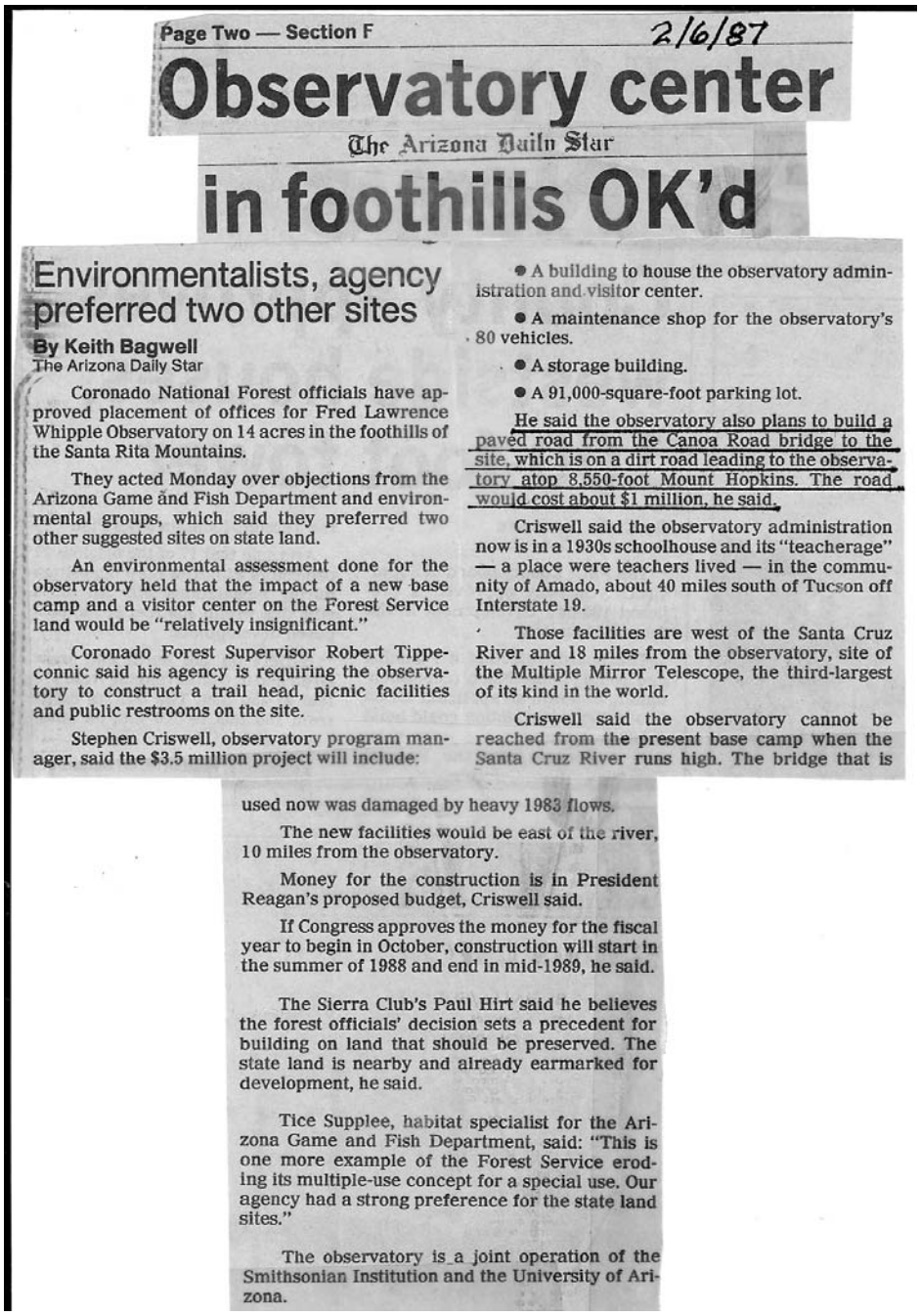
YEAR 1987

January 16, 1987

The contractor's cleaner reported that the door in room 10 of the Bowl dormitory was found open. The toilet bowl water and all water lines, including the interior wall lines, were frozen. Several days were required to repair this problem done mostly by Bill Kery our volunteer plumber.



Page Two — Section F 2/6/87

Observatory center in foothills OK'd

The Arizona Daily Star

Environmentalists, agency preferred two other sites

By Keith Bagwell
The Arizona Daily Star

Coronado National Forest officials have approved placement of offices for Fred Lawrence Whipple Observatory on 14 acres in the foothills of the Santa Rita Mountains.

They acted Monday over objections from the Arizona Game and Fish Department and environmental groups, which said they preferred two other suggested sites on state land.

An environmental assessment done for the observatory held that the impact of a new base camp and a visitor center on the Forest Service land would be "relatively insignificant."

Coronado Forest Supervisor Robert Tippeconnic said his agency is requiring the observatory to construct a trail head, picnic facilities and public restrooms on the site.

Stephen Criswell, observatory program manager, said the $3.5 million project will include:

- A building to house the observatory administration and visitor center.
- A maintenance shop for the observatory's 80 vehicles.
- A storage building.
- A 91,000-square-foot parking lot.

He said the observatory also plans to build a paved road from the Canoa Road bridge to the site, which is on a dirt road leading to the observatory atop 8,550-foot Mount Hopkins. The road would cost about $1 million, he said.

Criswell said the observatory administration now is in a 1930s schoolhouse and its "teacherage" — a place were teachers lived — in the community of Amado, about 40 miles south of Tucson off Interstate 19.

Those facilities are west of the Santa Cruz River and 18 miles from the observatory, site of the Multiple Mirror Telescope, the third-largest of its kind in the world.

Criswell said the observatory cannot be reached from the present base camp when the Santa Cruz River runs high. The bridge that is used now was damaged by heavy 1983 flows.

The new facilities would be east of the river, 10 miles from the observatory.

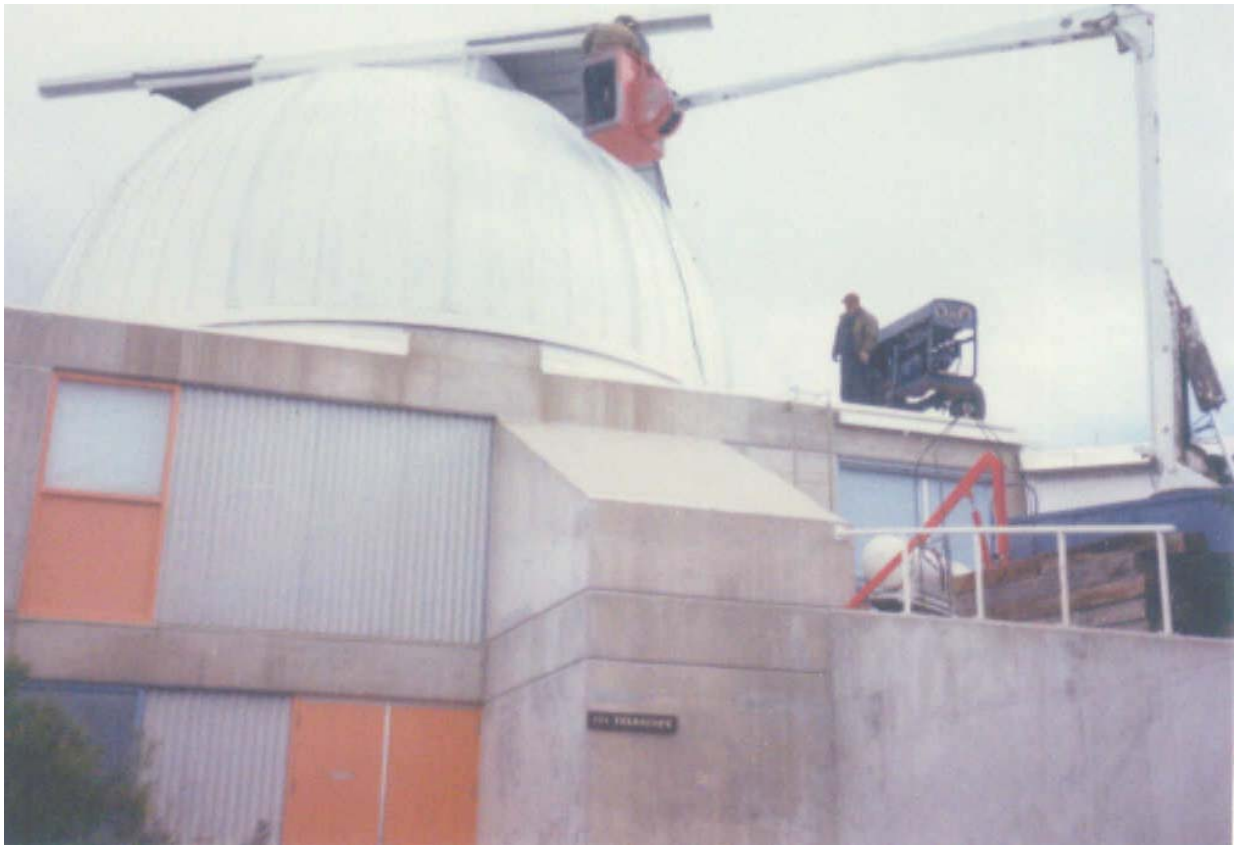
Money for the construction is in President Reagan's proposed budget, Criswell said.

If Congress approves the money for the fiscal year to begin in October, construction will start in the summer of 1988 and end in mid-1989, he said.

The Sierra Club's Paul Hirt said he believes the forest officials' decision sets a precedent for building on land that should be preserved. The state land is nearby and already earmarked for development, he said.

Tice Supplee, habitat specialist for the Arizona Game and Fish Department, said: "This is one more example of the Forest Service eroding its multiple-use concept for a special use. Our agency had a strong preference for the state land sites."

The observatory is a joint operation of the Smithsonian Institution and the University of Arizona.



60 INCH DOME SHUTTER REPAIR

February 7, 1987

Saturday. Bob Davis called Steve Criswell, at home, about the shutter. “It won’t close!” Around midnight high winds lifted the shutter base wheels out of the track.

Steve and Don Hogan went to the mountain. When we arrived it looked like the shutter was about to fall on to the driveway below. We used large bars, wood blocks, and come-alongs to lift the base wheels back on the track.

The wind blew 30 – 40 MPH all day. We could not get the shutter to close completely. No rain or snow was predicted so we left late in the afternoon. There was not much more we could at that point.

Monday, after a careful inspection with the cherry-picker, we found several broken welds on the top frame. Other members of the unit were found badly bent. The Support Crew worked all day on the problem.

Tuesday the crane was brought to the site. It was used to lift the welder on to the roof (shown above). This was necessary because the welding cables were not long enough to reach the work area. Bill Omann obtained some special aluminum welding rods to repair the shutter frame.

The telescope was used every night while this repair work was in progress. Another two crew days were required to complete this job.

Smithsonian Institution
Fred Lawrence Whipple Observatory

M E M O R A N D U M

February 27, 1987

TO: For the Record

FROM: Steve Criswell SJC

SUBJECT: Debriefing after the Storm of March 1987

What Happened

The Storm

In early March a 10-year snow storm dropped 2 to 4 feet of snow on FLWO. Jim Peters reported heavy snow at the 60 inch at about 10 PM on Tuesday, 24 Frebruary 1986. Don Hogan and Tony Jimenez left Amado for the ridge at midnight to plow snow. They cleared the road from the ridge down early Wednesday morning, but could not make head way above the ridge due to 2 to 4 feet of snow on the road.

Heavy snow continued to fall on Wednesday. Several attempts to clear the summit road with various pieces of equipment were not successful. Support quit working on the summit road and to keep the road to the ridge open.

Support started to dig, during daylight only, for the summit at about 2pm Thursday and reached the heated road at 7PM friday. It took 4 men in front-end loaders about 18 hours to dig from the ridge to the summit.

On Saturday, the ridge and lower road were plowed and on Sunday, the snowcat and blower were used to clean drifts from heated road.

Medical Emergency

On Thursday night, the support crew stopped digging toward the summit at nightfall and left for Amado. At 8 PM various persons in the valley heard a CB call for medical assistance from a young boy on Mt. Hopkins. After a period of confusion about, validation of, and location of the call, Pima County sent a deputy and helicopter, Tubac Fire Department sent an ambulance (driver by G. Alegria of the FLWO staff), and FLWO detoured the support crew(Don Hogan, Bill Omann, and Dan West) to the CH11 transmitter road. FLWO stood by while the deputy administered CPR. The man was declared dead at about 9 PM and the helicopter was canceled.

Lessons Learned

Snow Equipment

Trackster

The trackster (snow cat under common building) does not work in deep snow. The excess larger snow cat should be rebuilt for next year. This same type of snow cat has been used at Mt. Graham with success; therefore, we have reason to believe that, when rebuilt, this unit could provide emergency access to the summit area. We will keep the Trackster, until we have something better to work on the summit road.

Snowmobile

FLWO has a two man-snowmobile. It worked, but could carry only one person. With two persons on it, it could not stay on top of the snow.

Snow blowers

The 8hp home snow blower was able to blow snow when driving itself up the summit road. It was the only way that we could clean drifts off the summit road. A larger blower is probably what was needed to keep the road above the ridge open during this storm. Since this was a 10-year storm, FLWO can not justify the purchase a large blower; however, we will watch excess for one.

Communications

As always, FM radios were the backbone of both efforts. The radios worked; however, during the medical emergency, the following improvements would have helped.

Scanners

In a rescue effort involving several group several radio frequencies are used. A portable scanners located with the support supervisor and in Amado would be useful.

Channels above 6

All FLWO radios should have channels 8 to 16 programmed for transmission on local government emergency frequencies. Experience has shown that FLWO users do not abuse these frequencies.

CB Radios

Portable CB radios should be available in Amado and on the mountain. This is the only way we can talk to the public.

Santa Cruz Sheriff's telephone number

This telephone number should be on the blue sheet.

Handheld Radios

During the storm we ran low on handheld radios. We used several old handheld radios; however, we should budget for 4 new handheld radios as soon as we can.

Jobs well done

Support Staff

The motor pool and mountain staffs worked long hours under difficult conditions to keep the ridge open and to reopen the summit. 53 hours of overtime and 39 hours of comp time were used during the 6 day storm.

Vehicles

All vehicles from the snow blower to the snow plows started and worked throughout the storm. On average, these vehicles are at least 15 years old. The only failure was one hydraulic line on one snow plow.

Microwave link to the MMT

The link worked and reduced the pressure on support to open the road to the MMT quickly.

FM Radios

Although the storm damaged the repeater antenna, the the FM radio system worked throughout the storm.

Comments for the Future

Staffing

If the support group is reduced, we will not clear the roads as quickly as we did this time. We will still have enough persons to run the plows, but we can not sustain the long hours that we did in this storm. It should be noted that we did not work around the clock in this storm due to staff and visibility limitations.

DEEP SNOW ON HEATED SUMMIT ROAD

A five cubic yard, Army surplus, front end loader was pressed in service and used on the summit road. Using this unit as a plow did not work, the snow drifts were too high, deep, and long. It's large bucket was used to dig and dump the snow. This was very slow and cold work. Sometimes only 100-200 yards were cleared in an hour.

The entire road is rutted and in terrible shape. The heated road took several days to melt the snow. Several sections did not work at all. We needed to get a dewar to the MMT for them to continue observing. Steve Criswell and Kevin Harris used a snow blower to attack a huge snow drift at the top of the heated road. At the end of the day Craig Foltz, Fred Chaffee, and other MMT staff members managed to drive the dewar to the MMT.

All telescopes at the observatory remained in operation when the sky was clear.

Meanwhile at lower elevations on Saturday and Sunday many tourists and visitors came to play in the snow. Lots of kids, dogs, sleds, wagons, they had a great time.

March 1987

Between minor snow storms a heavy plywood floor was laid in the 60 inch observation room. A second layer of heavy plywood was screwed to an aluminum frame that was shaped like the room. Two scissor jack were set under the frame. The entire platform could now be raised and lowered about five feet. The purpose of this

platform was to make instrument changes and other operations easier and safer.
April 23, 1987

A VERY CLOSE CALL WITH THE WATER TRUCK

4/23/87

RUN AWAY WATER TRUCK GUARD RAIL ACCIDENT

Smithsonian Institution
Fred Lawrence Whipple Observatory

M E M O R A N D U M

May 8, 1987

TO: **Ralph Dumas**

FROM: **Steve Criswell** SJC

SUBJECT: Accident Report of April 23, 1987

On April 23, 1987 at approximately 10:00 a.m., an accident involving Faustino Jubera, Myron Clark, and a 18-ton water truck occurred on the summit heated road. This accident was nearly a tragedy. Fortunately, neither Tino or Myron were injured. The water truck was not damaged; however, approximately $24,000 of damage was done to the guardrails.

Accident

Tino was driving the water truck (SI-188, Unit 44) with Myron standing on the right front water sprayer platform. They were washing the concrete road surface to remove rocks and sand. Approximately 20 to 30 feet from the top of the heated road, Tino noticed that the brake pedal would not stop the truck. Tino tried to shift from forward low to reverse to back up.

He could not shift into reverse and the truck rapidly accelerated down the hill with Myron on the platform. Tino steered the truck and pumped the brakes. There was no braking action. As they approached the first left turn from the top, the water shifted to the right side of the tank causing the truck to slide to the outside of the road and actually causing sideways skidmarks.

As the truck moved to the outside and the speed increased, the rear duals left the concrete surface and mowed down the guardrail posts and cable. As the truck entered the right curve in the road, the braking action returned and Tino stopped the truck.

Photographs with descriptions are attached to illustrate the path of the truck and damage to the guardrails.

