SOUTHERN SKIES

Volume 13 Number 3 Summer 1993

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Journal of the Southeastern Planetarium Association

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***Southern Skies* Editor**
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3602 23rd Avenue West
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(813) 746-3522

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Southern Skies

Volume 13 **Number 3** **Summer 1993**

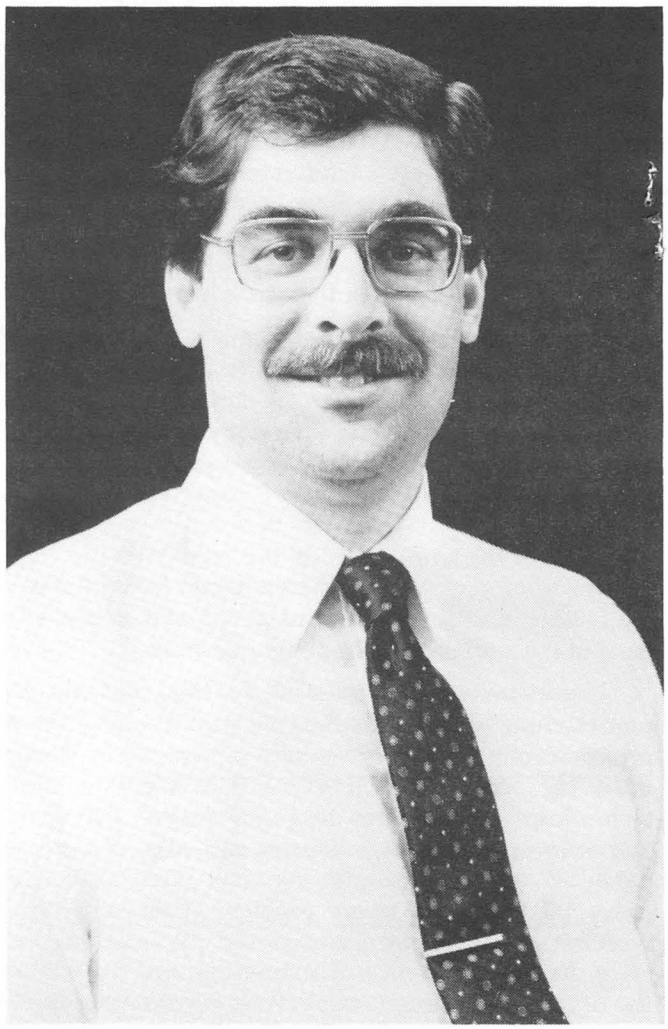
A Message From Your President

Technology and the Human Factor

I know that everyone who attended the '93 SEPA conference in Bradenton, Florida, enjoyed the experience immensely, particularly given the *Technologies* theme and the wealth of technologies displayed and represented at the meeting. Certainly by their nature, all planetaria are technological entities, regardless of their placement in school systems, universities, or museums. This "fact of life" was just as true nearly seven decades ago, when the first modern planetarium was created, as it is today. With the proliferation of slide projectors, computer-generated graphics and starfields, lasers, video, and automation control, planetaria are now, as they were in the 1920's, incarnations of technology. Given that, I personally found Don Hall's banquet address entitled *Me vs. Technology*, both humorous and illuminating. In particular, while providing his keen perspective on the subject of "interactive" theater technologies, Don hit on a critical theme -- namely the "dehumanization" of the modern planetarium.

To my mind, the ramifications of modern planetarium technologies represent a sort of "double-edged sword". On the one hand, these new technologies themselves offer us great potential in enhancing our ability to grasp the imaginations of our audiences with a host of captivating images and sounds. As a result, these technical wonders *can* go a long way toward assisting us in our goal of exciting and educating the public about astronomy--if used wisely. However, the downside of all this technology is its seductive quality--not as it affects the audience, *but as it affects planetarians.*

With the advent of these new technologies, particularly computer automation, there has come the realization that technology can make our lives in the planetarium easier. In that sense, an automation system in a planetarium can be considered roughly equivalent to a microwave oven or an automatic dishwasher in the



Richard McColman
Morehead Planetarium, Chapel Hill, NC

domestic setting. And besides making our lives easier, both of these manifestations of technology can improve efficiency, as well as freeing human beings from more repetitive, menial tasks.

With the proliferation of automated planetaria, there has been a growing trend in recent years to have the main planetarium staff (those responsible for institutional policy and programming) become less involved with show presentation. Meanwhile a secondary, or non-professional, staff is handed primary responsibility for running shows *and interacting with the visiting public.* There is arguably a certain logic to this trend for the totally-automated, taped-narrator audiovisual show. In such a situation, the 'live lecturer' is suddenly reduced to the role of 'console operator'--no, not even that--more of an 'equipment monitor' for the 30- to 45-minute duration of the program. In addition, the economic and facility-utilization pressures of the modern planetarium often dictate that more show presentations be thrust into the program schedule. Understandably, many modern planetaria are employing these ancillary, non-professional staffs to relieve professional personnel of the mundane task of 'baby-sitting' the automated techonlogy--thereby 'freeing' the latter to spend their time in other ways.

But what are we planetarians now "free" to do? Nowadays, "free" sometimes means *free to go back into the office, or the sound studio, or the darkroom, or even home,* while the surrogate theater operator stands-in to keep the shows running. This scenario is wonderful as long as (a) the professional staff continues to maintain good contact with school and public visitors in order to keep abreast of the needs of the audiences, (b) the surrogates are capable of presenting a warm, professional, and *human* image for the facility, and (c) are reasonably capable of answering most of the audiences' astronomy questions.

Unfortunately, *it is possible* in this scenario for a planetarium to loose its 'human quality', and instead, project a cold, sterile atmosphere to the visitor. Earlier, I used the term "seductive" to describe one trait of technology as it relates to planetarians' perceptions. Sometimes, technology is simplistically viewed as a panacea, and accordingly, we may latch onto it as a universal solution to every problem. Consequently, the director of the modern automated planetarium might view the computer-control technology and the exclusive use of the totally-taped starshow as negating the need for an interactive 'human element'. As a result, it might be assumed that the 'public education' mission of the facility is fulfilled largely without the need for substantive contact between knowledgeable planetarium staff and visitors. Accordingly, the *professional staff* might be hired without regard to either their astronomy knowledge, interpretive skills, or 'public relations' prowess. The final results of this can be that (a) with a minimized ability to knowledgeably relate to visitors, the staff loses its capability to make appropriate program and policy decisions for its audiences, and (b) audiences are left without access to knowledgeable staff who can adequately respond to their astronomical queries when visiting the planetarium.

I wonder if such a state of affairs is consistent with our goal of "educating the public", regardless of whether we see our mission as providing *formal* or *informal* education.

Certainly, these observations parallel a few of those made (in a much more strident tone) a couple of years ago in a well-known astronomy magazine's opinion column. Unlike that author, I am a strong advocate of audiovisuals and technology in the planetarium. However, I do agree that when technology is allowed to minimize or replace quality human interaction and scientifically-literate personnel, the planetarium rapidly loses its unique foothold in society as a place to explore, ask questions, *and engage in an active process of gaining understanding,* rather than simply being one of dozens of venues in which one can 'plug into' a one-way flow of homogenized 'edutainment'.

While in Bradenton, I recall having a hospitality-suite-conversation in the wee hours of the morning with John Hare. I asked him whether his recent expansion of automation capabilities meant that there was less human involvement in the performance of Bishop Planetarium's laser shows.

"No, and we never will stop having manual operation for some elements", John responded. "The extra automation just relieves the operator of some tasks, so that we can do other things manually--putting in that much more, and making the shows better and better."

This is perhaps the greatest contribution that technology can provide. Computer-control in the planetarium has certainly allowed for a more polished and visually-intensive taped-show performance. But much of the value in this technology is that it can enhance rather than replace the human and, in the case of star shows, educationally-interactive elements of the operation. A prime example of this technological enhancement is a new variant of the traditional 'live interactive' performance. In this hybrid program style, high-tech imagery is combined with the more intimate and human dynamics of the live planetarium experience. A number of facilities have recently adopted the use of slides, video, a wireless remote switch coupled to the automation control system, and a wireless microphone, all-together with the traditional live-lecturer-with-a-pointer to create an effective marriage between live 'interactivcity' and high-tech audiovisual performance. Outfitted in this way, the presenter can put on a show in which he or she can roam the theater at will, talking to the audience, and asking and answering questions--while

simultaneously triggering at-will short, preplanned and preprogrammed visual and audiovisual segments via the wireless remote.

Needless to say, when choreographed effectively, the audience experience is anything but cold and sterile, nor is it a dull, dry planetarium lecture.

Of course, this approach does require a dynamic and astronomically-informed person running the show. But, in the end, it is not the only way to promote a lively, fun, interactive atmosphere in the planetarium. Even taped, automated programs can be made more 'friendly'. Having a warm, knowledgeable planetarium professional to greet visitors, to introduce and wind-up the show with an informed live delivery, to thank the audience for visiting, to encourage questions before or after the show, *and to actually be able to answer questions and provide additional interpretation,* can result in an enhanced image for the planetarium. It will also help the planetarium fulfill its mission of exciting the community in learning about science in general, and astronomy in particular.

It is important that we continue to pursue the effective use of technology in our facilities when appropriate. But it is just as important that we be on our collective guard against being taken-in by the more seductive elements of technology. A particular technology shouldn't be used just because it exists, nor should it be used indiscriminately and without regard to its larger ramifications. What we must always remember is that, to be effective--both within and outside the planetarium--technology on its own cannot make the world a better place. Indeed, technology is a 'means' rather than an 'end'. In much the same way that a hammer alone cannot build a house, planetarium technology is merely a tool which is of no real value without the wise and sensitive guidance of a human hand.

To join S.E.P.A., or to renew your S.E.P.A. Membership, simply fill out this form and mail with $15.00 to:
Southeastern Planetarium Association
Linda Hare, Secretary/Treasurer
3602 23rd Avenue West
Bradenton, FL 34205

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Position _____

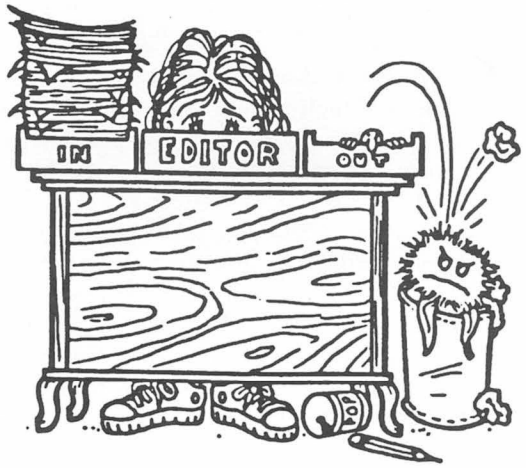
Facility _____

Business Address _____

Mailing Address (if different) _____

City _____ **State** _____ **Zip** _____

Phone _____



Editor's Message

Another SEPA Conference has come and gone! What a great week!! I always look forward to the professional aspects of the meetings, but must confess that I look forward to the personal aspects even more. It is always great fun renewing acquaintances, and being with friends who you have the opportunity to see only once a year. Because of the massive amount of work and time involved in helping to host a conference, it was a relief when the week was over, but there also was a down side when I realize that I won't be seeing a lot of my fellow planetarians for another year. Getting busy with *Southern Skies* almost immediately after the conference helped because I didn't have time to dwell on the down side.

Some news overheard at SEPA '93 that you may be interested in: Dave Maness has been appointed Director of Astronomy at the Virginia Living Museum (see Virginia news on page 26). Kris McCall announced that she will be having a baby in early '94.

