



## ***Rocky Enterprise Linux 9.2 Manual Pages on command 'zshcalsys.1'***

**C:\>man zshcalsys.1**

ZSHCALSYS(1)                    General Commands Manual                    ZSHCALSYS(1)

### NAME

zshcalsys - zsh calendar system

### DESCRIPTION

The shell is supplied with a series of functions to replace and enhance the traditional Unix calendar programme, which warns the user of imminent or future events, details of which are stored in a text file (typically calendar in the user's home directory). The version provided here includes a mechanism for alerting the user when an event is due.

In addition functions age, before and after are provided that can be used in a glob qualifier; they allow files to be selected based on their modification times.

The format of the calendar file and the dates used there in and in the age function are described first, then the functions that can be called to examine and modify the calendar file.

The functions here depend on the availability of the zsh/datetime module which is usually installed with the shell. The library function strptime() must be available; it is present on most recent operating systems.

### FILE AND DATE FORMATS

#### Calendar File Format

The calendar file is by default ~/calendar. This can be configured by the calendar-file style, see the section STYLES below. The basic format consists of a series of separate lines, with no indentation, each including a date and time speci?

fication followed by a description of the event.

Various enhancements to this format are supported, based on the syntax of Emacs calendar mode. An indented line indicates a continuation line that continues the description of the event from the preceding line (note the date may not be continued in this way). An initial ampersand (&) is ignored for compatibility.

An indented line on which the first non-whitespace character is # is not displayed with the calendar entry, but is still scanned for information. This can be used to hide information useful to the calendar system but not to the user, such as the unique identifier used by `calendar_add`.

The Emacs extension that a date with no description may refer to a number of succeeding events at different times is not supported.

Unless the done-file style has been altered, any events which have been processed are appended to the file with the same name as the calendar file with the suffix `.done`, hence `~/calendar.done` by default.

An example is shown below.

#### Date Format

The format of the date and time is designed to allow flexibility without admitting ambiguity. (The words ``date`` and ``time`` are both used in the documentation below; except where specifically noted this implies a string that may include both a date and a time specification.) Note that there is no localization support; month and day names must be in English and separator characters are fixed. Matching is case insensitive, and only the first three letters of the names are significant, although as a special case a form beginning "month" does not match "Monday". Furthermore, time zones are not handled; all times are assumed to be local.

It is recommended that, rather than exploring the intricacies of the system, users find a date format that is natural to them and stick to it. This will avoid unexpected effects. Various key facts should be noted.

? In particular, note the confusion between month/day/year and day/month/year when the month is numeric; these formats should be avoided if at all possible. Many alternatives are available.

? The year must be given in full to avoid confusion, and only years from 1900 to 2099 inclusive are matched.

The following give some obvious examples; users finding here a format they like and

not subject to vagaries of style may skip the full description. As dates and times are matched separately (even though the time may be embedded in the date), any date format may be mixed with any format for the time of day provide the separators are clear (whitespace, colons, commas).

2007/04/03 13:13

2007/04/03:13:13

2007/04/03 1:13 pm

3rd April 2007, 13:13

April 3rd 2007 1:13 p.m.

Apr 3, 2007 13:13

Tue Apr 03 13:13:00 2007

13:13 2007/apr/3

More detailed rules follow.

Times are parsed and extracted before dates. They must use colons to separate hours and minutes, though a dot is allowed before seconds if they are present.

This limits time formats to the following:

? HH:MM[:SS[.FFFFFF]] [am|pm|a.m.|p.m.]

? HH:MM.SS[.FFFFFF] [am|pm|a.m.|p.m.]

Here, square brackets indicate optional elements, possibly with alternatives.

Fractions of a second are recognised but ignored. For absolute times (the normal format require by the calendar file and the age, before and after functions) a date is mandatory but a time of day is not; the time returned is at the start of the date. One variation is allowed: if a.m. or p.m. or one of their variants is present, an hour without a minute is allowed, e.g. 3 p.m..