Probable Cause

In retrospect, Tino should not have attempted to shift the vehicle into reverse. Instead, he should have used the low gear and the emergency brake to control the truck speed. Tino, who has extensive driving experience with heavy-duty vehicles, said he forgot to use the emergency brake as everything happened in seconds.

Once the truck started down the hill, it was only luck and Tino's skillful driving that kept the truck on the road. Tino knew that Myron had a slight chance of surviving a jump off the platform. Inspection of the water truck's braking system by William Omann revealed dirt particles in the lower bore of the master cylinder assembly (See attached illustration).

Dirt particles evidently entered the primary cup and the lower cylinder bore causing the brake fluid to bypass the primary cup. The lack of fluid in the primary cup made the brakes fail. This master cylinder assembly does not include a check value: the check value in this system is in the air hydraulic cylinder.

Examination of the master cylinder assembly parts indicated the dirt most likely entered into the lower bore through a small hole in the protective rubber boot on the push rod. Push rod action caused the dirt particles to move from the hole of the rubber boot on a path from the secondary cup to the primary cup.

In the above incident, the loss of brakes occurred slowly as the fluid bypassed the primary cup. Releasing the brake pedal, allowing it to return to a non-use, stationary state, and depressing the brake again permitted effective use of the brakes.

Preventive maintenance records for the water truck show that the service is performed by FLWO motor pool on a semi-annual basis (prior to 1986, it was performed on an annual basis) even though the annual mileage of the water truck is minimal. The service and accident history is as follows:

01/11/85 @ 28,344 miles: All wheels were removed, brake system checked and all wheel bearings packed.

02/04/86 @ 28,570 miles: The truck was inspected for any potential problems and fluid levels were topped. Wheel caps were removed to check for water in bearings.

09/20/86 @ 28,647 miles: Same as previous service check.

03/15/87: Service was due.

04/23/87: Accident date.

04/28/87 @ 28,831 miles: Service is due. All components of

the brake system will be removed and rebuilt as needed.

Considerations and Conclusions

Regardless of vehicle size, no one should ever change gears on the heated concrete road. A low enough gear to control vehicle speed should be selected before entering the heated road.

Heavy equipment, such as the water truck, should not be used on the heated road if an alternate method is available. In this case, a smaller water truck should have been used.

When washing the summit road, the person handling the hose should walk by the side or behind the water truck. No one should ride in an elevated platform located on the outside of the truck cab.

FLWO makes a conscientious effort to perform preventive maintenance on vehicles: the occurrence of this problem between service checks on the truck with minimal mileage is rare. FLWO plans no changes in its preventive maintenance program.

The summit heated road is atypical of other sections of the access road. The grade is 23% with curves. Before driving this section of road, anyone should plan what to do if the engine loses power or the brakes fail. Since January 1, 1980, 24% of vehicle accidents at FLWO occurred on these 200 yards of the access summit road.

Remember that experience and time spent on the mountain can make one forget the dangers that surround those working on the mountain. It is only by making safety considerations part of the planning for any job that we can improve the safety at FLWO.

Attachments

c: w/o photos
N. Caldwell
D. Kurtenbach
D. Latham
F. Sharp
D. Slingerland, ODC
T. Weekes
J. Williams

Smithsonian Institution
Fred Lawrence Whipple Observatory

M E M O R A N D U M

April 27, 1987

TO: Safety Officer

FROM: Faustino Jubera FJ

SUBJECT: Run-Away Truck

On the morning of 23 April 1987, the following incident took place while in the process of washing down the concrete portion of the road to the summit.

I, Faustino Jubera was in the cab of the water truck, SI-188, Unit 44, and Myron Clark was on the water gun platform which is located on the right front side of said vehicle. As we were coming down washing the road, at approximately twenty (20) to thirty (30) feet from the top it was noted that the brake pedal kept going down slowly as it was depressed. When the truck didn't seem to want to come to a complete stop, I decided to put it in reverse and back up. Just about the time I was reaching for the gear shift, all hell broke loose.

The truck shot forward as I tried to shift, to no avail. I gave that up as a lost cause, and tried to steer or slow the truck down by pumping the brake pedal. No dice, it wasn't about to slow down with an approximate gross weight of 17-18 tons. As we came into the first left turn from the top, it seemed as if the water was swishing to the right side of the tank making the truck slide to the outside. When it started doing that maneuver, the thought came to me that I should bail out. Since there was absolutely no way my partner (Clark) could bail out, that thought quickly left me.

By this time our rate of descent was very rapid. As the truck went to the outside, the rear duals left the hard top, mowing down posts and cable as we went along. Then I thought to myself, if we make the next curve, which is a right curve, I'll use the knoll by the transformer as a run-away ramp. Just about the time we started the right curve the brakes took hold. Emergency brake; things were happening so fast I didn't even think of using it. Besides it would have burned up in 10 - 15 feet. After coming to a complete stop, a walk-around visual inspection was made of the unit. At this time it was noted the vehicle sustained minor damage. The same cannot be said of the guard rails.

Furthermore, I take back all I ever said about the railing!

April 30, 1987

Astronomer's death is blow to research

By C.T. Revere 4/30/87
The Ariz ıa Daily Star

University of Arizona astronomer Marc A. Aaronson was studying the movement of distant galaxies when an accident ended his life.

The nationally renowned astronomer was killed at Kitt Peak National Observatory on Thursday night when a metal door slammed shut, crushing him as he climbed outside to check the weather, a sheriff's spokesman said.

Aaronson's team had just finished calibrating the Mayall 4-meter telescope at about 8:30 p.m. when the accident occurred, said Carl Posey, a spokesman for the observatory.

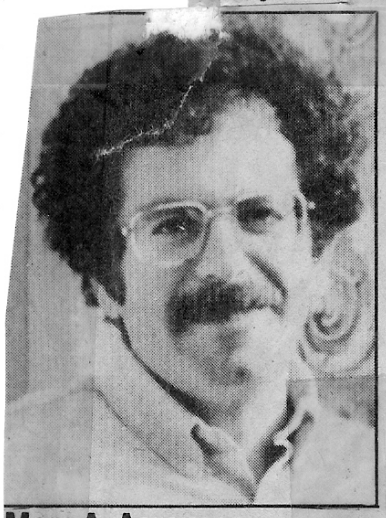
The telescope — one of the largest in the world — and its 500-ton rotating dome were being positioned for the night's observations, he said.

The dome was moving when Aaronson opened the stationary hatchlike door directly below it, Posey said. Aaronson apparently intended to climb out onto a catwalk below the dome, he said.

When the door opens outward, a switch automatically turns off the motor driving the dome.

"But a 500-ton dome has a lot of

See AARONSON'S, Page 4A



Marc A. Aaronson

Aaronson's death a blow to research

Continued from Page One

momentum, so it will creep a few feet after you turn it off," Posey said.

A steel ladder hanging down from the outside of the moving dome struck the door, closing it and crushing Aaronson as he climbed through, he said.

Aaronson came to the UA in September 1977, after earning a Ph.D. in astronomy from Harvard University, said UA spokeswoman Jan McCoy.

Aaronson arrived in Tucson with the Bart Bok Prize, a prestigious postdoctorate fellowship awarded by the UA astronomy department, McCoy said.

In 1981, Aaronson was given the George van Biesbroeck Award by the UA Department of Astronomy, McCoy said. The award was in honor of Aaronson's research that suggested the universe is 12 billion years old.

That same discovery earned Aaronson and two other astronomers a share of the Newton Lacy Pierce Prize in 1984.

The prize is given annually to astronomers age 35 or younger, McCoy said.

Aaronson was at Kitt Peak studying clusters of galaxies that appear to be moving faster than the effect of gravity would move them, McCoy said.

Similar projects are under way in Chile and Australia, she said.

Dr. Peter Strittmatter, head of the UA astronomy department, said Aaronson was an asset to the program since he arrived in 1977.

"He was clearly one of the most brilliant of the younger astronomers in this country," Strittmatter said yesterday. "He had a very great international reputation - We're all in a state of shock here."

The national observatories is conducting its own investigation of the incident, Posey said. The Mayall telescope was scheduled to resume operation last night, he said.

"It's way too early to say what will be done, but I think it's obvious that something will come out of this investigation to cover this type of thing," Posey said.

Aaronson is survived by his wife, Marianne; and two daughters, Laura, 9, and Jamie, 6.

Arizona Daily Star reporter Jim Erickson also contributed to this report.

June 26, 1987

Device nearly quadruples resolving power of MMT

By Jim Erickson
The Arizona Daily Star 6/26/87

Tucson astronomers have developed a device that nearly quadruples the resolving power of the Multiple Mirror Telescope, giving it greater ability to distinguish details than any other optical/infrared telescope in the world.

The articulated beam combiner, developed at the University of Arizona and the MMT Observatory, gives the telescope the resolving power of a 6.9-meter telescope, said Don McCarthy, associate astronomer at the UA's Steward Observatory. The largest optical telescope in operation is a Soviet 6-meter.

"In terms of resolving power, this makes it the largest telescope on a single mount in the world," McCarthy said yesterday.

Detailed images

Developed under a National Science Foundation grant, the beam combiner can be used to produce detailed images of celestial objects that emit visible or infrared radiation. Infrared radiation has wavelengths slightly longer than visible light.

"It will be useful for any problem in which you want to see in greater detail," McCarthy said.

Such problems could involve searching for planets orbiting nearby stars, studying the center of distant galaxies, mapping the surface of asteroids and monitoring the eruptions of volcanoes on Jupiter's moons, he said.

The beam combiner was scheduled to be tested for the second time last night at the MMT, south of Tucson on Mount Hopkins. It was successfully tested last month at the telescope, which is jointly operated by the UA and the Smithsonian Institution.

Since it became operational in 1979, the MMT's strength has been its light-gathering power, not its resolving power, McCarthy said.

By combining light from its six 1.8-meter mirrors, the MMT achieves the light-gathering power of a 4.5-meter telescope, enabling astronomers to view extremely faint objects.

Until recently, the MMT's resolving power has been relatively unimpressive because the six light beams did not arrive at the focal plane simultaneously, or in phase.

"It was not designed to combine light in phase," McCarthy said. "Most people (involved in the MMT design) wanted to see fainter and fainter objects, simply to collect the light and analyze its color, not to get detailed pictures."

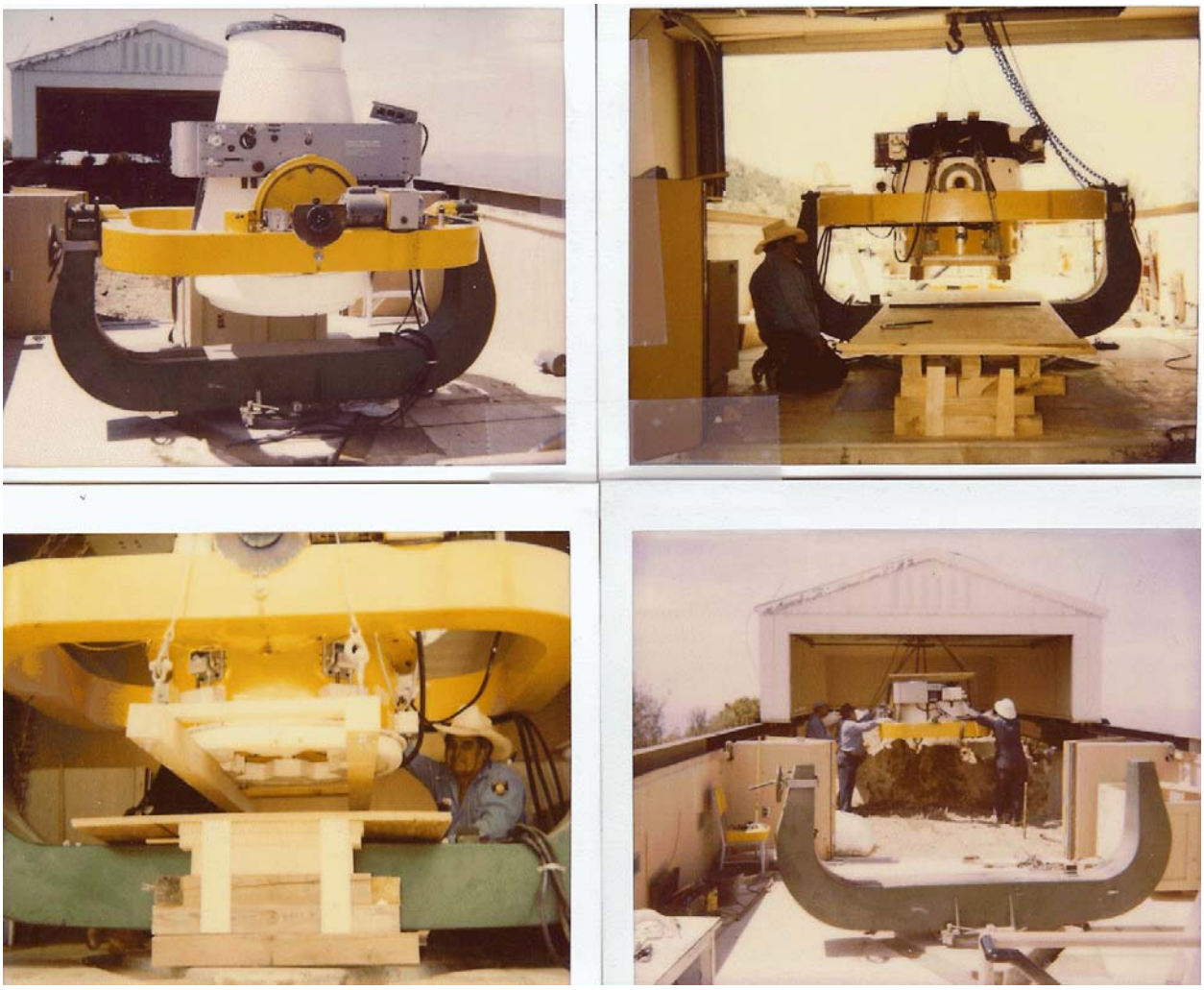
Beams arrive simultaneously

By 1983, astronomers had developed an MMT beam combiner that used prisms to delay the light beams so that all six arrived at the focal plane simultaneously to produce very sharp images.

That method was effective for visible light astronomy but not for infrared studies, because the glass prisms generated heat that the infrared detectors picked up.

The new articulated beam combiner reflects the six beams to the focal plane using six triangular mirrors. The combiner is about 7 inches by 4 inches and looks something like a large gemstone, McCarthy said.

The motor-driven mirrors can be positioned to ensure that the six beams arrive simultaneously.



The Observatory Laser System, the EECO Clock, and the Baker Nunn Camera was removed, crated, and stored in the Amado yard this month.

The rolling camera house roof with a chain hoist was used to move parts and pieces to a truck parked below in the parking lot.

Eleven crates, painted light green, were constructed to transport the Baker Nunn Camera and associated equipment.

Nine crates, painted white, were used for the Laser and clock equipment.

The total, measured weight, of the 20 crates was 15,710 pounds.

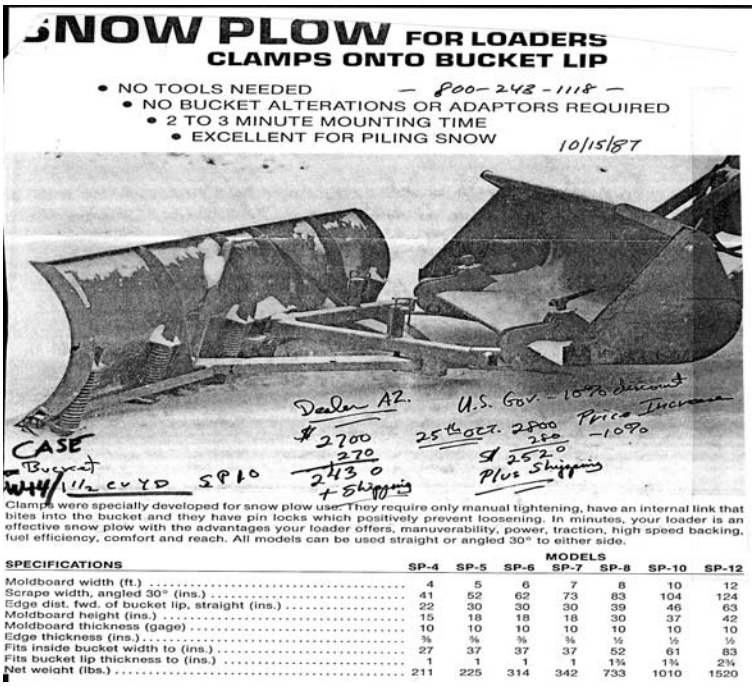
All of this equipment was stored in a large “loafing Shed” in the Amado yard waiting for shipment to the Smithsonian Institution’s Washington museum.

October 14, 1987

Ten foot fiberglass satellite TV dishes were installed at Knoll #4 for the Wickiup. They were camouflaged by an old Army guy---Dave Martina.

October 28,1987

Tony Jimenez, Equipment Operator since 1968 retired.



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SPECIFICATIONS	MODELS						
	SP-4	SP-5	SP-6	SP-7	SP-8	SP-10	SP-12
Moldboard width (ft.)	4	5	6	7	8	10	12
Scrape width, angled 30° (ins.)	41	52	62	73	83	104	124
Edge dist. fwd. of bucket lip, straight (ins.)	22	30	30	30	39	46	63
Moldboard height (ins.)	15	18	18	18	30	37	42
Moldboard thickness (gage)	10	10	10	10	10	10	10
Edge thickness (ins.)	⅜	⅜	⅜	⅜	½	½	½
Fits inside bucket width to (ins.)	27	37	37	37	52	61	83
Fits bucket lip thickness to (ins.)	1	1	1	1	1¾	1¾	2¼
Net weight (lbs.)	211	225	314	342	733	1010	1520

December 1987

Ordered this Clamp-On snow plow for future use on smaller tractors.

