North American
AstroPhysical Observatory

NAAPO (North American AstroPhysical Observatory)

"Signals"
Volume 9 Number 8
The NAAPO Newsletter
(September 1993)

Editor:
Earl W. Phillips, Jr.
7893 Thornfield Lane
Columbus, Ohio 43235
614-764-0476

NAAPO Coordinator:
Dr. Philip E. Barnhart
Dept. of Physics/Astronomy
Otterbein College
Westerville, Ohio 43081
614-898-1516

Meetings are held 1st & 3rd Saturdays of each month, beginning at 10:00am; at the office building at the site of the Radio Telescope; and each Tuesday evening starting at 5:00pm, at Room 805, Dreese Hall, OSU Campus.

IN THIS ISSUE:

SUMMER INTERN'S REPORT

By: Malinda McKay & Chris Slack

This summer was a summer of antenna pattern measurements. We started off with something relatively simple, a 2 element beam cut to 1420MHz This was the antenna normally used on the signal squirter. Our reasoning for measuring this antenna was that none of us had ever really done an empirical study of antenna patterns, and a small antenna seemed to be a logical first step before tackling the **Big Ear**.

The setup used for testing the antenna consisted of a transmitter and a receiver. The transmitter was a 1 mW signal source with a 16dB amplifier borrowed from the telescope. The signal was transmitted through the east feedhorn (which was not currently in use). Our receiving setup originally consisted of only the HP power meter and the beam at the end of a 200' extension cord. After taking a few readings and seeing the wild fluctuations we quickly decided that a BP filter was needed. The final setup included a 1390-1430MHz BP filter which eliminated our RFI problems caused by a receiver with an effective bandwidth of 10GHz. At the receiving point we rotated the antenna itself, taking measurements from the power meter every 10°. We then plotted the pattern on polar graph paper and came up with a nice looking plot. Now came the time to do "the real thing" and this antenna would be considerably more difficult to rotate than the little 5" Yagi.

In order to avoid rotating the feedhorns (which was never considered) we were planning to move the receiving antenna around the feedhorns, at a constant distance, and with an accurate sense of direction. Doing this with the equipment we had took some mathematics and some very complex measuring devices. For distance we used a 410' piece of nylon cord (which was attached to a strain gauge to assure a constant tension). The angles were determined by calculating the correct 5° cord lengths for a circle with a 410' radius. This method worked and proved to be quite accurate as we were later able to verify by using a transit provided to us by Dr. Barnhart.

As we began measuring the feedhorn pattern our receiving setup progressed. We decided, however, not to use the Yagi as the receiving antenna, but instead used a horn-type antenna similar to the skyhorn. Our power source progressed from the 200' of extension cord cobbled together from the **RO**'s supply, to the impressive 500' cord from **ESL** (which, assuming the parabola is still 410' from the feedhorns, is considerably longer than the reported 500'), and finally to a small lead-acid battery hooked up to the inverter lent to us by Steve Willard which was the best, and final source of power. For the first day of readings the horn was simply held above the ground a few feet, which proved less than ideal. So, a way was needed to raise it up high enough to not be affected by the ground plane. The solution came in the form of a forklift-

like piece of equipment from **ESL** which was laying unused around at the **RO**, which they call a "genie". This enabled us to raise the horn to a grand height of 14.55' (still not in the principal plane, but high enough to not see too much reflection from the ground plane). This setup provided us with a decent portable receiving device, helping us map the far field from 20° west to 20° east (everything on the ground plane).

From the measurements we took in the first 25 weeks we were able to plot the antenna patterns for both the east and west feedhorns from 20° E to 20° W. We also measured 25' distanced on the 0° line in order to determine where the far-field pattern began. It was calculated that the west feedhorn is more sensitive than the east by about 1dB, and that the far field begins at appr. 275'.

