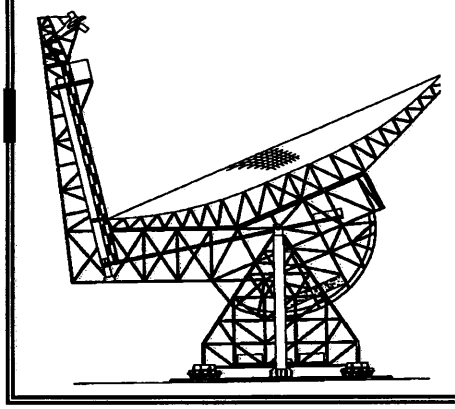


The Green Bank Tattler

You better read it, we could be talking about you!

Volume 5, Number 1 February 1997

Edited by F.Ghigo

Regular activities:

Aerobics every Tuesday and Thursday from 5:30 to 6:30 p.m. in the Tour Center. Call Janet Ghigo for info at 456-4893.

TaeKwonDo every Monday at the Tour Center: kids 5-12 at 6:00 to 6:30 pm; 12 & up at 6:30 to 8:30 pm. See Rich Hall for info.

Basketball every Wednesday evening 6:30-9:30 at the Green Bank School.

Sunday Menus at the Cafeteria

Feb.9 Cubed steak in gravy, rice, mixed vegetables, cauliflower.

Feb.16 Beef stew w/cornbread.

Feb.23 Pepper steak, parsley potatoes, baked apples, lima beans.

Mar.2 Barbecue chicken, brown potatoes, winter blend, carrots.

Mar. 9 Stuffed peppers w/tomato sauce, macaroni & cheese, peas & carrots, cauliflower.

Don't forget to sign up now for the **Billiards Tournament** to be held Tuesday February 25th. See Chuck Beverage or Bob Simmons

Be sure to attend the Kid's **Easter Party**, Sunday March 23rd, featuring a performance by the PCHS Thespians.

Transparent Subreflector Proposed

(by "Sparky" Minter)

In a recent meeting, Glen Langston proposed a radical new telescope design. It was proposed that by using a transparent subreflector, a Cassegrain telescope could be outfitted with a prime focus receiver. Although detailed designs and feasibility studies have yet to be developed, the scientific community is "excited" by the possibilities. This will double the sensitivity -- right, Glen?

Calendar of Upcoming Events

Feb.12	**Seminar**: Mark McKinnon. 3:30pm "Noise Balls and Linear Polarization"
Feb.17	Holiday (Presidents' Day)
Feb.25	**Billiards Tournament.**
Mar.12.	**Seminar**: Mike Stennes. 3:30pm. "LO Reference Distribution"
Mar.23	**Easter Party** (Tour Center)
Mar.28	Holiday (Good Friday)
Apr.16	**Seminar**: Bob Payne. 3:30pm "JAVA and HTML"
May 5-6	**GB-CV symposium:** in Auditorium.
May 14	**Seminar**: Mike Stennes. 3:30pm "GBT Gregorian Receivers"
May 26	Holiday (Memorial Day)
May 19-24	**Chautauqua** Conference in Auditorium.
June 18	**Seminar**: John Ford. 3:30pm "User's View of M&C System"
July 4	Holiday.
July 12-14	**SARA** Conference.

Welcome to

Stephen Simmons, born Oct.28th,

and to new employees:

Tim Glaser, a technician with the OVLBI group,

Dan Pedtke, an Electronics Engineer working with the OVLBI group,

Gary Anderson, an Electronics Engineer,

Joe McMullin, an aips++ programmer to arrive in late February,

and Lewis Beale.

Glass Eyeball Assemblies for the GBT

M. A. Goldman and D. H Parker

Measurement and adjustment of the active main reflector surface of the Green Bank Telescope will be accomplished with the help of an infrared laser-ranging system. Six Buck Rogers-type rangefinders, each shooting out a scanning laser beam, will be bolted to the vertical feed arm of the telescope. A glass cube corner prism will be put at a corner of each main surface panel, to reflect the beam back to its scan mirror. By microwave modulating beam intensity and measuring the return beam phase relative to a reference, the distance of the prism's optical center to the center of the scan mirror can be precisely measured. Knowing the distance of the prism center from a nearby panel surface point, one can then find the distance from each rangefinder's scan center to many surface points of the main reflector surface and measure its shape.

More than 2200 "glass eyes" (corner cube prisms) must be fastened to the surface panels. To accomplish this, one cements each prism into a zinc-aluminum alloy casting, which bolts to the surface panel. The perpendicular distance of the prism optical center to the casting surface that mates to the panel must be carefully measured, to locate the panel surface with respect to the prism center. This is a complicated business because the prisms sit in their castings at oblique angles to the panel-mating surface, to allow face-on viewing of the prisms by the rangefinders.

