2B.A – Observing & Reporting

RECON

RESEARCH AND EDUCATION
COLLABORATIVE OCCULTATION NETWORK

2016 Team Meeting
Carson City, Nevada
August 3-5, 2016

This material is based upon work supported by the NSF under Grant Nos. 1212159 and 1413072.

Flow of a Campaign

- Event signup
- Practice
- Event
- Report
- Data Transfer

Event signup

- Current system uses either OccultWatcher or a survey form John has provided
  - Important so that we know the message got out to everyone and provides early warning in case of a serious scheduling conflict
- New system will be a consistent form for all events that will automatically post to the project database at SwRI.
  - Will allow for automated email followup, first to the team lead, then to project

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Practice

- On some night before the event night:
  - Charge laptop and battery pack
  - Get a copy of the event planning page
    - Hard copy or use a smart phone
  - Setup system as if for event
  - Find target field and identify target star
  - (Optional) Save short video of field to share

Event

- Charge laptop (day of event)
- Charge battery pack (could take several days)
- Copy of planning charts
- Start setting up ~1 hour before event
- Find field
- Take data
- Stow equipment

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Event – setup

- Tripod
  - Full spread on legs
    - Snug tight for spreader against legs
  - Level
    - Move it around on the ground to find a level setup without the need to adjust the legs
    - Adjust legs as need if prior step doesn't work

Event – setup

- Tripod
- Mount telescope
  - Telescope on tripod
  - Don't mount anything else yet, just put the battery pack under the tripod

Event – setup

- IOTA box power up (look for indicator lights)
- Telescope setup
  - Mount Telrad
  - Mount and plug in hand-paddle
  - Take off cover (don't put it in the big case)
  - Install diagonal on back of tube
  - Install camera in diagonal
  - Connect power
  - Turn on the telescope

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Event – setup

- IOTA box power up (look for indicator lights)
- Telescope setup
- Run power/video cable from camera to IOTA-VTI and spare power lead, check to make sure camera power light is on
- Turn on laptop, wait for boot-up to complete
- Plug in USB/video adapter (with RCA cable)
- Start VirtualDub

Event – setup

- Plug in USB/video adapter (with RCA cable)
- Start VirtualDub – enable video capture display
  - Verify camera signal and IOTA signal getting through
    - P for “preview” if screen comes up green
  - Look for almanac update message
    - Clear message by switch from Time to position and back to Time.
    - This step is important! The time will be off by 1 second in 2016 but will be 2 seconds after Jan. 1, 2017 until the almanac is updated. This behavior depends on the version of IOTA-VTI.

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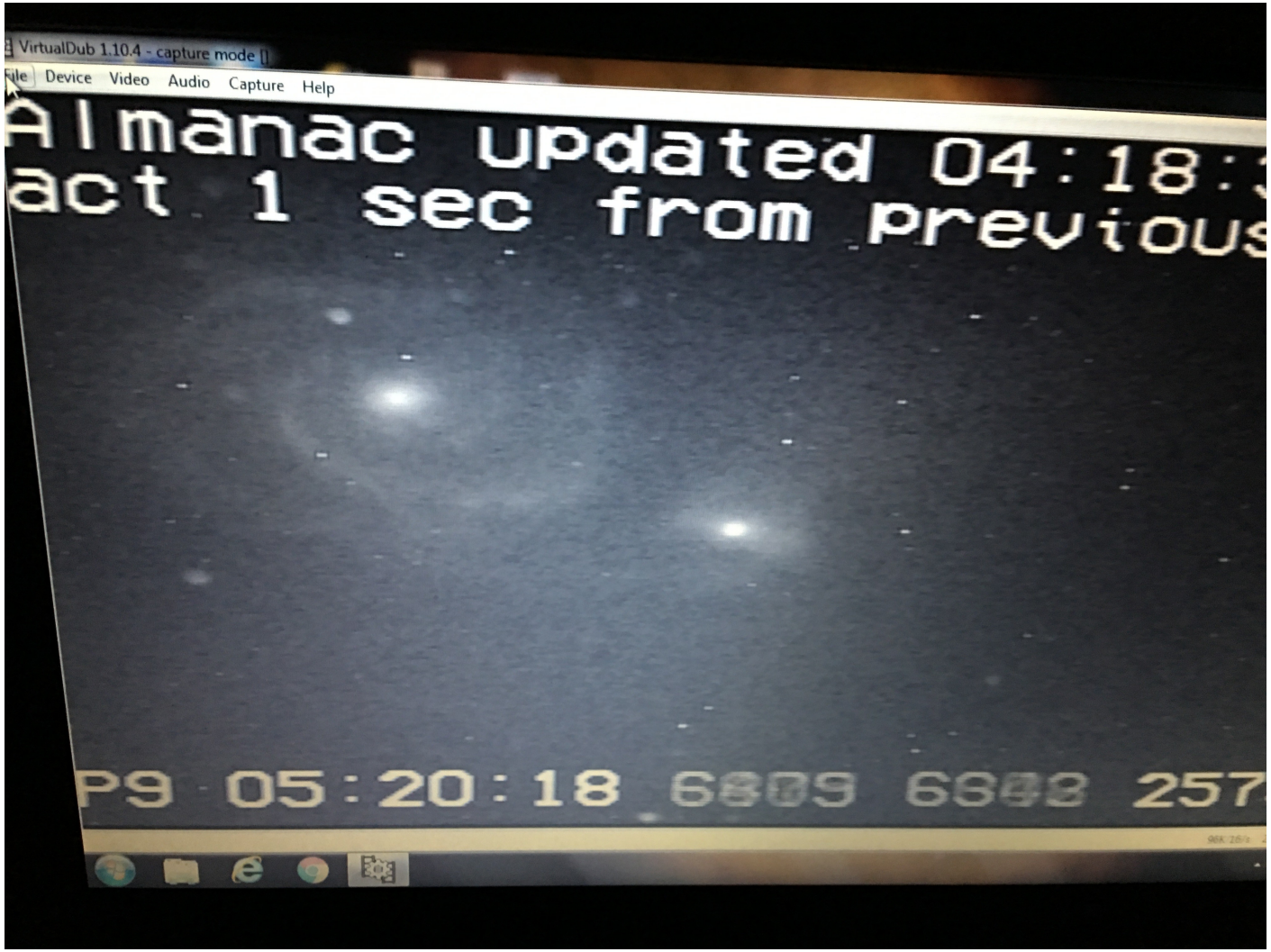
Almanac message