Time zones are not handled, though if one is matched following a time specification it will be removed to allow a surrounding date to be parsed. This only happens if the format of the timezone is not too unusual. The following are examples of forms that are understood:

+0100

GMT

GMT-7

CET+1CDT

Any part of the timezone that is not numeric must have exactly three capital let?

ters in the name.

Dates suffer from the ambiguity between DD/MM/YYYY and MM/DD/YYYY. It is recommended this form is avoided with purely numeric dates, but use of ordinals, eg. 3rd/04/2007, will resolve the ambiguity as the ordinal is always parsed as the day of the month. Years must be four digits (and the first two must be 19 or 20); 03/04/08 is not recognised. Other numbers may have leading zeroes, but they are not required. The following are handled:

- ? YYYY/MM/DD
- ? YYYY-MM-DD
- ? YYYY/MNM/DD
- ? YYYY-MNM-DD
- ? DD[th|st|rd] MNM[,.] [ YYYY ]
- ? MNM DD[th|st|rd][,.] [ YYYY ]
- ? DD[th|st|rd]/MM[,.] YYYY
- ? DD[th|st|rd]/MM/YYYY
- ? MM/DD[th|st|rd][,.] YYYY
- ? MM/DD[th|st|rd]/YYYY

Here, MNM is at least the first three letters of a month name, matched case-insensitively. The remainder of the month name may appear but its contents are irrelevant, so janissary, febrile, martial, apricot, maybe, junta, etc. are happily handled.

Where the year is shown as optional, the current year is assumed. There are only two such cases, the form Jun 20 or 14 September (the only two commonly occurring forms, apart from a "the" in some forms of English, which isn't currently supported). Such dates will of course become ambiguous in the future, so should ideally be avoided.

Times may follow dates with a colon, e.g. 1965/07/12:09:45; this is in order to provide a format with no whitespace. A comma and whitespace are allowed, e.g. 1965/07/12, 09:45. Currently the order of these separators is not checked, so illogical formats such as 1965/07/12, : ,09:45 will also be matched. For simplicity such variations are not shown in the list above. Otherwise, a time is only recognised as being associated with a date if there is only whitespace in between, or if the time was embedded in the date.

Days of the week are not normally scanned, but will be ignored if they occur at the start of the date pattern only. However, in contexts where it is useful to specify dates relative to today, days of the week with no other date specification may be given. The day is assumed to be either today or within the past week. Likewise, the words yesterday, today and tomorrow are handled. All matches are case-insensitive. Hence if today is Monday, then Sunday is equivalent to yesterday, Monday is equivalent to today, but Tuesday gives a date six days ago. This is not generally useful within the calendar file. Dates in this format may be combined with a time specification; for example Tomorrow, 8 p.m..

For example, the standard date format:

Fri Aug 18 17:00:48 BST 2006

is handled by matching HH:MM:SS and removing it together with the matched (but unused) time zone. This leaves the following:

Fri Aug 18 2006

Fri is ignored and the rest is matched according to the standard rules.

#### Relative Time Format

In certain places relative times are handled. Here, a date is not allowed; instead a combination of various supported periods are allowed, together with an optional time. The periods must be in order from most to least significant.

In some cases, a more accurate calculation is possible when there is an anchor date: offsets of months or years pick the correct day, rather than being rounded, and it is possible to pick a particular day in a month as '(1st Friday)', etc., as described in more detail below.

Anchors are available in the following cases. If one or two times are passed to the function calendar, the start time acts an anchor for the end time when the end time is relative (even if the start time is implicit). When examining calendar files, the scheduled event being examined anchors the warning time when it is given explicitly by means of the WARN keyword; likewise, the scheduled event anchors a repetition period when given by the RPT keyword, so that specifications such as RPT 2 months, 3rd Thursday are handled properly. Finally, the -R argument to calendar\_scandate directly provides an anchor for relative calculations.

The periods handled, with possible abbreviations are:

Years years, yrs, ys, year, yr, y, yearly. A year is 365.25 days unless there is

an anchor.

Months months, mons, mnths, mths, month, mon, mnth, mth, monthly. Note that m, ms, mn, mns are ambiguous and are not handled. A month is a period of 30 days rather than a calendar month unless there is an anchor.

