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Continuous Speech Processing API for Linux and Windows Operating Systems

Demo Guide

June 2005

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Revision History

This revision history summarizes the changes made in each published version of this document.

Document No.	Publication Date	Description of Revisions
05-1701-005	June 2005	Hardware Requirements section: For CSPLive and CSPdemoSTB, updated second bullet. Software Requirements section: Updated note about Global Call Protocols. Running the Demos chapter: Replaced /usr/dialogic directory with INTEL_DIALOGIC_DIR variable for all demos.
05-1701-004	October 2004	Global change: Introduced new demo called CSPdemoSTB (streaming to board). Demo Descriptions chapter: Updated with CSPdemoSTB description. System Requirements chapter: Updated with CSPdemoSTB information. Running the Demos chapter: Updated with CSPdemoSTB information. Demo Details chapter: Updated with CSPdemoSTB information.
05-1701-003	November 2003	Global change: The CSP demos (Linux and Windows, DM3 and Springware versions) have been integrated into new demos called CSPLive and CSPAuto. Demo Description chapter: Updated with CSPLive and CSPAuto demo descriptions. Running the Demo chapter: Rewritten to describe the CSPLive and CSPAuto demos. Demo Details chapter: Updated list of files used by the new CSP demos.
05-1701-002	September 2002	Preparing to Run the Demo chapter: Added new steps. Running the Demo chapter: Added new streaming/recording over TDM bus option.
05-1701-001	December 2001	Initial version of document.

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About This Publication

The following topics provide information about this publication:

- Purpose
- Applicability
- Intended Audience
- How to Use This Publication
- Related Information

Purpose

This publication describes the Continuous Speech Processing demonstration programs and provides instructions for running the demos on Linux* and Windows* operating systems.

Applicability

This document version (05-1701-005) is published for Intel® Dialogic® System Release 6.1 for Linux.

This document may also be applicable to later Intel Dialogic system releases on Linux and Windows. Check the Release Guide for your software release to determine whether this document is supported.

This document is applicable to Intel Dialogic system releases only. It is not applicable to Intel NetStructure® Host Media Processing (HMP) software releases. A separate document specific to running Continuous Speech Processing demonstration programs on HMP is provided.

Intended Audience

This publication is written for the following audience:

- Distributors
- System Integrators
- Toolkit Developers
- Independent Software Vendors (ISVs)
- Value Added Resellers (VARs)
- Original Equipment Manufacturers (OEMs)

How to Use This Publication

This publication assumes that you understand computer telephony terms and concepts, and are familiar with the Linux* or Windows* operating system and the C programming language.

The information in this guide is organized as follows:

- Chapter 1, "Demo Descriptions" provides a brief overview of the Continuous Speech Processing demos.
- Chapter 2, "System Requirements" discusses the hardware and software required to run the demos.
- Chapter 3, "Preparing to Run the Demos" lists the procedures you must follow before running the demos.
- Chapter 4, "Running the Demos" describes the steps to run the demos, the demo options, and how to stop the demo.
- Chapter 5, "Demo Details" provides additional information about the demos, such as the files used by the demos.

Related Information

See the following for more information:

- For information about Continuous Speech Processing library features and guidelines for building applications using CSP software, see the *Continuous Speech Processing API Programming Guide*.
- For details on all functions and parameters in the Continuous Speech Processing library, see the *Continuous Speech Processing API Library Reference*.
- For information about Voice library features and guidelines for building applications using Voice software, see the *Voice API Programming Guide*.
- For details on all voice functions, parameters, and data structures in the Voice library, see the *Voice API Library Reference*.
- For details on the Standard Runtime Library (a device-independent library that consists of event management functions and standard attribute functions), supported programming models, and programming guidelines for building all applications, see the *Standard Runtime Library API Programming Guide*.
- For details on all functions and data structures in the Standard Runtime Library library, see the *Standard Runtime Library API Library Reference*.
- For information on the system release, system requirements, software and hardware features, supported hardware, and release documentation, see the Release Guide.
- For details on known problems and late-breaking updates or corrections to the release documentation, see the Release Update. Be sure to check the Release Update for the software release you are using for any updates or corrections to this publication. Release Updates are available on the Telecom Support Resources website at *http://resource.intel.com/telecom/support/documentation/releases/index.htm*

- For guidelines on building applications using Global Call software (a common signaling interface for network-enabled applications, regardless of the signaling protocol needed to connect to the local telephone network), see the *Global Call API Programming Guide*.

