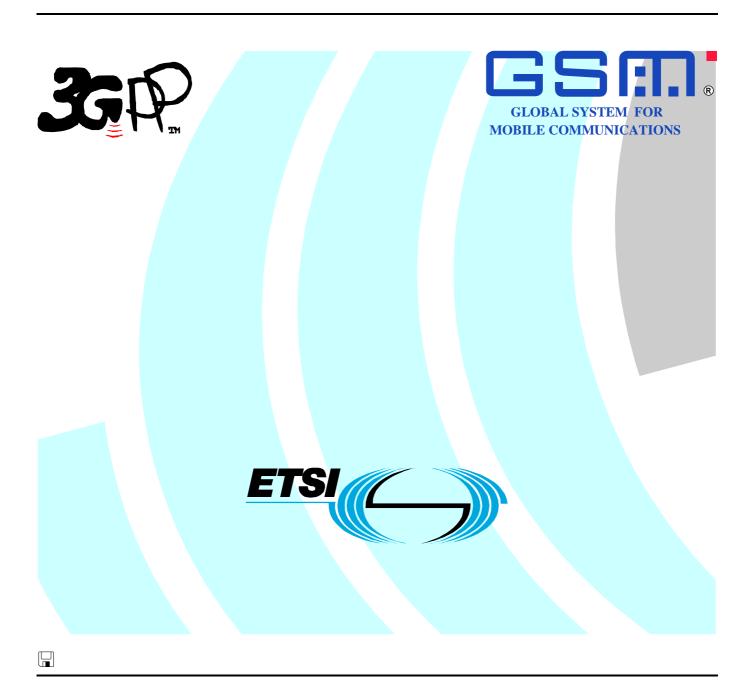
# ETSI TS 126 243 V6.1.0 (2004-12)

Technical Specification

Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); ANSI C code for the fixed-point distributed speech recognition extended advanced front-end (3GPP TS 26.243 version 6.1.0 Release 6)



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Keywords
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# Contents

Intell	ectual Property Rights	2
Forev	word	2
	word	
1	Scope	
2	References	
3	Definitions and abbreviations	
3.1	Definitions	
3.2	Abbreviations	5
4	C code structure	5
4.1	Contents of the C source code	5
4.2	Program execution	<i>6</i>
4.3	Code hierarchy	7
4.5	Variables, constants and tables	
4.5.1	Description of constants used in the C-code	13
4.5.2	Description of fixed tables used in the C-code	
4.5.3	Static variables used in the C-code	17
5	File formats	21
5.1	Speech file	21
Anne	ex A (informative): Change history	22
Histo		23

## **Foreword**

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# 1 Scope

The present document contains an electronic copy of the ANSI-C code for DSR Extended Advanced Front-end. The ANSI-C code is necessary for a bit exact implementation of DSR Extended Advanced Front-end.

## 2 References

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

[1] ETSI ES 202 050: "Distributed Speech Recognition; Advanced Front-end Feature Extraction

Algorithm; Compression Algorithm", Oct 2002.

[2] ETSI ES 202 212 "Distributed Speech Recognition; Extended Advanced Front-end Feature

Extraction Algorithm; Compression Algorithm, Back-end Speech Reconstruction Algorithm",

Nov 2003.

[3] 3GPP TS 26.177: "Speech Enabled Services (SES); Distributed Speech Recognition (DSR)

extended advanced front-end test sequences".

# 3 Definitions and abbreviations

## 3.1 Definitions

Definition of terms used in the present document, can be found in [1], [2]

## 3.2 Abbreviations

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

ANSI American National Standards Institute

I/O Input/Output

RAM Random Access Memory ROM Read Only Memory AFE Advanced Front-end

X-AFE eXtended Advanced Front-end DSR Distributed Speech Recognition

# 4 C code structure

This clause gives an overview of the structure of the bit-exact C code and provides an overview of the contents and organization of the C code attached to this document.

The C code has been verified on the following systems:

- Sun Microsystems workstations and GNU gcc compiler
- IBM PC compatible computers with Linux operating system and GNU gcc compiler.

ANSI-C was selected as the programming language because portability was desirable.

## 4.1 Contents of the C source code

The distributed files with suffix "c" contain the source code and the files with suffix "h" are the header files.

Makefiles are provided for the platforms in which the C code has been verified (listed above).

# 4.2 Program execution

There are separate executables for the FrontEnd and Vector Quantization, with and without Extensions. The command line options are described below.

<> - indicates parameters for the given option for running the executable

() – indicates default parameter.

#### FrontEnd w/ Extension:

USAGE: bin/ExtAdvFrontEnd infile HTK\_outfile pitch\_outfile class\_outfile [options] OPTIONS:

-q Quiet Mode (FALSE)

-F format Input file format *<NIST,HTK,RAW>* (NIST)
-fs freq Sampling frequency in kHz *<8,16>* (8)
-swap Change input byte ordering (Native)
-noh No HTK header to output file (FALSE)

-noc0 No c0 coefficient to output feature vector (FALSE)
 -nologE No logE component to output feature vector (FALSE)
 -skip header bytes n - Skip header, first n bytes (Only for -F RAW)

-noh, -noc0, -nologE and -skip\_header\_bytes are not used and should not be changed.

#### FrontEnd w/o Extension:

USAGE: bin/AdvFrontEnd infile HTK\_outfile [options]

OPTIONS: - Same as FrontEnd w/ Extension

#### **Vector Quantization w/ Extension:**

Usage: extcoder htk file in pitch file in class file in bitstream file out pitch file out txt file out -freq x -

VAD/No VAD

pitch\_file\_out txt\_file\_out -freq x Output quantised pitch period file. Vector quantiser output in text format. Sampling frequency in kHz (8 or 16).

-VAD Use voice activity detector data. Voice activity input file must have same name as htk\_file, but

extension .vad

-No\_VAD Do not incorporate voice activity detector information in output bitstream.

### **Vector Quantization w/o Extension:**

Usage: coder htk\_file\_in bitstream\_file\_out txt\_file\_out -freq x -VAD/No\_VAD htk\_file\_in Input mel-frequency cepstral coefficient file in HTK MFCC format.

bit\_file\_out Binary output bitstream.

txt\_file\_out Vector quantiser output in text format.
-freq x Sampling frequency in kHz (8 or 16).

-VAD Use voice activity detector data. Voice activity input file must have same name as htk\_file, but

extension .vad

-No\_VAD Do not incorporate voice activity detector information in output bitstream.

## File extension descriptions as generated by the sample script:

.cep – Binary file containing cepstral features in HTK format. Output from the FrontEnd, input to the vector quantizer. .pitch – Binary file containing pitch information. Output from the FrontEnd, input to the vector quantizer. Only used for Extension.

.class – Ascii file containing class information. Output from the FrontEnd, input to the vector quantizer. Only used for Extension.

.bs – Binary file containing the bitstream. Output from the vector quantizer.

.log – Log files from the different executables.

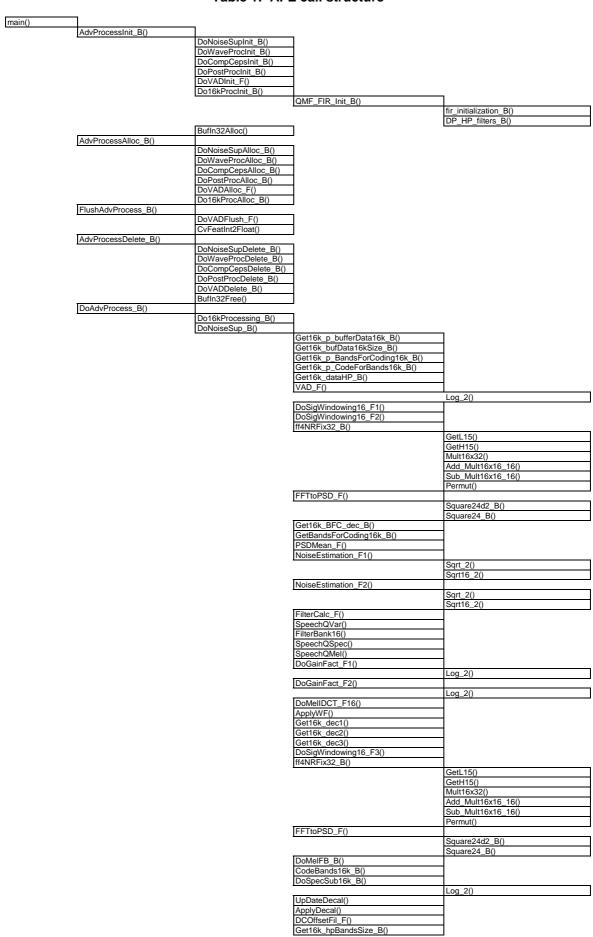
# 4.3 Code hierarchy

Tables 1 to 3 are call graphs that show the functions used for AFE (table 1), VQ (table 2), and Extension (table 3).

Each column represents a call level and each cell a function. The functions contain calls to the functions in rightwards neighboring cells. The time order in the call graphs is from the top downwards as the processing of a frame advances. All standard C functions: printf(), fwrite(), etc. have been omitted. Also, no basic operations (add(), L\_add(), mac(), etc.) or double precision extended operations (e.g. L\_Extract()) appear in the graphs.

The basic operations are not counted as extending the depth, therefore the deepest level in this software is level 7.

