

YEAR 1980

## MHO OPTICAL REFLECTOR BECOMES SOLAR FURNACE

The Mt. Hopkins Observatory 10-m optical reflector, long used in dark-sky searches for gamma rays, now will have a new daytime use collecting sun rays.

In another example of Smithsonian-University of Arizona cooperation, the university's Solar Energy Research Facility (SERF) has undertaken management of a project to explore the capabilities of the 10-m instrument as a powerful solar furnace.

The project is being funded by the Electric Power Research Institute (EPRI) at Stanford, a research organization funded by public utility companies.

The optical quality and focusing capability of the reflector are such that it can achieve a concentration at focus of approximately 9,000 "suns", i.e., 9,000 times the amount of sunlight normally falling on a given area. The concave dish's 75 square meters of mirrored surface can focus up to 85% of the incident light within a diameter of approximately 6 cm in the focal plane.

The overall optical quality of the 10-m dish is superior to that of standard solar furnaces and SERF is seeking just such quality for use in thermophotovoltaic power production research.

Primarily a tool for high-energy astrophysics research, the 248-mirror spherical reflector was built in 1967-8 to concentrate the very faint flashes of Cerenkov light upon photoelectric detectors. Cerenkov light is produced when the high-energy gamma rays strike the upper atmosphere. This indirect, ground-based method of detection successfully identified sources of gamma rays such as the Crab Nebula and Centaurus A.

The solar project will actually begin at night in September, using moonlight for its initial light-gathering measurements and the determination of modes of safe daytime operation. Considering the tremendous energy concentrated at the focus during full sunlight, the moonlight operation will allow for safe experimentation with various techniques.

At the same time, the reflector will remain available as a Cerenkov detector on moonless nights, since those periods are of little use to the SERF users.

Under a subcontract with the university, Mt. Hopkins will operate the fully-steerable dish and advise and assist SERF personnel. The Smithsonian will also provide mountain support and transportation for the research project.

After initial testing and calibration, the reflector's mirrors will be recoated and should provide capability for thermophotovoltaic, high-concentration photovoltaic, and high-temperature thermal power testing. Later, photochemistry and materials testing may also be included in the project.

The Principal Investigator for the project is Terry Triffet, Director of the University's Engineering Experiment Station. The Smithsonian personnel involved include Trevor Weekes, leader of the gamma-ray project, Steve Criswell, and Dick McCrosky.

—Dan Brocius

2/80

## WINTER AND WATER AT HOPKINS

Winter everywhere has been unusually mild this year, including Mt. Hopkins.

As of late January, the observatory had experienced only a few light rain showers and two measurable snowfalls. Both snow storms left only three inches on the ridge at the 7600-foot level and five inches on the summit.

But lack of snow notwithstanding, the MHO Support Crew was ready for the worst. The usual winter preparations began in September, since significant snowfall can occur as early as October.

Under the direction of Support Supervisor Don Hogan, sand was piled at strategic locations along the mountain road for use by the sanding trucks. The "Snowcat," and its "Cat House," were placed in the summit bowl for use when other transportation failed. All snow removal equipment was fitted with snowplow blades and chains.

Equipment not suited for winter use was removed to the Amado yard and all winter equipment was brought up the mountain. Water pipes were drained or wrapped against freezing. Snowplow drivers and safety observers were scheduled for the season.

While no one wanted to be snowbound, the MHO staff actually had hoped for precipitation in any form to recharge the mountain aquifer.

A major improvement and expansion of the mountain water supply system was completed late last summer. The upgraded system consists of a collecting tank at the "Lower Spring" (6,800-foot elevation), 5,000 feet of newly-laid pipe, and a 300,000-gallon-capacity storage tank.

When the new tank and previously existing storage tanks are filled, the mountain installations can survive for one year without any further precipitation.

Unfortunately, nearly simultaneous with the completion of the water system improvement, the Lower Spring failed. The summer monsoon did not supply the usual rain, so the spring is temporarily dry. Water must be trucked up the mountain while weather permits. And the new tank has yet to be filled.

Let it snow!

—Dan Brocius

Mike Megariz for 18 days with a broken arm. He broke it while hauling chairs in a flatbed truck downhill to the support building. He inquired with Dorothy Merchant about retiring.

Larry "Butch" Vaughn returned to Amado with the morning MMT shuttle. In his opinion the road is too muddy and slippery after a heavy rain on Valentine's Day.

February 20, 1980

Laurie Cota fell on the ice on the steps of the MMT building. Tony drove her to a doctor Green Valley. Xrays revealed that she had a broken wrist.

Cleo's \_\_\_?\_\_\_ retirement party. She is the first government employee to retire from the Observatory. (March 6, 1980)

Jacques Beckers, director of the MMT0, stated that over 2,000 scientists, students and visitors have visited the MMT since the dedication in May 1979.

Snow blades were installed on the corners of the MMT building. When the building is rotated they clear a nice clean

circular area around the building.

# Mountain living magnifies observatory crew's tasks

By CAROL SOWELL  
The Arizona Daily Star

MOUNT HOPKINS — When winter comes to Don Hogan's "city" — the Smithsonian Astrophysical Observatory atop Mount Hopkins — a galaxy of chores pop up.

Hogan is support supervisor for the observatory on the 8,550-foot peak in the Santa Rita Mountains. He and his six-member crew are responsible for everything from firefighting to changing light bulbs in the observatory's several buildings and along the road to them.

"Anything that can happen in town is magnified on the mountain," he said, and "anything" includes the weather.

Last year, winter meant heavy snows and ice that closed portions of the road at times.

So far this year there's a different problem, a familiar one in the desert — water.

"We got a third of an inch of water," Hogan said, after several days of rain in early January. "It's going to take a lot more than that to solve our problems."

Last summer the support crew put in a 300,000-gallon-capacity water-storage system. By the time it was finished, drought had set in, drying the mountain springs from which the observatory usually gets its water.

This fall and winter, Hogan's crew hauled water up the mountain from a railroad well in Amado — until the tank truck broke down.

"We were hauling up three loads a week average in our 2,500-gallon tank truck," Hogan said. "It cost 16 to 18 cents a gallon."

Hogan said he has enough water in storage now for three months. "It's a potential problem, but it's not a crisis situation," he said.

Though he'd rather not see snow, Hogan said he's "praying for a nice long rain."

But if snow comes, he's ready.

In September, Hogan and his crew started hauling truckloads of sand up the 18-mile dirt road that winds up the mountain from Amado. Piles of sand were left at intervals on the roadside.

The crew can spread the sand along the road almost daily to provide traction for the observatory's vehicles if the roads get icy. In the best of times, driving up the mountain road takes an hour, because vehicles can go only 15 to 25 miles an hour.

To make the trip as safe as possible, personnel have established a number of local safety regulations. For instance, the vehicle traveling uphill always has the right of way.

"If a vehicle goes over, it's a long time before you can get a helicopter or ambulance in here," Hogan said.

Whenever anybody leaves either the observatory headquarters in Amado or the mountaintop, the driver calls an answering service to say he's leaving. Then he calls again to say he's arrived. If that second call doesn't come, the crew goes looking. Radios in each vehicle keep people in touch.

"We haven't lost anybody yet, and we don't intend to lose anybody," said Hogan, who has worked on Mount Hopkins for 13 years.

"It's like running a small city on top of this mountain. We're 20 miles from the nearest town," Hogan said of his job.

Laurie Cota, a member of the support crew, cleans all the buildings, those which contain scientific facilities and the dorms or wickiups where astronomers and technicians sleep and cook.

The observatory sits on land leased from the U.S. Forest Service, and Hogan works with the agency to get clearance on any construction or landscaping changes that might affect the land itself.

Whenever any building goes up or a change is made on the road, Hogan replants the area with a spray of mulch and native seeds as soon as the dust settles.

"Most of my crew are ex-farmers. They know how to run all this equipment," he said. The heavy equipment is mostly government surplus, often remodeled to meet the mountain's needs, such as the snowplow created by replacing the bucket of a front-end loader with a plow blade. The crew members are versatile, able to be masons, carpenters, mechanics or whatever's needed, Hogan said.

If only the weather were as cooperative, his job would be much easier.

June 26, 1980

# memorandum

Steve Criswell *SC*

Blue Scout Accident 20 June 1980

For the Record

At about 3 P.M. on Friday, June 20, 1980, Jim Hadden lost control of the blue scout on the road below the bowl (KM32). The vehicle went over the edge and was stopped by rocks and trees about 60 feet down the slope. The vehicle did not roll and Jim Hadden was not injured.

The vehicle was lifted out by the crane on Monday and was trucked to Amado for inspection and repair. The inspection showed no faults or damage that would have impaired control of the vehicle before the accident.

After talking to the persons involved, the following is apparently what happened.

Due to lack of attention, Jim drove near the edge of the road and put the left wheel slightly over the edge. He was unable to return the vehicle to the center of the road due to the pull caused by the left wheel. When Jim realized that he was going over the edge, he turned to the left to take the vehicle over the edge instead of waiting for it to roll off sideways.

The apparent cause of the accident was driver error.

This accident underlines the importance of staying alert on the Mt. Hopkins road.

JC/dm

cc: R. McCrosky  
R. Dumas  
D. Kurtenbach  
W. Parsons  
MHO Distribution  
Project Heads  
James Hadden

Attachments: Driver's report  
Mechanic's report



MMTO Operation Manager J.T. Williams and Technician Larry

Vaughn were featured recently in the Arizona Daily Star describing various problems with the MMT. One of the unexpected problems with the telescope operation was the buildup of ladybugs on the steel track around which the building rotates. The solution was to affix hard rubber scrapers fore-and aft on the wheel housing to keep the track clear of squashed bugs.

SM&R hauled 8,000 gallons of water to the ridge. Cost per gallon \$.28 or \$1.40 to flush a toilet.

June 4, 1980

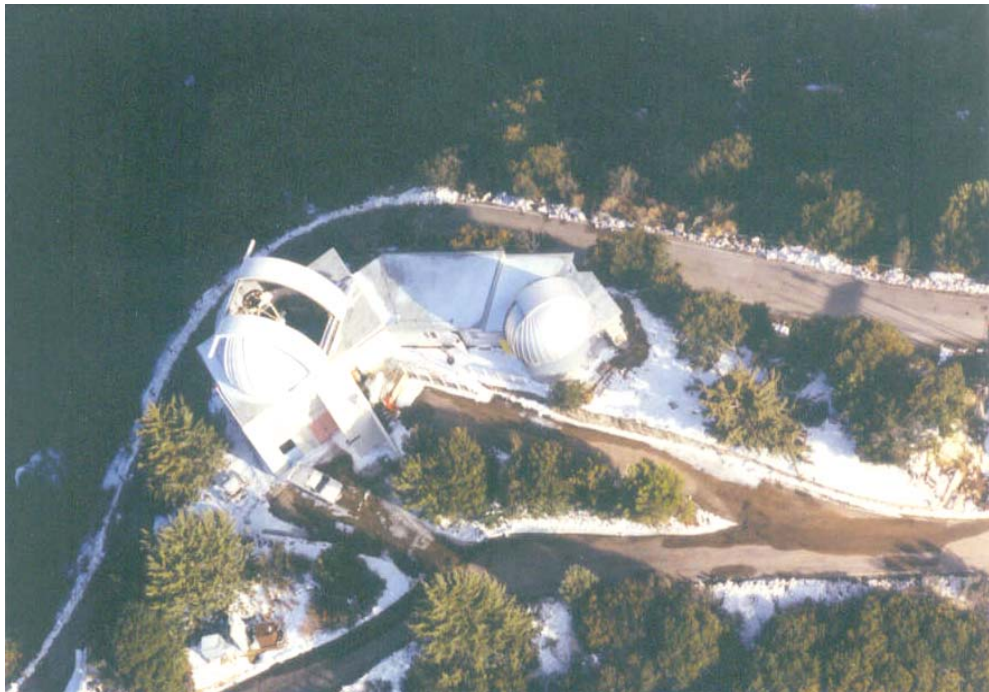
Completed construction of pump house between the water tanks on the ridge.

June 24, 1980

The Arizona Daily Star reports that a University of Arizona team confirmed Albert Einstein's theory of relativity at the MMT.

July 7, 1980

Annex building was completed between 60" and 48" telescopes domes on Knoll #1.



ANNEX BUILDING LOOKING DOWN

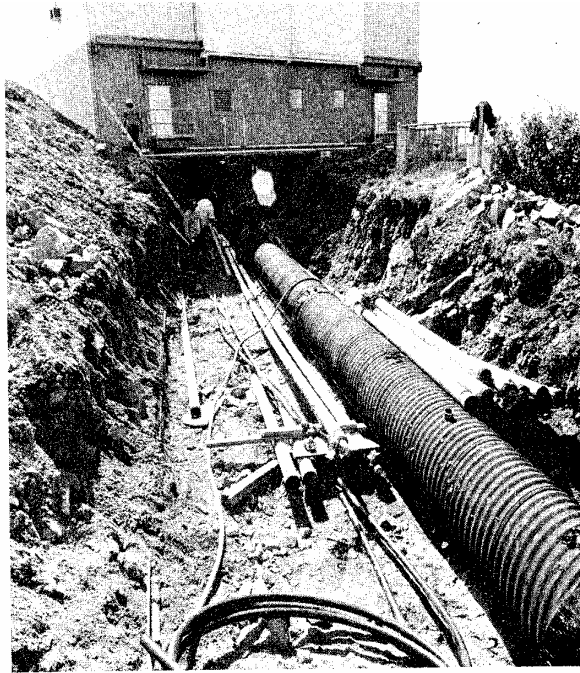
September 29, 1980

Arrangements were started by Mike Pearlman and Ralph Dumas to

transfer the Baker Nunn Camera to The Smithsonian National Air and Space Museum for exhibition in Washington, DC.

November 5, 1980

Ronald Reagan won the election in a landslide victory. Allen Haifley was certified as a snow plow operator.



The MMT parking lot looked like part of the Alaska Pipeline last summer as 100 feet of metal tubing stretched outward from the basement during installations of the new air venting system. (Photo by Donna Rakow)

### MMT'S "HEAT EXHAUSTION" MAY PRODUCE BETTER SEEING

"DANGER — A 20-foot hole may be outside this door!"

This hand-lettered sign appeared on the doorways of the MMT this summer to warn the staff inside the rotating building of a gaping trench below their doorstep.

The trench, cutting through the parking lot and leading to the summit edge, was dug to accommodate a large air duct system that should significantly improve the internal seeing at the MMT.

The MMT is already known for its "extraordinary seeing," that is, the extremely low level of atmospheric effects perturbing the observed light from stars and limiting image sharpness. However, temperature differentials within the observing chamber can degrade the quality of the "dome seeing," thus affecting the alignment of laser beams as well as the resolution of celestial objects.

The newly installed refinement, part of the original MMT design, exhausts warm air from the building out to the "average downwind" side of the site, far enough away from the telescope so the rising air streams will not affect the quality of stellar images.

One hundred feet of 30-inch-diameter, custom-made, corrugated, galvanized, metal pipe leaves the basement and snakes underground to a point some 85 feet away from the MMT. A fan in the vertical stack at the end of the run exhausts air through a diffuser resembling a "square mushroom."

