for the UE

Coding:

Initial value

- '00' normal operation.
- '80' type approval operations.
- '01' normal operation + specific facilities.
- '81' type approval operations + specific facilities.
- '02' maintenance (off line).
- '04' cell test operation.

All other values are RFU

- Additional information:

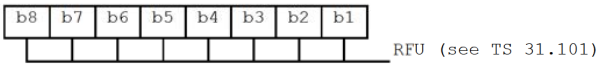
Contents:

additional information depending on the UE operation mode

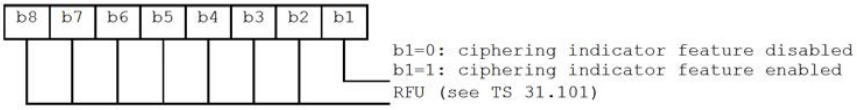
Coding:

- specific facilities (if b1=1 in byte 1):

Byte 2 (first byte of additional information):



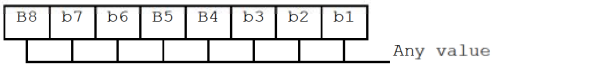
Byte 3 (second byte of additional information):



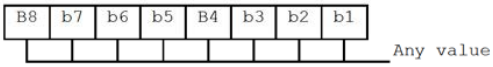
b1 is used to control the ciphering indicator feature as specified in TS 22.101 [24].

- ME manufacturer specific information (if b2=1 in byte 1):

Byte 2 (first byte of additional information):



Byte 3 (second byte of additional information):



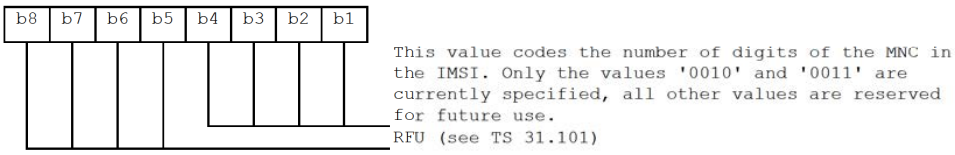
- Length of MNC in the IMSI:

Contents:

The length indicator refers to the number of digits, used for extracting the MNC from the IMSI

Coding:

Byte 4:



4.2.19 Void

4.2.20 EF_{CBMID} (Cell Broadcast Message Identifier for Data Download)

This EF contains the message identifier parameters which specify the type of content of the cell broadcast messages which are to be passed to the USIM.

Any number of CB message identifier parameters may be stored in the USIM. No order of priority is applicable.

Identifier: '6F48'	Structure: transparent	Optional
SFI: '0E'		
File size: 2n bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 2	CB Message Identifier 1	O	2 bytes
3 to 4	CB Message Identifier 2	O	2 bytes
2n-1 to 2n	CB Message Identifier n	O	2 bytes

- Cell Broadcast Message Identifier.

Coding:

- as in TS 23.041 [16]. Values listed show the identifiers of messages which shall be accepted by the UE to be passed to the USIM.

Unused entries shall be set to 'FF FF'.

4.2.21 EF_{ECC} (Emergency Call Codes)

This EF contains emergency call codes.

Identifier: '6FB7'	Structure: linear fixed	Mandatory
SFI: '01'		
Record size: X+4 bytes	Update activity: low	

Access Conditions:

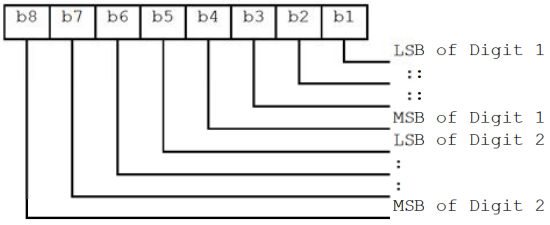
READ	ALW
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	Emergency Call Code	M	3 bytes
4 to X+3	Emergency Call Code Alpha Identifier	O	X bytes
X+4	Emergency Service Category	M	1 byte

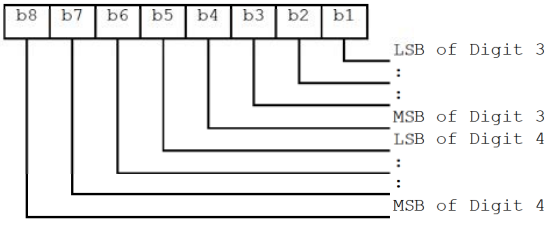
- Emergency Call Code.
  Contents:
  - Emergency Call Code.

  Coding:
  - the emergency call code is of a variable length with a maximum length of 6 digits. Each emergency call code is coded on three bytes, with each digit within the code being coded on four bits as shown below. If a code of less than 6 digits is chosen, then the unused nibbles shall be set to 'F'.

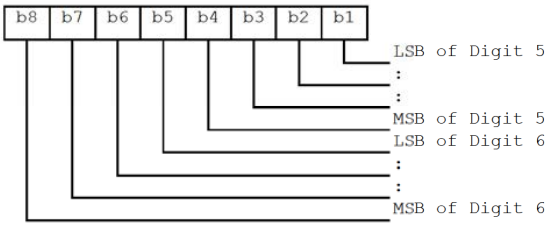
Byte 1:



Byte 2:



Byte 3:



- Emergency Call Code Alpha Identifier.
  Contents:
  Information about the dialled emergency number to be displayed to the user.

  Coding:
  this alpha-tagging shall use
  either:
  - the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0. The alpha identifier shall be left justified. Unused bytes shall be set to 'FF'.

  Or
  - one of the UCS2 coded options as defined in the annex of TS 31.101 [11].

- Emergency Service Category.
  Contents:
  Information to be sent to the network indicating the category of the emergency call.

  Coding:
  Coding according to 24.008 [9].

4.2.22 EF_{CBMIR} (Cell Broadcast Message Identifier Range selection)

This EF contains ranges of cell broadcast message identifiers that the subscriber wishes the UE to accept.

Any number of CB Message Identifier Parameter ranges may be stored in the USIM. No order of priority is applicable.

Identifier: '6F50'	Structure: transparent	Optional
File size: 4n bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 4	CB Message Identifier Range 1	O	4 bytes
5 to 8	CB Message Identifier Range 2	O	4 bytes
(4n-3) to 4n	CB Message Identifier Range n	O	4 bytes

- Cell Broadcast Message Identifier Ranges.
  Contents:
  - CB Message Identifier ranges:

  Coding:
  - bytes one and two of each range identifier equal the lower value of a cell broadcast range, bytes three and four equal the upper value of a cell broadcast range, both values are coded as in TS 23.041 [16] "Message Format on BTS-MS Interface - Message Identifier". Values listed show the ranges of messages which shall be accepted by the UE.
    Unused entries shall be set to 'FF FF FF FF'.

4.2.23 EF_{PSLOCI} (Packet Switched location information)

This EF contains the following Location Information:

- Packet Temporary Mobile Subscriber Identity (P-TMSI);
- Packet Temporary Mobile Subscriber Identity signature value (P-TMSI signature value);
- Routing Area Information (RAI);
- Routing Area update status.

Identifier: '6F73'	Structure: transparent	Mandatory
SFI: '0C'		
File size: 14 bytes	Update activity: high	

Access Conditions:

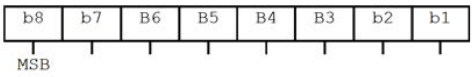
READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 4	P-TMSI	M	4 bytes
5 to 7	P-TMSI signature value	M	3 bytes
8 to13	RAI	M	6 bytes
14	Routing Area update status	M	1 byte

- P-TMSI.
  Contents:
  Packet Temporary Mobile Subscriber Identity.

  Coding:
  according to TS 24.008 [9].

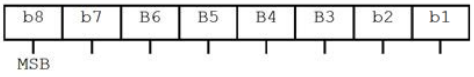
Byte 1: first byte of P-TMSI



- P-TMSI signature value.
  Contents:
  Packet Temporary Mobile Subscriber Identity signature value.

  Coding:
  according to TS 24.008 [9].

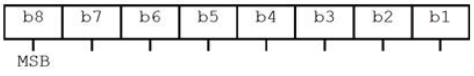
  Byte 5: first byte of P-TMSI signature value.



- RAI
  Contents:
  Routing Area Information.

  Coding:
  according to TS 24.008 [9].

Byte 8: first byte of RAI



- Routing Area update status.
  Contents:
  status of routing area update according to TS 24.008 [9].

Coding:
byte 14:

Bits:	b3	b2	b1.	
	0	0	0	: updated.
	0	0	1	: not updated.
	0	1	0	: PLMN not allowed.
	0	1	1	: Routing Area not allowed.
	1	1	1	: reserved.

Bits b4 to b8 are RFU (see TS 31.101 [11]).

4.2.24 EF_{FDN} (Fixed Dialling Numbers)

This EF contains Fixed Dialling Numbers (FDN) and/or Supplementary Service Control strings (SSC). In addition it contains identifiers of associated network/bearer capabilities and identifiers of extension records at the USIM ADF level. It may also contain an associated alpha-tagging. If this file is present in the USIM, the Enabled Services Table (EF_{EST}) shall also be present.

Identifier: '6F3B'	Structure: linear fixed	Optional
Record length: X+14 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN2
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier	O	X bytes
X+1	Length of BCD number/SSC contents	M	1 byte
X+2	TON and NPI	M	1 byte
X+3 to X+12	Dialling Number/SSC String	M	10 bytes
X+13	Capability/Configuration2 Record Identifier	M	1 byte
X+14	Extension2 Record Identifier	M	1 byte

For contents and coding of all data items see the respective data items of the EF_{ADN} (clause 4.4.2.3), with the exception that extension records are stored in the EF_{EXT2}.

By default, destination addresses which are not in EF_{FDN} shall not be allowed on any CS bearer service/teleservice or SMS when FDN is enabled.

For the FDN procedures related to SMS see TS 22.101 [24] and TS 31.111 [12].

NOTE: The value of X (the number of bytes in the alpha-identifier) may be different to the length denoted X in EF_{ADN}.

4.2.25 EF_{SMS} (Short messages)

This EF contains information in accordance with TS 23.040 [6] comprising short messages (and associated parameters) which have either been received by the UE from the network, or are to be used as an UE originated message.

Identifier: '6F3C'	Structure: linear fixed	Optional
Record length: 176 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

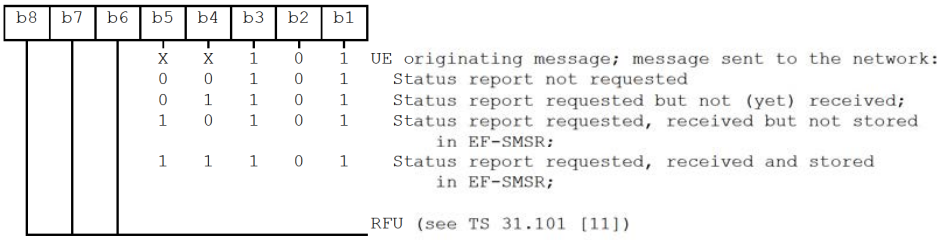
Bytes	Description	M/O	Length
1	Status	M	1 byte
2 to 176	Remainder	M	175 bytes

- Status.
  Contents:
  Status byte of the record which can be used as a pattern in the SEARCH RECORD command. For UE originating messages sent to the network, the status shall be updated when the UE receives a status report, or sends a successful SMS Command relating to the status report.

  Coding:



b8	b7	b6	b5	b4	b3	b2	b1	
					X	X	0	free space
					X	X	1	used space
					0	0	1	message received by UE from network; message read
					0	1	1	message received by UE from network; message to be read
					1	1	1	UE originating message; message to be sent
								RFU (see TS 31.101 [11])



b8	b7	b6	b5	b4	b3	b2	b1	
			X	X	1	0	1	UE originating message; message sent to the network:
			0	0	1	0	1	Status report not requested
			0	1	1	0	1	Status report requested but not (yet) received;
			1	0	1	0	1	Status report requested, received but not stored in EF-SMSR;
			1	1	1	0	1	Status report requested, received and stored in EF-SMSR;
								RFU (see TS 31.101 [11])

- Remainder.
  Contents:
  This data item commences with the TS-Service-Centre-Address as specified in TS 24.011 [10]. The bytes immediately following the TS-Service-Centre-Address contain an appropriate short message TPDU as specified in TS 23.040 [6], with identical coding and ordering of parameters.

  Coding:
  according to TS 23.040 [6] and TS 24.011 [10]. Any TP-message reference contained in an UE originated message stored in the USIM, shall have a value as follows:

	Value of the TP-message-reference:
message to be sent:	'FF'.
message sent to the network:	the value of TP-Message-Reference used in the message sent to the network.

  Any bytes in the record following the TPDU shall be filled with 'FF'.

  It is possible for a TS-Service-Centre-Address of maximum permitted length, e.g. containing more than 18 address digits, to be associated with a maximum length TPDU such that their combined length is 176 bytes. In this case the ME shall store in the USIM the TS-Service-Centre-Address and the TPDU in bytes 2-176 without modification, except for the last byte of the TPDU, which shall not be stored.

4.2.26 EF_{MSISDN} (MSISDN)

This EF contains MSISDN(s) related to the subscriber. In addition it contains identifiers of associated network/bearer capabilities and identifiers of extension records at the USIM ADF level. It may also contain an associated alpha-tagging.

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

Access Conditions:

READ	PIN
UPDATE	PIN/ADM (fixed during administrative management)
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier	O	X bytes
X+1	Length of BCD number/SSC contents	M	1 byte
X+2	TON and NPI	M	1 byte
X+3 to X+12	Dialling Number/SSC String	M	10 bytes
X+13	Capability/Configuration2 Record Identifier	M	1 byte
X+14	Extension5 Record Identifier	M	1 byte

For contents and coding of all data items see the respective data items of EF_{ADN}.

If the USIM stores more than one MSISDN number and the ME displays the MSISDN number(s) within the initialisation procedure then the one stored in the first record shall be displayed with priority.

NOTE: The value of X (the number of bytes in the alpha-identifier) may be different to the length denoted X in EF_{ADN}.

4.2.27 EF_{SMSP} (Short message service parameters)

This EF contains values for Short Message Service header Parameters (SMSP), which can be used by the ME for user assistance in preparation of mobile originated short messages. For example, a service centre address will often be common to many short messages sent by the subscriber.

The EF consists of one or more records, with each record able to hold a set of SMS parameters. The first (or only) record in the EF shall be used as a default set of parameters, if no other record is selected.

To distinguish between records, an alpha-identifier may be included within each record, coded on Y bytes.

The SMS parameters stored within a record may be present or absent independently. When a short message is to be sent from the UE, the parameter in the USIM record, if present, shall be used when a value is not supplied by the user.

Identifier: '6F42'	Structure: linear fixed	Optional
Record length: 28+Y bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to Y	Alpha-Identifier	O	Y bytes
Y+1	Parameter Indicators	M	1 byte
Y+2 to Y+13	TP-Destination Address	M	12 bytes
Y+14 to Y+25	TS-Service Centre Address	M	12 bytes
Y+26	TP-Protocol Identifier	M	1 byte
Y+27	TP-Data Coding Scheme	M	1 byte
Y+28	TP-Validity Period	M	1 byte

Storage is allocated for all of the possible SMS parameters, regardless of whether they are present or absent. Any bytes unused, due to parameters not requiring all of the bytes, or due to absent parameters, shall be set to 'FF'.

- Alpha-Identifier.
  Contents:
  Alpha Tag of the associated SMS-parameter.

Coding:
see clause 4.4.2.3 (EF_{ADN}).

NOTE: The value of Y may be zero, i.e. the alpha-identifier facility is not used. By using the command GET RESPONSE the ME can determine the value of Y.

- Parameter Indicators.
Contents:
each of the default SMS parameters which can be stored in the remainder of the record are marked absent or present by individual bits within this byte.

Coding:
allocation of bits:

bit number	Parameter indicated.
1	TP-Destination Address.
2	TS-Service Centre Address.
3	TP-Protocol Identifier.
4	TP-Data Coding Scheme.
5	TP-Validity Period.
6	reserved, set to 1.
7	reserved, set to 1.
8	reserved, set to 1.

Bit value	Meaning.
0	Parameter present.
1	Parameter absent.

- TP-Destination Address.
Contents and Coding:
as defined for SM-TL address fields in TS 23.040 [6].

- TP-Service Centre Address.
Contents and Coding:
as defined for RP-Destination address Centre Address in TS 24.011 [10].

- TP-Protocol Identifier.
Contents and Coding:
as defined in TS 23.040 [6].

- TP-Data Coding Scheme.
Contents and Coding:
as defined in TS 23.038 [5].

- TP-Validity Period.
Contents and Coding:
as defined in TS 23.040 [6] for the relative time format.

4.2.28 EF_{SMSS} (SMS status)

This EF contains status information relating to the short message service.

The provision of this EF is associated with EF_{SMS}. Both files shall be present together, or both absent from the USIM.

Identifier: '6F43'	Structure: transparent	Optional
File size: 2+X bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Last Used TP-MR	M	1 byte
2	SMS "Memory Cap. Exceeded" Not. Flag	M	1 byte
3 to 2+X	RFU	O	X bytes

- Last Used TP-MR.
  Contents:
  - the value of the TP-Message-Reference parameter in the last mobile originated short message, as defined in TS 23.040 [6].

  Coding:
  - as defined in TS 23.040 [6].

- SMS "Memory Capacity Exceeded" Notification Flag.
  Contents:
  - this flag is required to allow a process of flow control, so that as memory capacity in the UE becomes available, the Network can be informed. The process for this is described in TS 23.040 [6].

  Coding:
  b1=1 means flag unset; memory capacity available;
  b1=0 means flag set;
  b2 to b8 are reserved and set to 1.

4.2.29 EF_{SDN} (Service Dialling Numbers)

This EF contains special service numbers (SDN) and/or the respective supplementary service control strings (SSC). In addition it contains identifiers of associated network/bearer capabilities and identifiers of extension records at the USIM ADF level. It may also contain associated alpha-tagging.

Identifier: '6F49'	Structure: linear fixed	Optional
Record length: X+14 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1-X	Alpha identifier	O	X bytes
X+1	Length of BCD number/SSC contents	M	1 bytes
X+2	TON and NPI	M	1 byte
X+3 to X+12	Dialling Number/SSC String	M	10 bytes
X+13	Capability/Configuration2 Record Identifier	M	1 byte
X+14	Extension3 Record Identifier	M	1 byte

For contents and coding of all data items see the respective data items of the EF_{ADN} (clause 4.4.2.3), with the exception that extension records are stored in the EF_{EXT3} and capability/configuration parameters are stored in EF_{CCP2}.

NOTE: The value of X (the number of bytes in the alpha-identifier) may be different to the length denoted X in EF_{ADN}.

4.2.30 EF_{EXT2} (Extension2)

This EF contains extension data of an FDN (see FDN in 4.2.24).

Identifier: '6F4B'	Structure: linear fixed	Optional
Record length: 13 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN2
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Record type	M	1 byte
2 to 12	Extension data	M	11 bytes
13	Identifier	M	1 byte

For contents and coding see clause 4.4.2.4 (EF_{EXT1}).

4.2.31 EF_{EXT3} (Extension3)

This EF contains extension data of an SDN (see SDN in 4.2.29).

Identifier: '6F4C'	Structure: linear fixed	Optional
Record length: 13 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Record type	M	1 byte
2 to 12	Extension data	M	11 bytes
13	Identifier	M	1 byte

For contents and coding see clause 4.4.2.4 (EF_{EXT1}).

4.2.32 EF_{SMSR} (Short message status reports)

This EF contains information in accordance with TS 23.040 [6] comprising short message status reports which have been received by the UE from the network.

Each record is used to store the status report of a short message in a record of EF_{SMS}. The first byte of each record is the link between the status report and the corresponding short message in EF_{SMS}.

Identifier: '6F47'	Structure: linear fixed	Optional
Record length: 30 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	SMS record identifier	M	1
2 to 30	SMS status report	M	29 bytes

- SMS record identifier.
  Contents:

- this data item identifies the corresponding SMS record in EF_{SMS}, e.g. if this byte is coded '05' then this status report corresponds to the short message in record #5 of EF_{SMS}.

Coding:
- '00' - empty record;
- '01' - 'FF' - record number of the corresponding SMS in EF_{SMS}.

- SMS status report:
Contents:
  - this data item contains the SMS-STATUS-REPORT TPDU as specified in TS 23.040 [6], with identical coding and ordering of parameters.

Coding:
  - according to TS 23.040 [6]. Any bytes in the record following the TPDU shall be filled with 'FF'.

4.2.33 EF_{ICI} (Incoming Call Information)

If service n°9 is "available", this file shall be present.

This EF is located within the USIM application. The incoming call information can be linked to the phone book stored under $DF_{TELECOM}$ or to the local phone book within the USIM. The EF_{ICI} contains the information related to incoming calls.

The time of the call and duration of the call are stored in this EF. This EF can also contain associated alpha identifier that may be supplied with the incoming call. In addition it contains identifiers of associated network/bearer capabilities and identifiers of extension records at the USIM ADF level. The structure of this EF is cyclic, so the contents shall be updated only after a call is disconnected.

If CLI is supported and the incoming phone number matches a number stored in the phone book the incoming call information is linked to the corresponding information in the phone book. If the incoming call matches an entry but is indicated as hidden in the phone book the link is established but the information is not displayed by the ME if the code for the secret entry has not been verified. The ME shall not ask for the secret code to be entered at this point.

Optionally the ME may store the link to phone book entry in the file, so that it does not need to look again for a match in the phone book when it reuses the entry. But the ME will have to check that the incoming call number still exits in the linked phone book entry, as the link might be broken (entry modified). When not used by the ME or no link to the phone book has been found, this field shall be set to 'FFFFFF'.

The first byte of this link is used to identify clearly the phone book location either global (i.e. under $DF_{TELECOM}$) or local (i.e. USIM specific). To allow the reuse of the referring mechanism in further implementation of the phonebook under discussion, this byte can be used to indicate those.

For the current version of the phone book, the phone book entry is identified as follows:

- the record number in the EF_{PBR} which indicates the EF_{ADN} containing the entry;

- the record number inside the indicated EF_{ADN}.

The structure of EF_{ICI} is shown below. Coding scheme is according to EF_{ADN}

Structure of EF_{ICI}

Identifier: '6F80'	Structure: Cyclic	Optional
SFI: '14'		
Record length: X+28 bytes	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier	O	X bytes
X+1	Length of BCD number contents	M	1 byte
X+2	TON and NPI	M	1 byte
X+3 to X+12	Incoming Call Number	M	10 bytes
X+13	Capability/Configuration2 Record Identifier	M	1 byte
X+14	Extension5 Record Identifier	M	1 byte
X+15 to X+21	Incoming call date and time (see detail 1)	M	7 bytes
X+22 to X+24	Incoming call duration (see detail 2)	M	3 bytes
X+25	Incoming call status (see detail 3)	M	1 byte
X+26 to X+28	Link to phone book entry (see detail 4)	M	3 bytes

NOTE: When the contents except incoming call status are invalid, they are filled with 'FF'.

