Technical Specification Group Services and System Aspects **TSGS#27(05)0096**
Meeting #27, Tokyo, Japan
14-17 March 2005

Source: TSG-SA WG4

Title: CRs TS 26.290 & TS 26.304 on Corrections to Extended AMR-WB+ codec specifications (Release 6)

Document for: Approval

Agenda Item: 7.4.3

The following CRs, agreed at the TSG-SA WG4 meeting #34, are presented to TSG SA #27 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.290	005	1	Rel-6	Update for TCX coding mode selection table	F	6.1.0	S4	TSG-SA WG4#34	S4-050163
26.304	019	1	Rel-6	AMR-WB/AMR-WB+ switching	F	6.1.0	S4	TSG-SA WG4#34	S4-050156
26.304	020	2	Rel-6	Cleanup of unused C-code functions	F	6.1.0	S4	TSG-SA WG4#34	S4-050185
26.304	021	1	Rel-6	Correction of misbehaviour of constrained cholesky	F	6.1.0	S4	TSG-SA WG4#34	S4-050158
26.304	022	1	Rel-6	Source code bit exact editorial changes	F	6.1.0	S4	TSG-SA WG4#34	S4-050159
26.304	023	2	Rel-6	Correction of last frame processing	F	6.1.0	S4	TSG-SA WG4#34	S4-050160
26.304	024	1	Rel-6	Correction of frame erasure concealment	F	6.1.0	S4	TSG-SA WG4#34	S4-050207
26.304	025	1	Rel-6	Correction of references and terminology	F	6.1.0	S4	TSG-SA WG4#34	S4-050246

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Tdoc ⌘S4-050163

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CHANGE REQUEST

⌘ **TS 26.290** **CR** **005** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Update for TCX coding mode selection table
Source:	⌘	TSG SA WG4
Work item code:	⌘	AMRWB+
Date:	⌘	15/03/2005
Category:	⌘	**F**
Release:	⌘	REL-6

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:	⌘	TCX coding mode combination table (Table 11) in 26.290 is conflicting with ANSI C-source code, TS 26.304.
Summary of change:	⌘	According to TS 26.304 (cod_lf_b.c), if the flag is set disabling the use of TCX80, either TCX20 and TCX40 is selected for the encoding. Therefore Table 11 of Chapter 5.2.4 (ACELP/TCX open-loop mode selection) in TS 26.290 is updated to be consistent with TS 26.304.
Consequences if not approved:	⌘	In TS 26.290, Table 11 (TCX coding selection) is conflicting with ANSI C-source code, TS 26.304.

Clauses affected:	⌘	Table 11 in Chapter 5.2.4, TS 26.290

Other specs affected:	⌘	Y	N		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

1) Change for Table 11 in Chapter 5.2.4, TS 26.290

Before the change:

Table 11: Possible mode combination selected in TCXS

Selected mode combination after open-loop mode selection (TCX = 1 and ACELP = 0)	Possible mode combination after TCXS (ACELP = 0, TCX256 = 1, TCX512 = 2 and TCX1024 = 3)		
			NoMTcx
(0, 1, 1, 1)	(0, 1, 1, 1)	(0, 1, 2, 2)	
(1, 0, 1, 1)	(1, 0, 1, 1)	(1, 0, 2, 2)	
(1, 1, 0, 1)	(1, 1, 0, 1)	(2, 2, 0, 1)	
(1, 1, 1, 0)	(1, 1, 1, 0)	(2, 2, 1, 0)	
(1, 1, 0, 0)	(1, 1, 0, 0)	(2, 2, 0, 0)	
(0, 0, 1, 1)	(0, 0, 1, 1)	(0, 0, 2, 2)	
(1, 1, 1, 1)	(1, 1, 1, 1)		1
(1, 1, 1, 1)	(2, 2, 2, 2)	(3, 3, 3, 3)	0

After the change:

Table 11: Possible mode combination selected in TCXS

Selected mode combination after open-loop mode selection (TCX = 1 and ACELP = 0)	Possible mode combination after TCXS (ACELP = 0, TCX256 = 1, TCX512 = 2 and TCX1024 = 3)		
			NoMTcx
(0, 1, 1, 1)	(0, 1, 1, 1)	(0, 1, 2, 2)	
(1, 0, 1, 1)	(1, 0, 1, 1)	(1, 0, 2, 2)	
(1, 1, 0, 1)	(1, 1, 0, 1)	(2, 2, 0, 1)	
(1, 1, 1, 0)	(1, 1, 1, 0)	(2, 2, 1, 0)	
(1, 1, 0, 0)	(1, 1, 0, 0)	(2, 2, 0, 0)	
(0, 0, 1, 1)	(0, 0, 1, 1)	(0, 0, 2, 2)	
(1, 1, 1, 1)	(1, 1, 1, 1)	(2, 2, 2, 2)	1
(1, 1, 1, 1)	(2, 2, 2, 2)	(3, 3, 3, 3)	0

