SOUTHERN SKIES

Spring 1987 **Volume 7, Number 1**

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SUBMISSION GUIDELINES: Articles should be typed, double-spaced, one side per sheet. Computer printout (word processor) output is acceptable. Article should be accompanied by author's name, mailing address and phone number, as well as a statement to the Editor granting or refusing permission to reprint the article in other forms. Accompanying art must be labeled.

DEADLINES: Submit all copy and artwork to the Editor in accordance with the following deadlines:

Spring Issue (No. 1)	January 1	Fall Issue (No. 3)	July 1
Summer Issue (No. 2)	April 1	Winter Issue (No. 4)	October 1

Southern Skies

Spring 1987 Volume 7, Number 1

A MESSAGE FROM YOUR PRESIDENT

by Jon Bell

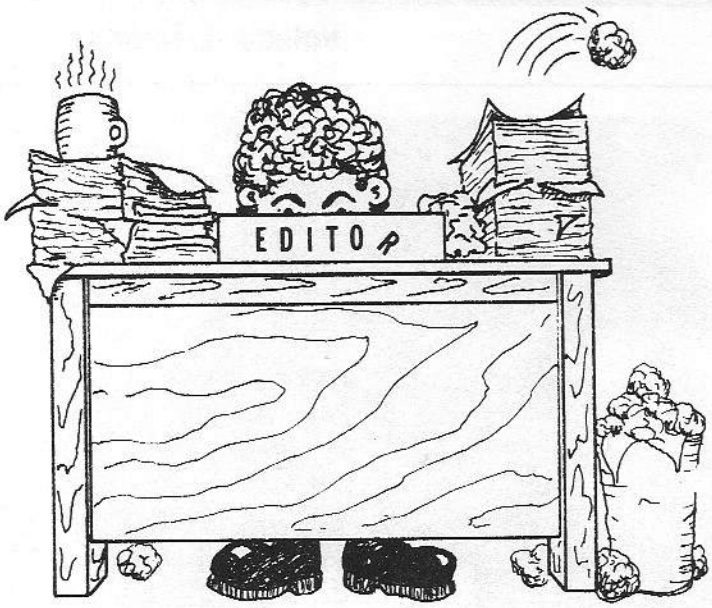
Well, here we are with a brand new issue of Southern Skies, a brand new year (well, slightly used anyway), and a brand new President for SEPA - me. We also have a new Vice-President, Dave Hofstetter, a new Past President, John Hare, and a new former Past President, Duncan Teague. Luckily there are also some constants in this formula, such as Sue Griswold, SEPA's Secretary-Treasurer, and Tom Hocking and Kathy Summers, who are editing and printing Southern Skies.

And according to good information that Hare has given me, there are quite a few other folks who are helping to keep SEPA alive and kicking through its various committees, like Jane Hastings, Mike Chessman, Charles Ferguson, Frank and Carol Palma, Lee Shapiro, Jim Hooks, Jack Fletcher and Ken Wilson, not to mention Mike Hutton and his staff, who'll be hosting the upcoming SEPA conference with the help of Florplan.

Finally, there's all of you - everyone who is a member of our organization and who has contributed so much at conferences and in special projects, whether in the presentation of a paper, planetarium program, technical advice, or just good ideas. Unlike other professional organizations, where colleagues number in the thousands or tens of thousands, the people who successfully operate planetariums are exceptional and few. The planetarium community is just that - a small, well-knit organization where the actions (or inactions) of any individual can count in a big way. SEPA has always had a reputation as one of the best, most active and viable affiliations around. That didn't just happen naturally; some people had to care enough and work hard enough to make it happen. We owe a lot to those people - and the best way I can think of to repay that debt is to become active in SEPA's business. And as we work toward

that goal, we may discover that we have in the process made it that much easier to accomplish our objectives in our own planetariums.

O.K., who gets the soapbox next?



Well, here we are again, with another thrill-packed issue. For me the biggest thrill was getting it out on time!

Please note yet another (oh gods, not again!) address change for me in the latest inside front cover of the Journal. I'm happy to report that your Editor is now the Educational Assistant at the Morehead Planetarium, and with any luck at all, will remain in that position for a long while to come.

The upcoming conference promises to be very exciting, especially for me, since it usually generates a wealth of wondrous articles and other information that inquiring minds like ours are just dying to know. So if you're planning to present a paper at the conference, please bring an extra copy for inclusion in the Journal. If there's any artwork which accompanies your paper, please bring a black and white, camera-ready copy of that as well.

And in the immortal words of Bartles & James, we thank you for your support!

TECHNICAL STANDARDS

by Robert C. Tate
Atlanta, Georgia

In recent years much has been said and written about the future of the planetarium, with some proclaiming it a dinosaur, marked for extinction, and others convinced that new technology will save us from the unemployment lines.

My own thoughts on the subject run along different lines. I still have faith that the planetarium is a unique facility in any community. Often we feel in competition with motion picture theaters, light shows, and who knows what else in the entertainment field. But stop and think . . . who did they call to find out about Halley's Comet? Apparently we still have something to offer society after all.

