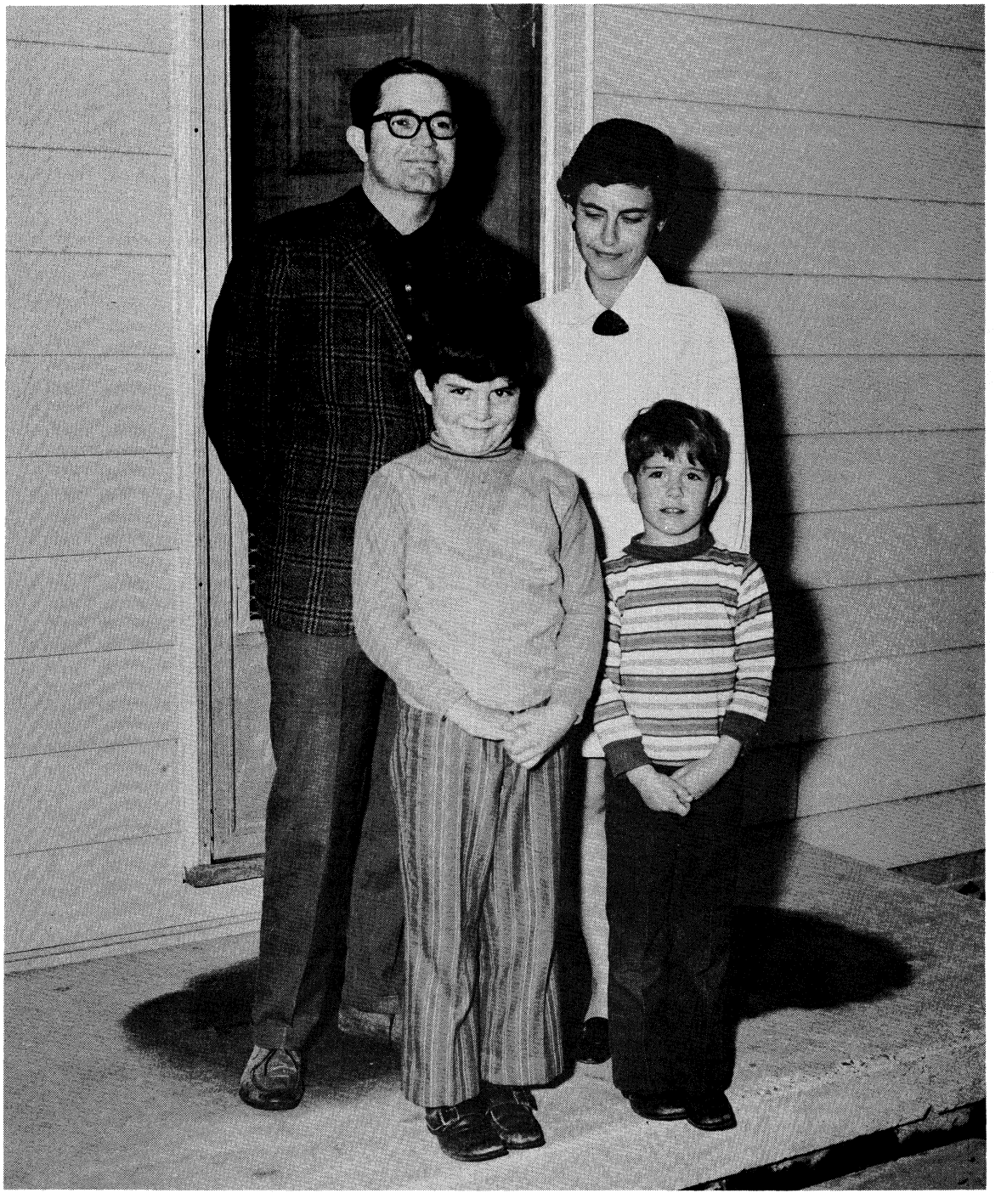
The OBSERVER

Vol. 10, No. 6 November 1970 Page 1



THE DAVID HOGGS

See story on next page.

FROM THE DIRECTOR'S OFFICE

W. E. Howard

On the cover of this issue of The Observer are Dave Hogg, his wife, Carol, and sons, Brian and Doug. Dave was appointed this fall by Dr. Heeschen to be the new Assistant Director for Green Bank Operations, succeeding Mort Roberts who has returned to Charlottesville to devote his energies full time to science again. The Hoggs moved to Green Bank in early September, immediately after a trip to Europe where Dave attended the symposium on quasars and radio-galaxies in Uppsala, Sweden and the International Astronomical Union in Brighton, England.

Dave was born in Ontario, Canada and is the son of two astronomers, the late Frank S. Hogg and Helen Sawyer Hogg, who is on the staff of the University of Toronto. He received his B.A. in physics and mathematics with first class honors at Queens University, Kingston, Ontario, his M.Sc. at Queen's and his Ph.D. in 1962 from the University of Toronto. He first came to Green Bank as a student in 1960, observed for his thesis on the 85-foot Tatel telescope, and joined the staff of the NRAO in late 1961. Dave has a long-standing research interest in supernovae and since the inception of the NRAO interferometer, he has been not only a major user of that telescope but also a mainstay in its planning and operation, being both the telescope observer's "friend" and its chief scheduler.

We all wish Dave Hogg well at his new job. His familiarity with the staff and telescopes at Green Bank, coupled with his enthusiasm and friendly nature, all point toward success in Green Bank. We'll miss him in Charlottesville!

****

The OBSERVER is a bimonthly publication of the National Radio Astronomy Observatory, P.O. Box 2, Green Bank, West Virginia 24944.

HAPPY HOLIDAYS

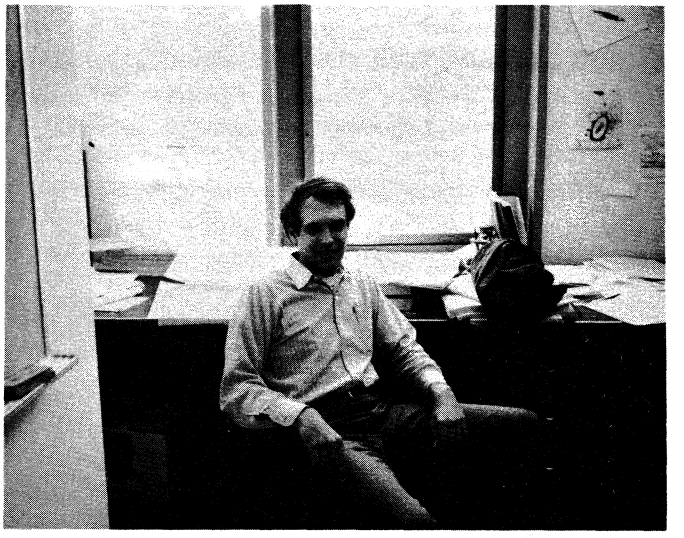
AN EXPERIMENTAL TEST OF GENERAL RELATIVITY USING A RADIO INTERFEROMETER

Richard Sramek

Einstein's General Relativity Theory, first published in 1916, is a theory of gravitation. Like the classical gravitation theory of Sir Isaac Newton, it seeks to explain why objects are observed to accelerate towards each other (e.g., apple falling to ground, Earth falling around the Sun, etc.). Newton postulated that all bodies exert a force on each other which is proportional to the product of their masses and varies inversely as the square of their separation. This theory stood for a couple hundred years and very successfully predicted the orbits of stars and planets. However, at the beginning of the Twentieth Century, Newtonian gravitation was found incompatible with the more sophisticated and physically accurate theories used to describe electromagnetic and high velocity phenomena. Rather than patch up Newtonian theory, Einstein suggested a whole new approach to gravity (an approach which agrees with the successful Newtonian theory in the limit of weak fields and low velocities).

In General Relativity it is postulated that a massive body warps the space around it and that gravity is not the result of a force but is just "straight line" motion in this curved space (to be more exact, geodesic motion in a non-euclidian, four-dimensional space-time).

With gravity a property of space rather than a particle-particle interaction, motion predicted by General Relativity differs somewhat from that predicted by Newtonian theory. For one, in Newtonian Theory, a light ray, being massless, will not be deflected while passing a large body (like the Sun). However, in General Relativity, the ray will move through space in a curve just as if it were a solid high velocity object. This deflection is very small, only 1.75 arc-seconds at the limb of the Sun. Astronomers have attempted to measure this during the last fifty years by measuring the positions of stars near the Sun and seeing if they are deflected from their positions when the Sun



Author Sramek

is on the other side of the sky, six months later. This technique has established that there is a deflection but the values obtained from several attempts are not vert consistent.

Last year, two groups of radio astronomers at CalTech tried a similar experiment at radio frequencies using interferometers in California. The position of the radio source 3C 279 was monitored as the Sun approached it. The source was seen to shift by the amount predicted by General Relativity with a possible experimental error of ± 10%.

This year the experiment is being done with the NRAO interferometer in an attempt to measure the value of the deflection to within ± 1%. Another theory of gravitation, the Brans-Dicke theory, predicts a deflection about 7% less than Einstein's General Relativity. If a high accuracy measurement can be made, we will have experimental evidence for one theory or the other. The long baseline and two receiving frequencies available with the NRAO interferometer may make such a distinction possible.

****

TERMINATIONS

E. Wayne Bostain ..... Computer Division

Shirell A. Farris ..... Computer Division

John B. White ..... Plant Maintenance

****

NEW-OLD EMPLOYEE

Dorsey L. Thacker ..... Electronics - CV

Welcome back, Skip!

