StratoScript™ 2.2 Command Reference

January 11, 2010

StratoScript is a simple language developed by Digitalis Education Solutions, Inc. for automating Nightshade™ (originally Stellarium) planetarium simulation software. Anyone with some astronomy knowledge can be successful with StratoScript scripting. Use it to alleviate tedious manual sequences or provide special effects with image manipulation, audio, video playback, and more.

This document outlines StratoScript commands supported by: **Nightshade 9.12.2 (Preview Edition)**
Stellarium, Digitalis Edition 2009.10.1

Command format basics:

- The command format consists of a command name followed by an optional list of arguments in the form of name/value pairs.
- Whitespace is used as a delimiter.
- Argument values requiring included whitespace can be enclosed in double quotes ("This is a value with spaces.").
- Commands and argument names are case insensitive, however argument values are typically case sensitive.
- Argument pairs can be arranged in any order.

COMMAND ARGUMENT_NAME1 ARGUMENT_VALUE1 ARGUMENT_NAME2 ARGUMENT_VALUE2 ...

Example Commands:

- select planet Jupiter
- flag atmosphere on
- date utc 1999-08-11T12:00:00
- wait duration 2.31
- moveto lat 45.7 lon -122 duration 5
- landscape name english_garden action load type spherical maptex egarden.png
- select nebula "Southern Ring Nebula" pointer off
- set home_planet "Solar System Observer"

Below is a complete list of valid commands, along with their supported argument names and values. Lowercase values are literal, uppercase values are explanatory (i.e. replace SECONDS with the number of seconds desired).

Features that will only work on particular planetarium system platforms are designated by the supported platform inside square brackets, in blue. For example, a feature only available on the Digitalis Digitarium® OP3 platform would be marked by: **[OP3]**.

Please note that a few features do not work on the Windows version, notably the external_viewer command and time zone or daylight savings related commands or features.

Command	Argument Names	Argument Values	Notes
audio	action	drop pause play resume sync	"drop" halts playback and drops the track from memory. To resume an audio track after pausing it where you left off, you can call action "play" again, but be sure not to specify a filename or it will treat it as a new track.
	filename	AUDIO_FILENAME	Used with "play" action. Format support depends on your binary. Ogg Vorbis format is recommended. WAV format should work but is discouraged because in this case the audio track will not adjust if the script is fast forwarded.
	loop	on off	Used with "play" action. Default is off
	output_rate	SAMPLES_PER_SECOND	For example, 44100 is CD quality audio.
	volume	decrement increment VOLUME_LEVEL	VOLUME_LEVEL is between 0 and 1, inclusive.
body	action	clear drop load	Add a new solar system body with the "load" action and a list of parameters and values as found in the standard ssystem.ini configuration file. Texture paths must be relative to the script. The body will not be added if there is already a body with the same name. Remove an added solar system body with the "drop" action and "name" parameter. Only bodies loaded from scripts with no currently loaded satellites and that are not the current home planet can be dropped. To remove all script added bodies at once use the "clear" action. This will not perform any action if the home planet would be dropped.
clear	state	natural	Turn off fog and all labels, lines, and art. Turn planet, star, and nebula rendering on. Deselect any selected objects. Return to initial fov and viewing direction. If state is natural, ground and atmosphere will be turned on, otherwise these will be turned off.