- For details on all functions and data structures in the Global Call library, see the *Global Call API Library Reference*.

- For details on configuration files (including FCD/PCD files) and instructions for configuring products, see the Configuration Guide for your product or product family.

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Demo Descriptions 1

This chapter provides a brief description of the Continuous Speech Processing demonstration programs.

Several Continuous Speech Processing demos are provided. They illustrate key product features such as barge-in, voice activity detection, and echo-cancelled recording.

The Continuous Speech Processing demo programs are as follows:

CSPLive demo

A multi-channel, interactive demo that can be run in one of two modes: interactive or diagnostic. The CSPLive demo also performs board discovery to detect the hardware in use, such as analog, E1, or T1 board. This demo is supported on DM3 boards and Springware boards.
- interactive mode – illustrates the operation of the **ec_stream( )** function or the **ec_reciottdata( )** function. This mode allows you to listen to a prompt, interrupt (barge-in) and stop the prompt, and start recording a message with echo cancellation.
- diagnostic mode – used to verify operation of parameters that are available with the **ec_setparm( )** function.

CSPAuto demo

A multi-channel, non-interactive demo that can be run in one of two modes: automatic or diagnostic. This demo is supported on DM3 boards and Springware boards.
- automatic mode – illustrates the operation of the **ec_reciottdata( )** function. This mode uses the number of CSP channels you specify. Channels are paired, with one channel playing an outgoing prompt (the channel being tested) while the other partner channel plays a barge-in prompt (the stimulus channel).
- diagnostic mode – used to verify operation of parameters that are available with the **ec_setparm( )** function.

CSPdemoSTB demo

A single-channel, interactive demo that illustrates the streaming to board feature. It can be run in one of two modes: interactive or diagnostic. This demo is supported on DM3 boards only.
- interactive mode – allows you to listen to a prompt, interrupt (barge-in) and stop the prompt, and start recording a message with echo cancellation.
- diagnostic mode – used to verify operation of parameters that are available with the **ec_setparm( )** function.

Source code for each demo is provided.

For more information on streaming to board, see the *Voice API Programming Guide* and *Voice API Library Reference*.

For more information on ec_ functions, see the *Continuous Speech Processing API Library Reference* and *Continuous Speech Processing API Programming Guide*.

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System Requirements 2

The requirements for running the Continuous Speech Processing demos are described in the following sections:

2.1 Hardware Requirements

To run the CSPLive demo, you need:

- One CSP-enabled board (DM3 or Springware board) configured as the first board in the system.
- A stimulus application to simulate calls to the demo or a phone connected directly to an analog board which can be used to make an actual call.

  OR

- For boards with a digital network interface, a T1 or an E1 line connected to your system. For boards with an analog interface, an analog line such as a connection to a PBX.

To run the CSPAuto demo, you need:

- One CSP-enabled board (DM3 or Springware board) configured as the first board in the system.

To run CSPdemoSTB, you need:

- One CSP-enabled board (DM3 boards only) configured as the first board in the system.
- A stimulus application to simulate calls to the demo or a phone connected directly to an analog board which can be used to make an actual call.

  OR

- For boards with a digital network interface, a T1 or an E1 line connected to your system. For boards with an analog interface, an analog line such as a connection to a PBX.

For other system configuration requirements, such as memory requirements, see the Release Guide for your system release.

2.2 Software Requirements

To run a CSP demo, you need the Intel® Dialogic® System Release with Continuous Speech Processing software. Be sure to select the Demos component when installing the system release.

Note: To run the CSPLive demo or the CSPdemoSTB demo, you also need to install Global Call Protocols, which is available as part of the system release install.

For a list of operating system requirements and supported compilers, see the Release Guide for your system release.

