



VBAS Planning - 2012 to 2020

3Q2011

Introduction

The VBAS is an all-volunteer organization with more than fifty years of history of operation in Huntsville. There is a long legacy of service to our membership and our community. This report is a summary of objectives for the society over the next several years with recommendations for improvements of those operations as set by the contributors.

Contributors to the planning report include, but are not limited to:

- Jeff Delmas, Dir of Planning & Research, and editor of this report
- Al Riesz, Past President
- Tom Burleson, Jr., President
- Mimmo DeMartino, Dir of Facilities
- Gena Crook, Dir of Education
- Melissa Snider, Treasurer
- Richard Norman, Dark Sky Rep
- Jared Cassidy, Membership

The editor wishes to thank all the members who offered their input to this report, whether they knew they were contributing or not.

Facilities

Facility Expansion

Our expansion needs at the site include the addition of new restroom facilities, a new ticketing and gift shop area, and a new temperature and humidity controlled library. The committee recommends using a modified form of the architectural plans created by Gerry Simpson in 2007 for the restroom, ticketing, and gift shop areas. This project added about 800 sq-ft and two bids came in at around \$125,000. If we add the library to this plan, we would need about 200 sq-ft additional of space for it. Please see VBAS_AdditionGSimpson.pdf.

Paved Parking/New Parking

Pave the existing parking area near the planetarium and expand the parking area to include the west side of the observing field. Rather than encroaching on the existing observing field area, the new area should be constructed by clearing an area about 25' by 100' along the length of the west side. That area will need to be filled and leveled for parking. This new area will also provide easier vehicle access to the observing field.

North Side Terraces

Build terraces on the north side of the planetarium to level it and keep the brush and trees away from the planetarium and A/C units to reduce fire hazard. Add a path from the fire exit to around the north side to the parking area. Add a picnic table or two or some rocking chairs for enjoying the view. [Ed Note: This could be a security issue. Hikers will use any furnishings available when no one is around.]

Landscaping/Lighting

Improve the overall landscaping of the facilities. Add low-maintenance white flowers because white creates a "moon garden." Install bat houses to attract mosquito eating bats.

Add permanent small dim lights along driveway that can be switched on and off inside one of our buildings. These are for the general public as they walk to the grass parking area in the dark.

Misc. Facilities Improvements

Rodent-proofing the buildings. [Ed. Note: I recommend a "planetarium cat".]

Financial Abstract

- Facilities Expansion (restrooms, ticketing & gift shop area, and library): \$250,000 or more.
- Parking:
 - Pave existing area: \$25,000
 - Add new Parking: \$25,000 (clearing, fill, and paving)
- Terraces/path: \$8,000
- Landscaping/Lighting: \$2,000
- Lighting: \$2,000

Planetarium Operations

Equipment Needs

The following equipment needs have been identified:

- Install new (used!) planetarium projector. [Now Complete!]
- Acquire a new computer in planetarium. \$500
- Improve the planetarium display cases and the Swanson light boxes.
- Add a dark sky display in the planetarium.
- Educational Tools [~\$3,500]
 - 2 Celestial spheres \$200
 - 2-3 Solar Magnetism kits: \$200
 - Globes of Venus, Moon and Mars: \$400 total
 - Binoculars for public stargazing: \$1000 for about 10 pairs
 - Hoberman spheres: \$120 for 2 small and 2 large
 - Library of children's books on constellations, dark sky, solar system and basic astronomy concepts: 20 copies of each book, \$15 per book, 5 titles = \$1500
 - Licensed music for planetarium: \$500
- Evaluate and update the sound system and acoustics in the planetarium. The sound system has a lot of dirty electrical connections and we need to set defaults optimized for a couple of different voice characteristics and music. Cost may range from \$200 to \$1000 depending on equipment and service needs.

Operational Goals

Planetarium operations represent our primary means of public service and also our largest source of revenue. Increasing planetarium attendance will increase both our goals of public service and our revenues. Current records show average Saturday attendance at 37 visitors. The committee recommends setting a goal of an average of 60 weekly attendees at the Saturday shows by the end of 2012. Achieving the goal will require improving advertising and the overall show experience. The show experience will be enhanced through achievement of any or all of the various other goals stated in this report.