The sources of undesirable warm air within the building include the computers and electronics of the control and instrumentation rooms. The electronics and motors on the OSS are heat sources within the observing chamber itself.

To remove heat accumulating in the chamber, the hollow yoke of the MMT is used as an air duct. A fan in the base of the telescope pier draws air through the yoke and down into the basement, where the main ventilation system has already dumped warm air from the other parts of the building. From here, the new \$30,000 air duct system exhausts the potentially disturbing heat into the Arizona atmosphere.

—Dan Brocius

YEAR 1981

January 2, 1981

## MIKE MEGARIZ OF MHO

Michael "Mike" Bracamonte Megariz, a member of the Mt. Hopkins Observatory Support Force for nearly a decade, died January 2, 1981, at his home in Tubac, Arizona, after suffering a heart attack. He was 62.

A native of Santa Cruz County, Megariz operated a small horse and cattle ranch where he broke and trained riding and racing horses for himself and others. He was well known on the small track horse-racing circuit of the Western states.

Megariz also had served as deputy sheriff and local school board member.

"A first-class individual who will be sorely missed by the staff here," commented supervisor Don Hogan, "No matter what task he had before him, Mike approached it in the same good-natured fashion."

Megariz had participated in the installation of the 24-inch telescope, testing of the Mt. Hopkins summit site, and the general construction efforts supporting the Multiple Mirror telescope project.

Mike is survived by his wife, Oralia; and his sons, Mike and Alex, all of Tubac.





## MT. HOPKINS OBSERVATORY



Volunteers Betty and Merle Finch display sign on the Mt. Hopkins "outreach van" which takes astronomy programs to schools. (Photo by Dan Brocius)

February 1981

Support personnel now required to wear safety shoes. MHO will reimburse the cost of shoes up to \$35.

A procedure for vision screening and safety glasses was also implemented

Smoking is no longer allowed in shuttles.

March 4, 1981

MEMORANDUM

Steve Criswell SC

Cost/Benefit Study of Contracting Mt. Hopkins Road  
Maintenance

For the Record

A detailed study has not been made. Historically the Mt. Hopkins Support Staff was a construction crew. The staff is now evolving slowly into a building maintenance staff. As this evolution takes place, Mt. Hopkins will consider farming out various parts of the road maintenance.

In the last year we have examined the feasibility of contracting road grading and/or snow plowing. In both cases we decided against contracting out for a combination of the following reasons.

- 1) Due to the remoteness of the site, and the small size of the job, there are not many contractors who are willing to bid the job.
- 2) We have a staff that can do the work.
- 3) Since the maintenance of the road is not a full time job, the transportation of the equipment to the mountain adds to the contract costs.
- 4) Due to transportation, priorities and labor policies, contractor response time is a problem. (i.e. no plowing on Sundays)
- 5) Mt. Hopkins must retain some heavy equipment to respond to emergencies.
- 6) Mt. Hopkins can obtain some types of heavy equipment in good condition for no cost via excess.

My feeling, without doing a study, is that we can do the work inhouse for less money so long as we can obtain good quality heavy equipment from excess. If we have to buy and replace heavy equipment in the commercial market, it would be cheaper to contract the work out.

These trade-offs are examined yearly or each time the staffing of Mt. Hopkins changes.

SJC/dm

R. McCrosky  
J. Gregory

F. Chaffee  
D. Hogan

# Our long-distance volunteers

By LORI L. RAKESTRAW  
OPA Staff Intern

Help!

That was exactly what Dan Brocious, public information officer at the Mount Hopkins Observatory in Amado, Ariz., needed and received from residents of Green Valley, a retirement community 15 miles from the site.

Last February, after reading the Torch volunteer issue, Brocious decided to form his own volunteer program at Mount Hopkins.

Until then, he was a one-man show—serving as switchboard operator, receptionist, salesclerk and projectionist, in addition to carrying out the more normal public information duties of tour guide, media specialist and lecturer—with only long-distance support from the Observatory's headquarters in Cambridge, Mass.

"It was obvious I needed help," Brocious said, "so I brought the volunteers in to greet visitors and answer phones."

He found his volunteers in the audience at one of the public lectures the Observatory sponsors for communities in the Santa Cruz Valley. After the talks, Brocious found he had recruited a dozen prospective volunteers; of those, six became the core unit of his program.

Each volunteer works one day a week from 8 in the morning until 4 p.m., with one individual serving as a "floating" volunteer (to fill in during someone else's vacation or illness). Besides answering the phones and greet-

ing visitors, they may sell postcards and posters or show films while Brocious gives tours, operates a mobile education van, lectures and plans publicity for the astronomical research facility.

"There are a lot of little things they do that make me more effective—a variety of functions that, if they weren't here, I'd be doing.

"I can leave the office and know things are being taken care of," Brocious said.

"There is no one here who hasn't been to the top (of Mount Hopkins) at least once," Brocious added. As part of his orientation program, he has given each volunteer an individual tour of the observatory.

He also held a group session in the converted schoolhouse which serves as the Observatory's operation base, and now, reception center.

Brocious intends to keep the volunteer staff at a minimum for a while, but may seek more "floaters" to guarantee volunteer coverage in the reception center each day.

Later, he hopes to attract students majoring in astronomy or museum studies from the University of Arizona in Tucson to serve as guides for the day-long bus tours of the mountaintop observing site. Student guides will learn to describe the ecology and wildlife of the mountain to visitors during the tour.

Then, Brocious hopes to have some more time to lecture and write about the largest field station of the Smithsonian Astrophysical Observatory. (See Torch, 'Q & A,' September 1980.)

April 1, 1981

Bill Kery and Dick Alexander started as mountain support as mountain support volunteers reading water meters and other routine tasks

DATE: May 5, 1981  
COPY TO  
FROM: Frederic H. Chaffee, Jr.  
SUBJECT: Mt. Hopkins Building Names

# memorandum

TO: Distribution

For a number of reasons we have decided to change the names of buildings at Mt. Hopkins which heretofore have had American Indian names to those which describe the building's function.

Thus the Wikieup will become the "Ridge dormitory". The "Hogan" becomes "Bowl dormitory" and the "Kiva" becomes the "Common building".

These changes will be reflected by the signs outside the buildings, the blue sheet and the new visitor's guide.

FHC/dm

cc: J. Beckers  
J. Cornell  
S. Criswell ✓  
J. Gregory  
H. Gursky

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5/28/81

# memorandum

Frederic Chaffee &/or Cindy

Spring party

IHO and MMT0 staff

You and your spouse (girlfriend, boyfriend, etc.) are invited to the 3rd annual FHC spring fling from 4:00 pm until the late hours of the 13 of June, 1981 at 2256 E. Prince Road.

Hamburgers and beverages will be served and you are asked to either provide a salad dish or a dessert.

Please let Cindy know whether or not you are coming so we can buy the appropriate amount of food.

Bring swimming suits and towels (and folding chairs if you have them).

July 7, 1981

Common building built by Sierrita Mining & Ranching



BOWL COMMON BUILDING - CAN YOU SEE THE DEER IN THE PICTURE?

## memorandum

September 11, 1981

Frederic H. Chaffee, Jr. *FHC*

Evening Orientation Session

MHO Employees

For the benefit of our new employees, Mrs. Larson (Ginnee) and Mrs. Alegria (Grace), I will be holding an orientation session on the mountain the night of 24 September. The purpose of these sessions is to provide MHO employees some insight into the scientific operation on the mountain. We will leave Amado at 5:00 PM and arrive at the ridge at 6:00 PM. Participants should bring a "brown bag" dinner, and the orientation will last until approximately 11:00 PM. Compensatory time will be given for all time spent on the mountain that evening. A shuttle will then be made available for participants who wish to return to Amado. Dorm rooms are available for those who prefer to sleep on the mountain and return to Amado the next morning.

Any MHO employees who have not participated in a mountain orientation session in the past are invited to attend, although we should limit the number of participants to 6 for any one session. If you are interested in attending, please sign this form and return it to Cathy. If more than 6 employees express an interest, I will schedule additional sessions.

I wish to participate in the 24 September scientific orientation on the mountain.

---

Signature

November 6, 1981

Bowl Restrooms built by Support Group. All of the plumbing was done by our volunteer Bill Kery, formerly a Plumbing Contractor in Connecticut. This saved us mucho grief and many dollars. This was a nine month, on and off project, with a total material cost of \$17,000.



THE BOWL RESTROOM UNDER CONSTRUCTION



BOWL RESTROOM



November 24, 1981.

# memorandum

Whipple Observatory Public In-  
formation Office  
Volunteer night on the Mountain

WO volunteers

Saturday, December 5, WO will sponsor an afternoon and evening  
tour of the Observatory for the volunteer staff.

The bus will leave Amado at 2 PM. The weather may be cold on the  
mountain so jackets are advised. Dress should be casual and  
comfortable.

Dinner is scheduled for approximately 5:30 PM at the Common  
Building. Hamburgers, cheeseburgers, soft drinks and coffee will  
be provided; volunteers may bring a potluck dish if they wish.

After dinner, a nighttime tour of the mountain will be conducted  
so that the volunteers can see the observers and astronomers at  
work.

The group will return to Amado late in the evening perhaps between  
10 and 11 PM. As always, the tour may be cancelled because of  
rain or snow.

Dan Brocious will drive the bus. Don Hogan will be tour director;  
other members of the WO staff might attend as well.

If you have any questions, please call the Public Information  
Office.

## CALLING ALL VOLUNTEERS IN FOLLOWING PHOTOS

First Photo: Dan Brocious, Harris Tate, Merle Finch,  
Dorothy Dietz, Trude Kery, Bill Kery, Betty Schmidt, Betty  
Finch and Gladys Walden.

Second Photo: (L. to R) Henry Heller, Betty Finch, Allen  
Haifley, Merle Finch.

Third Photo: Glades Walden, Florence Alexander, Dick Alexander,  
Jenifer Hafley, Cindy Smith.

Fourth Photo: Dan Brocious, "Telling it like it is" with Trude  
Kery

Fifth Photo: Bill Kery, Harris Tate, Betty Schmidt, Eldon  
Schmidt





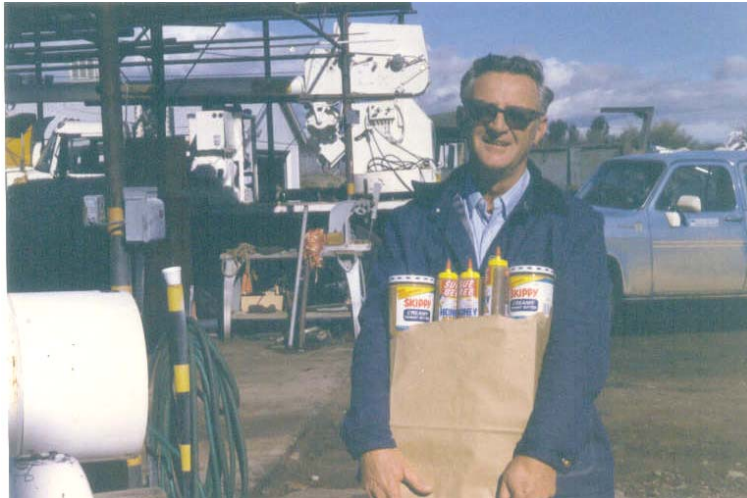


KITCHEN CLEAN-UP CREW - CINDY SMITH & JENNIFER HAIFLEY

YEAR 1982

January 27, 1982

Dick Alexander with the assistance of Bill Kery wrote a five page comprehensive study of water usage and made recommendations for the year 1982. This study was very well done and very much appreciated.



PEANUT BUTTER AND HONEY DELIVERY

### **MOUNTAIN STAPLE SUPPLIES**

A-1 sauce, aluminum foil, baking soda, BBQ sauce, catsup, chili powder, coffee (instant & drip), coffee filters, cooking oil, creamora, dishwasher soap, dishwashing soap, flour, hand/bath soap, honey, hot cocoa mix, instant ice tea, laundry soap, margarine, mayonnaise, mustard, paper towels, napkins, peanut butter, pepper, powdered milk, salad dressing, salt, Sanka, Saran wrap, soy sauce, spices, sugar, chili sauce, teabags, Tabasco, toothpicks, vinegar and wooden matches.

After much debate a vote was held with the staff about what type peanut butter should be stocked. SKIPPY SMOOTH was the preferred choice.

The staples were inventoried monthly by Observatory volunteers. This was usually done by Trudy Kery and Girt Trax. Each mountain building has a kitchen, with one at the base camp, resulting in a total of eight kitchens.

In addition to the staples list emergency food supplies were kept by staff members in their lockers in various buildings.

Discussed the cleaning contract and personnel problems with Fred Chaffee and Steve Criswell.

May 7, 1982

#### OBSERVATORY NAME DEDICATION



More than 100 people and VIP'S attended this dedication.

A large boulder was selected from our vast collection to

mount the official brass F.L.WHIPPLE plaque. More than 200 FLWO "T" shirts were sold at the base camp. This was the largest sale ever.

Dedication of the "Fred Lawrence Whipple Observatory"

Amado, Arizona

Friday, May 7, 1982

Schedule

8:30 AM Bus departure from the Doubletree Inn, Tucson  
9:30 AM Arrival at Whipple Observatory Office, Amado  
9:45 AM Departure from Amado by bus and carryalls to the mountain site. (Private cars may not be used on the access road.)  
11:00 AM Arrival at the Bowl Area (8000-foot level) on Mt. Hopkins  
11:30 AM Informal Ceremony  
12 Noon Buffet Luncheon  
1:00 PM Tour of facilities  
3:30 PM Departure from mountain  
4:30 PM Arrival in Amado and transfer to Tubac Country Club, Tubac  
6:00 PM Reception and dinner  
8:30 PM Return to Doubletree Inn, Tucson, by bus

Hotels

Most out-of-town guests will be staying at the Doubletree Inn, 445 South Alvernon, Tucson, AZ 85711 (602) 881-4200. Guests should make their own reservations. Identify yourself as part of the Smithsonian party and ask for the special rate of \$28 per night.

Amado Office

The Amado Office of the Whipple Observatory is located approximately 38 miles south of Tucson near the Amado Dog Track. Take I-19 South to the first Amado exit, turn left off the ramp, drive under the highway, and then turn right onto the Frontage Road and drive south. Turn left at Luna's Gas Station; the entrance to the office parking lot is only another 20 yards on the left.

Mountain Tours

For those who have not visited Mt. Hopkins before, access to the mountaintop facilities is by a one-lane, winding, dirt road without guardrails. Private cars are not allowed on the road; guests should plan to ride in Smithsonian vehicles leaving from Amado that morning at 9:45 am. All the astronomical facilities are above 7600 feet, with the lunch area and MMT approximately 1000 feet higher; since some walking may be necessary, guests with heart or respiratory problems may want to seek medical advice before deciding to visit the mountain.

The weather in May should be clear and warm; but the mountain areas can often be 10 to 20 degrees cooler than Tucson, and a jacket or light sweater is advisable. Most areas on the mountain are unpaved, rough, and dusty; sturdy walking shoes and old clothes are recommended, as are sunglasses or broad-brimmed hats.