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Preparing to Run the Demos   **3**

This chapter provides information on preparations to follow before running a Continuous Speech Processing demo.

Before running a CSP demo, take care to follow these procedures:

1. Adhere to the hardware and software requirements listed in Chapter 2, "System Requirements".

2. Ensure that Intel® Dialogic® System Service has been started for your board. In addition, be sure to download the appropriate firmware file (for Springware boards) or media load (for DM3 boards) that supports CSP. For information on firmware files, see the configuration manager utility (DCM) online help. For information on media load files, see the Configuration Guide for DM3 products. For information on installing the software and starting the boards, see the Installation Guide for your software release.

3. Run a CSP demo on one type of board at a time. If you have several types of boards in your system (such as analog and digital boards, Springware and DM3 boards), you must start Intel Dialogic System Service only on the board(s) for which you are running the demo. In Windows, you must disable Intel Dialogic System Service on all other boards. In Linux, perform download only on the board to be used for the CSP demo.

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Running the Demos 4

Information on running the Continuous Speech Processing demos is provided in the following sections:

4.1 Starting the Demos

The following sections provide information on starting the Continuous Speech Processing demos:

- Starting the CSPLive Demo
- Starting the CSPAuto Demo
- Starting CSPdemoSTB

4.1.1 Starting the CSPLive Demo

Instructions for starting the CSPLive demo are provided for Linux and for Windows.

Linux

To run the CSPLive demo, follow these instructions:

1. Open a command prompt window and go to the directory where the demo is located.

   On Linux, the default location is */demos/ec_demos/CSPLive/* under INTEL_DIALOGIC_DIR, the environment variable for the directory in which the software is installed.

2. At the command prompt, type

   ```
   ./CSPLive -<option>
   ```

   For help on demo options, type

   ```
   ./CSPLive -?
   ```

   Note: On Linux, the demo name is case-sensitive and must be entered as shown.

   The demo options are described in Table 1, "CSPLive Demo Options", on page 21. If you don't specify an option, default options are assumed.

Windows

To run the CSPLive demo, follow these instructions:

1. Open a command prompt window and go to the directory where the demo is located.

   On Windows, the default location is *\demos\speechprocessing\CSPLive* under INTEL_DIALOGIC_DIR, the environment variable for the directory in which the software is installed.

2. At the command prompt, type

   ```
   CSPLive -<option>
   ```

   For help on demo options, type

   ```
   CSPLive -?
   ```

   The demo options are described in Table 1, "CSPLive Demo Options", on page 21. If you don't specify an option, default options are assumed.

4.1.2   Starting the CSPAuto Demo

Instructions for starting the CSPAuto demo are provided for Linux and for Windows.

Linux

To run the CSPAuto demo, follow these instructions:

1. Open a command prompt window and go to the directory where the demo is located.

   On Linux, the default location is */demos/ec_demos/CSPAuto/* under INTEL_DIALOGIC_DIR, the environment variable for the directory in which the software is installed.

2. At the command prompt, type

   ```
   ./CSPAuto -<option>
   ```

   For help on demo options, type

   ```
   ./CSPAuto -?
   ```

   Note: On Linux, the demo name is case-sensitive and must be entered as shown.

   The demo options are described in Table 2, "CSPAuto Demo Options", on page 22. If you don't specify an option, default options are assumed.

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Windows

To run the CSPAuto demo, follow these instructions:

1. Open a command prompt window and go to the directory where the demo is located.

   On Windows, the default location is *\demos\speechprocessing\CSPAuto* under INTEL_DIALOGIC_DIR, the environment variable for the directory in which the software is installed.

2. At the command prompt, type

   ```
   CSPAuto -<option>
   ```

   For help on demo options, type

   ```
   CSPAuto -?
   ```

   The demo options are described in Table 2, "CSPAuto Demo Options", on page 22. If you don't specify an option, default options are assumed.

4.1.3   Starting CSPdemoSTB

Instructions for starting the CSPdemoSTB demo are provided for Linux and for Windows.

