

## Appendix D vis

### D.1 VIS Commands

Commands can be concatenated together by delimiting them with semi-colons (;). The available commands are listed below and

#### Summary of VIS commands.

Command	Function
array	Specifies which antennas to use
bells	Toggles the bells and whistles (border accessories)
caget	Show the ID number and time stamp of last datum received
concat	Concatenates cycles together
cycles	Restricts the CAGET database (default/max=5000)
define	Assigns a monitor point to a user definable quantity
dump	Sends a hardcopy of the display to the printer
expert	Make assumptions about experience of the user
filter	Toggles data filtering (doesn't plot bad data)
forward	Moves 1 'screen' forward in time
frequency	Apply polarisation correction (use with stokes)
grid	Plots a faint background grid
history	Controls the amount of data (in time) that is displayed
help	Accesses the on-line help information
labels	Show data only (no axes). Only used for remote observing.
lines	Forces lines to be drawn between plotted points
list	List all the sources on record
lock	Lock the left hand edge of a time based graph
measure	Measures the coordinates of a pixel
onsource	Causes data to be plotted, only when the array is 'on-source'
phase	Toggles phase-tracking
print	Print a hard copy of the current page in CAMON
polcal	Use with stokes command. Calibrate stokes data to be plotted.
quit	Exits the program gracefully
recall	Recalls a previously saved state
redraw	Clears and redraws the graph(s)
ref	Specifies a reference baseline
reset	Resets the VIS display to the original state
rewind	Moves 1 'screen' back in time
save	Saves a graphics state
scale	Sets the scale of a graph (to scale Time, use history)
sctype	Only plot data of that scan type
select	Specifies the baselines to be displayed
sort	Orders the baselines into length order
source	Causes only data from the specified source to be shown
squared	Forces aspect ratio to 1
status	Displays the current status of the VIS program
stokes	Enable display of Stokes parameters (see polcal
suppress	Kills non-normal baselines
suspend	Halts graph updates
time	Sets the time standard/zone used
uv:	Plots a quantity on the UV plane

**verbose** Message reports lengthen.

**zoom** Use mouse or cursor to scale a plot

**array [1|2|3|4|5|6]**  
 Specifies which antennas constitute a valid array. Subsequent use of the `select` command will automatically exclude the non-selected antennas. If no argument is specified, the default (all antennas) is restored.  
 Related commands: `onsource`.  
 Examples:  
 VIS> array 1235 – excludes antennas 4 and 6. If `select aa` was issued, only baselines 12AA, 13AA, 15AA, 23AA, 25AA and 35AA would be selected.  
 VIS> array – restore the setting to the default (all antennas). Note this is equivalent to VIS> array 123456.

**bells [on|off]** Bells and whistles.  
 bells puts additional information around the borders of the graphs. If no argument is specified, then the state will toggle.

**caget** Displays a one line message about the current caget cycle. It may be used as a diagnostic and is of little use to the observer. It is useful when the underlying data acquisition process seems to have failed. The caget command provides a very quick means of examining the last recovered cycle, and you can watch for increments as a sign of a properly working system. Of course, if the Compact Array is not operating the cycles won't increment. The data the caget command presents is also shown in the output of the `status` command.

**concat [on|off]**  
 May be used for concatenating cycles together. Its primary use is to examine data from similar sources without interspersed spaces. `concat` only affects data in which integration cycles (option 'n') is one of the axes. `concat` requires `suspend` to be turned on.  
 Example: use `source` to select only your calibrator, use `suspend` to halt updating, set the `history` to 12 hours and, using `concat`, display a tad graph.

**cycles c** Allows the user to control how many cycles of history will be looked at. Primarily used for speed considerations or software diagnosis.

**dump [b&w]**  
 Creates a PostScript file of the current graph. It will be saved as `~/vis.ps`. The file will automatically be spooled to a printer. Default is colour PostScript. You can also ask for black and white plots: use the argument `b&w`.  
 Related commands: `print`.

**exit** Exit the program.

**expert [on|off]**  
 Enable (`on`) or disable (`off`) display of standard information. For example, polarisation visibilities are usually not displayed, but can be by enabling expert mode. Another example is the aspect ratio of plots which will be 1:1 for a non-expert user  
 Related commands: `stokes`, `select`.

**filter [on|off]**  
 Suppresses inappropriate data from being plotted. The default is ON. Note that `onsource` will not work if `filter` is OFF. If no argument is specified the current state will toggle.

**forward** Shifts the history forward in time by one 'screen-width'. It will not let you set the time scale into the future (giving an appropriate warning). See also **history**.

