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April 2006 Logbook notes and other records compiled by Don Hogan

The following is an attempt to answer questions from friends, family members, and shipmates about the Observatory. Especially the question, "With a degree in Navigation and a Mate's License, what are you doing in the desert in Arizona?"

You'll find this not a scientific survey of telescopes. I suggest you conduct a Google search for scientific information.

For Observatory staff members this should bring back a few memories. Others might find this history interesting.

This 'Event' history has not been approved or authorized by either the Fred Lawrence Whipple Observatory or the Smithsonian Institution.

This is a summary of events of how an Observatory developed

as viewed from the trenches.

ENJOY!!!

**Fred Lawrence Whipple Observatory**  
**Event History 1966-2006**

YEAR 1966

January 21, 1966

Honorable Clinton P. Anderson  
Regent of the Smithsonian Institution  
United States Senate  
Washington. D.C. 20510

Dear Senator Anderson:

You may recall that our Astrophysical Observatory operates a Satellite Tracking Station in Organ Pass, New Mexico. This station has a staff of eight employees and is one of twelve such stations located in a camera network around the world. The Astrophysical Observatory is now forced to consider the movement of this station from New Mexico to Arizona.

In addition to research related to the Satellite Tracking Station, there are plans for research in theoretical stellar atmospheres and in gamma ray astronomy. Long-range plans call for an optical facility also, for advanced astrophysical research.

Because of the broad range of research contemplated for this Observatory, extensive surveys were made to locate the best possible site in the Southwestern United States. The desired site characteristics were high quality weather conditions and the absence of city lights, smog and haze, and nearby air lane routes. New Mexico was given very careful consideration in these studies. It was found however that Arizona, specifically an area near Tucson, has significantly improved site conditions. Experts in astronomy report that this area has the best astronomical "seeing" in the continental United States.

Our Tracking Station in New Mexico has in recent years suffered from a growing problem of sky-glow from nearby city lights, caused by the population growth in the nearby White Sands and Las Cruces area. Because of this problem alone, our Station would have to be moved in the near future.

The Smithsonian Astrophysical Observatory is currently applying for a preliminary permit to use Mount Hopkins in the Coronado National Forest, Arizona, as the site of the Observatory. If this application is approved, a proposal will be sent to the National Aeronautics and Space Administration to finance the move of our Organ Pass Station to the new site. No request for an increase in appropriations is contemplated for this move.

Because of your continuing interest in the Institution and particularly in astrophysics and space science, I thought you would like to have this advance information.

With best wishes.

Sincerely yours,

S. Dillon Ripley  
Secretary

January 22, 1966

United States Senate  
Committee On  
Aeronautical and Space Sciences

Dr. S. Dillon Ripley  
Secretary  
Smithsonian Institution  
Washington, D.C. 20560

Dear Dr. Ripley:

I have your letter of January 21 telling me that the Astrophysical Observatory is being forced to move their satellite tracking station at Organ Pass, New Mexico to Arizona.

I am sorry that they find it necessary to move this station from New Mexico to Arizona. I thought they were well satisfied with the results from the Organ Pass Station. I know how ruthless the people at the University of Arizona try to move everything to their State, and I am sorry to see this small operation suffer from that desire.

Sincerely yours,

Clinton P. Anderson

Attached to the above letters is a Memo Route Slip from Ginny (?) To Chuck. " This is the first laugh of this project so I thought you'd get a bang out of it." Dated 1/28/66

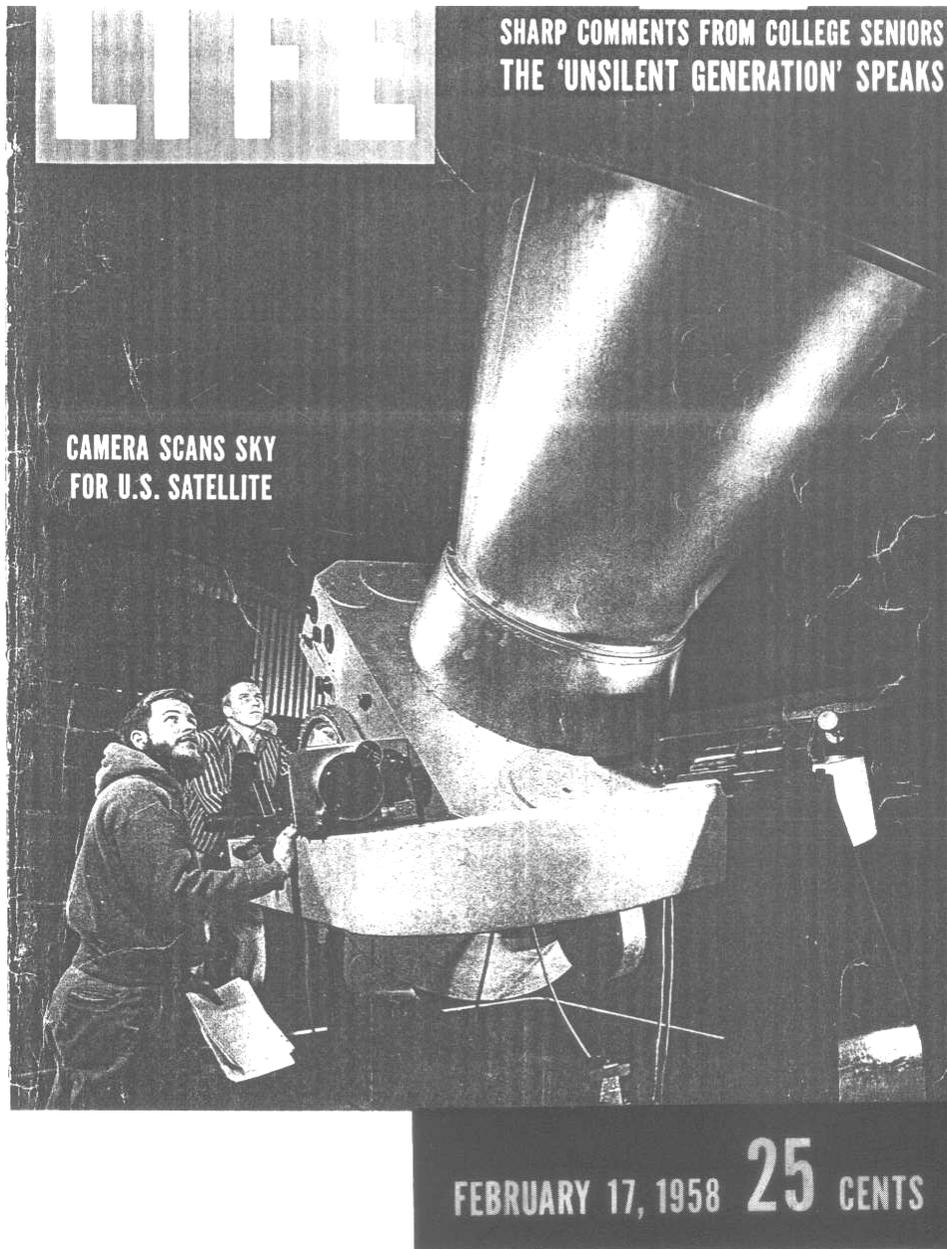
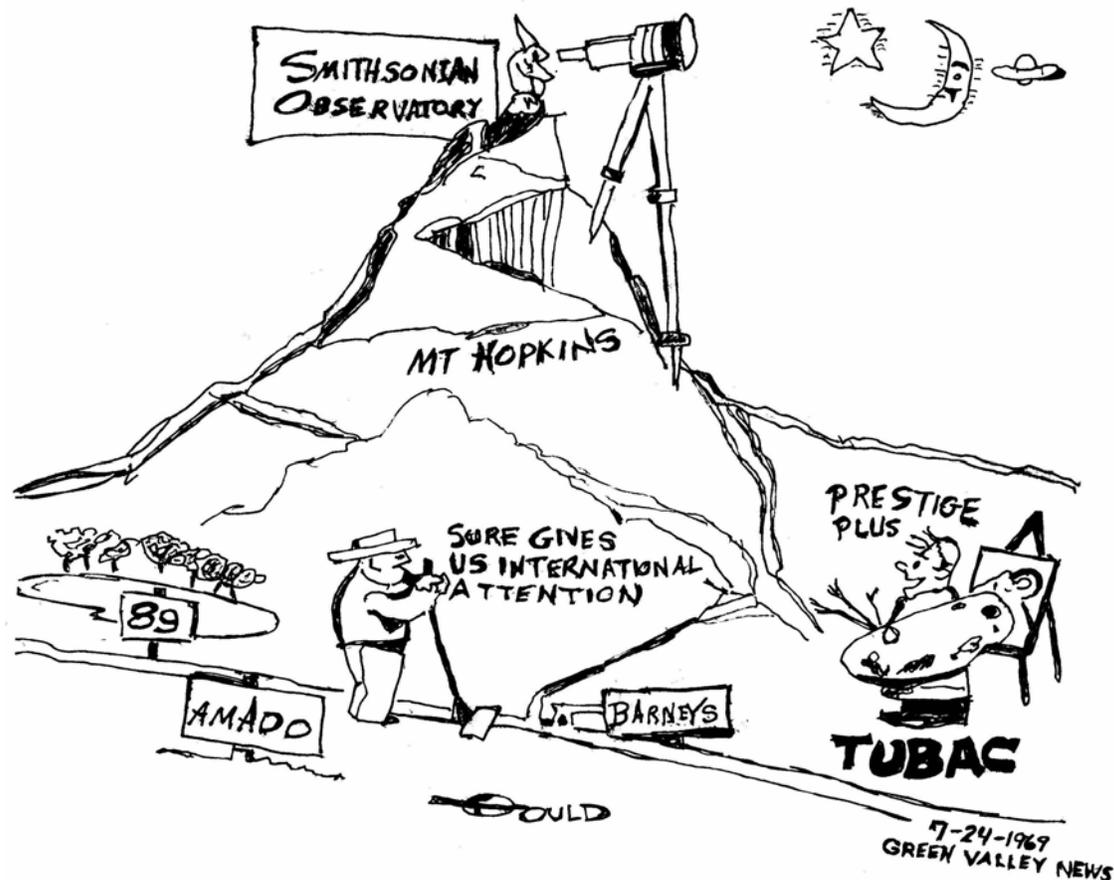


PHOTO TAKEN AT THE NEW MEXICO STATION

The man on the left is unknown to me. The other camera operator is Chuck Tougas. Staff members of the proposed Observatory were mostly selected from the Satellite Tracking Program.

January 21, 1966

The Smithsonian Astrophysical Observatory applied for a preliminary permit to use Mount Hopkins, Arizona in the Coronado National Forest as a site for a "Southwest Observatory" by S. Dillon Ripley, Secretary Smithsonian Institution, Washington, DC



Spring 1966

Charles Tougas was assigned to develop and manage the new Observatory facility at Mt. Hopkins. Chuck had been associated with the Smithsonian for more than seven years. He managed Satellite Tracking Stations in New Mexico, Peru and Argentina. His most recent assignment was as Field Supervisor of the Prairie Network in Lincoln, Nebraska.



CHUCK TOUGAS AT SAO CAMBRIDGE

Werner Kirchoff was assigned as a technical assistant to Tougas for Mt. Hopkins development.

The 7,600 foot ridge elevations were originally referred to as "Humps." The term "Humps" was later changed to "Knolls." These Knolls were numbered one thru five starting from the southern end of the ridge.

May 10, 1966

Reference: Memo from C. Tougas to Jack Coffee (SAO).

Subject: "Observers for the **Southwest Observatory**".

This is to follow up our discussion in Tucson vis-a-vis

observers for the proposed satellite tracking station. As you no doubt remember, the fact was brought out that certain desirable traits should be expected in the candidates for staffing the station at Mt. Hopkins. Since it will not be easy work by any means and the working conditions will less than ideal for quite a while, the attitudes of staff candidates should be of a nature to overcome the difficulties.

Enthusiasm, willingness to accept challenging situations, dedication, loyalty, pioneering spirit, personality compatibility with co-workers, etc. and all such positive traits should be present. Preferably more of these traits should be present than in a candidate for most of the other existing stations.

What I'm trying to say is: it seems to me that you and I agree that not just any observer should be sent to the proposed Mt Hopkins station. To give some frank and honest examples; the road to the station will be dangerous for a long time - It will be no place for any observer who has a known drinking problem (if such observers exist) to drive and endanger his own as well as others" safety and well-being. The remoteness of the station might warrant an observing schedule wherein a shift of observers would remain at the station for three days and be off for two days (or something like that).

Close relationships and working conditions over long periods of time might not be the place for observers with outstanding personality difficulties (if such exist). It looks like for while at least, duty at the proposed station will be more difficult and frustrating than at most existing stations. It is therefore suggested that great care be taken in the selection of the observing crew.

Perhaps, with the passage of time and the eventual development of the facilities is a more "elegant" level, the stringent observer selection policy could be lifted somewhat.

Note: The observatory has had several names. Originally it was called the Smithsonian Southwest Observatory. On a routine visit Dr. Whipple did not approved of the name and changed it to the Smithsonian Mt. Hopkins Observatory. Years later it was changed again and dedicated as the Fred Lawrence Whipple Observatory.

September 30,1966

The Forest Service is making every effort to be cooperative. They will allow an 8% road grade with short stretches to 10%. Reference C. Doran, U.S.F.S. conversation with J. Coffey. The finally road grade to the summit site was later approved to a very dangerous 23%.

December 1, 1966

C. Tougas, J. Burke, R. LaCount and W. Kirchhoff arranged to haul a "frozen" excess government property house trailer from Louisiana to Amado. The contractor quoted a hauling price of 55 cents per mile plus a \$5 Texas permit and a \$3.25 New Mexico road tax.

YEAR 1967

February 21, 1967

A presentation of the proposed layout of instruments and facilities buildings for the Southeast 7,600 foot ridge on Mt Hopkins was held in the Conference Room at 60 Garden Street, Cambridge, Massachusetts, from 10 AM to 2 PM. Twenty-one scientists, engineers, and other staff members attended.

The presentation by Werner Kirchhoff covered the following:

- 1) Access road - Final approach to the 7,600 foot Southeast ridge.
- 2) Circulation traffic Pattern on this ridge.
- 3) Requirements for positioning of instruments and associated work areas.
  - a) Gamma Ray Collector
  - b) 60" reflector and 12" telescopes
  - c) Baker Nunn Camera and laser equipment
- 4) Requirements for and positioning of "Common Facilitated buildings consisting of:
  - a) General facilities building having offices, a library, electronics lab, mechanical workshop, etc.
  - b) Recreational building having a lounge, mess room, kitchen, bunkrooms, wash and shower rooms, etc.