The remaining week and a half was spent trying to figure out how to do something useful in the field, since time was quickly running out. This proved considerably more difficult than our measurements on the ground plane before. In order to get true measurements we needed to be in the principal plane of the antenna, which in the center of the parabola is at 35'. We also needed to needed to be at a height higher than 14.55' when we went off the ground plane to measure the patterns in the field. Erecting a structure 35' high, which is stable, wind resistant, and portable is not an easy task. We went through several iterations starting with 3 sections of 10' aluminum mast with the 2 element Yagi (modified to be essentially a 3 element Yagi by the addition of a reflector made out of an old high voltage sign). This structure proved to be quite unstable and was never used for measurements. The second structure concerned the genie used for the original measurements with a section of 10' mast attached to it, along with the addition of a discone antenna because the Yagi had proved to be too directional for a true field probing. In order to make this structure more portable it was clamped to an old 2 wheel trailer which was lying around, bringing the total height to about 27'. Upon taking this device into the field and taking some measurements we found nothing. The needle on the meter never budged. The sidelobes were less than -75dB which is the range of the meter. On the next day we had a preamp ready to use with the system. When we brought the system into the field we found that we could see a signal (with an extra 35dB of amplification), but that it varied too much because of the antenna swaying in the wind due to the instability of the structure. We now had one last option; we built "**The Thing**". The Thing consisted of a base of 4 12' 2x4's, with some support sections and 4 swivel wheels on the bottom to make it semi-portable. The tripod was bolted to The Thing, with 30' of the steel telescoping mast provided for us by Dr. Dixon. The mast was guyed in eight places to the ends of the 4 2x4's (which were layed out in a configuration similar to that of a railroad crossing). The Thing is stable, tall, and amazingly enough, is even portable. Unfortunately, The Thing was completed too late for us to really have a chance to use it much. We were able to see that it should be stable enough to use for measurements, but that was all really. A few more guys wouldn't hurt either.

Over the past month we have had a lot of fun and have learned quite a bit. We would like to especially thank Steve Brown & Russ Childers for working with us and teaching us throughout the summer. The teaching we have received will not fall on deaf ears, we promise! We would also like to thank Dr. Barnhart and all of NAAPO for giving us the opportunity to come here this summer and for providing us with experiences that will last a lifetime.

Sincerely and with all appreciation; Chris Slack & Malinda McKay.

HRMS Quarterly Report - June 1993

By: Ron Baalke
Organization: Jet Propulsion Laboratory
Forwarded from the HRMS Project
NASA HIGH RESOLUTION MICROWAVE SURVEY
TARGETED SEARCH AND SKY SURVEY STATUS
QUARTERLY REPORT
JUNE 1993

BACKGROUND

The **High Resolution Microwave Survey (*HRMS*)** is part of the **Toward Other Planetary Systems (*TOPS*)** program in NASA's **Solar System Exploration Division**. The *HRMS* searches for evidence of planets orbiting other stars through radio emissions that may be produced by technological civilizations. The *HRMS* has two search modes, a **Sky Survey** and a **Targeted Search**. The Sky Survey is managed by the **Jet Propulsion Laboratory** and uses 34-meter antennas in **NASA's Deep Space Network** to sweep the entire sky over a wide range of frequencies for the presence of strong signals. The Targeted Search uses the largest available radio telescopes to observe nearby Sun-like stars over a narrower range of frequencies for weak signals. The Targeted Search is managed by **NASA's Ames Research Center**, which is also the lead center for the *HRMS*. The combination of the two search modes is millions of times more comprehensive than the sum of all previous search programs. The observational phase of the *HRMS* was inaugurated at 1900 UT on 12 October 1992 at the **NASA Goldstone Deep Space Communications Complex** in California and the **Arecibo Observatory** in Puerto Rico. The Arecibo Observatory is part of the **National Astronomy and Ionosphere Center** operated by **Cornell University** for the **National Science Foundation**. In a coordinated initial observation program, the Arecibo antenna pointed at the star Gliese 615.1A and the Goldstone antenna began to scan the area of sky that included the targeted star. This report presents an overview of the observations, project activities, and results to date.

THE OBSERVATIONS
Sky Survey

Initial observations began using the **Sky Survey Prototype System (*SSPS*)** with the new 34-meter antenna and an existing low noise microwave receiver at the **Venus Development Station** at Goldstone. The SSPS spectrum analyzer divides a single-polarization, 40 MHz wide radio frequency band into slightly more than two million channels of 19 Hz resolution. The SSPS observatory control software drives the antenna very rapidly in a precision scan pattern lasting about 90 minutes. The pattern systematically covers 1.4 degrees high by 30 degrees wide rectangles, called "skyframes," which are fixed on the celestial sphere. The skyframes therefore appear to move across the sky as the Earth rotates. While observing, the SSPS real time signal detection subsystem excises channels contaminated by terrestrial signals and stores data from uncontaminated channels whose power exceeds a specified threshold. The scan pattern is designed so that each point in a skyframe will be scanned by the antenna at least twice (with slightly different position offsets) separated by about eight minutes in time. At the completion of each skyframe, the SSPS post processing subsystem analyzes the stored data and selects 20 candidates for the first level verification tests. These tests employ the SSPS in a different mode to perform more sensitive and localized reobservations. Forty-six single-polarization skyframes have been completed (*i.e., both the initial skyframe and candidate reobservation phases were performed*). To date, a single event has reappeared in a first level verification