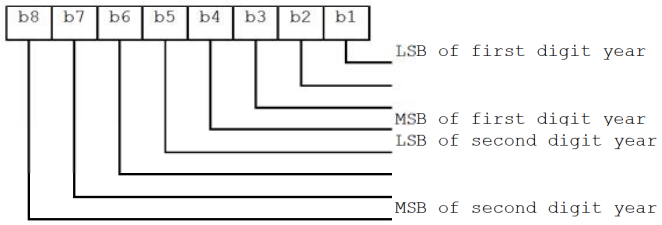
Detail 1 Coding of date and time.

Content:

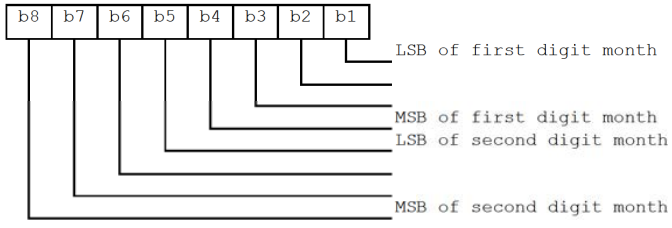
the date and time are defined by the ME.

Coding:

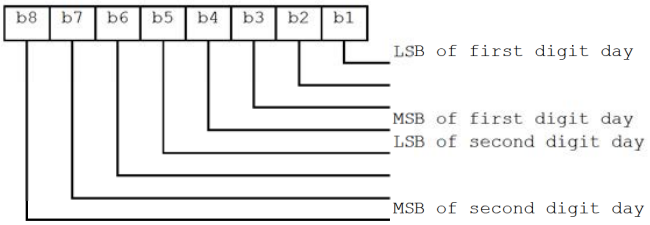
it is according to the extended BCD coding from Byte1 to Byte 7. The first 3 bytes show year, month and day (yy.mm.dd). The next 3 bytes show hour, minute and second (hh.mm.ss). The last Byte 7 is Time Zone. The Time Zone indicates the difference, expressed in quarters of an hour, between the local time and GMT. Bit 4 in Byte 7 represents the algebraic sign of this difference (0: positive, 1: negative). If the terminal does not support the Time Zone, Byte 7 shall be "FF". Byte X+15: Year.



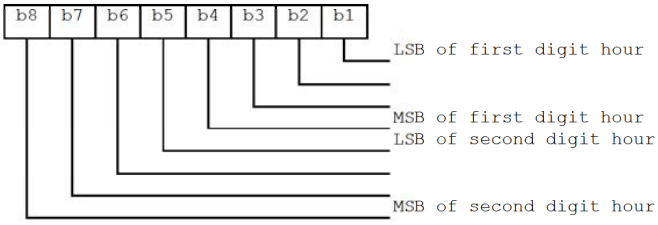
Byte X+16: Month



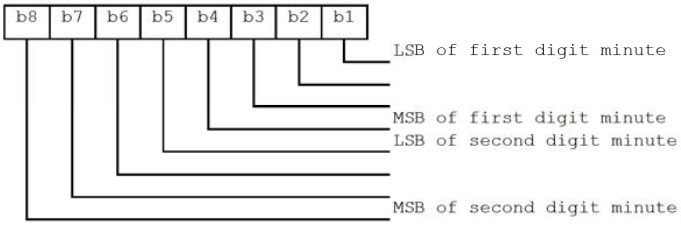
Byte X+17: Day



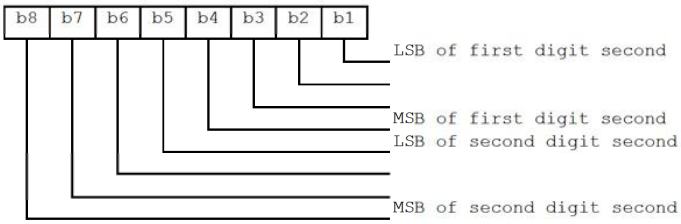
Byte X+18: Hour



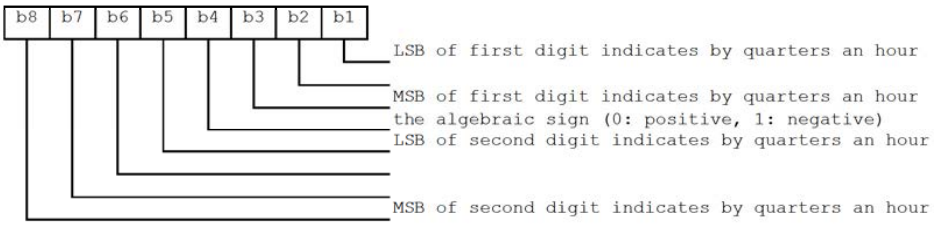
Byte X+19: Minute



Byte X+20: Second



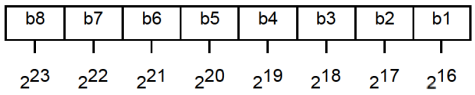
Byte X+21: Time Zone



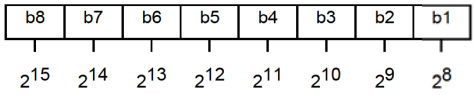
Detail 2 Coding of call duration.

Call duration is indicated by second.

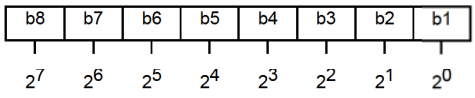
Byte X+22:



Byte X+23:



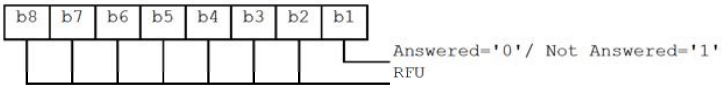
Byte X+24:



For instance, '00' '00' '30' represents 2^5+2^4.

Detail 3 Coding of Call status.

Byte X+25:

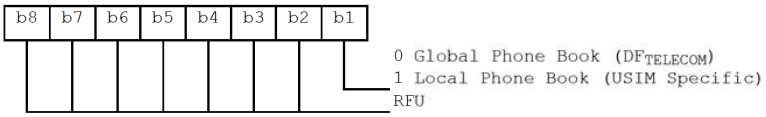


Detail 4 Link to phone book entry

For the current implementation of the phone book the following coding applies:

Phone book reference.

Byte X+26:



EF_{PBR} record number:

- Byte X+27: Hexadecimal value.

EF_{ADN} record number:

- Byte X+28: Hexadecimal value.

4.2.34 EF_{OCI} (Outgoing Call Information)

If service n°8 is "available", this file shall be present.

This EF is located within the USIM application. The outgoing call information can be linked to the phone book stored under $DF_{TELECOM}$ or to the local phone book within the USIM. The EF_{OCI} contains the information related to outgoing calls.

The time of the call and duration of the call are stored in this EF. It may also contain associated alpha identifier. In addition it contains identifiers of associated network/bearer capabilities and identifiers of extension records at the USIM ADF level. The structure of this file is cyclic, so the contents shall be updated only after a call is disconnected.

If the dialled phone number matches a number stored in the phone book the outgoing call information might be linked to the corresponding information in the phone book. The dialled number may match with a hidden entry in the phone book. If the dialled number matches a hidden entry in the phone book the link is established but the information related to the phone book entry is not displayed by the ME, if the hidden code has not been verified. The ME shall not perform hidden code verification at this point.

Optionally, the ME may store the link to phone book entry in the file, so that it does not need to look again for a match in the phone book when it reuses the entry. But the ME will have to check that the outgoing call number still exists in the linked phone book entry, as the link might be broken (entry modified). When not used by the ME or no link to the phone book has been found, this field shall be set to 'FFFFFF'.

Coding scheme is according to EF_{ICI}.

Structure of EF_{OCI}

Identifier: '6F81'	Structure: Cyclic	Optional
SFI: '15'		
Record length: X+27 bytes	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier	O	X bytes
X+1	Length of BCD number/SSC contents	M	1 byte
X+2	TON and NPI	M	1 byte
X+3 to X+12	Outgoing Call Number/SSC String	M	10 bytes
X+13	Capability/Configuration2 Record Identifier	M	1 byte
X+14	Extension5 Record Identifier	M	1 byte
X+15 to X+21	Outgoing call date and time	M	7 bytes
X+22 to X+24	Outgoing call duration	M	3 bytes
X+25 to X+27	Link to Phone Book Entry	M	3 bytes

NOTE: When the contents are invalid, they are filled with 'FF'.

4.2.35 EF_{ICT} (Incoming Call Timer)

If service n°9 is "available", this file shall be present.

This EF contains the accumulated incoming call timer duration value for the current call and previous calls. The EF is USIM specific and resides within the USIM application.

This file should have only one entry.

Structure of EF_{ICT}

Identifier: '6F82'	Structure: cyclic	Optional
Record length: 3 bytes	Update activity: high	

Access Conditions:

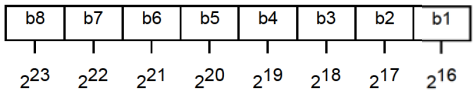
READ	PIN
UPDATE	PIN/PIN2 (fixed during administrative management)
INCREASE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	Accumulated call timer value	M	3 bytes

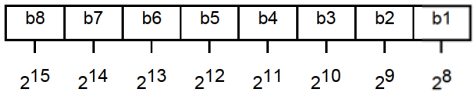
Coding:

Accumulated call timer value is indicated by second.

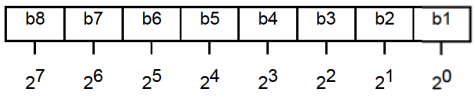
Byte 1:



Byte 2:



Byte 3:



For example, '00' '00' '30' represents 2^5+2^4.

4.2.36 EF_{OCT} (Outgoing Call Timer)

If service n°8 is "available", this file shall be present.

This EF contains the accumulated outgoing call timer duration value for the current call and previous calls. The EF is USIM specific and resides within the USIM application. The contents of this EF shall be updated only after a call is disconnected. The coding of this EF is the same as EF_{ICT}.

This file should have only one entry.

Structure of EF_{OCT}

Identifier: '6F83'	Structure: cyclic	Optional
Record length: 3 bytes	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN/PIN2 (fixed during administrative management)
INCREASE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	Accumulated call timer value	M	3 bytes

4.2.37 EF_{EXT5} (Extension5)

This EF contains extension data of EF_{ICI}, EF_{OCI} and EF_{MSISDN} of the USIM application.

Identifier: '6F4E'	Structure: linear fixed		Optional
Record length: 13 bytes		Update activity: low	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM			
Bytes	Description	M/O	Length
1	Record type	M	1 byte
2 to 12	Extension data	M	11 bytes
13	Identifier	M	1 byte

For contents and coding see EF_{EXT1}.

4.2.38 EF_{CCP2} (Capability Configuration Parameters 2)

This EF contains parameters of required network and bearer capabilities and terminal configurations associated with a call established using a fixed dialling number, a barred dialling number, an MSISDN, a service dialling number, an incoming call, an outgoing call or an MBDN. It is referred by EF_{FDN}, EF_{BDN}, EF_{MSISDN}, EF_{SDN}, EF_{ICI}, EF_{OCI}, EF_{MBDN} and EF_{CFIS} at USIM ADF level.

Identifier: '6F4F'	Structure: linear fixed		Optional
SFI: '16'			
Record length: X bytes, X≥15		Update activity: low	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM			
Bytes	Description	M/O	Length
1 to X	Bearer capability information element	M	X bytes

- Bearer capability information elements.

  - Contents and Coding:
    - see TS 24.008 [9]. The Information Element Identity (IEI) shall be excluded, i.e. the first byte of the EF_{CCP2} record shall be Length of the bearer capability contents.
    - unused bytes are filled with 'FF'.

4.2.39 EF_{eMLPP} (enhanced Multi Level Precedence and Pre-emption)

This EF contains information about priority levels and fast call set-up conditions for the enhanced Multi Level Precedence and Pre-emption service that can be used by the subscriber.

Identifier: '6FB5'	Structure: transparent	Optional
File size: 2 bytes	Update activity: low	

Access Conditions:

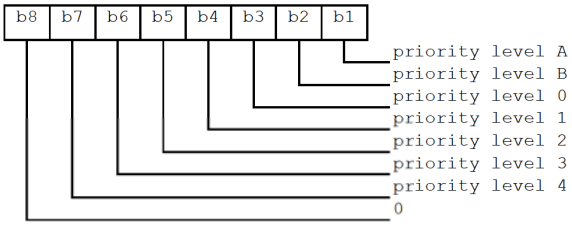
READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

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

- Priority levels.
  Contents:
  - the eMLPP priority levels subscribed to.

  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.

Byte 1:



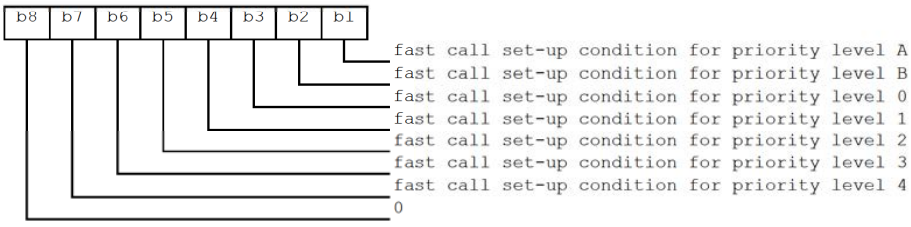
NOTE: Priority levels A and B can not be subscribed to (see TS 22.067 [5] for details).

EXAMPLE 1: If priority levels 0, 1 and 2 are subscribed to, EF_{eMLPP} shall be coded '1C'.

- Fast call set-up conditions.
  Contents:
  for each eMLPP priority level, the capability to use a fast call set-up procedure.

  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.

Byte 2: fast call set-up condition for:



EXAMPLE 2: If fast call set-up is allowed for priority levels 0, and 1, then byte 2 of EF_{eMLPP} is coded '0C'.

4.2.40 EF_{AAeM} (Automatic Answer for eMLPP Service)

This EF contains those priority levels (of the Multi Level Precedence and Pre-emption service) for which the ME shall answer automatically to incoming calls.

Identifier: '6FB6'	Structure: transparent	Optional
File size: 1 byte	Update activity: low	

Access Conditions:

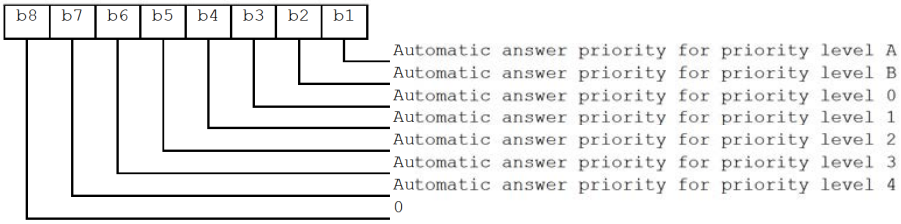
READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

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

- Automatic answer priority levels.
  Contents:
  - for each eMLPP priority level, the capability for the mobile station to answer automatically to incoming calls (with the corresponding eMLPP priority level).

  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.

Byte 1:



EXAMPLE: If automatic answer is allowed for incoming calls with priority levels A, 0 and 1, then EF_{AAeM} is coded '0D'.

4.2.41 Void

4.2.42 $EF_{Hiddenkey}$ (Key for hidden phone book entries)

This EF contains the hidden key that has to be verified by the ME in order to display the phone book entries that are marked as hidden. The hidden key can consist of 4 to 8 digits.

Identifier: '6FC3'	Structure: transparent	Optional
File size: 4 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 4	Hidden Key	M	4 bytes

- Hidden Key.
  Coding:

- the hidden key is coded on 4 bytes using BCD coding. The minimum number of digits is 4. Unused digits are padded with 'F'.

NOTE: The phone book entries marked as hidden are not scrambled by means of the hidden key. They are stored in plain text in the phone book.

4.2.43 Void

4.2.44 EF_{BDN} (Barred Dialling Numbers)

This EF contains Barred Dialling Numbers (BDN) and/or Supplementary Service Control strings (SSC). In addition it contains identifiers of associated network/bearer capabilities and identifiers of extension records. It may also contain an associated alpha-tagging. As the BDN service relies on the Call Control feature, BDN shall only be available if Call Control is available. If this file is present in the USIM, the Enabled Services Table (EF_{EST}) shall also be present.

Identifier: '6F4D'	Structure: linear fixed	Optional
Record length: X+15 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN2
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier	O	X bytes
X+1	Length of BCD number/SSC contents	M	1 byte
X+2	TON and NPI	M	1 byte
X+3 to X+12	Dialling Number/SSC String	M	10 bytes
X+13	Capability/Configuration2 Record Identifier	M	1 byte
X+14	Extension4 Record Identifier	M	1 byte
X+15	Comparison Method Pointer	M	1 byte

For contents and coding of all data items, except for the Comparison Method Pointer, see the respective data items of EF_{ADN}, with the exception that extension records are stored in the EF_{EXT4} and capability/configuration parameters are stored in EF_{CCP2}. The Comparison Method Pointer refers to a record number in EF_{CMI}.

NOTE: The value of X (the number of bytes in the alpha-identifier) may be different to the length denoted X in EF_{ADN}.

4.2.45 EF_{EXT4} (Extension4)

This EF contains extension data of a BDN/SSC.

Identifier: '6F55'	Structure: linear fixed	Optional
Record length: 13 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN2
DEACTIVE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Record type	M	1 byte
2 to 12	Extension data	M	11 bytes
13	Identifier	M	1 byte

For contents and coding see clause 4.4.2.4 EF_{EXT1}.

4.2.46 EF_{CMI} (Comparison Method Information)

This EF contains the list of Comparison Method Identifiers and alpha-tagging associated with BDN entries (see EF_{BDN}). This EF shall be present if EF_{BDN} is present.

Identifier: '6F58'	Structure: linear fixed	Optional
Record length: X+1 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier	M	X bytes
X+1	Comparison Method Identifier	M	1 byte

- Alpha Identifier.
  Contents:
  Alpha-tagging of the associated Comparison Method Identifier.

  Coding:
  Same as the alpha identifier in EF_{ADN}.

- Comparison Method Identifier.
  Contents:
  - this byte describes the comparison method which is associated with a BDN record. Its interpretation is not specified but it shall be defined by the card issuers implementing the BDN feature on their USIMs.

  Coding:
  - binary; values from 0 to 255 are allowed.
    The default coding 255 is reserved for empty field.

4.2.47 EF_{EST} (Enabled Services Table)

This EF indicates which services are enabled. If a service is not indicated as enabled in this table, the ME shall not select the service.

Identifier: '6F56'	Structure: transparent	Optional
SFI: '05'		
File size: X bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN2
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Services n°1 to n°8	M	1 byte
2	Services n°9 to n°16	O	1 byte
etc.			
X	Services n°(8X-7) to n°(8X)	O	1 byte

-Services
Contents: Service n°1: Fixed Dialling Numbers (FDN)
Service n°2: Barred Dialling Numbers (BDN)
Service n°3: APN Control List (ACL)

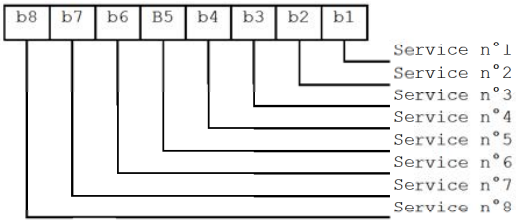
The EF shall contain at least one byte. Further bytes may be included, but if the EF includes an optional byte, then the EF shall also contain all bytes before that byte. Other services are possible in the future. The coding falls under the responsibility of the 3GPP.

Coding:

- 1 bit is used to code each service:
  - bit = 1: service activated;
  - bit = 0: service deactivated.
  - Unused bits shall be set to '0'.

A service which is listed in this table is enabled if it is indicated as available in the USIM Service Table (UST) and indicated as activated in the Enabled Services Tables (EST) otherwise this service is, either not available or disabled.

First byte:



etc.

4.2.48 EF_{ACL} (Access Point Name Control List)

This EF contains the list of allowed APNs (Access Point Names). If this file is present in the USIM, the Enabled Services Table (EF_{EST}) shall also be present.

Identifier: '6F57'	Structure: transparent	Optional
File size: X bytes (X>1)	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN2
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Number of APNs	M	1 byte
2 to X	APN TLVs	M	X-1 byte

For contents and coding of APN-TLV values see TS 23.003 [25]. The tag value of the APN-TLV shall be 'DD'. "Network provided APN" is coded with a TLV object of length zero.

4.2.49 EF_{DCK} (Depersonalisation Control Keys)

This EF provides storage for the de-personalization control keys associated with the OTA de-personalization cycle of TS 22.022 [27].

Identifier: '6F2C'	Structure: transparent	Optional
File Size: 16 bytes	Update activity: low	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1 to 4	8 digits of network de-personalization control key	M	4 bytes
5 to 8	8 digits of network subset de-personalization control key	M	4 bytes
9 to 12	8 digits of service provider de-personalization control key	M	4 bytes
13 to 16	8 digits of corporate de-personalization control key	M	4 bytes

Empty control key bytes shall be coded 'FFFFFFFF'.

4.2.50 EF_{CNL} (Co-operative Network List)

This EF contains the Co-operative Network List for the multiple network personalization services defined in TS 22.022 [27].

Identifier: '6F32'	Structure: transparent	Optional
File size: 6n bytes	Update activity: low	
Access Conditions: READ PIN UPDATE ADM DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1 to 6	Element 1 of co-operative net list	M	6 bytes
6n-5 to 6n	Element n of co-operative net list	O	6 bytes

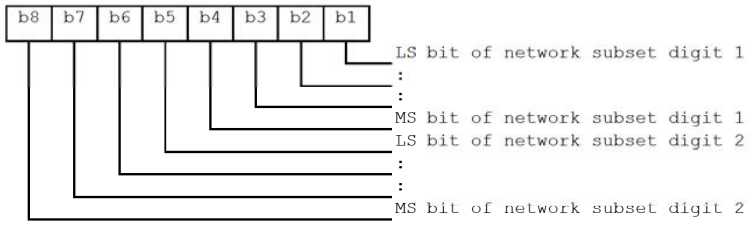
- Co-operative Network List.

  Contents:
  - PLMN network subset, service provider ID and corporate ID of co-operative networks.

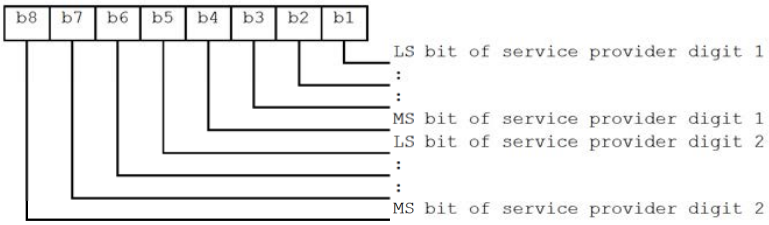
  Coding:
  - For each 6 byte list element.

Bytes 1 to 3: PLMN (MCC + MNC): according to TS 24.008 [9].

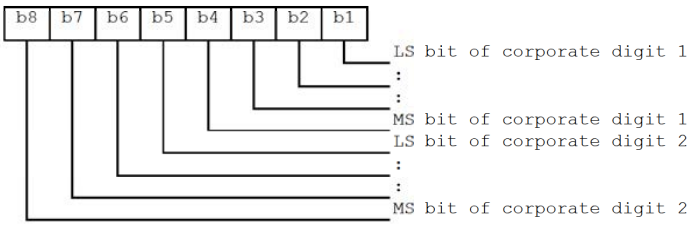
Byte 4:



Byte 5:



Byte 6:



- Empty fields shall be coded with 'FF'.
- The end of the list is delimited by the first MCC field coded 'FFF'.