7600 FOOT RIDGE LOOKING DOWN FROM THE SUMMIT - FLWO POST CARD 2006



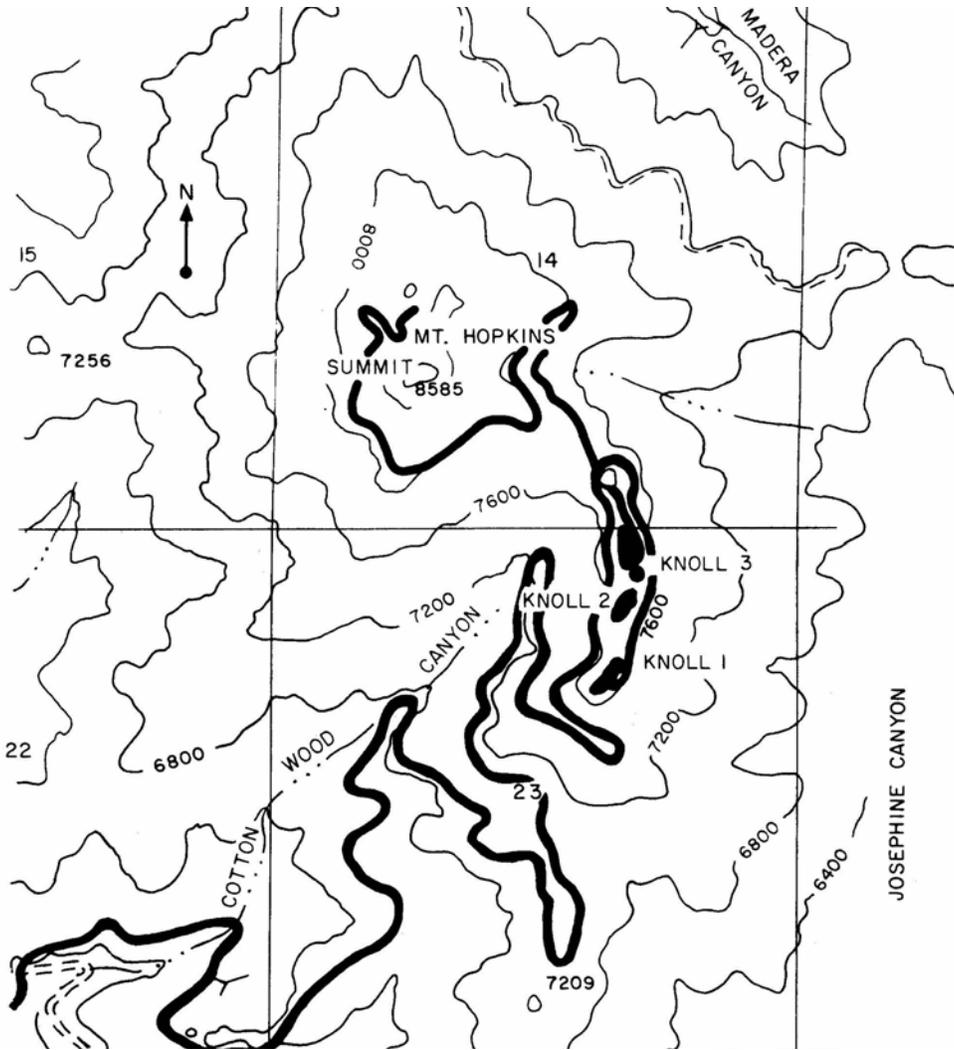
DR. WHIPPLE 1967

DR. FRED L. WHIPPLE'S VISIT ON KNOLL #4



A GREAT ROAD PHOTO LOOKING DOWN

This road configuration has been designed as a fire-break from the prevailing southwest winds. The dirt road is not level, it is insloped. Rain water runs across the road into a ditch allowing the road grader to pull up "fines" for resurfacing. Snow is also plowed into the ditch, not over the edge of the road.



MOUNTAIN TOPOGRAPHIC MAP

The heavy line on this map represents the proposed access road.

#### Spring

Started construction of the road to the 7,600 foot level of the southwest ridge of Mt Hopkins. Road was designed by Sanford Evans and built by Sierrita Mining and Ranching (SMR).

The Observatory office was located in Carmen. The actual mailing and shipping address was "Third House South of the Carmen Store", Carmen, Arizona.

#### June 1967

Don Hogan and Roger Carson were transferred from the New Mexico Baker Nunn Satellite Tracking Station to Mt. Hopkins for site testing. Directed by Robert Noyes and Donald Hall (SAO).



#### LOOKING UP FROM THE ROAD BIFORCATION

One road is shown going uphill. The lower, almost level, road continues around the south side of the mountain to Jessie's Mine.

July 1967

Arrangements were made to lease the land and use the Southern Pacific Railroad's Amado water well and pump system. The Observatory agreed to maintain and repair the system when necessary. Water was hauled to the mountain from this point for many years, usually in a 2,300-gallon tanker truck.

September 1967

Trevor Weekes arrived from Ireland, via Cambridge, Massachusetts and started observing with World War II Searchlights at a site near the present office (2006), motor pool, and visitor center.

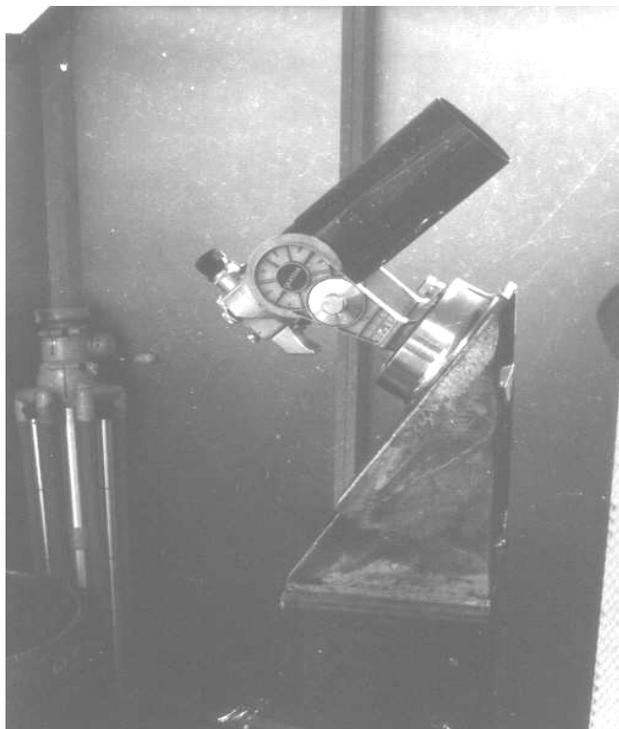


#### SEARCHLIGHT SITE

The travel trailer, shown above, was later airlifted via helicopter to a saddle northeast and just below the MMT site.

July 1967

Site testing (seeing tests) started with Questar Telescopes and tripods on ridge. We quickly discovered that the tripods were not stable enough on tripods for our star trail observations. Too much vibration was introduced. Thirty-five millimeter cameras were attached to the rear of the Questar Telescopes. Star trails were obtained by keeping the telescopes stationary, opening the shutter, and allowing the stars to "drag" across the film frames for approximately one minute.



QUESTAR TELESCOPE

Observations were made three times per night three nights a week weather permitting. Roger Carson and I camped on the mountain and lived in tent along the road at the 7,200-foot level. On the weekends we returned to our families in Las Cruces, New Mexico.



FIRST MOUNTAIN DOMITORY - TENT

The only other people on the mountain were the Sierrita

Mining and Ranching road construction crew who were working, actually blasting and bulldozing their way towards Knoll #1. Elmer McVey (MAC) and Lynn Harris were the leaders of the road crews. Years later Lynn would become the grandfather of my grandchildren.

The Forest Service considered SM&R the best mountain road builders in the country.

October 1967

Myron Clark hired as equipment operator paid by "station" funds. In July 1968 his pay was increased to \$3.74 per hour (WB-10) and paid by SAO funds. Designed as a "Lead Man" his pay was increased to \$4.11 per hour in January 1969. In 2006 the minimum wage is only \$5.15. I find this absolutely ridiculous!!!

November 6, 1967

At present, work on the short term goal is being performed to select the site for the 60 inch telescope. Three possible sites have been chosen for investigations on Knolls 1, 2, and 3. Each of these, 15 foot high observing piers and shelters have been constructed by the two observers, Don Hogan and Roger Carson. Star trail observations obtaining photographic records have begun. Preliminary results show seeing to be better than 2 seconds of arc required for the 60 inch at the three sites. Actual results determined that the "seeing" was less than 1 second of arc.



TEST TOWER KNOLL #3 WITH METAL SEARS SHED

The roof on this shed flipped back to expose the sky for the

Questar telescope. Communications between this tower and the Knoll #2 tower was difficult. A yell alerted the observer in the other tower to go to the phone. Two tin cans and a long kite string worked just fine.

November 1967

Excerpts from a memo from J.J. Burke (SAO) follow:

A communication system of a direct microwave link to Tucson costing \$8,000 has been postponed to FY69. Citizens band portable radio gear will continue to be used. A request was made for the installation of a temporary mobile party-line radio-phone on the ridge.

Power will continue to be generated on the mountain using surplus generators which at best are only in fair condition. The cost of running a power line up the mountain, under the road, is too great. Purchasing several small new generators is under consideration.

Water will continue to be hauled up the mountain.

December 27, 1967

Ref: Weekly Laser Report (17-23 December) from Ken Goodwin

The storm that struck this area on the 14<sup>th</sup> finally ended on the 21<sup>st</sup>. During the last few days of the storm, the snow turned to rain, which melted some of the snow on the mountain and caused flooding at the lower elevations. Amado was very hard hit, especially on the east side of the bridge where many of the residents were evacuated by helicopter. The bridge just south of Carmen was washed away and the highway north of Green Valley was under water.

Pete Anderson, Myron Clark, and Charles Tougas, managed to reach the station Tuesday afternoon and they spent the night there. Except for this, no one was able to reach the station again until Saturday. The generator ran out of fuel during this time, and consequently, power to the clock was lost. The road was still not cleared Saturday and we had to walk to reach the station. The camera house withstood the storm very well, and the equipment appeared to be in good condition. The road was expected to be open by the 26<sup>th</sup>. (It is).

December 29, 1967

Chuck Tougas reported that the 8-day blizzard resulted in snow depths of a measured 5 foot depths with drifts on the east ridge road of 15 feet. A Caterpillar D-6 bulldozer (Jessie Sinka), a Caterpillar D-4 bulldozer (Myron Clark), and a Austin-Weston road grader (rented from Sierrita Mining & Ranching) was operated by C. Tougas to clear snow and road rock slides. Flood damage in the valley was significant. This was the worst recorded snow storm since 1914.



MYRON CLARK ON D4 BULLDOZER

YEAR 1968

January 31, 1968

C. Tougas started making monthly reports to John Burke at the Smithsonian Astrophysical Observatory, Cambridge, Massachusetts. In the following *italics* will indicate when an excerpt has been inserted in this event history. These reports usually contained information on Construction, Road Maintenance, Visitors, Budget, Personnel, and Miscellaneous Special events.

*The road grader has been used to keep up with the road maintenance by utilizing Myron Clark as operator on a part-time services basis. Jessie Sinka and his bulldozer were used twice to remove slough obstacles. Several times tire chains had to be used to negotiate the road during the days of maximum melting of snow but otherwise the road has remained fairly passable. Stuck vehicles, although not a daily occurrence, were fairly common during this period and people became very adept at extricating cars and pickup trucks from the mud and snow.*

*The 30 KW Caterpillar generator armature burned up several weeks ago. The repair cost in the vicinity of \$600 plus the cost of getting the down from the mountain and back up again*

after repairs are completed.

Mr. Frank Conrad has announced his forthcoming resignation.

Mr R. Riley, US Forest Ranger, advised us that notice has been posted that Smithsonian had requested that 4800 acres around the Mt Hopkins area be withdrawn from any further mining developing. Existing mines and claims such as the TiaJuanna mine owned by the Mine Development of Amado (Jessie Sinka) should be challenged as to ore content and quality, according to Mr. Riley.

A large cleared area at the 6,000 foot level has been called "Jessie's Mine" for a traveler's location point. So far none of the mines operation has bothered our development in the slightest.

February 1968

The contract with Lynch Engineering & Construction Company is rapidly being completed. Blanton & Co. Architects, held three inspections on the Baker Nunn, Knoll #3 and the Gamma Ray Building on Knoll #1. The base and pier for the Ashdome 12 inch Telescope building on Knoll #1 is now ready for the concrete pour.

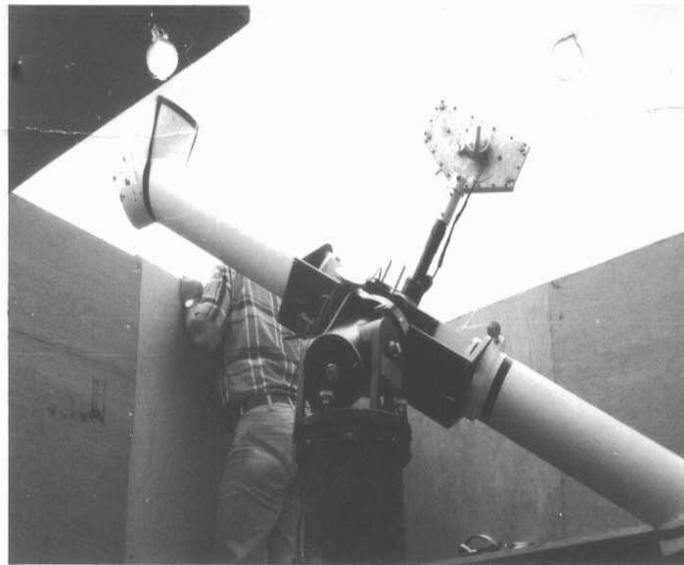
The road has been completely graded including the spur roads and its condition is now considered good rather than just fair.

Plans are underway for the arrival of the LOR dish and equipment we should have no trouble on that installation. Efforts are being made to obtain via GSA excess sources some mode of equipment that will allow for easy, safe installation and maintenance of the **252 glass mosaics** on the instrument.

An automatic answering/recording has been installed on the telephone at the Carmen Field Office with adequate results. Word has been received that a mobile radio telephone for the Observatory site will be installed soon (within two weeks).



MYRON CLARK - DON HOGAN- 1968



DOUBLE BEAM TELESCOPE

The double beam Telescope was the first interferometer used on the mountain.

February 29, 1968

The University of Hawaii loaned Mt. Hopkins a Double Beam Telescope for site testing. The telescope consisted of two  $4 \frac{1}{8}$ " aperture 42-inch focal length telescopes lenses arranged to view the same star through a single eyepiece with the objectives 65 inches apart. Built by Boller & Chivens. A 16mm Tri-X film streak

movie type camera was used to collect star trail data.

March 1968

Sierrita Mining and Ranching has nearly completed the segment on road that leads to the Mt. States Telephone Site using a TD 25 bulldozer. Plans are to extend this spur road to the summit.

Another foot of snow and a lot of rain caused mud and mucky road conditions at times. We have obtained a 2 ½ ton dump truck from Davis Monthan AFB, Tucson, excess property to haul road repair materials.

The rest of the station personnel from the Organ Pass Station at New Mexico arrived for duty. People at the Mt. Hopkins Observatory are now the following:

Laser/Baker Nunn

K. Morrison	D. Kenyon
K. Goodwin	J. Delgado
T. Butler	D. Daniels

Seeing Tests

D. Hogan	R. Carson
----------	-----------

L.O.R. Gamma Ray Project

T. Weekes	G. Reike
-----------	----------

Support

C. Tougas	M. Clark ( part time)
-----------	-----------------------

The Baker Nunn is now in operation with the end of focus tests. The Laser instrument has suffered a breakdown that at the moment refuses to succumb to analysis.

A mobile telephone was installed in one of the temporary trailers on the 7600 foot ridge. So far it has proven worthwhile except for erratic service.

A 2½ ton cargo truck (6X6) was obtained from Ft. Huachuca.

