SIDEREAL TECHNOLOGY

QUICK START Checklist
for
BASIC Operations of

Altitude/Azimuth Mounts

Version 1.0, Rev J
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This checklist only addresses "BASIC" Operations (enough to get you started enjoying your mount). "Intermediate" and "Advanced" Operations are covered in separate QuickStart Checklists for each of those levels of operations.

The Quick Start checklist is based on several assumptions being valid.

The first assumption is that the necessary software has been downloaded and installed. For NON-PC Operations (i.e. no PC, just the controller standalone) you need to install the configuration program (ServoConfig.exe) to set up the controller internal configuration. For PC Operations (that use the Sitechexe driver/user interface that provides the true power built into the Sitech system) you will need to install the configuration program (ServoConfig.exe) and also install Sitechexe.exe per the Release Notes (which augment the manuals with later information). Basically, the Release notes show you how to download and install the free Microsoft DotNet v4 framework that the Sitech software requires, and then download and run the free full install package for Sitech that installs all the other required

programs. If you want to use external programs (like a Planetarium program, or cameras or focusers, etc,) you will need to also install the free ASCOM Platform. For performing PlateSolves that are part of the very powerful suite of software provided by Dave Rowe that is included with the Sitech software to model your mount, you will need to download and install the Special Star Catalogs the PlateSolve software uses. Again, all of this is detailed in the Release notes.

All of these assumptions also start with the controller and servo motors having been mounted on the telescope mount, and wired per the SETUP Manual (SETUP Manual sections 1-5).

If an assumption is not valid, then stop right there and address it so it is a valid assumption. These are usually one time only things that once you get setup correctly do not normally change (except when called out).

The Quick Start section will also refer you to sections in the OPERATIONS Manual for additional details in settings things up. How much detail you need to do this will vary with your ATM experience and the type of your mount and the conversion configuration.

What is listed below hit some of the high points of getting things set up before you try to use the Quick Start section to start operating your mount:

1. Make sure you are using the latest software for Sitechexe (v0.90Ma) and ServoConfig (v1.3), and the latest firmware (v37A for ServoI and v88 for ServoII).
2. Do not connect Sitechexe.exe and ServoConfig to the same controller at the same time over the same comm port (basically only run one of the programs at a time)
3. Motor Encoder TicksperRev for BOTH axes MUST be set CORRECTLY. For non-roller drives, simply (and accurately) count teeth on the gears and cog belts. If using Pittman 8000 or 9000 series gearhead motors, the gear ratio you should use is provided in a table in the SETUP Manual para 2.3.4. For roller drives, use the tick calculator in ServoConfig. This is the single most important data entry thing you do (other than making them system move the right direction). Make sure it is sent to the controller and saved to the Flash ROM
4. If you have Scope encoders, make sure you enter the CORRECT ticks/rev for each axis in ServoConfig, and make sure “ignore scope encoders” is NOT checked in ServoConfig. Then send this to the controller, and save to Flash
5. Make sure the direction of the motor encoders and scope encoders is set up correctly. Make sure the latitude is entered correctly in both ServoConfig/AutoTracking Tab (southern hemisphere enter a negative number), and also in the Sitechexe.exe configuration/Scope Info tab (enter as a positive number, but check the appropriate North or South Box for Latitude). While watching the encoder data on the main page of ServoConfig, the right handpad pushbutton should make the Az axis rotate Clockwise (as viewed from above the mount). When the UP button on the handpad is pressed in the Northern Hemisphere, the scope should move up in altitude (to closer to the zenith). Both motor and scope encoders for Az and Alt should increase in value when you do this.

6. Make sure your scope is balanced well, in BOTH axes, and there is not excessive friction anywhere in the drive or bearing system on either axis. The connection to the mount for the motor output shaft should have almost no friction to turn it with the motor disconnected throughout its entire range of motion for the mount.
7. Make sure you are providing at least 12v dc to the controller
8. Make sure ALL of the mechanical connections for ALL the drive components and the scope encoders are TIGHT! Setscrews are terrible for loosening (so tighten them against a flatspot on the shaft whenever possible).
9. In Sitechexe, make sure the mount information is entered correctly on all of the config pages (Main Sitech screen / config tab / change config button).