4.2.51 $EF_{START-HFN}$ (Initialisation values for Hyperframe number)

This EF contains the values of $START_{CS}$ and $START_{PS}$ of the bearers that were protected by the keys in EF_{KEYS} or EF_{KEYSPS} at release of the last CS or PS RRC connection. These values are used to control the lifetime of the keys (see TS 33.102 [13]).

Identifier: '6F5B'	Structure: transparent	Mandatory
SFI: '0F'		
File size: 6 bytes	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	$START_{CS}$	M	3 bytes
4 to 6	$START_{PS}$	M	3 bytes

- $START_{CS}$
  Contents: Initialisation value for Hyperframe number – CS domain.
  Coding: The LSB of $START_{CS}$ is stored in bit 1 of byte 3. Unused nibbles are set to 'F'.

- $START_{PS}$
  Contents: Initialisation value for Hyperframe number – PS domain.
  Coding: As for $START_{CS}$.

4.2.52 $EF_{THRESHOLD}$ (Maximum value of START)

This EF contains the maximum value of $START_{CS}$ or $START_{PS}$. This value is used to control the lifetime of the keys (see TS 33.102 [13]).

Identifier: '6F5C'	Structure: transparent	Mandatory
SFI: '10'		
File size: 3 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	Maximum value of $START_{CS}$ or $START_{PS}$.	M	3 bytes

- Maximum value of $START_{CS}$ or $START_{PS}$.
  Coding: As for $START_{CS}$

4.2.53 $EF_{OPLMNwACT}$ (Operator controlled PLMN selector with Access Technology)

This EF contains the coding for n PLMNs where n is determined by the operator. This information is determined by the operator and defines the preferred PLMNs in priority order. The first record indicates the highest priority and the n^{th} record indicates the lowest. The EF also contains the Access Technologies for each PLMN in this list. (see TS 23.122 [31])

Identifier: '6F61'	Structure: transparent	Optional
SFI: '11'		
File size: 5n (where n ≥8 bytes)	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	1^{st} PLMN (highest priority)	M	3 bytes
4 to 5	1^{st} PLMN Access Technology Identifier	M	2 bytes
:	:		
36 to 38	8^{th} PLMN	M	3 bytes
39 to 40	8^{th} PLMN Access Technology Identifier	M	2 bytes
41 to 43	9^{th} PLMN	O	3 bytes
44 to 45	9^{th} PLMN Access Technology Identifier	O	2 bytes
:	:		
(5n-4) to (5n-2)	N^{th} PLMN (lowest priority)	O	3 bytes
(5n-1) to 5n	N^{th} PLMN Access Technology Identifier	O	2 bytes

- PLMN.
  Contents:
  - Mobile Country Code (MCC) followed by the Mobile Network Code (MNC).

  Coding:
  - according to TS 24.008 [9].

- Access Technology Identifier:
  Coding:
  - See $EF_{PLMNwACT}$ for coding.

4.2.54 $EF_{HPLMNwAcT}$ (HPLMN selector with Access Technology)

The HPLMN Selector with access technology data field shall contain the HPLMN code, or codes together with the respected access technology in priority order (see TS 23.122 [31]).

Identifier: '6F62'	Structure: Transparent	Optional
SFI: '13'		
File size: 5n (n ≥ 1) bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	1st PLMN (highest priority)	M	3 bytes
4 to 5	1st PLMN Access Technology Identifier	M	2 bytes
6 to 8	2nd PLMN	O	3 bytes
9 to 10	2nd PLMN Access Technology Identifier	O	2 bytes
:	:		
(5n-4) to (5n-2)	nth PLMN (lowest priority)	O	3 bytes
(5n-1) to 5n	nth PLMN Access Technology Identifier	O	2 bytes

- PLMN
  Contents:
  Mobile Country Code (MCC) followed by the Mobile Network Code (MNC).

  Coding:
  according to TS 24.008 [47].

- Access Technology:
  Contents: The Access Technology of the HPLMN that the ME will assume when searching for the HPLMN, in priority order. The first Access Technology in the list has the highest priority.

  Coding:
  - See $EF_{PLMNwACT}$ for coding.

4.2.55 EF_{ARR} (Access Rule Reference)

This EF contains the access rules for files located under the USIM ADF in the UICC. If the security attribute tag '8B' is indicated in the FCP it contains a reference to a record in this file.

Structure of EF_{ARR} at ADF-level

Identifier: '6F06'	Structure: Linear fixed	Mandatory
SFI: '17'		
Record Length: X bytes	Update activity: low	

Access Conditions:

READ	ALW
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Access Rule TLV data objects	M	X bytes

This EF contains one or more records containing access rule information according to the reference to expanded format as defined in ISO/IEC 7816-9 [26]. Each record represents an access rule. Unused bytes in the record are set to 'FF'.

If the card cannot access EF_{ARR} , any attempt to access a file with access rules indicated in this EF_{ARR} shall not be granted.

4.2.56 Void

4.2.57 EF_{NETPAR} (Network Parameters)

This EF contains information concerning the cell frequencies

Network Parameter storage may reduce the extent of the terminal search of FDD, TDD or GSM carriers when selecting a cell. The network parameters stored in the USIM shall be in accordance with the procedures specified in this clause.

The RF carrier frequency information is stored on 2 bytes and coded on 16 bits starting from 0,0 MHz. Each increment of the 16 bit value is an increment of 200 kHz in frequency. This allows the exact channel frequency to be stored in this data field making it independent of any band information. It is up to the terminal to associate the indicated frequency with a particular band, e.g. GSM 900, GSM 1800 etc. This means that a range from 0 to 13,1 GHz can be covered, with the resolution of 200 kHz. The frequency indicated is always the terminal receiver carrier frequency.

The EF provides a minimum storage capacity of 46 bytes in order to provide the capability of storing at least two cell information TLV objects, e.g. GSM/FDD or FDD/TDD in its minimum configuration, i.e. the terminal can rely on the required memory space for storing at least two cell information lists offering 8 GSM neighbour carrier frequencies and 8 Intra/Inter frequencies, respectively. In what configuration the available memory actually is being used is up to the terminal.

A terminal shall ignore a TLV object or the value of a carrier frequency which is beyond its capabilities, i.e. an FDD only terminal shall ignore the GSM related frequency information. When updating this file, the terminal shall update it with the current values available in the terminal. Updating of this file shall start from the beginning of the file. The terminal need not respect the structure of any information previously stored, i.e. an FDD only terminal may overwrite the GSM parameters stored in this file by another terminal.

The GSM cell information constructed TLV object contains the information of the BCCH channel frequency that the terminal is currently camped on, indicated by tag '80'. The constructed TLV object also contains an indication of up to 32 neighbour BCCH carrier frequencies indicated by tag '81'. In order to store a complete set of GSM network parameters, a total of 72 bytes is required. The terminal shall convert the BCCH channel information, as specified in TS 44.018 [28], received from the network into the corresponding frequency before storing it in the USIM.

The FDD cell information constructed TLV object contains the scrambling code information for the intra frequency carrier, tag '80', and the inter frequency scrambling codes, tag '81'. The intra frequency carrier information may contain up to 32 scrambling codes (m) while there is a limitation of the number of inter frequency scrambling codes (n1, n2, n3). The number of inter frequencies that can be indicated is limited to three and the total amount of scrambling codes for the inter frequencies is limited to 32 (n1+n2+n3 <= 32), i.e. if only one inter frequency carrier is indicated, it can contain up to 32 scrambling codes. If two or more inter frequency carriers are indicated, a total of 32 scrambling codes can be provided. How the information is split between the inter frequency carriers is determined by the terminal. In order to store a complete set of FDD cell information a total of 146 bytes is required. The terminal shall convert the UARFCN information, as specified in 25.101 [33], received from the network into the corresponding frequency before storing it in the USIM.

The TDD cell information constructed TLV object has the same structure as the FDD cell information TLV object.

NOTE: Currently there is no inter frequency cell information required for the TDD case.

Identifier: '6FC4'	Structure: transparent	Mandatory
File size: X >= 46 bytes	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 - X	TLV object(s) containing GSM/FDD/TDD cell information	O	

- EF_{NETPAR} Cell Information tags

Description	Value	Information Element size bytes
GSM Cell Information Tag	'A0'	1
Camping Frequency Tag	'80'	1
Camping Frequency Information		2
Neighbour Frequency Tag	'81'	1
Neighbour Frequency Information		2*m (8 <= m <= 32)
FDD Cell Information Tag	'A1'	1
Intra Frequency Information Tag	'80'	1
Scrambling code Information		2*m (8 <= m <= 32)
Inter Frequency Information Tag	'81'	1
Scrambling code information		2*(n1+n2+n3) (8 <= n1+n2+n3 <= 32)
TDD Frequency information Tag	'A2'	1
Intra Frequency Information Tag	'80'	1
Cell parameters ID		2*m (8 <= m <= 32)
Inter Frequency Information Tag	'81'	1
Cell parameters ID		2*(n1+n2+n3) (8 <= n1+n2+n3 <= 32)

- GSM Cell Information, if tag 'A0' is present in this EF the content of this TLV is as follows:

Description	Value	M/O	Length
GSM Cell Information Tag	'A0"	M	1
Length	'4+ (2+2*m) (<=70) '	M	1
Current camped cell BCCH frequency information tag	'80'	M	1
Length	'02'	M	1
Current camped BCCH frequency		M	2
Neighbour Cell BCCH Frequency information tag	'81'	O	1
Length	2*m (=< 32)	O	1
Neighbour BCCH carrier frequencies		O	2*m (8 <= m <= 32)

- FDD Cell Information. If tag 'A1' is present in this EF the content of this TLV is as follows:

Description	Value	M/O	Length
FDD Cell Information Tag	'A1'	M	1
Length	4+(2*m)+(4+2*n1)+(4+2*n2)+(4+2* n3) (<=144)	M	1
FDD Intra Frequency information tag	'80'	M	1
Length	2+2*m	M	1
Intra Frequency carrier frequency		M	2
Intra Frequency scrambling codes		M	2*m (8 <= m <= 32)
FDD Inter Frequency information tag (see NOTE 1)	'81'	O	1
Length	2+2*n (NOTE 2)	O	1
Inter Frequency carrier frequencies		O	2
Inter Frequency scrambling codes		O	2*n (NOTE 2)
NOTE 1: This TLV object may occur up to 3 times within the constructed TLV object depending how many inter frequencies are indicated NOTE 2: n is in this case n1, n2 or n3, 8 <= (n1+n2+n3)<=32			

- TDD Cell Information: If tag 'A2' is present in this EF the content of this TLV is as follows:

Description	Value	M/O	Length
TDD Cell Information Tag	'A2'	M	1
Length	4+(2*m)+(4+2*n1)+(4+2*n2)+(4+2*n3) (<=144)	M	1
TDD Intra Frequency information tag	'80'	M	1
Length	2+2*m	M	1
Intra Frequency carrier frequency		M	2
Intra Frequency scrambling codes		M	2*m (8 <= m <= 32)
TDD Inter Frequency information tag (see NOTE 1)	'81'	O	1
Length	2+2*n (NOTE 2)	O	1
Inter Frequency carrier frequencies		O	2
Inter Frequency scrambling codes		O	2*n (NOTE 2)
NOTE 1: This TLV object may occur up to 3 times within the constructed TLV object depending how many inter frequencies are indicated NOTE 2: n is in this case n1, n2 or n3, 8 <= (n1+n2+n3)<=32			

4.2.58 EF_{PNN} (PLMN Network Name)

This EF contains the full and short form versions of the network name for the registered PLMN. The ME shall use these versions in place of its own versions of the network name for the PLMN (stored in the ME's memory list), and also in place of the versions of the network name received when registered to the PLMN, as defined by TS 24.008 [9].

The first record in this EF is used for the default network name when registered to the HPLMN. Subsequent records are to be used for other network names.

Identifier: '6FC5'	Structure: linear fixed	Optional
SFI: '19'		
Record length: X bytes; X ≥ 3	Update activity: low	

Access Conditions:

READ	ALWAYS
UPDATE	ADM
ACTIVATE	ADM
DEACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Network name TLV objects	M	X bytes

- Network name TLV objects.
  The content and coding (Full name for network and Short name for network) is defined below, where the fields within the objects are defined in TS 24.008[9]:

Coding of the Network name TLV objects

Length	Description	Status
1 byte	Full name for network IEI (This shall be the same as that used in the MM information message).	M
1 byte	Length of Full name for network Name contents	M
Y bytes	Full name for network contents (Octets 3 to n of network name information element)	M
1 byte	Short name for network IEI (This shall be the same as that used in the MM information message).	O
1 byte	Length of Short name for network	C1
Z bytes	Short name for network contents (Octets 3 to n of network name information element)	C1
C1: this field shall be present if the short name for network IEI is present		

Unused bytes shall be set to 'FF'.

4.2.59 EF_{OPL} (Operator PLMN List)

This EF contains a prioritised list of Location Area Information (LAI) identities that are used to associate a specific operator name contained in EF_{PNN} with the LAI. The ME shall use this EF in association with the EF_{PNN} in place of any network name stored within the ME's internal list and any network name received when registered to the PLMN, as defined by TS 24.008 [9].

If the EF_{PNN} is not present then this file shall not be present.

Identifier: '6FC6'	Structure: linear fixed	Optional
SFI: '1A'		
Record length: X bytes, X >= 8	Update activity: low	

Access Conditions:

READ	ALWAYS
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 7	Location Area Identity	M	7 bytes
8	PLMN Network Name Record Identifier	M	1 byte

- Location Area Identity

  Contents:
  Location Area Information, this comprises of the MCC, MNC and LAC

  Coding:
  PLMN : according to TS 24.008 [9]
  A BCD value of 'D' in any of the MCC and/or MNC digits shall be used to indicate a "wild" value for that corresponding MCC/MNC digit

  LAC : according to 3G TS 24.008 [9]

  Two values for the LAC are stored in order to allow a range of LAC values to be specified for a given PLMN. A value of '0000' stored in bytes 4 to 5 and a value of 'FFFE' stored in bytes 6 to 7 shall be used to indicate the entire range of LACs for the given PLMN. In the case where only a single LAC value is to be specified then the value stored in bytes 4 to 5 shall be identical to the value stored in bytes 6 to 7 for the given PLMN. If a range of LAC values are to be specified, then the value stored in bytes 4 to 5 shall be the start of the LAC range and the value stored in bytes 6 to 7 shall be the end of the LAC range for the given PLMN.

- PLMN Network Name Record Identifier

  Contents:
  Identifier of operator name to be displayed

  Coding:
  A value of '00' indicates that the name is to be taken from other sources, see TS 22.101 [24]

  A value in the range '01' to 'FE' indicates the record number in EF_{PNN} that shall be displayed as the registered PLMN name

NOTE: The intent of this file is to provide exceptions to the other sources of a network name. Care should be taken not to introduce too many PLMN entries. An excessive number of entries could result in a longer initialisation period.

4.2.60 EF_{MBDN} (Mailbox Dialling Numbers)

This EF contains dialling numbers to access mailboxes associated with Voicemail, Fax, Electronic Mail and other messages. It may also contain associated alpha-tags for each supported mailbox. Each dialling number shall be associated with a message waiting indication group type using EF_{MBI} (see TS 23.038 [5] for message waiting indication group types).

This EF is mandatory if EF_{UST} indicates that the Mailbox Dialling Numbers service is available.

Identifier: '6FC7'	Structure: linear fixed	Optional
Record length: X+14 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN/ADM (fixed during administrative management)
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier	O	X bytes
X+1	Length of BCD number/SSC contents	M	1 byte
X+2	TON and NPI	M	1 byte
X+3 to X+12	Dialling Number/SSC contents	M	10 bytes
X+13	Capability/Configuration2 Record Identifier	M	1 byte
X+14	Extension 6 Record Identifier	M	1 byte

For contents and coding of all data items see the respective data items of the EF_{ADN} (clause 4.4.2.3), with the exception that extension records are stored in the EF_{EXT6} and with the exception that Capability/Configuration parameters are stored in the EF_{CCP2}.

NOTE: The value of X (the number of bytes in the alpha-identifier) may be different to the length denoted X in EF_{ADN}.

4.2.61 EF_{EXT6} (Extension6)

This EF contains extension data of an MBDN (see MBDN in 4.2.58).

Identifier: '6FC8'	Structure: linear fixed	Optional
Record length: 13 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN/ADM (fixed during administrative management)
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Record type	M	1 byte
2 to 12	Extension data	M	11 bytes
13	Identifier	M	1 byte

For contents and coding, see clause 4.4.2.4 (EF_{EXT1}).

4.2.62 EF_{MBI} (Mailbox Identifier)

This EF contains information to associate mailbox dialling numbers in EF_{MBDN} with a message waiting indication group type and subscriber profile (as defined in TS 23.097 [36]). A message waiting indication group type may either be Voicemail, Fax, Electronic Mail, Other or Videomail (as defined in TS 23.040 [6]).

This EF contains as many records as there are subscriber profiles (shall be record to subscriber profile). Each record contains references to mailbox dialling numbers in EF_{MBDN} (one reference for each message waiting indication group type).

This EF is mandatory if EF_{UST} indicates that the Mailbox Dialling Numbers service is available.

Identifier: '6FC9'	Structure: linear fixed	Optional
Record length: X bytes, X>=4	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN/ADM (fixed during administrative management)
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Mailbox Dialling Number Identifier – Voicemail	M	1 byte
2	Mailbox Dialling Number Identifier – Fax	M	1 byte
3	Mailbox Dialling Number Identifier – Electronic Mail	M	1 byte
4	Mailbox Dialling Number Identifier – Other	M	1byte
5	Mailbox Dialling Number Identifier – Videomail	O	I byte

- Mailbox Dialling Number Identifier (message waiting group type = Voicemail, Fax, Electronic Mail, Other or Videomail).
  Contents:
  Identifies the mailbox dialling number to be associated with message waiting type.

  Coding:
  '00' – no mailbox dialling number associated with message waiting indication group type.
  'xx' – record number in EF_{MBDN} associated with message waiting indication group type.

4.2.63 EF_{MWIS} (Message Waiting Indication Status)

This EF contains the status of indicators that define whether or not a Voicemail, Fax, Electronic Mail, Other or Videomail message is waiting (as defined in TS 23.040 [6]). The ME uses the status after re-activation to determine whether or not to display the respective message-waiting indication on its display.

This EF contains as many records as there are subscriber profiles (shall be record to subscriber profile) as defined in TS 23.097 [36] for MSP.

Identifier: '6FCA'	Structure: Linear fixed	Optional
Record length: X bytes, X >= 5	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Message Waiting Indicator Status	M	1 byte
2	Number of Voicemail Messages Waiting	M	1 byte
3	Number of Fax Messages Waiting	M	1 byte
4	Number of Electronic Mail Messages Waiting	M	1 byte
5	Number of Other Messages Waiting	M	1 byte
6	Number of Videomail Messages waiting	O	1 byte

Message Waiting Indication Status
Contents:
Indicates the status of the message-waiting indication.

Coding:
The indicator status for each indicator type is 1 bit long and set as follows:
bit = 1: Set Indication Active
bit = 0: Set Indication Inactive



Number of Voicemail Messages Waiting

Contents:

Contains the number of voicemail messages waiting (see TS 23.040 [6]).

Coding:

Binary.

Number of Fax Messages Waiting

Contents:

Contains the number of fax messages waiting (see TS 23.040 [6]).

Coding:

Binary.

Number of Electronic Mail Messages Waiting

Contents:

Contains the number of electronic mail messages waiting (see TS 23.040 [6])

Coding:

Binary.

Number of Other Messages Waiting

Contents:

Contains the number of other messages waiting (see TS 23.040 [6]).

Coding:

Binary.

Number of Videomail Messages Waiting

Contents:

Contains the number of Videomail messages waiting (see TS 23.040 [6]).

Coding:

Binary.

4.2.64 EF_{CFIS} (Call Forwarding Indication Status)

This EF contains the status of indicators that are used to record whether call forward is active. The ME uses the status after re-activation to determine whether or not to display the respective Call Forwarding indicator on its display.

This EF contains as many records as there are subscriber profiles (shall be record to subscriber profile) as defined in TS 23.097 [36] for MSP.

Identifier: '6FCB'	Structure: Linear Fixed	Optional
Record length: 16 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	MSP number	M	1 byte
2	CFU indicator status	M	1 byte
3	Length of BCD number	M	1 byte
4	TON and NPI	M	1 byte
5 to 14	Dialling Number	M	10 bytes
15	Capability/Configuration2 Record Identifier	M	1 byte
16	Extension 7 Record Identifier	M	1 byte

NOTE: For contents and coding of data items not detailed below, see the respective data items of EF_{ADN} (clause 4.4.2.3), Capability/Configuration2 Record Identifier and Extension 7 Record Identifier.

MSP number:

Contents:

The MSP number contains the Profile Identity of the subscriber profile. The Profile Identity shall be between 1and 4 as defined in TS 23.097 [36] for MSP.

Coding:

Binary.

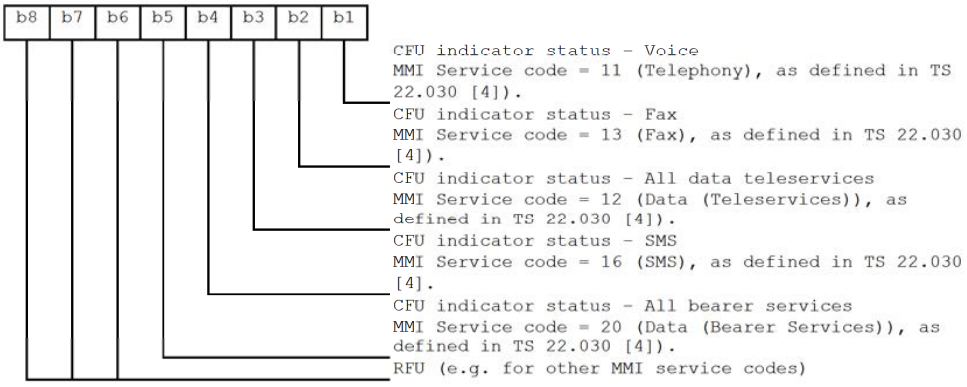
CFU indicator status:

Contents:

Indicates the status of the call forward unconditional indicator. Service code = 21 (CFU) or 002 (for CFU part of all CF), as defined in TS 22.030 [4]

Coding:

The indicator status for each indicator type is 1 bit long and is set as follows:
bit = 1: Set indication active
bit = 0: Set indication inactive.



4.2.65 EF_{EXT7} (Extension7)

This EF contains extension data of a CFIS (Call Forwarding Indication Status - see 4.2.64).

Identifier: '6FCC'	Structure: linear fixed	Optional
Record length: 13 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Record type	M	1 byte
2 to 12	Extension data	M	11 bytes
13	Identifier	M	1 byte

For contents and coding see clause 4.4.2.4 (EF_{EXT1}).

4.2.66 EF_{SPDI} (Service Provider Display Information)

This EF contains information regarding the service provider display i.e. the service provider PLMN list.