Weeks weeks, wks, ws, week, wk, w, weekly

Days days, dys, ds, day, dy, d, daily

Hours hours, hrs, hs, hour, hr, h, hourly

Minutes

minutes, mins, minute, min, but not m, ms, mn or mns

Seconds

seconds, secs, ss, second, sec, s

Spaces between the numbers are optional, but are required between items, although a comma may be used (with or without spaces).

The forms yearly to hourly allow the number to be omitted; it is assumed to be 1.

For example, 1 d and daily are equivalent. Note that using those forms with plurals is confusing; 2 yearly is the same as 2 years, not twice yearly, so it is recommended they only be used without numbers.

When an anchor time is present, there is an extension to handle regular events in the form of the nth someday of the month. Such a specification must occur immediately after any year and month specification, but before any time of day, and must be in the form n(th|st|rd) day, for example 1st Tuesday or 3rd Monday. As in other places, days are matched case insensitively, must be in English, and only the first three letters are significant except that a form beginning `month' does not match `Monday'. No attempt is made to sanitize the resulting date; attempts to squeeze too many occurrences into a month will push the day into the next month (but in the obvious fashion, retaining the correct day of the week).

Here are some examples:

30 years 3 months 4 days 3:42:41

14 days 5 hours

Monthly, 3rd Thursday

4d,10hr

Example

Here is an example calendar file. It uses a consistent date format, as recommended

above.

Feb 1, 2006 14:30 Pointless bureaucratic meeting

Mar 27, 2006 11:00 Mutual recrimination and finger pointing

Bring water pistol and waterproofs

Mar 31, 2006 14:00 Very serious managerial pontification

# UID 12C7878A9A50

Apr 10, 2006 13:30 Even more pointless blame assignment exercise WARN 30 mins

May 18, 2006 16:00 Regular moaning session RPT monthly, 3rd Thursday

The second entry has a continuation line. The third entry has a continuation line that will not be shown when the entry is displayed, but the unique identifier will be used by the `calendar_add` function when updating the event. The fourth entry will produce a warning 30 minutes before the event (to allow you to equip yourself appropriately). The fifth entry repeats after a month on the 3rd Thursday, i.e. June 15, 2006, at the same time.

## USER FUNCTIONS

This section describes functions that are designed to be called directly by the user. The first part describes those functions associated with the user's calendar; the second part describes the use in glob qualifiers.

### Calendar system functions

```
calendar [ -abdDsv ] [ -C calfile ] [ -n num ] [ -S showprog ]  
    [ [ start ] end ]
```

```
calendar -r [ -abdDrsv ] [ -C calfile ] [ -n num ] [ -S showprog ]  
    [ start ]
```

Show events in the calendar.

With no arguments, show events from the start of today until the end of the next working day after today. In other words, if today is Friday, Saturday, or Sunday, show up to the end of the following Monday, otherwise show today and tomorrow.

If end is given, show events from the start of today up to the time and date given, which is in the format described in the previous section. Note that if this is a date the time is assumed to be midnight at the start of the date, so that effectively this shows all events before the given date.

end may start with a +, in which case the remainder of the specification is

a relative time format as described in the previous section indicating the range of time from the start time that is to be included.

If `start` is also given, show events starting from that time and date. The word `now` can be used to indicate the current time.

To implement an alert when events are due, include `calendar -s` in your `~/.zshrc` file.

Options:

`-a` Show all items in the calendar, regardless of the start and end.

`-b` Brief: don't display continuation lines (i.e. indented lines following the line with the date/time), just the first line.

`-B lines`

Brief: display at most the first lines lines of the `calendar` entry.

``-B 1'` is equivalent to ``-b'`.

`-C calfile`

Explicitly specify a calendar file instead of the value of the `calendar-file` style or the default `~/calendar`.

`-d` Move any events that have passed from the calendar file to the "done" file, as given by the `done-file` style or the default which is the calendar file with `.done` appended. This option is implied by the `-s` option.

`-D` Turns off the option `-d`, even if the `-s` option is also present.