Command	Argument Names	Argument Values	Notes
configuration	action	load reload	Currently disabled.
date	local	[[-]YYYY-MM-DD]Thh:mm:ss	Set time to a specified date and/or time using current timezone. 'T' is literal.
	utc	[-]YYYY-MM-DDThh:mm:ss	Set time to a specified date and time in UTC time. 'T' is literal.
	relative	DAYS	Change date and time by DAYS (can be fractional).
	sidereal	SIDEREAL_DAYS	Change date and time by SIDEREAL_DAYS (can be fractional) based on the planet or moon you are on.
	load	current	Set date to current date.
deselect	constellation	CONSTELLATION	With no arguments, deselects current object selection, including any constellation selection. See select command. With a 3 character constellation abbreviation specified, will only deselect that constellation. See the constellation_names.eng.fab files for abbreviations in the data/sky_culture directories.
external_viewer	action	pause play resume stop	Use "action play" and filename together to start a video. On **[OP1 and OP2]** the video will hide Nightshade from view, but on **[OP3]** the video will overlay Nightshade. On **[OP2]** Nightshade and the media viewer can not both have open audio tracks at the same time. Also, the media player will look at filename cues for fulldome and altitude settings. Typically you will want the script to wait for some duration and then call this command again with an "action stop" to stop the video. Note that fast forwarding the script will not affect the media viewer.
	alpha	ALPHA	**[OP3]** IMPORTANT: 0 is transparent (default), 1 is opaque. ALPHA can be fractional.
	altitude	ALTITUDE_DEGREES	**[OP3]** For positioning the center of the video in dome coordinates. Zero is at the horizon, 90 is at the zenith.
	azimuth	AZIMUTH_DEGREES	**[OP3]** For positioning the center of the video in dome coordinates. Zero is North, 90 is East.

Command	Argument Names	Argument Values	Notes
external_viewer	background_framerate	FRAMES_PER_SECOND	**[OP3]** While playing a video Nightshade will slow its refresh rate to give more processing time to video playback. By default Nightshade will default to 24 fps. You should not need to adjust this value unless you want to tweak performance either due to jerky video or choppy Nightshade animation when doing both tasks. 10 is the minimum fps.
	clone	0, 1	**[OP3]** Whether to clone a video on opposite sides of the dome when using dome coordinates.
	coordinate_system	dome viewport	**[OP3]** What coordinate system to use to position the video. Must be defined at image load. Can not be changed later. Default is viewport. Dome coordinate system is just like horizontal coordinates, but does not change if you zoom.
	duration	SECONDS	**[OP3]** How long to take to complete the command.
	filename	VIDEO_FILENAME	Path must be relative to script.
	rotation	DEGREES	**[OP3]** Absolute rotation, positive is clockwise.
	scale	SCALE	**[OP3]** How large to draw the video. In viewport coordinates, at 1 the image is scaled to fit maximized on the dome. In dome coordinates, this defines the maximum angular width (or height) of the image in degrees.
flag	atmosphere	on, 1, off, 0, toggle	Draw atmospheric effects.
	azimuthal_grid	on, 1, off, 0, toggle	Draw azimuthal grid
	bright_nebulae	on, 1, off, 0, toggle	Select bright nebulae mode (draw at texture intensity rather than visual magnitude)
	cardinal_points	on, 1, off, 0, toggle	Draw cardinal points
	constellation_art	on, 1, off, 0, toggle	Draw constellation artwork
	constellation_boundaries	on, 1, off, 0, toggle	Draw contellation boundaries
	constellation_drawing	on, 1, off, 0, toggle	Draw constellation line drawings
	constellation_names	on, 1, off, 0, toggle	Draw constellation labels
	constellation_pick	on, 1, off, 0, toggle	Select constellation pick mode (whether to only draw selected constellations)

