SOUTHERN SKIES

TABLE OF CONTENTS

Newsletter of the Southeastern Planetarium Association

Southern skies

SOUTHEASTERN PLANETARIUM ASSOCIATION

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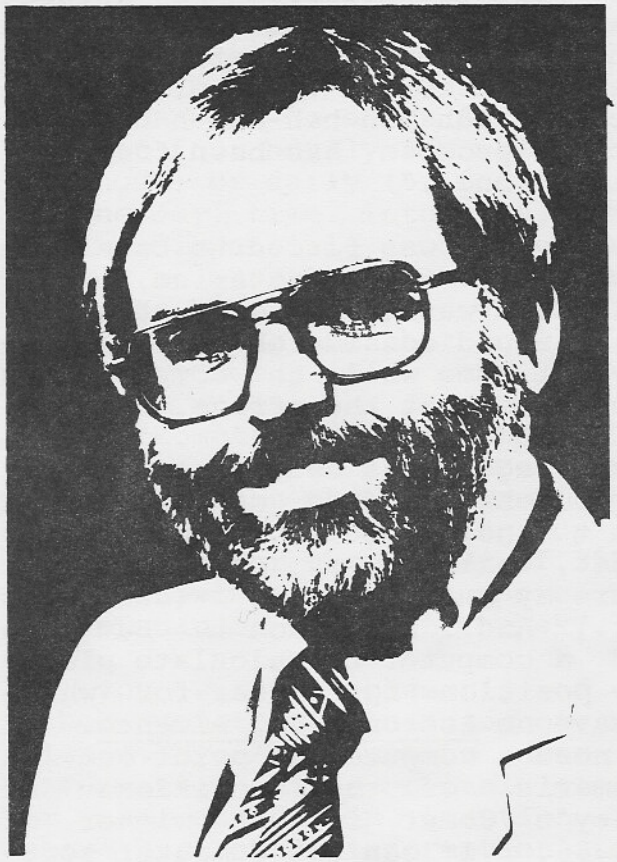
A Message from Your President

by Duncan Teague



In the spring of 1983 my resistance must have been down. It's that time of year when the first buds are coming out; pollen is in the air; and thousands of faces, tired of staring at classroom walls, are in the star theater. I was tired too, and I succumbed to a national disease. I bought a computer.

Knowing not whether I would show any aptitude for the devices, I didn't want to sink a lot of money into a computer. Besides, they intimidated me. Computer programmers "spoke" to the computers (and probably to God); they spoke only condescendingly to mere mortals. I was intimidated by computers the way a small child is intimidated by a big dog. I was afraid that if I made any wrong moves, it would bite me. My only experience with computers had been thirteen years ago. It involved "batch work" and "Fortran" and a "mainframe IBM" at Memphis State University. I still (shudder) have occasional nightmares about missing commas and misplaced periods.

But the computer I bought in April was unintimidatingly small, and so was its price tag. If it tried to bite me, I could just strangle it or drop kick it into the nearest waste-basket, and I wouldn't be out a lot of money. On second thought, my children might be able to use it for their school work. After all, hadn't the Memphis City Schools instituted a mammoth computer literacy and education program? Perhaps Kathy and Christy would be able to reason with the computer if I could not.

Over the last six months a magical transformation has taken place. Now when I go into a local department store, I sneak like a hippopotamus over to the computer display area. I roll up my sleeves, crack my knuckles, and type in a little four line program. The computer goes

crazy. Little kids look up from their consoles where they are playing TI Invaders or Munchman. Mothers snatch toddlers up into the protection of their shopping carts. The clerk whispers, "Who was that bearded man, anyway?"

Hi-ho, Silicon! Let the chips fall where they may!

Judy, my wife, has become a computer widow. If the family wonders where I am in the house, they have only to listen for a while. Inevitably, there will emanate from the deepest recesses of our spare bedroom a sound which would instantly win me a role as Renfield in a play about Dracula. Heh-heh-heh-heh-h-h-h-h-h. Another program has been freed of all its "bugs."

Recently I was forced to take the computer to the planetarium, so I could take walks with Judy at night. I have found considerably more harmony at home while the computer has found a home at the office.

A year ago I was dead set against the purchase of a computer. I didn't need one to compute my budget, balance my checkbook, or figure my income taxes. (Judy does that.) And I still don't. But I do need a computer to calculate planetary positions for a year for which I have no Astronomical Almanac. I do need a computer to print out an ephemeris of the positions of Halley's Comet for the winter of 1985-86. I can use computer software which will produce an animated display of Kepler's Second Law of Planetary Motion. The computer software is cheaper and more versatile than 16mm film or videotape.

You will find elsewhere in this issue of Southern Skies reviews of four computer software programs.

Four more will be reviewed in the next issue. If you are currently using commercially available or homemade astronomy software with your computer, write an article about it, and send it to Jack Fletcher. We who are now on intimate terms with computers would like to know about what's available, what's good, and what's not.

Astronomy Computer Programs

EPHEMERIS V

Ephemeris V is a planet finder program for the Timex Sinclair 16K computer. It loaded in one try and ran automatically. After briefly displaying the title, author, and copyright statements, it asks for information about the user's location in time and space. Inputs are required for the user's latitude and longitude (in decimal degrees), the date (as an eight-digit) number, and local time (using a 24-hour clock). There was a thoughtful reminder to subtract an hour for daylight savings time.

Since Ephemeris V is advertised as a planet finder, the program next asks what planet the user wants to find. The only one I could see the evening in question was Jupiter. I pressed the appropriate key for Jupiter and, a few seconds later, the television screen was filled with information in a neat display. Information included my latitude and longitude, local sidereal time, the current phase of the moon, the constellation in which Jupiter was located, and Jupiter's coordinates in three different systems: right ascension and declination; altitude and azimuth; and plain English.

The next screen is a menu of eight choices, the most impressive of which is a graphic display of the sky--a 50° section of the ecliptic including the planet just found and the nearby constellations. The position of the planet is indicated by a flashing 0.

The same information can be obtained for another planet, the sun, or the moon. If the object is not in the sky at the time specified during the set-up phase, the user is told this

information along with the time of the next meridian transit of that object.

Other options allow the alteration of the latitude, longitude, date, and time of observation. The last option is to find a "given point," essentially a process by which right ascension and declination of the "given point" are converted to altitude and azimuth.