`-n num, -num`

Show at least `num` events, if present in the calendar file, regardless of the start and end.

`-r` Show all the remaining options in the calendar, ignoring the given end time. The start time is respected; any argument given is treated as a start time.

`-s` Use the shell's `sched` command to schedule a timed event that will warn the user when an event is due. Note that the `sched` command only runs if the shell is at an interactive prompt; a foreground task blocks the scheduled task from running until it is finished.

The timed event usually runs the programme `calendar_show` to show the event, as described in the section UTILITY FUNCTIONS below.

By default, a warning of the event is shown five minutes before it is due. The warning period can be configured by the style warn-time or for a single calendar entry by including WARN reltime in the first line of the entry, where reltime is one of the usual relative time formats.

A repeated event may be indicated by including RPT reldate in the first line of the entry. After the scheduled event has been displayed it will be re-entered into the calendar file at a time reldate after the existing event. Note that this is currently the only use made of the repeat count, so that it is not possible to query the schedule for a recurrence of an event in the calendar until the previous event has passed.

If RPT is used, it is also possible to specify that certain recurrences of an event are rescheduled or cancelled. This is done with the OCCURRENCE keyword, followed by whitespace and the date and time of the occurrence in the regular sequence, followed by whitespace and either the date and time of the rescheduled event or the exact string CANCELLED. In this case the date and time must be in exactly the "date with local time" format used by the text/calendar MIME type (RFC 2445), <YYYY><MM><DD>T<hh><mm><ss> (note the presence of the literal character T). The first word (the regular recurrence) may be something other than a proper date/time to indicate that the event is additional to the normal sequence; a convention that retains the formatting appearance is XXXXXXXXTXXXXXX.

Furthermore, it is useful to record the next regular recurrence (as then the displayed date may be for a rescheduled event so cannot be used for calculating the regular sequence). This is specified by RECURRENT and a time or date in the same format. calendar\_add adds such an indication when it encounters a recurring event that does not include one, based on the headline date/time.

If calendar\_add is used to update occurrences the UID keyword described there should be present in both the existing entry and the added occurrence in order to identify recurring event sequences.

For example,

```
Thu May 6, 2010 11:00 Informal chat RPT 1 week
# RECURRENCE 20100506T110000
# OCCURRENCE 20100513T110000 20100513T120000
# OCCURRENCE 20100520T110000 CANCELLED
```

The event that occurs at 11:00 on 13th May 2010 is rescheduled an hour later. The event that occurs a week later is cancelled. The occurrences are given on a continuation line starting with a # char? acter so will not usually be displayed as part of the event. As elsewhere, no account of time zones is taken with the times. After the next event occurs the headline date/time will be `Thu May 13, 2010 12:00' while the RECURRENCE date/time will be `20100513T110000' (note that cancelled and moved events are not taken account of in the RECURRENCE, which records what the next regular recurrence is, but they are accounted for in the headline date/time).

It is safe to run `calendar -s` to reschedule an existing event (if the calendar file has changed, for example), and also to have it running in multiples instances of the shell since the calendar file is locked when in use.

By default, expired events are moved to the "done" file; see the `-d` option. Use `-D` to prevent this.

`-S showprog`

Explicitly specify a programme to be used for showing events instead of the value of the `show-prog` style or the default `calendar_show`.

`-v` Verbose: show more information about stages of processing. This is useful for confirming that the function has successfully parsed the dates in the calendar file.

`calendar_add [ -BL ] event ...`

Adds a single event to the calendar in the appropriate location. The event can contain multiple lines, as described in the section `Calendar File Format` above. Using this function ensures that the calendar file is sorted in date and time order. It also makes special arrangements for locking the file while it is altered. The old calendar is left in a file with the suffix

.old.

The option -B indicates that backing up the calendar file will be handled by the caller and should not be performed by calendar\_add. The option -L indicates that calendar\_add does not need to lock the calendar file as it is already locked. These options will not usually be needed by users.

If the style reformat-date is true, the date and time of the new entry will be rewritten into the standard date format: see the descriptions of this style and the style date-format.