Those of you at the conference learned about the medical problems that Charles Ferguson is going through. Charles is doing much better now, and is in a convalescent center in Knoxville. I'm sure he would like to hear from his friends out there. You can send cards or letters to the following address, and Ken (Charles' brother) will make sure they get to Charles.

Ken Ferguson
212 Norcross Drive
Apartment B
Knoxville, TN 37923

For those of you who subscribe to National Geographic, watch for your January issue. Art work by a fellow SEPA member, Joe Tucciarone, will be featured prominently in that issue. More news from Joe - Joe and Jennifer Hamilton have announced their engagement. Jennifer is the Museum Curator at the South Florida Museum/Bishop Planetarium (some of you may remember Jennifer as the brave person who stood on the ledge and snapped the conference photo). They are looking at a wedding date in early December.

I got a note from Grant Showbiz and Nigel Templeman (*Moodswings* artist and manager) from England. Nigel writes "...we initially felt like aliens when we were beamed down into SEPA Land for a most invigorating week. But, by the end of the week we felt like colleagues and friends. I would like to take this opportunity to thank everyone at SEPA for such a great week...". They would like to keep in touch with people they met at the conference, be it for professional or personal purposes. You can write or call them at:

ETC Management
30 Artesian Road
Bayswater
London W25DD England
Phone - 071-229-9877

Again, I want to thank all of you who have helped me get another issue out. Thanks to all who have contributed!!!!!! Thanks also to all of you who WILL contribute to upcoming issues. After listening to, and taking advise from, interested folks out there, there will be some changes in the next issue. I have already been in touch with several people who have agreed to contribute, and will be getting in touch with more of you in the very near future. If you have any suggestions, ideas, etc. as to how we can improve *Southern Skies*, please let me know.

SEPA ' 94
Charlotte, North Carolina
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SEPA '95
Macon, Georgia

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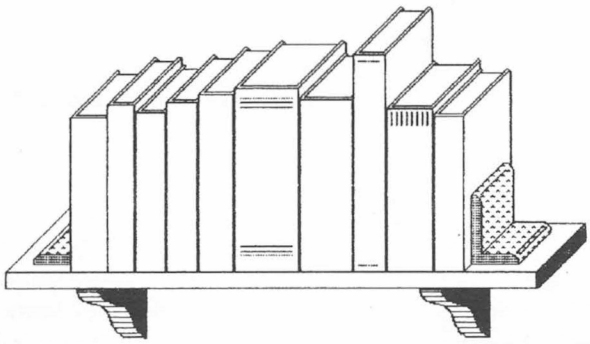
Look for updates in future issues of
Southern Skies



REVIEWS

by Dave Hostetter
Lafayette Planetarium
Lafayette, Louisiana

Touring the Universe through Binoculars

John Wiley and Sons, Inc., 1990
ISBN 0-471-51337-7
294 pages
Softback
$27.95

Reviewed by: Dave Hostetter

I usually suggest that beginning amateur astronomers spend some time observing with binoculars before buying a telescope; as a result, I've been looking for that perfect "first book" to recommend to beginners. **Touring the Universe through Binoculars** isn't it - but it comes closer than most of the others.

The heart of Harrington's book is a catalog of over 1000 objects suitable for viewing in binoculars. As might be expected, some are pretty easy to view while others are a challenge; some can be viewed in almost any common pair of binoculars, while others require giants. All 88 constellations are represented, although some are pretty barren. Still, it's a bit surprising to see just how many objects really are practical targets for binoculars. Seeing everything listed that's visible from a given location would keep any observer busy for a long time.

Each constellation's listings start with a clear table of objects, including (as necessary) their names or designations, types, coordinates, visual magnitudes, sizes, separations, periods, and brief comments. The better objects are more fully described in the text. Far from being a simple Messier list, these entries include objects from nearly 50 catalogs; in fact, Harrington has created his own catalog of a dozen or so binocular asterisms and interesting views.

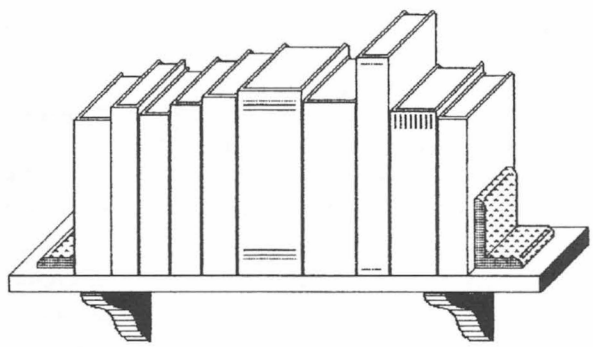
One feature that I like a lot for beginners is a Messier list dividing the objects into Skill Levels. Objects of Skill Levels 1 and 2 should be fairly easily located by beginners under suburban skies, while objects of Skill Levels 3 and 4 require both more skill and less light pollution.

The first several chapters include an introduction to the natures of the various types of objects in the catalog, all of which are clear enough to be understandable to most beginners. Solar viewing safety is emphasized, and the moon maps are easy to use. The "Stellar Happenings" chapter includes a variety of observing projects from monitoring variable stars to the Messier Marathon.

The appendices are well done; buying, maintaining, and mounting binoculars are discussed, along with binocular chairs, binocular telescopes, and binocular manufacturers. Other appendices include conversion from Universal Time to local time zones, lists of astronomical organizations and hot-lines, and a bibliography. Even the index is pretty complete.

So why isn't this the perfect beginner's handbook? For one thing, there's little discussion of how limiting magnitude, resolving power, or apparent angular diameter will effect the view in the binoculars. Without a knowledge of these concepts, a beginner is likely to spend a lot of time getting frustrated looking for objects that just can't be seen or which look far different than expected. Also, object positions are given in Right Ascension and Declination, or by reference to specific stars; this only works if the reader has (and knows how to use) a good star atlas.

Of course, that's one of the things planetarians are for: helping beginners take those first steps of learning the constellations and how to read star maps and atlases. After that, maybe you can turn them loose with **Touring the Universe through Binoculars**; in fact, you might find it pretty interesting yourself.



ORLANDO TO BUILD NEW SCIENCE CENTER

by Paul Trembly
John Young Planetarium
Orlando, Florida

The Past

The Orlando Science Center/John Young Planetarium has been an important part of Central Florida for nearly four decades. Originally incorporated in 1955 as the Central Florida Museum, the Science Center first existed as a "museum on the move", organizing science exhibits in bank lobbies, and taking demonstrations to Orlando area schools. In 1960 the Central Florida Museum and Planetarium opened its doors to the public in its present location. The planetarium had a 20 foot fiberglass dome and a Spitz A3 with folding metal chairs. The entire museum complex occupied the area that today houses the planetarium offices and production areas.

For the first decade, the museum was anthropology-centered. In response to a growing need for science technology education, the Board of Trustees voted to change directions in the early 1970's and the Museum's missions changed to a "hands-on" science center. At about this time the planetarium was expanded to the current 40 foot dome, and a Minolta MS-10 replaced the Spitz projector. The museum's name was also changed to The John Young Science Center and Planetarium.

Several building expansions between 1975 and 1985 have created a physical science exhibit hall, educational and exhibit shop space, and offices. The most current expansion occurred in 1989 with the creation of an early childhood exhibit area called Water Works, as well as Nature Works, an area dedicated to environmental sciences in Florida.

The Present

Today the Orlando Science Center is bursting at the seams with activity. Informal science education programs frequently keep the building open almost 24 hours a day. In the mornings school busses jockey for position in the driveway delivering between 500 and 1000 children per day for field trips. On weekend nights children and adults unroll their sleeping bags for "Camp-Ins". From hands-on demonstrations, to planetarium presentations, the Orlando Science Center offers a full spectrum of programs for its audience.

The demand from the local community to attend the Science Center's various programs is so great that it is becoming increasingly difficult to meet the visitor's needs in the existing 33,000 square foot complex. Currently, many of the summer programs are conducted at local schools in order to help serve the overflow.

The Future

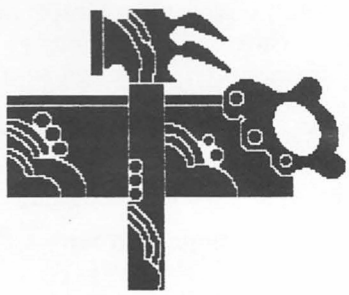
In 1989 the decision was made to explore the possibility of building a new Orlando Science Center. The Board began the lengthy process of determining the needs of the community as well as possible sources of funding. By 1992, the ground work was in place for a partnership to be formed between the Science Center and Orange County Public Schools. With the help of the school systems, a grant request was submitted to Florida State Secretary of Education, Betty Castor. This grant was for $16 million in PECO funds. (In the 1960's the residents of the State of Florida voted to set aside a percentage of gross receipts tax revenue each year for the construction of educational facilities. By law this money can only be used for construction and is not available for salaries or supplies.)

In May 1993 we received official word that the Orlando Science Center was awarded the grant. Payout of the State funds will be $1.6 million in 1993, $7.2 million in 1994, and $7.2 million in 1995. The State requires that the grant funds be matched dollar for dollar. At the writing of this article, the fund raising for the matching money was in progress.

The new Orlando Science Center will be about 200,000 gross square feet, and will include ten major exhibit halls, a career information center, a teacher training institute, and a large number of classrooms. Also included is an outdoor science park and a 70 foot interactive planetarium.

Details of the new planetarium will be decided during the next 24 months. Supporting the planetarium will be an observatory, and a full audio visual studio.

The call for architects has just gone out within the last month (May 1993), and we expect to occupy the new building in late 1997. The new Orlando Science Center will focus on basic science, applied technology, emphasizing the high technology industries of the region, and careers in science and technology.



PEN-A GIANT LEAP IN PLANETARIUM COMMUNICATIONS

by Richard McColman
Morehead Planetarium
Chapel Hill, North Carolina

As planetarians, we have been nearly starved for information. Sure, most of us subscribe to astronomy and other science-related periodicals. Many of us are also on the mailing lists of NASA and The Planetary Society. But, when it comes to planetarium-specific information--from the newest programming innovations, to the technical know-how on fixing that ailing star machine, to the latest job openings in the field--word has generally gotten around with the speed of a Victorian horse and buggy.

But no more! In the spring of 1993, Alan Gould of the Lawrence Hall of Science, and editor of the PPA journal *Panorama*, instituted something called the *Planetarium Electronic Newsletter*, or PEN. Through PEN and the global telecommunications network *Internet*, more than 60 planetarium professionals (at the time of this writing) in the United States and throughout the world have embarked upon an experiment to bring interplanetarium communications into the 21st century. And 'new' planetarians are getting onboard the PEN bandwagon virtually every day.

For those unfamiliar with *Internet*, it is a sort of computer 'supernetwork' linking thousands of other computer networks, and literally millions of people all over the world! By tying-in to the *Internet*, individual PEN users can get information from, or send information to, a single planetarian, or all PEN subscribers within a matter of minutes. And, access to *Internet* means that you'll also have access to a volume of other information and sources which will boggle the mind.

One of my greatest frustrations in this field has been in trying to communicate with other planetarians. Generally what happens is that I'll make a phone call to someone, only to find that he or she is unavailable--usually in the theater, giving shows. Once that person gets my message and breaks free to call--you guessed it--I'm nowhere near the phone. Sometimes this cycle can stretch on for several days without contact. With PEN, and the appropriate computer link, I can now send my colleague an electronic message which he or she can get at a convenient time. Then that person can answer me back, and I'll pick up his or her message when my schedule permits.

