

Semper 6 Command Reference

assign

keys:	name	'<text>'	name of file or tape to be assigned
	size	<number>	size of new disc file or memory in kilobytes
	slots	<number>	number of directory slots in new picture storage device, program library or help library
	device	<number>	new device number
	width	<number>	maximum record length for log file
options:	scratch/memory/ display/tape/file		type of device to assign (the default is to assign a permanent disc file)
	scratch		assign a temporary disc file which is automatically deleted when deassigned
	memory		assign a memory-based storage device
	display		assign the display device (see assign display for precise details)
	tape		mount and assign a magnetic tape
	file		assign a log file
	program/help		assign program or help library instead of picture storage device
	old/new		required device status
	old		if permanent disc file, open the file if tape, mount the tape to read existing data if log file, reuse an existing file
	new		if permanent disc file or log file, create a new file if tape, mount the tape and ignore any existing data
	wp		make the device write-protected (read-only)
append		position log file so that output is appended	
verify		verify assignment at the console	

Use the **assign** command to provide access to the various kinds of data storage devices supported by Semper: picture storage devices, program libraries, help libraries and log files. The physical storage which can be associated with a device depends on the type of data being stored and is one of the following: memory, file (permanent or temporary), magnetic tape and a display or framestore. Permanent files are created or located with a file name which you must specify. The file name may be a fully specified path name or the name of a file which appears on Semper's file search path. Temporary files are created with a file name generated by Semper and they are deleted automatically at the end of a Semper session. The display device, as well as storing picture data, can display images on a monitor and it may also allow you to capture images from a camera. Each

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device you assign is given a unique device number which you use subsequently to refer to the device. Use the command **show devices** to list the devices currently assigned and the **deassign** command to deassign them.

Examples

```
assign name 'v6disc'
```

This command assigns an existing picture file *v6disc* to the first free device number.

```
assign name 'emsa.bak' new size 5000
```

```
assign new size 5000  
File/tape name (as textstring): 'emsa.bak'
```

These identical commands assign a new file called *emsa.bak*, with 5000 kilobytes of available disc space. Note that if you do not specify a filename, Semper prompts for a name to be entered at the terminal. The filename must be enclosed in quotes.

```
assign memory size 3000
```

This command assigns 3 megabytes of memory for storing pictures.

```
assign display
```

This command assigns the display device (currently device number 1 is always assigned for the display).

```
assign scratch size 2000
```

This command assigns a 2 megabyte temporary disc file which will be deleted using **deassign**.

```
assign file name 'results.out'
```

This command assigns the log file called *results.out* to log processing results.

```
assign help name 'semper'
```

This assigns Semper's help library called *semper.hlb*.

```
assign program name 'myfile.lib'
```

This command assigns a program library called *myfile.lib*.

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```
assign wp name 'replace' device 8
```

This command assigns a write-protected file called *replace.dsk* as device 8.