A glue factory was set up in the basement of the Jansky Laboratory to fabricate the prism-casting assemblies. Mr. Alan (Todd) Wright has succeeded in manufacturing over 1900 assemblies without cracking a prism or smearing optical cement over any of the four optical surfaces of the prisms, turning out completed assemblies at the astonishing rate of five minutes per assembly.

The remaining prisms will be cemented into their castings after a final engineering decision is taken with regard to which of three types of casting will provide the best viewing angles from the rangefinders. (Each decision will probably take longer than five minutes per assembly.)

A sample of the assemblies will be measured in a 3-dimensional coordinate measuring machine, to locate the prism faces with respect to the panel-mating surface of the casting, to find the prism optical center. The remaining assemblies will be measured by a substitution method, using a laser rangefinder. From these measurements, distances from prism optical center points to panel surfaces can be determined to within 50 microns.

Nineteen cat's eye retroreflectors, which will be used to determine pointing and structural node movements of the GBT, were received from the University of Arizona. These are very wide angle reflectors, needed for ranging measurements under conditions where the viewing angle of the target reflector with respect to the rangefinder platform varies appreciably. Housings for these cat's eyes are in the design stage.

Rec. Association News

K.Lehman & C.Beverage

NRAOERA officers for 1997 are:

President	Kenny Lehman
VP	Bob Simmons
Treasurer	Greg Morgan
Secretary	Rob Taggart

New board members: John Ford, Brian Ellison, and Chuck Beverage.
Returning board member: Rich Hall.

Planned events:

- Billiards tournament on Feb. 25th -- sign up with Chuck Beverage or Bob Simmons.
- Skating party late March.
- Kids Easter Party, Sunday March 23, 1997. The PCHS Thespians will put on a play for the Easter party.
- Basketball every Wednesday at the GB school, 6:30 to 9:30

Radar Jamming Opportunities at Green Bank

(by "Sparky" Minter)

The OVLBI Earth Station has recently been given permission to transmit at both X and Ku bands, both used in police radars, which allows for the capability of jamming radars in the general vicinity of Green Bank. As an additional feature, the OVLBI Earth Station can simulate doppler shifts such that the police radar can be made to read any desired velocity.

To request time for radar jamming, please submit to the OVLBI group: time of jamming run, azimuth and elevation of patrol car, desired simulated vehicle speed.

Please note that the OVLBI Earth Station is only allowed to transmit above 5° elevation. All requests will undergo a peer review process involving astronomers and local law enforcement officials.

Update on Jansky Lab Building Addition

R. Fleming

The majority of the new building is complete with the exceptions of the shielded areas, replacement of the auditorium seating, installation of the vestibule adjacent to the anechoic chamber, and minor touch up painting and hardware items. NRAO began moving into offices on the first floor during January 1997.

The shielding effectiveness test of the Jansky addition second floor shielded rooms was conducted in November and the walls and ceiling as well as all penetrations failed to reach the specification of 60 dB from 10 MHz to 1 GHz. A design review was conducted and a solution to retrofit the copper painted walls was implemented. Copper covered polyester fabric was installed on all wall surfaces during December. This fabric is installed much like wallpaper with a seam overlap of 4-6 inches. Shielding effectiveness tests were again performed and the walls and floor surfaces now meet all specifications. Additional tests show that the ceiling (and roof area) still do not meet the specifications. A fix for the roof area is being designed the week of February 3. The new design should be implemented beginning around February 17th.

The unavailability of the second floor shielded areas has forced NRAO to change plans concerning OVLBI operations and the GBT Mockup. We now plan to establish the GBT Mockup in the Jansky Lab conference room and OVLBI will operate from their existing control room at the 45'.

NRAO Deer Hunt in Fourth Year

Frank Ghigo

The controlled hunt on the NRAO property is now in its fourth year. In October and December, during specified days, certain areas of the NRAO territory are opened to deer hunters. The areas are a minimum of 500 feet from any buildings or houses. I recently spoke with three WV DNR biologists who supervise the hunt, Jim Crum, Lou Smith, and Randy Tucker. Jim did most of the talking. The following information resulted from this conversation.

Hunters must register with the DNR biologists before going out into the designated areas, and must check in with them when they leave whether or not they kill any deer. Some hunters may not like the controlled nature of the hunt, but others find it comforting to know that if they do not return at the designated time someone will come looking for them.

All deer that are killed are weighed and inspected. The deer's age is estimated from its teeth. Internal organs including the kidneys and heart are examined and weighed to see how healthy and nourished the animal is. Parasites and diseases are checked for also. I'm sure we are happy to know that there has been no sign on any of the animals that have been inspected of the ticks that carry Lyme disease

The DNR is interested in conducting this controlled hunt because they can study a deer population in detail and try to understand the influences of environmental factors, food supply, hunting, and herd size on the general health of the deer. It has been known for many years that the deer are overpopulated in the NRAO area, most notably because of the prominent "browse line" that can be seen everywhere on the site. Most of the trees on the site are pines and all the branches have been nibbled off up to about 4 feet from the ground. Pine needles are tasty but not very nourishing, so deer eat them when there is no better quality food around. They are rather like junk food to deer. The inspection of the deer confirms that they are on the average undernourished, but otherwise generally healthy and disease-free. Deer are often found to have stomachs full of pine needles, indicating that better food is scarce.