A 5 ton water tanker was obtained from DMAFB



GEORGE FIELD - DAVID CHALLINOR - DR. FRED L.WHIPPLE STANDING NEXT  
TO THE BAKER NUNN CAMERA

April 1968

*A final inspection and acceptance was made for the Baker Nunn and the Gamma Ray Building. Since that time, work has been completed on the outside grading and seeding around the buildings. Three grasses recommended by the Forest Service were used to alleviate the dust problem around the LOR and help beautify the area.*

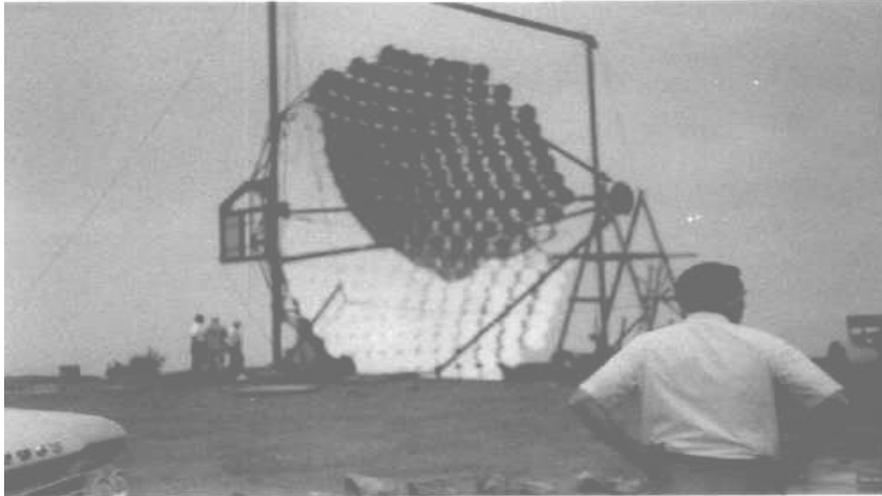
*The final alignment on the trail to the summit has been completed and about three mandays more are required to make the trail good enough for burro or horse travel. The trail is about one and a quarter miles long and remains on the southern exposure of the mountain in order to get away from the snowy side to the north in winter months. The average width is 12 feet to allow plenty of "elbow room" for pack animals. We are almost ready to start hauling materials needed to construct "seeing test" sites at the summit.*

*Water consumption at the Baker Nunn site seems to have leveled off to approximately 5000 gallons per month or about 166 gallons per day.*

The water tanker truck had to have its tires replaced with "second hand" new ones. (Done to stay within the budget)

May 1968

The Ash Dome was completely wired electrically by the support staff. Other items of construction during the month included the fabrication and assembly of the hoist/trolley/bosuns chair for the LOR.



L.O.R WITH TROLLEY/BOSUN CHAIR ASSEMBLY

The big dish arrived and was delivered safely at the site. In short order it was assembled structurally and then the mirrors installed. High winds precluded the alignment of the mirrors.

A month of clear nights has resulted in a very impressive demonstration of the work of the Baker Nunn Camera.

At the end of each monthly report was long listing of visitors, some of which came from foreign countries.

June 1968

A month of routine observation by all groups. A small accident happened when a visitors vehicle lost its brakes. Although the driver had the vehicle in #1 gear, he panicked a bit and, wishing to stop immediately drove it up the inside road bank and rolled the vehicle over onto its roof. The cab was "totaled" but no one was hurt. The vehicle blocked the road until dragged out of the way by another truck. This is the second such accident in the same stretch and for the same reason (also no one was hurt). A memo was written to the staff to regularly check their brakes.

May 27-30/1968

The first full length "double feature film" was taken from

Knoll #1 with the double beam telescope. This film was sent to the Sixty-Inch Telescope Committee. Members J. Burke, W. Kirchoff, S. Strom, D. Hall, S. Tishler, and C. Tougas for evaluation.

May(?)1968

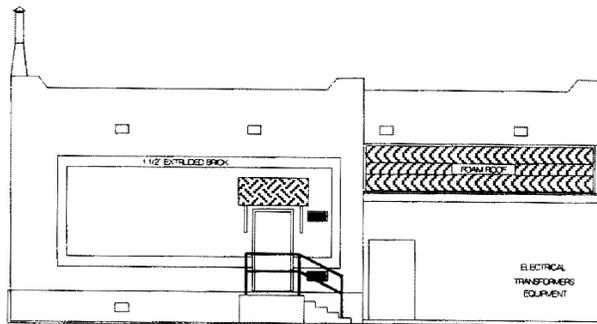
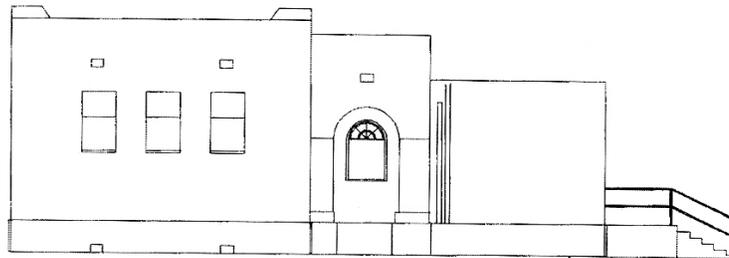
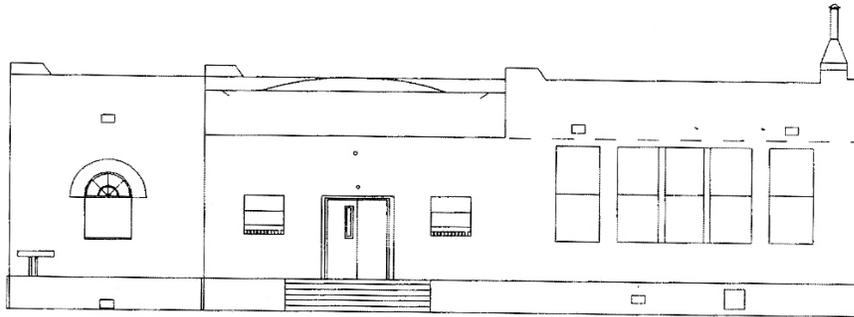
We started using the old Amado School and yard. The rented land was used for the motor pool and back yard storage. One restroom was used as a darkroom by the Observer Services Division. One larger room was used for repair of weather and electronic equipment.



FUEL TRUCK

This truck was used to fuel several generators on the mountain. Usually all fuel tanks were topped-off weekly by Mryon Clark.

# OLD AMADO SCHOOL



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MHO AMADO OFFICE

Shortly after we moved in a nice 4x6 foot Observatory Sign was installed at the entrance to the driveway. About the same time one morning several local people made a visit and talked to Chuck Tougas. They asked; "Why a government facility didn't have a flag out front?" Chuck explained that the observatory didn't have the time or the money for any flag poles. We were too busy! Apparently these visitors made a few calls to their congressmen. The 'word' came down from Washington via Cambridge to Chuck very early the next morning.

"ALL STOP!" People were dispatched to Tucson and Nogales for a flagpole, a flag and for sacks of cement. The remaining support guys started digging a hole. The next morning, without a ceremony, the flag was flying proudly next to the building. Under the "other duties as required" clause in his job description the motor pool mechanic was assigned the task of raising and lowering the flag daily.

Spring/Fall 1968

Hired Tony Jimenez, Mike Megariz, and Arnie Valdez as general laborers for the Support Group.

July 1968

*Work begun on the construction of the inter-building communications system. Digging of the trench that would accommodate the conduit (3 inch- 20 foot lengths) is about half finished. Approximately 2,500 will be required along the west slope of the 7,600-foot ridge. Neighborhood Youth Corps workers as well as others and rented equipment are being used with supervision by Observatory personnel.*

*More generator problems occurred during the month.*

*Four jeeps were obtained from excess property sources.*

*Myron Clark began as a full time employee as of July 1, 1968.*

August 1968

*The communications trench was completed. Pull box forms were constructed and will be filled with concrete soon.*

*Ten Meter Reflector site. Operations have begun under the directions of Dr. Weekes. The grass around the site had a good start with the summer rains, 5 inches this month. More seed was sown during the month.*

*Another GSA vehicle was turned in at Tucson. A good ambulance was obtained to house emergency first aid equipment and to be ready in the event of an accident.*

*Myron Clark and Don Hogan were sent to California to pick up a long Navy gray ambulance. On the way back the drivers ahead of us seeing us in their rear view mirrors pulled over to the left and allow us to drive on through. Really neat! We drove to well*

after sunset. About 10PM we pulled into a motel in Indio. After checking in I drove to a parking space in front of our room. While attempting to set the parking brake I instead stepped on the siren button on the floor. Holy Smoke, room lights flashed on, doors started opening, closing and slamming while we sat there laughing. Too funny! The remainder of the trip was uneventful.

September 1968

*Work on the communications system on the ridge continued. Mt. States Telephone Co. will provide service around October 15<sup>th</sup>.*

*Routine observations were made by all groups during the month. On moonless nights Roger Carson and Don Hogan began working with the gamma ray group on a half time basis.*

*More vehicles were obtained from government surplus sources.*

*Ed Horine returned from Peru for an assignment here. Dale Kenyon resigned. Joe Delgado and Jeff Bosel both were married before Jeff departed for Argentina.*



#### KNOLL #1 UTILITIES

The photographs above show the generators used to provide power to the Gamma Ray Building and the 12 inch telescope dome. The two tanks provided diesel fuel. A water tank (not shown) was located behind the weather tower. No telephone service was available. The 60-inch telescope concrete foundation footings were under construction, not visible, behind the 12-inch dome. In the distance, on Knoll #2 one can see the Observer Services Building (without the roof domes), the Site #2 "A" frame test tower, and well in the distance a corner of the Baker Nunn Building. The Baker Nunn Building received its power with generators similar to the ones shown. All generators were serviced daily usually by

Myron Clark.

October 1968

*Predictions are that telephone service to Knoll #1 will be complete by November 10<sup>th</sup>.*

*Work on the trail to the summit was renewed so that passage of pack horses would be possible. This was done and the horses have made some 20 trips with bare essentials for constructing a "seeing test" facility on the very top of the mountain. The horses really took quite a beating on this packing task due to rocks and small brush stumps on the rough surface.*

*Observations were routine during the month.*

October 23, 1968

The Observatory was dedicated on Knoll #1 by Dr. Fred Whipple, U.S. Representative Morris Udall, D-Arizona and Tucson Mayor James Corbett.



DEDICATION SPEAKER M. UDALL

*One hundred twenty-three people attended with everyone getting back down safely before sunset that afternoon. Two buses and 12 other vehicles were used in hauling people up and down. Coffee, donuts, and cookies were served and guided tours of the facilities were offered after the ceremonies. The road was graded for visitors but this was over due anyway.*

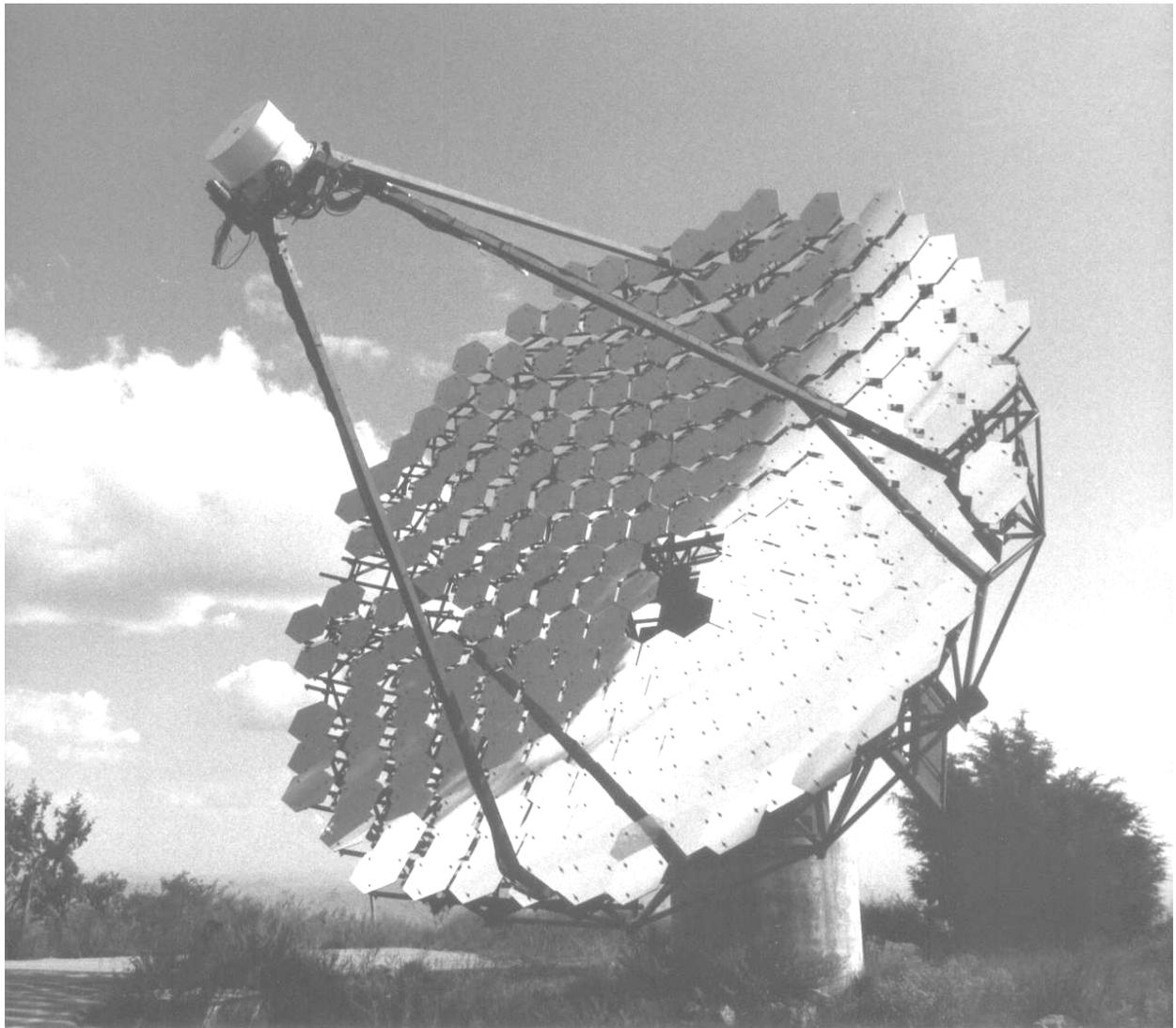
November 1968

Horses were used to get materials to the summit for a "seeing" test site.

Four more vehicles were acquired from excess one of which was a "cherry picker" for use with the gamma ray dish.

The water tanker truck was almost lost when it sank onto a soft shoulder near Iron Springs (about half way up the mountain). Quick thinking by the driver (Rudy Salcido) saved it and efforts of all righted it and brought it back up on the road after ten hours of work.

At least 80 MPH winds hit the ridge on November 29<sup>th</sup> the ridge house trailer was toppled onto its side. Seeing test towers also suffered some damage.



10 METER GAMMA RAY - LARGE OPTICAL REFLECTOR

1

1968

# Sky and TELESCOPE



Smithsonian's 10-meter Light Collector

## In This Issue:

★  
Vol. 36, No. 5  
NOVEMBER, 1968  
75 cents

Mount Hopkins Observatory  
Total Eclipse in Siberia  
NASA's Tenth Anniversary  
League Convention

Supernova in Messier 83  
American Astronomers Report  
Southwestern Astronomical  
Conference

YEAR 1969

Many of the following comments were taken from excerpts from Ron La Count's monthly reports to Mr. C. Tillinghast. These excerpts have been placed in *italics*.