- Scope Info Tab:
  - Upper two areas show the paths to the Sitech.cfg file (and the other configuration files), and to the "program files" like Sitechexe.exe, etc..
  - Fill in the information you want to refer to your mount by, and the pertinent info on your telescope
  - Fill in the geographic info (For Lat and Long, enter as deg:min:sec, and do not use a negative number. Instead make sure the right North/South and East/West boxes are checked)
- Mount Params Tab:
  - Check "Alt/Az"
  - Enter a lower altitude limit (Deg:Min:Sec).
  - Do not check the "use Horizon File Sitech.hrz" till you have learned how to build a horizon file (in the intermediate level operations checklist).
  - The default is to use the original PointXP routine to model the mount. To use the latest version, check "Use Active X PointXP". However, the use of mount modeling and any information on Point XP is not covered in this Basic QS Checklist (not covered till the Intermediate QS Checklist).
  - Joystick operations are also not covered in this Basic QS checklist.
  - Check Azim/RA NoWrap to prevent the Az axis from rotating more than 360 deg and twisting wires. The no go zone is a 360 deg (due north). This also means if you want to slew from NW to NE, the mount will slew thru due south to get there.
  - Ignore the gain settings for Basic Operations for now.
- Scope Encoders Tab:
  - If you do not have mount encoders, or do not wish to use them, check "Ignore". If you have mount encoders, select the correct mode to use them on the Scope Encoders tab. Med to high resolution encoders (about 200,000 ticks and higher, and this can be low resolution encoders that are geared up to increase resolution) can use Tick Management Mode. All others should use Precise Mode or Polite mode. Precise mode can cause small jumps while tracking. If that happens, use Polite mode to only use the

encoders while slewing and not while tracking. For polite or precise modes, initially set the supervisory threshold (deg:min:sec) to about 2 ½ times the encoder's resolution.
    - For now, do not use Drag Mode in Sitechexe
- Misc Tab:
    - Select the com port that the PC is using to connect to the controller (SETUP Manual para 8.2 has details on doing this)
    - Use the default time for the Comm Loop (250ms) for basic operations
    - Do not check mute sounds for now, since there are voice reports you may find useful.
    - Basic Operations do not use a separate Planetarium Program, so check Nutate, Aberate, and Refraction. Interfacing with a Planetarium Program via ASCOM is addressed in the Intermediate QS Checklist.
    - Set the Init Window Timeout box to something like 4 or 5 seconds
    - For Basic Operations disregard the camera control software settings
- Horizon File Tab:
    - The setup and use of the Horizon File is covered in the Intermediate QS Checklist.
- ASCOM & Logging Tab:
    - For Basic Operations, leave everything unchecked except "Priority = High
- Focus/Rotator Tab:
    - For Basic Operations, leave everything unchecked
- Potentiometers Tab:
    - For Basic Operations, leave everything unchecked
- When complete, check OK, and then I suggest closing and re-opening Sitechexe.exe

10. Set up the mount with the baseboard reasonably level (does not have to be perfect, but the more level the better).
11. Make sure your PC clock time is reasonably accurate.
12. Connect and have good comm between Sitechexe and your controller, with the controller powered up. Determine what com Port on your PC that you are using to connect to the controller (use the Device Manager to look at the Port statuses). To Connect to ServoConfig, click on Set Up Com Port in ServoConfig and use the drop down window to select the right comm port . In Sitechexe.exe, go to Config Tab/Change Config! Button/Misc Tab and select the right Com Port from the drop down window, then click OK.

OK, those 12 things really need to be satisfied as well as you can. If all of them are not satisfied, stop and fix them or you may not get good performance out of your mount. If you get confused on how to satisfy any of the 12, ask about specifics on how to on the SitechServo listserver after having read about that topic in the manuals and Release notes.
The remaining sections of the Alt/Az Quick Start are divided into:

- Basic Startup Procedure
- 1 Star Alignment Procedure (Basic Operations)

- 2-3 star Alignment Procedure for improved GO TO accuracy)
- GoTo Operations

Enjoy your system!!!!