Another sign of population pressure is that the does, who normally ovulate in November and start bearing fawns in May in other parts of the state, are a month late at NRAO. A doe would normally be pregnant in December, but in the four years that the hunt has been going on, only two does of those examined in December have been found to be pregnant. More older deer, in the 6 to 10 year age group, are taken here than in other parts of the state. This may result from the 30+ years of no hunting which allowed an older population to develop. The majority, however, are 1-4 years old.

By doing a census of deer every year and studying the health and condition of the deer, the DNR biologists hope to observe changes due to decreasing the numbers. Mike Holstine helps by doing counts in selected areas every fall. The census for the past few years has been roughly constant at 65 deer per square mile. For the 4.7 square miles of the NRAO property, this works out to about 300 deer total. The DNR are not certain as to the optimum number of deer. They have set a goal of killing about 70 mature does, per year. In the past years the number killed have fallen short of the goal. This year, due to more days allowed for hunting "antlerless deer", and more use of firearms allowed than before, a total of 100 were killed. By continuing the controlled hunt for several more years, the DNR hopes to see some changes in the total numbers and improvements in their nourishment.

Plant Maintenance News

Mike Holstine

Conduits, and More Conduits

Things have been quite busy at Plant Maintenance since our last newsletter. Work at the GBT has had PM personnel trenching around seven of the nine installed laser monuments to aid in the installation of power conduits and fiber optic cable around the partially completed ring. The week after Christmas saw much of this work started and now the installation is complete. The fiber run was placed for the soon-to-be-erected weather tower at the NE side of the GBT. Work left in this area includes mounding dirt around the piers to within about 14" of the top of the concrete and coning this fill out and away from the piers as an insulating material for the piers. Since PM is ill-equipped for a task such as this, this work may have to be contracted out. PM may "give it a go", however, on one of the monuments just to see what exactly might be involved in this undertaking.

Additionally at the GBT site, PM has recently completed a conduit installation across the site road to the Receiver room on the GBT site. The road was closed for about 1 1/2 hours while the road was cut, the conduit installed, and the trench backfilled. Fiber optic cable will be pulled from the Interferometer Control Building to the GBT manhole and from there to the Receiver room on the ground at the site, for the benefit of the Electronics staff.

"Musical Offices"

As many of you in the Lab are well aware, PM has been causing as much disturbance as possible in the life of the Business Management, Electronics, and Fiscal Divisions. The move to the new building has been started. Furniture has been delivered by truck to the new building, offloaded, unpacked, and delivered to the various offices in this building. The Business offices have been moved to the new addition and their vacated offices have been cleaned, fixed, and repainted. Five electronics employees have been moved to the former business offices; the copier to the old shipping/receiving room. Next will come the preparation of the old electronics offices, moves by more of electronics personnel, and a rework of several offices on the second floor of the Jansky Lab, with associated moves of musical offices. Many thanks to all personnel for putting up with the disturbance.

Site Safety Survey

The site safety committee has recently completed their annual site safety survey. All of the occupied spaces on site were visited as well as those areas not occupied, but visited due to work requirements. I must congratulate the committee on their thorough investigation of these areas. I must also congratulate all site personnel on their diligence in keeping safety our number one priority. Although there were many findings by the committee, the list of direct findings by the group has gotten shorter every year, attributed directly to each employee's attention to their work area. Remember, there is no better person to ensure the safety of a work area than the person who works there. The Green Bank site did not have a serious personal injury all year. CONGRATULATIONS, and KEEP UP THE GOOD WORK.

Food Co-op Delivery and Meeting Dates

Deliveries	Meetings
	Feb. 11
March 6	March 11
April 3	April 8
May 1	May 6
May 29	June 3

All meetings will be held at the Green Bank Library at 7:00 pm,

A New Coffee Break for the New Lab

F. Ghigo

The new lab addition will have a canteen on the second floor with stove and refrigerator -- an ideal spot for a coffee break room. But the timing of the coffee break is clearly critical. Since the electronics break is at 9:15 to 9:45 and the Jansky Lab basement coffee break is at 9:30 to 10:00, one might at first think that the New Lab break should be at 9:45 to 10:15. To accommodate those who might want to visit all of them, however, it is much more energy efficient to start at the highest level, in the new lab at 9:00, then proceed gradually to the basement. By then personnel will have consumed enough coffee to climb back up to their work places.

Where is Everybody?