Linux

To run CSPdemoSTB, follow these instructions:

1. Open a command prompt window and go to the directory where the demo is located.

   On Linux, the default location is */demos/ec_demos/CSPdemoSTB/* under INTEL_DIALOGIC_DIR, the environment variable for the directory in which the software is installed.

2. At the command prompt, type

   ```
   ./CSPdemoSTB -<option>
   ```

   For help on demo options, type

   ```
   ./CSPdemoSTB -?
   ```

   Note: On Linux, the demo name is case-sensitive and must be entered as shown.

   The demo options are described in Table 3, "CSPdemoSTB Options", on page 23. If you don't specify an option, default options are assumed.

Windows

To run CSPdemoSTB, follow these instructions:

1. Open a command prompt window and go to the directory where the demo is located.

   On Windows, the default location is *\demos\speechprocessing\CSPdemoSTB* under INTEL_DIALOGIC_DIR, the environment variable for the directory in which the software is installed.

2. At the command prompt, type

   ```
   CSPdemoSTB -<option>
   ```

   For help on demo options, type

   ```
   CSPdemoSTB -?
   ```

   The demo options are described in Table 3, "CSPdemoSTB Options", on page 23. If you don't specify an option, default options are assumed.

4.2 Demo Options

The following sections provide information on the Continuous Speech Processing demo options:

- CSPLive Demo Options
- CSPAuto Demo Options
- CSPdemoSTB Options

4.2.1 CSPLive Demo Options

For the CSPLive demo, the format for specifying options at the command prompt is:

```
CSPLive -<option> -<option> (and so on)
```

Table 1 illustrates options for the CSPLive demo. These options are specified from the command line. If an option is not specified when running a CSP demo, a default value applies.

For detailed information on functions and parameters mentioned in the table, see the *Continuous Speech Processing API Library Reference*.

Notes: **1.** The order in which you specify demo options is not important.

2. In the table, N represents an integer and ( ) represents an optional value.

Table 1. CSPLive Demo Options

Demo Option	Default Value	Description/Value
-?	none	Displays help.
-cN	-c1	Specifies the number of interactive channels to use. The channels are incremented based on the starting channel that is specified with the -s option.
-d	disabled	Enables diagnostic mode. In this mode, the demo tests the parameters available in **ec_setparm( )**. After the tests are completed, the demo resets all values to their original setting.
-hN	-h-40	Specifies the speech threshold value (in dBm) while a prompt is playing. This option allows you to change the value in DXCH_SPEECHPLAYTHRESH, a parameter of **ec_setparm( )**, from the default. The range is +3 to -54 dBm. **Note:** You must supply the plus or minus sign with this value. If background noise level is high and triggers the voice activity detector erroneously, you can set the speech threshold to a higher value, such as -20 dBm.
-l<filename>	disabled	Enables logging of results to a text file in the directory from which you ran the demo (diagnostic mode only). If you don't specify a log file name, the default file name is *CSPLive.log*. To specify a different name such as *test.log*, enter CSPLive -ltest.log.
-p		Used to override the default Global Call protocol. To see the default protocol in use for a board, enter CSPLive -? at the command line.
-r	disabled	Specifies the use of either the **ec_reciottdata( )** function or the **ec_stream( )** function in the demo run. Specifying -r illustrates the use of the **ec_reciottdata( )** function. Not specifying -r illustrates the use of the **ec_stream( )** function, which is the default setting.
-sN	-s1	Enables selection of the starting voice channel. The default is that the demo runs on the first channel of the first board. You can use this option to specify any channel of any CSP-enabled board in your system. **Note:** Selecting a channel on an unsupported board results in a demo failure.

4.2.2 CSPAuto Demo Options

For the CSPAuto demo, the format for specifying options at the command prompt is:

    CSPAuto -<option> -<option> (and so on)

Table 2 illustrates options for the CSPAuto demo. These options are specified from the command line. If an option is not specified when running a CSP demo, a default value applies.

For detailed information on functions and parameters mentioned in the table, see the *Continuous Speech Processing API Library Reference*.

Notes: **1.** The order in which you specify demo options is not important.

