

Source: TSG-SA WG4

Title: CRs TS 26.401 and TS 26.410 on aacPlus codec (Release 6)

Document for: Approval

Agenda Item: 7.4.3

The following CRs, agreed at the TSG-SA WG4 meeting #33, are presented to TSG SA #26 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.401	001	1	Rel-6	Alignment with C-code: Clarification on SBR mode to be used for mono only capable decoders	F	6.0.0	S4	TSG-SA WG4#33	S4-040776
26.410	001		Rel-6	Correction to C-code to increase error robustness	F	6.0.0	S4	TSG-SA WG4#33	S4-040642
26.410	002		Rel-6	Correction to C-code: Missing memory re- initialization	F	6.0.0	S4	TSG-SA WG4#33	S4-040643
26.410	003		Rel-6	Correction to C-code: Memory initialization added	F	6.0.0	S4	TSG-SA WG4#33	S4-040644
26.410	004		Rel-6	Correction to C-code: Wrong calculation of sine levels	F	6.0.0	S4	TSG-SA WG4#33	S4-040645
26.410	005		Rel-6	Correction to C-code: Prevent multiple reading of bitstream elements	F	6.0.0	S4	TSG-SA WG4#33	S4-040646
26.410	006	2	Rel-6	Correction to C-code: Corrected wrong table values	F	6.0.0	S4	TSG-SA WG4#33	S4-040828
26.410	007		Rel-6	Correction to C-code: Modify instrumentation	F	6.0.0	S4	TSG-SA WG4#33	S4-040657
26.410	008	1	Rel-6	Correction of C-code: Output data was copied into wrong array	F	6.0.0	S4	TSG-SA WG4#33	S4-040770
26.410	009	1	Rel-6	Correction to C-code: Bug in resampler	F	6.0.0	S4	TSG-SA WG4#33	S4-040775
26.410	010	1	Rel-6	Correction to C-code: Modify data types for FFT	F	6.0.0	S4	TSG-SA WG4#33	S4-040777
26.410	011	1	Rel-6	Correction to decoder C- Code: Alignment with MPEG specification	C	6.0.0	S4	TSG-SA WG4#33	S4-040778
26.410	012		Rel-6	Correction to C-code: Reset of Missing Harmonics flags during concealment added	F	6.0.0	S4	TSG-SA WG4#33	S4-040679
26.410	013		Rel-6	Removal of Complexity counters	F	6.0.0	S4	TSG-SA WG4#33	S4-040830

CR-Form-v7.1

CHANGE REQUEST

⌘ **26.401 CR 001** ⌘ rev **1** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: | UICC apps ME Radio Access Network Core Network

Title:	⌘ Alignment with C-code: Clarification on SBR mode to be used for mono only capable decoders		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> 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 <u>one</u> of the following releases: Ph2 (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) Rel-7 (Release 7)

Reason for change:	⌘ For mono only capable decoders, a discrepancy between C-Code and written specification exists. The written specification is lacking a clarification on the use of the LP-SBR for mono only capable decoders.
Summary of change:	⌘ Additional language is added to clarify on the usage of the LP-SBR tool for mono only capable decoders.
Consequences if not approved:	⌘ Mis-match between written specification and C-code may cause inconsistent implementations.

Clauses affected:	⌘ Section 9								
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications ⌘ TS 26.410 Test specifications O&M Specifications	Y	N	X			X		X
Y	N								
X									
	X								
	X								
Other comments:	⌘								

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

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

- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5 General

The Enhanced aacPlus general audio codec consists of MPEG-4 AAC, MPEG-4 SBR and MPEG-4 Parametric Stereo. The AAC is a general audio codec, SBR is a bandwidth extension technique offering substantial coding gain in combination with AAC, and Parametric Stereo enables stereo coding at very low bitrates. In addition to the above parts of the Enhanced aacPlus codec that are specified in ISO standards [5][6][7][8] there are 3 additional tools included in the Enhanced aacPlus decoder:

- Error concealment tools for AAC, SBR, and Parametric Stereo make the decoder robust against transmission errors like frame loss. These tools mitigate audible effects of such errors.
- The stereo-to-mono downmix tool enables a decoder only capable of mono output to downmix a stereo bitstream. For the AAC part this is done in the time domain after the stereo decoding but for SBR this is done on the SBR parameters and thus saving complexity since only a mono decoding of SBR is needed.
- The Spline resampler tool gives the possibility to resample the output to a sampling frequency different than what was supplied in the bitstream. This gives for example handsets with a D/A converter only capable of 16 kHz sampling frequency the possibility to play bit streams encoded with 22.05 kHz sampling frequency.

The 3GPP Enhanced aacPlus general audio codec [offers monophonic and stereophonic coding. For stereophonic coding two stereo modes are used: parametric stereo for low bitrates and M/S stereo for high bitrates. The codec](#) is based on the MPEG-4 Audio ISO standard. The cited ISO standards define several profiles and levels of which not all are applicable in the 3GPP context. From the ISO standards the following subset shall be used:

The Enhanced aacPlus general audio codec implements the High Efficiency AAC Profile at Level 2¹ as defined in [6]. In addition, the following restrictions ~~apply~~[applies](#):

- ~~—~~frameLengthFlag in GASpecificConfig() shall be 0 (i.e., 960 framing is not supported);

[For terminals supporting stereophonic output the following additional statements apply:](#)

- ~~—~~for mono and parametric stereo bitstreams, the Enhanced aacPlus decoder operates the SBR tool in HQ mode, [thus the SBR HQ tool is required](#);
- [the parametric stereo enhancement implements the baseline version of the parametric stereo coding tool in direct combination with the SBR tool, as defined in \[8\]](#).

-

- ~~—~~for [M/S](#) stereo bitstreams, [it is recommended that](#) the Enhanced aacPlus decoder operates the SBR tool in LP mode.

[For terminals that are only capable of producing monophonic output the following additional statements apply:](#)

- [implementation of the parametric stereo tool is not required. The decoder would skip the parametric stereo data and only decode the mono portion of the signal.](#)
- [the stereo-to-mono-downmix tool is required in order to be able to decode M/S stereo bitstreams.](#)
- [implementation of the SBR HQ tool is not required. Instead it is recommended to only implement the SBR Low Power tool since it allows for reduced computational complexity and lower memory requirements](#)

~~The parametric stereo enhancement implements the baseline version of the parametric stereo coding tool in direct combination with the SBR tool, as defined in [8].~~

¹ The HE-AAC Profile combines the AAC Low Complexity object type plus the SBR tool. The AAC LC object type does not implement the Long Term Predictor (LTP) tool. The Level 2 implies a restriction to a maximum of two channels. Furthermore in case of SBR being used, the maximum AAC sampling rate is restricted to 24 kHz whereas if SBR is not used the maximum AAC sampling rate is restricted to 48 kHz.

Figure 1 illustrates how the AAC, SBR and the Parametric Stereo tools are combined to form the enhanced aacPlus codec: aacPlus consists of AAC and SBR. Enhanced aacPlus consists of aacPlus and the additional Parametric Stereo tool. Enhanced aacPlus is thus a true superset of aacPlus and AAC.

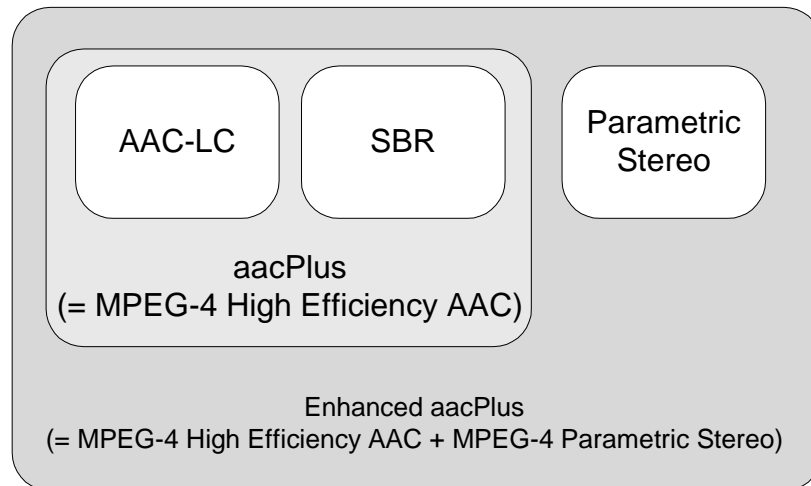


Figure 1: MPEG tools used to form the Enhanced aacPlus codec

7 Enhanced aacPlus general audio codec: Enhanced aacPlus encoder

Figure 2 shows a block diagram of the Enhanced aacPlus encoder. The input PCM time domain signal is first fed to a stereo-to-mono downmix unit, which is only applied if the input signal is stereo but the chosen audio encoding mode is selected to be mono.

Next, the (mono or stereo) input time domain signal is fed to an IIR resampling filter in order to adjust the input sampling rate $f_{s_{in}}$ to the best-suited sampling rate $f_{s_{enc}}$ for the encoding process. The usage of the IIR resampler is only applied if the input signal sampling rate differs from the encoding sampling rate. The IIR resampler may either be run as a 3:2 downsampler (e.g. to downsample from 48 kHz to 32 kHz) or as a 1:2 upsampler (e.g. to upsample from 16 to 32 kHz).