The function can use a unique identifier stored with each event to ensure that updates to existing events are treated correctly. The entry should contain the word UID, followed by whitespace, followed by a word consisting entirely of hexadecimal digits of arbitrary length (all digits are significant, including leading zeroes). As the UID is not directly useful to the user, it is convenient to hide it on an indented continuation line starting with a #, for example:

```
Aug 31, 2007 09:30 Celebrate the end of the holidays
    # UID 045B78A0
```

The second line will not be shown by the calendar function.

It is possible to specify the RPT keyword followed by CANCELLED instead of a relative time. This causes any matched event or series of events to be cancelled (the original event does not have to be marked as recurring in order to be cancelled by this method). A UID is required in order to match an existing event in the calendar.

calendar\_add will attempt to manage recurrences and occurrences of repeating events as described for event scheduling by calendar -s above. To reschedule or cancel a single event calendar\_add should be called with an entry that includes the correct UID but does not include the RPT keyword as this is taken to mean the entry applies to a series of repeating events and hence replaces all existing information. Each rescheduled or cancelled occurrence must have an OCCURRENCE keyword in the entry passed to calendar\_add which will be merged into the calendar file. Any existing reference to the occurrence is replaced. An occurrence that does not refer to a valid existing event is added as a one-off occurrence to the same calendar entry.

## calendar\_edit

This calls the user's editor to edit the calendar file. If there are arguments, they are taken as the editor to use (the file name is appended to the commands); otherwise, the editor is given by the variable VISUAL, if set, else the variable EDITOR.

If the calendar scheduler was running, then after editing the file calendar -s is called to update it.

This function locks out the calendar system during the edit. Hence it should be used to edit the calendar file if there is any possibility of a calendar event occurring meanwhile. Note this can lead to another shell with calendar functions enabled hanging waiting for a lock, so it is necessary to quit the editor as soon as possible.

## calendar\_parse calendar-entry

This is the internal function that analyses the parts of a calendar entry, which is passed as the only argument. The function returns status 1 if the argument could not be parsed as a calendar entry and status 2 if the wrong number of arguments were passed; it also sets the parameter reply to an empty associative array. Otherwise, it returns status 0 and sets elements of the associative array reply as follows:

time The time as a string of digits in the same units as \$EPOCHSECONDS

schedtime

The regularly scheduled time. This may differ from the actual event time if this is a recurring event and the next occurrence has been rescheduled. Then time gives the actual time and schedtime the time of the regular recurrence before modification.

text1 The text from the line not including the date and time of the event, but including any WARN or RPT keywords and values.

warntime

Any warning time given by the WARN keyword as a string of digits containing the time at which to warn in the same units as \$EPOCHSECONDS. (Note this is an absolute time, not the relative time passed down.)

Not set no WARN keyword and value were matched.

warnstr

The raw string matched after the WARN keyword, else unset.

#### rptime

Any recurrence time given by the RPT keyword as a string of digits containing the time of the recurrence in the same units as \$EPOCHSEC?

ONDS. (Note this is an absolute time.) Not set if no RPT keyword and value were matched.

#### schedrptime

The next regularly scheduled occurrence of a recurring event before modification. This may differ from rptime, which is the actual time of the event that may have been rescheduled from the regular time.

rptstr The raw string matched after the RPT keyword, else unset.

text2 The text from the line after removal of the date and any keywords and values.

#### calendar\_showdate [ -r ] [ -f fmt ] date-spec ...

The given date-spec is interpreted and the corresponding date and time printed. If the initial date-spec begins with a + or - it is treated as relative to the current time; date-specs after the first are treated as relative to the date calculated so far and a leading + is optional in that case. This allows one to use the system as a date calculator. For example, `calendar_showdate '+1 month, 1st Friday'` shows the date of the first Friday of next month.

With the option -r nothing is printed but the value of the date and time in seconds since the epoch is stored in the parameter REPLY.

With the option -f fmt the given date/time conversion format is passed to strftime; see notes on the date-format style below.