The only problems I found with Ephemeris V are in this option. When the right ascension and declination of the given point are input, the display shows the right ascension one minute less than the value input by the user. If the observer's local sidereal time and 0° declination are the inputs, the azimuth displayed should be 180°, and the altitude displayed should be the same as the altitude of the observer's celestial equator. Instead the program "crashes" and reports an error code that means an arithmetic overflow.

Despite these two minor problems, Ephemeris V is an impressive program. It can tell the user the required information for any year between 1920 and 2020. For the next SEPA Conference in Bradenton, Florida, Ephemeris V indicates that Mars and Saturn will be in conjunction in Libra, and that the third quarter moon will rise just in time for a midnight swim on the 21st (of June, 1984). It would make a great interactive lobby display for a science museum. Visitors could easily follow the prompts once the set-up phase is completed. I know I'll use Ephemeris V to provide answers to those off-the-wall questions I get by telephone about when the moon will be full next May and where to look in the morning sky for Venus and Mars.

Ephemeris V is available from Robotec, Inc., 59 C Street, Ampoint Industrial Park, Perrysburg, Ohio 43551. The cost is $14.95 + $1.25 shipping and handling for mail order for the cassette and the accompanying documentation.

COMET

"Comet" is a Timex Sinclair 16K computer program which produces an ephemeris of the position of a comet, an asteroid, a planet, or the sun from its orbital elements. There are five pages of documentation. Upon loading, the program shows the object's distance from the earth and from the sun. The other shows the objects magnitude and its angular distance (elongation) from the sun. Both formats display right ascension and declination of the object as well as the date and time it will be in that position.

Position can be shown for one time only or four hourly (or multiples of one hour) or daily (or for multiples of one day) time intervals. Think how indispensible such a program could be when the local news media want to know where and when to look in the sky to see that newly discovered comet.

Since "Comet" comes with the orbital elements for Halley's Comet already defined within the program, you'll have no trouble printing up your star maps for the winter of 1985-86 and showing exactly where Comet Halley can be found in the sky.

If you want an ephemeris of some other comet or of a major or minor planet, you'll have to enter some information on the orbital elements of the object in question. And where is that information to be found? Why, you're about to utilize parts of your Astronomical Almanac you never even knew existed. The information requested is found for major and minor planets (asteroids) in the current edition of The Astronomical Almanac on pages E2-E4 and pages G10-G12 respectively. For cometary orbits the information will be found in the International Astronomical Union circulars for comets and newly discovered asteroids.

After the prompted entries for the object's name and orbital elements, "Comet" asks whether a TV screen display or a hard copy printout is desired. Next it asks whether to

display magnitude and elongation or earth and sun distances. Finally the date for which the ephemeris display should begin is requested. The user must also specify the time intervals between calculated positions. A wait of several minutes is now at hand. The computer is making the calculations and preparing to send them to the TV screen or to the printer. The wait is rewarded with all the information promised neatly tabulated.

"Comet" is not for the person who just wants to say he saw a comet once. It is for the serious astronomer/astronomy educator who wants to track the movement of a celestial object.

"Comet" is $11.95 and is available from the author, Robert C. Moler, 5999 Secor Road, Traverse City, Michigan 49684.

COMET HALLEY

DATE	DIS/E AU.	DIS/S AU.	R. A. H	R. A. M	DEC. D	DEC. M
1985						
NOV02	1.04	1.9	05	17.9	+21	56
NOV12	0.79	1.76	04	21	+22	16
NOV22	0.64	1.51	02	44.5	+19	51
DEC02	0.63	1.46	00	51.9	+13	41
DEC12	0.77	1.31	23	30.4	+05	10
DEC22	0.96	1.15	22	42.4	+00	18
1986						
JAN01	1.16	1	22	13	-02	43
JAN11	1.34	0.85	21	52	-04	48
JAN21	1.48	0.72	21	34.2	-06	37
JAN31	1.56	0.62	21	15.4	-05	34
FEB10	1.54	0.52	20	58.1	-10	53
FEB20	1.43	0.63	20	40.1	-13	38
MAR02	1.24	0.74	20	22.8	-16	55
MAR12	1.01	0.88	20	03.1	-21	15
MAR22	0.75	1.03	19	31.4	-27	54
APR01	0.53	1.18	18	16.1	-39	10
APR11	0.42	1.34	14	48.7	-45	44
APR21	0.55	1.49	11	51.9	-30	43

GALAXY

"Galaxy" is a Timex Sinclair 16K Computer program which can simulate the appearance and rotation of spiral galaxies. It loads in a short time and runs automatically. The program first offers a choice between Keplarian rotation and the creation of a spiral of Archimedes. The latter is better for some Sc type galaxies. (Kepler's Third Law of Planetary Motion says that material farther from the galactic center revolves more slowly than does material closer to the galactic center. Type Sc galaxies are loosely wound spirals with small nuclei. Now aren't you glad you didn't have to look up that information?)

You can create your own galaxy by deciding upon the following: whether your galaxy will be a spiral or a barred spiral; to what percent of the galactic radius the bar, if any, extends before it breaks into a spiral; and to what percent of the galactic radius the nucleus extends. Your next decision is whether you want to view the galaxy from a polar or an equatorial position or some angle in between 0° and 90°. Sorry, the program does not provide a three-dimensional view, so don't expect a central hub with the equatorial view. Finally you are asked whether you want to view a continuous display of the galaxy's rotation from time 0, in increments of 20 (arbitrary) time units, or at one particular time after the initial position, a horizontal bar, at time 0.

The display can be stopped and conditions altered at the whim of the user. Simulations of known spiral galaxies, for example, M31, M51, M81 and NGC 1300, can be quickly carried out by entering the appropriate parameters. For the above four galaxies the data provided within the two page documentation is all the information you will need.

After I saw title slides animated via an Apple II computer at last August's SEPA Conference, I can hardly wait to start making dissolve sequences of rotating spiral galaxies with the images generated by this program.

"Galaxy" is $9.95 and is available from the author, Robert C. Moler, 5999 Secor Road, Traverse City, Michigan 49684.

ORBIT

"Orbit" is a demonstration program for the Timex Sinclair 16K Computer. The program displays orbit shapes as a function of eccentricity and also produces an animated display of an object with Keplerian motion in that orbit. Kepler's Second Law of Planetary Motion states that an object sweeps out equal areas within the orbit in equal time intervals.

"Orbit" loaded in one try, and it ran automatically, presenting two choices for display:

1. Orbit Shapes
2. Keplerian Motion

If the first option is chosen, the user is asked for the eccentricity of the orbit to be plotted. For circles and ellipses the largest orbit that will fit the display screen is then drawn by the computer. For parabolas and hyperbolas the user is asked to decide by how many pixels the focus and vertex of the orbit should be separated. Suggested separations are provided in the two-page documentation. For consistency all orbits are aligned with the right edge of the display screen.