Table 1: AFE call structure



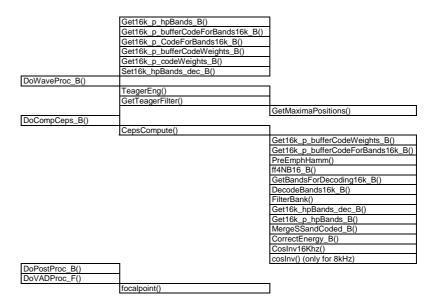
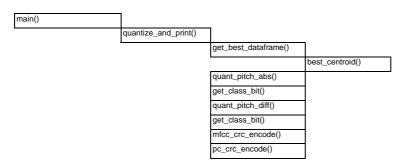
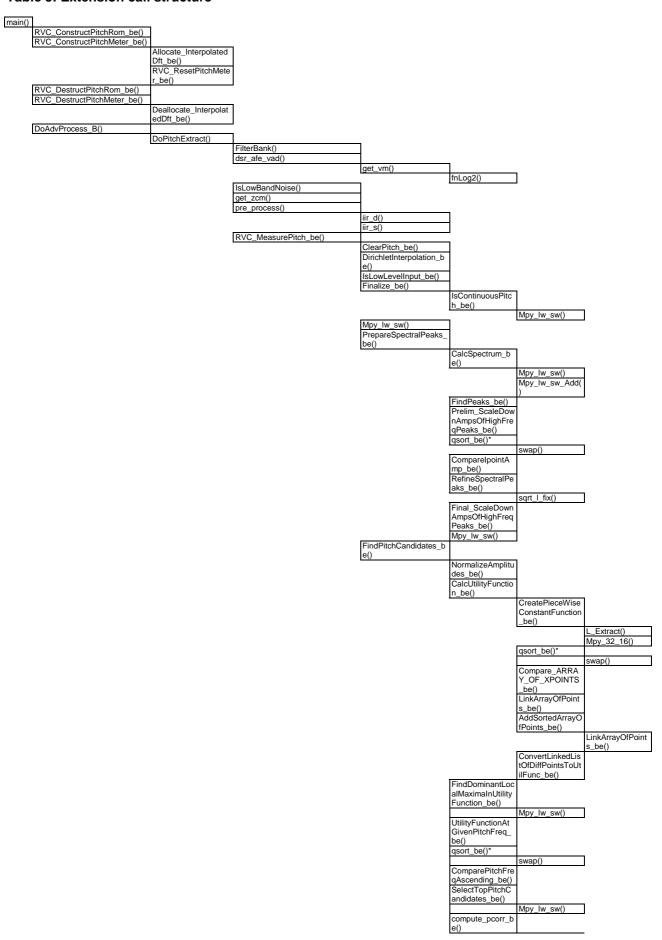
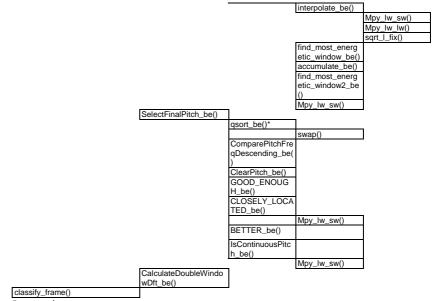


Table 2: VQ call structure



**Table 3: Extension call structure** 





<sup>\*</sup> qsort\_be() is a recursive function

# 4.5 Variables, constants and tables

The data types of variables and tables used in the fixed point implementation are signed integers in 2's complement representation, defined by:

- Word16 16 bit variable;
- Word32 32 bit variable.

# 4.5.1 Description of constants used in the C-code

Table 5a: Global constants for AFE

Constant	Value	Description
NS_SPEC_ORDER_16K	64	Noise suppression Array length
NS_HANGOVER_16K	15	Noise suppression hangover count
NS_MIN_SPEECH_FRAME_HANGOVER_16K	4	Noise suppression minmum speech frame hangover count
NS_ANALYSIS_WINDOW_16K	80	Noise suppression analysis window
PERC_CODED	0.7	lambda merge (empirically set constant)
LAMBDA_NSE16k	0.99	Noise estimation Lambda
NS_NB_FRAME_THRESHOLD_NSE	100	Noise suppression number of frame threshold used for NSE
LENGTH_QMF	118	QMF filter length
f24	1	multiplier for QMF filter coefficients
SHFF_H	8	shift to get higher value
L_H	16	shift to get lower value
HP16k_MEL_USED	3	Higher frequnecy band Mel used
NB_LP_BANDS_CODING	3	Lower frequency band used in coding
NE16k_FRAMES_THRESH	100	Noise estimation frames threshold
NB_TOPOSTPROC	12	Number of coefficients to postprocess
CEP FRAME LENGTH	200	Frame length for cepstral coefficients
CEP NB COEF	13	Number of cepstral coefficients (including c0)
CEP NB CHANNELS	23	Number of filters used for cepstral coefficients
CEP FFT LENGTH	256	FFT length for cepstral coefficients
FRAME_BUF_SIZE	241	Denoised Output buffer size
FRAME SHIFT	80	WaveProcessing input frame shift
FRAME LENGTH	200	WaveProcessing frame size
NS SPEC ORDER	65	Noise suppression array length (8khz)
NS_BUFFER_SIZE	180	Noise suppression past frame size
NS FRAME SHIFT	80	Noise suppression input frame shift
NS HALF FILTER LENGTH	8	Noise suppression filter half size
NS NB FRAME THRESHOLD LTE	10	Noise suppression long term energy forgetting factor threshold (in frames)
NS NB FRAME THRESHOLD NSE	100	Noise suppression spectrum estimate forgetting factor threshold (in frames)
NS MIN FRAME	10	Number of frame threshold to update average energy for Nosie suppression VAD
NS FFT LENGTH	256	FFT length for noise suppression
WF MEL ORDER	25	Noise suppression Wiener filter order
SHFT NOISE	14	shift applied to noise spectrum estimate
SHFT FACT MUL	14	shift applied to gain coefficient (nosie suppression gain factoriization)
IDCT ORDER	25	Noise suppression idct order
NS BETA	0.98	Noiseless signal suppression factor
NS RSB MIN	0.079432823	Minimum a priori SNR
NS LAMBDA NSE	0.99	Forgetting factor for noise spectrum estimate
NS LOG SPEC FLOOR	-10.0	average energy minimum threshold
NS_SNR_THRESHOLD_VAD	15	SNR threshold for noise suppression VAD
NS_SNR_THRESHOLD_UPD_LTE	20	Long term energy update threshold for noise suppression VAD
NS_ENERGY_FLOOR	80	Energy Minimum threshold for noise suppression VAD
MaxPos	10	Maximum number of maxima in waveprocessing
WP EPS	0.2	weigthing value added or substracted for waveprocessing

## Table 5b: Global constants for VQ

Constant	Value	Description
MIN_PERIOD	1245184	Minimum pitch period allowed
MAX_PERIOD	9175040	Maximum pitch period allowed
NUM_MULTI_LEVELS_1	26	number of levels in pitch quantization
NUM_MULTI_LEVELS_2	24	number of levels in pitch quantization
UNVOICED_CODE	0	init value for Qpindex

## Table 5c: Global constants for Extension

Constant	Value	Description
HISTORY_LEN	100	History length - past samples for pitch extraction
DOWN_SAMP_FACTOR	4	Down-sampling factor - used in computing correlation
NO_OF_DFT_POINTS	128	Number of DFT points
BREAK_POINT	12	Break point - marks the end of low frequency band
LBN_HIST_WEIGHT	32440	Low band noise history weight
LBN_CURR_WEIGHT	328	Low band noise current weight (32768 - LBN_HIST_WEIGHT)
LBN_MAX_THR	124518	Low band noise maximum threshold
LBN_LOW_ENR_LEVEL_MANT	32000	Low band noise low energy level mantissa
LBN_LOW_ENR_LEVEL_SHFT	22	Low band noise low energy level shift
RVC_OK	0	Return code for success
RVC_ERR	-1	Return code for unspecified error
RVC_ERR_NOT_ENOUGH_MEMORY	-2	Return code for not enough memory
RVC_ERR_ILLEGAL_ARGUMENT	-3	Return code for an illegal input / output argument
RVC_ERR_IO_FAILED	-4	Return code for failed input / output to a file
RVC_ERR_BAD_FILE_FORMAT	-5	Return code for a bad file header
RVC_ERR_NOT_INITIALIZED	-6	Return code for failure due to improper initialization
RVC_ERR_ILLEGAL_USAGE	-7	Return code for illegal usage of a function
RVC_ERR_NOT_ENOUGH_SAMPLES	-8	Return code for insufficient number of samples
RVC_ERR_NOT_IMPLEMENTED	-9	Return code for an unimplemented function

