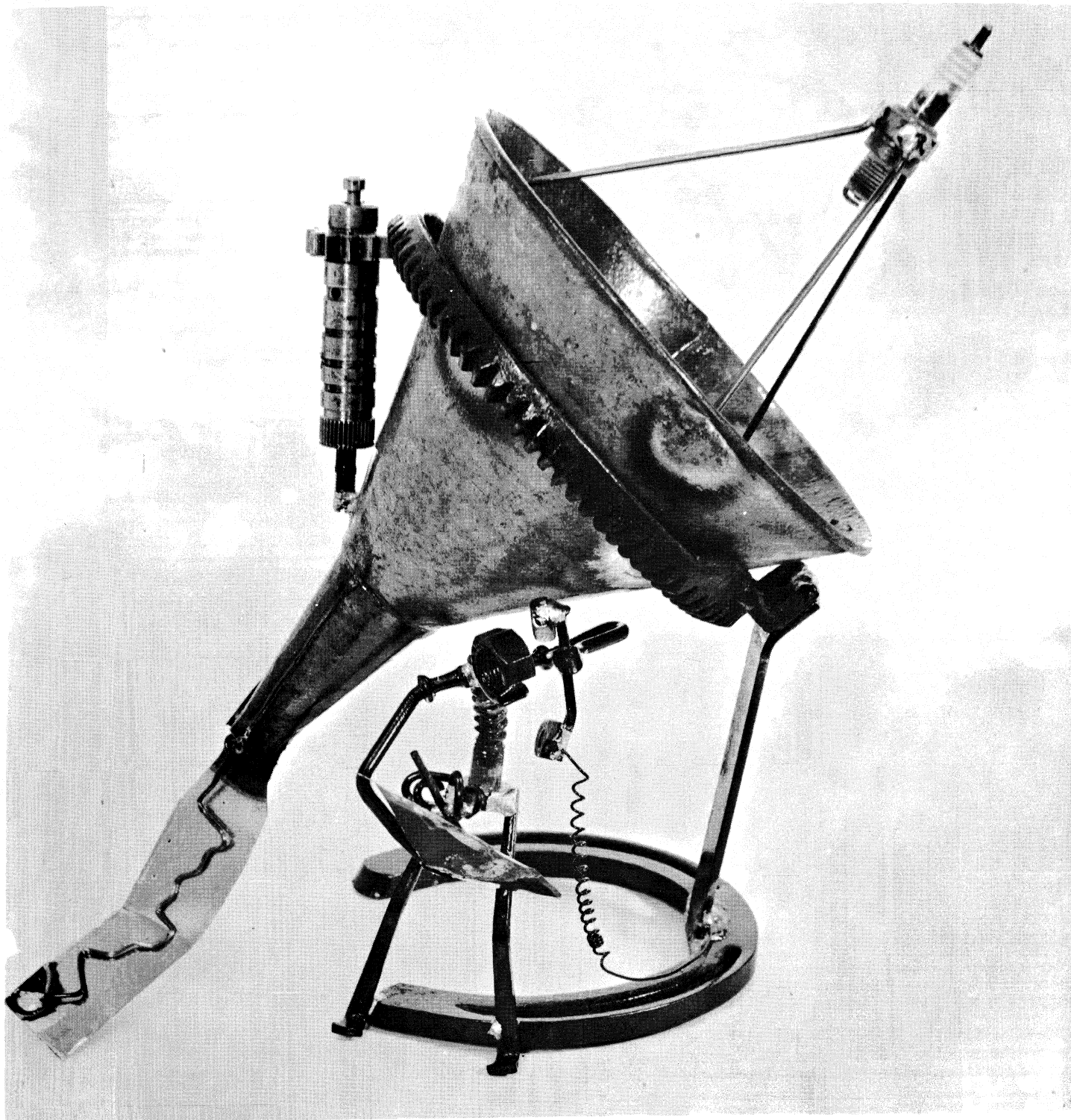


The O B S E R V E R

Vol. 12, No. 6

November 1971

Page 1



A BIT OF HUMOROUS SCULPTURE

Story on Page 2

THE COVER PICTURE

Some strange things come in the mail. On Monday morning, September 27, Ether Tyson brought a package into my office and asked if it could possibly be for me. It wasn't addressed to me but it had a correct address for NRAO. I suppose it was brought to me because I have been known to receive rather unusual mail. I didn't recognize the name or the return address on the outside of the package. Nor had anyone else, apparently. As Ether stood watching, I gingerly unwrapped the package. Inside was a strange bit of modern sculpture. At first I failed to recognize it for what it was. I concluded it was sent by a visitor who had taken our summer tour. Someone who was so taken by our magnificent radio telescopes that he was inspired to create this bit of humorous sculpture.

--- Wally Oref

**HAPPY
HOLIDAYS**



A special thanks to all of those who helped assemble the OBSERVER.

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

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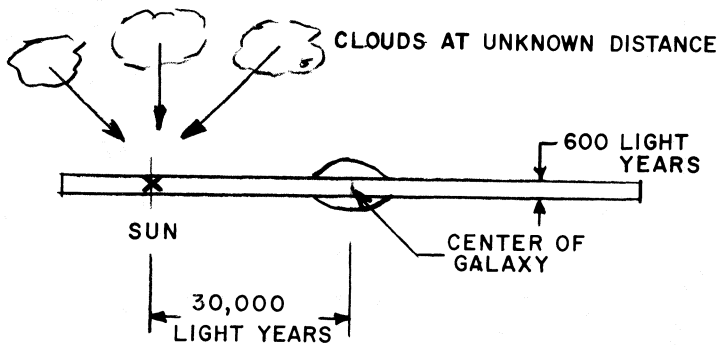


THE HIGH VELOCITY CLOUD CONFERENCE

G. L. Verschuur

Some of you might remember that a large group of miscellaneous looking people gathered at the Observatory on Labor Day and two succeeding days, and might still be wondering what that was all about. Well, the NRAO was host to an international conference on high velocity clouds. Never heard of them? Don't know what they are? Well, we don't know what they are either, which is why almost all the people, both observers and theoreticians who had worked on the problem, were gathered together at Green Bank to try and solve the problem.

