Print Finder Charts for AstroPlanner

Print Finder Charts is a script for AstroPlanner astronomical planning software. It adds a new feature to AstroPlanner, which allows you to batch-print a series of finder charts for an observing list with one command.

The charts are tailored for a given observing site, date and time, as well as telescope and eyepiece combination. They are specially formatted in a three-pane layout to assist in starhopping.

Print Finder Charts is intended for observers who use printed charts to locate objects at the telescope, and typically do not take their computer into the field.

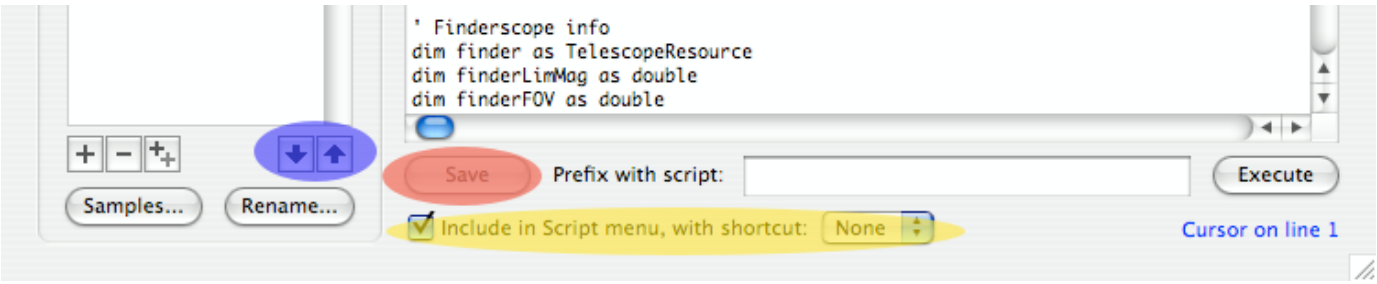
Requirements

- You must have AstroPlanner software **version 1.5.8 or later**, on Windows XP or Macintosh.
  This script will not work on prior versions of AstroPlanner.
- You must be a registered (paid) user of AstroPlanner. The free edition does not support add-on scripts such as this one.
- You must install stellar catalogs appropriate for the generated charts.You can install stellar catalogs from the AstroPlanner CD-ROM, download them from the AstroPlanner website, or install them using the **Catalogue Manager** feature built into AstroPlanner.
  We recommend you choose one or more of the following catalogs:
  - **ASCC Lite Catalog**, for finderscope views. This catalog is required, and *Print Finder Charts* will ask you to install it if it is not present.
  - **All-Sky Compiled Catalog**, for eyepiece views.
  - **Tycho II Catalog** for eyepiece views. (Avoid the obsolete "Tycho Input Catalog", which sounds similar but contains less accurate data).
  - **Hubble Guide Star Catalog** for eyepiece views. (This catalog is available only on the AstroPlanner CD-ROM edition).
- You must enter at least one observing site, telescope and eyepiece in the AstroPlanner **Resources** pane (select **Edit** > **Resources...** from the menu). *Print Finder Charts* draws charts based on these resources.

Installation

There are two ways to install the *Print Finder Charts* script.

1. You can download and install the script from within AstroPlanner. This is the recommended way to install the script. Follow these steps:
   a. From the AstroPlanner main menu, choose **Script** > **Edit Scripts...** The Scripts pane appears.
   b. Click on the down-arrow button in the lower left corner of the Scripts pane (highlighted with the blue oval in the screenshot below).



   The Download pane appears.
   c. In the Download pane, find and select "Print Finder Charts" from the list of user-submitted scripts, then

click **Download**.

d. The Download pane disappears, and the script appears in the Scripts pane.
e. Make sure to check the **Include in Script menu** checkbox (highlighted in yellow), then click **Save** (highlighted in red).
f. Close the Scripts pane.
g. Now you can select *Print Finder Charts* from the AstroPlanner **Script** menu.