reobservation, albeit at a much weaker power level than in the original skyframe. The event did not survive additional verification tests, and the appearance of one such false alarm in 46 skyframes is consistent with statistical expectations arising from small fluctuations caused by the thermal noise of the receiver itself. The SSPS is now observing for approximately 30-40 hours per week on the 34-meter Goldstone antenna. The SSPS has completed a series of special observations on a nearby 26-meter antenna at lower microwave frequencies. These observations were designed to enhance radio astronomy spinoffs from ongoing Sky Survey operations and to improve interference excision algorithms. Three skyframes covering half the galactic plane visible from the northern hemisphere were repeatedly observed in frequency bands that include the natural emission lines produced by hydrogen atoms and hydroxyl radicals (OH). Results of these observations, including maps of the detected emission, will be published later this year. Work continues at JPL on the development of the Sky Survey Operational System (with sixteen times the bandwidth of the SSPS) and of the wide band receiver systems to be used by both search modes.

Targeted Search

The Targeted Search System (TSS) used the Arecibo 305-meter antenna, the world's largest radio telescope, during its initial campaign to observe 25 stars within 100 light years of the Earth. Receivers provided by the observatory allowed observations in four frequency bands covering a total of about 300 MHz within the range from 1300 MHz to 2400 MHz. The TSS processes a dual-polarization 10 MHz wide radio frequency band into more than 14 million channels, each only 1 Hz wide. It simultaneously processes the same band into channels with 7 Hz and 28 Hz resolution. Real time signal detectors scrutinize the data for the presence of continuous wave and pulsed signals that may drift in frequency by as much as 1 Hz per second. An "observation" of a star in a 10 MHz frequency band consisted of three steps: pointing the antenna at the star, then away from the star, and then back at the star. Each step lasted either 92 seconds or 299 seconds. Signals that were present only when the telescope was pointed at the star (and not previously seen in other observations) were selected as candidates for further verification tests. Signals that were present both "on" and "off" the star were rejected as terrestrial interference. During the 200 hours of assigned telescope time the TSS made 436 observations of the target stars and a variety of test observations. Many interference signals were detected and cataloged while fifteen signals satisfied the basic candidate selection criteria. These candidates were immediately subjected to further verification tests, but all proved to be intermittent terrestrial interference. Analysis of the data collected at Arecibo continues with the goal of developing better techniques for quickly identifying, classifying, and perhaps even avoiding interference signals. Since returning from Arecibo, the TSS has been reassembled in the development laboratory at NASA Ames. This is part of a planned system expansion timed to coincide with major upgrade activities at the Arecibo Observatory. The "lessons learned" through operational experience are also being implemented as modifications to several circuit boards and improvements in the software. Over the coming months, the TSS will expand to process two dual-polarization 10 MHz radio frequency bands with additional resolutions. The **Mobile Research Facility** that houses the TSS for transportation to and operation at observatories has received additional cabling and electronics racks needed for the 20 MHz system. The expanded TSS is required for the 1994 Targeted Search Campaign, during which nearby Sun-like stars in the Southern Hemisphere will be observed using the 64-meter antenna of the **Parkes Observatory** in Australia. Parkes is part of the **Australian Telescope National Facility** operated by the **Commonwealth Scientific Industrial Research Organization**. A Memorandum of Agreement has been negotiated between **NASA** and **CSIRO** through the **Australian Space Office** for the use of this facility.

RESULTS

No signals of extraterrestrial intelligent origin have been detected. It is encouraging that most of the terrestrial interference signals encountered so far have been immediately recognized as such by the Sky Survey and Targeted Search Systems. A few signals required additional verification tests to determine that they were of human origin or due to thermal noise. In summary, the *HRMS* has successfully inaugurated its observational phase. Both the Targeted Search and the Sky Survey components are using the lessons learned in the initial observations to improve their hardware, software, and observation techniques as they expand their systems by stages to the final configurations required to pursue the full-scale search. For more information, please contact:

SETI Program Office
M.S. 244-11
NASA Ames Research Center
Moffett Field, CA 94035-1000
phone: (415) 604-6505

-or-

SETI Office
M.S. 303-401
Jet Propulsion Laboratory
Pasadena, CA 91109
phone: (818) 354-6270

JPL Mission Updates

By: Ron Baalke
Organization: Jet Propulsion Laboratory
Forwarded from:
PUBLIC INFORMATION OFFICE
JET PROPULSION LABORATORY; CALIFORNIA
INSTITUTE OF TECHNOLOGY;
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION;
PASADENA, CALIF. 91109.

