

SOUTHERN SKIES



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E R R A T A

We apologize for this newsletter being about a month late, but some unforeseen events delayed its printing. We will do our best to see that this does not happen in the future. There are also two mistakes that were inadvertently made. Please note the corrections below:

1. Inside front cover - Duncan Teague is now president. Mike Ryan has become our immediate-past president. Duncan's Address is: Craigmont Planetarium; 333 Covington Pike; Memphis, TN, 38128.

John Hare is now president-elect. John's address is: Bishop Planetarium; 201 10th Street, West; Bradenton, FL, 33505.

2. The ending to Mike Ryan's article "How About Something Different for School Shows?" was left out. Our apology to Mike. The remaining portion of Mike's article which abruptly ends on page 7 continues below.

... night city pan and Statue of Liberty large on dome. Scenes from all parts of the country flashed in tempo with the music.

MAKE IT LIKE A MEMORY, Barry Gibb, Instrumental (up tempo). Gell Kodolith fireworks explode in starry sky (a real nightmare to program on my real-time dissolve units).

BREAKDOWN, Alan Parsons project, (only finale of cut used). Statue of Liberty once again appears. Swirling red colored clouds center on porch. Meteor shower emanates from porch with polarized waving American flag added for finale (apple pie, mother and country).

I have found that a program such as this has a life span of only two years. Since popular music was selected, the numbers would get old if I tried to stretch the show further.

Let's assume you have a program like this in the can. The question now is to whom do you offer it within your school system? Surprisingly, the cross section is quite large and diversified. Obviously your first advertising focus should be toward band and choral classes. But don't make the mistake of limiting yourself only to these groups. Consider, if you will, the following classes who have scheduled field trips to this show: EH classes, EMR classes, TMR classes (TMR teachers have told me that their kids talk about the show for weeks afterwards--these poor kids are never allowed to take any other field trips), art classes, the teachers of which use the program as an introduction for music-inspired art work, and even gifted language-art classes who will embark on music-inspired creative writing assignments.

As you can see, potential is there and has proven its educational worth--at least in our school system. If you haven't tried a program of this nature, it might be well worth your consideration. You might be surprised at the interest you can generate.

I have only two problems which continue to plague me: (1) How do I top what I have just done when it comes time for Concert IV? and (2) what stock answer do I give to the unending request from kids to play Pink Floyd?

Editor

Southern skies



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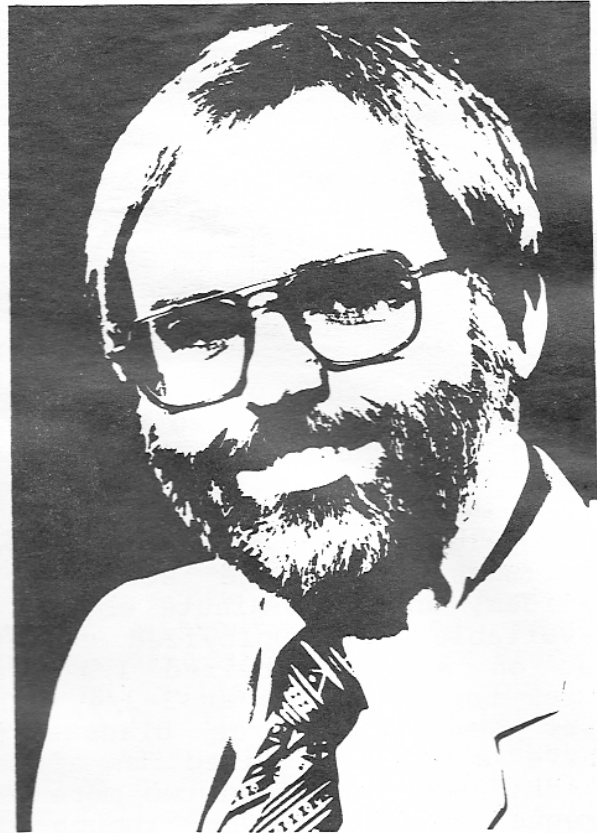
A MESSAGE FROM YOUR PRESIDENT

by Duncan R. Teague

I am filled with inertia when it comes time to begin a writing project. When it is necessary to get the first words down on paper for a personal correspondence, an article for Southern Skies, or a new program script, I have a terrible time getting started. Once started, however, the same inertia keeps me going long past the point at which anything important is said. With this in mind, let me say what is important first.

Thank you, Michael F. Ryan, for the talent and leadership you have given to SEPA as our President for the last two years. Mike's concern, sensitivity, tact, and understanding of both issues and people have shown him to be a rare person. The word "class" comes to mind. There is no more fitting appellation. Class means superior quality and style. SEPA has been imbued with these attributes during Mike's term of office. Whether with a pointer or a gavel in his hand, Mike Ryan's act is a hard one to follow.

The Southeastern Planetarium Association has many of the qualities that give an individual planetarium the potential to do great things: a great staff; excellent internal communication; adequate finances;



and the beginnings of a resource library. As we all have the opportunity to see at our annual conferences, SEPA members really know how to put together fine educational programs in an imaginative and entertaining format. Our Southern Skies newsletter is unsurpassed in its ability to provide solid answers to our questions; keep us informed about new ideas, trends, and developments; and uplift our spirits when it seems that "no one understands." Our dues are adequate to cover our current requirements, and the membership is supportive of necessary changes. SEPA's new script library will be a

valuable resource. Even the most creative person eventually runs out of ways to describe celestial objects and events. The script library will provide you with other talented people's perceptions of your topic of interest. Even with all these qualities SEPA can still do more to realize its potential.

I propose a new project which will involve the distribution of a complete star show on free loan to any SEPA member who wishes to obtain it. The word "complete" implies that the distribution package should contain a well-annotated script, and audiotape, and a set of slides. No items should be available for purchase so that no individual or organization can be accused of profiteering. All items in the package would be on loan for a period of two weeks for reproduction by the borrower.

To initiate this project Craigmont Planetarium is prepared to distribute Jim McMurtray's "Starlight," which was reviewed in the November 1982 issue of Southern Skies. The "Starlight" production package includes a 32-page script, 164 slides, and a 52-minute soundtrack available on a Dolbyized cassette or on a non-Dolbyized 1/4 track reel tape recorded at 3-3/4 inches per second. Three planetariums have already received the "Starlight" materials and two more have requested them even though the availability of the program is just now confirmed. Send me a letter or a postcard if you are interested in borrowing "Starlight." Please indicate your preference of tape format and the best time to send "Starlight" to you.

I hope other SEPA members will respond to this project by offering to share what they have created. The Florida planetariums showed what a consortium can do when they distributed their Bode's Law program in 1978. It is my hope that at least two different programs will be made available each year. The first is "Starlight." What's next?

On a different subject is a recently received copy of a new GLPA booklet, Tips on How to Handle the Handicapped in the Planetarium, edited by Gail Bouslog and David Parker. The 135-page booklet is scheduled for release at the joint MAPS/GLPA conference this May. It contains ten articles and nine complete scripts for programs serving the mentally handicapped, the visually limited, and the hearing impaired. Interesting to note is the fact that 12 of the 19 articles/scripts are authored by SEPA members. To order this or other "Tips" booklets contact David E. Parker, GLPA Treasurer, Tipton Planetarium, 817 South Main Street, Tipton, IN 46072.