No.   Proc.	DVC EDD EAT ODEN EILE	I 40	Deturn and for failure to open a file
250.1 TRL			
SOLIC TORN   1942			
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HISTORY LEAD OF THE CONTROL OF THE C		50	
Window Left   18		25	Frame length downsampled divided by 2
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Min. C.   L. MING. S.   Min. C.			
Manufact Animal Section   Manufact Animal			
No.   Sept.   Sept.			
No.   Section			
Section   Sect			
CRES MATAC COMPL		18022	
29491   Sharper process   Sharper   Sharper   Sharper process	CE_SM_FAC_COMPL		
C. GAMAA COMPR		3277	Channel noise energy smoothing factor
G. GAMMA COMPL   99.03   Low gamma value complement			
IE GAMMA			
III GAMANA COURF   3777   https://doi.org/10.1008/j.com/ 19.008191			
10   BETA			
H. BETA			
No.   February			
SINE_START_CHAN   4   Sine_start channel (for sine wave detection)   Peak to variety through   Peak to variety threshold			
PEAK TO AVE THLD         10         Peak to average threshold           PEY THLD         15/23942         Deviction inverteded           PYSTER CNT, THLD         9         Hysteries count threshold           CUPDATE CNT, THLD         300         Proceedings count threshold           FIX SA         24576         Short Count threshold           FIX SA         24576         Short Count of the process count threshold           FIX SA         24576         Short Count of the process count threshold           FIX SA         24576         Short Count of the process count threshold           FIX SA         24576         Short Count of the process count of the proces			
WYSTER, CHT THLD			
NON_SPECH_TH_D	HYSTER_CNT_THLD		Hysteresis count threshold
Fig. 14			
Fig. 18			
FILE   1/1			
WITHER DES ADOWNOTH         85         One third of the reference bandwidth           WITWO THERDS, REF, BANDWIDTH         17         Two thirds of the reference bandwidth           MIN. ENERGY S, MANTISSA         25600         Minimum energy shift           WING ENERGY S, SHIFT         18         Minimum energy shift           WORDS, SAMPLE RATE QO         0x1740         Reference sampling rate in Qo format           WORDS, SAMPLE RATE QO         0x1740         Reference sampling rate in Qo format           WORDS, SAMPLE RATE QO         0x1740         Reference sampling rate in Qo format           WORDS, SAMPLE RATE QO         0x1740         Reference sampling rate in Qo format           WORDS, SAMPLE RATE QO         0x1740         Reference sampling rate in Qo format           WORDS, CARL TO LO 15         0x0571A         Frequency domain score threshold 2 in Q15 format           WORD CRIT CHILD Q 15         0x06867         Sum threshold in Q14 format           WORADOCRR THLD Q 115         0x06967         Sum threshold in Q14 format           WORADOCRR THLD Q 115         0x0607         Pitch candidate correlation threshold 2 in Q15 format           WORADOCRR THLD Q 15         0x0607         Pitch candidate correlation threshold 3 in Q15 format           WORADORD THLD Q 15         0x0607         Pitch candidate correlation threshold 2 in Q15 format	= :		
WITHOUT PHIRDS REF BANDWIDTH			
Minimage			
Minimum energy shift			
SWREFS AMPLE RATE 00         Ox1F40         Reference sampling rate in 0.0 format           WKCLOSE PACTOR 014         Ox4CCD         Closeness factor in 0.14 format           WKPD SCORE, THLD1, 015         0x6307         Frequency domain score threshold 2 in 0.15 format           WKD SCORE, THLD2 015         0x6507         Frequency domain score threshold 2 in 0.15 format           WKCRTD, OFFSET, 015         0x6517         Correlation threshold in 0.15 format           WKCRTD, OFFSET, 015         0x000170A         Offset for finding a better pitch enaddate in 0.15 format           WKCRTD, OFFSET, 015         0x000170A         Offset for finding a better pitch enaddate in 0.15 format           WKCANDORR, THLD3, 0.15         0x060CD         Pitch candidate correlation threshold 1 in 0.15 format           WKCANDORR, THLD3, 0.15         0x06CD         Pitch candidate correlation threshold 1 in 0.15 format           WKDARDORR, THLD3, 0.15         0x06CD         Pitch candidate correlation threshold 1 in 0.15 format           WKDARDORR, THLD3, 0.15         0x06EPC         Pitch candidate correlation threshold 1 in 0.15 format           WKDARDORR, THLD3, 0.15         0x06EPC         Pitch candidate correlation threshold 1 in 0.15 format           WKDARDORR, THLD3, 0.15         0x06EPC         Pitch candidate correlation threshold 1 in 0.15 format           WKDARDORR, THLD3, 0x1         0x16EPC         Pitch candida			
swFD_SCORE_THILD_G15         0x8307         Frequency domain score threshold 1 in Q15 format           swFD_SCORE_THILD_Q15         0x670A         Frequency domain score threshold 2 in Q15 format           swCORT_HLD_Q15         0x651F         Correlation threshold in Q15 format           wCRITD_OFFSET_Q15         0x0000170A         Offset for finding a better pitch candidate in Q15 format           wCANDCORR_THLD2_Q15         0x0000170A         Offset for finding a better pitch candidate correlation threshold in Q15 format           swCANDCORR_THLD3_Q15         0x0590A         Pitch candidate correlation threshold 3 in Q15 format           swCANDCORR_THLD3_Q15         0x069F6         Pitch candidate correlation threshold 3 in Q15 format           swCANDCORR_THLD3_Q15         0x069F6         Pitch candidate correlation threshold 3 in Q15 format           swCANDCORR_THLD3_Q15         0x069F6         Pitch candidate amplitude threshold 3 in Q15 format           swCANDCORR_THLD3_Q15         0x069F6         Pitch candidate amplitude threshold 3 in Q15 format           swCANDCORR_THLD3_Q15         0x069F6         Pitch candidate correlation threshold 3 in Q15 format           swCROPER_Q COEFF         0x069F6         Pitch candidate correlation threshold 3 in Q15 format           swCROPER_Q COEFF         0x069F6         Pitch candidate correlation threshold 3 in Q15 format           swCROPER_Q COEFF         0x069F6			
SWFD_SCORE_THLD2_Q15         Ox570A         Frequency domain score threshold 2 in Q15 format           SWCORR_THLD_Q15         0x651F         Ox76667         Sum threshold in Q15 format           SWCANT_THLD_Q14         0x6667         Sum threshold in Q15 format           WCRTD_OFFSET_Q15         0x0000170A         Ox799A         Ptch candidate correlation threshold 1 in Q15 format           SWCANDCORR_THLD2_Q15         0x599A         Ptch candidate correlation threshold 3 in Q15 format           SWCANDCORR_THLD3_Q15         0x565P         Ptch candidate correlation threshold 3 in Q15 format           SWCANDARP_THLD3_Q15         0x565P         Ptch candidate correlation threshold 3 in Q15 format           SWSTARTTREQ_COEFF         0x555P         Slant frequency coefficient (for candidate search)           William Frequency         0x666E         And frequency coefficient (for candidate search		0x4CCD	
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sws.UM. THLD. 0.14         Ox6667         Jum threshold in Q14 format           wCRTD.OFFST. Q15         0x0000170A         D789A         Pitch candidate correlation threshold in Q15 format           swCANDOORR. THLD2, Q15         0x799A         Pitch candidate correlation threshold 1 in Q15 format           swCANDOORR. THLD3, Q15         0x65CD         Pitch candidate correlation threshold 3 in Q15 format           swCANDADAP. THLD3, Q15         0x65CD         Pitch candidate surplitude threshold 3 in Q15 format           swSTARTREG, COEFF         0x553F         Start frequency coefficient (for candidate search)           swSTARTREG, COEFF         0x553F         Start frequency coefficient (for candidate search)           DIRICHLET, KERNEL SPAN         8         Direchtek kemal span (for interpolation)           REF, SAMPLE, RATE         80000         Reference sampling rate           REF, SAMPLE, RATE         80000         Reference sampling rate           REF, SAMPLE, BANDWIDTH         174762667         Two thricks of the reference bandwidth           wTHIRD, REF, BANDWIDTH         174762667         Two thricks of the reference bandwidth           wWFWE, CHEIGHT         0x1800         Side weight           swAMP, SCALE, DOWN12         0x393A         Amplitude scale down factor 2           swAMP, SCALE, DOWN2         0x393A         Amplitude scale down fac			
WCRTIO_OFFSET_015         0x0000170A         Offset for finding a better pitch candidate in C15 format           WCANDCORR_THLD2_015         0x799A         Pitch candidate correlation threshold 2 in 015 format           WCANDCORR_THLD2_015         0x599A         Pitch candidate correlation threshold 2 in 015 format           WCANDAWP_THLD3_015         0x66CD         Pitch candidate correlation threshold 3 in 015 format           WCANDAWP_THLD3_015         0x66ED         Pitch candidate correlation threshold 3 in 015 format           WCANDAWP_THLD3_015         0x66ED         Pitch candidate correlation threshold 3 in 015 format           WSCANDCORR_TRAND         0x66ED         Pitch candidate correlation threshold 3 in 015 format           WSCANDER_CREP_COEFF         0x666E         End frequency coefficient (for candidate search)           DIRCHLET_KERREL_SPAN         8         Discribet kemal span (for interpolation)           WFEF_SANDWIDTH         4000         Reference sampling rate           WFEF_BANDWIDTH         87391333         One third of the reference bandwidth           WITHER DEEP SANDWIDTH         174762667         The othrise of the reference bandwidth           WWO_THIRDS_REF_BANDWIDTH         174762667         The othrise of the reference bandwidth           WWO_THIRDS_ADDWIDTH         174762667         The othrise of the reference bandwidth           WWO_THER_WIGHT <td></td> <td></td> <td></td>			