Command	Argument Names	Argument Values	Notes
flag	ecliptic_line	on, 1, off, 0, toggle	Draw ecliptic line
	equator_line	on, 1, off, 0, toggle	Draw equator line
	equatorial_grid	on, 1, off, 0, toggle	Draw equatorial grid
	fog	on, 1, off, 0, toggle	Draw fog along the horizon (support depends on landscape)
	moon_scaled	on, 1, off, 0, toggle	Draw the moon scaled
	landscape	on, 1, off, 0, toggle	Draw the landscape
	light_travel_time	on, 1, off, 0, toggle	Whether to correct for light travel time when drawing planets and moons.
	manual_zoom	on, 1, off, 0, toggle	Select manual zoom mode
	meridian_line	on, 1, off, 0, toggle	Draw the meridian line
	milky_way	on, 1, off, 0, toggle	Draw the Milky Way
	nebulae	on, 1, off, 0, toggle	Draw nebulae
	nebula_names	on, 1, off, 0, toggle	Draw nebula labels
	object_trails	on, 1, off, 0, toggle	Draw motion trails for planets and moons
	planets	on, 1, off, 0, toggle	Draw planets and moons
	planet_names	on, 1, off, 0, toggle	Draw planet labels
	planet_orbits	on, 1, off, 0, toggle	Draw planet orbits
	point_star	on, 1, off, 0, toggle	Draw stars and planets as single pixels regardless of magnitude
	script_gui_debug	on, 1, off, 0, toggle	If on, will print script errors to the screen. Good for debugging.
	show_tui_datetime	on, 1, off, 0, toggle	Draw the date and time
	show_tui_short_obj_info	on, 1, off, 0, toggle	Draw information about the selected object
	star_names	on, 1, off, 0, toggle	Draw star labels
	star_twinkle	on, 1, off, 0, toggle	Draw stars twinkling
	stars	on, 1, off, 0, toggle	Draw stars
	track_object	on, 1, off, 0, toggle	Center view on currently selected object.

Command	Argument Names	Argument Values	Notes
image	action	load drop	Drop images when no longer needed to improve performance.
	alpha	ALPHA	0 is transparent (default), 1 is opaque. ALPHA can be fractional. Note that images are drawn in the order they were loaded.
	altitude	ALTITUDE_DEGREES	For positioning the center of the image in horizontal/dome coordinates. Zero is at the horizon, 90 is at the zenith.
	azimuth	AZIMUTH_DEGREES	For positioning the center of the image in horizontal/dome coordinates. 0 is North, 90 is East.
	coordinate_system	dome equatorial horizontal j2000 viewport	What coordinate system to use to position the image. Must be defined at image load. Can not be changed later. Default is viewport. Dome coordinate system is like horizontal, but does not change if you zoom.
	duration	SECONDS	How long to take to complete the command.
	filename	IMAGE_FILENAME	Path must be relative to script.
	mipmap	on, 1, off, 0	If on, this will make images a little blurry, but this avoid distracting scintillation as an image is moved around the dome. Most useful with high contrast images with a lot of detail.
	name	IMAGE_NAME	Used to refer to the image in later calls to manipulate the image. Images must be in PNG format. If images do not have dimensions that are powers of 2 (128, 256, etc.) they are resized when loaded to meet this requirement.
	rotation	DEGREES	Absolute rotation, positive is clockwise.
	scale	SCALE	How large to draw the image. In viewport coordinates, at 1 the image is scaled to fit maximized in the viewport. In horizontal/dome coordinates, this defines the maximum angular width (or height) of the image in degrees.
	xpos	X_POSITION	Where to draw center of image. Viewport coordinates: 0 is center of viewport, 1 is right edge of viewport. Horizontal/dome coordinates: altitude angle Equatorial coordinates: The declination angle in degrees J2000 coordinates: The declination angle in degrees

Command	Argument Names	Argument Values	Notes
image	ypos	Y_POSITION	Where to draw center of image. Viewport coordinates: 0 is center of viewport, 1 is top edge of viewport. Horizontal/dome coordinates: azimuth angle Equatorial coordinates: The right ascension angle in degrees J2000 coordinates: The right ascension angle in degrees
landscape	action	load	Load a landscape.
	fov	ANGLE	For fisheye landscapes, sets the field of view of the texture, typically 180°. Default is 180°.
	base_altitude	ALTITUDE_DEGREES	**(NEW)** The altitude angle of the bottom of the texture. Default is -90°.
	night_texture	IMAGE_FILENAME	**(NEW)** This image will fade in overlaying the normal texture as it gets dark. This image is optional. The file name needs to be specified in full including the path relative to the script. Must be PNG format with the sky transparent.
	mipmap	on, 1, off, 0	**(NEW)** Whether to use mipmapping. If you have high contrast texture details, your landscape may look better with this option. Default is off.
	rotate_z	ANGLE	**(NEW)** Rotate the landscape around the z (up) axis. Default is 0° with the spherical landscape seam to the East and a fisheye oriented with the texture top at North.
	texture	IMAGE_FILENAME	The standard landscape image. The file name needs to be specified in full including the path relative to the script. Must be PNG format with the sky transparent.
	top_altitude	ALTITUDE_DEGREES	**(NEW)** The altitude angle of the top of the texture. Default is 90°.
	type	old_style fisheye spherical	"old_style" is quite complex and may be deprecated at some point. See a landscape.ini file for parameter information. "fisheye" is best is you have only one fisheye image with the zenith in the center. "spherical" is recommended for it's simplicity and also can support cylindrical landscapes using base_altitude and top_altitude parameters.