Drinking water, soft drinks, and rest rooms are available on the mountain.

Tubac Country Club

The Tubac Country Club is located about 7 miles south of Amado (and a mile north of the village of Tubac itself.) Instead of turning off at Amado, continue south on I-19 until Exit 40 (Chavez Siding Road). Turn left off the ramp, drive under the highway, turn right on the Frontage Road, and drive south. The entrance to the Country Club is marked by a distinctive Spanish-style arch visible from the highway. Turn left at the arch and drive east toward the river (and Mt. Hopkins); the club is in an old hacienda and the silos of the former stables are easily seen. For guests who take the mountain tour during the day, showers and locker room facilities will be available, so one should bring a change of clothes.



## Developer Whipple honored

# Hopkins Observatory renamed

By Steve Williams  
The Arizona Daily Star

Mount Hopkins Observatory has a new name — the name of a man whose momentous career in astronomy started as a by-product of his love for tennis.

"I went to college because I was mainly interested in tennis," the near-legendary astronomer said after a mountaintop ceremony Friday that inaugurated the Fred Lawrence Whipple Observatory.

"If I hadn't had polio at the age of 4, I would've been a better tennis player," said the 75-year-old, who smokes a pack of cigarettes a day and rides a bicycle 12 miles round trip to work daily in Cambridge, Mass. "And I would've been a tennis bum, because there wasn't much money in it back then."

"It's an eerie feeling to see my name on a rock here," Whipple said after a plaque with the observatory's new name on it was unveiled.

The observatory on Mount Hopkins, in the Santa Rita Mountains south of Tucson, was built and developed under his leadership. It opened in 1968.

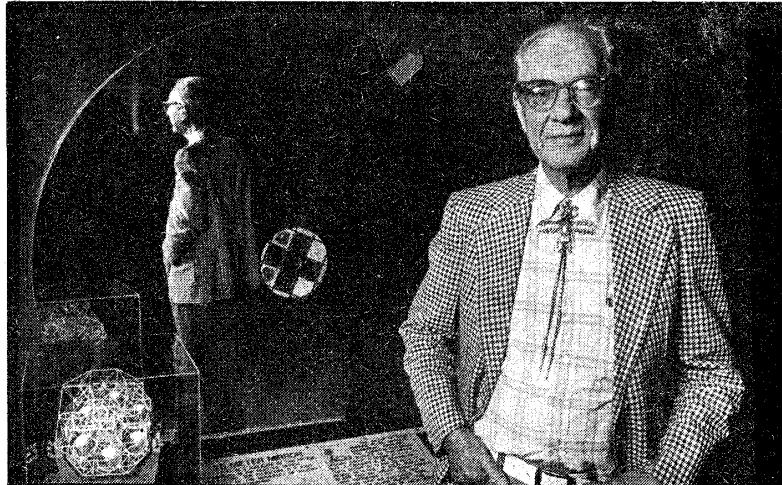
From 1955 to 1973, Whipple was director of the Smithsonian Astrophysical Observatory, based in Cambridge with field stations around the world.

He chose the site for the observatory that now bears his name "in '65 or '66," after studying several locations in the Southwest. "We drove up an old mine road as far as we could go, and then we hiked up animal trails.

"When I saw the top (of Mount Hopkins) I said, 'I want something good up there.'"

After starting to attend the University of California at Los Angeles in 1924, Whipple "decided to major in math, because I could get good grades in it and look good when I went home," he said.

"I decided to minor in physics and astronomy. I realized I was never going to be a great tennis star, and I got interested in astronomy," he said.



Joe Patronite, The Arizona Daily Star

### Whipple and a copy of the revolutionary mirror he designed

Whipple, who considers himself a "cosmic engineer," is responsible for the basic design of the 3-year-old, revolutionary Multiple-Mirror Telescope, which is jointly owned and operated by the Smithsonian and the University of Arizona.

Besides the MMT, which is the third-largest optical telescope in the world, the Whipple Observatory also has 60-inch and 24-inch reflecting telescopes, satellite-tracking equipment and a light-gathering instrument used to study gamma rays.

After graduating in 1927 with a bachelor's degree in math, Whipple went to the University of California at Berkeley, where he completed his Ph.D. in astronomy in 1931.

He began working at Harvard College Observatory in 1931 and is now a professor emeritus at Harvard University.

While doing his graduate work in Berkeley, he began working in stellar astronomy, but he later became interested in comets.

In the early 1940s, he announced his "dirty snowball" theory of comets — the idea that comets are made of ice and

rocks, a theory later proved.

By studying 150 years of comet observations, he plotted orbits of comets and discovered that most of the meteors we see are actually comets burning up in the Earth's atmosphere.

Comets are still the main focus of his research. He tried to persuade the U.S. government to fund an unmanned probe to Halley's Comet when its 75-year orbit brings it near the sun again in 1986.

Having failed, he joined the imaging team for the European Space Agency's probe to the comet.

Ten years after normal retirement age, Whipple hasn't lost any zest for his work.

"He's busier now than he was 10 years ago," said James Cornell, publications manager for the Harvard-Smithsonian Center for Astrophysics.

Whipple said that in science, "when the journals won't publish your papers anymore, you know you're over the top. They're still publishing mine.

"Astronomy is my vocation as well as my vocation. I never intend to retire."

November 10, 1982

The following is scanned from an old daily logbook.

## memorandum

November 10, 1982

Steve Criswell

Ready Mix Truck Accident at FLWO - November 3, 1982

### For the Record

At approximately 5:30 PM on November 3, 1982 a ready mix truck going up the mountain owned by Curb Service Inc. and driven by Steve Buchanan, an employee of Curb Service Inc. went off the FLWO access road near KM 24. The truck rolled down the slope 30 feet and started to burn. The driver apparently escaped with minor injuries. The burning truck started a small tree and brush fire. FLWO and MMTO personnel had the fire under control by 8:00 PM and completely out by 9:00 PM. If the fire had not been put out, it could have threatened the Observatory, since the wind was gusting to 25 MPH.

This memo contains a detailed description of the accident and an analysis of FLWO emergency procedures.

DESCRIPTION

5:15-5:30PM

A ready mix concrete truck being driven up the mountain went off the road at KM24. At a narrow spot in the road, the left front tire apparently hit a soft/narrow spot and dropped off the road. The truck then continued off the road. It appears to have rolled once and stopped pointing up at the road. The gas tank was probably ruptured by a rock as the truck rolled. A spark from somewhere then ignited gasoline. The driver was bruised but not seriously injured and he climbed out of the cab. The driver of the cement truck and the driver following him then started to fight the fire with shovels.

5:50-6:00 PM

A call from an unknown person on the FLWO FM radio system said "Can anybody hear me? There is a fire on the mountain." This call was heard by the MMT, Don Hogan at his house, Fred Chaffee and Rich Cromwell who were on their way down the mountain at about KM 18, and Steve Criswell at his house. The MMT operator, Carol Heller, was new and tried to answer with a handheld radio which apparently was not working. She was not familiar with the phone type of radio control in the MMT control room. As a result, the MMT did not answer this call. Don Hogan tried to answer, but with the handheld radio he had could not reach the mountain. Steve Criswell answered the call from his house with a good base station but could not get the caller to respond. Don Hogan went outside his house and could see smoke. He called Dick White, the 60 inch observer, and asked him to look for the fire. Dick reported that he saw nothing. In response to the radio traffic the MMT went out and could see smoke near the road. Bill Kindred and Roy Tucker got in a shuttle and started down the road toward the fire. They used the shuttle radio to stay in touch with Steve Criswell at his house. Don Hogan headed for the Amado base camp.

6:00-6:15 PM

Steve Criswell contacted Myron Clack and Jim Peters and asked them to go to Amado. Steve also called the Forest Service and described the situation to them. The Forest Service said that all their personnel and equipment were fighting a fire in the Huachuca mountains. They wished us luck.

6:15-6:30PM

Bill and Roy arrived at the fire site and described the situation

via radio to Don and Steve. They attempted to find fire boxes at Jesse's Mine parking lot and the large storage tank area. When they could not find boxes at these sites, they headed for the box at the ridge. Don Hogan called Dick and asked him to get the ridge fire truck and to start filling it with water. Now that the radio was covered in Amado, Steve left his house for Amado.

It was now dark and the moon would not be up until about 9 PM.

6:30-6:45 PM

Myron arrived in Amado and took the large water truck to the Amado well to start filling it. Don and Jim unloaded the dewar from Don's pickup and loaded the pickup with radios, first aid supplies, and all the fire extinguishers that they could find. Bill and Roy arrived at the ridge to help Dick and to get supplies from the ridge fire box.

6:45-7:00 PM

Jim and Don left Amado for the fire. Bill, Roy, and Dick left the ridge for the fire. Steve talked to the MMT and explained the use of the phone type radio so that we would have good communications when everyone was on the road. Steve also gave an updated description of the situation to the Forest Service.

7:00-7:15

Since no one could communicate with Myron at the well, Steve went to find out what was happening. Myron could hear what was happening but could not break the repeater with his hand held radio. Myron estimated that he had the truck about two thirds full. Myron, Steve, and Don decided not to wait for the truck to fill completely. Myron and Steve left the well for the fire. Bill, Roy, and Dick arrived at the fire. The two truck drivers who had been fighting the fire left the site to get medical assistance. Don, who was on the road gave fire truck pump operating instructions via radio to Bill, Roy, and Dick. They started to control the grass and brush fire, and to cool down the gas tank on the truck with the 150 gallons in the fire truck.

7:15-7:30 PM

Don and Jim arrived at the fire. The fire truck ran out of water.

7:30-7:45

Steve arrived at the fire in a crew cab. Myron arrived at the



fire with the large water truck. Chuck Dexheimer, Forest Service, arrived at the fire in a pickup. We started to pump water directly from the large water truck onto the fire from the road. Since we were concerned that we were using water too quickly, we changed over and used the large water truck to fill the fire truck. The smaller, longer, more easily controlled hose from the fire truck was then used to fight the fire.

7:45-8:15 PM

We put out most of the brush and trees in this way; however, the truck and its tires were still burning. Roy took the hose over the side and was able to start getting water directly on the truck.

8:15-8:45 PM

The fire appeared to be out but we continued to wet the area down. A total of about 1800 gallons was used to put the fire out.

8:45-9:00 PM

Don, Bill, and Roy went over the side with the hose and shovels to smother and wet down the remaining hot areas.

9:00-9:15 PM

We cleaned up and left the site.

October 1, 1982


Congress passed a "Continuing Resolution Bill" that kept the government running and also kept our paychecks coming.

Bill Kery donated more than \$300 worth of plumbing tools and equipment to the Observatory.

Wrote a letter of complaint to the Leonard Valve Company about the Bowl Dormitory shower valves. These valves just don't work properly. They don't mix the hot and cold water properly with sudden changes from hot to cold. Not funny!!!

YEAR 1983

# memorandum

DATE: April 1, 1983  
TO: Don Hogan   
SUBJECT: Winter Storm Summary (1982-83)  
FROM: Steve Criswell

Attached is a summary of the winter storms from November 1982 to April 1983. It was a busy season but not the worst we have experienced.

We spend \$2234 or 118 hours for overtime. Outside assistance for drilling, blasting and boulder removal cost us \$2767. A total of 90 hours was spent in compensatory time.

Snow depth total was a minimum on the ridge of 52 inches and a maximum on the summit road/bowl area of 103 inches (this maximum does not include drifts).

This was not a typical Arizona winter; lets hope next year is better.

/ga

c: Dr. F. Chaffee  
Mr. J.T. Williams  
Mr. D. Brocious

July 30, 1983

The 60 inch mirror needed to be cleaned and resurfaced. Liberty Mirror, Brackenridge, Pennsylvania was selected to do the work.

The Observatory's job was to remove the mirror from its cell and transport it to and from a town near Pittsburg.

Both the primary and the secondary mirrors were packed-up and placed on our best riding truck called "Lady."

Dick Alexander, an Observatory Volunteer and retired Chemical Engineer with Du Pont and Don Hogan drove the truck a total of 4,555 miles round trip. We called Amado once a day to report our progress and to check on any schedule changes.

Our Schedule:

30 July Saturday      Leave Amado

5 August (Friday) Unload at Liberty  
15 August (Monday) Load at Liberty  
22 August (Monday) Start reinstalling the mirrors  
at FLWO.

Everything went according to schedule.

We learned that 75 MPH on the speedometer was actually 59 MPH one road mile was equivalent to 1.28 miles. We averaged 10 miles per gallon- average price per gallon \$1.28. The truck had three gas tanks resulting in fewer stops during the day.



TINO JUBERA AND DON HOGAN REMOVING THE 60 INCH MIRROR

The truck ran trouble free except for replacing one tail light and the air conditioning belt.

On the return trip we refueled in Huntington, West Virginia. The station attendant asked where we were headed. Dick told him we were returning to Arizona. I added, "with rattlesnakes in the in the big box." We were going to return them to mountains in Southern Arizona after being "milked" in Washington for medical venom. I slapped the box with one hand and asked him if he could hear the rattles. "No I don't!" Put your ear against the box and listen. He did and I slapped the box again. "Did you hear them?" "Yeah I did, and he backed away from the box.

Dick and I drove away laughing.





60 INCH BEFORE AND AFTER RESURFACING



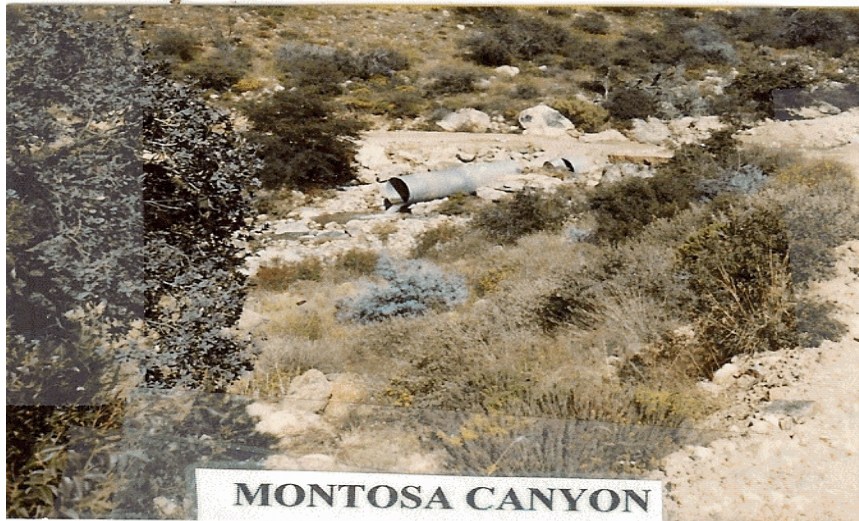
BEAUTIFUL GLASS GOING HOME

October 2,1983

Sunday. The both bridges, (this and the foot bridge) washed away at the Amado Crossing. Heavy rain caused flooding and extensive road damage. Observers and equipment operators were transported from the Amado Office to the mountain via helicopter.