****

Information for the "New Employees" and "Terminations" Sections supplied by Mary Ann Starr.

****

TRUSTEES' MEETING

The Trustees of Associated Universities, Inc., held their annual meeting in Green Bank on October 15 and 16. Business meetings were held the afternoon of October 15 and the morning of October 16. New members elected to the Board of Trustees are:

Dr. A. G. Hill (MIT)
Dr. A. K. Mann (U. Pennsylvania)
Mr. B. G. Willis (Johns Hopkins)
Dr. C. Bockelmann (Yale)

In addition to their business meetings on October 15, the Trustees heard scientific presentations by David Buhl, Richard Sramek, and Robert Hjellming. These talks were followed by a tour of the telescopes with staff members as guides.

OLD FRIENDS-NEW FACES

Frances Copper

Professor Donald Osterbrock, University of Wisconsin, will give a talk on "Ionization and Excitation of the Gas in Seyfert Galaxies," November 12, 1970 at 4:00 p.m. in the Charlottesville auditorium.

Dr. Robert Whitehurst, on sabbatical leave from the Department of Physics, University of Alabama, has been a visitor at the NRAO since September. He will be with us until February 1971.

Robert Whitehurst

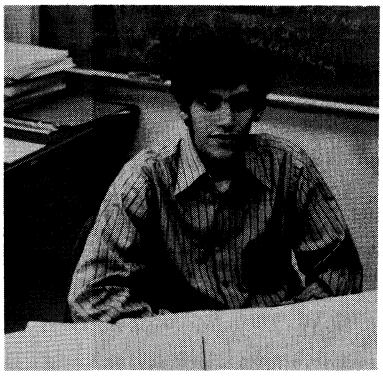
****

Alas, β Lyrae, Alas!
You're Entirely Surrounded By Gas
Your Turbulent Streams
Give Poor Otto Bad Dreams
And Prevent Him From Learning Your Mass.

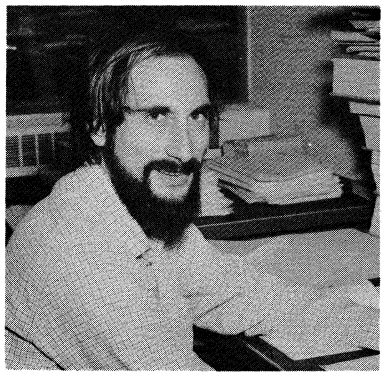
--Anonymously Attributed
To E. K. L. Upton

****

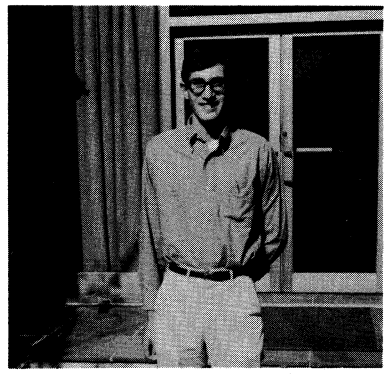
NEW EMPLOYEES



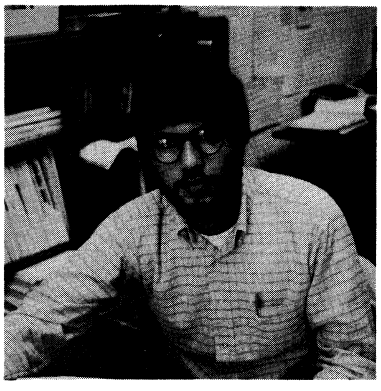
Alan D. Ezer
Co-Op - CV



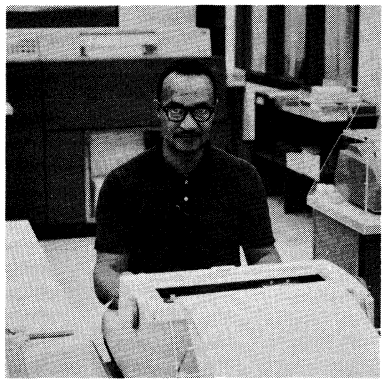
Edward B. Fomalont
Basic Research - GB



Louis J. Gross
Co-Op - CV

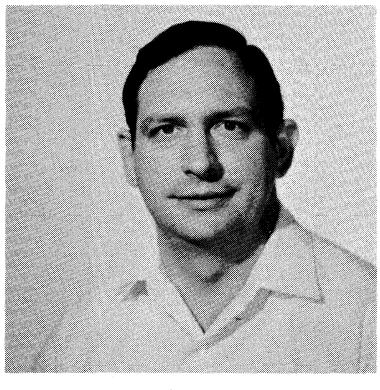


James C. JaFolla
Co-Op - CV

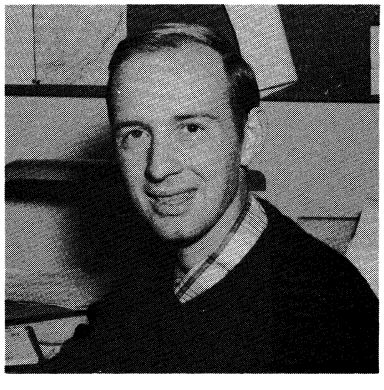


William R. Murray
Computer Div. - CV

James D. Scarl
Tucson



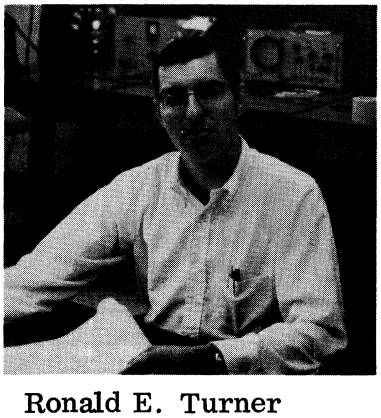
Ernest Schuetz, Jr.
Tucson



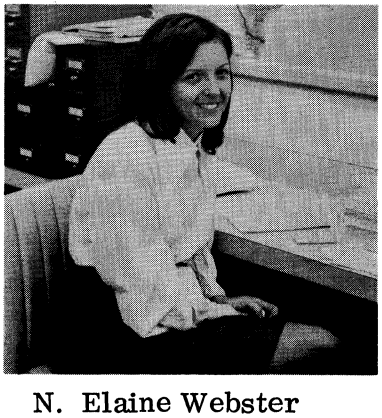
Lloyd M. Swartz
Electronics - GB

SORRY
NO
PHOTO

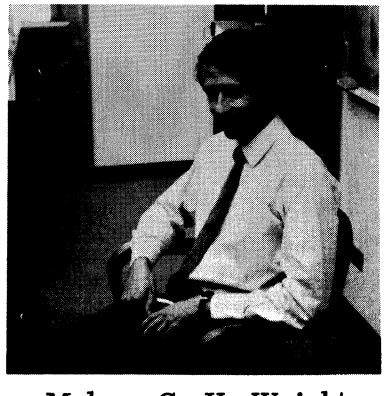
Martin L. Tester
Tucson



Ronald E. Turner
Electronics - CV



N. Elaine Webster
Scien. Services - CV



Melvyn C. H. Wright
Basic Research - CV

TOURIST PROGRAM

Wally R. Oref

This summer a record number of people will have visited the NRAO. Up to October 18, 20,380 people took the regular tour. Last summer 11,120 people visited the Observatory. Visitors came from every state in the Union and from many foreign countries as well. As in past years, the majority of visitors came from West Virginia and four neighboring states. Fifty-one percent came from West Virginia, 11% from Virginia, 10% from Ohio, 8% from Maryland, and 7% from Pennsylvania.

We expanded the tour program this year. The number of tour days was increased to 91. Last year we only had 52. This summer we offered 13 tours each day. Last year we gave only 5. In 1969 the tours ended on August 24, but this year we ended daily tours on September 7 and ran weekend tours until October 31. By giving daily tours, more tours per day, and extending the tour season, we feel we accommodated most of the visitors who wanted to see the Observatory.

The content of the tour program was also increased. Three information panels were placed at the tourist center, and one each at the 2-foot, 140-foot, and 300-foot telescopes. A 2-foot radio telescope observing at 22 GHz was added to the program to show how a radio telescope works and to explain how one is used. Stereo tape systems were installed in buses this year and a tape narration of the tour used.

Questionnaires filled out by visitors showed that they particularly liked the 2-foot, the movie, and the large telescopes. In general, they indicated they were pleased with the whole tour. However, visitors said that they were disappointed because they could not visit a control room or get closer to the larger telescopes (because of construction at the 300-foot and painting at the 140-foot). They suggested we include the calibration horn and a control room in the tour, and give more information about current and past research.

Looking over our records we noted the following miscellaneous information:

Most popular tour day:	Sunday
Least popular tour day:	Monday
Average number of tourists per day:	224
Most popular tour time:	9:30 a.m.
Highest one day's registration:	501*

* On September 6.

* * * *

SWITCHBOARD STATISTICS - GREEN BANK

Shirley Carpenter

August

No. of FTS calls placed	1,152
No. of FTS calls completed	505
No. of calls on tie lines	3,617
No. of calls through Lewisburg	75

September

No. of FTS calls placed	914
No. of FTS calls completed	410
No. of calls on tie lines	4,070
No. of calls through Lewisburg	121

Calls placed through Lewisburg consist of credit card calls, collect calls, return calls (back through operator numbers), personal calls, and calls that we have difficulty placing on FTS lines.