swCANDCORR_THLD1_G15         0x799A         Pitch candidate correlation threshold 1 in Q15 format           swCANDCORR_THLD3_Q15         0x599A         Pitch candidate correlation threshold 3 in Q15 format           swCANDCORR_THLD3_Q15         0x68CD         Pitch candidate correlation threshold 3 in Q15 format           swSTARTREO_COEFF         0x553F         Start frequency coefficient (for candidate search)           swSTARTREO_COEFF         0x563F         Start frequency coefficient (for candidate search)           DIRCHLET_KERNEL_SPAN         8         Direchlet kernal span (for interpolation)           REF_SAMPLE_RATE         8         Direchlet kernal span (for interpolation)           REF_BANDWIDTH         4000         Reference sampling rate           REF_BANDWIDTH         97381333         One third of the reference bandwidth           wTWO_THIRDS_REF_BANDWIDTH         174762667         Two thirds of the reference bandwidth           wTWO_THIRDS_REF_BANDWIDTH         0x5000         Center weight           swSIDE_WEIGHT         0x1800         Side weight           swAAP_SCALE_DOWN1         0x5333         Amplitude scale down factor 1           swAAP_SCALE_DOWN2         0x3949A         Amplitude scale down factor 2           swUDIST2         4600         Utility function distance 2           swUDIST3         4760			
swCANDCORR_THLD2_Q15         0x599A         Prich candidate correlation threshold 2 in Q15 formats           swCANDCORR_THLD3_Q15         0x66CD         Prich candidate correlation threshold 3 in Q15 formats           swCANDAMP_THLD3_Q15         0x65EF         Prich candidate correlation threshold 3 in Q15 formats           swSTARTFREQ_COEFF         0x65EF         Prich candidate correlation (or candidate search)           DIRCHLET_KERNEL_SPAN         8         Direchte Kennel span (for interpolation)           REF SAMPLE_RATE         8000         Reference sampling rate           REF_BANDWIDTH         4000         Reference bandwidth           WTHIRD REF_BANDWIDTH         87391333         One third of the reference bandwidth           WTWO_THIRDS_REF_BANDWIDTH         873913333         One third of the reference bandwidth           WTWO_THIRDS_REF_BANDWIDTH         174762667         Two thirds of the reference bandwidth           WTWO_THIRDS_REF_BANDWIDTH         0x5800         Center weight           SwCENTER_WEIGHT         0x5800         Center weight           SwADE_BEL_DOWN1         0x5333         Amplitude scale down factor 1           SwAMP_SCALE_DOWN2         0x399A         Amplitude scale down factor 2           SwADP_SCALE_DOWN2b         0x7333         Amplitude scale down factor 2           SwADP_SCALE_DOWN2b         0x73			
swCANDOCRR_THLD3_Q15         Ox6CCD         Pich candidate correlation threshold 3 in Q15 format           swCANDAMP_THLD3_Q15         Ox68F6         Pich candidate amplitude threshold 3 in Q15 format           swSTARTREQ_COEFF         0x553F         Staff frequency coefficient (for candidate search)           SwSTARTREQ_COEFF         0x563F         Staff frequency coefficient (for candidate search)           DIRICHLET KERNEL_SPAN         8         Direchlet kemal span (for interpolation)           REF_BANDWIDTH         4000         Reference sampling rate           REF_BANDWIDTH         4000         Reference bandwidth           wTHIRD_REF_BANDWIDTH         112762667         Two thirds of the reference bandwidth           wTWO_THIRDS_REF_BANDWIDTH         112762667         Two thirds of the reference bandwidth           wTWO_THIRDS_REF_BANDWIDTH         112762667         Two thirds of the reference bandwidth           wWTWO_SCALE_DOWN         0x5000         Side weight           swSIDE_WEIGHT         0x1600         Side weight           swADP_SCALE_DOWN         0x5030         Araplitude scale down factor 1           swADP_SCALE_DOWN         0x5030         Araplitude scale down factor 2           swLDISTS         4160         Utility function distance 2           swLDISTS         4160         Utility function distance 2 <td></td> <td></td> <td></td>			
swCANDAMP_THLD3_Q15 swSADRATERED_COEFF 0x565F 0x565F 0x666F 0x666			
swSTARTEREQ_COEFF			
swENDFREQ_COEFF  Ox4666 End frequency coefficient (for candidate search)  DIRCHLET_KERNEL_SPAN  B Direchlet Kernel span (in interpolation)  REF_SAMPLE_RATE  8000 Reference sampling rate  REF_BANDWIDTH  4000 Reference bandwidth  WTHIRD REF_BANDWIDTH  174762667 Two thirds of the reference bandwidth  WTHIRD REF_BANDWIDTH  174762667 Two thirds of the reference bandwidth  WTHIRD REF_BANDWIDTH  174762667 Two thirds of the reference bandwidth  SWEDE_WEIGHT  0x5000 Center weight  SWEDIE_WEIGHT  0x5001 Side weight  SWAMP_SCALE_DOWN1  SWAMP_SCALE_DOWN2  0x3333 Amplitude scale down factor 1  SWAMP_SCALE_DOWN2  0x393A Amplitude scale down factor 2  SWAMP_SCALE_DOWN2  0x393A Amplitude scale down factor 2  WEIGHT  SWAMP_SCALE_DOWN2  0x393A Amplitude scale down factor 2  WUSIST  4-1600 Uility function distance 2  Uility function distance 2  WUSIST  4-6400 Uility function distance 3  WISIST  4-6400 Uility function distance 1  WISIST  4-6400 Uility function distance 1  WISIST  4-6400 Uility function distance 1  WISIST  4-6400 Uility function distance 2  WISIST  4-6400 Uility function distance 2  WISIST  4-6400 Uility function distance 1  WISI			
REF SAMPLE RATE  8000 Reference sampling rate REF BANDWIDTH  4000 Reference bandwidth  WTHIRD REF BANDWIDTH  87381333 One third of the reference bandwidth  WTWO_THIRDS_REF_BANDWIDTH  174762667 Two thirds of the reference bandwidth  WTWO_THIRDS_REF_BANDWIDTH  0x5000 Center weight  SwiSIDE_WEIGHT  0x5000 Center weight  0x5333 Amplitude scale down factor 1  SwAMP_SCALE_DOWN2  0x393A Amplitude scale down factor 2  3wAMP_SCALE_DOWN2  0x7333 Amplitude scale down factor 2b  WUDIST1  4-1600 Utility function distance 1  WILL WILL WILL WILL WILL WILL WILL WIL	swENDFREQ_COEFF		
REF BANDWIDTH 8731333 On Pilifo of the reference bandwidth wITHIRO REF BANDWIDTH 174762667 Two thirds of the reference bandwidth wITHIRO THERE AND WIDTH 174762667 Two thirds of the reference bandwidth wXCENTER WEIGHT 0x5000 Center weight 0x5000 Side weight 0x5000 Side weight 0x5030 Amplitude scale down factor 1 0x5030 Amplitude scale down factor 2 0x5030 Amplitude scale down fac	DIRICHLET_KERNEL_SPAN	8	Direchlet kernal span (for interpolation)
WTHIRD REF_BANDWIDTH			
Image: Content   Imag			
swCENTER_WEIGHT         0x5000         Center weight           swSIDE_WEIGHT         0x1800         Side weight           swAMP_SCALE_DOWN1         0x5333         Amplitude scale down factor 1           swAMP_SCALE_DOWN2         0x399A         Amplitude scale down factor 2           swAMP_SCALE_DOWN2b         0x7333         Amplitude scale down factor 2b           swUDIST1         -4160         Utility function distance 1           swUDIST2         -6400         Utility function stance 2           swLSTEP         -16384         Utility function step           swFREQ_MARGIN1         0x4AE1         Frequency margin 1           swAMP_MARGIN2         0x07AE         Amplitude margin 2           MIN_STABLE_FRAMES         6         Minimum number of stable frames           MAX_TRACK_GAP_FRAMES         2         Maximum pitch track gap frames           swSTABLE_FREQ_UPPER_MARGIN         0x68EB         Stable frequency lower margin           UNVOICED         0         Pitch frequency of an unvoiced frame           wMAX_PITCH_FREQ         0x014A0000L         Maximum pitch frequency in Hz           MIN_PITCH_FREQ         0x00340000L         Minimum pitch frequency in Hz           MIGHTPAFERQ         0x00C80000L         Minimum pitch frequency in Hz           MICHARA			
SWSIDE WEIGHT         0x1800         Side weight           swAMP_SCALE DOWN1         0x5333         Amplitude scale down factor 1           swAMP_SCALE DOWN2         0x399A         Amplitude scale down factor 2           swAMP_SCALE DOWN2b         0x7333         Amplitude scale down factor 2b           swUDIST1         -4160         Utility function distance 1           swUDIST2         -6400         Utility function distance 2           swUSTEP         -16384         Utility function distance 2           swFREQ MARGIN1         0x4AE1         Frequency margin 1           swAMP_MARGIN1         0x07AE         Amplitude margin 2           swAMP_MARGIN1         0x07AE         Amplitude margin 1           swAMP_MARGIN2         0x07AE         Amplitude margin 2           MIN_STABLE FRAMES         6         Minimum number of stable frames           swSTABLE_FREQ_UPPER_MARGIN         0x6EB         Stable frequency upper margin           swSTABLE_FREQ_UPPER_MARGIN         0x6EB         Stable frequency on a unvoiced frame           UNYOICED         0         Pitch frequency of an unvoiced frame           WMAX_PITCH_FREQ         0x01440000L         Maximum pitch frequency           WMX_PITCH_FREQ         0x00440000L         Maximum pitch frequency in Hz           W			
SWAMP_SCALE_DOWN12         0x5333         Amplitude scale down factor 1           SWAMP_SCALE_DOWN2b         0x7333         Amplitude scale down factor 2           SWAMP_SCALE_DOWN2b         0x7333         Amplitude scale down factor 2b           SWUDIST1         -4160         Utility function distance 1           SWUDIST2         -6400         Utility function distance 2           SWUSTEP         -16384         Utility function distance 2           SWAMP_MARGIN1         0x07AE         Amplitude margin 1           SWAMP_MARGIN2         0x07AE         Amplitude margin 1           MIN_STABLE_FRAMES         6         Minimum number of stable frames           MAX_TRACK_GAP_FRAMES         2         Maximum per of stable frames           MAX_TRACK_GAP_FRAMES         3         Stable frequency lower margin           UNYOICED         0         Pitch frequency lower margin <t< td=""><td></td><td></td><td></td></t<>			