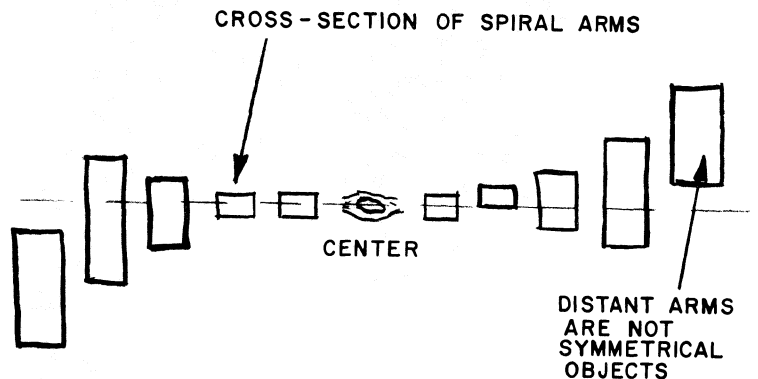
The high velocity clouds are clouds of hydrogen gas which appear to be moving toward the sun at very high speeds in parts of the sky where this is not expected. The diagram below shows an edge-on view of our Milky Way Galaxy which is shaped like a giant wheel. In the direction indicated by the arrows,



we see clouds of hydrogen gas, which radiate radio waves at 21-cm wavelength, moving with speeds of up to 200 km/sec toward us. It does not mean that the gas is all falling toward the sun because the true motion of the clouds might be quite different from a motion directly toward us; for example, the path of the clouds could be inclined and we only see an apparent motion toward us. We do not know the distance to these clouds, which makes them rather difficult to explain. The point is that when one looks up away from the Milky Way plane one expects to see very little hydrogen, and the gas we do see

is expected to be close and should not be moving very fast. The only motion expected is the so-called random motions of clouds which is less than 10 km/sec. Instead, we find the presence of lots of these high-velocity clouds. There are also some south of the Milky Way and some in a direction opposite to that of the center of our Galaxy.

The meeting in Green Bank discussed the observations of the clouds and the theories put forward. It was mainly a discussion meeting and many animated arguments were heard. A popular theory is that the negative velocity clouds are matter falling into the Galaxy from the so-called "empty" spaces between galaxies. In fact, on this model our galaxy is still forming. Personally, since the meeting, I am convinced that the clouds are part of very distant spiral arms in our galaxy. They appear to have velocities towards us (negative) because of the geometry of the location of the distant spiral arms and the sun. The distant spiral arms are highly distorted and a better side view of our galaxy is perhaps as drawn below.



Our Galaxy therefore appears to be highly distorted at its outer reaches and might not be a simple wheel-shaped object as we used to think.

The participants all enjoyed the meeting very much and the atmosphere here in Green Bank was perfect for creating an environment in which people could relax while at the same time work hard at trying to solve the problems.

JUNE-DEC. 1971-NRAORA

Richard Fleming

As President of your R. A. for this six-month term of office, I would like to report on the progress and activities that occurred. First, let me thank each and every one of the board members who worked very hard to make this an eventful and progressive six months.

As you recall, changes to the constitution and by-laws voted on in May 1971 established that five members of the board (the five with the highest number of votes) should serve an 18-month term, until Dec. 31, 1972, and the remaining six positions would be refilled this November and those elected would serve a two-year term. There would then be annual elections with the term being two years so as to have overlapping terms in order to have experienced people on the board at all times.

The present members of the board are:

- x Richard Fleming - President
- *x Craig Moore - Vice-President
- x Jane Chestnut - Secretary
- *x Pearl Clarkson - Treasurer
- Carl Davis - Purchasing Agent
- * Don Stone
- *x George Liptak
- Dorman Williams
- Marvin Wimer
- Tony Miano
- Dave Williams
- * Finance Committee
- By-Laws
- x Serve as members until Dec. 31, 1972

In addition to the regular administrative functions, the following is a list of activities sponsored or to be sponsored by your R. A. during 1971-72:

- 1) Summer Picnic
- 2) Two Clay Days at the Pottery Workshop (Summer)
- 3) Four Clay Days in November
- 4) Halloween Dance
- 5) Christmas Party for Children
- 6) Christmas Dance for Teenagers

- 7) New Year's Dance
- 8) Valentine's Dance
- 9) Summer Movie Program
- 10) Bowling (CV and GB)
- 11) Softball (CV and GB)
- 12) Basketball (GB)
- 13) Resurface Tennis Courts

The R. A. Finance Committee recently completed the FY 72 budget and has submitted it to NRAO for approval. Election of new board members takes place in November and they will assume duties in January 1972. January will also be the time for election of officers and a new and hopefully even bigger year for the R. A.

In closing, I would like to again thank the board for a job well done and to thank Dr. Hogg and John Hawkins for their willing and able help during the year.

COOKING EXCHANGE

In the September 16, 1971 issue of the Brookhaven Bulletin there was an article about a cooking club at Brookhaven. The club, called the Cooking Exchange, was formed by wives and foreign visitors with a common interest in good food. According to the article, the purpose of the Cooking Exchange is to demonstrate, exchange, and sample the exotic, as well as the standard, dishes of various countries.

Regular meetings are held every other Thursday. Each adult is charged 75¢ to pay for the cost of cooking demonstrations and babysitters. Two cookbooks have been published of recipes demonstrated at these regular meetings.

The Cooking Exchange even has something for the men. Husbands are invited to a Christmas Party where they get to sample the delicious delicacies of the season from many countries. At the end of the year's activities, the men are also invited to a fabulous dinner.

Ladies, something like this could be started here to help pass the winter months. Let your imaginations take over.

RECEIVER INSTALLATION
ON THE 140-FOOT

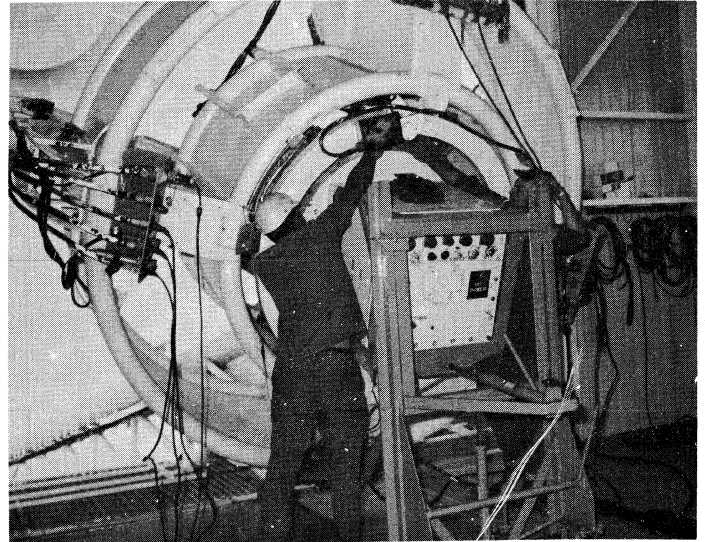
Craig Moore

We thought our readers might be interested in what takes place when a receiver is put on one of the NRAO telescopes. The accompanying pictures depict what goes on at the 140-foot as many people from various divisions at the NRAO lend a hand.