* * * *

ELECTRONICS - GB

Bill Brundage

In the front-end group, Moore, Becker, Dunbrack, Friel, McCormack, Miano, and machine shop personnel recently completed and installed an adjustable polarization system for the cooled OH receivers. It consists of a spinning horn at the vertex of the 140-ft and an intermediate frequency polarizing circuit. Observer Manchester likes it so well that now the 300-ft receiver group is planning to build a similar device. Roulette anyone? Where she stops, nobody knows!

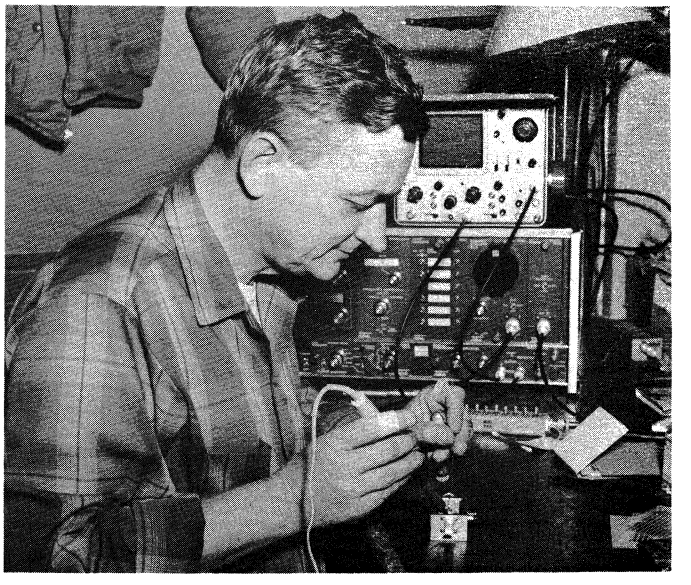
Behrens and Kuhlken, in between cryogenic paramps, are designing an antenna pattern measuring range. This will help us evaluate old feeds and design new ones. Wooddell and Balister built 600 and 800 MHz feeds for molecular spectral line observations on the 140-ft.

Dolan and Mayor are watching over two water vapor (22 GHz) receivers and are attempting to correlate atmospheric water vapor and droplets with abberations in the interferometer data.

Mauzy, Mayor and Friel of the receiver back-end group have completed and tested the IF filter system of the Model III Autocorrelation Receiver. Beale and Mauzy are developing a local oscillator system which takes a 5 MHz VLB reference signal and generates a phase-stable output in 10 MHz steps from 1 to 2 GHz. Balister, Jeffries and Becker are nearing completion of a prototype universal IF processor for the Model III Autocorrelator which will make its operation much more flexible. A critical part of the processor is a 1000 to 1300 MHz frequency synthesizer. It seems digital integrated circuits (40 transistors and 50 resistors, more or less, in one little 3/4 x 1/2 x 1/8 inch package) are no longer the exclusive domain of the digital group!

In the interferometer group, Coe, Shank, Ervine and Oliver are chasing a few remaining bugs out of the new 11/3 cm receivers. In between fumigating, routine maintenance, and telescope moves, they also are developing three new 21 cm front-ends with clip-on feeds for use with the new Model III Autocorrelator and line interferometry.

The 300-ft receiver group is frantically trying to get systems ready by the time the resurfaced 300-ft goes back into operation. A new 11 cm, 3-feed, 4 receiver front-end is taking shape under the hands of Fleming, Mayor and Morris. There was some excitement in the lab when the radome of a new feed blew out with a loud FOOM at only 3 psi before the very eyes of a vice president of its manufacturer Brundage and Skaggs are improving the pulsar receiver and preparing new cables for the traveling feed. The 21 cm, 4-feed receiver also is being improved. Fleming and Morris are going into "mass production" of wideband (20 to 600 MHz) solid-state amplifiers. Since these amps cost about 1/5 that of similar commercial units, they will be used extensively in receiver systems. Don must have acquired magnifiers for eyes since working on those miniature amps!



Don Morris

In October, Fleming gave a talk on radio astronomy to the Central North Carolina Section of the IEEE (Institution of Electrical and Electronic Engineers). Some recruiting too perhaps?

Continued, next page --

The digital group has expanded like an octopus, gobbling up another lab room and the VLB electronics group. Weimer, Hallman, Schiebel and Turner are slowly making headway adapting TV video tape recorders to take reliably 4-megabit data (that's 4 million bits of digital information per second). This seems to be a difficult feat. Co-op student Bonebrake has been working on a system to set clocks to within 5 microseconds of UTC time using Loran-C transmissions. Hansson, Mauzy, and Vrable are developing the VLB intermediate frequency processor, local oscillator and clock systems. On his return to Sweden, Bert Hansson will duplicate this system. Hallman completed a gaussian non-gaussian probability-density-function discriminator (how about that mouthful) which was used by Townes and company on the 140-ft. Clark, Vrable and Hansson nearly have working the VLB tape processor/computer system.

The instrument repair group of Anderson and Chestnut have acquired a few more components for the measurement lab. They are busier than ever keeping the growing number of lab instruments in working order.

Lloyd Swartz, the new Pocahontas County High School electronic technology and vocational electricity teacher, is working part-time with Dolan on interference studies and chasing. Welcome aboard, Lloyd, and happy hunting!

In between VLB front-ends, Payne and Becker (and Bowyer, of course) have been testing the feasibility of using an optical collimator in stabilizing to 2 seconds of arc a position reference platform for the homology telescope. During the course of a prototype system, they find the 140-ft deck moves around by some 10's of seconds of arc. Gee, and we didn't realize the 140-ft was mounted on a block of rubber!

****

MORE ELECTRONICS - GB

Carolyn Dunkle

Even though most of the astronomers were in Europe this summer, activity in GB Electronics moved along. Sandy Weinreb and family moved over for the summer and he kept the place jumping.

John Payne, handsome electronics engineer, pilot, never-going-to-get-married bachelor, seasoned traveler, girl chaser and chased by girls from many countries, caught (or was caught by) Linda Peery in Green Bank (that little isolated town in West Virginia, U.S.A., Continent of North America). We can definitely say that the marriage of John and Linda was the social event of the season (or seasons). The day that John announced, "I'm going to get married!" was a record day for remarks such as, "I don't believe it!", "You're kidding me!" and "Not old John!" — but sure enough, John and Linda took the marriage vows on August 22. Her dad, Buck Peery of Engineering, gave the bride away and John's parents flew in from England for the event. In case you didn't know, Linda is a grad student of Mary Baldwin and is now attending the UVA. John transferred to CV (reason obvious) but says he and Linda plan to return to GB soon.

There is a new face in the lab. It belongs to Bill Brundage. He shaved!

Dick Skaggs has been in Federal Court quite a few times lately. Guess you are wondering what a nice fellow like Dick has done. Answer: Nothing; just serving jury duty.

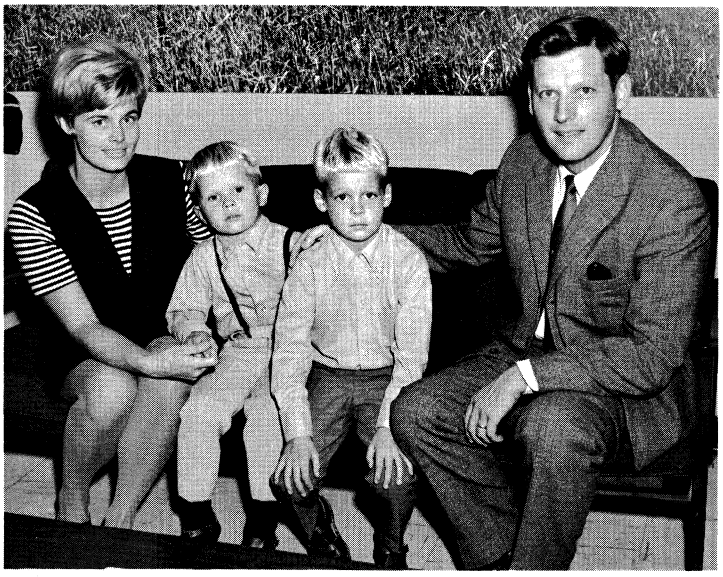
Mike Balister's caving expeditions are "quite the thing". He has discovered a cave which he will tell you about in the next Observer issue. He probably spends more time rescuing cavers than exploring.

The summer students were more quiet than ever before. Only one prank was reported, and they denied it. So, there are no funny stories to tell about what the students did to so and so. Diane Williams, the only female student in GB, was the leader of "women's lib" but she only had one follower — a male summer student.

Remark at annual picnic: "Dr. Hvatum, you're the sharpest guy in Charlottesville. You came to Green Bank instead of going to Europe." Reply: "I knew it all the time!"

By the time you read this, Bert Hansson and family will be back in Sweden. We enjoyed their three-month visit with us. Best of luck Bert, Brigitta, Anders and Erik! (See next page for photo.)

Continued, next page --



The Hanssons

****

APPALACHIAN POTTERS IN PERSPECTIVE

Virginia Van Brunt

Someone said that enthusiasm for pottery is reminiscent of childhood experiences such as making mud pies or wading through water pools and feeling the clay ooze between the toes. Whatever the reason, pottery is gaining favor as a medium of creative expression in the craft world, and Appalachian potters are joining the growing ranks of "mud-slingers."

Clay is one of the oldest of craft mediums and dates back to prehistoric cultures. Originally, forms were built up freehand or on a simple mold and dried in the sun. Various coatings were added to make them waterproof. With the discovery of fire, the potter's wheel, and a firing kiln, potters soon developed sturdy objects of a reliable, functional nature.

