HourGlass
for HP-UX

Reference Manual

HourGlass Support
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Introduction

HourGlass for HP-UX is an essential testing tool in the quest for Year 2000 compliance of all your in-house and third-party applications, utilities, and system software.

HourGlass for HP-UX allows you to create “private clocks”, which may be set to any HP-UX-supported date and time (past, present, or future). You may then attach any processes you chose to these “private clocks”.

Whenever any process attached to a private clock asks for the system date/time, it will get whatever date/time its private clock currently says.

Private clocks are created and attached to processes in one of two ways:

1) Via a set of rules, permitting you to *automatically* attach private clocks to all processes that match a selection rule (i.e. by program name, UID, GID, eUID, or eGID); or

2) by executing a command within your session, which creates a private clock that will be attached to all programs you run in that session.

HourGlass for HP-UX is simple to use (much simpler than it may sound at this point), safe, and thorough.

Some of the uses of HourGlass for HP-UX include:

- Discovering which applications call system date functions
- Testing in-house software
- Testing third-party applications and utilities
- Running non-year-2000-compliant applications after 2000-01-01
- Re-running month- or year-end jobs at other times
- Testing modified month- or year-end jobs in advance

Overview

HourGlass for HP-UX consists of the following components:

- The `hourglass` control program, used to enable/disable the HourGlass intercept routine, create private clocks, start/stop logging, and issue other commands to HourGlass.
- The `hgconfig` rules file, used to create rule-based automatic private clocks.
- The `hourglass_call.log` and `hourglass_event.log` log files in `/var/adm`.
- A cgi-bin program for optional use with a web server.

How to Install HourGlass for HP-UX

HourGlass for HP-UX can either be downloaded from our web site (http://www.allegro.com/hourglass2000), or loaded from tape. If you download the software, the installation instructions are on the web page. If you received a tape, the installation instructions are included with the tape.

Regardless of how you received HourGlass, once you have put the files on your machine, the installation is the same:

1. Run the HourGlass for HP-UX install script

   ```
   cd /opt/allegro/hourglass
   ./Install
   ```

   The script will generate a new kernel (/stand/vmunix), and will ask for permission to reboot. Once the reboot is done, HourGlass for HP-UX will be installed and nearly ready to run.

2. ***reboot***

3. Logon as `root`

4. Obtain a license string

   HourGlass for HP-UX needs a license string to enable it to run. There are two methods of getting one:

   - request over the network

     If your HP 9000 is on the internet (and your firewall allows HTTP traffic), you can run `/opt/allegro/hourglass/bin/hourglass`, and it will ask for permission to request a license string from the Allegro Consultants, Inc., web server. The response should come back within a few seconds, and your demo license string will be automatically installed.

   - request via email (or fax)

     Email the output of:

     ```
     uname –a; model
     ```

to HGreg@allegro.com, along with your name, company, address, and phone number. We will email you a license string as soon as possible. When you receive our reply, there will be one line with a lot of hex numbers, like:

```
INSTALL $a0987eed $219ae0ba ... $fecae09b $e22e1eaa $de651f45
```

Run `/opt/allegro/hourglass/bin/hourglass` and enter that string. That installs the license, and HourGlass for HP-UX should be fully functional.

5. Enable HourGlass for HP-UX

By default, HourGlass doesn't startup in the "enabled" state. Enable HourGlass by doing:

```
/opt/allegro/hourglass/bin/hourglass enable
```

This would typically be done only once per bootup.

6. Test HourGlass for HP-UX

Try giving your session a private clock with the date 1/1/2000:

```
/opt/allegro/hourglass/bin/hourglass setdate 1/1/2000
date
```

Restore the date:

```
/opt/allegro/hourglass/bin/hourglass setdate original
date
```

7. Consider testing the rule-based dates

The file `/opt/allegro/hourglass/hgconfig` contains the rules HourGlass for HP-UX uses to determine whether or not a new process should be given an a private clock (with an altered date/time).