Option two asks how many positions are to be plotted on the orbit and then asks for the eccentricity and focus/vertex separation distance. The display on the screen can take several forms:

A. A single animated point continuously moving along the orbit.

B1. All points plotted in sequence and left on the screen, the screen erased when the orbit is completed, and then continuous repetition of this sequence.

B2. Display B1 halted, instead of erased, upon completion of the orbit.

From the halted display, B2, a copy of the orbit may be printed. All formats return the user to the master menu.

The documentation accompanying "Orbit" says it is an educational demonstration program. It would be more educational if it contained a brief tutorial section on how eccentricity affects orbit shapes and the different classifications into which conic sections fall. This tutorial section could be accessed by users unfamiliar with the concept and bypassed by experienced users. It would also be quite instructive to see appropriate lines drawn from a focus to adjacent points plotted on the orbit to clarify the concept of equal areas swept out in equal time intervals (see slide #65 from your "Cosmos" set).

"Orbit" will be useful to the planetarian to produce dissolve sequences of orbital motion. The slingshot effect of a planet's altering the speed and direction of a spacecraft is easily shown with this program.

"Orbit" is $9.95 and is available from the author, Robert C. Moler, 5999 Secor Road, Traverse City, Michigan 49684.

Planetarium/Space Theater

by A.F. Jenzano
former Director of
Morehead Planetarium and
Astronaut Training at UNC

When is a planetarium not a planetarium? When it is a space theater.

Planetariums utilize theatrics to provide entertaining education. Space theaters utilize theatrics to provide educational entertainment. This distinction in media philosophy accounts for their design differences in projection systems and surfaces, which sometimes facilitates mutually rewarding, supplemental programming.

Planetariums are composite optical instruments with separate projectors which produce solar and stellar images in coordinated motion over 100% of a concentric, horizontal hemisphere (dome). Supporting theatrics can be superimposed anywhere on the entire sky dome. The total view simulates the natural sky for any cyclic time and location on or about the earth.

Space theaters are wide film projection systems with a high intensity light source to cover 80% of a tilted hemisphere (screen). Supporting astronomic effects are computerized, superimposed projections, usually favoring visibility in the forward motion picture area. The total simulation conveys 3-D impressions of geographic or cosmic scenes, and of sensory motion by the observer with respect to the projectied environment.

A full awareness that space theater programming has evolved dramatically from conceptual planetarium interdependence to enterprising entity independence developed on my trip home from the last International Planetarium Society Conference. My appreciation of this was later reinforced after reading the fine feature, "San Diego's Adventure in Space," by Pamela D. Crooks in the Februry issue of Sky & Telescope.

From Vancouver, I took the opportunity to stop over in Minneapolis-St. Paul for demonstration visits with Maxine Haarstick at the Science Museum Planetarium, and Mike Day for two different, dynamic Omnitheater shows. These respective professionals made no pretense at facility duality, competition, or conflict in principal program purpose. The wide screen shows are accurate billed as "the most vivid moviegoing experience of your life." As an added personal opinion, the filmed stars seemed to complement picture integrity better than those projected separately.

Thereafter, I visited Tom Callen at the National Air and Space Museum in Washington, DC to see his super planetarium presentation in the Albert Einstein Spacearium, and to witness another wide screen spectacular in the adjacent Samuel P. Langley Theater. Proximity notwithstanding, there is strong popular support for both of these cultural resources. Together they attract about a third of the total attendance to the entire institution.

Space theater projection systems require standards of tilted screen reflectivity, size, shape, and position which are inconsistent with features needed for the kind of astronomy education being effectively disseminated under horizontal domes at hundreds upon hundreds of well established planetariums.

With a tilted screen configuration, time-tested techniques for presenting elements of astronomy, especially to novices, are rendered inapplicable. In example, there is no terrestrial horizon from which to realistically reference and demonstrate principles of navigation, circumpolarity, and celestial phenomena such as risings and settings, seasons, or "the midnight sun." In addition, fruitful student participation, especially at the cardinal points, is unfeasible. Finally, random observation and comparison of widely separated celestial objects is very inconvenient for individuals seated far in front of the gravity zenith. None of these instructional inhibitions is encountered with a conventional planetarium complex.

Twenty-three years ago, America's astronauts began celestial study sessions with a Zeiss instrument and Mercury space capsule simulator in the Morehead Planetarium at UNC. Throughout fifteen years of their training, the horizontal dome horizon proved to be an indispensable reference plane for uncomplicated learning and practicing for mission launches and on-board experimentation. Also, it was vital to expedient realignment of celestial circumstances in order to preview potential delay options for just about every mission.

Fifteen years ago, most planetariums began to experience economic pressures building against free public services and nonprofit educational programs. In defense, it became necessary to reduce or terminate many of these activities, employ more sophisticated spatial effects, and exploit extra-curricular revenue sources. These soon developed into enterprising space and sensory oriented programs...the precursors of the space theater concept. As an example of the contemporary "sensory over teaching" precept, Mike Sullivan, first Director of the San Diego Space Theater, described their underlying purpose, in part, as follows: "Rather than tell you the names of five stars, or teach you to find your latitude, we want to bring you an appreciation of the universe..."

The epitome of technical and educational compatibility of the two concepts was formally realized with the October 1980 marriage of Zeiss' Model VI and Imax's Omnimax in the Hong Kong Space Theater, where they function coordinately under the same horizontal dome. Next to having joint facilities when affordable, this combination pioneers an ideal solution. Alternatively, where funding is limited, I strongly advise new planetarium oriented prospects to "go horizontal" and theater advocates to "go tilted."

Fortunately, many planetariums managed to survive the space theater outgrowth period. Better still, there is a refreshing return to factual astronomy programming in both school units and public presentations. Today's sophisticated audience is not satisfied with an exciting theatrical experience, but requires an accurate and realistic astronomical simulation as well. Perhaps it's because prevailing data from NASA missions and probes have transformed some of our space trip fantasies into space science curiosities.