UA astronomers are starry-eyed at mirror's debut

By Jim Erickson
The Arizona Daily Star

12/21/87

UA astronomer Roger Angel looked like a kid who had just discovered that a magnifying glass can burn holes in a piece of paper.

He stood, mesmerized, with his arms extended high over his head, trying to focus a fist-sized blob of sunlight onto a sheet of Styrofoam.

That nondescript patch of light was the product of several years' work at the Steward Observatory Mirror Lab, beneath Arizona Stadium. It was the first image captured by the first telescope mirror cast in the University of Arizona's revolutionary rotating furnace.

"That's the first star to shine on it — the first of many," Angel said yesterday morning as sunlight angled into the cavernous lab and lit the concave surface of the 4-foot mirror.

The mirror threw a beam of reflected sunlight across the room onto the Styrofoam sheet held by Angel, the mirror lab director.

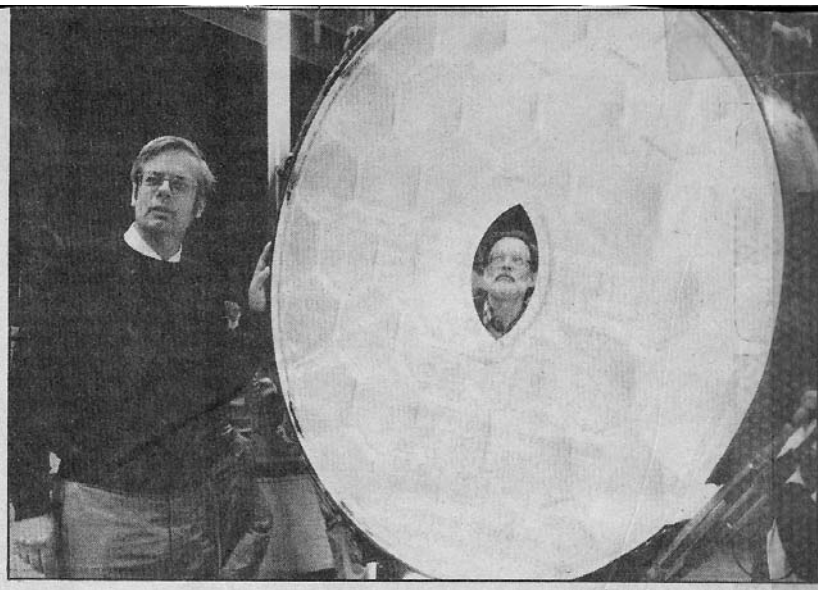
The mirror's unveiling yesterday marked another milestone in the UA's drive toward a new generation of powerful optical telescopes. Those telescopes will be equipped with light-gathering mirrors larger than any in use.

The 4-foot mirror will be turned over to the Smithsonian Institution. After its surface is polished smooth and coated with a thin layer of reflective aluminum, it will be mounted in a telescope on Mount Hopkins, 35 miles south of Tucson.

The UA and the Smithsonian jointly operate the Multiple Mirror Telescope on Mount Hopkins. If the furnace proves successful, it will be used to cast a single mirror to replace the telescope's six primary mirrors.

The mirror lab crew is already preparing

See **MIRROR**, Page 2B



Jackie Bell, The Arizona Daily Star

Angel, left, and Dana Mitchell show off first mirror cast in the new oven

Mirror

Continued from Page 1B

the furnace for the next project, a 3½-meter reflector (about 11½ feet) destined for a New Mexico mountaintop.

But the crew took a breather yesterday morning, a few minutes to pose for group photos and reflect on how far they had come.

Twenty-three tons of steel and nearly a mile of electric heating coils went into the giant furnace that dominates the mirror lab. If everything goes as planned, it will someday be used to "spin-cast" lightweight honeycomb mirrors 26 feet across — more than six times larger than the mirror displayed yesterday.

ELEPHANT HEAD BRIDGE

December 31,1987

The Amado bridge sections were destroyed by a contractor and buried in mud at the Amado Crossing. We have been using this new Elephant Head Bridge for several weeks. Transportation to and from the mountain has become much easier.

YEAR 1988

January 4,1988

Tino Jubera retired from FLWO. Bill Omann was assigned to duties at the University of Arizona Mirror Lab. Dan West designated as the Acting Automotive Foreman.

Federal employees were given the option of remaining in their existing retirement plan or joining the new FERS retirement program.

January 17, 1988

A major snow storm started. All snow equipment was placed in motion for four days. Hired a SM&R equipment operator, Lynn Harris, to assist in snow removal.

February 1988

Support started cleaning the 158 culverts along the mountain road with a backhoe and high pressure hose from the water truck

March 1988

SM&R started grading the goad. Myron Clack and Dave Martina used the big loader and a new to us(surplus)multi wheeled compactor to put the road in great shape.

April 4, 1988

The University of Arizona lost to Oklahoma in the FINAL FOUR at Kansas City. The Gamma Ray Group got the March Madness Fever. We installed a regulation basket on a pole in a barrel of concrete at knoll #1. A bad shot or a bad bounce usually put the ball down in the ditch on the next road level. Time out was called while the person the made the bad shot, or had the bad luck, drove down about a mile to retrieve the ball. A wooden snow fence was setup to prevent this from happening but it it not always work.

April 18,1988

Jim Jones joined the Support Group as a Heavy Equipment Operator.

May 30, 1988

The hiking trails to Mt. Wrightson were closed to the public while the Arizona Game and Fish Department hunted a mountain lion with 10 tracker dogs. The lion had threatened several hikers. This generated a roar of protest by hundreds of people in Tucson.

The lion was killed June 4th and trails re-opened.

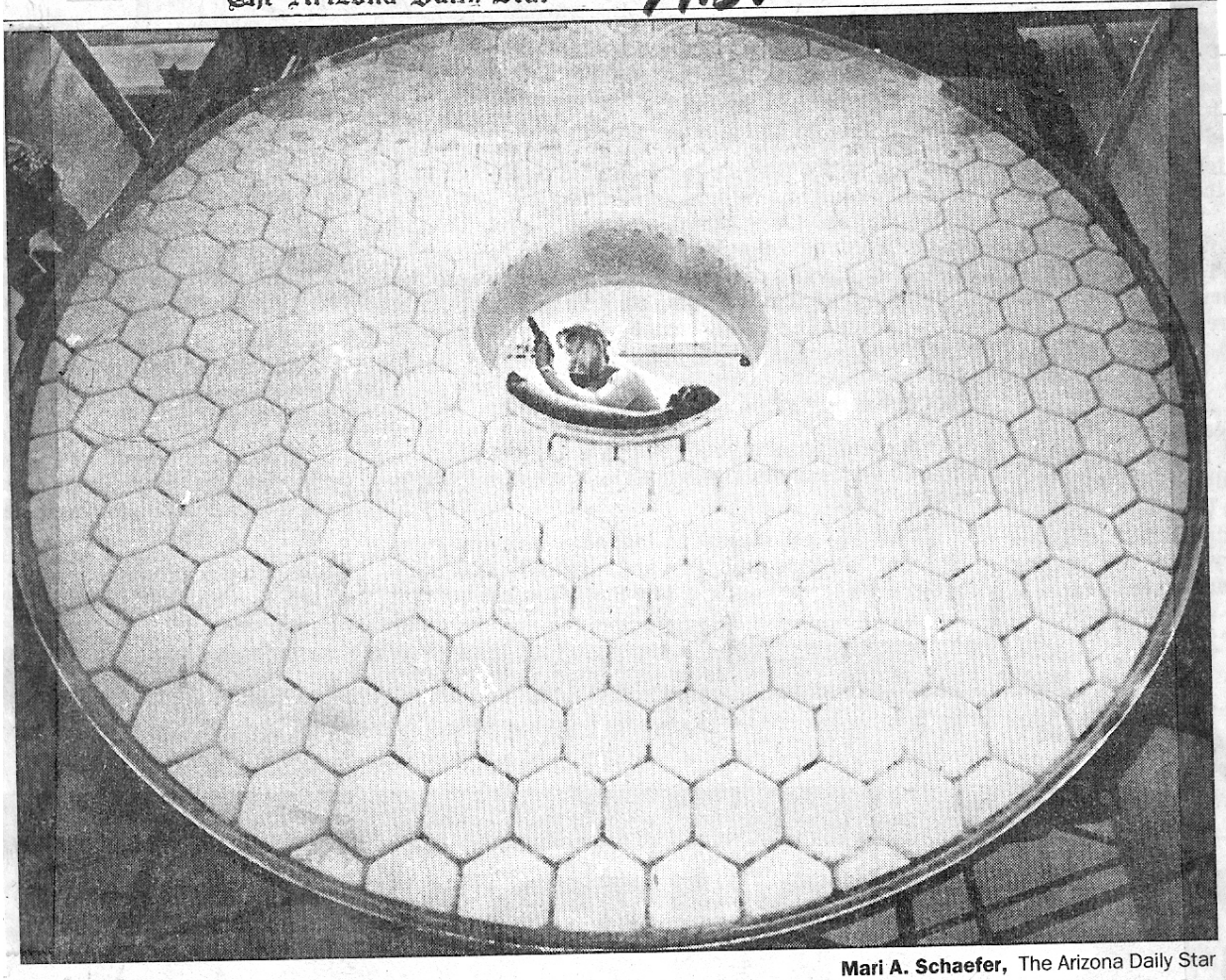
June 14, 1988

Personnel transfer. Seven goldfish were moved from the Gamma Ray pond the bowl water hole. Unfortunately four died overnight.

Oh it should be mentioned that Governor Mecham was found not guilty to all charges in his impeachment trail yesterday.

July 1988

The Arizona Daily Star 7/15/88



Mari A. Schaefer, The Arizona Daily Star

Polishing pressure — Dan Watson, a University of Arizona research assistant, cleans a 3.5 meter telescope mirror at the UA's Steward Observatory Mirror Laboratory. He was using a high-pressure water hose Tuesday to remove the hundreds of water-soluble blocks that created the hollow honeycomb interior of the mirror that was cast in April.

July 23, 1988

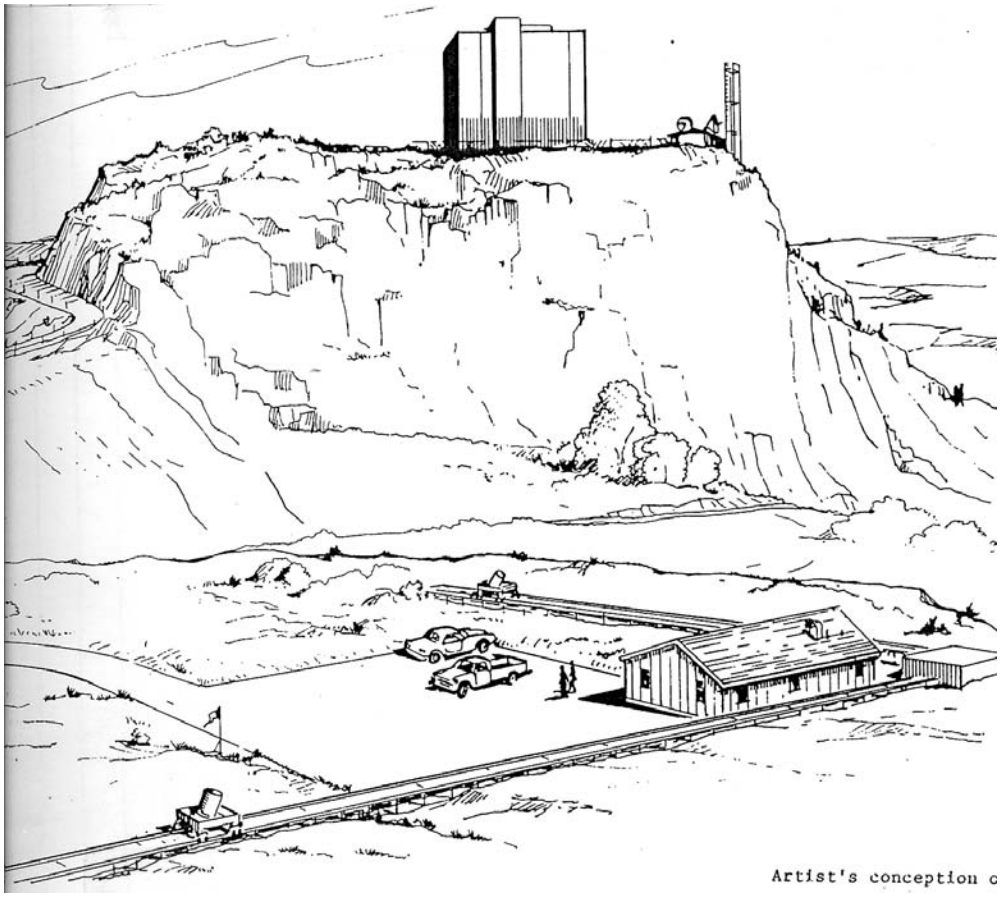
The University of Arizona agrees to place only one telescope on Mt. Graham. Originally the University requested 20 acres be set aside for as many as seven telescopes.

September 1988

Dave Feagan of the Gamma Ray Group directed the Support Group in making 208 lead tiles. A steel mold was made to pour the one half inch by 10 inch square hot lead material. This task took about two weeks to complete between other chores on the mountain.

DeWayne Kuetenbach was assigned to assist Marion Rice with construction monitoring. This will last until the Base Camp, Ridge Dorm, the Summit Support Building, and the road paving work are completed.

October 1988



IOTA ARTIST DRAWING

8/16/88 STAR

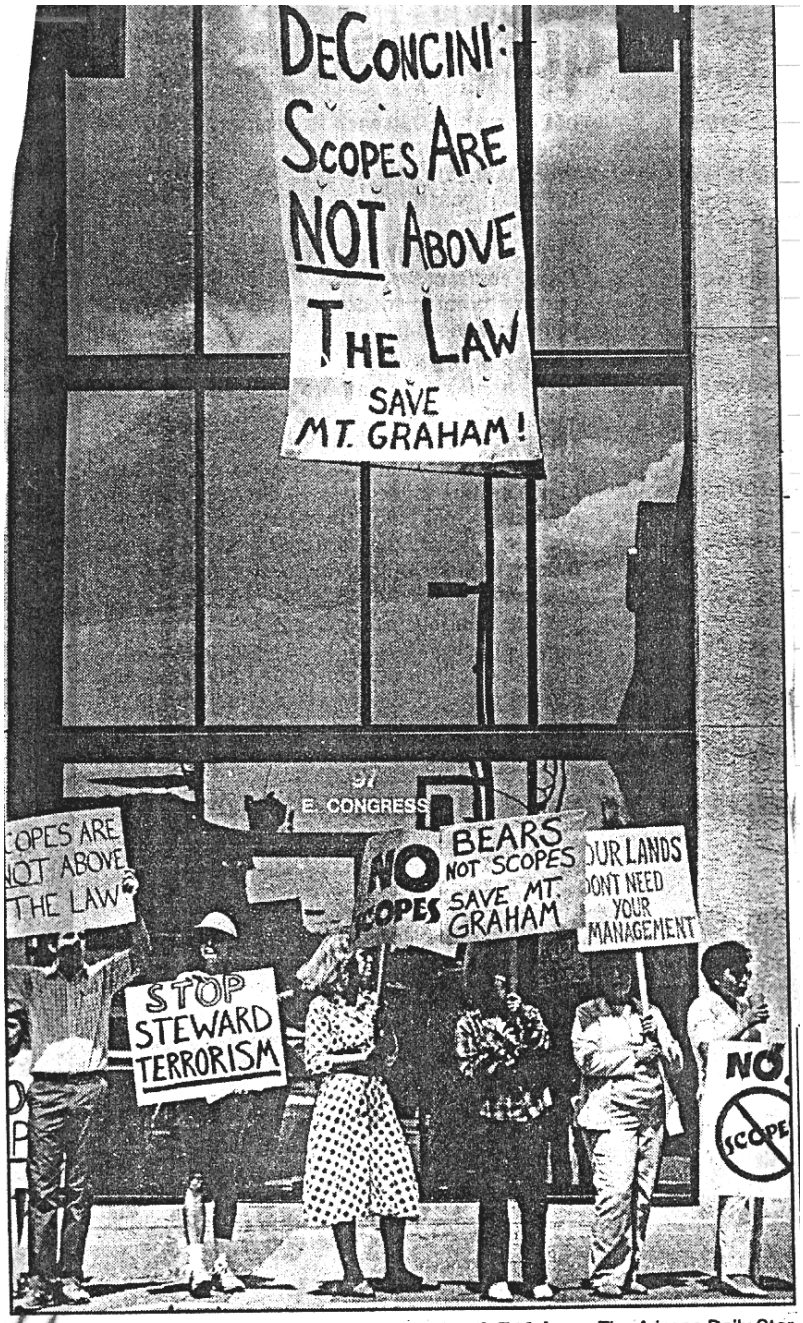
Scopes trash peaks

I would like to express my concern over the Forest Service considering the telescopes on Mount Graham.

I am not only concerned about the red squirrel, but denial of access to the area. Southern Arizona has very few beautiful peaks for us to enjoy. Mount Graham is one of the nicest. The Forest Service would be doing the public a great disservice by allowing the University of Arizona to destroy Mount Graham with its clutter of telescopes. I sincerely hope that the Forest Service will seriously consider the preservation of Mount Graham and its beauty.