*March 9, 1969*

*Kenneth Goodwin was transferred from the Satellite Tracking Program to the Observer Services Division site testing project.*

*March 17, 1969.*

*A Barium Package was released from the satellite HEOS (Highly Eccentric Orbital Satellite) Photographs taken by NASA's Wallops Island Station and our Baker Nunn Station were highly successful.*

*March 11, 1969*

*A bond issue which proposed a new street lighting system for Tucson was defeated by the city's voters. Astronomers in the Tucson area had been concerned over possible harm to "astronomical seeing."*

March 1969

Typical Observing Services Division Monthly Report:

From Don Hogan To: Ron La Count in the Cambridge, Harvard University, Massachusetts SAO Headquarters. Copy to Mike Pearlman and others.

Project Scanner - During the month of March the Observer Services Division spent nearly all of its time working on the 12 inch telescope. Dr. Fred Chaffee returned to Cambridge March 2, 1969. Project Scanner was considered operational and the field operation was transferred to the observing services personnel. It was our intention to have Rick Schwartz act as a telescope guider and Don Hogan operated the electronic and key punch equipment downstairs until Ken Goodwin's transfer became effective (March 9<sup>th</sup>). The weather, cloudy mainly, made observing nearly impossible for the following week and very few observations were actually obtained.

Poor skies prevailed for most of the month, however the following data was obtained:

<u>Star</u>	<u>Number of scans</u>
Alpha Canis Majoris	11
Epsilon Orionis	10
Alpha Leo	5
Beta Ursa Majoris	5



Several paragraphs were contained reports regarding the weather instruments in use at various sites. Four minor snow storms were reported

Job interviews were conducted and the following people hired: Mr. D. Kurtenbach a local high school teacher and Mr D. Gingerich a former observer with the satellite tracking program.

March 28, 1969

A draft work statement was submitted to NASA, by Dr. Michael Pearlman, "For Performing Seeing Experiments at SI's Mt Hopkins. The cost estimate for one year was \$117,695.

March 31, 1969

Richard Schwartz received a six month appointment to the scanner project with Don Hogan's Observer Services Division. He rented a small adobe house at the Rex Ranch. This began a long relationship with the ranch especially when the river crossing became impassable.

May 5, 1969

One inch of snow fell on the ridge. Considerable time was spent overseeing the excavation of the 60 inch telescope building site.

May 6, 1969

George Rieke passed his oral examination in the Physics Department, Harvard University on his doctoral thesis "A Search for Cosmic Sources  $10/11^{th}$  to  $10/14^{th}$  eV Gamma Rays." This is the first Ph.D awarded for experimental work under-taken exclusively at Mt. Hopkins.

Point Image Monitor Experiment. Mr. Donald Hogan was brought to Cambridge to familiarize himself with the unit and its operation. Dr. Pearlman and Mr Hogan ran the PIM on the 7 inch telescope at Harvard and were satisfied that the electronics and optics were performing correctly. The unit was shipped to Mt Hopkins on April 25<sup>th</sup>.

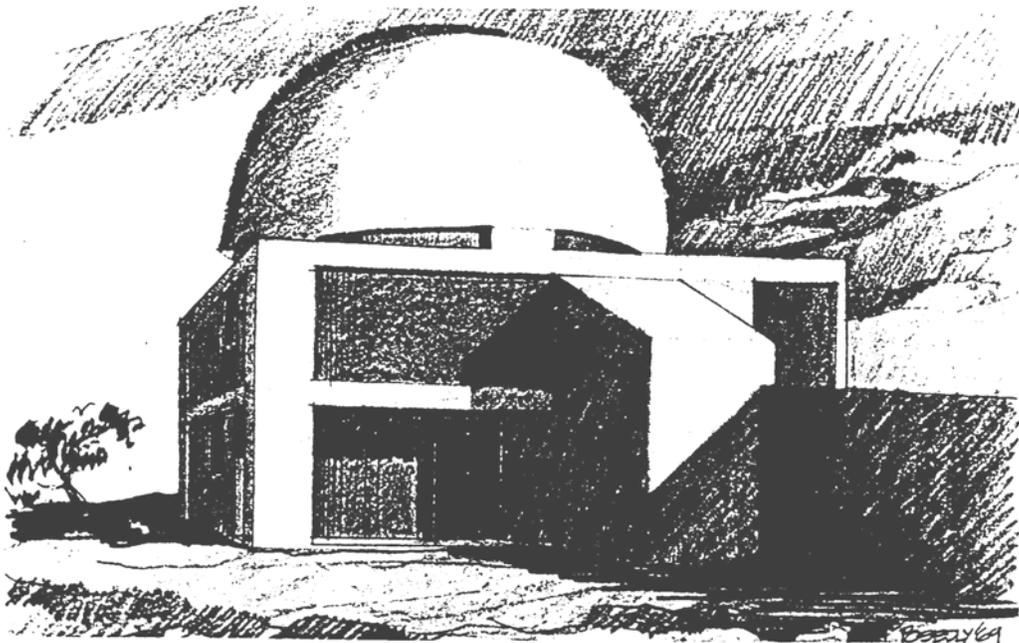
# the SIO NEWS

Smithsonian Astrophysical Observatory

Cambridge, Massachusetts

Vol. IX No. 4A

April, 1969



## NEXT BUILDING FOR HOPKINS

April 1969

Blanton and Company, Tucson architects, prepared the preliminary sketch of the 60 -inch telescope building scheduled for construction later this year on Mt. Hopkins. The building will have experiment rooms on the ground floor and second floors isolated and insulated from the unheated dome on the roof. The telescope will have a special focus which can be deflected into any of three rooms where three different experiments may be set up simultaneously.

June 18, 1969

One hundred cylinders of helium were delivered for the weather balloon experiments by the Observer Services group. A limited number of this heavy cylinders were hauled to the mountain on a routine basis.

The wooden sheds were removed from the ridge. The Forest Service considered them a serious fire hazard. Unfortunately, the several are now uncovered and will be endangered by rains during the upcoming rainy season.

Considerable effort has been made towards establishing and up-dating fire safety precautions. Fire fighting lockers, equipped by the Forest Service, have been installed on the ridge and below it on the access road. A full water tanker is stationed on the ridge as well as one jeep fully equipped for fire fighting. A second equipped is stationed at the Amado Field Office.

June 18, 1969

Started launching weather balloons from the Observer Services Building on Knoll #2. Launched a total of 111 balloons until March 1971. Night launches had a small battery with a flashing light bulb attached. In addition to the radiosonde data collection we tracked and plotted the direction and altitude of the flight using nautical maneuvering board plotting sheets..

Dr. C.A. Lundquest announced the appointment of Dr. Trevor Weekes to the newly created position of Resident Scientific Director of the Mt. Hopkins Observatory.

The aerovane installation on the 8,585 foot summit was completed and in operation on it's 28 foot tower.

July 1969

Arrangements were made to shield the Amado Dog Track Lights. Prior to each race the track lights brightness was increased. This light increase was detected by the Large Optical Reflector on Knoll #1. The Race Track was very cooperative and installed light shields. The observatory staff assisted with the installation.

July 13, 1969 Dorothy Merchant was hired as part time (mornings only) Secretary/Bookkeeper. IS 4-1 full time annual salary \$5145.

August 13, 1969

The hundred foot Microthermal tower was erected on Knoll #2. Permission for a second tower on the summit was received in September by the Forest Service. MHO then airlifted approximately 13,000 pounds of construction material by commercial helicopter. The summit tower was erected by the end of the month.

September 1, 1969

Typical Observer Schedule for September follows:

Stellar Image Monitor - 3 nights per week

Marc des Tombe

Paul Clements

Don Hogan

Spectral Hygrometer - Daymen - 5 days per week.

Duane Kurtenback

Steve Rocketto

Project Scanner, 12 inch Telescope - 3 nights per week

Dr. Fred Chaffee

Dan Daniels

Ricky Schwartz

Day/Night Trouble Shooter - Ken Goodwin also to work with Mr Mike Schumate to setup a new JPL experiment.

September 4, 1969

Started training and observing with the Stellar Image Monitor (6 inch telescope) from the dome on the roof of the Observer Services Building on Knoll #2 for studies by NASA-Jack Buffton and SAO-Michael Pearlman.

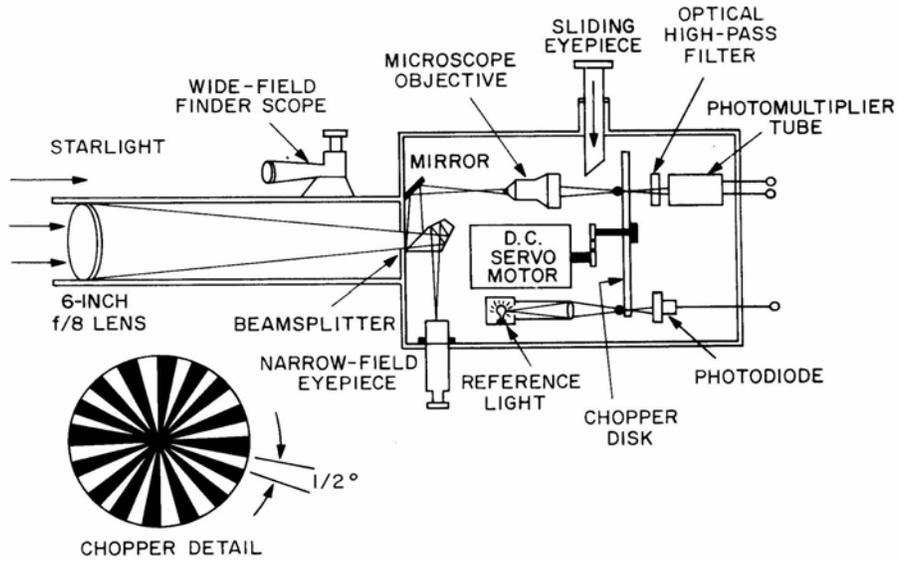


OBSERVER SERVICES BUILDING WITH TWO DOMES ON ROOF

This building was located on the south end of Knoll #2. Also shown in the photo is the site testing "A" frame tower (upper right).

In addition to housing the observing equipment it contained a full size regulation pool table. We fabricated a large and heavy plywood cover for the table and used it for data reduction. The pool table was later moved to the Wickiup for use downstairs by

staff members on cloudy nights. Kevin Harris became very good at the game resulting in his winning the Championship at the University of Arizona. He also represented the University in national championships around the country. He did very well!



NASA STELLAR IMAGE MONITOR SYSTEM

September 1969

The Observatory rented the small adobe house across the street from the Amado School for use as a general office.

The Tubac School Board approved the request for construction of a government surplus Quonset Hut on the old school grounds.

Six surplus searchlights arrived for use by the Gamma Ray Project.



SEARCHLIGHTS WITH 10 METER ON KNOLL # 1

These searchlights were used on a regular basis to continue the all-sky survey of possible gamma ray sources. The mirrors on the searchlights measured 60 inches in diameter and weighted about 175 pounds. Years later I purchased two mirrors. One was used as a satellite TV receiver in my back yard to watch the Boston Bruins hockey games. When they scrambled the TV signals my days of watching free satellite TV ended.

September 22, 1969

Memo to Project Heads from Trevor Weekes

Subject: Solo Night Operations on Mt. Hopkins

Because of manpower limitations several projects on Mount Hopkins are now operated by night by observers working at night by observers working alone. Where possible this practice should be avoided. When expediency demands that only one observer can be assigned to a building, the following guidelines should be followed to minimize the risks involved.

- (1) Only experienced observers, thoroughly familiar with the project should be asked to work alone.
- (2) Operation should be routine with the minimum of innovation. Outside work i.e. away from the building should be avoided.
- (3) The observer should be instructed to make contact with

another group on the mountain upon arrival; they should callback at midnight and before the experiments are closed down at dawn.

- (4) Driving the mountain road after a night observing is particularly hazardous. Where possible observers should double up for travel purposes.

As the number of people working on the mountain increase and the facilities improve, these restrictions can be relaxed. In the meantime the cooperation of all personnel is requested.

Cc: Dr. Lundquist, Mr. R. La Count, Mr. R McCarthy



#### 12 INCH TELESCOPE

The 12-inch telescope was operated nightly while the 60-inch telescope building was under construction during the day. In the years to follow the 12-inch grew to a 24-inch and later to a powerful 48-inch telescope.

When the wind came from the wrong direction the "seeing" deteriorated due to the exhaust from the generators south of the dome. This condition was not acceptable. The generators were moved to Knoll #4. A heavy electrical power cable was later laid on the west slope below the ridge road to run power to Knoll #1.

*November 1969*

*Two years of weather data reduction has been completed and forwarded to SAO.*

Ken Morrison has been appointed as Mt. Hopkins Safety Officer. He has also been appointed temporarily as the 60-inch Telescope Project Coordinator.

November 14, 1969

The 60-inch dome was lifted onto the building. Some difficulties were experienced due to unusually high winds.

The Gamma Ray Project devoted the entire month to the Crab Nebular pulsar experiment.

The Baker Nunn group successfully made 233 photographic observations during the month. Included was photography done with the camera for every five minutes for a four-hour period in an attempt to record a waste water dump from the Apollo 12 spacecraft. The 54B rocket and spacecraft were recorded on film during this entire period. The waste water dump was also recorded

September - December 1969

Mobile Laser Operation (MOBLAS)



KNOLL #3 WITH MOBLAS EQUIPMENT ON LEFT SIDE OF PHOTO

The purpose of the collocation of this NASA laser system with SAO's laser system is to inter-compare satellite tracking data between the two systems. This is part of a geodetic observation system inter-comparison investigation which is world wide in scope. Additionally, an attempt will be made to demonstrate the feasibility of daytime laser tracking. RE: Memo from Mr. Ron La Count, SAO to Ranger Randy Riley, U. S. Forest Service



NASA MOBILE LASER SYSTEM

The large concrete pad in the photo was later used as the concrete floor of Support Building. The trailer shown is the one that was blown over on its side during a windstorm last winter.

*December 14, 1969*

*Approximately 90 percent of the mount was delivered to Amado. Despite our instructions to the Tinsley people, they used*

a vehicle which was too long to negotiate the mountain road. It was necessary therefore, to off-load the mount parts onto SAO vehicles and delivered to the 60-inch building. The mount was inserted into the building using a commercially hired crane.

All major work on the 60-inch building was essentially complete. The final water spray test was not completed due to foul weather.

Twelve jeeps and one 6 X 6 water tanker were obtained from government excess property sources.

YEAR 1970

January 6, 1970



JEEP ACCIDENT - PHOTO FROM JIM CORNELL(SAO)

Ref: Accident Report from Don Hogan to Mr. C. Tougas. At 11 PM, Tuesday night, January 6, 1970 after finishing my work on the southeast ridge of Mt. Hopkins, I proceeded alone in a mechanically sound jeep down the road to Amado. Most of the road was dry and clear of snow and ice. Certain sections of the road that are not exposed to the winter sun were packed with snow and occasional patches of ice.

While proceeding slowly (5-10 MPH) down a 10-12% snow packed grade at approximately the 5,800-foot level in four wheel drive and second gear, the rear wheels suddenly skidded toward the outside edge of the road. In rapid succession the jeep (with

brakes applied) slid toward the inside bank. The angle of approach was such that without going very far or high on the bank the jeep rolled 90 degrees landing on the driver's side. While attempting to break my fall, my left foot was crushed under the door frame.

I managed to free myself by pulling my foot out of my boot and waited for assistance. Prior to crawling out of the jeep I tossed my briefcase and a seat on to the road. I thought I could smell gasoline so I took things and crawled down hill and got well clear of the scene. I sat on the seat, watched the satellite Echo go overhead, and waited. I took my stocking cap off and wrapped it around my foot fearing frostbite.