SWAMP_SCALE_DOWN2 SWAMP_SCALE_DOWN2b SWAMP_SCALE_DOWN2b SWAMP_SCALE_DOWN2b SWAMP_SCALE_DOWN2b SWAMP_SCALE_DOWN2b SWAMP_SCALE_DOWN2b SWAMP_MCATT  -4160 Uility function distance 1 SWDDIST2 -6400 Uility function distance 2 Uility function stepe 1-16384 Uility function step SWFREQ_MARGIN1 SWAMP_MARGIN1 SWAMP_MARGIN2 OX07AE Amplitude margin 1 SWAMP_MARGIN2 OX07AE Amplitude margin 1 SWAMP_MARGIN2 OX07AE Amplitude margin 1 SWAMP_MCATTALE_FRAMES 6 Minimum number of stable frames MAX_TRACK_GAP_FRAMES 2 MAXIMIN pith track gap frames SWSTABLE_FREQ_UPPER_MARGIN OX4E14 Stable frequency upper margin SWSTABLE_FREQ_UPPER_MARGIN OX4E14 Stable frequency lower margin UNVOICED 0 Pitch frequency of an unvoiced frame WMAX_PITCH_FREQ OX01A40000L MAX_PITCH_FREQ MAX_PITC			·
SWAMP_SCALE_DOWN2b  WATER SWUDIST2  -6400  Utility function distance 1  SWUDIST2  -6400  Utility function distance 2  SWUSTEP  -16384  Utility function distance 2  SWUSTEP  -16384  Utility function distance 2  SWUSTEP  -16384  Utility function distance 1  SWAMP_MARGIN1  SWAMP_MARGIN1  SWAMP_MARGIN2  SWAMP_MARGIN2  MIN_STABLE_FRAMES  -6 Minimum number of stable frames  MAX_TRACK_GAP_FRAMES  -6 Minimum number of stable frames  MAX_TRACK_GAP_FRAMES  -7 Maximum pitch track gap frames  SWSTABLE_FREQ_UPPER_MARGIN  MAX_PITCH_FREQ  SWSTABLE_FREQ_UPPER_MARGIN  MAX_PITCH_FREQ  SWSTABLE_FREQ_UPPER_MARGIN  MINIMIMIMIT SWSTABLE_FREQ  SWSTABLE_FREQ_UPPER_MARGIN  SWSTABLE_FREQ_UPP			
SWUDIST1			
SwUSTEP  swFREQ_MARGIN1  0x4AE1 Frequency margin 1  swAMP_MARGIN2  0x07AE Amplitude margin 2  Maximum pither stable frames  MAX_TRACK_GAP_FRAMES  2 Maximum pith track gap frames  swSTABLE_FREQ_UPPER_MARGIN  0x6EB Stable frequency topper margin  swSTABLE_FREQ_LOWER_MARGIN  0x6EB Stable frequency topper margin  swAMP_ITCH_FREQ  0x01A40000L Maximum pitch frequency of an unvoiced frame  low MAX_PITCH_FREQ  0x0340000L Minimum pitch frequency  MAX_PITCH_FREQ  420 Maximum pitch frequency  MAX_PITCH_FREQ  420 Maximum pitch frequency in Hz  MIN_PITCH_FREQ  420 Maximum pitch frequency in Hz  MIN_PITCH_FREQ  420 Maximum pitch frequency in Hz  MIN_PITCH_FREQ  420 Minimum pitch frequency  MIN_PITCH_FREQ  420 Minimum on the frequency  Minimum on the frequency  Minimum on the frequency  Minimum on the spectrum  MAX_PEAKS_FOR_SORT  30 Maximum number of local maxima on the spectrum  MAX_PEAKS_FOR_SORT  30 Maximum number of peaks (final)  MAX_PEAKS_FINAL  40 Maximum number of peaks (final)  MAX_PEAKS_FINAL  41 Maximum number of peaks (final)  MAX_PEAKS_FUNC_LOOP_LIM_SNG  30 Create Piecewise function loop limit for short window	swUDIST1		Utility function distance 1
SWFREQ MARGIN1 SWAMP_MARGIN2 OXO7AE Amplitude margin 1 SWAMP_MARGIN2 OXO7AE Amplitude margin 1 SWAMP_MARGIN2 OXO7AE Amplitude margin 1 SWAMP_MARGIN2 MIN STABLE FRAMES 6 Minimum number of stable frames MAX_TRACK_GAP_FRAMES 2 Maximum pitch track gap frames SWSTABLE_FREQ_UPPER_MARGIN OX4E14 Stable frequency upper margin SWSTABLE_FREQ_UPVER_MARGIN OX68EB SWSTABLE_FREQ_UPVER_MARGIN OX68EB Stable frequency upper margin UNVOICED 0 Pitch frequency of an unvoiced frame WMAX_PITCH_FREQ OX01A40000L Maximum pitch frequency of mary moviced frame WMAX_PITCH_FREQ OX0340000L Minimum pitch frequency in Hz HIGHPASS_CUTOFF_FREQ S2 Minimum pitch frequency in Hz HIGHPASS_CUTOFF_FREQ S300 Highpass cut-off frequency in Hz HIGHPASS_CUTOFF_FREQ OX00C80000L Short window end frequency IwSHORT_WIN_START_FREQ OX00C80000L Short window end frequency IwSHORT_WIN_START_FREQ OX00C80000L Short window end frequency IwSINGLE_WIN_END_FREQ OX00C80000L Single window end frequency IwDOUBLE_WIN_END_FREQ OX00C80000L OX00FROOD OX0FREQ OX00C80000L OX0FREQ OX00C80000L OX0FREQ			
swAMP_MARGIN1			
SWAMP_MARGIN2  MIN_STABLE_FRAMES  6 Minimum number of stable frames  MAX_TRACK_GAP_FRAMES  2 Maximum pitch track gap frames  SWSTABLE_FREQ_UPPER_MARGIN  0x4E14  Stable frequency upper margin  SWSTABLE_FREQ_LOWER_MARGIN  0x68EB  Stable frequency lower margin  UNVOICED  0 Pitch frequency of an unvoiced frame  WMAX_PITCH_FREQ  0x01A40000L  Maximum pitch frequency  WMIN_PITCH_FREQ  0x00340000L  Minimum pitch frequency  WMIN_PITCH_FREQ  MAX_PITCH_FREQ  10 Maximum pitch frequency  Minimum pitch frequency  MIN_PITCH_FREQ  10 Maximum pitch frequency  MIN_PITCH_FREQ  MAX_PITCH_FREQ  11 Minimum pitch frequency  MIN_PITCH_FREQ  12 Minimum pitch frequency  MIN_PITCH_FREQ  Max_PITCH_FREQ  M			
MIN_STABLE_FRAMES  AMA_TRACK_GAP_FRAMES  AMA_MARGIN  A			
MAX_TRACK_GAP_FRAMES  swSTABLE_FREQ_UPPER_MARGIN  0x68EB  Stable frequency lower margin  0x08EB  stable frequency of an unvoiced frame  swSTABLE_FREQ_LOWER_MARGIN  0x01A40000L  0 Pitch frequency of an unvoiced frame  lwMAX_PITCH_FREQ  0x01A40000L  Maximum pitch frequency  MAX_PITCH_FREQ  420  Maximum pitch frequency in Hz  MIN_PITCH_FREQ  420  Minimum pitch frequency in Hz  Minimum sitch frequency  Minimum number of local maxima on the spectrum  Minimum sitch frequency  Maximum number of local maxima on the spectrum  Minimum sitch frequency  Minimu			
swSTABLE_FREQ_UPPER_MARGIN  0x4E14  Stable frequency upper margin  0x68EB  Stable frequency lower margin  0 Pitch frequency of an unvoiced frame  IMMAX_PITCH_FREQ  0x01A40000L  Maximum pitch frequency  MMIN_PITCH_FREQ  0x0340000L  Minimum pitch frequency  MMX_PITCH_FREQ  420  Maximum pitch frequency in Hz  MIN_PITCH_FREQ  420  Maximum pitch frequency  Max_PITCH_FREQ  420  Maximum pitch frequency  Max PITCH_FREQ  420  Maximum pitch frequency  Max PITCH_FREQ  420  Maximum number of lacinos in Hz  Max_PEAKS_PRELIM  70  Maximum number of peaks (preliminary)  MIN_PEAKS  72  Minimum number of peaks (preliminary)  MIN_PEAKS_FINAL  40  Maximum number of peaks (final)  Max_PRELIM_CANDS  Create Piecewise function loop limit for single window  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  Create Piecewise function loop limit for single window  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  Average  30  Create Piecewise function loop limit for single window  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  30  Create Piecewise function loop limit for single window			
SWSTABLE_FREQ_LOWER_MARGIN  Ox68EB  Stable frequency lower margin  Ox01A40000L  Maximum pitch frequency  IMMAX_PITCH_FREQ  Ox01A40000L  Minimum pitch frequency  MAX_PITCH_FREQ  MAX_PITCH_FREQ  MAX_PITCH_FREQ  MAX_PITCH_FREQ  MIN_PITCH_FREQ  MIN_MIN_PITCH_FREQ  MIN_MIN_PITCH_FREQ  MIN_PEAKS_PRELIM  MIN_PEAKS_PRELIM  MIN_PEAKS_PRELIM  MIN_PEAKS_PINAL  MIN_PRELIM_CANDS  MIN_MIN_PITCH_FREQ  MIN_MIN_MIN_PITCH_FREQ  MIN_MIN_MIN_MIN_MIN_MIN_MIN_MIN_MIN_MIN_			
UNVOICED  0 Pitch frequency of an unvoiced frame  IMMAX_PITCH_FREQ  0x01A40000L Maximum pitch frequency  MAX_PITCH_FREQ  0x0034000U Minimum pitch frequency  MAX_PITCH_FREQ  420 Maximum pitch frequency in Hz  MIN_PITCH_FREQ  420 Maximum pitch frequency in Hz  MIN_PITCH_FREQ  MIN_PITCH_FREQ  420 Maximum pitch frequency in Hz  MIN_PITCH_FREQ  MO0068000L Minimum pitch frequency in Hz  MIN_PITCH_FREQ  MO0068000L Short window start frequency  MIN_PITCH_FREQ  MO0068000L Short window start frequency  MIN_PITCH_FREQ  MO0068000L Single window start frequency  MIN_POUBLE_WIN_START_FREQ  MO0068000L Single window end frequency  MIN_POUBLE_WIN_START_FREQ  MO0078000L Double window end frequency  MAX_POUBLE_WIN_END_FREQ  MO0078000L Double window end frequency  MAX_POUBLE_WIN_END_FREQ  MAXIMUM number of local maxima on the spectrum  MAX_PEAKS_FOR_SORT  MIN_PEAKS  MAX_MIN_MIN_PEAKS  MIN_MIN_PEAKS  MIN_MIN_PEAKS  MIN_MIN_MIN_PEAKS  MIN_MIN_MIN_MIN_MIN_MIN_MIN_MIN_MIN_MIN_			
WMIN_PITCH_FREQ	UNVOICED	0	Pitch frequency of an unvoiced frame
MAX_PITCH_FREQ  MIN_PITCH_FREQ  52 Minimum pitch frequency in Hz  MIN_PITCH_FREQ  53 Minimum pitch frequency in Hz  HighPASS_CUTOFF_FREQ  300 Highpass cut-off frequency in Hz  NO_OF_FRACS  77 Number of fractions in the frations table  WSHORT_WIN_START_FREQ  WSHORT_WIN_END_FREQ  WSHORT_WIN_END_FREQ  WSHORE_WIN_END_FREQ  WSHORE_WIN_END_FREQ  WSHORE_WIN_END_FREQ  WSOUCE  WSHORE_WIN_END_FREQ  WSOUCE  WSHORE_WIN_END_FREQ  WSOUCE  WSHORE_WIN_END_FREQ  WX00020000L  Single window start frequency  WSINGLE_WIN_END_FREQ  WX00020000L  Single window end frequency  WDOUBLE_WIN_START_FREQ  WX00020000L  WDOUBLE_WIN_END_FREQ  WX00020000L  WDOUBLE_WIN_END_FREQ  WX00020000L  WAX_PEAKS_FOR_SORT  MAX_PEAKS_FOR_SORT  MAX_PEAKS_PRELIM  7 Maximum number of peaks (preliminary)  MIN_PEAKS  7 Minimum number of peaks (final)  MAX_PEAKS_FINAL  20 Maximum number of peaks (final)  MAX_PERLIM_CANDS  CREATE_PIECEWISE_FUNC_LOOP_LIM_SH  20 Create Piecewise function loop limit for single window  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  X00000000L  Number of frequency  MAX_MAX_PEAKB  MAX_PECAMS_FINAL  MAX_PECAMS_FINAL  MAX_PECAMS_FUNC_LOOP_LIM_SNG  X0000000L  Maximum number of peaks (final)  MAX_PECAMS_FUNC_LOOP_LIM_SNG  X0000000L  Maximum number of peaks (preliminary candidates (pitch)  Create Piecewise function loop limit for single window			
MIN_PITCH_FREQ  52 Minimum pitch frequency in Hz  HIGHPASS_CUTOFF_FREQ  300 Highpass cut-off frequency in Hz  Number of fractions in the frations table  wshort_Win_START_FREQ  0x00C80000L Short window start frequency wshort_Win_End_FreQ  0x01A40000 Short window end frequency wshort_Win_START_FREQ  0x00B40000L Single window start frequency wsingle_Win_START_FREQ  0x00D20000L Single window end frequency wsingle_Win_START_FREQ  0x00D20000L Single window end frequency wsingle_win_START_FREQ  0x00D20000L Single window end frequency wdow end frequency wdx_DEAKS_FOR_SORT  30 Maximum number of local maxima on the spectrum MAX_PEAKS_PELIM  70 Maximum number of peaks (preliminary) MIN_PEAKS  71 Minimum number of peaks MAX_PEAKS_FINAL  20 Maximum number of peaks MAX_PEAKS_FINAL  20 Maximum number of peaks MAX_PEAKS_FINAL  40 Maximum number of peaks MAX_PELIM_CANDS CREATE_PIECEWISE_FUNC_LOOP_LIM_SH CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG Create Piecewise function loop limit for short window CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG Create Piecewise function loop limit for single window			