"Potting" has become one of the most popular handcrafts in this country, especially since the 1940's. The reasons are many, but probably the most important is the sheer excitement of the process. Opening a fired kiln is much like coming downstairs on Christmas Day, one never knows quite what to expect. There is an old story that Chinese potters carefully fashioned a clay figurine to be placed on the kiln door to ward off evil spirits and assure a good firing.

In the U.S. today, modern potters tend toward unique, one of a kind objects, such as casseroles, jars, murals in clay, and abstract structural clay forms—in stark contrast with mass produced items. Potters are throwing aside their functional traditions and are exploiting the use of clay as a form of artistic expression.

****

AUI SCHOLARSHIP WINNER

In 1965 the first two AUI scholarships were awarded to Carl Rose and David Hamed. Since then two scholarships have been awarded annually. In this article we report on Carl Rose. In the next issue we will report on David Hamed.

Carl M. Rose. Carl is the stepson of Bearyl McLaughlin, who is employed as an electrician in our maintenance division. Carl, better known as "Mike", graduated from Green Bank High School in June, 1965. He received his B.A. in Education from Marshall University in January 1970. While at Marshall University he was a member of the ROTC and Scabbard and Blade. Carl was commissioned a 2nd Lt., January 24, 1970 and at the present time is in the U.S. Army Helicopter School, Fort Walters, Texas.

He is married to the former Karen Boggs of Ravenswood, who is also a graduate of Marshall University.

****

2-FOOT TELESCOPE

Dick Fleming

The two-foot telescope was retired from active duty on September 6, 1970. This faithful telescope received a temporary honorable discharge for service performed during the summer tour program. Received along with the discharge papers was a letter of commendation from the commanding officer (Wally Oref) for service above and beyond the call of duty (putting up with summer students, tourists, and an occasional "news reporter").

A special pat on the dish was given to the young telescope for the confirmation of microwave noise emissions from rainstorms due to the electric discharges that occur between charged water droplets (Science, August 7, 1970, Vol. 169, p. 583).

Only a few battle scars were received with one being rather memorable and painful. The young telescope was performing his normal duty of staring at the sun hour after hour when a sharp sporadic pain was felt in the lower back-end (that's like back-end in a radio telescope). The chief surgeon was called in for a consultation and after several hours of testing and tourists asking, "Why doesn't it work? ", it was determined that one of the main operational amplifiers was faulty. A fast transplant was performed and the patient recovered completely to finish the summer's work.

It's not likely that this telescope will remain in retirement too long and about June of next year the Littlest Telescope will once again scan the sky much to the tourists' delight.

****

NRAORA NEWS

Jon Spargo

After a hectic summer, duing which your board strived to maintain the pace of accustomed activities while adjusting to our new non-dues paying system, things have begun to settle to something more or less like a normal routine. We are pleased to note that the annual picnic plus two pool parties were carried out successfully as well as several other minor chores.

In the work pending or completed department, there are several items worth mentioning. A new handball backboard has been completed and installed. The softball diamond and backstop were relocated and work is progressing on a chicken wire fence behind home plate. We hope the fence will save a lot of balls from going into the wilderness. The rifle range has undergone a face-lifting and it is hoped that a firing shelter will be constructed soon. A new plate has been constructed for the pottery wheel which is located in the ceramics room of the Arbogast House. In addition, the board appointed Mrs. Richard Fleming and Mrs. Michael Davis custodians of the pottery equipment. They have informed the board that they hope to have another "clay day" sometime this fall similar to the successful one held this summer.

We wish to thank all who have helped or are helping with the aforementioned projects.

Some items of current and future interest are as follows:

We are pleased to note that bowling leagues have been formed both in Charlottesville and Green Bank and are functioning well.

Organizational meetings for the winter basketball league are now taking place. Watch your mailbox and bulletin boards for notices.

Plans are well along for the Halloween costume party and dance on November 7. We regret the late date for the dance; however, the availability of a band dictated our final choice. Incidentally, the band will be "The Esquires". The dance will be held in the new warehouse auditorium.

We will soon begin work on the annual Christmas holiday activities.

We would like to remind you that a new budget will go into effect on the first of the year. Any items to be considered for the new budget should be in the board's hands by December 1, 1970, because the budget must be worked out and approved before January 1, 1971.

Continued, next page --

We would also like to remind you that the Recreation Association cannot function effectively unless members are willing to contribute. Please feel free to come to any of the regular monthly meetings. Monthly meetings are held on the second Tuesday of each month in the basement conference room of the Jansky Lab and start at 3:30 p.m. We will appreciate your ideas and your support.

* * * *

36-FOOT

Bob Hogarth

July and August were washed out by the seasonal rains, so we tore into the remodeling/expansion program. The control room was completely rearranged and one can now swing a cat provided it is short-tailed. There is much more equipment in the same room, and it is beginning to resemble a 747 cockpit.

Sid Smith, Dorman Williams and Boyd Wright were here in August to overhaul the dome door and install a new type of roller wheel, which works quite well. They also releveled the dome azimuth track.

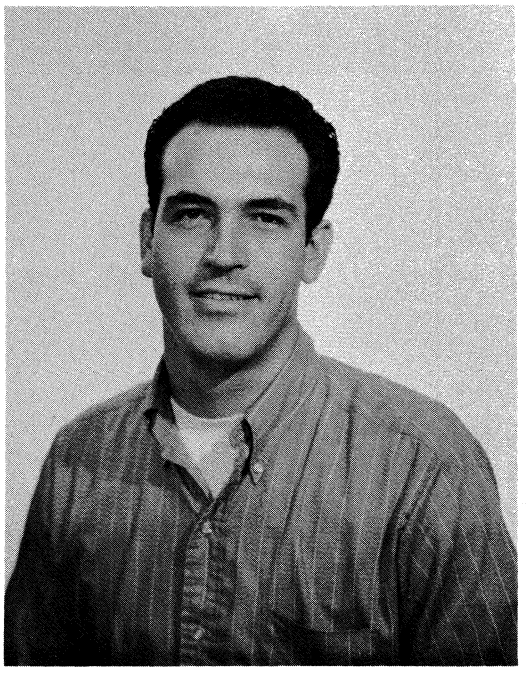
We are now a 24-hour operation, and we have acquired several new people as a result. Charles Lipscomb and Martin Tester are telescope operators, Ernest Schuetz, Jr., is our electronics technician and James D. Scarl is our digital technician.

Chuck comes to us from Alamagordo, New Mexico. He and his wife, Linda, have a 3-year old daughter, Shiela.

Jim is from Clemson University in South Carolina. His wife, Pat, their 7-year old daughter, Judy, and 2-year old son, Jim Jr., are getting use to life in the great southwest.

Marty and his wife, Hercilia, have been Tucsonians for the past nine years. They have four children: Harry (8), Trini (7), Mary (6), and Albert (4).

Ernie has been in Tucson four years. He is single, but says he is going to commit matrimony one of these days.



Charles E. Lipscomb

* * * *

300-FOOT TELESCOPE

Ken Cottrell

It wouldn't do for me to predict when the steel workers of Micro-T Corporation will finish constructing the new surface. The last time I attempted to report on their progress, my words, through no fault of my own, were ancient history by the time the Observer's press finally began to roll. So, I'll just cool it this time. Nary a word will I write about any deadlines or completion dates. We'll simply allow the eloquence of their performance to take its dazzling course. You may want to saunter by sometime to see for yourselves.

Be certain, however, that these steel workers are an impressive lot. They work swiftly and enthusiastically with precision. On a typical day they begin by unloading the four crates of new surface panels from RSI's daily scheduled tractor-trailer run. Gently, the panels are

Continued, next page --

uncrated and neatly stacked without so much as marring their glossy coat of fresh, white paint. (At this point engineer John Ralston, NRAO's quality watchdog for this job, can be seen scurrying about, inspecting every rivet, every brace, and summarily rejecting any panel which may be blemished.) The empty crates are replaced on the tractor-trailer and the driver is cleared to highball. The steel workers then carefully load the panels on their specially rigged, cable drawn freight elevator and lift the panels to the telescope's surface plane for installation. When finished, three or four of them climb aboard to steady the load and to guide it through the narrow passage formed by the telescope's structural framework. A spirited rebel yell (most of the steel workers are from Oklahoma, Mississippi, and West Virginia) pierces the stillness of Deer Creek Valley, ground man Harry Chocklett engages the winch, and elevator and cargo creep upward. When the surface plane is reached, two rebel yells sound out, a signal to stop the elevator. The panels are off-loaded, and now begins a display of that prowess and that defiance of danger by which steel workers earn their pay and justify their pride. Some of the surface panels can be carried by one man. They are approximately ten feet long and three feet wide. Each worker takes one, raises it above his head, and balances it. Adroitly, like a high wire performer, one hundred feet above terra firma he walks along a two inch steel beam to the location where the panel will be fitted and bolted into place.

As many as one hundred two panels have been installed in a single day — a record that may be surpassed before the job is completed. The work is being done with such precision that only minor secondary adjustments will possibly be necessary.

Micro-T Vice President, Donald G. Wood, and his professionally endowed crew merit high praise for a superb accomplishment.

Engineer William del Guidice has designed and directed the construction of a highly effective separator tank to eliminate any traces of oil pollution in Deer Creek which might be caused by drainage from the 300-foot drive machinery. The tank, in this particular application, will separate oil from water. It operates on the principle that oil floats on water. Discharge from the telescope pit sump will enter the tank. Any oil in the discharge will flow off into a separate compartment where it will be trapped. When necessary, the recovered oil can be pumped out through the tank and into the normal telescope drainage system.