Anyone taking the hike to Mount Wrightson in the Santa Rita mountains can see the total destruction in the Mount Hopkins area with construction of telescopes and roads. It looks like a garbage dump.

E.W. Nowell



A.E. Arlaza, The Arizona Daily Star

10/4/88

Anti-scopes — A group opposed to the plan to put seven telescopes on Mount Graham, near Safford, demonstrates outside Sen. Dennis DeConcini's Tucson office. The Democrat supports the plan in Congress. About 30 to 50 people joined the protest yesterday by the Coalition to Preserve Mount Graham.

October 22, 1988

A UA trailer was destroyed in Mt Graham blaze. Estimated loss was estimated at $20,000. The Graham County Sheriff's Department is investigating.

Group says scopes will be destroyed

Earth First! decries Mt. Graham plan

By Jim Erickson
The Arizona Daily Star

Any telescopes built on Mount Graham will be destroyed, a co-founder of the militant conservation group Earth First! says.

"Certainly, a lot of people in Southern Arizona think Mount Graham is a very important place and that plans for an observatory will lead to the unraveling of a relict ice age forest — and those people aren't going to back down," said Dave Foreman of Tucson, publisher of The Earth First! Journal.

The University of Arizona is seeking U.S. Forest Service approval to build seven telescopes just below the 10,720-foot summit of Mount Graham, near Safford.

"There are people who are prepared to make them put the scopes up there several times — which means a telescope doesn't see the stars very well if its mirror is broken," Foreman said.

"It's certainly not something I would do myself, but anybody with any sense has to realize that's something that *will* happen," he added.

"If they put scopes up there, those scopes will have to be replaced because of damage," he said Monday.

Remarks draw criticism

Observatory supporters yesterday expressed outrage over Foreman's remarks.

"If they are serious, and if this is a tactic to frighten the civilized and to motivate others, then this would seem to go well beyond monkeywrenching tactics and would smack of domestic terrorism," said J.T. Williams, chairman of UA's Mount Graham Task Force.

Foreman is the author of a 1985 ecological sabotage handbook titled "Ecodefense: A Field Guide to Monkeywrenching." That 185-page, illustrated manual explains how to spike trees, dismantle billboards, disable helicopters, destroy power lines, jam locks and make stink bombs.

Such acts are known in the movement as "ecotage" or "monkeywrenching." The latter term was coined by Tucson author Edward Abbey, whose 1975 novel "The Monkey Wrench Gang" helped inspire Earth First!

"No compromise"

Foreman and several colleagues formed Earth First! in 1980 after becoming disillusioned with the mainstream environmentalist movement. The group's emblem is a raised fist, and its slogan is "No compromise in the defense of Mother Earth."

Local members of the group have been vocal opponents of the Mount Graham observatory for several years and have hinted that monkeywrenching might be an option. But Foreman is believed to be the first to openly state that the telescopes would be destroyed.

"I thought we lived in a rational society, and it's very sad that people would behave or think that way," said Peter Strittmatter, director of the UA's Steward Observatory.

The university is working on security measures to protect the construction site if the telescopes are built, Strittmatter said yesterday.

See **TELESCOPES,** Page 3B

Williams said: "My guess is that Earth First! is primarily playing to the media or looking for attention," Williams said.

He added that it is "important that our society not be frightened by this type of thing, because if we become frightened by these tactics, they will be effective by default."

"Work within the system"

Observatory opponent Paul Pierce, director of the Coalition for the Preservation of Mount Graham, was quick to distance himself from Foreman's remarks.

"I hope he is not serious, and I hope that the rest of the environmental and outdoor groups that have worked to preserve Mount Graham don't get accused of condoning that type of activity," Pierce said yesterday.

"We've made a conscious effort to work within the system — totally legal — and we're going to keep it that way," Pierce said.

The coalition, which includes 34 environmental and sporting organizations, has scheduled a demonstration at Sen. Dennis DeConcini's office at noon tomorrow to protest the Democratic senator's efforts to get the observatory approved legislatively.

In recent years, Earth First! members have condemned the proposed observatory at public hearings and at demonstrations outside the federal building and Steward Observatory.

At a 1986 public hearing, an Earth First! member urged that Mount Graham be declared a wilderness area so that wolves and possibly grizzly bears could be reintroduced.

Wearing Clorox bottles

At another hearing, Earth First! staged a skit in which "astronomers" (wearing Clorox bottles to represent telescope domes) gunned down other members dressed as Mount Graham red squirrels. That rodent is an endangered subspecies that lives only on the mountain.

Last summer, Earth First! announced plans to reforest a dirt road atop Mount Graham to improve habitat for the red squirrel. That plan was later dropped, but it may be revived this weekend during an Earth First! regional meeting on Mount Graham.

MT. GRAHAM: MUCH MORE THAN SQUIRRELS AND SCOPES

It's about power, money, and special interests!
It's about the destruction of one of America's great national treasures!
It's about a few people who would like to be:

ABOVE THE LAW!!

Today, in Washington, Arizona congressmen are pushing special legislation to EXEMPT the UA's telescope development from NATIONAL ENVIRONMENTAL PROTECTION LAWS. This proposed bill:

- **ELIMINATES YOU,** the public, from the public review process (as guaranteed every American by the Nat'l Environmental Policy Act);
- **OVERRIDES** conservation management guidelines in the Coronado National Forest Plan and the National Forest Management Act;
- **SIDE-STEPS** the U.S. Fish and Wildlife Service's Biological Opinion regarding the protection of endangered species.

If this legislation passes, it will set a dangerous NATIONAL PRECEDENT that ERODES YOUR RIGHTS as provided by AMERICAN ENVIRONMENTAL LAW.

*CONTACT YOUR CONGRESSMEN IMMEDIATELY, ESPECIALLY SENATORS McCAIN and DECONCINI, AND TELL THEM YOU OPPOSE THIS UNNECESSARY LEGISLATION.

Sen. Dennis DeConcini: 602-629-6831 / Sen. John McCain: 602-629-6334
Rep. Jim Kolbe: 602-629-5210 / Rep. Mo Udall: 602-629-6404
Rep. John Rhodes: 602-831-6433 / Rep. Bob Stump: 602-261-6923
Rep. John Kyl: 602-840-1891
Letters c/o: US Senate, Washington DC 20510; US House of Representatives, Washington DC 20515

For three years the UA has rejected compromises offered by the US Forest Service and the US Fish and Wildlife Service. Now the UA wants Congress to write them a BLANK CHECK.

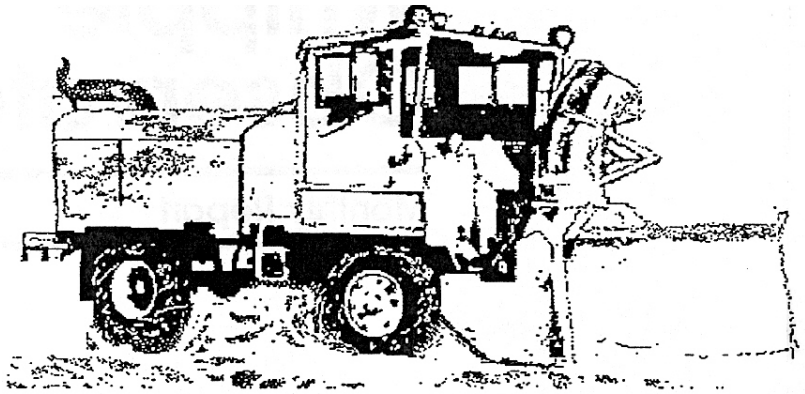
HELP US STOP THIS ASSAULT ON THE DEMOCRATIC PROCESS

*PLEASE SEND A CONTRIBUTION TO THE COALITION TO HELP WITH PUBLICITY, LEGAL FEES, AND OUR VOLUNTEER WATCHDOG IN WASHINGTON.

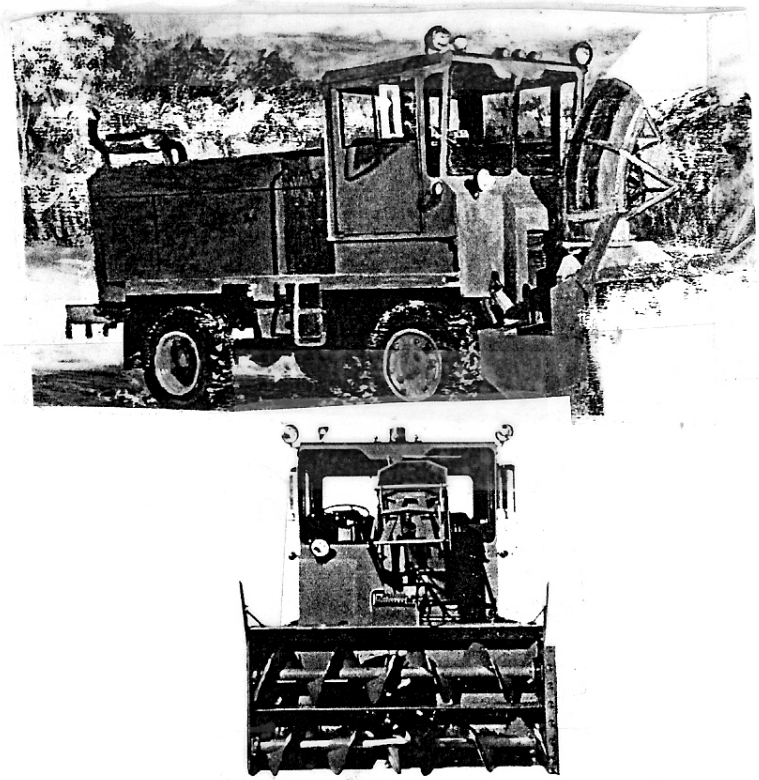
Make checks payable to:

MT. GRAHAM COALITION
P.O. BOX 1949 TUCSON, AZ. 85702

690 E. 19th ST., SUITE #100



The observatory now has a snow blower. This 18 ton machine is 30 feet long and can throw 30 tons of snow and rocks per minute. Snow and rocks can be thrown more than 100 feet faster than you can throw a baseball. The snow blower will remove snow from the road without damaging the guard rails. The power and capability of the snow blower creates some safety concerns for mountain users and the support crew. While the snow blower is operating, the visibility of the two operators in the cab is limited. The operators may not see a vehicle within throwing distance at a lower elevation on the mountain road. Don Hogan will periodically make radio announcements and phone calls to telescope facilities to inform mountain users and other workers of location of the snowblower. It may be necessary to close or restrict traffic for short periods on the section of the road with the snow blower.



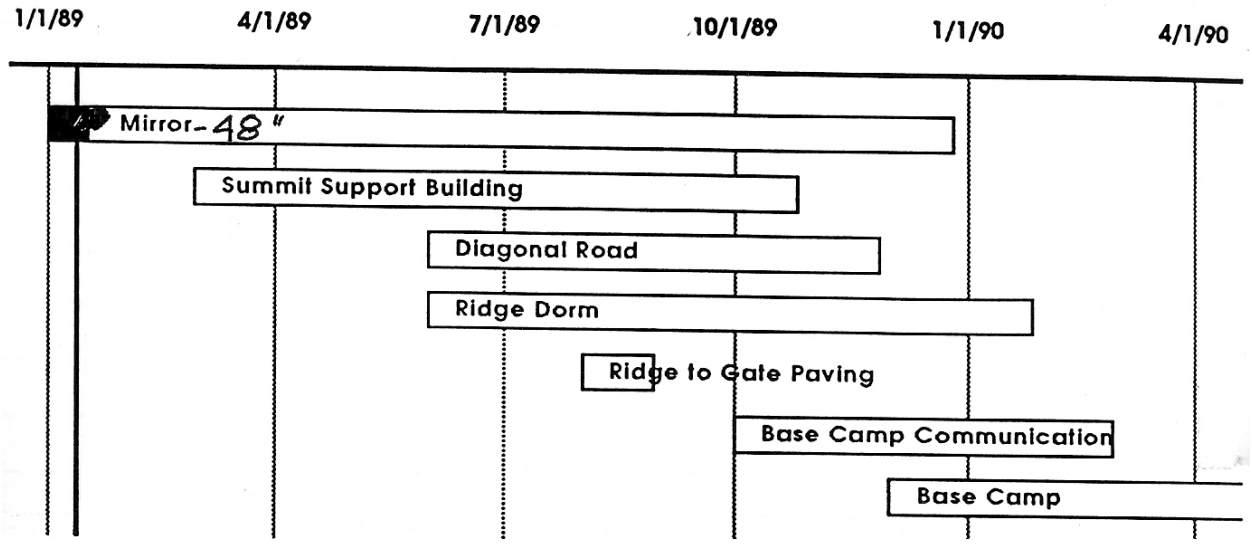
AN AWESOME MONSTEROUS SCARY MACHINE

YEAR 1989

January 1989

Planning started to replace the 60-inch dome. Two types are available at this time. The selection will be made between 1.) ObservaDome of Jackson, Mississippi and 2.)Ash Dome of Plainfield, Illinos. Observers seem to prefer the Ash Dome with a wide aperature. Cost about $70,000.

Construction Schedules The schedule below shows construction planned for the coming year at FLWO:



Arnie Valdez the motor pool assistant retired.

January 20, 1989

This is Ronald Reagans last day as President.

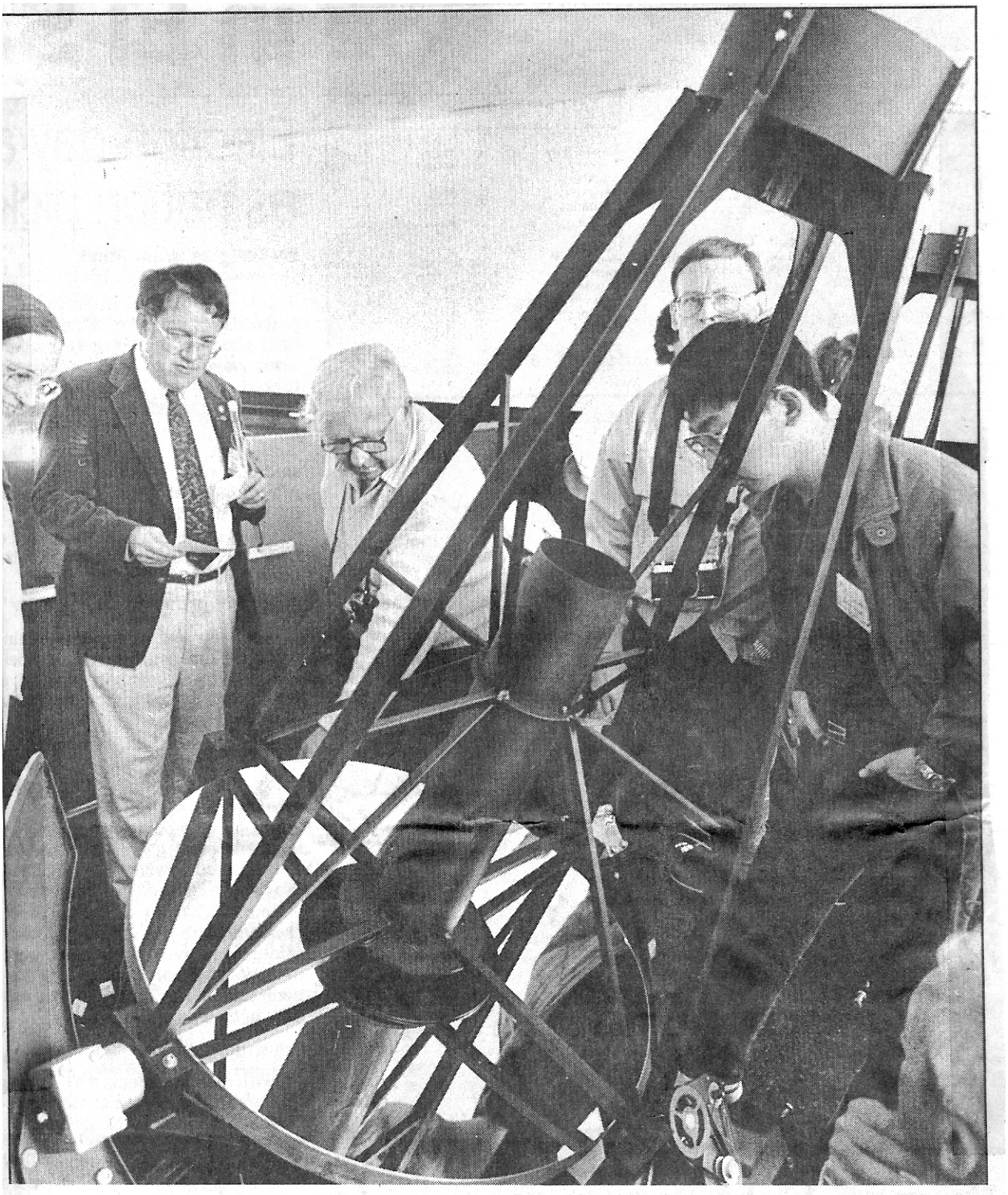
February 13, 1989

John Huchra relieved Dave Latham as Associate Director. Kirk Gilmore resigned to take a position at Lick Observatory.

March 1989

Removed the summit Heliport and cleared the area for the planned IOTA project.