But that's not all! Suppose you have need for some planetarium information--like where to get access to a particular video sequence for your new show, or how to fix a planet assembly on your star machine, or who did that neat workshop at last year's GLPA conference you've been hearing about. Its now possible to ask dozens, even hundreds of other planetarians at once, and get that information back in a matter of days.

The advantages of PEN are:

1) It provides a mechanism for fast, two-way communications between two *or more* individuals or facilities.

2) It's cheap, since without printing costs, PEN is free to all subscribers with direct access to *Internet*, as through a school or business.

3) It's relatively clean and resource-conscious, since it uses no paper.

4) It's fun. It's enjoyable, and gratifying to be able to communicate with your friends in such a lively, rapid manner.

5) And, it's easy, especially once you get over the initial 'learning curve' on computer telecommunications, and find a means in your community to connect to *Internet*.

What do you need to link up and start communicating with your fellow planetarians via PEN?

First, you need access to *Internet* and compatible hardware to link up. Check to see if your school, college, or museum already has a subscription to *Internet*. If not, you can access it indirectly through many commercial computer bulletin-board services like *Compuserve*. Also, there is a growing trend in many communities to establish 'free-nets', which can provide alternative low/no-cost ways to get access. Here are just a few of the non-college/university Internet Access Sites (bulletin-board services, or BBS's) available in the SEPA region:

Phone #	BBS	Location	Baud	Fee
407-299-3661	vicstoy	Orlando, FL	(x100)	no
407-438-7138	jwt	Orlando, FL	12/24	no
502-957-4200	disk	Louisville, KY	12/24/96	yes
904-456-2003	amaranth	Pensacola, FL	3/12/24	no
919-493-7111	wolves	Durham, NC	12/24/96	no

Essentially, any computer with a modem and a communications program can connect you via a phone line--once you've found a computer network that will link to *Internet*. If you are part of a college or university, the process may be as easy as calling the school's computer center and asking for an 'e-mail address'. In such a situation, you may not even need a modem with your computer, as some systems have super fast data transfer methods (such as *Ethernet*) that do not require modems.

Additionally, for those folks like me, who are near-illiterates when it comes to computer telecommunications, it's a good idea to find someone that has some experience with the ins and outs of modems, bulletin-board services, and computer data networks. All the protocols, terminal emulations, bits, parity, baud rates, error-correction protocols, and so forth, can be a nightmare if you try starting out in the telecommunications world on your own! However, most everyone nowadays is a personal friend of a computer hacker, programmer, or bulletin-board junkie, and these people can be invaluable in helping to ease the initial frustration. In fact, for the telecommunication 'novice' I would strongly recommend scheduling a couple of short sessions with one of these folks to come in and sit with you at the computer as you start out. Such an approach can get you 'set up' right from the start, with a minimal amount of hair-pulling. These people will probably be able to help you cut through the 'jungle' of modem types and communications software (much of it shareware) to choose from, too. There are also several good books in publication now that can help you make your way through the *Internet*. One that comes highly recommended is *The Whole Internet User's Guide and Catalog* by Ed Krol, 1992, ISBN: 1-56592-025-2, published by O'Reilly and Associates, Inc., Sebastopol, California, (phone number 800-998-9938, or fax 707-829-0104).

Once you get your *Internet* or other 'e-mail address', you'll need to send that to Alan Gould, along with your first and last names, and the name of your institution. Alan's e-mail address is:

lhs@garnet.berkeley.ed

You can send him your e-mail address via *Internet*. If, for some reason, you feel compelled to send Alan the stuff via the post office (computer telecommunications fans refer to this as "snailmail"), his address is:

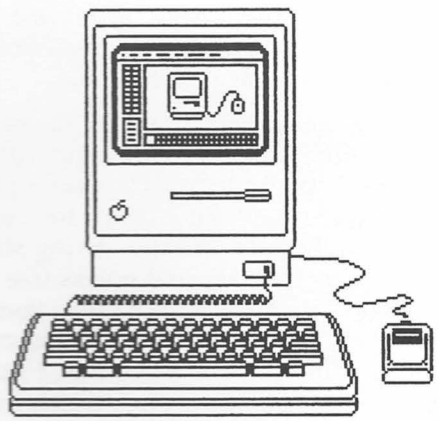
Alan Gould
Lawrence Hall of Science
University of California
Berkeley, CA 94720

(510) 642-5863

Right now, Alan sends PEN out to subscribers on a weekly basis. When you subscribe, he'll send you the latest issue of PEN, a 'Planetarian's Calendar'--which gives a rundown on major planetarium and astronomy-related meetings and sessions, and a list of current subscribers, including their e-mail addresses. This last item is great, as it serves as an 'e-mail directory', so subscribers can contact each other on an individual basis. To get information or inquiries disseminated to the entire PEN subscribership, an e-mail message can simply be sent to Alan, and he will include it in the following issue of PEN.

There are also plans in the works to get an electronic 'newsgroup' or 'discussion group' instituted for planetarians. My understanding of this service is that it will allow planetarians (and perhaps some other folks, depending on just how it is set up) to literally communicate 'real time'. This could be sort of like a 'computer town meeting', in which planetarians could go 'on-line' at the same time and discuss an important 'issue of the day', just as if they were sitting in a room together (except that the 'talking' would be via keyboard, and over thousands of miles, rather than by mouth). The only drawback to the discussion-group idea is that, because of technical constraints, it probably won't be available for folks indirectly connecting to *Internet* via a non-*Internet*-dedicated network, such as the commercial BBS's.

As you can see, the *Planetarium Electronic Newsletter* contains vast potential in enhancing information-flow between planetarians--regardless of proximity. While the association journals do a wonderful job as *journals*--by publishing conference papers, running book reviews, and having regular columns on planetarium-related issues--their relatively low frequency of publication means that they don't work nearly so well as 'newsletters'. In fact, most of the time, 'the news' in the journals has usually become 'the olds' by the time they are typed, edited, printed, and mailed. PEN, on the other hand, is immediate and responsive, and it is also a two-way communications device--something that the journals will never be. For this reason, I believe that the creation of PEN is an important event in the evolution of the planetarium, and would encourage everyone in the SEPA region to consider subscribing.



THE ROLE OF THE TELESCOPE IN A PLANETARIUM

By: James Mullaney
Spitz, Inc.
Chadds Ford, Pennsylvania

Ed.: The following was presented at SEPA '93 in Bradenton, Florida, and was previously published in ***The High Altitude Observer.***

There exists a traditional but often-overlooked symbiotic relationship between "skyshow" presentations in a planetarium and seeing the "real thing" through an astronomical-quality telescope of adequate aperture. This involves the best of man's ingenious efforts to faithfully reproduce the starry sky inside a theater, on the one hand, and confronting the original masterworks of the heavens face to face, on the other.

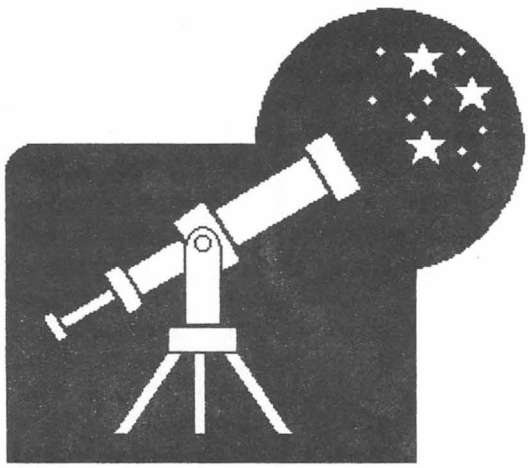
I have had the opportunity over the years of introducing tens of thousands of people to the stars using some of the largest planetarium instruments ever made, including the huge Zeiss Mark II and the Spitz Space Voyager. I've also had the privilege of showing like numbers the wonders of the heavens through some of the finest telescopes in existence, among them Celestron Schmidt-Cassegrains up to 22" in aperture, a historic 13" Fitz-Clark refractor and a 30" Brashear refractor, this last instrument being the 5th largest in the world.

This experience in "star hustling" (to use Jack Horkheimer's famous phrase) both the artificial sky and the real one leaves no doubt in my mind that the wonder awakened in a planetarium presentation must be complimented by firsthand viewing of celestial objects through a telescope for maximum impact. By this I mean a transforming and elevating personal encounter with astronomy that your students or visitors will carry with them for the rest of their lives.

In the March, 1990, issue of Sky & Telescope magazine, I contributed a one-page "Focal Point" opinion piece entitled "Metaphysical Stargazing". In it, I pointed out the subtle but very real and significant benefits to the individual of "communing" directly with the heavens through naked-eye, binocular and (especially) telescopic observation of its wonders. The enthusiastic response from amateur and professional astronomers, planetarium educators, science teachers and students (of all age levels) clearly showed that a resonant cord had been struck in these readers from around the world.

Among the benefits of "stargazing" covered in this article are the therapeutic relaxation, expansion of consciousness and spiritual contact that come with contemplative viewing of the cosmic depths. Central to all of this is what I like to call the "photon connection" - the incredible fact that when we look at celestial objects (be they a few light minutes away as in the case of the sun, or billions of light years distant for galaxies and quasars) we are in direct physical contact with them as the photons end their journey across space and time on the retinas of our eyes. A piece of something that was once inside of them is now inside us!

Realization of this profound fact helps explain the strange fascination we all seem to have with the stars, and how something so remote and beyond our reach can have such a lasting impact upon us. It also shows why the CCD/video imaging that's all the rage today - even given its attendant wondrous capabilities - simply doesn't "cut it". Looking at celestial objects on a TV monitor or projected onto a planetarium dome (even in real-time) cannot fulfill the need of the human mind and soul for that direct personal contact with the cosmos from which we sprang. As Eric Hoffer so well expressed it, "It's a kind of homing impulse -- we are drawn to where we came from.".



My premise here then is that providing an opportunity for firsthand telescopic encounters with the day or night sky as part of a planetarium visit is essential to any truly meaningful and lasting educational astronomy experience. In other words, every such institution -- be it a large museum installation or small school facility -- should have one or more good telescope available (and scheduled) for regular use in its programming, weather permitting.

As to what size, type and make of instrument this should be, it really matters little so long as the optics are good and the mounting stable. Nothing so draws attention as an open observatory dome, or a large telescope tube looming against the sky in the parking lot of a planetarium. The latter is especially so for the big

Dobsonian reflectors that have become very popular with stargazers in recent years, looking for all the world as they do like some huge celestial cannon aimed heavenward!

My personal preference, from the standpoint of such factors as observer convenience, portability (if required), light grasp, resolution, field of view, image scale, and atmospheric and thermal considerations, are the compact Schmidt-Cassegrain catadioptrics that are in such widespread use today. An instrument in the 8" to 14" aperture range (whether portable or permanently mounted) makes a superb teaching and entertaining tool for use at a planetarium. Few realize that, given good atmospheric seeing (image steadiness) conditions, such an instrument will show features on the moon's surface just a few hundred yards across and detail in sunspots only several miles in size! Likewise, on nights of good atmospheric transparency (clarity), scopes of this class are capable of revealing the nearest quasars -- even from the heart of a light-polluted city!

I invite each one of you, as planetarians and fellow stargazers, to put this premise to the test by giving your students or visitors (plus staff and administrators as well!) a look through a telescope as the climax (its traditional function at most major planetariums in the past) to their encounter with the universe. Experience for yourself the wonder in their eyes, the excitement in their voices and the astonishment on their faces as they peer into space. You will then know beyond any doubt that they have indeed "connected" with the cosmos. And you will realize once again why you have made it your business and your mission to point the way skyward to all who will look and listen.