2. In the table, N represents an integer and ( ) represents an optional value.

Table 2. CSPAuto Demo Options

Demo Option	Default Value	Description/Value
-?	none	Displays help.
-a	disabled	Specifies a board with an analog interface. **Note:** The options -a, -e and -t are mutually exclusive.
-cN	-c2	Specifies the number of channels to use in automatic mode. Enter an even number, as channels are paired. If you enter an odd number, the demo reduces that number to an even number. For example, if you enter 7, the demo revises that number to 6. **Note:** This value is ignored for diagnostic mode. See -d option for information on setting diagnostic mode.
-d	disabled	Enables diagnostic mode. In this mode, the demo tests the parameters available in **ec_setparm( )**. After the tests are completed, the demo resets all values to their original setting.
-e	disabled	Specifies an E1 board. The protocol used is A and B bits set to 1 for off-hook and 0 for on-hook. Bits C and D are ignored. **Note:** The options -a, -e and -t are mutually exclusive.
-hN	-h-40	Specifies the speech threshold value (in dBm) while a prompt is playing. This option allows you to change the value in DXCH_SPEECHPLAYTHRESH, a parameter of **ec_setparm( )**, from the default. The range is +3 to -54 dBm. **Note:** You must supply the plus or minus sign with this value. **Note:** This value is ignored for diagnostic mode. If background noise level is high and triggers the voice activity detector erroneously, you can set the speech threshold to a higher value, such as -20 dBm.
-iN	-i2	Specifies the number of iterations. For a simple test, you can specify 1. For a longevity test, you can specify 2 or more. **Note:** This value is ignored for diagnostic mode.
-l<filename>	disabled	Enables logging of results to a text file in the directory from which you ran the demo. If you don't specify a log file name, the default file name is *CSPAuto.log*. To specify a different name such as *test.log*, enter CSPAuto –ltest.log.

Table 2. CSPAuto Demo Options (Continued)

Demo Option	Default Value	Description/Value
-sN	-s1	Enables selection of the starting voice channel.
		The default is that the demo runs on the first channel of the first board. You can use this option to specify any channel of any CSP-enabled board in your system.
		Be aware of the following usage notes:
		• Specify an odd number for the starting channel (channels are paired). If you enter an even number, the demo reduces it to an odd number.
		• This option is ignored for the diagnostic mode.
		• Selecting a channel on an unsupported board results in a demo failure.
-t	enabled	Specifies a T1 board.
		The protocol used is Ear & Mouth (E&M) where A and B bits are set to 1 for off-hook and 0 for on-hook. Bits C and D are ignored.
		Note: The options -a, -e and -t are mutually exclusive.

4.2.3 CSPdemoSTB Options

For CSPdemoSTB, the format for specifying options at the command prompt is:

```
CSPdemoSTB -<option> -<option> (and so on)
```

Table 3 illustrates options for the CSPdemoSTB demo. These options are specified from the command line. If an option is not specified when running a CSP demo, a default value applies.

For detailed information on CSP functions and parameters mentioned in the table, see the *Continuous Speech Processing API Library Reference*.

For detailed information on voice functions and parameters mentioned in the table, see the *Voice API Library Reference*.

Notes: **1.** The order in which you specify demo options is not important.

2. In the table, N represents an integer and ( ) represents an optional value.

Table 3. CSPdemoSTB Options

Demo Option	Default Value	Description/Value
-?	none	Displays help.
-a	before	Used to initiate prompt play **after** the circular stream buffer is filled with data. The default is to initiate prompt play **before** the buffer is filled with data.
-b	disabled	Enables barge-in, which allows the caller to interrupt a prompt. This option corresponds to the DXCH_BARGEIN parameter in **ec_setparm( )**.
-cN	-c1	Specifies the channel number to use.