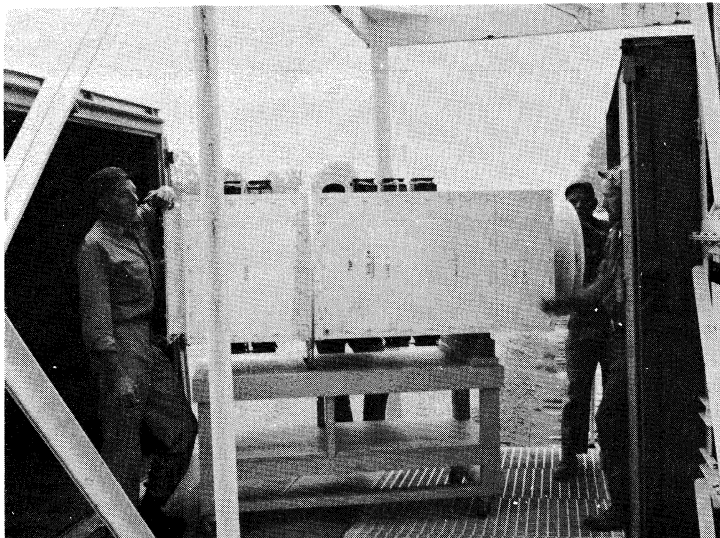
A few weeks before installation, the front-end box is moved from the warehouse to the Jansky Lab. Scheduled observers are contacted and any special requirements for their experiment are discussed. Necessary modifications are incorporated and the receiver is checked out.

As the installation date draws near, the chief telescope operator, Howard Brown, notifies the various divisions and coordinates their efforts. Bob Elliott's crew picks up the front-end and other equipment and moves it to the telescope, and brings back the previously installed equipment. Meanwhile, Herb

Hanes and his telescope mechanics will be removing the previous front-end from the telescope focus ring. In the case of a cryogenically cooled receiver, the cryogenic mechanic, Dave Williams, must be on hand.



Ron Gordon and Russ Poling installing the front-end box in focus ring.



Bob Elliott's crew moving the front-end box onto the 140-foot service tower elevator (Merle Kerr, Neil Horner, Neil McLaughlin, and Dharl McLaughlin).

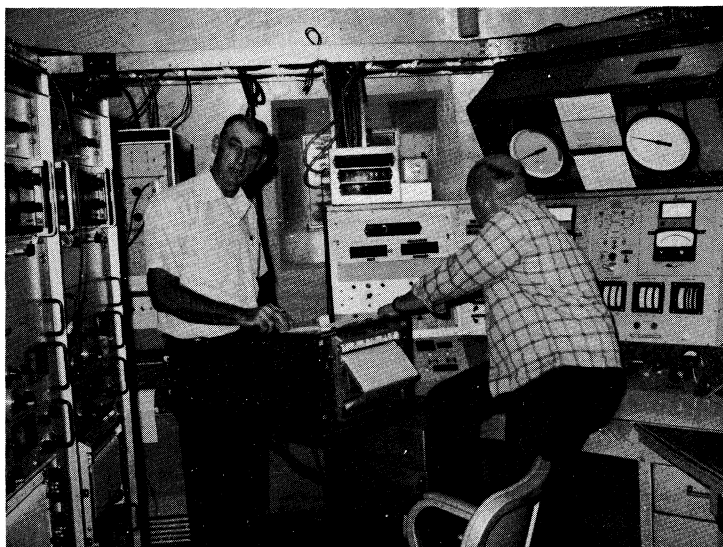
At the same time the front-end box is being installed by Electronics Division personnel, the telescope operators are connecting the control rack and back-end equipment. The cabling list is then sent up to the service tower so that the proper telescope cables are connected to the front-end box. After the rough focus and polarization positions are established and recorded, the telescope operators move the box through its focus and polarization drive range so that the telescope jumper cables can be properly located to prevent excessive strain or damage. In the case of a cryogenically-cooled receiver, such as the 18-cm receiver shown in the pictures, a vacuum pump is connected to the paramp dewar. After an hour or so the refrigeration system is started and the receiver begins to cool. At this time the vacuum pump

continued, next page--

is disconnected and the front-end box can be turned on and sealed up so as to stabilize the internal temperature. When it is apparent that the receiver is going to cool down, the service tower is moved away and the telescope



Electronics Division's Tom Dunbrack connecting control rack cables.



Bill Hunter and Ralph High recording rough focus and polarization positions.

is pointed skyward. The receiver is then tuned up and checked out before being turned over to the observer.

It is the many people who have worked together in a coordinated effort that make receiver installation seem like a simple, uneventful task.

300--FT. NEWS

Jon Spargo

We are happy to report that the last of the recent major revitalization projects at the 300-ft., namely the new control building addition, is nearing completion.

At present, our target date for relocating the control room equipment in the new control room is November 15. Barring any unforeseen developments, we should be able to meet this date without much difficulty.

In the next issue we hope to be able to present a feature length article, complete with before and after photos, on our new edifice. In the meantime we would like to award a hearty thanks and well done to the members of the B. G. R. Construction Company, with whom we've enjoyed working these past few months.

With the completion of this last phase of "face lifting", the 300-ft. can again demand the spotlight on the world astronomical scene and, in fact, we can still lay claim to being the largest. The largest steerable non-oscillating antenna in the world, that is.

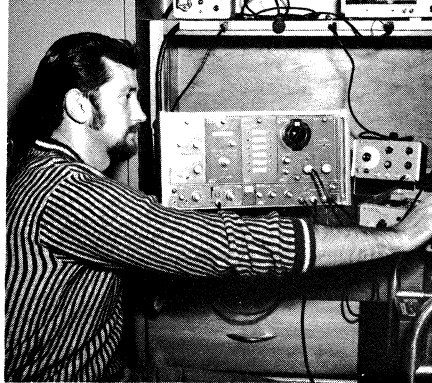
WANTED

Two used windows suitable for cold frame. Price must be reasonable. W. Oref Ext. 270

NEW EMPLOYEES



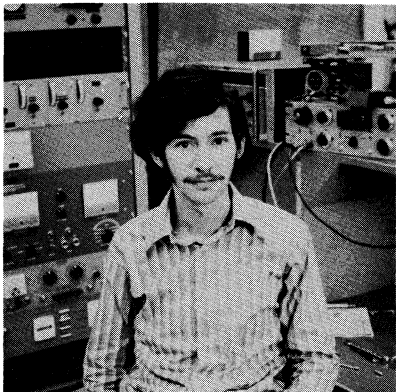
Billie Jo Kinnison
Accounting Clerk-GB
Fiscal Division



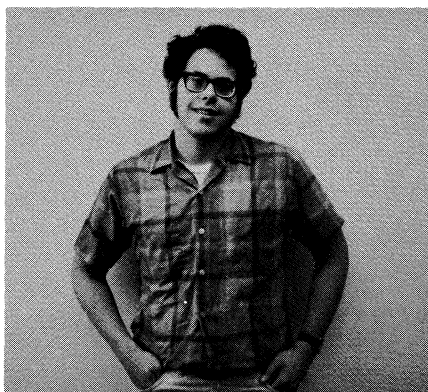
Donald L. Nelson
Intermediate Technician-GB
Electronics Division



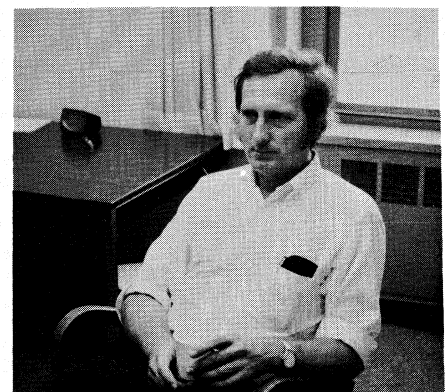
Duane D. Madron
Head--Plant Maintenance-GB
Plant Maintenance Div.