In order to avoid ambiguity with negative relative date specifications, options must occur in separate words; in other words, -r and -f should not be combined in the same word.

#### calendar\_sort

Sorts the calendar file into date and time order. The old calendar is left in a file with the suffix .old.

#### Glob qualifiers

age The function age can be autoloaded and use separately from the calendar sys?

tem, although it uses the function `calendar_scandate` for date formatting.

It requires the `zsh/stat` builtin, but uses only the builtin `zstat`.

`age` selects files having a given modification time for use as a glob qualifier. The format of the date is the same as that understood by the `calendar` system, described in the section `FILE AND DATE FORMATS` above.

The function can take one or two arguments, which can be supplied either directly as command or arguments, or separately as shell parameters.

```
print *(e:age 2006/10/04 2006/10/09:)
```

The example above matches all files modified between the start of those dates. The second argument may alternatively be a relative time introduced by a `+`:

```
print *(e:age 2006/10/04 +5d:)
```

The example above is equivalent to the previous example.

In addition to the special use of days of the week, `today` and `yesterday`, times with no date may be specified; these apply to today. Obviously such uses become problematic around midnight.

```
print *(e-age 12:00 13:30-)
```

The example above shows files modified between 12:00 and 13:00 today.

```
print *(e:age 2006/10/04:)
```

The example above matches all files modified on that date. If the second argument is omitted it is taken to be exactly 24 hours after the first argument (even if the first argument contains a time).

```
print *(e-age 2006/10/04:10:15 2006/10/04:10:45-)
```

The example above supplies times. Note that whitespace within the time and date specification must be quoted to ensure `age` receives the correct arguments, hence the use of the additional colon to separate the date and time.

```
AGEREF=2006/10/04:10:15
```

```
AGEREF2=2006/10/04:10:45
```

```
print *(+age)
```

This shows the same example before using another form of argument passing.

The dates and times in the parameters `AGEREF` and `AGEREF2` stay in effect until unset, but will be overridden if any argument is passed as an explicit argument to `age`. Any explicit argument causes both parameters to be ignored.

nored.

Instead of an explicit date and time, it's possible to use the modification time of a file as the date and time for either argument by introducing the file name with a colon:

```
print *(e-age :file1-)
```

matches all files created on the same day (24 hours starting from midnight) as file1.

```
print *(e-age :file1 :file2-)
```

matches all files modified no earlier than file1 and no later than file2; precision here is to the nearest second.

after

The functions `after` and `before` are simpler versions of `age` that take just one argument. The argument is parsed similarly to an argument of `age`; if it is not given the variable `AGEREF` is consulted. As the names of the functions suggest, a file matches if its modification time is `after` or `before` the time and date specified. If a time only is given the date is today.

The two following examples are therefore equivalent:

```
print *(e-after 12:00-)
```

```
print *(e-after today:12:00-)
```

## STYLES

The `zsh` style mechanism using the `zstyle` command is describe in `zshmodules(1)`.

This is the same mechanism used in the completion system.

The styles below are all examined in the context `:datetime:function:`, for example `:datetime:calendar:`.

`calendar-file`

The location of the main calendar. The default is `~/calendar`.

`date-format`

A `strftime` format string (see `strftime(3)`) with the `zsh` extensions providing various numbers with no leading zero or space if the number is a single digit as described for the `%D{string}` prompt format in the section `EXPANSION OF PROMPT SEQUENCES` in `zshmisc(1)`.

This is used for outputting dates in `calendar`, both to support the `-v` option and when adding recurring events back to the calendar file, and in `calen?`

dar\_showdate as the final output format.

If the style is not set, the default used is similar the standard system format as output by the date command (also known as `ctime format`): `%a %b %d %H:%M:%S %Z %Y'.

#### done-file

The location of the file to which events which have passed are appended. The default is the calendar file location with the suffix .done. The style may be set to an empty string in which case a "done" file will not be maintained.

#### reformat-date

Boolean, used by calendar\_add. If it is true, the date and time of new entries added to the calendar will be reformatted to the format given by the style date-format or its default. Only the date and time of the event itself is reformatted; any subsidiary dates and times such as those associated with repeat and warning times are left alone.