KIRLIAN FOOTPRINTS IN THE SHRINE OF THE HOLY STARLAB

and other Tales from Beyond the Bayou

by Dave Hostetter
Lafayette Planetarium
Lafayette, Louisianna

Ed: The following was presented at SEPA '93.

Over the past several years, the Lafayette Natural History Museum and Planetarium has experienced an increasing number of serious problems with its building. In particular, water comes into the planetarium whenever we have a hard day's rain, typically in amounts of 10 - 20 gallons. In fact, water has been coming into our electrical systems areas for over a dozen years, and into the Planetarium for nearly 20; despite persistent effort, funding has not been available to eliminate the problem or the dangers.

Over the last five years, this has been compounded by the discovery that the ceiling over the dome is falling in, by water coming through Museum windows in other parts of the building in increasing amounts whenever it rains (we actually have to put little buckets out all over the building), and by the museum's non-compliance with Federal guidelines for handicapped accessibility. Planetarium seats are so old that they snap off when visitors sit in them. The lower outside facing of the building is falling apart, and the first floor slab is cracked so that water dripping into the office of the Exhibits Curator actually seeps through the floor to drip into the Planetarium office below.

The Museum and Planetarium will celebrate its 25th anniversary next March. As the facility has evolved during those nearly 25 years, the numbers of both our activities and staff have greatly increased, resulting in a facility too small for our purposes. After many years of talking, it has finally become clear that some repairs need to be made, and there is a good chance that when those happen, either the building will be expanded to meet our needs better, or we will purchase a much larger, older building downtown to adapt for reuse as a museum. We expect a decision to be made in the Fall.

Assuming this happens, what are our plans? At this time they are still nebulous, although the studies due out soon should clarify things. Just in the last 8 months, it has been suggested that we: do nothing and allow the building to continue to deteriorate; bulldoze the building and fire the staff to ease the budget crunch; repair the current building to safe standards; repair the current building and enlarge it to about triple its current size; buy the old building downtown where we are temporarily housing exhibits and adapt it for reuse as a museum; buy one of several other suggested old buildings for adaptive reuse; build a parking garage at our present site and expand into what is now the parking lot; and, build an entirely new museum building. For the Planetarium alone, it has been suggested to: do nothing; repair it only for safety (putting a false floor into the projection booths rather than eliminating the water leaks); modernize it at the present site; move it to an adaptive reuse site and modernize it; build a new one near an adaptive reuse site; and, build a new one in a new building.

As a result of all of our problems, the Museum and Planetarium building stopped public operations (we don't like to use the word "closed") for three months last September while awaiting repairs. Because of all the studies and conflicting plans being made, it now looks as if that three months will stretch to 1 - 3 years.

While some of the Museum staff and all of its exhibits moved to a downtown location, the Planetarium turned to Starlab. We rented a dome from the Louisiana Nature and Science Center in New Orleans, and took our act on the road. In addition to Starlab programs, we developed classroom presentations about space flight, astronomy, and model rocketry, and were able to offer programs of one sort or another for students from Kindergarten to 12th Grade. Teachers can schedule one or more of these programs for an entire school day; depending on travel time (our travel radius is about 2 hours from the Museum), we can do 4 to 7 programs per day, serving anywhere from 120 to 500 students. Eighth Grade classes within our parish get their programs for free, since their costs have been prepaid by the school board. Otherwise, the cost of a day of programs is $150, plus a travel charge of $25 - $45 if the school is not in our parish; we feel this is pretty reasonable, as it breaks down to roughly 30 cents to one dollar per student, depending on the number of students involved. Although this appears to be roughly half of what is common nationwide, we have gotten a number of complaints for charging anything at all.

Of course, there was truly only one thing that we could call an outreach program involving taking a vanload of equipment into the schools: **Star Truck** (and, yes, we got permission from Summer Nights before we stole their title!).

Response to the Star Truck has been mixed. Schools that scheduled a visit loved us, but we scheduled far fewer days of programs than we had hoped, and served only 6000 students instead of our normal 18,000. We believe there were several reasons for this. First, we lost the first couple of months of school while preparing presentations - rather than taking schlock into the schools, we waited until the programs were truly ready. Second, we found that this type of outreach was very time

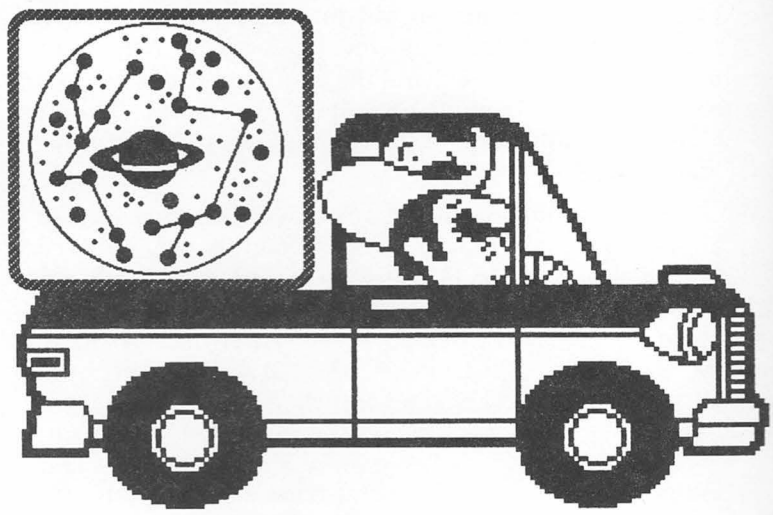
consuming; maintaining the public programs and services we normally offered, coupled with the time-consuming job of scheduling, meant that we could offer school programs only three days a week. These two factors obviously dramatically reduced the number of school days available for scheduling.

Another problem is the natural reluctance of the schools to try new programs. There is also still some confusion as to whether or not the Museum and Planetarium is closed or open at all; there were a lot of contradictory news reports when it happened. Some of the problem is our advertising; apparently a great deal of it stopped somewhere short of the teachers, since about a third of the teachers who called had never seen it even though multiple copies were sent to their school. Finally, part of the problem is the cost: teachers used to bring their classes to the Museum for an exhibit tour and star show for a dollar a head; now doing both an exhibit and a Star Truck visit costs closer to two dollars a head, and we have trouble convincing teachers that this is a bargain even though hundreds of kids are involved rather than just their class.

We are planning several steps to deal with these problems. First, we want to improve our school advertising. Information for next year went out to the schools in May, and some schools have already contacted us for next year's Star Truck; we intend to send out flyers and brief reminders more often, too. In addition, we hope to get scheduled to address principal's meetings, and hope to use advertising in the local newsletters of the local public and diocese school boards (and those of parishes within our driving range). With luck, we will also have word-of-mouth advertising from the teachers who scheduled Star Truck this year. In an attempt to make **Space Science To Go** even more attractive, we plan to retain and expand our Starlab offerings, to replace most of our classroom presentations with dynamic interactive video programs, and to add additional classroom programs.

Public confusion about the Planetarium's location and status has naturally affected our public programming; worse, public programs in Starlab have proven remarkably unpopular. Adults, particularly the elderly, just don't like crawling through a tunnel to sit on the floor. Adults with children have generally been willing to play along, but there have been many instances of people arriving for a program, taking one look at Starlab, and leaving. Attendance has plummeted - it is rare to have even 10 people for a public presentation, and monthly attendance is now about the same as the attendance formerly was for one Sunday afternoon in the regular planetarium. For the rest of this calendar year we will be experimenting with alternating Starlab programming with more traditional lecture-style programming in hopes that frequent changes of topic will bring people back more often.

Clearly our Museum and Planetarium has had a difficult year. We have seen the loss of our facility, confusion and uncertainty regarding which building our programs and exhibits would occupy, uncertainty in whether or not the Museum would survive, greatly decreased attendance, public confusion, and - inevitably - poor staff morale. There are three good things that have come out of it all, though. One, we are still operating - and although a few services have been eliminated, most remain. Second, through the staff's sheer hard work and determination the quality of what we do has remained high. Finally, because of decreasing attendance, public dissatisfaction with Starlab, and telephone inquiries regarding the return of the regular planetarium, our Star Theater has gained a new respect from higher-ups in the Museum. Suddenly people are telling me what was previously unthinkable - that the Planetarium is something no one else in the area has, that it is a diamond in the rough, and that we need to emphasize it far more when we reopen. There is even official discussion to keep the Natural History Museum's name unchanged, but informally and publicly to call the entire facility "The Planetarium". I am hopeful that this sudden respect will translate into a better planetarium and better in-house support when we get back in operation.



STARBOWLS: CONSTELLATIONS FOR THE BLIND

by Jalie Phifer
Gibbes Planetarium
Columbia, South Carolina

Ed: The following was presented at SEPA '93.

PART I

How would you handle it if a totally blind person came to one of your star shows? That happened to me. The result was the creation of a tactile Starbowl, an easy-to-make, inexpensive, curved map of the seasonal night sky. It is made with raised bumps and connecting strips inside a bowl that can be held in one's lap.

The idea began when a blind student, David, from the University of South Carolina was sent by his astronomy professor to attend our planetarium lab session on celestial mechanics, entitled "Time and Coordinates". When I learned that David would be coming, I went home and tried to fashion a simple celestial sphere with only the stars and grid-lines we would actually cover in the lab, using a plastic bounce-ball and a hot-glue gun. Unfortunately, the ball exploded. Next I made a styrofoam model with pins and ribbons. David loved it and said later that he was able to follow along with the rest of the class by using the ball.

At this point I called Kris McCall, Director of the Sudekum Planetarium and President-Elect of SEPA, to see if she had done anything like this. She had not, but she encouraged me to pursue it. For the rest of the story and the results I must completely share credit with her. It was only Kris' support and help that enabled me to continue this project.

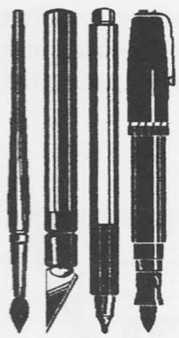
Later, I asked David how the ball could be improved for future blind visitors. He recommended (1) using only basic constellation shapes, (2) using Hi-Marks glue to create the stars, (3) "connecting" the star dots so these shapes might be felt, and (4) using braille labels to mark the constellations. In addition, he said I should either make a larger ball (8" diameter or larger) or else create the star map on the inside of a salad bowl.

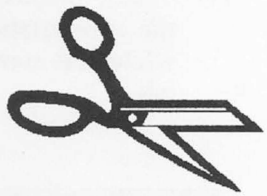
David then put me in touch with Sheila Compton, Director of the South Carolina Commission for the Blind. After holding the same Styrofoam ball, she and two of her colleagues said that a bowl would be easier than a ball for the average person to use in learning about the night sky. So, the original purpose of the tactile starball or bowl evolved from teaching celestial mechanics, to a more practical use of teaching constellations to blind visitors who might attend a "current night sky" planetarium program.

My goal was to design a Starbowl that was easy and inexpensive to make. I decided to make sets of four bowls - one for each season. The dates I used were the 15th of January, April, July, and October.

For my prototype bowl, I had to figure out how to accurately position the stars inside the bowl. I used the star chart in Astronomy magazine. I broke it up into a pie-grid and with thin, black Form-A-Line tape, made a similar grid inside the bowl, and marked where the stars were with a pen. It can be done this way, but it is not accurate, and certainly not easy or efficient.