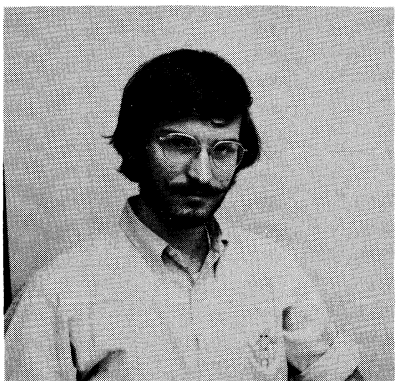
Joseph P. Greenberg
Co-op-CV
Scientific Services



David M. Berg
Co-op-CV
Scientific Services



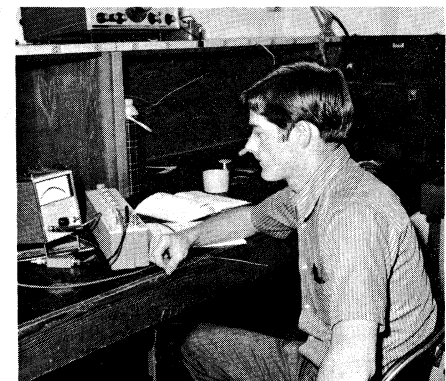
Paul L. Baker
Research Associate-CV
Basic Research



Thomas M. Bania
Library Assistant-CV
Scientific Services



Denis A. Elliott
Vis. Jr. Research Assoc.-CV
Scientific Services



William F. Radcliff
Intermediate Technician-GB
Electronics Division

continued, next page--

REHIRES

Gregory D. Athens, Computer Division

TERMINATIONS

Claudia L. Peery, Administrative Services
 Robert B. Houck, Scientific Services
 Dennis G. Sweeney, Scientific Services
 Douglas L. Morrison
 Terry L. Richardson
 Michael L. Anderson
 John D. McLaughlin
 Dennis B. Ward, Scientific Services
 Dr. Carl E. Heiles, Basic Research
 Barbara P. Smith, Scientific Services
 James W. Fullmer, Scientific Services
 Claude N. Williams, Scientific Services
 Peter A. Camana, Scientific Services
 C. Keith Sword, Scientific Services
 Haywood C. Smith, Scientific Services
 Patrick S. Yeung, Scientific Services
 Kenneth E. Anderson, Electronics Division
 Denis A. Elliott, Scientific Services
 David L. Ehnebuske, Computer Division
 Robert P. Nichols, Telescope Operations
 William R. Murray, Computer Division

WINTER DRIVING

Winter will soon be upon us. Now is the time to ready ourselves and our cars for winter driving. Below is a true-false quiz. In the space () mark T or F. Answers to the quiz will be found on page 10. The authority is the National Safety Council. Following the true-false quiz is a checklist for winterizing your car.

1. A battery should be checked more often and kept at full charge in winter because it is less efficient in cold weather.()
2. Bleeding your tires to decrease pressure puts more rubber on the road and increases traction.()

3. Unlike the recommendation for regular tires, wheels with studded tires should not be rotated.()
4. In sleet, fog and swirling snow, keep headlights on high beam to increase visibility.()
5. Pull nose first into driveways and parking stalls because it's easier to back out in bad weather.()

Winterizing Your Car

Be winter wise--use this check list to winterize your car.

- () Brakes - Be sure they are balanced. Equal pull on all wheels is a must to avoid skids.
- () Tires - Regular tires must have good tread. Snow tires help in snow, but are no better for stopping on ice--unless they have studs.
- () Windshield - Check wiper blade tension and defroster. Add proper anti-freeze solution to washers.
- () Exhaust - Carbon monoxide is deadly. Inspect muffler and entire exhaust system for leaks.
- () Trunk - Carry tire chains, window scraper-brush, traction mat (such as a piece of carpet or metal mesh), booster cables and shovel.

For Sale

140 feet of post holes. Recently I had a dry well drilled. As a result, I am able to offer 6 inch diameter post holes of any length at very reasonable prices.
 Inquire: Noe Waters 456-9000

GREEN ARBOR GARDEN CLUB

Kay Williams

Although May 1971 marked the last meeting of the year for the Green Arbor Garden Club, it has been a most active and fruitful summer. New officers were elected and installed at the May luncheon meeting.

The new officers are:

- President Mrs. David Hogg
- Vice President Mrs. Sidney Smith
- 2nd Vice President Mrs. Moro Beard
- Secretary Mrs. Curtis Moore
- Treasurer Mrs. James Dolan



Mrs. Tom Williams, retiring president, gave a tea at her home honoring the new and retiring officers. Dr. Hogg and Mr. Tom Williams paid us a visit during the tea.

This summer the club members planted almost 500 annuals around the Residence Hall, Jansky Laboratory and Redwood House. Last fall, members planted flower bulbs that provided a delightful display this spring. More bulbs will be planted this fall. Approximately 180 trees were planted using the Observatory's landscape architecture plans as a guide. These trees will provide the background for future and continued plantings as called for in these landscape plans. Men from the Works Area provided very able assistance in planting these trees.

Community projects started last year (mini-park and school beautification) were continued and improved upon. Many long, hard hours were put in on these projects. The girls had extra work to do because an early storm last winter blew over the beautiful virgin oak which was the focal point of the mini-park, and damaged some work already done by club and members of community organizations. The scrap metal around the school buildings was removed. Now the planting program can be carried forth as planned.

Regular monthly meetings were resumed in September. This meeting was devoted entirely to business. A Christmas bazaar is again planned for this year; the dates will be announced later.

At our October 19 meeting we were honored to have as our guest speaker, Mr. S. S. Schroder (Mary Brundage's father), who presented a timely talk and demonstration on Christmas decorations. Mr. Schroder has been engaged in business involving flowers, landscaping and associated activities for 30 years.

Carol Hogg, Emma Beard, and I attended our district club meeting on October 8, which was held in Princeton, West Virginia.

We regret the loss of member Marlene Yost (Mrs. Gaylord Yost), who moved to Asheville, North Carolina where her husband was transferred. Marlene was our Conservation Chairman.

FACTS FROM FISCAL

Perhaps you may be wondering how you will stand with the Internal Revenue Service when you file your 1971 Federal Income Tax Returns.

We may be able to help by telling you what your taxable income will be for the year, as well as the amount of income tax we will withhold during 1971.

Come by the Fiscal Office in Green Bank, or call us.