Approximately two hours later (1:30 AM ) Mr. Rocketto and Mr. desTombe arrived. They knew something was wrong before they arrived when they saw the headlights of the vehicle were vertical, not horizontal, from the upper section of the road. They were able to get around the overturned jeep and we drove to Amado. We swapped the jeep for the ambulance and drove to Tucson arriving at the hospital sometime after 3:00 AM.

The following recommendations were made based on this experience.

1. Rollbars be installed on all jeeps and soft top vehicles.
2. When packed snow and ice conditions exist these areas be sanded.
3. Where possible a bar-ditch be cut into the bank to act as a curb.
4. Sound or signal devices be carried in all vehicles.
5. The ambulances remain at both the 7,600 ridge and the Amado office ready for immediate use equipped with blankets and first aid supplies.

Xrays revealed that several metatarsel foot bones were broken. Several toes were mildly frostbitten. After a few days in the hospital I left with a cast up to my knee. Six weeks later the cast was removed.

Through the years as the Support Supervisor sanding the road became a very personal thing to me. (More on this subject later)

January 9, 1970

Memo from The undersigned Observers to Mr. R. La Count at SAO  
Subject: Poor Road and Vehicle Conditions

Recent events, notably Mr. Hogan's accident, have caused us to reconsider road and vehicle safety standards at Mt. Hopkins Observatory.

Vehicle maintenance has been relegated to a low priority and at the present time, virtually no safe vehicles are available for observer use.

Resources for proper road and vehicle maintenance must be provided.

We feel that we have the option to refuse to drive any unsafe vehicle and we intend to exercise that option in the future.

Signed by: Mr Daniels, Mr. desTombe, Mr. Rocketto, Mr. Clements, and Mr. Kurtenback.

*January 25, 1970*

*Mr. Bastiaan van't Sant was transferred from the Satellite Tracking Division. Bas and his family arrived from Ethiopia. Previously he had worked tracking satellites in Iran (with Don Hogan) and South Africa. When it became obvious that the "seeing" project needed an electronics technician I was asked by Ron La Count who I wanted in the system.. I requested Bas and surprisingly I got him. What I could do else? Right!? Bas?*

*Mr. R. Schwartz resigned and entered the University of Arizona.*

*A series of Public Lectures started in Amado. Dr. George Reike spoke on "The Sixties, Astronomy Turns On." Approximately 30 people attended. In the following months Steve Rocketto, Trevor Weeks, Chuck Tougas, Don Hogan and Dave Le Conte spoke to the same small crowd.*

*February 5, 1970*

*The 60 inch telescope mirror met image requirements and was accepted from Owens-Illinos. It was shipped and arrived in Amado on February 23<sup>rd</sup>.*

*February 17-18, 1970*

*The Baker Nunn Camera photographed Comet 1969 G (Tago-Sato-Kosaka).*

*Over 100 cubic yards of crushed rock were hauled up hill in motor pool dump trucks for spreading around the immediate area of the 60" Telescope building and its approaches in an effort to decrease the dust problem. This job should be completed within a week.*

*March 18, 1970*

*The assembly of the 60 inch telescope and mount started. Dr. Carlton, Dr.Schild, Messrs. Tougas, Morrison, Hoffman, Clark, Comerford, and several members of the Mt. Hopkins staff assisted in the installation.*

*The spray tests on the dome were completed it no longer leaks. Other problems with the Observa-Dome needed attention.*

*April 15, 1970*

Simultaneous star observations were made from Knoll #2 with the Double Beam Telescope and the NASA Stellar Image Monitor. We observed the star Arcturus.

April 30, 1970

Ron La Count arranged a transfer of a Lewis Building from NFEC in Washington, D.C. This 20' X 48' prefabricated building should arrive in June. It will be situated on the 7600 ridge (Knoll #4) and will be used as a combination dormitory/office. It will later be named a "Wickieup."

May 1970

Four major generator breakdowns occurred during the month. Inquires were made to four electric power companies in the vicinity about the cost of a underground line to the ridge.

The first observations ever taken from the summit, of Mt. Hopkins were made with the double beam telescope. Visual estimates indicate that the "seeing" is less than one arc second, and every bit as good as any site on the 7600' ridge. In the next few weeks it is planned to observe simultaneously with the stellar image monitor on Knoll #2. The results of these observations should prove very interesting.

Mr. M des Tome resigned and MR S. Rocketto was transferred to Wallops Island during the month.

One Radiosonde Balloon launch was made this month. The purpose of the launch was to determine how well and how far a balloon could be tracked with binoculars and the Questar telescope. Preliminary results indicate that a balloon can be tracked to more than 40,000 feet. This data was forwarded to the Wallops Island Weather Bureau Facility.



*ON THE TOP — The first major astronomical instrument has been installed on the summit (8585 feet) of Mt. Hopkins. Early this summer, a team of men from the Atmospheric Investigation Program, under the direction of Don Hogan, installed a dual-beam telescope designed to measure star-image quality as seen from the peak. Here, standing by their handiwork and looking as if they were in the polar regions rather than sunny Arizona, are (from left) Bastiaan Van't Sant, Ken Goodwin, and DeWayne Kurtenbach.*

May 27, 1970

Double Beam Telescope Observations made on the summit. Tracked Spica and Arcturus. Seeing estimated 1 to 1.5 seconds of arc. Observations were made by Ken Goodwin, Don Hogan, Dewayne Kurtenbach, and Bas van'tSant.

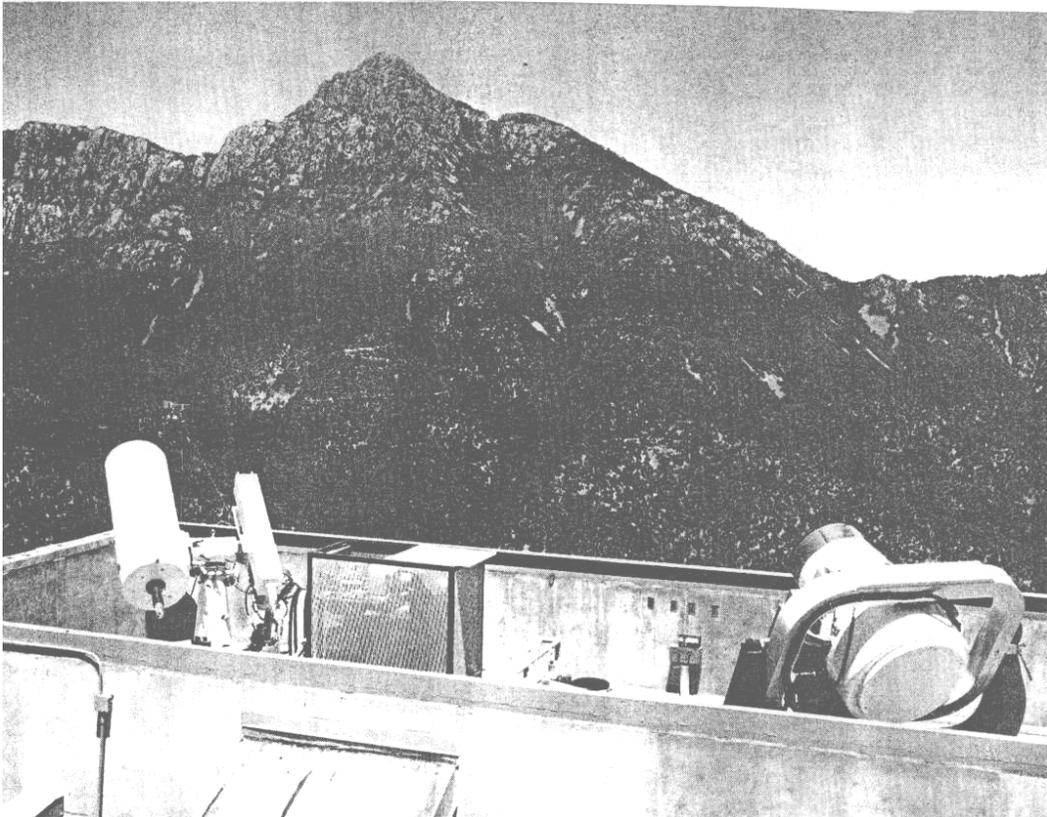
There was no road to the summit. We hiked to the summit on a crude mountain foot trail nightly prior to sunset and came down the same trail at sunrise. This trail was about a mile in length and rose 700 feet in elevation. Occasionally we would disturb a large group of turkeys that would swoop down to a lower level.

The telescope and equipment were packed to the summit site in slings, backpacks or on pack-horses. The hired horses could carry a load of about 100 pounds on the sometimes steep trail only twice a day. One of the horses developed a "rose tumor" on one hoof. The other horse fell about 20 feet coming down hill. The man in front of the horse jumped sideways off the trail as the stumbling horse went tumbling past him.

At this point the horse owner refused to make any more trips up the trail. We also had enough of this packing experiment.

Fortunately we had succeeded in getting what we needed to the summit.

The observatory continued the lecture series on astronomy and astrophysics for the general public in the Amado School House. About thirty local people attended. The lectures are now held in Green Valley with at least several hundred people attending.



SATELITTE TRACKING SYSTEM - KNOLL #3

The Smithsonian satellite tracking installation seen against the background of Mount Wrightson ( 9,600 feet), the highest peak in the Santa Rita Range, of which Mount Hopkins is next (8555 feet). The Baker Nunn camera at right was No. 1 in the Smithsonian network when operating at Organ Pass, New Mexico. At left is the Spacerays laser, on a manual mount controlled altazimuth mounting that has a pointing accuracy of better than half a minute of arc. The square tube encloses the laser optics and is mounted on an I-beam that serves as an optical bench. The circular tube is a Cassegrain telescope that receives the reflected laser pulses. Photograph by Tom Butler, observer.

This satellite tracking system is now on display at the

Smithsonian Space Museum in Washington, D.C.

The 60-inch telescope went into operation and is now generating data.



BAKER NUNN CAMERA

June 14, 1970

According to Ron La Count's monthly report this was the most fruitful observing month to date by all projects.

July 15, 1970

*Trevor Weeks met with the Tucson City Council on the subject of "Light Pollution." Dr R. Weymann (the new director of Stewart Observatory and Dr. A Hoag, Kitt Peak also attended.*

July 31, 1970

*A Baker Nunn Building transformer was hit by lightning, and burned beyond repair. The burn marks were evident to a height of approximately 20 feet up the side of the building.*

July 31, 1970

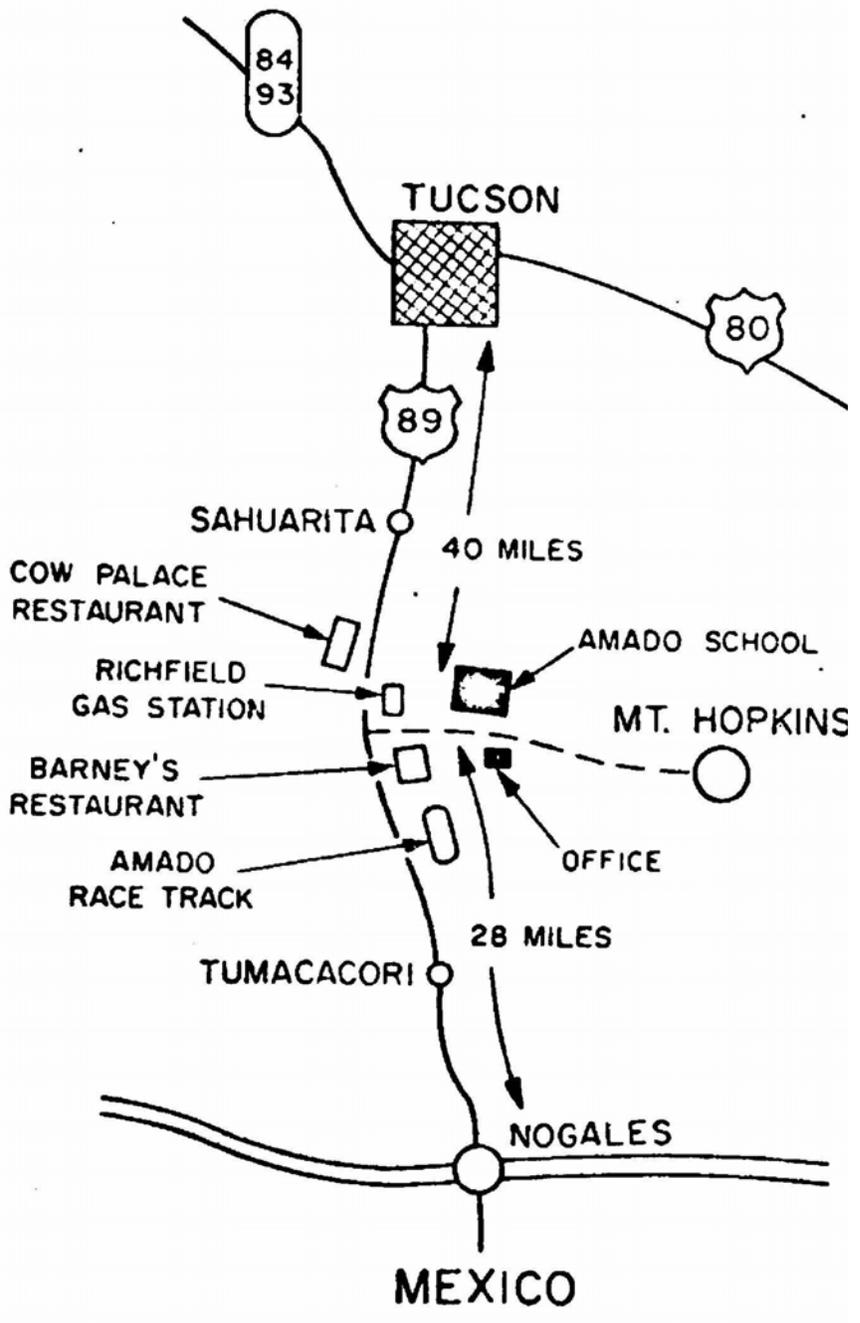
With all of the activity at the Observatory the following draft, written by Chuck Tougas, became necessary. Six months later a more elaborate copy was published by SAO. All visitors were given copies and encouraged to read it.

## ORIENTATION PAMPHLET

This pamphlet is designed to acquaint the visitor, visiting astronomer, observer, technician or new employee with the details of SAO policy, rules and regulations, facilities, rights, privileges, responsibilities and taboos at the Mt. Hopkins Observatory in Arizona. It includes a variety of details that are subject to changes as time and need create them and, although revisions to update this pamphlet will be printed from time to time, a verbal orientation with Observatory personnel about current conditions will take precedence over this pamphlet. Besides reading this pamphlet before arriving, the visitor is expected to plan on spending some time chatting with permanent Observatory staff before proceeding up the hill to visit or work at the Mt. Hopkins Observatory even though his last visit was quite recent. This should avoid confusion and allow for safer, more efficient operations and the cooperation of all will be greatly appreciated.

The Public Information Office at SAO in Cambridge has produced a recent publication concerning Mt. Hopkins and the work going on there. Included in this publication is a history of the Observatory at Mt. Hopkins. The Mt. Hopkins Department at SAO has a set of files which contains records, pictures and mementoes of the place. Besides the above, verbal accounts of personal experiences of recent and past visitors concerning conditions at the Observatory should aid the potential visitor.