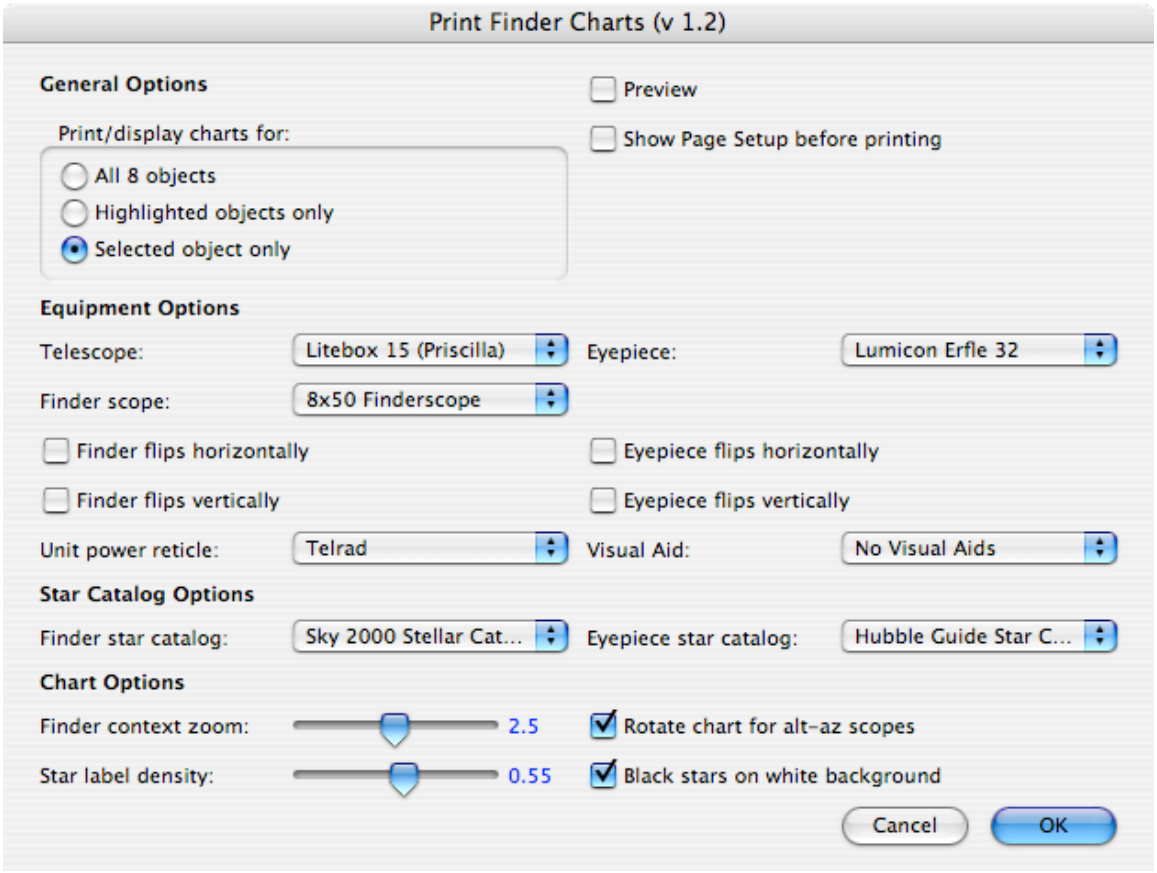
2. You can download and install the script manually.

   Click here to download the latest version of the Print Finder Charts script.

   The script will appear in your browser. It is a plain text file which you can save into the AstroPlanner script folder (called "AstroPlanner Scripts" in the folder where AstroPlanner is installed on your system). Consult the *AstroPlanner User's Guide* for detailed instructions to install the script. You must give the script a name that appears in the menu; I call it "Print Finder Charts". Make sure to check the **Include in Script menu** checkbox so the script will appear in the AstroPlanner **Script** menu.