CRYOGENICS

Dave Williams

Cryogenics, as Webster defines it, is the science of refrigeration with reference to methods for producing very low temperatures. The accepted division between regular refrigeration and cryogenics is -150°C (-238°F). Temperatures above -150°C are considered refrigeration and temperatures below -150°C are considered cryogenics. Cryogenics is used in many fields, including rocketry, medicine, and many different branches of industry. One other use of cryogenics, not mentioned above, is in electronics. A specific electronic application of cryogenics at NRAO is in our parametric amplifiers.

Parametric amplifiers become more sensitive at temperatures produced by cryogenic refrigerators. To illustrate, a receiver system with a noise temperature of 350° Kelvin at 70°F (room temperature) would have a theoretical noise temperature of only 20° Kelvin when cooled by a cryogenic refrigerator, thus giving a much better source to noise ratio.

Cryogenic refrigerators use helium as a cooling agent. The helium is supplied to the refrigerator by a compressor much like the one used in a regular household refrigerator. Of course, the cryogenic refrigerator is capable of cooling to a much colder temperature. The standard refrigerator can cool to approximately $+10^{\circ}\text{F}$ while cryogenic refrigerators can cool to -450°F or lower, which is much colder than any of us can comprehend.

In operation here now are five receivers (3-cm, 3.5-cm, 6-cm--narrow band, 6-cm--broad band, and 18-cm) cooled with model 350 Cryodyne refrigerators made by Cryogenics Technology, Inc. Two other receivers (2-cm and 21-cm) are being built which will use similar refrigerators. These refrigerators are capable of reaching temperatures down to near absolute zero (absolute zero = 0°K = -273°C = -459°F). The actual capability of these refrigerators is 15°K without any load or 20.5K with a 3 watt load.

This past spring Comsat sent us a Maser with a center frequency of 4.1 GHz cooled by a CTI model 400 refrigerator system. This

refrigerator is capable of cooling to 3.8°K but practical considerations limit us to 4.2°K . At the present time the future of this system is not clear, although there has been some interest shown to install it on the 300-foot next spring.

The cryogenics department at NRAO consists of Howard Brown, Eugene Marcum and myself. We are solely responsible for the maintenance of all cryogenic systems here and at Charlottesville. At the present time the cryogenics lab is in the Whistler Building which is located a few yards west of 85-1 control building.

Answers to True-False Quiz

1. True--A battery can lose much of its power when very cold. Keep the water level up, cable connections clean and tight, and test the charge occasionally with a hydrometer.
2. False-- Decreasing tire pressure does not increase traction. The only increase is in tire wear due to soft sidewalls and cupped treads.
3. True--When you remove studded tires for summer, mark their wheel positions. The studs wear at an angle depending on the direction of wheel rotation. If the angle is reversed, the studs turn in the rubber in an attempt to correct the angle, may loosen and fall out.
4. False--High beams only increase glare. Use low beams. And keep them on, too, in murky or snowy daylight hours. Furthermore, parking lights were never intended to be used when a vehicle is in motion.
5. False--When parking overnight, back into a driveway or parking stall when possible so it is easier to reach the engine compartment with jumper cables from another vehicle. (Unless of course your battery is located in the rear compartment.) By the way, do you know where your battery is located?

A VISIT TO POLAND

K. I. Kellermann

On our way to Moscow in June for the second NRAO-USSR VLB experiment, John Broderick and I wished to stop in Poland to visit Joe Maslowski who you will all remember from his recent stay at NRAO. For reasons which are still unknown, I was unable to obtain a Polish visa, although John and Diane Broderick, who applied at the same time, received theirs promptly. On the other hand, I received my Russian visa promptly, although the Brodericks, who applied at the same time, did not get theirs until a few days before leaving. I was not so lucky and was told by the Polish Embassy that I could stop in Europe and receive it there, but not in the U.S.A.

Getting a Visa

Unfortunately, because of the strange procedures used by the airlines to set rates, this extra stopover would have cost about \$330. To avoid this I obtained a ticket to Warsaw, Poland with a 30 minute connection in Amsterdam, and arranged to miss my connection. Since there was no flight to Warsaw until the next day, I accepted the apologies of the airline and set off for the Polish Embassy in the Hague to "pick up my visa" which had been promised to me by the consulate in Washington. Having had some experience dealing with Eastern European countries, I was not surprised to be told that they never heard of me, and I was asked to fill out an application and wait. While I waited for several hours, a steady stream of Dutchmen came in, filled out their applications, and departed after 20 or 30 minutes with their visa. About once an hour I would inquire about my visa and was told to "wait." Finally, I got the word. "No!"

But, "Why?", I complained. "Everyone else got one in a few minutes."

"Because you are an American", was the straightforward reply.

Well, at first I figured if they didn't want me, the hell with it, but then my curiosity to go where I wasn't allowed got the better of me and I gave them a big song and dance about urgent business in Poland, etc. I was then told that if I wanted, they would call Warsaw and check, but I would

have to pay for the call in advance. They wouldn't accept my American dollars, and having no Dutch money, I had to go get some from my wife who was "patiently" waiting all this time in the car (neither of us had had any sleep in the previous 24 hours, having been traveling).

After a few more hours I was told to produce some more Dutch money and was finally given my visa.

Arrival in Warsaw

When I arrived in Warsaw the next day, a few hours late due to a delayed airplane, I was met by Joe and the Brodericks who had arrived the day before. They were all frantically yelling at me to hurry through customs because we had only a short time to catch the train to Cracow (Joe's home). So I rushed to one of the ten lines of customs agents and managed to get a second place. Unfortunately, in front of me was a Pole returning from an extended trip. When a Polish citizen leaves Poland, he has to declare everything he takes with him and when he returns he is expected to have no more or no less in his suitcase. So I waited while the customs inspector checked each sock, each handkerchief, etc., against a list. Finally, I got disgusted and switched to a different line. But this was the same story and Joe called down from the observation area above for me to move to a nearly empty line at the end. Here the man in front of me had a few hundred 3D postcards of girls which the customs inspector inspected--one by one. So I changed lines again. This time the man in front had some sort of problem with his money and after much discussion he left with the inspector to appeal to higher authorities, so I had to change again. This time I finally made it to the inspector who promptly stamped my papers without question or inspection, and I was allowed to pass through one of the 10 little one-way doors which were at the end of each line.

As soon as I passed out of the customs area and heard the door click behind me, I realized that I had left behind one piece of my luggage. Down the line of doors I noticed that one of the other doors had not tightly closed. Although one does not generally go

continued, next page--

back to a restricted customs area even in Western countries, without a lot of red tape, I quietly slipped back through the open door to retrieve my luggage. By some stroke of luck this door led to one of other many lines which I had been standing on and my luggage was sitting right there on the floor, just where I had left it. So I quickly picked it up, unnoticed by anyone, and "smuggled" it back out the door.

Joe led us immediately to a waiting taxi to go to the railroad station, but it was too late and we had missed the train. While waiting for the next train, Joe called Cracow to confirm our hotel reservations, not wanting to repeat the previous days difficulties when he found that the Warsaw hotel where he and the Brodericks were to stay had lost their reservation, and they ended up in a remote primitive hotel outside Warsaw.