If you edit the rules, they must be "loaded" before they will take effect. The load is done via:

```
/opt/allegro/hourglass/bin/hourglass config load
```

8. Test web-based status

   If you have a web server on your HP 9000, you can get HourGlass for HP-UX status by moving (or copying) the files in `/opt/allegro/hourglass/cgi-bin/*` to your web server's CGI BIN directory. Then, you can check HourGlass for HP-UX status from a web browser. Assuming your CGI BIN directory is called "cgi-bin" (from the browser viewpoint), you can look at:

   ```
   http://&lt;your-machine&gt;/cgi-bin/hourglass
   ```

9. CGI versus security

   Normally, HourGlass will not allow a non-superuser to see information about a process other than their own (or their session leader). However, some system managers wish to be able to use a web browser to report on all processes with private clocks.

   So, we provide two CGI-BIN scripts and two associated programs (cgiwhoall and cgiwhoalt) to report this information. The two programs are setuid'd to root, so they run as root. This allows them to display information about all processes on the system.

   If you don't want non-superusers to be able to see the clock information of all processes in the system, then either don't put the `/opt/allegro/hourglass/cgi-bin/hourglass-who-all` and `/opt/allegro/hourglass/cgi-bin/hourglass-who-alt` files into your CGI directory or put the scripts in a password-protected CGI-BIN directory, or remove the "setuid" bit from the two programs:

   ```
   chmod  -s /opt/allegro/hourglass/bin/cgi*
   ```

   The script `/opt/allegro/hourglass/cgi-bin/hourglass-who-all` uses `/opt/allegro/hourglass/bin/cgiwhoall`,
   and the script `/opt/allegro/hourglass/cgi-bin/hourglass-who-alt` uses `/opt/allegro/hourglass/bin/cgiwhoalt`.

Starting and Stopping HourGlass for HP-UX

After you have installed HourGlass for HP-UX, you must enable the HourGlass for HP-UX intercept routine before any private clocks can be created and attached to processes:

1. Log on as root (if you haven't already)

2. Start the HourGlass for HP-UX intercept routine by typing:

```
/opt/allegro/bin/hourglass enable
```

HourGlass for HP-UX will now intercept all system date/time calls, from all processes, until you disable it or re-boot the system; however, it won't attach private clocks to any processes (i.e. it won't change any dates/times) until you tell it to using the `hourglass` command and/or the `hgconfig` rules file, described later.

The enable command is needed once per bootup of HP-UX.

To disable the HourGlass for HP-UX intercept routine, just type:

```
/opt/allegro/bin/hourglass disable
```

HourGlass will be disabled until an `enable` command is done.

To check the status of HourGlass for HP-UX, type:

```
/opt/allegro/hourglass/bin/hourglass status
```

We also provide a cgi-bin program to display HourGlass status and statistics. It can be used by any web server running on your HP 9000 -- just copy `/opt/allegro/hourglass/cgi-bin` to your cgi-bin directory, and then point your web browser at `http://your.web.server/cgi-bin/hourglass .`

Quick Start Guide to HourGlass for HP-UX

This section is intended to give you a quick demonstration of some of the features of HourGlass for HP-UX. More information, details, complete syntax, etc. can be found in the rest of this manual.

After you have installed and started HourGlass for HP-UX, type in the commands shown below (you can, of course, leave out the explanatory comments).

Check the current "real date/time":

```
$ date
Mon Apr  6 13:21:01 PDT 1998
```

First, a demonstration of a "Relative Constant Time" private clock (this is the default date calculation method); this tells HourGlass to set the private clock for my session to a specified date/time, and then let it advance normally.

```
$ hourglass -setdate 2002-05-14
HourGlass for HP-UX : version 98I
Date/time prior to alter: 1998-04-06 @ 13:21:15.0 (GMT: 1998-04-06 @ 20:21:15.0)
Date/time after alter:    2002-05-14 @ 13:21:15.0 (GMT: 2002-05-14 @ 20:21:15.0)

$ date
Tue May 14 13:21:16 PDT 2002
```

Wait one minute, and see what time it is:

```
$ date
Tue May 14 13:22:23 PDT 2002
```

"ACT" stands for "Absolute Constant Time"; this tells HourGlass to set a private clock to a specified date/time, and then stop the clock.

```
$ date
Mon Apr  6 13:24:34 PDT 1998
$ hourglass -setdate act 05/14/2002 10:30
HourGlass for HP-UX : version 98I
Date/time prior to alter: 1998-04-06 @ 13:24:54.0 (GMT: 1998-04-06 @ 20:24:54.0)
Date/time after alter:    2002-05-14 @ 10:30:00.0 (GMT: 2002-05-14 @ 17:30:00.0)

$ date
Tue May 14 10:30:00 PDT 2002
```

