

# RECON Software

RECON Community Education

Plumas County, California

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**RECON**



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# Local Contact Information

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   or      [RECON.Quincy@gmail.com](mailto:RECON.Quincy@gmail.com)
- ◆ RECON project blog      <http://tnoRECON.net/>
- ◆ Quincy team newsgroup  
                                 <http://groups.google.com/group/quincy-recon>
- ◆ Quincy RECON is also on google+  
                                 <https://www.google.com/+QuincyRECON>



# RECON Data Repository

- ◆ *.avi* files and observation logs are uploaded by RECON teams to <http://spikard.boulder.swri.edu/upload.html>
- ◆ Data file repository contents available to all at <http://www.boulder.swri.edu/~buie/recon/data/>
- ◆ User-name and PW needed to download files for analysis.
  - ◆ Contact community team leader, member, or RECON principal investigator to obtain.



# Finding Occultations

- ◆ Occult Watcher (OW)  
<http://www.hristopavlov.net/OccultWatcher/>
- ◆ Software Requirements for running OccultWatcher:
  - ◆ Windows 98 or later. Works best on XP Professional, Vista, or preferably Windows 7 (32 or 64 bit). Now Windows 8 also.
  - ◆ Microsoft.NET Framework 2.0 or later.
- ◆ Configuration: General, Event filters ,and Prediction feeds
  - ◆ IOTA, North American Lower Magnitude, TNO extras, ...
- ◆ Remember to submit results to [reports@asteroidoccultation.com](mailto:reports@asteroidoccultation.com)



# Making Star Finder Charts

- ◆ Use the AAVSO's Variable Star Plotter (VSP)  
<http://www.aavso.org/vsp>
- ◆ Advanced Options:
  - ◆ Enter RA and Declination of target star
  - ◆ Use name of occulting object as title.
  - ◆ Enter Field of View in minutes of arc ( $1^\circ = 60'$ )
  - ◆ Set magnitude limit lower (larger number) with smaller field  
(Note magnitude limit in comments field below title.)
  - ◆ Set: North Up, East Left (no diagonal), No, None, Printable, No, Yes
- ◆ Plot Chart then use browser back button for next field/mag.



# Editing Captured Video

- ◆ Visit and download Virtual Dub  
<http://www.virtualdub.org/>
- ◆ If needed, obtain the X-video codec from [www.xvid.org](http://www.xvid.org) to use with Mini-DVR *.avi* files  
<http://www.xvid.org/Downloads.15.0.html>
- ◆ Use Virtual Dub to clip the occultation event segment from the [longer] captured video *.avi* file and uncompress it frame-by-frame into a new [much larger] *.avi* file so it can be processed by LiMovie.





# Capturing Data from the Video

- ◆ Visit and download LiMovie  
[http://www005.upp.so-net.ne.jp/k\\_miyash/occ02/limovie\\_en.html](http://www005.upp.so-net.ne.jp/k_miyash/occ02/limovie_en.html)
- ◆ LiMovie processing limit is about 2041-frames or 68 sec. per analysis (running at 29.97 frames/sec).
  - ◆ If your video is longer, use VirtualDub or other video editing software to split it into smaller files. NOTE frame numbers!
- ◆ LiMovie instructions at  
[www005.upp.so-net.ne.jp/k\\_miyash/occ02/limovie\\_en.files/LIMOVIE.doc](http://www005.upp.so-net.ne.jp/k_miyash/occ02/limovie_en.files/LIMOVIE.doc)



# Using LiMovie

- ◆ File → “AVI File Open” → select *.avi* produced from Virtual Dub
- ◆ Click on your target star and adjust the red circle (*radius* in *number of pixels / radius* box) until it encloses all of your star and as little sky as possible. Adjust the blue annulus to be beyond the red circle and not include any other stars or bad pixels. Make sure your star can't slop over into this “doughnut.”  
Make sure *Kiwi* is checked (middle right edge of the screen)
- ◆ Use TIVi to have **LiMovie** read the IOTA time stamps.
- ◆ Star Tracking → “**drift**” mode  
Use “Star Image [3D]” for proper radius aperture and background radius selections. Can use “noise reduction” mode for assistance .



# Using LiMovie (continued)

- ◆ “Measurement Panel” → Start  
Light Curve Data will appear on the right-side.  
Note the frames being processed on the left under “Current Frame.” (29.97 Frames/sec)
- ◆ When complete, “Save to “CSV-File”
- ◆ Open CSV-File, Select entire column “K”.  
Make graph.
  - ◆ Output will be Light Flux (Y-axis) vs Frame Number (X-Axis).
- ◆ Modify headings and labels as desired and **Save as an Excel file.**



# Excel Notes

- ◆ Column A: Frame number from the Virtual Dub *.avi*
- ◆ Columns D, E, & F: Hours, Minutes, & Seconds captured from IOTA time stamp via TVI character recognition.
  - ◆ Convert to Excel-displayable time with formula (row 7 example):  
 $=D7/24+E7/60/24+(F7-0.267)/60/60/24$
  - ◆ NOTE -0.267sec. is timing correction to offset equipment delay
  - ◆ Use an empty column and set it as the x-axis label instead of A
- ◆ Column K contains the light flux data.

# More Information & Results

- ◆ Visit [www.asteroidOccultation.com](http://www.asteroidOccultation.com)
- ◆ North American Asteroidal Occultation Program  
<http://www.asteroidoccultation.com/observations/NA/>
- ◆ For consolidated occultation results, go to  
<http://www.asteroidoccultation.com/observations/Results/>
- ◆ International Occultation Timing Association (IOTA)  
<http://www.occultations.org/>