So You Gotta Write A Script

by Dr. William Gutsch*

At the recent SEPA meeting, I was asked by Ken Wilson (of the Science Museum of Virginia) to take part in a Writers' Workshop along with Phil Groce, Duncan Teague and Lauray Yule. A bunch of you folks were in attendance, and I hope you had as much fun as I did. Jack Fletcher was there and asked if I would write an article on script writing for an issue of Southern Skies. In time, I hope Phil, Duncan and Lauray will similarly be asked to etch their thoughts in ink. (Rule #1: Don't mix metaphors!) So here, for those of you who

A) couldn't make it to SEPA
B) slept late and missed out after doing naughty things in the Hospitality Suite the night before
C) were silly enough to have gone to that OTHER seminar that morning, or
D) were in faithful attendance but had your tape recorder break down...

are some of the personal pearls of wisdom I vaguely remember dispensing that sultry Virginia morning.

I. Getting Started

The first thing I have to tell you is something I'm not going to tell you--namely how to go about writing a planetarium script. This is partly because I've found that ultimately most generalities get you in the neck and partly because I never write two scripts in quite the same way. Sometimes, I start with an outline. Sometimes, I don't. Sometimes I write from beginning to end. Sometimes, I really don't have a firm feeling about what I want my opening statements to be until I've written the rest of the show, so I

write the beginning last. I really don't think this is a lack of discipline. I think it comes down to starting different projects with what seems natural to you as an individual and to that particular project at the time in question.

Don't get hung up on procedure. Go with your own flow. Mel Brooks once said, "A good script writes itself." From my experience, I tend to agree. If writing a particular script comes about as easily as pulling teeth, it will likely also be painful to your audience. If you hit a real block, go on to another part of the show and come back to the problem area later. If you run into lots of blocks, maybe the best place for that whole script, at least for the time being, is in a drawer and not in your theater.

II. Using the Medium

Recognize the strong points of your planetarium as a medium and write for them. We all share certain things: a dome and stars. It's our best "special effect." But above and beyond this, the planetarium is a medium which in a very unique way can literally surround an audience with sight and sound. TV can't. Movies can't. Even I-MAX doesn't. Write with constant thought to what your audience will experience and USE THE DOME.

The annotations in the margins of a script are as important as the script itself, and the first obligation to put those annotations there should fall on the writer. If you have a paragraph of script and you can't come up with something new for your audience to look at, and others on your staff can't either, it's probably wise to consider ripping out that paragraph. If it's great prose, fine, save it for that wonderful book or magazine article you're going to write someday. Don't stick it in your show and stick your audience with it.

One example I cited at SEPA of "using the dome" is launch sequence we once did in a sci-fi show at Strasenburgh. The time setting is something like the year 2010, and the world is about to be destroyed in a collision with a renegade planetoid. In the scene in question, the U.S., the U.S.S.R., the Chinese and "the Arab-Israeli Coalition" are all going to be launching some of their nuclear warheads simultaneously to try to blow the thing to kingdom come.

We started the scene with the countdown at T-20 seconds in English as a hemispherical "window" showing the American launch complex was faded up over about 1/4 of the dome. At about T-16 seconds, the countdown cross faded to Russian as a second "window" was added showing the Russian launch complex. At about T-11 seconds, we went to Chinese. At T-7 we, in turn, had the track go to Hebrew as the fourth "window" was added and we filled the entire environment of the dome. For "3, 2, 1, ignition, etc." we were back in English and on cue, the rockets in all four launch sub-scenes lifted off their respective pads. An example of how carefully thought out script can dictate both the audio and visual devices used in a scene which, in turn, take good advantage of the planetarium screen as a unique A-V environment.

III: Topics and Treatments

A common problem with many planetarium shows (including some I've written) is a tendency to wind up telling most of your audience more than they ever wanted to know about (fill in the blank). A good example is ASTEROIDS...but I doubt it. The truth is there are only 3 people on this entire planet who really care 45 minutes worth about ASTEROIDS... and they're professional astronomers who make a living studying the damn things and for some unaccountable reason aren't sick of them yet. Extensive surveys show that the average person, even when "in the mood," is only being more than polite if not falling into a coma after hearing 5 1/2 minutes about ASTEROIDS and that includes the fact that there are big ones and small ones and really dark ones and one named Bertha. And don't tell your-

self, "It's good for those folks in the audience." They don't really need to know a whole lot about asteroids to get to heaven or even become socially acceptable.

So...don't eliminate the word asteroid from all future scripts. Just put things in perspective and say a few neat things about asteroids in conjunction with a broader topic with more mass appeal, such as in a solar system show or in a show that deals with a lot of different serendipitous discoveries in astronomy or whatever.

How can you tell if a show topic you're considering has the potential for mass appeal? (Remember most of us do have to pay the rent as well as enlighten the human race.) Imagine doing a 30-second TV commercial about this particular show. Imagine someone has given you enough money to do a really good 30-second TV commercial. Only rules: 1) you can only show visuals that are really in the show and 2) you can only talk about things that are really in the show. (No dancing girls in your show? You can't show dancing girls.) Okay, now picture this commercial being seen by two people sitting on a sofa at the end of a long, hard day in East Rutherford, New Jersey, during a break in Hollywood Squares. If at the end of imagining this couple watching your commercial, you can imagine them grabbing each other and saying, "Oh, oh, let's run right down there and see that!" and you're not smiling... you probably have a good idea for a planetarium show with good general appeal.

IV: Experiment

Don't be afraid to experiment with new types of programs. Documentaries are the standard meat and potatoes of planetariums, but over the years many of us have experimented with science fiction, poetry and even comedy as vehicles for sharing knowledge and excitement about the universe. It's good for us as writers and producers because it allows us to stretch our sense of what the planetarium as a medium can do. And it's good for our public because it teaches them to always be prepared to see us in a new light. People return to the same movie theater again and again because they are always showing new movies. The same can and should be said for your planetarium.

V: Breathing and Shutting Up

Lastly, recognize the fact that while it's your script and the script is a very important part of your show because it conveys all that wonderful knowledge you're just itching to convey, one of the most important things a script writer can do is "know when to shut up." In other words, don't overwrite the show. A script that babbles at people non-stop is counterproductive. The audience won't remember all that stuff anyway. Give the audience breathing time by giving visuals and music the opportunity to carry portions of the show. You'll not only have a better production, but you may actually find your audience remembering more because you periodically gave them time to absorb things before going on. Remember, if affective response isn't high, you can't expect much in the way of cognitive gains.

And, with that, I'll shut up.

*Dr. Gutsch is currently Chairman of the American Museum-Hayden Planetarium in New York. From 1973 to 1982 he was Staff Astronomer and Script Writer for the Strasenburgh Planetarium in Rochester.

