Easy G.729A

Technical Document
Version 2.0－ Revision 2006-11-11

@Copyright 2004-2006 Imtelephone.com
No part of this manual may be reproduced in any form, written or otherwise, without the express written permission of Imtelephone.com.

Table of Contents

Introduction

EasyG729A is an implementation of ITU G.729A. EasyG729A support multiple channels concurrent. There is no limit in concurrent channels and it can up to thousands channels.

EasyG729A is an 8kbps coder that encodes/decodes speech signal. The coder operates on speech frames of 10 ms, corresponding to 80 samples at a sampling rate of 8000 samples/sec. In addition to the 10 ms speech frame duration, there is also a look-ahead delay of 5 ms, resulting in a total initial algorithmic delay of 15ms.

EasyG729A codec specifications	
Bit rate (kbps)	8
Speech sampling rate(Hz)	8000
Frame duration (ms)	10
Look-ahead delay (ms)	5ms
Samples in one Frame	80
Frame size before encode(bytes)	160
Frame size after encode(bytes)	10

EasyG729A has a binary release version on Windows and Linux. The source code of EasyG729A is written by C/C++, so you can easily port it to UNIX, PPC,DSP, Vxworks or other operation system that support C/C++.

PACKAGE CONTENTS

EasyG729A.pdf	This document
EasyG729A.lib	Win32 statically linkable library of G729A for Pentium and compatible processors.
libG729a.a	Linux statically linkable library of G729A for Pentium and compatible processors.
EasyG729A.h	API prototypes and constants declarations required by the sample programs.
test_encode directory	Microsoft VC6.0 sample application and Linux GCC sample application. Demonstrating encoder API calls to the codec for encoding a speech file.
test_decode directory	Microsoft VC6.0 sample application and Linux GCC sample application. Demonstrating decoder API calls to the codec for decoding a speech file.

The encoder requires raw 16-bit mono PCM speech data sampled at 8000 Hz as input, i.e., without any header information. For every speech frame, consisting of 80*16 bit (160 bytes) samples

CODEC COMPLEXITY

The codec complexity is represented as percentage of CPU usage, and is as follows when tested on an Intel 800 MHz Celeron-MMX:

Encoder 4% CPU time
Decoder 2% CPU time

ABOUT THE ENCODER/DECODER SAMPLE PROGRAMS

The sample programs under test_encode directory and test_decode directory are used to simulate the encoder and decoder, and demonstrate how to initialize and call the encoding and decoding process. The encoder and decoder are run as follows (where **infile** and **outfile** are raw 16 bit PCM files sampled at 8 kHz):

EasyG729A_encoder `infile bitstream`
EasyG729A`_decoder bitstream outfile`

To build the speech encoder (or decoder) sample programs on Windows, you can open TEST_ENCODE.dsw or TEST_DECODE.dsw with VC6.0 or later version. After compiler and link, it will create the execute program of test_encode.exe or test_decode.exe, you can test it with following command.

test_encode `test.pcm test.cod`
test_decode `test.cod test.pcm`

To build the speech encoder (or decoder) sample programs on Linux, you only need rum **make** command. After you successfully finished make command, you can run **make run** to test encoder and decoder.

EasyG729A API FUNCTIONS

EasyG729A_init_encoder

Description Initializes the memory needed by the encoding process. This function must be called prior to opening or re-opening a channel.

Syntax

```
#include "EasyG729A.h"

CODER_HANDLE EasyG729A_init_encoder( );
```

Arguments none

Returned value Return a handle that represent an encode channel, this value will used at EasyG729A_encoder and EasyG729A_release_encoder

EasyG729A_encoder

Description Encode an 80 words speech frame into a 10 bytes packed bit stream.

Syntax

```
#include "EasyG729A.h"

bool   EasyG729A_encoder(CODER_HANDLE hEncoder, short
*speech, unsigned char *bitstream);
```

Arguments hEncoder The coder handle returned by EasyG729A_init_encoder

speech	Input speech buffer containing one frame of 16-bit PCM speech data.
Bitstream	Output bit stream buffer containing packed bit stream.

Returned value Return true if successful, return false if failed.

EasyG729A_release_encoder

Description release the memory allocated by the encoding process. This function must be called before you quit your program. If not, it will cause the memory leak.

Syntax

```
#include "EasyG729A.h"

bool   EasyG729A_release_encoder(CODER_HANDLE hEncoder);
```

Arguments hEncoder The coder handle returned by EasyG729A_init_encoder

Returned value Return true if successful, return false if failed.

EasyG729A_init_decoder

Description Initializes the memory needed by the decoding process. This function must be called prior to opening or re-opening a channel.

Syntax

```
#include "EasyG729A.h"

CODER_HANDLE EasyG729A_init_decoder( );
```

Arguments None

Returned value Return a handle that represent an decode channel, this value will used at EasyG729A_decoder and EasyG729A_release_decoder

EasyG729A_decoder

Description Decodes a 10 bytes packed bit stream into an 80 words speech frame.

Syntax

```
#include "EasyG729A.h"

bool   EasyG729A_decoder(CODER_HANDLE hDecoder, unsigned
char *bitstream, short *synth_short );
```

Arguments

hDecoder	The decoder handle returned by EasyG729A_init_decoder
bitstream	Input buffer containing packed bit-stream.
synth_short	Output buffer containing one frame of decoded 16 bits PCM.

Returned value	Return true if successful, return false if failed.

EasyG729A_release_decoder

Description	release the memory allocated by the decoding process. This function must be called before you quit your program. If not, it will cause the memory leak.
Syntax	#include “EasyG729A.h” bool EasyG729A_release_decoder(CODER_HANDLE hDecoder);
Arguments	hDecoder The coder handle returned by EasyG729A_init_decoder
Returned value	Return true if successful, return false if failed.

FAQs

Here are some frequently asked questions about the EasyG729A.

Q — Is the implementation of G.729A interoperable with the other company’s version?
A — The implementation of EasyG.729A is fully conform to ITU G.729A, It can interoperate with other G.729A implementations.

Q — What type of speech input format is required?
A — Raw 16-bit mono PCM sampled at 8000Hz. Do not use .WAV files. They contain a header that will produce distortion at the start of a decoded audio sample because the encoder interprets the header as speech data.

Q — How can I convert my .WAV files to raw 16 bit mono PCM sampled at 8000 Hz?
A — Use an audio editing tool such as SoX - Sound eXchange. See home.sprynet.com/~cbagwell/sox.html for more information

Q — Can I get link on platforms other than Pentium or compatible?
A — The object code provided in this package is Microsoft Win32 and Linux x86 compatible. It is compiled for the Pentium family of processors. If you want to use EasyG729A on other platforms, you should buy the source code of EasyG729A. Then you can compile and link.

Q — Is the EasyG729A codec able to handle multiple channels?
A — Yes, It can handle multiple channels. There is no limited.

Q — Is the EasyG729A codec free to use?
A — No, The version you get freely is a version only for test. If you want to use it in commercial, you must buy it from www.imtelephone.com. This version has the same function with the formal release version, but It can only run 60 hours continuously.

Q — How much does the EasyG729A codec cost?

A — The object code of Windows or Linux is $2000/year. The source code is $20000/year. You can buy it from www.imtelephone.com.