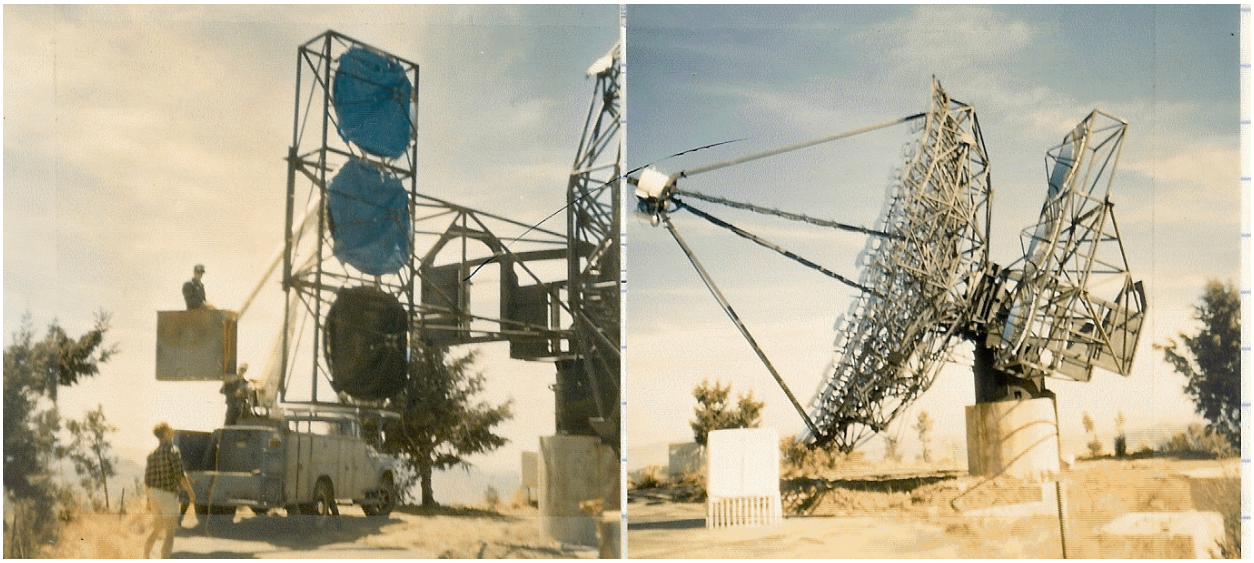
The Fairborn Observatory (APT)project expects to have four automatic telescopes in operation by the end of the month. These telescopes let astronomers get a nights sleep. The Arizona Daily Star had a nice story about this project recently.



Bruce McClelland, The Arizona Daily Star

Automatic stargazing — Astronomers from across the nation inspect one of the Automatic Photoelectric Telescopes that collects data without the aid of astronomers at the Smithsonian Institution's Fred L. Whipple Observatory on Mount Hopkins, 35 miles south of Tucson.

More than 100 astronomers from around the world attended a symposium in Tucson regarding this APT project.



April,5, 1989
MEMO:
To: Steve Criswell
From: Trevor Weekes
Subject: Support Assistance in Mounting Mirrors on 10m Reflector

I would like to express my appreciation (and that of my colleagues) at the fine effort put out by various members of the Support Group in assisting us in mounting six 1.5 m aperture mirrors on the 10m Reflector

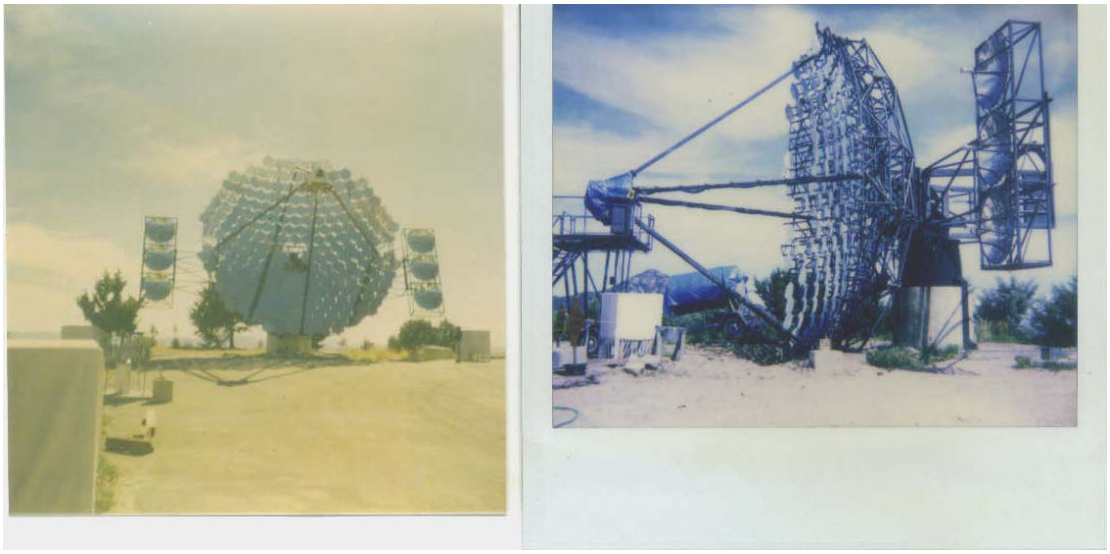
In the early stages of the project, Marion Rice provided invaluable advice on the general design of the mirror support structure, on contracting out the support arms and on interfacing the arms and support structure.

Bill Omann did a massive job of re-working the mirror support structure; this included re-welding many bad joints and reinforcing the overall structure. As a result of his fine work. the various components joined together nicely and thus required minimal adjustment.

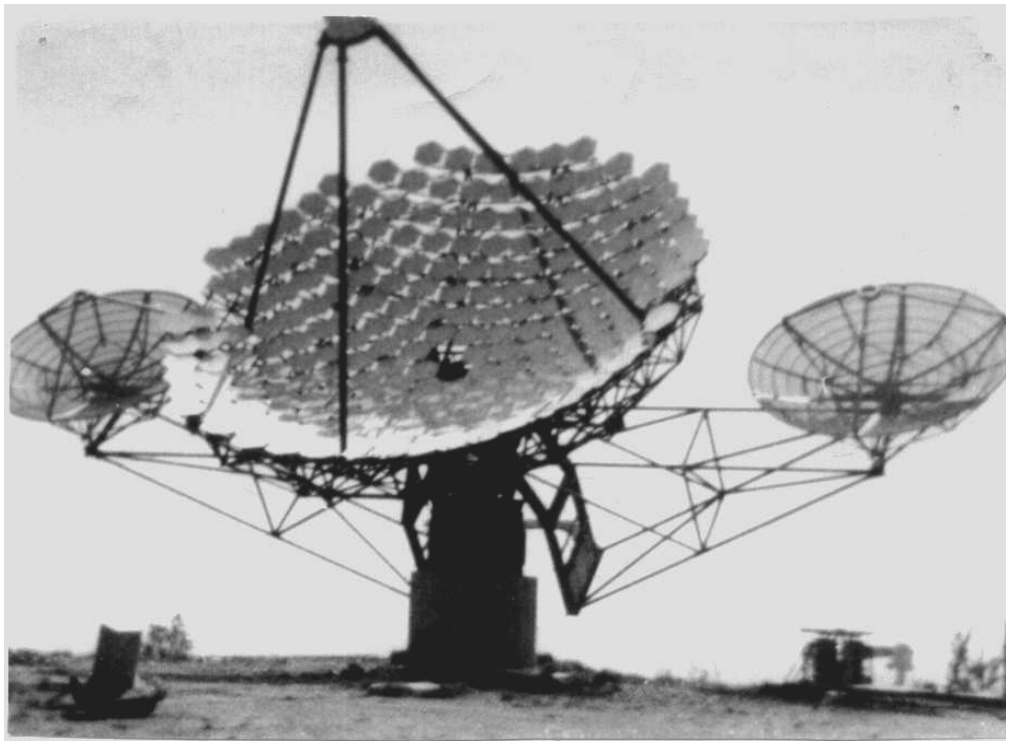
Thanks to the careful planning of Don Hogan, the arms and mirrors were mounted in a single day; since this required careful interplay between the crane, the sun, and the 10m this was an outstanding effort. This would not have been possible without the skill and cheerful cooperation of Myron, Dave, and Jim. To have employees on the staff who will leave their beds at 3:30 AM in order to be on Knoll One before dawn says much for the organization and the morale of the staff.

Sometimes we have discussions on how big the support crew should be to be able to complete this task in-house is a strong argument for maintaining a strong local support force. It would be woefully complicated to have to contract out this job.

I enclose some pictures of the project in progress and also when completed.



SIX SEARCHLIGHT MIRRORS HUNG OUTBOARD OF 10 METER



THE L.O.R. WITH “MICKEY MOUSE EARS”- 19??

April 26,1989
Replaced the summit water tank with the crane.
Vandals cut Kitt Peak power pole. The observatory generators
kept them in operation. Six O’odham villages lost power.

May 5, 1989

Tucson, Friday, May 5, 1989

UA equipment damaged; scope opponents suspected

By Jim Erickson
The Arizona Daily Star

Opponents of the UA's plans to build telescopes on Mount Graham apparently were responsible for about $3,000 worth of damage to astronomical equipment on a hill west of downtown Tucson, university police said yesterday.

Two University of Arizona microwave dishes on Tumamoc Hill were damaged and a telescope housing had about 40 small holes poked into it, said Sgt. Brian Seastone of the university police.

The vandalism was discovered yesterday morning when a technician visited the site to work on the microwave dishes.

Seastone said the damage probably occurred within the last five days. Police are investigating a possible link between the Tumamoc Hill incident and vandalism last week at Kitt Peak National Observatory, he said.

The vandals left several Earth First! stickers, said Robert McMillan, a senior research associate at the UA's Lunar and Planetary Lab.

Jean Eisenhower, an activist with the radical environmental group, said yesterday, "It's probably an individual Earth Firster, I'll go so far as to say that.

"But it could also have been someone who got hold of some Earth First! stickers," she said.

The damaged microwave dishes belong to the Lunar and Planetary Lab and were used to relay data from Kitt Peak to the Space Sciences Building on the UA campus, McMillan said.

The dishes were dented and will have to be replaced, said McMillan, who visited the Tumamoc Hill site yesterday. The dishes were used to relay data from the Space Watch telescope, which is used to search for asteroids that might be on a collision course with Earth.

"We seem to be confronted with guerrilla terrorism that is randomly directed," said Eugene Levy, director of the Lunar and Planetary Lab.

"They've damaged an installation dedicated to an entirely benign scientific activity, and I guess I would describe this as a remarkable tragedy."

The damaged 21-inch telescope belongs to the UA's Steward Observatory, but it is used primarily by students at Pima Community College, said observatory director Peter Strittmatter.

Last week, electricity to Kitt Peak and six Tohono O'odham villages was knocked out when a power pole was sawed down near the base of the mountain. A man identifying himself as a "scope buster" called the Tucson office of The Arizona Republic to claim responsibility.

In the past three weeks, six to eight windows have been smashed at the office of the Tucson-based National Optical Astronomy Observatories, director Sidney Wolff said.

The UA plans to build seven telescopes on Coronado National Forest land atop Mount Graham, near Safford. Observatory opponents say the project would seriously damage the mountain ecosystem, which includes the endangered Mount Graham red squirrel.

The observatory hired Double Check Security of Tubac to patrol and check the office and grounds. Employees were alerted to watch for suspicious people on the road.

This is the 10th year of MMT operations. Many newspaper articles and TV newscast covered the event all week.

May 12, 1989

A woman on the cleaning crew reported that the door to the Gamma Ray restroom was “all torn-up, kinda like an animal chewed its way in!” We went to the building to investigate. It was indeed all torn-up.

It turns out that a gamma ray astronomer, who was working alone that night locked the door to use the restroom. Much to his surprise and chagrin he found he could not open the door. He was locked in and could not get the door to open.

Meanwhile the 10 meter dish was in slow motion scanning the sky. He realized that he *must* get out and store the dish properly before the sun rises. It’s anyone’s guess what a 10 meter magnifying glass, with the sun on it, would burn up. Panic time!

He tried kicking the door out and putting his shoulder to it, like they do in the movies, but it would not budge.

He needed a tool like an axe or a hammer. The only thing he could find was a 4-inch pair of scissors in the first aid kit in the medicine cabinet.

It took him more than an hour to stab, slash, and kick his way out.

The lock was in fact faulty and jammed. The question remains, “why at 3AM, and alone, did he lock the door in the first place?”

June 1989

During the month the Mt Graham controversy continued in both the newspapers and local TV stations.

The following clips are just a few samples of the letters to the editor.

MORE LETTERS

6/27/89

Squirrels number few

We are writing in response to your article, "Mount Graham red squirrels are more numerous than had been thought," June 15, the title of which was misleading; an additional 17 to 19 squirrels could hardly be considered "more numerous" in light of future habitat destruction if the telescopes are built.

We vehemently disagree with the Forest Service's assessment and handling of the Mount Graham/red squirrel population issue, which became "a crisis situation" the day they brought in the first bulldozer.

The squirrels are not the pivotal issue here, nor is the fact that there are special (i.e., military) interests in this project, though neither one of these should have been enough to stop it. The squirrels are simply one of the many unwitting victims of a disturbing trend of habitat destruction in the name of technological progress and profit at the taxpayers' expense in order to keep the military-industrial complex juggernaut rolling along.

We are certainly not against the pursuance of astronomical knowledge, but what will it be worth to future generations in need of potable water and breathable air?

Mark R. Higgins
Kathleen Lavoie

Betrayal of sacredness

The very idea of building an observatory on Mount Graham just makes me cringe all over. There is no way that anyone can haul heavy equipment 10,000 feet to the top of the mountain, chop down trees, pour concrete and then still call it minimal damage. It will be major, irreparable damage. For us to destroy our natural resources to get a better look at the Milky Way is both nonsensical and brutal.

This sounds like the old pessimism and despair of James Watt who thought his mission in life was to "ravage and destroy the doomed Earth."

This is not a church issue. The fact that the Vatican owns one of the telescopes has nothing to do with the church. The Vatican could buy El Con Mall and call it Vatican Mall and it still would not involve the church. It may not be an ecclesiastical question, but it is a spiritual question. And this whole project betrays a total lack of the sense of the sacred.

The bottom line is: The end does not justify the means.

6/29/89

The Rev. Gilbert Padilla
Holy Family Church

No outrage in order

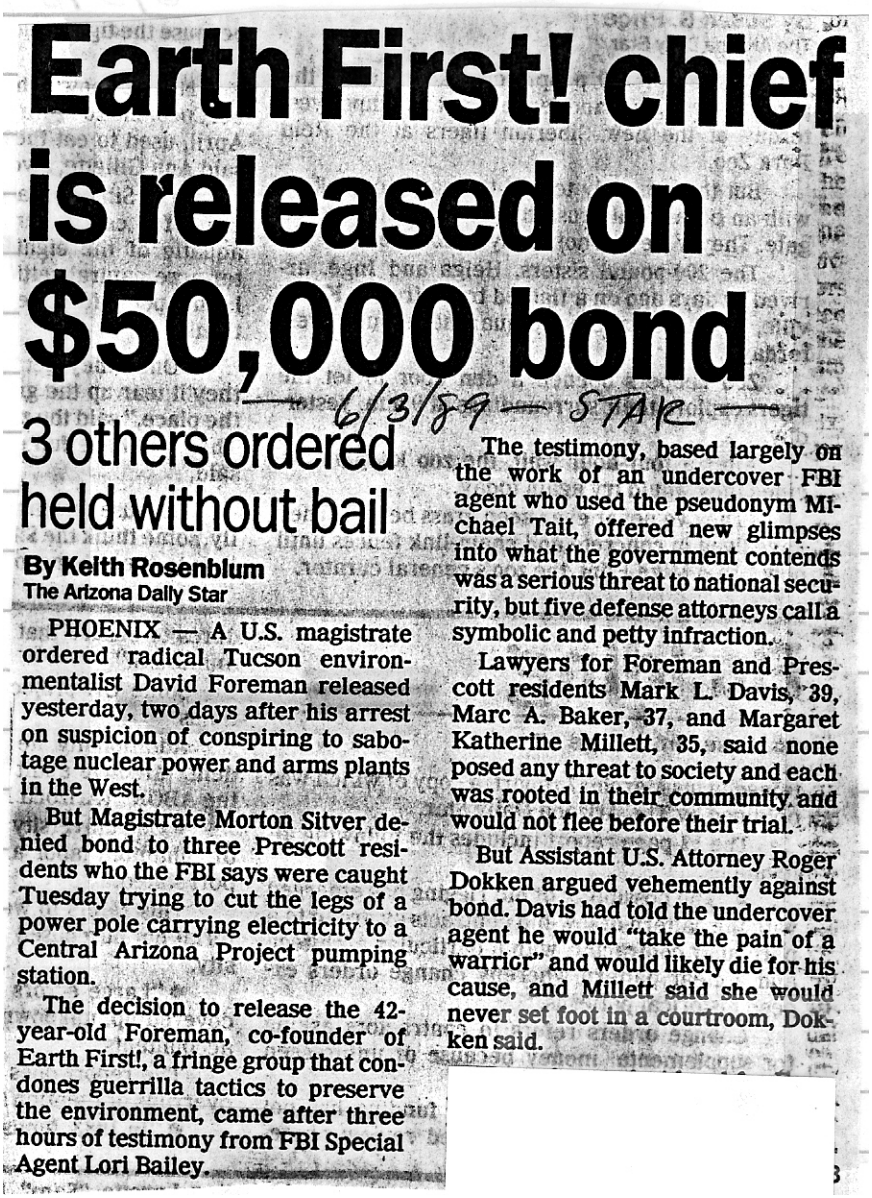
Regarding your article on the University of Arizona's increased security costs because of the recent break-in (Official says animal-rights activism at UA prompted costly extra security," May 20), your article left the reader with the impression that these costs were somehow going to be borne by hard-working taxpayers.