Elsewhere in this issue or in subsequent issues of Southern Skies you may find the unrestrained verbiage of several student interns who work with the Craigmont High School Planetarium. Their articles will address such subjects as "What is a Planetarium Intern?," "How to Produce Planetarium Programs for Radio" and "How to Do a Play in the Planetarium." You may enjoy reading the wisdom of these high school students. (Besides, it keeps me from having to write the articles myself for that taskmaster, Jack Fletcher.) These young people were anxious to express themselves. An attempt to get my wife to contribute a column on what it means to be the spouse of a planetarian was met with uncontrollable laughter.

By the way, my sincere thanks go to Media Tech for the nice Christmas present. (It works great, Joe.)

Best wishes to all of you for the new calendar year.

DON'T MESS WITH ME, I'M A PLANETARIUM INTERN

by Mark Stephens, Intern
Craigmont Planetarium
Memphis, Tennessee

"Testing . . . Testing . . . Does this thing work? Ahem! Good afternoon, and welcome to the Craigmont Planetarium! We're happy to see so many bright, smiling faces in the audience today and we hope you will come to visit us in the future.

"If you will look to the rear of the Star Theater you will notice two or three roughly humanoid figures standing in the aisles and leaning on the equipment. Contrary to appearances, these are neither statues, wax-works, nor department store mannequins. They are our Planetarium Interns."

Planetarium Internship is a unique program at Craigmont High School. I have been a Planetarium Intern for two years now and I'm certain that "unique" is the word.

Basically, the program is an academic course in which high school students are allowed to work in the school planetarium for a science credit. Since the Star Theater is located in the heart of a metropolitan high school and since labor is expensive, it only makes sense to use those valuable natural resources who are out skipping study halls and breaking test-tubes even as we speak. (So thought our mentor, Duncan Teague.)

Now, you can't just let anybody run amuck in a room full of valuable equipment. A planetarium has standards to maintain! Besides, running amuck in a room full of valuable equipment should be the sole prerogative of the Director.

So, after being carefully recruited ("We need four volunteers: You, you, you and you."), diligently tested ("Name the ingredients in a Big Mac. You have four seconds."), and painstakingly interviewed ("What did you say your name was?") I was ushered into the august presence of Fred the Planetarium Projector and his nearly-humble servant, Mr. Mister Teague. How awesome! How breathtaking! How strangely human! (and the projector wasn't bad, either). It was a great moment. I had fought the good fight, persevered against incredible odds, strained for the stars! Now, what?

What indeed! From that point onward I was immersed in an ocean of knowledge. I was an integral part of the fine-tuned mechanism a planetarium staff must be. I was in a class that systematically covered virtually every subject known to man.

We progressed from higher math ("Count all the slides in this box. No fair using your fingers.") through physics ("How can I get a ten-cent screw into a dollar-fifty baffle without screwing up a quarter-of-a-million dollar Fred?") through English ("Go bat out an article for the Septic newsletter." "Sure, boss.") to religion (When a massive power failure occurs in a room full of savage fifth graders and today is your day to "wing it" what is left but prayer?).

I have thoroughly enjoyed my stint here at the Planetarium. It is an important part of my life and I am grateful to all concerned. Adventure is the spice of life, and jauntily exploring the universe with a motley crew and madcap captain (no names will be mentioned except to say Duncan Teague) can surely be described as nothing else.

To paraphrase a well-known television show:

"Space, the final frontier.
These are the voyages of the
starship Overpriced.
It's one-day-at-a-time mission,
To explore strange new special
effects,
To seek out new strife and new
vast irritations,
To boldly go where no man wants
to go!"

Mark Stephens, Intern
Craigmont Planetarium

(Mark Stephens is a junior at Craigmont High School. He and Robert Bowers, a classmate who is also a Planetarium Intern, are our resident writers. Mark and Robert extensively revised and adapted two science fiction works for production as Star Dramas, and Mark co-authored our spring 1982 star show, "The Age of Space.")

TRIALS AND TRIBULATIONS

OR

"JOHNNY, WE CAN DO THE PLAY RIGHT HERE!"

by Robert T. Bowers, Intern
Craigmont Planetarium
Memphis, Tennessee

While new ideas are not always well received, I'm going to try to sell you a relatively new one concerning planetariums. At Craigmont High School in Memphis, Tennessee, we have performed plays in our planetarium. On the past three Halloweens we have produced Bram Stoker's Dracula, The Vampire, Sir Fred Hoyle's The Black Cloud, and Isaac Asimov's Nightfall. All of these plays were performed by live actors in the star theater. Successful as these ventures have been, "Star Dramas" remain a relatively untried art form.

Initially a Star Drama may seem to be a difficult endeavor at best, but the major problems to be solved are no different from those found in the production of a traditional drama.

First you need to choose a play to produce. Science fiction or horror themes seem to fit the Halloween atmosphere best, and that still leaves a wide field to utilize, from "Macbeth" to "Visit to a Small Planet." You can use works that were designed for the theater, or you can adapt a work yourself. If you're talented enough, you may consider writing your own play (at your own risk). Any of these alternatives will work so long as the special features of your planetarium are considered when choosing.

Next you need to find a source of talent. Remember you are not recording voices on tape; you need people who can dedicate serious time to rehearsals, performances and, most importantly, planning the cast party. Your best route may be to work with a community theater group. Craigmont, fortunately, has a built-in theater group, its high school drama department.

Once you have conned someone into accepting the role of theatrical director, several potential headaches become his (hers). Holding auditions, choosing stage and props managers, scheduling rehearsals, and advising actors become someone else's problems. Certain problems, however, become yours and yours alone.

For instance, do you have directional seating or concentric seating? If the latter, particular attention must be paid to stage design. Lights for the actors will certainly be in part of the audience's eyes. Is your instrument on an elevator? If so, then you can lower it when it is not essential to the action. Lighting must be carefully designed. It must be able to illuminate the actors without washing out the panoramas. The set change crew needs lots of practice moving props and changing sets between scenes. Why? Have you ever noticed how dark a planetarium is when all the lights are turned off? It is extremely difficult to

accomplish set changes in the dark and SILENTLY! Add some music to provide continuity from one scene to the next and to cover the sounds of the set crew.

None of these problems is insurmountable. In the past two years I have found planetarium directors to be exceedingly intelligent, creative and above all, devious. (Devious? Well, I have worked under Duncan Teague for two years. Need I say more?)

There is a good side to all of this effort. Producing a play in a planetarium has its advantages. Ninety percent of all sets can be done with a panorama system. Special effects which interact with your actors are limited only by your imagination. (What about the one that you've never used before?) Crossfaders are very versatile. And what about your sound system? What sound effects do you have hidden away to complement the mysterious acoustics of your star theater?

All in all, a Star Drama is unequalled in audience enthusiasm, attraction and response.

Robert T. Bowers, Intern
Craigmont Planetarium

(Robert Bowers is a junior at Craigmont High School. He and classmate Mark Stephens, both Planetarium Interns, completely rewrote and adapted for the planetarium our last two Star Dramas, The Black Cloud and Nightfall. Robert and Mark also had acting parts in the productions.)

A DIFFERENT KIND OF RADIO-ASTRONOMY

by Debbie Mapstone, Intern
Craigmont Planetarium
Memphis, Tennessee

As a senior in high school I needed one more class. I was looking for something science related that I wouldn't get bored with in the middle of the year. Fortunately our school has included in its facilities a planetarium. As a Planetarium Intern, I perform a variety of duties including ushering children into the theater, operating the console during the program, and cleaning up the theater after the group has left. One of my other duties is producing three-minute programs called "The Sky Tonight" for broadcast on our school's FM radio station, WQOX, or X-88 as it is known.