HIGHPASS_CUTOFF_FREQ 300 Highpass cut-off frequency in Hz NO_OF_FRACS 77 Number of fractions in the frations table WSHORT_WIN_START_FREQ 0x00C80000L WSHORT_WIN_END_FREQ 0x01A40000 Short window start frequency WSINGLE_WIN_START_FREQ 0x00640000L Single window start frequency WSINGLE_WIN_START_FREQ 0x00640000L Single window start frequency WSINGLE_WIN_END_FREQ 0x00340000 Double window end frequency WDOUBLE_WIN_START_FREQ 0x00340000 Double window start frequency WDOUBLE_WIN_END_FREQ 0x00780000L Double window end frequency WAX_LOCAL_MAXIMA_ON_SPECTRUM 70 Maximum number of local maxima on the spectrum MAX_PEAKS_PRELIM 7 Maximum number peaks for sorting MAX_PEAKS_PRELIM 7 Maximum number of peaks MAX_PEAKS_PRELIM 7 Minimum number of peaks MAX_PEAKS_FINAL 20 Maximum number of peaks MAX_PEALS_FUNC_LOOP_LIM_SH 20 Create Piecewise function loop limit for short window CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG 30 Create Piecewise function loop limit for single window			
NO_OF_FRACS  WSHORT_WIN_START_FREQ  0x00C80000L Short window start frequency WSHORT_WIN_END_FREQ  0x01A40000 Short window end frequency Short window end frequency WSINGLE_WIN_START_FREQ  0x00B40000L Single window end frequency WSINGLE_WIN_START_FREQ 0x00D20000L Single window end frequency WDOUBLE_WIN_START_FREQ 0x00340000 Double window end frequency WDOUBLE_WIN_END_FREQ 0x00780000L Double window end frequency WDOUBLE_WIN_END_FREQ 0x00780000L Double window end frequency MAX_LOCAL_MAXIMA_ON_SPECTRUM 70 Maximum number of local maxima on the spectrum MAX_PEAKS_FOR_SORT 30 Maximum number of peaks (preliminary) MIN_PEAKS 7 Minimum number of peaks (preliminary) MIN_PEAKS 7 Minimum number of peaks MAX_PEAKS_FINAL 20 Maximum number of peaks (final) MAX_PRELIM_CANDS 4 Maximum number of preliminary candidates (pitch) CREATE_PIECEWISE_FUNC_LOOP_LIM_SH 20 Create Piecewise function loop limit for short window CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG 30 Create Piecewise function loop limit for single window			
WSHORT_WIN_START_FREQ  WSHORT_WIN_END_FREQ  WSHORT_WIN_END_FREQ  WSHORT_WIN_END_FREQ  WSHORT_WIN_END_FREQ  WSOMADOWNOL  WSINGLE_WIN_START_FREQ  WSOMADOWNOL  WSHOEL_WIN_START_FREQ  WSOMADOWNOL  WDOUBLE_WIN_START_FREQ  WSOMADOWNOL  WDOUBLE_WIN_START_FREQ  WSOMADOWNOL  WDOUBLE_WIN_END_FREQ  WSOMADOWNOL  Double window start frequency  WAX_LOCAL_MAXIMA_ON_SPECTRUM  MAX_PEAKS_FOR_SORT  MAX_PEAKS_PRELIM  TO  Maximum number of local maxima on the spectrum  MAX_PEAKS_PRELIM  TO  Maximum number of peaks (preliminary)  MIN_PEAKS  TO  Minimum number of peaks (final)  MAX_PEAKS_FINAL  DO  MAXIMUM number of peaks (final)  MAX_PERLIN_CANDS  THE START SHORT WARRING (FINAL)  AMAX_MAX_PEAKIS_FUNC_LOOP_LIM_SH  DO  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  Single window start frequency  WXODC8000L  Double window end frequency  Maximum number of local maxima on the spectrum  Maximum number of local maxima on the spectrum  Maximum number of peaks (preliminary)  Min_max_peaks_FOR_SORT  Minimum number of peaks (preliminary)  MIN_PEAKS  TO  Maximum number of peaks  MAX_PEALIN_CANDS  Create Piecewise function loop limit for short window  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  Create Piecewise function loop limit for single window			
IwSHORT_WIN_END_FREQ     0x01A40000     Short window end frequency       IwSINGLE_WIN_START_FREQ     0x00640000L     Single window start frequency       IwDOUBLE_WIN_START_FREQ     0x00340000     Double window end frequency       IwDOUBLE_WIN_END_FREQ     0x00340000     Double window start frequency       IwDOUBLE_WIN_END_FREQ     0x00780000L     Double window end frequency       MAX_LOCAL_MAXIMA_ON_SPECTRUM     70     Maximum number of local maxima on the spectrum       MAX_PEAKS_FOR_SORT     30     Maximum number peaks for sorting       MAX_PEAKS_PRELIM     7     Maximum number of peaks (preliminary)       MIN_PEAKS     7     Minimum number of peaks (final)       MAX_PEAKS_FINAL     20     Maximum number of peaks (final)       MAX_PRELIM_CANDS     4     Maximum number of peaks (final)       CREATE_PIECEWISE_FUNC_LOOP_LIM_SH     20     Create Piecewise function loop limit for short window       CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG     30     Create Piecewise function loop limit for single window			
WSINGLE_WIN_START_FREQ  WSINGLE_WIN_END_FREQ  0x000640000L  Single window start frequency  Single window end frequency  WDOUBLE_WIN_START_FREQ  0x00340000  Double window start frequency  WDOUBLE_WIN_END_FREQ  0x00780000L  Double window end frequency  WAX_LOCAL_MAXIMA_ON_SPECTRUM  70  Maximum number of local maxima on the spectrum  MAX_PEAKS_FOR_SORT  30  Maximum number of peaks (preliminary)  MIN_PEAKS  7  Minimum number of peaks (preliminary)  MIN_PEAKS  7  Minimum number of peaks  MAX_PEAKS_FINAL  20  Maximum number of peaks (final)  MAX_PEALIM_CANDS  4  Maximum number of peaks (final)  MAX_PELIM_CANDS  CREATE_PIECEWISE_FUNC_LOOP_LIM_SH  20  Create Piecewise function loop limit for short window  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  30  Create Piecewise function loop limit for single window			
WSINGLE_WIN_END_FREQ  WDOUBLE_WIN_START_FREQ  WDOUBLE_WIN_END_FREQ  WDOUBLE_WIN_END_FREQ  WDOUBLE_WIN_END_FREQ  WDOUBLE_WIN_END_FREQ  WAX_LOCAL_MAXIMA_ON_SPECTRUM  MAX_PEAKS_FOR_SORT  WAX_PEAKS_PRELIM  MAX_PEAKS_PRELIM  MAX_PEAKS_PRELIM  MIN_PEAKS  MINIMUM number of peaks (preliminary)  MIN_PEAKS  MAX_PEAKS_FINAL  WAX_MAX_PEAKS_FINAL  WAX_PEAKS_FINAL  WAX_PRELIM_CANDS  WAX_PRELIM_CANDS  WAX_PEAKS_FINAL  WAX_PRELIM_CANDS  WAX_PRELIM_CANDS  WAX_PEAKS_FINAL  WAX_PRELIM_CANDS  WAX_PRE			
wDOUBLE_WIN_END_FREQ     0x00780000L     Double window end frequency       MAX_LOCAL_MAXIMA_ON_SPECTRUM     70     Maximum number of local maxima on the spectrum       MAX_PEAKS_FOR_SORT     30     Maximum number peaks for sorting       MAX_PEAKS_PRELIM     7     Maximum number of peaks (preliminary)       MIN_PEAKS     7     Minimum number of peaks       MAX_PEAKS_FINAL     20     Maximum number of peaks (final)       MAX_PRELIM_CANDS     4     Maximum number of preliminary candidates (pitch)       CREATE_PIECEWISE_FUNC_LOOP_LIM_SH     20     Create Piecewise function loop limit for short window       CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG     30     Create Piecewise function loop limit for single window	IwSINGLE_WIN_END_FREQ	0x00D20000L	Single window end frequency
MAX_LOCAL_MAXIMA_ON_SPECTRUM 70 Maximum number of local maxima on the spectrum MAX_PEAKS_FOR_SORT 30 Maximum number peaks for sorting MAX_PEAKS_PRELIM 7 Maximum number of peaks (preliminary) MIN_PEAKS 7 Minimum number of peaks MAX_PEAKS_FINAL 20 Maximum number of peaks (final) MAX_PELIM_CANDS 4 Maximum number of preliminary candidates (pitch) CREATE_PIECEWISE_FUNC_LOOP_LIM_SH 20 Create Piecewise function loop limit for short window CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG 30 Create Piecewise function loop limit for single window			
MAX_PEAKS_FOR_SORT     30     Maximum number peaks for sorting       MAX_PEAKS_PRELIM     7     Maximum number of peaks (preliminary)       MIN_PEAKS     7     Minimum number of peaks       MAX_PEAKS_FINAL     20     Maximum number of peaks (final)       MAX_PELIM_CANDS     4     Maximum number of preliminary candidates (pitch)       CREATE_PIECEWISE_FUNC_LOOP_LIM_SH     20     Create Piecewise function loop limit for short window       CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG     30     Create Piecewise function loop limit for single window			
MAX_PEAKS_PRELIM     7     Maximum number of peaks (preliminary)       MIN_PEAKS     7     Minimum number of peaks       MAX_PEAKS_FINAL     20     Maximum number of peaks (final)       MAX_PRELIM_CANDS     4     Maximum number of preliminary candidates (pitch)       CREATE_PIECEWISE_FUNC_LOOP_LIM_SH     20     Create Piecewise function loop limit for short window       CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG     30     Create Piecewise function loop limit for single window			
MIN_PEAKS 7 Minimum number of peaks MAX_PEAKS_FINAL 20 Maximum number of peaks (final) MAX_PRELIM_CANDS 4 Maximum number of preliminary candidates (pitch) CREATE_PIECEWISE_FUNC_LOOP_LIM_SH 20 Create Piecewise function loop limit for short window CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG 30 Create Piecewise function loop limit for single window			
MAX_PEAKS_FINAL  20 Maximum number of peaks (final)  MAX_PRELIM_CANDS  4 Maximum number of preliminary candidates (pitch)  CREATE_PIECEWISE_FUNC_LOOP_LIM_SH  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  30 Create Piecewise function loop limit for single window  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG			
MAX_PRELIM_CANDS  4 Maximum number of preliminary candidates (pitch)  CREATE_PIECEWISE_FUNC_LOOP_LIM_SH  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG  30 Create Piecewise function loop limit for single window  CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG			
CREATE_PIECEWISE_FUNC_LOOP_LIM_SH 20 Create Piecewise function loop limit for short window CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG 30 Create Piecewise function loop limit for single window			
CREATE_PIECEWISE_FUNC_LOOP_LIM_SNG 30 Create Piecewise function loop limit for single window			