```
assign new tape name 'mrc132'
```

This command mounts/assigns a blank tape with the serial name *mrc132*.

Description

The **assign** command assigns a unique device number which you subsequently use to refer to the device. The device number is returned in the variable *n*. You can specify the device number to be assigned (provided it is not already in use) with the **device** key. Failing that, **assign** chooses the lowest free device number. Note that the display device is always assigned with device number 1. There is a limit to the number of devices. The command **show system** will list how many devices Semper can support. Use the command **show devices** to list the details of all the devices currently assigned. To deassign or close the device, use the **deassign** command. You specify which device to deassign with the **device** key (you may use the **display** option instead to deassign the display device). All devices are automatically deassigned at the end of a Semper session.

Semper supports four different kinds of data storage devices according to the type of data being stored:

picture storage device	- Semper pictures
program library	- Semper programs
help library	- on-line help
log files	- ASCII text file (output only)

A picture storage device (or picture library/archive) can store up to 999 Semper pictures of arbitrary size (within the limits set by the capacity of the device and the limits imposed by Semper itself). Pictures are primarily used to encode image data but they can also be used to store other kinds of data like display look-up tables, histograms, position lists, particle parameter lists, etc. Use the **examine** command to list the contents of a picture storage device and the commands **create**, **copy**, **renumber**, **delete**, **directory** and **compress** to manage its contents. When you refer to Semper pictures you must specify the device number either explicitly (for example, **5:233, 2001, n:4**, etc.) or implicitly when the picture resides on the current picture storage device (for example, **:12, :pic, 100**). The variable *cd* returns the device number for the current picture storage device (so the previous examples are interpreted as **cd:12, cd:pic, cd:100**).

A program library contains the text for Semper programs together with some extra information to speed up the invocation of programs and the execution of **for** loops and **jump** commands. You invoke a program with the **library** command by giving the name of the program. Unlike Semper pictures, you do not have to specify a device number. If programs with the same name appear in different program libraries, the program library search order determines which one is invoked. Use the command **order** to set or modify the program library search order. Use the command **show programs** to list the contents of a program library and the commands **add**, **list**, **copy**, **rename**, **delete**, **directory** and **compress** to manage its contents.

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A help library contains the text for Semper's interactive **help** command. This allows you to obtain detailed and up-to-date information about all of Semper's facilities and commands. Help libraries are created and managed by a separate program **helpman** which you invoke outside of a Semper session.

You use log files to record textual data generated by Semper. There are six categories of output text: console, log, diagnostic, monitor, command and input text, any combination of which can be output to a log file. You use the **echo** command to specify what kind of text is to be output to a log file. The command **show echo** lists the current echo settings.

The physical storage associated with each type of data storage device can take a number of different forms:

picture device	-	memory, permanent or temporary binary file, display, tape
program library	-	memory, permanent or temporary binary file
help library	-	memory, permanent or temporary binary file
log files	-	permanent text file

The data stored in a memory-based device is permanently stored in memory. This provides the most efficient form of access to data, provided that your system can support large memory arrays (this is not the case for PC systems based purely on MS-DOS).

Files provide the most important form of data storage. They can reside on any physical medium which can be accessed via your machine's file system using the normal file naming conventions (principally hard disc, but could also be floppy disc, networked files, etc.). Permanent files (in the sense that they are intended to have a visible presence in the file system) must be given a file name. Temporary files are created with a Semper-generated name and they are automatically deleted when deassigned.

The display device, at the same time as functioning as a picture storage device (possibly providing access as efficient as with a memory-based device), can display and manipulate picture data. The resolution of the storage is limited to 8 bits or less per pixel, so there is the facility to scale data values into the range supported by the display memory. When data is read back the inverse scaling transformation is applied so that the data is returned scaled to the original source data range, but with possible loss of precision. The display device also supports the overlaying of graphical data on top of an image, cursor driven data input and the manipulation of look-up tables. You use the following commands to control these facilities:

general	-	erase, partition, view
look-up tables	-	ladjust, lset, lut, pshow
interactive input	-	draw, pdraw, sketch, xwires
display output	-	display, ramps, rgb
graphical i/o	-	contour, mark, ovread, overwrite, ymod

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Display look-up tables define a mapping from stored data values to displayed intensities and colours. The mapping does not change the stored data and can usually be applied instantaneously. If the display device is a framestore, it will also allow you to capture images with a camera, with the camera image displayed live on the monitor. Once a camera image has been captured it can be accessed like any other display picture.

Some Semper systems support direct tape access for the retrieval of picture data from tape archives. Magnetic tapes are intrinsically serial in nature: writing data at a given position renders data further down the tape inaccessible. Picture numbers correspond directly to the relative position of the picture on the tape (picture 3 is the third recorded picture, etc.) but only the **copy** command is allowed to write to the tape. The **rewind** command initiates a rewind without waiting for the operation to complete.

The **assign** command can be used with the following combinations of keys and options:

assign old permanent file	assign [old] [program/help] name '....' [wp]
assign new permanent file	assign new [program/help] name '....' size ... [slots ...]
assign temporary file	assign scratch [program/help] size ... [slots ...]
assign memory	assign memory [program/help] size ... [slots ...]
assign display	assign display [..... extra keys/options
assign log file	assign file name '....' [new/old] [width ...] [append]
assign magnetic tape	assign tape name '....' [new/old] [wp]

In the first four examples above, the default is to assign a picture storage device. If however you specify the option **program** or **help**, a program library or help library is assigned instead.

In the absence of the options **scratch**, **memory**, **display**, **tape** or **file**, the **assign** command assigns a permanent file. If the option **old** is specified, an existing file is assigned. If the option **new** is specified a new file is created. If during an interactive session a newly created file would replace an existing file, you will be asked for confirmation. Option **old** is assumed if neither **old** or **new** is specified.

If the **scratch** option is given, a temporary file is assigned. The file will be created in the current directory unless one of the following environment variables is set to a valid directory pathname:

semper\$temp, tempdir, tempfiles, temp

in which case, the file will be created in the named directory. If more than one of these environment variables is set, the first one in the list which is set is used. Semper generates a unique 8 character file name beginning with "zzzz" and followed by the appropriate file extension. The contents of a temporary file are deleted automatically when the file is deassigned. On some systems, the file's directory entry is deleted as soon as the file is created, so the file will not appear in the file system but space is still allocated to the file. If Semper terminates abnormally, the operating system will automatically free this space.

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The **memory** option allows you to create memory-based devices where all the data is stored in memory. As long as your system can support large memory arrays, this approach provides the most efficient way to store and process data because it avoids the delays inherent in disc i/o. For commands which require more random access to data, storing all the data in memory can bring very significant performance improvements over and above the improvements obtained from Semper's disc caching scheme.

You can achieve similar results for accessing data in existing disc files with the **cache memory** command. This reads the entire contents of a file (which you have previously assigned as a Semper device) into a memory array, converting the device into a memory-based device. The data is written back to disc when the **flush**, **cache free** or **deassign** commands are used on the same device.

If the option **display** is specified, the **assign** command assigns the display device and returns the frame size in variables *fsize* and *fs2*, the monitor size in variables *msize* and *ms2* and the number of frames in variable *nframe*. You may find that your version of the **assign display** command accepts additional keys or options, controlling details of the hardware configuration, such as the number of display frames to be made available to you. Consult the documentation for your installation for more details.

If the option **file** or **tape** is specified instead, a log file or tape is assigned.

When assigning a permanent file, magnetic tape or log file, a file or tape name must be given. This can be specified with the **name** key, but if you omit the key and you are running an interactive session, Semper will prompt for the file or tape name, for example,