Wait one minute, and see what time it is:

```
$ date
Tue May 14 10:30:00 PDT 2002
```

To switch your session back to the system clock (so that it gets the "original" or "real" date/time), use this command:

```
$ hourglass -setdate orig
HourGlass for HP-UX : version 98I
Date/time prior to alter: 2002-05-14 @ 10:30:00.0 (GMT: 2002-05-14 @ 17:30:00.0)
Date/time after alter:    1998-04-06 @ 13:29:41.0 (GMT: 1998-04-06 @ 20:29:41.0)

$ date
Thu Apr  6 13:29:41 PDT 1998
```

Now a quick demonstration of "Delta Time"; this tells HourGlass to set the private clock to the "real" date/timeplus or minus a fixed offset:

```
$ date
Mon Apr  6 13:31:05 PDT 1998
$ hourglass -setdate delta 2 years
HourGlass for HP-UX : version 98I
Date/time prior to alter: 1998-04-06 @ 13:31:12.0 (GMT: 1998-04-06 @ 20:31:12.0)
Date/time after alter:    2000-04-07 @ 13:31:12.0 (GMT: 2000-04-07 @ 20:31:12.0)

$ date
Thu Apr  6 13:31:16 PDT 2000
```

Now that we're done testing, let's switch back to the system clock:

```
$ hourglass -setdate orig
HourGlass for HP-UX : version 98I
Date/time prior to alter: 2000-04-07 @ 13:34:46.0 (GMT: 2000-04-07 @ 20:34:46.0)
Date/time after alter:    1998-04-06 @ 13:34:46.0 (GMT: 1998-04-06 @ 20:34:46.0)

$ date
Mon Apr  6 13:34:47 PDT 1998
```

Definitions

Before we go any further, a few definitions are necessary:

Private clock

A clock with a date and/or time distinct from the system clock.

Private clock are created two ways:

1. by a rule in the `hgconfig` file, which will attach it to all processes that match the criteria in the rule;
2. by the `hourglass -setdate` command, which will attach it to all processes created by the session that issued the command.

Altered date/time

the date/time a process gets from a “private clock”, which may be (and usually is) different from the real date/time of the “system clock”.

Real date/time

the system clock’s current date/time, also known as the "original" date/time.

hgconfig rules file

the HourGlass configuration file, used to create private clocks and associate them with processes based on logon (jobname, userid, account, and/or group), program name, or ldev number.

hourglass -setdate

used to create a private clock for an entire session.

Date calculation method

When you create a private clock, you need some way to tell HourGlass for HP-UX what date/time to set the private clock to, and whether that clock should be "running" or "frozen". HourGlass for HP-UX provides four methods for calculating what date/time to set a private clock to, and how that clock will keep running:

A. **Relative Constant**: Start a private clock at a specific date/time, and let it run normally.

B. **Absolute Constant**: Set a private clock to a specific date/time, and freeze it.

C. **Delta**: Start a private clock at the current “real” or “altered” date/time plus or minus any number of years, hours, etc., and let it run normally.

D. **Original**: use the system clock instead of a private clock.

Date and Time Formats

Many HourGlass for HP-UX commands require you to enter a date and/or a time (referred to throughout this manual as a "date/time", for simplicity). HourGlass for HP-UX can accept the date/time in any of several different formats (in all formats, the separator may be either a "-" or "/"):

Format	Example 1	Example 2	Example 3
`yyyymmdd[hhmm[ss]]`	`20010514`	`19991022`	`19991231235959`
`mm/dd/[yy]yy [timespec]`	`05/14/2001`	`10-22-99`	`12/31/99 23:59:59`
`[yy]yy/mm/dd [timespec]`	`2001/05/14`	`99-10-22`	`99-12-31 23:59`
`dd/mm/[yy]yy [timespec]`	`14/05/2001`	`22-10-99`	`31-12-99 2359`

- The [timespec] is: hh:mm[:ss] or hhmm[ss]. If you don't specify a time the current time is assumed.

- Only dates from 1970-01-01 through 2037-12-31 are valid. Because of this, HourGlass assumes 2-digit years from 00 through 37 are 21st century (2000-2037), and 2-digit years from 38 through 69 are invalid.