Many of our problems are a result of our own haphazard adoption of new planetarium technology. Twenty-five years ago any program could be run in any planetarium since all planetariums were similarly equipped, having a lecturer to read the script, a slide projector to show graphics, and the planetarium projector to make the stars and planets and to show motions. Things don't work like that now, as a glance at Figure 1 will show.

Perhaps a little myth will help to illustrate the situation. There once was a marvelous new invention which appeared in a very large city. It was called the motion picture projector and people came from far and wide to see the moving images made by this marvelous invention and to be entertained by it. Some of the people who came to see the movies wanted people in their communities to experience this new educational and entertaining invention, so each of them, upon returning to their own communities marched down to the nearest machine shop and described what he had seem at the marvelous new entertainment facility in the big city.

With only a description of the end result, each machinist designed his own version of the motion picture projector for the local

community. Along with these projectors, cameras were also designed and built by the machine shops. Small chemical factories in each community were employed to produce film stock which could run on the new camera and projector, and each theater went out to make its own movies on topics of interest to the local citizens.

Some of the movies made by the local theaters were quite good, but since every theater had its own format of film and its own design of projector, none of which ran at the same speed or used the same size film, the movies could not be shared from one city to another. The good movies could only be seen in the theaters which had produced them.

But most of the movies weren't particularly well made, nor were they exciting and entertaining to the local citizens. Unfortunately funding was not available for each film crew to travel all over the world to make interesting movies. Expert writers, producers and photographers could not make a living working for the small theaters. Once the local citizens had seen a few of the low-budget local productions, they saw little reason to return, and the local theaters faltered, slowing slipping into disuse.

But can you blame the patrons? After all, how much would you pay to see anyone's home movies?

We in the planetarium production game are producing home movies. Some of them are good, some aren't, and for good reason. Tens of millions of dollars are spent on the production of each block buster movie. This expenditure can be justified because literally tens of thousands of theaters all over the world will be showing these movies. The reason they will be showing these movies is because the motion picture industry has a set of standards so that all theaters are equipped with compatible projectors and sound systems which can be used to show every movie made. Movie theaters are standardized.

Could the planetariums of this nation profit by standardizing operations and equipment? I think so. In the sixty or more years that planetariums have been in operation, less than 100 programs have been offered for sale or trade. The reason more programs aren't available is that they tend to be produced to be performed on only one set of equipment in one planetarium. On my shelves are about a dozen planetarium programs which I did not produce. Since my equipment normally isn't set up to show these programs, I rarely use them in any form and I have never run one exactly as it was designed to be run.

If, however, all these programs had been written with some standard projection format in mind, then once I had set up my equipment to show one of these programs, I could show all of them merely by changing one tape and a few slide trays!

Further, if 500 planetariums in this country were all set up with the same projector fields, had compatible control systems, and similar sound equipment, then these 500 planetariums could pool funds to hire the best writers, the best artists, the best musicians, and produce fantastic planetarium programs which would run perfectly in every one of the 500 planetariums.

The program would arrive in a big box, with opaqued slides already in their proper trays, with unique special effects projectors ready to plug in and with an audio tape ready for the recorder. Set up would be a snap! We could easily compete with motion picture theaters because we would have a really top-notch product to offer to the public rather than "home movies."

All this will never happen until we agree on a set of technical standards and commit ourselves to implementing them in every planetarium.

HOW TO IMPLEMENT STANDARD SET UPS

In most industries, when standards are set, it is done in one of two ways. First a professional organization of some sort meets, recognizes the need and forms a study committee to write standards. This has been done for so long, we don't even think about how many threads per inch there are on the bolts we buy at the hardware store, or the size of tape we need for out recorders, the type of plumbing fittings we need on a garden hose, or the number of sprocket holes in a roll of 35 mm film, yet all of these items meet some standard for size, shape, or configuration.

Often in the absence of a professional standards committee, the standard is set by industry itself. Right now home video players come in Beta and VHS formats. These two formats are battling it out in our domestic market and VHS seems to be pulling ahead, but the dust is yet to settle on this one. At some point, probably, a standard will have to be specified for home video.

In our planetariums there seems to be no way to have a committee settle on a set of technical standards. At one time a standards committee formed by the I.P.S. looked at the problem and decided there was no solution. Since I.P.S. has as its only purpose the improvement of communication among planetariums, this failure is not surprising. Since I.P.S. produces no needed product, there is no incentive for planetariums to give up their diversity to accept technical standards.

While we may recognize the need to standardize our facilities, without a good incentive, few of us will actually do it. Incentive could come in easy ways, however. If the Strassenburg Planetarium had specified a set of projector format and audio tape standards when it first offered a program for sale, then anyone who had ever shown a Strassenburg program would be on the standard. Other planetariums selling shows would probably have adopted the same standards also.

Our incentive, therefore, can come from the groups who are producing and distributing planetarium programs. If three or more major distributors of programs would agree to produce their programs along a standard format, then within a year nearly every planetarium would be set up to show hundreds of planetarium programs, as planetariums on the standard started producing their own shows.

A set of standards should contain the following

1. A standard field format for slide projectors
2. A standard audio tape format
3. A list of standard special effects projectors
4. A standard plug configuration for special effects projectors
5. A standard writing format for the script pages.