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CHANGE REQUEST

⌘ **TS 26.304 CR 019** ⌘ **rev 1** ⌘ Current version: **6.1.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	AMR-WB/AMR-WB+ switching
Source:	⌘	TSG SA WG4
Work item code:	⌘	AMRWB+
Date:	⌘	15/03/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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)*
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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:	⌘	Erroneus update of some of the encoder and decoder state variables in AMR-WB/AMR-WB+ switching.
Summary of change:	⌘	In the encoder this change fixes the misalignment in the adaptive codebook vector update in transition between AMR-WB modes and extension modes. In the decoder this change fixes the misalignment in the synthesized audio vector in transition between AMR-WB modes and extensions modes. Furthermore, saturation control for the synthesized audio vector in the decoder when switching towards an AMR-WB mode is corrected.
Consequences if not approved:	⌘	Audible distortion in synthesized audio when switching between AMR-WB and extension modes due to erroneous update of some of the codec state variables.

Clauses affected:	⌘	Files “cod_cp_state.c” and “dec_cp_state.c” of the ANSI C source code

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

1) Changes in the source file “cod_cp_state.c”

Lines 51 – 52

Before the change:

```
mvr2r(wb->mem_wsp, wbP->old_d_wsp, PIT_MAX / OPL_DECIM);
mvr2r(wb->mem_hp_wsp, wbP->hp_old_wsp, PIT_MAX / OPL_DECIM);
```

After the change:

```
mvr2r(wb->mem_wsp, wbP->old_d_wsp + PIT_MAX_MAX - PIT_MAX, PIT_MAX / OPL_DECIM);
mvr2r(wb->mem_hp_wsp, wbP->hp_old_wsp + PIT_MAX_MAX - PIT_MAX, PIT_MAX /
OPL_DECIM);
```

Line 64

Before the change:

```
wbP->old_exc[i] = (float)(wb->mem_exc[i] * pow(2, -(wb->mem_q)));
```

After the change:

```
wbP->old_exc[i] = (float)(wb->mem_exc[PIT_MAX_MAX - PIT_MAX + i] * pow(2, -(wb-
>mem_q)));
```

Lines 108 – 109

Before the change:

```
mvr2r(wbP->old_d_wsp, wb->mem_wsp, PIT_MAX / OPL_DECIM);
mvr2r(wbP->hp_old_wsp, wb->mem_hp_wsp, PIT_MAX / OPL_DECIM);
```

After the change:

```
mvr2r(wbP->old_d_wsp + PIT_MAX_MAX - PIT_MAX, wb->mem_wsp, PIT_MAX / OPL_DECIM);
mvr2r(wbP->hp_old_wsp + PIT_MAX_MAX - PIT_MAX, wb->mem_hp_wsp, PIT_MAX /
OPL_DECIM);
```

Line 134

Before the change:

```
tmp2 = (Word16)(fabs(wbP->old_exc[i]));
```

After the change:

```
tmp2 = (Word16)(fabs(wbP->old_exc[PIT_MAX_MAX - PIT_MAX + i]));
```

Line 142

Before the change:

```
wb->mem_exc[i] = ((Word16)(wbP->old_exc[i])) << Q_new;
```

After the change:

```
wb->mem_exc[i] = ((Word16)(wbP->old_exc[PIT_MAX_MAX - PIT_MAX + i])) << Q_new;
```

2) Changes in the source file “dec_cp_state.c”

Line 71

Before the change:

```
wbP->old_synth_pf[i] = (float)wb->mem_syn_out[i];
```

After the change:

```
wbP->old_synth_pf[PIT_MAX_MAX - PIT_MAX + i] = (float)wb->mem_syn_out[i];
```

Lines 98 – 99

Before the change:

```
if (ftemp < -32768.0f)    wb->mem_gain[i] = -32768.0f;
else if (ftemp > 32767.0f)wb->mem_gain[i] = 32767.0f;
```

After the change:

```
if (ftemp < -32768.0f)    wb->mem_gain[i] = (Word16)-32768;
else if (ftemp > 32767.0f)wb->mem_gain[i] = (Word16)32767;
```

Line 138 (replaced with four lines of source code)

Before the change:

```
wb->mem_syn_out[i] = (Word16)wbP->old_synth_pf[i];
```

After the change:

```
ftemp = wbP->old_synth_pf[PIT_MAX_MAX - PIT_MAX + i];
if (ftemp < -32768.0f)    wb->mem_syn_out[i] = (Word16)-32768;
else if (ftemp > 32767.0f)wb->mem_syn_out[i] = (Word16)32767;
else                      wb->mem_syn_out[i] = (Word16)ftemp;
```

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CHANGE REQUEST

⌘ **26.304** **CR** **020** ⌘ **rev** **2** ⌘ Current version: **6.1.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Cleanup of unused C-code functions
Source:	⌘	TSG SA WG4
Work item code:	⌘	AMR-WB+
Date:	⌘	15/03/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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:

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:	⌘	Code that is not used is unnecessary to keep
Summary of change:	⌘	Unused code is removed
Consequences if not approved:	⌘	May lead to confusions regarding the size of the code.