Fire in the Planetarium

by Robert C. Tate
Harper Planetarium
Atlanta, Georgia

One of the worst disasters to occur in a planetarium is a fire. Naturally all planetariums, being civic minded (and government inspected) public meeting places, have appropriately located and maintained fire

extinguishers to put out the fires caused by dropped cigarettes and by vandals in the restrooms.

The most damaging fire, however, can be in the electronic controls of your console. Here a small relay or other component can do just enough damage to bring out the fire extinguisher. Then the real damage occurs as you blast a water jet into works, destroying all sorts of components and shorting out your circuits (and possibly shocking a few patrons). If you use a powder-type extinguisher, you are in for hours of work cleaning residue off circuit boards, recorder heads and relays. CO_2 extinguishers are so cold that delicate IC's and transistors can be destroyed if sprayed. What's a planetarium director to do?

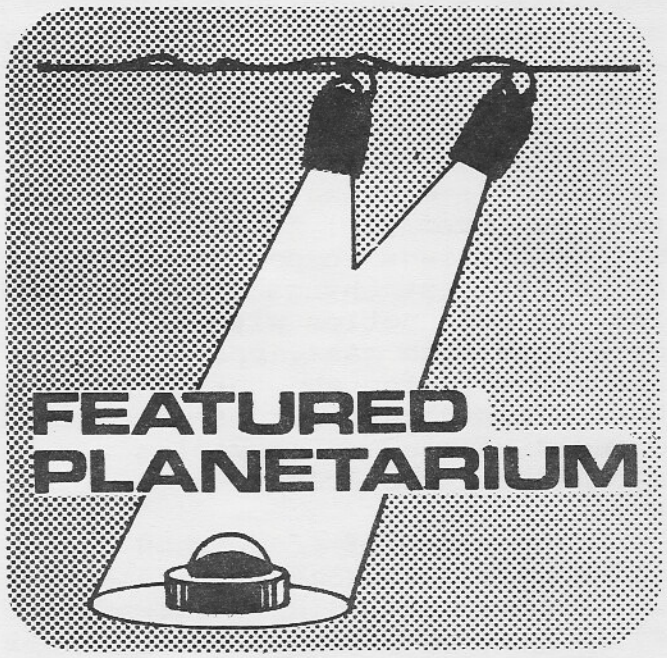
The answer is a fire extinguisher filled with Halon 1211. This stuff is not as cold as CO_2 so it won't destroy components, leaves no residue and doesn't short out circuits. A five-pound extinguisher should cost about $60.00, which is a lot less than the cost of rebuilding all your electronics. GET ONE!

FOUND!

by John Hare
Bishop Planetarium
Bradenton, Florida

The Bishop Planetarium is pleased to announce that the position of Planetarium Specialist has been filled. Elizabeth S. Wasiluk (Betty) has joined our staff effective October 1983. Betty is a six-year veteran of the profession. She worked at planetariums at Cheektowaga and S.U.N.Y. Buffalo while doing undergraduate studies, served as director of the J.M. McDonald Planetarium, Hastings, Nebraska, and most recently as a graduate teaching assistant at S.U.N.Y. Buffalo while earning her Master's degree.

Betty describes herself as "extremely dedicated or a complete masochist." Those of you already acquainted with Betty probably know she possesses the necessary state of mind to survive in Bradenton.



The Planetarium at the
St. Charles Parish Library

The Planetarium at the St. Charles Parish (County) Library is a small (6.1 m / 20 ft.) facility located in the western portion of the Parish, which is divided in two by the Mississippi River. Located about 30 miles west of New Orleans near the town of Luling, the Planetarium is one of two public planetaria in the New Orleans metropolitan area.

One of the most unique features of the Planetarium is the fact that it is part of a public library, one of only a handful in the nation. This makes for some obvious advantages (i.e. proximity to research material). Administratively, the Planetarium is treated as an educational branch of the library and is given a modest annual operation and maintenance budget. Currently there is one full time and one part time staff member working specifically for the Planetarium. There is also a small cadre of very active volunteers here as well.

Physically, the Planetarium is attached to the West Regionaly Library Building. By locking two doors, the building can be divided into two separate buildings. The Planetarium has a separate front entrance and lobby. The original

plans for the building (opened 1977) called for a large meeting room. Some forward-looking members of the Library Board of Control arranged for the pre-construction conversion of the meeting room into a planetarium sporting a fiberglass dome in the 30' x 40' room.

Originally, the Viewlex Apollo III projector was operated using the standard Viewlex automation system, with the console located beneath the projector in the center of the chamber. But since the planetarium was not being used as such all of the time, it was also booked as a meeting room. Because the seating wasn't fixed to the floor, this dual duty was at least feasible. There was one problem, however: the Viewlex was extremely heavy, and very difficult to move, although it could be done with advance notice.

Over the last few years, numerous improvements have been made to the facility. To make the projector more secure and also more portable, it was taken off the standard control console and mounted instead on an automotive hydraulic lift. The lift and projector (with the former in the down position) are surrounded by a box whose lid can be padlocked when the projector is not in use. This set-up also solves the portability problem since the lift is mounted on lockable wheels. By unplugging two 110 VAC cords at the bottom of the box, the whole thing can be locked up in an adjacent storage room (which also serves as darkroom, electronic shop, wood shop and "breaker-box central"). The Viewlex console has been removed and replaced by a plywood podium at the edge of the dome containing our small array of sound system components and our projector and special effects control system. To operate things we use 3 BSR-type RF dimming/switching units. The keypads are recessed into the top of the podium, along with 3 Ektagraphic remotes and 9 hard-wired lamp/motor switch combinations. The podium is on wheels, and is stored out of the chamber each evening. An additional BSR unit with an ultrasonic hand remote has been added.

The AC power is supplied from above the drop-in tile ceiling in the form of a double outlet. All podium controls (including those for the speakers) are grouped in a large wire-harness which splits into five Cinch-Jones plugs and a lone AC plug (sound system power) which is then plugged into the corresponding outlets in the ceiling. Each group of planetarium effects is assigned to a breaker in the storage room, which insures that an unwanted signal from the BSR units will not turn on a projector unexpectedly.

The current configuration allows us to control up to 16 lamp or motor switches on each of the BSR units. In order to "patch" effects into the system, all we have to do is change the code on the appliance or lamp module which the effect is plugged into.

Our facility offers public shows, school shows, and special group presentations. We do not charge a fee for any of our services. We offer public programs on Monday and Wednesday evenings at 7:30 p.m., with outdoor observing after all shows (weather permitting) using our Dynamax-8, Astroscan 2001, and Celestron 11 x 80 binoculars. School and group shows are given on a first-come, first-served basis.

