StratoScript™ 11.12.1 Command Reference

November 6, 2012

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 (where supported), and more.

This document outlines StratoScript commands supported by: **Nightshade 11.12.1**

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 action load type spherical texture egarden.png
- select nebula "Southern Ring Nebula" pointer off
- set home_planet "Solar System Observer"

Below is a 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). The background color of the commands alternates in gray below to aid readability. Note that command arguments may span page breaks in this document.

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 or newer platforms is 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.

New features for this release: Galactic grid flag and color is new. New wait command option allows waiting until a specific time into a script before continuing with the next command. For example, "wait until 1:30" would wait until 1 minute and 30 seconds into the script and then continue on to the next command.

Command	Argument Name	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.
audio	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.
audio	loop	on off	Used with "play" action. Default is off
audio	output_rate	SAMPLES_PER_SECOND	For example, 44100 is CD quality audio.
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 Name	Argument Values	Notes
color	property	azimuthal_grid cardinal_points constellation_art constellation_boundaries constellation_lines constellation_names ecliptic_line equator_grid equator_line galactic_grid meridian_line nebula_circle nebula_names planet_names planet_orbits planet_trails precession_circle satellite_orbits	Set the color of the specified property to the value given by the arguments r, g and b (see below).
color	r g b	[0, 1]	Specifies the red green and blue color channels to be used by the element referenced by the property argument. For example, 'color property planet_orbits r 0.2 g 0 b 0' sets planet trails to a deep red color. All three color channels must always be specified.
configuration	action	load save	Load the default settings. Saving is not allowed from a script for safety.
cove_lights	connect	N/A	Will attempt to establish a connection with the cove light controller.
cove_lights	duration	SECONDS	Number of seconds to transition to a new color given by the 'all' function. If absent, the duration defaults to zero.
cove_lights	function	all preset	The 'all' function sets the r,g,b values for the lights. The preset function returns the lights to a predefined preset. See details below.
cove_lights	protocol	bowen	Selects the protocol for the cove lighting system. Currently, only the Bowen protocol is supported.
cove_lights	r g b	[0,1]	One or more of the r,g,b arguments is specified for the function 'all'. The lights will change over the time specified by the 'duration' argument to the color specified.

Command	Argument Name	Argument Values	Notes
cove_lights	preset	PRESET	An integer denoting the desired preset to load. The duration argument will not effect preset loading.
date	local	[[-]YYYY-MM-DD]Thh:mm:ss	Set time to a specified date and/or time using current timezone. 'T' is literal.
date	utc	[-]YYYY-MM-DDThh:mm:ss	Set time to a specified date and time in UTC time. 'T' is literal.
date	relative	DAYS	Change date and time by DAYS (can be fractional).
date	sidereal	SIDEREAL_DAYS	Change date and time by SIDEREAL_DAYS (can be fractional) based on the planet or moon you are on.
date	load	current preset	Set date to current date, or date saved as preset start up 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.
external_viewer	alpha	ALPHA	**[OP3+]** IMPORTANT: 0 is transparent (default), 1 is opaque. ALPHA can be fractional.
external_viewer	altitude	ALTITUDE_DEGREES	**[OP3+]** For positioning the center of the video in dome coordinates. Zero is at the horizon, 90 is at the zenith.
external_viewer	azimuth	AZIMUTH_DEGREES	**[OP3+]** For positioning the center of the video in dome coordinates. Zero is North, 90 is East.

Command	Argument Name	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.
external_viewer	clone	0, 1	**[OP3+]** Whether to clone a video on opposite sides of the dome when using dome coordinates.
external_viewer	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.
external_viewer	duration	SECONDS	**[OP3+]** How long to take to complete the command.
external_viewer	filename	VIDEO_FILENAME	Path must be relative to script.
external_viewer	rotation	DEGREES	**[OP3+]** Absolute rotation, positive is clockwise.
external_viewer	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	antialias_lines	on, 1, off, 0, toggle	Draw smoother lines.
flag	atmosphere	on, 1, off, 0, toggle	Draw atmospheric effects.
flag	azimuthal_grid	on, 1, off, 0, toggle	Draw azimuthal grid.
flag	bright_nebulae	on, 1, off, 0, toggle	Select bright nebulae mode (draw at texture intensity rather than visual magnitude).
flag	cardinal_points	on, 1, off, 0, toggle	Draw cardinal points.
flag	clouds	on, 1, off, 0, toggle	Draw clouds when rendering planets such as Earth.
flag	circumpolar_circle	on, 1, off, 0, toggle	Draw circumpolar circle showing limit of sky visibility.
flag	constellation_art	on, 1, off, 0, toggle	Draw constellation artwork.
flag	constellation_boundaries	on, 1, off, 0, toggle	Draw contellation boundaries.