Clauses affected:	⌘	util_stereo_x.c proto_func.h			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:
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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 file *util_stereo_x.c*

Line 84 to be removed

```
 #if 1
```

Lines 239-315 to be removed

```
#endif

/*****************************************************************************
*********/
 /*
  Euclidian distance
 */
 float vect_dist(float  *x,
         float   *y,
         int    n)
 {
  int i;
  float sum;
  sum = 0.0;
  for (i=0;i<n;i++) {
     sum += (x[i]-y[i])*(x[i]-y[i]);
  }
  return(sum);
 }
 /*
  Code book search
 */
 void  cb_search(float *x,
         float *xq,
         int n,
         float *cb,
         int cb_size,
         int *winner)
 {
  int i;
  int index=0;
  float min_dist;
  float dist;
  /* initialize the minimum distance */
  min_dist = 1e16f;
  /* loop through the codebook entries */
  for(i=0;i<cb_size;i++)
  {
     dist = vect_dist(x,&(cb[i*n]),n);
     if(dist < min_dist)
     {
        min_dist = dist;
        index = i;
     }
  }
```

```
  for(i=0;i<n;i++)
  {
    xq[i] = cb[index*n+i];
  }
  *winner = index;
  return;
}
/*
  Predictive vector quantizer
*/
void pvq(float *x,
     float *old_x,
     float *cb,
     float *cbm,
     float a,
     int n,
     int cb_size,
     int *winner)
{
  float e[MAX_VECT_DIM];
  float eq[MAX_VECT_DIM];
  int i;
  /* compute the predictor error */
  for(i=0;i<n;i++){
    e[i] = (x[i] - cbm[i]) - a *old_x[i];
  }
  /* quantize the error */
  cb_search(e,eq,n,cb,cb_size,winner);
  /* save for next frame */
  for(i=0;i<n;i++){
    old_x[i] = eq[i] + a *old_x[i];
  }
}
#if 1
```

Line 362 to be removed

```
#endif
```

Line 429-480 to be removed

```
/*
  Cholesky linear equation solver
*/
int cholsol(float r[HI_FILT_ORDER][HI_FILT_ORDER],
     float c[HI_FILT_ORDER],
     float h[HI_FILT_ORDER],
     int n)
{
  float p[HI_FILT_ORDER];
  int i,j,k;
  float sum;
  /* cholesky decomposition */
  for(i=0;i<n;i++)
  {
    for(j=i;j<n;j++)
    {
      for(sum=r[i][j],k=i-1;k>=0;k--)
      {
        sum -= r[i][k]*r[j][k];
      }
      if(i==j)
      {
```

```
          if(sum < EPSILON) {
            return(1);
          }
          p[i] = (float)sqrt(sum);
        }
        else
        {
          r[j][i] = sum/p[i];
        }
      }
    }
    /* linear system solving */
    for(i=0;i<n;i++)
    {
      for(sum=c[i],k=i-1;k>=0;k--)
      {
        sum -= r[i][k]*h[k];
      }
      h[i] = sum/p[i];
    }
    for(i=n-1;i>=0;i--)
    {
      for(sum=h[i],k=i+1;k<n;k++)
      {
        sum -= r[k][i]*h[k];
      }
      h[i] = sum / p[i];
    }
    return(0);
  }
```

Line 649-679 to be removed

```
  float cos_fac(int n,
          int n1,
          int n2)
  {

    double cte,cc,arg;
    float val;
    int i;
    if(n<n1)
    {
      cte = 0.25*PI2/(float)n1;
      cc = 0.5*cte - 0.25*PI2;
      arg=cc;
      for(i=0;i<n;i++)
      {
        arg+=cte;
      }
      val=(float)cos(arg);
    } else
    {
      cte = 0.25*PI2/(float)n2;
      cc = 0.5*cte;
      arg=cc;
      for(i=n1;i<n;i++)
      {
        arg+=cte;
      }
      val=(float)cos(arg);
    }
    return val;
  }
```

2. How the code is changed in the file *proto_func.h*

Line 192-194 to be removed

```
float vect_dist(float *x, float *y, int n);
void cb_search(float *x, float *xq, int n, float *cb, int cb_size, int *winner);
void pvq(float *x, float *old_x, float *cb, float *cbm, float a, int n, int
cb_size, int *winner);
```

Line 207 to be removed

```
int cholsol(float r[HI_FILT_ORDER][HI_FILT_ORDER], float c[HI_FILT_ORDER], float
h[HI_FILT_ORDER], int n);
```