Usage

Choose **Print Finder Charts** from the **Script** menu. A dialog box appears, to choose options for printing charts.



The options are grouped into categories covering overall preferences, the equipment you will use, star catalogs for charting, and the way charts should be drawn. They are described in the following sections.

General Options

The **Print/display charts for** option allows you to print the entire list, highlighted objects only, or a single selected object.

Print Finder Charts uses objects from the currently active plan document. You must have at least one object in your plan document.

Check the **Preview** check box to get an on-screen preview, rather than a hardcopy printout.

Check the **Show Page Setup before printing** check box if you want to control certain aspects of your printout, for example whether to print portrait or landscape.

Equipment Options

Print Finder Charts uses your telescope, eyepiece, and other equipment selections to determine how the various charts on each page are drawn.

The **Telescope** menu chooses the telescope you will use to observe. *Print Finder Charts* presents you with the default telescope selection taken from the current plan document. If your plan document has no telescope, it suggests the default you set in the AstroPlanner **Resources** pane instead.

If you don't see your telescope in the list, you can add it using the AstroPlanner **Resources** pane (**Edit > Resources... > Telescopes**).

The **Finder scope** menu chooses the finder scope you will use along with your main telescope. *Print Finder Charts* gets this list from the AstroPlanner **Resources** pane. If you don't see a suitable entry listed for your finder scope, you will need to create separate telescope entries for each finder scope you will want to use. For more details, see the section Adding a Finder Scope below.

Check the **Finder flips horizontally** and/or **Finder flips horizontally** checkboxes if your finderscope gives you an inverted view (vertical) or mirror-image view (horizontal).

The **Eyepiece** menu chooses the eyepiece you will use to locate objects. Print Finder Charts starts by suggesting the default eyepiece you set in the AstroPlanner **Resources** pane. If you don't see a suitable eyepiece listed, you can add it using the AstroPlanner **Resources** pane (**Edit > Resources... > Eyepieces**).

Check the **Eyepiece flips horizontally** and/or **Eyepiece flips horizontally** checkboxes if your telescope gives you an inverted view (vertical) or mirror-image view (horizontal) in the eyepiece. Typically, refractors, Schmidt-Cassegrain and Maksutov-Cassegrain scopes with a mirror diagonal will flip the image horizontally, while Newtonian and Dobsonian reflectors flip the image vertically.

The **Unit power reticle** menu chooses a reflex sighting device you will use to locate objects. Your three choices are:

1. Telrad
2. Rigel QuikFinder
3. Red Dot

Print Finder Charts will draw rings for the sighting reticle you choose on the chart printout.

The **Visual Aid** menu chooses a barlow lens or other accessory you will use in conjunction with your eyepiece. It affects magnification and field of view for the eyepiece chart. If you don't see your favorite accessory on the list, you can add it using the AstroPlanner **Resources** pane (**Edit > Resources... > Visual Aids**).

Star Catalog Options

The **Finder star catalog** menu selects the stellar catalog for drawing finderscope charts. Print Finder Charts presents a selection of catalogs from those you have currently installed within AstroPlanner. It displays the catalogs whose limiting magnitude makes them suitable for rendering charts that approximate the view seen through your finderscope.

The **Eyepiece star catalog** menu selects the stellar catalog for drawing eyepiece charts. Print Finder Charts presents a selection of catalogs from those you have currently installed within AstroPlanner. It displays the catalogs within AstroPlanner which are suitable for charts approximating the view seen through your eyepiece. For eyepiece charts, the deeper the limiting magnitude (more stars) in the star catalog, the better.

Chart Options

The **Finder context zoom** slider affects the field of view of the Finder Context chart. At the minimum (1.0), the Finder Context view displays the same field of view as your finder scope. At the maximum (4.0), the Finder Context view displays four times the field of view as your finder scope. You can set this high to provide more context in a part of the sky with few bright stars, or lower it to provide a more detailed finder scope view in crowded areas such as the Milky Way constellations. The default is 3.0.