The Sky Tonight is broadcast weekly, once during the school day so that other schools can listen in on the program, and once at night just before the station's sign-off time (usually 9:00 p.m.). The Sky Tonight is supposed to be a planetarium show without a planetarium. The first two minutes is a general description of the major constellations of the season. This portion of the program is updated monthly to take into account the changing positions of the constellations. The final minute of the program is more specific, pointing out weekly changes in the appearance of the heavens. Movements of the moon and its passage by bright stars or planets are described. Any special events such as eclipses, meteor showers, conjunctions, and so forth are mentioned. My reference for this segment of the program is the Abrams Planetarium Sky Calendar.

In producing The Sky Tonight we record the music for the program in one channel of a two-track tape recorder. Then we go back and record the narration on the other channel. In this way we can dub over parts of a previous program that are no longer relevant without having to re-record the whole program, and we can retain any still useful information such as they mythology of the constellations described in the first segment of the program.

The final result is a smooth sounding program about the happenings in the sky. In producing these programs I have become much better acquainted with the hard work that goes into producing a radio program or a planetarium program, and I appreciate the end result much more.

Debbie Mapstone, Intern
Craigmont Planetarium

(Debbie Mapstone, a senior at Craigmont High School, has portrayed one of the wives of Dracula and a Russian scientist in two of our Halloween Star Dramas. She is the resident "voice" of Craigmont Planetarium who could certainly warm even the coldest heart to the magic of astronomy.)

HOW ABOUT SOMETHING DIFFERENT FOR SCHOOL SHOWS?

by Mike Ryan

Lake County Schools Planetarium
Howey In The Hills, Florida

For years I have been convinced that there is something wrong with a notion held by many star theaters across the country that the only type of star program to be offered to school children is the basic live lecture. Were I to subscribe to that belief, whatever creative juices I can muster up most surely

would have been evaporated a long time ago and this career would have been degenerated into a "job" with all of the negative and boring connotations one associates with that term.

As a consequence, I have attempted in the last 6 years to stretch the scope of the planetarium into areas which some education purists might find repugnant. Consider, if you will, one such area: music.

Mind you, I am not talking about "light shows." I prefer the term "Cosmic Concert." Some of you may think that I am splitting hairs with this differentiation, yet to me there is a significant difference between the two. (Feel completely free to disagree with me if you wish.)

A light show (at least the majority of the ones I have seen around the country) is designed to blow away the mind (or in the case of some-- induce violent headaches) both audibly and visually. The louder the sound, the more frequent the strobes, the fancier the laser images, the weirder the special effects, the more acid the rock music...generally, the more popular the show is.

Perhaps I should pause here and interject that I do not have anything against such programs. Just look around at any star theater that must subsist on income derived from ticket sales, and you will invariably find that those who have found a market for light shows are the same star theaters who are now on solid financial ground. More power to them.

A school Cosmic Concert, on the other hand, starts with the same basic format--music--but differs in the type of music used and the visuals accompanying said music, and most importantly is of educational benefit, sneaking the learning in while the audience thinks it is being entertained.

In the past six years I have produced three such Cosmic Concerts and believe me when I say that it is no easy task. As you shall read shortly when I delve into the details of my last concert, the selection of the music to be used was the easiest of the production work. It's what you do with the numbers chosen that can tax the imagination. Unlike a traditional star program in which there is a theme to be explored, a concert which uses a variety of musical numbers has no central topic and the mind is left open to a seemingly endless set of possibilities.

Since it is educational in nature, our school concerts have relied very heavily on slides. (Concert III used more than 280 slides divided among 4 Ektagraphics!)

Below is a listing of the musical numbers selected for Concert III with a brief description of how a theme was visually developed to compliment the audio portion.

THE TURN OF A FRIENDLY CARD,
PART TWO, Alan Parsons Project.

House lights dim, rotating star field comes on. F/D sequence shows a poker hand being laid out one card at a time: 3 kings, 1 ace plus one card face down. Hand reaches toward mystery card and flips it, exposing a treble clef instead of expected card face. Kodalith, gelled treble clefs dissolve into main title sequence which credits musical numbers used.

(Note: The following three numbers were incorporated into a 3-part presentation of what I called the NASA story: Part I--Early Failures, Part II--The Eyes of Man (forgive me for stealing your show title, Phil.) and Part III--Images of Reality.)

NUTCRACKER SUITE, Tchaikowsky

Movie of early NASA failures.

FOR YOUR EYES ONLY, Sheena Easton

Slides of Jupiter and moons, Saturn and moons from Voyager probes. A happy accident occurred when the lyrics "But you don't have to read between the lines" were sung and the slides were zeroing in on detail of Saturn's ring system.

NEVER SAY GOODBYE, Percy Faith

16mm film from "Starbound" used with Jack Horkheimer's permission.

SWEET DREAMS, Air Supply

Various slides from TV series Star Trek shown with heavy emphasis on scenes of Captain Kirk with various female members on the show.

CHARIOTS OF FIRE, Vangelis

Laser images (John Hare's scanning design).

BAROQUE HOEDOWN, Perry-Kingsley
(the music used in the Electrical Parade at Walt Disney World.)

Home-made movie of "how not to use a telescope."

TIME, Alan Parsons

Planetarium machine featured. Diurnal and annual motion sun moving against planetarium great circles. Also rotating clock hand shown against clock face.

TOTAL ECLIPSE, Alan Parsons Project

Pictorial history of the rise of Hitler and Nazi Germany.

GENESIS, Ch. 1, V. 32,
Alan Parsons Project

Pictorial history of the destruction during World War II (nothing of a stomach-turning nature used.)

AMERICA, Neil Diamond

Ominous clouds from previous two selections dissolve to starry sky,



LAFAYETTE PLANETARIUM

LAFAYETTE NATURAL HISTORY MUSEUM, PLANETARIUM AND NATURE STATION

by Dave Hostetter
Curator of the Planetarium
Lafayette, Louisiana

The Lafayette Natural History Museum, Planetarium, and Nature Station is a small institution concentrating on exhibits about the people and environment of south Louisiana. The Nature Station, situated across town from the rest of the Museum, features an excellent nature trail, while the Museum itself yearly presents a series of exhibits that are changed frequently so that return visitors always find something new.

The planetarium itself is located in the Museum's lower level, at the north end of the building. The star instrument is your average Spitz A-4, but we like to think that it is installed in a dome theater that's a bit different from most. For instance, all the chairs rotate 360°! This allows us to move the audience's attention to any part of the dome quite easily (but we have to warn the kiddies about falling out!) The southern end of the chamber is squared off, and quite a bit larger than the

dome itself, giving us lots of room for telescopes, workshop tables and chairs, and so on.

The Planetarium was closed for remodeling during the summer of 1981. We installed a couple of projection booths and a red cypress control console, while changing the control system completely. If you attended the Memphis SEPA meeting you may remember that Ray Shubinski was presented with the remains of our old panel--we now have controls by Mediatech. Our standard capabilities include two dissolve units, two-projector animation, carousel zoom and rotator projectors, a pair of cross-fading six-Ektagraphic pan systems, and up to six Ektagraphic control boxes that can be scattered around behind the dome to allow projection in all directions. To this we can add up to twenty-five special effects (we hope to have that many functional projectors by sometime next year), and as many as eight projectors for manual control only. You can imagine how much flexibility that gives us--our main problems are lack of technical staff and deciding just how to vary the system for each program title!