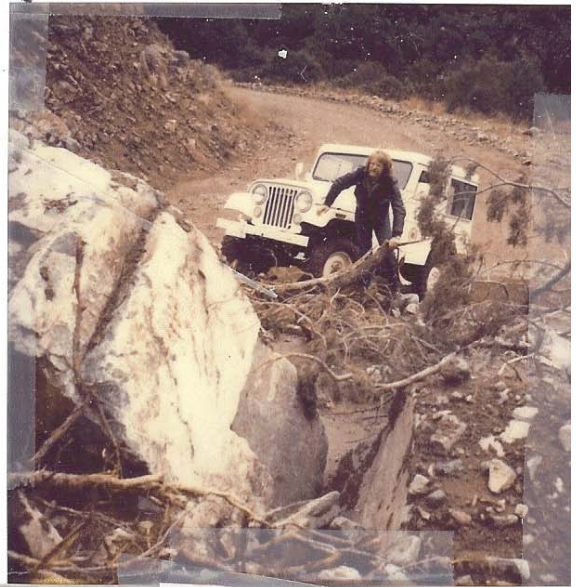




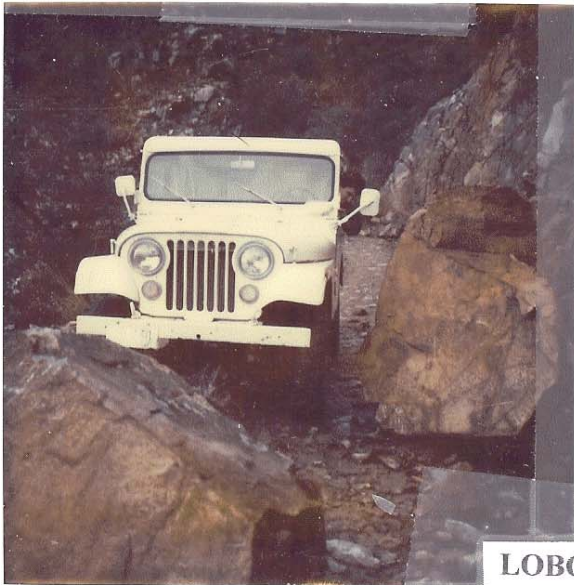
TWO SECTIONS OF THE ROAD WASHED OUT AT THIS POINT KM 14



KEVIN HARRIS



RUDY SCHILD



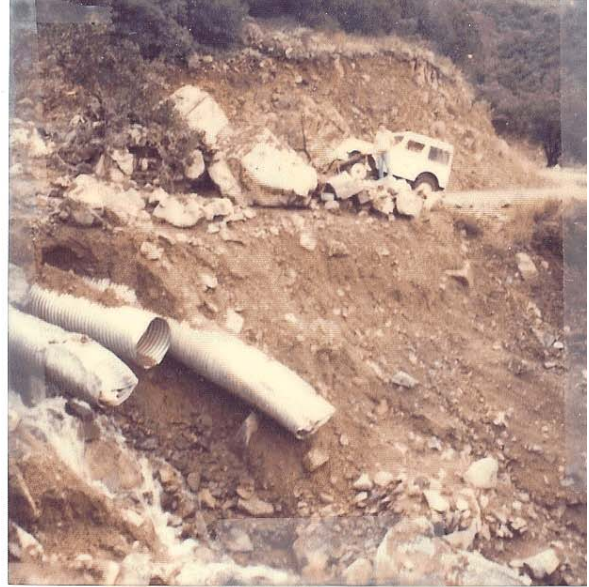
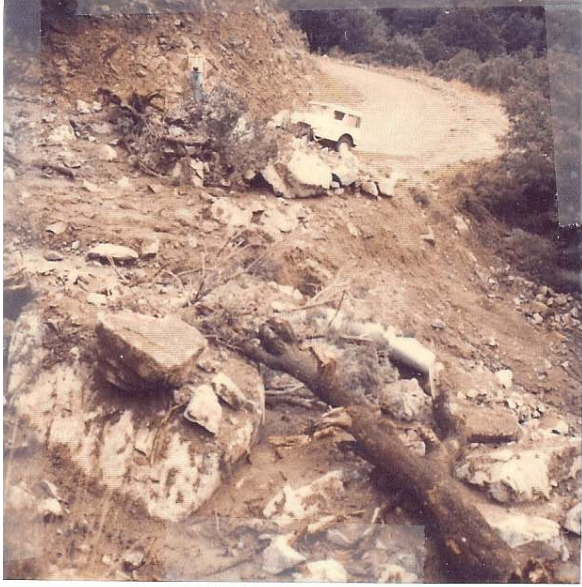
LOBO CANYON



ESTIMATED 300+ CUBIC YARDS OF MUD, BOULDERS AND TREES ON ROAD

Some the boulders were larger than the observatory's front end loader. We could not move this massive mess so we hauled sand and other materials and built a jeep road over the pile.

The rain actually started on Wednesday September 28<sup>th</sup> and continued for five days. On the second day, Thursday, the tour bus passengers waited two hours for the water to go down at the bottom of Montosa Canyon. A 6X6 long-bed and shuttles was sent to the site from Amado. All of the tourist were loaded on the rear of this military truck and driven across the rising wash. Shuttles returned them to Amado. This was a trip that they'll long remember.



#### LOBO CANYON-KM 22 CULVERT PIPES BENT AND MOVED

Helicopters were used to transport observers and equipment operators to the ridge. The helicopter was used also to survey the road damage.

The landline power to the mountain went out. Generators were placed on line for many days. Hauling fuel to them became a major problem. A complete day was required to deliver fuel via the Rio Rico Bridge.

Sierrita Mining & Ranching was hired to rebuild and repair the road. A large 5 cubic yard loader was driven by Norman Harris from Continental (Green Valley) over muddy back roads on the east side to Montosa Canyon.



A "State of Emergency" was declared for Southern Arizona.

Friday, five days after the Amado bridge washed out a 150 KW generator was driven and delivered to the MMT via Rio Rico. Butch, Russ, Rob, and JT had this generator on line to the MMT(only) by 11 PM. Electric power on the mountain had problems and was unreliable. Many man days and nights were spent working power problems.

While returning to Amado and just after sunset Tino Jubera, in the fuel truck, took a wrong turn and got lost on the east side of the river south of Tubac. A radio conversation on the subject went like this. "Hey I'm lost in patch of mesquite trees." "Well where are you?" "Damn it if I knew where I was I wouldn't be lost! HEHEHE!!! Heard on the radio! Standby! We'll have Myron come and find you! Myron, who lives on the east side of the river in Tubac, located Tino and put him on the right road home.

Two large boulders would not move using the big loader. Blasting was required the following day.

Two hours and fifty minutes was the average time spent to get to ridge with various kinds of vehicles. Total distance 58 miles one way.

The mountain road is rough and bumpy. An estimated seventy percent of the road fines have washed away. Many months of hauling in dump trucks will be necessary to put the road in decent condition.

Not including replacement of the Amado bridge repair estimates follow:

Flood Damage	\$123,030
Improvements to withstand the next flood	\$ 40,000
Work required before flood	<u>\$ 49,000</u>
Total	<u>\$221,380</u>

September 11, 1983

Surveyed the broken bridge in Amado with Gary Fox of SM&R. We decided to route the water under the standing part of the bridge and then build approaches to both ends of the concrete. This required a great deal of compacted material but we did it. We drove over this "jury-rigged" broken bridge for many months.

September 28, 1983

A temporary , 5 culvert pipe, Amado dirt crossing washed out last night. Ed Hackett, in his own pickup truck, got stuck in the crossing about midnight and walked home. His truck was pulled out in the morning.

The crossing at Ficketts was completed today for public use.

November 22, 1983

The recently repaired crossing at Amado washed out again.

December 20, 1983

No rain recently but the water in the river is up two feet. What's happening? We learned that they were releasing water from the Patagonia Lake. The local kids were fishing and catching rainbow trout in the mighty Santa Cruz River.

YEAR 1984

January 4, 1984

Completed the Wildlife Water Hole (Goldfish Pond) near the Gamma Ray building. Used cement that was left over from the 3 meter Dish project. The 1,000 gallon hole was dug in September but not completed due to flood and road problems. The water for this pond was mostly collected from the building roof.

Later, on a town supplies run, Tino bought \$3 worth of Goldfish in plastic bags from Kmart. In the years to come these little fish multiplied and reach lengths of about six inches.

This small pond was a great attraction for birds, deer and other animals on the mountain.

# The "FINAL

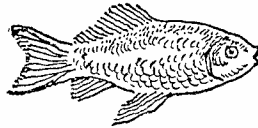
CHAPTER XX

## WORD ON

1/24/84  
GOLDFISH

### GOLDFISH

As an aquarium fish the Goldfish is, of course, extremely attractive, and as was mentioned previously, for the beginner it is very easily taken care of. In addition, it has long been known that goldfish can stand more rigors of weather than other fish kept as pets, and like all members of the carp family, can even stand being frozen into blocks of ice



COMMON GOLDFISH

and be alive and healthy when thawed out. They can be bred out-of-doors in mild weather, and if successive pools are established and the pets move from one to another where not too much force of water drops into the pools, they will do even better than in the house.

From these facts, it is easy to see that the common goldfish is the hardiest fish ever placed in a private or public aquarium. He is also the common ancestor of all the more colorful newer varieties that have been developed by selective breeding through the centuries.

**Varieties of Goldfish.** As the majority of these types would be unavailable to the average person who would want goldfish for the amusement of his family, we will touch only upon the more readily available.

Another larger rectangular pond was also built in the summit bowl area. Water off the Restroom roof drained into this pond via a three inch underground PVC pipe.

The article above answers a frequently asked question about freezing and survival.

January 5, 1984.

Heavy rain wash out the Amado Crossing again. A large semi pulling a trailer with 10-12 horses aboard got stuck trying to cross. Santa Cruz County put up a sign saying "Road Closed" and then used a road grader with a chain to pull the semi out of the river.

Chavez Crossing was used to get to the mountain.

January 6, 1984

The Fickett and Tubac Crossings washed out. Sierrita Mining and Ranching hauled 4 large (42"X 40') culverts to the Amado crossing from the Duval Mine. The observatory's loader, dump trucks and grader was used to assist the County rebuild the Amado Crossing. Two days were required to make this repair.

This crossing has been washed out four times since October.

February 1984

Continued using lignum sulfinat on the areas around the telescopes and on the road to keep the dust down. It works but it is a slow process that requires a great deal of water.

A road realignment plan to the mountain was proposed by passing the Rex Ranch area. Approval and money was necessary.

Started taking reflectivity tests on the 60 inch mirror on a weekly basis.

Discovered that the dome wheel bearings had not been greased since the dome was installed 16 years ago.

March 1984

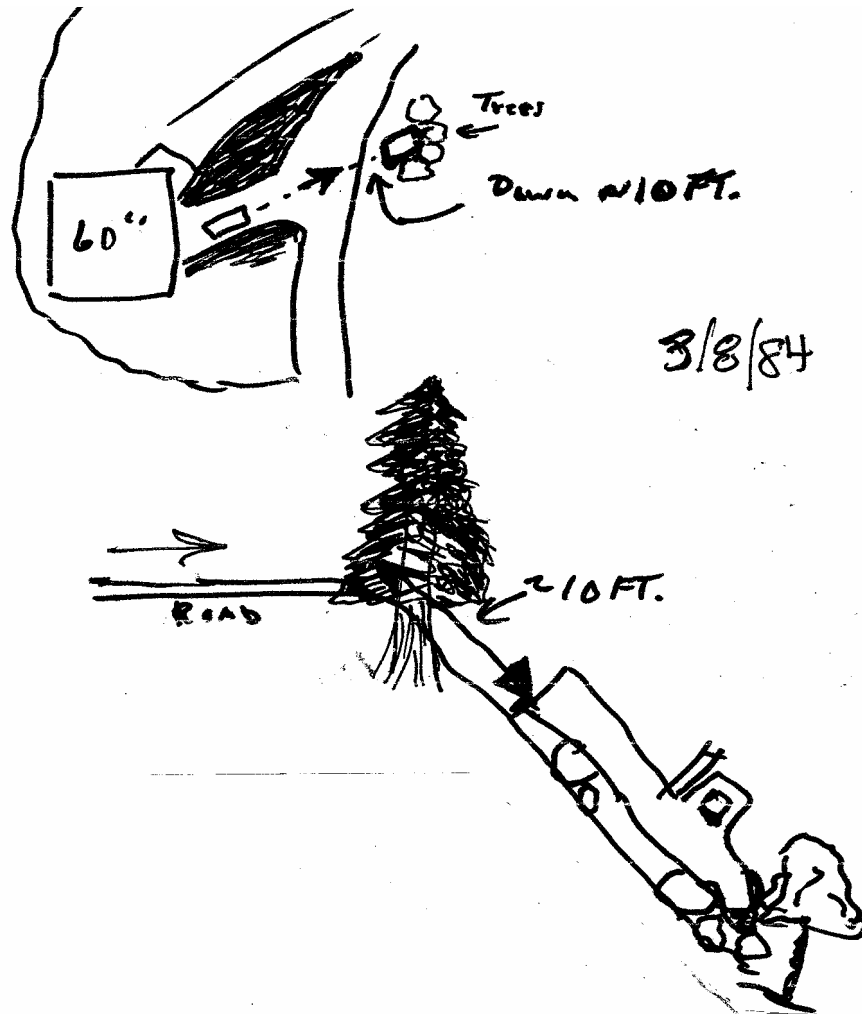
Many memos were written about what to do about the road. It was suggested that forget about the road and build an aerial tramway.

March 12, 1984

Public tours resumed using the 24 passenger bus four days a week.

J.T. Williams and Bill Omann have been planning and started to work on building a site test tower at Mt Graham. Volunteers from our staff assisted in a 8 cubic yard concrete pour and placement near the end of the month. Our crane and other equipment were also "loaned" and used at Mt Graham.

After months of grief Bill Kery, a volunteer plumber, replaced all ten shower valves in the Bowl Dormitory. No more complaints of "ALL HOT" or "NO HOT" water is expected.



PICKUP OVER THE SIDE - BRAKE WAS NOT SET

It's obvious that the writer is neither an artist or an English major.

The paperwork was started to hire four temporary manual laborers to work at Mt. Graham in May, June and July. Myron Clark and Jim Hadden spent 22 mandays on the project in March and April.

MMTO DARTERS AIM FOR BULL'S-EYE

MMTO technician Rob Kloza has hit the bull's-eye in the southern Arizona darting world.

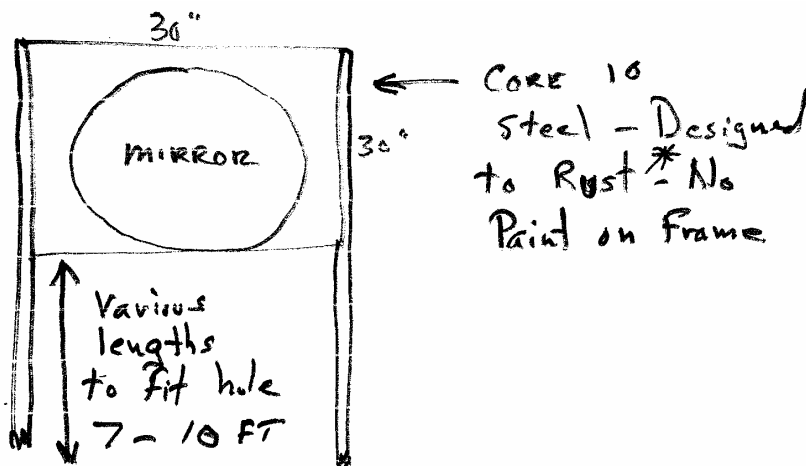
"Amado Rob" is the only member of the Southern Arizona Darting Association to be on two teams competing in the season's finals. As one of the "Magicians," a six-member Mixed Doubles team, Kloza helped his crew take the Tucson City Championship April 29. Paired with Janice Kindred (spouse of MMTO IR instrument specialist Bill Kindred) Kloza and his mates beat the defending champions, "Ton of Fun," for the title.

