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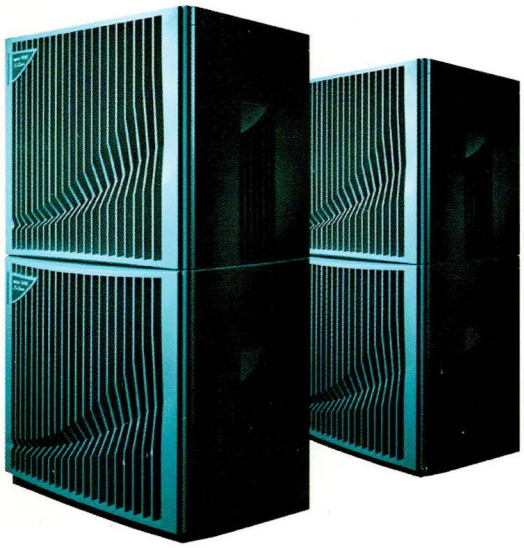
Exemplar
S-Class and
X-Class Servers



CXdb Quick Reference

Fourth Edition

Hewlett-Packard Company
Convex Division
3000 Waterview Parkway
P.O. Box 833851
Richardson, TX 75083-3851
United States of America

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Notice

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Using CXdb

1

Compiling your program for CXdb

CXdb can debug Fortran, C, and C++ programs compiled on the Exemplar S2000, SPP1200 Series, and SPP1600 Series systems using the following compilers:

- Exemplar Fortran — `/opt/fortran/bin/f77`
- Exemplar C — `/opt/ansic/bin/C89`
- Exemplar C++ — `/opt/CC/bin/CC`
- HP Fortran 90 — `/opt/fortran90/bin/f90`

The Exemplar C, Fortran 77, and C++ compilers are based on standard Hewlett-Packard compilers, which have been modified to support the Exemplar programming model.

For your application to run properly under CXdb, you must use the Exemplar linker `ld`.

To compile an application for symbolic debugging with CXdb, use the `-g` compiler option. For example:

```
% f77 -g myprog.f
```

To compile a Fortran 90 application, you must also include the `-Wl,+tools` option. For example:

```
% f90 -g foo.f90 -Wl,+tools
```

NOTE: The `-g` option is incompatible with optimization levels above `+O0`.

If you have compiled your program *without* debugging information, you can still debug it with CXdb. However, in this case only global identifiers and function names can be referenced by their symbolic names. To access local variables and function arguments, you must specify their addresses rather than symbolic names. No source code correlation will be available.

Invoking CXdb

Use the `cxdb` command to invoke CXdb in either of two interfaces:

- **GUI mode**—Provides a window environment for X terminals that includes full use of a mouse to perform debugging functions in CXdb.
- **Line mode (tty interface)**—Allows you to use CXdb interactively without the graphical user interface on either windowless terminals (such as VT-100s) or X terminals.

In GUI mode

Assuming your DISPLAY environment variable is set correctly, invoke CXdb in GUI mode from the shell with the `cxdb` command. For example:

```
% /opt/cxdb/bin/cxdb a.out &
```

In the above example, a.out is the name of the executable file to debug. This is the most common way to invoke CXdb.

If you do not specify the name of an executable file on the shell command line, CXdb opens the Mode Selection dialog, where you can select whether you want to debug an executable file (the default), a running process, a core file, or execute the `mpirun` command.

In line mode (tty interface)

From the shell, invoke CXdb in line mode (tty interface) using the `-nw` (no windows) option of the `cxdb` command. For example:

```
% /opt/cxdb/bin/cxdb -nw a.out
```

In the above example, a.out is the name of the executable file to debug.

If you do not specify an executable file on the shell command line, you can use the CXdb `debug` command to select whether you want to debug an executable file, a running process, or a core file.

Using `cxdb` command options

Refer to "Starting CXdb — cxdb command," on page 27 for a list of the `cxdb` command options.

Loading a program to debug

With CXdb, you can debug:

- An executable file
- A core file
- A running process
- An MPI application

Normally, you specify which type of debugging you want to do when you invoke CXdb, as described in the next section.

Invoking CXdb

When you invoke CXdb, you can specify the type of debugging you want to do by using the appropriate options on the command line.

Invoking CXdb with the name of an executable file

To debug an executable file, invoke CXdb from the shell with the name of an executable. For example:

```
% /opt/cxdb/bin/cxdb <executable>
```

The above command invokes CXdb in GUI mode. CXdb loads the executable file to debug by executing the `debug exec` command on the specified file. CXdb assumes that the first file that is not preceded by an option flag is the executable file.

Invoking CXdb with the name of a core file

To invoke CXdb from the shell with the name of a core file to debug, use the `-c` option of the `cxdb` command. For example:

```
% /opt/cxdb/bin/cxdb -c <corefile> <executable>
```

The above command starts CXdb in GUI mode. CXdb loads the core file to debug by executing the `debug core` command on the specified core file.

Specifying the executable file is optional — this incorporates debugging information from the executable that generated the core file. If you do not specify an executable, you can still debug the core image using absolute addresses, but debugging information is severely limited.

Invoking CXdb with the ID of a running process

To invoke CXdb from the shell and attach to a running process to debug, use the `-a` option of the `cxdb` command.

For example:

```
% /opt/cxdb/bin/cxdb -a <process-id> <executable>
```

The above command starts CXdb in GUI mode. CXdb attaches to the process to debug by executing the `debug attach` command on the specified process ID.

Specifying the executable file is optional— this incorporates debugging information from the executable that generated the process. If you do not specify an executable, you can still debug the process image using absolute addresses, but debugging information is severely limited.

Invoking CXdb with the name of an MPI application

To invoke CXdb from the shell with the name of an MPI application to debug, use the `-mpi` option of the `cxdb` command. For example:

```
% /opt/cxdb/bin/cxdb -mpi <appFile>
```

The above command starts CXdb in GUI mode. CXdb invokes the `mpirun` command, which creates the MPI processes and attaches them to CXdb.

The appFile is the name of the file that specifies which executable to use, and how many processes or instances of that executable should be created. For more information about `mpirun` and how to specify the contents of the appFile, see the *HP MPI User's Guide.*

Loading a program after invoking CXdb

If you do not specify a file or process to debug when invoking CXdb, you must specify one later by one of the following methods:

- In GUI mode, use the Mode Selection dialog to select whether you want to debug an executable file, a core file, a running process, or an MPI application.
- In line mode, use the `debug` command to specify an executable file, a core file, or a running process to debug.

If you later want to specify a new process of file to debug, you can use the `debug` command in either line mode or GUI mode to specify a new executable file, core file, or running process to debug.

NOTE: You cannot use the `debug` command to specify an MPI application to debug. Use the `mpirun` command instead.

User interface and windows

There are two user interfaces for CXdb: GUI mode and line mode (tty interface).

This section explains how to create CXdb windows in GUI mode, then lists common debugging tasks and their associated CXdb windows, along with line mode command equivalents, where applicable.

Creating CXdb windows (GUI mode)

To create CXdb windows:

- **Command window** — Created automatically when you execute the `cxdb` command.
- **Source Code window** — By default, created automatically when you execute the `debug executable` or `debug attach` commands. Can also be created by selecting Source Code from the Windows menu in any CXdb window.
- **Process interface window** — Created automatically when you execute the `run` or `rerun` command.
- **Assembly Code window** — Select Assembly Code from the Windows menu in any CXdb window.
- **Memory Display window** — Select Memory Display from the Windows menu in any CXdb window.
- **Stack Trace window or register windows** — Select the appropriate item from the Windows menu in any CXdb window.
- **Help window** — Select the Window Overview, Using Help, or Release Notice item from the Help menu in any CXdb window, or execute the `help` command.
- **Edit window** — Execute the `edit` command.
- **Shell window** — Execute the `shell` command.