The planetarium seats 40 comfortably, although for some shows we have had as many as 88 people at one time for a showing of "Planets of Doom." Yes, we can do Hansen shows --a recently installed cove and some well-placed holes in the dome allow for this.

Most of these modern conveniences were in place and operating when I took over as Director in February 1982. I was formerly used to much larger facilities (the Abrams Planetarium at Michigan State University, and the Griffith Observatory in Los Angeles), and thought that I'd be roughing it out in the swamp (we've got one behind the building!). You can imagine my surprise when I found out that my first show was to be the full-length version of "Planets of

Doom"! We could even do 90% of the called-for special effects!

It seemed for a while that my main problem was making people aware that there was a planetarium out here. That was readily solved by contacting the New Orleans daily paper, the local weekly paper, and the Community Calendars of a few radio stations. I have recently started a quarterly newsletter (called "Star Stuff") which highlights upcoming events in both the indoor and outdoor heavens. Our mailing list is fast approaching 500 people.

I extend an open invitation to all SEPA members to visit our facility. You might be pleasantly surprised.

(In-House) Laser Shows... A Long Term Proposition

by John Hare
Bishop Planetarium
Bradenton, Florida

Historical Perspectives

The earliest records of lightshows in a planetarium come from the Morrison Planetarium in San Francisco. Between 1957 and 1960, Henry Jacobs, a musician, and Jordan Belson, a filmmaker, combined efforts with Dave Perrazo, a student artist, and others at the planetarium. A number of shows called Vortex and later Vortex II were presented between 1957 and 1960. The shows were set to a variety of music and a number of special effect projectors and traditional planetarium projectors provided the visual support.

The shows were described as "experiments in visual and acoustic space."

These ended in 1960 when the planetarium withdrew its support.

Vortex III was presented by David Rodger in Vancouver with the same artists in the mid 1970s.

There seems to have been a gap then until the late 60s.

Salt Lake City, that hotbed of radical activity, seems to have been the next chapter in lightshow development. A group called the "Rainbow Jam" produced a show that combined synthesizer music and lighting effects. In addition to the Hansen Planetarium, the show was presented at the Gates Planetarium in Denver.

Upon hearing of the successes of that production we at Abrams Planetarium at Michigan State University inquired as to the possibility of their coming to East Lansing. For whatever reason we were never able to bring them there, so we began exploring the possibilities of doing our own production.

Being in the center of a college campus with 40,000 students, we decided that our best chance would be a show set to rock music; and since the ones we had heard about had live music, ours was going to be live too. A local promoter put us in touch with a band and a group of hippies calling themselves "New Eye See the Light Show." The show ran for three weekends in November of 1970 and averaged 138% capacity. By 1971, Steve Benedict of the light show was employed by Abrams as a technician, and we began producing our shows 100% in-house.

Steve Benedict left Abrams and took his increasingly sophisticated show on the road to a number of planetariums, finally going to a recorded soundtrack in 1974.

We at Abrams continued developing our hardware and software and began using lasers in 1973 for nothing more than "music vision" effects.

1973 marked the opening of Laserium in Los Angeles at the Griffith. That was followed in 1974 by additional shows at the Gates in Denver, and the Hayden in New York City.

The successes of Laserium, and to a lesser degree Eye See the Light Show, Heavy Water, and others, initiated a controversy that still has not totally abated.

It seems to me that an increasing number of people, from planetarians to independent laser show personnel, feel that perhaps it was a fad that is now on the decline. I believe that is totally wrong! But, it is wrong only if we take some very positive action. I'll get to that in a minute.

Why Do It?

Before we worry about setting up the right kind of show, let's sell the Board of Directors, the museum director, or whoever it is that has the final approval, on the idea of doing a show in your facility. Most likely, your primary reason is to increase your revenues. There's no question that that will happen. How much depends on a number of factors, but is most affected by whether you are contracting the show, and therefore netting in most cases considerably less than 50% of the gross, or doing it yourself and netting 100%.

The indirect benefits of running a laser show can be quite significant. People who would have never visited your facility before have all of a sudden "discovered" a whole gamut of activities that take place under your roof. Your laser show program guides of course should mention all of these events. Offer a discount on your starshow tickets when they buy laser show tickets. Our evening starshow attendance has increased threefold since we began laser shows, and our overall starshow and museum attendance, exclusive of laser shows, has increased from 38,000 in 1979 to 71,000 in 1982. Attendance at our observing sessions has also increased significantly. If you have an information line, put your laser show information after the starshow and observatory information. That phone number should be included in all of your advertising. Have your planetarium logo on your laser show T-shirts.

The improvements you make to your sound system will mean that all of your shows will sound better.

The exposure by media coverage of your laser shows will in many cases call attention to other programs and activities.

The direct benefits are obvious and can be applied in a number of ways. Since we began our laser shows we have increased our professional planetarium staff from two to four, have increased our museum staff by one professional, and have increased our support staff by one full time and several part timers.

Equipment and facilities upgrading has been taking place at an accelerated rate as well.

What to Do?

Now let's look at the positive action that we as planetarians can take to insure the longevity of the laser show and its accompanying benefits.

When lightshows or laser shows first appeared they were a new and different art form. I like to think of them in the same way as television when it first became widely available. Early TV programming in most cases tended to be simple, poorly conceived, aimed at the lowest common denominator, etc. But, it was new, dynamic, entertaining and very successful. It also evolved tremendously and has continued to do so.

When laser shows or lightshows first open in a given location many enjoy initial and short term success but become increasingly difficult to sell in the long run. Advertising and promotion is scrutinized and adjusted to try to maintain a high level of attendance. Laser show companies will leave a location to relocate at a more profitable site; or in many cases, the planetarium will change companies to bring in a fresh perspective and a slightly different product to hype.

But what is the nature of the product? I recently saw a laser show at a facility that has been running such shows for a number of years. The most recent production was only slightly different from their original, yet this was a different company and a number of years had elapsed. Extensive use was made of laser graphics and other technological innovations not available with the early laser shows. But it was an hour of just lasers. During a quiet part of the show an audience member called out "boring" and there was only a smattering of applause at the conclusion. I doubt that most people in attendance at that show would ever return to another. Also, people can be wowed only so long over a new experience; and assuming the show continues in about the same vein, no matter where you are, sooner or later you will run out of people. So, laser shows are dying, right?