The day before, competing in the Open Division and "shooting" the feathered missiles with equally deadly accuracy, Kloza boosted the "Desperadoz" to a second place finish in the same championship competition.

MMTO staffers Warren Davison and Kirk Gilmore joined Janice Kindred this season on another Open Division team, "Boardwalk." They also made the playoffs, but, alas, went down in the preliminary round to the team that eventually went on to take first place.

The "house" dart team, otherwise known as the "MMT Stars," includes Davison, Gilmore, Bill and Janice Kindred, Kloza, and Russ Stenman. Although now taking a break after the 16-week competition season, the MMTO shooters continue to practice during lunch hours in the FLWO Common Building. Thus, they sharpen their skills on what must be--at altitude 8200 feet--one of the world's highest dart boards.

A regulation "BOAR HAIR" dart board was installed at the Common Building. Nothing else was acceptable.



May 16, 1984

Four of six road mirrors were installed on blind turns on the road. These convex mirrors allowed a driver to see an oncoming vehicle that cannot be seen otherwise.



FRED LAWRENCE WHIPPLE OBSERVATORY

May 2, 1984

To: Fred Lawrence Whipple Observatory  
staff and volunteers

Dear Colleagues,

Through the generosity of the James Smithsonian Society of the Smithsonian Associates, the Fred Lawrence Whipple Observatory has established an "Amateur Astronomy Vista" in the foothills of the Santa Rita mountains on the road leading to the observatory's research facilities atop Mt. Hopkins.

The Astronomy Vista is designed for the use of all amateur astronomers throughout Southern Arizona. The site, on the eastern slope of Montosa Canyon about 9 miles from Interstate Highway 19, has concrete pads and benches for the placement of telescopes and other instruments and interpretative signs describing the flora, fauna and geology of this rich nature area.

We hope that amateurs will be able to share the same dark skies and clear viewing that have made the Santa Ritas the location for the Smithsonian's major ground-based instruments, including the Multiple Mirror Telescope operated jointly with the University of Arizona.

I invite you to join us for the official dedication of the Astronomy Vista on Saturday, May 19. Guests will assemble at the Vista site in Montosa Canyon at approximately 6 p.m. for a short ceremony followed by light refreshments. Then, after sundown, amateurs will have an opportunity to make their first observations. Please rsvp to the Public Information Office in Amado.

We do hope you'll join us--and bring your telescope.

Sincerely,

Frederic H. Chaffee, Jr.  
Resident Director  
Fred Lawrence Whipple Observat

FHC:db  
encl.

SMITHSONIAN INSTITUTION  
ASTROPHYSICAL OBSERVATORY



INFORMATION  
2) 398-2432

BUSIN  
(602) 62  
(FTS) 76

FRED LAWRENCE WHIPPLE OBSERVATORY

May 18, 1984

Mr. Myron Clark  
Clark Farms  
P.O. Box 253  
Tubac, AZ 85640

Dear Mr. Clark:

The F.L. Whipple Observatory gratefully acknowledges the receipt of the 250 bales of hay (mulch).

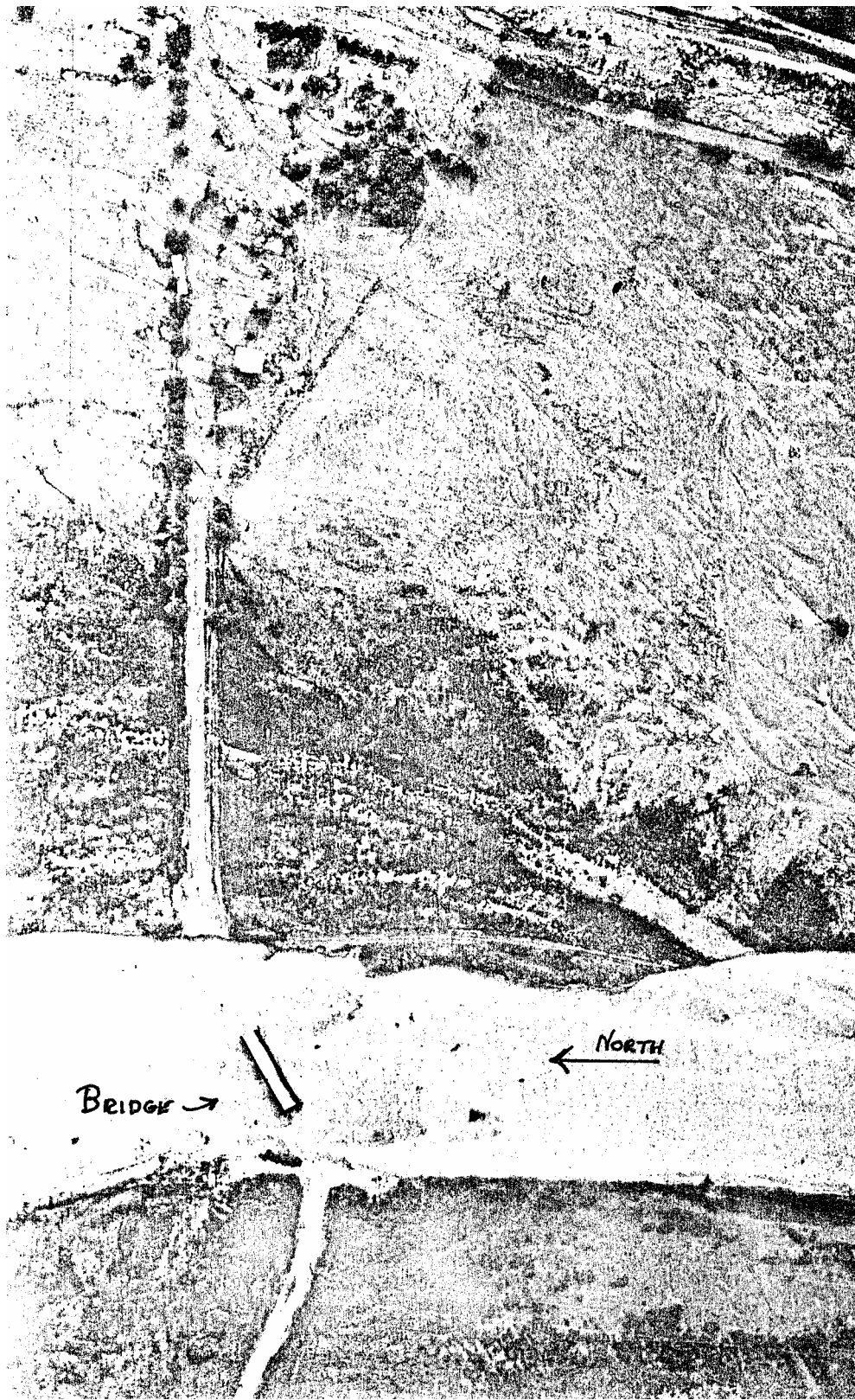
This hay, used in conjunction with seed and water will be used to revegetate the disturbed and scarred observatory grounds. The observatory's revegetation program not only improves the appearance of the grounds but helps to control the dust around the telescopes.

Thank you once again.

Donald F. Hogan  
Support Supervisor

c: Dr. F. Chaffee  
Mr. S. Criswell  
Support File





## RIVER WATER SURROUNDS THE AMADO BROKEN BRIDGE



### **Rough crossing**

As described on Page 3 of last month's Torch in "Floods Isolate Mount Hopkins," it's been rough going for staff and others trying to commute to the mountaintop facility. The temporary river crossing connecting the Amado, Ariz., base camp of SI's Whipple Observatory with its telescope facilities atop the mountain have been wiped out eight times in less than a year. This photo taken by Smithsonian staff photographer Dane Penland shows the status of the Santa Cruz River crossing in late October. On the left are remains of the bridge that was washed out earlier in the year.

The following was given very serious consideration for FLWO.

**BRIDGES**  
 Made of Railroad Steel  
 25' or 30' Long x 6' Wide

**STORAGE**  
 30' x 4' x 6' or 8' High  
 25' or 30' Long x 6' Wide

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 FMC for Army. Less than 100 miles on unit.  
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Keith Mays, The Arizona Daily Star

**No parking** — The Santa Cruz River north of Amado, back on July 17, bore no signs warning, "Don't park, or you'll be flowed away." So the driver of this Mustang decided to leave his car in a "safe" spot rather than risk crossing, Dan Brocius of the Smithsonian

Astrophysical Observatory said yesterday. But the river expanded still more, swallowing up the car. Now passable, the crossing at Canon Road is the only access to roads leading to the Whipple Observatory or Mount Hopkins.

# Heavy rains cause derailment near Tubac

By The Associated Press

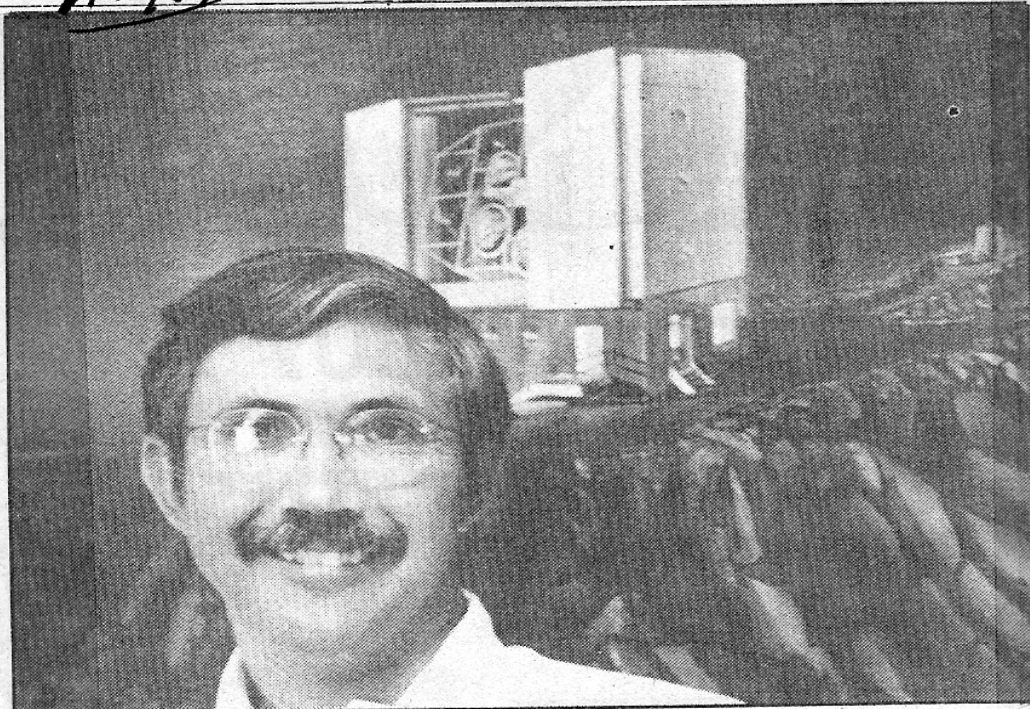
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TUBAC — The Santa Cruz County Sheriff's Office says heavy rains in the Tubac area yesterday afternoon washed out the Southern Pacific Railroad tracks, causing a train derailment at about 6:30 p.m. Authorities said all four engine cars were derailed, as were six of the approximately 70 freight cars. The three Southern Pacific crew mem-

bers on board the northbound train were not injured. Three persons believed to be illegal immigrants riding the train also escaped without apparent injury, the sheriff's office said. The sheriff's office also said that a side road to Tubac and Tumacacori was washed out by heavy rainfall, as was the Sonoita Creek Road at the Rio Rico Golf Course. The temporary road was constructed following last October's major flooding.

7/11/84

The Arizona Daily Star



Frederic H. Chaffee Jr. moves across the mountain

## Acting director is named MMT Observatory chief

Frederic H. Chaffee Jr. has been appointed director of the Multiple Mirror Telescope Observatory, located at the summit of Mount Hopkins, 40 miles south of Tucson.

Chaffee has been acting director of the observatory since Jacques M. Beckers resigned in March. Beckers is now associate director of the National Optical Astronomy Observatories, headquartered in Tucson.

Chaffee will resign as resident director of the Smithsonian Institution's Fred L. Whipple Observatory, which shares Mount Hopkins with the Multiple Mirror Telescope.

In his new position, Chaffee will oversee operation of the MMT, a

revolutionary instrument that uses six 72-inch mirrors to collect and focus starlight. Operated jointly by the Smithsonian Institution and the University of Arizona, it is the third largest optical telescope in the world.

Chaffee received a bachelor's degree from Dartmouth College in Hanover, N.H., in 1963 and a doctorate in astronomy from the UA in 1968. He was with the Smithsonian Astrophysical Observatory in Cambridge, Mass., before joining the Whipple Observatory — formerly Mount Hopkins Observatory — as a staff astronomer. He was later appointed resident director.

