3GPP TSG SA WG3 Security — SA3#33 **S3-040402**
10-14 May 2004, Beijing, China

CR-Form-v7

CHANGE REQUEST

⌘	**33.105**	**CR**	**CRNum**	⌘ **rev**	**-**	⌘	Current version:	**4.1.0** ⌘

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

Proposed change affects: UICC apps⌘ ☒ ME □ Radio Access Network □ Core Network ☒

Title:	⌘	Correction of inconsistencies in AK computation for re-synchronisation	
Source:	⌘	Orange	
Work item code:	⌘	UTRAN Security	***Date:*** ⌘ 23/04/2004
Category:	⌘	**F**	***Release:*** ⌘ *Rel-4*
		Use one of the following categories: ***F** (correction)* ***A** (corresponds to a correction in an earlier release)* ***B** (addition of feature),* ***C** (functional modification of feature)* ***D** (editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.	*Use one of the following releases:* *2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *Rel-4 (Release 4)* *Rel-5 (Release 5)* *Rel-6 (Release 6)*

Reason for change:	⌘	f5 is used instead of f5* in figures 3 and 4 to align the figures with the text.
Summary of change:	⌘	f5 is replaced by f5* in figures 3 and 4 to align the figures with the text.
Consequences if not approved:	⌘	Consistency problem. Potential misinterpretation of AK computation for re-synchronisation.

Clauses affected:	⌘	5.1.1.3, 5.1.1.4			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

****************** BEGIN OF CHANGE ******************

5.1.1.3 Generation of re-synchronisation token in the USIM

Upon the assertion of a synchronisation failure, the USIM generates a re-synchronisation token as follows:

a) The USIM computes MAC-S = f1*$_K$(SQN$_{MS}$ || RAND || AMF*), whereby AMF* is a default value for AMF used in re-synchronisation.

b) If SQN$_{MS}$ is to be concealed with an anonymity key AK, the USIM computes AK = f5*$_K$(RAND), and the concealed counter value is then computed as SQN$_{MS}$ ⊕ AK.

c) The re-synchronisation token is constructed as AUTS = SQN$_{MS}$ [⊕ AK] || MAC-S.

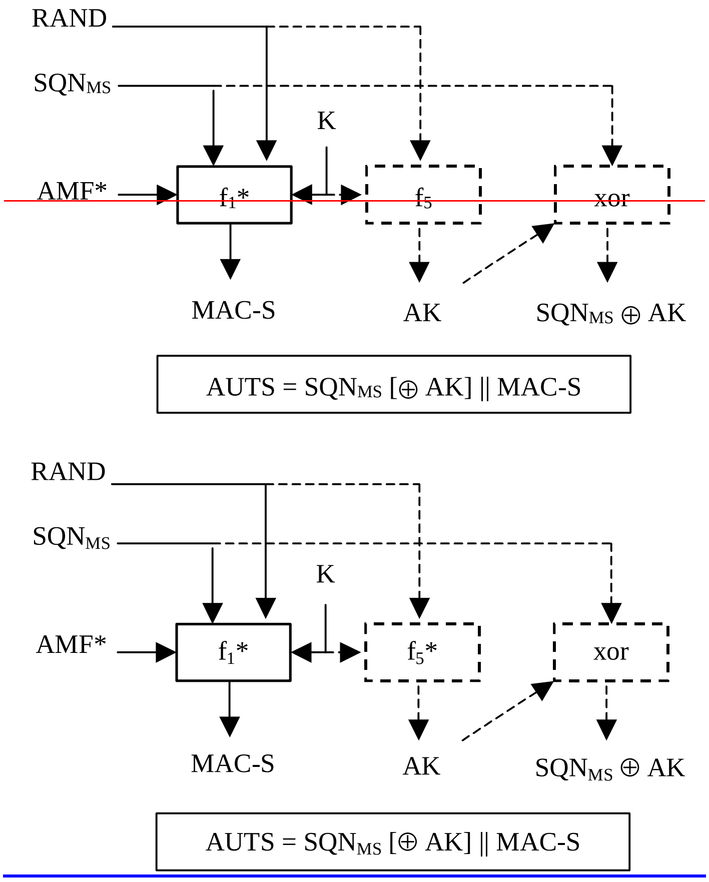
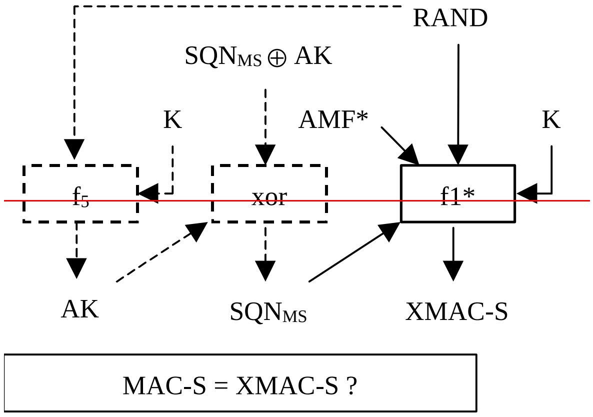


Figure 3: Generation of re-synchronisation token in the USIM

5.1.1.4 Re-synchronisation in the HLR/AuC

Upon receipt of an indication of synchronisation failure and a (AUTS, RAND) pair, the HLR/AuC may perform the following cryptographic functions:



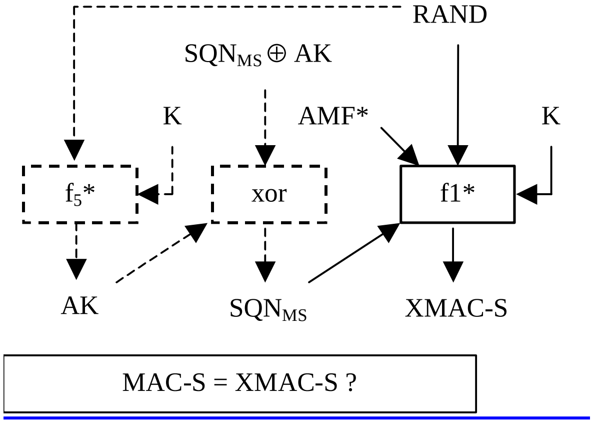


Figure 4: Re-synchronisation in the HLR/AuC

a) If SQN_{MS} is concealed with an anonymity key AK, the HLR/AuC computes AK = $f5*_K$(RAND)and retrieves the unconcealed counter value as SQN_{MS} = ($SQN_{MS} \oplus$ AK) xor AK.

b) If SQN generated from SQN_{HE} would not be acceptable, then the HLR/AuC computes XMAC-S = $f1*_K$(SQN_{MS} || RAND || AMF*), whereby AMF* is a default value for AMF used in re-synchronisation.

****************** END OF CHANGE ******************