- If the date is ambiguous, "mm/dd/yy" is assumed; e.g. 01/02/03 is January 02, 2003.

The "Delta" method requires an offset, which may be entered in the following format:

```
[*] [nn YEARS] [nn WEEKS] [nn DAYS] [nn HOURS]
```

For example:

- DELTA 5 YEARS
  means "add 5 years to the current private clock date/time"

- DELTA -7 YEARS
  means "subtract 7 years from the current private clock date/time"

- DELTA * 4 YEARS
  means "set the private clock to the system clock date/time plus 4 years"

- DELTA * 5 YEARS 2 HOURS
  means "set the private clock to the system clock plus 5 years and 2 hours"

As you can see from the examples, the "*" means set the private clock to the system clock +/- the offset; without the "*", the offset is added to the current private clock date/time.

Executing HourGlass for HP-UX Commands

Throughout the rest of this manual, you will see references to the `hourglass` command. HourGlass for HP-UX commands may be entered as command line parameters, or by running hourglass and typing the commands at the `HourGlass:` prompt.

The hourglass program resides in `/opt/allegro/hourglass/bin`. We recommend adding this directory to your path by modifying the file `/etc/path`. Throughout the remainder of this manual, we will assume you have done so, and will give examples like "`hourglass –status`" rather than "`/opt/allegro/hourglass/bin/hourglass –status`".

The following are two different ways to do exactly the same thing (attach a private clock to my session set to January 1st, 2000):

- Using the `hourglass` command:

```
hourglass -setdate 2000-01-01
```

- Running the `hourglass` program interactively

```
$ hourglass
HourGlass: setdate 2000-1-1
HourGlass: exit
```

Rather than showing all of the different ways to execute every command, the rest of the manual will use the `hourglass` command.

Private Clocks

As we mentioned before, there are two ways to create private clocks:

1. the `/opt/allegro/hourglass/hgconfig` configuration file; and

2. the `hourglass -setdate` command.

The `/opt/allegro/hourglass/hgconfig` file is used to associate private clocks with processes based on rules. These rules allow you to specify what processes an automatic private clock should be created for and attached to. You might use this to

1. test scripts without having to modify each individual script file;

2. set up a year2000 test userid so that anyone who logs in with that userid automatically gets a private clock;

3. force certain programs to **always** use a private clock (or, if desired, the system clock). One example: if you have a program that you already know won't work properly after 2000-01-01, but you want to test scripts that run that program, you can tell HourGlass for HP-UX to always return the "real" time to that particular program.

The `hourglass -setdate` command is used create a private clock attached to all process in your session. When you enter the `hourglass -setdate` command, a new private clock is created and starts running. From then on, all programs you run in your session will use that same private clock.

Order of Precedence

With the possibility that a given process may qualify for multiple private clocks, it's important to know how HourGlass for HP-UX will decide which clock to attach to it. HourGlass for HP-UX follows these four steps in order, and stops as soon as a qualifying private clock is found:

1. Search the config file for the first "ALWAYS" private clock matching the new process. If none is found,

2. Use the private clock attached to the session that the process is running under. If none is found,

3. Search the config file for the first non-"ALWAYS" private clock matching the new process. If none is found,

4. Use the system clock.

The `$hourglass -setdate` Command: Creating Private Clocks for Entire Sessions

The `hourglass -setdate` command tells HourGlass for HP-UX to create and set a private clock, and then attach that private clock to your session leader process (usually your top-level shell), and to all new processes created by your session. It doesn't affect any other jobs or sessions on the system.

There are four versions of the `hourglass -setdate` command, one for each of the four "date modification methods" (see "Definitions" and "Date and Time Formats" for details on what each method does, and how to enter the date/time). The method name may be abbreviated to the portion in capitals (e.g., "ABS" instead of "ABSOLUTE"). If no method is specified, "RELative" is assumed.

```
hourglass -setdate ORIGinal
hourglass -setdate [*] <DELTA nnn YEARS
hourglass -setdate <ABSolute date
hourglass -setdate <RELative date
```

(DT is a synonym for DELTA, ACT for ABSOLUTE, and RCT for RELATIVE)

Examples:

```
hourglass -setdate original
hourglass -setdate delta 5 years
hourglass -setdate absolute 2000/1/1
hourglass -setdate rct 2025/05/14
hourglass -setdate 2025/05/14
```

After you enter the `hourglass -setdate` command, any process within your session that asks for the current date/time will get the date/time for your private clock[1].