Command	Argument Name	Argument Values	Notes
flag	constellation_drawing	on, 1, off, 0, toggle	Draw constellation line drawings.
flag	constellation_names	on, 1, off, 0, toggle	Draw constellation labels.
flag	constellation_pick	on, 1, off, 0, toggle	Select constellation pick mode (whether to only draw selected constellations).
flag	ecliptic_line	on, 1, off, 0, toggle	Draw ecliptic line.
flag	equator_line	on, 1, off, 0, toggle	Draw equator line.
flag	equatorial_grid	on, 1, off, 0, toggle	Draw equatorial grid.
flag	fog	on, 1, off, 0, toggle	Draw fog along the horizon (support depends on landscape).
flag	galactic_grid	on, 1, off, 0, toggle	Draw galactic grid.
flag	moon_scaled	on, 1, off, 0, toggle	Draw the moon scaled.
flag	landscape	on, 1, off, 0, toggle	Draw the landscape.
flag	light_travel_time	on, 1, off, 0, toggle	Whether to correct for light travel time when drawing planets and moons.
flag	manual_zoom	on, 1, off, 0, toggle	Select manual zoom mode.
flag	meridian_line	on, 1, off, 0, toggle	Draw the meridian line.
flag	milky_way	on, 1, off, 0, toggle	Draw the Milky Way.
flag	nebulae	on, 1, off, 0, toggle	Draw nebulae.
flag	nebula_names	on, 1, off, 0, toggle	Draw nebula labels.
flag	object_trails	on, 1, off, 0, toggle	Draw motion trails for planets and moons.
flag	planets	on, 1, off, 0, toggle	Draw planets and moons.
flag	planet_names	on, 1, off, 0, toggle	Draw planet labels.
flag	planet_orbits	on, 1, off, 0, toggle	Draw planet orbits.
flag	precession_circle	on, 1, off, 0, toggle	Draw Earth precession circle.

Command	Argument Name	Argument Values	Notes
flag	point_star	on, 1, off, 0, toggle	Draw stars and planets as single pixels regardless of magnitude.
flag	script_gui_debug	on, 1, off, 0, toggle	If on, will print script errors to the screen. Good for debugging.
flag	show_tui_datetime	on, 1, off, 0, toggle	Draw the date and time.
flag	show_tui_short_obj_info	on, 1, off, 0, toggle	Draw information about the selected object.
flag	star_names	on, 1, off, 0, toggle	Draw star labels.
flag	star_twinkle	on, 1, off, 0, toggle	Draw stars twinkling.
flag	stars	on, 1, off, 0, toggle	Draw stars.
flag	track_object	on, 1, off, 0, toggle	Center view on currently selected object.
flag	tropic_lines	on, 1, off, 0, toggle	Draw tropic line.
image	action	load drop	Drop images when no longer needed to improve performance.
image	alpha	ALPHA	0 is transparent (default), 1 is opaque. ALPHA can be fractional. Note that images are drawn in the order they were loaded.
image	altitude	DEGREES	For positioning the center of the image in horizontal/dome coordinates. Zero is at the horizon, 90 is at the zenith.
image	azimuth	DEGREES	For positioning the center of the image in horizontal/dome coordinates. 0 is North, 90 is East.
image	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.
image	duration	SECONDS	How long to take to complete the command.
image	filename	IMAGE_FILENAME	Path must be relative to script. For backward compatibility images should be in PNG format, but JPEG, GIF, TIFF and other formats are supported. If images do not have dimensions that are powers of 2 (128, 256, etc.) they are resized when loaded to meet this requirement.

Command	Argument Name	Argument Values	Notes
image	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.
image	name	IMAGE_NAME	Used to refer to the image in later calls to manipulate the image.
image	rotation	DEGREES	Absolute rotation, positive is clockwise.
image	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.
image	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
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.
landscape	fov	DEGREES	For fisheye landscapes, sets the field of view of the texture, typically 180°. Default is 180°.
landscape	base_altitude	DEGREES	The altitude angle of the bottom of the texture. Default is -90°.
landscape	night_texture	IMAGE_FILENAME	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.
landscape	mipmap	on, 1, off, 0	Whether to use mipmapping. If you have high contrast texture details, your landscape may look better with this option. Default is off.
landscape	rotate_z	DEGREES	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.

Command	Argument Name	Argument Values	Notes
landscape	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.
landscape	top_altitude	DEGREES	The altitude angle of the top of the texture. Default is 90°.
landscape	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.
meteors	zhr	ZENITH_HOURLY_RATE	
moveto	lat	default DEGREES	Latitude. South is negative. Value of "default" will reload value from configuration file.
moveto	lon	default DEGREES	Longitude. West is negative. Value of "default" will reload value from configuration file.
moveto	alt	default METERS	Altitude. Value of "default" will reload value from configuration file.
moveto	heading	default DEGREES	Heading. Value of "default" will reload value from configuration file.
moveto	duration	SECONDS	How long to take to effect this change.
nebula	action	load drop clear	Load a new nebula to supplement or replace a standard nebula image. Drop a script added nebula (use the name parameter), or clear all script added nebulae.
nebula	angular_size	ARC_MINUTES	Image angular size.
nebula	credit	STRING	Credit for the photographer who has provided usage permission.
nebula	de	DEGREES	Declination.
nebula	distance	LIGHT_YEARS	Distance to the nebula.
nebula	filename	IMAGE_FILENAME	