Once these are defined then everyone would know how to arrange their planetarium equipment so that it would rarely need any changes or new set-ups regardless of what program is being run.

Shortages in equipment would immediately be spotted, and priority could be given in the budget process to "raise the planetarium up to specified standards."

Last month the SEPA Journal printed a sample set of standards to show what technical standards might look like. Since I don't sell programs I'll leave the actual standards to the program producers.

Agreeing on standard formats, etc. doesn't require that you follow them in your theater if you don't want to, just that all shows that are shared from one dome to another would be on the standard. Naturally our uniqueness is a necessity, and some of us want to experiment with all-sky projectors while others like to play with video. That's fine, but we should, at the minimum, be compatible with each other in the basics of our operations.

FIGURE 1

Typical Planetarium Equipment (circa 1961)

1. Star projector
2. One slide projector
3. A few special effects (meteors, constellation outlines, etc.)
4. Record player or tape player
5. Lecturer with projection pointer

Typical Planetarium Equipment (1986)

1. Star Projector
2. 1-20 slide projectors
3. Zoom projector
4. Slew projector
5. Horizon system
6. All-sky system
7. 16mm motion picture
8. 35mm motion picture
9. 70mm motion picture
10. Projection video
11. 1-8 track tape player
12. Rotators
13. Anamorphic rotators
14. Atmospheric effects
15. Strobes
16. Lasers
17. Dissolvers
18. Computer systems
19. Other special effects
20. Lecturer with pointer

SAMPLE PLANETARIUM STANDARDS

Definition: A planetarium is a theater with a domed projection screen used to study and display the environment and containing the following equipment

1. A projector to show the relative positions of stars and solar system objects as seen from various locations on the earth at various times.
2. A set of slide projectors as specified below.
3. Additional effects projectors as specified below.
4. A sound system as described below.

Slide projector fields

Slide projectors shall be oriented in the dome to produce a center field with a left field and a right field which overlap the center field, so that the left and right fields touch at their common edge. This produces a 50% overlap of the center with the left and right fields. Projectors are to be assigned to fields in configurations as listed below depending on the total number of projectors available.

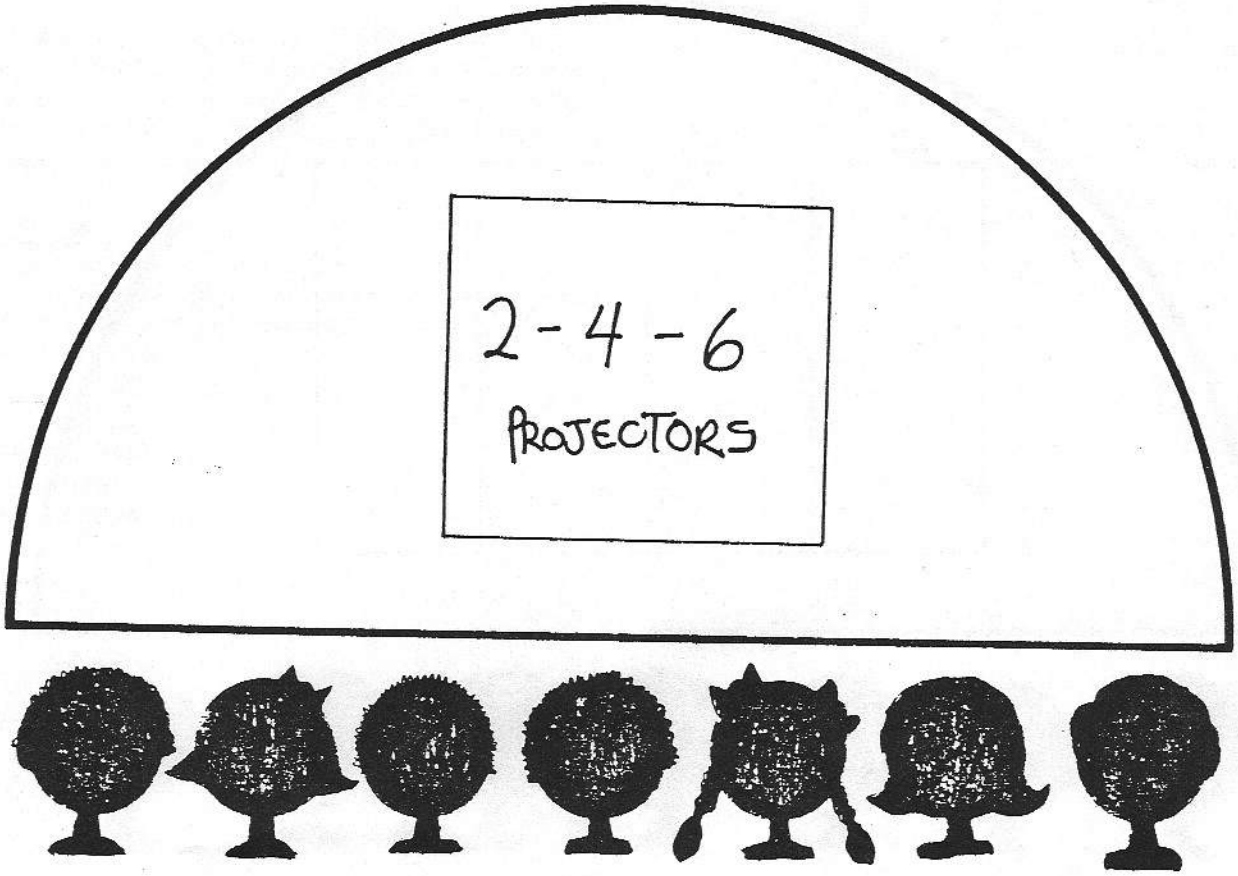
Total Projectors	Left	Center	Right
3	1	1	1
4	1	2	1
5	1	3	1
7	2	3	2
8	2	4	2
12	3	6	3