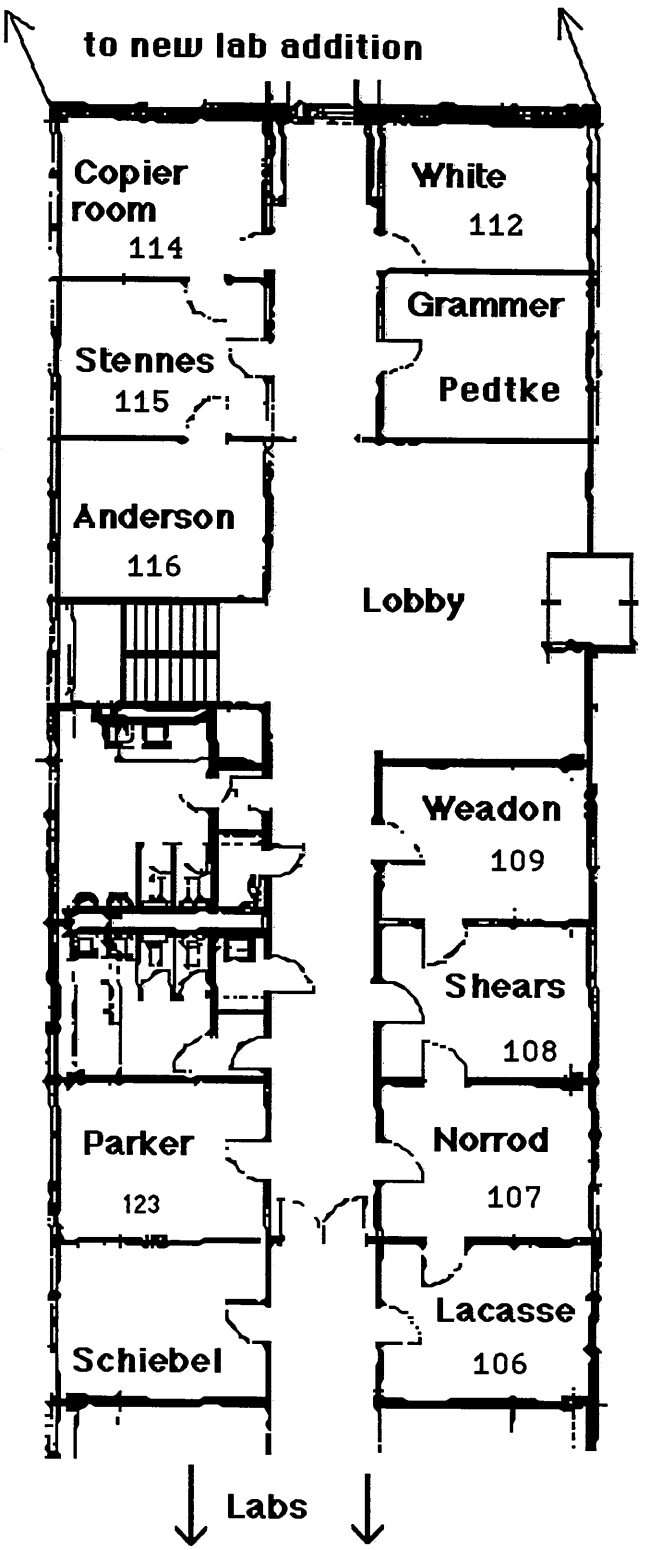
The diagrams on this page and the next two pages show the planned arrangement of people in the Jansky Lab and the new addition. We will all be a little confused until we get used to the new locations of many staff members.