Line 219 to be removed

```
float cos_fac(int n, int n1, int n2);
```

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CHANGE REQUEST

⌘ **26.304** **CR** **021** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Correction of misbehaviour of constrained cholesky
Source:	⌘	TSG SA WG4
Work item code:	⌘	AMRWB+
Date:	⌘	15/03/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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)*
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Use one 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:	⌘	Constrained cholesky linear system solver produces incorrect results for strongly harmonic signals due to covariance matrix conditioning.
Summary of change:	⌘	Detection of such instability is done and correction of the filter when an instability is detected.
Consequences if not approved:	⌘	May in rare cases lead to quality impairments due to unbalanced stereo image in the mid-band frequency range when purely harmonic signals are encoded

Clauses affected:	⌘	util_stereo_x.c			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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downloaded from the3GPP 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 file *util_stereo_x.c*

Before the change (lines 545 – 563)

```
#ifdef CHOLSOLC_PATCH
  sum = 0;
  for(i=0;i<n;i++){
     sum += h[i] ;
  }
  sum = fabs(sum);
#endif
  for(i=0;i<n;i++){
     h[i] += lambda*v[i];
  }
#ifdef CHOLSOLC_PATCH
  if (sum > 1.0) {
    sum = 1.0/sum;
    for(i=0;i<n;i++) {
       h[i] *= sum;
    }
  }
#endif
```

After the change

```
  sum = 0;
  for(i=0;i<n;i++){
     sum += h[i] ;
  }
  sum = fabs(sum);

  for(i=0;i<n;i++){
     h[i] += lambda*v[i];
  }

  if (sum > 1.0) {
    sum = 1.0/sum;
    for(i=0;i<n;i++) {
       h[i] *= sum;
    }
  }
```

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CHANGE REQUEST

⌘ **26.304** **CR** **022** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Source code bit exact editorial changes
Source:	⌘	TSG SA WG4
Work item code:	⌘	AMR-WB+
Date:	⌘	15/03/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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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:	⌘	Unnecessary code need to be removed, comments to be corrected, and allocated memory freed at the end of execution.
Summary of change:	⌘	enc_wbplus.c Correct comment (change TS26.304 to TS26.290). Add function close_wbp to prevent memory leak Initialise Coder_state_plus to NULL dec_wbplus : Remove comment in line 329 Add "stderr" to fprintf to remove warning Remove unnecessary parameter in function init_decoder_amrwb_plus
Consequences if not approved:	⌘	May lead to confusions if comments not corrected. May lead to memory leak if memory not freed.

Clauses affected:	⌘	`enc_wbplus.c, dec_wbplus.c`

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	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.

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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.

Changes to the C-code

1. How the code is changed in the file *enc_wbplus.c*

Lines 28

Before the change:

```
fprintf(stderr, "-mi     Mode Index (0..15  -> AMR WB\n                  16..47
-> AMR WB+) (see ts 26.304 Table 14) \n");
```

After the change:

```
fprintf(stderr, "-mi     Mode Index (0..15  -> AMR WB\n                  16..47
-> AMR WB+) (see ts 26.290 Table 25) \n");
```

Lines 231 – 241

Before the change:

```
conf->mode_index = atoi(*argv);
if (conf->mode_index < 0 || conf->mode_index > 47)
{
  fprintf(stderr, "Unknown Mode Index (see TS 26.304 Table 14)\n");
  exit(EXIT_FAILURE);
}
else if (conf->mode_index == 9 || conf->mode_index == 14 || conf->mode_index ==
15)
{
  fprintf(stderr, "Mode Index %d is reserved (see TS 26.304 Table 10)\n", conf-
>mode_index);
  exit(EXIT_FAILURE);
}
```

After the change:

```
conf->mode_index = atoi(*argv);
if (conf->mode_index < 0 || conf->mode_index > 47)
{
  fprintf(stderr, "Unknown Mode Index (see TS 26.290 Table 25)\n");
  exit(EXIT_FAILURE);
}
else if (conf->mode_index == 9 || conf->mode_index == 14 || conf->mode_index ==
15)
{
  fprintf(stderr, "Mode Index %d is reserved (see TS 26.290 Table 21)\n", conf-
>mode_index);
  exit(EXIT_FAILURE);
}
```

Line 543: Insert the following code

```
void close_wbp(Coder_State_Plus *st, Word16 UseCaseB)
{

  if(st->stClass != NULL && UseCaseB > 0 )
  {
    free(st->stClass);
    st->stClass = NULL;
  }
  if(st->vadSt != NULL && UseCaseB > 0 )
    wb_vad_exit(&st->vadSt);


  if(st != NULL)
  {
    free(st);
    st = NULL;
  }

}
```

Line 553

Before the change:

```
Coder_State_Plus *st;
```

After the change:

```
Coder_State_Plus *st = NULL;
```

Lines 733-734

Before the change:

```
      frame++;
      fprintf(stderr, " Frames processed: %ld    \r", frame);
```

After the change:

```
      fprintf(stderr, " Frames processed: %ld    \r", frame);
      frame++;
```