Now, this is where Kris comes in. Kris has the computer program *Voyager 1.2* (Carina Software) that can generate 3-D starcharts with the correct spherical distortion. Her idea was to laserprint these charts and for me to photograph them with Kodalith film, mount them into slides, and project each slide into a bowl. I could then use a felt-tip pen to "dot" where the stars were. This method worked beautifully! [A word of caution here: I have the computer programs *Dance of the Planets* and *SkyGlobe*. Neither one of these programs worked. *Dance of the Planets* will only show flat pictures, while *SkyGlobe* images are so poor that I was unable to use them. So Kris used the *Voyager* program to create the maps: flat pictures of 3-D charts for the four seasons -- 10 PM April 15th, July 15th, and October 15th, and 9:30 PM on January 15th.]





Other materials needed are:

1) 4 Texas-Ware bowls, 10" inside diameter (11 3/8" outside rim-to-rim). These bowls, unlike most, are completely spherical on the inside. They proved tough and unbreakable, and can withstand oven temperatures of at least 400 degrees F for at least 3 hours. These bowls can be bought or ordered through BI-LO grocery stores for about $4.00 each.

2) Kodalith film for making slides of the star charts. Can be purchased at local camera shops. I bought one 36-exposure roll for $6.95.

3) 4 slide mounts

4) Braille labels for cardinal points and constellations. David Houck, Director of the SC Federation for the Blind, offered to have braille labels made for me free of charge. If you decide to make your own, be sure to consult someone who reads braille! There are over 60 different letters and diphthongs in the braille alphabet. There are also shortcuts used in some words that a non-braille reader would not know about, such as "ll" for "little".

5) An ordinary felt-tip pen

6) A fine-tip, waterproof pen (Sharpie worked best for me).

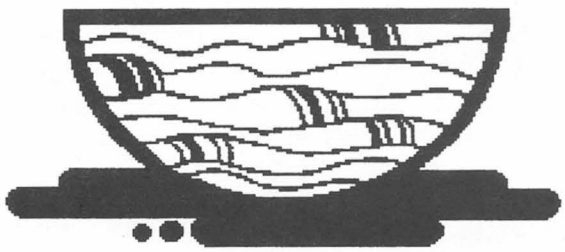
7) Rubbing alcohol (for wiping off the ink).

8) Fine-tipped, sharp scissors (for cutting the tape).

9) Black, very thin (0.71mm or 2 pt.) Form-A-Line Charting & Graphic Art Tape (or a similar tape).

10) Hi-Marks "3-D fluorescent marker" glue, @ $3.75 per tube, made by Kentucky Industries for the Blind (works like decorative craft glue, only better).

11) A slide projector to project a slide image of the constellations downward onto a bowl while you mark the stars inside the bowl in ink.



To begin, I photographed each starchart large enough to fill the field-of-view in the camera. Since there are more constellations than I wanted to use, I simply ignored the ones I didn't need. I put the slide of the starchart into a downward-facing projector with a blank bowl underneath. I then turned the projector and positioned the bowl so that the chart fit exactly inside it.

Next, I marked off the cardinal points, the meridian, and the stars with the waterproof pen, and drew crude (later to be wiped off) connecting lines with the regular pen. It can be easier to do the connecting lines with the projector turned off. It took about 15-20 minutes per bowl, but would have been faster had the bowl been anchored down to something.

At this point, I put the braille labels for North, South, East, West, NE, NW, SE, and SW around the rim, but this step is just as easily saved for later.

The tricky part was squeezing the Hi-Marks glue onto the dots. In general, I used larger bumps for bright stars and smaller bumps for dim stars, but did not get picky about the magnitudes. This step always took me at least an hour. The Hi-Marks glue takes at least three hours to dry.

After the Hi-Marks glue had dried, I wiped off the drawn lines and replaced them with pieces of the Form-A-Line tape between the stars to create the constellation patterns The January bowl took about 45 minutes for this step.

Finally, I stuck the braille labels on the outside of each bowl, corresponding to their constellations. Thus, a person can have one hand inside the bowl touching, say, Leo, while the other hand touches Leo's label on the same spot outside of the bowl. Mary Powers, teacher of the visually impaired students at Crayton Middle School in Columbia, SC, said that the labels should be parallel. When the bowl is sitting upside down, the labels are right-side up, parallel, and reading from left to right.

And that's it!

PART II

My newly made Starbowls met with David's immediate approval, and he said the bowl size was just right. Then I got in touch with Elizabeth May, Vision Specialist for Richland County School District 2 in Columbia, SC. She arranged for me to meet with three students (Jeffery, Quann, and Farrukh) who are legally blind, but can discern light and color. Farrukh was almost completely blind and read braille, the other two did not.

Jeffery was 9 years old, Quann was 10, and Farrukh was 21. All were very patient with me and were good listeners. Jeffery was little for a 9-year-old, and he said the bowls were too big. He was bright and eager to learn about the stars, however, and proudly showed me a little alphabet book he had drawn about space, including "B is for Betelgeuse". Quann disagreed, saying the bowls were too small. He wanted them to be about 4" wider in diameter. In addition, Quann thought I should use wider connecting lines. Farrukh, on the other hand, said the bowl size was just right! She urged me to create

corresponding, flat starcharts with braille labels to accompany the bowls.

To make these corresponding, flat charts, I just xeroxed the original curved charts Kris had sent me. Secondly, I "whited-out" all the constellations and lines not actually used in the bowls. Thirdly, I xeroxed these simplified charts onto different colors of cardstock paper and had them laminated. Then, I simply put the Hi-Marks glue, tape, and braille labels on as before.

Farrukh learned how the Starbowls worked much faster than did the other two, which was not surprising, since only she could read the braille labels and cardinal points, and since she was more than twice as old as Jeffery and Quann. She loved the Starbowls, and she helped Jeffery find some of the constellations while I worked one-on-one with Quann. I had to guide Jeffery and Quann both verbally and physically, while Farrukh required only verbal directions. This, however, was the easy part.

The tough part was explaining to them what I thought was obvious -- what the bowls were, how they related to the night sky, and why the stars and constellations were so interesting. I found myself groping for words when they asked me what stars and constellations were. I kept wanting to use the word "see". They asked me why people would want to look at the stars. "Because they are very beautiful" I stammered, while they patiently waited for a reason why THEY should be interested.

They asked how the bowls related to the sky. When I said the edge of the bowls represented the horizon, they asked what a horizon was. Again, I was stumped. "As far as you can see" was what I wanted to say, but that wouldn't do here. A better way of describing it might be: "The ground is like a table, and the horizon is the edge--everything above the table is the sky."

I had the students hold the bowls upside-down over their heads. "The top of the bowl represents what is straight up over your head, and the sides of the bowl show what a sighted person would see in front, in back, to the left, and to the right", I said. This technique seemed to make sense to them.

Farrukh asked why people see different stars at different times of the night. I did not know how to explain to her, as a blind person, how the Earth's rotation lets us see different stars all during the night. But, now I would explain that you can make a fist to represent the Earth and think of your thumb as a person standing on the Earth. Hold your fist in the middle of the bowl, not touching the sides. Slowly turn your fist, and your thumb will be in different places. The person on the Earth will see different parts of the bowl (or sky) as the fist moves.

All three students agreed the "dot" sizes for the stars were just right. Later, Farrukh's science teacher suggested the bowls be made with a hook to hang them upside-down from a stand so that students would not have to hold the bowls over their heads a long time.

Finally, I met with Mary Powers of Richland School District 1, and two of her students. Justin was a totally blind 8th grader who read braille and whose mother taught science. Aisha was a quiet 15 year old who could once see, but was now almost fully blind due to a brain tumor. Aisha also read braille. On each of these two I tried a starbowl and its newly made, corresponding flat chart. Both said the bowl size and star sizes were fine. Justin was bored and said he had no interest in astronomy. He said he had no use for such a bowl. Aisha, however, remembered what the stars used to look like before she went blind. She said she missed them and would love to have a bowl.

With Justin and Aisha, as with Jeffery and Quann, it still took careful coaching on how to "read" the Starbowl. How hard it was to watch them feel for a constellation and miss it - just barely - again and again before landing on it! Jeffery, Farrukh, Aisha, and David were all openly enthusiastic about the Starbowls, while Quann seemed only mildly interested and Justin was bored.

The one reason for my sharing this with you is to challenge you to come up with your own ideas for reaching the blind. I hope others will build on this concept. I have applied for a patent for this and for the name, but this is not to keep any of you from making it, and I am not out to make a profit. Rather, this is to allow everyone in planetariums the privilege of freely making them on their own. The idea is to keep some company from holding the patent and preventing you and me from producing our own for our own use, or helping each other produce our own.

We live in a culture in which many of our highest ideas are related to stars. A famous singer is a rock *star*. A famous actor is a movie *star*. We tell children to "reach for the *stars*". Even Jesus said, "I am the bright and morning *star*". Don't we who are privileged to have eyes that can see the stars, and an understanding of what we behold, owe it to those who don't have either one, to let them have a taste of the heavens?

LED PENLIGHTS

By Dexter LeDoux
Lafayette Planetarium
Lafayette, Louisianna

Ed: The following was presented at SEPA '93 by Dave Hostetter.

Last year when our planetarium closed for repairs, we rented a Starlab portable planetarium for use in both public and school programming.

Because of our inexperience in using a Starlab, a number of unexpected problems showed up during the course of the school year. One involved our school program, "Finding Your Star", based on an old program from the Lawrence Hall of Science in Berkeley.

In "Finding Your Star", each student is given a star map and the class is divided into groups. After a brief introduction to the sky, the students learn how to use the star maps, and each group then uses their maps to locate an assigned constellation. Since the constellation search happens when the lights are down, each group is given a red flashlight so their maps can be seen.

We originally used very small standard flashlights with bulbs stained red, but despite their small size these flashlights - really light pollution projectors - lighted the little Starlab dome so brightly that students often could not locate their constellations. After some thought, Dexter came up with a possible solution: a flashlight using a red LED instead of a regular lamp.

We thought this was a pretty original solution, but since then we have seen information about other LED flashlights; there was even a brief article about one in "Astronomy" magazine a few months ago. Still, we wanted to let you know about ours as another option if you are looking for a dim red light. This one lights up a star map quite nicely while at the same time being dim enough that it doesn't light the Starlab dome even when pointed straight up. It's a good tool for lighting maps in an enclosed dome and takes only about 20 minutes to make.

Dexter's LED flashlight is essentially a penlight flashlight case with a red LED (Radio Shack #276-068) replacing the regular bulb. It's designed so that the batteries make reliable contact with the LED while remaining easy to change, and is fairly easy to build.

As many of you know, LEDs have two legs, the longer one being the positive terminal of the LED (called the anode) and the shorter one being the negative terminal (called the cathode). To make the LED work, it's necessary to touch the positive end of the battery to the anode and the negative end of the battery to the cathode. In our flashlight, Dexter used the metal penlight case to help make a complete connection from the negative terminal leg of the LED to the negative end of the battery. Care must be taken not to apply too much voltage to the LED to avoid burning it out.

The LED Dexter chose has a small plastic pin between the anode and cathode legs. To allow the positive end of the battery to make contact with the LED anode, he bent the anode over the plastic pin, then cut the anode so it didn't touch the cathode.

Preparing the cathode is a bit trickier. He bent the LED cathode leg over the edge of the metal LED housing, and soldered the leg to the housing itself (after filing the finish off the housing to allow good contact). Since he used the nut that came with the LED to fasten the LED to the penlight casing, in some of our flashlights it was necessary to file down the solder joint to allow the nut to pass later. Finally, he cut off the rest of the cathode's leg to prevent it from touching the threads on the outer housing of the LED.