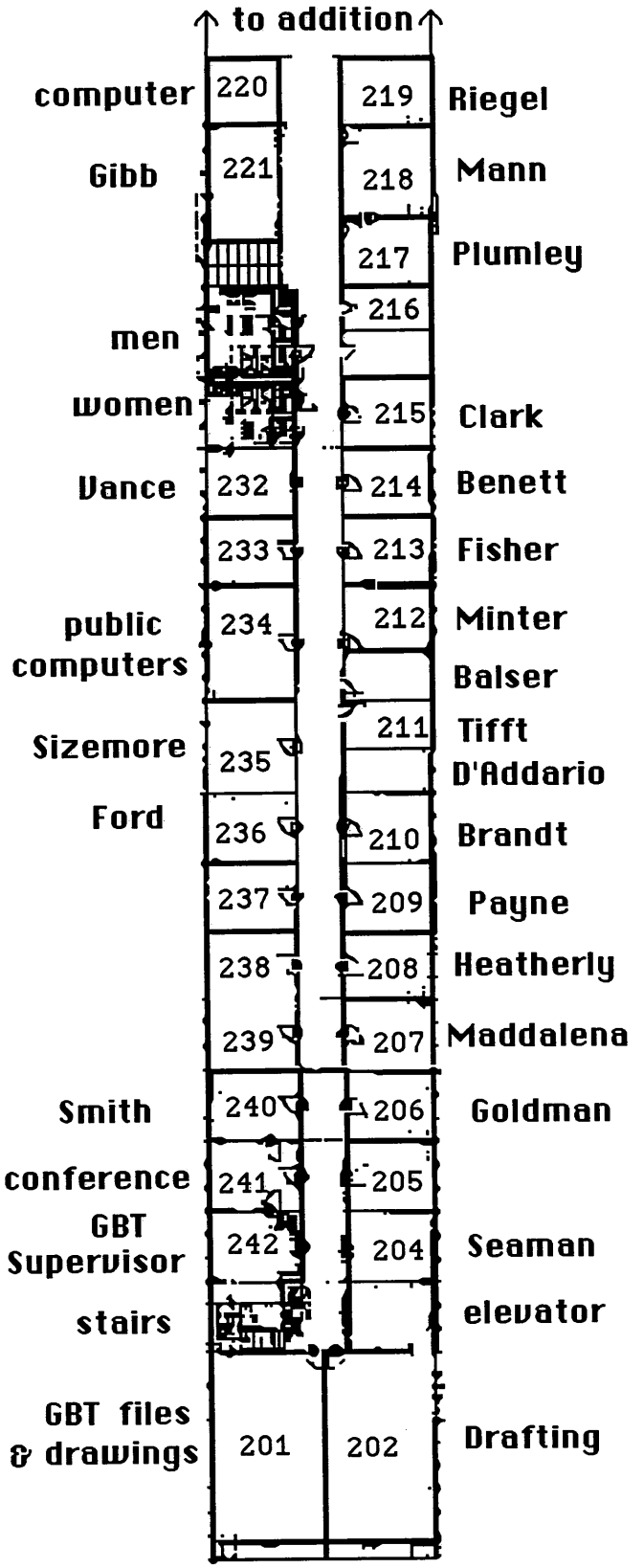
This page shows where everyone is in the west half of the first floor of the Jansky lab. All the business staff (Fleming, Warner, Ziegler, Beverage) and the mail room have moved into the new lab addition building. This allowed the electronics department to expand to fill the entire first floor of the Jansky Lab.

The office cubicles vacated by White, Grammer, Stennes, Lacasse, and Sizemore will have their walls moved to make more lab space.

The GBT control room "mock-up" is being assembled in the former conference room in the Jansky Lab basement.

Jansky Lab - first floor
New office occupants.





Jansky Lab: Second Floor

This shows the planned arrangement of people in offices after Curry, Lockman, Ghigo, Hall, Langston, McKean, and McKinnon move to the first floor of the new lab addition. (See next page for new lab diagrams)

All are moving now into the first floor of the addition, expect for Ghigo, who will move when the second floor is ready in a month or two.

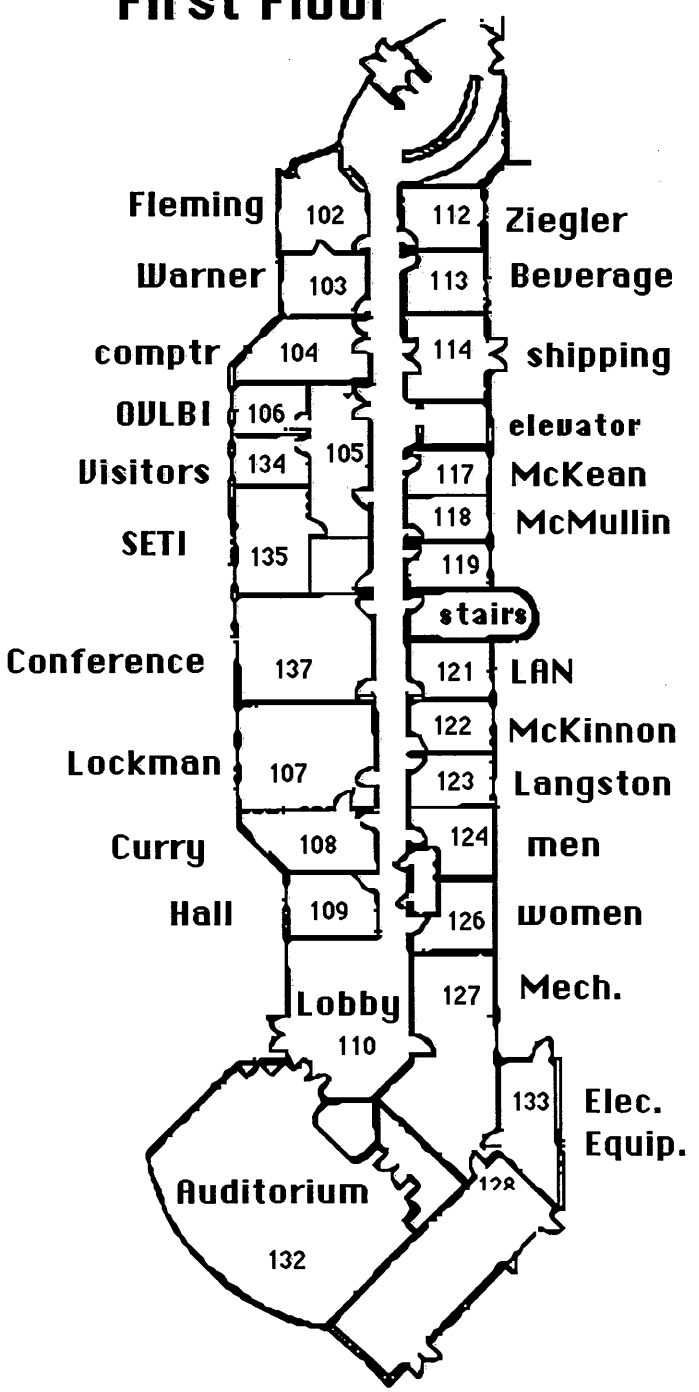
The library also waits until the second floor is ready before moving. The former library space will house the GBT drawings, files, and other documentation.