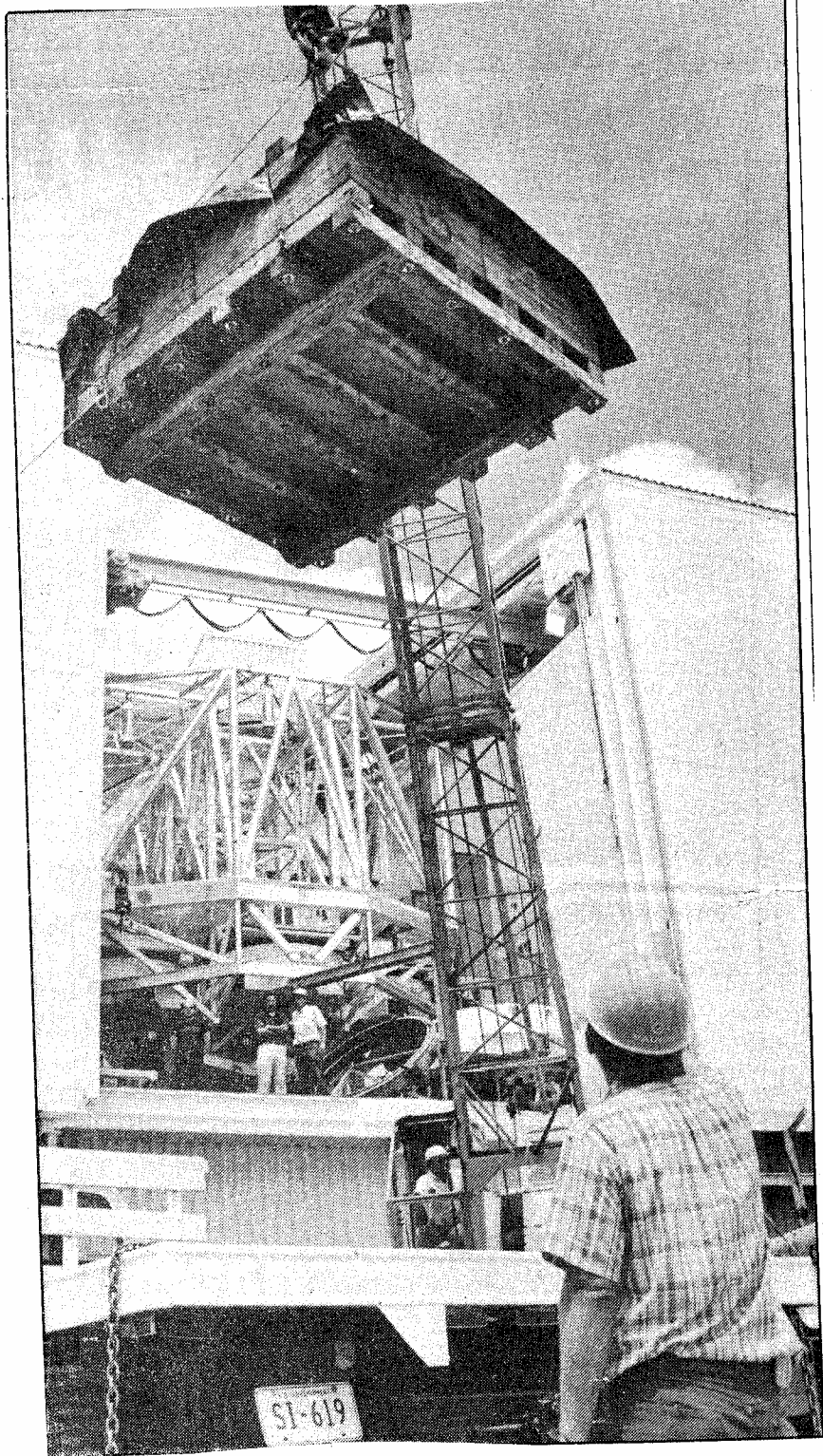


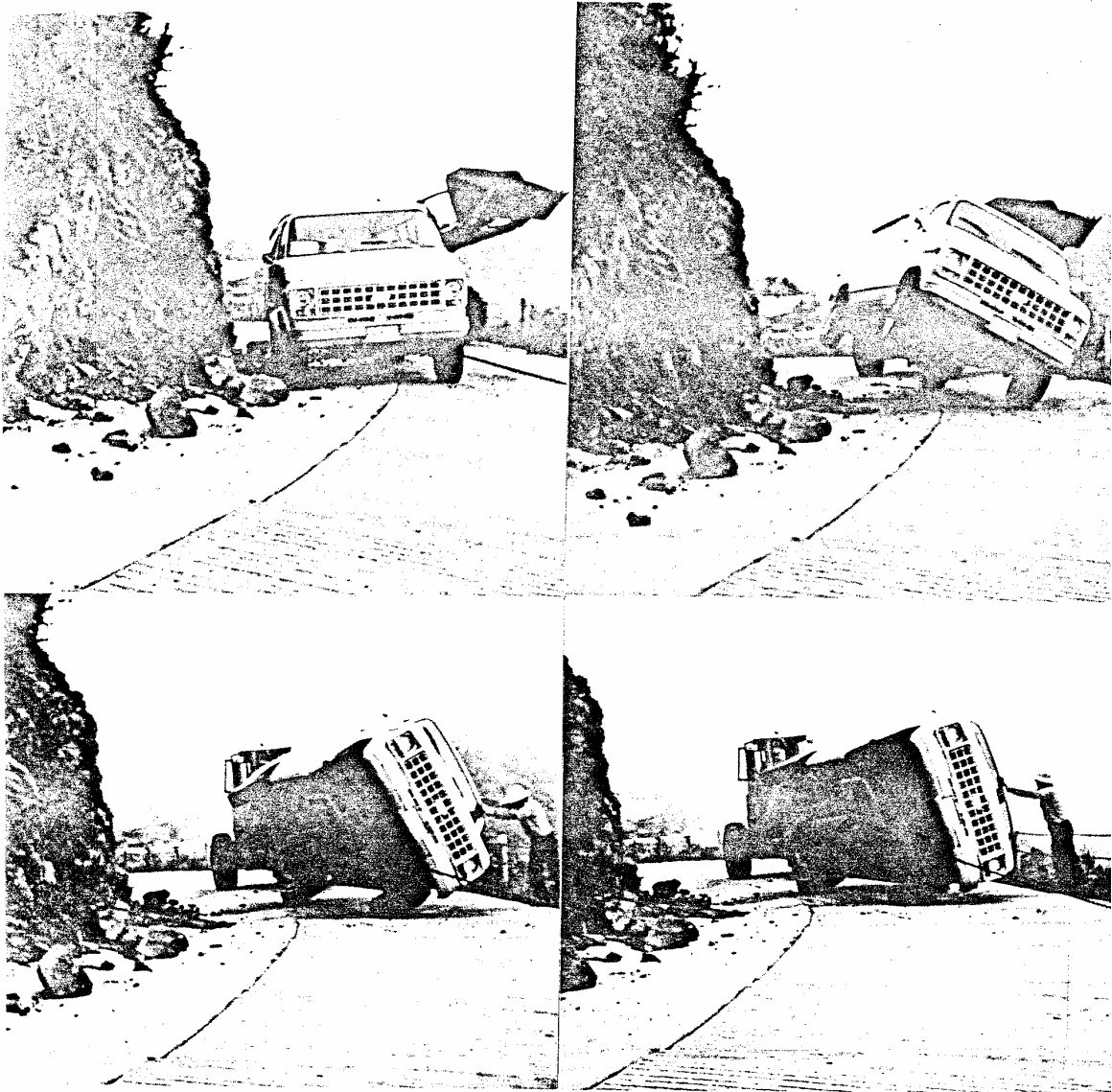
Keith Mays, The Arizona Daily Star

**Who's watching the sky? — Larry Vaughn, above, prepares one of six mirrors from the Multiple Mirror Telescope on Mount Hopkins, high in the Santa Rita Mountains, for its journey to a Tucson laboratory, where it will be recoated with aluminum. Every two years or so, the coating, just billionths of an inch thick, becomes worn and loses some reflecting power. Below, the boxed-up mirror is lowered onto a truck for a slow journey down 18 miles of rugged dirt road.**

August 3, 1984

Cathy Sitter resigned as Facilities Administrator. She worked more than 10 years at FLWO.



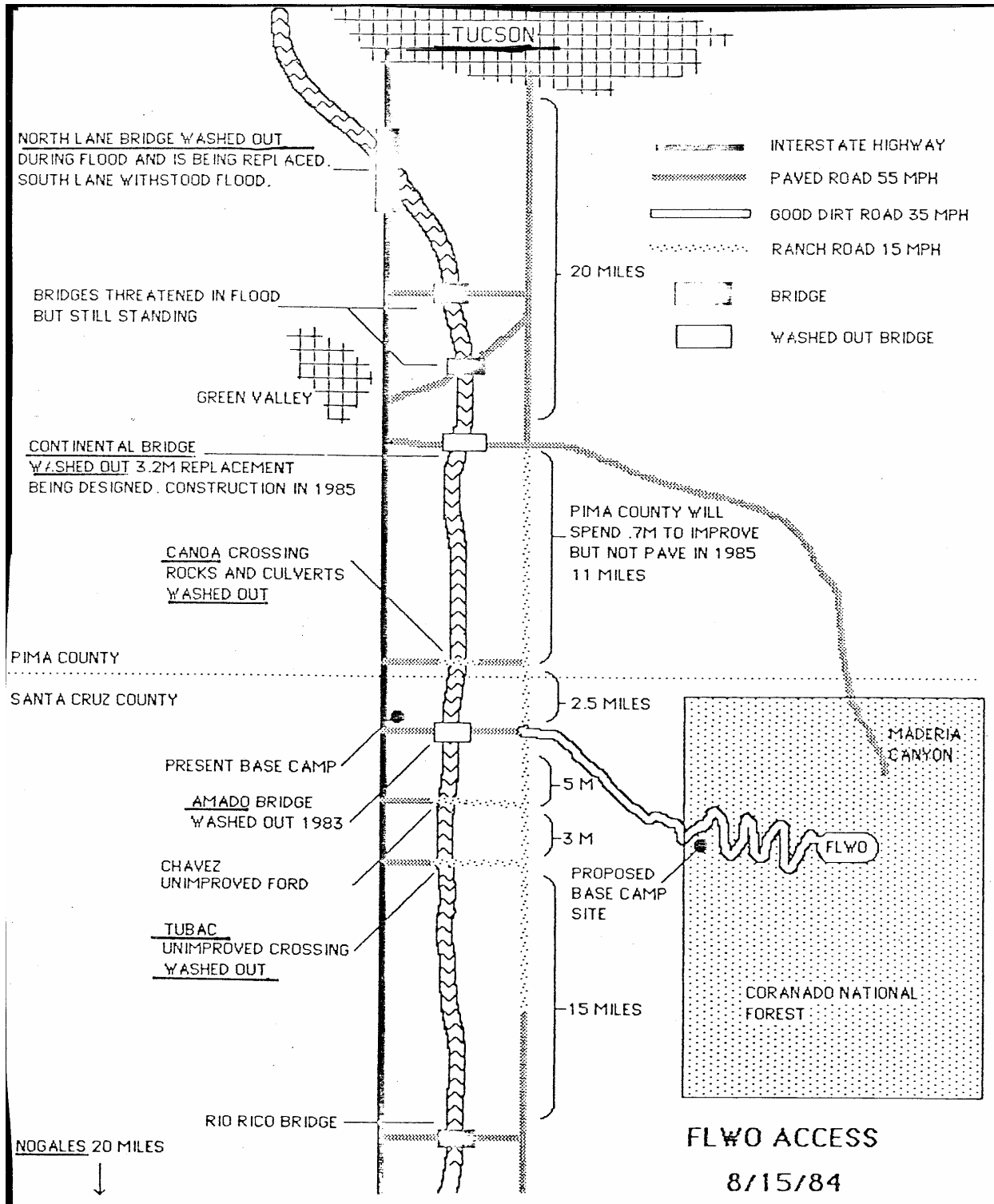


ROLLED VEHICLE UPRIGHTED

The driver of this vehicle did not shift into first gear before attempting to drive the steep road to the summit. The vehicle stalled and the driver lost control as it accelerated backwards without power brakes. The vehicle rolled on to its side and stopped on the pavement. Fortunately, no one was injured.

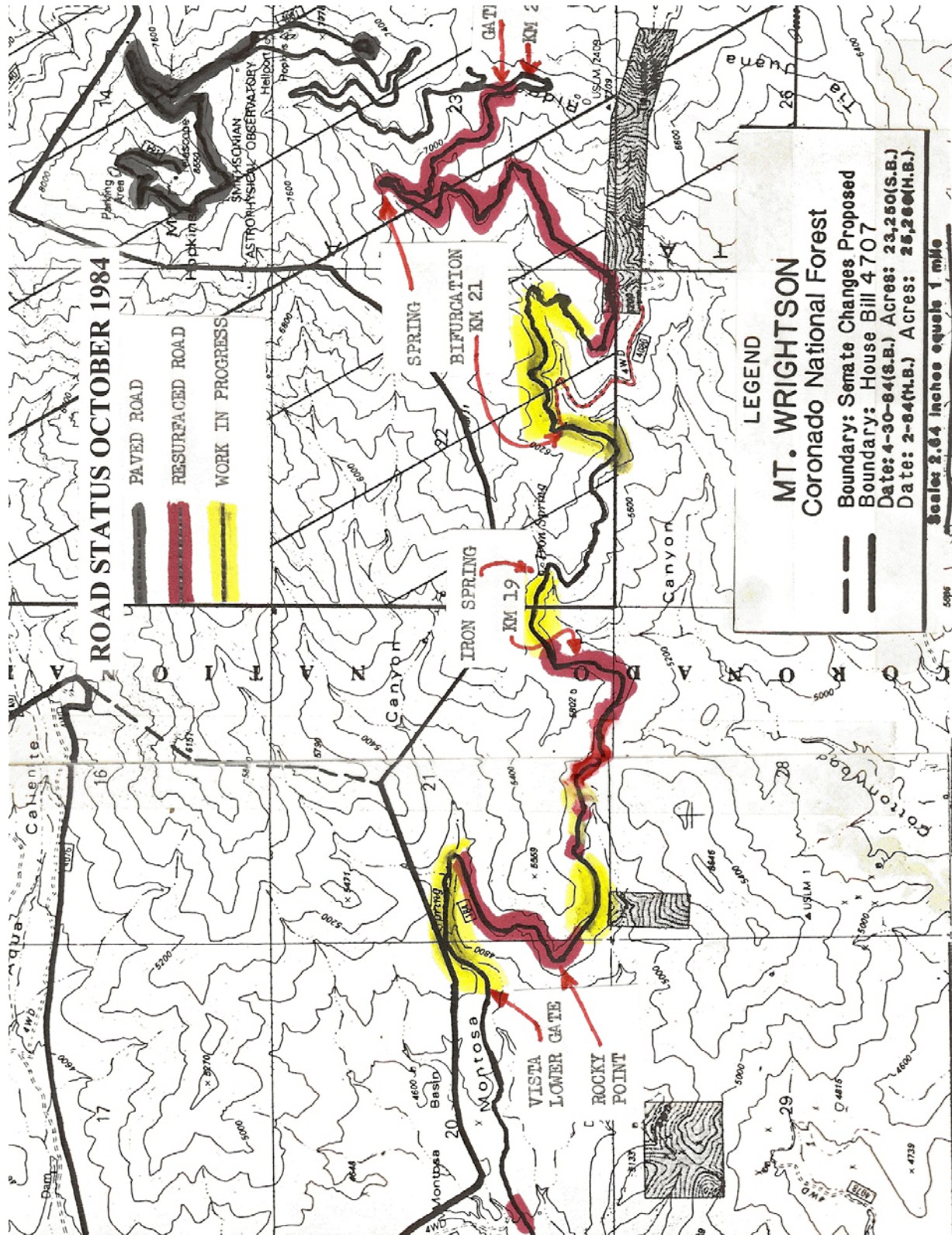
In an earlier accident the road was covered with snow and ice. The driver started down from the top and lost control of the vehicle which finally rolled over and stopped on the road. A 4 wheel drive truck was involved but the wheel hubs were not engaged.