Table 3. CSPdemoSTB Options (Continued)

Demo Option	Default Value	Description/Value
-d	disabled	Enables diagnostic mode. In this mode, the demo tests the parameters available in **ec_setparm( )**. After the tests are completed, the demo resets all values to their original setting.
-e	disabled	Enables echo cancellation. This option corresponds to the ECCH_ECHOCANCELLER parameter in **ec_setparm( )**.
-hN	-h0	Specifies the host to firmware buffer size. Valid values are: 0=4k, 1=8k, 2=16k, 3=32k, 4=2k, 5=1k, 6=1.5k This option uses the **dx_setchxfercnt( )** function.
-i	disabled	Enables initial DX_MAXSIL termination condition in the DV_TPT structure (uses the TF_SETINIT flag).
-l\<filename\>	disabled	Enables logging of results to a text file in the directory from which you ran the demo (diagnostic mode only). If you don't specify a log file name, the default file name is *CSPdemoSTB.log*. To specify a different name such as *test.log*, enter `CSPdemoSTB -ltest.log`.
-m	disabled	Enables DX_MAXSIL termination condition in the DV_TPT structure.
-p\<name\>		Specifies the Global Call protocol to be used. The default protocol is pdk_us_mf_io.
-tN	-t-40	Specifies the speech threshold value (in dBm) while a prompt is playing. This option allows you to change the value in DXCH_SPEECHPLAYTHRESH, a parameter of **ec_setparm( )**, from the default. The range is +3 to -54 dBm. **Note:** You must supply the plus or minus sign with this value. If background noise level is high and triggers the voice activity detector erroneously, you can set the speech threshold to a higher value, such as -20 dBm.
-v	disabled	Enables VAD-initiated streaming where streaming begins only after speech is detected. This option corresponds to the ECCH_VADINITIATED parameter in **ec_setparm( )**.

4.3 Using the Demos

The following topics provide information on using the Continuous Speech Processing demos:

- Using the CSPLive Demo (Interactive Mode)
- Using the CSPLive Demo (Diagnostic Mode)
- Using the CSPAuto Demo (Automatic Mode)
- Using the CSPAuto Demo (Diagnostic Mode)
- Using CSPdemoSTB (Interactive Mode)
- Using CSPdemoSTB (Diagnostic Mode)

4.3.1   Using the CSPLive Demo (Interactive Mode)

The CSPLive demo is a multi-channel demo that can be run in either interactive mode or diagnostic mode.

In interactive mode, the CSPLive demo illustrates the operation of the **ec_reciottdata( )** function or the **ec_stream( )** function.

Note: Be sure that the proper media load (DM3 boards) or firmware file (Springware boards) is downloaded to the board.

The CSPLive demo runs as follows in interactive mode:

1. After the demo starts, it waits for an incoming call.

2. Once the demo answers the call, the welcome prompt, *Welcome.pcm*, is played.

3. You can interrupt or barge in on the prompt as it is playing. As soon as you speak, the prompt stops playing and echo-cancelled recording begins. TDX_BARGEIN and TEC_VAD events are generated. The demo records your message for a few seconds and stores the message in *rec_xxx.pcm*, where *xxx* represents the channel number. At the end of this time, the TEC_STREAM event is generated to indicate termination of recording.

   The demo then plays back the echo-cancelled recording of your message.

4. The demo waits up to 45 seconds for the next action or event. If no further action or event is received, the demo is completed.

Example 1

To run the CSPLive demo with the **ec_stream( )** function, type:

```
CSPLive
```

Example 2

To run the CSPLive demo with the **ec_reciottdata( )** function, type:

```
CSPLive -r
```

4.3.2 Using the CSPLive Demo (Diagnostic Mode)

The CSPLive demo is a multi-channel demo that can be run in either interactive mode or diagnostic mode.

In diagnostic mode, this demo can be used to verify operation of parameters available through **ec_setparm( )**. The demo alternatively sets each parameter to the minimum value and maximum value, and returns the appropriate message. After the demo is completed, the parameters are reset to their default values (see demo source code). For detailed information on CSP functions and parameters, see the *Continuous Speech Processing API Library Reference*.

To save the results of the demo run in a log file, use the -l option.

Example

To run the CSPLive demo in diagnostic mode, type:

```
CSPLive -d -l<log name>
```

For example, to run a test and log the results in *dmtest.log* file, type:

```
CSPLive -d -ldmtest.log
```

4.3.3 Using the CSPAuto Demo (Automatic Mode)

The CSPAuto demo is a multi-channel, non-interactive demo that can be run in either automatic mode or diagnostic mode.