PLANETARY MISSION STATUS
July 29, 1993

GALILEO: The spacecraft is now one month from its encounter with asteroid Ida, at 2400 kilometers, on August 28, 1993. Scientific observations will be recorded for later playback. Galileo will go into Jupiter orbit and operate a probe in its atmosphere on December 7, 1995. Spacecraft condition is excellent, except that the high-gain antenna is still only partly deployed; science and engineering data are being transmitted via the low-gain antenna, which the mission team is planning to use for the Jupiter mission. Galileo was launched October 18, 1989, flew by Venus in 1990 and Earth in 1990 and 1992 for gravity assists, and flew by asteroid Gaspra in October 1991.

MAGELLAN: The aerobraking program, begun May 25, is expected to be complete in early August, putting the spacecraft in a lower and more circular orbit for higher-resolution gravity mapping of higher

latitudes and the poles. This procedure, dipping into Venus's upper atmosphere each orbit, has produced new knowledge of the atmospheric properties. Magellan was launched May 4, 1989. It radar mapped more than 98 percent of Venus's surface from September 1990 to September 1992, and surveyed parts of the gravitational field from its elliptical orbit for the next 8 months.

MARS OBSERVER: The spacecraft, currently 5.5 million kilometers (3.4 million miles) from Mars, is being prepared to enter orbit on August 24. Spacecraft health and performance are normal. It will then be maneuvered into a mapping orbit; science operations are planned to start in mid-December. Mars Observer was launched September 25, 1992.

TOPEX/POSEIDON: The satellite is healthy, and all scientific instruments are performing normally, typically providing three playbacks per day. The mission is mapping global sea level changes, reflecting seasonal warming and cooling and winds. So far it has accumulated 7 months of data. TOPEX/Poseidon was launched August 10, 1992.

ULYSSES: The spacecraft is in a highly inclined solar orbit, now nearly 36 degrees south relative to the Sun's equator, in transit from its Jupiter gravity assist in February 1992 toward its solar polar passages (about 80 degrees south and north) in 1994 and 1995. Spacecraft condition and performance are excellent, with Ulysses gathering data on the heliosphere — the realm dominated by the solar wind. The Ulysses spacecraft was built by the **European Space Agency** and launched October 6, 1990.

VOYAGER 1 and 2: The two Voyager spacecraft are continuing their Interstellar Mission, having remotely detected the heliopause, the boundary between the solar magnetosphere and interstellar space, for the first time last month. Voyager l, launched September 5, 1977, is currently 8 billion kilometers (5 billion miles) from the Sun after flying by Jupiter and Saturn in 1979 and 1980; Voyager 2, launched August 20, 1977, to fly by Jupiter (1979), Saturn (1981), Uranus (1986) and Neptune (1989), is now more than 6 billion kilometers (3.9 billion miles) from the Sun.

RO "SOCIAL EVENT OF YEAR" MARRED RY ATTACK OF MYSTERIOUS CREATURE

An otherwise idyllic setting for the RO Social Event of the Year was marred by the repeated attacks of a large water creature, apparently a resident of Loch Dixon.

Affectionately dubbled "OH2131" by Dr. Dixon, several eyewitness accounts at the site describe the creature as being some 110 meters in length, and at times emitting a soft growl, loudest at roughly 21 centimeters.

Several RO volunteers and their children were menaced by the creature. At one point, it grabbed volunteer Tom Hanson and dragged him to the far side of the Loch, where it is rumored that poisonous turtles nest. Tom managed to extricate himself from the jaws of the monster and swim back to the safety of the dock.

Talk of a conspiracy floated about as Dr. Dixon was witnessed placing children in a dock-side "tenderizing unit" before sacrificing them to the creature. When questioned by this reporter, Dr. Dixon refused to comment, saying only that "I am not allowed to discuss it". In an obvious attempt to avert everyone's attention from the creature, Dr. Dixon conducted several tours of his beautiful new home.

A lack of natural food sources seems to be the reason for the sacrifices. A conspicuous lack of fish in the Loch was evident, and the barns and stables are devoid of cows and horses. Apparently, the only thing left

for Dr. Dixon to feed his creature is RO volunteers. What better way to ensure a good meal for it, than to stage a party for the volunteers?