Identifier: '6FCD'	Structure: transparent	Optional
SFI: '1B'		
File size: x bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to x	TLV object(s) containing Service Provider information	M	x bytes

Tag Value	Tag Description
'A3'	Service provider display information Tag
'80'	Service provider PLMN list tag

The service provider display information object is a constructed TLV.

- Service provider PLMN list
  Contents:
  This TLV contains a list of n PLMNs in which the Service Provider Name shall be displayed, as defined in clause 4.2.12 (EF_{SPN}).

  Coding:

Description	M/O	Length
Service provider PLMN list tag	M	1 byte
Length (see note)	M	x bytes
1st PLMN entry	M	3 bytes
2nd PLMN entry	O	3 bytes
3rd PLMN entry	O	3 bytes
…		
nth PLMN entry	O	3 bytes
Note: the length is 3*n bytes, where n denotes the number of PLMN entries. The length can be coded on one or more bytes.		

Each PLMN is coded as follows:
Mobile Country Code (MCC) followed by the Mobile Network Code (MNC) according to TS 24.008 [9].
In case a PLMN entry is not used, it shall be set to 'FF FF FF'.

4.2.67 EF_{MMSN} (MMS Notification)

If service n°52 is "available", this file shall be present.

This EF contains information in accordance with 3GPP TS 23.140 [38] and X.S0016-000-A v1.0 [45] comprising MMS notifications (and associated parameters) which have been received by the UE from the network. A 3GPP terminal needs only to support the MMS implementation specified in 3GPP TS 23.140 [38].

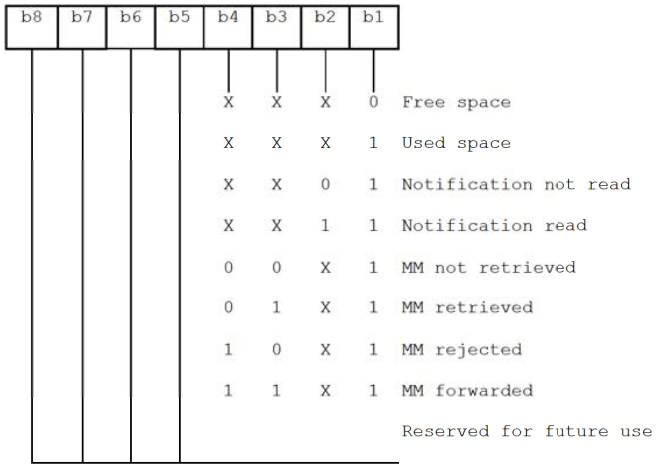
Identifier: '6FCE'	Structure: Linear fixed		Optional
Record length: 4+X bytes	Update activity: low		
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM			
Bytes	**Description**	**M/O**	**Length**
1 to 2	MMS Status	M	2 bytes
3	MMS Implementation	M	1 byte
4 to X+3	MMS Notification	M	X bytes
X+4	Extension file record number	M	1 byte

- MMS Status

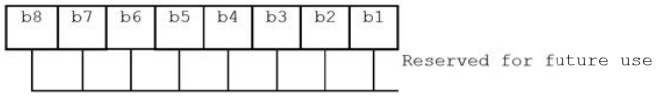
Content:
The status bytes contain the status information of the notification.

Coding:
b1 indicates whether there is valid data or if the location is free. b2 indicates whether the MMS notification has been read or not. Bits b3-b4 of the first byte indicate the MM retrieval, MM rejection, or MM forwarding status, Bits b5-b8 of the first byte and the entire second byte are reserved for future use.

First byte:



Second byte:



- MMS Implementation
  Contents:
  The MMS Implementation indicates the used implementation type, e.g. WAP.
  Coding:
  Allocation of bits:
  Bit number Parameter indicated
  1 WAP implementation of MMS as defined in 3GPP TS 23.140 [38]
  2 Reserved for 3GPP2: M-IMAP implementation of MMS as defined in X.S0016-000-A v1.0 [45]
  3 Reserved for 3GPP2: SIP implementation of MMS as defined in X.S0016-000-A v1.0 [45]
  4-8 Reserved for future use

  Bit value Meaning
  0 Implementation not supported.
  1 Implementation supported.

- MMS Notification
  Contents:
  The MMS Notification contains the MMS notification.
  Coding:
  The MMS Notification is coded according to the MMS Implementation as indicated in Byte 3.
  Any unused byte shall be set to 'FF'.

- Extension file record number
  Contents:
  - extension file record number. This byte identifies the number of a record in the EF_{EXT8} containing extension data for the notification information. The use of this byte is optional. If it is not used it shall be set to 'FF'.
  Coding:
  - binary.

4.2.68 EF_{EXT8} (Extension 8)

If service n°53 is "available", this file shall be present.

This EF contains extension data of a MMS Notification (Multimedia Messaging Service - see 4.2.67).

Identifier: '6FCF'	Structure: linear fixed	Optional
Record length: X+2 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Record type	M	1 byte
2 to X+1	Extension data	M	X bytes
X+2	Identifier	M	1 byte

The structure of this EF is identical to the structure of EF_{EXT1} (see clause 4.4.2.4).

- Record type.
  Contents:
  type of the record, see clause 4.4.2.4

  Coding:
  according to the "additional data" type

- Extension data.
  Contents:
  additional data (MMS notification extension)

Coding:
the first byte of the extension data gives the number of bytes of the remainder of the MMS notification in this record. The following bytes contain the extension of the MMS notification.

- Identifier.
  Contents:
  identifier of the next extension record (in EXT8) to enable longer storage of information.

  Coding:
  record number of next record. 'FF' identifies the end of the chain.

4.2.69 EF_{MMSICP} (MMS Issuer Connectivity Parameters)

If service n°52 is "available", this file shall be present.

This EF contains values for Multimedia Messaging Connectivity Parameters as determined by the issuer, which can be used by the ME for MMS network connection. This file may contain one or more sets of Multimedia Messaging Issuer Connectivity Parameters. The first set of Multimedia Messaging Issuer Connectivity Parameters is used as the default set. Each set of Multimedia Messaging Issuer Connectivity Parameters may consist of one or more Interface to Core Network and Bearer information TLV objects, but shall contain only one MMS implementation TLV object, one MMS Relay/Server TLV object and one Gateway TLV object. The order of the Interface to Core Network and Bearer information TLV objects in the MMS Connectivity TLV object defines the priority of the Interface to Core Network and Bearer information, with the first TLV object having the highest priority.

Identifier: '6FD0'	Structure: Transparent	Optional
File Size: X_1+…+ X_n bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X_1	MMS Connectivity Parameters TLV object	M	X_1 bytes
X_1+1 to X_1 + X_2	MMS Connectivity Parameters TLV object	O	X_2 bytes
…	…		
X_1+…+ X_{n-1}+1 to X_1+…+ X_n	MMS Connectivity Parameters TLV object	O	X_n bytes

MMS Connectivity Parameters tags

Description	Tag Value
MMS Connectivity Parameters Tag	'AB'
MMS Implementation Tag	'80'
MMS Relay/Server Tag	'81'
Interface to Core Network and Bearer Information Tag	'82'
GatewayTag	'83'
Reserved for 3GPP2: MMS Authentication Mechanism Tag	'84'
Reserved for 3GPP2: MMS Authentication User Name Tag	'85'

- MMS Connectivity Parameters contents

Description	Value	M/O	Length (bytes)

MMS Connectivity Parameters Tag	'AB'	M	1
Length	Note 1	M	Note 2
MMS Implementation Tag	'80'	M	1
Length	1	M	1
MMS Implementation Information	--	M	1
MMS Relay/Server Tag	'81'	M	1
Length	X1	M	Note 2
MMS Relay/Server Address	--	M	X1
MMS Authentication Mechanism Tag	'84'	C1	1
Length	X2	C1	Note 2
MMS Authentication Mechanism	--	C1	X2
MMS Authentication User Name Tag	'85'	C1	1
Length	X3	C1	Note 2
MMS Authentication User Name	--	C1	X3
1st Interface to Core Network and Bearer Information Tag (highest priority)	'82'	C2	1
Length	Y1	C2	Note 2
1st Interface to Core Network and Bearer information	--	C2	Y1
2nd Interface to Core Network and Bearer Information Tag	'82'	C2	1
Length	Y2	C2	Note 2
2nd Interface to Core Network and Bearer information	--	C2	Y2
...			
Nth Interface to Core Network and Bearer Information Tag (lowest priority)	'82'	C2	1
Length	Y3	C2	Note 2
Nth Interface to Core Network and Bearer information	--	C2	Y3
GatewayTag	'83'	O	1
Length	Z	O	Note 2
Gateway Information	--	O	Z
Note 1: This is the total size of the constructed TLV object Note 2: The length is coded according to ISO/IEC 8825 [35] C1: Reserved for 3GPP2: only present if M-IMAP or SIP indicated in tag 80 C2: only present if WAP is indicated in tag 80			

- MMS Implementation Tag '80'
  See section 4.2.67 for contents and coding.

- MMS Relay/server Tag '81'
  Contents:
  The MMS relay/server contains the address of the associated MMS relay/server.
  Coding:
  The MMS relay/server address is coded according to the guideline provided in 3GPP TS 23.140 [38].

- MMS Authentication Mechanism Tag '84'
  Contents:
  The MMS authentication mechanism contains the authentication mechanism used for M-IMAP and SIP.
  Coding:
  The MMS authentication mechanism is coded according to the guidelines provided in X.S0016-000-A v1.0 [45].

- MMS Authentication User Name Tag '85'
  Contents:
  The MMS Authentication User Name contains the authentication user name used for M-IMAP and SIP.
  Coding:
  The MMS authentication User Name is coded according to the guidelines provided in X.S0016-000-A v1.0 [45].

- Interface to Core Network and Bearer Information Tag '82'
  Contents:

The Interface to Core Network and Bearer Information may contain the following information to set up the bearer: Bearer, Address, Type of address, Speed, Call type, Authentication type, Authentication id, Authentication password.

Coding:
The coding is according to the guideline provided in 3GPP TS 23.140 [38].

- Gateway Tag '83'

Contents:
The Gateway may contain the following information; Address, Type of address, Port, Service, Authentication type, Authentication id and Authentication password.

Coding:
The coding is according to the guideline provided in 3GPP TS 23.140 [38].

Unused bytes shall be set to 'FF'.

An Example for the coding of these parameters can be found in Annex J.2.

4.2.70 EF_{MMSUP} (MMS User Preferences)

If service n°52 is "available", this file shall be present.

This EF contains values for Multimedia Messaging Service User Preferences, which can be used by the ME for user assistance in preparation of mobile multimedia messages (e.g. default values for parameters that are often used).

Identifier: '6FD1'	Structure: Linear Fixed	Optional
Record Length: X bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	MMS User Preference TLV Objects	M	X bytes

MMS User Preference tags

Description	Tag Value
MMS Implementation Tag	'80'
MMS User preference profile name Tag	'81'
MMS User Preference information Tag	'82'

MMS User Preference information

Description	Value	M/O	Length (bytes)
MMS Implementation Tag	'80'	M	1
Length	1	M	Note
MMS Implementation information	--	M	1
MMS User preference profile name Tag	'81'	M	1
Length	X	M	Note
MMS User profile name	--	M	X
MMS User Preference information Tag	'82'	M	1
Length	Y	M	Note
MMS User Preference information	--	M	Y
Note: The length is coded according to ISO/IEC 8825 [35]			

- MMS Implementation Tag '80'

For contents and coding see 4.2.67

- MMS User preference profile name Tag '81'
  Contents:
    Alpha tagging of the MMS user preference profile.
  Coding:
    this alpha-tagging shall use either:
    - the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0. The alpha identifier shall be left justified.
    or:
    - one of the UCS2 coded options as defined in the annex of TS 31.101 [11].

- MMS User Preference information Tag '82'
  Contents:
    The following information elements may be coded; Sender Visibility, Delivery Report, Read-Reply, Priority, Time of Expiry and Earliest Delivery Time.
  Coding:
    Depending upon the MMS implementation as indicated in Tag '80'.

An Example for the coding of these parameters can be found in Annex J.1.

4.2.71 EF_{MMSUCP} (MMS User Connectivity Parameters)

If service n°52 and n°55 are "available", this file shall be present.

This EF contains values for Multimedia Messaging Connectivity Parameters as determined by the user, which can be used by the ME for MMS network connection. This file may contain one or more sets of Multimedia Messaging User Connectivity Parameters. Each set of Multimedia Messaging User Connectivity Parameters may consist of one or more Interface to Core Network and Bearer information TLV objects, but shall contain only one MMS implementation TLV object, one MMS Relay/Server TLV object and one Gateway TLV object. The order of the Interface to Core Network and Bearer information TLV objects in the MMS Connectivity TLV object defines the priority of the Interface to Core Network and Bearer information, with the first TLV object having the highest priority.

Identifier: '6FD2'	Structure: Transparent	Optional
File Size: X_1+…+ X_n bytes	Update activity: low	

Access Conditions:

READ	PIN	
UPDATE	PIN/PIN2	
		(fixed during administrative management)
DEACTIVATE	ADM	
ACTIVATE	ADM	

Bytes	Description	M/O	Length
1 to X_1	MMS Connectivity Parameters TLV object	O	X_1 bytes
X_1+1 to X_1 + X_2	MMS Connectivity Parameters TLV object	O	X_2 bytes
…	…		
X_1+…+ X_{n-1}+1 to X_1+…+ X_n	MMS Connectivity Parameters TLV object	O	X_n bytes

For the contents and coding see 4.2.69

4.2.72 EF_{NIA} (Network's Indication of Alerting)

If service n°56 is "available", this file shall be present.

This EF contains categories and associated text related to the Network's indication of alerting in the MS service defined in TS 22.101 [24].

Identifier: '6FD3'	Structure: linear fixed		Optional
Record length : X+1 bytes		Update activity: low	
Access Conditions: READ PIN UPDATE ADM INVALIDATE ADM REHABILITATE ADM			
Bytes	Description	M/O	Length
1	Alerting category	M	1 byte
2 to X+1	Informative text	M	X bytes

- Alerting category

  Contents:

  category of alerting for terminating traffic.

  Coding:

  according to TS 24.008 [9]. Value 'FF' means that no information on alerting category is available.

- Informative text

  Contents:

  text describing the type of terminating traffic associated with the category.

  Coding:

  see the coding of the Alpha Identifier item of the EF_{ADN}. The maximum number of characters for this informative text is indicated in TS 22.101 [24].

4.2.73 EF_{VGCS} (Voice Group Call Service)

If service n°57 is "available", this file shall be present.

This EF contains a list of those VGCS group identifiers the user has subscribed to. The elementary file is used by the ME for group call establishment and group call reception.

Identifier: '6FB1'	Structure: transparent		Optional
File size: 4n bytes (n <= 50)		Update activity: low	
Access Conditions: READ PIN UPDATE ADM INVALIDATE ADM REHABILITATE ADM			
Bytes	Description	M/O	Length
1 to 4	Group ID 1	M	4 bytes
5 to 8	Group ID 2	O	4 bytes
:	:	:	:
(4n-3) to 4n	Group ID n	O	4 bytes

- Group ID

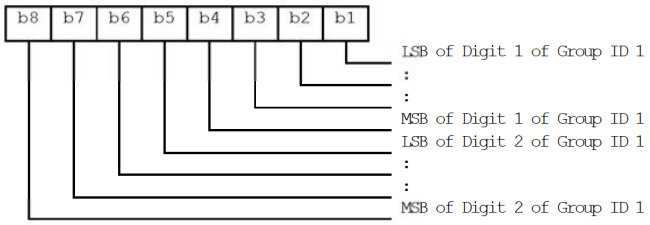
  Contents: VGCS Group ID, according to TS 23.003 [25]

  Coding:

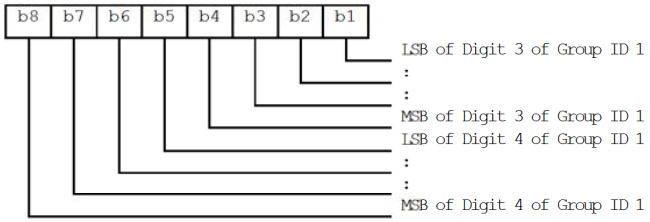
  The VGCS Group ID is of a variable length with a maximum length of 8 digits. Each VGCS Group ID is coded on four bytes, with each digit within the code being coded on four bits corresponding to BCD code.

If a VGCS Group ID of less than 8 digits is chosen, then the unused nibbles shall be set to 'F'. VGCS Group ID Digit 1 is the most significant digit of the Group ID.

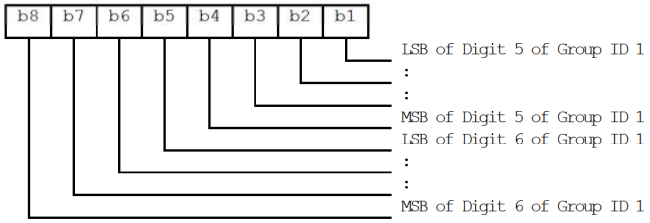
Byte 1:



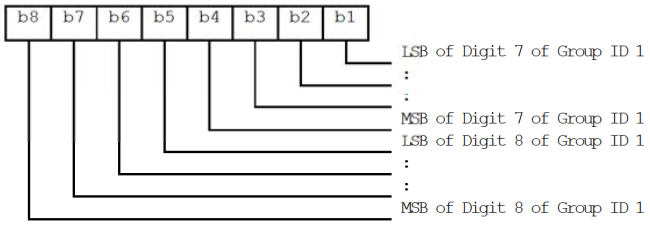
Byte 2:



Byte 3:

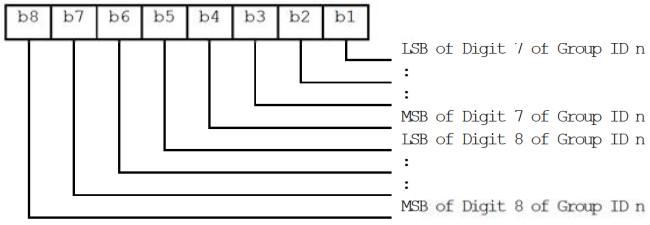


Byte 4:



:
: etc.....

Byte (4n-3) to 4n:



If storage for fewer than the maximum possible number *n* of VGCS Group IDs, is required, the excess bytes shall be set to 'FF'.

4.2.74 EF_{VGCSS} (Voice Group Call Service Status)

If service n°57 is "available", this file shall be present.

This EF contains the status of activation for the VGCS group identifiers. The elementary file is directly related to the EF_{VGCS}. This EF shall always be allocated if EF_{VGCS} is allocated.

Identifier: '6FB2'	Structure: transparent	Optional
File size: 7 bytes	Update activity: low	

Access Conditions:

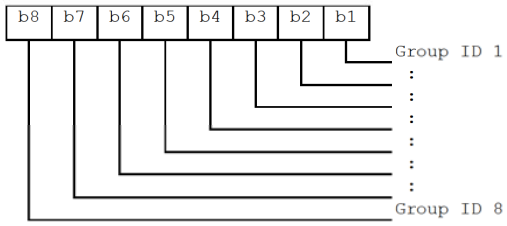
READ	PIN
UPDATE	PIN/ADM (fixed during administrative management)
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1 to 7	Activation/Deactivation Flags	M	7 bytes

Activation/Deactivation Flags

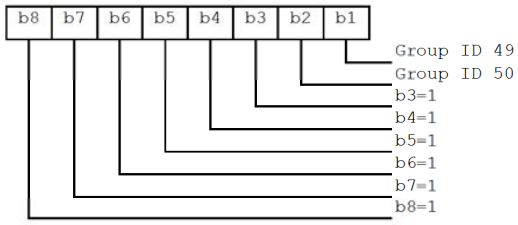
Contents: Activation/Deactivation Flags of the appropriate Group IDs
Coding: bit = 0 means - Group ID deactivated
bit = 1 means - Group ID activated

Byte 1:



etc : : : : : : : :

Byte 7:



4.2.75 EF_{VBS} (Voice Broadcast Service)

If service n°58 is "available", this file shall be present.

This EF contains a list of those VBS group identifiers the user has subscribed to. The elementary file is used by the ME for broadcast call establishment and broadcast call reception.

Identifier: '6FB3'	Structure: transparent	Optional
File size: 4n bytes (n <= 50)	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
INVALIDATE	ADM
REHABILITATE	ADM

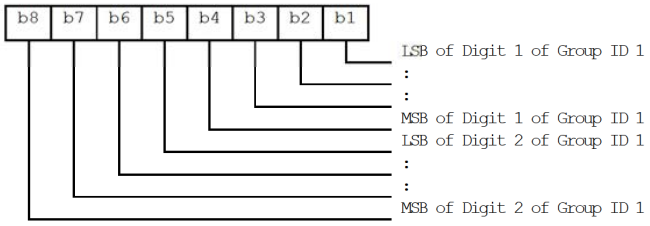
Bytes	Description	M/O	Length
1 to 4	Group ID 1	M	4 bytes
5 to 2	Group ID 2	O	4 bytes
:	:	:	:
(4n-3) to 4n	Group ID n	O	4 bytes

Group ID

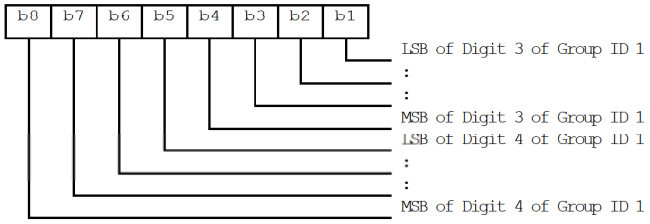
Contents: VBS Group ID, according to TS 23.003 [25]

Coding: The VBS Group ID is of a variable length with a maximum length of 8 digits. Each VBS Group ID is coded on four bytes, with each digit within the code being coded on four bits corresponding to BCD code. If a VBS Group ID of less than 8 digits is chosen, then the unused nibbles shall be set to 'F'. VBS Group ID Digit 1 is the most significant digit of the Group ID.

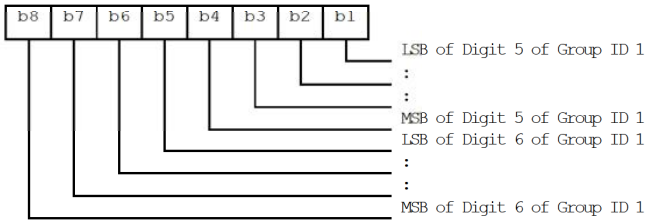
Byte 1:



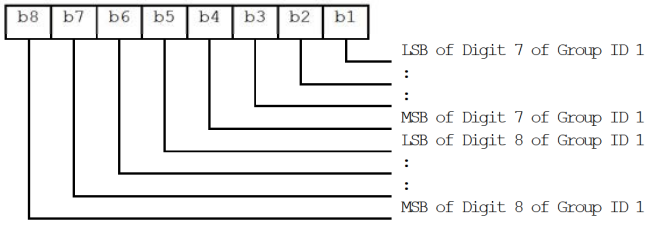
Byte 2:



Byte 3:

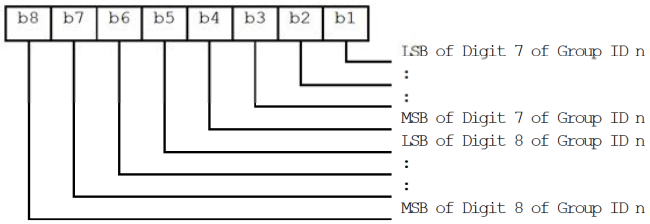


Byte 4:



:
: etc.....