Lines 884-893

Before the change:

```
if(conf.FileFormat == F3GP)
   {
      Close3GP(output_filename);
   }
   else
   {
      fclose(f_serial);
   }
   Wave_fclose(f_speech, bitsPerSample);
   exit(EXIT_SUCCESS);
```

After the change:

```
  if(conf.FileFormat == F3GP)
   {
      Close3GP(output_filename);
   }
   else
   {
      fclose(f_serial);
   }
   Wave_fclose(f_speech, bitsPerSample);

   if(stAmrwbEnc != NULL)
       E_IF_exit(stAmrwbEnc);

   close_wbp(st, conf.use_case_mode);

   exit(EXIT_SUCCESS);
```

2. How the code is changed in the file *dec_wbplus.c*

Line 329

Delete the following line:

```
//   if (conf.mono_dec_stereo) num_channels = 1;
```

Lines 334-340

Before the change:

```
   if(conf.fer_sim) {
      if ((f_fer = fopen(fer_filename,"rt")) == NULL)
      {
         fprintf("Error opening fer file %s.\n",fer_filename);
         exit(0);
      }
   }
```

After the change:

```
   if(conf.fer_sim) {
      if ((f_fer = fopen(fer_filename,"rt")) == NULL)
      {
         fprintf(stderr, "Error opening fer file %s.\n",fer_filename);
         exit(0);
      }
   }
```

Line 418

Before the change:

```
         init_decoder_amrwb_plus(st_d, (int) num_channels, fst,
conf.mono_dec_stereo, 0);
```

After the change:

```
         init_decoder_amrwb_plus(st_d, (int) num_channels, fst, 0);
```

3GPP TSG-SA4 Meeting #34
Lisbon, Portugal, 21-25 February 2005

Tdoc ⌘S4-050160

CR-Form-v7.1

CHANGE REQUEST

⌘ **26.304** **CR** **023** ⌘ **rev** **2** ⌘ Current version: **6.1.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Correction of last frame processing
Source:	⌘	TSG SA WG4
Work item code:	⌘	AMR-WB+
Date:	⌘	15/03/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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:

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:	⌘	Portion of the signal at the end of file not processed.
Summary of change:	⌘	In enc_wbplus.c Lines 731 & 797 : Change loop condition and remove exit condition to allow processing of last frame
Consequences if not approved:	⌘	May lead to missing samples at the end of file after decoding.

Clauses affected:	⌘	`enc_wbplus.c`

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	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.

Changes to the C-code

1. How the code is changed in the file *enc_wbplus.c*

Lines 731

Before the change:

```
   while (lg == (numOfChannels * (L_frame - nb_hold)) || frame == 0)
   {
```

After the change:

```
   dataSize *= numOfChannels;
   dataSize -= lg;
   while (lg != 0 || frame == 0)
   {
```

Lines 797 to 804

Before the change:

```
lg =
         read_data(f_speech, channel_right + nb_hold,
                   (numOfChannels * (L_frame - nb_hold)));
      /* End processing if not enough input data */
      if (lg != (numOfChannels * (L_frame - nb_hold)))
      {
         break;
      }
```

After the change:

```
lg =
         read_data(f_speech, channel_right + nb_hold,
                   (numOfChannels * (L_frame - nb_hold)));

      dataSize -= lg;
      if (dataSize < 0) /* prevent to read end file wav header */
      {
          break;
      }
```

3GPP TSG-SA4 Meeting #34
Lisbon, Portugal, 21-25 February 2005

Tdoc ⌘S4-050207

CR-Form-v7.1

CHANGE REQUEST

⌘ **26.304** **CR** **024** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Correction of frame erasure concealment
Source:	⌘	TSG SA WG4
Work item code:	⌘	AMR-WB+
Date:	⌘	15/03/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
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A *(corresponds to a correction in an earlier release)*
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Use one 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:	⌘	Frame erasure works using the auxiliary fer file but not otherwise.
Summary of change:	⌘	Reset the bfi to zero after an erased frame. Set bfi to 1 when receiving frames with frame type 14 or 15.
Consequences if not approved:	⌘	Leads to problems in frame erasure concealment

Clauses affected:	⌘	`dec_wbplus.c, bitsream.c, proto_func.h, wbplus3gplib.h, 3gplib.lib`

Other specs affected: ⌘	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.