C.A. Tougas  
July 31. 1970



SAO STAFF RESIDENT AT MT. HOPKINS

STADAD STATION (BAKER NUNN/LASER) 792-6397

John Scott, Manager 623-6397  
 Joe Delgado 792-1612  
 Tom Butler 625-8796  
 Al Almazan 623-2731

OBSERVING SERVICES DIVISION 792-6398

Don Hogan, Manager 398-2507  
 DeWayne Kurtenbach 625-8239  
 Ken Goodwin 625-4384  
 Bastiaan van't Sant 625-3552

GAMMA RAY PROJECT 792-6398

Dr. Trevor Weekes 625-3144  
 Edward Horine 398-2516

60" TELESCOPE 792-6222

Dr. Fred Chaffee 792-7581

AMADO FIELD OFFICE 792-6358

Resident Director-----	Dr. Trevor Weekes	625-3144
Field Manager-----	Charles Tougas	398-2257
Special Assistant-----	Kenneth Morrison	398-2506
Maintenance-----	Myron Clark	398-2330
Motor Pool-----	Duane Gingerich	398-2531
Secretary-----	Dorothy Merchant	398-2555
Safety Officer-----	Kenneth Morrison	398-2506
Inventory-----	Duane Gingerich	398-2531
Library Committee-----	Thomas Butler	625-8796
	Dorothy Merchant	398-2555
Machine Shop Committee-----	Edward Horine	398-2516
Accommodations Committee-----	Dr. F. Chaffee	793-7581
	Dorothy Merchant	398-2555

SAFETY OFFICER

The support staff of the Observatory has assigned a safety officer to maintain strict standards of safety for the Observatory ridge, the access road and the Amado Field Office facility. Standard codes of fire prevention policies are in effect everywhere. The Fire fighting equipment, ambulances and first aid supplies are part of the safety officer's responsibility. As soon as possible after arrival, personnel are urged to talk with the safety officer about specific details of safety.

OBSERVATORY MOTOR VEHICLES

The Observatory maintains a motor pool consisting of personnel carriers and support vehicles for official use only. Each project is assigned one or two personnel carriers, usually jeeps, for use by observing staff of that project. Usually a pickup truck or other vehicle is also assigned to each project for doing project shopping in Tucson. Whenever other specialized equipment is needed it is assigned from the support vehicles on an as-needed basis with the permission of the Field Manager or Transportation Officer.

It should be noted that the maintenance of flexibility and variety of the motor pool within the limitations of budgetary cut-backs means that the cooperation of everyone in the wise and efficient scheduling of trips is very necessary. The observation of speed limitations, safety rules, equipment check list procedures, and careful driving habits is required from everyone in order to make the system work.

All personnel are required to have a valid U.S. Government driver's license. in order to be eligible to operate any SAO vehicles.

The speed limit on the access road is 30 mph on the "flats" (from Amado to the bottom of Montosa Canyon) and 15 mph from the bottom of Montosa Canyon to the Observatory Ridge.

Use of 4-wheel drive is recommended on wet surfaces only. Persistent use of this feature, on dry hard roads wears out the vehicle much faster.

Each driver is expected to check out his vehicle before leaving the Amado office or the Observatory ridge.

- |              |                    |                 |
|--------------|--------------------|-----------------|
| (1) Gasoline | (7) Jack           | (13) Flashlight |
| (2) Oil      | (8) Jack handle    |                 |
| (3) Brakes   | (9) Lug wrench     |                 |
| (4) Tires    | (10) Spare tire    |                 |
| (5) Steering | (11) First Aid Kit |                 |
| (6) Lights   | (12) Blankets      |                 |

should all be checked. The telephone answering service in Tucson should be called (792-2575) before starting for and upon arriving

at the destination. In the event of accident, breakdown or other delay, this system allows for initiation of search and rescue efforts. (see below).

Uphill traffic has precedence over downhill traffic whenever meeting head-on and a backing up to a turn-off is necessary unless the downhill vehicle consists of heavy trucking versus a lightweight uphill vehicle.

The road to the Observatory is defined as a FAIR WEATHER single lane access road and, should the weather be foul, one should not use it unless absolutely necessary.

In the event of breakdowns or vehicle failures of any kind, verbal or written notification including causes should be made as soon as possible to a motor pool representative in order that prompt attention to the matter be given.

When returning to the Amado office, vehicles should be parked facing North on the "line". This readily indicates to support personnel that servicing of the vehicle is necessary. This usually occurs every morning and includes fuel and oil replenishment and safety checks of vehicle components. Once this check is made, the vehicle is returned to the "line" and is parked facing South.

In an urgent or emergency situation wherein servicing is required and no support personnel are present, servicing is possible at the Richfield station where a charge account exists.

In order to provide a greater degree of safety enroute to and from the Observatory the following procedures will be followed:

1. Prior to your departure, telephone the answering service operator and give her the information below:
  - A. Smithsonian Institution
  - B. The driver's name
  - C. Passenger's names
  - D. Type of vehicle and/or number
  - E. Actual departure time
  - F. Expected arrival time (departure time + 1½ hours)
2. Upon arrival inform the operator.
3. The answering service telephone number is 792-2575
4. If the operator does not receive notification of your arrival, within the time specified, she will assume an emergency condition exists. The operator will then take the following action:
  - A. Call both the office and the mountain
  - B. If she is unsuccessful she will then start to call certain names and numbers from a list that we will provide.
5. When notification of an overdue vehicle has been received from the operator the following action shall be taken by Observatory personnel:

A. When possible conduct a visual check to determine if, in fact, the vehicle did arrive or if it is enroute.

B. Organize whatever personnel are necessary or available to conduct a search for the vehicle and personnel. Both the ambulance on the ridge and the office shall be used for this purpose. The persons to contact to initiate a search from the Amado office are: Mr. Tougas 398-2257, Mr. Morrison 398-2506, Mr. Clark 398-2330, Mr. Gingerich 398-2531.

C. Notify the safety officer of the results of the search. Communicate as necessary to keep others informed of action taken or the results of such action.

D. If a serious accident has occurred as soon as possible notify the following:

1. The Safety Officer - Mr. K. Morrison
2. The Resident Director - Dr. T.C. Weekes
3. The Field Manager - Mr. C. Tougas
4. The Station Division Manager

These procedures are being initiated for your safety, therefore the full cooperation of all personnel is necessary if this safety procedure is to be effective.

It is requested that all Project Managers discuss this system with their personnel to insure that the procedures are thoroughly understood.

#### POWER GENERATORS

The facilities on the Observatory ridge are powered by generators in the knoll #4 area. The oil changes and back-up generator checks, as well as filter changes and regular maintenance chores, occur on a scheduled basis. When the generator is shut down, orientation classes are conducted by support personnel for the benefit of all Observatory staff members. In the event of power failure, it is often the case that support personnel are not present and that other staff members are called upon to switch to another generator or otherwise solve power failure problems. It is therefore recommended that as many staff members as possible attend the generator sessions as often as possible.

All power failures should be reported promptly and in detail to support personnel as soon as possible.

### LIGHTS ON THE OBSERVATORY RIDGE

Great effort and expense have been made to situate the scientific instruments on the Observatory's ridge at Mt. Hopkins. The quality of the data derived with the instruments is directly related to the preservation of such characteristics as the pure night time environment unblemished by man-made lights that is present there. For that reason, the darkness of the nights must be considered almost sacred and all efforts must be made to preserve it. All buildings have black-out shades over the windows. All personnel are asked to cooperate and not use vehicle headlights on or near the ridge. Before opening a door to a building, staff members are urged to turn off lights in buildings so as not to interfere with or ruin any scientific experiments in progress. Personnel should make every effort to arrive at the Observatory ridge before sunset and to leave after sunrise.

When a particularly light sensitive experiment is in progress, instructions will be posted on the 7,100 foot level. Beyond this point, always drive with lights on low beam.

### "SOLO" WORK ON THE RIDGE

As a necessary safety precaution no person is permitted to work alone on the ridge at night. Full moon periods and weekends are usually less busy periods at the Observatory than other times. Efforts should be made to schedule work in conjunction with the presence of others on the ridge. The gamble of working alone is really not worth the risk of accidents involved.

### TELEPHONE USAGE

In order to save toll charges and cut telephone operating costs, the following procedures should be followed:

1. When calling the Amado (398) area from the Amado office use the 398 line. No charge in this procedure.
2. When calling Tucson or the FTS line (SAO, etc.) use the 792 exchange from the Amado office or the ridge.
3. If you are to call other areas in Arizona use the 792 line to call Phoenix!

example: to call Green Valley or Nogales  
Dial: 8-261-3900

The operator will connect you with the number you want between the hours of 8 A.M. to 5 P.M.

If it becomes necessary to call between the hours of 5 P.M. to 8 A.M.

Dial: 8-202-967-1221

This is the Washington Operator and she will make the connection for you.

No commercial charges will be made when these procedures are used and it will result in a large savings on the telephone bill.

To call Tucson numbers, just dial the number nine (#9) first, and then dial the number you want.

To call any number outside Tucson, you must go through the FTS operator.

To get any FTS operator always dial eight (#8) first, then the number of the FTS operator in that particular area. Every number of the FTS system is in the red and pink "Telephone Users Guide" in most buildings.

#### ALCOHOLIC BEVERAGES

It has been Observatory policy that, for obvious safety considerations, no alcoholic beverages be allowed on the ridge at Mt. Hopkins.

#### WATER USAGE

Diligent attention to restricted water use on the ridge is suggested as it has been estimated that water costs 5 cents per gallon at that point. Faucet leaks or other failures should be reported promptly so that repairs and modifications can be made as soon as possible.

#### FIRE FIGHTING EQUIPMENT AND FIRE PREVENTION

The Observatory maintains 3 fire trucks and other fire fighting equipment for use in the event of fire. One is located north of knoll #3 on the ridge at Mt. Hopkins and the other two are at the field office facility at Amado. The latter two are also part of the Amado Volunteer fire department. If a fire breaks out, all available staff are requested to drop everything and make every effort to extinguish it. There are fire extinguishers in all buildings as well as shovels and barrels of sand near each building that should be utilized in extinguishing fires.

Strict fire prevention practices should be followed in and around all buildings, on the ridge, and along the access road to the Observatory.

As they are discovered, any fires, either near or far, should be reported immediately to Observatory personnel in all buildings for help in extinguishing them and, when applicable, to the Forest Service via the telephone numbers listed at each telephone. Water supplies for fighting fires are located all along the ridge and at several points along the access road.

#### TO REPORT FIRES CALL THE FOLLOWING NUMBERS DURING THE 1970 FIRE SEASON

Day-----	795-6230	Office - Santa Rita, Santa Catalina
Day or Night		Districts
Holidays-----	793-7297	Residence - Santa Rita Ranger
Day-----	792-6487	FTS Fire Dispatcher
Day or Night		
Holidays-----	795-3968	Residence - Fire Dispatcher

#### AMBULANCES

The Observatory maintains two ambulances complete with first aid kits, blankets and flashlights. One is located on the ridge just north of knoll #3 and the other is at the Amado Field Office facility. These are for emergency use only and permission for any other use must be obtained from the motorpool officer.

#### TRASH REMOVAL

During most of the year, burning trash or open fires of any kind are not allowed on the Observatory ridge or along the access road according to Forest Service policy. Trash should be deposited in plastic bags and periodically brought to the Amado office and put into the dump truck where it will be taken away to the official dumping grounds. A utility trailer with a canvas top is located north of knoll #3 on the ridge. Trash may be deposited there as well and it periodically is brought down the hill to Amado.

It is strongly suggested that all personnel refrain from littering along the ridge or the access road in order that the natural beauty of the area be preserved. Save the bottles and cans and other litter for the trash basket.

#### JANITORIAL SERVICES

The Observatory employs part-time High School help for some six hours per week at the Amado field office for janitorial duties inside and outside the facilities at Amado. No other janitorial services exist on the ridge at Mt. Hopkins except those provided on a non-scheduled basis by support and observing personnel.

#### OVERNIGHT ACCOMMODATIONS

At the present time there are very limited overnight accommodations on the ridge at Mt. Hopkins. The Observatory temporarily maintains a house trailer set up near the northern end of knoll #3. The accommodations Committee is responsible for the policy, rules and regulations concerning such facilities and the secretary handles reservations and other details. Towels and linen handling rules, as well as cooking and cleaning regulations, are posted on the premises.

#### USE OF LINEN

The Accommodations Committee has set up a check-out and a sign-in system for linen so we can keep track of where it is being used. The linen is picked up every other Tuesday at about 11:00.

We have reserved a shelf in the Amado school-house storeroom for clean linen and will have a hamper in the same room for dirty linen. Also there will be a signout sheet for returning dirty linen and checking out clean linen, the date of the next linen pickup and delivery will be posted.

The cooperation of all in signing in and out for linen will be greatly appreciated.

#### STORAGE AT AMADO FIELD OFFICE

It is not uncommon for visiting SAO personnel to want to store something in Arizona until their next visit. There are a limited number of foot lockers available for the storage, under lock and key, of personal effects, instruments or equipment for short or long term periods. Arrangements can be made with the secretary at the Amado Field Office.

#### DESK SPACE AT AMADO FIELD OFFICE

There are a few desks, and space for same, available at the Amado Field Office facility. Any visiting SAO personnel requiring to use these and/or any equipment such as the copying machine, typewriter, secretarial services, etc., should arrange for them with the secretary.

#### SCIENTIFIC LIBRARY

Until adequate room can be built on the ridge itself, the Observatory maintains a small scientific library at the Amado Field Office secretarial office. A library committee governs policy, rules and regulations and the secretary handles the day to day details of borrowing and returning books and journals.

#### MACHINE SHOP

A small machine shop is being set up at the old Amado School and will be available to qualified Observatory personnel. Safety rules and professional practices will be in effect at all times and written regulations for use of the tools and machines will be posted on the premise by the machine shop committee.

#### PURCHASES

The Observatory maintains charge accounts at many various Tucson and Nogales supply houses. When charging items, the project name should be noted and the signature of the purchaser should appear on every invoice. The Observatory pays only 1½% sales tax. Petty cash slips are reimbursed at the Amado Field Office by the Field Manager, and, if needed, petty cash advances are possible in special cases. In all cases, an itemized listing on a standard invoice dated and signed as paid by the supplier is required rather than just a cash register slip. Project heads should always be aware of purchasing authority for their individual projects.

#### EXCESS GOVERNMENT PROPERTY ACQUISITION

Being federally funded, the Observatory enjoys the rights and privileges of excess government property acquisition. Various catalogs from property sources are received each week and these are available for perusal by Observatory personnel. Besides the catalogs, regular

visits are made to nearby military establishments by support personnel for screening and acquisition purposes. Whenever convenient, members of each project should avail themselves of these services for the acquisition of needed equipment and supplies.

#### COPYING MACHINE

The 3M copying machine is available for official use by Observatory personnel. It is requested that the usage sheet be accurately filled out every time the machine is operated. If large usage is anticipated, prior notice is requested so that proper supplies can be assured.

#### SUMMER EMPLOYMENT

In order to accomplish yearly special tasks, the Observatory employs a few part-time summer employees, usually High School and College students, or members of the Neighborhood Youth Corps. These employees' duties are scheduled well in advance of the summer months and if certain work is required to be scheduled, project heads are urged to initiate plans in the Spring of the year. Last minute adjustments in the scope of the labor force are difficult.