In automatic mode, the demo uses the number of CSP channels you specify. Channels are paired, with one channel playing an outgoing prompt (the channel being tested) while the other partner channel plays a barge-in prompt (the stimulus channel).

For example, Channel 1 is paired with Channel 2. Channel 2 plays a prompt. Channel 1 waits one second and plays its own prompt to simulate barge-in. Channel 2 detects the barge-in, stops its prompt, and begins echo-cancelled recording. After each iteration, the two partner channels change roles. Therefore, to test all CSP channels, you must run at least two iterations (two loops). This mode uses **ec_reciottdata( )**.

Example

To run the CSPAuto demo in automatic mode, type:

```
CSPAuto -<board type> -c<no. of channels> -i<no. of iterations> -l<log
name>
```

For example, to run a 12-channel test (two iterations is the default) on an E1 board and log the results in *autotest.log* file, type:

```
CSPAuto -e -c12 -lautotest.log
```

Note: The `-c` value must be a positive, even number.

4.3.4 Using the CSPAuto Demo (Diagnostic Mode)

The CSPAuto demo is a multi-channel, non-interactive demo that can be run in either automatic mode or diagnostic mode.

In diagnostic mode, this demo can be used to verify operation of parameters available through **ec_setparm( )**. The demo alternatively sets each parameter to the minimum value and maximum value, and returns the appropriate message. After the demo is completed, the parameters are reset to their default values (see demo source code). For detailed information on CSP functions and parameters, see the *Continuous Speech Processing API Library Reference*.

To save the results of the demo run in a log file, use the `-l` option.

Example

To run the CSPAuto demo in diagnostic mode, type:

```
CSPAuto -d -l<log name>
```

For example, to run a test and log the results in *dmtest.log* file, type:

```
CSPAuto -d -ldmtest.log
```

4.3.5 Using CSPdemoSTB (Interactive Mode)

The CSPdemoSTB demo is a single-channel demo that can be run in either interactive mode or diagnostic mode. This demo is supported on DM3 boards only.

Note: Be sure that the proper media load is downloaded to the DM3 board.

The CSPdemoSTB demo runs as follows in interactive mode:

1. After the demo starts, it waits for an incoming call.

2. Once the demo answers the call, the welcome prompt, *Welcome.pcm*, is played.

   If -a option is specified, the welcome prompt starts playing **after** the circular buffer is filled with data. Otherwise, the prompt starts playing **before** the buffer is filled with data. The default setting (-a not used) is to play the prompt before the buffer is filled.

3. You can interrupt or barge in on the prompt as it is playing. As soon as you speak, the prompt stops playing (if -b option is used) and echo-cancelled recording begins. TDX_BARGEIN and TEC_VAD events are generated (if -b and -v options are used). The demo records your

message for a few seconds and stores the message in *ec_stream.pcm*. At the end of this time, the TEC_STREAM event is generated to indicate termination of recording.

The demo then plays back the echo-cancelled recording of your message.

4. The demo is completed.

Example

To run CSPdemoSTB in interactive mode, type:

```
CSPdemoSTB
```

For example, to run the CSPdemoSTB demo with barge-in enabled, echo cancellation enabled, DX_MAXSIL enabled, VAD-initiated mode enabled, using the ISDN protocol, type:

```
CSPdemoSTB -b -e -m -v -pisdn
```

4.3.6   Using CSPdemoSTB (Diagnostic Mode)

The CSPdemoSTB demo is a single-channel demo that can be run in either interactive mode or diagnostic mode. This demo is supported on DM3 boards only.

In diagnostic mode, this demo can be used to verify operation of parameters available through **ec_setparm( )**. The demo alternatively sets each parameter to the minimum value and maximum value, and returns the appropriate message. After the demo is completed, the parameters are reset to their default values (see demo source code). For detailed information on CSP functions and parameters, see the *Continuous Speech Processing API Library Reference*.