The essential cause of oil pollution from the 300-foot has been overflow of the drive chain oil bath. This occurs primarily as a result of heavy rains and melting snows. The drive chain oil bath is a metal trough-like container mounted in the telescope pit area. It is partially filled with oil. As the telescope is moved, its drive chain passes through the oil — a means of lubrication. Outside the pit area the chain is exposed to the weather. When it rains, or when snow is melting, water runs down the chain and into the oil bath, causing it to overflow. Such overflow will now be pumped into the new separator tank.

The telescope mechanics have spent much time and effort to alleviate the overflow problem. They have sealed the pit area against the weather and are now taking steps to place a heavy sheet-metal covering over the entire length of the drive chain as a protective water shed outside the pit area.

Recently, 300-foot and 140-foot operations personnel were granted the gratifying privilege of visiting the NRAO's Charlottesville headquarters. It was a whirlwind, one-day encounter but our main objectives were accomplished. We wanted to follow-up the finished product of our labors. We wanted to observe and learn more about the process of digital tape data reduction. We especially wanted to discuss some of the complaints and problems which are mutually shared with the Computer Division people. We wanted to more fully appreciate the human dimension of our company by a face-to-face meeting with the Charlottesville employees — people

Continued, next page --

whom we had worked with only in an obscure way, through telephone conversations and inter-office memos.

Just for a day we had the run of the place. We toured the entire building, met a lot of interesting people, visited with some of the scientists we had worked for at Green Bank, peered in on Jack Cochran's exotic electronics experiments, and marveled at the watch work miniaturization of Art Shalloway's autocorrelator modules. We were impressed by the all-business hustle and efficiency shown by the IBM 260 operators. We enjoyed the hallway pictorial display of many of the world's major radio telescopes, more telescopes than I thought existed.

It was a good and productive enterprize and we would like to express our sincere thanks to those who made it possible.

"We're gonna get it together" may be the appropriate refrain around the 300-foot these days. Activity is intensifying. A new scientific instrument is being born — a more powerful instrument, capable of expanding man's comprehension of the universe. Reason, however, would stoically forewarn against the expectation of any final revelation. In searching out the universe we are forever at the beginning. H. G. Wells has put it right.

> " For Man there is no rest and no ending — he must go on — conquest beyond conquest. This little planet, Earth, its winds and ways and all the laws of mind and matter that restrain him. Then the planets about him. And at last immensity to the stars. And when he has conquered all the deeps of Space and all the mysteries of Time — still he will be beginning. "

Yet, at this crossroads of creation, we will not relinquish a special longing. Our hearts earnestly whisper that the times are fulfilled. This imperfect product of man's sublimatory urge will find the mark. One clear, star-studded night, under the control of our undeserving hands, it will detect, display, and record some cosmic pulse of everlasting hope. The human spirit will soar again, and peace and brotherhood will play a long, healing visit to this threatened mit of dust called Earth.

* * * *

WHY WE ARE CLEANING UP THE 300-FOOT SURFACE

M. Davis

The scientific benefits of the new surface are twofold: we will have a "clean" beam at 21 cm, and we will be able to observe at shorter wavelengths; just how short is to be determined by a series of test measurements to be done when the surface is finished. The so-called "error beam" with the old surface represented a loss of about half of the effective area of the telescope at 21 cm and, being about 6 degrees wide, produced spurious responses when the telescope was used in or near the galactic plane or too close to a strong radio source. When the "error beam" disappears with the new surface, we will not only improve the sensitivity at 21 cm by nearly a factor of two, but we will be able to observe near the galactic plane and close to strong radio sources without the spurious signals that used to plague these observations. Hydrogen line observations at 21 cm will be more precise and easier to interpret. Observations of OH at 18 cm will be practicable, and a new multi-feed 11 cm front-end is being built for use with the re-surfaced telescope. Observers of extragalactic hydrogen are looking forward to the tracking capability of the new focusing rig, to be installed next year, since it now takes an hour of observing at the 140-foot to achieve the signal-to-noise ratio which will be obtained in a single four-minute observation with the re-surfaced 300-foot telescope.

Careful attention to calibration procedures will be needed, particularly at short wavelengths

Continued, next page --

since the bending of the back-up structure with changing zenith angle will be the limiting factor in these observations. However, the increased sensitivity and wavelength capabilities offered by the new surface open a broad spectrum of astronomical problems to study.

* * * *

NOTES FROM THE LIBRARY

Virginia Van Brunt

In an earlier column we wondered aloud if anyone could tell us how the DOGWOOD got its name. A recent communication from the National Museum of Natural History at the Smithsonian Institution has finally given us some answers. The source is a 1617 reference from A New English Dictionary on Historical Principles edited by James A. H. Murray and printed in 1897. This reference states that the tree was called "Houndes tree", "Hounde berie", or "Dogge berie tree" because things considered inedible or useless to man were often termed "dog".

A citation dated 1838 derives the name from a mixture of the leaves used to wash dogs, and free them from vermin.

Now that the last of the summer students have gone, we welcome the staff back to the library. There are even chairs to spare again. I would like to remind new staff members that forms are available in both libraries for ordering reprints and personal books at discount prices through the library book dealer.

We are all aware that mail service is sometimes slow. Perhaps the following example of a confused address explains to some degree why mail is slow. An envelope received in Tucson from the USSR acknowledging receipt of our reprint series was addressed as follows:

National Radio Astronomy Observatory
Green Bank West Virginia
Charlottesville
Tucson Arizona
USA

We are happy to know NRAO reprints reach Russian astronomers but our mailing labels must really confuse the Russians.

* * * *

FEATHERS, PLEASE!

Jon Spargo

In this day of enlightenment and good will toward our brother, there remains yet another situation to which the application of brotherly love and compassion may yet save the day. I'm speaking of the plight of our red brother, the American Indian, and in particular those of the Southwest United States.

In a recent letter from my sister, who is employed by the National Park Service as an archaeologist, I was informed that the indians of that area were no longer permitted to hunt certain species of wild fowl for the purpose of obtaining feathers for their ceremonial headdresses. I was then asked if perhaps I could supply the needed plumage of thse hapless indians by reason of the bountiful supply of wild turkey in our area.

Alas, a hunter I am not, and so I appeal to those that are to help me. If you are among the fortunate ones who have bagged a turkey, or know someone that has, and wouldn't mind surrendering the feathers, I will gladly accept all donations. I am told that the wing and tail feathers are the most desirable, although any and all kinds will be accepted.

On behalf of my sister and the indians in her region, I thank you.

* * * *

To reason without data is nothing
but delusion.

---

* * * *

CLEANING UP THE 300-FOOT SURFACE

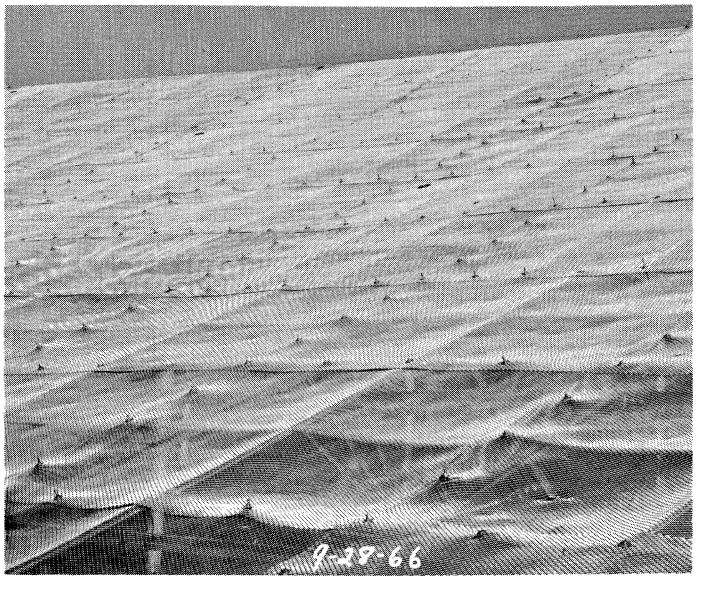
John Ralston

Added to the spectacular panorama of the fall season color in Deer Creek Valley is a new addition. This added attraction has been in the making since June 11, 1970, and should put an everlasting touch to the beauty of the 1970 fall season at NRAO.

Although the natural panoramic beauty will fade as winter nears, the 300-foot telescope with its magnificant new face will be a scenic view for many seasons to come.

This engineering endeavor was started in April 1969, when Rohr Corporation finished the Reflector Surface Replacement Study and was released for further study by the NRAO Engineering Division.

Many hours of study and thought are wrapped up in Rohr Corporation's concept of an adjustable mounted, light-weight screen surface panel to be installed on a twisted, deflected and unsteady structure that has been a work horse for the scientific staff since it became operable in the fall of 1962.



Old Surface of 300-Foot

The new, adjustable panel concept was a real challenge to the Engineering Division and an equal challenge to telescope operations, electronics, and the scientific staff.

After specifications were drafted by us, specifying the criteria for fabrication and installation, a bid package was assembled and sent out to five different companies which were qualified on past performance bases. All five prospective bidders returned bids, and evaluation of these bids required further effort by engineering and administrative people to choose the best qualified bidder. After several trips to the fabrication plants of the prospective bidders, the award was given to Radiation Systems, Inc., McLean, Virginia.

Panel production started in early spring on the 1,308 panels of 39 different configurations in size and shape. In the meantime, Micro-T, Inc., was awarded the subcontract to remove the existing mesh surface, adjusting studs and supports, and install the new support saddles and panels for Radiation Systems, Inc.