The only full-time planetarium position at the Museum is that of Curator of the Planetarium. Repairs and other technical work are largely handled by a part-time technician who comes in for a few hours a week; other than that we rely on a small gaggle of Happy Volunteers, particularly during show production. We all share the same office/workshop, together with several families of mosquitoes.

We normally do from 3 to 5 public shows weekly, along with telescope observing with a Celestron 8 on clear Tuesday evenings; during the school year we generally see around 12,000 students (from preschool through graduate school), including all third and eighth graders in the Parish school system.

During the summers, the Museum offers a substantial number of public workshops. In the planetarium this year, we offered evening "real-sky" constellation shows, star shows for children, workshops on the operation of small telescopes, and a Space Academy for upper elementary and junior high students. An Autumn workshop giving hints on how to buy a telescope intelligently is scheduled for late October.

As a year-round service, we operate "Lafayette Sky Information," a 24-hour taped telephone message telling callers what objects they can expect to find in the early evening sky.

Our programming generally consists of shows obtained from other planetaria, but we try to do one or two in-house shows each year. Our recent titles include "UFOs: Fact or Fantasy," and "The New Solar System." Christmas shows from 1982 on will be original productions, and we expect to produce a program for Autumn of 1983 about stellar evolution (concentrating on the constellation Taurus). In addition to this, between each "major" program we do a few weeks of live constellation shows while changing effects.

We have a lot of projects to look forward to over the next few years, also. This school year we expect to begin developing PIPS astronomy classes for teachers, special programs for area gifted students, and perhaps public programs with subtitles for the hearing-impaired. The facility may grow, too--we hope to remodel the entrance and exit to the dome itself, and the Museum may get an Education Wing (perhaps with an observatory for the 10" Cave-Astrola reflector recently donated to us). And, of course, we will continue to pester the City personnel administrators for a Planetarium technician.

Meanwhile, any technical wizards with a desperate need for lots of work but no pay can feel free to contact me.

MORE TIPS FROM THE PLANETARIUM

by Bob Tate
Harper Planetarium
Atlanta, Georgia

Tip #006 by Bob Tate

Another free magazine, Functional Photography, is available for the asking from Photographic Applications in Science and Technology, Inc., 101 Crossways Park West, Woodbury, NY 11797. This magazine is designed for people who use photography in scientific applications.

WHY A WORM?, PART II: THE SOLUTION

by Jim Summers
Jim Cherry Memorial Planetarium
Atlanta, Georgia

In part one of "Why a Worm" you shared in our realization that our political well-being and prospects for the future necessitated that we develop some type of programming suitable for young children in the planetarium. Now, self-preservation is a strong motive for action, so it was not long before we began to try out ideas. We were further stimulated in our efforts by the decision to initiate school programs for both kindergarten and first grade students.

Our first program was a simple story called "The Wuzzles and the Wicked Star." It was presented at Halloween, close on the heels of Star Wars, and followed the classic formula of the conflict between good and evil, between darkness and light, at the heart of the film. We were so proud of ourselves! We had written a program for children and it had a clear moral. There

was only one problem; morals are great for children aged 8 years and 3 months to 8 years and 4 months. For everyone else stories with a moral are much like a dose of medicine -- a spoon full of sugar may help get it down, but it's not a whole lot of fun for anyone.

Now, this is not to say that the "Wuzzles" was a disaster. It wasn't. The people loved it, and we enjoyed doing it, because none of us knew any better.

For the time being we turned our attention to the school programs, which resolved into an introduction to the theater and a brief look at the night sky. Our only innovative addition was the construction of a face--two eyes and a big red nose--which we attached to the north star ball transforming the Zeiss into a large, friendly robot. To complete the illusion we added a recorded voice. That voice belonged to Fernbank's resident bug eater and spider expert, Dr. Fred Sherberger.

It never occurred to us that kindergarten or first grade students would recognize the voice, but as luck would have it, some of the students attending the first presentation of the program had just a few days earlier been in one of Fred's classes. From that day onward our projector has been named "Fred".

The next year saw an increase in the number of students in our system attending kindergarten, so the pressure was on us once more to develop some innovative programming for children. Halloween seemed to be the likely time for another try. Enter J. Willard Worm.

The idea for a worm came from an incident some years earlier in the planetarium. Julius Staal was giving a lecture on the planets on a Halloween evening. In the course of the presentation he was to zoom in on a slide of Mars. Unknown to him, the technician had substituted a picture of a grinning pumpkin. Initially there was no discernable

difference. It was not until the audience began to laugh that the substitution was discovered.

It seemed reasonable to assume that if Mars could be imitated by a pumpkin, that we could make some sort of an identification between the red planet and Halloween. Why not have the earth being invaded by flying pumpkins from Mars? It seemed like a good idea, but what kind of a hero could save the earth from an invasion of pumpkins? A pumpkin worm, naturally.

Worms are great characters for stories. They are easy to draw, if you are going to illustrate the story with drawings, and they are easy to make if you want to photograph one in some sort of recognizable situation, such as looking through a telescope or sitting in the the cockpit of an airplane.

A half-dozen styrofoam balls, some odds and ends of pink styrofoam, some Elmer's glue, a couple of tubes of acrylic paint and an eager wife-to-be type helper who is willing to spend her evenings painting a worm is all you need to create a great children's hero.

J. Willard needed one final thing to make him a star. (Approximately one solar mass of hydrogen. Not that kind of star! Sorry.) He needed some sort of audio effect that people would remember. This came in the form of a "chomp sequence".

Take one Welsh corgi named Snorky (who likes to chomp on ice cubes), a bucket of ice cubes and a tape recorder and you get some of the greatest crunching, slurping and swallowing sounds imaginable. Add a crossfade sequence of a pumpkin disappearing in large bites, and the children met their new superhero. Perhaps J. Willard will someday replace Superman, perhaps not. Check this space next issue to find out about J. Willard Worm's success and prospects for the future.

If you need additional cables from your console to your cove, but your architect didn't have conduits for them installed at the time your place was built, you can add them by running a 2 1/2-inch diameter plastic drain pipe (or plastic conduit) straight up from the side of your console into the cove. There will be enough space in the pipe to run lots of wires and they will be out of your way, out of sight, and the fire marshal won't have a heart attack when he inspects your place.

SLEUTHING THE RUSSIAN SPACE PROGRAM

PART II

by Duncan R. Teague
Craigmont Planetarium
Memphis, Tennessee

(This is the second part of a two-part article summarizing a lecture by James Edward Oberg presented at the 1982 SEPA conference. James Edward Oberg is an author, lecturer and editor on the topics of space flights, astronomy and UFOs. Mr. Oberg's lecture was based on his new book Red Star in Orbit, published by Random House.)

In many cases the Soviets have been more successful at public relations than they have been at accomplishing mission goals. When the race to the moon was won by the United States, Russia cancelled its moon landing program for two reasons. There were technical problems and there was a desire to have the world believe that the American achievement was merely a detour on the road to the real goal of space exploration--that of establishing a permanently manned space station in orbit around the earth. A Russian moon landing would have confirmed what they were denying--that they had always intended to go to the moon. Prepared speeches for cosmonauts to read, however, declared that when American astronauts walked on the moon, they would find the footsteps of Soviet cosmonauts already there.