#### show-prog

The programme run by calendar for showing events. It will be passed the start time and stop time of the events requested in seconds since the epoch followed by the event text. Note that calendar -s uses a start time and stop time equal to one another to indicate alerts for specific events.

The default is the function calendar\_show.

#### warn-time

The time before an event at which a warning will be displayed, if the first line of the event does not include the text EVENT reltime. The default is 5 minutes.

## UTILITY FUNCTIONS

#### calendar\_lockfiles

Attempt to lock the files given in the argument. To prevent problems with network file locking this is done in an ad hoc fashion by attempting to create a symbolic link to the file with the name file.lockfile. No other system level functions are used for locking, i.e. the file can be accessed and modified by any utility that does not use this mechanism. In particular, the user is not prevented from editing the calendar file at the same time

unless `calendar_edit` is used.

Three attempts are made to lock the file before giving up. If the module `zsh/zselect` is available, the times of the attempts are jittered so that multiple instances of the calling function are unlikely to retry at the same time.

The files locked are appended to the array `lockfiles`, which should be local to the caller.

If all files were successfully locked, status zero is returned, else status one.

This function may be used as a general file locking function, although this will only work if only this mechanism is used to lock files.

#### `calendar_read`

This is a backend used by various other functions to parse the calendar file, which is passed as the only argument. The array `calendar_entries` is set to the list of events in the file; no pruning is done except that ampersands are removed from the start of the line. Each entry may contain multiple lines.

#### `calendar_scandate`

This is a generic function to parse dates and times that may be used separately from the calendar system. The argument is a date or time specification as described in the section `FILE AND DATE FORMATS` above. The parameter `REPLY` is set to the number of seconds since the epoch corresponding to that date or time. By default, the date and time may occur anywhere within the given argument.

Returns status zero if the date and time were successfully parsed, else one.

Options:

- a The date and time are anchored to the start of the argument; they will not be matched if there is preceding text.
- A The date and time are anchored to both the start and end of the argument; they will not be matched if there is any other text in the argument.
- d Enable additional debugging output.
- m Minus. When `-R anchor_time` is also given the relative time is calculated.

lated backwards from anchor\_time.

-r The argument passed is to be parsed as a relative time.

-R anchor\_time

The argument passed is to be parsed as a relative time. The time is relative to anchor\_time, a time in seconds since the epoch, and the returned value is the absolute time corresponding to advancing anchor\_time by the relative time given. This allows lengths of months to be correctly taken into account. If the final day does not exist in the given month, the last day of the final month is given. For example, if the anchor time is during 31st January 2007 and the relative time is 1 month, the final time is the same time of day during 28th February 2007.

-s In addition to setting REPLY, set REPLY2 to the remainder of the argument after the date and time have been stripped. This is empty if the option -A was given.

-t Allow a time with no date specification. The date is assumed to be today. The behaviour is unspecified if the iron tongue of midnight is tolling twelve.

#### calendar\_show

The function used by default to display events. It accepts a start time and end time for events, both in epoch seconds, and an event description.

The event is always printed to standard output. If the command line editor is active (which will usually be the case) the command line will be redisplayed after the output.

If the parameter DISPLAY is set and the start and end times are the same (indicating a scheduled event), the function uses the command xmessage to display a window with the event details.

#### BUGS

As the system is based entirely on shell functions (with a little support from the zsh/datetime module) the mechanisms used are not as robust as those provided by a dedicated calendar utility. Consequently the user should not rely on the shell for vital alerts.

There is no calendar\_delete function.

There is no localization support for dates and times, nor any support for the use of time zones.

Relative periods of months and years do not take into account the variable number of days.

The `calendar_show` function is currently hardwired to use `xmessage` for displaying alerts on X Window System displays. This should be configurable and ideally integrate better with the desktop.

`calendar_lockfiles` hangs the shell while waiting for a lock on a file. If called from a scheduled task, it should instead reschedule the event that caused it.

zsh 5.8

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ZSHCALSYS(1)