The Variable Star Plotter - Help Guide

Locating a variable star is a learned skill. To aid the observer, finding charts with well-determined, visual-magnitude sequences of comparison stars should be used. We urge our observers to use these charts in order to avoid the conflict that can arise when magnitudes for the same comparison star are derived from different sets of charts. This could result in two different values of variation being recorded for the same star on the same night.

The standard AAVSO charts are now generated with the on-line Variable Star Plotter (VSP). These have completely replaced the old, pre-made paper or electronic charts.

VSP Quick Guide:

A simple, typical example (for R Leonis) will show how easy it is to generate a chart. See Figure 2.1 for reference.

Go to the VSP webpage (www.aavso.org/vsp). Using the "Plot a Quick Chart..." section at the top of the form:

1. Enter the star's name (e.g. "R Leo") in the box labelled "What is the name, designation, or AUID of the object?". The case does not matter.

2. Select the chart scale from the "Choose a predefined chart scale" drop down box. In this example we select 'B' scale (which is equivalent to a 3.0 degree field of view).

3. Accept the default options for the rest of the form.

4. Click the 'Plot Chart' button.

A new window should open showing the chart in graphics format (.png). This may be printed or saved. The sample chart created using this procedure can be seen in Figure 2.2.

An explanation of the VSP online form follows.

WHAT IS THE NAME, DESIGNATION OR AUID OF THE OBJECT?

Enter either the star's name or other identifier into the box (this will be described in more detail in Chapter 4 of this manual). Alternatively, you can enter the right ascension (RA) and declination (DEC) position you wish to have in the center of the chart in the appropriate boxes below the "PLOT ON COORDINATES" heading.

CHOOSE A PREDEFINED CHART SCALE

This drop down menu allows you to set the field of view according to the old finder chart scales. On the menu you will see designations 'A', 'B', 'C', etc. For example, an 'A' chart will show you 15 degrees of sky and stars down to 9th magnitude. A 'B' chart will show you 3 degrees of sky and stars down to 11th magnitude. You need to use a chart, or series of charts, that cover the range of magnitudes of the variable star you are observing. This is also determined by the instrumentation you are using. See Table 2.1 for further explanation of chart scales.

CHOOSE A CHART ORIENTATION

This option will help you to create a chart which, when viewed upright, will show the stars in the same orientation as that seen in your observing equipment. For example, if your telescope gives you an "upside down" image (as with a refractor or reflector using no diagonal), you will want to use the "Visual" option which will give you a chart having south at the top and west toward the left. If you use a diagonal, you may wish to select the "Reversed" option which creates a chart with north up and west to the left. The "CCD" option creates a chart with north at the top and east to the left that can also be useful for binocular and naked eye observing. There is more on chart orientation in Chapter 3.

DO YOU WANT A CHART OR A LIST OF FIELD PHOTOMETRY?

Visual observers should select "Chart". CCD or PEP observers who want access to precise photometry of the comparison stars, may wish to select "Photometry Table" to get a table of multicolor photometry instead of a star chart.

DO YOU HAVE A CHART ID?

Every chart is plotted with a chart id in the upper right hand corner. This number/letter combination should be reported with your variable star

Figure 2.1 — *The Variable Star Plotter*

Variable Star Plotter (VSP)

VARIABLE STAR PLOTTER

WHAT IS THIS?

The Variable Star Plotter (VSP) is the AAVSO's online chart plotting program that dynamically plots star charts for any location on the sky, or for any named object currently in the Variable Star Index (VSX). By creating charts this way, every chart utilizes the most current data available. Through the use of unique Chart IDs generated by the Variable Star Plotter, one user can plot a chart, and another user in different part of the world can plot an identical chart by simply using the same Chart ID. The Variable Star Plotter is the tool you should use to create any chart that you would like to use.

WHAT CAN I DO?

By entering an object name or its coordinates on the sky, the Variable Star Plotter can produce a star chart for that object or location, and tailor it to your specific observing requirements. Many different parameters are adjustable via this interface, allowing you to get the perfect chart for the job. Customizable field of view, print resolution, magnitude limit, and orientation can be set for any chart plotted, or these values can be auto-assigned by selecting from one of the legacy chart scales familiar to many of our long-time observers. The charts produced by this tool include comparison star sequences for visual magnitude estimations.

HOW CAN I GET HELP?

We have two help guides available for the Variable Star Plotter in Portable Document Format (PDF). These document may be read using the free Adobe Reader program. The One-page Help Guide is a concise reference sheet for the VSP interface, and the Detailed Help Guide is a more in-depth narrative on how to use this tool. If you need further assistance, send us an E-mail at: **aavso@aavso.org**. We also have instructions for a GET method API to directly plot charts from your web site or custom software.

PLOT A QUICK CHART...

WHAT IS THE NAME, DESIGNATION, OR AUID OF THE OBJECT?
Required if no coordinates are provided below

R Leo

CHOOSE A PREDEFINED CHART SCALE
A is larger, slower; G is smaller, faster.

B

CHOOSE A CHART ORIENTATION

⦿ Visual   ◯ Reversed   ◯ CCD

DO YOU WANT A CHART OR A LIST OF FIELD PHOTOMETRY?

⦿ Chart   ◯ Photometry Table

PLOT CHART

ADVANCED OPTIONS

DO YOU HAVE A CHART ID?
A Chart ID will allow you to reproduce prior charts

PLOT ON COORDINATES
Required if no name is provided above

RIGHT ASCENSION

DECLINATION

WHAT WILL THE TITLE FOR THIS CHART BE?
Displayed at the top-center of the chart

WHAT COMMENTS SHOULD BE DISPLAYED ON THE CHART?
Displayed beneath the chart star field

MISCELLANEOUS OPTIONS

180	**FIELD OF VIEW** *
11	**MAGNITUDE LIMIT** *
75	**RESOLUTION** *

WHAT NORTH-SOUTH ORIENTATION WOULD YOU LIKE?