The creature has evidently reproduced, for several of its young were seen swimming about in the Loch. One witness, who asked not to be identified, described the young as appearing to him as "extremely large 'tadpole' type creatures; as if regular bullfrog eggs were hatched in the cooling towers of Chernobyl". Some of the young were seen swimming in the tenderizing unit, and one of them spat acid at the party's attendees, in an attempt to blind them so they would fall into the Loch, only to become meals for their parent.

Many attempts were made to capture the creature's image on film, but most of the pictures mysteriously came out either blank or badly out of focus.This reporter, for one, wants to know the facts. What is this creature of the Loch? Why is Dr. Dixon secretly harboring a seemingly intelligent life form? Researching minds want to know!

Actual unretouched negative of Loch Dixon Monster

17 July 1993 MEETING NOTES

The meeting began at roughly 10:15am. Those in attendance were Brown, Phillips, Slack, Dixon, John & Ken Ayotte, Schumacher, Stephens, Mrs. & Malinda McKay, and Campanella.

Brown reports that he and the summer interns have been making measurements of the feed horns.

Hanson reports that we are being urged to remove the old computer punch cards from Baker Systems. There has been no recent change in the card-to-tape project.

Schumacher reports that he has continued his work on the KLT, producing more output. He feels that he has found at least one case where the KLT will outperform the FFT in signal detection.

Campanella has been travelling lately, and has had little time for his **RO** duties.

Slack brought Russ Childer's charts of the CASS A region, showing both point and diffuse sources. They need a comparison chart to determine if some of the point sources are previously uncatalogued. He reports that he has been busy measuring the feed horns, and has plotted their response at varying distances. He has found that the response does not peak at the center, but about 4° off. One possible reason may be the

"blinders". He plans to test the horns with the blinders removed to test his theory.

Stephens comments that he attended the meeting as an observer. He also commented on the feed horn measurements, offering suggestions.

Phillips brought a modem program that sets a PC's clock to the USNO's Atomic Clock. He also brought the results of his **RFI** survey of some 3 years ago, as the seed of a potential RFI database for the detection system to query in case of a suspect signal.

Ken Ayotte reports that he has constructed a power supply for his receivers, and that his education grant proposal from **NAAPO** has been accepted. John reports that he is still working on scanning the Ohio Survey into PC format.

Mrs. McKay has started working on the weed control problem, and reports that her husband would like to get involved, possibly assisting Tom Hanson on the card-to-tape project from his home. Malinda has been working with Chris Slack & Steve Brown on the feed horn measurements.

A presentation on **Fuzzy Logic** was then given by Chris Slack, with a slant on the possible future use of this field in the area of signal detection. He also feels that Fuzzy Logic could be useful as a means to separate **RFI** from signal. A general discussion on the subject followed, with many possibilities floated about as to the application of Fuzzy Logic to radio astronomy. He promises to continue working in this field.

The meeting broke at roughly 11:40am, with most going off to their respective tasks.

Light Pollution Update:
MOVEMENT UNDERWAY TO HALT "BILLBOARDS IN SPACE" CONCEPT

By: Earl Phillips

A movement has begun, mainly within the astronomical community, to stop the "Billboards In Space" idea before it ever gets a chance to fly. "Billboards In Space" is the generic name for any proposal to launch into Low Earth Orbit, platforms which would be visible from the Earth's surface at night, and which carry commercial advertising.

The movement began after news of just such an idea was proposed by the Roswell, Ga firm **Space Marketing, Inc.** Their proposal has generated volumes of press releases, letters, and articles in opposition. All the articles I've read so far say pretty much the same thing; a mile-long Mylar covered platform will be launched into Low Earth Orbit in 1996, rivaling the full moon in size and brightness, and will carry commercial advertising.

The proposal began as a way to hype the 1996 Summer Olympic Games, held in Atlanta, Ga. Dubbed "The Environmental Platform" by its creators, it is planned to carry a battery of ozone reading monitors. According to a telephone and fax interview I conducted with Space Marketing, Inc's CEO **Mike Lawson**, *"the advertising part of the platform has been blown out of proportion by the astronomical community and the press. It will not display commercial advertising, but rather a symbol that represents recycling and the wise use of Earth's resources. Any company that wishes to, may purchase rights to the logo and print it on their products, thus identifying themselves with the message the logo intends to foster."* Also, rather than being visible at night, Lawson states that the platform *"would be visible only during daylight hours, and then*

only for 10 - 15 minutes out of every ninety". Further, he states that the platform is expected to last only *"14 - 20 days, after which time it will simply burn up in the upper atmosphere"*.