#### VISITORS TO 60" BUILDING

Visitors to the 60" building are welcome in general with scientific visitors and family and friends of our own staff particularly so. For the good of the building and its inhabitants we must establish certain rules, however:

1. Visitors should make appointments whenever possible. If no appointment has been made, dropping in is alright only in the afternoon. Most of the observers using the building will be sleeping and should not be disturbed in the morning during their sleep.
2. To reduce dust in the building, visitors should shake and brush their clothing as much as possible, and then take off their shoes upon entering and leave them in the vestibule.
3. There should be no smoking in the building, to reduce contamination of optics.

#### PUBLIC INFORMATION AND PUBLIC RELATIONS

All personnel are reminded that SAO policy suggests that any press release should originate at the Public Information Office at SAO in Cambridge. Visiting members of the press or others, are always welcome at the Observatory. However, visitor facilities are very limited and it is suggested that prior appointments be made for tours of the Observatory. Unaccompanied visitors are not allowed to wander around on the ridge by themselves for fear of injury to themselves or damage to equipment and instruments.

### PUBLIC LECTURES

During the winter months, regular scheduled talks are given for the public at the Old Amado School Auditorium. Lectures are also planned by Observatory personnel for the science classes at Sahuarita High School and Nogales High School.

Visiting SAO personnel are urged to partake in these programs to aid in these efforts of Public relations.

### GAMMA RAY PROJECT: SPECIAL RULES

- (1) Because the 10m reflector is unshielded, it is extremely sensitive to stray light. Keep lights to a minimum on the ridge. When the reflector is in operation, a red light is turned on visible from the road below (where the warning sign is) and along the ridge. At these times use only lights on low beam; use only parking lights from the point where one begins to turn south along the ridge road, i.e. at the generator building.
- (2) The mirrors on the reflector are front-aluminised; do not touch.
- (3) The various searchlight reflectors scattered over the mountain have been accurately aligned; do not climb on them or disturb them.
- (4) Only those listed in the control room are authorized to move the reflector.
- (5) In general these experiments are in operation only in the dark of the moon and on very clear nights.
- (6) Your interest in our experiments is welcomed at all times except before noon on the nights after we have operated (when there may be observers sleeping in the building).

### AIRPORT VEHICLES

In order to save on car rental fees, the Observatory has available to visiting SAO personnel a limited number of sedans. By planning details beforehand with the secretary, visitors may arrange to have a vehicle at their disposal at the Tucson International Airport upon their arrival for work at Mt. Hopkins. These are not new, do not have air conditioning and a government driver's license is required to operate them. However, the use of these is recommended in view of the general need to save on expenditures.

Upon arrival at Amado, the sedans should be parked at the motor pool there and arrangements made for transportation up the mountain in more adequate vehicles.

August 13, 1970

A check of motor vehicle maintenance indicates that passenger carrying mountain vehicles require 3 mandays per month of maintenance.

Mr. Phillip H. Babcock, SI Washington

August 13, 1970

Mr. C. Tougas, Mt. Hopkins Observatory

### Vehicles

As requested, here is our list of Observatory vehicles classified into ROAD and NON-ROAD for insurance purposes:

#### ROAD VEHICLES

	<u>Make</u>	<u>Model</u>	<u>Serial No.</u>	<u>Year</u>
yes	1. Dodge	Carryall	1181486124	1963 —
yes	2. Dodge	Carryall	1161299629	1963 —
yes	3. Dodge	Sedan	4146160259	1964
yes	4. Chevrolet	Station Wagon	11235L133165	1965
yes	5. Chevrolet	Sedan	153696L183243	1966
yes	6. Plymouth	Sedan	2037184329	1963 —
yes	7. Chevrolet	3/4 ton Pick-up	CS148T137394	1968
yes	8. Ree Motors	2 1/2 ton truck tractor	103736	1951
yes	9. International	5 ton truck tractor	FR48935	1956
yes	10. Ford	1 Ton Truck	F35JK295346	1962
yes	11. Ford	1 Ton Truck	F35JE300140	1962
No	12. Chevrolet	1 1/2 ton truck	1C499K134896	1961

#### NON-ROAD VEHICLES

	<u>Make</u>	<u>Model</u>	<u>Serial No.</u>	<u>Year</u>
	1. Internat'l	Scout Utility truck	FC 59794	1962
	2. Internat'l	Crew Cab	SB198087A	1961 —
	3. Internat'l	Crew Cab	SB196956A	1961 —
	4. Chevrolet	1/2 ton Pick-up	OC144L127705	1960 —
	5. Chevrolet	1/2 ton Pick-up	OC144L127392	1960 —
	6. Chevrolet	1/2 ton Pick-up	OC144L127058	1960 —
	7. Willys	1/2 ton Jeep	180041	1958 —
	8. Willys	1/2 ton Jeep	66460	1953 —
	9. Willys	1/2 ton Jeep	66523	1953 —
	10. Willys	1/2 ton Jeep	59817	1953 —
	11. Willys	1/2 ton Jeep	G2758-8358686	1953 —
	12. Willys	1/2 ton Jeep	43082	1953 —
	13. Willys	1/2 ton Jeep	21105	1952 —
	14. Willys	1/2 ton Jeep	58994	1952 —
	15. Willys	1/2 ton Jeep	26807	1952 —
	16. Willys	1/2 ton Jeep	41215	1960 —

<u>Non-Road Vehicles (con't)</u>			
<u>Make</u>	<u>Model</u>	<u>Serial No.</u>	<u>Year</u>
17. Dodge	3/4 ton 4 X 4 Pick-up	80250928	1953
18. Dodge	Ambulance	649	1959
19. Chevrolet	3/4 ton Pick-up	2 C143L116235	1962
20. Chevrolet	3/4 ton Pick-up	3E56F020075	1956
21. Chevrolet	3/4 ton Pick-up	3E56F018701	1956
22. Ford	3/4 ton Pick-up	F25J7G20674	1957
23. Ford	3/4 ton Pick-up	F25J7G20631	1957
24. Pontiac	Ambulance	361P38379	1961
25. Ree Motors	6 X 6 Water Tanker	118774	1954
26. Ree Motors	6 X 6 Dump Truck	M-34347	1953
27. Ree Motors	6 X 6 Cargo Truck	M-37990	1953
28. Ree Motors	6 X 6 Cargo Truck	107569	1954
29. Ree Motors	2 1/2 ton 6X6 Fire Truck	132515	1954
30. Ree Motors	5 ton 6X6 Wrecker Truck	3150	1953
31. Dodge	3/4 ton 4 X 4 Fire Truck	G27418358517	1953
32. Dodge	3/4 ton 4 X 4 Fire Truck	8004925	1953
33. Fuel Tanker--Ford	Fuel Tanker	F60CE270019	1962
34. Ford	2 1/2 ton Dump Truck	F6000K57004	1960
35. Internat'l	Cherry Picker Truck	SAB2283	1962
36. Internat'l	Cherry Picker Truck	B172SB-134921E	1962
37. Dodge	3 ton truck	M806H02936	1963
38. Studebaker	6 X 6 Water Tanker	M-31734	1953
39. Studebaker	3 ton Truck	E405333	1963
40. Studebaker	6 X 6 Compressor Truck	M-22117	1952
41. Kaiser Jeep	5 ton 6 X 6 Wrecker Truck	572710595	1953
42. Chevrolet	1 1/2 ton Truck	1C439K134896	1961

cc: Mr. John Gregory  
Dr. T. Weekes  
File

September 8, 1970

Memo Excerpts From. Trevor Weekes To John Gregory SAO  
We have now operated for over two years on surplus vehicles; almost all of these have done more in excess of 100,000 miles and are obtained in "R" condition. Although we have had at least half a dozen accidents that could have been fatal ( not all due to vehicle failures). That we have not had a real serious accident is the measure of the skill of our drivers and the ingenuity of our Motor Pool Staff who keep these vehicles running; there is also a large amount of luck involved.

Every year we have promised our observing staff that this system is only temporary and that come the next fiscal year we will be upgrading our transportation system. The number of mechanical failures in vehicles while traveling the mountain road is a serious moral problem.

We have had two potentially serious accidents due to vehicle failure which involved visiting scientists. Our vehicles are somewhat of a joke in the Tucson astronomical community.



#### JEEP WHEEL FAILURE

While driving along the "flats" this jeep's front-end dug into the road and stopped while the wheel came off and rolled more than 30 feet ahead.

September 1970

Mr. John Gregory started writing monthly reports to Mr. Bartnik. Ron La Count took a job in Washington with the National Science Foundation.

The road was graded for the 60-inch Telescope dedication and for a following "Open House for the general public.

Winds of 82 MPH were recorded this month on the ridge.

Nat Carlton wrote to John Gregory stating that the dust accumulation on the 60-inch telescope and at other projects is intolerable.

September 29, 1970

A special ceremony was held to dedicate the new 60-inch telescope to the memory of the late Carlton W. Tillinghast, Jr.

October 1970

Bas van't Sant joined Dr. Fred Chaffee for Optical Astronomy.

*A couple of trips to California by support people resulted in the acquisition of the Lewis Building. This was soon to be called a "Wickiup" and served as a ridge dormitory.*

December 21, 1970

In a staff memo Trevor Weekes wrote it is time to consider

the installation of a small computer on site. Something like a IBM 1620 - useful, obsolete and cheap.

#### YEAR 1971

January 1, 1971

Recent newspaper articles appeared about Chuck Tougas "scrounging" excess government property for use by the Observatory. "Operation Sand Storm". Excess government property was inventoried and stored. Later it was sold or disposed of via GSA. This material/evidence was finally released by the Justice Department in 1974.

January 15, 1971

*The NASA Barium Cloud Project trailers, vans, generator, and other equipment arrived in Amado and the loading, delivery and unloading up on the ridge near Knoll #3 has been completed.*

The NASA is planning an experiment in the Spring of 1971 in which a quantity of barium will be released in space at an altitude of approximately 30,000 kilometers. The primary means of obtaining data from this experiment is through the use of ground based optical instruments located at sites in both North and South America which have proven weather conditions suitable for night sky photography. Such a site is the Smithsonian Southwest Observatory at Mt. Hopkins, Arizona.

Weather must be clear at all sites for any of the following launch windows. April 19 to April 28, 1971 or from May 18 to May 27, 1971 to conduct this experiment.

Sometime after this group was settled in the manager came to me and complained about not having custodial service. I explained that we don't provide that kind of service because we were limited in manpower and his crew would have to pick up after themselves. While we were talking a man in a hooded parka came trudging along on the road with a large plastic sack on his back. The timing couldn't have been better. I pointed out that that guy was the Observatory's Director, Trevor Weekes. I never received another complaint about custodial services again.

*The mildness of the winter season made the support operations easier than in the years gone by. The amount of moisture, rain and snow, that fell was not enough to interrupt the use of the Observatory access road or the facilities on the ridge.*

*The Waukesha continued to be the main source of power on the ridge backed up by two Caterpillar generators.*



#### BARIUM CLOUD EXPERIMENT EQUIPMENT

March 4, 1971

Sanford Evans, Civil Engineer, with Cella, Barr, Evans, associates ran a flag line at an average seven percent grade from the Mountain States Telephone relay site to the Mt. Hopkins saddle. Rock blasting and extensive excavation was predicted. Ground Inspection is difficult. Quote: "Those persons desiring to see this route on the ground do so at some risk of being scratched

and worked over by the brush." Also beware of rattlesnakes!

*Work continued to solve the dust problem around the 60" Telescope and the Gamma Ray Dish. Pea gravel and asphalt penetration on this area is planned*

March 10, 1971

The Observatory hired a Bell 47G helicopter to fly Messrs. Tougas, Evans and Riley to the summit area to study the proposed road alignment. Total cost \$375.

April 1971

*The concrete foundation and floor of the Lewis Building was completed. Two almost new 4X4 fire trucks were obtained from excess property sources and, after servicing, these will be placed "on the line" both on the observatory ridge and at the Amado field office thus supplementing existing firefighting equipment.*

In conjunction with Kitt Peak National Observatory we started planning to conduct a series of experiments utilizing a simple camera system to obtain photographic visibility distances from the KZAZ TV site. This was done for several months on a part time basis prior to the summer rainy period..

*Chuck Tougas recommended that the summit road construction start as a "in-house" basis utilizing Jessie Sinka and his mining crew.*

The work actually started in November.

While working on this job Jessie was loaned a Observatory crew cab pickup truck for hauling his crew and equipment. He drove this pickup home nightly so he could get an early start in the mornings.

Jessie lived in a trailer on Bekins's property in Amado. One night during this road project a vehicle pulled into Jessie's yard and opened fire on the pickup and his trailer. Jessie hit the deck and waited for the shooting to stop. After about five minutes of intense activity the vehicle raced away.

This incident was never reported to the local sheriff.

Jessie continued to use this crew cab (with bullet holes) on the job after the Observatory replaced the vehicles window glass.

What was that all about? Who knows?

June 1971

Temporary employees, Wages As Earned (WAE) included: Henry Vilia, Rudy Salcido, Don Monzingo, Arnie Valdez, Tony Jimenez, Alen and Tom Linderman, Laman Lankford, Robert Hollinesworth, Tim Clark, Carlos Colderon, Basil Dye and Jessie Sinka. These men worked on the road surfaces and on the Lewis Building (Wickiup).

BEKINS MINERAL RESOURCES  
 10850 Riverside Drive  
 North Hollywood, California 91602

THESE SUPPLIES AND/OR SERVICES  
 HAVE BEEN RECEIVED SATISFACTORILY  
 AND PAYMENT IS RECOMMENDED

#289

DATE 12-3-71 SIGNED [Signature] Date November 26 1971  
 To Smithsonian Institution Mt. Hopkins Observatory

Address P.O. Box 97

City Amado, Arizona 85640

Nov. 1	4 hours Caterpillar D8 Bulldozer on Mountain road work at \$25/hr 6 hours compressor (500cfm) at \$15/hr.	100 00 90 00
Nov. 2	3 hours D8 Bulldozer time 6 hours compressor time	75 00 90 00
Nov. 3	3 hours D8 Bulldozer time 2 hours compressor time	75 00 30 00
Nov. 4	2 hours D8 Bulldozer time 2 hours compressor time	50 00 30 00
Moving	charges for pulling D8 Bulldozer off mountain at end of job: 12 hours	300 00
Moving	charges for pulling D6 Bulldozer off mountain at end of job: 6 hrs at \$20/hr	120 00
Moving	track air drill rig off mountain at end of job: 12 hours at \$10.00/hr.	120.00
	Total	\$1080 00
	Plus invoices for materials as follows:	
	D.W. Jaquays Equip. Co. Inv #91526	85.36
	Arizona Cedar Rapids Co. Inv. #T15302	99.96
	Arizona Cedar Rapids Co. Inv # T15514	51.08
	Arizona Cedar Rapids Co. Inv. #T15453	61.11
	Bill Wieman Petty cash slip for gasoline	2.51
	Sarge's Arco Service Gasoline #7026	1.36
	Sarge's Arco Service Gasoline #7630	2.09
	Sarge's Arco Service Gasoline #6992	3.40
	Sarge's Arco Service Gasoline #8036	.98
	GRAND TOTAL	\$1387.85

Redifrm  
85 882

STATEMENT

JESSIE'S INVOICE

July 1971

The near new 250 KW Caterpillar generator was placed into service and has been performing very satisfactory. Minimum voltage and frequency fluctuations have been observed.



Vol. XI, No. 4

Autumn 1971

## SAO and U of A To Build MMT

The University of Arizona will team up with SAO to build a Multiple-Mirror Telescope (MMT), a radically new type of astronomical instrument using an array of several relatively small mirrors to produce a single large telescope.

The unusual MMT concept will cluster six 72-inch mirrors around a central core so that light from celestial sources that strikes each of the individual mirrors will be focused into a single image, thus producing the light-gathering power equivalent to a 176-inch telescope.