The Russians believe that their's is a society of destiny, of the future. They believe that space exploration is a symbol of a futuristic outlook, and they strive constantly to use their space program to enhance their national image. But the Russians are creatures of habit. So despite their secrecy about their space program, much can be learned about their activities by knowing only a few basic patterns which change only gradually.

If the orbital inclination and altitude of a Soviet launch is known, then it is possible to identify the launch site, launch vehicle and payload of the mission. For 95 percent of all Russian space shots, it can be determined whether a satellite payload is intended for oceanographic surveillance, military communications or spying.

Russian politicians and scientists consistently repeat a litany that they believe mankind's route into space will be through permanently manned space stations. The Soviets are gaining significant understandings of human behavior after extended periods in space, but they cannot resist publicity stunts, even while performing legitimate tasks.

Due to a "life" of only 2-3 months of certain components of the Soyuz spacecraft, a new Soyuz ship must be brought up to a crew occupying a Salyut space station for extended periods of time. A visiting crew would typically bring up supplies and mail to the Salyut crew and exchange Soyuz spacecraft, returning in the old ship. This event was not allowed to become "routine." Instead a "stunt" was staged whereby a "guest cosmonaut," until recently only from Communist bloc countries, was selected to be the pilot for the exchange Soyuz spacecraft. This provided a challenge for James Oberg, sleuth of the Russian space program. He was asked to predict, on one occasion, when the next launch would take place and what country's guest cosmonaut would pilot the mission.

The first part of the puzzle was easy to solve. Due to the laws of orbital mechanics, Russian Soyuz launches always take place every 59 1/2 days. This allows for linkup with the orbiting Salyut space station with a minimum of maneuvering. The second part of the puzzle was a bit less obvious. Oberg, still relying on the Russians to be creatures of habit, noticed that the guest cosmonauts were being chosen in a methodical manner, based upon where the name of their countries fell in (Cyrillic) alphabetical order!

On this one particular occasion Oberg humorously brags that he correctly predicted the Mongolian cosmonaut...with the candlestick...in the parlor. Actually the prediction was for the Mongolian cosmonaut and Soviet cosmonaut to be launched on a Sunday at 6:00 p.m. local time. His prediction was essentially correct. Oberg missed the launch time by one minute! He further predicted a slight departure from the practice of exchanging Soyuz spacecraft. Oberg correctly predicted that the visiting crew would not exchange ships but would return in their own. The reason for this prediction for a departure from the basic pattern was quite subtle, though logical. The orbiting crew's spacecraft was a new design, the Soyuz T. The visiting crew was relatively inexperienced and were not qualified to fly the new ship back to earth.

Major departures from the Soviets' patterned, methodical operations may signify major new developments in the Russian space program. Oberg remarked that a recent two-orbit mission which splashed down in the Indian Ocean may be evidence of a significant new project, such as a Soviet two-stage space shuttle or a new killer satellite. Whatever secrecy or false leads accompany this new development, James Edward Oberg welcomes a new challenge to sleuth the Russian space program.

(Mr. Oberg indicated to me that he would be willing to autograph copies of his book, Red Star in Orbit, and include any dedication as may be desired. His address is Route 2, Box 350, Dickinson, Texas 77539. The price of the book is \$12.95, and Mr. Oberg asks that payment sent to his home address include an extra \$1.00 for postage.)

Tip #008 by Bob Tate

Keep a couple of old catalogs from Sears and from some of the discount houses around. If you need a photograph of some object, you can almost always find one in the catalog. I recently used such catalogs to put together a sequence of slides of clocks for a photographic collage. Two catalogs produced enough pictures of clocks for over thirty slides.

Tip #009 by Bob Tate

Silicone sealant makes great glue for use on special effects projectors. It dries fast, is rubbery, but can take very high temperatures without decomposing. As a bonus, it comes in colors (check local glass companies or plastics suppliers for silicone in colors). You can use black to help make boxes light tight. To clean smears of it, before it dries, use Xylol (xylene).

Tip #010 by Bob Tate

Often you can find a black and white print of the face of some famous astronomer. These might look like old woodcuts. I run across these quite often, and they are needed for history sections of your programs. Xerox these from the book in which you find them, then add a little color with colored pencils, then photograph in color. The color adds some interest over the usual black and white. (Does anyone know what color Newton's hair and eyes were?)

EASY STAR DIAGRAMS

by Bob Tate
Harper Planetarium
Atlanta, Georgia

Frequently we have to draw star diagrams for newsletters, curricula, displays, etc. Producing star images for these charts is difficult, particularly if you want to use different symbols for different star magnitudes. An easy solution to this problem is to use dry transfer images of stars which are available from Chartpak, available at most good art supply stores, or available from Chartpak Rotex, Avery Products Corp., Santa Ana, California.

These stars come in a variety of styles and a check of their catalog will help you decide which stars you wish to use. I have decided to use a variety of star styles as shown in Figure 1.

To make an adequate diagram of one constellation, I select a star chart (usually Norton's Star Atlas) and lay tracing paper over the desired constellation. The dry transfer stars are then applied to the tracing paper for reproduction later.

Figure 2 shows some constellations produced this way. By the way, a Kodalith photograph of one of these makes a great slide.

Figure 1

First Magnitude	RDMS 185	*
Second Magnitude	RDMS 184	*
Third Magnitude	RDMS 186	*
Fourth Magnitude	RDMS 183	*
Fifth Magnitude	Make a dot with an ink pen	•

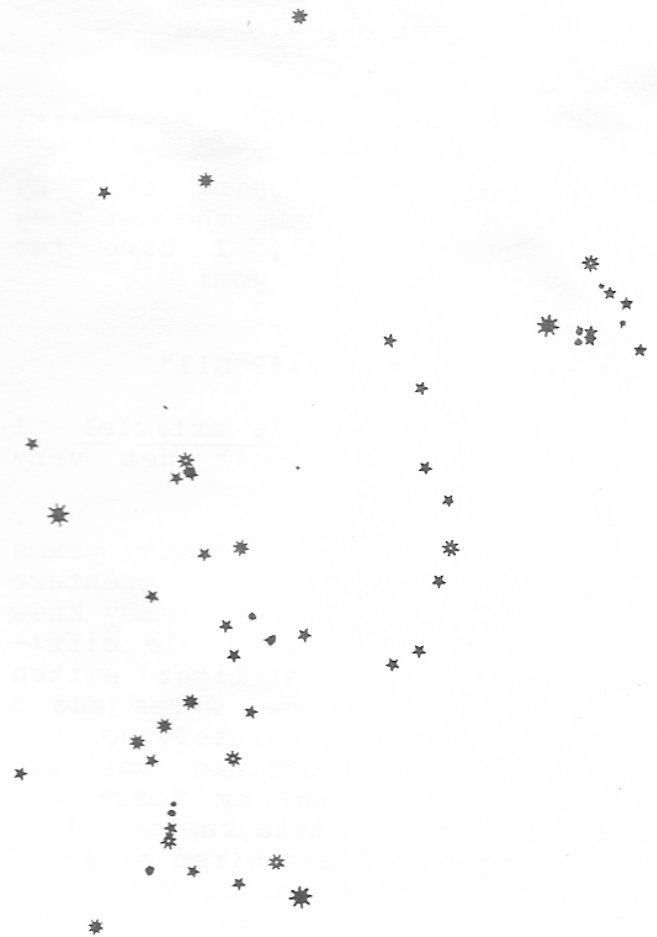


Figure 2



**DR. STRANGE'S SEPA
CIRCUITS CLINIC, etc.**

by Joseph M. Hopkins
Bishop Planetarium
Bradenton, Florida

!***!*** AUTHOR'S NOTE ***!***!***!