The Enhanced aacPlus encoder basically consists of the well-known AAC² (Advanced Audio Coding) waveform encoder, the SBR (Spectral Band Replication) high frequency reconstruction encoding tool and the Parametric Stereo encoding tool. The Enhanced aacPlus encoder is operating in a dual rate mode, whereas the SBR encoder operates at the encoding sampling rate $f_{s_{enc}}$ as delivered from the IIR resampler and the AAC encoder at half of this sampling rate $f_{s_{enc}}/2$. Consequently a 2:1 downsampler is present at the input to the AAC encoder. For an efficient implementation an IIR (Infinite Impulse Response) filter algorithm is used. The Parametric Stereo tool is used for low-bitrate stereo coding, i.e. ~~below up to and including~~ a bitrate of 36 kbit/s. The AAC encoder implementation complies with the AAC Low Complexity Object Type [5].

9 Enhanced aacPlus general audio codec: Additional Decoder Tools

Three additional tools are incorporated in the Enhanced aacPlus that are not part of the cited ISO standards. These are a error concealment algorithm, stereo-to-mono downmix, and a spline resampler.

The error concealment, e.g. in case of frame loss, is achieved by designated algorithms in the decoder for AAC, SBR and Parametric Stereo: the AAC core decoder employs signal-adaptive spectrally shaped noise generation for error

² AAC has been standardized as recommended audio codec in 3GPP, Release 5

concealment, in the SBR and Parametric Stereo decoders, error concealment is based on extrapolation of guidance, envelope, and stereo information.

If the transmitted stream is a M/S stereo stream, but a monophonic output is requested, for each of the two components a stereo-to-mono downmix tool is available. In case of AAC the downmix is applied in the time-domain after AAC decoding. In case of SBR the stereo SBR stream is mapped to a mono SBR stream, thus resulting in low computational complexity since all further processing is then done on one channel only. If the transmitted stream uses parametric stereo, but a monophonic output is requested, the Parametric Stereo decoder is deactivated. ~~For a terminal that is only capable of producing monophonic output, the SBR Low Power tool shall always be used since it allows for reduced computational complexity and lower memory requirements.~~

Finally a spline resampler algorithm is used to match the Enhanced aacPlus decoder output sampling rate to any arbitrary sampling rate. The spline resampler is only used if the handset requires any other specific output sampling rate different from $f_{s_{enc}}$ or $f_{s_{enc}}/2$, e.g. 8 or 16 kHz if $f_{s_{enc}}$ is 44.1 kHz. ~~Contrary to an IIR or FIR resampling algorithm, a spline resampler algorithm allows to resample with a fairly low computational cost and at a reasonable high audio quality, independent from the actual input to output sampling rate ratio (whereas a resampling with an FIR or IIR filter with a fractional downsampling ratio like 44.1 or 22.05 to 16 kHz can be burdensome).~~

The additional decoder tools are described in [9].

CHANGE REQUEST

⌘ **26.410 CR 001** ⌘ rev **-** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to C-code to increase error robustness		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	Ph2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)
			Rel-7 (Release 7)

Reason for change:	⌘ ResetSbrQmf() and SbrDec() need an additional parameter (number of audio channels)
Summary of change:	⌘ Additional parameter is introduced, calls to ResetSbrQmf() and SbrDec() are corrected
Consequences if not approved:	⌘ Erroneous behaviour of decoder in case the first frame of an incoming bitstream is distorted or lost

Clauses affected:	⌘ C-code appendix						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
	Y	N					
	<input type="checkbox"/>	<input checked="" type="checkbox"/>					
	<input checked="" type="checkbox"/>	Test specifications	⌘				
<input checked="" type="checkbox"/>	O&M Specifications	⌘					
Other comments:	⌘						

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In file sbrdecoder.c line 360, replace:

```
"
        LOOP(1);
        for (lr = 0 ; lr < MAXNRQMFCHANNELS; lr++) {
#ifdef NON_BE_BUGFIX
            PTR_INIT(1); FUNC(5);
#else
            PTR_INIT(1); FUNC(4);
#endif
            err |= resetsbrQMF (&(sbrChannel[lr].sbrDec),
                                hHeaderData,
                                lr,
#ifdef NON_BE_BUGFIX
                                *numChannels,
#endif
                                sbrChannel[lr].hPrevFrameData);
        }
"
```

with

```
"
        LOOP(1);
        for (lr = 0 ; lr < MAXNRQMFCHANNELS; lr++) {
            PTR_INIT(1); FUNC(5);
            err |= resetsbrQMF (&(sbrChannel[lr].sbrDec),
                                hHeaderData,
                                lr,
                                *numChannels,
                                sbrChannel[lr].hPrevFrameData);
        }
"
```

In file sbrdecoder.c, line 414, replace:

```
"
        LOOP(1);
        for (lr = 0 ; lr < MAXNRQMFCHANNELS; lr++) {
#ifdef NON_BE_BUGFIX
            PTR_INIT(1); FUNC(5);
#else
            PTR_INIT(1); FUNC(4);
#endif
            err |= resetsbrQMF (&(sbrChannel[lr].sbrDec),
                                hHeaderData,
                                lr,
#ifdef NON_BE_BUGFIX
                                *numChannels,
#endif
                                sbrChannel[lr].hPrevFrameData);
        }
"
```

with

```
"
        LOOP(1);
        for (lr = 0 ; lr < MAXNRQMFCHANNELS; lr++) {
            PTR_INIT(1); FUNC(5);
            err |= resetsbrQMF (&(sbrChannel[lr].sbrDec),
                                hHeaderData,
                                lr,
                                *numChannels,
                                sbrChannel[lr].hPrevFrameData);
        }
"
```

```

                                sbrChannel[lr].hPrevFrameData);
    }
"

```

In file sbrdecoder.c line 707, replace

```

"
#ifdef NON_BE_BUGFIX
    PTR_INIT(3); ADD(1); FUNC(11);
#else
    PTR_INIT(3); ADD(1); FUNC(10);
#endif
    sbr_dec (&sbrChannel[0].SbrDec,
            timeData,
            pworkBuffer1,
            InterimResult,
            hHeaderData,
            hFrameDataLeft,
            sbrChannel[0].hPrevFrameData,
            (hHeaderData->syncState == SBR_ACTIVE),
            &sbrDecoderInstance.ParametricStereoDec,
            &sbrChannel[1].SbrDec.synthesisQmfBank
#ifdef NON_BE_BUGFIX
            , *numChannels
#endif
    );
"

```

with

```

"
    PTR_INIT(3); ADD(1); FUNC(11);
    sbr_dec (&sbrChannel[0].SbrDec,
            timeData,
            pworkBuffer1,
            InterimResult,
            hHeaderData,
            hFrameDataLeft,
            sbrChannel[0].hPrevFrameData,
            (hHeaderData->syncState == SBR_ACTIVE),
            &sbrDecoderInstance.ParametricStereoDec,
            &sbrChannel[1].SbrDec.synthesisQmfBank
            , *numChannels
    );
"

```

In file sbrdecoder.c line 743, replace

```

"
#ifdef NON_BE_BUGFIX
    PTR_INIT(3); ADD(1); FUNC(11);
#else
    PTR_INIT(3); ADD(1); FUNC(10);
#endif
    sbr_dec (&sbrChannel[1].SbrDec,
            timeData + codecFrameSize,
            pworkBuffer1,
            InterimResult,
            hHeaderData,
            hFrameDataRight,
            sbrChannel[1].hPrevFrameData,
            (hHeaderData->syncState == SBR_ACTIVE),
            NULL,
            NULL
    );
"

```

```

#ifdef NON_BE_BUGFIX
    , *numChannels
#endif
    );
"

with

"
PTR_INIT(3); ADD(1); FUNC(11);
sbr_dec (&sbrChannel[1].sbrDec,
        timeData + codecFrameSize,
        pworkBuffer1,
        InterimResult,
        hHeaderData,
        hFrameDataRight,
        sbrChannel[1].hPrevFrameData,
        (hHeaderData->syncState == SBR_ACTIVE),
        NULL,
        NULL
        , *numChannels
    );
"

```

In file sbr_dec.h line 96, replace:

```

"
int
resetsbrQMF (HANDLE_SBR_DEC hSbrDec,
            HANDLE_SBR_HEADER_DATA hHeaderData,
            int sbrChannel,
#ifdef NON_BE_BUGFIX
            int nChannels,
#endif
            HANDLE_SBR_PREV_FRAME_DATA hPrevFrameData);
"

```

with

```

"
int
resetsbrQMF (HANDLE_SBR_DEC hSbrDec,
            HANDLE_SBR_HEADER_DATA hHeaderData,
            int sbrChannel,
            int nChannels,
            HANDLE_SBR_PREV_FRAME_DATA hPrevFrameData);
"

```

In file sbr_dec.c line 45, replace

```

"
void
sbr_dec (HANDLE_SBR_DEC hSbrDec,
        float *timeIn,
        float *timeOut,
        float *interimResult,
        HANDLE_SBR_HEADER_DATA hHeaderData,
        HANDLE_SBR_FRAME_DATA hFrameData,
        HANDLE_SBR_PREV_FRAME_DATA hPrevFrameData,