On June 9, 1970, the 300-foot telescope was stowed and the refurbishing began. The old screen was removed progressively as the new saddles were installed. On August 1, the 2,640 saddles were completely welded to the structural back-up structure of the antenna to a tolerance of 1/4" in elevation, ± 15 seconds of arc on slope angle of the top surface of the saddle and ± 1/4" circumferentially and radially from focal axis. These tolerances were an absolute "must" for the panels to fit on the saddles and maintain proper gap between panels along with only minor elevation adjustments to bring the 7,848 control points (6 per panel) to the proper contour.

The twisted, deflected, massive structure began to "grin" as its face became properly shaped. The top surface was then given two coats of paint and the "grin" became broader. The 2,640 adjusting studs with mounting plates to receive the new panels were installed and set to a constant dimension above the saddles.

Continued, next page --

Since the new panels had not arrived on site yet, work was stopped for a two-week period. This did not change the "grin" to a "frown" but only prolonged the agony of the 300-foot getting a new face.

On September 2, the first master ring of the new panels was installed. The progressive installation of the new surface grew and grew and the "grin" became a "smile" as the last series of panels were installed.

New Surface of 300-Foot

During the face-lifting of the surface other work was incorporated to the drive system, making it variable speed. Also, the Engineering and Electronics Divisions have designed a traveling platform to be installed next year in the apex house which will provide east-west travel, focus and polarization for a much better operational instrument.

New helium lines were installed for the cryogenics system in the front-end, and a rearranged and newly painted console was installed for the addition of the variable speed and traveling platform systems.

All in all, these major changes could not have materialized had it not been for a combined effort by all concerned. Although none of the major alterations have been combined to perform an operational sequence, we are hoping this will be achieved by the last week in November, and all concerned can receive an extra "Thanksgiving".

* * * *

"We're happy to meet you this morning... good morning..." — so our school day begins at kindergarten. We are twenty-five people arriving on the big school bus eager to work at 8:25 a.m. (We have no riots, prejudices, or drug abuses to report — nothing of interest some may say.) We draw, color, paint, play music, sing, listen to records, listen to stories, do our workbooks, enjoy our weekly newspapers, pick up whatever we get out to play, take turns with all things ... we are so very busy.

We have a playhouse upstairs this year. Mrs. Edmund Gardner is up there ... she's one of the people who works here. "Teacher" (Mrs. Troy Henderson) is downstairs ... she just reads to us and teaches. Neither of these people will let you be rude ... we don't really want to be, anyway.

We always "give ourselves a pat on the back ... we are jolly good elves ..."

Come visit our school sometime ... we all like company.

* * * *

NEWS ABOUT A FORMER EDITOR

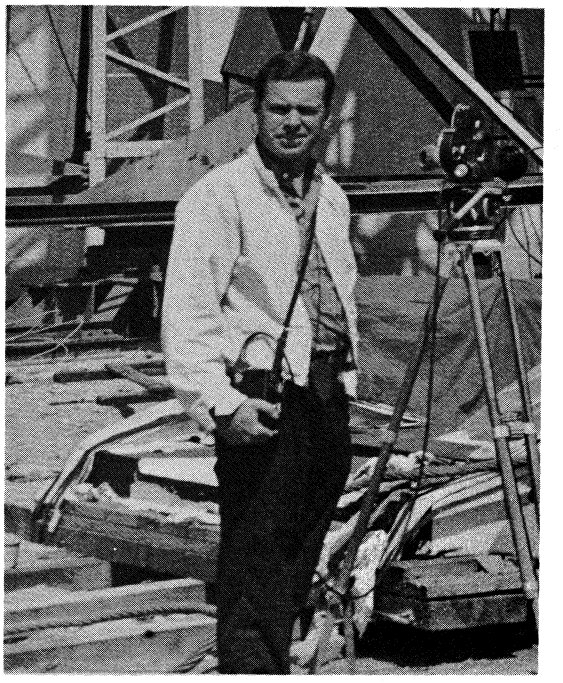
Many of you who were working for the Observatory in 1964-64 will remember Peter Good. Peter came to Green Bank in 1964 to photograph the construction of the 140-foot. In between filming he was editor of the Observer.

While at Green Bank, Peter made two films, one on the construction of the 140-foot and the other on the Observatory, which we use in our tourist program. He says that he still looks upon these two films with satisfaction and whenever he shows them it brings back happy memories of Green Bank and West Virginia. After finishing the Green Bank films, he returned to Brookhaven.

At Brookhaven he photographed and edited reports and scientific films. Because this work was rather boring to him, he stayed at BNL only a short while before returning to his home town of Los Angeles. He was in L.A. five months before he landed a job as third photography assistant on a pilot TV show that lasted only 10 days. But it was here that he discovered that being a Hollywood cameraman was not really his goal in life.

After the short-lived pilot TV show, he took a job with a local firm that made "cheapie" travel films for TV. His first assignment with the local firm was a film on a nudist colony. (Can you imagine photographer Good in a nudist colony?) Shortly after this film, he went to Israel and made a ONE hour documentary for TV. About this time, the local firm landed a contract to produce 26 animal-documentary films for network TV ("Animal World"). This work took him first to East Africa and eventually all over the world to film some 22 animal shows. By this time he had established a reputation filming animals. It was near the end of this series of shows that he approached Walt Disney Studios for a job, and he got it.

At the present time he is directing and photographing a one-hour TV show for their Sunday night series, "The Wonderful World of Disney." Peter is on location in a desert near Tucson where is is completing work on a film about coatimundis (pronounced "co-wa-tee-mun-dee"). This show, which is about a little-known, desert raccoon-like animal, will be shown sometime in 1971. If the title isn't changed, it will be called "Coca, The Coatimundi." Let's watch for it on TV.



****

HOME STUDY COURSE IN ASTRONOMY

We received an announcement in the mail of two home study courses in astronomy. To our knowledge, this is the first time astronomy has been offered as a correspondence course.

The two courses, Astronomy I and II, cover basic facts of practical astronomy, both visual and telescopic. Astronomy I, a course of 10 lessons, is $75. Astronomy II, a course of 18 lessons, is $125.

A brochure detailing these courses is on file in the Public Education Office. Both courses are accredited by the National Home Study Council.

****

140-FOOT TELESCOPE

Bill Hunter

Action at the 140-foot telescope has been more or less routine these past summer months. Observing has gone along very smoothly with a minimum of interruptions. Much of our work has been centered around spectral line measurements and a furious search for new molecules, and I understand quite successfully in some instances.

The telescope was painted by J. L. Waters & Co., and completed well ahead of schedule. In case you are curious, the color of the base is beige. Some of us were all for a pretty pink or bright "Fire Engine" red but we didn't win out.

Al Hogan was transferred from the 300-foot to the 140-foot so he could give us inexperienced turkey searchers some fine points on finding and acquiring the great American bird. He had adapted quite well and we appreciate his efficiency both as a bird instructor and as an excellent operator.

Bob Nichols, another of our fine operators, is the proud papa of a new boy born in August. Congratulations, Bob and Vicky!

The recent articles by Dr. Kenneth Kellermann, we thought, were most enjoyable and informative. It certainly gave us laymen an insight into aspects of the life of the scientist we did not generally picture. We, surely, appreciate more the fortitude and effort required to achieve a successful conclusion to an experiment of this magnitude.

According to discussions aired for the past year in the 140-foot kitchen, we are soon to be priviledged to witness a rare demonstration in stamina and speed. Russ Bussard (the wirey old fox) has challenged Russ Poling (a racy young colt) to a foot race from the 140-foot telescope to the guard house. The great day will be announced and spectators are expected to donate a reasonable sum to be presented to the victor. At the present, I'm a little reluctant to take bets on the fox.

* * * *

Bill del Guidice (Engineering) said that he just had to turn this picture over to the Observer. The happy and elated fellow in the picture is volunteer fireman Dick Fleming (Electronics). The picture was taken shortly after Dick was told that the Durbin Fire Department's unit won first prize at the Highland County Fair in Monterey.

* * * *

FLU SHOTS

This year 100 employees signed up for flu shots. Last year 78 signed up to take the shots.

There are many arguments for and against the flu shots. If you are interested in what doctors say about it, you should read "Who Should Have A Flu Shot" in the October issue of Woman's Day Magazine.

* * * *

ROLLING ALONG

Bob Eskanazy

The NRAO-Charlottesville bowling teams, in their third year, are now in full swing. The response to our request for bowlers was outstanding this year. We now have six full teams consisting of four members on each team and numerous bowlers on reserve who are used as substitutes when our regular members are absent.

Our teams and team members are:

The Buffers — Elaine Litman, Burton Litman, Bernie Pasternak, Tom Wilson.

The Narrows — Bruce Balick, Bob Brown, Bill Meredith, Shelton Reid.

N.A.T.S. — Louise Ashworth, Takenori Nakano, Mary Ann Starr, Gene Tademaru.

Resistors — Jack Cochran, Bob Eskanazy, Gloria Eskanazy, Gene Runion.

Team Too! — Neil Albaugh, Jesse Davis, Hannalowe Wiedenhoever, Wolfgang Wiedenhover.

The Four G's — Bill Howard, Hein Hvatum, Phyllis Jackson, Art Shalloway.

The teams meet every Tuesday evening at the Mountain Bowl Bowling Lanes in Charlottesville at 7:30 p.m.