Special Effects Projectors

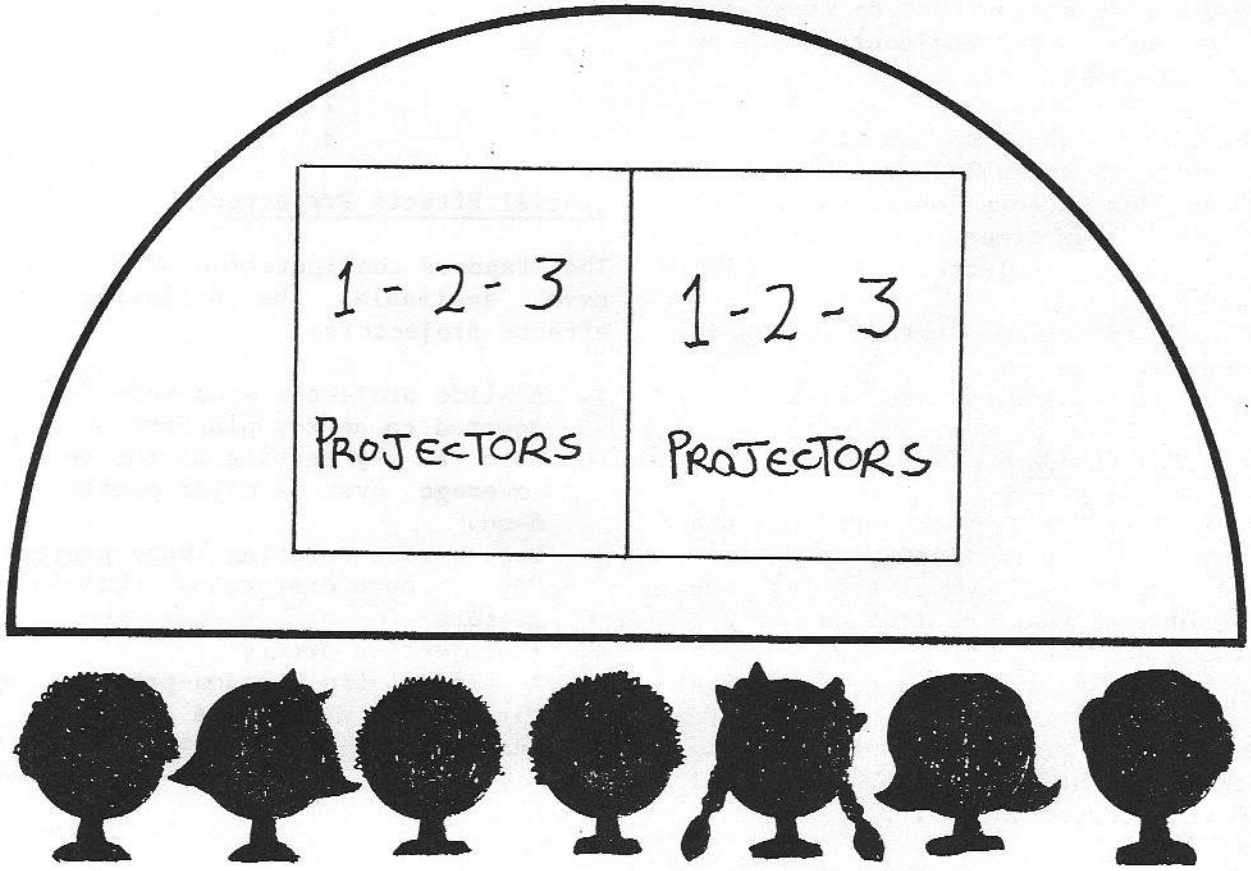
The standard configuration planetarium will have available the following special effects projectors.

1. A slide projector with zoom lens either mounted on an x-y platform or projected onto an x-y panning mirror to provide coverage over a major portion of the dome.
2. One or more rotating image projectors
3. One or more distortion (ripple) projectors
4. A projection orrery
5. A partial-pan horizon-projector system with three projectors and wide-angle lenses in adjacent fields