Changes to the C-code

1. How the code is changed in the file *proto_func.h*

Lines 789 to 791

Before the change:

```
short ReadRawFile(DecoderConfig *conf, short *extension, short *mode, short
*st_mode, short *fst, FILE *f_serial, void *serial);

int get_nb_bits(short extension, short mode, short st_mode);

short ReadHeader(short FileFormat, short *extension, short *mode, short
*st_mode, short *fst, short offset, FILE *f_serial);
```

After the change:

```
short ReadRawFile(short *tfi, int *bfi, DecoderConfig *conf, short *extension,
short *mode, short *st_mode, short *fst, FILE *f_serial, void *serial);

int get_nb_bits(short extension, short mode, short st_mode);

short ReadHeader(short *tfi, int *bfi, short FileFormat, short *extension, short
*mode, short *st_mode, short *fst, short offset, FILE *f_serial);
```

2. How the code is changed in the file *dec_wbplus.c*

Line 310

Before the change:

```
Open3GP(input_filename,0,&conf);
```

After the change:

```
Open3GP(&fti, bfi, input_filename,0,&conf);
```

Line 320

Before the change:

```
ReadHeader(conf.FileFormat, &(conf.extension), &(conf.mode), &(conf.st_mode),
&(conf.fscale), 0, f_serial);
```

After the change:

```
ReadHeader(&tfi, bfi, conf.FileFormat, &(conf.extension), &(conf.mode),
&(conf.st_mode), &(conf.fscale), 0, f_serial);
```

Lines 384 to 394

Delete the lines:

```
/* set the tfi */
      tfi = frame%4;
      /* read frame erasures every forth frame */
      if(conf.fer_sim) {
         if(tfi == 0)
         {
            for(i=0;i<4;i++) {
               fscanf(f_fer,"%d",&bfi[i]);
            }
         }
      }
```

Line 397-411

Before the change:

```
if (conf.FileFormat == F3GP)
      {
          if(GetNextFrame3GP(&extension,&mode,&st_mode,&fst,(void *)serial,0))
          {
             break;
          }
          conf.mode = mode;
          conf.st_mode = st_mode;
      }
      else
      {
          if(!ReadRawFile(&conf, &extension, &mode, &st_mode, &fst, f_serial,
(void*) serial))
            break;

      }
```

After the change:

```
if (conf.FileFormat == F3GP)
      {
          if(GetNextFrame3GP(&tfi, bfi, &extension,&mode,&st_mode,&fst,(void
*)serial,0))
          {
             break;
          }
          conf.mode = mode;
          conf.st_mode = st_mode;
      }
      else
      {
           if(!ReadRawFile(&tfi, bfi, &conf, &extension, &mode, &st_mode, &fst,
f_serial, (void*) serial))
            break;
      }

     /* set the tfi for SIMULATION PURPOSE */
     /* read frame erasures every forth frame for wb+*/
     /* read frame erasures every frame for amr-wb*/
      if(conf.fer_sim) {
         if(conf.extension > 0)
         {
             for(i=0;i<4;i++)
```

```
            {
               fscanf(f_fer,"%d",&bfi[i]);
            }
        }
        else
        {
            fscanf(f_fer,"%d",&bfi[tfi]);
        }
     }
```

3. How the code is changed in the file *bitstream.c*

Line 10

Insert:

```
#define NO_DATA -3
```

Lines 127 to 218

Before the change:

```
short ReadHeader(short FileFormat, short *extension, short *mode, short
*st_mode, short *fst, short offset, FILE *f_serial)
{
  short mode_index, fst_index, index, tfi, nb_read = 0;
  unsigned char byte;


  nb_read += fread(&byte, sizeof(unsigned char), 1, f_serial);
  if(nb_read ==0)
    return nb_read;

  mode_index = (byte & 127);
  *st_mode  = -1;
  /* If frame ereased : don't change old conf just modify mode */
  if( mode_index > 47 || mode_index < 0 ||        /* mode unknown */
      mode_index == 14 || mode_index == 15 ||     /* Frame lost or ereased */
      (mode_index == 9 && *extension == 1))       /* WB SID in WB+ frame */
  {
    /* If mode_index unknown, frame is ereased  or NO_DATA */
    if (mode_index == 14)
      *mode = 14;
    else
      *mode = 15;

    nb_read += fread(&byte, sizeof(unsigned char), 1, f_serial); /* read one
more byte to ensure empty header */

    return nb_read;
  }

  if(mode_index >15)      /* wb+ */
  {
    if(mode_index < 24)    /* Mono mode only */
```

```
    {
      *mode =   mode_index - 16;
    }
    else
    {
      index = mode_index - 24;
      *mode = miMode[2*index];
      *st_mode = miMode[2*index+1];
    }
    *extension = 1;
    nb_read += fread(&byte, sizeof(unsigned char), 1, f_serial);
    tfi = (byte & 0xc0);
    fst_index = (byte & 0x1F);
    if(fst_index < 1)
        fst_index = 1;        /* prevent isf < 0.5 */
    *fst = isfIndex[fst_index];
  }
  else      /* WB and caracterize WB+*/
  {
    if(mode_index == 10)
    {
      *extension = 1;
      *mode = 2;        /* 14m */

    }
    else if (mode_index == 11)
    {
      *extension = 1;
      *mode = 2;        /* 18s */
      *st_mode = 6;
    }
    else if (mode_index == 12)
    {
      *extension = 1;
      *mode = 7;        /* 24m */
    }
    else if (mode_index == 13)
    {
      *extension = 1;
      *mode = 5;        /* 24s */
      *st_mode = 7;
    }

    else
    {
      *extension = 0;
      *mode =   mode_index;
    }
    nb_read += fread(&byte, sizeof(unsigned char), 1, f_serial);
    tfi = (byte & 0xc0);
    fst_index = (byte & 0x1F);
    if(fst_index != 0 && fst_index != 8)
    {
      fprintf( stderr, "Internal Sampling Frequency not supported with AMW WB
and caracterized WB+ modes " );
      exit(EXIT_FAILURE);
    }
    *fst = isfIndex[fst_index];
  }

  return nb_read;
}
```