I think that before the UA is allowed to outrage the public by promoting the idea that animal rightism is going to cost them more because of security, we should be well-informed about monies the vivisection community has at its disposal. When a grant is applied for, it is inflated by as much as two or three times, but this extra money does not and never has gone for actual research. The UA admits as much by stating they have "indirect cost recovery" funds. This is just a fancy term for "overhead" (profit?) and since the public has already been bilked for it, it can be used to pay for any costs associated with animal research without digging into more pockets.

Give us a break! The crytosporidium mice weren't the catastrophe they claimed, and neither is their "poor me" story.

6/29/89

Roberta S. Wright



Earth First! chief is released on $50,000 bond

6/3/89 — STAR

3 others ordered held without bail

By Keith Rosenblum
The Arizona Daily Star

PHOENIX — A U.S. magistrate ordered radical Tucson environmentalist David Foreman released yesterday, two days after his arrest on suspicion of conspiring to sabotage nuclear power and arms plants in the West.

But Magistrate Morton Sitver denied bond to three Prescott residents who the FBI says were caught Tuesday trying to cut the legs of a power pole carrying electricity to a Central Arizona Project pumping station.

The decision to release the 42-year-old Foreman, co-founder of Earth First!, a fringe group that condones guerrilla tactics to preserve the environment, came after three hours of testimony from FBI Special Agent Lori Bailey.

The testimony, based largely on the work of an undercover FBI agent who used the pseudonym Michael Tait, offered new glimpses into what the government contends was a serious threat to national security, but five defense attorneys call a symbolic and petty infraction.

Lawyers for Foreman and Prescott residents Mark L. Davis, 39, Marc A. Baker, 37, and Margaret Katherine Millett, 35, said none posed any threat to society and each was rooted in their community and would not flee before their trial.

But Assistant U.S. Attorney Roger Dokken argued vehemently against bond. Davis had told the undercover agent he would "take the pain of a warrior" and would likely die for his cause, and Millett said she would never set foot in a courtroom, Dokken said.

The above is an excerpt from a very long newspaper article of the court hearing.

Mt. Graham squirrel accidentally killed in tagging by UA team

By Jim Erickson
The Arizona Daily Star

Trapping and tagging endangered Mount Graham red squirrels was suspended after UA biologists accidentally killed one of the rare rodents this week.

A 10-month-old Mount Graham red squirrel died Tuesday after it was live-trapped and given an anesthetic, said Randall Smith, a U.S. Forest Service wildlife biologist.

The red squirrels, an endangered subspecies found only on the 10,720-foot mountain near Safford, were being trapped and tagged as part of a monitoring program required by the U.S. Fish and Wildlife Service.

The monitoring program is designed to determine how construction of the University of Arizona's proposed Mount Graham observatory would affect red squirrels. The university hopes to begin construction this summer.

"The squirrel had been removed from the trap, and it was kicking and biting as they always do, and this person was applying an anesthetic to quiet it down in order to put tags in the ears," said UA biologist Russell Davis, director of the monitoring program.

"All of a sudden she noticed that she didn't see any respiratory movements," said Davis, an associate professor of ecology and evolutionary biology.

Smith said the death may have been caused by the anesthetic in combination with dehydration or heat stress. An autopsy probably will be performed to determine what killed the squirrel, Davis said.

Two graduate students work with Davis on the squirrel-monitoring project. They had been trained in proper trapping and tagging techniques, Davis said.

The squirrel was the second the team had trapped.

The procedure involves baiting wire cages with pecans, then forcing the trapped squirrels to inhale an etherlike anesthetic called metofane, Davis said. Colored, numbered, thumbtack-sized aluminum tags are attached to the ears of the squirrel, one on each ear.

Trapping and tagging will resume in about a week, but no anesthetic will be used, Davis said. Instead, one person will hold the squirrel while another applies the tags, he said.

Only one or two more squirrels

See **SQUIRREL,** Page 3B

Continued from Page 1B

are expected to be tagged, Smith said. The trappers will try to capture the squirrels living closest to the construction site, he said.

Davis, who has been trapping and tagging small mammals since 1960, opposes the tagging of Mount Graham squirrels. He said biologists could gain the necessary data about changes in squirrel behavior without tagging.

About two weeks ago, Davis said: "Tags in the ears increase the chance of infection, and I dread the possibility of one of these squirrels dying.

"The loss of one squirrel in a population this size is real serious," he said.

The number of remaining Mount Graham red squirrels is estimated at 116 to 167.

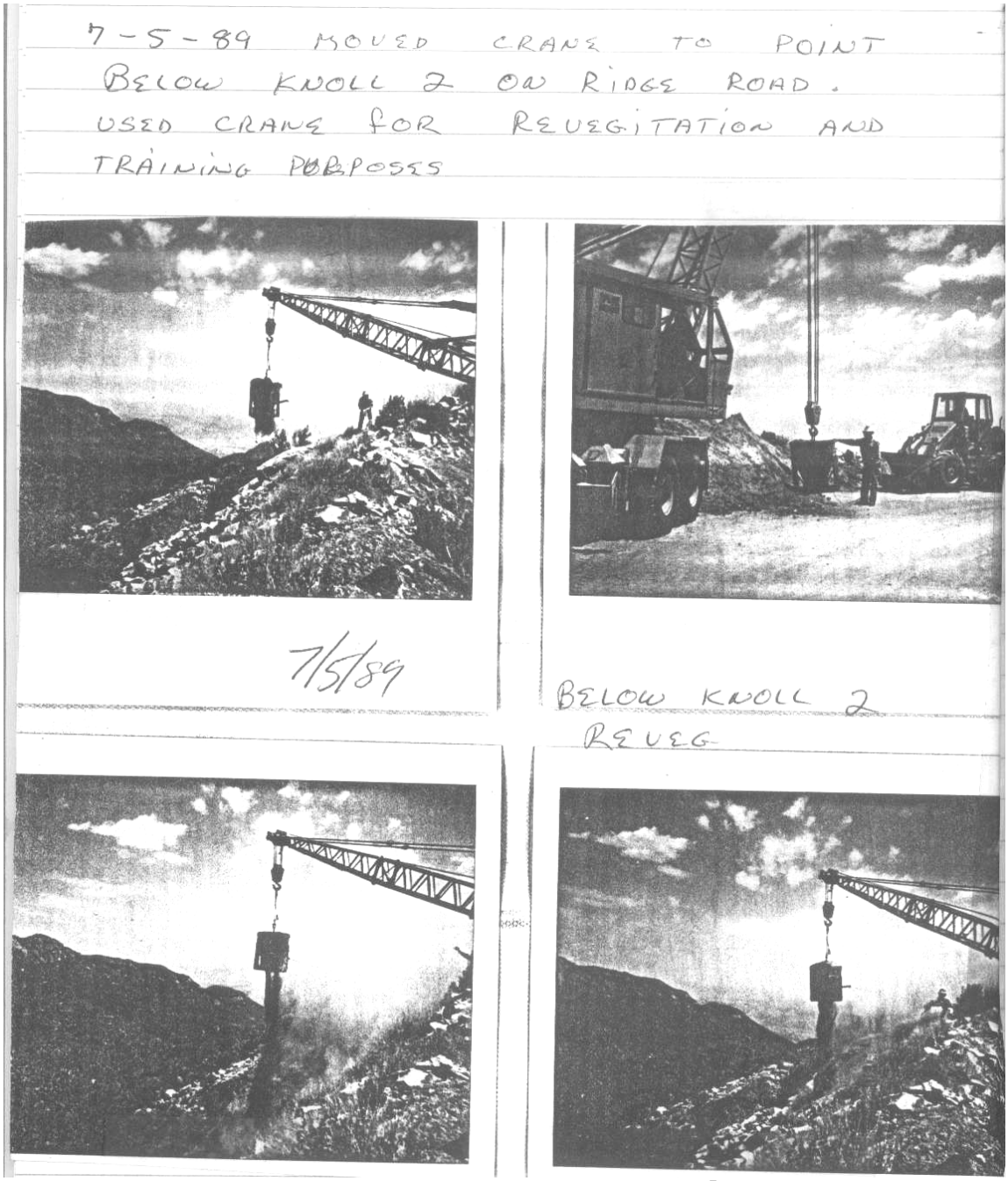
The UA must monitor the squirrels for at least 30 days before tree felling and excavation can begin for the observatory project. The official 30-day monitoring period is scheduled to begin in about one week, Davis said yesterday.

Observatory opponent Paul Pierce said the squirrel's death demonstrates that "things are out of control for the squirrels on top of Mount Graham."

"They are in danger from the construction and also from the way they are being monitored and captured," said Pierce, chairman of the Grand Canyon chapter of the Sierra Club.

The Sierra Club and several other national conservation groups filed a lawsuit Thursday to stop the observatory project in order to save the endangered squirrel.

July, 5, 1989



Photos and notes from Myron Clark.

In addition to using the crane to spread top soil at various site the photos below shows the Support Crew spreading old hay bails to stabilize the soils and seed.

The photo on the lower right shows the mulcher being used to spread seed and mulch on a barren slope. Usually this mulching was done just prior to the summer rainy season.

In addition to making the mountain aesthetically pleasing revegetation it helps keep the dust down.

REVEGETATION OF MOUNTAIN SLOPES

This old photo shows the 500 gallon hydro mulcher (lower right) in use. The mulcher was loaded with various types of native seeds and sprayed on bare spots along the mountain road.

October 1989

The Summit, MMT, shop building was completed.

SUPPORT CREW JIM JONES, MYRON CLARK, DAVE MARTINA, DON HOGAN

September 1989

Black and Brown bears are becoming a common sight in the Summit Bowl area.

Dormitory rates were increased to $25 (from $12) per person per night.

Marion Rice and Steve Criswell met with the Santa Cruz County Board of Supervisors to seek that body’s approval of a new road toward the Elephant Head Bridge.

The spring has stopped running. We started hauling water to the mountain again.

9/89

Whipple Observatory Information — STAFF

Amado Office	Comm.	FTS
Business Office (602)	670-6741	762-6741
Public Information	398-2432	
FAX (24-hr autoansr)	670-6779	762-6779
Tucson Offices	**SO Room 458**	
Dr. Weekes	670-6749	762-6749
Dr. Caldwell	621-1535	762-6749
Dr. Peterson	621-1535	762-6749
Science Office	621-1704	762-6749
Planetarium Bsmnt.	621-6537	762-5339
MMTO Office	621-1558	762-6750
SO Room 460	670-6750	
Ans. Mach. [Bruno]	621-7650	
Mountain		
GAMMA RAY (602)	670-6744	762-6744
Data	670-6736*	762-6736*
SUPPORT SHOP	670-5201	762-5201
GENERATOR SHED	670-5201	762-5201
CONSTRUCTION TRLR.	670-6755	762-6755
FAIRBORN OBS	670-5201	762-5201
Data	670-6756*	762-6756*
RIDGE DORMITORY	670-6744	762-6744
1.5 M & 61 CM TEL	670-6746	762-6746
FAX (24-hr autoansr)	670-6737/9*	762-6737/9*
Data	670-6755*	762-6755*
MMT BUILDING &	670-6747	762-6747
COMMON BUILDING	621-7933	
MMT Paging System	621-5117	
MMT Data	670-6757/8*	762-6757/8

* SAO Microwave System; others U.S. West

Amado Intercoms			
Alegria	12	Public Info	13
Brocious	9	Ready Room	7
Criswell	3	MMT Desk	15
Kurtenbach	11	Motor Pool	6
Larson	4	Garage	14
Myres	2	Paging	19
Rice	5	Teacherage	0
Weekes	8		

Mountain Intercoms			
Fairborn Obs.	21	MMT Office	41
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Gamma Ray	23	MMT Electronic	43
Support Building	24	MMT Control	44
1.5 M. Tel. Library	25	LAB, SG	45
1.5 M. Tel. Control	25	LAB, IR	46
1.5 M. Workshop	25	MMT Library	46
Generator Shed	28	MMT Machine	47
61 cm Control Rm	29	MMT Computer	48
		Common Bldg	49

Employees	Office
ALEGRIA, Grace (602)	670-6741
BARLOW, David	621-1369
BLANCO, Dan	621-7649
BOYD, Lou	235-1897
BROCIOUS, Dan	670-6741
CALDWELL, Dr. Nelson	670-6749
CHAFFEE, Dr. Frederic	621-1812
CLARK, Dusty	621-3072
CLARK, Myron	670-5201
CRISWELL, Stephen	670-6741
FOLTZ, Dr. Craig	621-1269
GENET, Russ	988-6561
GRAY, Lynn	670-6744
HARRIS, Kevin	670-6744
HELLER, Carol	670-6747
HOGAN, Don	670-5201
HOLLEMAN, Bob	621-1558
HORINE, Ed	670-6746
JONES, Jim	670-5201
KINDRED, Bill	621-7933
KURTENBACH, Kurt	670-6741
KWOK, Ping-Wai	670-6744
LARSON, Ginnee	670-6741
LESTER, Howard	621-3451
McAFEE, John	670-6747
McCLURE, Mac	621-7651
McANINCH, Gary	670-6741
MARTINA, Dave	670-5201
MYRES, Karen	670-6741
OMANN, Bill	670-6741
OUELLETTE, David	670-6747
PAGNOTTA, Cheryl	621-7933
PETERS, Jim	670-6747
PETERS, Wayne	621-7933
PETERSON, Ruth	621-1704
POYNER, Tony	621-5185
RICE, Marion	670-6755
ROBERTSON, Janet	670-6747
RUSS, Barbara	621-1558
SABOL, Barry	621-5414
SCOTT-FLEMING, Ian	621-7647
SHARP, Frank	621-5414
SMITH, Dennis	621-7933
STENMAN, Russ	670-6747
VACANTI, Giuseppe	670-6749
VAN'T SANT, Bas	670-6746
WEEKES, Dr. Trevor	670-6749
WEST, Dan	670-6741
WILLIAMS, J.T.	621-5407
WILLIAMS, Myles	670-6741

9/89

Information and Assistance:

Weekdays - Office Hours: Amado Office 670-6741
Weekends - After Hours: Recorded Info 670-6741
**Program Manager - S. Criswell 398-2618
**Support Supervisor - D. Hogan 398-2507

Safety Coord. - D. Kurtenbach 625-8239
Doublecheck Security 281-8555
Central Alarm 622-8824
***Emergency Coordinators*

October 1989

SM&R's bulldozer started clearing site for the new dormitory site at Knoll #4.

Jim Jones was out while recovering from an operation. Myron Clark was also out with a bad back. A request was made for temporary assistance.

October 5, 1989

Hurricane Raymond deposited 3-5 inches of rain in the Santa Cruz Valley. The river is running bank to bank which is now about 700 feet wide.

SM&R hauled the largest load **ever** to the mountain, 21.5 ton 10-foot concrete culverts. These culverts will be used as the tunnel entrance to the ridge dormitory. (For info the MMT arms weighted 14 tons and the MMT base weighted 20 tons.)

The FLWO Special Activities Committee consisting of Dave Martina, Jim Jones, and Cheryl Pagnotta started planning a staff Christmas Party.

October 20, 1989

High winds broke the welds on the ridge Satellite TV dish. The dish was found on the road 30 feet from it's base. We are just too busy to make any repairs now.

November 15, 1989

While training the engine on the big snow blower developed a knock. Low oil? This caused a big argument, shouting match, and nearly a fight about its operation between Bill Omann and Dave Martina.

Harvard-Smithsonian Center for Astrophysics

MEMO

To: FLWO/MMTO staff. Date: 20 Oct., 1989

From: Trevor Weekes TCW

Subject: What's new at Gamma-ray?

New Faces/old faces.
We are pleased to welcome Eduardo Colombo who will spend the year with us as a Predoctoral Fellow. Eduardo is a Physics student at the University of Buenos Aires. He will be working with us in our observing program on the 10 m and helping to build a small atmospheric Cherenkov telescope to go to Argentina.
In the New Year we expect short observing visits from two new doctoral students at University College, Dublin : Michael Punch and Karen O'Flaherty. Hopefully these will be preludes to longer stays in the following year.
Mark Lang has returned to U.C.D. after a year at FLWO as Predoctoral Fellow; we hope to see him return for an observing trip in the spring. Dick Lamb, on sabbatical this year, will spend four months at FLWO at the beginning of 1990.

Progress by degrees.
In a sudden outbreak of doctoritis, Ping-wai Kwok has had his Ph.D. dissertation accepted by the University of Arizona (Physics); similarly Daryl Macomb has persuaded the Iowa State University that he should be elevated to the doctoral ranks. This month both Josh Reynolds and Gary Gillanders have submitted their Ph.D. dissertations to University College, Dublin.

GRANITE
The rumors that we have been approved by DOE to expand our operation to include a second 10 m aperture camera are true. This will be built around an existing solar concentrator which we will purchase from the Southern California Edison Company. We hope to see it in Amado early in the New Year and on the mountain by the summer. It will take a little longer to equip it with new mirrors and electronics but hopefully it will be operational by 1991. The University of Michigan (Drs. Akerlof and Meyer) will be joining our collaboration.

South Pole
Our experiment at the South Pole operated well and we have 42 days (of 24 hours) of data in hand. TCW will spend the month of November there and will make some adjustments to the detector so that it can be operated for another year. We are also collaborating with Wisconsin and Purdue in setting up a bigger detector.

December 5, 1989
Memo: To Steve/Karen
Subject: Monthly Report Info

In the past three months we have hauled 101,200 gallons of water to the spring water tank. (it was pumped uphill from there saving many miles of hauling to the ridge)

Please remind the staff to conserve water.