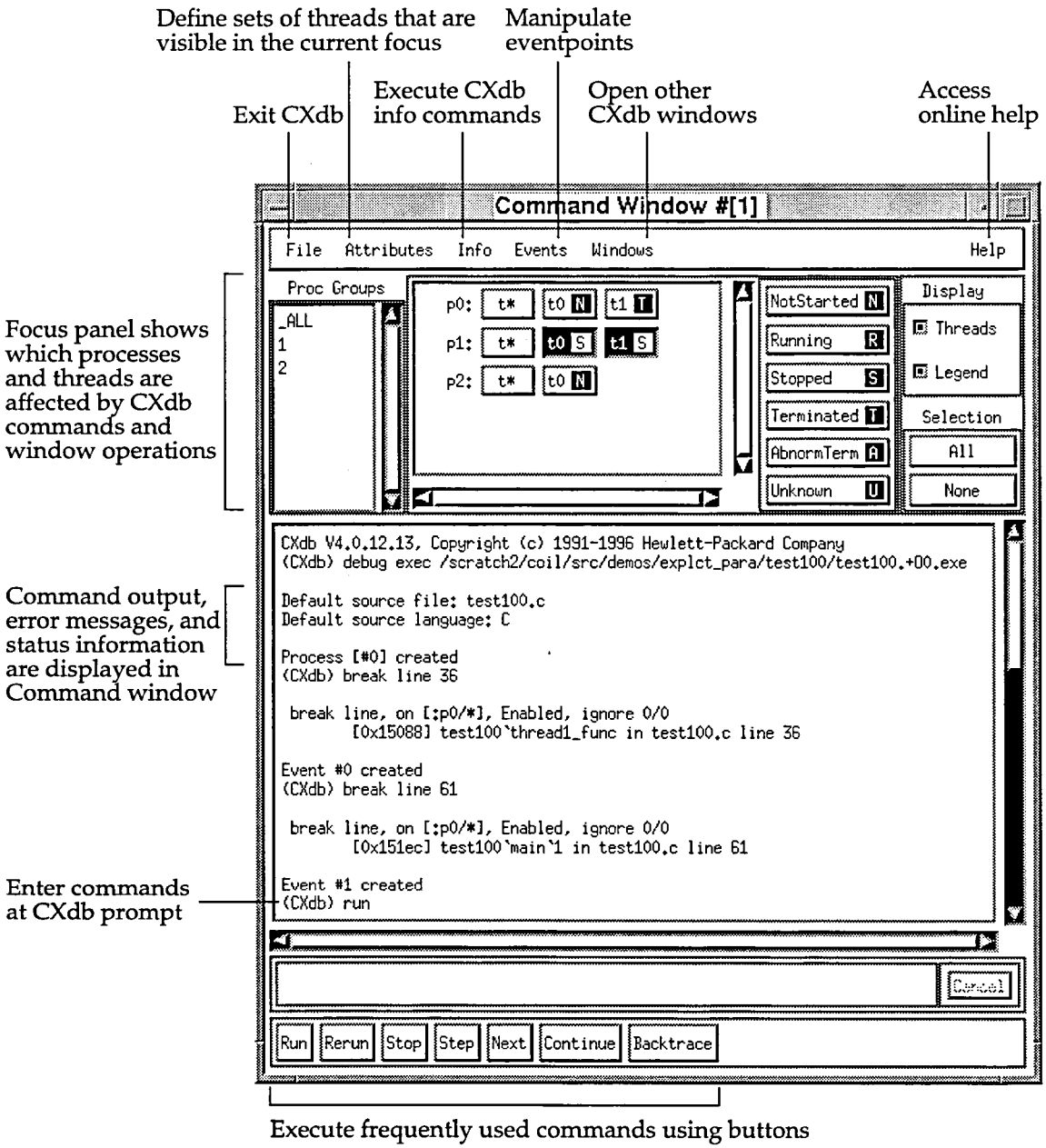
When a new window is created, it inherits the focus of the window from which it was created. That is, the new window displays the same processes and threads as the parent window. To change the focus, use the `set focus` command or the focus panel in the Command window.

CXdb windows and line mode equivalents

If you want to...	Use this CXdb window...	Line mode (tty interface) command equivalent
Enter commands; view command output and messages	Command	Invoke CXdb from the shell with the `-nw` option and enter commands at the `(CXdb)` prompt.
View source code	Source Code	`list`
View assembly-language code	Assembly Code	`disassemble`
View contents of process memory	Memory Display	`examine`
View process stack frames	Stack Trace	`backtrace; info frame; info args; info locals`
View contents of processor status word register (PSW)	Processor Status Word	`info psw`
View contents of general registers	General Registers	`info registers`
View contents of space registers	Space Registers	`info space registers`
View contents of control registers	Control Registers	`info control registers`
View contents of floating point registers	Floating point Registers	`info floating point registers`
Provide interactive input to and output from the running process	Process interface window	Process input, output, and messages are sent to stdin, stdout, and stderr in line mode.
Execute shell commands	Shell	`shell`

Using the Command window

The Command window (shown below) is the primary way to communicate with CXdb in GUI mode. It appears automatically when you start CXdb with the `cxdb` command (assuming your `DISPLAY` environment variable is set correctly and you have not invoked CXdb with the `-nw` option).

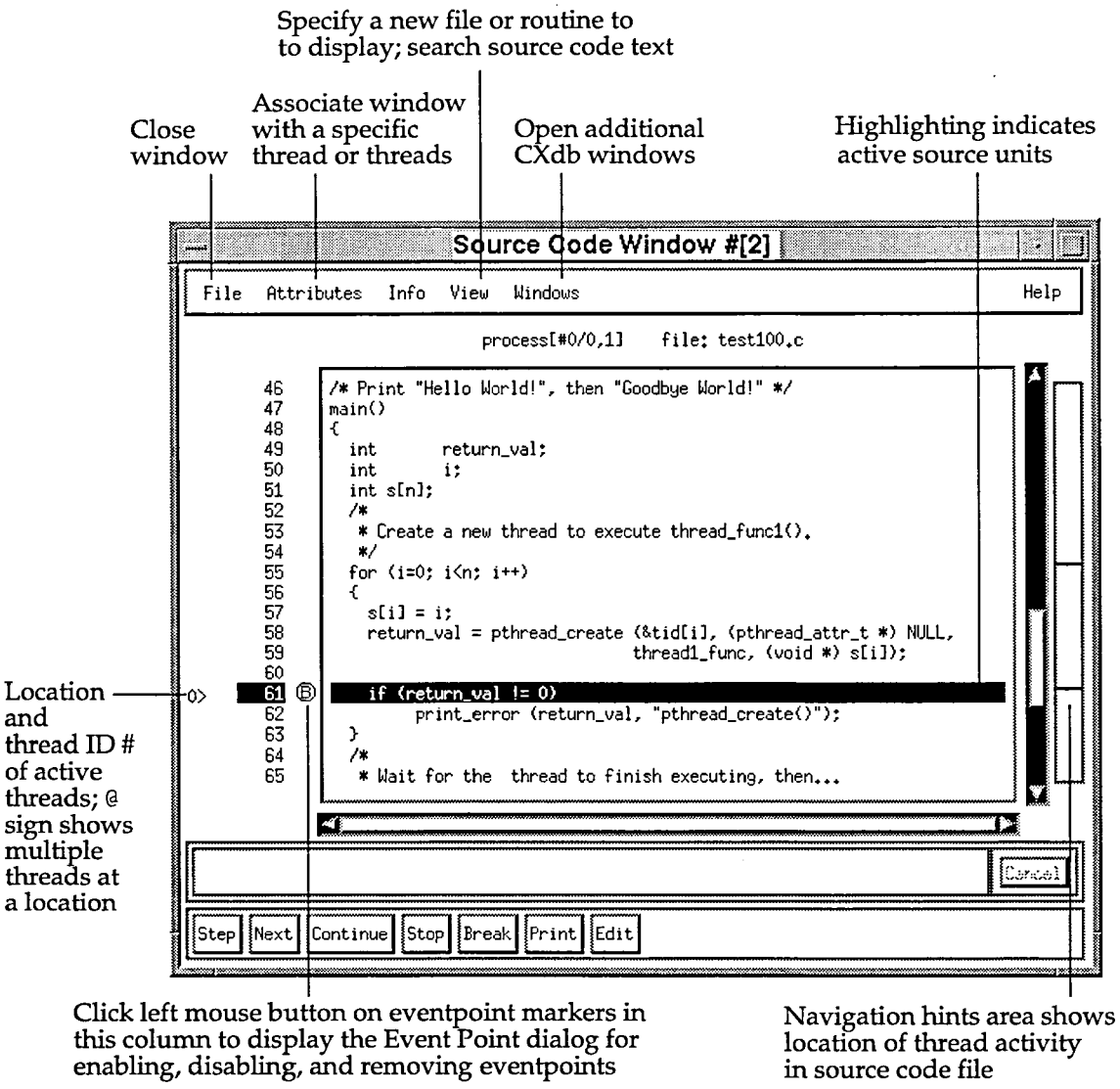


CXdb stores the last 100 commands you entered in a history buffer:

- Press **CTRL-p** to go to the previous line in the command history; use **CTRL-n** to go to the next line.
- Use the `info history` command to display the command history; use the `recall` command to retrieve and re-execute a command.

Using the Source Code window

The Source Code window (shown below) displays the source code files associated with the executable file. By default, a Source Code window is automatically created when you specify an executable file to debug. You can have multiple Source Code windows open during a debugging session.



Working with multiple threads and processes

If you have an application that runs as multiple threads or multiple processes (such as a message passing application), you might want to apply CXdb commands and GUI operations to some of the threads and processes while leaving the others unaffected. You can define the focus for CXdb commands and GUI operations by using the commands listed in the following table.