Operational goals include:

- Part-time staff for planetarium operations/buildings custodian. Start with 10-20hrs/wk.
- With regular staff, we can conduct some daytime planetarium shows and tours
- Join the Alabama Mountain Lakes Association at \$150 per year. They restock rack cards at all tourist locations in North Alabama. We'd have to supply them with 5000 rack cards initially (\$825) and then resupply 1000 cards (\$325) per year.

Effective advertising is essential as it is very easy to spend money on advertising that doesn't perform for us. Our primary goal is to increase guests at shows, a direct and measurable fulfillment of our mission statement.

Financial Abstract

- \$2,000 initial advertising
- \$10,000-\$20,000/yr staff & advertising

Observatories

Operational Mission

Operation of the observatories' assets fulfills three main missions:

- Support planetarium operations
- Provide education and fellowship opportunities to members and the community in the science and craft of telescope use and construction.
- Provide research-level educational and operational capability in support of the science of astronomy.

Planetarium Operational Support

An operational model is proposed for the observatories during public shows. The model defines a three stage observing experience for guests as follows:

1. A hands-on telescope that visitors can operate themselves. This scope should be simple and rugged enough for guests to use. Guests should be encouraged to use the scope to view the moon and planets, and possibly a few of the brighter clusters or nebulae.
2. The C16. Guests are invited to directly observe objects the operator chooses. This the current operation of the C16.
3. The Swanson 21". Guests are invited to view objects captured on camera that the operator chooses. Objects will often be galaxies or faint nebulae that are difficult to view by direct observation.

The three-stage observing experience mimics stages that amateur astronomers often move through as their observing skills increase. It provides guests with a means of experiencing various forms of telescope use and to compare the advantages and disadvantages of each.

Swanson 21"

Equipment Needs of the S21

The Swanson observatory was made operational in the Fall of 2009 with the L-CROSS Lunar Impact event as the driving goal toward initial computerized operation. Since then, continued improvements have been made. At this time, further possible improvement can be made to enhance our ability to both operate the scope and provide members and guests better ability to observe near and deep sky objects.

The telescope pointing accuracy is currently insufficient to operate on a completely computerized basis. Once an observing target is decided, typical operation involves using the

computer to move to a nearby star of mag 8 or greater. The computer control puts the star near the fov, but often misses. Using the wide angle finder camera, we center the star in the fov and reset the computer positional on the star. Then we can hop to the faint target with sufficient accuracy.

Operation of the Swanson can improve in one of two directions: continue operating with a video camera or operate with a CCD camera as the primary camera. Advantages and disadvantages of each are:

1. Video Platform

This is our current mode of operation and is a reliable performing mode. It is easy to learn and easy to use. However, it is limited by the image capture system currently used.

It could be greatly improved by using a more modern video camera. The StellaCam II has an exposure range of between $1/30^{\text{th}}$ of a second to 8 seconds. It cannot be used for planets or the moon without additional filters. A StellaCam 3 or MallinCam provides much greater range. The MallinCam can range from $1/12,000^{\text{th}}$ of a second to 56 seconds. A StellaCam 3 ranges from $1/2000^{\text{th}}$ of a second to 8 seconds. The StellaCam 3 also has an unlimited integration mode that allows it to be operated for any length of time, more like a CCD camera is used. This mode, however, does not update the screen until after exposure is completed. If we continue in this mode, we should set a goal of either acquiring a StellaCam 3 (which can be operated with our current remote control) or acquire the means of computer controlling the existing MallinCam.

2. CCD Camera

A CCD camera can provide much higher quality images and a larger field of view than a video camera. Our current field of view using the StellaCam II is $12'$ or about $1/5^{\text{th}}$ of a degree. The StellaCam has a $1/4''$ chip. A CCD camera with a $.5''$ to $1''$ chip will give a field of view of about 0.5° - 1.0° .

However, CCD camera use requires better pointing accuracy than we currently have with the S21 and the images only update every few minutes or however long the exposure is. That is, a CCD camera is good for making images, but not as well suited for live display to guests as is a video camera.

The committee recommends operating the S21 as a hybrid video-CCD system. We recommend:

- A 4"-5" refractor of about 1000mm focal length to mount piggy-back on the S21. This will become the platform for the current StellaCam II and provide the visual feedback needed to compensate for inaccuracies in pointing and for "live" displays for guests.

