

NAME

spec, fourc, twoc, surf, etc. – X-ray diffractometer operation for specific configurations

SYNOPSIS

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fourc [ -fFLsy ] [ -d debug ] [ -g geometry ] [ -N my_name ]
  [ -u user ] [ -t tty ] [ -T fake_tty ]
  [ -o option=value [...] ] [ -C file [...] ]
  [ -D directory ] [ -p fd pid ] [ -S | -S p1 | -S p1-p2 ]
  [ -l outputfile [...] ]
```

DESCRIPTION

spec provides a software environment for the operation of an X-ray diffractometer and other data-acquisition instruments. spec contains a sophisticated command interpreter that uses a C-like grammar and is partially modeled on the standard UNIX utility *awk*. spec supports a variety of X-ray diffractometer configurations. The diffractometer geometry is chosen by the program name. Some of the more popular geometries currently supported include:

spec – General instrument control and data acquisition

fourc – Standard four-circle diffractometer

twoc – Standard two-circle diffractometer

sixc – Six-circle diffractometer (*delta, theta, chi, phi, mu, gamma*)

kappa – kappa diffractometer

psic – Psi-circle, including kappa type

surf – Various liquid surface diffractometer configurations

The following options are recognized:

-f

Fresh start. All symbols are set to their default values and the standard macros are read to establish the default state.

-F

Clean and fresh start. All symbols are set to their default values but no command files are read and no macros are defined. Only the built-in commands are available.

-s

Simulation mode. No hardware commands are issued. If started in simulation mode, simulation mode cannot be turned off without restarting the program.

-y

Yes, change motor controller registers initially if they disagree with the *settings* file. Normally, spec requires you to confirm such a change. This flag would be useful if you know controller power had been turned off.

-L

Do not check or create the state-file lock. Normally, spec prevents more than one instance of itself using the same user-name plus terminal-name derived state file. In some situations, particularly if a site configures the state files to reside on an NFS-mounted disk, the lock test that spec uses always indicates another instance of spec is running, making it impossible to start. This flag overrides that test. Normally, this flag will not be used.

-d *debug*

Set the initial value of the debugging variable *DEBUG* to *debug*. See the *debug* help file for a list of the debugging categories. A value of 192 is useful for debugging hardware problems.

- g geometry**
Force loading of macro files and activation of geometry calculations for the specified geometry, while using the configuration files taken from the name by which `spec` is invoked.
- N my_name**
Use `my_name` for setting the `spec` prompt and the name of the configuration file directory. Also sets the geometry as if `-g` was given as an argument. To select a geometry not corresponding to `my_name`, use the `-g` flag after the `-N` flag.
- u user**
Use `user`'s last saved state as the current user's initial state.
- t tty**
Use the current user (or `user`'s) last saved state from the terminal specified by `tty`. The terminal can be specified as `-t /dev/tty01` or `-t tty01`. Note, `spec` uses the string `ttyp#` to refer to a pseudoterminal.
- T fake_tty**
This option creates a user state associated with `fake_tty`, which may be any name (although only the first six characters are used). This option allows you to bypass the locking feature that prevents multiple instances of `spec` to be started by the same user from the same terminal.
- o option=value**
Initializes the `spec_par()` `option` to `value`. See the `spec_par` help file for a list of the available options. Multiple `-o` options may be given.
- C file**
Open the command file `file` as a start-up command file to be read after the standard start-up command files, but before the optional file `spec.mac` in the current directory, which will always be read last. If there is an error in reading or executing the commands in these files, `spec` will jump to the main prompt and not read any remaining queued command files. Up to 32 files may be specified with multiple `-C` options. (This flag added in `spec` release 5.07.01-1.)
- D directory**
Use `directory` instead of the compiled-in name (usually `/usr/local/lib/spec.d`) or the value of the `SPECD` environmental variable (if set) as the auxiliary file directory.
- p fd pid**
Indicates that `spec` input is coming from a pipe from another program. The argument `fd` is the file descriptor that `spec` should use for standard input. The argument `pid` is the process ID of the spawning process. If `fd` is zero, `spec` will not re-echo input from the file descriptor to `spec`'s standard output.
- S**
Starts `spec` in server mode listening at the first available port in the default range of 6510 to 6530.
- S p1**
Starts `spec` in server mode listening at the specified port number `p1`.
- S p1-p2**
Starts `spec` in server mode listening on the first available port in the given range.
- l outputfile**
Specifies an output file. Output to the file will begin immediately, so will include the initial hardware configuration messages. Files will be opened even when starting fresh. (Added in `spec` release 5.09.02-2.)

ENVIRONMENT

spec uses the following environment variables:

SPECD – An auxiliary file directory to use instead of the compiled in name.

TERM – The text terminal type.

GTERM – The graphics terminal type for high-resolution graphics

HOME – The user's home directory.

SHELL – The shell program to be used for interactive subshells.

SPEC_PAGER or PAGER – A program through which to pipe the help files. If unset, the *less* command with special arguments is used.

DISPLAY – The display name and screen number on which to display the X-window plots.

FILES

spec.d is the auxiliary file directory, often */usr/local/lib/spec.d*. *gconf* is the name by which spec was invoked, as in *fourc*, *twoc*, etc.

./spec.mac – Optional private command file always read at startup.

spec.d/site.mac – Optional site command file always read at startup.

spec.d/site_f.mac – Optional site command file read on fresh start.

spec.d/standard.mac – Standard macro definitions read on fresh start.

spec.d/gconf.mac – Standard geometry macro definitions read on fresh start. Uses only first 4 letters of *gconf*.

spec.d/gconf/config – Hardware configuration file.

spec.d/gconf/settings – Motor settings file.

spec.d/gconf/conf.mac – Optional configuration command file always read at startup.

spec.d/gconf/userfiles/hdw_lock – Hardware lock file.

spec.d/gconf/userfiles/user_ttyL – User's lock file. Uses only first 6 letters of *user* and of *tty*.

spec.d/gconf/userfiles/user_ttyS – User's state file. Uses only first 6 letters of *user* and of *tty*.

spec.d/gconf/userfiles/user_ttyP – User's data points file. Only first 6 letters of *user* and of *tty*.

*spec.d/help/** – Help files.