Thank you,
Don

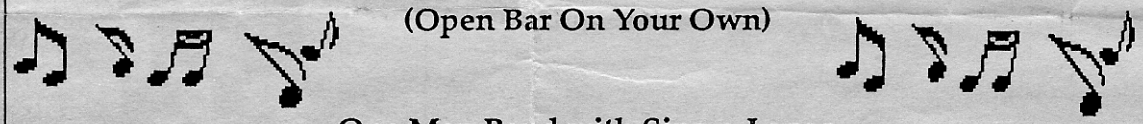
Note:
(1) 101,200 gallons required 44 trips to and from the mountain.
(2) The mountain use rate is still around 800 gallons per day.
(3) Estimated cost approximately $.71 per gallon.
(4) SM&R has hauled an additional 5,600 (probably more) gallons to our spring and heliport tanks.

Friday, December 15 at 5:30 p.m.

Halfway Station Restaurant
27930 So. Nogales Hwy.
Amado

Buffet Dinner
Chips & Dip
Tacos, Enchilades, Tamales, Chile Rellenos,Tortillas
Beans & Rice
Coffee, Tea, Sodas

(Open Bar On Your Own)



One Man Band with Sing-a-Longs

Santa Claus for the Kids
(Parents may bring a $5 gift for Santa Claus to give your children)

Cost

Volunteers and Retirees--Free
Children Under Age 10--Free
Everyone Else--$5 per person

(Staff who are major contributors are not charged)

December 20, 1989

Memo: For The Record –from Don Hogan

Knoll #3 – A.P.T. Construction Site – Mr. Ron Kerns

Ron complained of leg pain and dizziness while placing rocks in a hole with fresh concrete (lightning pole base). He walked about 30 feet and laid down on the road edge. He then stated that he had pain in his back not his leg(?). We treated him for shock. Arrangements were made for medical assistance and transportation.

Laying down was his most comfortable position.

When he rolled over or moved “the pain was not that bad” and he agreed to us taking him down for medical attention.

“I think I pulled a muscle or something.” We constructed a body-board, removed the back seat from a shuttle vehicle, and started to transport him downhill. We met the Tubac Ambulance just above the road bifurcation (KM 21) and transferred him to their care.

The road was bumpy and he complained of increased pain. Although they drove very slowly it was painful for him. They decided at that point to arrange for a helicopter airlift.

The helicopter landed on the Astronomy Vista parking lot (KM15) He was airlifted from that point (4:15 PM) to the University of Arizona Medical Center, Tucson, Arizona.

He was treated for pain and was examined by no less than six doctors. Xrays and a M.R.I. scan was completed at 11 PM.

He made it very clear to me and others that he did not want his wife informed. She is staying with her mother in Waynesburg, Ohio.

Thursday: 2 PM No diagnosis has been made at this time.

Note: After nine days and many medical tests and scans in the hospital the doctors could not pin-point a problem. He was released and placed on light duty in Amado. This was a really strange case! This was also the first day that Ron did any physical work.

December 22, 1989

Memo: To: MMTO Director and Mr. Frank Sharp, Manager

Subject: Emergency Assistance

Attached is a report of basic facts concerning Mr. Ron Kerns and his recent back injury on the mountain.

This report makes no mention that at a remote site medical assistance is not immediately available. We must do the best we can with what we have and with the people that are available.

People on your staff performed in such a way that one might think that the whole event was rehearsed. Not only did they assist with first aid and transportation but they dealt with the victim’s

emotional state.

The two people involved were Dennis Smith and Cheryl Pagnotta. They responded quickly to my request for assistance, delivered the required vehicle, assisted in the removal of the back seat, and provided the extra hands necessary for careful handling of the injured man. Cheryl also rode downhill in the vehicle attempting to make him comfortable until medical assistance arrived.

Thank you…and your people for their outstanding response It's nice to know that in an emergency the different groups on the mountain can interact beautifully.

In January Ron Kerns was dismissed from the observatory staff. About a month later we received the following note.

Support CREW and AMADO Base CAMP

Dear Everyone,

I just wanted to thankyou all for letting me be part of the Support Group. I have never worked with so many that cares about the job 100% of the time. Everone helps eachother out so very well. All want to help do the job to get it done right. There very caring and trusting people to work with. Its the teem effort what I like and everyones serious about there job.

Its just a blessing that I got the oppertunity to get to work with that type of CREW. I hope I can find an other job that has the same spirt of pulling together like you all do here at the Smithsonian Institution.

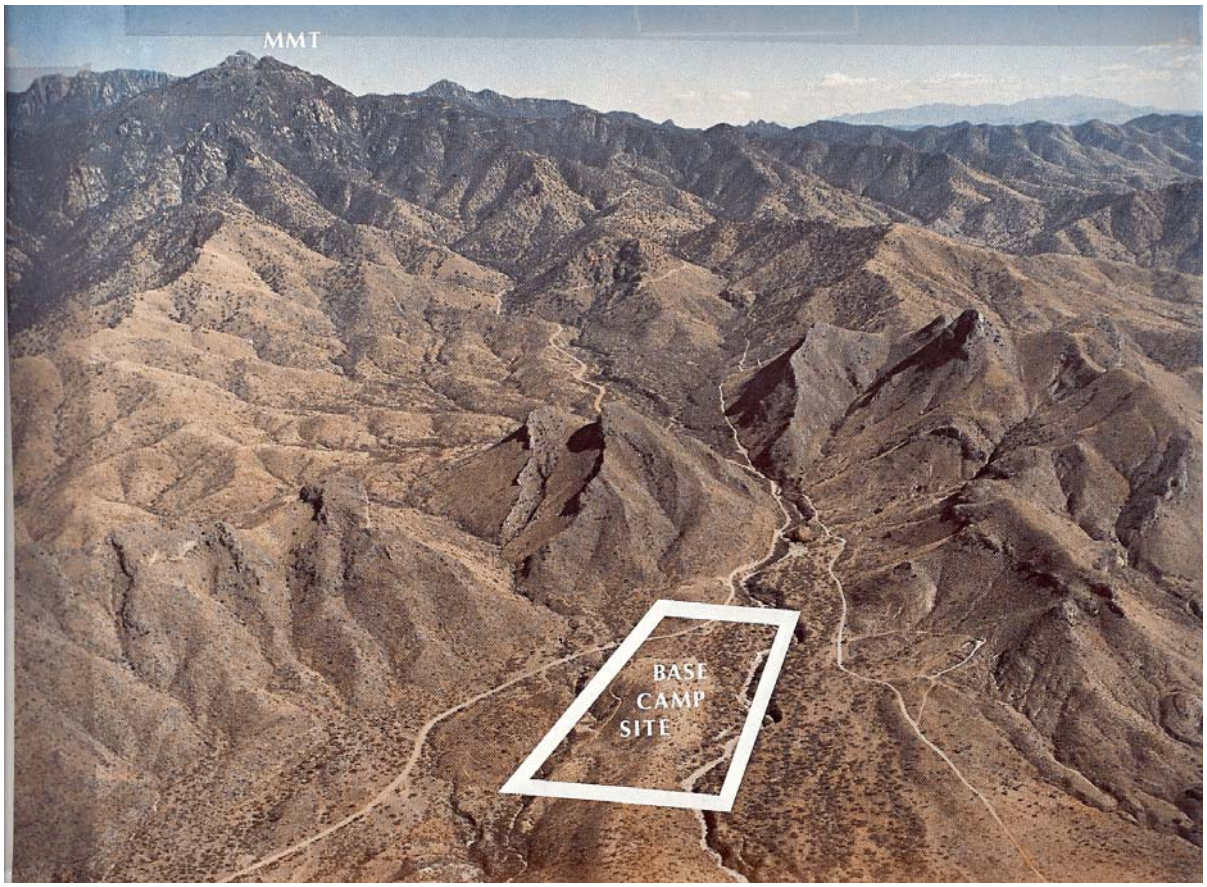
Thanks again for the time I got to spend here working for such wonderful PEOPLE.

Yours truley
Ronny Ray Kerns
SSgt USAF-RES

P.S. Have a NICE DAY.

YEAR 1990

January 1990



AERIAL VIEW OF THE PROPOSED BASE CAMP SITE LOOKING EAST

This site is at the base of Montosa Canyon about 4 air miles east of Amado on Forest Service Land.

January 9, 1990

Prior to construction at the Base Camp Dan Brocious discovered this very special “rock” on site. The Support Group used the crane to move this large petroglyphic rock. This rock was careful placed in a large tire sling and hauled to Amado for safe keeping. Upon completion of the new base camp it was placed on the

patio of the Visitor’s Center.

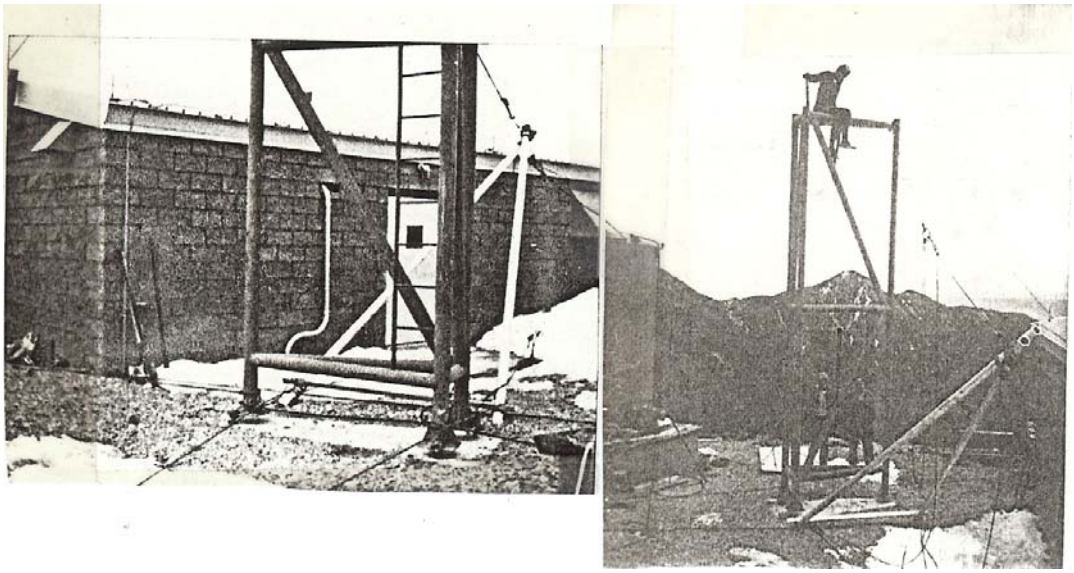
These rock carvings probably were made by the Hohokam people who lived in this region more than 1000 years ago. These symbols are similar to rock carving found elsewhere in the Southwest.

Not all discoveries at the Observatory were made in space.

January 28,1990

Ted Groner started as a computer programmer at the 60" telescope.

BASE CAMP PETROGLYPHS



January 1990

The MMT staff people, Russ Stedman and Dennis Smith, along with the Support Crew erected this 1,955 Pound, 20 foot frame for future use with microwave dishes.

Tucson, Thursday, February 22, 1990

TUCSON/ARIZONA

UA prof gets death threat over work on Mt. Graham

A University of Arizona professor received a death threat in connection with his work on a controversial UA observatory project on Mount Graham, university police said yesterday.

Sgt. Brian Seastone said Conrad Istock, head of the department of ecology and evolutionary biology, was told in a letter that he would be killed if construction of telescopes caused extinction of endangered squirrels on the peak near Safford.

"We're taking it as a death threat," Seastone said. "The investigation is continuing. We would have to review it with the county attorney to determine what charges might be filed on it" if a suspect were arrested.

Seastone said the letter said, in part: "If the red squirrel meets with extinction, and if such extinction is in any way tied to telescope construction, I intend to kill you. . . . And while it would be too late to save the red squirrel, maybe taking you out would save some future threatened species."

Istock, who is in charge of an ecological study of the squirrels, said he received the letter at his office earlier this month and considered it "a bonafide threat on my life."

"It gets you on edge when somebody says they want to murder you," he said. "And the thing is, if I were killed tomorrow, it wouldn't do anything to change what's happening on the mountain."

The UA has congressional approval to build a $200 million observatory complex on the 10,717-foot mountain. Environmental activists have filed a U.S. District Court lawsuit seeking to block the project on the grounds that it would degrade the mountain habitat and possibly drive the squirrels to extinction.

Squirrel roundup

It seems like every week or so somebody goes up on Mount Graham and counts the red squirrels. Each time there are fewer of them. So far, the telescope people really haven't done very much on the mountain, so I think it is becoming clear that the squirrels are being counted to death.

The little critters can probably learn to live with the telescopes, but we have got to get those guys with the clipboards the hell off that mountain.

Alex R. Jacobs

February 1990

The Smithsonian Astrophysical Observatory has decided to remove the 24-inch telescope and replace it a 48-inch telescope. This new telescope will increase the light gathering capability of the facility more than fourfold. This larger telescope will fit in the present building but it must be modified.

A new larger telescope pier, and a “Doghouse” addition with new floor trenches will be constructed by contractors.

The existing 24-inch telescope will be removed and donated to State University New York (SUNY at Stony Brook), Dean Peterson. Support will disassemble the telescope for shipment in a rental truck for the ride to New York.

24-INCH REMOVAL CREW

March 1990

Installed a new VGA, 16 *color*, monitor to the old 286 IBM computer in the Support Building. The colors make drawing with FastCAD much easier.

April 1990

Ten acres were cleared at the base camp site for the new facility.

A rough-cut road was made across the desert from KM 10 to Elephant Head Road.

Installation of the microwave telephone system was started by Frank Sharp (MMT) and Lou Boyd (APT).

The generator building was cleared of all kinds of “stuff” and prepared for use as a mirror coating facility for Gamma Ray mirrors.

June 20, 1990

Actually started conversion of the Generator Shed on Knoll #4 into a Optical Mirror Lab/Room for the Gamma Ray Project.

July 7,1990

The Ridge Dormitory was completed by SM&R. Norman Harris, the father of three of my grandkids, managed the project.

THE WICKIUP REPLACEMENT

This new ridge dormitory has ten bedrooms, a large common and kitchen area, and an elevator. It’s a really nice facility.

July 16, 1990

Monday, 10AM, a pickup truck owned by Hoskish Elevator Co. got stuck in the river at the Amado Crossing. The river was

running fast and deep.

Tuesday, 6:30AM. The pickup truck was no longer visible. It disappeared under the mud down stream.

September 4, 1990

Memo To: Project Heads
From: Steve Criswell
Subject: Vehicles in the River

Over the weekend, two vehicles were stuck in the river at Amado.

George Reike in a two-wheel-drive University of Arizona van.
Ed Horine in a four-wheel-drive GSA shuttle.

Stuck is a nice word for the situation where the vehicles are in the river deep enough to fill the engine and the interior with sand and water. Both vehicles were retrieved, but the damage was substantial. The cost of repairing the GSA shuttle must be paid by FLWO.

A good road, with a bridge, existed. Your observers elected to take a chance crossing the river to save a few minutes. To do this, they had to pass the Amado parking lot entrance sign that reads “RIVER CROSSING CLOSED”. Both persons made bad judgments, they are both old mountain hands and should have known better.

Please instruct your observers to use the new diagonal Road, if there is water in the river.

A map showing the route is attached.

Copies: Caldwell, Chaffee, Foltz, Horine, Huchra, Rieke, Weeks.

Labor Day Weekend.

Ed Horine called Dan West who went down to the river and pulled Ed’s vehicle out.

Saturday afternoon 1:30 PM. George Reike called for assistance. Don Hogan went to the office gathered up some heavy chains and drove the long bed 6 X 6 truck to the river’s edge. The river was running rather fast and more than a foot deep. The van had settled in the sand and was slowly going down. Somebody had to hook the chain to the rear axle. “I didn’t drive in George, you go in and hook up the chain.” He did and got soaked in the process.

We pulled his van back to the Amado Schoolhouse Office parking lot. They later totaled the vehicle, just too much water damage.

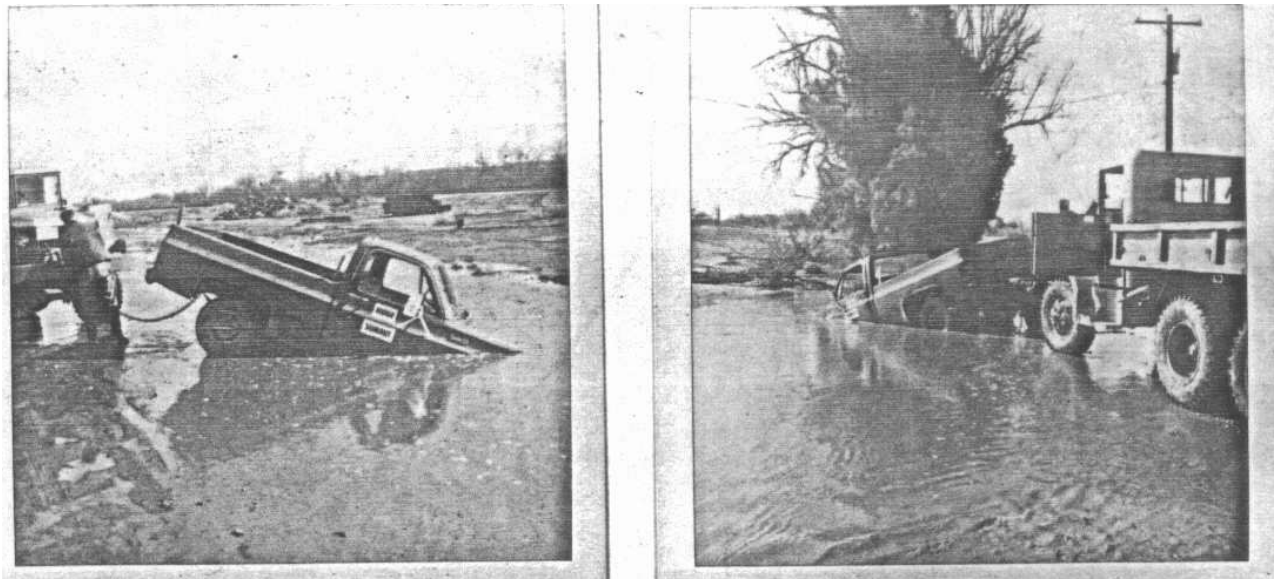
The following Tuesday Myron Clark drove the large road grader

into the river and got stuck. Dan West with a second road grader pulled him out.