Several offices become available on the Jansky Lab second floor, so expect to see more moves in the future. Here's your opportunity to get a new office -- put in a request now!

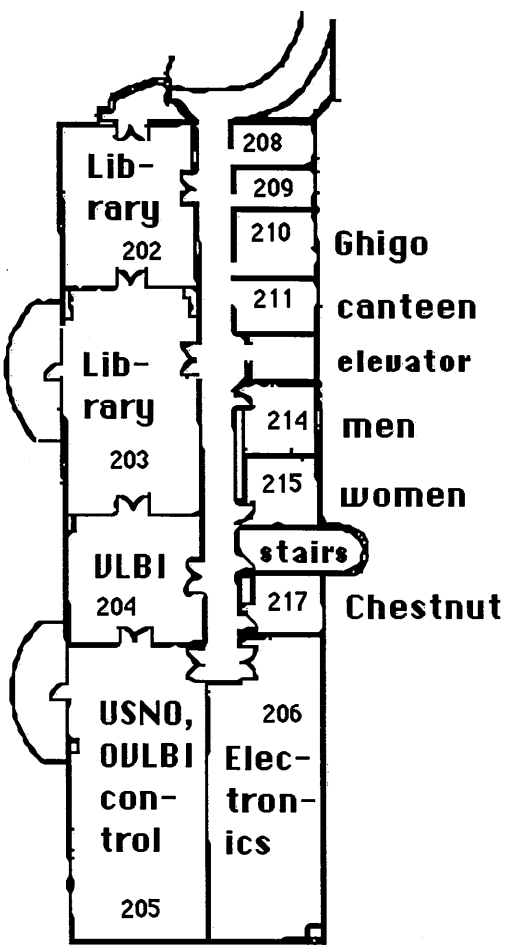
Lab Addition being populated.

Staff members are now moving into the first floor of the new Lab addition. Here is the plan for who will be where. Moving into the second floor will take place in a month or two.

First Floor



Second Floor



Record of Weather extremes from the Interferometer

OCTOBER TEMPERATURE RECORDS

DAY	YEAR	TEMP. F HI	TEMP. F LO	DAY	YEAR	TEMP. F HI	TEMP. F LO
1	1986	81		16	1989	75	
1	1993		26	16	1986		22
2	1967	82		17	1994	76	
2	1992		26	17	1994		19
3	1967	84		18	1994	77	
3	1974		24	18	1970		19
4	1967	82		19	1984	78	
4	1974		17	19	1976		18
5	1982	79		20	1979	75	
5	1968		23	20	1992		12
6	1990	80		21	1979	78	
6	1988		22	21	1981		19
7	1983	76		22	1975	78	
7	1985		20	22	1974		17
8	1993	75		23	1975	78	
8	1991		18	23	1982		16
9	1990	77		24	1989	78	
9	1988		19	24	1969		9
10	1975	76		25	1975	77	
10	1972		23	25	1978		19
11	1995	76		26	1984	73	
11	1994		18	26	1987		16
12	1989	77		27	1984	76	
12	1994		20	27	1979		11
13	1969	82		28	1984	78	
13	1987		18	28	1969		14
14	1975	79		29	1971	73	
14	1988		14	29	1969		14
15	1989	80		30	1991	75	
15	1979		17	30	1969		10
				31	1982	74	
				31	1968		16

MAX.	PRECIP.	RAIN	SNOW	MAX.HEAT	DEGREE-DAYS
	1976	10.1		1988	734
	1978		3		
MIN.	PRECIP.	RAIN	SNOW	MIN.HEAT	DEGREE-DAYS
	1994	0.61		1984	255
	1996		0		