**frequency [on|off]**  
 Normalise the phases for the observing frequency. That is, it divides astronomical phase by frequency in GHz and plots result as round trip phase. Shows how much LO phase noise is

leaking into the astronomical phase. If no argument is specified, the current state will toggle.  
Related commands: `phase`.

`grid [on|off]`

Plots a faint grid behind the graph (no argument toggles the grid on and off).

`history HHhMMmSSs [HHhMMmSSs]`

Allows the user control over the size of the horizontal axis (e.g., time or the 'time depth' of a graph which does not have time as one of its axes). VIS allows you to specify a second argument in the same format that represents the offset from the current plot time. If the `lock` command is activated, the first argument of the history command is ignored. The only acceptable formats are those with 'hms' or ':' delimiters, using the latter, the first numeric field is hours.

Related commands: `forward`, `rewind`, `zoom`.

Examples:

VIS> `history 10m 1h30m` – to look at 10 minutes of data that ended 1 and a half hours ago.

VIS> `history 25m` or VIS> `history 0:25` – the most recent 25 minutes of data displayed. You cannot use `scale` to adjust a time axis.

`labels [on|off]`

Turn on/off labels on the graph. No argument toggles the state on/off.

`lines [on|off]`

Ordinarily, points are only joined by lines if they have time specified as one of the axes. By turning `lines` on, you force connecting lines on non-time based plots. If no argument is specified, the state will toggle.

`list`

This command will cause VIS to search through all its available records and print a listing of the sources it can find. For surveys, this may be a lot!

`lock [on|off]`

This command locks the graphical display to a time. This will cause all subsequent plots to access data back to this time, regardless of the `history` command. This command is very useful in stopping data from 'rolling' off the end of a chronological display. By setting it at the start of a run, the incoming data will continue to squeeze in, so that at the completion, the display will have the entire run. To use this mode, it must be started when the telescope is off source. If no argument, the state will toggle.

`measure [top|middle|bottom]`

This enables you to get a precise measurement of any point on a graph. As there may be more than one graph on the screen at any given time, you must specify which one, using `top`, `middle` or `bottom`. If there are two graphs, `middle` is not valid, and if there is only one, then no arguments should be specified. Once entered, the program will instruct you to click at the appropriate point in the selected graph. This may be done with the mouse, or the cursor keys. To select a point, any mouse button or any non-cursor key may be used. The coordinates of the selected point will be displayed appropriately.

`onsource [on|off]`

When `onsource` is activated and `filter` is off, only data obtained while the antennas specified by the `array` command are on source will be plotted. That is, slew time, antenna drive failure, etc. will be blanked out. If no argument, the state will toggle.

`phase [on|off]`

Phase tracking. This prevents sudden 360 degree phase jumps caused by VIS trying to contain the astronomical phase within the  $-180^\circ$  to  $180^\circ$  range. The algorithm works by comparing each datum with the datum immediately before it. If a jump of more than  $270^\circ$  is detected,

VIS will move  $(360 - jump)^\circ$  in the other direction. If no argument is specified, then the phase tracking state will toggle.

`polcal [on|off]`

Apply the latest polarisation calibration (no argument will toggle the state). The calibration applied is in the file at `$log:leakage.log`. If no argument, the state will toggle.  
Related commands: `stokes`.

`quit` Exits the program gracefully.

`recall [name|list]`

Recovers data from the time when a `save` command to the same `name` was entered. If the requested name is `list`, then all the saved states that are remembered are listed - BE WARNED: this may be a lot!

`redraw` Replots the screen. Useful after resizing a window.

`ref [##XX]`

Sets a reference baseline. All data will have the corresponding point of the reference baseline subtracted from them. The reference baseline may be specified as the full 4 character designation (e.g., 34CC). To remove the reference baseline, enter `ref` without any arguments.

`reset` Returns VIS to its default (startup) settings.

`rewind` Causes the `history` offset to be increased by the `history` value. This effectively causes a move of one 'screen-width' back in time. Useful for use with the `lock` command. Not useful with non-chronological graphs. Related commands: `forward`.

`save name` Remembers the setting of the current display. May be recalled using the `recall` command. `name` can be a maximum of 32 characters.