If you've been skipping over my articles because you thought they were too technical, I have two things to say to you:

#1 "PFGGH!!*?G!!"

#2 "Please read this article! I PROMISE that it won't get very technical at all!"

Once upon a time (not so many years ago) there existed a creature strange--me! (But you already knew that!) I had considerable difficulty wiring in a light switch (which only takes two wires and a screwdriver) and absolutely no inkling of any electronic aptitude whatsoever. I had my first encounter with an Ektagraphic slide projector when I was hired as an AV tech at the Pink Palace Museum in Memphis and I got my first look at programmers, dissolvers, and the like at the same time. This was back about 1976, so I don't have an incredibly long background in this field. I have picked up a few tidbits and tricks along the way and I will try to impart some of them to you in a useful manner.

As you may have noticed, I have been writing technical articles for this newsletter for over a year now, and most of them have included at least some circuitry (some have been almost all circuitry) for you to build. This is not done to prove that I can draw pretty circuits, but it is done in an attempt to provide you with the means to build things that are either very expensive to buy, or are simply not available commercially at all. I realize however, that some of you don't feel that you even begin to know where to start in circuit-building (you may even be unsure of which end of a soldering iron to hold). DO NOT LET THIS STOP YOU! There is enormous pleasure to be gained by watching a circuit you built perform flawlessly, and even the most accomplished engineer had to start from scratch originally!

The technique I use for circuit engineering is composed of three basic parts:

1. Examination of Needs - This is probably the most important step (and often the most neglected); know what you want each part of the circuit to do (and not do) and write it down before you start.
2. Circuit Design - Keep it as simple as possible; design it in stages; steal liberally from circuits already designed and working; modify existing circuits to do new things.
3. Circuit Construction - Build up a prototype using some sort of prototyping construction materials (more on that later); build your circuit in stages and then test and troubleshoot each stage independently before connecting them together; test and retest before installation (if you expect it to work first time, every time--you're dreamin!)

In my next two articles I will cover in more detail some techniques for execution of Steps 2 and 3 including books, periodicals, and other materials which will help in finding circuits which you can "rip-off" for your own needs, and suggestions of materials (and places to get them) to help you with easy construction techniques. Again, I promise that these sessions will be highly non-technical.

"What happened to Step #1? Why am I not covering it in another article?" A brilliant question! I can do little to help you in the examination of your needs except to tell you that liberal use of pencil and paper will help, and that you will become better and better with practice. It is very hard to predict in advance all of the parameters of a circuit and all of the outside-world conditions to which it will be subjected, but as you do it more and more you will become more proficient.

Okay, let's stop right here and clarify one point--I'm not talking about circuits which have a schematic diagram which covers a half-page or the people who can design them. I'm talking to you about your circuit that has two switches and maybe even (should we dare?) a potentiometer. Start small. If you can do a circuit to switch a projector on and off, then you can do one to switch it on and off from two different places. Then you can make it so one switch locks out the other. Then you can make it dim up with one switch and flash on with the other. Then you can make it advance when it dims down. Then you can make it start a mirror moving so the next slide will appear in a different place or pan across the dome. And so on, and so on, etc. Pretty soon you have a fairly versatile circuit, but you started with just one switch. ANYBODY CAN DO THAT!

One final word before I release you to the next level of consciousness. I write these articles to try to help you, but it would help me tremendously to know what you need and want. So, it's positive feedback time, folks! If you want more basic articles, let me know. If you want articles on specific topics, let me know. If you have specific circuits or types of circuits you would like to see covered, let me know. If you want equipment reviews, let me know. If you want tips on how to get more out of commonly used projectors, programmers, dissolvers, dimmers and the like, let me know. And, (since negative feedback can be very important in circuit design) if you have any criticisms or you simply want me to shut up, let me know. I WANT TO HEAR FROM YOU! Write or call me:

Joseph M. Hopkins,
Technical Director
Bishop Planetarium
102 10th Street West
Bradenton, FL 33505

Phone: 1-813-746-4132

Tip #011 by Bob Tate

If you have some old plexiglas lying around and the paper covering has dried out so it won't come off easy, wet the paper with Xylol (xylene) and let it sit for a while, then scrape the paper off. Finally clean and polish the plex with some more Xylol.

Tip #012 by Bob Tate

If you need sockets for projection bulbs or other lamps, contact Barbizon Electronics, 426 W. 55th Street, New York, NY 10019. They have sockets at low prices for just about any bulb. Call them up and tell them the ANSI code of the lamp and they can give you a socket number and price.

MAKING VERY SIMPLE STUDENT SPECTROSCOPES

by Dave Hostetter
Lafayette Natural History Museum
Planetarium and Nature Center
Lafayette, Louisiana

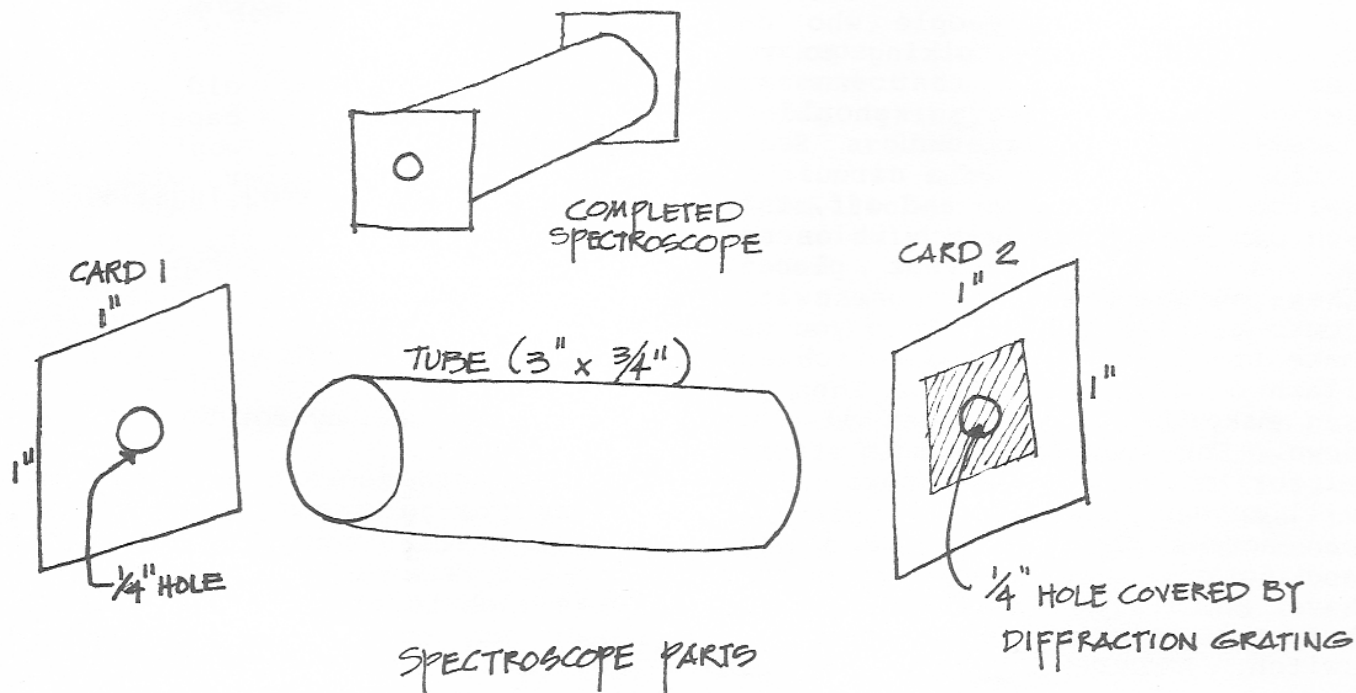
If you regularly teach the ideas of spectroscopy to your student visitors, you are probably aware of the diffraction grating slides that are sold by Edmund Scientific. These are fine if you are looking for something that is inexpensive and easy to use, but if you would like something a little more whizzo for special workshops or multiple-visit classes, it is easy to make a spectroscope for a quarter or two apiece.