Command	Argument Names	Argument Values	Notes
meteors	zhr	ZENITH_HOURLY_RATE	
moveto	lat	default LATITUDE	South is negative. Value of "default" will reload value from configuration file.
	lon	default LONGITUDE	West is negative. Value of "default" will reload value from configuration file.
	alt	default ALTITUDE	In meters. Value of "default" will reload value from configuration file.
	duration	SECONDS	How long to take to effect this change.
script	action	play end pause resume	Note that pause toggles playback. If a script plays another script, the first will terminate.
	filename	SCRIPT_FILENAME	
select			If no arguments are supplied, deselects current object. (Leaves constellation selection alone.) See deselect command.
	constellation	CONSTELLATION_SHORT_NAME	3 character abbreviation from constellation_names.eng.fab in the data/sky_cultures directories, case insensitive.
	hp	HP_NUMBER	
	nebula	NEBULA_NAME	Name as defined in data/nebula_textures.fab but with underscores replaced with spaces and the name string in double quotes.
	planet	PLANET_NAME	Name as defined in data/ssystem.ini or "home_planet" to select your current home planet.
	pointer	on, 1, off, 0	Whether to draw the highlighting pointer around the selected object. Default is on.

Command	Argument Names	Argument Values	Notes
set	atmosphere_fade_duration	SECONDS	
	auto_move_duration	SECONDS	used for auto zoom
	constellation_art_fade_duration	SECONDS	
	constellation_art_intensity		0-1
	landscape_name		from landscapes.ini
	light_pollution_luminance		measured in Cd/m^2
	max_mag_nebula_name		only label nebulas brighter than this
	max_mag_star_name		only label stars brighter than this
	moon_scale		1 is real size
	heading	DEGREES	0 is default, otherwise you can rotate the sky simulation around the zenith.
	home_planet		Change viewing location, case sensitive
	sky_culture		Culture directory name in the data/sky_cultures directory
	sky_locale		locale code: fr, zh_HK, etc.
	star_limiting_mag		Default is 6.5. Simply does not draw stars dimmer than this value at a full sky view. Might be removed in future releases.
	star_mag_scale		
	star_scale		
	star_twinkle_amount		0 is no twinkling
	time_zone		See data/zone.tab for valid timezone names. Does not work on Windows currently. Example: set time_zone "America/Louisville"
	zoom_offset	AMOUNT	Change where tracked objects show up on the dome. AMOUNT can range from -0.5 to +0.5. Zero is the default, and objects track and zoom to the zenith. A value of -0.5 will position objects approximately 45 degrees above the South horizon.

Command	Argument Names	Argument Values	Notes
timerate	rate	SECONDS_PER_SECOND	Set simulation time rate.
wait	duration	SECONDS	SECONDS can be fractional. This is a very important command, because most of the time in a script you will be waiting. Without wait commands everything would happen so quickly that you would not see or hear much of anything.
zoom	auto	in initial out	"initial" returns to configured initial fov and viewing direction
	fov	FIELD_OF_VIEW	in degrees
	delta_fov	DELTA_DEGREES	
	duration	SECONDS	Not used with delta_fov