swSUM_FRACTION	0x799A	Sum fraction
swAMP_FRACTION	0x33F8	Amplitude fraction
MAX_BEST_CANDS	2	Maximum number of best candidates (pitch)
N_OF_BEST_CANDS_SHORT	2	Number of best candidates for short window
N_OF_BEST_CANDS_SINGLE	2	Number of best candidates for single window
N_OF_BEST_CANDS_DOUBLE	2	Number of best candidates for double window
N_OF_BEST_CANDS	6	Number of best candidates for all windows
SIZE_SCRATCH_DOPITCH	1090	Scratch memory size for DoPitch() function (This is the actual size required. The declared size in C simulation is 1632)
SIZE_SCRATCH_ADVPROCESS	825	Scratch memory size for DoAdvProcess() function (This is the actual size required.
		The declared size in C simulation is 1100)
RVC_PITCH_ROM_SIG	11031	Signature for RVC_PITCH_ROM structure
RVC_PITCH_METER_SIG	21053	Signature for RVC_PITCH_METER structure

# 4.5.2 Description of fixed tables used in the C-code

This section contains a listing of all fixed tables sorted by source file name and table name. All table data is declared as **Word16**.

Table 6a: Fixed tables for AFE

File	Table Name	Length	Description
16kHzProcessing_B.c	table_pow2	33	Table for square root
	LambdaNSEx2	100	Table used to compute first 100 LambdaNSE
	dp02_h	59	MSB of QMF filter coefficients
	dp02_l	43	LSB of QMF filter coefficients
PostProc_B.c	targetLMS16	12	Target for blind equalization
ComCeps_B.c	HalfHamming16	100	Hamming window coefficients
	CosMatrix16	144	Inverse cosinus coefficients at 8Khz (not used at 16khz)
	CosMatrix16_16khz	156	Inverse cosinus coefficients at 16Khz
	pondMelFilter	309	Mel bank coefficients
ff4nrFix16_B.c	tabSin	64	Sine table
	tabCos	64	Cosine table
MathFunc.c	tbInt0	48	Coefficients for computation of square root
ExtNoiseSup_B.c	lambda_1divX	20	Computation of 1/N
	Hann_sh32_hi	100	MSB of hanning window coefficients (32 bits)
	Hann_sh32_lo	100	LSB of hanning window coefficients (32 bits)
	Hann_sh24_hi	100	MSB of hanning window coefficients (24 bits)
	Hann_sh24_lo	100	LSB of hanning window coefficients (24 bits)
	pondMelFilterNoise	157	Mel-frequency scale coefficients (applied to the Wiener filter)
	idctMel16	234	Mel-warped inverse DCT coefficients
	pondMelFilter16k	134	Filter bank coefficients at 16Khz
	M1_LamdaLTE	8	Computation of 1/N
	M1_LambdaNSEx2	100	Computation of 2/N
	M1_LamdaNSE	9	Computation of 1/N
	mInvLambda16	10	Comutation od 2/N

Table 6b: Fixed tables for VQ

File	Table Name	Length	Description
coder_VAD.c	quantizer16kHz_0_1	128	vq table
	quantizer16kHz_2_3	128	vq table
	quantizer16kHz_4_5	128	vq table
	quantizer16kHz_6_7	128	vq table
	quantizer16kHz_8_9	128	vq table
	quantizer16kHz_10_11	64	vq table
	quantizer16kHz_12_13	512	vq table
	quantizer8kHz_0_1	128	vq table
	quantizer8kHz_2_3	128	vq table
	quantizer8kHz_4_5	128	vq table
	quantizer8kHz_6_7	128	vq table
	quantizer8kHz_8_9	128	vq table
	quantizer8kHz_10_11	64	vq table
	quantizer8kHz_12_13	512	vq table
	weight16kHz_c0_shift	1	vq weights
	weight16kHz_c0_norm	1	vq weights
	weight16kHz_logE	1	vq weights
	weight8kHz_c0_shift	1	vq weights
	weight8kHz_c0_norm	1	vq weights
	weight8kHz_logE	1	vq weights
	plwQuantLevels[127]	127*2	vq tables for pitch/class quantization
	ppplwQuantSections[8][3]	24*2	vq tables for pitch/class quantization
	plwQuantLevels[31]	31*2	vq tables for pitch/class quantization
	pplwQuantSections[4][3]	12*2	vq tables for pitch/class quantization
	pswRatioThld_1[4][6]	24	vq tables for pitch/class quantization
	piMultiLevelIndex[4]	4	vq tables for pitch/class quantization
	pswRatioThld_2[4][8]	32	vq tables for pitch/class quantization
	piMultiLevelIndex_2[4]	4	vq tables for pitch/class quantization
	swAlpha1	1	pitch/class constants
	swAlpha2	1	pitch/class constants

**Table 6c: Fixed Tables for Extension** 

File	Table name	Length	Description
ExtNoiseSup_B.c	pswPePower	129	Coefficients to compute the pre-emphasis power spectrum
preProc_B.c	pswHpfCoef	15	High pass filter coefficients
preProc_B.c	pswLpfCoef	15	Low pass filter coefficients
preProc_B.c	pswLfeCoef	3	Low frequency emphasis filter coefficients
dsrAfeVad_B.c	piBurstConst	20	Burst length constants for different SNR's
dsrAfeVad_B.c	piHangConst	20	Hang length constants for different SNR's
dsrAfeVad_B.c	piVADThld	20	VAD voice metric thresholds for different SNR's
dsrAfeVad_B.c	piVMTable	90	Voice metric table as a function of SNR index
dsrAfeVad_B.c	piSigThld	20	Signal threshold table as a function of SNR
dsrAfeVad_B.c	piUpdateThld	20	Update threshold table as a function of SNR
dsrAfeVad_B.c	pswShapeTable	23	Spectral shape correction table
fix_mathlib.c	coeff_sqrt5_58	5	Coefficients for computation of square root
fix_mathlib.c	coeff_sqrt5_78	5	Coefficients for computation of square root
rvc_pitch_init_B.h	ROM_astFrac	312	Fractions table
rvc_pitch_init_B.h	ROM_pstWindowshiftTable	514	Complex exponents table for time shifting in frequency domain
rvc_pitch_init_B.h	ROM_aswDirichletImag	8	Imaginary part of the Dirichlet kernel

# 4.5.3 Static variables used in the C-code

In this section two tables that specify the static variables for the AFE, VQ, and Extension respectively are shown.