```

```

        int applyProcessing
        ,HANDLE_PS_DEC h_ps_d,
        HANDLE_SBR_QMF_FILTER_BANK hsynthesisQmfBankRight
#ifdef NON_BE_BUGFIX
        , int nChannels
#endif
    )
"

```

with

```

"
void
sbr_dec (HANDLE_SBR_DEC hSbrDec,
        float *timeIn,
        float *timeOut,
        float *interimResult,
        HANDLE_SBR_HEADER_DATA hHeaderData,
        HANDLE_SBR_FRAME_DATA hFrameData,
        HANDLE_SBR_PREV_FRAME_DATA hPrevFrameData,
        int applyProcessing
        ,HANDLE_PS_DEC h_ps_d,
        HANDLE_SBR_QMF_FILTER_BANK hsynthesisQmfBankRight
        , int nChannels
    )
"

```

in file sbr_dec.c line 80, replace

```

"
#ifdef NON_BE_BUGFIX
    BRANCH(1);
    if (nChannels == 1)
#else
    INDIRECT(1); ADD(1); BRANCH(1);
    if(hHeaderData->channelMode==PS_STEREO)
#endif
    {
        MOVE(1);
        bUseLP = 0;
    }
"

```

with

```

"
#ifdef LP_SBR_ONLY
    BRANCH(1); ADD(1);
    if (nChannels == 1)
    {
        MOVE(1);
        bUseLP = 0;
    }
#endif
"

```

In file sbr_dec.c line 614, replace

```

"
int

```

```

resetsbrQMF (HANDLE_SBR_DEC hSbrDec,
             HANDLE_SBR_HEADER_DATA hHeaderData,
             int sbrChannel,
#ifdef NON_BE_BUGFIX
             int nChannels,
#endif
             HANDLE_SBR_PREV_FRAME_DATA hPrevFrameData)
"

```

with

```

"
int
resetsbrQMF (HANDLE_SBR_DEC hSbrDec,
             HANDLE_SBR_HEADER_DATA hHeaderData,
             int sbrChannel,
             int nChannels,
             HANDLE_SBR_PREV_FRAME_DATA hPrevFrameData)
"

```

In file sbr_dec.c line 627, replace

```

"
#ifdef NON_BE_BUGFIX
    int bUseLP=1;
#endif
"

```

with

```

"
    int bUseLP=1;
"

```

In file sbr_dec.c line 640, replace

```

"
#ifdef NON_BE_BUGFIX
    INDIRECT(1); ADD(2); LOGIC(1); BRANCH(1);
    if (nChannels == 1)
    {
        MOVE(1);
        bUseLP = 0;
    }
#endif
"

```

with

```

"
    INDIRECT(1); ADD(2); LOGIC(1); BRANCH(1);
    if (nChannels == 1)
    {
        MOVE(1);
        bUseLP = 0;
    }
"

```

in file sbr_dec.c line 669, replace

```
"
#ifdef NON_BE_BUGFIX
    BRANCH(1);
    if (!bUseLP) {
#endif
    PTR_INIT(1);
    overlapBufferImag[1] = ptr;

    ADD(1);
    ptr += NO_SYNTHESIS_CHANNELS;
#ifdef NON_BE_BUGFIX
    }
#endif
"
```

with

```
"
    BRANCH(1);
    if (!bUseLP) {
        PTR_INIT(1);
        overlapBufferImag[1] = ptr;

        ADD(1);
        ptr += NO_SYNTHESIS_CHANNELS;
    }
"
```

In file sbr_dec.c line 717, replace

```
"
#ifdef NON_BE_BUGFIX
    BRANCH(1);
    if (!bUseLP) {
#endif
    MOVE(1);
    overlapBufferImag[1][k] = 0;
#ifdef NON_BE_BUGFIX
    }
#endif
"
```

with

```
"
    BRANCH(1);
    if (!bUseLP) {
        MOVE(1);
        overlapBufferImag[1][k] = 0;
    }
"
```

CHANGE REQUEST

⌘ **26.410 CR 002** ⌘ rev **-** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to C-code: Missing memory re-initialization		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	Ph2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)
			Rel-7 (Release 7)

Reason for change:	⌘ Uninitialized memory in the degreeAlias array		
Summary of change:	⌘ Added code to properly initialize degreeAlias		
Consequences if not approved:	⌘ DegreeAlias could contain uninitialized elements		

Clauses affected:	⌘ C-code appendix										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> </table>	Y	N		X		X		X	Other core specifications	⌘
Y	N										
	X										
	X										
	X										
		Test specifications									
		O&M Specifications									
Other comments:	⌘										

How to create CRs using this form:

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- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
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- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

in file sbr_dec.c line 298, replace

```
"
    float degreeAlias[NO_SYNTHESIS_CHANNELS]
    #if defined NON_BE_BUGFIX
    = {0.0f}
    #endif
    ;
"
```

with

```
"
    float degreeAlias[NO_SYNTHESIS_CHANNELS];
"
```

in file sbr_dec.c after line 307, add

```
"
    if (bUseLP) {
        FUNC(2); LOOP(1); PTR_INIT(1); MOVE(1); STORE(NO_SYNTHESIS_CHANNELS);
        memset (degreeAlias, 0, NO_SYNTHESIS_CHANNELS * sizeof (float));
    }
"
```

CHANGE REQUEST

26.410 CR 003 # rev - # Current version: **6.0.0**

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

Proposed change affects: UICC apps# ME Radio Access Network Core Network

Title:	# Correction to C-code: Memory initialization added		
Source:	# TSG-SA WG4		
Work item code:	# PSSrel6	Date:	# 14/12/2004
Category:	# F	Release:	# Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	Ph2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)
			Rel-7 (Release 7)

Reason for change:	# Imaginary parts of autocorrelation variable were nto initialized		
Summary of change:	# Added code to initialize such variabiles		
Consequences if not approved:	# Uninitialized memory would be used		

Clauses affected:	# C-code appendix						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	#	X	Other core specifications	#
Y	N						
#	X						
	#	Test specifications	#				
	#	O&M Specifications	#				
Other comments:	#						

How to create CRs using this form:

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

In file lpp_tran.c line 136, replace

```
"  
#if defined NON_BE_BUGFIX  
    MOVE(3);  
    ac->r01i = ac->r02i = ac->r12i = 0.0f;  
#endif  
"
```

with

```
"  
    MOVE(3);  
    ac->r01i = ac->r02i = ac->r12i = 0.0f;  
"
```

CR-Form-v7.1

CHANGE REQUEST

⌘ **26.410 CR 004** ⌘ rev **-** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to C-code: Wrong calculation of sine levels		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	Ph2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)
			Rel-7 (Release 7)

Reason for change:	⌘ Sine level in highest QMF band was calculated wrong		
Summary of change:	⌘ Corrected sine level calculation		
Consequences if not approved:	⌘ Sine level calculation wrong		

Clauses affected:	⌘ C-code appendix										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> </table>	Y	N		X		X		X	Other core specifications	⌘
Y	N										
	X										
	X										
	X										
		Test specifications									
		O&M Specifications									
Other comments:	⌘										

How to create CRs using this form:

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

In file env_calc.c line 1575, replace

```
"
#ifdef NON_BE_BUGFIX
    ADD(1); BRANCH(1);
    if(tone_count <= 16)
#else
    ADD(3); LOGIC(1); BRANCH(1);
    if(tone_count <= 16 && k + lowSubband < 62)
#endif
    {
        BRANCH(1);
        if (freqInvFlag) {
            ADD(1); STORE(1);
            *ptrReal++ = signalReal + sineLevelPrev;
#ifdef NON_BE_BUGFIX
            ADD(2); BRANCH(1);
            if (k + lowSubband < 62) {
#endif
                MAC(1); STORE(1);
                *ptrReal = *ptrReal - 0.00815f*sineLevel;
#ifdef NON_BE_BUGFIX
            }
#endif
        }
        else {
            ADD(1); STORE(1);
            *ptrReal++ = signalReal - sineLevelPrev;
#ifdef NON_BE_BUGFIX
            ADD(2); BRANCH(1);
            if (k + lowSubband < 62) {
#endif
                MAC(1); STORE(1);
                *ptrReal = *ptrReal + 0.00815f*sineLevel;
#ifdef NON_BE_BUGFIX
            }
#endif
        }
    }
"
```

with

```
"
    ADD(1); BRANCH(1);
    if(tone_count <= 16)
    {
        BRANCH(1);
        if (freqInvFlag) {
            ADD(1); STORE(1);
            *ptrReal++ = signalReal + sineLevelPrev;

            ADD(2); BRANCH(1);
            if (k + lowSubband < 62) {
                MAC(1); STORE(1);
                *ptrReal = *ptrReal - 0.00815f*sineLevel;
            }
        }
        else {
            ADD(1); STORE(1);
            *ptrReal++ = signalReal - sineLevelPrev;
        }
    }
"
```

```

        ADD(2); BRANCH(1);
        if (k + lowSubband < 62) {
            MAC(1); STORE(1);
            *ptrReal = *ptrReal + 0.00815f*sineLevel;
        }
    }
}
"