After having a few warm beers (ice has not yet been invented in Poland), I decided to play tourist and take a few pictures. Since in the Communist countries, picture taking at militarily strategic places like airports and rail stations is usually restricted, I inquired of Joe if this was allowed and he assured me that it was. Fortunately, my camera did not operate (otherwise I might now be in a Polish prison), and we took our places in our compartment on the train. In the process the strap on one of my bags broke and the resulting crash spilled a bottle of Scotch on the floor. In our seats, I immediately removed the film from my camera and put it in my pocket, before opening the camera to find out what was wrong. A few minutes later two stern looking Police arrived looking for the "foreign spy" photographing the Warsaw train station. I was told to hand the camera over - and did so, pointing out that since there wasn't any film in the camera I couldn't be spying. They seemed to accept this explanation, not noticing what seemed to me like a huge bulge in my shirt pocket, and returned my camera, wishing us a pleasant trip.

After a five hour trip we arrived in Cracow. As we left the train station, John was approached by an attractive young lady and told in French "Venez avec moi" ("Come with me!"). John looked a bit startled, and whispered to me, "What do I do with Diane?"

To John's disappointment, however, a man who looked just like him (if you can believe

that) arrived and the girl, realizing her mistaken identity, went to him. Meanwhile, the rest of the train passengers had formed a long line to wait for taxis. Then out of a dark corner came a sinister looking character who explained that he had a taxi parked just around the corner. Since he was in a hurry to go home, he didn't want to wait in the taxi line for a customer. And since we were obviously also in a hurry and didn't want to wait in the customer line for a taxi, we could "just follow him to his taxi."

Against my better judgement, we agreed and were driven to our hotel - one of the best in Cracow, arriving about five minutes past 10 PM. Upon trying to register, we learned that the hotel only keeps the reservations until 10PM and had just given our rooms away, in spite of the fact that Joe had especially called from Warsaw to confirm the reservations. We raised hell for a while and then finally resorted to a capitalistic bribe. This produced some sympathy from the hotel clerk, who explained that there was an international film festival in town, and all the hotel rooms were taken. (This also explained John's little episode at the train station - he was apparently mistaken for a big film producer). The clerk further explained that all the hotel rooms were being arranged by the Film Festival who had their headquarters in a hotel at the other end of town, and we could go there and possibly get rooms.

Then again out of the dark appeared our friendly taxi driver (the one who had indicated an hour earlier that he was in a hurry to get home) and he offered to take us across town, for a small fee. At the other hotel we were assigned rooms back at the first hotel, in fact they were the specific rooms which had just been given away. But it was emphasized that the rooms were for one night only.

We returned to our original hotel with the same taxi, and dismissed the driver - somewhat later, but considerably richer than he originally anticipated. By this time it was after 11 PM and, since I hadn't eaten since breakfast, I was starved. Joe checked and found to our pleasant surprise that the dining room was open until 12 PM.

continued, next page--

Following a quick wash to remove the grime from the days adventures, we arrived in the dining room about 11:30. Fortunately, the menu was in English, German, and French, as well as Polish, and after a few minutes John noticed the small print which stated "No hot food served after 11:45." So we quickly summoned the waiter and ordered roast beef for the Brodericks and chateaubriand for me. Fifteen minutes later the roast beef arrived, but no chateaubriand. When I queried the waiter, he indicated that they were all out of Chateaubriand. Being very hungry I wasn't about to be fussy, so I replied that the roast beef would be fine. But he smiled, pointed to his watch which now indicated 11:47 PM, and said "Sorry."

At this point I got about as mad as I have ever been, cursed the waiter in English and German (neither of which he understood) and demanded to see the head waiter, and the manager. John and Diane offered me some of their ample portion of roast beef which I secretly ate, not wanting to give the waiter any satisfaction. Finally, the head waiter brought me a huge portion of meat to keep me quiet.

The next morning we began negotiations to retain our rooms for another night. The hotel clerk told us all about the film festival and no rooms being available. Also, he told us, today was his birthday, and he had received many presents. So we gave him a "birthday present," an engraved picture of Abraham Lincoln, signed by the Treasurer of the United States, and we got our rooms for another night. This procedure was repeated in one form or another for each day of our stay.

A Day at the Police Station and Then to the Salt Mines

After a few days of sightseeing, we had to cope with a potentially serious problem. John and Diane Broderick's Polish visa expired on June 9, but their visa to enter Russia was not valid until June 10. There were only two possible solutions--try to extend the Polish visa or try to change the Russian visa--sort of like a choice between fighting Cassius Clay or Mohammed Ali. A telegram to Russia produced no reply, which was not surprising since my own telegram sent from Holland some days earlier had not

yet arrived, so we were forced to deal with the locals. Initial inquiries produced the surprising information that tourist visas could simply be extended at any "Orbis" tourist bureau. But Joe had advised us previously to get "Regular" visas instead of "tourist" visas, since we were there on official business, and with the "Regular" visa we would get special treatment.

As it turned out, there are two differences between a "tourist" visa and a "regular" visa. 1) The tourist visa cost \$5 and the regular one \$13, and 2) a tourist visa can be extended in a few minutes by any tourist bureau and a regular visa only by the police after a "small investigation."

So we set off for the local police station. A Polish police station is not hard to describe. It is copied from the typical communist police station that you see on the movies or on TV. Bare walls, with many doors leading to various padded interrogation rooms, and stern looking men entering and leaving various doors at frequent intervals.

While I was told to wait, the Brodericks were taken to one of the padded interrogation rooms and interrogated. Why did they want to stay in Poland? Why were three Americans going to Russia for a month? Somehow John explained all this and after a few hours obtained his extension.

That afternoon Joe took us to a very old salt mine which seemed like an appropriate place to visit following the police station. Upon returning we ran across our old friend, the taxi driver, who offered to drive us back to Warsaw (200 miles) for a mere \$20 (which he could exchange on the Black-Market for many times that in Polish Zloties).

Since hotel rooms were so scarce in Poland, we had attempted to secure one in advance for a one-night stay in Warsaw. We had given the hotel clerk a small bribe in dollars (Polish money is useless for such important transactions in Poland) to secure us a hotel in Warsaw, but when we queried him about it a few days later, he didn't remember us! So we went to Warsaw without a reservation.

Being experienced now in Polish hotel arranging, we drove to one of the most expensive looking places. Since John and Diane had been thrown out of this place a few days earlier when they tried to get a room, I
continued, next page--

was chosen to negotiate. I simply marched up to the desk, announced my name, and asked for my room. I was told there was some difficulty and I should see another clerk who was out; but when he returned things were "straightened out" and we had rooms. When the porter had taken our baggage to the rooms, I figured that since Poland seemed to appreciate the vices of capitalism such as tips more than other communist countries, I offered the porter a few zloties for his help. He politely returned the money, indicating that the zloties were no good, but that he would like American money.