After the change:

```
short ReadHeader(short *tfi, int *bfi, short FileFormat, short *extension, short
*mode, short *st_mode, short *fst, short offset, FILE *f_serial)
{
  short mode_index, fst_index, index, nb_read = 0;
  unsigned char byte;


  nb_read += fread(&byte, sizeof(unsigned char), 1, f_serial);
  if(nb_read ==0)
    return nb_read;

  mode_index = (byte & 127);

  /* If frame ereased : don't change old conf just modify mode */
  if( mode_index > 47 || mode_index < 0 ||        /* mode unknown */
      mode_index == 14 || mode_index == 15 ||     /* Frame lost or ereased */
      (mode_index == 9 && *extension == 1))       /* WB SID in WB+ frame  not
supported case so declare a NO_DATA*/
  {

      if (*extension == 1) /* wb+ concealment */
      {
         if (mode_index == 14)
         {
            bfi[offset] = 1;
            nb_read += fread(&byte, sizeof(unsigned char), 1, f_serial); /* read
one more byte to ensure empty header */
            if (byte == 15)
            {
                *tfi  = ((*tfi+1)%4); /* assuming 1 frame increment */
                return NO_DATA;
            }
            *tfi = (byte & 0xc0)>>6;

         }
         else if (mode_index != 14)
         {
             bfi[offset] = 1;
             *tfi =((*tfi+1)%4); /* assuming 1 frame increment */
             return NO_DATA;
         }
      }
      else
      {
        /* If mode_index unknown, frame is ereased  or NO_DATA */
        if (mode_index == 14)
        {
            *mode = 14;
            nb_read += fread(&byte, sizeof(unsigned char), 1, f_serial); /* read
one more byte to ensure empty header */
            if (byte == 15)
            {
                *tfi  = ((*tfi+1)%4); /* assuming 1 frame increment */
                bfi[*tfi] = 1;
                return NO_DATA;
            }
            *tfi = (byte & 0xc0)>>6;
            bfi[*tfi] = 1;
        }
        else
```

```
      {
        *mode = 15;
        *tfi =((*tfi+1)%4); /* assuming 1 frame increment */
        bfi[*tfi] = 1;
        return NO_DATA;
      }

    }
    return nb_read;
}
*st_mode  = -1;

if(mode_index >15)      /* wb+ */
{
  if(mode_index < 24)    /* Mono mode only */
  {
    *mode =   mode_index - 16;
  }
  else
  {
    index = mode_index - 24;
    *mode = miMode[2*index];
    *st_mode = miMode[2*index+1];
  }
  *extension = 1;
  nb_read += fread(&byte, sizeof(unsigned char), 1, f_serial);
  *tfi = (byte & 0xc0)>>6;
  fst_index = (byte & 0x1F);
  if(fst_index < 1)
      fst_index = 1;        /* prevent isf < 0.5 */
  *fst = isfIndex[fst_index];
}
else      /* WB and caracterize WB+*/
{
  if(mode_index == 10)
  {
    *extension = 1;
    *mode = 2;        /* 14m */

  }
  else if (mode_index == 11)
  {
    *extension = 1;
    *mode = 2;        /* 18s */
    *st_mode = 6;
  }
  else if (mode_index == 12)
  {
    *extension = 1;
    *mode = 7;        /* 24m */
  }
  else if (mode_index == 13)
  {
    *extension = 1;
    *mode = 5;        /* 24s */
    *st_mode = 7;
  }

  else
  {
    *extension = 0;
    *mode =   mode_index;
  }
```

```
    nb_read += fread(&byte, sizeof(unsigned char), 1, f_serial);
    *tfi = (byte & 0xc0)>>6;
    fst_index = (byte & 0x1F);
    if(fst_index != 0 && fst_index != 8)
    {
      fprintf( stderr, "Internal Sampling Frequency not supported with AMW WB
and caracterized WB+ modes " );
      exit(EXIT_FAILURE);
    }
    *fst = isfIndex[fst_index];
  }
  bfi[*tfi] = 0;  /* Good frame */

  return nb_read;
}
```