The flashlight casing is from an Eveready flashlight; the on/off switch is at the top and works like the top of a ballpoint pen. The top unscrews to allow access to the AAA batteries. After opening the casing, remove both the original bulb and a small plastic tube that holds the bulb; doing this leaves a quarter inch hole at the front of the flashlight. Place the lock washer and nut from the LED into the flashlight casing, lock washer first. Then put the LED into the front of the casing from the outside, passing the cathode's solder joint through the lock washer and nut; after that, screw the LED into the casing, tightening it down with a small pair of pliers.

In the original form of the flashlight, the switch at the top made contact with the battery with a spring. Since the LED is shorter than the original bulb, the spring will have to be stretched slightly to allow contact in the new version. If the spring is allowed to touch the flashlight casing when the top is screwed back on, the switch will be bypassed and the LED will remain on until the batteries run down; to prevent this, insert a tube of light cardboard or thick paper into the flashlight casing around the batteries. It should stick up far enough to keep the spring away from the casing, but not so far as to interfere with the screw-on threads of the flashlight top. A piece of thick paper 4" long and 1-3/8" wide works well. At this point, install batteries, and the LED flashlight is ready for use.

We used these flashlights a number of times during the past school year with great success. The only weakness concerns the switch: if students flick the switch repeatedly (as many are accustomed to doing with a ballpoint pen), sooner or later the spring will shift and the LED will no longer turn off; this is easily fixed between shows by simply unscrewing the top and putting it back on. Using the paper tube as an insulator has nearly eliminated this problem, rendering the flashlights about as "8th grader-proof" as anything can be. We have found these LED flashlights to be an excellent solution for reducing red light pollution in the dome, and recommend them to you.

ATTACKING SLIDE ADVANCE PROBLEMS IN THE EKTAGRAPHIC III

by Richard McColman
Morehead Planetarium
Chapel Hill, South Carolina

Ed.: This article was originally published in The Planetarian, March, 1991.

In the early 1980's, Eastman Kodak decided to shelve its long-revered line of slide projectors. The old "tried and true" Carousel and Ektagraphic models (which had for years served as the mainstay in both amateur and professional A-V circles) were deemed obsolete by the marketing and engineering experts at Kodak. The old line had undergone several changes and additions of features over time. But it was, alas, seen by Rochester as too outmoded in basic design layout to accommodate the growing demands of A-V specialists for new product features.

The successors to the old Kodak slide projectors were soon introduced and sported a stylish external appearance as well as a number of new design updates including: powered-down tray removal, a built-in 'homing switch' for pro A-V applications, and improved cooling. One of the most significant changes in these projectors came in the form of a rear-accessed 'lamp module'. This last feature made it possible for A-V professionals to change a lamp without disturbing projector alignment, and do so almost instantly during the actual run of a show!

These new features (or variants of them in other projector lines) soon became industry standards. Despite the diehard Ektagraphic II devotees, Ektagraphic model III's rapidly began to replace the older units in the projection areas of many auditoriums and planetariums.

But as time passed, and operational hours began to pile up on the new projectors, repair technicians got the opportunity to assess the real guts of these audiovisual wonders. The reviews were mixed. While the new models did evidence certain internal design improvements, many technicians bemoaned what they saw as a 'flimsy quality' in the updated units. Many pointed to the extensive use of plastics in the projectors, particularly in the projector case. Some argued that screw holes in the thermo-plastic case would simply wear out with repeated disassembly and reassembly. The new projectors were also seen as more difficult to repair, as the replacement of many small parts in the units required extensive projector disassembly. Nonetheless, the new projector line, because of its enhanced features, has generally been viewed as an overall improvement in slide projector technology, and the author, for one, has enjoyed using the Ektagraphic III's.

Cycling Problems

One major weakness in the new projector line, though, lies in the slide-advance mechanism. Because of certain design peculiarities, the new Ektagraphics can, over time, develop an annoying tendency to project the wrong slide at the wrong time. In fact, these problems can become so acute as to render the offending units virtually useless for show presentations. Some time ago, while at Gibbes Planetarium, we began to experience slide-advance difficulties with our Ektagraphic III's. The first evidence of this came in the form of one particular projector that, on occasion, would fail to cycle when issued an advance command by our Spice Automation system. Because this cycle-failure at first seemed to occur around the same point in certain shows, we initially suspected an automation failure.

Eventually, this assumption proved to be erroneous. While the technical staff at Sky-Skan suggested that we look for loose wiring in the projector, our troubleshooting led us to reject this as a candidate for the problem.

As sometimes happens when technical bugs arise, this gremlin was only intermittent in frequency, making it extremely difficult to track down. It seemed that every time we pulled the projector after an advance-failure, we were unable to duplicate the anomaly on the work bench. Frustration mounted as the projector would foul up once in half-a-dozen shows or so, but would hum along very nicely when opened up for inspection. The dilemma went on for days without satisfactory resolution.

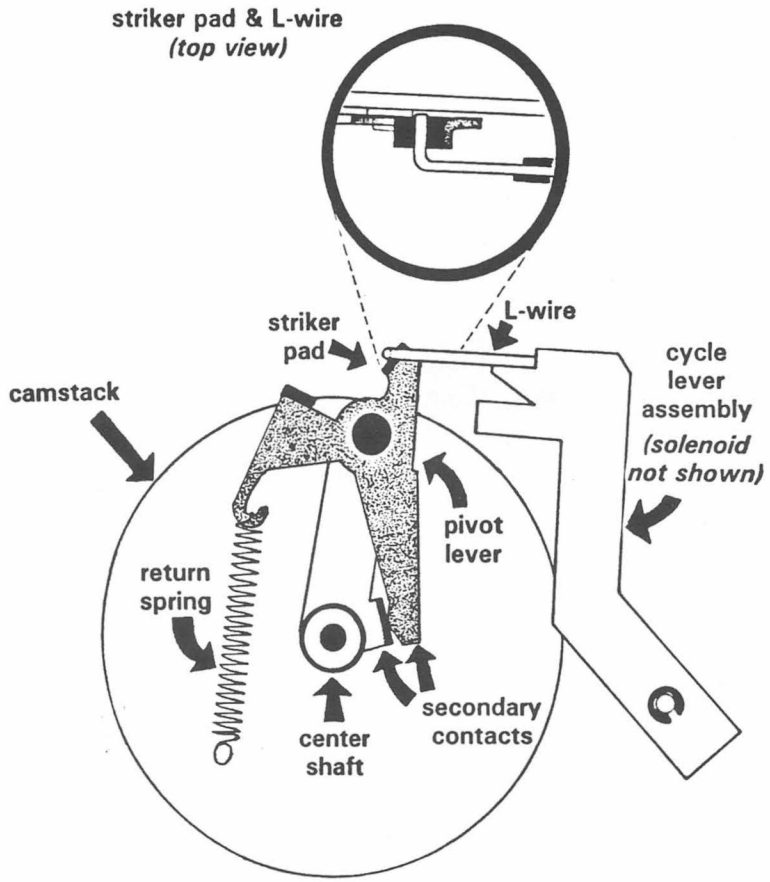
The Cruddy Contacts

After haggling with the projector for a week or so, we were determined to fix the blasted thing. It was nerve-wracking to face an audience, unsure whether the show would run properly or not. Although we had a spare projector to insert in the offending unit's place, it was imperative that we establish reliability in the primary projector to free-up the backup in the event of any failure in our other units.

During close scrutiny inside our problem projector though, a suspicious phenomenon began to catch ou attention--a 'green crud' covering some electrical contact crucial to the operation of the cycling mechanism.

For those experiencing the intrigue, or misfortun (depending on your point of view), of probing th internal guts of a Carousel or Ektagraphic slide projecto there are three large moving parts that will immediate catch your attention: the motor, the fan, and the camsta assembly. Probably anyone, including a mechanical idi can easily identify these first two items of interest. prime concern here, though, is the *camstack assemb*

which can be recognized as the large part in the projector that rotates once for each advance of a slide. (If unsure about this, plug in a projector with the bottom case removed, switch it to 'fan' and press either the 'forward' or 'reverse' buttons.) The camstack assembly looks like a series of thin metal and plastic disks on a rotating steel shaft, with thin spaces between the disks. Within these spaces are molded plastic 'cams' with high and low areas which lift and lower the metal levers that change slides and index the slide tray. A cursory inspection will reveal that this assembly possesses what we'll refer to as a *striker pad*, a tiny metal rectangle designed to stop the rotation of the camstack each time it hits a small steel L-wire (so named here because it is shaped like a letter "L"). This wire is part of what Kodak calls the *'cycle lever assembly'*. With the fan running in an opened projector (the bottom case portion of a model-III can be lifted away after removing six Philips or Torx screws), the interaction of



Camstack Assembly
(cutaway view, looking down center shaft)

the camstack and cycle lever assemblies can be studied. When depressing the 'forward' or 'reverse' buttons, the *cycle solenoid* (that fiberglass-tape-wrapped cylinder inside a U-shaped steel bracket with a plunger sticking out one end) lifts the cycle lever and its L-wire away from the camstack's striker pad--allowing the camstack to begin its rotation. Once the 'forward' or 'reverse' button is let go, the cycle lever drops back into its spring-loaded position. Then, as the camstack finishes one complete rotation, the striker pad hits the cycle lever's L-wire, stopping rotation and the cycle action. Therefore, the striker pad and L-wire combination constitute a sort of "mechanical stop", determining the 'start-point' and 'end-point' of the slide-cycling action.

Along with performing this purely mechanical function, the striker pad and L-wire also serve as electrical contacts. They are hooked up in such a way as to pass electrical current for the very same cycle solenoid which starts the camstack rotation in the first place! Therefore, these two parts must offer a relatively low resistance to electrical current in order to operate the solenoid.

The 'green crud' mentioned earlier was all over the L-wire and striker pad. It seemed unlikely that this coating would make for a low-resistance electrical pathway. Checking the circuit with a volt-ohmmeter confirmed this hypothesis--we were getting resistance readings varying from about 10 to 200 ohms.

Calls to Kodak revealed that the company had recently been plagued with numerous complaints identical to ours. The technical representative we spoke with explained that follow-up research had discovered that the so called 'conductive grease' used to lubricate the striker pad and L-wire would, over time, degrade into a tough *non-conductive* green coating. This in turn, would drop the current available to the cycle solenoid. The recommended solution was to clean the striker pad and L-wire, and relubricate them with a thin film of "Super Lube', a milky-clear Teflon-based lubricant in a gray tube manufactured by an outfit located in Bohemia, New York. It turns out that this same lubricant is currently available at Radio Shack stores where it is sold under the name "Lube Gel' (catalogue #64-2326). Although the use of such a lubricant initially concerned us (since Teflon is generally used in other applications as an electrical insulator), the Kodak rep assured us that a thin film of 'Super Lube' would provide little or no electrical resistance in this particular application.

The Problem Returns

After placing the troublesome projector back into service, we monitored its performance closely. Days, weeks, and months went by without incident. It appeared that our failure-to-cycle problem finally had been found and fixed. Nearly a year went by without a slide-advance malfunction in our Ektagraphics. Then suddenly, the problem began to occur in another of our Ektagraphic III's, and the unit was summarily pulled, serviced, and replaced. But much to our dismay, the Kodak-recommended service procedure had little or no effect on the malfunctioning unit. At best, the projector might merely make a loud buzzing sound (a chattering cycle solenoid) when given an advance or reverse command. At worst, it would simply sit there silently (except for the fan noise), refusing to cycle.