`scale [qty] [min max]`

The `scale` command lets you scale vertical axes manually. The program keeps track of which quantity has been manually set rather than the actual graph axis. Thus it is possible to scale the amplitudes, look at the *uv* coverage, and then return to the amplitudes with the old scaling remembered. To invoke this feature you need to specify the quantity to scale and the minimum and maximum values. It is possible to reverse the `max.` and `min.` but the graph will be inverted. To cancel manual scaling, enter `scale` without any arguments. This will not automatically redraw the screen (use `redraw`). To cancel the scaling for only one quantity, enter `scale qty` (the screen will be redrawn in this case).

WARNING: Setting the scales can be a trap as you might not see data outside the scaled region that would otherwise concern you.

Related commands: `history`.

Examples:

`scale a 0 1` – set amplitude scale between 0 and 1.

`scale a` – set amplitude to autoscale.

`select [#] [#] [x] [x] [, [-] [#] [#] [x] [x]]`

Allows you to specify which baselines are displayed for the majority of quantities (where antenna based quantities are plotted the `array` command should be used). The arguments are full or partial baseline specifications. Baseline specifications can be negated with a minus (-) sign. There is a maximum of 15 baselines that can be plotted simultaneously. See also the `array` and `suppress` commands.

Examples:

VIS> `select 25aa` – select (plot) only the baseline 25AA.

VIS> `select bb,-4` – plot all the frequency 1, YY polarisation baselines, but exclude those baselines that involve antenna 4.

`sort [on|off]`  
Allows traces to be sorted in logical (12,13,14,...) order – `off`, or baseline (shortest to longest) order – `on`. This may be useful on an amplitude *vs* baseline (a–b) plot. No argument will toggle the value.

`source [name]`  
By specifying a name, VIS will only plot data obtained on a scan with a source of that name. The remainder will be left blank. It may be deactivated by typing `source` with no arguments.

`squared on|off`  
For expert users only, this command gives the option of forcing both axes to use the same scale. It is not particularly suitable for graphs involving time or cycles. It may be useful for Real-Imaginary or *uv* plots. It has the potential of messing-up the display. Use with caution.

`status`  
Shows you the current status of VIS. It indicates what options have been selected, any scaling information and how much data is being displayed.

`stokes [on|off]`  
Enable the stokes parameters (I, Q, U and V) instead of conventional linear polarisations (AA, BB, AB, BA). Stokes parameters can then be selected using the `select` command.  
Related commands: `select`, `polcal` and `expert`.

`suppress [on|off]`  
Suppresses non-standard phases such as 34AD or 11AA (no argument will toggle the value). If you turn the suppression `off` VIS expects that you are an expert user – the novice may cause it to crash!

`suspend on|off`  
VIS typically updates the screen as new data comes in. It is possible to suspend these updates and thus is especially useful when looking back through the history.

`time [AEST|UT|EDST|GMST|LST]`  
Change the time standard used to plot the labels on a time axis. (UTC & GMT are converted to UT)

`uv:a`  
Plot the amplitude on a *uv* grid. The grid is then displayed as a grey-scale 2D plot. `uv:a` only works for a specific source (see `source`), with `onsource` tracking (`onsource`) and suspended updating (`suspend`). It will not work under AB,CD, etc. baselines. All AA or CC polarisations are suggested. It will conform to any scale commands, but the units of *u* and *v* are in grid pixels. Amplitude can also be scaled.

`verbose [on|off]`  
Explanations of every command executed will be given if the state is `on`. If no argument is specified, the state will toggle.

`zoom [top|middle|bottom] [x] [y]`  
This enables you to use the mouse/cursor in order to scale a graph. As there may be more than one graph on the screen at any given time, you must specify which one, using `top`, `middle` or `bottom`. If there are only two graphs, `middle` is not valid, and if there is only one, then no arguments should be specified. The second set of arguments determines whether the zoom will be on the x-axis, y-axis or both (default).  
The program will instruct you to click at the lower/left corner of the region to zoom in on, followed by a request for a second click at the upper/right corner. This may be done with the mouse, or the cursor keys. To select a point, any mouse button or any non-cursor key may be used. When the above sequence has been performed, the window will be scaled and redrawn appropriately.  
Note that, if you intend to zoom on the time axis, the `suspend` command must be used first to prevent rapid screen updating. `zoom` will not work on the XDISP display.

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To 'un-zoom' use the `scale` command.

Examples:

`VIS> apd-t` or `tdpa` – select three graphs (Amplitude, Phase and Delay) versus Time.

To have a closer look at the phases: `VIS> zoom m y` gives mouse control over the middle (centre) graph – namely the 'phase' plot. It will allow the selection of a new vertical scale (specified by the 'y'). Then use `VIS> scale p` (i.e., with no limits) to reinstate auto-scaling on the phase display.