To change your session back to the system clock (the "real" date/time), simply type:

```
hourglass -setdate original
```

[1] Unless that process qualified for a private clock in the hgconfig file which has the "ALWAYS" flag set (see the section "The hgconfig File: Creating Private Clocks Automatically", and "Order of Precedence" in the "Private Clocks" section).

The `hgconfig` File: Creating Private Clocks Automatically

Whenever you enable HourGlass for HP-UX (via the `hourglass -enable` command), it looks for a file named `/opt/allegro/hourglass/hgconfig`. Each line of this file is a “rule” describing automatic private clocks, and specifying what processes will be attached to them. When a new process is created, HourGlass checks the rules that were loaded from this file to decide whether a private clock should be automatically created for (and attached to) the new process.

The `hgconfig` file also has rules to create "ALWAYS" private clocks. Private clocks created via the `hourglass -setdate` command take precedence over rules in the `hgconfig` file, **unless** the `hgconfig` file rule has the "ALWAYS" option (see “Order of Precedence”, above).

Private clocks may be created for, and attached to, particular processes based on:

1. The program filename (without the path), up to 14 characters
2. The real user id (UID) or effective user id (eUID), numeric or name
3. The real group id (GID) or effective group id (eGID), numeric or name

Although regexp expressions aren't supported, you may use a single "*" wildcard in place of any of the above.

For each rule, you specify:

1. The Date Calculation Method,
2. the Date/Time (for ACT and RCT rules) or Offset (for DT rules), and
3. if that rule should be an "ALWAYS" rule, overriding private clocks created via `hourglass –setdate` commands.

Since "an example is worth a thousand syntax diagrams", here is the syntax diagram for the rules in the HGCONFIG file, followed by some examples and a discussion of what they mean.

Syntax:

```
Progname   UID  GID  eUID  eGID  Date [Time]   [ALWAYS]
```

Notes on syntax:

- "ALWAYS" and "Time" are optional; everything else is required.
- Lines beginning with "#" are ignored.

- The "*" wildcard may be used in place of the program name, UID, GID, eUID or eGID.

- The "ALWAYS" option means: "use the automatic private clock created by this rule instead of any session private clock created by an `hourglass -setdate` command".

Some example rules:

```
## Progname        UID  GID  eUID  eGID  Date          [Time]   [ALWAYS]
#  *               *    104  *     *     act 1/1/2000  12:34
#  *               root 105  *     *     rct 1/1/2000
#  *               *    john *     *     rcd 1/1/2000
#  *               *    107  *     *     delta 1 year
#  virct           *    *    *     *     rct 1/1/2000
#  vircta          jill *    *     *     rct 1/1/2000            always
#  foo             jill *    *     *     rct 1/1/2000  19:45     always
#  vi1year         *    *    *     *     delta 1 year
```

The `/opt/allegro/hourglass/hgconfig` file is read when you start HourGlass for HP-UX via the `hourglass -enable` command. If you make changes to `hgconfig` after you start HourGlass for HP-UX, you can use the following command to load your changed rules immediately:

```
hourglass -config load [configfilename]
```

For example,

```
hourglass –config load
```

will load rules from `/opt/allegro/hourglass/hgconfig`

The new rules will only be applied to processes created after the new rules are loaded. To have the new rules immediately applied to processes which already exist, type:

```
hourglass -config reevaluate
```

To see what rules are currently in effect:

```
hourglass -config show
```

To read and syntax-check (but not load) a new config file:

```
hourglass -config read newconfigfilename
```

or, to read and display (but not load) a new config file:

```
hourglass -config readshow newconfigfilename
```

To "load" a new config file (i.e. replace the current rules with your new rules):

```
hourglass -config load newconfigfilename
```

or, interactively:

```
$ hourglass
HourGlass: config read newconfigfilename
HourGlass: config replace
HourGlass: exit
```

Logging Date/Time System Calls

The HourGlass for HP-UX logging facility gives you the ability to determine what programs use the standard date/time system calls (e.g. `time()`, `gettimeofday()`). A record can be written to the log file for each system call, or a single summary record can be written at process termination time, or both.