All you really need are some index cards, pieces of diffraction grating, a small tube, and a little glue. Cut the index cards into one-inch squares, and punch a hole in each one using your garden-variety holepunch. On half of the cards, attach enough diffraction grating to cover the hole. When your students come in, have each

one get a pair of cards and a tube, and glue them together (simple enough, but it will take twice as long as you think!).

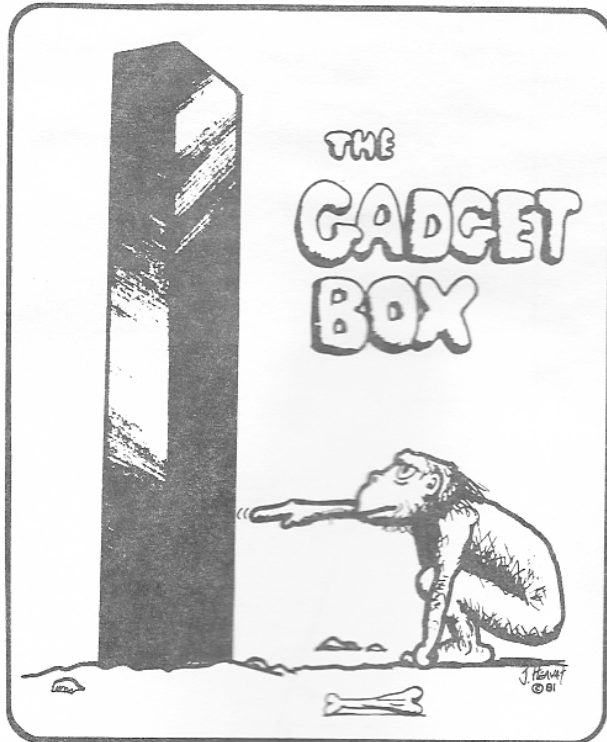
The advantages of all this are that the students get something that they have made themselves, the spectroscopes grab their attention and, simple as these instruments are, they provide a good dark background for observing spectra. Spectra of gas discharge tubes stand out particularly well.

The only part that might be difficult to find is the tube itself. The best things that I have used are model rocketry "BT-20" engine tubes from Estes Industries, but you may have to buy the whole engine mount in order to get them (if you buy in quantity you might be able to avoid this). Otherwise, you may have to buy the tubes in 18" segments if you can't find a local supplier of something about the right size.



Tip #013 by Bob Tate

Another good supplier for electronic parts is Hanifin Electronics, Bridgeport Industrial Park, Building 6, Fourth & Coates STS., Bridgeport, PA 19405. Orders go to P.O. Box 188, Bridgeport, PA 19405. They have a toll-free number for orders, 800-523-0334. Get their catalog.



THE SLEW AND ZOOM PROJECTOR

by Bob Tate
Harper Planetarium
Atlanta, Georgia

In a recent article, I described the construction of a very compact six to one zoom lens which could fit in place of the regular lens on an Ektagraphic projector. The original design goal of the project was to build a projector which could move the zoomable image anywhere in the dome, with motions both in altitude and azimuth. Further, this projector was to be compact enough to mount in the cove at the rear of the planetarium.

The requirement to cove mount the assembly precluded the time-honored

method of motorizing mirrors to slew in altitude and azimuth. Such moving mirrors cannot be fitted easily into a twelve-inch wide cove. Further, the limits of travel for a moving mirror are set by many factors, such as image size, projector location, and desire to avoid introducing image rotation into the other motions.

I decided to replace the moving mirror, and its design problems, with a moving projector. Quite often single slide projectors are mounted on turntables, but rarely do we go to the trouble of motorizing the motions on an Ektagraphic projector because of its weight and the high starting inertia the motors must overcome in getting the projector moving. This problem was solved by using heavy-duty reversible synchronous motors (Hurst Series CA). These seem to produce constant torque, and the projector moves at a constant speed from start-up.

While many projector bulbs cannot operate except within a limited range of filament orientations, the ELH and ENG bulbs used in later Ektagraphics are specified to burn any way from base down to horizontal. This bulb life has not been affected by moving the projector.

Friction drive wheels and discs are used on both axes. The discs are made of plexiglas, mounted to the base, in the case of the azimuth, and to the projector box in the case of the altitude. Each of these discs is wrapped on its outer edge with a rubber tire made from a vacuum cleaner drive belt available at any hardware store.

The motors themselves are mounted on spring-loaded pivot plates to maintain adequate friction between drive wheel and drive disc.

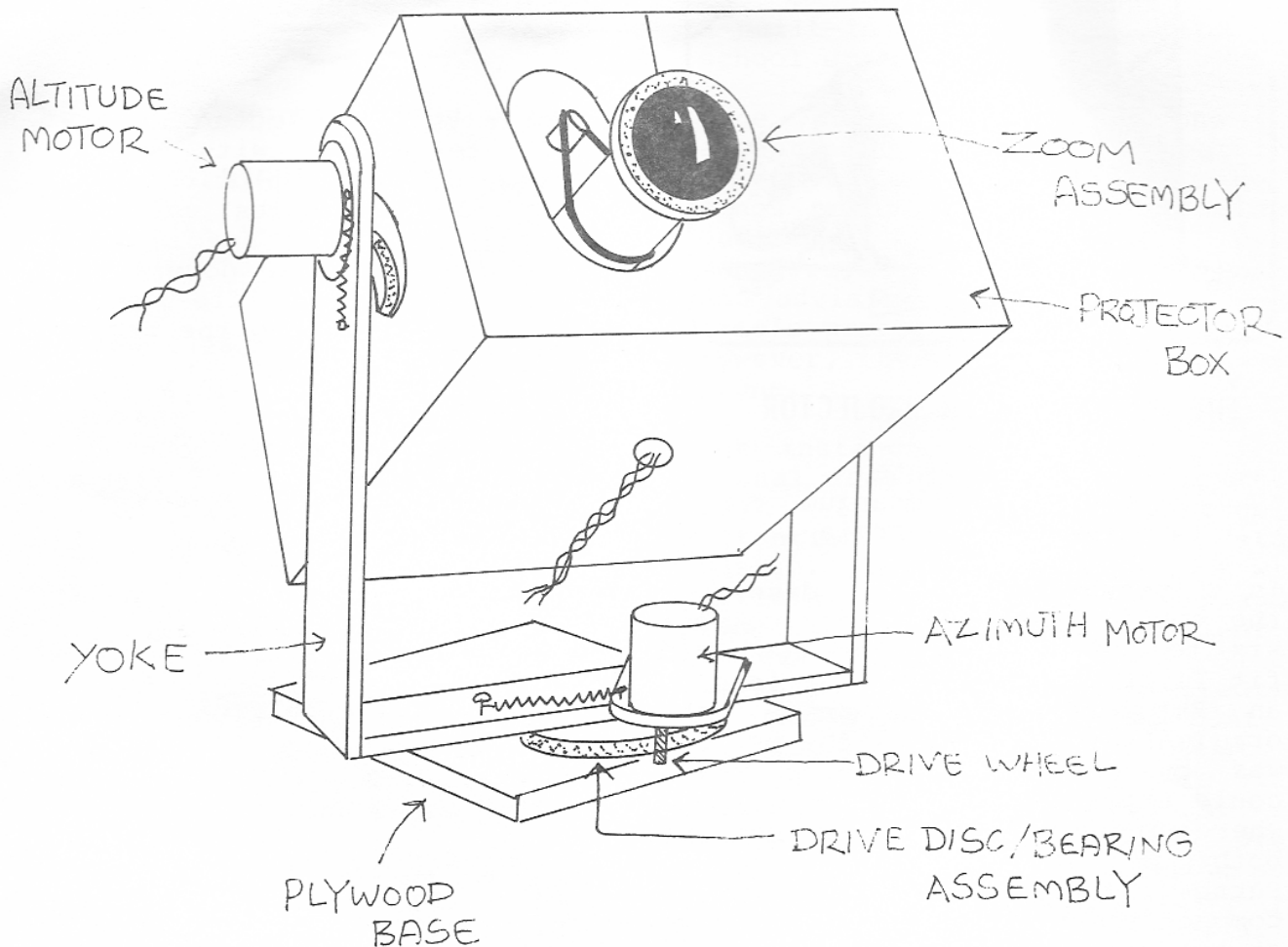
The projector is mounted in a somewhat light-tight box with muffin fan cooling. The placement of this fan helps balance the assembly to make movement easier.