Byte (4n-3) to 4n:



If storage for fewer than the maximum possible number *n* of VBS Group IDs, is required, the excess bytes shall be set to 'FF'.

4.2.76 EF_{VBSS} (Voice Broadcast Service Status)

If service n°58 is "available", this file shall be present.

This EF contains the status of activation for the VBS group identifiers. The elementary file is directly related to the EF_{VBS}. This EF shall always be allocated if EF_{VBS} is allocated.

Identifier: '6FB4'	Structure: transparent	Optional
File size: 7 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN/ADM (fixed during administrative management)
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1 to 7	Activation/Deactivation Flags	M	7 bytes

Activation/Deactivation Flags

Contents: Activation/Deactivation Flags of the appropriate Group IDs
Coding: see coding of EF_{VGCSS}

4.2.77 EF_{VGCSCA} (Voice Group Call Service Ciphering Algorithm)

This EF contains the ciphering algorithm identifiers for each of the Master Group Key (V_Ki) of each VGCS group that the user has subscribed to (defined in EF_{VGCS}).

If service n°64 is "available", this file shall be present.

Identifier: '6FD4'	Structure: transparent	Optional
File size: 2n bytes (n <= 50)	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1	VGCS Group ciphering algorithm identifier for 1st V_Ki of Group 1	M	1 byte
2	VGCS Group ciphering algorithm identifier for 2nd V_Ki of Group 1	M	1 byte
3	VGCS Group ciphering algorithm identifier for 1st V_Ki of Group 2	O	1 byte
4	VGCS Group ciphering algorithm identifier for 2nd V_Ki of Group 2	O	1 byte
:	:	:	:
2n-1	VGCS Group ciphering algorithm identifier for 1st V_Ki of Group n	O	1 byte
2n	VGCS Group ciphering algorithm identifier for 2nd V_Ki of Group n	O	1 byte

Ciphering Algorithm Identifier:

Contents: Ciphering Algorithm identifier for the specified Master Group Key of each Voice Call Group
Coding:

Value

'00' no ciphering
'01' ciphering with algorithm GSM A5/1
'02' ciphering with algorithm GSM A5/2
'03' ciphering with algorithm GSM A5/3
'04' ciphering with algorithm GSM A5/4
'05' ciphering with algorithm GSM A5/5
'06' ciphering with algorithm GSM A5/6
'07' ciphering with algorithm GSM A5/7
'08' to 'FF' RFU

4.2.78 EF_{VBSCA} (Voice Broadcast Service Ciphering Algorithm)

This EF contains the ciphering algorithm identifiers for each of the Master Group Key (V_Ki) of each VBS group that the user has subscribed to (defined in EF_{VBS}).

If service n°65 is "available", this file shall be present.

Identifier: '6FD5'	Structure: transparent	Optional
File size: 2n bytes (n <= 50)	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1	VBS Group ciphering algorithm identifier for 1st V_Ki of Group 1	M	1 byte
2	VBS Group ciphering algorithm identifier for 2nd V_Ki of Group 1	M	1 byte
3	VBS Group ciphering algorithm identifier for 1st V_Ki of Group 2	O	1 byte
4	VBS Group ciphering algorithm identifier for 2nd V_Ki of Group 2	O	1 byte
:	:	:	:
2n-1	VBS Group ciphering algorithm identifier for 1st V_Ki of Group n	O	1 byte
2n	VBS Group ciphering algorithm identifier for 2nd V_Ki of Group n	O	1 byte

Ciphering Algorithm Identifier:

Contents: Ciphering Algorithm identifier for the specified Master Group Key of each Voice Broadcast Group

Coding: See coding of EF_{VGCSCA}

4.2.79 EF_{GBABP} (GBA Bootstrapping parameters)

This EF contains the AKA Random challenge (RAND) and Bootstrapping Transaction Identifier (B-TID) associated with a GBA bootstrapping procedure. This file shall be present if the GBA service (service number 68) is allocated in EF_{UST} (USIM Service Table).

Identifier: '6FD6'	Structure: transparent	Optional
File length: L+X+N+3 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Length of RAND (X)	M	1 byte
2 to (X +1)	RAND	M	X bytes
X+2	Length of B-TID (L)	M	1 byte
(X+3) to (X+2+L)	B-TID	M	L bytes
X+L+3	Length of key lifetime	M	1 byte
(X+L+4) to (X+L+N+3)	Key lifetime	M	N bytes

Length of RAND

Contents: number of bytes, not including this length byte, of RAND field

RAND

Contents: Random challenge used in the GBA_U bootstrapping procedure.

Coding: as defined in 33.103 [13]

Length of B-TID

Contents: number of bytes, not including this length byte, of B-TID field

B-TID

Content: Bootstrapping Transaction Identifier the GBA_U bootstrapped keys
Coding: As defined in TS 33.220[42]

Length of key lifetime

Contents: number of bytes, not including this length byte, of key lifetime field

Key lifetime

Content: Lifetime of the GBA_U bootstrapped keys
Coding: As defined in TS 33.220[42]

4.2.80 EF_{MSK} (MBMS Service Keys List)

A record of this EF contains the list of MBMS Service Keys (MSK) and associated parameters, which are related to an MBMS Key Domain. There are up to two MSKs per Key Domain ID/Key Group ID pair, where the Key Group ID is the Key Group part of the MSK ID as defined in TS 33.246 [43]. Two 4 byte MSK IDs stored within a record have the same value for the 2 byte Key Group part. This file shall be present if the MBMS security service (service number 69) is allocated in EF_{UST} (USIM Service Table).

Identifier: '6FD7'	Structure: linear fixed	Optional
Record length: 19 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	Key Domain ID	M	3 bytes
4 to 7	1st MSK ID	M	4 bytes
8 to 11	1st Time Stamp Counter (TS)	M	4 bytes
12 to 15	2nd MSK ID	M	4 bytes
16 to 19	2nd Time Stamp Counter (TS)	M	4 bytes

Key Domain ID:

Content: Identifier of the Domain of the BM-SC providing MBMS Service.
Coding: As defined in TS 33.246 [43]

MSK ID:

Content: Identifier of MBMS Service Key (MSK) within a particular Key Domain.
Coding: As defined in TS 33.246 [43]

Time Stamp Counter (TS):

Content: Counter for MIKEY replay protection in MTK delivery. Each counter is associated with a particular MSK.
Coding: As defined in TS 33.246 [43]

4.2.81 EF_{MUK} (MBMS User Key)

This EF contains the identifier of the MBMS User Key (MUK) that is used to protect the transfer of MBMS Service Keys (MSK). The file also contains the Time Stamp Counter associated with the MUK, which is used for Replay Protection in MSK transport messages. This file shall be present if the MBMS security service (service number 69) is allocated in EF_{UST} (USIM Service Table). This EF shall not contain MUK IDs with the same NAF_ID part.

Identifier: '6FD8'	Structure: linear fixed	Optional
Record length: Z bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Bytes
1 to Z	MBMS User Key TLV objects	M	1 to Z

MBMS User Key tags

Description	Tag Value
MUK ID Tag	'80'
Time Stamp Counter Tag	'81'

MBMS User Key information

Description	Value	M/O	Length (bytes)
MUK ID Tag	'80'	M	1
Length	X	M	Note
MUK ID value	--	M	X
Time Stamp Counter Tag	'81'	M	1
Length	Y	M	Note
Time Stamp Counter value	--	M	Y
Note: The length is coded according to ISO/IEC 8825 [35]			

- MUK ID Tag '80'
  Content:
  Identifier of MBMS User Key (MUK) being used for MSK transfer security.
  Coding:
  As defined in TS 33.246 [43]

- Time Stamp Counter Tag '81'
  Content:
  Counter for MIKEY replay protection in MSK delivery. The counter is associated with the particular MUK. The length value is defined in TS 33.246 [43].
  Coding:
  As defined in TS 33.246 [43]

Unused bytes shall be set to 'FF'.

4.2.82 Void

4.2.83 EF_{GBANL} (GBA NAF List)

If service n°68 is "available", this file shall be present.

This EF contains the list of NAF_ID and B-TID associated to a GBA NAF derivation procedure.

Identifier: '6FDA'	Structure: Linear fixed	Optional
Record length: Z bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to Z	NAF Key Identifier TLV objects	M	Z bytes

NAF Key Identifier tags

Description	Tag Value
NAF_ID Tag	'80'
B-TID Tag	'81'

NAF Key Identifier information

Description	Value	M/O	Length (bytes)
NAF_ID Tag	'80'	M	1
Length	X	M	Note
NAF_ID value	--	M	X
B-TID Tag	'81'	M	1
Length	Y	M	Note
B-TID value	--	M	Y
Note: The length is coded according to ISO/IEC 8825 [35]			

- NAF_ID Tag '80'
  Contents:
  Identifier of Network Application Function used in the GBA_U NAF Derivation procedure.
  Coding:
  As defined in 33.220 [42]

- B-TID Tag '81'
  Content:
  Bootstrapping Transaction Identifier of the GBA_U bootstrapped key
  Coding:
  As defined in TS 33.220 [42]

Unused bytes shall be set to 'FF'

4.2.84 EF_{EHPLMN} (Equivalent HPLMN)

If service n°71 is "available", this file shall be present.

This EF contains the coding for n EHPLMNs. The usage of EHPLMN is defined in 23.122 [31]. This data field shall not contain the HPLMN code derived from the IMSI as an EHPLMN entry.

Identifier: '6FD9'	Structure: transparent	Optional
SFI: 'xx'		
File size: 3*n (where n ≥1)	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	1st EHPLMN (highest priority)	M	3 bytes
4 to 6	2nd EHPLMN	O	3 bytes
:	:		
(3n-2) to (3n)	nth EHPLMN (lowest priority)	O	3 bytes

- EHPLMN
  Contents:
  - Mobile Country Code (MCC) followed by the Mobile Network Code (MNC).
  Coding:
  - according to TS 24.008 [9].

  Unused entries shall be set to 'FF FF FF'

4.3 DFs at the USIM ADF (Application DF) Level

DFs may be present as child directories of USIM ADF. The following DFs are defined:

$DF_{PHONEBOOK}$ '5F3A'.

$DF_{GSM-ACCESS}$ '5F3B'.

DF_{MExE} '5F3C'.

DF_{WLAN} '5F40'.

DF_{SoLSA} '5F70'.

(DF for application specific phonebook. This DF has the same structure as the $DF_{PHONEBOOK}$ under $DF_{TELECOM}$).

4.4 Contents of DFs at the USIM ADF (Application DF) level

4.4.1 Contents of files at the DF SoLSA level

This only applies if the Support of Localised Service Areas is supported, as indicated by Service Number 23 in the USIM Service Table and specified in 3GPP TS 23.073 [23].

The EFs contain information about the users subscribed local service areas.

4.4.1.1 EF_{SAI} (SoLSA Access Indicator)

This EF contains the 'LSA only access indicator'. This EF shall always be allocated if DF_{SoLSA} is present.

If the indicator is set, the network will prevent terminated and/or originated calls when the MS is camped in cells that are not included in the list of allowed LSAs in EF_{SLL}. Emergency calls are, however, always allowed.

The EF also contains a text string which may be displayed when the MS is out of the served area(s).

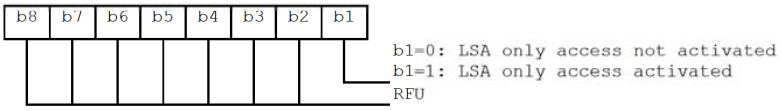
Identifier: '4F30'	Structure: transparent	Optional
File size: X + 1 bytes	Update activity: low	
Access Conditions: READ PIN UPDATE ADM INVALIDATE ADM REHABILITATE ADM		

Bytes	Description	M/O	Length
1	LSA only access indicator	M	1 byte
2 to X+1	LSA only access indication text	M	X bytes

- LSA only access indicator

  Contents: indicates whether the MS is restricted to use LSA cells only or not.

  Coding:



- LSA only access indication text

  Contents: text to be displayed by the ME when it's out of LSA area.

  Coding: the string shall use either

  - the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0. The alpha identifier shall be left justified. Unused bytes shall be set to 'FF'; or
  - one of the UCS2 coded options as defined in the annex of 3GPP TS 31.101 [11].

4.4.1.2 EF_{SLL} (SoLSA LSA List)

This EF contains information describing the LSAs that the user is subscribed to. This EF shall always be allocated if DF_{SoLSA} is present.

Each LSA is described by one record that is linked to a LSA Descriptor file. Each record contains information of the PLMN, priority of the LSA, information about the subscription and may also contain a text string and/or an icon that identifies the LSA to the user. The text string can be edited by the user.

Identifier: '4F31'	Structure: linear fixed	Optional
Record length: X + 10 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1 to X	LSA name	O	X bytes
X+1	Configuration parameters	M	1 byte
X+2	RFU	M	1 byte
X+3	Icon Identifier	M	1 byte
X+4	Priority	M	1 byte
X+5 to X+7	PLMN code	M	3 bytes
X+8 to X+9	LSA Descriptor File Identifier	M	2 byte
X+10	LSA Descriptor Record Identifier	M	1 byte

- LSA name

  Contents: LSA name string to be displayed when the ME is camped in the corresponding area, dependant on the contents of the LSA indication for idle mode field.

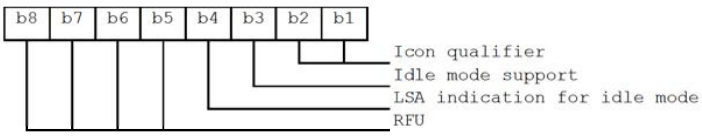
  Coding: the string shall use either

  - the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0. The alpha identifier shall be left justified. Unused bytes shall be set to 'FF'; or
  - one of theUCS2 code options defined in the annex of TS 31.101 [11].

- Configuration parameters

  Contents: Icon qualifier, control of idle mode support and control of LSA indication for idle mode.

  Coding:



Icon qualifier:

Contents: The icon qualifier indicates to the ME how the icon is to be used.

b2, b1: 00: icon is not to be used and may not be present
01: icon is self-explanatory, i.e. if displayed, it replaces the LSA name
10: icon is not self-explanatory, i.e. if displayed, it shall be displayed together with the LSA name
11: RFU

Idle mode support:

Contents: The idle mode support is used to indicate whether the ME shall favour camping on the LSA cells in idle mode.

b3 = 0: Idle mode support disabled
b3 = 1: Idle mode support enabled

LSA indication for idle mode:

Contents: The LSA indication for idle mode is used to indicate whether or not the ME shall display the LSA name when the ME is camped on a cell within the LSA.

b4 = 0: LSA indication for idle mode disabled
b4 = 1: LSA indication for idle mode enabled

Bits b5 to b8 are RFU (see subclause 9.3).

- Icon Identifier

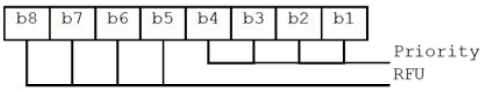
  Contents: The icon identifier addresses a record in EF_{IMG}.

  Coding: binary.

- Priority

  Contents: Priority of the LSA which gives the ME the preference of this LSA relative to the other LSAs.

  Coding:



  '0' is lowest priority, 'F' is highest.

- PLMN code

  Contents: MCC + MNC for the LSA.

  Coding: according to GSM 24.008 [9] and EF_{LOCI}.

- LSA Descriptor File Identifier:

  Contents: these bytes identify the EF which contains the LSA Descriptors forming the LSA.

  Coding: byte X+8: high byte of the LSA Descriptor file;
  byte X+9: low byte of the LSA Descriptor file.

- LSA Descriptor Record Identifier:

  Contents: this byte identifies the number of the first record in the LSA Descriptor file forming the LSA.

  Coding: binary.

4.4.1.3 LSA Descriptor files

Residing under DF_{SoLSA}, there may be several LSA Descriptor files. These EFs contains one or more records again containing LSA Descriptors forming the LSAs. LSAs can be described in four different ways. As a list of LSA IDs, as a list of LAC + CIs, as a list of CIs or as a list of LACs. As the basic elements (LSA ID, LAC + CI, CI and LAC) of the four types of lists are of different length, they can not be mixed within one record. Different records may contain different kinds of lists within the EFs. Examples of codings of LSA Descriptor files can be found in annex F.

Identifier: '4FXX'	Structure: linear fixed	Optional
Record length: n*X+2 bytes	Update activity: low	

Access Conditions:

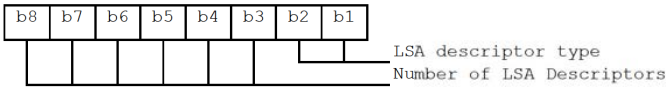
READ	PIN
UPDATE	ADM
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1	LSA descriptor type and number	M	1 byte
2 to X+1	1st LSA Descriptor	M	X bytes
X+2 to 2X+1	2nd LSA Descriptor	M	X bytes
(n-1)*X+2 to n*X+1	nth LSA Descriptor	M	X bytes
n*X+2	Record Identifier	M	1 byte

- LSA descriptor type and number:

  Contents: The LSA descriptor type gives the format of the LSA descriptor and the number of valid LSA Descriptors within the record.

  Coding:



  LSA descriptor type:

  Contents: Gives the format of the LSA Descriptors.

  b2, b1: 00: LSA ID.
  01: LAC + CI
  10: CI
  11: LAC

  Number of LSA Descriptors:

  Contents: Gives the number of valid LSA Descriptors in the record.

  Coding: binary, with b8 as MSB and b3 as LSB leaving room for 64 LSA Descriptors per record.

- LSA Descriptor

  Contents: Dependant of the coding indicated in the LSA descriptor type:

  - in case of LSA ID the field length 'X' is 3 bytes;
  - in case of LAC + CI the field length 'X' is 4 bytes;
  - in case of CI the field length 'X' is 2 bytes;
  - in case of LAC the field length 'X' is 2 bytes.

Coding: according to TS 24.008 [9].

- Record Identifier:

  Contents: This byte identifies the number of the next record containing the LSA Descriptors forming the LSA.

  Coding: record number of next record. 'FF' identifies the end of the chain.

This file utilises the concept of chaining as for EF_{EXT1}.

The identifier '4FXX' shall be different from one LSA Descriptor file to the other and different from the identifiers of EF_{SAI} and EF_{SLL}. For the range of 'XX', see TS 31.101 [11].

4.4.2 Contents of files at the DF PHONEBOOK level

The UICC may contain a global phonebook, or application specific phonebooks, or both in parallel. When both phonebook types co-exist, they are independent and no data is shared. In this case, it shall be possible for the user to select which phonebook the user would like to access.

It is recommended that the terminal searches for the global phonebook located under $DF_{TELECOM}$ as its presence is not indicated anywhere in the USIM application.

The global phonebook is located in $DF_{PHONEBOOK}$ under $DF_{TELECOM}$. Each specific USIM application phonebook is located in $DF_{PHONEBOOK}$ of its respective Application ADF_{USIM}. The organisation of files in $DF_{PHONEBOOK}$ under ADF_{USIM} and under $DF_{TELECOM}$ follows the same rules. Yet $DF_{PHONEBOOK}$ under ADF_{USIM} may contain a different set of files than $DF_{PHONEBOOK}$ under $DF_{TELECOM}$. All phonebook related EFs are located under their respective $DF_{PHONEBOOK}$. USIM specific phonebooks are dedicated to application specific entries. Each application specific phonebook is protected by the application PIN.

EF_{ADN} and EF_{PBR} shall always be present if the $DF_{Phonebook}$ is present. If any phonebook file other than EF_{ADN} or EF_{EXT1}, is used, then EF_{PBC} shall be present.

If a GSM application resides on the UICC, the EFs ADN and EXT1 from one $DF_{PHONEBOOK}$ (defined at GSM application installation) are mapped to $DF_{TELECOM}$. Their file IDs are specified in TS 51.011 [18], i.e. EF_{ADN} = '6F3A' and EF_{EXT1} = '6F4A', respectively.

If the UICC is inserted into a terminal accessing the ADN and EXT1 files under $DF_{TELECOM}$; and a record in these files has been updated, a flag in the corresponding entry control information in the EF_{PBC} is set from 0 to 1 by the UICC. If the UICC is later inserted into a terminal that supports the 3G phonebook, the terminal shall check the flag in EF_{PBC} and if this flag is set, shall update the EF_{CC}, and then reset the flag. A flag set in EF_{PBC} results in a full synchronisation of the phonebook between an external entity and the UICC (if synchronisation is requested).

The EF structure related to the public phonebook is located under $DF_{PHONEBOOK}$ in $DF_{TELECOM}$. A USIM specific phonebook may exist for application specific entries. The application specific phonebook is protected by the application PIN. The organisation of files in the application specific phonebook follows the same rules as the one specified for the public phone book under $DF_{TELECOM}$. The application specific phonebook may contain a different set of files than the one in the public area under $DF_{TELECOM}$.

4.4.2.1 EF_{PBR} (Phone Book Reference file)

This file describes the structure of the phonebook. All EFs representing the phonebook are specified here (with the exception of EF_{PSC}, EF_{PUID} and EF_{CC}), together with their file identifiers (FID) and their short file identifiers (SFI), if applicable.

Certain kinds of EFs can occur more than once in the phonebook, e.g. there may be two entities of Abbreviated Dialling Numbers, EF_{ADN} and EF_{ADN1}. For these kinds of EFs, no fixed FID values are specified. Instead, the value '4FXX' indicates that the value is to be assigned by the card issuer. These assigned values are then indicated in the associated TLV object in EF_{PBR}.

The SFI value assigned to an EF which is indicated in EF_{PBR} shall correspond to the SFI indicated in the TLV object in EF_{PBR}.

The reference file is a file that contains information how the information in the different files is to be combined together to form a phone book entry. The reference file contains records. Each record specifies the structure of up to 254 entries

in the phone book. Each phone book entry consists of data stored in files indicated in the reference file record. The entry structure shall be the same over all the records in the EF $_{PBR}$. If more than 254 entries are to be stored, a second record is needed in the reference file. The structure of a phone book entry is defined by different TLV objects that are stored in a reference file record. The reference file record structure describes the way a record in a file that is part of the phonebook is used to create a complete entry. Three different types of file linking exist.

Type 1 files: Files that contain as many records as the reference/master file (EF_{ADN}, EF_{ADN1}) and are linked on record number bases (Rec1 -> Rec1). The master file record number is the reference.

Type 2 files: Files that contain less entries than the master file and are linked via pointers in the index administration file (EF_{IAP}).

Type 3 files: Files that are linked by a record identifier within a record.

Table 4.1: Phone Book Reference file Constructed Tags

Tag Value	Constructed TAG Description
'A8'	Indicating files where the amount of records equal to master EF, type 1
'A9'	Indicating files that are linked using the index administration file, type 2. Order of pointer appearance in index administration EF is the same as the order of file IDs following this tag
'AA'	Indicating files that are linked using a record identifier, type 3. (The file pointed to is defined by the TLV object.)