There are two `hourglass` commands used to control logging: the `–logdaemon` command and the `–logging` command. The `–logdaemon` command is used to start and stop the logging daemon; the `–logging` command is used to control what gets logged.

Starting and stopping logging

The syntax of the `–logdaemon` command is:

```
LOGDaemon [STATus]
LOGDaemon CLEAR
LOGDaemon KILL
LOGDaemon [ <FORCE | KILL> ] START  [#secs] [LINES #lines] [FormFeed]
```

The logging daemon is not started by default. To start the logging daemon, use the command:

```
hourglass –logdaemon start
```

If a logging daemon is already running, the command will be rejected. To kill the currently running logdaemon and start a new one, type:

```
hourglass –logdaemon kill start
```

To just kill the current logdaemon, simply:

```
hourglass –logdaemon kill
```

To check the current status of the logdaemon, type:

```
hourglass –logdaemon status
```

The `–logdaemon clear` and `–logdaemon –force` options are only needed if something goes wrong. Use `clear` to tell HourGlass to "forget" that a logdaemon is running; use `force` to tell HourGlass to start a new logdaemon, even if there is already one running.

When you start the logdaemon, you may also specify how frequently it updates the logfile (every 20 seconds, by default). If date/time calls are being made faster than the logdaemon can update the log file, logging information may be lost.

Normally, the logdaemon writes a page heading to the logfile every 55 lines. You can change the page size via the `lines #lines` option. You can tell the logdaemon to insert formfeeds (^L) between pages via the `formfeed` option.

Controlling what gets written to log files

The `hourglass –logging` command is used to control what gets written to the logging file by the logdaemon. (Note: only clock_gettime(), ftime(), gettimeofday(), and time() can be individually logged.) The syntax is:

```
LOGGING [ <NOne | ALL | ALTered | UNALTered | EXIT | EXITALT> ]
```

The log file used by the logging daemon is `/var/adm/hourglass_call.log`

To see the current logging status, just type:

```
hourglass -logging
```

There are four options controlling what to log.

To write a record to the log file for each date/time system call that uses a private clock, type:

```
hourglass –logging altered
```

To write a record to the log file for each date/time system call that uses the system clock, type:

```
hourglass –logging unaltered
```

To write a summary record, at process termination, of date/time system calls that use a private clock, type:

```
hourglass –logging exitalt
```

To write a summary record, at process termination, of date/time system calls that use the system clock, type:

```
hourglass –logging exit
```

To turn on all four logging options, type:

```
hourglass –logging all
```

To turn off all logging options, type:

```
hourglass –logging none
```

Note: `hourglass –logging exitalt` is probably the most useful logging option.

Rebuilding the log files

In addition to the date/time system calls logging, HourGlass for HP-UX keeps a log file of control and logging commands it executes; the log file names is `/var/adm/hourglass_event.log`

Should you need to rebuild the two log files, the command is:

```
hourglass –buildlog
```

Viewing the log files

To view the log files, you can use the commands:

```
hourglass –showlog calls
hourglass –showlog events
```

Additional HOURGLASS Commands

The section contains brief notes on a number of less-commonly-used (but still useful) HourGlass for HP-UX commands.

Controlling Who Can Use Certain HourGlass Commands

Normally, only a **superuser** can use the `config`, `enable`, `disable`, `logdaemon` and `logging` HourGlass for HP-UX commands. The following command gives you the ability to allow other users to do so:

```
hourglass -[dis]allow   [ <control| logging | all> ]
```

If you would like to allow any user to be able to config, enable, and disable HourGlass for HP-UX, type (as superuser):

```
hourglass –allow control
```

To allow any users to use the logdaemon and logging HourGlass for HP-UX comamnds, type (as superuser):

```
hourglass –allow logging
```

The command `hourglass –allow all` is short for `houglass –allow control,logging`

To disallow control or logging commands (after you've previously allowed them), type:

```
hourglass –allow control
 hourglass –disallow logging
```

To see the current status:

```
hourglass -allow
```

Displaying Current Date/Time Information

HourGlass for HP-UX can display information about the current system date and time, in several different formats:

```
hourglass –calendar
hourglass –clock
hourglass –date [GMT | LOCal]
hourglass –dateline
```

Display Private Clock Information

HourGlass for HP-UX can show you what processes are currently attached to private clocks:

```
hourglass -who [me | all | private]  [active] [calls]
```

The `hourglass -who` command reports the clock status of your process (`me`), all processes with a private clock (`private`), or all processes (`all`). The keyword `active` tells HourGlass to only report those processes that have used at least one time routine since they started. The keyword `calls` tells HourGlass to report the number of calls made to the various time routines instead of displaying program name and user name for each process.