The **Star label density** slider affects how many stars get labels, across all charts. At the minimum (0.0), no stars are labeled. At the maximum (1.0), every star on the chart gets a label. Adjust this to your liking; generally observers find that a setting that labels the brighter stars without crowding better helps them orient themselves with the sky. The default is 0.55.

Check the **Rotate chart for alt-az scopes** checkbox if you have an alt-az mount (Dobsonians, or grab-and-go style tripod mounts) and would like the charts rotated to match the orientation of the sky while you are observing. If you check this option, first make sure you fix the time of the plan document to the approximate time you plan to observe.

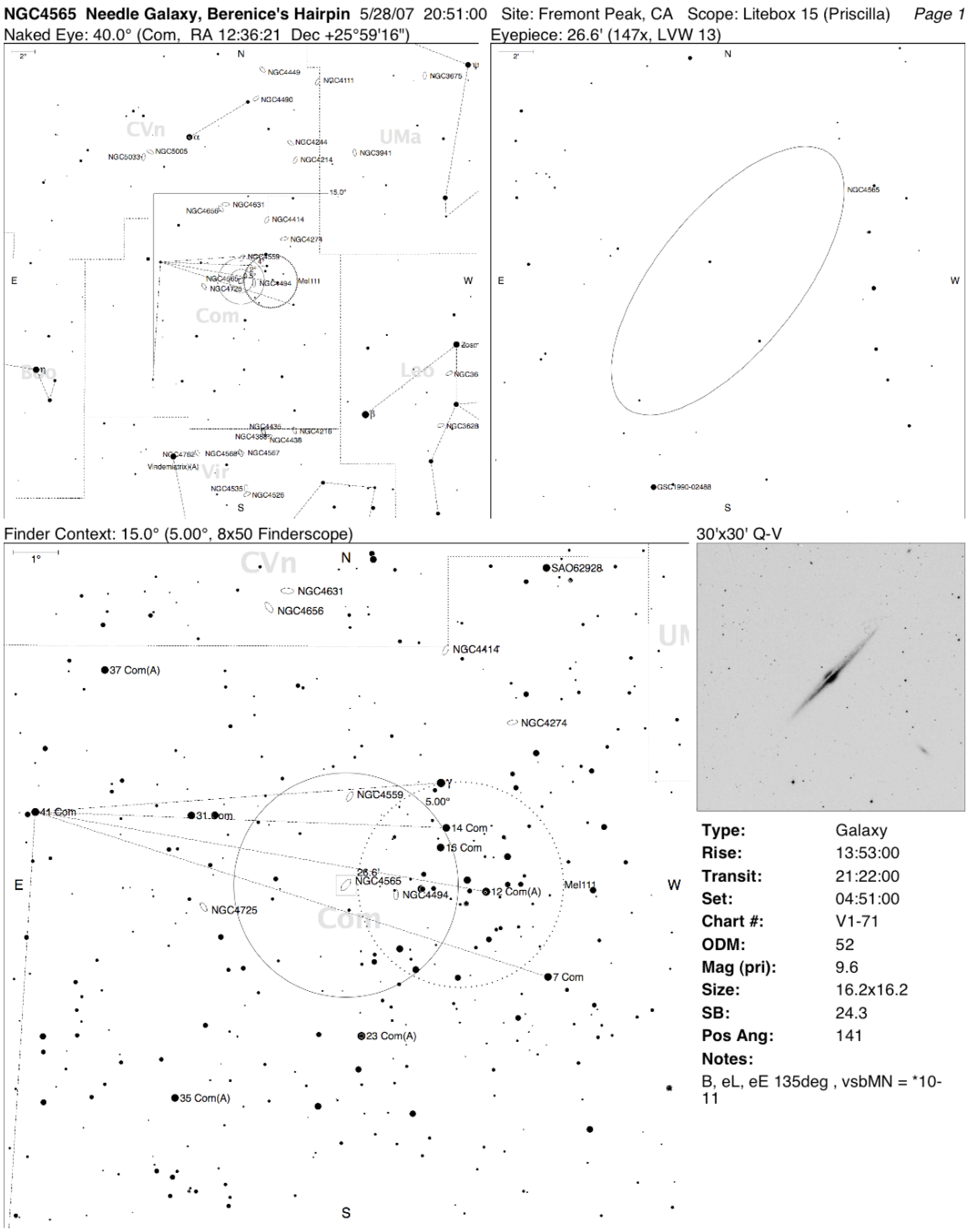
Check the **Black stars on white background** checkbox to generate a finder chart suitable for hardcopy printing, that will save on ink and toner. If you would rather have a black background (perhaps to preserve your night vision while using charts with a red flashlight), leave this box unchecked.