◯ North Up   ⦿ North Down

WHAT EAST-WEST ORIENTATION WOULD YOU LIKE?

⦿ East Right   ◯ East Left

WOULD YOU LIKE TO DISPLAY A DSS IMAGE ON THE CHART?
If Yes, retrieves and displays an image from the Digitized Sky Survey

⦿ No   ◯ Yes

WHAT OTHER VARIABLE STARS SHOULD BE MARKED?

⦿ None   ◯ GCVS only   ◯ All

WOULD YOU LIKE ALL MAGNITUDE LABELS TO HAVE LINES?
If Yes, this will force lines to be drawn from all magnitude labels to the stars

⦿ No   ◯ Yes

HOW WOULD YOU LIKE THE OUTPUT?
If HTML, headers/footers and other extra information will be shown

⦿ HTML   ◯ Printable

WOULD YOU LIKE A BINOCULAR CHART?
Binocular charts omit comparison star labels not useful for binocular viewing.

⦿ No   ◯ Yes

RESET ALL   **PLOT CHART**

observations. If you would like to replot a lost chart, just type in the chart id here and the chart will be replicated using all the settngs you used to plot it the first time. This can also be used if you wish to share information relating to the chart you use with other people.

PLOT ON COORDINATES
Instead of typing in a star's name, you may enter the RA and DEC of the center of the chart you create. When entering coordinates, you must separate the hours, minutes, and seconds of RA with either spaces or colons. The same applies to separating degrees, minutes, and seconds in Dec.

WHAT WILL THE TITLE OF THE CHART BE?
The title is a word or phrase you'd like to see displayed at the top of the chart. You do not need to enter anything into the title field. However, a short title can be very useful. Include the star name and chart type such as, "R Leonis B Chart." The big letters are easier to see in the dark and knowing the chart scale may be useful. If you leave this field blank, the star's name will appear in the title field on the chart.

WHAT COMMENTS SHOULD BE DISPLAYED ON THE CHART?
The Comment field can also be left blank, but if you create a chart for a specific purpose that can't be explained in the title field, this is the place to do it. Comments will be placed at the bottom of the chart.

FIELD OF VIEW
This is the chart's field of view expressed in arc minutes. Acceptable values range from 1 to 1200 arc minutes. When you use a predefined scale from drop-down list, the FOV will be filled in for you automatically.

MAGNITUDE LIMIT
This is the limiting magnitude for the field. Stars fainter than this will not be plotted. Be careful not to set the limit too faint. If the field for the star you wish to plot is in the Milky Way, you could wind up with a chart that is completely black with stars!

Table 2.1 – *Chart Scales*

	arc/mm	area	good for
A	5 minutes	15 degrees	binoculars/finder
B	1 minute	3 degrees	small telescope
C	40 seconds	2 degrees	3–4" telescope
D	20 seconds	1 degree	≥ 4" telescope
E	10 seconds	30 minutes	large telescope
F	5 seconds	15 minutes	large telescope
G	2.5 seconds	7.5 minutes	large telescope

RESOLUTION
This refers to the size of the chart as seen on your computer screen. A resolution of 75 dpi is the default value for most web pages. Higher resolution will give you better quality, but larger images that may not fit on a single printed page. When in doubt, it is probably best to use the default value.

WHAT NORTH-SOUTH ORIENTATION WOULD YOU LIKE? AND WHAT EAST-WEST ORIENTATION WOULD YOU LIKE?
These fields allow you to further customize the orientation of the chart to suit your equipment in case you need something other than the choices given in "CHOOSE A CHART ORIENTATION".

WOULD YOU LIKE TO DISPLAY A DSS IMAGE ON THE CHART?
By default, a black and white chart will be drawn with circles representing stars. If you would prefer to have a real picture of the sky instead, click "Yes" and a picture from the Digitized Sky Survey will be plotted. Charts plotted with this option take longer to create than ones without.

WHAT OTHER VARIABLE STARS SHOULD BE MARKED?
Sometimes, more than one variable star can be found within a field. If you would like these other variables shown on the chart, select either "GCVS only" or "All". General Catalog of Variable Stars (GCVS) variables tend to be more well known. If you select "All" you will also get many new and suspected variable stars which could make the field quite crowded.

WOULD YOU LIKE ALL MAGNITUDE LABELS TO HAVE LINES?
By selecting "Yes" you will force lines to be drawn from all magnitude labels to the stars.

HOW WOULD YOU LIKE THE OUTPUT?
Select "Printable" to get a chart suitable for printing.

WOULD YOU LIKE A BINOCULAR CHART?
Selecting this option produces charts that only label specially selected comparison stars useful for observing stars in the AAVSO Binocular Program. Generally, this means only a handful of comparison stars brighter then 9th magnitude will be shown near these bright binocular variable stars. You will know when you are in this mode because binocular charts are plainly marked in the upper right hand corner. Remember to deselect this button when you wish to make telescopic charts again.

The AAVSO Binocular Program

The AAVSO Binocular Program consists of 153 bright variables in the northern and southern hemispheres. They are mostly semi-regulars and Miras, with a few other types sprinkled in. Most of the stars range between 3.0 and 9.5V and can be observed best using simple hand held binoculars.

Using the specially designed "Binocular Charts" will make it easier for you to find the stars and make estimates which you should submit to the AAVSO in the usual manner.

For a complete listing of the stars in the Binocular Program and more information about the special charts please visit this page: http://www.aavso.org/aavso-binocular-program