This year, it appears, we have reached a more balanced league as far as averages and handicaps. On our October 6 meeting, the League standings did not change. All the teams split winning two and losing two. If you are a bowler, or if you have bowled in a league, you will realize this is a rare occurrence.

As in any competitive sport, certain outstanding achievements are in sight. This gives the member bowlers a little more incentive when he or she is competing with the team or individual who holds the score of high game, high series, or even high average.

Some of these achievement to date are:

High Game		
Men	207	Gene Tademaru
Women	192	Mary Ann Starr
High Series		
Men	536	Steve Manzo (sub)
Women	501	Mary Ann Starr
High Average		
Men	164	Gene Tademaru
Women	155	Mary Ann Starr

The League standings as of October 6 are:

Team	Won	Loss	Percent
Resistors	14	6	.700
N.A.T.S.	13	7	.650
Narrows	10	10	.500
Buffers	10	10	.500
Team Too	7	13	.350
Four G's	6	14	.300

****

GREEN BANK BOWLING

Ken Anderson

Earlier this year feelers were put out to employees to see how much interest there was in forming a bowling team to bowl in one of the leagues in Elkins. Interest was good enough that 18 people said they were interested in bowling on a regular or occasional basis. A few of the interested got "cold feet" and dropped out but enough people expressed interest in bowling to form a Monday and a Tuesday night team.

The first week's scores weren't very impressive. In fact, they were pretty low and a lot of us were beginning to wonder if we hadn't made a mistake in joining a men's league, but we had some ready excuses.

Continued, next page --

A few of the team members had never bowled and some had bowled very little in the last 10 years. Actually, however, after a few games under their belts, many team members have improved their scores.

At this writing, the Monday night team is in sixth place (12 team league) and the Tuesday night team is also in sixth place — someone said that they can't go lower. Jon Spargo has the high series (603) and high game (230) for the Monday night team. Kermit Friel has the high series (526) and high game (223) for the Tuesday night team.

Some comments have been expressed that the women should have been asked if they wanted to form a league team. To determine their interest, forms have been sent to female employees and employees' wives.

* * * *

SAFE HUNTING

Jim Dolan

Hunting season always brings a few reports of unfortunate accidents with firearms. Already I have read of one 16-year old boy shot to death while hunting on opening day, October 10. Big game season is just around the corner with the added danger of high power rifles in use. Thousands of hunters will be afield during both small and big game seasons.

Every year a few hunters are killed or injured either by himself or by another, careless hunter. None of these accidents need to happen if all hunters treat their firearms and bows with care demanded by a lethal weapon. As bad, or worse, as being killed or wounded would be to kill or wound another hunter, possibly a friend or member of one's own family. I don't know about you, but I believe it would be hard to live with the knowledge that my carelessness had caused the death or wounding of another person.

Hunting accidents can be avoided. This seems to be a good time for everybody to read and remember the 10 commandments for hunter safety. They are as follows:

1. Treat every gun with the respect due a loaded gun. This is the cardinal rule of gun safety.

2. Guns carried into camp or home must always be unloaded, and taken down or have actions open; guns always should be encased until reaching shooting areas.

3. Always be sure that the barrel and action are clear of obstructions.

4. Always carry your gun so that you can control the direction of the muzzle, even if you stumble. Keep the safety on until you are ready to shoot.

5. Be sure of your target before you pull the trigger.

6. Never point a gun at anything you do not want to shoot.

7. Unattended guns should be unloaded; guns and ammunition should be stored safely beyond reach of children and careless adults.

8. Never climb a tree or a fence with a loaded gun.

9. Never shoot at a flat, hard surface or the surface of water.

10. Do not mix gunpowder and alcohol.

So, enjoy your hunting trip in safety but don't take any "sound" shots. That could be me in the brush!

* * * *

SAVE MONEY: RELOAD

George Liptak

Oh, no, my hangup may not be yours, so rest assured cigarettes, booze, and women will not be compromised by this article.

One most interesting and financially rewarding facility available to NRAO employees is being overlooked by many persons: the use of shotshell and metallic cartridge reloading equipment. The reloading room is located in the Arbogast House — first floor, porch entrance, first door on the right. The entrance key is always available from the guard house. This room contains a work bench upon which is mounted all the equipment one would need to reload a shotshell or rifle or pistol cartridge. This reloading equipment is top grade, easy to use, and capable of turning out reliable and safe reloads. Shotshell equipment is available for the following gauges:

12 ga.	2 3/4 - 3"	Field or Target
16 ga.	2 3/4"	Field or Target
20 ga.	2 3/4 - 3"	Field or Target
28 ga.	2 3/4"	Field or Target

These are adjustable for almost any powder and charge, amount of shot, or any shot size — No. 4, No. 5, No. 6, No. 7 1/2, etc. Speed is attained by the use of preset bushing that keeps the determined amount of shot or powder constant and also the use of one-piece plastic inserts which act as gas seal, space filler, and shot container all in one. If you are familiar with the Remington Power-Piston, then this is an example of a one-piece plastic insert. Most empty shotshells reloaded so far have been Remington, since the Power Piston is the only insert available at the reloading room at this time. Each manufacturer recommends using his own insert in his own case. This does give proven results. However, one can experiment using one make insert in various make cases. Inserts for Winchester and Federal cases should be available soon. Too, this equipment will effectively reload both paper or the more modern plastic hulls.

For those who really wish to rough it, there is available a wooden mallet, a teaspoon, a rusty nail, and a towel. The nail is for punching out the old, tired primer, the spoon to measure powder and shot, the mallet to drive it all home, and the towel to cry in when you mash your thumb.

For rifle and pistol cartridges, the following die sets are available:

1) .270 Win.	10) .30 Carbine
2) 38/40	11) .284 Win.
3) 30/06 Govt.	12) .257 Roberts
4) 6.5 x 55	13) 6 m/m Rem.
5) .222 Rem.	14) .30/30
6) .45 ACP	15) .308 Win.
7) .22 Hornet	16) 6.5 M-S
8) .243 Win.	17) .300 Sav.
9) .225 Win.	18) .35 Rem.

If you have your own dies or can borrow them, one is still welcome to use the rest of the reloading equipment. There is a powder scale, powder measure, case trimmer, and the press itself. Reloading manuals are in the room to help you decide the correct load for your own use.

Bullets, powder, primers, shot, power pistons, etc., are available at cost from Leroy Webb, honorary Rifle and Pistol Club mascot Sergeant-at-Arms, or Bill Horne, Flag Bearer.

One should keep in mind that the most expensive component in any cartridge, be it rifle, pistol, or shotshell, is the case or container itself. The retail price for a box of 20 - 30/06 Govt. cartridges, which most everyone is familiar with, is approximately $5.25. With an expenditure of less than $10, one could reload 100 cartridges of the 30/06 type. That's five boxes!! And so it goes with pistol and shotshells as well. Most shotshell hulls will safely stand five or more reloads, while rifle cases may vary from one to more than thirty reloads. Solid brass cases, being crystalline in structure and subjected to much higher chamber pressures and temperatures, are somewhat less

Continued, next page --

predictable than the high impact extruded plastic shotshell cases which are made to operate in lower pressure and temperature ranges. There are many other variable factors also involved here.

There is the story of a well-known timekeeper on the site who makes a habit of hunting only with extremely poor or nervous shooters, especially those that shoot fast and often. Its been said Mister X manages to recover the still smoking empty hull before it hits the ground. He does very little hunting himself that day, but smiling, returns home with enough reloadable hulls for future safaris of his own. Tricky, eh? Of course, said Mister X categorically denies this, with another smile and a shrug.

Reloading requires common sense and care for best results. The facilities are available for your use. The Rifle and Pistol Club, caretaker of this facility, extends an open invitation to all to attend its functions and to participate in the use of all reloading and range facilities.

Come join us and let it all hang out!! You see, the money you save by reloading increases your spending power on the cigarettes, booze and women. Uh...., 'nuf sed.

****

DECORATED CAKES

If you would like to have a special cake prepared for occasions such as showers, birthdays, weddings, anniversaries, or for special times of the year such as Thanksgiving, Christmas, Valentine's Day, etc., place your order with Shirley Carpenter. The price is right, too.

Cake decorating began as a hobby, but Shirley is now turning it into a semi-business; so, telephone Shirley (456-4269) when you need a special cake.

****

BOOSTERS CLUB FORMED

Jim Dolan

On October 21, 1970 a dinner meeting was held at the Pocahontas County High School to organize a Pocahontas County Athletic Boosters Club. Approximately 62 persons enjoyed the fine meal prepared by the cafeteria staff and served by the cheerleaders.

The club was formed and officers and directors were elected. Eight directors were elected, two from each district in the County. The membership approved $5.00 per family as an annual fee and a committee was appointed to prepare tentative by-laws.

Officers for the 1970-71 term are:

President ..... Jim Dolan

Vice President .... Ernie Shaw

Secretary ..... Nancy Galford

Treasurer ..... Phillip Cain

The next meeting is scheduled for Wednesday, November 18, at 6:30 p.m. If you plan to attend, please call the school in advance so the cafeteria will know how many dinners to prepare.

If you are interested in the athletic program in Pocahontas County, please try to attend the meeting.

****

FOR SALE

FM tuner cartridge for tape player in car or home. Comes with instructions and 9 V battery. Just plug into tape player and listen. Price: $20 — was $29.95 new and used 3 weekends.

Richard Fleming
GB extension 214

****

GARDEN CLUB

Kay Williams

As this is being written, the members of the Green Arbor Garden Club are anxiously looking forward to the district meeting, October 15 at Pipestem, West Virginia's newest state park. We are to be presented our charter as a federated garden club with state and national affiliations.