NOVEMBER TEMPERATURE RECORDS

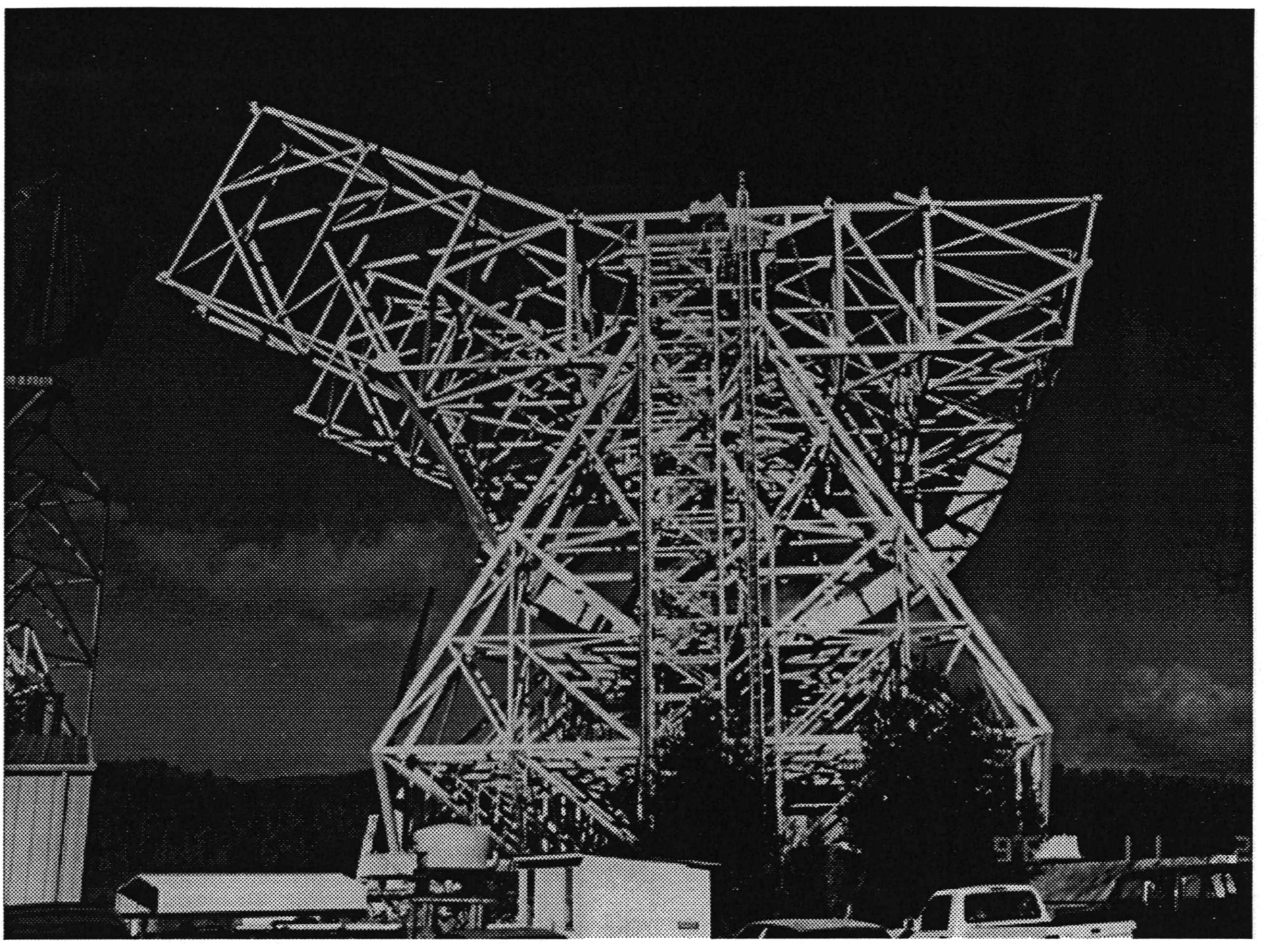
DAY	YEAR	TEMP. F HI	TEMP. F LO	DAY	YEAR	TEMP. F HI	TEMP. F LO
1	1982	75		16	1988	66	
1	1993		19	16	1967		5
2	1982	75		17	1971	69	
2	1980		14	17	1970		10
3	1987	79		18	1975	70	
3	1991		15	18	1988		14
4	1994	75		19	1985	70	
4	1991		5	19	1980		14
5	1978	70		20	1979	68	
5	1991		4	20	1980		7
6	1975	74		21	1979	66	
6	1991		9	21	1969		7
7	1980	73		22	1983	66	
7	1967		10	22	1987		1
8	1975	75		23	1982	63	
8	1993		8	23	1981		3
9	1975	77		24	1973	70	
9	1976		5	24	1970		5
10	1975	69		25	1973	65	
10	1995		16	25	1970		-2
11	1985	67		26	1990	67	
11	1973		10	26	1971		0
12	1982	66		27	1990	71	
12	1996		10	27	1991		3
13	1994	72		28	1990	69	
13	1976		9	28	1996		10
14	1993	73		29	1991	66	
14	1976		1	29	1969		8
15	1973	70		30	1970	60	
15	1996		4	30	1976		1