```

In file env_calc.c line 1620, replace

```

"
#ifdef NON_BE_BUGFIX
    ADD(1); BRANCH(1);
    if(tone_count <= 16)
#else
    ADD(3); LOGIC(1); BRANCH(1);
    if(tone_count <= 16 && k + lowSubband < 62)
#endif
    {
        BRANCH(1);
        if (freqInvFlag) {
            ADD(1); STORE(1);
            *ptrReal++ = signalReal - sineLevelPrev;

#ifdef NON_BE_BUGFIX
            ADD(2); BRANCH(1);
            if (k + lowSubband < 62) {
#endif
                MAC(1); STORE(1);
                *ptrReal = *ptrReal + 0.00815f*sineLevel;
#ifdef NON_BE_BUGFIX
            }
#endif
        }
        else {
            ADD(1); STORE(1);
            *ptrReal++ = signalReal + sineLevelPrev;

#ifdef NON_BE_BUGFIX
            ADD(2); BRANCH(1);
            if (k + lowSubband < 62) {
#endif
                MAC(1); STORE(1);
                *ptrReal = *ptrReal - 0.00815f*sineLevel;
#ifdef NON_BE_BUGFIX
            }
#endif
        }
    }
}
"

```

with

```

"
    ADD(1); BRANCH(1);
    if(tone_count <= 16)
    {
        BRANCH(1);
        if (freqInvFlag) {

```



```

ADD(1); STORE(1);
*ptrReal++ = signalReal - sineLevelPrev;

ADD(2); BRANCH(1);
if (k + lowSubband < 62) {
    MAC(1); STORE(1);
    *ptrReal = *ptrReal + 0.00815f*sineLevel;
}
}
else {
    ADD(1); STORE(1);
    *ptrReal++ = signalReal + sineLevelPrev;

    ADD(2); BRANCH(1);
    if (k + lowSubband < 62) {
        MAC(1); STORE(1);
        *ptrReal = *ptrReal - 0.00815f*sineLevel;
    }
}
}
"

```

CHANGE REQUEST

⌘ **26.410 CR 005** ⌘ rev **-** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to C-code: Prevent multiple reading of bitstream elements		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F Use <u>one</u> 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 .	Release:	⌘ Rel-6 Use <u>one</u> of the following releases: Ph2 (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) Rel-7 (Release 7)

Reason for change:	⌘ Under certain circumstances, the PS side information could be read multiple times, leading to erroneous results
Summary of change:	⌘ Ensure that bitstream elements are only read once
Consequences if not approved:	⌘ Wrong behaviour of the decoder in case of distorted bitstreams

Clauses affected:	⌘ C-code appendix														
Other specs affected:	<table><thead><tr><th>Y</th><th>N</th></tr></thead><tbody><tr><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td>Other core specifications</td><td>⌘</td></tr><tr><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td>Test specifications</td><td></td></tr><tr><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td>O&M Specifications</td><td></td></tr></tbody></table>	Y	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Other core specifications	⌘	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Test specifications		<input checked="" type="checkbox"/>	<input type="checkbox"/>	O&M Specifications	
Y	N														
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Other core specifications	⌘												
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Test specifications													
<input checked="" type="checkbox"/>	<input type="checkbox"/>	O&M Specifications													
Other comments:	⌘														

How to create CRs using this form:

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

In file env_extr.c line 352, replace

```
"  
#ifdef NON_BE_BUGFIX  
    INDIRECT(1); BRANCH(1); LOGIC(1);  
    if (!hPs->bForceMono && !bPsRead)  
#else  
    INDIRECT(1); BRANCH(1);  
    if (!hPs->bForceMono)  
#endif  
"
```

with

```
"  
    INDIRECT(1); BRANCH(1); LOGIC(1);  
    if (!hPs->bForceMono && !bPsRead)  
"
```

CHANGE REQUEST

⌘ **26.410 CR 006** ⌘ rev **2** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to C-code: Corrected wrong table values		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	Ph2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)
			Rel-7 (Release 7)

Reason for change:	⌘ Center frequency values in decoder C-code were not correctly derived from the formula described in the written specification.
Summary of change:	⌘ Corrected table entries by correctly applying the formula described in the written specification
Consequences if not approved:	⌘ Mismatch between written specification and decoder C-code. Stereo image affected negatively

Clauses affected:	⌘ C-code appendix						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
	Y	N					
	<input type="checkbox"/>	<input checked="" type="checkbox"/>					
	<input checked="" type="checkbox"/>	Test specifications	⌘				
<input checked="" type="checkbox"/>	O&M Specifications	⌘					
Other comments:	⌘						

How to create CRs using this form:

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

In decoder code, file sbr_rom.c, line 1295, replace

```
"
#ifdef NON_BE_BUGFIX
/* the old center frequencies (found in "else") were too small (factor 1/2) */
const float aFractDelayPhaseFactorReSubQmf[SUBQMF_GROUPS]=
{
    0.988295f,  0.896293f,  0.720854f,  0.478309f,
    0.896293f,  0.988295f,
    -0.542441f,  0.039260f,  -0.926857f,  -0.974173f
};

const float aFractDelayPhaseFactorImSubQmf[SUBQMF_GROUPS]=
{
    -0.152555f,  -0.443462f,  -0.693087f,  -0.878192f,
    0.443462f,  0.152555f,
    -0.840094f,  -0.999229f,  -0.375416f,  0.225801f
};
#else
const float aFractDelayPhaseFactorReSubQmf[SUBQMF_GROUPS]=
{
    0.997069f,  0.973728f,  0.927592f,  0.859741f,
    0.973728f,  0.997069f,
    0.478309f,  0.720854f,  0.191237f,  -0.113637f
};

const float aFractDelayPhaseFactorImSubQmf[SUBQMF_GROUPS]=
{
    -0.076502f,  -0.227714f,  -0.373595f,  -0.510731f,
    0.227714f,  0.076502f,
    -0.878192f,  -0.693087f,  -0.981544f,  -0.993522f
};
#endif
"
```

with

```
"
const float aFractDelayPhaseFactorReSubQmf[SUBQMF_GROUPS]=
{
    0.988295f,  0.896293f,  0.720854f,  0.478309f,
    0.896293f,  0.988295f,
    -0.542441f,  0.039260f,  -0.926857f,  -0.974173f
};

const float aFractDelayPhaseFactorImSubQmf[SUBQMF_GROUPS]=
{
    -0.152555f,  -0.443462f,  -0.693087f,  -0.878192f,
    0.443462f,  0.152555f,
    -0.840094f,  -0.999229f,  -0.375416f,  0.225801f
};
"
```

In decoder code, file sbr_rom.c, line 1386, replace:

```
"
#ifdef NON_BE_BUGFIX
/* the old center frequencies (found in "else") were too small (factor 1/2) */
```

```

const float aFractDelayPhaseFactorSerResubQmf0[SUBQMF_GROUPS]=
{
    0.985777f,  0.874408f,  0.664252f,  0.379052f,
    0.874408f,  0.985777f,
    -0.712639f, -0.117537f, -0.994792f, -0.840093f
};

const float aFractDelayPhaseFactorSerResubQmf1[SUBQMF_GROUPS]=
{
    0.956940f,  0.634393f,  0.098017f, -0.471397f,
    0.634393f,  0.956940f,
    -0.555570f, -0.980785f,  0.555570f,  0.980785f
};

const float aFractDelayPhaseFactorSerResubQmf2[SUBQMF_GROUPS]=
{
    0.990730f,  0.917599f,  0.776734f,  0.578534f,
    0.917599f,  0.990730f,
    -0.330597f,  0.206631f, -0.772013f, -0.989689f
};

const float aFractDelayPhaseFactorSerImSubQmf0[SUBQMF_GROUPS]=
{
    -0.168059f, -0.485191f, -0.747508f, -0.925375f,
    0.485191f,  0.168059f,
    -0.701531f, -0.993068f, -0.101924f,  0.542442f
};

const float aFractDelayPhaseFactorSerImSubQmf1[SUBQMF_GROUPS]=
{
    -0.290285f, -0.773010f, -0.995185f, -0.881921f,
    0.773010f,  0.290285f,
    0.831470f, -0.195090f,  0.831470f, -0.195090f
};

const float aFractDelayPhaseFactorSerImSubQmf2[SUBQMF_GROUPS]=
{
    -0.135845f, -0.397508f, -0.629829f, -0.815658f,
    0.397508f,  0.135845f,
    -0.943772f, -0.978419f, -0.635607f, -0.143234f
};

#else
const float aFractDelayPhaseFactorSerResubQmf0[SUBQMF_GROUPS]=
{
    0.996438f,  0.968093f,  0.912210f,  0.830377f,
    0.968093f,  0.996438f,
    0.379052f,  0.664252f,  0.051029f, -0.282760f
};

const float aFractDelayPhaseFactorSerResubQmf1[SUBQMF_GROUPS]=
{
    0.989177f,  0.903989f,  0.740951f,  0.514103f,
    0.903989f,  0.989177f,
    -0.471397f,  0.098017f, -0.881921f, -0.995185f
};

const float aFractDelayPhaseFactorSerResubQmf2[SUBQMF_GROUPS]=
{
    0.997680f,  0.979183f,  0.942532f,  0.888407f,
    0.979183f,  0.997680f,
    0.578534f,  0.776734f,  0.337629f,  0.071802f
};

const float aFractDelayPhaseFactorSerImSubQmf0[SUBQMF_GROUPS]=
{
    -0.084330f, -0.250591f, -0.409724f, -0.557202f,
    0.250591f,  0.084330f,
    -0.925375f, -0.747508f, -0.998697f, -0.959191f
};

const float aFractDelayPhaseFactorSerImSubQmf1[SUBQMF_GROUPS]=
{
    -0.146730f, -0.427555f, -0.671559f, -0.857729f,
    0.427555f,  0.146730f,