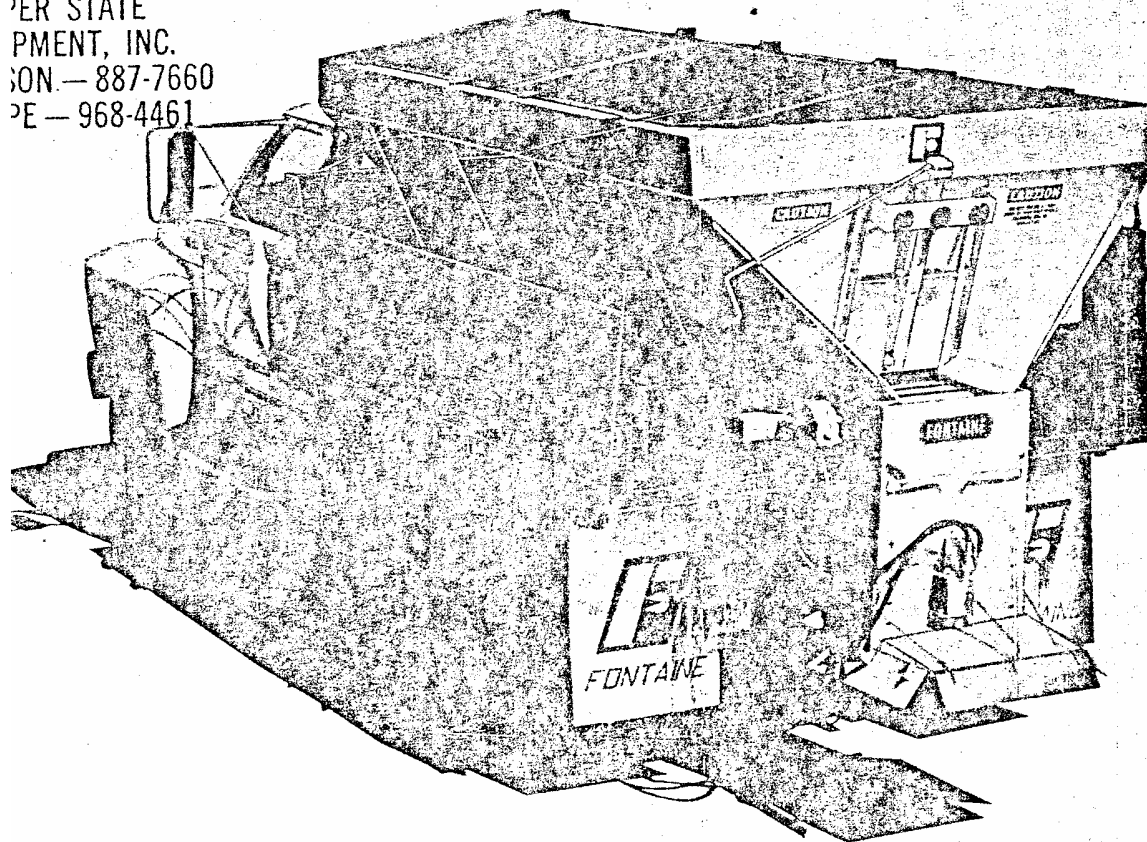
Santa Cruz County will not replace the Amado's Bridge. A bridge will be built in Tubac instead. The observatory's office is about half

way between both proposed bridges.



The road was resurfaced with "white stuff" from the Glove mine.

PER STATE  
PMENT, INC.  
SON — 887-7660  
PE — 968-4461



ROAD SAND SPREADER

December 12, 1984

This \$5,000, 6 yard, spreader was ordered to make the sanding of ice on the road easier. This unit will replace two smaller B-47 aircraft tow vehicles, with 1 yard spreaders, that are now in use. One person will be able to sand the road make it considerably safer.

December 19, 1984

Pima County Board of Supervisors authorized the building of a 600-foot bridge on Elephant Head Road. Cost \$1.1 million.

**HURRAY!!!**

YEAR 1985

January 4, 1985

A Sundt Construction bulldozer tested the Chavez Crossing and found a deep hole on the west side. Running water was as high as its tracks.

ONCE AGAIN INTO (OR ACROSS) THE BREACH

For the umpteenth time, the Whipple Observatory Support Crew has constructed another crossing of the Santa Cruz River at Amado. Opened March 8, the combination rock causeway and bridge spans more than 700 feet of river bed.

The Amado Bridge washed out in the October 1983 flood. Since that time, at least seven crossings have been built at Amado, only to succumb later to high water. Heavy rains last summer and fall caused the river bed to triple in width. The former bridge built to span approximately 150 feet stood forlornly in the middle of a 700-foot-wide channel.

The new crossing incorporates the 120 feet of remaining bridge deck in its design. A curving rock causeway stretches 400 feet from the west bank to the bridge, where a ramp brings the road to the level of the bridge. At the downward-sloping east end of the bridge another 300 feet of rock roadway connects the bridge to the bank. The rock causeway forces the water of the still flowing Santa Cruz under the bridge.

The FLWO support crew welded reinforcing rod and plate on the bridge to ensure its stability under load. Indeed, in testing, it withstood 40-ton rock trucks passing over it.

An outside contractor using 17-cubic-yard-capacity dump trucks hauled the 3,000 cubic yards of rock used in construction. (The biggest truck in the FLWO motor pool can haul only 5 cubic yards per load.) The Anamax Mining Company donated the rock from its tailings pile. After the contractor bulldozed and compacted the rock into position, the observatory support crew hauled and spread dirt to provide a smooth roadway. FLWO engineer Marion Rice supervised the construction during seven 12-hour days.

Since last October, trips to the mountain from the Amado office usually required a 34-mile detour to the nearest standing bridge.

52 MILES - ONEWAY - 2 <sup>hrs</sup> 15 <sup>mins</sup>

January 19, 1985

Mark Postman, MMT Grad Student, called to report that he had flipped a jeep on its side 100 feet above the Wickiup. He was driving too fast on a mild curve. He is OK but the jeep has a few more dents on its side. It was not blocking the road so we left it there until Monday.

January 24, 1985

Marion called the mountain to tell people to drive out via Rio Rico. He had just pulled two vehicles, not ours, out of the soft mud at the Amado Crossing. It had been raining for two days.

Two days of rain and snow followed this incident. The road was plowed and sanded in a routine manner.

February 1, 1985

The lowest mountain temperature was reported last night--2°F. The water pipes in the Common Building Kitchen froze. No water was also reported in several other building.

It snowed in the valley down to 2,500 feet.

February 11, 1985

FLWO permanent maintenance/support staff will now be required to wear blue uniforms with shoulder patches provided by the observatory.



SHOULDER PATCH

# MULTIPLE MIRROR TELESCOPE OBSERVATORY

Smithsonian Astrophysical Observatory and Steward Observatory, University of Arizona

February 11, 1985

Reply to: MMT Observ  
University of  
Tucson, Ariz  
(602) 621-151

Mrs. Margaret Hird  
Smithsonian Institution  
SI Building 228  
Washington, DC 20560

Dear Margaret:

It was a pleasure to see you again last week. I hope your trip down the mountain was less eventful than the trip up. I wish to restate and reemphasize the specific needs of the MMTO with respect to adequate access to our observatory site on Mt. Hopkins. Although continued pressure on Pima and Santa Cruz counties needs to be applied to provide a "permanent" crossing near Amado, the wheels seem to be turning to construct such a crossing sometime in 1986. My feeling is that Steve Criswell can keep that effort moving along locally.

I am most concerned about the time between now and that of the implementation of "permanent" solution. There has been no adequate river crossing near Amado for almost one-third of the time since the October 1983 flood. This fraction is steadily increasing as the river widens with each new rainfall -- being now 720 feet across compared to 150 feet in September 1983. The lack of such a crossing has taken its toll on the MMTO staff. Our mountain secretary of 5 years resigned last summer, almost certainly because of the strain of commuting daily from Tucson to the mountain. Several MMTO staff members have developed health problems which can be attributed to the more than 6 hours of daily riding in four-wheel drive vehicles over the rough roads you have experienced first-hand. There is a noticeable tendency of MMTO employees based in Tucson to resist going to the mountain, resulting in noticeable polarization between mountain and Tucson staff. I take great pride in the quality of the staff of this remarkable facility, and am greatly distressed by the decline of morale which has taken place since October 1983, and which decreases almost in direct proportion to the width of the Santa Cruz River. Furthermore, it was a great tragedy that, with the enormous world-wide interest in the MMT, we were unable to provide access to the mountain for the many interested astronomers from all over the world who attended the American Astronomical Society meeting in Tucson last month. Such an opportunity will not recur for another decade.

The detrimental effect of all of these factors is difficult to quantify, but its reality is palpable to all of us who live with it on a daily basis.

Mrs. Margaret Hird  
February 11, 1985  
Page Two

Our need to transport large mirrors up and down the mountain at 50 day intervals beginning in June 1985 is perhaps the most tangible event for which the lack of a river crossing presents a fundamental obstacle. We have been awaiting this scheduled major upgrade to the MMT for several years, and we cannot afford to postpone it. Too much is at stake both in terms of the increased productivity of the MMT and in the testing of Roger Angel's pyrex mirrors on which so many future telescope projects depend.

The only satisfactory solution to all of these problems would be to construct some type of temporary bridge at Amado which could stand up to the normal river flows which occur after every rainfall. My hope is that SI can elicit quick response from some military group, such as the Army Corps of Engineers, to erect a Bailey or related bridge between now and June. With Senator Goldwater's unique Smithsonian-military-Arizona connections, he would seem to be capable of providing the necessary leverage to see that some help is forthcoming.

I urge you to keep whatever pressure is necessary to help us through this difficult period.

Sincerely,



Frederic H. Chaffee, Jr.  
Director

FHC:kem

cc: Criswell ✓

Latham

Shapiro





SMALL RATTLE SNAKE - DON HOGAN - MYRON CLARK



April 22, 1985

## SERVICE ON THE MOUNT

Complaints of a bad sewage odor were reported when walking between the 60 inch telescope building and the gamma ray building. Three days were spent trying to locate the sewer line and septic tank. It had been seventeen years since the tank was installed and it had never been serviced. Rolling rocks had broken the old 60-inch drain line to the tank. This line was replaced and a new leaching field dug because the original field had broken lines and they were not connected to the tank. All of this work was done with manual labor because we could not get a backhoe down to that level.

When the 1,200-gallon tank was finally found the cover was slid off for a pump out. Unfortunately the tank was located too far below the road to get suction from a normal commercial service truck. The only solution to the overflowing tank problem was to use the 200 foot two inch long suction hose that had recently been used at the Wickieup. After much preparation, the hose was attached and secured with tie downs. The tank was drained and the cover put back in place.

Unbeknownst to us, the sludge had not been dispersed and distributed as we had planned and it oozed down to the inside road ditch on the next level. As fate would have it, the tour bus was driving downhill by this area. The protests by the passengers were as strong as the odor.

Another incident had happened earlier that morning when one of the workers was digging around the open septic tank. He took off his jacket and hung it on an upright shovel handle. The shovel tipped over and the jacket fell into the savory sewer soup. After he obtained another shovel he started fishing out the jacket. We all yelled, "Hey forget it, we'll get you another jacket." He replied, "It's not the jacket I'm after...my lunch is in the pocket!"

I have been told not to forget the story about another septic tank problem and the dramatic solution, so here goes. About a month before the previously described service on the mount, we had a similar problem with a full septic tank at the Wikieup. A number of calls were made to companies that drain tanks. After explaining the location and the height of the road above the tank, they all told me that they could not help us. Damn, another septic service problem.

A meeting of the minds decided to suction off the tank and use the contents for a practical fertilization and revegetation project. A two-inch, 200 foot heavy PVC line was obtained from another project on the mountain. It was brought to the patio level behind the Wickieup. This suction line was then strung out down hill. A number of rope ties were made to keep the line in place. A canvas cover was secured to the downside end of the line. Tino Jubera and Arnie Valdez were stationed there to release the cover when instructed.

At this point a small crowd of the observatory staff had gathered on the porch and others looked out the windows of the building. The cover of the 1000-gallon septic tank had been removed. While everyone watched in anticipation, the suction line was filled with water from a garden hose and inserted into the tank. Everything and everybody was ready! "Release the cover!" At first nothing happened and then, all of a sudden, the flow started... and fast!!! The downhill end started to whip wildly around like a freewheeling fire hose under pressure. The force of the "stuff" was too much to control and it randomly sprayed all over the hillside. Tino and Arnie were terrified and started screaming and

scrambling, on all fours, up the steep slope. It was not funny for them, but witnesses to this fiasco thought otherwise and laughed to the point of tears. The more these poor guys scrambled and screamed the more people laughed. They made it to the top in record time.

The system had worked. The tank was drained in less than five minutes and belched out a final loud slurp. The laughter continued, especially when Tino stated, "Damn-it, that was NOT FUNNY, you guys!"

Septic tales reviewed and edited by Charlie Fields an old shipmate.

: UA - MMT0 Staff  
FLWO Staff

DATE:  
24 June 1985

: Marion Rice *MJR*

T: Amado River Crossing

The Arizona National Guard will conduct a training exercise at the Amado Bridge this summer. Some work will be done the weekend of June 28th. The bulk of the work will occur July 13 through 20th. About two dozen men will be involved. They will stay at the Armory in Nogales. Machinery will begin arriving during the week of June 24th. It will be parked in the Smithsonian fenced yard at Amado.

The work will consist of hauling rock to improve the causeways on both sides of the bridge and channel work in the river bed.

The road will be closed from July 13 to July 20. Both Canoa and Chavez crossings are usable.

c: Ron Martinesi, Middleton Ranch  
Lee Franklin, Rex Ranch  
David Parker  
KZAZ  
Ralph Wingfield  
Frank Krupp, Jr., Santa Cruz County  
Gerry Lockwood, Coronado National Forest

One of the National Guard scrappers "hooked" the railroad track and tore up about 50 feet of the rail. It was quickly repaired and used by the railroad.

July 1985

Karen Erdman-Myers joined the staff as Administrative Officer. She was soon to learn that all men see in only 16 colors. Peach, for example, is a fruit not a color. Pumpkin is also a fruit. We have no idea what mauve is!

To be more politically correct we will no longer use the terms man days or man hours. We'll not use the phrase "buck-up" with road materials. From now on we'll "pile" stuff up!

July 9, 1985

Jim Hadden resigned from the mountain support group and applied for a disability. A rapid replacement was requested. Four months, later (October 11<sup>th</sup>) a Personnel Announcement a "Job Posting" was made. It was revised in November. In December we received a list of six candidates. On January 7<sup>th</sup> these candidates were interviewed. The best candidate with the most skills and experience, Russ Stenman, did not get the job because he was not a veteran. March 3, 1986 Dave Martina joined the Support Group nine months after Jim resigned.

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Smithsonian Institution  
Fred Lawrence Whipple Observatory

**M E M O R A N D U M**

November 14, 1985

**TO:** Don Hogan  
**FROM:** Karen Erdman-Myres  
**SUBJECT:** Update on Maintenance Worker Position

- \* To date, the total number of interested applicants is 49. Of that number, seven applications have been received. The deadline for receipt of applications is COB November 22.
- \* Subsequent to the closing date of 11/22/85, all applications are to be forwarded to OPM in Phoenix for rating. Applicants who claim 5-point Veterans Preference must provide proof at time of hiring; whereas, anyone claiming 10-point Veterans Preference must complete Form 15 and submit it with the Application for Federal Employment.

July 1985

A Ridge Dormitory Committee was formed to provide insight from users for repairs and refurbishments to the Wickieup. The best estimate for a new dormitory is three years.

Don  
LOOK!  
  