Wednesday afternoon a Rex Ranch Pickup pulling six horses in a trailer got stuck. Several hours were spent unloading the horses and leading them to the east side of the river and pulling the truck and trailer out of the river by others.

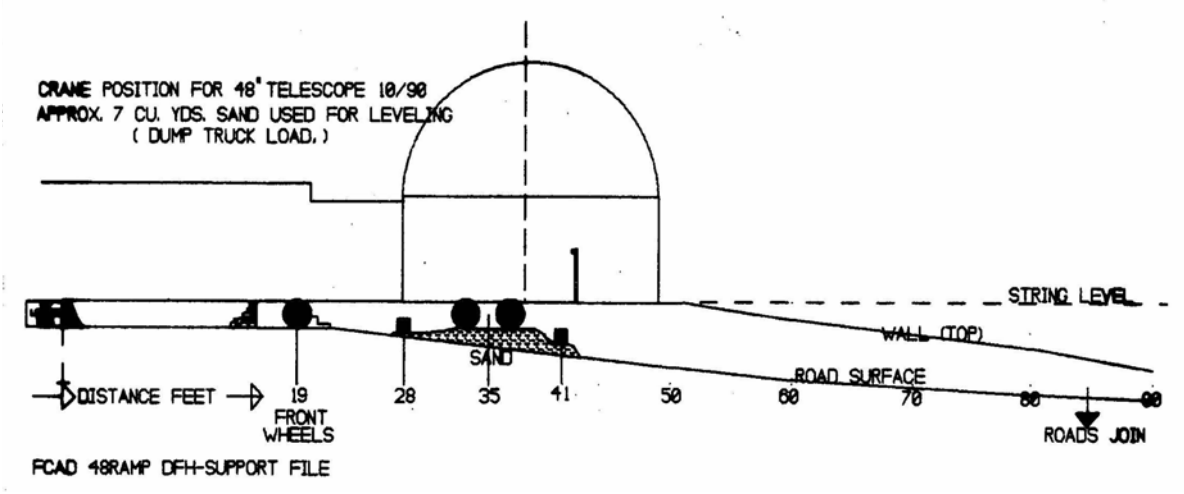
Large barriers with signs, “Crossing Closed”, were positioned on both sides of the river. They were ignored! “It’s not deep, I can make it.” Several other 4X4 vehicles were also stuck in the river last week that were pulled out by the local gas station’s tow-truck.

And then there was this other “stuck” pickup near the Amado railroad crossing.

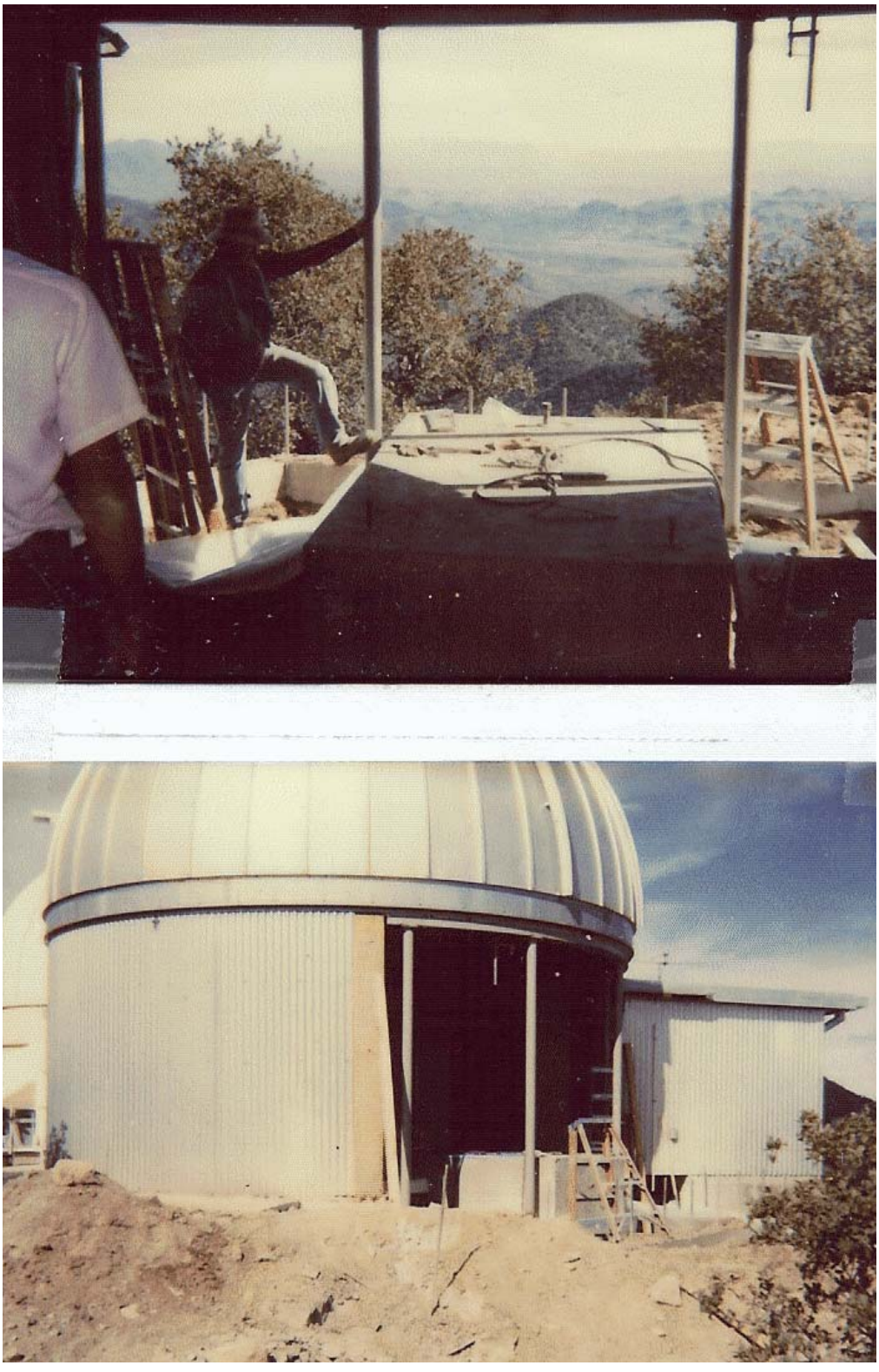


ANOTHER ONE TOTALED

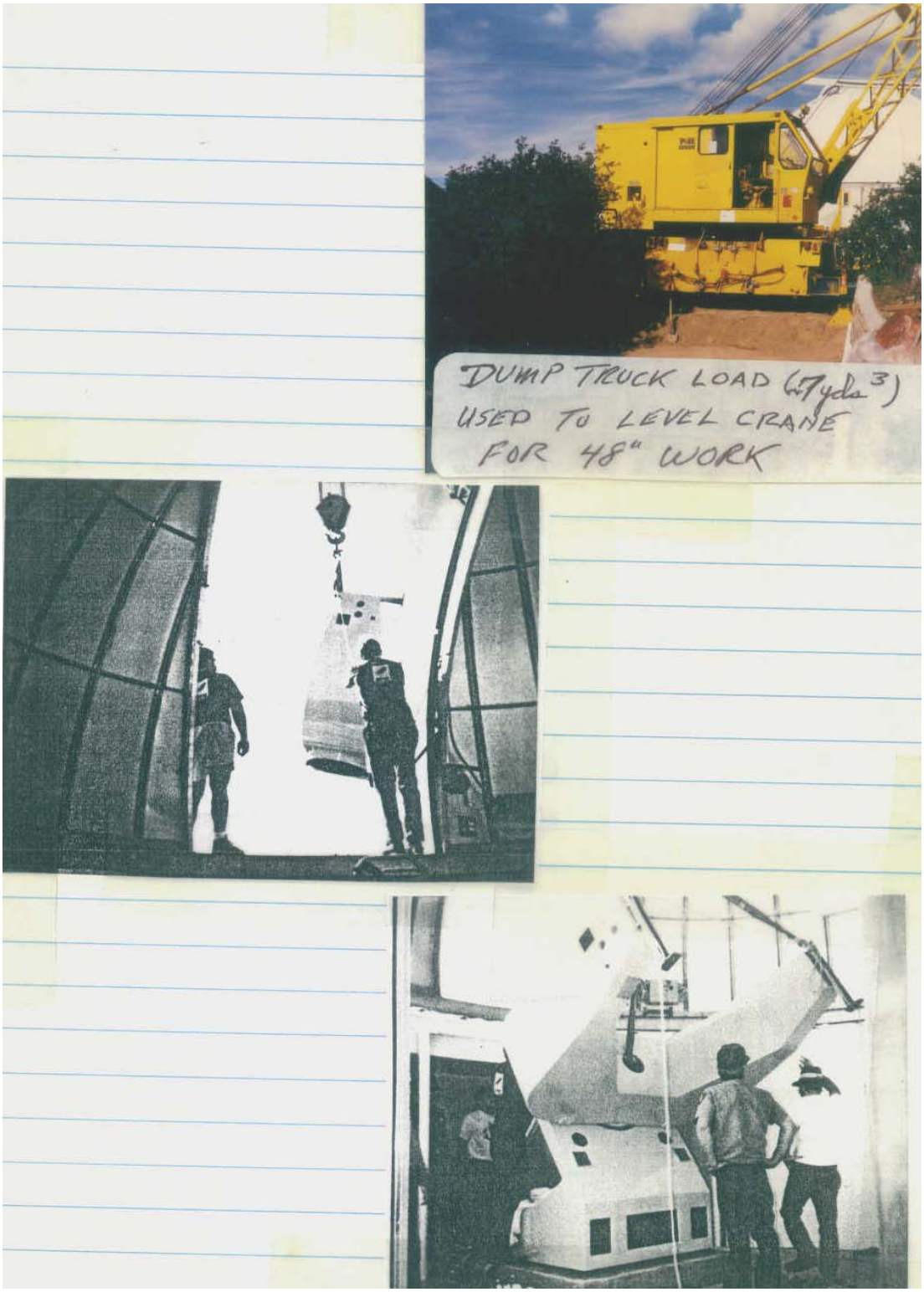
September 21-28, 1990



48 INCH TELESCOPE LIFT PLAN FastCAD DRAWING



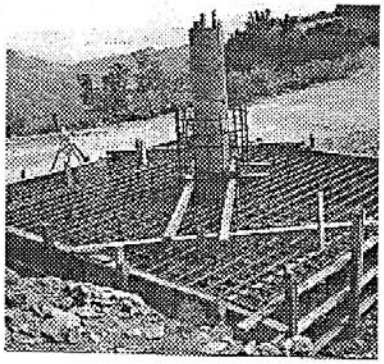
48-INCH BUILDING WAITING FOR THE DOG HOUSE ADDITION



A PAGE FROM THE CRANE LOGBOOK

Photos above show the 48-inch telescope being installed.

Fred Lawrence Whipple Observatory



Looking SE at 11-Meter Pier Form

11-Meter

The 11-meter transportation damage was repaired by Bill Omann. DeWayne Kurtenbach coordinated the installation of the pad by Soto Construction Company. FLWO has requested Forest Service approval to install a metal building near the 11-meter pad. The center section of the 11-meter will be installed in October.

Mirror Coating

The mirror coating facility was discussed with SI Environmental personnel during their visit in September. We need to improve ventilation and install a collection tank. In general, there should be minimal environmental problems with the facility.

IOTA

Drilling consultants visited the mountain and determined that the drill they had suggested was not appropriate for the IOTA site. They proposed investigating the site with a backhoe. Don Hogan is coordinating these foundation studies.

48-Inch Telescope

Modifications to the 24-inch building were sufficiently completed by the support group to allow telescope installation. Finishing of the building interior and floor remain to be done.

The primary mirror was accepted by SAO. Raleigh Optical experienced problems testing the visual secondary. There appears to be about 1/8 wave of spherical aberration in the secondary. The visual secondary will be used in the telescope for initial telescope testing. Dave Anderson will finish the IR secondary and improve secondary testing techniques. The visual secondary will then be returned to Dave for final figuring.

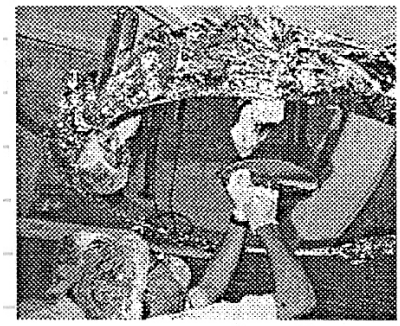
The primary and visual secondary were aluminized at the UA Sunnyside facility by Bill Omann, Bill Kindred, and J.T. Williams. The mirrors were transported to the mountain by Bill Omann

The 48-inch telescope mount was installed by DFM personnel. The installation went smoothly. Bill Omann, Dan West and Gary Poczulp installed the primary mirror and cell in the telescope. Don Hogan, Myron Clark, Jim Jones, and Dave Martina provided rigging and crane operation.

48-Inch Telescope

The visual secondary and the pod were installed by John Geary and Nelson Caldwell.

First light occurred at about 10:15 pm on September 28, 1990. Various problems with the secondary mounting and the pod prevented testing of the optics or the mount. The pod and secondary were returned to Cambridge. We will test the telescope when the pod is returned in November. Our goal is to have the telescope on line by January 1, 1990.



Bill Kindred Examines 48" Mirror

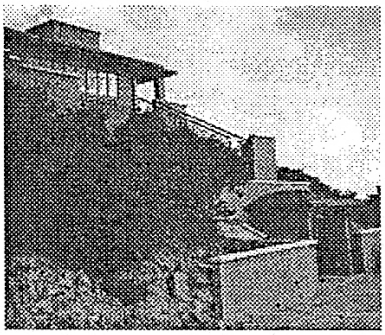
Heavy Monsooons

Heavy summer rains continued through September. By the end of September, Tucson's year-to-date rainfall was 8.27 inches. Through the end of September, the average year-to-date rainfall is 5.24 inches. The new access road via Canoa bridge continued to offer an alternative to the crossing through the Santa Cruz River at Amado. This detour added 6 minutes to the trip to the mountain. Despite warnings, vehicles continued to get stuck in the river. In one case, the damage was substantial.

Water Shortage

The mountain top water storage can hold 400,000 gallons. It is now 100% full. The mountain top uses about 900 gallons a day. We no longer have a water shortage.

Ridge Dorm Opens



Ridge Dorm Entrance

The new, long awaited, Ridge Dorm was finally completed and a small opening celebration was held August 31, 1990. The new dorm should significantly improve the quality of life on the mountain.

New Access Road

Work on the new road continues. Granite Construction has started hauling ABC for the new road. FLWO has contracted with Granite to haul about 5,000 cubic yards of ABC, aggregate-base-coarse, to the FLWO road above Montosa Canyon. The new road is scheduled to be completed in November.

Base Camp

The exterior walls of all base camp buildings are in place and the interior walls are being built. Insulating, electrical, and plumbing work is in progress. The base camp completion is scheduled for February 1990. Marion Rice monitors the road and base camp construction contract.

Safety

FLWO annual safety, fire, and environmental inspection occurred in September. Various safety courses were given. We discussed what to do with the MMT quiet power transformer which is PCB contaminated with 103 ppm.

Forest Service

The annual meeting with the Forest Service was held September 11, 1990. Jim Abbot, the new Forest Supervisor of the Cononado National Forest, was given a tour of the base camp and mountain facilities. Discussion focused on upcoming road paving work at the visitors facility at the base camp.

Sky Map

A map of the October sky is attached.

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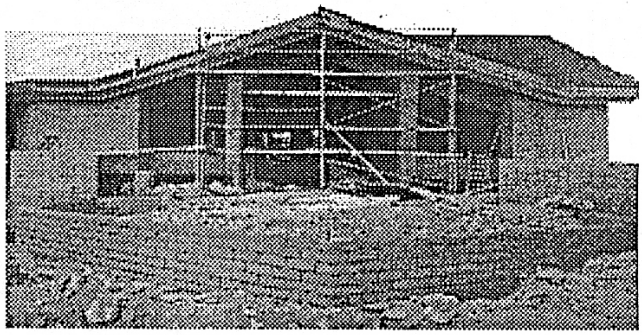

Base Camp Visitor's Center

September 24, 1990

The parts and pieces of the 48-inch telescope arrived. The week was spent assembling this new telescope with DFM Engineering of Colorado.

October 1, 1990

The White House and Congress passed a “Continuing Resolution” to provide money for the government to continue operating.

October 3, 1990

For the first time the 300,000 gallon water tank at the residence area above the gate was full. We’ll not have to haul water for a very long time.

December 31,1990

Bill Omann started working at the University Mirror Lab half time.