Lines 280-294

Before the change:

```
short ReadRawFile(DecoderConfig *conf, short *extension, short *mode, short
*st_mode, short *fst, FILE *f_serial, void * serial)
{
  short i, n = 0, nb_bits, nb_byte, *pt_serial, *ptr;
  pt_serial = (short *) serial;
  for (i = 0; i < 4; i++)
  {
      if(!ReadHeader(conf->FileFormat, extension, mode, st_mode, fst, i,
f_serial))
        break;
      /* assume there is no amrwb -> wb+ switching inside superframe */
      conf->mode = *mode;
      conf->st_mode = *st_mode;
      if(*extension >0)
      {
        if (*mode != 15)
        {
```

After the change:

```
short ReadRawFile(short *tfi, int *bfi, DecoderConfig *conf, short *extension,
short *mode, short *st_mode, short *fst, FILE *f_serial, void * serial)
{
  short i, n = 0, nb_bits, nb_byte, *pt_serial, *ptr, retval;
  pt_serial = (short *) serial;
  for (i = 0; i < 4; i++)
  {
      retval = ReadHeader(tfi, bfi, conf->FileFormat, extension, mode, st_mode,
fst, i, f_serial);
      if(!retval)
        break;

      /* assume there is no amrwb -> wb+ switching inside superframe */
      conf->mode = *mode;
      conf->st_mode = *st_mode;
      if(*extension >0)
      {
        if (retval != NO_DATA)
        {
```

4. Changes to the 3gpfileformat library in the file *wbplus3gplib.h*

Lines 8 and 9

Before the change:

```
int GetNextFrame3GP(short *extension, short *mode, short *st_mode, short
*fst,void *serial, int init);
int Open3GP(char *filename, int verbose, DecoderConfig *conf);
```

After the change:

```
int GetNextFrame3GP(short * tfi, int* bfi, short *extension, short *mode, short
*st_mode, short *fst,void *serial, int init);
int Open3GP(short *tfi, int *bfi, char *filename, int verbose, DecoderConfig
*conf);
```

5. Changes to the 3gpfileformat library in the file *3gplib.lib*

The library has been changed by implementing the needed corrections. The source code of this library is not part of the 3GPP distribution.

3GPP TSG-SA4 Meeting #34
Lisbon, Portugal, 21-25 February 2005

Tdoc ⌘S4-050246

CR-Form-v7.1

CHANGE REQUEST

⌘ **26.304** **CR** **025** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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 [X] Radio Access Network ☐ Core Network [X]

Title:	⌘	Correction of references and terminology
Source:	⌘	TSG SA WG4
Work item code:	⌘	AMR-WB+ ***Date:*** ⌘ 15/03/2005
Category:	⌘	**F** ***Release:*** ⌘ Rel-6

Use one of the following categories:
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Use one 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:	⌘	Incorrect references and terminology.
Summary of change:	⌘	Removal of incorrect references and correction of wrong terminology.
Consequences if not approved:	⌘	May be confusing if not corrected.

Clauses affected:	⌘	Section 2. Section 5.2.

Other specs affected:	⌘	Y	N		⌘
			X	Other core specifications	
			X	Test specifications	
			X	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.

First change

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 26.273: "ANSI-C code for the Fixed-point Extended AMR Wideband codec".

[2] 3GPP TS 26.290: " Audio codec processing functions; Extended AMR Wideband codec; Transcoding functions ".

[3] 3GPP TS 26.274: " Audio codec processing functions; Extended Adaptive Multi-Rate - Wideband (AMR-WB+) codec; Conformance testing ".~~3GPP TS 26.xxx (tbd): "3GPP audio codecs, Conformance".~~

~~[4] 3GPP TS 26.201: " AMR Wideband speech codec; frame structure".~~

~~[5] IETF Internet Draft: "Real-Time Transport Protocol (RTP) Payload Format for Extended AMR Wideband (AMR-WB+) Audio Codec", Sjoberg J., Westerlund M. and Lakaniemi A., http://www.ietf.org/internet-drafts/draft-ietf-avt-rtp-amrwbplus-01.txt, July 2004.~~

~~[6] 3GPP TS 26.193: " AMR Wideband speech codec; Source controlled rate operation".~~

[4~~7~~] 3GPP TS 26.244: "Transparent end-to-end packet switched streaming service (PSS); 3GPP file format (3GP)"

Second change

5 File formats

This clause describes the file formats used by the encoder and decoder programs.

5.1 Audio file (encoder input/decoder output)

Audio files read by the encoder must be formatted as 16 bits PCM wave (*.wav) files. The decoder output is written as a 16 bit PCM wave file (*.wav).

Note that the decoder, with proper command line switch, can produce a mono file from a stereo bit-stream.

5.2 Parameter bitstream file (encoder output/decoder input)

For AMR-WB+ operation, the files produced by the audio encoder/expected by the audio decoder are either according to the ~~transport interface~~raw format defined in Reference [2] Section 8.2, or according to the 3GP file format [~~7~~4], whereby the storage sample definition is found in Reference [2] Section 8.3.