To celebrate finding a room, we went out for dinner at a restaurant called the "Crocodile." After being seated, a jovial waiter arrived, greeted us, and handed us the Polish menu. Seeing our puzzled looks, he inquired "Sprechen sie Deutsch?" or "Do you speak German?" Now I only know about 10 words of German, and in Germany I would have surely replied "no", but in Warwaw, German seemed a lot more familiar than Polish, so I said, "Ja--Yes." My theory was that in a restaurant it is not really necessary to understand individual words and if you just sort of get the general ideas, you get enough to eat. So when the waiter asked a lot of questions which I vaguely understood to mean "Do we want meat or fish, beef or pork, vegetables, potatoes, wine, red or white, coffee, etc?" I confidently replied, trying to appear that I understood everything. John and Diane had their doubts about my lingual ability, but they were very impressed a short while later when we were served a very excellent roast beef dinner with all the trimmings.

After finishing eating, the waiter returned, cleared the table, and asked a question which I took to be, "Do you want dessert?" Feeling very proud of my demonstrated linguistic ability, I complimented the waiter on the fine meal and asked for the dessert. Five minutes later the waiter returned, with another complete dinner of ham, boiled potatoes, and cabbage!

By the next day the Brodericks had cold feet about staying in Warsaw alone, and elected to fly with me to Moscow, in spite of the fact that they did not have a valid Russian visa.

Next issue: How the Brodericks got into Russia, how we got involved in the annual

Soviet war games, how Barry Clark nearly got electrocuted, and the return of the VLB clock.

Carl Davis's Potatoes

Pictured below is a part of Carl Davis's 1971 potato crop. For size comparison we used a 3-3/4 inch softball. One potato in this



Some French Fries

group weighed 2-1/2 pounds, several others weighed 2 pounds, and lots of them weighed at least 1-1/2 pounds. Carl planted 50 pounds of certified Kennebec seed potatoes and harvested nine bushels (about 500 pounds worth). Not a bad return by anyones standards. If you are interested in raising big potatoes next year, why don't you go and talk potatoes with Carl?

Tally of annual deer harvest in 1970:

Bow hunters: 3
Gun Hunters: 10
Diesel driving observers: 5

NOTICE

To give erstwhile potters the chance to finish up any projects in the works and to give everyone (especially the erstwhile potters) a chance to make Christmas presents and ornaments, the Clay House--that's the Arbogast House on the road to the GB airstrip--will be open every Saturday evening in November, 7:00-10:00 p.m.

MEIN CORRELATOR IST KAPUT



Wolfgang Wiedenhoefer and Auto Correlation Receiver

This picture was taken shortly after Wolfgang Wiedenhoefer (Max Planck) saw the auto correlator upon its arrival in Germany. Wolfgang thought for sure the receiver had been damaged in shipment and hence his expression. (Photo courtesy Art Shalloway).

COULD YOU ESCAPE?

Without taking time to think it over, could you name two ways out of each room in your house, especially bedrooms?

If not, start pre-planning for emergency escape in case of fire by working out an alternate exit from every room, such as a window leading onto a porch roof or directly above shrubbery which would break a fall.

Because most home fires break out at night, it's essential to hold back fire by sleeping with bedroom doors closed, to pre-arrange a signal which will arouse and alert the household, and to have a well-rehearsed escape plan. Teach everyone to test for heat outside his bedroom by feeling the upper part of his closed door--if the door seems hot, keep it closed, sound the alert, and immediately use a pre-planned alternate exit.

Arrange for help in escaping for young children and aged or infirm persons. Decide on an outside meeting place where everyone will go for a "head count". Plan to call the fire department from a neighbor's house--not from your own telephone if your house is on fire.

Finally, impress upon everyone, especially the children, the need to strictly obey the rule "Once Out, Stay Out!" No toy or treasure and not even the family pet is worth risking a human life in its rescue.

QUALITIES REQUISITE IN RESEARCH PERSONNEL

(Reprinted from JOPCAS, the Journal of the Pocahontas County Astronomical Society, Vol. XXIII, No. 4, Sept. 10, 1971.)

Summer Student

Leaps tall buildings with a single bound
Is more powerful than a locomotive
Is faster than a speeding bullet
Walks on Water
Gives advice to God

continued, next page--

Scientific Supervisor

Leaps short buildings with a single bound
 Is more powerful than a switch engine
 Is just as fast as a speeding bullet
 Walks on water if the sea is calm
 Talks with God

Staff Scientist

Leaps short buildings with a running start
 and a favorable wind
 Is almost as powerful as a switch engine
 Is faster than a speeding 33
 Walks on water in indoor swimming pools
 Talks with God if special request if approved

Research Engineer

Barely clears quonset huts
 Loses tug-of-war with locomotive
 Can fire a speeding bullet
 Swims well
 Is occasionally addressed by God

Technical Manager

Steps over dog houses with ease
 Recognizes locomotive immediately
 Can fire a BB gun
 Can float on his back
 Talks with God's secretary if special request

Technician

Runs into buildings
 Recognizes locomotive two out of three times
 Is not issued ammunition
 Can stay afloat if properly instructed in
 the Mae West
 Talks to walls

Accountant

Falls over door steps when trying to enter
 buildings
 Says, "Look at the choo-choo"
 Wets himself with a water pistol

Plays in mud puddles
 Mumbles to himself

Co-op

Lifts buildings and walks under them
 Kicks locomotives off the track
 Catches speeding bullets in his teeth and
 eats them
 Freezes water with a glance
 Is God

SEARCH FOR LIFE IN SPACE

In a September issue of the New York Times, Walter Sullivan reported on an international conference held in Russia for the purpose of considering the possibility of communicating with life elsewhere in the universe. Scientists who attended the conference agreed almost unanimously that chances of intercepting signals from other intelligence were good--good enough to justify a serious search.

An international group will be formed to coordinate research in this field. Two areas of search were proposed: One would search the several hundred nearest stars and the other would search for variable signals from more distant supercivilizations.

It was brought out at the conference that last year the Russians had conducted experiments designed to intercept signals from intelligent beings in space. No evidence of signals attributable to intelligent beings were found.

The first such attempt to monitor signals from extraterrestrial life was made at NRAO in 1960. In that experiment, called Project Ozma, two nearby solartype stars, Epsilon Eridani and Tau Ceti, were searched. Results of the experiment were negative.

Scientists attending the Russian conference included Nobel Prize-winning biologist, Francis H. C. Crick of Cambridge University, Nobel Prize-winning physicist, Charles A. Townes of the University of California, and radio astronomers R. N. Bracewell, Frank Drake, and Thomas Gold.

SUMMERTIME WISDOM

Ken Cottrell

In the season of winter a wise man came
With words so convincing, our cause to
defame.

"Prideful vanity! The most endless quest!
Why not let the heavens rest
From your hopeless, irrelevant probing?"

"One of your number already has said
Where one question's answered ten others
are bred.

Why not direct your talents instead
To pursuits which are not so confusing?