The first file ID in the first record of EF_{PBR} indicated using constructed Tag 'A8' is called the master EF. Access conditions for all other files in the Phonebook structure using Tags 'A8', 'A9' or 'AA' is set to the same as for the master EF unless otherwise specified in the present document.

File IDs indicated using constructed Tag 'A8' is a type 1 file and contains the same number of records as the first file that is indicated in the data part of this TLV object. All files following this Tag are mapped one to one using the record numbers/IDs of the first file indicated in this TLV object.

File IDs indicated using constructed Tag 'A9' are mapped to the master EF (the file ID indicated as the first data object in the TLV object using Tag 'A8') using the pointers in the index administration file. The order of the pointers in the index administration file is the same as the order of the file IDs presented after Tag 'A9'. If this Tag is not present in the reference file record the index administration file is not present in the structure. In case the index administration file is not present in the structure it is not indicated in the data following tag 'A8'.

File IDs indicated using constructed Tag 'AA' indicate files that are part of the reference structure but they are addressed using record identifiers within a record in one or more of the files that are part of the reference structure. The length of the tag indicates whether the file to be addressed resides in the same directory or if a path to the file is provided in the TLV object.

Type 2 and type 3 files contain records that may be shared between several phonebook entries (except when otherwise indicated). The terminal shall ensure that a shared record is emptied when the last phonebook entry referencing it is modified in such a way that it doesn't reference the record anymore.

NOTE: in the current version of the specification, only type 3 files contain records that may be shared.

Each constructed Tag contains a list of primitive Tags indicating the order and the kind of data (e.g. ADN, IAP,…) of the reference structure.

The primitive tag identifies clearly the type of data, its value field indicates the file identifier and, if applicable, the SFI value of the specified EF. That is, the length value of a primitive tag indicates if an SFI value is available for the EF or not:

- Length = '02' Value: 'FID (2 bytes)'
- Length = '03' Value: 'FID (2 bytes)', 'SFI (1 byte)'

Table 4.2: Tag definitions for the phone book kind of file

Tag Value	TAG Description
'C0'	EF_{ADN} data object
'C1'	EF_{IAP} data object
'C2'	EF_{EXT1} data object
'C3'	EF_{SNE} data object
'C4'	EF_{ANR} data object
'C5'	EF_{PBC} data object
'C6'	EF_{GRP} data object
'C7'	EF_{AAS} data object
'C8'	EF_{GAS} data object
'C9'	EF_{UID} data object
'CA'	EF_{EMAIL} data object
'CB'	EF_{CCP1} data object

Table 4.3 (below) lists the allowed types for each kind of file:

Table 4.3: Presence of files as type

File name	Type 1	Type 2	Type 3
EF_{AAS}			X
EF_{ADN}	X		
EF_{ANR}	X	X	
EF_{EMAIL}	X	X	
EF_{EXT1}			X
EF_{GAS}			X
EF_{GRP}	X		
EF_{IAP}	X		
EF_{PBC}	X		
EF_{SNE}	X	X	
EF_{UID}	X		
EF_{CCP1}			X

Phone Book Reference file EF_{PBR} structure

Identifier: '4F30'	Structure: linear fixed	Conditional (see Note)
Record Length: X bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	TLV object(s) for indicating EFs that are part of the phone book structure	M	X bytes

NOTE: This file is mandatory if and only if $DF_{Phonebook}$ is present.

At the end of each record, unused bytes, if any, shall be filled with 'FF'.

4.4.2.2 EF_{IAP} (Index Administration Phone book)

This file is present if Tag 'A9' is indicated in the reference file.

The EF contains pointers to the different records in the files that are part of the phone book. The index administration file record number/ID is mapped one to one with the corresponding EF_{ADN} (shall be record to record). The index administration file contains the same amount of records as EF_{ADN}. The order of the pointers in an EF_{IAP} shall be the same as the order of file IDs that appear in the TLV object indicated by Tag 'A9' in the reference file record. The amount of bytes in a record is equal to the number of files indicated the EF_{PBR} following tag 'A9'.

The value 'FF' is an invalid record number/ID and is used in any location in to indicate that no corresponding record in the indicated file is available.

The content of EF_{IAP} is set to 'FF' at the personalisation stage.

Index administration file EF_{IAP} structure

Identifier: '4FXX'	Structure: linear fixed	Conditional (see Note)
SFI: 'YY'		
Record Length: X bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Record number of the first object indicated after Tag 'A9'	M	1 byte
2	Record number of the second object indicated after Tag 'A9'	C	1 byte
X	Record number of the x^{th} object indicated after Tag 'A9'	C	1 byte

NOTE 1: This file is mandatory if and only if type 2 files are present.
NOTE 2: x^{th}-field marked with 'C' is mandatory if x^{th}-object indicated following tag 'A9' is present in EF_{PBR}

4.4.2.3 EF_{ADN} (Abbreviated dialling numbers)

This EF contains Abbreviated Dialling Numbers (ADN) and/or Supplementary Service Control strings (SSC). In addition it contains identifiers of associated network/bearer capabilities and identifiers of extension records. It may also contain an associated alpha-tagging.

Identifier: '4FXX'	Structure: linear fixed	Conditional (see Note)
SFI: 'YY'		
Record length: X+14 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier	O	X bytes
X+1	Length of BCD number/SSC contents	M	1 byte
X+2	TON and NPI	M	1 byte
X+3 to X+12	Dialling Number/SSC String	M	10 bytes
X+13	Capability/Configuration1 Record Identifier	M	1 byte
X+14	Extension1 Record Identifier	M	1 byte

NOTE: This file is mandatory if and only if $DF_{PHONEBOOK}$ is present.

- Alpha Identifier.
  Contents:
  - Alpha-tagging of the associated dialling number.

  Coding:
  - this alpha-tagging shall use either:
    - the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0. The alpha identifier shall be left justified. Unused bytes shall be set to 'FF'.

    or:

- one of the UCS2 coded options as defined in the annex of TS 31.101 [11].

NOTE 1: The value of X may be from zero to 241. Using the command GET RESPONSE the ME can determine the value of X.

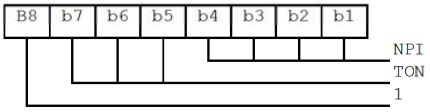
- Length of BCD number/SSC contents.
  Contents:
  - this byte gives the number of bytes of the following two data items containing actual BCD number/SSC information. This means that the maximum value is 11, even when the actual ADN/SSC information length is greater than 11. When an ADN/SSC has extension, it is indicated by the extension1 identifier being unequal to 'FF'. The remainder is stored in the EF_{EXT1} with the remaining length of the additional data being coded in the appropriate additional record itself (see clause 4.4.2.4).

  Coding:
  - according to TS 24.008 [9].

- TON and NPI.
  Contents:
  - Type of number (TON) and numbering plan identification (NPI).

  Coding:
  - according to TS 24.008 [9]. If the Dialling Number/SSC String does not contain a dialling number, e.g. a control string deactivating a service, the TON/NPI byte shall be set to 'FF' by the ME (see note 2).

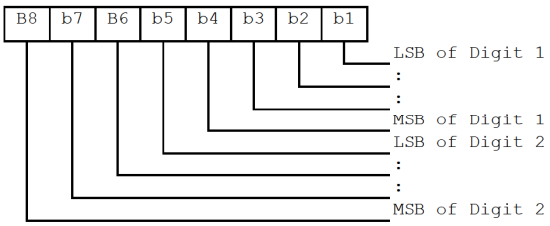
NOTE 2: If a dialling number is absent, no TON/NPI byte is transmitted over the radio interface (see TS 24.008 [9]). Accordingly, the ME should not interpret the value 'FF' and not send it over the radio interface.



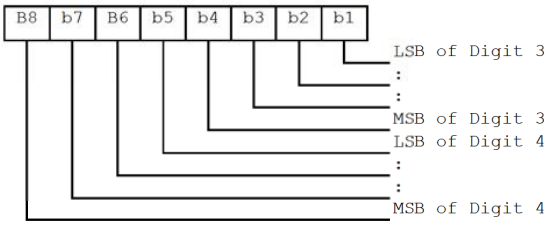
- Dialling Number/SSC String
  Contents:
  - up to 20 digits of the telephone number and/or SSC information.

  Coding:
  - according to TS 24.008 [9], TS 22.030 [4] and the extended BCD-coding (see table 4.4). If the telephone number or SSC is longer than 20 digits, the first 20 digits are stored in this data item and the remainder is stored in an associated record in the EF_{EXT1}. The record is identified by the Extension1 Record Identifier. If ADN/SSC require less than 20 digits, excess nibbles at the end of the data item shall be set to 'F'. Where individual dialled numbers, in one or more records, of less than 20 digits share a common appended digit string the first digits are stored in this data item and the common digits stored in an associated record in the EF_{EXT1}. The record is identified by the Extension 1 Record Identifier. Excess nibbles at the end of the data item shall be set to 'F'.

Byte X+3



Byte X+4:



etc.

- Capability/Configuration1 Record Identifier.
  Contents:
  - capability/configuration identification byte. This byte identifies the number of a record in the EF_{CCP1} containing associated capability/configuration parameters required for the call. The use of this byte is optional. If it is not used it shall be set to 'FF'.

  Coding:
  - binary.

- Extension1 Record Identifier.
  Contents:
  - extension1 record identification byte. This byte identifies the number of a record in the EF_{EXT1} containing an associated called party subaddress or additional data. The use of this byte is optional. If it is not used it shall be set to 'FF'.
  - if the ADN/SSC requires both additional data and called party subaddress, this byte identifies the additional record. A chaining mechanism inside EF_{EXT1} identifies the record of the appropriate called party subaddress (see clause 4.4.2.4).

  Coding:
  - binary.

NOTE 3: EF_{ADN} in the public phone book under $DF_{TELECOM}$ may be used by USIM, GSM and also other applications in a multi-application card. If the non-GSM application does not recognise the use of Type of Number (TON) and Number Plan Identification (NPI), then the information relating to the national dialling plan shall be held within the data item dialling number/SSC and the TON and NPI fields set to UNKNOWN. This format would be acceptable for 3G operation and also for the non-GSM application where the TON and NPI fields shall be ignored.

EXAMPLE: SIM storage of an International Number using E.164 [22] numbering plan.

	TON	NPI	Digit field.
USIM application	001	0001	abc...
Other application compatible with 3G	000	0000	xxx...abc...

where "abc..." denotes the subscriber number digits (including its country code), and "xxx..." denotes escape digits or a national prefix replacing TON and NPI.

NOTE 4: When the ME acts upon the EF_{ADN} with a SEARCH RECORD command in order to identify a character string in the alpha-identifier, it is the responsibility of the ME to ensure that the number of characters used as SEARCH RECORD parameters are less than or equal to the value of X if the MMI allows the user to offer a greater number.

Table 4.4: Extended BCD coding

BCD Value	Character/Meaning
'0'	"0"
:	:
'9'	"9"
'A'	"*"
'B'	"#"
'C'	DTMF Control digit separator (see TS 22.101 [24]).
'D'	"Wild" value. This will cause the MMI to prompt the user for a single digit (see TS 22.101 [24]).
'E'	RFU.
'F'	Endmark e.g. in case of an odd number of digits.

BCD values 'C', 'D' and 'E' are never sent across the radio interface.

NOTE 5: The interpretation of values 'D', 'E' and 'F' as DTMF digits is for further study.

NOTE 6: A second or subsequent 'C' BCD value will be interpreted as a 3 second PAUSE (see TS 22.101 [24]).

4.4.2.4 EF_{EXT1} (Extension1)

This EF contains extension data of an ADN/SSC.

Extension data is caused by:

- an ADN/SSC which is greater than the 20 digit capacity of the ADN/SSC Elementary File or where common digits are required to follow an ADN/SSC string of less than 20 digits. The remainder is stored in this EF as a record, which is identified by a specified identification byte inside the ADN/SSC Elementary File. The EXT1 record in this case is specified as additional data;
- an associated called party subaddress. The EXT1 record in this case is specified as subaddress data.

Identifier: '4FXX'	Structure: linear fixed	Optional
SFI: 'YY'		
Record length: 13 bytes	Update activity: low	

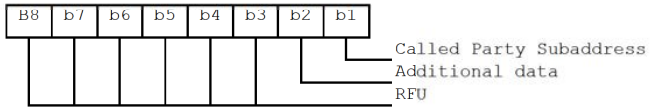
Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Record type	M	1 byte
2 to 12	Extension data	M	11 bytes
13	Identifier	M	1 byte

- Record type.
  Contents:
  - type of the record.

  Coding:



- b3-b8 are reserved and set to 0;
- a bit set to 1 identifies the type of record;
- only one type can be set;

- '00' indicates the type "unknown" or "free".

The following example of coding means that the type of extension data is "additional data":

B8	b7	b6	b5	b4	b3	b2	b1
0	0	0	0	0	0	1	0

- Extension data.
  Contents:
  additional data or Called Party Subaddress depending on record type.

  Coding:
  Case 1, Extension1 record is additional data:
  - The first byte of the extension data gives the number of bytes of the remainder of ADN/SSC. The coding of remaining bytes is BCD, according to the coding of ADN/SSC. Unused nibbles at the end shall be set to 'F'. It is possible if the number of additional digits exceeds the capacity of the additional record to chain another record inside the EXT1 Elementary File by the identifier in byte 13. In this case byte 2 (first byte of the extension data) of all records for additional data within the same chain indicates the number of bytes ('01' to '0A') for ADN/SSC (respectively MSISDN, LND) within the same record unequal to 'FF'.

  Case 2, Extension1 record is Called Party Subaddress:
  - The subaddress data contains information as defined for this purpose in TS 24.008 [9]. All information defined in TS 24.008, except the information element identifier, shall be stored in the USIM. The length of this subaddress data can be up to 22 bytes. In those cases where two extension records are needed, these records are chained by the identifier field. The extension record containing the first part of the called party subaddress points to the record which contains the second part of the subaddress.

- Identifier.
  Contents:
  identifier of the next extension record to enable storage of information longer than 11 bytes.

  Coding:
  record number of next record. 'FF' identifies the end of the chain.

- Example of a chain of extension records being associated to an ADN/SSC. The extension1 record identifier (Byte 14+X) of EF_{ADN} is set to 3.

	EF_{EXT1}												
	Byte: 1	2	3	4	5	6	7	8	9	10	11	12	13
	Record Type	Extension data											Identifier
Record 1	01	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	FF
Record 2	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Record 3	02	0A	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	04
Record 4	02	04	xx	xx	xx	xx	FF	FF	FF	FF	FF	FF	06
Record 5	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Record 6	01	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	01

In this example, ADN/SSC is associated to additional data (records 3 and 4) which represent the last 27 or 28 digits of the whole ADN/SSC (the first 20 digits are stored in EF_{ADN}) and a called party subaddress whose length is more than 11 bytes (records 6 and 1).

4.4.2.5 EF_{PBC} (Phone Book Control)

This EF contains control information related to each entry in the phone book. This EF contains as many records as the EF_{ADN} associated with it (shall be record to record). Each record in EF_{PBC} points to a record in its EF_{ADN}. This file indicates the control information and the hidden information of each phone book entry.

The content of EF_{PBC} is linked to the associated EF_{ADN} record by means of the ADN record number/ID (there is a one to one mapping of record number/identifiers between EF_{PBC} and EF_{ADN}).

Structure of control file EF_{PBC}

Identifier: '4FXX'	Structure: linear fixed	Conditional (see Note)
SFI: 'YY'		
Record length: 2 bytes	Update activity: low	

Access Conditions:

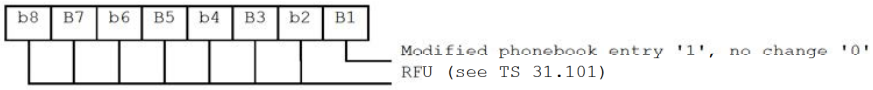
READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Entry Control Information	M	1 byte
2	Hidden Information	M	1 byte

NOTE: This file is mandatory if one or both of the following is true:
- hidden entries are supported
- a GSM SIM application is supported in the UICC.

- Entry Control Information.
  Contents:
  - provides some characteristics about the phone book entry e.g. modification by a terminal accessing the ADN and EXT1 files under $DF_{TELECOM}$ (see clause 4.4.2).

  Coding:



- Hidden Information.
  Contents:
  indicates to which USIM application of the UICC this phone book entry belongs, so that the corresponding secret code can be verified to display the phone book entry. If the secret code is not verified, then the phone book entry is hidden.

  Coding:
  '00' – the phone book entry is not hidden;
  'xx' – the phone book entry is hidden. 'xx' is the record number in EF_{DIR} of the associated USIM application.

4.4.2.6 EF_{GRP} (Grouping file)

This EF contains the grouping information for each phone book entry. This file contains as many records as the associated EF_{ADN}. Each record contains a list of group identifiers, where each identifier can reference a group to which the entry belongs.

Structure of grouping file EF_{GRP}

Identifier: '4FXX'	Structure: linear fixed	Conditional (see Note)
SFI: 'YY'		
Record Length: X bytes (1 ≤ X ≤10)	Update activity: low	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1	Group Name Identifier 1	M	1 byte
2	Group Name Identifier 2	O	1 byte
X	Group Name Identifier X	O	1 byte

NOTE: This file is mandatory if and only if EF_{GAS} is present.

- Group Name Identifier x.

Content:
- indicates if the associated entry is part of a group, in that case it contains the record number of the group name in EF_{GAS}.
- One entry can be assigned to a maximum of 10 groups.

Coding:
- '00' – no group indicated;
'XX' – record number in EF_{GAS} containing the alpha string naming the group of which the phone book entry is a member.

4.4.2.7 EF_{AAS} (Additional number Alpha String)

This file contains the alpha strings that are associated with the user defined naming tags for additional numbers referenced in EF_{ANR}.

Structure of EF_{AAS}

Identifier: '4FXX'	Structure: linear fixed	Optional
SFI: Optional		
Record length: X bytes	Update activity: low	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1 to X	Alpha text string	M	X bytes

- Alpha text string.

Content:
- user defined text for additional number.

Coding:
- same as the alpha identifier in EF_{ADN}.

4.4.2.8 EF_{GAS} (Grouping information Alpha String)

This file contains the alpha strings that are associated with the group name referenced in EF_{GRP}.

Structure of EF_{GAS}

Identifier: '4FXX'	Structure: linear fixed	Conditional (see Note)
SFI: Optional		
Record length: X bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha text string	M	X bytes

NOTE: This file is mandatory if and only if EF_{GRP} is present.

- Alpha text string

Content:
- group names.

Coding:
- same as the alpha identifier in EF_{ADN}.

4.4.2.9 EF_{ANR} (Additional Number)

Several phone numbers and/or Supplementary Service Control strings (SSC) can be attached to one EF_{ADN} record, using one or several EF_{ANR}. The amount of additional number entries may be less than or equal to the amount of records in EF_{ADN}. The EF structure is linear fixed. Each record contains an additional phone number or Supplementary Service Control strings (SSC). This record cannot be shared between several phonebook entries. The first byte indicates whether the record is free or the type of additional number referring to the record number in EF_{AAS}, containing the text to be displayed. The following part indicates the additional number and the reference to the associated record in the EF_{ADN} file. In addition it contains identifiers of associated network/bearer capabilities and identifiers of extension records.

Structure of EF_{ANR}

Identifier: '4FXX'	Structure: linear fixed	Optional
SFI: 'YY'		
Record length: 15 or 17 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Additional Number Record identifier	M	1 byte
2	Length of BCD number/SSC contents	M	1 byte
3	TON and NPI	M	1 byte
4 to 13	Additional number/SSC String	M	10 bytes
14	Capability/Configuration1 Record Identifier	M	1 byte
15	Extension1 Record Identifier	M	1 byte
16	ADN file SFI	C	1 byte
17	ADN file Record Identifier	C	1 byte

NOTE: The fields marked C above are mandatory if and only if the file is not type 1 (as specified in EF_{PBR})

- Additional Number Record Identifier

Content:
- describes the type of the additional number defined in the file EF_{AAS}.

Coding:
- '00' – no additional number description;
'xx' – record number in EF_{AAS} describing the type of number (e.g. "FAX");
'FF' – free record.

- Length of BCD number/SSC contents

Contents:
- this byte gives the number of bytes of the following two data items containing actual BCD number/SSC information. This means that the maximum value is 11, even when the actual additional number/SSC information length is greater than 11. When the additional number/SSC has extension, it is indicated by the extension1 identifier being unequal to 'FF'. The remainder is stored in the EF_{EXT1} with the remaining length of the additional data being coded in the appropriate additional record itself (see clause 4.4.2.4).

Coding:
- same as the length of BCD number/SSC string byte in EF_{ADN}.

- TON and NPI.

Contents:
- Type of number (TON) and numbering plan identification (NPI).

Coding:
- same as the TON and NPI byte in EF_{ADN}.

- Additional number/SSC string

Content:
- up to 20 digits of the additional phone number and/or SSC information linked to the phone book entry.

Coding:
- same as the dialling number /SSC string in EF_{ADN}.

- Capability/Configuration1 Record Identifier.

Contents:
- This byte identifies the number of a record in the EF_{CCP1} containing associated capability/configuration parameters required for the call. The use of this byte is optional. If it is not used it shall be set to 'FF'.

Coding:
- binary.

- Extension1 Record Identifier.

Contents:
- extension1 record identification byte. This byte identifies the number of a record in the EF_{EXT1} containing an associated called party subaddress or additional data. The use of this byte is optional. If it is not used it shall be set to 'FF'.
  if the number requires both additional data and called party subaddress, this byte identifies the additional record. A chaining mechanism inside EF_{EXT1} identifies the record of the appropriate called party subaddress (see clause 4.4.2.4).

Coding:
- binary.

- ADN file SFI.

Content:
- Short File identifier of the associated EF_{ADN} file.

Coding:
- as defined in the UICC specification.

- ADN file Record Identifier

  Content:
  - record identifier of the associated phone book entry.

  Coding:
  - 'xx' – record identifier of the corresponding ADN record.

4.4.2.10 EF_{SNE} (Second Name Entry)

The phone book also contains the option of a second name entry. The amount of second name entries may be less than or equal to the amount of records in EF_{ADN}. Each record contains a second name entry. This record cannot be shared between several phonebook entries.

Structure of EF_{SNE}

Identifier: '4FXX'	Structure: linear fixed	Optional
SFI: 'YY'		
Record length: X or X+2 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	Alpha Identifier of Second Name	M	X bytes
X+1	ADN file SFI	C	1 byte
X+2	ADN file Record Identifier	C	1 byte

NOTE: The fields marked C above are mandatory if and only if the file is not type 1 (as specified in EF_{PBR})

- Alpha Identifier of Second Name.

  Content:
  - string defining the second name of the phone book entry.

  Coding:
  - as the alpha identifier for EF_{ADN}.

- ADN file SFI.

  Content:
  - Short File identifier of the associated EF_{ADN} file.

  Coding:
  - as defined in the UICC specification.

- ADN file Record Identifier

  Content:
  record identifier of the associated phone book entry.

  Coding:
  'xx' – record identifier of the corresponding ADN record.

4.4.2.11 EF_{CCP1} (Capability Configuration Parameters 1)

This EF contains parameters of required network and bearer capabilities and ME configurations associated with a call established using a phone book entry.