If you want to...	Use these commands...	Comments
Specify which threads and processes are affected by CXdb commands and GUI operations	`set focus`	The default focus is all threads of all processes. If you have changed the focus, you can return to the default state by using the `set focus all` command.
Display the current focus setting.	`info focus`	
Specify which threads are visible for processes in the current focus.	`set threads`	This command also affects which threads are visible when you use the *<focus-override>* parameter.
Display thread information.	`info threads`	This command lists the current state of each thread, ID numbers of active threads, and identifies the current thread.
Define a group of related processes and threads.	`add group`	CXdb automatically assigns an ID number to the group when you create it. Group 0 is the default, and it contains all threads of all processes.
Display current group definitions.	`info group`	

For example:

```
(CXdb) set focus :p1,3 :t2,3,5
```

The above command sets the focus to threads 2, 3, and 5 of processes 1 and 3. Only these threads and processes are affected by subsequent CXdb commands and GUI operations.

```
(CXdb) info focus
:p1 :t2,3,5 :p2 :t2,3,5
```

The above command show the current focus setting.

```
(CXdb) set threads 3,6
```

The above command sets the focus to threads 3 and 6 for all processes in the current focus.

```
(CXdb) add group :p* :t0
group 1 created
```

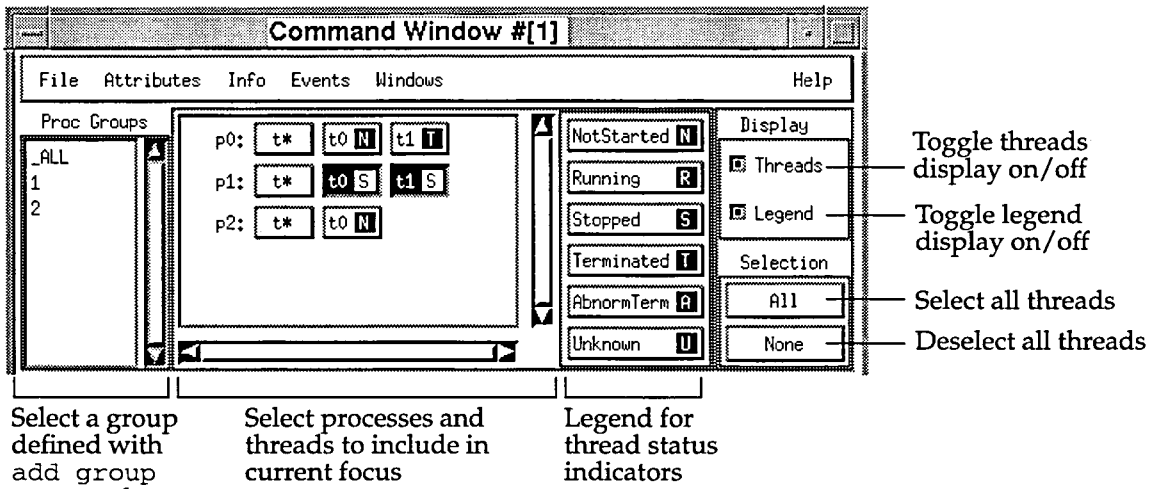
The above command creates a group that consists of thread 0 of each process. The group ID number is 1.

```
(CXdb) set focus :g1
```

The above command sets the focus to all the processes and threads in group 1.

Setting the focus in GUI mode

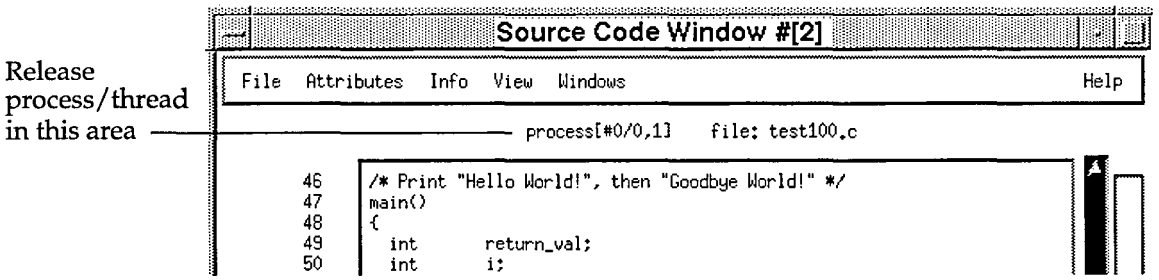
In GUI mode, you can display and set the current focus by using the focus panel in the Command window, as illustrated below.



To apply a thread focus selection to another window, such as the Source Code window, perform the following drag-and-drop steps:

1. In the focus panel, place the mouse cursor over the individual process or thread toggle button you want to select. Do not select a group, a process label, or t*.

2. Hold down the middle mouse button, and drag the selected process/thread to the window where you want to apply it.
3. Release the process/thread icon in the part of the target window that lists process/thread activity, which is the bar just below the menu bar. (See figure below.)



Using the <*focus-override*> parameter

You can use the <*focus-override*> parameter with an individual CXdb command to override the current focus for that one command *only*. The <*focus-override*> parameter does not change the current focus for any concurrent or subsequent commands.

The <*focus-override*> parameter can include process lists, thread lists, and group lists. For example:

```
(CXdb) :p* :t0 step
```

The above command steps thread 0 of all processes.

Working with breakpoints, tracepoints, and watchpoints

The following table lists selected commands for working with breakpoints, tracepoints, and watchpoints. All of the commands listed are available in both GUI mode and line mode (tty interface).

If you want to...	Use these command(s)...

Display information about breakpoints, tracepoints, watchpoints, or all eventpoints	`info break`
	`info trace`
	`info watch`
	`info event`

Set a breakpoint or tracepoint at a routine	`break routine` *<routine-name>* `trace routine` *<routine-name>*
Set a breakpoint or tracepoint at a line	`break line` *<line-number>* `trace line` *<line-number>*
Set a breakpoint or tracepoint at an instruction	`break instruction` *<address>* `trace instruction` *<address>*
Set a watchpoint to monitor an address range	`watch` *<address>*
Set a conditional breakpoint	`event relation` *<expression>*
Disable a breakpoint, tracepoint, or watchpoint	`disable event` *<event-number>*
Enable a breakpoint, tracepoint, or watchpoint	`enable event` *<event-number>*
Remove a breakpoint, tracepoint, or watchpoint	`remove event` *<event-number>*

Refer to following sections for complete syntax and additional commands:

- "Setting breakpoints — break commands" on page 29
- "Setting tracepoints — trace commands" on page 30
- "Displaying eventpoint information" on page 32
- "Removing eventpoints" on page 33
- "Eventpoint handler commands" on page 34

Controlling process execution

Before using any of the CXdb commands for controlling process execution, make sure that you:

- Compile your program with the `-g` option.
- Load the executable file you want to debug.
- Set at least one breakpoint. (CXdb does not automatically set a breakpoint at the first line of your program. However, if you use the `step` or `next` command without setting a breakpoint, CXdb will set a breakpoint at the first instruction of the main program routine.)

The following table describes how to perform basic program execution tasks. Refer to "Stepping process execution" on page 15 for a description of stepping commands.

If you want to...	Use this command or key...	Comments
Run your program	`run`	By default, automatically creates a process interface window in GUI mode.
Rerun your program using the previous argument list	`rerun`	
Continue execution of a stopped process	`continue`	
Continue process execution from within an eventpoint handler	`resume`	Can be used only within an eventpoint handler. This is the only process execution command that can be used within an eventpoint handler.
Stop process execution	Type **CTRL-c** in the Command window	Aborts the command that started process execution.
Terminate a running process	`kill process`	

In GUI mode you can also control process execution by:

- Using the Run, Rerun, and Continue command buttons in the Command window
- Using the Continue command button in the Source Code or Assembly Code windows

Stepping process execution

The following table shows commands used for stepping process execution within CXdb.

The <*granularity*> (step size) you specify with stepping commands is optional, and can be:

- `statement`
- `routine`
- `block`

If no granularity is specified, CXdb uses the default stepping granularity.

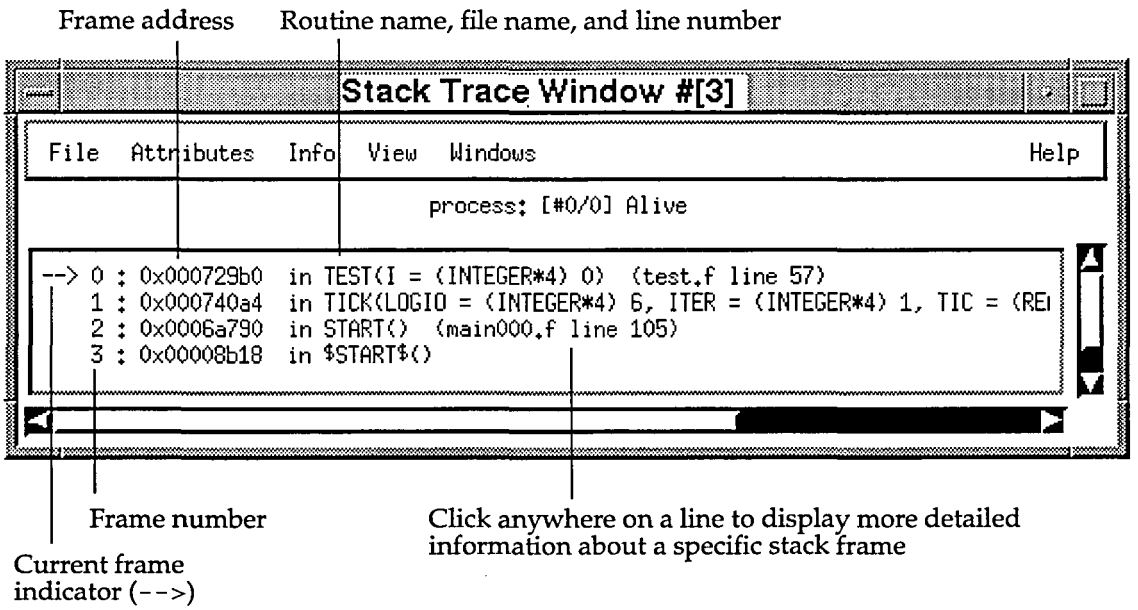
Refer to "Stepping commands" on page 37, for complete command syntax and additional commands.