With the exception of the `me` keyword, only a superuser can use this command.

The default (`hourglass -who` with no options) is treated like `hourglass -who private`.

Examples:

To report private clock information about your session:

```
hourglass -who me
```

To report clock information for all processes that have a private clock:

```
hourglass -who priv
```

or

```
hourglass -who
```

To report clock information for all processes:

```
hourglass -who all
```

To report clock information for all processes that have a private clock **and** have made at least one time call:

```
hourglass -who alt active
```

Displaying HourGlass Status Information

The `status` command reports information about HourGlass configuration, and/or logging, and/or global usage statistics. The syntax is:

```
hourglass -status <ZERO | ALL | CONFIG | EVENTS | STATS>
```

The command:

```
hourglass –status stats
```

displays global usage statistics, including:

- number of calls to clock_gettime(), and how many were altered;
- number of calls to ftime(), and how many were altered;
- number of calls to gettimeofday(), and how many were altered;

- number of calls to time(), and how many were altered;
- when the global counters were last set to zero (by STATUS ZERO);
- number of configuration rules.

The command:

```
hourglass -status config
```

is a synonym for CONFIG. It reports the current configuration rules (if any).

The command:

```
hourglass status events
```

is a synonym for `hourglass showlog events`. It shows the HourGlass control events that have been logged.

The command:

```
hourglass -status all
```

is a synonym for `hourglass -status stats config event`.

The command:

```
hourglass -status zero
```

resets the global call counters to 0.

Reading HourGlass Commands From A File

The command:

```
hourglass -use[q] filename
```

Reads hourglass commands from a file.

Contacting Allegro Consultants, Inc.

The command:

```
hourglass-contact
```

simply prints information on how to contact us. (This is the same information that is on the third page of this manual.)

Running HourGlass for HP-UX Interactively

There are several commands that are only useful if you run HourGlass for HP-UX interactively by typing

```
hourglass
```

This will give you the "`HourGlass:` " prompt. You can then enter any of the commands described in this manual, as well as a few others designed to make interactive use easier. Here are the additional commands available in interactive mode:

```
HourGlass: exit
HourGlass: quit
HourGlass: //
```

All three commands terminate the current interactive run of HourGlass for HP-UX; they have no effect on any private clocks currently in use (by your session or anyone else's).

```
HourGlass: help
```

Provides interactive help on the various HourGlass commands.

```
HourGlass: [re]set [ <80 | 132 | COLumns # | LINES # | PAGING> ]
HourGlass: [re]set COPYLP
HourGlass: [re]set <GMT | LOCaltime>
```

The SET/RESET commands allow you to change the setting of various HourGlass options that, for the most part, affect output formatting during this run of HourGlass.

```
HourGlass: set columns ###
```

The COLUMNS option tells HourGlass that your terminal is ### columns wide. Normally, HourGlass uses the value from the COLUMNS environmental variable (and defaults to 80 if there is none).

```
HourGlass: set 80
```

`set 80` is short for `set columns 80`

```
HourGlass: set 132
```

`set 132` is short for `set columns 132`

```
HourGlass: set paging
HourGlass: reset paging
```

This enables/disables the "`Hit <return> to continue, / to stop:` " prompt (default: enabled).

```
HourGlass: set copylp
```

`set copylp` causes all subsequent output from this run of HourGlass to be copied to the printer (via /dev/lp).

```
HourGlass: reset copylp
```

closes the printer file (if it was open).

```
HourGlass: set gmt
HourGlass: set localtime
HourGlass: reset gmt
HourGlass: reset localtime
```

`set localtime` (or `reset gmt`) tells HourGlass that you prefer to see date/time in local time (TZ relative), not GMT.

`set gmt` (or `reset localtime`) tells HourGlass that you prefer to see date/time in GMT, not localtime. (Default: `set localtime`)

```
HourGlass: set lines ###
```

The `lines` option tells HourGlass that your terminal is ### lines (or rows) long. Normally, HourGlass uses the value from the `lines` environmental variable (and defaults to 24 if there is none).