Structure of EF_{CCP1}

Identifier: '4FXX'	Structure: linear fixed		Optional
SFI: 'YY'			
Record length: X bytes, X ≥ 15		Update activity: low	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM			
Bytes	Description	M/O	Length
1 to X	Bearer capability information element	M	X bytes

- Bearer capability information element.

  Contents and Coding:
  - see TS 24.008 [9]. The Information Element Identity (IEI) shall be excluded; i.e. the first byte of the EF_{CCP1} record shall be Length of the bearer capability contents.

"- unused bytes are filled with 'FF'

4.4.2.12 Phone Book Synchronisation

To support synchronisation of phone book data with other devices, the USIM may provide the following files to be used by the synchronisation method: a phone book synchronisation counter (PSC), a unique identifier (UID) and change counter (CC) to indicate recent changes.

If synchronisation is supported in the phonebook, then EF_{PSC}, EF_{UID}, EF_{PUID} and EF_{CC} are all mandatory.

4.4.2.12.1 EF_{UID} (Unique Identifier)

The EF_{UID} is used to uniquely identify a record and to be able to keep track of the entry in the phone book. The terminal assigns the (UID) when a new entry is created. The value of the UID does not change as long as the value of the PBID remains the same. The UID shall remain on the UICC, in EF_{UID}, until the PBID is regenerated. This means that when a phone book entry is deleted, the content of the linked information (e.g. ADN, E-MAIL,..) shall be set to the personalization value 'FF…FF'. But the UID-value of the deleted record shall not be used when a new entry is added to the phonebook until the PBID is regenerated, but it shall be set to a new value.

If/when the PBID is regenerated, all UIDs for the entry in the phone book shall be assigned new values starting from 1. The new value of the UID for each entry shall then be kept until the PBID is regenerated again.

Structure of EF_{UID}

Identifier: '4FXX'	Structure: linear fixed		Conditional (see Note)
SFI: 'YY'			
Record length: 2 bytes		Update activity: low	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM			
Bytes	Description	M/O	Length
1 to 2	Unique Identifier (UID) of Phone Book Entry	M	2 bytes
NOTE: This file is mandatory if and only if synchronisation is supported in the phonebook.			

- Unique Identifier of Phone Book Entry.

Content:
- number to unambiguously identify the phone book entry for synchronisation purposes.

Coding:
- hexadecimal value. At initialisation all UIDs are personalised to "00 00" (i.e. empty).

4.4.2.12.2 EF_{PSC} (Phone book Synchronisation Counter)

The phone book synchronisation counter (PSC) is used by the ME to construct the phone book identifier (PBID) and to determine whether the accessed phone book is the same as the previously accessed phone book or if it is a new unknown phone book (might be the case that there is one phonebook under DF-telecom and one phone book residing in a USIM-application). If the PSC is unknown, a full synchronisation of the phone book will follow.

The PSC is also used to regenerate the UIDs and reset the CC to prevent them from running out of range. When the UIDs or the CC has reached its maximum value, a new PSC is generated. This leads to a scenario where neither the CC nor the UIDs will run out of range.

The PSC shall be regenerated by the terminal if one of the following situation applies:
- the values of the UIDs have run out of range;
- the whole phone book has been reset/deleted;
- the value of the CC has run out of range.

Structure of EF_{PSC}

Identifier: '4F22'	Structure: transparent	Conditional (see Note)
SFI: 'YY'		
File size: 4 bytes	Update activity: low	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1 to 4	Phone book synchronisation counter (PSC)	M	4 bytes
NOTE: This file is mandatory if and only if synchronisation is supported in the phonebook.			

- PSC: Unique synchronisation counter of Phone Book.

  Content:
  number to unambiguously identify the status of the phone book for synchronisation purposes.

  Coding:
  hexadecimal value.

  The phone book identifier (PBID) coding based on the EF_{PSC} is described hereafter:

- For a phone book residing in DF-telecom:
  - PBID = ICCid (10bytes) "fixed part" + 4 bytes (in EF_{PSC}) "variable part".
- For a phone book residing in an USIM application:
  - PBID = 10 last bytes of (ICCid XOR AID) "fixed part" + 4 bytes (in EF_{PSC}) "variable part".

  To be able to detect if the PSC needs to be regenerated (i.e. the variable part) the following test shall be made by the terminal before for each update of either the CC or the assignment of a new UID:
  - Each time the terminal has to increment the value of the UID the following test is needed:
    - If UID = 'FF FF' then.

      {Increment **PSC** mod 'FF FF FF FF'; all the UIDs shall be regenerated}.

- Each time the terminal has to increment the value of CC the following test is needed:

  If CC = 'FF FF' then.

  {Increment **PSC** mod 'FF FF FF FF'; CC=0001}.

NOTE: If the phonebook is deleted then the terminal will change the **PSC** according to:

Incrementing **PSC** modulus 'FFFFFFFF'.

4.4.2.12.3 EF_{CC} (Change Counter)

The change counter (CC) shall be used to detect changes made to the phone book.

Every update/deletion of an existing phone book entry or the addition of a new phone book entry causes the terminal to increment the EF_{CC}. The concept of having a CC makes it possible to update the phone book in different terminals, which still are able to detect the changes (e.g. changes between different handset and/or 2nd and 3rd generation of terminals).

Structure of EF_{CC}

Identifier: '4F23'	Structure: transparent	Conditional (see Note)
SFI: 'YY'		
File size: 2 bytes	Update activity: high	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1 to 2	Change Counter (CC) of Phone Book	M	2 bytes
NOTE: This file is mandatory if and only if synchronisation is supported in the phonebook.			

- Change Counter of Phone Book.

  Content:
  - indicates recent change(s) to phone book entries for synchronisation purposes.

  Coding:
  - hexadecimal value. At initialisation, CC shall be personalised to '00 00' (i.e. empty).

4.4.2.12.4 EF_{PUID} (Previous Unique Identifier)

The PUID is used to store the previously used unique identifier (UID). The purpose of this file is to allow the terminal to quickly generate a new UID, which shall then be stored in the EF_{UID}.

Structure of EF_{PUID}

Identifier: '4F24'	Structure: transparent	Conditional (see Note)
SFI: 'YY'		
File size: 2 bytes	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 2	Previous Unique Identifier (PUID) of Phone Book Entry	M	2 bytes

NOTE: This file is mandatory if and only if synchronisation is supported in the phonebook.

- Previous unique Identifier of Phone Book Entry.

Content:

- Previous number that was used to unambiguously identify the phone book entry for synchronisation purposes.

Coding:

- As for EF_{UID}

4.4.2.13 EF_{EMAIL} (e-mail address)

This EF contains the e-mail addresses that may be linked to a phone book entry. Several e-mail addresses can be attached to one EF_{ADN} record, using one or several EF_{EMAIL}. The number of email addresses may be equal to or less than the amount of records in EF_{ADN}. Each record contains an e-mail address. The first part indicates the e-mail address, and the second part indicates the reference to the associated record in the EF_{ADN} file. This record cannot be shared between several phonebook entries.

Structure of EF_{EMAIL}

Identifier: '4FXX'	Structure: linear fixed	Optional
SFI: 'YY'		
Record length: X or X+2 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	E-mail Address	M	X bytes
:			
:			
X+1	ADN file SFI	C	1 byte
X+2	ADN file Record Identifier	C	1 byte

NOTE: The fields marked C above are mandatory if and only if the file is not type 1 (as specified in EF_{PBR})

- E-mail Address.

Content:

- string defining the e-mail address

Coding:
- the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0. The alpha identifier shall be left justified. Unused bytes shall be set to 'FF'.

- ADN file SFI.

Content:
- short File identifier of the associated EF_{ADN} file.

Coding:
- as defined in TS 31.101.

- ADN file Record Identifier.

Content:
- record identifier of the associated phone book entry.

Coding:
- binary.

4.4.2.14 Phonebook restrictions

This clause lists some general restrictions that apply to the phonebook:

- if an EF_{PBR} file contains more than one record, then they shall all be formatted identically on a type-by-type basis, e.g. if EF_{PBR} record #1 contains one type 1 e-mail then all EF_{PBR} records shall have one type 1 email;

- if an EF_{PBR} record contains more than one reference to one kind of file, such as two EF_{EMAIL} files, then they shall all be formatted identically on a type-by-type basis, e.g. if an EF_{PBR} record has 2 email addresses, then they shall have the same record size and the same number of records in each EF_{PBR} entry;

- an EF_{PBR} record may contain TLV entries indicating that the file exist as a type 1 and 2 file, e.g. a phonebook entry may have two emails, one with a one-to-one mapping (type 1) and one with a indirect mapping (type 2). Regardless of the type, files in all entries shall have the same record configuration;

- an EF_{PBR} record shall not contain more than one occurrence of a given kind of file indicated in tag 'AA' (type 3 link). For instance, an EF_{PBR} record may only contain one reference to an EF_{EXT1}.

4.4.3 Contents of files at the DF GSM-ACCESS level (Files required for GSM Access)

The EFs described in this clause are required for the USIM application to be able to access service through a GSM network.

The presence of this DF and thus the support of a GSM access is indicated in the 'USIM Service Table' as service no. '27' being available.

4.4.3.1 EF_{Kc} (GSM Ciphering key Kc)

This EF contains the ciphering key Kc and the ciphering key sequence number n for enciphering in a GSM access network. If the GSM access service is available on the USIM, then this file is mandatory.

Identifier: '4F20'	Structure: transparent	Optional
SFI: '01'		
File size: 9 bytes	Update activity: high	

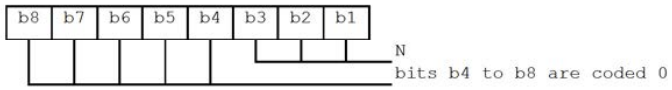
Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 8	Ciphering key Kc	M	8 bytes
9	Ciphering key sequence number n	M	1 byte

- Ciphering key Kc.
  Coding:
  - the least significant bit of Kc is the least significant bit of the eighth byte. The most significant bit of Kc is the most significant bit of the first byte.

- Ciphering key sequence number n
  Coding:



NOTE: TS 24.008 [9] defines the value of n=111 as "key not available". Therefore the value '07' and not 'FF' should be present following the administrative phase.

4.4.3.2 EF_{KcGPRS} (GPRS Ciphering key KcGPRS)

This EF contains the ciphering key KcGPRS and the ciphering key sequence number n for GPRS (see TS 23.060 [7]). If the GSM access service is available on the USIM, then this file is mandatory.

Identifier: '4F52'	Structure: transparent	Optional
SFI: '02		
File size: 9 bytes	Update activity: high	

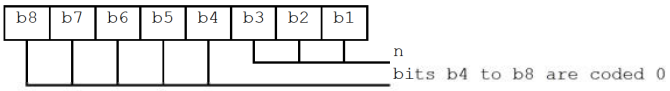
Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 8	Ciphering key KcGPRS	M	8 bytes
9	Ciphering key sequence number n for GPRS	M	1 byte

- Ciphering key KcGPRS.
  Coding:
  the least significant bit of KcGPRS is the least significant bit of the eighth byte. The most significant bit of KcGPRS is the most significant bit of the first byte.

- Ciphering key sequence number n for GPRS.
  Coding:



NOTE: TS 24.008 [9] defines the value of n=111 as "key not available". Therefore the value '07' and not 'FF' should be present following the administrative phase.

4.4.3.3 Void

4.4.3.4 EF_{CPBCCH} (CPBCCH Information)

This EF contains information concerning the CPBCCH according to TS 44.018 [28].

CPBCCH storage may reduce the extent of a Mobile Station's search of CPBCCH carriers when selecting a cell. The CPBCCH carrier lists shall be in accordance with the procedures specified TS 23.022 [29]. The MS stores CPBCCH information (from the System Information 19 message, Packet System Information 3, and Packet System Information 3 bis) on the USIM. The same CPBCCH carrier shall never occur twice in the list.

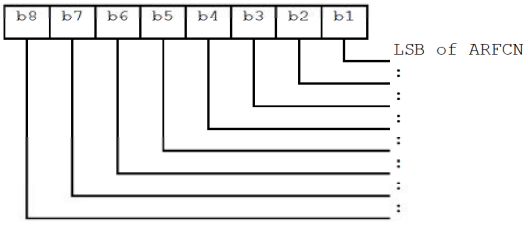
Identifier: '4F63'	Structure: transparent	Optional
File size: 2n bytes	Update activity: high	

Access Conditions:

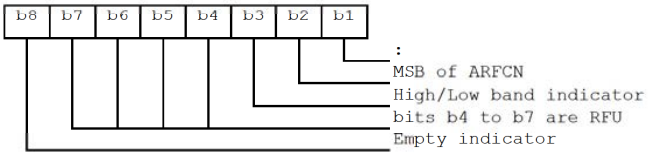
READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 2	Element 1 of CPBCCH carrier list	M	2 bytes
2n-1 to 2n	Element n of CPBCCH carrier list	M	2 bytes

- Element in CPBCCH carrier list
  Coding:
  Byte 1: first byte of CPBCCH carrier list element



Byte 2: second byte of CPBCCH carrier list element



- ARFCN (10 bits) as defined in TS 45.005 [34].
- High/Low band indicator: If the ARFCN indicates possibly a channel in the DCS 1800 or a channel in the PCS 1900 band, if the bit is set to '1' the channel is in the higher band (GSM 1900). If the bit is set to '0', the lower band (GSM 1800) is indicated. If ARFCN indicates a unique channel, this indicator shall be set to '0'.

- Empty indicator: If this bit is set to '1', no valid CPBCCH carrier is stored in this position. If the Empty Indicator is set to '1', the content of the CPBCCH carrier field shall be ignored. The empty indicator shall also be used, and set to '1', if storage of fewer than maximum number n, of CPBCCH carrier fields is required.

4.4.3.5 $EF_{InvScan}$ (Investigation Scan)

This EF contains two flags used to control the investigation scan for higher prioritized PLMNs not offering voice services.

Identifier: '4F64'	Structure: transparent	Optional
File size: 1 byte	Update activity: low	

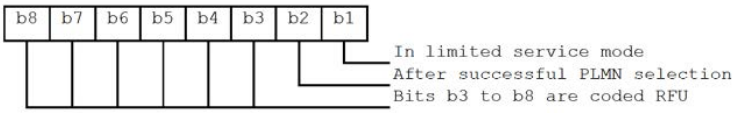
Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Investigation scan flags	M	1 byte

- Investigation scan flags

  Coding:



  A '1' in a bit position indicates that the investigation scan shall be performed for the condition corresponding to that bit position and a '0' that it shall not be performed.

If this elementary file is not present, no investigation scan shall be performed.

4.4.4 Contents of files at the MExE level

This clause specifies the EFs in the dedicated file DF_{MExE}. It only applies if the USIM supports MExE (see TS 23.057 [30]).

The EFs in the Dedicated File DF_{MExE} contain execution environment related information.

4.4.4.1 $EF_{MExE-ST}$ (MExE Service table)

This EF indicates which MExE services are available. If a service is not indicated as available in the USIM, the ME shall not select this service.

Identifier: '4F40'	Structure: transparent	Optional
File size: X bytes, X ≥ 1	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Services n°1 to n°8	M	1 byte
2	Services n°9 to n°16	O	1 byte
etc.			
X	Services (8X-7) to (8X)	O	1 byte

-Services

Contents: Service n°1: Operator Root Public Key
Service n°2: Administrator Root Public Key
Service n°3: Third Party Root Public Key
Service n°4: RFU

Coding:
the coding rules of the USIM Service Table apply to this table.

4.4.4.2 EF_{ORPK} (Operator Root Public Key)

This EF contains the descriptor(s) of certificates containing the Operator Root Public Key. This EF shall only be allocated if the operator wishes to verify applications and certificates in the MExE operator domain using a root public key held in the USIM. Each record of this EF contains one certificate descriptor.

For example, an operator may provide a second key for recover disaster procedure in order to limit OTA data to load.

Identifier: '4F41'	Structure: linear fixed	Optional
Record length: X + 10 bytes	Update activity: low	

Access Conditions:

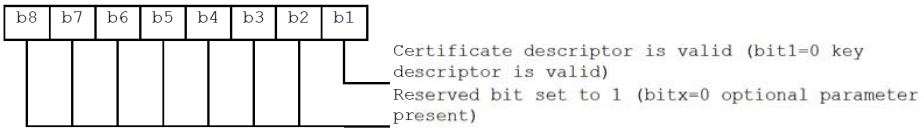
READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Parameters indicator	M	1 byte
2	Flags	M	1 byte
3	Type of certificate	M	1 byte
4 to 5	Key/certificate file identifier	M	2 bytes
6 to 7	Offset into key/certificate file	M	2 bytes
8 to 9	Length of key/certificate data	M	2 bytes
10	Key identifier length (X)	M	1 byte
11 to 10+X	Key identifier	M	X bytes

- Parameter indicator

Contents:
The parameter indicator indicates if record is full and which optional parameters are present

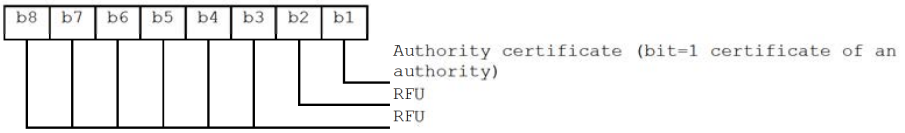
Coding: bit string



- Flags

Contents:
The authority flag indicates whether the certificate identify an authority (i.e. CA or AA) or not.

Coding: bit string



- Type of certificate

  Contents:
  This field indicates the type of certificate containing the key.

  Coding: binary:
  0 : WTLS
  1 : X509
  2 : X9.68
  Other values are reserved for further use

- Key/certificate File Identifier

  Contents:
  these bytes identify an EF which is the key/certificate data file (see clause 4.4.4.5), holding the actual key/certificate data for this record.

  Coding:
  byte 4: high byte of Key/certificate File Identifier;
  byte 5: low byte of Key/certificate File Identifier.

- Offset into Key/certificate File

  Contents:
  these bytes specify an offset into the transparent key/certificate data File identified in bytes 4 and 5.

  Coding:
  byte 6: high byte of offset into Key/certificate Data File;
  byte 7: low byte of offset into Key/certificate Data File

- Length of Key/certificate Data

  Contents:
  these bytes yield the length of the key/certificate data, starting at the offset identified in "Offset into Key/certificate File" field.

  Coding:
  byte 8: high byte of Key/certificate Data length;
  byte 9: low byte of Key/certificate Data length.

- Key identifier length

  Contents:
  This field gives length of key identifier

  Coding:
  binary

- Key identifier

  Contents:
  This field provides a means of identifying certificates that contain a particular public key (chain building) and linking the public key to its corresponding private key. For more information about value and using see TS 23.057 [30].

  Coding:
  octet string

NOTE: transparent key/certificate data longer than 256 bytes may be read using successive READ BINARY commands.

4.4.4.3 EF_{ARPK} (Administrator Root Public Key)

This EF contains the descriptor(s) of certificates containing the Administrator Root Public Key. This EF shall only be allocated if the SIM issuer wishes to control the Third Party certificates on the terminal using an Administrator root

public key held in the USIM. Each record of this EF contents one certificate descriptor.

This file shall contain only one record.

Identifier: '4F42'	Structure: linear fixed	Optional
Record length: X + 10 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Parameters indicator	M	1 byte
2	Flags	M	1 byte
3	Type of certificate	M	1 byte
4 to 5	Key/certificate file identifier	M	2 bytes
6 to 7	Offset into key/certificate file	M	2 bytes
8 to 9	Length of key/certificate data	M	2 bytes
10	Key identifier length (X)	M	1 byte
11 to 10+X	Key identifier	M	X bytes

For contents and coding of all data items see the respective data items of the EF_{ORPK} (clause 4.4.4.2).

4.4.4.4 EF_{TPRPK} (Third Party Root Public Key)

This EF contains descriptor(s) of certificates containing the Third Party root public key (s). This EF shall only be allocated if the USIM issuer wishes to verify applications and certificates in the MExE Third Party domain using root public key(s) held in the USIM. This EF can contain one or more root public keys. Each record of this EF contains one certificate descriptor.

For example, an operator may provide several Third Party Root Public Keys.

Identifier:'4F43'	Structure: linear fixed	Optional
Record length: X + Y + 11 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Parameters indicator	M	1 byte
2	Flags	M	1 byte
3	Type of certificate	M	1 byte
4 to 5	Key/certificate file identifier	M	2 bytes
6 to 7	Offset into key/certificate file	M	2 bytes
8 to 9	Length of key/certificate data	M	2 bytes
10	Key identifier length (X)	M	1 byte
11 to 10+X	Key identifier	M	X bytes
11+X	Certificate identifier length (Y)	M	1 byte
12+X to 11+X+Y	Certificate identifier	M	Y bytes

- Certificate identifier length
  Contents:
  This field gives the length of the certificate identifier

  Coding:
  binary

- Certificate identifier
  Contents:
  This field identifies the issuer and provides an easy way to find a certificate. For more information about the value and usage see TS 23.057 [30].

  Coding:
  Octet string

For contents and coding of all other data items see the respective data items of the EF_{ORPK} (clause 4.4.4.2).

4.4.4.5 EF_{TKCDF} (Trusted Key/Certificates Data Files)

Residing under DF_{MExE}, there may be several key/certificates data files. These EFs containing key/certificates data shall have the following attributes:

Identifier: '4FXX'	Structure: transparent	Optional
File size: Y bytes	Update activity: low	
Access Conditions: READ PIN UPDATE ADM DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1 to Y	Key/Certificate Data	M	Y bytes

Contents and coding:

Key/certificate data are accessed using the key/certificates descriptors provided by EF_{TPRPK} (see clause 4.4.4.4).

The identifier '4FXX' shall be different from one key/certificate data file to another. For the range of 'XX', see TS 31.101 [11]. The length Y may be different from one key/certificate data file to another.

4.4.5 Contents of files at the DF WLAN level

This clause describes the additional files that are used for WLAN purposes.

DF_{WLAN} shall be present at the ADF_{USIM} level if either of the services nº59, nº60, nº61, nº62, nº63 or nº66 are allocated in the corresponding EF_{UST} (USIM Service Table).

4.4.5.1 EF_{Pseudo} (Pseudonym)

This EF contains a temporary user identifier (pseudonym) for subscriber identification. Pseudonyms may be provided as part of a previous authentication sequence. Pseudonyms are used as defined in [40]. This file shall be present if service nº59 is allocated in EF_{UST}.

Identifier: '4F41'	Structure: Transparent	Optional
SFI : '01'		
File size: Y bytes (Y≥n+2)	Update activity: high	
Access Conditions: READ PIN UPDATE PIN DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1 to 2	Pseudonym Length	M	2 bytes
3 to n+2	Pseudonym	M	n bytes

-Pseudonym Length

Contents:
- this byte gives the number of bytes of the following data item containing the Pseudonym value.

Coding:
- unsigned length coded on 2 bytes

- Pseudonym.

Contents:

-Pseudonym to be used as the username part of the NAI

Coding:

- As described for the user portion of the NAI in [41]. Unused bytes shall be set to 'FF' and shall not be considered as a part of the value.