Accordingly, we again cleaned and lubed the striker pad and L-wire in the offending projector, and watched its performance closely. To our utter amazement and frustration, the unit showed absolutely no sign of improvement! Suspecting that the problem was with the solenoid itself, we again opened up the malfunctioning projector, and this time adjusted the mechanical link between the solenoid and the cycle lever (a procedure that will often clear up solenoid-buzzing). But, repeated adjustments didn't abate the problem. Next, we tested the rectifier diodes that feed DC-voltage to the solenoid, and they checked out fine. Finally, we changed out the solenoid altogether--but still no change. Frustration was now leading to near panic, since a recent change in our projector layout in the planetarium had temporarily left us without a spare projector at all! We had to find a solution to the problem--and fast! To make matters even worse, more and more units were experiencing the same problem. Within days, nearly half the Ektagraphic projectors in the planetarium were exhibiting intermittent failure-to-cycle problems. Oddly, it seemed that an insidious projector virus had invaded the planetarium--and there appeared to be no way to stop it. Even Kodak couldn't help us cure the epidemic.

Poking and Probing

Sometimes when you're stumped by a mystery, it helps to leave it for a while to give the brain a rest. This approach will often produce a fresh perspective when reattacking the problem later. Unfortunately, we couldn't afford the luxury of waiting around for some nebulous and, as yet, unknown inspiration to arise and bite us on the behind.

"Certainly someone else has had similar problems", we thought.

Accordingly, we called Ty Bloomquist at Sky-Skan. Ty had always been more than helpful in the past, and though the problem wasn't with Sky-Skan's equipment, we felt it possible that, through the grapevine, he had heard a similar story. After describing our dilemma, Ty recalled that another Sky-Skan customer, Novins Planetarium in Toms River, New Jersey, had experienced some Ektagraphic troubles.

We phoned Novins Planetarium Director Eric Zimmerman. It turned out that his description of their Ektagraphic troubles was identical with ours--and he too

hadn't yet found a fix. As the conversation progressed, we realized that his frustration closely paralleled our own. Several of his projectors had even been sent out to Kodak for repair, but, in the end, came back with the same insidious gremlins. At one point in the discussion, Eric mentioned a fact that we hadn't thought about--that the old Ektagraphic II's had never experienced such a difficulty. While they might rarely require solenoid or camstack timing adjustments, the model II's were much more reliable cyclers than their Ektagraphic III counterparts seemed to be, at least for now.

We mulled over this very salient point. Our own experience at Gibbes had borne out Eric's assertion. Before switching over to the Ektagraphic III's, our old projectors--despite their otherwise dilapidated conditions--had never once evidenced such a cycling problem.

"Something in the basic model III design," we surmised, "must be causing the problem...something that isn't in the Ektagraphic II!" The point was so obvious that it had previously escaped us altogether. With that we sprinted over and retrieved one of our old Kodak projectors, and opened it up. With old and new units side-by-side we studied them to compare their inner workings.

The Revelation

Although the mechanical guts of the old and new Ektagraphics are different in specific layout, they do have many functional similarities. After a few moments, though, one thing started to become obvious--the electrical pathway for the cycle mechanism on the new model was more complex than on the older unit. Instead of possessing a fixed camstack striker contact like on the Ektagraphic II, the new model had a sort of 'floating point' design. The Ektagraphic III's steel striker pad was really just the bent end of a pivoting lever that extends further down into the camstack assembly. Whereas the steel wire striker contact on the model-II connects directly to the electrically grounded center shaft of its camstack assembly, electrical current in the model-III has a more convoluted path. Just beneath the opposite end of the striker pad's integral pivot lever (which is attached to the camstack via a loose rivet) resides a small gold-colored contact plate measuring roughly 2 x 5 mm. It is this secondary contact that is connected electrically to the camstack shaft in the model III. Because the pivot lever is spring loaded, it does not touch this secondary contact when a slide advance or reverse is in progress (the camstack is rotating). However, when a slide-cycle ends, caused by the striker pad hitting the L-wire, the resulting force knocks the striker pad/pivot lever back. This makes the opposite end of the pivot lever press against the secondary contact inside the camstack assembly. Therefore, to initiate the next slide advance or reverse, the current to the cycle solenoid must negotiate, not one, but two sets of moving electrical contacts. While we had cleaned and lubricated the striker pad and L-wire, up to this moment we had paid no attention to this second set of contacts.

What was the condition of the second set of contacts? First, the geometry of the camstack assembly makes it difficult to examine this area when the camstack is in its 'at rest' or non-cycling position. By running the projector fan and then turning it off immediately upon pressing the 'forward' button, the camstack can be parked at another position. (The secondary contacts can be accessed by running the camstack about 1/3 of a full rotation.)

After running the camstack around for inspection, we immediately spotted something--tiny blackened areas on the small secondary contact plate and on the underside of the pivot lever, exactly where the two parts make electrical contact. Using the tip of a straight blade precision screwdriver and a solvent-soaked cotton swab, we cleaned these deposits from both parts.

"Could these tiny blemishes really have been the culprit", we wondered?

Over the next day or so we pulled every Ektagraphic projector out of the planetarium for inspection. Besides cleaning and relubricating the striker pads and L-wires in the units, we checked the condition of their secondary contacts. It turned out that, without exception, each projector with cycling problems exhibited the tiny sooty spots on its secondary contacts. Additionally, every properly operating unit showed little or no evidence of secondary-contact blackening.

Now came the acid test. After cleaning up the contacts in all projectors and reinstalling them, we waited to discover whether our new remedy had worked. Although it seemed likely that the culprit finally had been found, we already had been frustrated too often to assume success.

Days passed with no missed cycles. Still, it was difficult to assume anything. But with each show presented it became more and more obvious that the problem was fixed.

Understanding the Problem

As we discussed in our earlier installment on corrosion and its effects on electrical flow, any non-conductive impurities or deposits between contacts in an electrical circuit will essentially act like a resistor, reducing the current flow to the component(s) drawing that current--in this case, the cycle solenoid. As more resistance is placed in the circuit, less current is available for the solenoid to lift the cycle lever assembly. One can actually create a test of such a failure mode by wiring a rheostat in series with the solenoid. As more resistance is dialed-in on the rheostat, the pulling action of the solenoid against the mechanism's return springs becomes

progressively diminished until the solenoid makes a chattering noise and fails to pull in. If the resistance is increased further, the current drops until there isn't even enough energy available to make the solenoid buzz.

This is exactly what happens when either or both sets of the aforementioned electrical contacts become too dirty. The problem gets aggravated even further when the cycling mechanism is being controlled by the typical automation system. Although some of the cheaper control systems switch the 'forward' and 'reverse' current using conventional electrical relays, the more advanced systems use solid-state devices for this application. As the electrical current passes through one of these, the circuit potential drops by a couple of volts. This explains why, in such cases, it may be possible to cycle a malfunctioning projector with the 'forward' or 'reverse' switches on the projector itself, while the automation system can make the unit do nothing more than buzz.

Ektagraphic III's generally begin to experience such problems when they're about 4 to 5 years old, depending upon how much they're used. (It's interesting that they come with a three year warrantee!) By that time, the 'conductive grease' will have fully deteriorated inside the hot environment of the projector, and the oxides will have sufficiently accumulated on the secondary contacts inside the camstack.

Since the conductive grease deteriorates into a rather tough film, it is best to use a sharp knife to lightly scrape the deposits from the striker pad and L-wire, as well as intermittently scrubbing the parts with a cotton swab soaked with contact cleaner or denatured alcohol. Once clean and shiny, the contact surfaces of these parts should be coated with a thin film of Super Lube (or Lube Gel). The secondary contacts inside the camstack should be lightly scraped with the point of a precision screwdriver or other suitable instrument, and finished off with a soaked cotton swab. It is very important to note, however, that *no lubricant whatsoever* should be placed on these secondary contacts, as they touch each other with relatively light pressure. A coating of lubricant could, in this application, serve as a source of resistance to electrical current. Besides, the secondary contacts are not subject to the kind of mechanical stresses and friction that are present at the striker pad and L-wire.

Over-Anxious Cyclers

Another strange problem that occasionally plagues the Ektagraphic III is a tendency of the projector to advance erroneously one tray position when the fan is turned on. This phenomenon can pose a problem, especially in those systems that turn off a projector fan when that unit isn't projecting a slide.

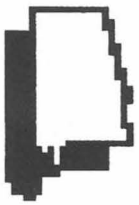
The cause of this problem is a misaligned L-wire which is positioned so that the striker pad is contacted too close to its edge. Since the striker pad is tilted back a bit when contacting the L-wire, the latter has a slight tendency to ride up the slope of the striker pad when the fan turns on (the motion is precipitated by a slight lurch in the camstack's slip-clutch). If the L-wire contacted the striker pad too close to its 'trailing edge' at the end of the previous cycle, the camstack could have just enough mechanical energy at the next fan turn-on to push the L-wire out of the way--leading to an unwanted advance.

Although Kodak recommends replacing the entire cycle lever assembly (which includes the L-wire) to correct this problem, such a task can be avoided most of the time by simply bending the L-wire. However, in such a situation, it is very important to keep from bending or otherwise placing stress on the remainder of the cycle lever assembly. We achieve this by using two sets of long nose pliers. (Don't use those spindle jawed "needle-nose" pliers, though, as they are not strong enough to bend the steel wire.) By clamping down with one pair of pliers on the L-wire close to its riveted attachment point on the cycle lever, one can relieve the lever from any bending stresses applied to the L-wire with the second pair which is clamped on the free end. When the adjustment is successfully completed, the L-wire should contact the striker plate at dead center.

On occasion, though, you may encounter a cycle lever assembly with "too much play". In such a case, the wire won't contact the striker plate consistently in the same position. Although you can fix the problem by replacing the cycle lever assembly, this is definitely not a task for the faint of heart. Going this route requires almost complete disassembly of what Kodak calls the '*mechanism assembly*' (that rectangular metal box which contains the cycle lever, camstack, solenoid, slide gate, and all the other levers, springs, etc. that cycle the slides). You'll soon find yourself hurling a mass of expletives at the confounded thing. In such a scenario, we recommend that, instead, you replace the entire mechanism assembly. Although this part runs around $70, you'll find it more than worth the investment in preserving your sanity. Besides, the mechanism assembly is hard enough to replace by itself.

After solving the Ektagraphic III's cycling problems, we have once again fallen in love with these opto-electro-mechanical beasties, despite their increased tendencies toward chronic mis-cycling. By periodically venturing into your projectors to tackle these rather exotic, but simply corrected gremlins, you too can get the most out of their updated features without having to suffer from their design pitfalls.

NEWS FROM SEPA STATES



ALABAMA

Jayne Ray
Planetarium
Muscle Shoals

Among the most successful programs presented by the Muscle Shoals Planetarium this year were visits by two guest speakers. Being encouraged to try in every way to peak the interest of students in the fields of math and science, we looked around for interesting people who could offer input which would help in this. Since we are located near Marshall Space Flight Center, the search began there.

In the Fall Miss Janet Dowdy, of the Payload Crew Training Branch at Marshall, came to speak to our high school science students, as well as the local astronomical society. She spoke about her work and specifically about her involvement with shuttle mission STS 50 the previous summer. Miss Dowdy was extremely well received, and many students crowded around after the program to ask questions. At least one student made a definite career decision because of her visit.

This Spring Professor Willie Prosthaufer, retired Chief of Rocket Development for Marshall Space Flight Center, and original member of the Von Braun Rocket Team that worked at Peenemunde, spoke to World History and Science students and the local astronomical society. He is wonderful in telling the story of the German rocket team and has so many worthwhile personal stories as well as being a rocket expert. Professor Prosthaufer really enjoys speaking and is able to communicate on a level that students and lay people can understand. The response of the students and public was very encouraging. The fact that Professor Prosthaufer is one of a vanishing breed was clearly evident.