To perform this stepping task...	Use this command...
Set the default stepping granularity for CXdb.	`set step [<granularity>]`
Step process execution by 1 source unit of the specified granularity, stepping into subroutine calls	`step [<granularity>]`
Step the process by 1 instruction, stepping into subroutine calls	`step instruction`
Finish executing (step out of) a source unit of the specified granularity	`finish [<granularity>]`
Step process execution to the next source unit of specified granularity, stepping over subroutine calls	`next [<granularity>]`
Step to the next instruction, stepping over subroutine calls.	`next instruction`

In GUI mode, you can also execute stepping commands by using the Step and Next command buttons in the Command, Source Code, or Assembly Code windows.

Obtaining a stack backtrace

You can obtain a stack backtrace in GUI mode by opening a Stack Trace window. You can do this by selecting the Stack Trace item from the Windows menu in any CXdb window. A sample Stack Trace window is shown below.



In GUI mode, you can also click on the Backtrace command button in the Command window.

At the command line (in either line mode or GUI mode), you can obtain a stack backtrace by executing the `backtrace` command at the (CXdb) prompt. For example:

```
(CXdb) backtrace
Process [#0/0]
cf> 0 : 0x80001658 in SUB1(MAXLEN = (INTEGER*4) 1000, A = (REAL*4(1:<TEMP0>)) ,
 B = (REAL*4(1:<TEMP0>, 1:<TEMP0>)) ) (para.f line 22)
 1 : 0x800014ce in PARA() (para.f line 11)
 2 : 0x80001d08 in _main(1, 0xffffcad8, 0xffffcae0)
 3 : 0x80001108 in ___ap$envret()
```

Displaying and modifying program data

This section describes commands for displaying or modifying the contents of the variables and memory segments associated with your program. CXdb provides commands that can access the variables either symbolically by identifer or directly by address.

Refer to the following sections for complete command syntax:

- "Using the print command" on page 40
- "Viewing and modifying memory" on page 41
- "Displaying register contents" on page 43
- "CXdb info commands" on page 45

If you want to...	Use this command...	Comments
Display information about arguments.	`info args`	
Display the local variables of the current routine.	`info locals`	
Display all symbol names used in the program.	`info symbols`	
Display detailed information for a single variable, debugger variable, or language expression.	`info expression`	Shows the object type, storage location, size, data type, current value and *liveness* ranges (range of memory where the value of the variable is available for displaying)
Print a program variable or language expression.	`print` *<language-expression>*	Use the `info formatting` command to display current settings for print options.
Print an array slice.	`print` *<array-name>* *<starting-subscript>* `[..`*<ending-subscript>*`]`	If you do not specify an *ending_subscript*, the default array slice is the single element specified by the *starting_subscript*.

If you want to...	Use this command...	Comments
Specify format for displaying units of memory with `print` command.	`print/B` — Binary output `print/x` — Hexadecimal output `print/d` — Signed decimal output `print/e`[*<width>.<precision>*] — Scientific notation `print/f`[*<width>.<precision>*] — Floating point notation `print/i` — Instruction format `print/K` — C++ class members	Do not use a space between the word "`print`" and the display format specification. Not all print formats are available for all memory unit types.

Set print options.	`set printopts padding`
	`set printopts nopadding`
	`set printopts precision`
	`set printopts maxarray`
		Force alignment with leading zeros (padding).
		Disable padding with leading zeros (default).
		Set precision for real (floating-point) numbers.
		Set maximum number of array elements to be printed at one time.

Display contents of memory.	`examine`	In GUI mode, you can also open a Memory Display window. Refer to the "examine" reference topic for formatting options.

Display register contents for registers available on your system.	`info registers`
	`info floating point registers`
	`info psw`
	`info space registers`
	`info control registers`
		In GUI mode, you can open register windows for the registers available on your system.

Using CXdb in line mode

Line mode allows you to use CXdb interactively without the graphical user interface. Line mode is designed primarily for use on windowless terminals (for example, VT-100s), but you can also use it on X terminals.

At your shell prompt, enter the following command to invoke CXdb in line mode:

```
% cxdb -nw
```

In line mode, process output appears intermixed with CXdb output on your screen (stdout), unless you redirect the output. By default, the output is paged using the `less` utility.

NOTE: If your PAGER environment variable is set to anything other than `less`, paging of output will not work properly.

In line mode, echoing of input from command files and initialization files is disabled by default. To enable echoing of this input, use the `set echo` command.

CXdb line mode provides command line editing functions similar to UNIX command line editing. You can display the key bindings for these editing functions by entering **CTRL-?** on the CXdb command line.

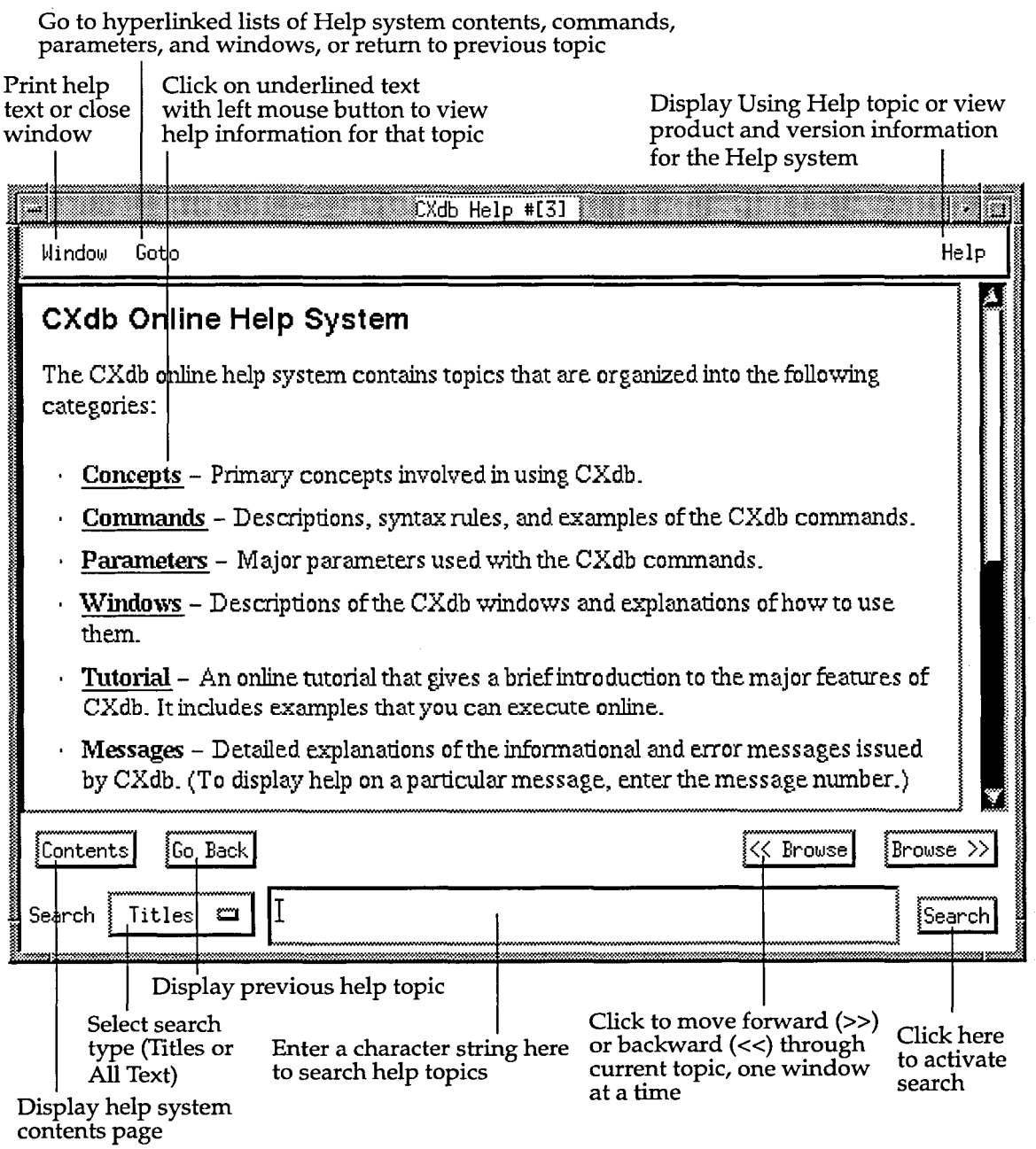
In line mode, whenever the process is stopped or the stack frame is changed, CXdb displays 5 lines of source code surrounding the line of source code at the point of execution. For example, lines of source code context are displayed:

- When the process is stopped by a breakpoint or an eventpoint of type spawn, join, or signal
- When the process stops after executing commands that affect process execution, such as `step`, `next`, `finish`, or `goto`
- When you change the current stack frame by executing the `frame` command or the aliases `up` and `down`

Some CXdb windows and commands are not available in line mode. Refer to the section "CXdb windows and line mode equivalents" on page 6 for alternative or equivalent commands to use in line mode.