Looking forward to our first full year as a federated club, it is a good time to review the accomplishments of the past year. Suffering through usual growing pains of such a fast growing and young club, we did manage to accomplish a great deal. At our regular monthly meetings, luncheon was served beautifully by Mr. McLaughlin and his staff. Our programs, provided by our own members and friends, were varied and interesting. In the spring, Dr. Eugene Hutton of Elkins, W. Va. was engaged, through the conservation chairman and her committee to conduct a wild flower tour. The tour centered around the summit of Cheat Mountain and the Gaudineer Fire Tower area where we enjoyed a picnic supper at the end of the tour.

Not to give the impression that we are purely a social club, I must acquaint you with our serious side. A lot of our members have put a great deal of time and physical effort into three of our Environmental Improvement Programs, all of which are being entered in both state and regional competition. Although we would be pleased and delighted to be the recipient of an award, we will be equally proud of our final accomplishments at the culmination of these projects to have been responsible for the beautification of these areas.

The first of these programs was accomplished this spring, when our annual Observatory beautification was carried on. We planted four evergreens, one spreading yew, and over four hundred annuals provided by the Observatory and one hundred Norway Spruce seedlings, provided by the Forest Service. Our future plans for this program are to put in more permanent plantings each year.

Two long term community programs have been started, one a mini-park located near the bridge south of Green Bank. With the continued help of a hard working committee, Girl Scouts, Boy Scouts and the State Road Commission, this should develop into a really delightful picnic and rest area for the many tourists who visit our area each summer.

Our second community project is to clear, plant and beautify the area around the Green Bank School buildings. Some eighty shrubs were donated and planted by the club along the north and west boundaries of the parking area at the school. Further work on this project is being delayed until the scrap metal around the old shop buildings is removed by the school and taken to the new Pocahontas High School shop facilities.

Our third project is on conservation of our beautiful mountains and streams. Our first step was taken when a letter in the form of a petition was prepared by the chairman of the conservation committee, and with twenty-eight signatures was sent to each of our United States Senators, Robert C. Byrd and Jennings Randolph, and our representative, Harley O. Staggers, urging them to take appropriate action to stop the deep mining operations to help save one of West Virginia's best trout streams, the Shaver's Fork of Cheat River in Randolph County. The water quality is being threatened by plans for deep mining in this area, which activity could result in the sterilization of the stream in which neither fish life nor plant life could survive. We received replies from all three of these men expressing their concern and thanking us for our interest. We continue to be kept informed of the progress being made. We like to feel that our letters were partially responsible when the permit for such mining activities was recently denied by the Department

Continued, next page --

of Natural Resources. However, the mining companies have already filed again for permits. We are hopeful that a similar refusal will be made.

We plan to continue our activities on all of these programs during the ensuing year and are looking forward to our regular monthly luncheon meetings and interesting programs.

We were recently honored by a brief visit by Mrs. Clifford E. Fitzwater of Huntington and Mrs. George A. Patterson of Lewisburg who are, respectively, president and vice president of the West Virginia Federation. See photo. Their enthusiastic comments were most flattering and encouraging.

Photo 1 — left to right: Mrs. Curtis Moore, Mrs. Elbert Whanger, Mrs. Dorman Williams, Mrs. Clifford E. Fitzwater (Federation President), Mrs. Moro Beard. Standing, left to right: Mrs. Gaylord Yost, Mrs. George A. Patterson (Federation Vice President), and Mrs. Thomas Williams.

Photo 2 — Standing: Mrs. Mary Jo Sharp. Seated, left to right: Mrs. James Dolan, Mrs. Thomas Williams, Mrs. David Hogg, Mrs. Dorman Williams, Mrs. Fred Crews, and Mrs. McCutcheon Barnwall.

Photo 1 — Recent visit by President and Vice President of West Virginia Federation.

Photo 2 — September program guest, Mary Jo Sharp from Marlinton, leads group on flower arrangement.

Footnote: See what you started, Dr. Findlay, and what you, Dr. Roberts, continued to sponsor. Thank you both for your encouragement and cooperation.

****

POCAHONTAS COUNTY HIGH SCHOOL

Bob Vance

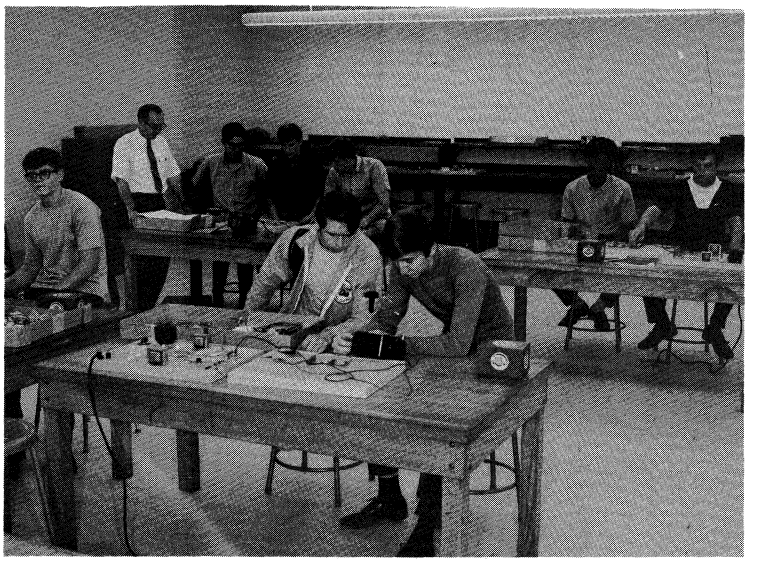
The new high school opened on schedule for the fall term with a student body of 553 students and 38 faculty members. The building was nearly complete and the finishing work has been done in conjunction with school activities.

The water systems with storage tanks have been completed and are operating as designed. The football stadium lights were installed by Penn Line Service, Inc. The bleachers in the gymnasium have been installed with some work remaining on the back-boards and the scoreboard.

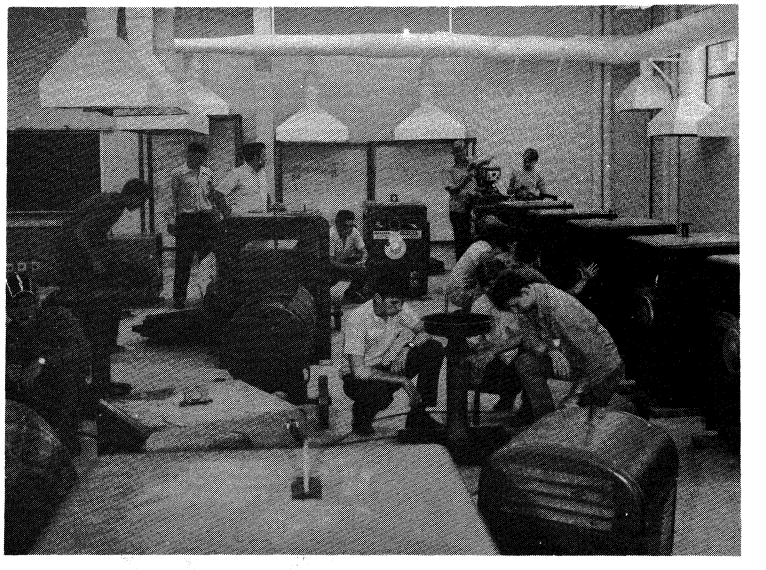
A maintenance shop has been erected near the parking lot of the new school by Gem Corporation of Summersville, West Virginia.

Plans are presently underway to organize a Boosters Club for the high school. See Jim Dolan's article on page 22.

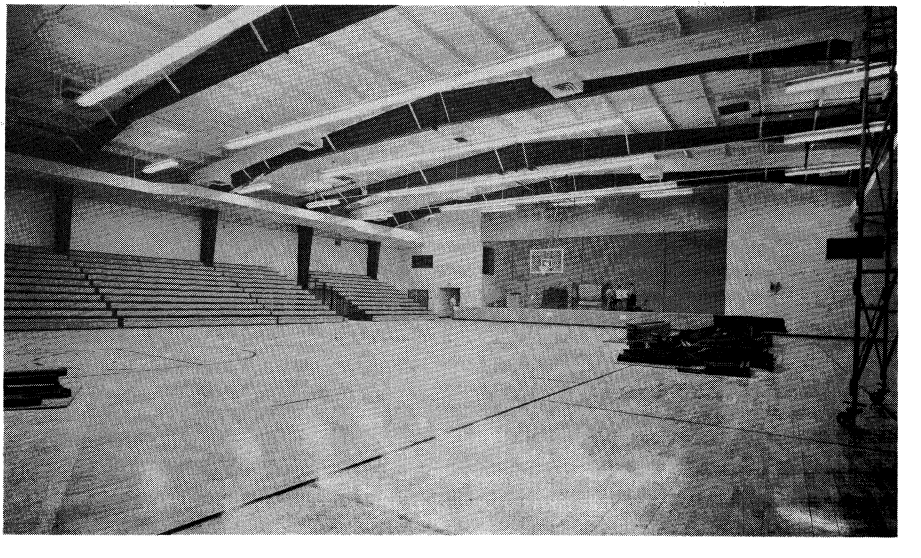
Plans are also being formalized for an open house and dedication ceremony on November 8, 1970. More details will be published in the local papers in the near future.



Vocational Electronics



Vocational Welding



Gym

bowling nraora style

This should equalize the handicap tonight!