Certainly not in Bradenton, nor necessarily anywhere else with the right approach.

We as planetarians have worked extensively with incandescent special effects for years. We also have pro- duced spectacular starshows that have continuity, good visual support, good audio tracks and impact. Why shouldn't the same principles work for laser shows? The laser should be thought of as simply another special effect. Granted it is your most "powerful" special effect, but by selective use it can have a much greater impact than it otherwise would. We use lasers in just about every song in our lightshows, but in different ways. Sometimes they are used on the vocals, or the instrumentals, or maybe on just the lead guitar or a synthesizer, etc. In many cases the lasers are a backdrop for one or more of an extensive array of incandescent effects. Use your imagination and creativity to design and build your incandescents as you would for your starshows.

In many cases traditional planetarium effects can have a major impact on the show; an earth limb with a rotating space station against the backdrop of stars; the bridge of an alien spacecraft; tumbling asteroids, bolides, zoomed images, gyrating star motion, films, etc.

Video production is an area we have yet to move into, but is only a matter of time before we do.

If outside companies are to continue to be a long term element in planetariums, they will have to evolve their shows much more than they have. Where possible, why shouldn't they turn to use for expertise and assistance, and in turn allow us a greater slice of the pie?

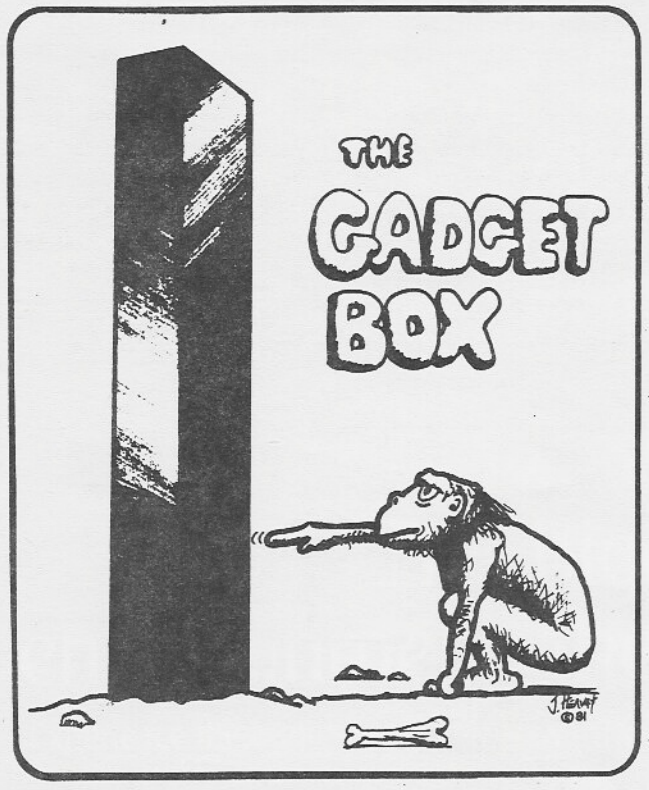
If the show at your facility is dying, don't write it off as a passing phenomenon.

If you're dealing with an outside company, tell them what you feel is needed for them to improve and upgrade their show. Offer your staff's expertise and help in incorporating additional hardware and ideas as available and, of course, for adequate compensation. Several laser show companies support their shows with incandescent equipment but none do to the extent that is easily possible.

If it is your own show that's dying, take a good look at what you are doing. Put the same enthusiasm and creativity in them as you would your starshows. Your starshows don't look the same today as they did five or ten years ago, neither should your laser shows. Unfortunately, too many do.

Today, the debate is no longer, should we be doing laser shows, but rather, how can we best utilize and benefit from such a show in our facility?

A successful, ongoing laser show in your planetarium can allow you to operate an across-the-board expanded operation that can, in turn, better serve the cultural and educational needs of the schools and general public in your area.



Hot-Rod That Carousel!

(But Remember that the Speed Limit is 55 S.P.M.*)

***Slides Per Minute**

by Joe Hopkins

After your morning coffee break in the sumptuous staff Jacuzzi, you may be looking for some worthwhile activity to fritter away the remaining hours before you return to your own palace or pad for an evening of sartorial splendor. How many times have you wished that you could get just a bit more light from that Carousel with the 14 wheels, gels, and bits of broken glass in front of the lens? Or, how many times have you wished for a way to get a bit less light at maximum intensity (and longer lamp life in the process), without resorting to cardboard in front of the lens? You say your light output from your Carousels is just right? Well, how about hot-rodding them for more light output and then limiting the maximum brightness so that an ENH lamp will still put out the same amount of light but last from 1,000-3,000 hours? Then read on, oh children of the sand!

The method I have chosen to generate additional light from the Carousel lamp system does not involve changing it electrically in any way. Instead, we will work on the optical system. By replacing the standard front-surface mirror which reflects the lamp's output through the condensing system (open the lamp door and look), with a mirror which reflects 90% of the visible light strikingit but passes 80% of the infrared (heat) on through to the metal backing plate, we eliminate most of the heat passing through the condensing system. This allows us to remove (Gently! It will shatter easily.) the heat-absorbing glass in the condensing system. This glass robs you of a surprising amount of light. To demonstrate, remove the heat-absorber from an otherwise standard Carousel and set it side by side with a stock projector with the same lamp. There's quite a difference! Incidentally, if you need more light from a projector which will be up for short periods you can just remove the heat-absorber, a Q & D way to hot-rod!

The mechanics of the conversion are simple. Remove the bottom housing of the projector and you will see that the lamp assembly and condensing system are mounted in one corner of the case. After you get good you will be able to remove the lamp assembly without removing the condenser system; for now, remove the condenser system first (carefully!) and remove the mounting hardware from the case. Now remove the hex-head screws holding the lamp assembly in place (do not confuse with the Phillips-head mirror-adjusting screws--don't mess with those.) and pull it out--OOPS! The wires to the lamp socket are still holding it in place! Don't be a dummy like I was on my first conversion and undo and re-splice these wires. The socket is attached to the assembly with a little E-ring;

remove it and the pressure washers under it with a pair of needlenose pliers and the socket will stay wired up in the projector while you work on the lamp assembly.

Now for the fun part! You must remove the old mirror by chipping it away (carefully, please!); I use a small screwdriver to wedge underneath it and I do it over a garbage can to catch the pieces (protect your eyes!). Once you have the mirror completely chipped away you must remove the black silicone adhesive residue on the mirror backing plate (I scrape; there may be an adequate solvent). Now mount the new mirror with 2 or 3 small dabs of white silicone sealant (the heat has to be allowed to pass through to the metal surface), let it dry thoroughly and then reassemble the projector.