Output

When you have made your choices, click OK. Print Finder Charts will generate a single-page finder chart for each object you selected or highlighted.

Charts Page

The example shown here illustrates a hardcopy printout, with both **Black stars on white background** checked. (Web viewers can click on the image to download a high-quality PDF sample).



The page shows a series of three charts, with progressively smaller fields of view, centered on the target. The time and observing site are taken from the current plan document. The telescope listed is the one you chose in the *Print Finder Charts* dialog.

1. The upper left pane shows a naked-eye constellation chart. A box indicates the boundary of the "Finder Context" chart in the lower left. At the center of the chart are concentric rings highlighting the target, for the unit power finder you selected.
2. The lower left chart pane is based around your selected finderscope. The field of your finder scope is set in the context of the sky surrounding the finderscope view, and outlined in a circle. The innermost box outlines the boundary of the eyepiece chart, shown in detail on the upper right.

3. The upper right pane shows an eyepiece chart of the desired target, with the FOV based upon the telescope, eyepiece, and visual aid chosen in the *Print Finder Charts* dialog.
4. The lower right-hand column of the page includes a sky survey photo of the object. You must first download the images in AstroPlanner as a separate step before printing, using the **Object > Download and Cache DSS Images...** feature. Otherwise, no image will appear on the printout.
5. Beneath the sky survey photo (if included) is a set of detailed information for the object, including rise/transit/set time, magnitude, surface brightness, etc.

Print Finder Charts automatically determines the limiting magnitude of the star field for the finderscope chart from the finderscope you selected. If you selected a flipped view for the finderscope, *Print Finder Charts* will flip the finderscope chart accordingly.

Likewise, *Print Finder Charts* automatically determines the limiting magnitude of the eyepiece star field from the telescope you selected. If you selected a flipped view for the eyepiece, *Print Finder Charts* will flip the eyepiece chart accordingly.