Getting help online

To access the CXdb Help system and bring up the CXdb Help window, select the Window Overview, CXdb Overview, Using Help, or Release Notice item from the Help menu in any CXdb window, or execute the `help` command. The CXdb Help window is shown below.



Mouse and keyboard shortcuts

This section lists selected mouse and keyboard shortcuts for command-line editing, assuming that you have not modified the default button or key bindings.

Key	Function
CTRL-a	Beginning of line
CTRL-b	Back one character
META-b	Back one word
CTRL-d	Delete forward one character
META-d	Delete forward one word
CTRL-e	End of line
CTRL-f	Forward one character
META-f	Forward one word
CTRL-u	Beginning of line, delete line
CTRL-k	Delete to the end of the line
CTRL-v, PAGE UP	Scroll down one page (Command window only)
META-v, PAGE DOWN	Scroll up one page (Command window only)
TAB	Complete current command
CTRL-p	View previous entry in the command history
CTRL-n	View next entry in the command history
CTRL-l	Redraw screen
LEFT ARROW (<—)	Left one character (Command window only)
RIGHT ARROW (—>)	Right one character (Command window only)
CTRL-?	List all available key bindings (line mode only)

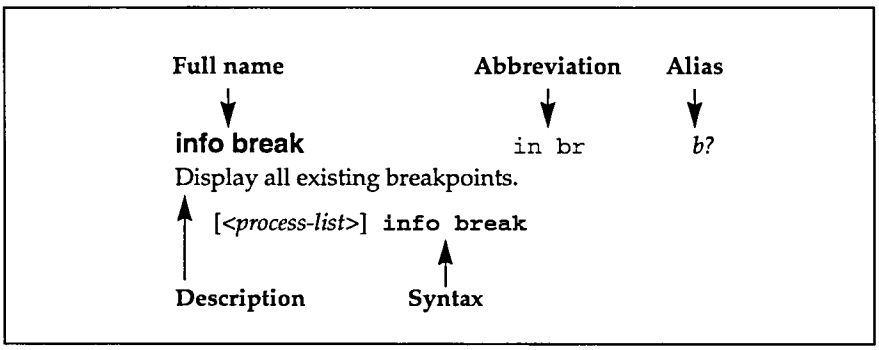
Command syntax and descriptions

2

This section lists the following information for each CXdb command:

- Full command name
- Shortest abbreviation for the command
- Default alias for the command
- Brief description of what the command does
- Syntax of the command

The information is presented in the following format:



This section also presents brief descriptions and syntax for some of the parameters used with CXdb commands.

Parameters

This section describes some of the major parameters used with CXdb commands.

<array-slice>

A subset of an array.

<starting-subscript>`[..`*<ending-subscript>*`]`

<debugger-variable>

A variable defined and used in CXdb commands.

`[cxdb$ | $]`*<variable-name>*

<directory-specifier>

A directory path name.

<directory-specifier>

<environment-variable>

A shell environment variable.

<environment-variable>

<even-handler>

A set of CXdb commands that executes when an eventpoint is triggered.

`{` *<CXdb-command>* `;` `[...]` `}`

<event-specifier>

An eventpoint identifier.

`{`*<eventpoint-number>* `|` *<debugger-variable>* `|` `*` `}`

<eventtype-specifier>

An eventpoint type.

```
{ break | trace | watch | exec | join | relation |
   signal | spawn | * }
```

<file-name>

The name of a file.

`[`*<directory-specifier>*`/]` *<file-name>*

<focus-override>

A list of processes, threads, or groups.

`{`*<process-list>* `[`*<thread-list>*`]` `[,...]` `|` *<group-list>*`}`

<frame-specifier>
A stack frame identifier.

[{+ | -}] *<integer>*

<granularity>
Source unit granularity.

{**statement** | **block** | **routine**}

<language-expression>
A valid expression in the source language.

<language-expression> [**\;**]

<line-specifier>
A source line identifier.

[*<file-name>***:**] *<integer>*

<process-list>
A list of CXdb process numbers.

:p {*<process-number>*[**..***<process-number>*] [**,** ...] | *****}

<redirection operator>
An operator that redirects CXdb command output and messages.

{**>** | **>!** | **>>** | **>>!** | **>&** | **>&!** | **>>&** | **>>&!**}

<regular-expression>
A character patern for searches.

{*<character-string>* | *<search-operator>* [...]}

<signal-specifier>
A signal identifier.

{*<signal-name>* | *<abbreviated-name>* | *<signal-number>*}

<source-unit>
A source unit identifier.

[*<file-name>***:**] *<source-unit-number>*

<string>
A character string.

<character-string>

<thread-list>

A list of thread numbers.

```
:t {<thread-number> [, ...] | *}
```

Starting CXdb — `cxdb` command

Use the following command to invoke CXdb. To access symbolic debugging information, you must first compile your program with the `-g` option:

cxdb `cxdb`

Invoke CXdb from the shell.

```
cxdb [-a <process-id>] [-csd ]
    [-D <directory-specifier>[, ...]]
    [-f <command-file>]
    [-mpi <appFile>] [-nw ] [-nx ]
    [-x <command-list>] [[-e ] <file-name>]
    [[-c] <file-name>] [<X-Toolkit-options>]
```

Parameter	Meaning
`-a` *<process-id>*	Attaches CXdb to the process with the specified process ID.
`-c` *<file-name>*	Specifies a core file to debug.
`-csd`	Invokes CXdb in line mode and incorporates aliases for `csd` debugger commands.
`-D` *<directory-specifier>*	Specifies a directory to add to the default search path.
`-e` *<file-name>*	Specifies an executable file to debug.
`-f` *<command-file>*	Executes the specified CXdb command file.
`-mpi` *<appFile>*	Specifies an MPI application to debug.
`-nw`	Invokes CXdb in line mode.
`-nx`	Prevents CXdb from executing initialization files.
`-x` *<command-list>*	Specifies a list of CXdb commands to be executed at start-up. Separate multiple commands in the list with a semicolon (`;`).
<X-Toolkit-options>	Specifies an X Toolkit option.

`quit` command

quit `q`

Exit from CXdb.

```
quit
```

`help` command

help `h` *?*

Invoke the CXdb help system.

```
help [<string>]
```

The string you enter can be a CXdb command, CXdb error message identifier, or other text string.

Specifying an executable file, core file, or process to debug

debug core `deb c` *dbgc*

Specify a core file or checkpoint file to debug.

`debug core` *<core-file>* [`executable` *<executable-file>*]

debug executable `deb e` *dbg*

Specify a new executable file to debug, or associate the specified executable with the existing CXdb process.

`debug executable` *<executable-file>*

debug attach `deb a` *dbgp*

Attach to a running process to debug.

`debug attach` *<process-id>* [`executable` *<executable-file>*]

detach `det`

Detach from a process.

[*<process-list>*] `detach`

Setting breakpoints — `break` commands

break instruction — `bre i` — *bi*

Set a breakpoint at an instruction.

[*<process-list>*] `break instruction` *<language-expression>*
[{*<event-handler>*}] [*<debugger-variable>*]

break line — `bre l` — *bl*

Set a breakpoint at a source line.

[*<process-list>*] `break line` *<line-specifier>*
[{*<event-handler>*}] [*<debugger-variable>*]

break routine — `bre r` — *br*

Set a breakpoint at the beginning of a routine.

[*<process-list>*] `break routine` *<language-expression>*
[{*<event-handler>*}] [*<debugger-variable>*]

break source — `bre s` — *bs*

Set a breakpoint at a source unit.

[*<process-list>*] `break source` *<source-unit>*
[{*<event-handler>*}] [*<debugger-variable>*]

Setting tracepoints — `trace` commands

trace instruction `tra i` *ti*

Set a tracepoint at an instruction.

[*<process-list>*] `trace instruction` *<language-expression>*
[{*<event-handler>*}] [*<debugger-variable>*]

trace line `tra l` *tl*

Set a tracepoint at a source line.

[*<process-list>*] `trace line` *<line-specifier>*
[{*<event-handler>*}] [*<debugger-variable>*]

trace routine `tra r` *tr*

Set a tracepoint at the beginning of a routine.

[*<process-list>*] `trace routine` *<language-expression>*
[{*<event-handler>*}] [*<debugger-variable>*]

trace source `tra s` *ts*

Set a tracepoint at a source unit.

[*<process-list>*] `trace source` *<source-unit>*
[{*<event-handler>*}] [*<debugger-variable>*]

Setting other types of eventpoints — `event` and `watch` commands

event exec `eve e`

Set an eventpoint to watch for an `exec(2)` system call by the process.

[*<process-list>*] `event exec` [{*<event-handler>*}] [*<debugger-variable>*]

event join `eve j`

Set an eventpoint to trap a thread joining.

[*<process-list>*] `event exec` [{*<event-handler>*}] [*<debugger-variable>*]

event relation `eve rel`

Set an eventpoint to watch for an expression to become true.

[*<process-list>*] [`event relation` *<language-expression>*
[{*<event-handler>*}] [*<debugger-variable>*]

event signal `eve si`

Set an eventpoint to catch a signal.