SiTech Standalone (NO PC) *[assumes Alt/Az Mount without mount encoders, controller set to Slew and Track Mode, and no PC connected to controller, or an Alt/Az mount with mount encoders, controller set to either Drag and Track or Slew and rack Mode, and no PC connected]*	**Sitechexe (PC operations)** *[assumes Alt/Az Mount with or without mount encoders, and PC configured to establish com to controller. Configuring to Drag and track or Slew and track is optional]*	**Paragraph Reference to Operations Manual for additional information**
Basic Startup Procedure		
Assemble Mount and set up ground board reasonably level	Assemble Mount and set up ground board reasonably level. Connect Controller to PC serial port or to usb-serial dongle.	
Set up Drag and Track or Slew and Track mode per Manual.	Setting up Drag and track mode is optional when using a PC. However, if you want to have the mount start tracking before starting Sitechexe, set up Drag and Track or Slew and Track and initialize per the no PC column	OPERATIONS Manual, para 2.1.1 for Drag and Track or Slew and Track mode, and 2.2 for Slew and Track Mode.
	Set up Sitechexe Configuration (only the Basic Features for now) per the OPERATION Manual	OPERATIONS Manual para 4.11 (Including 4.11.1 thru 4.11.7), and the Release Notes
If Latitude IS setup per the manual: Aim the scope at the North Celestial Pole (NCP, not at Polaris) and Power on the controller. If Latitude is NOT setup: aim at Zenith and press&hold Top Right (RTN) button for more than 4 seconds. Then move scope to center on the NCP and press&hold Top Left button (ESC) for more than 4 seconds. (to save the Lattitude press and hold both top keys simo for more than 10 seconds)	Power on the Controller, and PC, and after boot up, start Sitechexe.exe (connects to the controller automatically)	OPERATIONS Manual para 2.1.2 and 2.1.3 for Drag and Track or Slew and Track Init details.
When operating in Standalone Mode (no PC connected), use the SPD button on the handpad to toggle between Slew and Pan and Guide speeds.	When using Sitechexe, use the SPD button on the hardware handpad to toggle between Slew, Pan and Guide speeds.	Refer to OPERATIONS Manual para 4.3.2 to use the Virtual Handpad in Sitechexe (including changing speeds between Slew, Pan, and Guide) Refer to the SETUP Manual, para 8.3.1 (in the “Speed Text Boxes”

		paragraph) to change the Slew, Pan and Guide Speeds using ServoConfig/Edit Parameters/Get Data from Controller/Motors-Encoders Tab
Scope will start tracking and no further initializations are required. Scope is aimed at the NCP, so you will not see the mount moving. GoTo not supported, so use handpad to manually slew to desired target, or de-clutch, move, re-clutch)	Scope will not start tracking or perform GOTOs until the first Init is performed. Until init performed, use handpad to slew to desired target or declutch, move, and re-clutch.	

SiTech Standalone (NO PC) *[assumes Equatorial Mount without mount encoders, controller set to Equatorial Mode, and no PC connected to controller]*	**Sitechexe (PC operations)** *[assumes Equatorial Mount without mount encoders, controller set to Equatorial Mode, and PC configured to establish com to controller, and to "Track on Start"]*	**Paragraph Reference to Operations Manual for additional information**
1 Star Alignment Procedure (Basic Operation)		
No initializations are used or required after the basic startup Initializations were performed	Manually slew scope to a user selected known star that is not within 10 deg of the Zenith. Any Azimuth is fine. Use up/down/left/right buttons to center star accurately (use SPD button to change to slower PAN speed to make centering easier). NOTE: After Sitechexe is started, an Alt/Az mount will NOT start tracking till you actually perform the 1st Init. At this point do NOT worry that the star is drifting off……	Use an illuminated reticle eypiece if possible, otherwise use a moderate to high powered EP to assure star is well centered (too hard to use a widefield EP to get things accurately centered)
Mount is tracking. GoTo is not supported. Slews are done via handpad buttons, or de-clutch, move, and re-clutch.	Perform either **A** (use SkyView) or **B** (use built in star Catalogue) **A:** On FEATURES TAB, click on SkyView. Click on star in SkyView that scope is aimed at **B:** Click on Sitechexe GoTo/Sync Tab, then Click on STAR button. Select Star name for star that scope/mount is centered on	Release Notes for SkyView (Sky Window) info OPERATIONS Manual para 4.6 (including 4.6.1 thru 4.6.5) for GOTO/Sync tab details.
----------	Click on SYNC button. (Sync window will open and count down to perform an offset init, and then close)	OPERATIONS Manual paras 4.7, 4.8, and 4.9, plus the Release Notes
----------	Mount is tracking and ready to use, and will support GoTo. Accuracy depends on mount mechanical condition, errors in your entered latitude and longitude, PC Clock time accuracy and accuracy of zenith alignment (how level is the base?)	If tracking does not start, go back and make sure all the assumptions and Config setup were done correctly