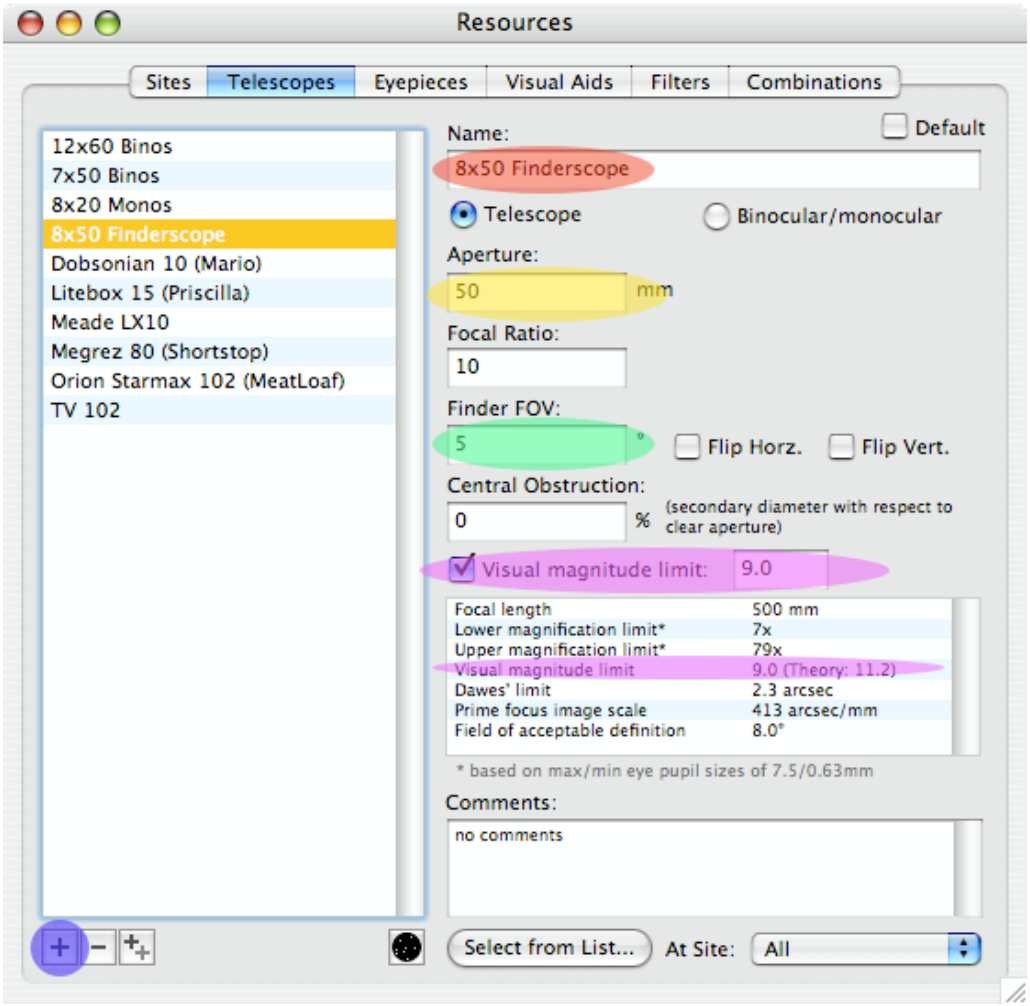
To locate a target in the sky, start by aiming your scope to the general area with the naked eye chart. Then successively match your finderscope and eypeiece views against the corresponding charts until you reach your target. Finally, use the sky survey photos and the object data to help verify what you've located.

Adding a Finder Scope

Print Finder Charts treats a finder scope just like any other telescope that you set up in AstroPlaner. You create and manage finder scopes using the AstroPlanner **Resources** pane.

To add a finder scope, follow these steps:

1. From the AstroPlanner menu, choose **Edit > Resources... > Telescopes**. The AstroPlanner telescope resources panel appears.



2. Click the "**+**" button in the lower left corner (highlighted in blue). A new telescope entry appears.
3. Enter the name for your finderscope (highlighted in red). Choose the **Telescope** button underneath the name field.
4. Enter the aperture of your finder scope (highlighted in yellow).
5. Enter the field of view of your finder scope (highlighted in green).
6. Inspect the limiting visual magnitude (highlighted in purple) inside the table. AstroPlanner calculates a limiting magnitude for you based on the settings you have entered. In this example, AstroPlanner calculated 11.2 as the limiting magnitude for the scope. You may also want to manually set the limiting magnitude to override the default provided by AstroPlanner, if you see too many (or too few) stars in the finder scope chart. To override the automatic value and set your own limiting magnitude, check the **Visual magnitude limit** checkbox (also highlighted in purple) and enter the value you want AstroPlanner to use (9.0 in this example).
7. Close the **Resources** pane.
8. Now you can choose the finder scope from the *Print Finder Charts* dialog, as described above.