```



```

    -0.881921f, -0.995185f, -0.471397f, 0.098017f
};
const float aFractDelayPhaseFactorSerImSubQmf2[SUBQMF_GROUPS]=
{
    -0.068081f, -0.202980f, -0.334115f, -0.459057f,
    0.202980f, 0.068081f,
    -0.815658f, -0.629829f, -0.941279f, -0.997419f
};
#endif
"

```

with

```

"
const float aFractDelayPhaseFactorSerReSubQmf0[SUBQMF_GROUPS]=
{
    0.985777f, 0.874408f, 0.664252f, 0.379052f,
    0.874408f, 0.985777f,
    -0.712639f, -0.117537f, -0.994792f, -0.840093f
};
const float aFractDelayPhaseFactorSerReSubQmf1[SUBQMF_GROUPS]=
{
    0.956940f, 0.634393f, 0.098017f, -0.471397f,
    0.634393f, 0.956940f,
    -0.555570f, -0.980785f, 0.555570f, 0.980785f
};
const float aFractDelayPhaseFactorSerReSubQmf2[SUBQMF_GROUPS]=
{
    0.990730f, 0.917599f, 0.776734f, 0.578534f,
    0.917599f, 0.990730f,
    -0.330597f, 0.206631f, -0.772013f, -0.989689f
};
const float aFractDelayPhaseFactorSerImSubQmf0[SUBQMF_GROUPS]=
{
    -0.168059f, -0.485191f, -0.747508f, -0.925375f,
    0.485191f, 0.168059f,
    -0.701531f, -0.993068f, -0.101924f, 0.542442f
};
const float aFractDelayPhaseFactorSerImSubQmf1[SUBQMF_GROUPS]=
{
    -0.290285f, -0.773010f, -0.995185f, -0.881921f,
    0.773010f, 0.290285f,
    0.831470f, -0.195090f, 0.831470f, -0.195090f
};
const float aFractDelayPhaseFactorSerImSubQmf2[SUBQMF_GROUPS]=
{
    -0.135845f, -0.397508f, -0.629829f, -0.815658f,
    0.397508f, 0.135845f,
    -0.943772f, -0.978419f, -0.635607f, -0.143234f
};
"

```

CHANGE REQUEST

⌘ **26.410 CR 007** ⌘ rev **-** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to C-code: Modify instrumentation		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	Ph2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)
			Rel-7 (Release 7)

Reason for change:	⌘ Several places where code was over- and/or underinstrumented		
Summary of change:	⌘ Instrumentation corrected		
Consequences if not approved:	⌘ Wrong calculation of computational complexity		

Clauses affected:	⌘ C-code appendix										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> </table>	Y	N		X		X		X	Other core specifications Test specifications O&M Specifications	⌘
Y	N										
	X										
	X										
	X										
Other comments:	⌘										

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under [ftp://ftp.3gpp.org/specs/](http://ftp.3gpp.org/specs/) For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

In file env_extr.c line 685, replace

```
"
    for (i = 0; i < h_frame_data->frameInfo.nEnvelopes; i++) {
        h_frame_data->domain_vec[i] = (unsigned char)getbits (hBitBuf,
SI_SBR_DOMAIN_BITS);
    }

    for (i = 0; i < h_frame_data->frameInfo.nNoiseEnvelopes; i++) {
        h_frame_data->domain_vec_noise[i] = (unsigned char)getbits (hBitBuf,
SI_SBR_DOMAIN_BITS);
    }
"
```

with

```
"
    PTR_INIT(2); LOOP(1);

    for (i = 0; i < h_frame_data->frameInfo.nEnvelopes; i++) {
        FUNC(2); STORE(1);
        h_frame_data->domain_vec[i] = (unsigned char)getbits (hBitBuf,
SI_SBR_DOMAIN_BITS);
    }

    PTR_INIT(2); LOOP(1);
    for (i = 0; i < h_frame_data->frameInfo.nNoiseEnvelopes; i++) {
        FUNC(2); STORE(1);
        h_frame_data->domain_vec_noise[i] = (unsigned char)getbits (hBitBuf,
SI_SBR_DOMAIN_BITS);
    }
"
```

In file main.c line 149, replace

```
"
static void
interleaveSamples(float *pTimeCh0,
                  float *pTimeCh1,
                  short *pTimeOut,
                  int frameSize,
                  int *channels)
{
    int i;

    FLC_sub_start("interleaveSamples");

    LOOP(1);
    for (i=0; i<frameSize; i++)
    {
        MOVE(1);
        *pTimeOut++ = (short) *pTimeCh0++;

        ADD(1); BRANCH(1); MOVE(1);
        if(*channels == 2) {
            *pTimeOut++ = (short) *pTimeCh1++;
        }
        else {
            *pTimeOut = *(pTimeOut-1);
            *pTimeOut++;
        }
    }
}
```

```

    }
}
MOVE(1);
*channels = 2;
FLC_sub_end();
}
"

```

with

```

"
static void
interleaveSamples(float *pTimeCh0,
                 float *pTimeCh1,
                 short *pTimeOut,
                 int frameSize,
                 int *channels)
{
    int i;
    for (i=0; i<frameSize; i++)
    {
        *pTimeOut++ = (short) *pTimeCh0++;
        if(*channels == 2) {
            *pTimeOut++ = (short) *pTimeCh1++;
        }
        else {
            *pTimeOut = *(pTimeOut-1);
            *pTimeOut++;
        }
    }
    *channels = 2;
}
"

```

In file main.c line 556, add:

```

"
    ADD(1); LOGIC(1); BRANCH(1);
"

```

In file main.c line 587, replace

```

"
    /* clip time samples */
    FLC_sub_start("main_clipTimeSamples");
    MULT(1); LOOP(1);
    for (i = 0; i < frameSize * numChannels; i++) {
        ADD(1); BRANCH(1);
        if (TimeDataFloat[i] < -32768.0) {
            MOVE(1);

```

```

        TimeDataFloat[i] = -32768.0;
    }
    else {
        ADD(1); BRANCH(1);
        if (TimeDataFloat[i] > 32767.0) {
            MOVE(1);
            TimeDataFloat[i] = 32767.0;
        }
    }
}
FLC_sub_end();
"

```

with

```

"
/* clip time samples */
for (i = 0; i < frameSize * numChannels; i++) {
    if (TimeDataFloat[i] < -32768.0) {
        TimeDataFloat[i] = -32768.0;
    }
    else {
        if (TimeDataFloat[i] > 32767.0) {
            TimeDataFloat[i] = 32767.0;
        }
    }
}
"

```

In file main.c line 611, remove

```

"
    PTR_INIT(3); FUNC(5);
"

```

In file main.c line 641, remove

```

"
    ADD(1);
"

```

CR-Form-v7.1

CHANGE REQUEST

⌘ **26.410 CR 008** ⌘ rev **1** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction of C-code: Output data was copied into wrong array		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	Ph2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)
			Rel-7 (Release 7)

Reason for change:	⌘ Output data was copied into wrong place		
Summary of change:	⌘ Corrected the pointer to the output array		
Consequences if not approved:	⌘ In certain cases (downsampled output), right channel output data will be wrong		

Clauses affected:	⌘ C-code appendix										
Other specs Affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	⌘	X	⌘	X	⌘	X	Other core specifications	⌘
Y	N										
⌘	X										
⌘	X										
⌘	X										
		Test specifications									
		O&M Specifications									
Other comments:	⌘										

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

In file sbr_dec.c line 416, replace

```
"
    FUNC(7);
    cplxSynthesisQmfFiltering (QmfBufferReal,
                               QmfBufferImag,
                               timeout,
                               hSynthesisQmfBankRight,
                               bUseLP,
                               h_ps_d,
                               0);
"

with

"
    MULT(1); ADD(2); FUNC(7);
    cplxSynthesisQmfFiltering (QmfBufferReal,
                               QmfBufferImag,
                               timeout-noCols*(NO_SYNTHESIS_CHANNELS - hSbrDec-
>SynthesisQmfBank.no_channels),
                               hSynthesisQmfBankRight,
                               bUseLP,
                               h_ps_d,
                               0);
"
```

CHANGE REQUEST

⌘ **26.410 CR 009** ⌘ rev **1** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to C-code: Bug in resampler		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	Ph2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Rel-4 (Release 4)	
		Rel-5 (Release 5)	
		Rel-6 (Release 6)	
		Rel-7 (Release 7)	