[*<process-list>*] `event signal` *<signal-specifier>* [{*<event-handler>*}]
[*<debugger-variable>*]

event spawn `eve sp`

Set an eventpoint to trap the spawning of a thread.

[*<process-list>*] `event spawn` [{*<event-handler>*}][*<debugger-variable>*]

watch `w`

Set a watchpoint to monitor an address range.

[*<process-list>*] `watch` *<starting-address>* [{ `..`*<ending address>* | `:`*<byte-count>*}]
[{*<event-handler>*}] [*<debugger-variable>*]

Displaying eventpoint information

info break `in br` *b?*

Display all existing breakpoints.

[<*process-list*>] `info break`

info event `in event` *e?*

Display the specified eventpoints.

`info event` [<*event-specifier*>] [, ...]

info eventtype `in eventt` *et?*

Display all eventpoints of the specified type.

[<*process-list*>] `info eventtype` { <*eventtype-specifier*> [, ...]

info trace `in tr` *t?*

Display all tracepoints.

[<*process-list*>] `info trace`

info watch `in w` *i w*

Display all watchpoints.

[<*process-list*>] `info watch`

Enabling, disabling, and setting ignore counts for eventpoints

enable event `ena event` *en*

Enable eventpoints.

`enable event` *<event-specifier>* [, ...]

enable eventtype `ena eventt`

Enable all eventpoints of the specified type.

[*<process-list>*] `enable eventtype` *<eventtype-specifier>* [, ...]

disable event `disab event` *dis*

Disable eventpoints.

`disable event` *<event-specifier>* [, ...]

disable eventtype `disab eventt`

Disable all eventpoints of the specified type.

[*<process-list>*] `disable eventtype` *<eventtype_specifier>* [, ...]

set ignore `se ig`

Set an ignore count for an eventpoint.

`set ignore` *<ignore-count>* *<event-specifier>* [, ...]

Removing eventpoints

remove event `rem event` *e-*

Delete the specified eventpoints.

`remove event` *<event-specifier>* [, ...]

remove eventtype `rem eventt` *et-*

Delete all eventpoints of the specified type.

[*<process-list>*] `remove eventtype` *<eventtype-specifier>* [, ...]

Eventpoint handler commands

clear default handler `cl d h`

Clear the default handler for all eventpoints.

```
clear default handler
```

clear handler `cl h`

Clear the handler for a specified eventpoint.

```
clear handler <event-specifier> [, ...]
```

clear typehandler `cl t`

Clear the handler for a specified type of eventpoint.

```
clear typehandler <eventtype-specifier> [, ...]
```

echo `ec`

Echo a character string.

```
echo[/n] <string> [ ... ]
```

if `if`

Establish conditional execution of CXdb commands.

```
if (<relational-expression>) <command-set> [ else <command-set>]
```

resume `res`

Continue execution of the process from within an eventpoint handler.

```
resume
```

set default handler `se de h`

Set the default handler for eventpoints.

```
set default handler {<event-handler>}
```

set handler `se h`

Set the handler for a specified eventpoint.

```
set handler <event-specifier> [, ...] {<event-handler>}
```

set typehandler `se ty`

Define the default handler for all eventpoints of the specified type.

```
set typehandler <eventtype-specifier> [, ...] {<event-handler>}
```

Process execution commands

continue `con` *c*

Continue execution of the process.

[*<focus-override>*] `continue` [*<count>*] [`&`]

detach `det`

Detach from a process.

[*<process-list>*] `detach`

goto address `go a`

Branch to the specified address.

[*<focus-override>*] `goto address` *<language-expression>*

goto line `go l`

Branch to the specified source line.

[*<focus-override>*] `goto line` *<line-specifier>*

goto source `go s`

Branch to the specified source unit.

[*<focus-override>*] `goto source` *<source-unit>*

kill process `k p` *k*

Terminate a running process.

[*<process-list>*] `kill process`

rerun `rer` *rr*

Create and execute a new process, using the previous argument list.

[*<process-list>*] `rerun` [`&`]

resume `res`

Continue execution of the process from within an eventpoint handler.

`resume`

return `ret`

Return to the calling routine.

[*<focus-override>*] `return` *<language-expression>*

run `ru` *r*

Create and execute a new process.

[<*process-list*>] `run` [<*argument-list*>] [`&`]

stop `sto`

Stop execution of the process.

[<*process-list*>] `stop`

Stepping commands

The <*granularity*> (step size) you specify with CXdb stepping commands can be one of the following:

- `statement`
- `block`
- `routine`

finish `fini`

Finish executing (step out of) the specified source unit.

[<*focus-override*>] `finish` [<*granularity*>] [`&`]

next `n`

Step to the next source unit, ignoring subroutine calls.

[<*focus-override*>] `next` [<*granularity*>] [<*count*>] [`&`]

next instruction `n i` *ni, nexti*

Step to the next instruction, stepping over subroutine calls.

[<*focus-override*>] `next instruction` [<*count*>] [`&`]

set default step `se de s`

Set the default stepping granularity.

`set default step` <*granularity*>

set step `se st`

Set the stepping granularity.

[<*process-list*>] `set step` <*granularity*>

step `ste` *s*

Step to the next source unit.

[<*focus-override*>] `step` [<*granularity*>] [<*count*>] [`&`]

step instruction `ste i` *si, stepi*

Step to the next instruction.

[<*focus-override*>] `step instruction` [<*count*>] [`&`]

Viewing source code

list

`li`

List lines of source code.

`list` [[*<file-name>*`:`] *<starting-line>*] [*<number-of-lines>*]]
[`routine` *<language-expression>*]

Viewing assembly-language code

disassemble

`disas`

Display the assembly-language code.

[*<focus-override>*] `disassemble`
[*<starting-address>* [{ `..`*<ending-address>* | `:`*<instruction-count>* }]]

Displaying and modifying data

evaluate `eva`

Evaluate a language expression.

[*<focus-override>*] `evaluate` *<language-expression>*

info args `in ar` *args*

Display arguments of the current routine.

[*<focus-override>*] `info args`

info expression `in ex` *describe, whatis*

Display the characteristics of the specified language expression.

[*<focus-override>*] `info expression` *<language-expression>*

info line `in li` *i li*

Display the source units for a specified line.

[*<process-list>*] `info line` *<line-specifier>*

info locals `in lo` *locals*

Display the local variables of the current routine.

[*<focus-override>*] `info locals`

info sourceunit `in so` *i so*

Display the specified source unit.

[*<process-list>*] `info sourceunit` *<source-unit>*

info symbols `in sy` *globals, symbols*

Display program symbols.

[*<process-list>*] `info symbols` [*<regular-expression>*]

Using the `print` command

print `pr` *p*

Evaluate a language expression and print the result.

[*<focus-override>*] `print[/[n]` *<format>*] *<language-expression>*

`n` Suppresses newline character at end of printed data

<format> options are as follows:

`B`	Binary
`C`	Fortran complex
`L`	Fortran logical
`c`	ASCII character
`d`	Signed decimal
`e[`*<width>*`.`*<precision>*`]`	Scientific
`f[`*<width>*`.`*<precision>*`]`	Floating-point notation
`K`	C++ class members
`i`	Instruction
`o`	Octal
`s`	String
`u`	Unsigned decimal
`x`	Hexadeximal

info formatting `in fo` *ifo*

Display settings of print options for memory display formats.

[*<process-list>*] `info formatting`

set printopts maxarray `se pr m`

Set the maximum number of array elements to print.

`set printopts maxarray` *<number-of-elements>*

set printopts nopadding `se pr n`

Disable padding with leading zeros when printing.

`set printopts nopadding`

set printopts padding `se pr pa`

Enable padding with leading zeros when printing.

`set printopts padding`

set printopts precision `se pr pr`

Set the precision used to print floating point numbers.

`set printopts precision` *<width>*`.`*<precision>*

Viewing and modifying memory

copy cop

Copy a memory region.

[*<focus-override>*] `copy` *<source-address>*
[{ ..*<ending-address>* | :*<byte-count>* }] `\;` *<destination-address>*

examine exa *x*

Display a region of memory.

[*<focus-override>*] `examine [ /` {*<memory-unit>* *<format>* *<fpmode>*}]
<starting-address> [{ . .*<ending-address>* | :*<unit-count>*}]

evaluate eva

Evaluate a language expression.

[*<focus-override>*] `evaluate` *<language-expression>*

fill fil

Fill a region of memory with the value of an expression.

[*<focus-override>*] `fill [ /` *<memory-unit>*] *<starting-address>*
[{ . .*<ending-address>* | :*<unit-count>* }] `\;` *<language-expression>*

get ge

Restore the contents of memory regions from a binary file.

[*<focus-override>*] `get` *<file-name>*
[*<starting-address>* [{. .*<ending-address>* | :*<byte-count>*}]] [`\;` ...]

info formatting in fo *ifo*

Display the settings for memory display formats.

[*<process-list>*] `info formatting`

put pu

Save the contents of memory to a file for later retrieval.

[*<focus-override>*] `put` *<file-name>* *<starting-address>*
[{. .*<ending-address>* | :*<byte-count>*}] [`\;` ...]

set format se fo

Set the formats for displaying memory.