Table 7a: AFE static variables

Struct Name	Variable	Type[Length]	Description
QMF FIR	Variable	Type[Length]	Description
·· _	lengthQMF	Word32	QMF Filter length
	*dp_l	Word16	QMF filter low frequency Coeff
	<u> *dp_h</u>  *T	Word16 Word16	QMF filter high frequency Coeff
	T_dec	Word16	Temporary QMF filter buffer  Multiplier for T
DataFor16kProc_B			
	FrameLength	Word32	Input Frame length
	FrameShift numFramesInBuffer	Word32 Word32	Shift value for the frame  Number of frames in buffer
	SamplingFrequency	Word32	Sampling frequency (8/16)
	Do16kHzProc	BOOLEAN	Flag to enable 16kHz processing
	*hpBands_B	Word32	Buffer for HP bands
	hpBandsSize CodeForBands16k B	Word32 Word32[9]	hpBands_B buffer size HP coding buffer
	bufferCodeForBands16k B	Word32[27]	buffer used for HP coding
	codeWeights_B	Word16[3]	code Weights buffer
	bufferCodeWeights_B	Word16[9]	buffer used for code Weights
	* pQMF_Fir *bufferData16k B	QMF_FIR Word32	Pointer to QMF_FIR structure temporary buffer to carry QMF LP data
	bufData16kSize	Word32	16k data buffer size
	*FirstWindow16k	MelFB_Window	pointer to MeIFB_Window structure
	noiseSE16k_B	Word32[3]	noise spectrul energy variable
	noise_dec BandsForCoding16k_B	Word16 Word32[9]	Multiplier for noiseSE16k_B buffer for storing Bands for Coding
	vadCounter16k	Word32[9]	vad flag counter
	vad16k	Word32	vad flag
	nbSpeechFrames16k	Word32	number of speech frames counter
	hangOver16k	Word32 Word32	hang over used for VAD
	meanEn16k nb frame threshold nse	Word32 Word32	mean Energy variable threshold NSE for frame
	lambda_nse	Word16	lambda NSE variable
	*dataHP_B	Word32	buffer stores QMF HP value
	dec_16k	Word16[5]	Multiplier for dataHP_B buffer
	BFC_dec fb16k dec	Word16[1] Word16[3]	Multiplier for computing bands for coding  Buffer is used to store multiplier for current and pervious two frames
PostProcStructX	is reit_acc	TT GIGT G[G]	Sanor to dood to store manipus for carroin and pervisus the manies
	weightLMS	Word32[12]	Current LMS weight
CompCepsStructX	FFTLength	Word32	FFT size
	Do16khzProc	Word16	Flag to enable 16kHz processing
	*pData16k	Word32	Pointer to data for 16Khz processing
WaveProcStructX			
	*TeagerFilter16  *TeagerWindow32	Word32 Word32	Pointer to teager filter Pointer to teager window
	TeagerOnset	Word32	Unused
	FrameLength	Word32	Input frame length
ns_var_F	0	Word16	0
	SampFreq Do16khzProc	Word16	Sampling frequency (8/16) Flag to enable 16kHz processing
	buffers.nbFramesInFirstStage	Word32	number of frames in first stage
	buffers.nbFramesInFirstStage	Word32	number of frames in second stage
	buffers. nbFramesOutSecondStage	Word32	number of frames out og second stage
	buffers. FirstStageIn16Buffer buffers.SecondStageInBuffer32	Word16[180] Word32[180]	First stage buffer Second stage buffer
	buffers. SecondDecalSig	Word16[4]	Shift factor for each sub-frame of second stage buffer
	prevSamples32.lastSampleIn32	Word32	Last input sample of DC offset compensation
	prevSamples32.lastDCOut32	Word16	last output sample of DC offset compensation
	prevSamples32. oldShift spectrum.indexBuffer1	Word16 Word16	Iprevious window shift factor of DC offset compensation  Where to enter new PSD for first stage, alternatively 0 and 1
	spectrum.indexBuffer2	Word16	Where to enter new PSD for second stage, alternatively 0 and 1
	spectrum.noiseSE1_32	Word32[65]	Noise spectrum estimate for first stage
	spectrum.noiseSE1_dec	Word16[65]	Shift factor for Noise spectrum estimate (first sage)
	spectrum.noiseSE2_32 spectrum.noiseSE2_dec	Word32[65] Word16[65]	Noise spectrum estimate for second stage Shift factor for Noise spectrum estimate (second sage)
	spectrum.PSDMeanAntBuffer1	Word32[65]	1st stage PSD Mean buffer for precedent frame
	spectrum.nSigSE1Ant_dec	Word16[65]	Shift factor for PSD Mean buffer for precedent frame (1rst stage)
	spectrum.PSDMeanAntBuffer2	Word32[65]	2nd stage PSD Mean bufferfor precedent frame Shift factor for PSD Mean buffer for precedent frame (2nd stage)
	spectrum.nSigSE2Ant_dec spectrum.denSigSE1_32	Word16[65] Word32[65]	Shift factor for PSD Mean buffer for precedent frame (2nd stage)  1st stage PSD Mean buffer
	spectrum. nSigSE1Cur_dec	Word16[65]	Shift factor for PSD Mean buffer (1rst stage)
	spectrum. denSigSE2_32	Word32[65]	2nd stage PSD Mean buffer
	spectrum. nSigSE2Cur_dec	Word16[65]	Shift factor for PSD Mean buffer (2 <sup>nd</sup> stage)  Nubmer of frames (for the 2 stages)
	vad_data_ns_F. nbFrame vad_data_ns_F. flagVAD	Word16[2] Word16	Vad Flag (1 = SPEECH, 0 = NON SPEECH)
	vad_data_ns_F.hangOver	Word16	hangover
	vad_data_ns_F. nbSpeechFrames	Word16	Number of speech frames (used to set hangover)
	vad_data_ns_F.meanEn32 vad_data_ca. flagVAD	Word16	Mean energy for VAD  Vad Flag (1 = SPEECH, 0 = NON SPEECH)
	vad_data_ca. flagVAD vad_data_ca.hangOver	Word16 Word16	hangover
	vad_data_ca. nbSpeechFrames	Word16	Number of speech frames (used to set hangover)
	vad_data_ca.meanEn32	Word32	Mean energy for VAD
	vad_data_fd.MelMean	Word16	SpeechQMel (for frame dropping)
	vad_data_fd.VarMean	Word32	SpeechQVar (for frame dropping)

	vad_data_fd.AccTest	Word32	SpeechQSpec (for frame dropping)
	vad_data_fd.AccTest2	Word32	
	vad_data_fd.SpecMean	Word32	SpecMean (for frame dropping)
	vad_data_fd.MelValues	Word16[2]	SpeechQMel (for frame dropping)
	vad_data_fd.SpecValues	Word32	SpeechQSpec (for frame dropping)
	vad_data_fd.SpeechInVADQ	Word16	Flag (for frame dropping)
	vad_data_fd.SpeechInVADQ2	Word16	Flag (for frame dropping)
	gainFact.logDenEn1_32	Word32[3]	Denoise frame energy for gain factorization
	gainFact.lowSNRtrack32	Word32	Low SNR level for gain factorization
	gainFact. alfaGF16	Word16	Wiener filter gain factorization coefficient
VADStructX_F			
	Focus	Word16	Position of circular buffe
	HangOver	Word16	Hangover length
	FlushFocus	Word16	Position in circular buffer when emptying at end
	H_CountDown	Word16	Main hangover countdown
	V_CountDown	Word16	Short hangover countdown
	**OutBuffer	Word32	outBuffer pointer pointer
	*OutBuffer	Word32[7]	outBuffer pointer
	OutBuffer	Word16[7x15]	outBuffer

## Table 7b: VQ static variables

Struct Name	Variable	Type [Length]	Description
coder_VAD.c	four_frames[27]	Word16[27]	Previous frames used to build multiframe
	plwQPHistory[3]	Word32[3]	History of Pitch
	IReliableFlag	Word16	Pitch reliability flag

**Table 7c: Extension static variables** 

Struct Name	Variable	Type[Length]	Description
	iFirstFrameFlag	Word16	First frame flag
	pswUBSpeech	Word16[200]	Upper band speech
	pswDownSampledProcSpeech	Word16[75]	Down-sampled processed speech
	IwCritMax	Word32	Maximum power ratio
	iOldPitchPeriod	Word16	Old pitch period value
	iOldFrameNo	Word16	Old frame number
PCORR_STATE_be	s_be		
	lwX1_X1	Word32	X1*X1
	lwZ1_Z1	Word32	Z1*Z1
	lwZ2_Z2	Word32	Z2*Z2
	lwX1_Z1	Word32	X1*Z1
	lwX1_Z2	Word32	X1*Z2
	lwZ1_Z2	Word32	Z1*Z2
	swX1_Sum	Word16	Sum of X1
	swZ1_Sum	Word16	Sum of Z1
	swZ2_Sum	Word16	Sum of Z2
	iBurstConst	Word16	Burst constant
	iBurstCount	Word16	Burst count
	iHangConst	Word16	Hang constant
	iHangCount	Word16	Hang count
	iVADThld	Word16	VAD threshold
	iFrameCount	Word16	Frame count
	iFUpdateFlag	Word16	Forced update flag
	iHysterCount	Word16	Hysteresis count
	iLastUpdateCount	Word16	Last update count
	iSigThId	Word16	Signal threshold
	iUpdateCount	Word16	Update count
	iChanEnrgShift	Word16	Channel energy shift
	iChanNoiseEnrgShift	Word16	Channel noise energy shift
	pswChanEnrg	Word16[23]	Channel energy
	pswChanNoiseEnrg	Word16[23]	Channel noise energy
	swBeta	Word16	Beta value
	swSnr	Word16	SNR value
NormSw	pnsLogSpecEnrgLong		
	swMantissa	Word16[23]	Mantissa
	iShift	Word16[23]	Shift
	swC0	Word16	C0 value
	swC1	Word16	C1 value
	swC2	Word16	C2 value
	pswHpfXState	Word16[6]	High pass filter input state
	pswHpfYState	Word16[12]	High pass filter output state
	pswLpfXState	Word16[6]	Low pass filter input state
	pswLpfYState	Word16[12]	Low pass filter output state
	pswLfeXState	Word16	Low frequency emphasis filter input state
	pswLfeYState	Word16[2]	Low frequency emphasis filter output state

# 5 File formats

This section describes the file formats used by the AFE, VQ & Extension programs.

# 5.1 Speech file

Speech files read by the X-AFE and written by the Extension consist of 16-bit words. The byte order depends on the host architecture (e.g. MSByte first on SUN workstations, LSByte first on PCs etc)

# Annex A (informative): Change history

Change history							
Date	TSG#	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2004-06	24	SP-040343			Version 6.0.0 approved at 3GPP TSG SA#24	2.0.0	6.0.0
2004-12	26	SP-040837	001	1	Software bug correction: Removal of Basicops simulation of "C" shift operator	6.0.0	6.1.0
2004-12	26	SP-040837	002	1	Software bug correction: Initialization of the variables lwc and i2aScale	6.0.0	6.1.0
2004-12	26	SP-040837	003	1	Software bug correction: Wrong assignment of the variables *piReliableFlag and *pcQPIndex	6.0.0	6.1.0
2004-12	26	SP-040837	004	2	Software bug correction: Use of incorrect variable fRefPeriod instead of iRefPeriod	6.0.0	6.1.0
2004-12	26	SP-040837	005		Add reference to test sequences document	6.0.0	6.1.0

# History

Document history						
V6.1.0	December 2004	Publication				