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2 or 3 (or more) Star Alignment Procedure (Improved GoTo Accuracy)		
No initializations are used or required.	If you want increased accuracy over a single star init accuracy, you can perform 2 or 3 (3 is recommended) inits. These inits will be Cal Star Inits rather than the simple Offset Init done when only performing a single init. Manually slew scope to a user selected known star (Star #1) that is not within 10 deg of the Zenith. Use up/down/left/right buttons to center star accurately (use SPD button to change to slower PAN speed to make centering easier) Use an illuminated reticle eypiece if possible, otherwise use a moderate to high powered EP to assure star is well centered (too hard to use a widefield EP to get things accurately centered) NOTE: An Alt/Az mount will NOT start tracking till you actually perform the 1st Init. At this point do NOT worry that the star is drifting off……	
----------	Perform either **A** (use SkyView) or **B** (use built in star Catalogue) **A:** On FEATURES TAB, click on SkyView. Click on star in SkyView that scope is aimed at. *… or …* **B:** Click on Sitechexe GoTo/Sync Tab, then click on STAR button. Select Star name for star that scope/mount is centered on	Release Notes for SkyView (Sky Window) info OPERATIONS Manual para 4.6 (including 4.6.1 thru 4.6.5) for GOTO/Sync tab details
----------	Click on SYNC button.	OPERATIONS Manual paras 4.7,

	When Sync Window opens, click on left button to STOP countdown timer. Click on Cal Star Init, then click on OK. Cal Star Init is performed on Star #1 and window closes.	4.8, and 4.9, plus the Release Notes
----------	Center scope on User Selected Star#2 (separate by 90 to 120 in Azimuth)	
----------	Repeat above Init procedure for Star#2, except no need to stop timer (default will be Cal Star Inits after 1st Cal Star Init was performed)	
----------	Repeat above procedure for User Selected Star#3 (However, Separate in Altitude as much as possible from Stars #1 and #2). Mount is tracking and ready to use, and will support GoTo.	
----------	If desired, add additional Cal Star Inits. Use PXP Window to monitor "RMS pointing error" and "sensitivity" as CalStar Inits are added (smaller is better for both terms). Scatter additional inits around sky evenly, on both sides of the meridian and at different RA and Decs for best results.	Information on the Original PXP Routine is in the OPERATIONS Manual, para 5.1.1 . Info on the latest PXP Routine is in the Release Notes (Scripted PXP Ops and PlateSolve operations will be addressed in the Intermediate Operations Quick Start Checklist.)
Mount is tracking. GoTo is not supported. Slews are done via handpad buttons.	Mount is tracking and ready to use, and will support GoTo.	

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GoTo Operations		
GoTo is not supported. Slews are done via handpad buttons. After slew to approx area of desired target, use Local search to perform an automated spiral search of the area (assumes setup previously performed per SETUP Manual, section 8.3.7). Start Search: Top Left (ESC) /Down button for low power EP (Top Left / Up for high Pwr EP). Increase search speed: Top Left/UP, decrease Top Left/Down) Reverse search direction (spiral IN): press Down Button. Return to Spiral OUT, press Up button. Pause search: press SPD key, to resume press Up, Down, or SPD. Exit (Stop) Search: Press Left or Right button.	Click on Features>SkyView. Current position of scope is indicated by a small white circle Change Stellar Sky Mag, Deep Sky Mag, and type of objects as needed to locate your desired GOTO target. Left click on target, and click on GOTO. Scope will slew to target. Right click will be interpreted as a random area to be able to go to.	The Release Notes contain the latest information on SkyView (referred to as Sky Window in the Release Notes)
Toggle tracking on/off with Top Right (RTN) button on handpad		