Command	Argument Name	Argument Values	Notes
nebula	magnitude	MAGNITUDE	
nebula	name	NEBULA_NAME	Name as defined in data/nebula_textures.fab or new name.
nebula	ra	DEGREES	Right ascension.
nebula	rotation	DEGREES	Rotation of the image texture around it's center.
nebula	texture_luminance_adjust		Allows adjustment of the texture brightness (1 if no change required).
script	action	play end pause resume	Note that pause toggles playback. If a script plays another script, the first will terminate.
script	filename	SCRIPT_FILENAME	
select			If no arguments are supplied, deselects current object. (Leaves constellation selection alone.) See deselect command.
select	constellation	CONSTELLATION_SHORT_NAME	3 character abbreviation from constellation_names.eng.fab in the data/sky_cultures directories, case insensitive.
select	hp	HP_NUMBER	Select a star by its Hipparcos number.
select	nebula	NEBULA_NAME	Name as defined in data/nebula_textures.fab but with underscores replaced with spaces and the name string in double quotes.
select	planet	PLANET_NAME	Name as defined in data/ssystem.ini or "home_planet" to select your current home planet.
select	pointer	on, 1, off, 0	Whether to draw the highlighting pointer around the selected object. Default is on.
set	atmosphere_fade_duration	SECONDS	
set	auto_move_duration	SECONDS	used for auto zoom

Command	Argument Name	Argument Values	Notes
set	constellation_art_fade_duration	SECONDS	
set	constellation_art_intensity	SCALE	0-1
set	duration	SECONDS	Currently only used for setting a duration for a heading or home_planet change (see below).
set	landscape_name	LANDSCAPE_NAME	from landscapes.ini
set	light_pollution_limiting_magnitude	MAGNITUDE	Set naked eye limiting magnitude due to light pollution (light_pollution_luminance is now deprecated)
set	line_width	PIXELS	Can be fractional when using antialiased lines (see flag antialias_lines above).
set	max_mag_nebula_name		only label nebulas brighter than this
set	max_mag_star_name		only label stars brighter than this
set	milky_way_intensity		1 is the default
set	milky_way_texture	default IMAGE_FILENAME	Replace the milky way spherical texture with your own image. Use "set milky_way_texture default" to return to the default texture.
set	moon_scale		1 is real size
set	heading	DEGREES	0 is default, otherwise you can rotate the sky simulation around the zenith. Duration argument supported, see above.
set	home_planet	PLANET_NAME	Change viewing location, case sensitive
set	sky_culture	CULTURE_DIRECTORY	Culture directory name in the data/sky_cultures directory
set	sky_locale	LOCALE	locale code: fr, zh_HK, etc.
set	star_limiting_mag	MAGNITUDE	Default is 6.5. Simply does not draw stars dimmer than this value at a full sky view. Might be removed in future releases.
set	star_mag_scale		
set	star_scale		

Command	Argument Name	Argument Values	Notes
set	star_twinkle_amount		0 is no twinkling
set	time_zone	TIME_ZONE	See data/zone.tab for valid timezone names. Does not work on Windows currently. Example: set time_zone "America/Louisville"
set	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.
sky_culture	action	load	Load a new sky culture, which can include constellation lines, constellation art, constellation boundaries, and star names. This data is loaded into memory and will be replaced if another sky culture is selected or loaded.
sky_culture	path	CULTURE_DIRECTORY	CULTURE_DIRECTORY is relative to the script's location. The directory should contain all the files necessary to define a sky culture. See the built in cultures in the data/sky_cultures/ directory for examples.
timerate	rate	SECONDS_PER_SECOND	Set simulation time rate.
wait	action	reset_timer	This is a rarely used but useful argument to reset the timer for the next wait duration command. For example, if you load a number of images you do not know how much time this will take on different hardware. If you want to load your images and then wait 1 second before doing something else, just using a duration argument might not work as you intend because the image loading takes some amount of time, maybe even more than 1 second since the last wait command. So by using this command right after loading the images, you can have a definite starting point for your next wait duration command.
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.
wait	until	HOURS:MINUTES:SECONDS	Wait to proceed with the next command until the script has run for this much time since being started. SECONDS are required, HOURS are not required, and MINUTES are only required if HOURS are used.

Command	Argument Name	Argument Values	Notes
zoom	auto	in initial out	"initial" returns to configured initial fov and viewing direction
zoom	fov	DEGREES	Change the current field of view, in degrees
zoom	delta_fov	DEGREES	
zoom	duration	SECONDS	Not used with delta_fov