Karen

All beds and bedding were replaced. Two rooms were made available for day sleepers at the Satellite Tracking Station.

OPTIONAL FORM NO. 10  
JULY 1973 EDITION  
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

# Memorandum

to: Support, MHO

DATE: July 12, 1985

: D. Kurtenbach *OK*

: S. Criswell *SK*

: Power Outage, 07/08/85

I would like to take this opportunity to thank you for your help in the restoration of power in a timely fashion on 7/09/85. Also the fine job of back filling on 7/10/85. It is a pleasure to work with people who respond the way Mr. Hogan and Mr. Jimenez did during this near crisis. As you know, the new generator also went out during this period of time so we went from three power sources to one in a 24-hour period.

Once again, thank you for your help in this matter.

cc: D. Hogan ✓

A. Jimenez

Power outages were not unusual. No one knows how many times the landline failed requiring digging and splicing of faults.

August 9, 1985

Steve Criswell's shuttle broke down at the gate. The battery was changed. He also had two flats on the drive to the ridge.

August 14, 1985

Drove the old crane downhill to Amado. It was replaced with our new surplus crane.

August 27, 1985

Constructed concrete forms for four Gamma Ray experiment boxes. They'll be set up in a 20 meter triangle on Knoll #1. Four more boxes will be set up later.

August 22, 1985

Santa Cruz County decided to build much-debated river bridge

in Tubac not in Amado.



September 1985

I purchased a world war two surplus searchlight mirror and constructed a satellite TV receiver for use at home. It worked well especially for Boston Bruins hockey games. I recommended we do the same for the mountain dormitories. It was decided that the observatory would buy commercial units if desired.

This system was used for several years until they started to scramble the signal.

September 16, 1985

National TV CBS featured observations of Comet Halley taken by the MMT.

September 20, 1985

The Baker-Nunn/Laser Building was formally approved for use by Fairborn Observatory, APT, by David Latham(SAO) and Steve Criswell.



#### APT BUILDING

The building on the upper right in the photo rolls out on rails automatically, exposing the APT telescopes to the night sky.

This building was used routinely on weekends at first by Lou Boyd.

Large amounts of road cap materials, white stuff, were hauled from the Glove Mine and spread on the mountain road. This was done routinely for several months.

The Wickiup Committee recommended the following for the Wickiup:

1. Eliminate all mice and bugs ASAP.
2. Obtain a Dart Board
3. Obtain a Video Recorder
4. Obtain a computer with a word processor.
5. Obtain a satellite dish for 24 hour TV
6. Obtain reading material on the popular science level.
7. Need better drainage in the downstairs shower.
8. Remove and replace ALL windows. Seal and insulate.
9. Sound proof the entire building.
10. Only stock "Classic Coke" get rid of the other stuff.
11. Replace the cleaning crew. They are not doing things right.



Tucson, Tuesday, October 8, 1985

# House OKs new facilities for Mt. Hopkins visitors

By Mark Sullivan  
States News Service

WASHINGTON — The House unanimously authorized \$4.5 million yesterday for a new base camp and a visitors' center for the astronomical observatory atop Mount Hopkins south of Tucson.

The current base camp, situated at Amado east of Interstate 19 and 18 miles from the mountain, is decrepit, too small and is situated on the wrong side of the Santa Cruz River, said Steve Criswell, program manager at the Fred Lawrence Whipple Observatory.

The camp provides logistical support for the observatory, including fuel storage, offices and equipment to keep the rugged road to the 8,555-foot summit open.

"We're delighted that the House authorized the funds," Criswell said. "It's just one of a number of steps we have to take to begin construction in 1987."

The observatory, which is a joint project of the Smithsonian Institution and the University of Arizona, houses the third-largest telescope in the world, the Multiple Mirror Telescope, which is the equivalent of a single-mirror, 176-inch telescope.

The buildings on the current 4.25-acre site include a converted school house built in the 1930s and a single-story house converted to office use.

With more than 200 scientists visiting the area every year and a permanent staff of 20, the quarters

fall far short of the observatory's needs, said Ross Simons, a spokesman for the Smithsonian in Washington.

Moreover, since October 1983, when a flood on the Santa Cruz River washed out the bridge between the base camp and the observatory, scientists do not have all-weather access, Simons said.

Both Pima and Santa Cruz counties have refused to rebuild the bridge, Simons and Criswell said.

"We need a logistical base east of the river and close to the mountain that will provide for the scientists and the observatory's maintenance equipment," Simons said.

Simons added that the new camp would include a separate visitors' center that would show movies and give public tours of the 4,774-acre observatory area. Three sites for the new base are being reviewed.

The first is located near the border of the Coronado National Forest and Arizona state land, west of the entrance to Montosa Canyon and east of Amado. The second two sites are halfway between the Coronado National Forest and Amado, Criswell said, adding that more detailed information about them will be made public sometime in the next three weeks.

If Congress gives final approval for the money before the end of the 99th Congress next year, construction could begin in 1987, Criswell said.

son, Saturday, December 7, 1985

## **OSU to join UA in building big telescope**

COLUMBUS, Ohio (AP) — Ohio State University's role in building perhaps the largest optical-infrared telescope in the world gained approval yesterday from OSU trustees.

The university board of trustees approved OSU's participation with the University of Arizona to build an 11.3-meter telescope, which may be placed on Mount Graham, northeast of Tucson. Both schools contributed \$300,000 toward a first-phase, two-year effort on an engineering feasibility and design study. This includes designing the telescope mount and drives, a building for the instrument and a mirror support system.

The cost of the entire project could approach \$50 million and would be raised through private sources. Each school's final cost will depend on whether other institutions join the program.

The key to the work is a new method of casting large-scale telescope mirrors developed at the University of Arizona. OSU is to develop a communications system that allows astronomers on both campuses to operate the telescope remotely.

December 31, 1985

First Automatic Photoelectric Telescope (APT) installation, alignment, and checkout were completed by Louis Boyd and Russell Genet.

YEAR 1986

January 1, 1986

The first fully automatic telescope observations were successfully made at the APT site. Needing more space for expansion about ten years later they move to a 40 acre site in the Patagonia mountains in southern Arizona. They now operate eight, large and small, fully automatic telescopes with several more under construction.

# ROBOTIC OBSERVATORIES

A Handbook of Remote — Access  
Personal — Computer Astronomy



**RUSSELL M. GENET & DONALD S. HAYES**

With Donald H. Epand, Louis J. Boyd and Donald F. Keller

Foreward by Richard Berry

One of several automatic telescopes shown on the cover on one of many books describing its operation. Observations are made on all (4) telescopes nightly without an observer being present. The data is automatically sent to scientists around the country every morning.

This is a truly amazing operation. For more information on this project Google search Fairborn Observatory.



ADMIRERS OF 30 INCH APT

Left to right - Russell Genet, Fairborn Observatory, Dave Latham, Harvard-Smithsonian Center for Astrophysics, Lou Boyd, Fairborn, and Sallie Baliunas, Harvard-Smithsonian.

January 7, 1986



Nelson Caldwell started at 60 Inch Telescope as project

director.

**Smithsonian Institution**  
Fred Lawrence Whipple Observatory

**M E M O R A N D U M**

February 12, 1986

**TO:** Safety File  
**FROM:**  Dan Brocious, Steve Criswell <sup>S>C</sup> and Don Hogan  FLWO  
**SUBJECT:** Medical evacuation of Michael Kurtz, CfA, via  
helicopter, Feb. 5, 1986.

At 6 p.m., 2/5/86, Program Manager Steve Criswell was notified by John Huchra, CfA, that astronomer Michael Kurtz was ill and might need to be taken off the mountain for medical care. (Criswell, Hogan and Brocious were at the Baker-Nunn site on the Ridge.)

The evening before, Kurtz had suffered chest pains and numbness on his left side. Kurtz told no one of his symptoms, but went to bed. Upon rising the next afternoon, the pains and numbness were gone, but Kurtz felt completely exhausted. Kurtz then told several people of his symptoms, which prompted Huchra to notify Criswell.

Kurtz was reluctant to leave the mountain, so (with the help of Margaret Geller, CfA) Huchra arranged for him to talk with a Boston-area cardiologist. After interviewing Kurtz, the cardiologist recommended that Kurtz be transported immediately to a hospital via helicopter [6:25 p.m.].

Criswell called the first helicopter airlift number on the FLWO Phone List (Arizona Dept. of Public Safety). After receiving no answer, he then called the Pima County Sheriff Rescue Unit [6:30 p.m.]. After taking the information, the dispatcher said he would call back. At 6:38 p.m., the dispatcher called back and said a helicopter was in the air on its way.

In the meantime, Hogan and Brocious attempted to turn on the Ridge helipad lights. Neither the pad lights nor the windsock spotlight worked. They replaced fuses to no avail. They then illuminated the pad by running extension cords to clamp-on spotlights with red bulbs and turned a truck spotlight on the windsock. (Subsequent investigation by DeWayne Kurtenbach, FLWO, revealed that all of the bulb filaments in the pad light system were burned out, probably by a lightning strike. The lights were operational when last inspected December 1985.)

---more---

At 6:55 p.m. the helicopter appeared over the mountain. It landed at 6:58 p.m. The helicopter was from the Arizona Department of Public Safety. It carried a pilot and two paramedics.

The paramedics examined Kurtz, started monitoring his heart with a portable EKG, inserted an IV and started a glucose drip. Kurtz was then strapped into the helicopter and taken to Tucson Medical Center. The helicopter left the pad at 7:25 p.m.

Remarks:

The Pima County Sheriff Rescue Unit dispatcher suggested that in future we dial the 911 emergency number and ask for the medical dispatcher whenever we need a helicopter. (From any telephone on the mountain, dial 9-911.)

The Arizona Department of Public Safety has a medical evacuation helicopter permanently stationed at the Tucson Medical Center helipad. The DPS office at TMC is always open. The direct, 24-hour telephone number is 323-9883. This is the helicopter which responded to our call and is the only one in the Tucson area specifically designated for medical evacuation. The usual crew is a pilot, paramedic and flight nurse.

DKB:nec

c: D. Brocious, FLWO  
S. Criswell, FLWO  
R. Dumas, SAO  
D. Hogan, FLWO  
D. Kurtenbach, FLWO

March 3, 1986

Dave Martina joined the Support Group.

FLWC Staff and Volunteers

Photos  
taken  
3/21/82

DATE: April 8, 1982

Don Hogan *A*

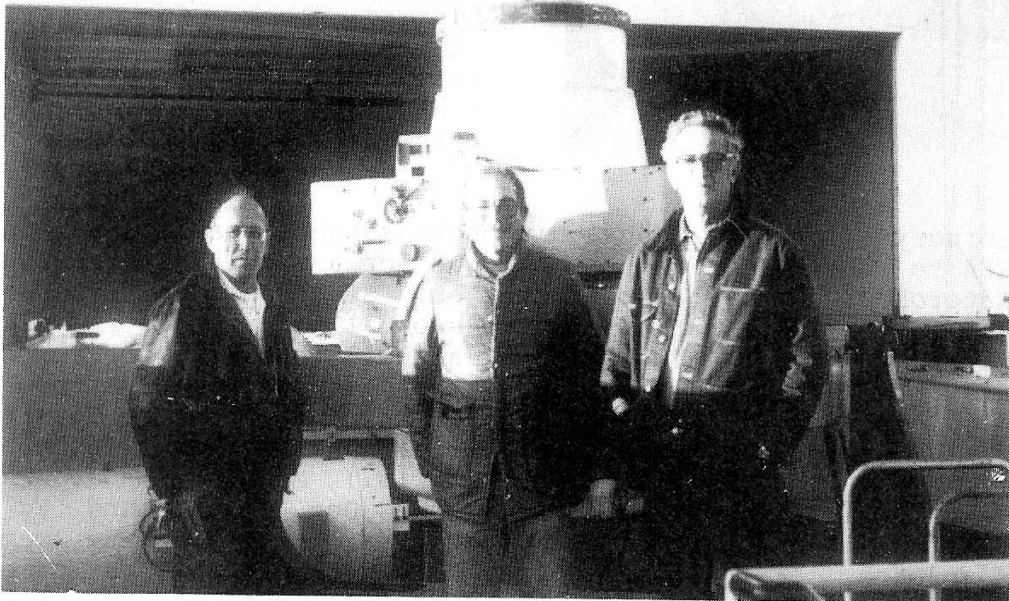
### Baker-Nunn Comet Photographs

Photographs of Comet Halley taken with the Baker-Nunn camera are available to all staff members. The test prints are posted on the employee's bulletin board in the Amado Office.

The cost of each print is as follows:

3½" x 5":	.50 each
5" x 7"	1.75 each
8" x 10"	3.00 each

Prints may be ordered from the volunteers in the Public Information Office. Please pay in advance for your order. The deadline for orders is April 25.



FLW meets a real "dirty snowball;" comet hunters atop Mt. Hopkins; and the famous Halley filmed by a famous camera. See inside for more details.

Ed Horine

Dan Brocius

Don Hogan

# The CFA Almanac

Vol. V No. 2

June 1986



In February, National Geographic photographer Jonathan Blair came to the CFA to photograph Fred L. Whipple for a special article on comets and asteroids. With a props budget only Geographic can afford, Blair arrived with a gigantic "dirty snowball" produced in Vermont and trucked to Cambridge. The snowball actually had lost about one-third of its mass by the time it was strong-armed into Classroom A, but Whipple determined it still must have weighed about a quarter-ton. (Above: Publications Manager Jim Cornell and Sky and Telescope editor Steve O'Meara help remove the debris.) Meanwhile, at Whipple's namesake observatory, \* Dan Brocius, Don Hogan, and Ed Horine reactivated the historic old Baker-Nunn satellite tracking camera to make photos of Comet Halley in mid-March. The camera was decommissioned nearly a decade ago and now is part of the historical artifacts collection of the National Air and Space Museum, although it remains in place on Mt. Hopkins. To outfit the camera for its brief comet patrol, it was necessary to obtain special film from one of the few remaining active cameras operated by the Canadians. The result was a series of quite creditable comet photos, including one (not shown here) that captured, appropriately enough, the faint track of an artificial satellite on the same frame. (Snowball photos by Arlene Walsh)

April 1986

Fully automatic observations were made with roof controls and weather sensors (APT)

May 5, 1986

Seventh Anniversary of the MMT Dedication birthday party was held at the base camp by the staff. Fred Chaffee was the host.



Plenty of beer, chips, and cold-cuts were served.

July 7, 1986

Gary McAninch started at FLWO as Tour Bus Driver.



VERY STEEP AND DANGEROUS ROAD AHEAD JUST BELOW THE MMT

This last 300 feet of concrete heated road has a grade of 23 percent.

JULY 1986

Two additional automatic telescopes were added to the APT facility.

A road fill contract with Allied Wenco, Inc. was completed. Materials, white stuff, was hauled from the Glove Mine.

September 1986

The site for the new ridge dormitory was selected. The west side of Knoll #4 was chosen.

December 18, 1986

Experimented with a large road sweeper to clear snow on road. It was difficult to maneuver and made a mess of the back of the loader. After several uses we put it back on the surplus property

list.

Don worked on the annual manpower report on a well used and repaired 286 IBM computer in the Support Building.