To save the results of the demo run in a log file, use the -l option.

Example

To run the CSPdemoSTB demo in diagnostic mode, type:

```
CSPdemoSTB -d -l<log name>
```

For example, to run a test and log the results in *dmtest.log* file, type:

```
CSPdemoSTB -d -ldmtest.log
```

4.4   Stopping the Demos

Typically the CSP demos run the specified number of iterations and stop automatically.

If necessary, you can press **Ctrl-C** at any time to exit a CSP demo. All channels and files are properly closed by the demo.

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Demo Details 5

The following sections provide further detail on the Continuous Speech Processing demos. You do not need this information to run the demo successfully.

5.1 Files Used by the Demos

This section lists the files used by the various CSP demos.

Table 4 lists the files used by the CSPLive demo.

Table 4. Files Used by the CSPLive Demo

File Name	Purpose
CSPLive.c	Source code file.
CSPLive.exe	Executable file.
CSPLive.h	Header file.
CSPLive.log	Default name of the log file. This ASCII text file logs the results of a CSP demo (diagnostic mode only).
rec_*xxx*.pcm	The file generated when running the CSPLive demo in interactive mode, where *xxx* represents the number of the channel being tested. For example, *rec_002.pcm* is the file for channel 2 which is being tested. This file contains a recording of speech from the channel being tested.
Welcome.pcm	The outgoing prompt used by the channel being tested. This prompt simulates what a caller might hear.

Table 5 lists the files used by the CSPAuto demo.

Table 5. Files Used by the CSPAuto Demo

File Name	Purpose
BargeIn.pcm	The second welcome prompt used when running the CSPAuto demo (in automatic mode). Used by the stimulus channel to simulate a person speaking.
CSPAuto.c	Source code file.
CSPAuto.exe	Executable file.
CSPAuto.h	Header file.
CSPAuto.log	Default name of the log file. This ASCII text file logs the results of a CSPAuto demo run. For example, the log lists the test mode, number of channels used, number of iterations, and the activities that occur as the demo progresses.
rec_ch*xx*.pcm	The file generated by the **ec_reciottdata( )** function, where *xx* represents the number of the channel being tested. For example, *rec_ch02.pcm* is the file for channel 2 which is being tested. This file contains a recording of speech from the stimulus channel when running the CSPAuto demo (in automatic mode).
Welcome.pcm	The first prompt used by the channel being tested. This prompt simulates what a caller might hear.

Table 6 lists the files used by the CSPdemoSTB demo.

Table 6. Files Used by CSPdemoSTB

File Name	Purpose
CSPdemoSTB.c	Source code file.
CSPdemoSTB.exe	Executable file.
CSPdemoSTB.h	Header file.
CSPdemoSTB.log	Default name of the log file. This ASCII text file logs the results of a CSP demo (diagnostic mode only).
ec_stream.pcm	The file generated when running the CSPdemoSTB demo in interactive mode. This file contains a recording of speech from the channel being tested.
Welcome.pcm	The outgoing prompt used by the channel being tested. This prompt simulates what a caller might hear.

5.2 Summary of Differences Among Continuous Speech Processing Demos

The following summarizes the differences in how the demos operate on Linux and Windows:

- The functions **dx_fileopen( )**, **dx_fileclose( )**, **dx_write( )** are used in Windows but are not supported in Linux. Linux version uses **open( )**, **close( )**, **write( )**.
- The parameter _O_CREAT is used in Windows, while O_CREAT (without the leading underscore) is used in Linux. The parameter O_BINARY is not used in Linux.

- **Sleep( )** is used in Windows; **sleep( )** in Linux. In Linux, **sleep( )** is in units of seconds while in Windows, **Sleep( )** is in units of milliseconds.

- In Linux, define "NULL" to 0 for **dx_open( )**.

- In Linux, **sr_getboardcnt( )** is not supported and not used.

- Wink handle section was rewritten in Linux.

- In Linux, *windows.h* and **Beep( )** are not used. The header file *sys/time.h* is used instead of *time.h*, and *sys/io.h* is used instead of *io.h*.

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