Notes and Tips

- *Print Finder Charts* stores your settings once, for all plan documents. So, the next time you start *Print Finder Charts*, it will already select for you the same settings you used last time.
- If the margins on your page are too large, the charts will be too small to read. You can adjust the page margins in AstroPlanner via the **Preferences... > Printing > Print Margin** pane. I set mine to 0 on all sides, to get the largest chart possible. Even with minimal margins, the printout does not get clipped on my printer. But your mileage may vary.
- If you get too many (or too few) stars on the charts, you can manually adjust the limiting magnitude for the telescope/finder scope in the **Resources** pane to set the stellar density to your liking. See the section Adding a Finder Scope for more details.
- The charts can take a while to process - please be patient! Don't start printing charts right before you're about to run out

the door to go observing!

Known Issues

- Some stars are missing in the corners if you rotate the charts for alt-az scopes. This is normal behavior of the AstroPlanner charting engine.
- Some users on Windows XP have reported hardcopy printouts with white stars on a black background (not good for the ink or toner cartridge in your printer). My tests under Windows XP do not show this problem, but this is likely because I am printing to a PostScript printer. The exact cause of this problem is unknown, but is likely related to printer drivers. Try upgrading your printer drivers to see if this resolves the problem.
- There is no legend for the chart symbols in the printout.
- If you add or remove telescopes, eyepieces, visual aids, or stellar catalogs, the saved chart settings can get confused the next time you open the plan document. (This can also happen if you upgrade to a newer version of AstroPlanner). If you re-enter your settings and save the plan file, all will be well once again.
- On the Macintosh, if you click the Cancel button in the middle of printing, AstroPlanner will crash. (On Windows XP, there is no Cancel button during printing). The crash is a known limitation with the application development environment that AstroPlanner is hosted upon. Unfortunately, it can't be resolved within the script or within current versions of AstroPlanner.

Feedback

You can send questions, comments, bug reports, etc. to: mportuesi@yahoo.com, or post them in the Yahoo! Groups AstroPlanner forum. I'd be interested to know if anyone actually uses this script and finds it useful. I created it for my own use, but I would like it to be useful for others as well.

Revision History

- Version 1.3.1, 2007-09-15
  - Use AP resource panel font settings as the default, to allow users control over font size on printouts
  - Remove filtering for star atlases on eyepiece and finder selectors. This will allow users to choose any star atlas for finder and eyepiece charts.
  - Default star catalog selection to first suitable star catalog.
  - Require special star catalog (ASCC Lite) and choose it as the default to special star catalog
  - Leave out preview check box on Macintosh, since the Mac OS Print Preview feature works better.
- Version 1.3, 2007-05-28
  - Add support for displaying object information on the chart printout. Limit DSS images to only the first image for each object to guarantee room on the page for object information.
  - Add support for saving settings to AP global settings database. Previous versions saved data on a per-plan file basis.
  - For preview mode, base the resolution of onscreen window from screen size (make preview as wide as user's screen).
  - Now requires AstroPlanner 1.5.8, due to global settings support.
- Version 1.2.1, 2006-09-30
  - Bugfix: Skip printing page number in page header if object description text will overlap.
  - Bugfix: Always save user choices back to plan file if user clicks OK. There were previously some circumstances where it didn't.
  - Enhancement: Choose a smaller font for page labels, to fit more text (hopefully) on page.
  - Enhancement: Display number of highlighted objects in dialog box.
- Version 1.2, 2006-09-07
  - Split observing form feature out into a separate script. The existing script was getting quite large, and the dialog was getting too crowded. To focus on more charting features, the observing forms had to go.
  - Add constellation lines to finder chart, to make it easier to connect with the naked eye view.
  - Fix the FOV to 40 degrees in the naked eye chart, to assist in starhopping.