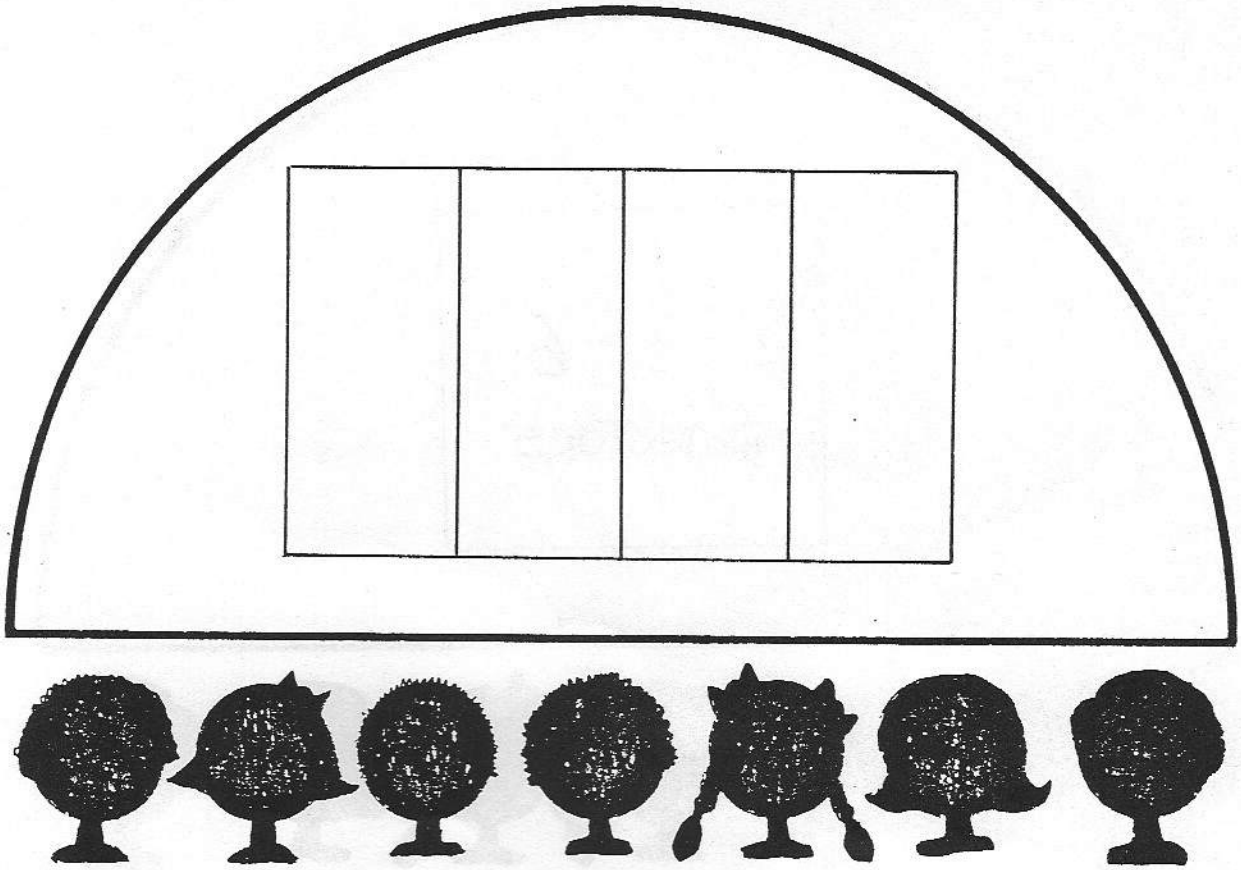
CENTER SLIDE PROJECTOR FIELD



LEFT AND RIGHT SLIDE PROJECTOR FIELDS



50% OVERLAP OF CENTER AND SIDE FIELDS



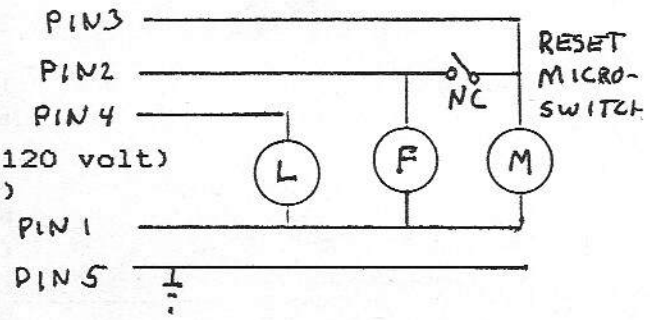
Projector Plug Configurations

Special effects projectors, where possible shall be wired with the following specifications.

1. 120 volt a.c. lamps, fans, and effects motors

2. All connections to the projector will be by the use of six pin Cinch-Jones type plugs with the following pin assignments:

Pin	Wire
1	120 volt common
2	fan (high 120 volt)
3	effects motor (high 120 volt)
4	lamp (high 120 volt)
5	ground
6	—



Sound System

The planetarium will be equipped with a four-track reel to reel recorder capable of running at 7 1/2 and 15 i.p.s.

Voice, music, and sound effects are to be recorded on channels one and two for stereo reproduction and control signals for dissolvers or computer control systems are to be recorded on channel four.

Script Format

Scripts are to be reproduced with the following information on each page:

1. Show title, author, or origin
2. Page number
3. Line numbers
4. Time codes
5. Event codes
6. Text

Comments on these specifications are welcome.