Reason for change:	⌘ Resampler didn't work properly when number of output channels was changed during operation
Summary of change:	⌘ Several variables which were instantiated per-channel are replaced by only one variable irrespective of the number of channels, such that malfunction is prevented
Consequences if not approved:	⌘ Resampler will work wrong if number of channels changes from 1 to 2 during operation

Clauses affected:	⌘ C-code appendix						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<input type="checkbox"/>	Test specifications					
	<input type="checkbox"/>	O&M Specifications					
Other comments:	⌘						

How to create CRs using this form:

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downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

In file main.c line 289, add

```
"  
    int numChannelsLast = 0;  
"
```

In file main.c line 541, add

```
"  
    ADD(2); LOGIC(1); BRANCH(1);  
    if (numChannels == 2 && numChannelsLast == 1) {  
        FUNC(1);  
        CopyResamplerState(splineResampler);  
    }  
"
```

In file main.c line 565, add

```
"  
    ADD(2); LOGIC(1); BRANCH(1);  
    if (numChannels == 2 && numChannelsLast == 1) {  
        FUNC(1);  
        CopyResamplerState(splineResampler);  
    }  
"
```

In file main.c line 587, add

```
"  
    numChannelsLast = numChannels;  
"
```

In file spline_resampler.h line 35, add

```
"  
void CopyResamplerState(HANDLE_SPLINE_RESAMPLER hr);  
"
```

In file spline_resampler.c line 53, replace

```
"
    int remainder[2];
    int quotient[2];
"
```

with

```
"
    int remainder;
    int quotient;
"
```

In file spline_resampler.c line 96, replace

```
"
    INDIRECT(4); DIV(4); STORE(4);
    (*hr)->remainder[0] = Fin % Fout;
    (*hr)->remainder[1] = Fin % Fout;
    (*hr)->quotient[0] = Fin / Fout;
    (*hr)->quotient[1] = Fin / Fout;
"
```

with

```
"
    INDIRECT(2); DIV(2); STORE(2);
    (*hr)->remainder = Fin % Fout;
    (*hr)->quotient = Fin / Fout;
"
```

In file spline_resampler.c line 165, add

```
"
void CopyResamplerState(HANDLE_SPLINE_RESAMPLER hr)
{
    FLC_sub_start("CopyResamplerState");

    INDIRECT(2); MOVE(2);
    hr->distance[1] = hr->distance[0];
    hr->position[1] = hr->position[0];

    FLC_sub_end();
}
"
```

In file spline_resampler.c line 184, replace the comment:

```
"
    PTR_INIT(10); /* hr->position[ch]
                  hr->distance[ch]
```

```

        hr->quotient[ch]
        hr->remainder[ch]
        hr->L
        hr->invL
        hr->iirFilterCoeff_a
        hr->iirFilterCoeff_b
        tmpOutSamples[]
        ioBuffer[]
*/
"

```

with

```

"
PTR_INIT(10); /* hr->position[ch]
                hr->distance[ch]
                hr->quotient
                hr->remainder
                hr->L
                hr->invL
                hr->iirFilterCoeff_a
                hr->iirFilterCoeff_b
                tmpOutSamples[]
                ioBuffer[]
*/
"

```

In file spline_resampler.c line 263, replace

```

"
    hr->position[ch] += hr->quotient[ch];
    hr->distance[ch] += hr->remainder[ch];
"

```

with

```

"
    hr->position[ch] += hr->quotient;
    hr->distance[ch] += hr->remainder;
"

```

In file spline_resampler.c line 327, replace

```

"
    inIndex      += hr->quotient[ch];
    hr->distance[ch] += hr->remainder[ch];
"

```

with

```

"
    inIndex      += hr->quotient;
"

```

```
    hr->distance[ch] += hr->remainder;
"
```

In file spline_resampler.c line 401, replace

```
"
    inIndex      += hr->quotient[ch];
    hr->distance[ch] += hr->remainder[ch];
"
```

with

```
"
    inIndex      += hr->quotient;
    hr->distance[ch] += hr->remainder;
"
```

CHANGE REQUEST

⌘ **26.410 CR 010** ⌘ rev **1** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to C-code: Modify data types for FFT		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		Ph2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)
			Rel-7 (Release 7)

Reason for change:	⌘ FFT implementation in encoder and decoder used <code>double</code> instead of <code>float</code>
Summary of change:	⌘ Corrected data type in all occurrences
Consequences if not approved:	⌘ FFT implementation will use an oversized data type

Clauses affected:	⌘ C-code appendix												
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> <td></td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> <td>Other core specifications</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> <td>Test specifications</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> <td>O&M Specifications</td> </tr> </table>	Y	N		⌘	X	Other core specifications	⌘	X	Test specifications	⌘	X	O&M Specifications
Y	N												
⌘	X	Other core specifications											
⌘	X	Test specifications											
⌘	X	O&M Specifications											
Other comments:	⌘												

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

In encoder and decoder, in file cfft.c every instance of the word double should be replaced by float.

Affected lines: 56, 57, 58, 63, 64, 69, 70, 71, 72, 117, 244, 652

CHANGE REQUEST

⌘ **26.410 CR 011** ⌘ rev **1** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to decoder C-Code: Alignment with MPEG specification		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ C	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	Ph2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Rel-4 (Release 4)	
		Rel-5 (Release 5)	
		Rel-6 (Release 6)	
		Rel-7 (Release 7)	

Reason for change:	⌘ The decoder lacked a functionality for parametric stereo which was not used during selection testing but is part of the MPEG specification. This lacking functionality would enable the parametric stereo decoder to read and decode frames which contain 34-band high resolution parametric stereo data.
Summary of change:	⌘ Missing functionality added to decoder code in order to make it consistent with the written specification.
Consequences if not approved:	⌘ Decoder code does not fully correspond to the specification through which it is defined. May cause interoperability problems with content conforming to the MPEG specification but created by other encoders

Clauses affected:	⌘ C-code appendix						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
	Y	N					
	<input type="checkbox"/>	<input checked="" type="checkbox"/>					
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test specifications	⌘				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	O&M Specifications	⌘				
Other comments:	⌘						

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

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

- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

In file ps_bitdec.c line 35, replace

```
"
#ifdef NON_BE_BUGFIX
static const int aNoIidBins[3] = {NO_LOW_RES_IID_BINS, NO_IID_BINS,
NO_HI_RES_BINS};
static const int aNoIccBins[3] = {NO_LOW_RES_ICC_BINS, NO_ICC_BINS,
NO_HI_RES_BINS};
#else
static const int aNoIidBins[2] = {NO_LOW_RES_IID_BINS, NO_IID_BINS};
static const int aNoIccBins[2] = {NO_LOW_RES_ICC_BINS, NO_ICC_BINS};
#endif
"
```

with

```
"
static const int aNoIidBins[3] = {NO_LOW_RES_IID_BINS, NO_IID_BINS,
NO_HI_RES_BINS};
static const int aNoIccBins[3] = {NO_LOW_RES_ICC_BINS, NO_ICC_BINS,
NO_HI_RES_BINS};
"
```

in file ps_bitdec.c line 162, replace

```
"
#ifdef NON_BE_BUGFIX
noIidSteps = h_ps_dec->bFineIidQ?NO_IID_STEPS_FINE:NO_IID_STEPS;
INDIRECT( 1 ); BRANCH( 1 ); MOVE( 1 );
#else
noIidSteps = NO_IID_STEPS;
MOVE( 1 );
#endif
"
```

with

```
"
noIidSteps = h_ps_dec->bFineIidQ?NO_IID_STEPS_FINE:NO_IID_STEPS;
INDIRECT( 1 ); BRANCH( 1 ); MOVE( 1 );
"
```

In file ps_bitdec.c line 181, replace

```
"
deltaDecodeArray(h_ps_dec->bEnableIid,
h_ps_dec->aaIidIndex[env],
aPrevIidIndex,
h_ps_dec->abIidDtFlag[env],
#ifdef BUGFIX_050804
aNoIidBins[h_ps_dec->freqResIid],
#else
```

```

                                aNoIidBins[h_ps_dec->freqResIid?1:0],
#endif
                                (h_ps_dec->freqResIid)?1:2,
                                -noIidSteps,
                                noIidSteps);
#ifdef BUGFIX_050804
INDIRECT( 4 ); BRANCH( 1 ); MOVE( 2 ); FUNC( 8 );
#else
INDIRECT( 4 ); BRANCH( 2 ); MOVE( 2 ); FUNC( 8 );
#endif
"

```

with

```

"
    deltaDecodeArray(h_ps_dec->bEnableIid,
                    h_ps_dec->aaIidIndex[env],
                    aPrevIidIndex,
                    h_ps_dec->abIidDtFlag[env],
                    aNoIidBins[h_ps_dec->freqResIid],
                    (h_ps_dec->freqResIid)?1:2,
                    -noIidSteps,
                    noIidSteps);
INDIRECT( 4 ); BRANCH( 1 ); MOVE( 2 ); FUNC( 8 );
"