    - Draw boxes rather than circles for FOV outline in naked eye chart and finder chart. It's now easier to tell chart boundaries from fields of view. As a result, the script now requires AP 1.5.3.
    - Remove the crosshairs in the eyepiece and finder chart views, as they are simply clutter.
    - Set multiple and variable star display in eyepiece view. It was too much clutter to display multiple and variable stars in the other views.
    - Set the limiting magnitude for finder chart from finder scope itself, and add an option to the dialog to select finder scope. This requires the user to add their finder scope(s) to resources.
    - Improve the page header and finder scope chart view. The name of the plotted object is highlighted in bold.
    - Include object name as well as ID in page header on printout. This makes referring to other charts and lists much easier.
    - Add checkbox to rotate chart for alt/az telescope. This will rotate the chart for the current time in the plan document.
    - Add checkbox to show the Page Setup dialog before printing begins.
    - Add slider to control zoom factor for FOV on finder context chart.
    - Add slider to choose density of star labels in all three charts.
    - Add Script requirements.
    - Remove mjp_pfc_ prefix from plan file properties. They are not necessary, as per Paul R.
- Version 1.1, 2006-08-12
    - Added finderscope flip Horiz/Vert checkboxes to the dialog box, so they are together with the ones for the eyepiece chart.
    - Added observing aid selector to the dialog box, to allow the selection of barlow lenses and whatnot for the eyepiece chart.
    - Added menu for choosing Telrad, rigel or red-dot unit power finders.
    - Fixes for display if the selected scope is a binocular.
    - Some cosmetic changes to the dialog box.
    - Documentation updates, including detailed install procedure.
- Version 1.0, 2006-08-06
    - New chart layout (3 chart views, with larger finderscope view and vertical layout of DSS images).
    - Star sizes are now more realistic and charts should be much easier to use, due to updates and new scripting features in AstroPlanner 1.5.1.
    - You can now choose the star catalogs used to plot charts:
        - You can choose separate stellar catalogs for finder and eyepiece views.
        - Catalog selection is based from selected star catalogs the user currently has installed.
        - At least one high-density stellar catalog must be installed. The script checks at startup.
        - Selected catalogs are saved and restored to/from the plan file.
    - New dialog box layout. Controls are grouped by category.
    - Display script version to user in title bar.
    - Refactored script code to make chart drawing routines more modular, less coupled to main script.
    - Added a namespace qualification 'mjp_pfc_' to settings saved in the plan file, to avoid name collisions with scripts written by others.
    - Add check for AP version 1.5.1 or later.
    - Fix AP crash that occurs if plan document does not have a site selected.
    - Add check for observing site in **Resources**... pane.
    - Surround main code with try/catch block, to prevent AP crash in the event of a script exception.
- Version 0.92, 2006-07-01
    - Added black-on-white printing option; affects preview as well as hardcopy equally (on-screen preview window now always matches hardcopy)
    - Removed the DSS checkbox, legacy item now largely unnecessary; script always prints DSS images if they are present
    - Bug fix: properly handle case where no default telescope/eyepiece exists in **Resources...** pane
    - Use AngleFormatted() to display angles, rather than clunky old code to format these strings
    - Refactor somethingToPrint() check code into separate function, and make it work without iterating over observing list
    - Refactor: GetEyepieceIndex() -> GetDefaultEyepieceIndex()
    - Now requires AstroPlanner 1.5.1a10 due to use of new scripting functions.

- Version 0.91, 2006-06-29
  - Check to make sure telescopes are defined and proper catalogs are installed when script is run.
  - Check to make sure there is at least one astronomical object to print (selected or highlighted).
  - Save all scope-related settings to plan file in between runs.
  - Tested with AstroPlanner 1.5.1a10. Degrees symbol in charts now displays correctly, and charts now have finer lines in hardcopy printouts due to enhancements within AstroPlanner itself.
- Version 0.9, 2006-06-24
  - Initial public release.