Robert C. Tate
Harper Planetarium
3399 Collier Drive NW
Atlanta, GA 30331

by Richard McColman
Gibbes Planetarium

Over a year has elapsed since the tragic explosion in the skies over Cape Canaveral that claimed the lives of the Challenger 51-L crew. Throughout the ensuing period, the media has been awash with doom and gloom with regard to the U.S. space program. A state of muted anxiety hangs over the space and related science communities, and the once-hallowed halls of NASA echo with general apprehension. We in the planetarium field, no doubt, are feeling a similar sense of uneasiness as the nation lies stuck in a "space dry-dock."

It is timely at this point though, to judge the Challenger accident in the broader historical and human context. Such a pragmatic perspective will be necessary in the coming months as the country makes its way back to an "on-line" space status.

In our age of technology, it's easy to forget how dangerous manned space flight really is. We seldom think about the many near-misses and close-calls that have occurred in our reach for the heavens. In numerous instances, the malfunction of one or two small components, out of literally thousands, has almost resulted in catastrophic failure.

In July 1961, for example, Gus Grissom nearly drowned after splashdown when the hatch of his Mercury capsule blew off prematurely, causing the spacecraft to sink to the ocean bottom. Only quick thinking and assistance from the recovery helicopters saved his life.

Astronauts Neil Armstrong and Dave Scott almost didn't make it back from their 1966 Gemini 8 flight. After achieving the first space docking with an Agena target vehicle, a maneuvering thruster stuck on, throwing the combined craft into a sixty-RPM tumble. In the end, the pilots survived a truncated mission through their own skill and quick thinking.

Technical bugs in space continued during the Apollo moon program. On April 13, 1970, Apollo 13 was on its way toward the third lunar landing. At a distance of 205,000 miles from Earth, one of the service module's oxygen tanks exploded. Shrapnel from the detonation penetrated the remaining tank, creating a rapid leak, and leaving the command module with only its extremely limited re-entry oxgyen and electrical supplies. Accordingly, the three-man crew hastily aborted the flight and used the moon lander as a "lifeboat" for the return home. Had the accident happened after entering lunar orbit, the spacecraft would have been unable to return to Earth. The astronauts would have been doomed to spend their final hours circling the barren, airless globe.

Of course, the most devastating blow to the Apollo program had already occurred, on January 27, 1967 - exactly 19 years and one day before Challenger's ill-fated launch. Astronauts Gus Grissom, Ed White, and Roger Chaffee were killed by an oxygen fire in a ground test of their new Apollo 1 spacecraft.

The list of techinical failures that have threatened U.S. space missions and flight crew safety goes on and on.

The USSR hasn't been immune to problems in space either. Although we don't have access to a comprehensive Soviet space history, we <u>are</u> aware of at least two Russian disasters. In April 1967, Vladmir Komarov was killed after re-entry when the parachute lines on his Soyuz 1 module tangled - crashing his vehicle at a speed of 300 mph. And four years later, on June 20, 1971, the three cosmonauts of Soyuz 11 died during their return to Earth, when a malfunctioning valve depressurized the spacecraft.

The Challenger tragedy was, in the end, determined to be a result of human error - in reality, a series of human errors. This fact, however, shouldn't really surprise or startle anyone. Most space malfunctions of the past have been attributable to some manager, engineer, or technician either taking inappropriate action, or failing to take an action which was called for in a particular situation.

For instance, Gordon Cooper's Faith 7 capsule was found during post-flight inspection to contain some 720 flaws, largely due to faulty workmanship. The launch pad booster-shutdown of Gemini 6 was caused by the failure of a technician to remove a dust cap from the Titan propulsion system. And a similar technical oversight in June 1966, led to Gemini 9'd inability to dock with its shroud-obstructed target vehicle. Apollo 12's difficulties in the first minute of flight were due to a less-than-prudent decision to launch during a thunderstorm. And the Apollo 13 oxygen-tank explosion was caused by inadequate subcontractor component designs, coupled with technician errors at the prime contractor and improper de-tanking and monitoring during pad tests at the Kennedy Space Center.

In actuality, the unfortunate series of Solid Rocket Booster oversights and blunders which litter the path to 51-L (dating back to the mid-70's), isn't really an anomalous deficiency in an otherwise pristine history of space flight. (Remember - "Our rockets always blow up.") In some ways, the Challenger pre-accident scenario closely resembles that of the Apollo 1 fire. In the words of Dr. Joseph Shea, then Apollo Spacecraft Program Manager:

> We were frankly worried about the state of euphoria that was beginning to set in on the public mind about how easy this particular thing was. 'You light a match at the pad . . . the bird goes up . . . everything's great . . . the guys come back down again . . . you've got some heros.' That's the fun part of it, though. We were hoping to impress people that there were mortals working on the program.

In December 1966, Shea cited "something like 20,000" bugs in the Apollo system. "We hope to God there is no safety involved in the things that slip through," he added. Amazingly prophetic. Nonetheless, the Apollo program ultimately proved one of the major milestones in manned spaceflight, and it contributed heavily to the success of Skylab and Apollo-Soyuz, both of which borrowed heavily from the mass of Apollo technology.

To a large degree, the Apollo 1 fire was much worse than Challenger in that it struct an unproven program which had yet to fly its first mission. On the other hand, there have already been 24 successful shuttle flights - accounting for half of all U.S. manned missions to date.