4.4.5.2 $EF_{UPLMNWLAN}$ (User controlled PLMN selector for WLAN Access)

This EF contains the coding for preferred PLMNs to be used for WLAN PLMN Selection. This information is determined by the user and defines the preferred PLMNs of the user in priority order. The first record indicates the highest priority and the nth record indicates the lowest. This file shall be present if service n°60 is allocated in EF_{UST}.

Identifier: '4F42'	Structure: transparent	Optional
SFI: '02'		
File size: 3n (where n ≥8)	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	1st PLMN (highest priority)	M	3 bytes
4 to 6	2nd PLMN	M	3 bytes
:	:		
22 to 24	8th PLMN	M	3 bytes
25 to 27	9th PLMN	O	3 bytes
:	:		
(3n-2) to 3n	Nth PLMN (lowest priority)	O	3 bytes

- PLMN

Contents:
- Mobile Country Code (MCC) followed by the Mobile Network Code (MNC).

Coding:
- according to TS 24.008 [9].

4.4.5.3 $EF_{OPLMNWLAN}$ (Operator controlled PLMN selector for WLAN Access)

This EF contains the coding for operator preferred PLMNs to be used for WLAN PLMN Selection. This information is determined by the operator and defines the operator preferred PLMNs in priority order. The first record indicates the highest priority and the nth record indicates the lowest. This file shall be present if service n°61 is allocated in EF_{UST}.

Identifier: '4F43'	Structure: transparent	Optional
SFI: '03'		
File size: 3n (where n ≥8)	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to 3	1st PLMN (highest priority)	M	3 bytes
4 to 6	2nd PLMN	M	3 bytes
:	:		
22 to 24	8th PLMN	M	3 bytes
25 to 27	9th PLMN	O	3 bytes
:	:		
(3n-2) to 3n	Nth PLMN (lowest priority)	O	3 bytes

- PLMN

  Contents:
  - Mobile Country Code (MCC) followed by the Mobile Network Code (MNC).

  Coding:
  - according to TS 24.008 [9].

4.4.5.4 EF_{UWSIDL} (User controlled WLAN Specific IDentifier List)

This file contains the user preferred list of WLAN specific identifier (WSID) for WLAN selection in priority order. This file is used for WLAN selection as described in [40]. This file shall be present if service nº62 is allocated in EF_{UST}.

Identifier: '4F44'	Structure: linear fixed	Optional
SFI: '04'		
Record size: X+1 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Length	M	1 bytes
2 to X + 1	WSID value	M	X bytes

-Length

Contents:
- this byte gives the number of bytes of the following data item containing the WSID value.

Coding:
- unsigned length coded on one byte

-WSID Value

Contents:
- WLAN specific identifier (WSID) as defined in 3GPP TS 24.234 [40].

Coding:
- binary. Unused bytes shall be set to 'FF' and not used either as a part of the value or for length calculation.

4.4.5.5 EF_{OWSIDL} (Operator controlled WLAN Specific IDentifierList)

This file contains the operator preferred list of WLAN specific identifier (WSID) for WLAN selection in priority order. This file is used for WLAN selection as described in [40]. This file shall be present if service nº63 is allocated in EF_{UST}.

Identifier: '4F45'	Structure: linear fixed	Optional
SFI: '05'		
Record size: X + 1 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Length	M	1 bytes
2 to X + 1	WSID value	M	X bytes

-Length

Contents:

- this byte gives the number of bytes of the following data item containing the WSID value.

Coding:

- unsigned length coded on one byte

-WSID Value

Contents:

- WLAN specific identifier (WSID) as defined in 3GPP TS 24.234 [40].

Coding:

- binary. Unused bytes shall be set to 'FF' and not used either as a part of the value or for length calculation.

4.4.5.6 EF_{WRI} (WLAN Reauthentication Identity)

This EF contains a list of parameters linked to a re-authentication identity to be used in fast re-authentication. Re-authentication identities and related parameters (Master Key and Counter Value) are provided as part of a previous authentication sequence. This file shall be present if service n°66 is allocated in EF_{UST}.

Identifier: '4F46'	Structure: Transparent	Optional
SFI: '06'		
File size: n bytes (n≥J+K+L+6)	Update activity: high	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Reauthentication Identity Tag '80'	M	1 byte
2	Re-authentication Identity Length	M	1 byte
3-J+2	Re-authentication Identity Value	M	J bytes
J+3	Master Key Tag '81'	M	1 byte
J+4	Master Key Length	M	1 byte
J+5-J+K+4	Master Key Value	M	K bytes
J+K+5	Counter Tag '82'	M	1 byte
J+K+6	Counter Length	M	1 byte
J+K+7-J+K+L+6	Counter Value	M	L bytes

- Reauthentication Identity

Contents:

- Re-authentication identity TLV to be used as the username part of the NAI.

Coding:

Tag '80'

Unsigned length on 1 byte

Value: As described for the user portion of the NAI in TS 33.234 [41]. Unused bytes shall be set to 'FF' and shall not be considered as a part of the value.

- Master Key
  Contents:
  - Master Key TLV.

  Coding:
  Tag '81'
  Unsigned length on 1 byte
  Value: As described in TS 33.234 [41].

- Counter
  Contents:
  - Counter TLV

  Coding:
  Tag '82'
  Unsigned length on 1 byte
  Value: As described in TS 33.234 [41].

4.5 Contents of EFs at the TELECOM level

The EFs in the Dedicated File $DF_{TELECOM}$ contain service related information.

4.5.1 EF_{ADN} (Abbreviated dialling numbers)

In case of a present GSM application on the UICC the first EF_{ADN} (i.e. reflected by the first record in EF_{PBR}) of the $DF_{PHONEBOOK}$ is mapped (with an identifier equal to '6F3A') to $DF_{TELECOM}$ to ensure backwards compatibility.

A 3G ME shall not access this file. The information is accessible for a 3G ME in EF_{ADN} under $DF_{PHONEBOOK}$.

4.5.2 EF_{EXT1} (Extension1)

In case of a present GSM application on the UICC the first EF_{EXT1} (i.e. reflected by the first record in EF_{PBR}) of the $DF_{PHONEBOOK}$ is mapped (with an identifier equal to '6F4A') to $DF_{TELECOM}$ to ensure backwards compatibility.

4.5.3 EF_{ECCP} (Extended Capability Configuration Parameter)

In case of a present GSM application on the UICC the first EF_{CCP1} (i.e. reflected by the first record in EF_{PBR}) of the $DF_{PHONEBOOK}$ is mapped (with an identifier equal to '6F4F') to $DF_{TELECOM}$ to ensure backwards compatibility. There shall not be any EF_{CCP} (with a file-id of '6F3D') under $DF_{TELECOM}$ because otherwise a GSM terminal could create inconsistencies within the phonebook.

4.5.4 EF_{SUME} (SetUpMenu Elements)

This File is defined in TS 102 222[39], and has the file identifier '6F54'.

4.6 Contents of DFs at the TELECOM level

DFs may be present as child directories of $DF_{TELECOM}$. The following DFs have been defined:

- $DF_{GRAPHICS}$ '5F50'.
- $DF_{PHONEBOOK}$ '5F3A'.

(DF for public phone book. This DF has the same structure as $DF_{PHONEBOOK}$ under ADF USIM).

- $DF_{MULTIMEDIA}$ '5F3B'.

4.6.1 Contents of files at the $DF_{GRAPHICS}$ level

The EFs in the Dedicated File $DF_{GRAPHICS}$ contain graphical information.

4.6.1.1 EF_{IMG} (Image)

Each record of this EF identifies instances of one particular graphical image, which graphical image is identified by this EF's record number.

Image instances may differ as to their size, having different resolutions, and the way they are coded, using one of several image coding schemes.

As an example, image k may represent a company logo, of which there are i instances in the UICC, of various resolutions and perhaps encoded in several image coding schemes. Then, the i instances of the company's logo are described in record k of this EF.

Identifier: '4F20'	Structure: linear fixed	Optional
Record length: 9n+1 or 9n+2 bytes	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	ADM
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1	Number of Actual Image Instances	M	1 byte
2 to 10	Descriptor of Image Instance 1	M	9 bytes
11 to 19	Descriptor of Image Instance 2	O	9 bytes
9(n-1)+2 to 9n+1	Descriptor of Image Instance n	O	9 bytes
9n + 2	RFU (see TS 31.101 [11])	O	1 byte

- Number of Actual Image Instances.

  Contents:
  - this byte gives the number of actual image instances described in the following data items (i.e. unused descriptors are not counted).

  Coding:
  - binary.

- Image Instance Descriptor

  Contents:
  - a description of an image instance.

  Coding:
  - Byte 1: Image Instance Width

  Contents:
  - this byte specifies the image instance width, expressed in raster image points.

  Coding:
  - binary.

Byte 2: Image Instance Height.

Contents:
- this byte specifies the image instance height, expressed in raster image points.

Coding:
- binary.

Byte 3: Image Coding Scheme.

Contents:
- this byte identifies the image coding scheme that has been used in encoding the image instance.

Coding:
- '11' - basic image coding scheme as defined in annex B;
- '21' - colour image coding scheme as defined in annex B;
- '22' - colour image coding scheme with transparency as defined in annex B;
  other values are reserved for future use.

Bytes 4 and 5: Image Instance File Identifier.

Contents:
- these bytes identify an EF which is the image instance data file (see clause 4.6.1.2), holding the actual image data for this particular instance.

Coding:
- byte 4: high byte of Image Instance File Identifier;
- byte 5: low byte of Image Instance File Identifier.

Bytes 6 and 7: Offset into Image Instance File.

Contents:
- these bytes specify an offset into the transparent Image Instance File identified in bytes 4 and 5.

Coding:
- byte 6: high byte of offset into Image Instance File;
  byte 7: low byte of offset into Image Instance File.

Bytes 8 and 9: Length of Image Instance Data.

Contents:
- these bytes yield the length of the image instance data, starting at the offset identified in bytes 6 and 7. For the colour image coding scheme, as defined in annex B, the length of image instance data excludes the CLUT.

Coding:
- byte 8: high byte of Image Instance Data length;
- byte 9: low byte of Image Instance Data length.

NOTE: Transparent image instance data longer than 256 bytes may be read using successive READ BINARY commands.

4.6.1.2 EF_{IIDF} (Image Instance Data Files)

Residing under $DF_{GRAPHICS}$, there may be several image instance data files. These EFs containing image instance data shall have the following attributes:

Identifier: '4FXX'	Structure: transparent	Optional
Record length: Y bytes	Update activity: low	
Access Conditions: READ PIN UPDATE ADM DEACTIVATE ADM ACTIVATE ADM		

Bytes	Description	M/O	Length
1 to Y	Image Instance Data	M	Y bytes

Contents and coding:
- Image instance data are accessed using the image instance descriptors provided by EF_{IMG} (see clause 4.6.1.1).

The identifier '4FXX' shall be different from one image instance data file to the other. For the range of 'XX', TS 31.101 [11]. The length Y may be different from one image instance data file to the other.

4.6.2 Contents of files at the $DF_{PHONEBOOK}$ under the $DF_{TELECOM}$

This DF has the same structure as $DF_{PHONEBOOK}$ under the ADF_{USIM}.

4.6.3 Contents of files at the $DF_{MULTIMEDIA}$ level

The EFs in the Dedicated File $DF_{MULTIMEDIA}$ contain multimedia information. This DF shall be present if service n°67 is available, i.e. if the card supports MMS storage.

4.6.3.1 EF_{MML} (Multimedia Messages List)

If service n°67 is "available", this file shall be present.

This file contains information about the MM data stored in EF_{MMDF}. MM information are encapsulated in a BER-TLV data object. Each data object in EF_{MML} points to a corresponding MM in EF_{MMDF}.

Identifier: '4F47'	Structure: BER-TLV	Optional
	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	M/O	Length
1 to X	MM Descriptor Data Object(s)	M	X bytes

- MM Descriptor Data Object

The content and coding are defined below:

Coding of the MM Descriptor Data Objects

Length	Description	Coding	Status
1 to A bytes (A ≤ 3)	MM Descriptor Data Object tag	As defined in TS 31.101 [11] for BER-TLV structured files	M
1 to B bytes (B ≤ 4)	MM Descriptor Data Object length	As defined in TS 31.101 [11] for BER-TLV structured files	M
1 byte	MMS Implementation tag '80'		M
1 byte	MMS Implementation length		M
1 byte	MMS Implementation	See below	M
1 byte	MM File Identifier / SFI tag '81'		M
1 byte	MM File Identifier / SFI length		M
1 or 2 bytes	MM File Identifier / SFI	See below	M
1 byte	MM Content Data Object Tag tag '82'		M
1 byte	MM Content Data Object Tag length		M
1 to C bytes (C ≤ 3)	MM Content Data Object Tag	See below	M
1 byte	MM Size tag '83'		M
1 byte	MM Size length		M
1 to D bytes (D ≤ 4)	MM Size in bytes	See below	M
1 byte	MM Status tag '84'		M
1 byte	MM Status length		M
2 bytes	MM Status	See below	M
1 byte	MM Alpha Identifier tag '85'		M
1 byte	MM Alpha Identifier length		M
1 to E bytes	MM Alpha Identifier	See below	M

- MMS Implementation

Contents:

The MMS Implementation indicates the used implementation type, e.g. WAP.

Coding:

Allocation of bits:

Bit number	Parameter indicated
1	WAP implementation of MMS
2-8	Reserved for future use

Bit value	Meaning
0	Implementation not supported.
1	Implementation supported.

- MM File Identifier / SFI

  Contents:

  file identifier or SFI of EF_{MMDF} which contains the actual MM message. If the length of this TLV object is equal to 1 then the content indicates the SFI of the EF_{MMDF}, the SFI is coded on b1 to b5. Otherwise the TLV contains the file identifier.

  Coding:

  according to TS 31.101 [11].

- MM Content Data Object Tag

  Contents:

  tag indentifying a MM (i.e. identifying a data object) within EF_{MMDF}.

  Coding:

  according to TS 31.101 [11].

- MM Size

  Contents:

  size of the corresponding MM stored in EF_{MMDF}.

  Coding:

  according to TS 31.101 [11].

- MM Status

  Contents:

  The status bytes contain the status information of the stored Multimedia Message.

  Coding:

  First byte:

  bit b1 indicates whether the MM has been read or not. Bit b2 indicates the MM forwarding status. Bit b3 indicates whether it is a received MM or an originated MM. Bits b4-b8 are reserved for future use.

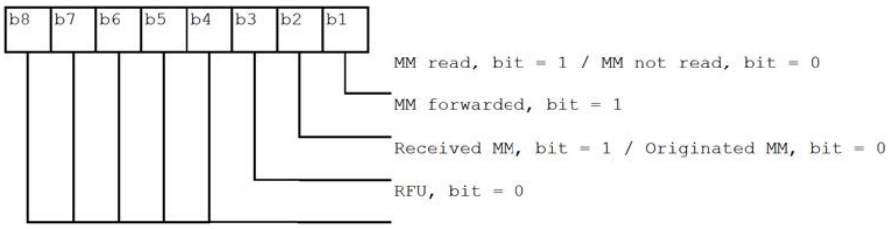
  Second byte:

  Coding of the second byte depends on whether the MM has been identified as a received MM or originated MM in the first byte:

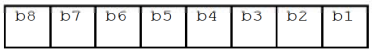
  - Received MM coding:
    bits b1 and b2 are used to provide information on Read-reply reports. Bits b3 to b8 are reserved for future use.

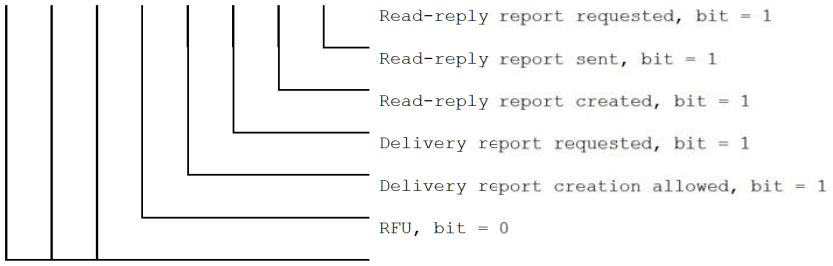
  - Originated MM coding:
    bit b1 is used to provide information on Delivery-report. Bits b2 to b8 are reserved for future use.

First byte:

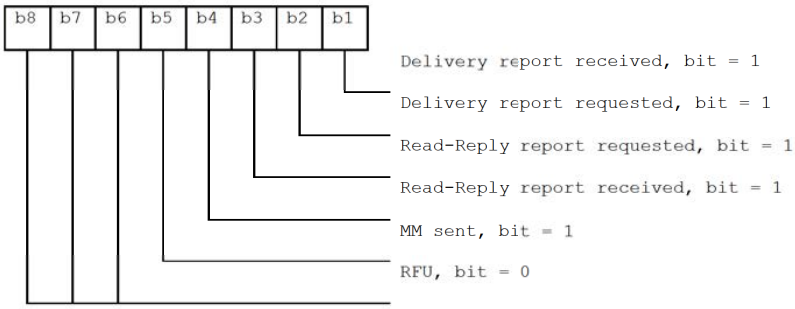


Second byte coding for Received MM:





Second byte coding for Originated MM:



- MM Alpha Identifier
  Contents:
  information about the MM to be displayed to the user (e.g. sender, subject, date etc).
  Coding:
  this alpha identifier shall use either:
  - the SMS default 7-bit coded alphabet as defined in TS 23.038 [5] with bit 8 set to 0. The alpha identifier shall be left justified. Unused bytes shall be set to 'FF';
  - or one of the UCS2 coded options as defined in the annex of TS 31.101 [11].

4.6.3.2 EF_{MMDF} (Multimedia Messages Data File)

If service n°67 is "available", this file shall be present.

Residing under $DF_{MULTIMEDIA}$, this EF contains Multimedia Messages data. The structure of this EF is BER-TLV (see TS 31.101 [11]). Each MM in this file is identified by a tag. The tag value for a particular MM in this file is stored in EF_{MML}.

Identifier: '4F48'	Structure: BER-TLV	Optional
	Update activity: low	

Access Conditions:

READ	PIN
UPDATE	PIN
DEACTIVATE	ADM
ACTIVATE	ADM

Bytes	Description	M/O	Length
1 to X	MM Content Data Object(s)	M	X bytes

- MM Content Data Object
  The content and coding are defined below:

Coding of the MM Content Data Objects

Length	Description	Coding	Status
1 to T bytes (T ≤ 3)	MM Content Data Object tag	As defined in TS 31.101 [11] for BER-TLV structured files	M
1 to L (L ≤ 4)	MM Content Data Object length	As defined in TS 31.101 [11] for BER-TLV structured files	M
X-L-T bytes	MM Content	According to MMS Implementation	M

Contents:

The Multimedia Message content consists of MM headers and a message body. The content of the Multimedia Message data depends on whether the MM has been identified as a received MM or an originated MM:

- For a received message, the stored Multimedia Message data consists of the information elements (i.e. relevant MM control information and MM content) of the MM1_retrieve.RES (see TS 23.140 [38]).

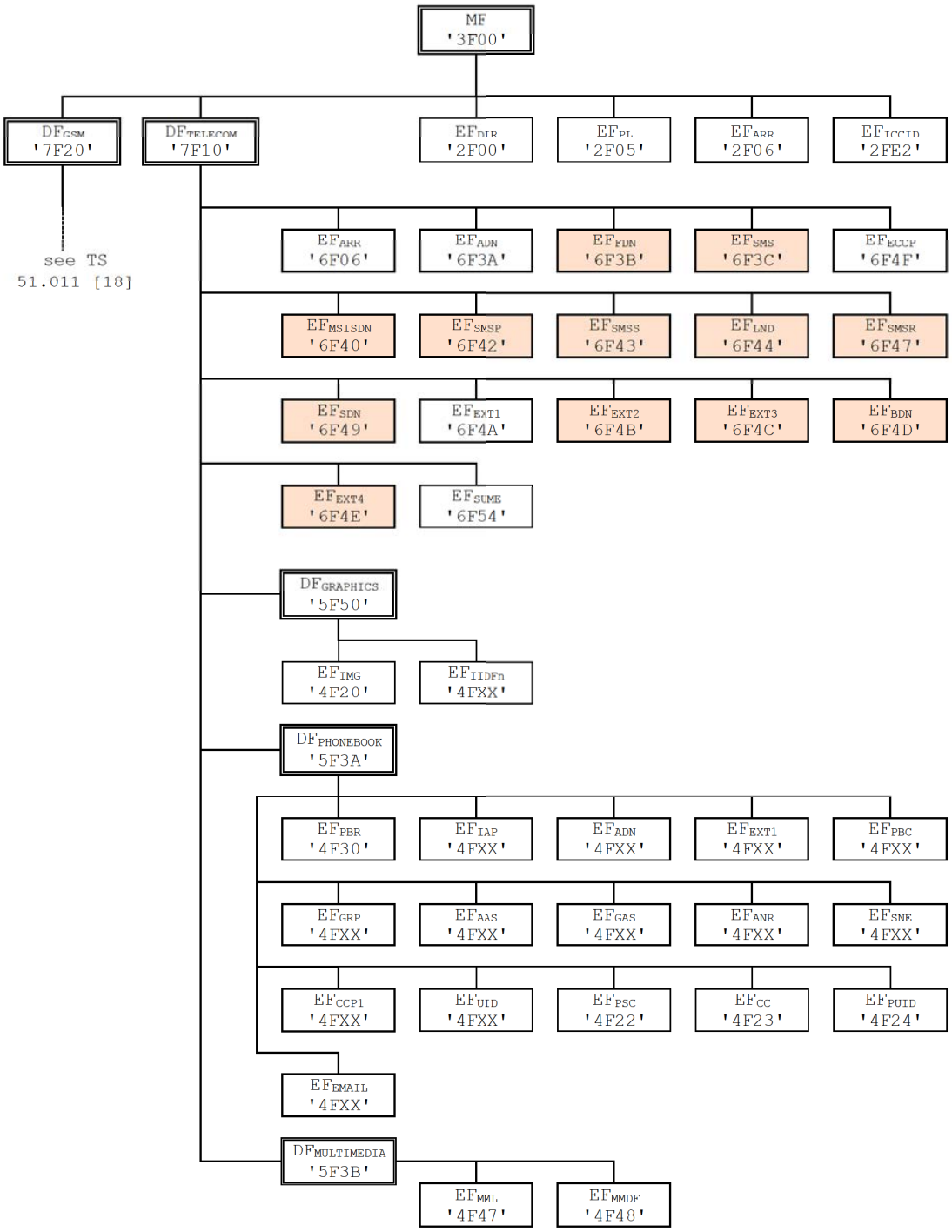
- For an originated message, the stored Multimedia Message data consists of the information elements (i.e. relevant MM control information and MM content) of the MM1_submit.REQ (see TS 23.140 [38]).

Coding:

The MM data encapsulation scheme and encoding rules are defined by the MMS Implementation.

4.7 Files of USIM

This clause contains two figures depicting the file structure of the UICC and the ADF_{USIM}. ADF_{USIM} shall be selected using the AID and information in EF_{DIR}.



NOTE 1: Files under $DF_{TELECOM}$ with shaded background are defined in TS 51.011 [18].
NOTE 2: The value '6F65' under ADFUSIM was used in earlier versions of this specification, and should not be re-assigned in future versions.

Figure 4.1: File identifiers and directory structures of UICC