"Astronomers are mortal. They cannot dis-
cern

The model on which infinities turn,
When will arrogant mankind learn
That God resists such striving?

"Are you not aware of humanity's poor?
Has it escaped your mind that we face the
last war?

Why should you consider other worlds more
When you know that your own is dying?"

Then a summertime wise man chanced by our
door

With words more convincing than the wise
man's before.

"Press on, good explorers of the cosmic
main.

By your searching light we shall rise again
And our species will go on living.

"The unitive power of your glorious art
Will transcend the walls which hold nations
apart.

We shall know that brotherhood decreed by
the heart,
Our souls released for true loving.

"The time is fast nearing when all must
agree
That, to enter God's realm, you are justly
free.

He is man's projection through eternity.
To know this truth is saving.

"No question posed will you fail to resolve,
From the giant explosion to how planets
evolve.

By your unyielding effort all mysteries
dissolve.

The veil of forever is rising."

GREEN BANK BOWLING NEWS

Don Stone

The second season of bowling is well
underway. The Tuesday Night Team started
bowling on September 7 and the Monday Night
Team on September 14. The team rosters are
as follows:

Monday Night Team

Don Hovatter, captain
Wendell Monk
Jon Spargo
Herb Hanes
Bob Vance
Ron Weimer
Howard Brown
Troy Henderson

Tuesday Night Team

Don Stone, captain
Leroy Webb
Russ Poling
Bill Vrable
John Matheny
Wally Oref
Dave Williams
Harold Crist

So far this season we have lost more
games than we have won, but we hope to im-
prove as the season moves along. That's
what happened last year. Both teams start-
ed off slowly but ended the 1970 season
with an almost 50/50 record. Even if we
don't always win, we generally have a good
time and that counts for something.

TUSON TOPICS

Bob Hogarth

The land of golden sunshine has been a bit soggy lately. The seasonal rains have stayed an extra long time, making for some rather poor observing. There was even a light veil of snow on the mountain, accompanied by hailstones the size of marbles and gusts of 90+ miles and hour on top. This is rather unusual this early in the year.

A number of NRAO people attended a Kitt Peak employees' picnic on Saturday, September 25th. We won our share of the door prizes-- Ned Conklin celebrated his birthday by winning the first drawing, dinner for two at Don Quijote's, a nice Spanish-style restaurant in town. Then John Rather took the second drawing, a set of beer mugs--very appropriate.

Gene Wetmore is now our Chief Telescope Operator, having served as an operator for the past 15 months. Congratulations, Gene.

That's 30 from the land of mild winters.

MEDICAL INSURANCE FOR
DEPENDENT STUDENTS

Children of the Observatory employees are regularly covered under the employee's Family Medical Insurance Plan until the December 31st following their 19th birthday. Dependent Student Coverage is available for a child over age 19 provided he is attending school on a full-time basis, and provided the employee applies for the coverage.

If you have a full-time student in your family who will reach age 19 this year, be sure to apply for Dependent Student Coverage on his behalf as soon as possible. No additional premium is required for this coverage.

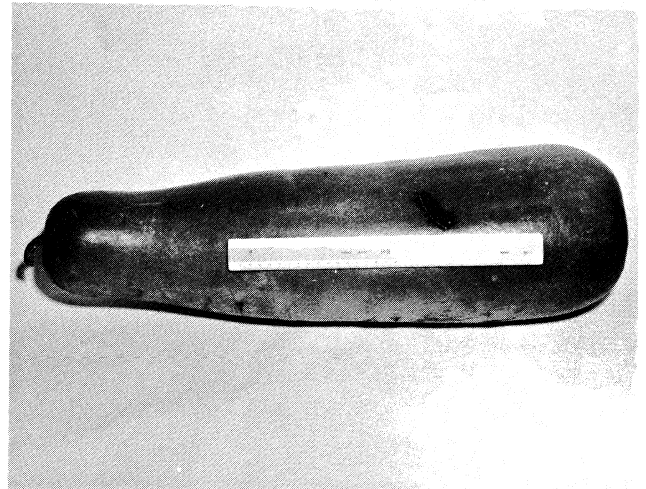
Application can be made at the Personnel Offices in Green Bank and Charlottesville. Further information can be obtained by calling Green Bank, Ext. 209, or Charlottesville, Ext. 312.

Employees with children who are no longer eligible for Dependent Student Coverage should notify the Personnel Office immediately.

HAPPY BIRTHDAY--AUI/BNL

Associated Universities, Inc. and Brookhaven National Laboratories both celebrated their 25th anniversaries on October 13-14-15, 1970.

Congratulations.



Steve's Bean

No kidding it is a bean. It's listed in the seed catalog as a Guinea Bean. This is not the size recommended for best eating. For good eating they should be picked when about 10 inches long. Steve Mayor let this one grow to see how big it would get. Steve got his seed from Carl Wooddell who also gave seeds to Wally Oref. Plantings by Carl and Wally did not amount to a hill of beans.

Remaining NRAO Holidays-1971

November 25, 1971	Thanksgiving Day
November 26, 1971	Holiday
December 24, 1971	For Christmas Day
December 31, 1971	For New Year's Day 1972

CROSSWORD PUZZLE

Barry Clark

ACROSS

1. Another name for Dicke radiometer
5. A logic element
7. W5I
10. A fruit and an assignation
13. Popular front end
16. Unpopular man in Spanish Netherlands
17. Abraham comes from here
18. Place where wires meet
21. Unit of frequency
23. Means very different things to ancient Egyptians and modern astronomers
24. Edible tuber
27. Early 20th century astronomer and observatory founder
28. If you don't get this one, you should _____
29. College degree
31. We are _____ in our work
33. Number system
35. State abbreviation
36. 20th century Evangelist
40. Pad
43. FORTRAN logical operator
44. Clara Bow
45. We're finished _____ (2 words)
46. Electronic component
47. Electronic component

DOWN

2. Not as low noise as 13 across
3. Proper length of the world line
4. Possessing great 3 down
5. What 23 across was to the Egyptians
6. An angular coordinate
8. Father of natural logarithms
9. A type of variable in PL/I
11. Can do
12. FORTRAN built in function
13. 13 across needs one of these
14. Plural present to be
15. I wish all the components were _____
19. Creation of Frank L. Baum
20. When the observations were made
22. Linearly propagating bundle of electromagnetic radiation
25. Three (prefix)
26. Reactionary novelist (first name)
27. The shape of a plant and a type of dress
30. Without this, a computer is bombinating in the void

(DOWN cont.)

31. Preposition
32. Genetic material
34. English tax
35. Estimated minimum capacity
36. Small noise in an oscilloscope; large noise on a campus
37. Complete
38. Biological version of 13 down
39. 1553164.13 wavelengths of the red cadmium line
41. Raw material for making poi
42. City in France

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Answers may be obtained from Barry Clark upon request.

15 Years Ago

Did you realize it was 15 years ago on November 17, 1956 that the National Science Foundation contracted with Associated Universities to proceed with the construction of the National Radio Astronomy Observatory?