[*<focus-override>*] `set format` *<memory-unit>* *<format>*

set memory `se m`

Set the unit size for displaying memory.

[*<focus-override>*] `set memory` *<memory-unit>*

Displaying stack frame information

backtrace `ba` *bt*

Display the frames of the call stack.

[*<focus-override>*] `backtrace` [*<frame-count>*]

frame `fr` *f*

Change the current stack frame.

[*<focus-override>*] `frame` *<frame-specifier>*

info frame `in fr` *if r*

Display a stack frame.

[*<focus-override>*] `info frame` [*<frame-specifier>*]

info frame at `in fr a` *if r a*

Display the stack frame at the specified address.

[*<focus-override>*] `info frame at` *<language-expression>*

Displaying register contents

info control registers `in co r` *i co r*

Display the control registers.

[*<focus-override>*] `info control registers`

info floating point registers `in fl p r` *i flp r*

Display the floating-point registers.

[*<focus-override>*] `info floating point registers`

info psw `in ps` *i ps*

Display the processor status word (PSW) register.

[*<focus-override>*] `info psw`

info registers `in r` *i r*

Display the contents of general registers.

[*<focus-override>*] `info registers`

info space registers `in sp r` *i sp r*

Display the space registers.

[*<focus-override>*] `info space registers`

Searching memory

find memory backward `find m b` *fmb*

Find the first occurence of a byte pattern within a memory region.

[*<focus-override>*] `find memory backward [ / <memory-unit> ]`
<byte-pattern> <lowest-address> {`..`*<highest-address>* | `:` *<byte-count>*}

find memory forward `find m f` *fmf*

Find the first occurrence of a byte pattern within a memory region.

[*<focus-override>*] `find memory forward [ / <memory-unit>]`
<byte-pattern> <starting-address> {`..`*<ending-address>* | `:`*<byte-count>*}

Searching source code

find source `find s` *fs*

Search for all occurrences of a text string in a source file.

`find source` *<string>* [*<filename>*]

CXdb `info` commands

info alias `in al` *i al*

Display aliases.

`info alias` [<*regular-expression*>]

info args `in ar` *args*

Display arguments of the current routine.

[<*focus-override*>] `info args`

info break `in br` *b?*

Display all existing breakpoints.

[<*process-list*>] `info break`

info control registers `in co r` *i co r*

Display the control registers.

[<*focus-override*>] `info control registers`

info cxdb `in cx` *i cx*

Display the status of the current CXdb session.

`info cxdb`

info default environment `in d e` *i d e*

Display all default environment variables.

`info default environment` [<*regular-expression*>]

info environment `in en` *env?*

Display all process environment variables.

[<*process-list*>] `info environment` [<*regular-expression*>]

info errno `in er` *i er*

Display the system error message received by the process.

[<*focus-override*>] `info errno`

info event `in event` *e?*

Display the specified eventpoints.

`info event` [<*event-specifier*>] [, ...]

info eventtype `in eventt` *et?*

Display all eventpoints of the specified type.

[*<process-list>*] `info eventtype` *<eventtype-specifier>* [, ...]

info execmode `in ex`

Display the current execution mode.

`info execmode`

info expression `in ex` *describe, whatis*

Display the characteristics of the specified language expression.

[*<focus-override>*] `info expression` *<language-expression>*

info floating point registers `in fl p r` *i flpr*

Display the floating-point registers.

[*<focus-override>*] `info floating point registers`

info focus `in foc` *i foc*

Display the current CXdb focus.

`info focus`

info formatting `in fo` *ifo*

Display the settings for memory display formats.

[*<process-list>*] `info formatting`

info frame `in fr` *ifr*

Display a stack frame.

[*<focus-override>*] `info frame` [*<frame-specifier>*]

info frame at `in fr a` *ifra*

Display the stack frame at the specified address.

[*<focus-override>*] `info frame at` *<language-expression>*

info group `in g` *ig*

Display currently defined groups.

`info group` [*<group-list>*]

info history `in h` *ih*

Display the CXdb command history.

`info history` [*<command-count>*]

info line `in li` *i li*

Display the source units for a specified line.

[*<process-list>*] `info line` *<line-specifier>*

info locals `in lo` *locals*

Display the local variables of the current routine.

[*<focus-override>*] `info locals`

info macro `in m` *i m*

Display macros.

`info macro` [*<regular-expression>*]

info objectmap `in o` *i o*

Display the object map.

[*<process-list>*] `info objectmap`

info path `in pa` *p+*

Display the directories in the search path.

[*<process-list>*] `info path`

info process `in pr` *p?*

Display the status of the process.

[*<process-list>*] `info process`

info psw `in ps` *i ps*

Display the processor status word (PSW) register.

[*<focus-override>*] `info psw`

info registers `in r` *i r*

Display the contents of the general registers.

[*<focus-override>*] `info registers`

info scope `in sc` *where*

Display the current scope path.

[*<focus-override>*] `info scope`

info shlib `in sh` *i sh*

Display the current list of shared libraries specified for debugging.

`info shlib`

info signal `in si` *i si*

Display signal names, numbers, and settings for signal actions.

[<*process-list*>] `info signal` [<*signal-specifier*>] [, ...]

info sourceunit `in so` *i so*

Display the specified source unit.

[<*process-list*>] `info sourceunit` <*source-unit*>

info space registers `in sp r` *i sp r*

Display the space registers.

[<*focus-override*>] `info space registers`

info stack `in st` *i st*

Display information about the process stack.

[<*focus-override*>] `info stack`

info symbols `in sy` *globals, symbols*

Display program symbols.

[<*process-list*>] `info symbols` [<*regular-expression*>]

info threads `in th` *i th*

Display threads of the current process.

[<*process-list*>] `info threads`

info trace `in tr` *t?*

Display all tracepoints.

[<*process-list*>] `info trace`

info type `in ty` *i ty*

Display information about type definitions for a single thread of a single process in a C program.

[`:p`<*process*-number>] [`:t`<*thread-number*>] `info type` [<*regular-expression*>]

info watch `in w` *i w*

Display all watchpoints.

[<*process-list*>] `info watch`

Debugging shared libraries

The following commands for debugging shared libraries are enabled by default. If you do not want to debug shared libraries, you can invoke `cxdb` with the `-noshl` option to disable shared library support.

add shliblist `ad s`

Add library names to the list of shared libraries specified for debugging.

`add shliblist` *<library-name>* **[**, ... **]**

clear shliblist `cl s`

Remove all library names from the list of shared libraries specified for debugging.

`clear shliblist`

info shlib `in sh` *i sh*

Display the current list of shared libraries specified for debugging.

`info shlib`

remove shliblist `rem sh`

Delete library names from the list of shared libraries specified for debugging.

`remove shliblist` *<library-name>* **[**, ... **]**

set shliblist `se shl`

Clear and respecify the list of shared libraries to debug.

`set shliblist` **[***<library-name>* **[**, ... **]** | ***]**

Logging input, output, and messages

You can log the following types of information to files:

- CXdb error and informational messages.
- User entries on the CXdb command line.
- Normal output generated by CXdb in response to commands.

To append to an existing log file, use redirection operators.

add cmderr `ad cmde`

Add file names to the list of files that log CXdb messages.

```
add cmderr <filename> [, ...]
```

add cmdlog `ad cmdl`

Add file names to the list of files that log CXdb input.

```
add cmdlog <filename> [, ...]
```

add cmdout `ad cmdo`

Add file names to the list of files that log CXdb command output.

```
add cmdout <filename> [, ...]
```

clear logging `cl l`

Disable logging of CXdb input to files.

```
clear logging
```

clear noclobber `cl n`

Allow overwriting of existing files used for logging or redirection operations.

```
clear noclobber
```

remove cmderr `rem cmde`

Delete file names from the list of files that log CXdb messages.

```
remove cmderr <filename> [, ...]
```

remove cmdlog `rem cmdl`

Delete file names from the list of files that log CXdb input.

```
remove cmdlog <filename> [, ...]
```

remove cmdout `rem cmdo`

Delete file names from the list of files that log CXdb command output.

```
remove cmdout <filename> [, ...]
```

set cmderr `se cmde`

Clear and replace the list of files that log CXdb messages.

```
set cmderr <filename> [, ...]
```

set cmdlog `se cmdl`

Clear and replace the list of files that log CXdb input.

```
set cmdlog <filename> [, ...]
```

set cmdout `se cmdo`

Clear and replace the list of files that log CXdb output.

```
set cmdout <filename> [, ...]
```

set logging `se l`

Enable logging of CXdb input to files.

```
set logging
```

set noclobber `se n`

Enable the noclobber option to prevent overwriting of existing files used for logging or redirection.

```
set noclobber
```

Redirecting process I/O

To redirect process I/O, use a shell redirection operator with the CXdb `run` command. For example, the command

```
(CXdb) run < prog_input > prog_output
```

starts execution of your program, with input from the file prog_input. Output from the program is directed to the file prog_output.

CXdb redirection operators

For command output

Operator	Action
>	Overwrite existing command output file, unless noclobber is set.
>>	Append new output to an existing file. An error occurs if the specified file does not exist.
>!	Overwrite existing output file, regardless of overwrite protection.
>>!	Append new output to an existing file. Create the file if it does not exist.