- Acquire a suitable CCD camera of SBIG class, <http://www.sbig.com/ST-8300M.html>, for use with the S21. Estimated cost - \$2,000. [Ed. Note: We still have \$2600 from a donation by Terri Sims, the widow of Richard Sims designated for use on the S21.]
- Acquire a remotely operable filter wheel and suitable color filters for use with the CCD camera. Estimated cost - \$1000 for filter wheel and \$400 for color filters.
- Refigure and resurface the S21 main mirror. Estimated cost: \$2,500
- Acquire a new 6"-7" secondary flat mirror. Our current mirror is 5" and allows some light to escape. The internal hole of the main is about 7". Estimated cost: \$1000.

Operational Goals for the S21

We recommend the following operational goals for the S21:

- Operator Training for three to five additional observers to be completed by Dec 2012.
- Regular operators for Saturday shows by Dec 2012.
- Regular image processing of data gathered.
- Image processing training for members interested in taking data gathered and turning it into images for use on our web site and other media.

C16

The C16 needs both mechanical and optical maintenance.

Equipment Needs of the C16

- New digital setting circles?
- Refiguring and resurfacing the C16 primary and secondary mirrors. Estimated cost \$2,000

Research Goals for the Observatories

The S21 is nearing levels sufficient to provide research grade performance. We recommend working toward establishing an adjunct relationship with UAH or A&M to support research work in areas where our equipment will be suitable. Such areas may include spectroscopy, photometry, or exoplanet measurement.

Dark Skies, Sidewalk Astronomy, and Outreach

Here are some goals:

- 3-5 professionally designed displays for Dark Skies and Sidewalk Astronomy. [See INERGI web site]
 - Estimated cost - \$3,000
- Mobile Platform for 14" Meade. The concept is to use a small trailer and weatherproof shell. Jacks will be used at observing site to stabilize the platform for observing. The system should be suitable for direct or video observing. The existing MallinCam and color monitor can be used if a video is needed.

- Estimated cost: \$10,000 – 15,000 [for suitable trailer, shell, and related equipment.]
- Must solve storage/weather problem. Perhaps this could be stored at the south side of the observing field once work is done.
- This project needs a "champion" to take primary responsibility for operations and maintenance.
- Purchase 8" Meade for Sidewalk Astronomy events (something that one person can set up).

Membership

Membership is the most vital aspect of the long-term survivability of the society. We recommend putting plans in place to both increase our total membership and to increase the involvement of each member in the operations of the society.

Member Involvement

Yeah!

Members' Meetings

Attendance at member's meetings of late has dropped to a rather low number. It is typical to have no more than a dozen or so members attend a Friday members meeting.

Create PodCasts of Technical Presentations

See <http://www.astrosociety.org/education/podcast>

Recruitment

What should we do to increase membership and member involvement. Crickets chirping...

Other Operations

Web Site

Goals for the web site include:

- Establish a password protected members-only area for access to society data we don't want open to the public.
- Support the ability to collect membership payment, sales, and donations through our website.
- Provide an area and process to collect the various documents important to the society and organize them for ready access: historical, administrative, procedural, engineering, presentation, and others. This area should be partitioned with some public access and others within the members-only section.

Via Stellaris

Goals for the Via Stellaris include:

- Find a new editor. Not that Richard isn't covering this well, but he's only filling in until we can find a new editor!

By-Laws

The committee recommends forming a by-laws committee to review the current set of by-laws and submit a report of recommended changes to the board of directors.

Financial

Fundraising Methods

The committee recommends forming a fundraising subcommittee to pursue financial means to achieve the goals set forth in this report. The board should add members as appropriate.

These methods are considered most likely to produce sufficient funds to meet the stated goals:

- Corporate Grants, Donations, and Exchanges
- Charitable Foundation Grants
- Government Grants

Other means may also be used, but are considered less effective than these.

VBAS Foundation

The committee recommends establishing an operating trust fund with the goal of building up a long term financial base from which to fund periodic and regular expenses, as determined by the board or trustees of the fund. The fund should be established in such a manner as to restrict access to allow only use of only a portion of the growth of the fund in the previous year until a sustaining level is achieved. Once a sustaining level is achieved, yearly withdrawals should be determined in a manner to preserve or grow the sustaining level. Yearly drives to increase the trust are recommended. Members and friends of VBAS should be encouraged to include the trust in their wills.

If the original founders had formed such a trust over fifty years ago, the current value of it could easily be in the six or seven figure range. VBAS is a tax deductible organization and we should take advantage of that fact in soliciting funds for the trust. Direct fundraising events, such as a dinner and auction, could be effective means of building the financial base of such a trust.