```

In file ps_bitdec.c line 200, replace

```

"
    deltaDecodeArray(h_ps_dec->bEnableIcc,
                    h_ps_dec->aaIccIndex[env],
                    aPrevIccIndex,
                    h_ps_dec->abIccDtFlag[env],
#ifdef BUGFIX_050804
    aNoIccBins[h_ps_dec->freqResIcc],
#else
    aNoIccBins[h_ps_dec->freqResIcc?1:0],
#endif
                    (h_ps_dec->freqResIcc)?1:2,
                    0,
                    NO_ICC_STEPS-1);
#ifdef BUGFIX_050804
INDIRECT( 4 ); BRANCH( 1 ); MOVE( 2 ); FUNC( 8 );
#else
INDIRECT( 4 ); BRANCH( 2 ); MOVE( 2 ); FUNC( 8 );
#endif
"

```

with

```

"
    deltaDecodeArray(h_ps_dec->bEnableIcc,
                    h_ps_dec->aaIccIndex[env],
                    aPrevIccIndex,
                    h_ps_dec->abIccDtFlag[env],

```

```

        aNoIccBins[h_ps_dec->freqResIcc],
        (h_ps_dec->freqResIcc)?1:2,
        0,
        NO_ICC_STEPS-1);
INDIRECT( 4 ); BRANCH( 1 ); MOVE( 2 ); FUNC( 8 );
"

```

In file ps_bitdec.c line 225, replace

```

"
#ifdef NON_BE_BUGFIX
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
#else
    for (gr = 0; gr < NO_BINS; gr++) {
#endif
"

```

with

```

"
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
"

```

In file ps_bitdec.c line 235, replace

```

"
#ifdef NON_BE_BUGFIX
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
#else
    for (gr = 0; gr < NO_BINS; gr++) {
#endif
"

```

with

```

"
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
"

```

In file ps_bitdec.c line 245, replace

```

"
#ifdef NON_BE_BUGFIX
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
#else
    for (gr = 0; gr < NO_BINS; gr++) {
#endif
"

```

"

with

"

```
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
```

"

In file ps_bitdec.c line 255, replace

"

```
#ifndef NON_BE_BUGFIX
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
#else
    for (gr = 0; gr < NO_BINS; gr++) {
#endif
```

"

with

"

```
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
```

"

In file ps_bitdec.c line 265, replace

"

```
#ifndef NON_BE_BUGFIX
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
#else
    for (gr = 0; gr < NO_BINS; gr++) {
#endif
```

"

with

"

```
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
```

"

In file ps_bitdec.c line 275, replace

"

```
#ifndef NON_BE_BUGFIX
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {
#else
```



```
    for (gr = 0; gr < NO_BINS; gr++) {  
#endif  
"
```

with

```
"  
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {  
"
```

In file ps_bitdec.c line 319, replace

```
"  
#ifdef NON_BE_BUGFIX  
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {  
#else  
    for (gr = 0; gr < NO_BINS; gr++) {  
#endif  
"
```

with

```
"  
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {  
"
```

In file ps_bitdec.c line 328, replace

```
"  
#ifdef NON_BE_BUGFIX  
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {  
#else  
    for (gr = 0; gr < NO_BINS; gr++) {  
#endif  
"
```

with

```
"  
    for (gr = 0; gr < NO_HI_RES_BINS; gr++) {  
"
```

In file ps_bitdec.c line 356, replace

```
"  
#ifdef NON_BE_BUGFIX
```

```

INDIRECT( 1 ); ADD( 1 ); LOOP( 1 );
  for (env=0; env<h_ps_dec->noEnv; env++) {
INDIRECT( 1 ); ADD( 1 ); BRANCH( 1 );
  if (h_ps_dec->freqResIid == 2)
  {
    map34IndexTo20 (h_ps_dec->aaIidIndex[env]);
  FUNC( 1 ); INDIRECT( 1 );
  }

INDIRECT( 1 ); ADD( 1 ); BRANCH( 1 );
  if (h_ps_dec->freqResIcc == 2)
  {
    map34IndexTo20 (h_ps_dec->aaIccIndex[env]);
  FUNC( 1 ); INDIRECT( 1 );
  }
}
}
#endif
"

```

with

```

"

INDIRECT( 1 ); ADD( 1 ); LOOP( 1 );
  for (env=0; env<h_ps_dec->noEnv; env++) {
INDIRECT( 1 ); ADD( 1 ); BRANCH( 1 );
  if (h_ps_dec->freqResIid == 2)
  {
    map34IndexTo20 (h_ps_dec->aaIidIndex[env]);
  FUNC( 1 ); INDIRECT( 1 );
  }

INDIRECT( 1 ); ADD( 1 ); BRANCH( 1 );
  if (h_ps_dec->freqResIcc == 2)
  {
    map34IndexTo20 (h_ps_dec->aaIccIndex[env]);
  FUNC( 1 ); INDIRECT( 1 );
  }
}
}
"

```

In file ps_bitdec.c line 414, replace

```

"
#ifdef NON_BE_BUGFIX
BRANCH( 1 ); ADD( 1 );
  if (h_ps_dec->freqResIid > 2){
    h_ps_dec->bFineIidQ = 1;
  INDIRECT( 1 ); MOVE( 1 );
    h_ps_dec->freqResIid -=3;
  INDIRECT( 1 ); ADD( 1 );
  }
  else{
    h_ps_dec->bFineIidQ = 0;
  INDIRECT( 1 ); MOVE( 1 );
  }
}
#endif
"

```

with

```
"  
BRANCH( 1 ); ADD( 1 );  
    if (h_ps_dec->freqResId > 2){  
        h_ps_dec->bFineIdQ = 1;  
INDIRECT( 1 ); MOVE( 1 );  
        h_ps_dec->freqResId -=3;  
INDIRECT( 1 ); ADD( 1 );  
    }  
    else{  
        h_ps_dec->bFineIdQ = 0;  
INDIRECT( 1 ); MOVE( 1 );  
    }  
"
```

In file ps_bitdec.c line 431, replace

```
"  
#ifdef NON_BE_BUGFIX  
BRANCH( 1 ); ADD( 1 );  
    if (h_ps_dec->freqResId > 2){  
        h_ps_dec->bFineIdQ = 1;  
INDIRECT( 1 ); MOVE( 1 );  
        h_ps_dec->freqResId -=3;  
INDIRECT( 1 ); ADD( 1 );  
    }  
    else{  
        h_ps_dec->bFineIdQ = 0;  
INDIRECT( 1 ); MOVE( 1 );  
    }  
#endif  
"
```

with

```
"  
BRANCH( 1 ); ADD( 1 );  
    if (h_ps_dec->freqResId > 2){  
        h_ps_dec->bFineIdQ = 1;  
INDIRECT( 1 ); MOVE( 1 );  
        h_ps_dec->freqResId -=3;  
INDIRECT( 1 ); ADD( 1 );  
    }  
    else{  
        h_ps_dec->bFineIdQ = 0;  
INDIRECT( 1 ); MOVE( 1 );  
    }  
"
```

In file ps_bitdec.c line 438, replace

```

"
#ifdef NON_BE_BUGFIX
    h_ps_dec->bEnableExt = (int) getbits (hBitBuf, 1);
    FUNC( 2 ); INDIRECT( 1 ); STORE( 1 );
#else
    getbits (hBitBuf, 1);
    FUNC( 2 );
#endif
"

```

with

```

"
    h_ps_dec->bEnableExt = (int) getbits (hBitBuf, 1);
    FUNC( 2 ); INDIRECT( 1 ); STORE( 1 );
"

```

In file ps_bitdec.c line 459, replace

```

"
#ifdef BUGFIX_050804
    if ((h_ps_dec->freqResIid > 2) || (h_ps_dec->freqResIcc > 2)) {
#else
    if ((h_ps_dec->freqResIid > 1) || (h_ps_dec->freqResIcc > 1)) {
#endif
"

```

with

```

"
    if ((h_ps_dec->freqResIid > 2) || (h_ps_dec->freqResIcc > 2)) {
"

```

In file ps_bitdec.c line 489, replace

```

"
#ifdef NON_BE_BUGFIX
    BRANCH( 1 ); INDIRECT( 1 );
    if (h_ps_dec->bFineIidQ){
        CurrentTable = (Huffman)&aBookPsIidFineFreqDecode;
    PTR_INIT( 1 );
    }
    else {
        CurrentTable = (Huffman)&aBookPsIidFreqDecode;
    PTR_INIT( 1 );
    }
#else
    CurrentTable = (Huffman)&aBookPsIidFreqDecode;
    PTR_INIT( 1 );
#endif
"

```

with

```
"  
BRANCH( 1 ); INDIRECT( 1 );  
    if (h_ps_dec->bFineIidQ){  
        CurrentTable = (Huffman)&aBookPsIidFineFreqDecode;  
PTR_INIT( 1 );  
    }  
    else {  
        CurrentTable = (Huffman)&aBookPsIidFreqDecode;  
PTR_INIT( 1 );  
    }  
"
```