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  - Create data directory and set file name for event
    - Record time/position video (10-15 seconds)

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Directories and Files

- All data in your “Data” folder
- Each night of observing, use a different folder
  - YYYYMMDD – UT date of observations
- The first file name should following the pattern
  - YYYYMMDD_01.avi
    - You don't type in .avi, use the same date as the directory
    - First file will be _01, second _02, …
    - VirtualDub will automatically adjust and the top of the window will tell you what file name it will use

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Event – setup

- Plug in USB/video adapter (with RCA cable)
- Start VirtualDub – enable video capture display
- Align telescope
  - Remember, there are different types of alignment methods
  - If the same thing is failing over and over again, try something else
  - Solar system (or 1-star) alignment can work surprisingly well when using Precise GoTo

Event – setup

- Plug in USB/video adapter (with RCA cable)
- Start VirtualDub – enable video capture display
- Align telescope
- Focus telescope
  - Use the mask on a bright star and don't forget to remove the mask when done
  - Sometimes (if you are patient) focusing to bring out faint stars works better than the mask but this can be really tough to do when working at SENSEUP=128x
  - Good focus is extremely important for data quality

Event – setup

- Plug in USB/video adapter (with RCA cable)
- Start VirtualDub – enable video capture display
- Align telescope
- Focus telescope
- Set the camera to the senseup setting for the event (this gives it time to settle down)
- Setup complete! Ready to move on

Event – Find the Field

- Make sure to use “of date” coordinates for the RECON telescopes.
- GoTo RA/Dec
  - Requires the use of the star training sets
  - Telescope behavior will be different every night
- Precise GoTo can work without training
  - Very effective, even with poor alignments provided you can see the helper star in the Telrad
- Remember, you may have to rotate the finder chart to get it to match the display on the laptop

Record Data

- Start recording data at appointed time
  - Many ways to start saving video, make sure to verify that you are indeed taking data by looking at the status screen on the right hand side
  - During recording, don't adjust position unless necessary. Use slowest hand-paddle speed that works, avoiding large jumps and smeared images.
- Stop data (Esc) at appointed time

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Calibration Data

- Once event data are completed, collect the calibration data
- Turn off telescope drive (stops tracking the sky and stars look trailed) and take 2 minutes of video
- Put telescope cover on to block light from the sky and take 2 minutes of video

Stow the gear for next time

- Tear down the system and stow.
  - You are packing for the next event.
  - If the conditions are wet, it is valuable to stow them inside with the lids and covers open to let everything dry out. Close things up the next day.
  - The computer is last to be packed since you need to transfer data before final stowage

Report what happened

- Transfer your notes to the data directory
  - YYYYMMDD_log.txt or scanned logsheet
  - Include who was in attendance and who did what
  - Include description of weather conditions
  - Include list of files collected and what's in them
  - Include any other descriptions of the team efforts desired, the good, the bad, the ugly...
  - All of this is written to communicate to some unknown scientist 10 years (or more) from now to let them know what these files represent

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Report what happened

- Transfer your notes to the data directory
- Fill in online report for your site
  - http://spikard.boulder.swri.edu/recon/report.php
  - You have 7 days to file this report but it's best to do this quickly so everyone can see how the event went

Transfer the data

- Connect the laptop to the internet
- Start the data transfer tool (cwrsync), depending on connection speed this will take a while and may need to be restarted many times
- Keep trying to run the tool until it no longer transmits any data and there are no errors

Most common failures in transferring data

1) Network interruption
   a) Wireless connections periodically reset. Interval depends on things normally out of our control.
   b) Wired connections can be more robust
2) Network restrictions (district or school firewall)
   a) Cwrsync requires ssh (port 22) connection to spikard.boulder.swri.edu
3) Data are not in the right directory

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Wiring Maintenance Kit

- Several sites have had wiring failures, most common to fail is the dual power/video cable
- We now have “kits” with all of the wiring (except for USB-video adapter) that we will mail out when there are problems
- These kits can be used to isolate the failing component
- Unused and bad parts are to be returned to SwRI