For error and information message output

Operator	Action
>&	Overwrite existing message output file, unless noclobber is set.
>>&	Append new message output to an existing file. An error occurs if the specified file does not exist.
>&!	Overwrite existing message output file, regardless of overwrite protection.
>>&!	Append new message output to an existing file. Create the file if it does not exist.

Setting and clearing CXdb defaults

clear echo `cl ec`

Disable echoing of input from initialization files and command files.

```
clear echo
```

clear noclobber `cl n`

Allow overwriting of existing files used for logging or redirection operations.

```
clear noclobber
```

set echo `se ec`

Enable echoing of input from command files and initialization files.

```
set echo
```

set evalopts iprecision `se ev i`

Set the size of integer constants for CXdb.

```
set evalopts iprecision {4 | 8}
```

set evalopts rprecision `se ev r`

Set the size of real numbers for CXdb.

```
set evalopts rprecision {4 | 8}
```

set format `se fo`

Set the formats for displaying memory.

[*<focus-override>*] `set format` *<memory-unit> <format>*

set memory `se m`

Set the unit size for displaying memory.

[*<focus-override>*] `set memory` *<memory-unit>*

set noclobber `se n`

Enable the noclobber option to prevent overwriting of existing files used for logging or redirection.

```
set noclobber
```

set printopts maxarray `se pr m`

Set the maximum number of array elements to print.

`set printopts maxarray` *<number-of-elements>*

set printopts nopadding `se pr n`

Disable padding with leading zeros when printing.

```
set printopts nopadding
```

set printopts padding `se pr pa`

Enable padding with leading zeros when printing.

```
set printopts padding
```

set printopts precision `se pr pr`

Set the precision used to print floating point numbers.

```
set printopts precision <width>.<precision>
```

set shell `se sh`

Set the type of shell invoked from within CXdb.

```
set shell {sh | csh | tcsh | ksh}
```

set typehandler `se t`

Define the default handler for all eventpoints of the specified type.

```
set typehandler <eventtype-specifier> [, ...] {<event-handler>}
```

Setting and clearing global process defaults

These commands affect any new process that is created by CXdb *after* the default is changed.

add default environment `ad d e` *denv+*

Add or modify environment variables in the default environment.

```
add default environment
    <environment-variable> = <string> [, ...]
```

add default path `ad d p` *dp+*

Add directories to the default search path.

```
add default path <directory-specifier> [, ...]
```

clear default environment `cl d e`

Remove all environment variables from the default environment.

```
clear default environment
```

clear default handler `cl d h`

Clear the default handler for all eventpoints.

```
clear default handler
```

remove default environment `rem d e` *denv-*

Delete environment variables from the default environment.

`remove default environment` *<environment-variable>* [, ...]

remove default path `rem d p` *dp-*

Delete directories from the default search path.

`remove default path` *<directory-specifier>* [, ...]

set default environment `se de e` *denv=*

Clear and redefine the environment variables for the default environment.

`set default environment` *<environment-variable>* = *<string>* [, ...]

set default format `se de fo`

Set the default formats for displaying memory.

`set default format` *<memory-unit>* *<format>*

set default handler `se de h`

Set the default handler for eventpoints.

`set default handler` {*<event-handler>*}

set default memory `se de m`

Set the default unit size for displaying memory.

`set default memory` *<memory-unit>*

set default path `se de pa` *dp=*

Set the default search path.

`set default path` *<directory-specifier>* [, ...]

set default pshell `se de ps`

Set the default process shell.

`set default pshell {sh | csh}`

set default step `se de s`

Set the default stepping granularity.

`set default step` *<granularity>*

Setting and clearing defaults for the current process

These commands affect default settings for the *current* process only.

add environment `ad e` *env+*

Add or modify environment variables in the process environment.

[*<process-list>*] `add environment` *<environment-variable>* = *<string>* [, ...]

clear environment `cl en`

Remove all environment variables from the process environment.

[*<process-list>*] `clear environment`

clear handler `cl h`

Clear the handler for a specified eventpoint.

`clear handler` *<event-specifier>* [, ...]

clear typehandler `cl t`

Clear the handler for a specified type of eventpoint.

`clear typehandler` *<eventtype-specifier>* [, ...]

remove environment `rem en` *env-*

Delete environment variables from the process environment.

[*<process-list>*] `remove environment` *<environment-variable>* [, ...]

remove path `rem p` *p-*

Delete directories from the process search path.

[*<process-list>*] `remove path` *<directory-specifier>* [, ...]

set environment `se en` *env=*

Clear and redefine the environment variables for the process environment.

[*<process-list>*] `set environment` *<environment-variable>*=*<string>* [, ...]

set path `se pa` *p=*

Set the search path for the process.

[*<process-list>*] `set path` *<directory-specifier>* [, ...]

Working with aliases and macros

alias `al`

Define an alias.

`alias` *<alias-name> <string>*

csd `csd`

Enable compatibility with `csd` debugger commands.

`csd`

gdb `gdb`

Enable compatibility with `gdb` debugger commands.

`gdb`

info alias `in al` *i al*

Display aliases.

`info alias` [*<regular-expression>*]

info macro `in m` *i m*

Display macros.

`info macro` [*<regular-expression>*]

macro `m`

Define a macro.

`macro` *<name>* [(*<parameter>*[:*<default>*][, ...])]*<string>*

remove alias `rem a`

Delete an alias.

`remove alias` *<alias-name>*

remove macro `rem m`

Delete a macro.

`remove macro` *<macro-name>*

Path and directory commands

add path `ad p` *p+*

Add directories to the search path.

[*<process-list>*] `add path` *<directory-specifier>* [`,` ...]

cd `cd`

Change the console working directory.

`cd` *<directory-specifier>*

info path `in pa` *p+*

Display the directories in the search path.

[*<process-list>*] `info path`

pwd `pw`

Display the name of the console working directory.

`pwd`

Working with signals

event signal `eve si`

Set an eventpoint to catch a signal.

[*<process-list>*] `event signal` *<signal-specifier>*
[**{**<*event-handler*>**}**] [*<debugger-variable>*]

info signal `in si` *i si*

Display signal names, numbers, and settings for signal actions.

[*<process-list>*] `info signal` [*<signal-specifier>*] [`,` ...]

set signal *se si*

Set the actions for the specified signal.

[*<process-list>*] `set signal` *<signal-specifier>*
[{**stop** | **nostop**}`,`] [{**pass** | **nopass**}`,`] [{**print** | **noprint**}]

signal process `sig p`

Send a signal to the process and continue process execution.

[*<process-list>*] `signal process` *<signal-specifier>* [**&**]

Working with threads

clear idlethreads `cl i`

Disable display of information about idle threads.

```
clear idlethreads
```

event join `eve j`

Set an eventpoint to trap a thread joining.

[*<process-list>*] `event join [ {`*<event-handler>*`} ]` [*<debugger-variable>*]

event spawn `eve sp`

Set an eventpoint to trap the spawning of a thread.

[*<process-list>*] `event spawn [ {`*<event-handler>*`} ]` [*<debugger-variable>*]

info threads `in th` *i th*

Display threads of the current process.

[*<process-list>*] `info threads`

set idlethreads `se i`

Enable display of information about idle threads.

```
set idlethreads
```

set threads `se th`

Specify a thread or set of threads to pass to CXdb commands that perform actions on or display information for specific threads.

`set threads` [*<thread-number>* [`,` ...]]

Controlling process and thread focus

set focus `se foc`

Specify the processes and threads to which CXdb commands and operations are applied.

`set focus {<process-list> [<thread-list>] [, ...] | <group-list> | all}`

info focus `in foc` *i foc*

Display the current focus setting.

`info threads`

add group `ad g`

Create a group of processes and threads to use in setting the focus.

`set focus <process-list> [<thread-list>] [, ...]`

info group `in g` *i g*

Display currently defined groups.

`info group [<group-list>]`

set threads `se th`

Specify a thread or set of threads to pass to CXdb commands that perform actions on or display information for specific threads.

`set threads [<thread-number> [, ...]]`

info threads `in th` *i th*

Display threads of the current process.

`[<process-list>] info threads`

Debugger variables

A debugger variable can store

- The results of a language expression
- The contents of a register
- A signal number
- A CXdb object number, such as an eventpoint number or window number

CXdb also has predefined debugger variables for registers and other values. Refer to the "debugger variables" reference page or online help topic for information and examples on creating and referencing debugger variables.

remove variable `rem v`

Delete a debugger variable.

`remove variable` *<debugger-variable>*

CXdb history commands

info history `in h` *i h*

Display the CXdb command history.

`info history` [*<command-count>*]

recall `rec` *!*

Reexecute a previous command.

`recall [ ? ]`*<string>*

Miscellaneous commands

echo ec

Echo a character string.

```
echo[/n] <string> [...]
```

edit ed

In GUI mode, open an editor window and edit a file.

```
edit [<file-name>]
```

if if

Establish conditional execution of CXdb commands.

```
if (<relational-expression>) <command-set> [else <command-set>]
```

shell sh

Invoke a shell.

```
shell [/<shell-specifier>] [<shell-commands>]
```

source sou

Execute a CXdb command file.

```
source <file-name>
```

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