```
assign
file name (as textstring): 'my_disc'
```

where "my_disc" is the file name (the character string must be enclosed in quotes).

Default file name extensions are provided according to the type of device being assigned:

picture file	<i>.dsk</i>
program library	<i>.plb</i>
help library	<i>.hlp</i>
log file	<i>.log</i>

If no file extension is given, the default extension is used. If you are assigning an existing file, and a file with the default extension does not exist, a further search for the file name without the extension is made. When creating a new file, the default file extension is always used. When referring to an existing file you can specify just a file name instead of a fully specified path name, in which case the file must lie somewhere on Semper's file search path to be found. The current directory is always the first directory in the search path. Use the command **show path** to list Semper's file search path. When creating a new file, you should give a fully specified pathname unless you want the file to be created in the current directory. The command **show devices** always lists the full path name.

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When creating a new permanent file, a temporary file or a memory-based device, you must specify a data storage size in kilobytes with the **size** key. The total size of the device also includes space for a header block and a directory, so the overall size of the device will be larger than the size you specify with the **size** key. You can control the size of the directory with the **slots** key. For picture storage devices, the default directory size is the maximum possible (each slot requires 8 bytes and the absolute maximum number of slots required is 2002, giving a maximum size of 16KB). Here you would use the **slots** key to create a picture device with a smaller directory. Each program in a program library takes up one slot of 64 bytes and the default is to create a program library with 64 slots. Directory entries in a help library vary in size, but the slot size is assumed to be 64 bytes, with a default directory size of 400 slots (a total size of 25KB).

When assigning files or magnetic tapes, you can specify the **wp** option to protect all the data from accidental deletion or overwriting, irrespective of any other protection status. In multi-user installations the **wp** option is usually required when assigning files belonging to other users (for which you may not have write access privileges). It also makes it possible for more than one Semper session to share access to the same file. The **wp** option is ignored when option **new**, **scratch**, **memory** or **file** is used.

You use the **file** option to open/create log files for recording text output by Semper. The **echo** command controls what type of text is output to each file. When a file is assigned, all output to that file is disabled. Use the command **show echo** to list the current echo settings for each file. A file, when it is opened, is positioned at the beginning, unless option **append** is used, in which case it will be positioned at the end and text output to the file will be added to any text already in the file. Text is truncated to the output width for the file. This is specified by the **width** key and defaults to 132.

The operation of the **assign** command is confirmed on the console. You can suppress this output by setting the option **noverify**.

Notes

variables set:	<i>n</i>	(number of assigned device)
	<i>fsize, fs2</i>	(display frame size)
	<i>nframe</i>	(number of display frames)
	<i>msize, ms2</i>	(display monitor size)
see also:	general:	deassign, programs, scratch, show compress, copy, create, delete, directory, examine, renumber, flush
	programs:	add, compress, copy, delete, for, jump, library, list, order, rename, show
	help:	help
	memory:	cache
	display:	contour, display, drag, erase, ladjust, lset, lut, mark, overread, overwrite, partition, pdraw, pshow, ramps, rgb, sketch, view, xwires, ymod
	log file:	echo, show
	tape:	copy, rewind

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Defaults and Ranges

keys/options	defaults	range
name	<i>none</i> , prompts for filename if interactive	valid file name
size	<i>none</i>	positive integer
slots	maximum possible for a picture device, 64 slots for a program library 400 slots for a help library	positive integer
device	first free device number	integer in range 2 to system limits (type show system)
width	132	integer in range 1 to 200
scratch/memory/ display/tape/file	assign permanent disc file	
program/help	assign picture storage device	
old/new	if a permanent disc file or tape, old is assumed if a log file and the file does not exist, create it, otherwise, output an error message	
wp	if existing help library, write-protection on otherwise, write-protection off	
append	position file at the beginning	
verify	verification on	