In file ps_bitdec.c line 502, replace

```
"  
#ifdef NON_BE_BUGFIX  
BRANCH( 1 ); INDIRECT( 1 );  
    if (h_ps_dec->bFineIidQ){  
        CurrentTable = (Huffman)&aBookPsIidFineTimeDecode;  
PTR_INIT( 1 );  
    }  
    else {  
        CurrentTable = (Huffman)&aBookPsIidTimeDecode;  
PTR_INIT( 1 );  
    }  
#else  
    CurrentTable = (Huffman)&aBookPsIidTimeDecode;  
PTR_INIT( 1 );  
#endif  
"
```

with

```
"  
BRANCH( 1 ); INDIRECT( 1 );  
    if (h_ps_dec->bFineIidQ){  
        CurrentTable = (Huffman)&aBookPsIidFineTimeDecode;  
PTR_INIT( 1 );  
    }  
    else {  
        CurrentTable = (Huffman)&aBookPsIidTimeDecode;  
PTR_INIT( 1 );  
    }  
"
```

In file ps_bitdec.c line 515, replace

```
"  
#ifdef NON_BE_BUGFIX  
BRANCH( 1 ); INDIRECT( 1 );
```

```

        if (h_ps_dec->bFineIidQ){
            CurrentTable = (Huffman)&aBookPsIidFineTimeDecode;
PTR_INIT( 1 );
        }
        else {
            CurrentTable = (Huffman)&aBookPsIidTimeDecode;
PTR_INIT( 1 );
        }
    #else
        CurrentTable = (Huffman)&aBookPsIidTimeDecode;
PTR_INIT( 1 );
    #endif
"

```

with

```

"

BRANCH( 1 ); INDIRECT( 1 );
    if (h_ps_dec->bFineIidQ){
        CurrentTable = (Huffman)&aBookPsIidFineTimeDecode;
PTR_INIT( 1 );
    }
    else {
        CurrentTable = (Huffman)&aBookPsIidTimeDecode;
PTR_INIT( 1 );
    }
"

```

In file ps_bitdec.c line 541, replace

```

"
#ifdef BUGFIX_050804
PTR_INIT( 1 ); INDIRECT( 2 ); LOOP( 1 );
    for (gr = 0; gr < aNoIccBins[h_ps_dec->freqResIcc]; gr++) {
#else
PTR_INIT( 1 ); BRANCH( 1 ); INDIRECT( 2 ); LOOP( 1 );
    for (gr = 0; gr < aNoIccBins[h_ps_dec->freqResIcc?1:0]; gr++) {
#endif
"

```

with

```

"

PTR_INIT( 1 ); INDIRECT( 2 ); LOOP( 1 );
    for (gr = 0; gr < aNoIccBins[h_ps_dec->freqResIcc]; gr++) {
"

```

In file ps_bitdec.c line 554, replace

```

"
#ifdef NON_BE_BUGFIX

```

```

INDIRECT( 1 ); BRANCH( 1 );
if (h_ps_dec->bEnableExt) {
    int cnt, i;

    cnt = (int)getbits (hBitBuf, 4);
    FUNC( 2 );

    ADD( 1 ); BRANCH( 1 );
    if (cnt==15)
    {
        cnt += (int)getbits (hBitBuf, 8);
        FUNC( 2 ); ADD( 1 );
    }

    LOOP(1);
    for (i=0; i<cnt; i++)
    {
        getbits(hBitBuf, 8);
        FUNC(2);
    }
}
#endif
"

```

with

```

"

INDIRECT( 1 ); BRANCH( 1 );
if (h_ps_dec->bEnableExt) {
    int cnt, i;

    cnt = (int)getbits (hBitBuf, 4);
    FUNC( 2 );

    ADD( 1 ); BRANCH( 1 );
    if (cnt==15)
    {
        cnt += (int)getbits (hBitBuf, 8);
        FUNC( 2 ); ADD( 1 );
    }

    LOOP(1);
    for (i=0; i<cnt; i++)
    {
        getbits(hBitBuf, 8);
        FUNC(2);
    }
}
"

```

In file ps_dec.c line 82, replace

```

"
#ifdef NON_BE_BUGFIX
    INDIRECT(1); MOVE(1);
    h_ps_dec->bEnableExt = 0;
    h_ps_dec->bFineIidQ = 0;
#endif
"

```

with

```
"  
    INDIRECT(1); MOVE(1);  
    h_ps_dec->bEnableExt = 0;  
    h_ps_dec->bFineIidQ = 0;  
"
```

In file ps_dec.c line 634, replace

```
"  
#ifdef NON_BE_BUGFIX  
BRANCH(1); INDIRECT(1);  
    if (pms->bFineIidQ)  
    {  
        noIidSteps = NO_IID_STEPS_FINE;  
    MOVE(1);  
        pScaleFactors = scaleFactorsFine;  
    PTR_INIT(1);  
    }  
    else{  
        noIidSteps = NO_IID_STEPS;  
    MOVE(1);  
        pScaleFactors = scaleFactors;  
    PTR_INIT(1);  
    }  
#else  
    noIidSteps = NO_IID_STEPS;  
    MOVE(1);  
    pScaleFactors = scaleFactors;  
    PTR_INIT(1);  
#endif  
"
```

with

```
"  
  
BRANCH(1); INDIRECT(1);  
    if (pms->bFineIidQ)  
    {  
        noIidSteps = NO_IID_STEPS_FINE;  
    MOVE(1);  
        pScaleFactors = scaleFactorsFine;  
    PTR_INIT(1);  
    }  
    else{  
        noIidSteps = NO_IID_STEPS;  
    MOVE(1);  
        pScaleFactors = scaleFactors;  
    PTR_INIT(1);  
    }  
"
```


In file ps_dec.c line 91, replace

```
"
#ifdef NON_BE_BUGFIX
    int bEnableExt;
    int bFineIidQ;
    int aIidPrevFrameIndex[NO_HI_RES_BINS];
    int aIccPrevFrameIndex[NO_HI_RES_BINS];
    int aaIidIndex[MAX_NO_PS_ENV+1][NO_HI_RES_BINS];
    int aaIccIndex[MAX_NO_PS_ENV+1][NO_HI_RES_BINS];
#else
    int aIidPrevFrameIndex[NO_BINS];
    int aIccPrevFrameIndex[NO_BINS];
    int aaIidIndex[MAX_NO_PS_ENV+1][NO_BINS];
    int aaIccIndex[MAX_NO_PS_ENV+1][NO_BINS];
#endif
"
```

with

```
"
    int bEnableExt;
    int bFineIidQ;
    int aIidPrevFrameIndex[NO_HI_RES_BINS];
    int aIccPrevFrameIndex[NO_HI_RES_BINS];
    int aaIidIndex[MAX_NO_PS_ENV+1][NO_HI_RES_BINS];
    int aaIccIndex[MAX_NO_PS_ENV+1][NO_HI_RES_BINS];
"
```

CHANGE REQUEST

26.410 CR 012 # rev - # Current version: 6.0.0

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	# Correction to C-code: Reset of Missing Harmonics flags during concealment added		
Source:	# TSG-SA WG4		
Work item code:	# PSSrel6	Date:	# 14/12/2004
Category:	# F	Release:	# Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		Ph2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)
			Rel-7 (Release 7)

Reason for change:	# Missing harmonics flags shall be cleared during concealment. This is already reflected by the written specification but not implemented accordingly in the C-Code. If missing harmonics occur during concealed frames the audio quality may suffer.
Summary of change:	# Alignment of C-Code to written specification on the correct treatment of missing harmonics flags in the concealment case.
Consequences if not approved:	# Discrepancy between written specification and C-Code, suboptimal audio quality performance for concealed frames.

Clauses affected:	# C-code appendix										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	X			X		X	Other core specifications	# TS 26.402
Y	N										
X											
	X										
	X										
		Test specifications									
		O&M Specifications									
Other comments:	#										

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

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

- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

In file env_dec.c line 420, add:

```
"  
PTR_INIT(1); /* h_sbr_data->addHarmonics[i] */  
LOOP(1);  
for (i=0; i < MAX_FREQ_COEFFS; i++) {  
    MOVE(1);  
    h_sbr_data->addHarmonics[i] = 0;  
}  
"
```

CHANGE REQUEST

⌘ **26.410 CR 013** ⌘ rev **-** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Removal of Complexity counters		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PSSrel6	Date:	⌘ 14/12/2004
Category:	⌘ F	Release:	⌘ Rel-6
	<i>Use one of the following categories:</i> 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 .		<i>Use one of the following releases:</i> Ph2 (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) Rel-7 (Release 7)

Reason for change:	⌘ Complexity counters were provided to 3GPP in order to help 3GPP through the selection process for PSS/MMS audio codecs. The copyright statement included with the software states clearly the purpose of such a software contribution. VoiceAge is unwilling to transfer the copyright of these computational tools to 3GPP.
Summary of change:	⌘ The complexity evaluation tools are removed
Consequences if not approved:	⌘ 3GPP Copyright policies are violated.

Clauses affected:	⌘ All files *.c, *.h						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Test specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> O&M Specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
Other comments:	⌘						

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

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

- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request

Changes to the C-code:

1. How the code is changed in the files **.c*.h*

Complexity counters are removed. Complexity counting tools are also removed:
flc.c, flc.h.

#include statements relative to the files flc.h are also removed from the source code.