The mirror which performs this miracle of modern-day science is usually referred to as a "cold mirror" and the one I use is available as Edmund Scientific part #42,414 (it must be cut; make sure the person cutting is careful because both sides are coated) and it yields six mirrors of almost identical size to the original Kodak mirror.

Now that you have increased your light output (or even if you haven't this mod works equally well on stock projectors) you may want to limit your maximum brightness level to a level somewhat less than full (particularly in smaller domes with control systems which won't do this for you), if you are getting too much light. To do this is really simple. It merely involves putting a limiting element in series with the lamp. Something as simple as a resistor will work, but you probably want it to be adjustable and adjustable resistors to carry the lamp current are not small. As we would like for this assembly to fit inside the Carousel we must look for something very compact.

Since you can wire two dimmers in series with a lamp load (one to do the dimming up and down and the other to set the maximum level) we're going to put a dimmer inside the Carousel. Let me stop here and say to those of you who have electrical access to your control system that putting the level-setting dimmers in the system rather than in the projectors is less work and allows you freedom from worrying whether a projector is modified or not.

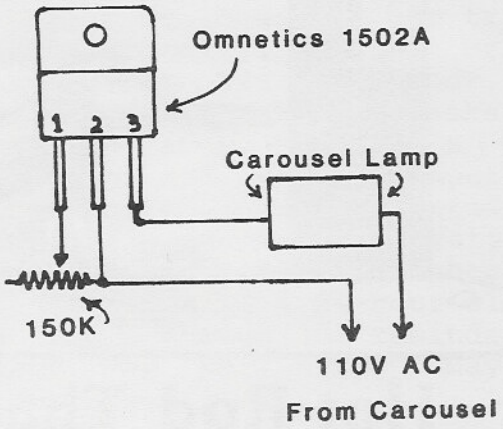


FIGURE 1

The circuit of Figure 1 shows the dimmer--which only has two components! The Omnetics 1502A chip is about $10 and contains all the circuit elements except for the level pot for which we use a little trimmer resistor (or you can drill a hole in the plastic back plate and mount a pot which will give you outside access). I mount the chip using the screw on the fan housing which holds down the thermal fuse (you have to drill the hole on the Omnetics 1502A out a little larger for the screw to pass through); use some electrical tape laid down on the fan housing in the area underneath the chip leads to insulate the connections from the housing; insulate the connections themselves with electrical tape or heat-shrink.

A good time to perform this modification is while you are doing the cold-mirror mod, as the lamp socket will be exposed and you can splice the wiring from your dimmer into one of the wires coming into the socket. (See Figure 2)

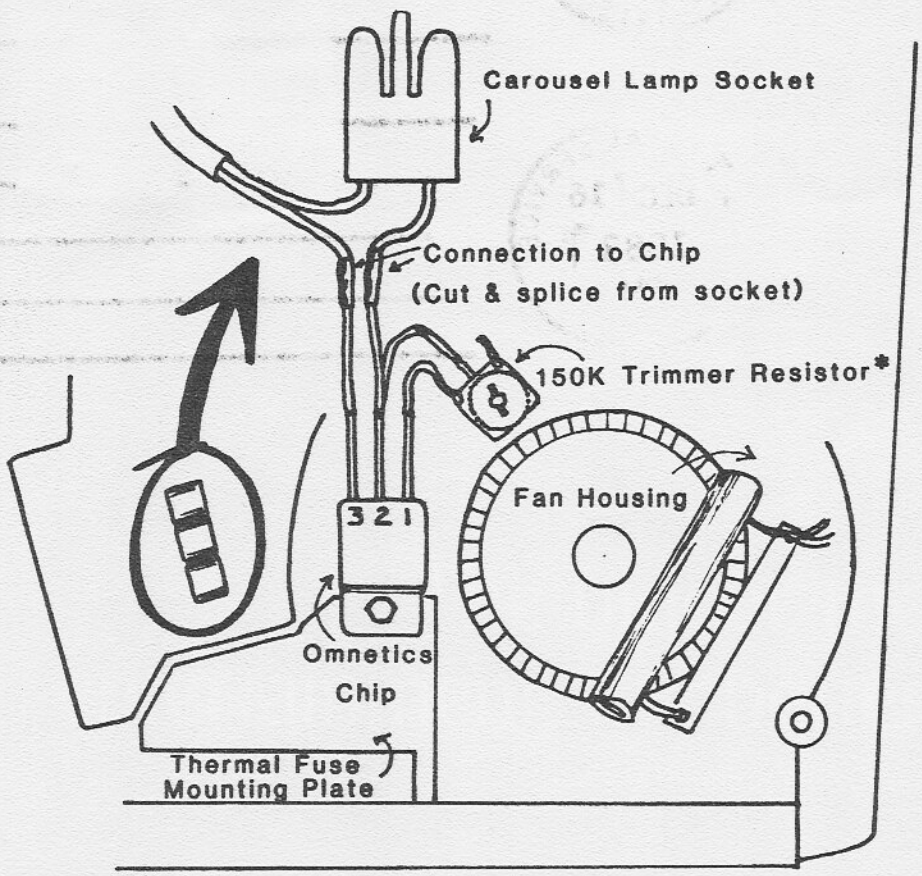


FIGURE 2

Remember! You are dealing with 110 volts AC inside the projector, so be neat and careful with your wiring.

Now you can set your maximum brightness level to anything needed and, with more light to start with from the cold-mirror, you've turned your Carousel into a more versatile piece of equipment (and voided your warranty in the process. Oh well!)

As you re-enter the world of administrators and shoe-laces (which is more important?) remember that it's not how fast the tray goes 'round, it's what comes out the lens that counts! More Carousel articles are on the way. If you have questions or just want to whisper dirty things, contact me.

Joseph M. Hopkins
Technical Director
Bishop Planetarium
201 10th Street West
Bradenton, Florida 33505
(813) 746-4132

NEED LUMILINE LAMPS?

Timothy Bowen, the new director of the Settlemyre Planetarium, writes that he has lumiline lamps for sale. Timothy has approximately 75 lamps (half yellow and half blue). Lamps are slightly used and the asking price is $4.00 each.

If you are interested, contact:

Timothy Bowen
Settlemyre Planetarium
Mt. Gallant Road
Rock Hill, SC 29730
(803) 329-2121