It will be difficult to top these speakers next year, but we plan to make this a part of our program every year. I encourage others to look around for people who might contribute in this way to their programs. Many times local grants are available, and people like Miss Dowdy and Professor Prosthaufer will speak for little more than expenses. If anyone is interested in these two speakers, I will be happy to share more information.

FLORIDA

The Bishop Planetarium in Bradenton is presenting *The Planet Patrol: Solar System Stake Out* as their public starshow through September 6th. They are presenting *Larry Cat in Space* at the Saturday Children's Program through August. They also offer a multi-media presentation called "The Tonite Show" in their Science Theatre every Friday and Saturday night. Through July, the show is *The Milky Way: A Binocular Tour*. In August the program will deal with meteor showers, meteors, and comets - taking a close look at the Perseid meteor shower. They are also keeping busy with a full slate of Laser Lightshows.

The Buehler Planetarium in Davie is running Teddy's Quest as their current family feature, and The Light-Hearted Astronomer as The Evening Sky Gallery program. They are also presenting four Laser Lightshows each weekend. Duke Johnson has announced that his "tour of duty" as an intern at the Buehler has come to a close. The incoming intern is Jean Philpott who is moving into Florida from Pennsylvania.

GEORGIA

KENTUCKY

LOUISIANA

Dave Hostetter
Natural History Museum
and Planetarium
Lafayette

Mike Sandras at the Daily Living Science Center in Kenner reports that his facility has installed Joe Hopkins Engineering automation and upgraded their projectors and audio system. The adjacent observatory is being used for high school and college level observing projects. The facility is preparing to install a full-scale mock-up of Martin Marietta's rejected space station proposal.

Lafayette's planetarium remains out of operation awaiting repairs. Area schools received visits from Star Truck, with Starlab programs and classroom presentations. Summer public programs will change monthly, using a variety of formats, and the planetarium will sponsor several events for Spaceweek and National Aviation Week. In June, the planetarium participated in *La Science en Fete* (the French National Festival of Science).

The St. Charles Parish Library Planetarium is working with local school officials in an attempt to increase local school participation.

The Louisiana Nature and Science Center Planetarium in New Orleans is showing "The Little Star That Could" and a variety of laser shows. The staff plans to celebrate the Mars Observer Mission with Mars Day in September. Among other things, they plan to display a full size model of a Viking spacecraft.

MISSISSIPPI

Gary Lazich
Davis Planetarium
Jackson

Jim Hill, director of the Rainwater Observatory and Planetarium in French Camp commands an array of 17 telescopes ranging in size from 4" to 20.5" with a 32" on order.

The French Camp Academy music room where he teaches houses a restored Observa-Dome planetarium and sections for a portable 6-meter dome which seats 45 people. Jim coordinates public and Academy astronomy club activities, a library with hundreds of astronomical reference items, public and private observing programs, and a monthly newsletter. This past summer he participated in SPICA at Harvard University and returned with Harvard business cards and a missionary fervor to develop astronomy teaching workshops statewide. (Jim hosted the first Mid-South Regional Star Gaze and dedicated the 32" in April. I presented a campfire talk on sky lore; Gerritt Verschuur, former director of Fiske Planetarium and now a professor in Memphis, summarized the latest research on Earth-orbit-crossing asteroids in a talk called "This Island Earth".)

The McNair Space Theater of the Russell C. Davis Planetarium in Jackson unveiled its new laser projection system on Thanksgiving weekend. Developed by Brevard Community College of Cocoa, Florida, the system combines a Lexel krypton-argon laser operating at 2 Watts with an attached projection head featuring polychromatic acousto-optic modulators for full-spectrum output. BCC is leasing its series of Laser Visions programs at a nominal per-viewer charge. The Davis Planetarium Foundation purchased the system with a loan from Trustmark Bank.

Fundraising and production continue for *Voyages*, an 8-perf/70mm documentary film celebrating the spirit of exploration, to be released late in 1993 by C-360, Inc. With Planetarium Manager Richard Knapp as producer and Don Warren as director, the production team has already filmed a Space Shuttle launch in Florida, the Japanese Santa Maria off the coast of Guam, the Hokule'a near Hawaii, and various space and undersea sets in Jackson. The Minolta Corporation has contributed $500,000 toward the projected $1.6 million cost of the film.

NORTH CAROLINA

Too hot for the zoo? Too far to the beach? Pool's too crowded? Movie's too much? Remember the Morehead! Through August they will be running: Mystery of the Universe, Ages of Discovery, Sky Rambles, The Travels of Terry Trasher, and Rainbow War.

SOUTH CAROLINA

Rick Greenawald
Hooper Planetarium
Greenville

The hot days of summer have arrived in South Carolina, just like the rest of the southeast. However, the weather doesn't seem to be slowing down the planetarians here.

Jim Brown of the Stanback Planetarium in Orangeburg reports that his theater has recently acquired a couple of donations. The first donation was a Spitz A1 projector which is currently being used as a display in the lobby area. The second donation was an 18 inch Newtonian Reflector, however Jim reports that they don't have any land or money to put up an observatory.

Jeff Guill of the Gibbes Planetarium in Columbia reports excellent attendance by school groups and group tours during the past school year, approximately 21,000 passed through the theater. Also out of Gibbes is the news that effective August 13th Jalie Phifer will be leaving in order to pursue her M.A. in Curriculum and Instruction with an emphasis in astronomy at the University of North Carolina-Chapel Hill. The planetarians of South Carolina wish you lots of luck Jalie. We're sure the staff of Morehead will be seeing Ms. Phifer from time to time.

From here in Greenville I would also like to report excellent attendance for the past school year, just over 27,000 students and teachers passed through the theater. This represents over a ten percent increase from the previous school year. For the upcoming year I am hoping to break 30,000 as we add a couple of new programs. We are also retooling some of our current live school programs to make them stronger. Now for the most encouraging news. The Roper Mountain Science Center was slated for a ten percent budget cut by the school board for the 1993-94 fiscal year. This cut would have cost us one staff position and half of our operating budget from the district! The cut would have been very painful to us, however at the last minute we were given a reprieve and we are all breathing a little easier.

Ed. note: I received the following personal note from Rick and thought you would all be interested.

I hope this finds you in time for the journal. It is a little late since I have had to add some news out of Greenville. It follows:

The big news out of Greenville is that on June 24th, Lori, my wife, gave birth at 2:56 AM to our 8 pound 5 ounce daughter. We named her Mackenzie Marie Greenawald. Dad feels that she has real potential since he wore an astronomy club shirt to the event, and the doctor who delivered her is a member of the astronomy club, and she was born in the wee morning hours. So much for the full moon nonsense - it was crescent.

TENNESSEE

Kris McCall
Sudekum Planetarium
Nashville

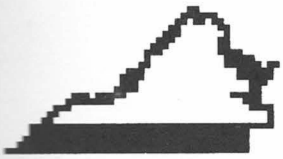
Mike Chesman, at the Bays Mountain Park Planetarium in Kingsport, reports they have been busy this summer not only giving shows in the dome but also providing a variety of outreach and special programs. Students attending Governor's School in Knoxville have visited the planetarium and conducted a variety of astronomy activities. The local astronomy club has been instrumental in providing telescope viewing opportunities for a slew of scout camps and other interested parties.

This year the summer reading program at area libraries was called "Star Kids". Mike says they gave talks at several locations and have received terrific feedback in the form of original stories and drawings from the kids.

In middle Tennessee more than a dozen libraries had Starlab come from the Sudekum Planetarium to provide special enrichment programs.

Meanwhile in Nashville, the Sudekum Planetarium is presenting "Star Stealers: Planet Patrol 2" to thousands of visitors. It has been very hot there which definitely does contribute to the high attendance.

Director Kris McCall and Artist Jim Chapman are wrapping up work on "Our Place In Space", preparing to install "Cosmic Catastrophes" to accompany a Fall exhibit called "Dinosaur Park", and getting in gear to begin production of "In Search of Intelligence".



VIRGINIA

David C. Maness has been appointed the Director of Astronomy at the Virginia Living Museum Planetarium in Newport News. Dave has been the Acting Astronomy Director for the last three months while a nationwide search was conducted to replace former Director, Jon U. Bell. In accepting the position, Dave said, "I feel like this is a position for which I have been in training for the past 12 years. I look forward to building on the already high quality and variety of astronomy activities presently offered by the Museum." Congratulations Dave!!!

WEST VIRGINIA

The Berkeley County Planetarium is located in Hedgesville High School in Hedgesville, WV. Betty Wasiluk has been running the planetarium (a Spitz 373 in a 20 foot dome) since October 1993. Betty says her facility is a blend of both high tech (computers, automation, etc.) and low tech (a cookie sheet covers the console board and keeps dirt out). If you have a low tech idea that solves a problem in your dome, Betty would like you to send it to her, and she will compile a list for a future issue of *Southern Skies* if there is enough interest. Her address is: Elizabeth S. Wasiluk, Berkeley County Planetarium, Rt. 1 - Box 89, Hedgesville, WV 25427.

Ed.: Thanks to all who contributed to this column. As you can see by the spaces not filled, we need more contributors Gary Lazich sent the Mississippi news for this issue, but because of his work load and personal obligations, he will not be able to continue. Gary has made the following suggestion--"...because Mississippi has so few planetariums (and only one active public one), you might have the coordinator of an adjacent state (Louisiana, Alabama, or Tennessee) include Mississippi news as well.

In the cases where there is no name identifying the contributor of news from a state, the news was taken from information sent to the Editor of "Southern Skies" by the various facilities in that state.

POSITION ANNOUNCEMENT

The Gibbes Planetarium at the Columbia Museum of Art is seeking a qualified professional to serve as Planetarium Production Assistant. This person, along with the Planetarium Director, is responsible for the production of public and school planetarium shows. Production activities include: script writing, photography, film developing, working with slides, graphics and visual design, audio production, and multi-image automation programming.

The Planetarium Production Assistant will also help present public and school planetarium programs, as well as assisting in the repair and maintenance of planetarium equipment. This person will also work as backup for the weekend console operator. A general knowledge of astronomy is required, along with experience in audiovisual production techniques and good public speaking skills.

The Gibbes Planetarium incorporates a modified Minolta MS-10 Star Projector housed in a 26 foot dome, a cove projection system and concentric seating with a capacity of 55. Included in the planetarium chamber are twelve Ektagraphic-style slide projectors, over 60 special effect projectors, a video projection system, and a Sky Skan SPICE Automation system. The Planetarium department also has a darkroom, a technical workshop area, a sound production area, and staff offices adjacent to the theater. Attendance at Gibbes is about 30,000 per year, making it one of the best-attended planetaria in the nation for its size range (30 feet and below). Presently the staffing level stands at two full-time and one part-time personnel, with future increases expected as the operation grows. The eventual goal of the museum is to construct a 50-foot planetarium within a new museum complex.

Preference will be given to individuals with previous experience. Starting salary is $15,000 - $18,000, depending upon experience and qualifications. Benefits include medical and dental. Resumes and/or inquiries may be directed to:

Jeff Guill
Planetarium Director
Gibbes Planetarium
1112 Bull Street
Columbia, SC 29201
803-799-2810

Applications will be accepted until a suitable candidate is found.

SUMMER

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Linda Hare, Editor
Bishop Planetarium
201 10th Street West
Bradenton, FL 34205