MAX.	PRECIP.	RAIN	SNOW	MAX.HEAT	DEGREE-DAYS
	1985	10.6		1976	1093
	1995		22		
MIN.	PRECIP.	RAIN	SNOW	MIN.HEAT	DEGREE-DAYS
	1981	0.54		1985	535
	1994		0		

DECEMBER TEMPERATURE RECORDS

DAY	YEAR	TEMP. F HI	TEMP. F LO	DAY	YEAR	TEMP. F HI	TEMP. F LO
1	1977	64		16	1984	58	
1	1976		0	16	1989		-18
2	1982	69		17	1984	64	
2	1971		-2	17	1989		-25
3	1982	66		18	1984	59	
3	1979		-3	18	1989		-10
4	1982	73		19	1967	61	
4	1974		3	19	1989		-10
5	1975	66		20	1987	58	
5	1974		-8	20	1981		-10
6	1975	59		21	1994	55	
6	1969		1	21	1981		-14
7	1980	59		22	1990	61	
7	1977		3	22	1989		-17
8	1980	65		23	1974	58	
8	1977		-1	23	1989		-17
9	1980	58		24	1979	57	
9	1989		3	24	1989		-19
10	1971	63		25	1987	57	
10	1995		-2	25	1983		-13
11	1979	63		26	1982	59	
11	1977		-5	26	1980		-12
12	1979	65		27	1994	57	
12	1988		-12	27	1989		-11
13	1975	60		28	1984	63	
13	1982		-7	28	1977		-7
14	1975	54		29	1984	66	
14	1982		-4	29	1967		-4
15	1984	68		30	1992	63	
15	1989		-6	30	1967		-17
				31	1972	62	
				31	1983		-4

MAX.PRECIP		RAIN	SNOW	MAX.HEAT	DEGREE-DAYS
	1978	8.22		1989	1505
	1989		22.3		
MIN.PRECIP.		RAIN	SNOW	MIN.HEAT	DEGREE-DAYS
	1980	0.85		1984	863
	1994		0		



The GBT continues to grow at a steady pace. This picture, taken in December 1996, shows the horizontal part of the feed arm extending to the left. In January, this has extended further, and soon the vertical part will begin to be assembled.

The trial assembly of the backup structure is almost 70% complete as of early February 1997, with completion expected in June.

National Radio Astronomy Observatory

Green Bank, West Virginia

February 1997

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	**3** 9:00 am- New Conf. Room. - GBT Mtg. 1:00 p.m. - Upst OVLBI 6:00 - 8:00 p.m. Tae Kwon Do Tour Center	**4** 11:00 a.m. - New Conf. Rm. Computer Mtg. 5:30 - 6:30 p.m. Aerobics Tour Center	**5** 11:00 - 12:00 - Upst. - OVLBI 1:00 - 2:30 p.m. Upst. - Sizemore 2:00 p.m. - New Conf. Room McKinnon	**6** 11:00 a.m. - Upst A/D Meeting 5:30 - 6:30 p.m. Aerobics Tour Center	**7** 9:00 -11:00 a.m. - Upst. - Sizemore 1:30 p.m. Bsmt. - Summer Students	**8**
9	**10** 9:00 a.m.-Bsmt GBT Meeting 1:00 p.m.-Upst OVLBI 6:00 - 8:00 p.m. Tae Kwon Do Tour Center	**11** 9:00 - 10:30 - Upst - Coor. Meeting - GBT 5:30 - 6:30 p.m. Aerobics Tour Center	**12** 3:30 - Bsmt. Tech. Seminar	**13** 2:30 p.m. - New Conf. Room - Teacher Mentorship Prog. 5:30 - 6:30 p.m. Aerobics Tour Center 7:00 p.m. - Bsmt. H. Radio Mtg.	**14**	**15**
16	***17*** ***HOLIDAY!!!***	**18** 5:30 - 6:30 p.m. Aerobics Tour Center	**19**	**20** 5:30 - 6:30 p.m. Aerobics Tour Center	**21**	**22**
23	**24** GBT Mtg. - Bsmt. - 9:00 am 1:00 p.m.-Upst OVLBI 6:00 - 8:00 p.m. Tae Kwon Do Tour Center	**25** 9:00 - 10:30 a.m. - UPST - GBT Coor. Mtg. 5:30 - 6:30 p.m. Aerobics Tour Center	**26**	**27** 5:30 - 6:30 p.m. Aerobics Tour Center	**28**	