The Challenger disaster and other space accidents dramatically demonstrate the impossibility of achieving absolute perfection. And without that absolute perfection, sooner or later, lives will inevitabily be lost. As hard as we humans try to prevent it, incompetence, sloppy workmanship, and poor judgements will occasionally slip through. Along with everything else, we carry our frailities with us as we reach for the stars. All we can do is try; which is what the crew of Challenger did.

One day in the future, though, shuttle flights will become a regular, if not routine, occurrence. Astronauts and technology will, no doubt, dazzle us anew with spectacular accomplishments and astounding milestones. Citizens from other fields will once more fly into space leading off with backup Teacher-in-Space, Barbara Morgan. Sometime in the 1990's, the U.S. will build a space station in orbit - a permanently manned platform for science and technical research, supplied and replenished by the shuttle fleet. And plans are on the drawing board for a return to the moon as well as a manned expedition to Mars, early in the 21st century - both using the space station as a base for launch.

The groundwork for these exciting goals has already been laid in the previous 25 years of man in space - by the bold strides of the Mercury and Gemini projects, by the spectacular Apollo moon landings, by the science and research gains of Skylab, and most recently, by the equally impressive achievements of the space shuttle.

The next quarter-century in space should sustain the advances of the past, with the advent of technologies and scientific advances undreamed of only years ago. Man will carry on the drive to explore the unknown, continuing in the tradition of the great pioneers of history.

But along with all the daring, the tenacity, and the ingenuity, we are also the bearers of imperfection. As much as we may try, we cannot rid ourselves of our flaws and shortcomings, either here on Earth . . . or in the quest for the heavens.

Challenger has taught us that all of the planning and machines will not free man from his deficiencies. What we need to learn is that along with the ecstacy of success, we must accept the inevitability of failure. This is the true test of our strength and courage. Not just to cross a milestone in the cosmos, but to fight and overcome the ever-present weaknesses of man. We must continue aiming for the stars . . . in the memory of the Challenger crew.

* *

FOR YOUR INFORMATION

All meteorites found within the United States must, according to the National Antiquities Act, be given to or offered for sale to the Smithsonian Institution.

WELCOME TO SEPA 1987

The Florida Association of Planetariums and Brevard Community College are pleased to announce the 1987 SEPA conference. As you can see from the enclosed schedule, the conference this year is a long and busy one.

This year's conference "TAKING STOCK IN YOUR PROFESSION" focuses on the resources available to the planetarium profession. In addition to numerous demonstrations and manufacturer's exhibits, we will be presenting twenty complete planetarium programs. (All of which are commercially available).

The length of the conference has also generated a relatively high registration fee. However, considering the number of meals provided, the unusual entertainment, and the inexpensive room rates, your cost per day is very reasonable.

Transportation to the Cocoa area is very good. By car, Interstate 95 provides direct access from the North and South. If you are coming from the West, the Bee-Line Expressway connects Orlando International with central Brevard County.

If you wish to fly to the conference, we suggest making connections to Orlando International. From the airport you can take a limo or bus. For further information call: Amer. People Movers (305) 851-1020 or Airport Limo (305) 423-5566 or (305) 859-4667 to make connections with your flight.

Personally, I would recommend renting a car. The cost is very reasonable and public transportation is almost non-existent in Brevard County. In addition, the Planetarium and the motel are in the "sticks" and without personal transportation you will be grounded except for conference activities. Buses will be provided to delegates only to go to KSC and most major functions. AVIS has been selected as the official car company for the conference. Call AVIS at 1-800-331-1600 and refer to AVIS worldwide discount number A/W 022806 for special conference rates.

The weather in Florida during the month of June is *VERY HOT* and humid. Except for the banquet, you can wear casual cotten clothing for comfort. Be sure to bring your bathing suit.

Upon arrival, you will be given the opportunity to register for various workshops and planetarium programs. Only eight of the twenty planetarium programs are scheduled to be shown twice and some workshops will fill up fast. When you arrive take a minute to examine the literature and make your selections ASAP.

Of special interest to everyone will be the conference at sea aboard the SS Scandinavian Sky. Your registration fee gets you on the ship and three meals. For your enhanced pleasure and comfort, you might consider renting a cabin for the day. The cost is $60, and if shared with some of your friends, it would provide you with a nice home base during the cruise. Changing rooms, lockers, and showers are available if you do not want a private room.

Other activities aboard the ship such as video games, fishing, souvenirs, skeet shooting, drinks, and of course gambling are an additional charge. Plan your budget accordingly.

In preparation for the conference "TAKE STOCK" in: Dieting, No-Doz, Suntan lotion and Aspirin.

SEE YOU IN JUNE!!