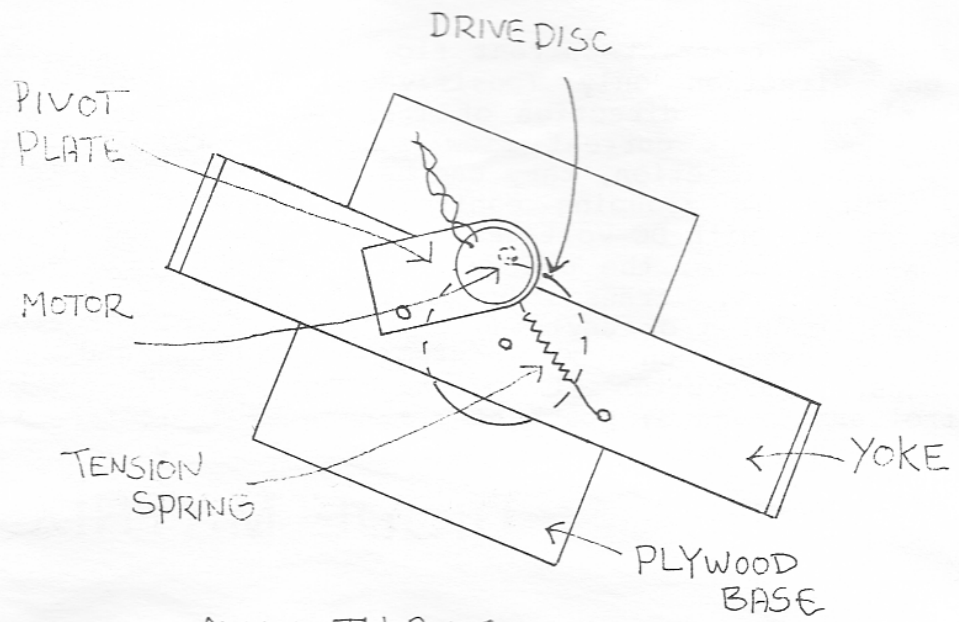
Since the assembly is mounted in the back of the dome (I have chevron seating) the projector can move the image from horizon to a point 20° past the zenith, and 105° to either side in azimuth. Moving beyond these limits introduces distortion which in some cases is objectionable, and in any case is out of the comfortable viewing range from most seats in the dome. Working within these limits of motion eliminates the need for slip rings to carry power and the cables freely move around with the projector.

Because of the compact zoom lens design, the zoom easily rides with the projector. This would not be possible with zoom designs which mount out in front of the projector as with more traditional designs.

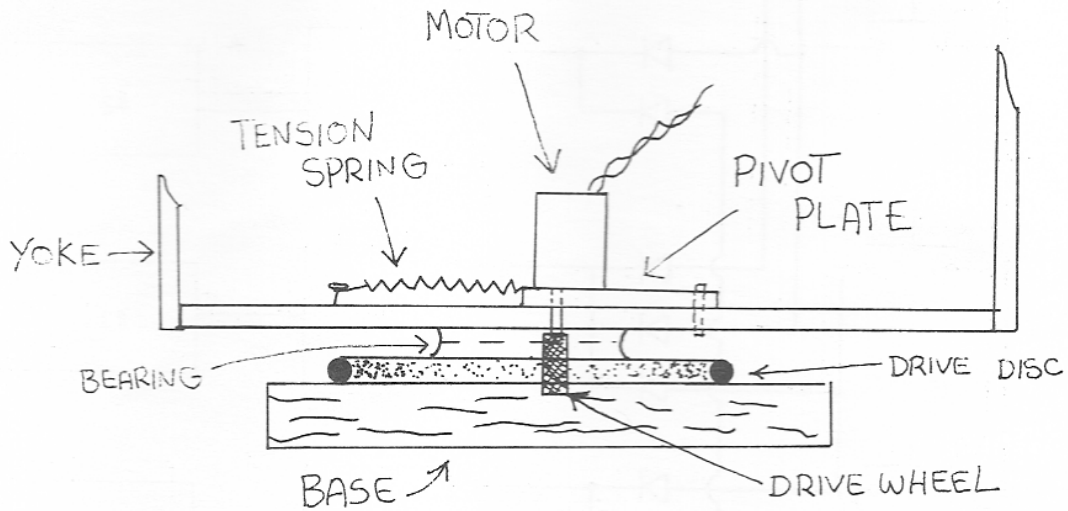
One slight problem exists. Since the Ektagraphic changes slides by gravity feed, slides don't always change when the projector is in its extreme high altitude position. This has caused no serious problems since the projector can be lowered in altitude before slides are changed. Future plans call for the addition of one of Joe Hopkins' speed changers for each of the synchronous motors, and possibly a position readout for each axis.

More than average time and effort have been put into this special effect and it is better built than most, but it is proving to be a work horse in the planetarium and can do the job usually done by a variety of specialized projectors.





AZIMUTH AXIS
TOP VIEW



AZIMUTH AXIS
SIDE VIEW

Joseph M. Hopkins
Bishop Planetarium

Since diodes restrict current flow to one direction only (positive will flow in the direction of the arrow) and block current flow in the opposite direction, they can be very useful in grouping controls which operate with DC voltages. In the example above, the controllers may be relays, transistors, AC switching modules or anything else which operates on DC control voltages. Pushbutton #1 operates controllers 1 and 3; pushbutton #2

operates controllers 1, 2, and 3; pushbutton #3 operates controllers 3 and 4; pushbutton #4 operates controllers 2 and 4. Any combination of devices can thus be programmed into groups by using a diode matrix. The pushbuttons could just as easily be positions on a stepper solenoid or rotary switch. Follow the circuit paths through and see how diodes conduct for some switches and block for others.

DIODE MATRIX