In addition to conventional optical astronomy, the MMT will have special capabilities for use in infrared research. The instrument, which is expected to be operational in about 10 years, will be the world's third largest optical telescope and the largest ever designed for infrared astronomy.

In late October, the Arizona Board of Regents gave approval for the University to participate with SAO in the joint project.

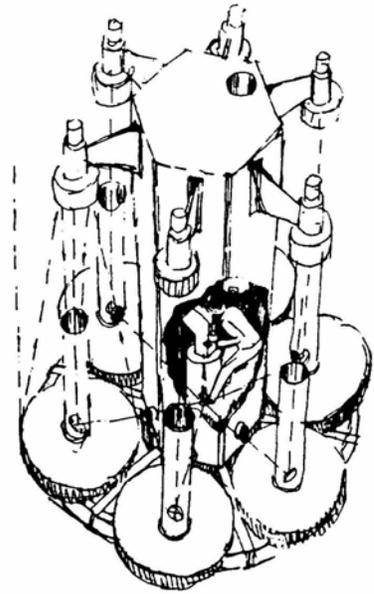
SAO's part in the MMT effort is funded by an initial Federal appropriation of \$500,000, with comparable funds expected in each of the next 2 fiscal years.

The University will contribute the six quartz mirror blanks that make up the optical system, and its laboratories will prepare the mirrors for astronomical use.

An eight-man Multiple Mirror Telescope (MMT) Committee chaired by Dr. Fred L. Whipple has been formed to direct the development, operation, and administration of the facility. Other SAO members of the committee are: Dr. Nathaniel Carleton, Dr. David Latham, and Mr. Robert Bartnik. The University members are Drs. Frank Low, Aden Meinel, Albert Weaver, and Raymond Weymann.

\* The MMT will be located at either the Smithsonian's Mt. Hopkins Observatory south of Tucson or at the University's Catalina Station on Mt. Lemmon north of the city. For the past 6 months, atmosphere-quality tests have been conducted at both sites.

The determining factor in the tests will be the amounts of light pollution (reflected ground lights) and water vapor (the gaseous state of water that absorbs celestial infrared light) over the prospective sites. The test results should be announced sometime later this year.



Artist's conception of the MMT's six-mirror configuration.

## ISRAEL DEDICATES FIRST OBSERVATORY

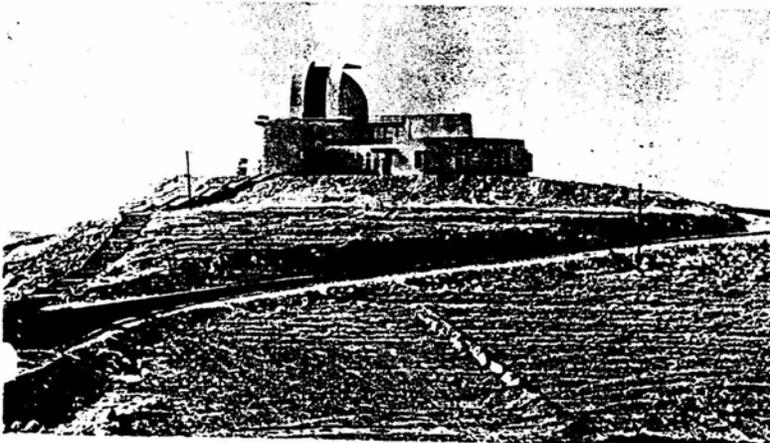
The first astronomical observatory in Israel officially opened October 26 at Mitzpe Ramon, a little town some 100 miles south of Tel Aviv in the Negev Desert.

Some of the world's leading astronomers were among the 300 guests attending dedication ceremonies for the new Florence and George S. Wise Observatory, a field research facility of the Department of Physics and Astronomy of Tel Aviv University.

The \$1.5 million installation features a 40-inch reflecting telescope and its associated electronic equipment for advanced studies of the stars and galaxies and for research on quasars and x-ray sources.

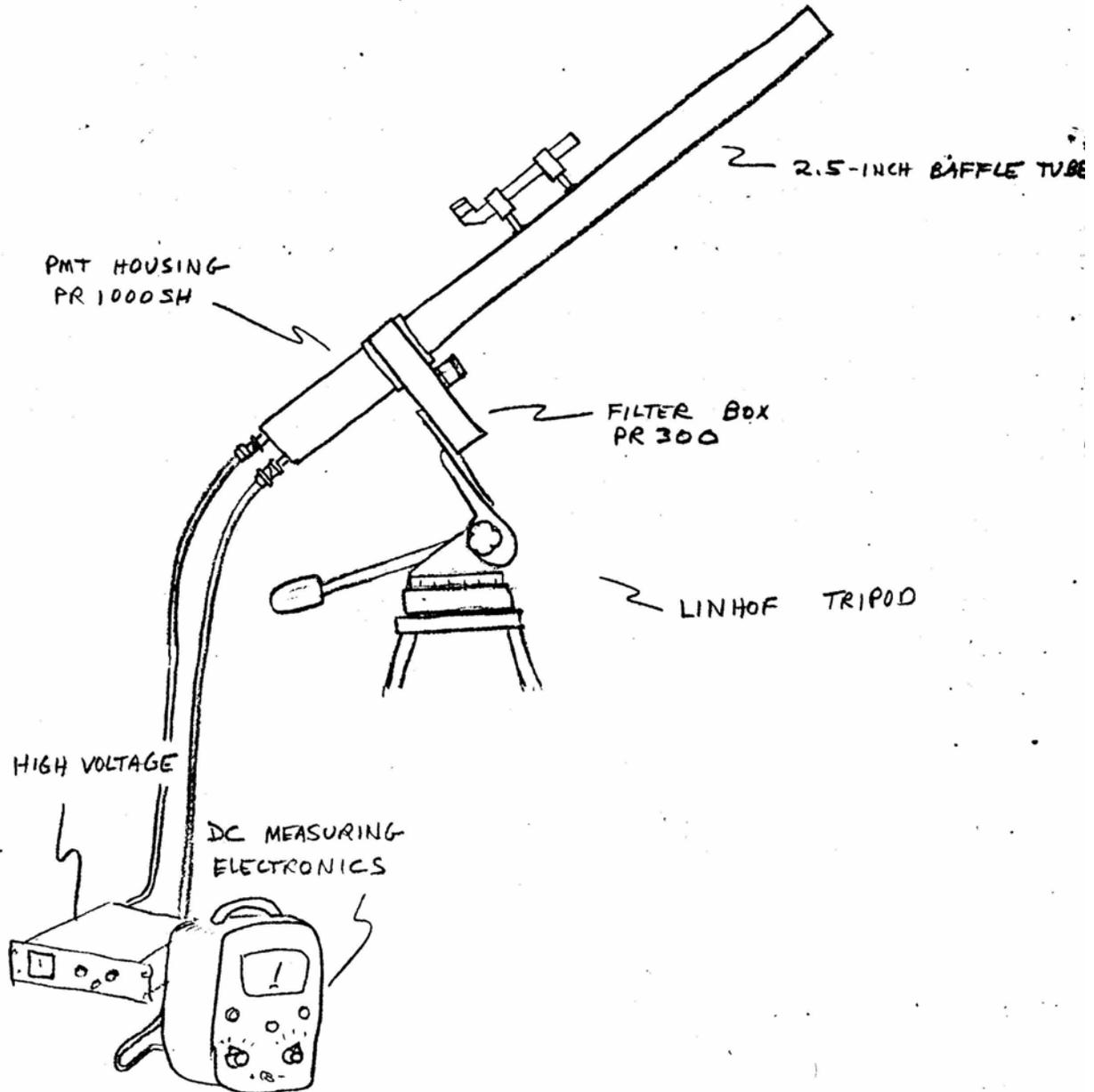
The location of the observatory makes it particularly useful for cooperative programs with observatories in the Western Hemisphere. Although located at approximately the same latitude as most major US observatories (i.e., Kitt Peak, Mt. Palomar, Mt. Hopkins), the 10-hour longitudinal gap between the two areas of the world provides a theoretical 18-hour period of darkness for long-term Israeli-American observations of time-dependent phenomena.

The new observatory was established with assistance from the Smithsonian Institution, which made some \$500,000 in US-Israeli "counter-part funds"



The new Wise Observatory perched 3400 feet above the Negev.

14 APRIL 71  
DWL



DAVE LATHEM'S SITE TESTING PHOTOMETER

The above instrument was added to our other site testing equipment and used to compare the "seeing" qualities between Mt. Hopkins and Mt. Lemon during the summer months. A part time assistant Luis Salazar was hired to work with Ken Goodwin, DeWayne Kurtenbach and Don Hogan. The data was analyzed here and at SAO.

August 1971

Some planting of shrubs and trees was accomplished with the help of County Agent Dan Gerhart. This beautification Effort is the start toward making the ridge more presentable.

The recently constructed dormitory should be ready for occupancy in September.

The construction of the road to the summit has reached the half way point.

October 1971

Several deluge-like rain storms hit just prior to the scheduling of the seal coating as an anti dust measure. Repairs had to be made on shaping the surface before the seal was applied. The delays were costly in time and equipment rentals.

Mr. Mike Megariz of the support crew received minor injuries after jumping off a pneumatic-tired roller near Lobo Canyon. In coming down hill the brakes started to smoke until there was no stopping this flat-land roller. Mike bailed out while it was gaining speed and just prior to hitting a bump in the road. Hitting the bump it went over the side and down several hundred feet before coming to a halt at the bottom of the canyon. Estimated cost to repair this roller was \$5,462. After negotiations the Observatory wound up buying this smashed piece of steel and then sold it to a junk dealer.

The following are some interesting comments extracted from Sanford Evans, Civil Engineer, letter to John Gregory at SAO. The estimated road length from the Mt. Bell site to the saddle of Mt. Hopkins is 6,400 feet. One can expect about forty percent rock and ledge factor. One a good day you could expect to progress about 150 feet per day. There is no way to make a meaningful cost estimate. The contract must provide flexibility based on conditions.

YEAR 1972

March 22,1972

After months of planning we started a helicopter airlift of 30 tons of material to four summit sites for "seeing" tests.

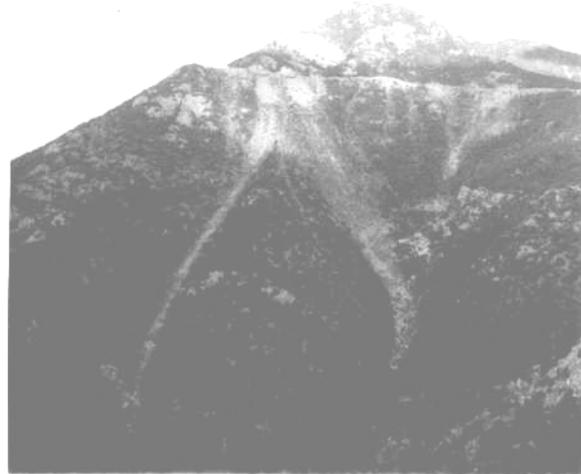
The road to the summit ended on the west side of the mountain about one half mile above the "Wishbone Scar". Money was not available to build a proper dirt road to the summit. Jessie Sinka and his local mining crew were hired to build a *cheap* rough "jeep-trail" to the summit from Knoll #4.

They failed to follow the survey markers or proposed grades. When the going became difficult, with ledges and huge boulders, they went above and below the grade stakes. Indiscriminate blasting resulted in two major vegetation scars on the mountain.

When the Forest Service, Ranger Randy Riley, discovered this trail building all work ceased immediately. A notable quote was made by the Forest Service Engineer Mike Nolan. **"You can see those damned scars all the way from El Paso."**



MOUNTAIN BELL SCAR



WISH BONE SCAR

Needless to say we lost credibility with the Forest Service. They made more frequent visits to the mountain and took longer looks at any proposed building plans.

Extensive design drawings and engineering calculations were required by Tom Hoffman, SAO's Engineer, to construct wooden "A" Frame towers for "seeing tests" in the summit area. Similar towers had been approved and were used on the ridge for several years.

March 23, 1972

We completed the helicopter airlift of 3 large "A" frame towers, water, cement, cement mixer, 3-12 foot, 12 inch, culvert pipes, plywood, lumber, tools, wire and cable, test instruments, and a small travel trailer with a 25 inch excessed color TV set.

Summit crew K. Goodwin, D. Kurtenbach, C. Tougas, M. Megariz, A. Valdez.

Ridge crew - G. Veith, M. Clark, A. Jimenez, D. Gingerich, K. Morrison, D. Hogan.

Three sites in the summit area were selected for site testing. Prior to the airlift brush was cleared, 5'X5'X3' holes were dug with picks and shovels for the telescope pier bases.

A Alouette III helicopter could lift about 1200 pounds in our mountain altitude. The air time rate was \$500 per hour which meant we had to have our act together. The average pallet trip took

about five minutes, round trip, from the ridge. Additional time was required to place the "A" frames over the base holes and to fly the travel trailer to its site. Once the "A" were positioned the 12 foot by 12 inch steel culvert pipes were airlifted "end-on." These pipes were lowered slowly through the "A" frames into the holes.

We started at 6 AM planning on a one day 10 hour operation. Two days were required. The helicopter's fuel truck broke down on the road to the Observatory. After a number of trips everything stopped while the helicopter waited for more fuel. We were not charged for the down time.

The summit crew hiked to the summit, with their lunches, prior to the helicopters arrival from Phoenix.



## HELICOPTER AIRLIFT FROM RIDGE TO SUMMIT SITES

Quick hookups and releases were made by using sling rings and nautical type pelican hooks. If endangered the pilot could also release the load.

Seventy-two, mostly pallet lifts, were made successfully. A 2,600-foot spool of three conductor electrical power cable was also airlifted. This was later pulled downhill to Knoll #4 and acted as a very long extension cord for the weather instruments and the TV set.

When all materials had been delivered to one site the summit crew quickly hiked to the next site. The cement mixer was delivered to the highest site and later pulled downhill to the next work site.



TEST TOWER UNDER CONSTRUCTION

April 5, 1972

The Summit "A" Frame Test Site #1 (the present MMT site)

construction was completed.

The Observatory obtained a new GMC dump truck and a Allis Chalmers 1 cubic yard front end loader for road work and other projects. These units were the first new machinery that was added to the motor pool fleet.



DR. TREVOR WEEKES AT THE SUMMIT TEST SITE

April 11,1972

Mixed and poured the concrete base of the Site #2 test tower.

April 18,1972

Mixed and poured the base of the Site #3 test tower. (present 2006 IOTA SITE).

April 25,1972

Dragged the cement mixer from the bowl downhill on the north side of the mountain, several miles, to the parking lot in Madera Canyon. It was then loaded on a pickup and hauled back to Amado. It was too expensive to leave on the summit or to replace. It was needed for other projects on the ridge.

April 27, 1972

Setup and aligned the Questar telescopes on all three sites. Weather instruments were set up at the trailer site in the saddle north and just below the summit.

April 28, 1972

A Mt. Hopkins staff reorganization brings on J.T. Williams as Field Manager, George Veith as Assistant Field Manager, and Dave Gambrell as Administrator. Chuck Tougas and Ken Morrison remained on staff but were relieved of all administrative responsibilities. Wyt Wright was designated as Safety Officer. The pool table was moved from the Support Building and setup in the Wickiup

May 8, 1972

Summit simultaneous site comparisons were begun by observers K. Goodwin, D. Kurtenbach, D. Hogan, and David Latham (SI Cambridge).