SEPA 1987 CONFERENCE TENTATIVE SCHEDULE

JUNE 7 — JUNE 14, 1987

SUNDAY JUNE 7

9:00 a.m. - 5:00 p.m. ..... IPS Executive Meeting

12:00 p.m. - 6:00 p.m. ..... Registration at Ramada Inn

6:00 p.m. - 8:00 p.m. ..... Registration and Reception at Astronaut Memorial Hall

8:00 p.m. - ? ..... Cinema shootout - Radian projector
Omni films projector and multi-image prologue presentations

MONDAY JUNE 8

8:00 a.m. - 5:00 p.m. ..... Visit Kennedy Space Center — lunch on your own
OR Planetarium programs at Astronaut Memorial Hall and video shootout at Theatre 360 — lunch at BCC

6:00 p.m. - 8:00 p.m. ..... Dinner - BBQ at BCC and guest speaker

TUESDAY JUNE 9

8:00 a.m. - 5:00 p.m. ..... Visit Kennedy Space Center — lunch on your own
OR Planetarium programs at Astronaut Memorial Hall and video shootout at Theatre 360 — lunch at BCC

6:00 p.m. - 8:00 p.m. ..... Dinner at BCC and guest speaker

WEDNESDAY JUNE 10

10:00 a.m. - 10:00 p.m. ..... Cruise to the Bermuda Triangle (if you dare)
Breakfast, Lunch, and Dinner included

10:00 a.m. - 12 noon ..... Exhibitors set up at sea

2:30 p.m. - 5:00 p.m. ..... Paper session at sea

THURSDAY JUNE 11

9:00 a.m. - 4:30 p.m. ..... Travel to Orlando Science Center
View two planetarium programs — tour facility — papers, workshops, and demonstrations as time permits — lunch provided

5:00 p.m. - 8:30 p.m. ..... Visit Lake Buena Vista at Disney — Dinner on your own

FRIDAY JUNE 12

9:00 a.m. - 12 noon ..... Planetarium programs at Astronaut Memorial Hall
alternate with workshops and demonstrations

12 noon - 1:00 p.m. ..... Lunch — provided

1:00 p.m. - 3:00 p.m. ..... Planetarium programs at Astronaut Memorial Hall
alternate with programs at theatre 360

3:00 p.m. - 5:00 p.m. ..... Special audio demonstrations with Jack Tamul, Mark Petersen *OR* John Serrie
designated time for exhibitors

6:30 p.m. - 9:00 p.m. ..... Banquet and special guest speaker at Holiday Inn Oceanfront

SATURDAY, JUNE 13

8:30 a.m. - 9:45 a.m. ..... Paper session

10:00 a.m. - 12 noon ..... Planetarium programs and workshops

12 noon - 1:00 p.m. ..... Lunch — provided

1:00 p.m. - 5:00 p.m. ..... Planetarium programs — designated time for exhibitors

5:00 p.m. - ? ..... Dinner — on your own

SUNDAY, JUNE 14

9:00 a.m. - 12 noon ..... SEPA Business meeting — door prizes, faint etc.

PUBLIC SERVICE ANNOUNCEMENT

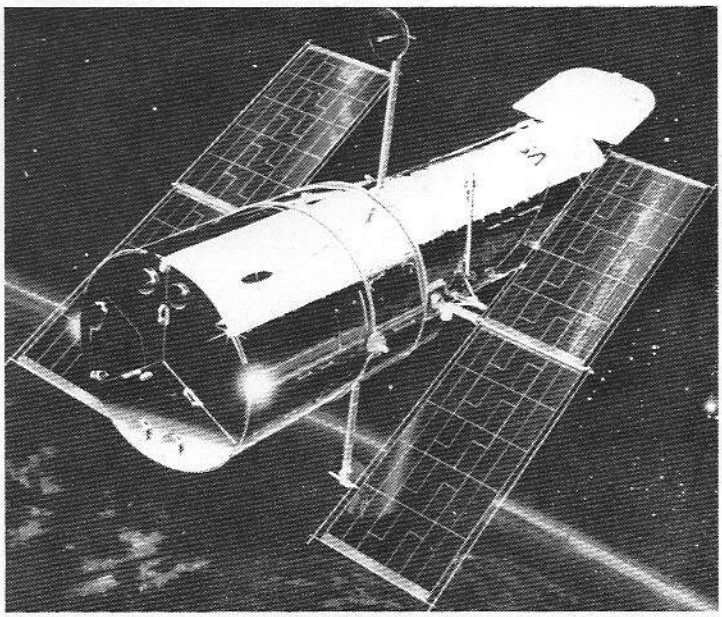
FIRST LIGHT

The Space Telescope Story

"First Light" is a 33 minute program, adaptable to all size planetariums, tracing the history of telescopes, detailing the Hubble Space Telescope and exploring the objects it will investigate.

PRODUCTION KIT CONTAINS:

- 220 slides
- Sound track with entrance and exit music on professional quality cassette (Dolby B, Dolby C, or dbx)
- Production Book



COST:

- $200 (purchase orders or checks acceptable)

— or —

- Borrow the kit for up to 3 weeks free of charge and duplicate it — you pay return postage and insurance only.

AVAILABLE JULY 1, 1987

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Please send me the "First Light" production package.

Name _____

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MARYLAND SCIENCE CENTER

Check the boxes that apply:

☐ We will purchase the kit

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☐ We will borrow the kit

Audio noise reduction preferred:

☐ Dolby B ☐ Dolby C ☐ dbx

Please return to: Andrea MacMurray
Davis Planetarium — Maryland Science Center
601 Light Street — Baltimore, Maryland 21230 — (301) 685-2370