"The reason for the ozone monitoring instrumentation, according to Lawson, *"is the fact that current ozone monitoring instrumentation is rapidly nearing the end of their useful lives, and would otherwise have to be replaced at taxpayer expense"*. Lawson feels that his company's proposal will *"effectively replace the current monitors at zero expense to the taxpayer, because the entire cost will be born by the companies purchasing the rights to display the environmentally friendly logo. In light of the current concentration on lowering the federal deficit, it makes sense to shift as much of the burden as possible off the backs of the taxpayers"*. Lawson is scheduled to testify before a Senate Sub-Committee on his proposal the week of 7/26/93.

Congress has also taken issue with such proposals. Senate bill number **S-1145**, jointly introduced by **Vermont Republican Senator James Jeffords and Massachussetts Democratic Representative Ed Markey**, entitled the "**Space Advertising Prohibition Act**", declares that *"the use of outer space for advertising purposes is not an appropriate use of outer space and should be prohibited". Other lawmakers, and lawyers, however, feel that the bill is poorly worded, and will therefore be difficult to uphold. As currently worded, it outlaws "all advertising in outer space, for purposes of marketing or otherwise promoting the sale or use of goods and services"*. As **Glenn Reynolds**, Executive Vice President of the National Space Society, and law professor at the University of Tennessee, puts it, *"this bill is a law professor's nightmare". If one of my students had drafted this, I'd have given him an F. Because the definition of space advertising is so broad, it basically outlaws everything — TV commercials, company logos on the sides of rockets, the works. It's sloppy"*.

Obviously, any proposal that would add to the growing influence of light pollution should rightly be fought. Astronomers have a tough enough time as it is plying their trade through light pollution, and astronomy educators are finding it increasingly difficult to teach the wonders of the heavens, when fewer and fewer stars are available to view. While this particular proposal doesn't seem all that bad on the face of it, there will be proposals submitted within the next 5 years that will directly affect the night-time light pollution. I urge everyone to get ready to battle these future proposals, if you wish to continue to see the stars at all. The best way is to let our elected officials know how we feel on the subject. Contact the elected representatives of your state and let them know that you refuse to allow the night sky to become a backdrop for commercial advertising. You can also leave a message for **Vice President A1 Gore, at (202) 456-1111**, from 9am to 5pm Eastern time. As the self proclaimed "environmentally friendly Vice President", this is an excellent litmus test.

For further information on this particular proposal, or others along the same vein, you may contact the author at 7893 Thornfield Lane, Columbus, Oh 43235; or by phone 6pm-10pm Mon-Fri & 10am-10pm weekends, (614) 764-0476; or electronically at ephillip@magnus.irccohio-state.edu.

ed. note: *Since I wrote this article, I have received a copy of the bill mentioned above. I will send copies of it to anyone interested. Additionally, I have learned that the bill is currently under consideration in the Committee on Commerce, Science, and Transportation. I will also provide the names and addresses of the committee members to anyone wishing to contact them for the purpose of expressing their opinion on this matter.*

DELAWARE, OH CLOSE TO ADOPTING LIGHTING RESTRICTIONS

The City of Delaware, Ohio, just north of Perkins Observatory & "Big Ear", has lately been considering the inclusion of lighting restrictions to their zoning codes. The lighting regulations, similar to those already adopted by **Liberty Township**, just west of the observatories, strictly limit lighting amounts and take specific issue with light trespass, as well as demanding the use of full cut-off type fixtures.

The final decision by the **Planning Commission** was delayed due to testimony by 2 local electric company representatives, who stated that the use of Low Pressure Sodium lamps were potentially dangerous, subject to explosion. Research on this possibility showed that there is no undue safety concerns in their use, however.

At their regular meeting in July, the Planning Commission voted unanimously to send the proposal to the **City Commissioners** with their favorable recommendation to approve it into law. The City Commissioners will meet the last Monday of August to consider the proposal.

7 AUG. 1993 MEETING NOTES

The meeting began at roughly 10:15am. Those in attendance were Barnhart, Phillips, Dixon, O'Connor, Mrs. McKay, J & K Ayotte, Janis, and Childers.

Barnhart reports that Steve Brown is away on vacation.

Dixon reports that he is almost ready for the trip to Santa Cruz, and Ayotte brings more transparencies for his talk there.

Phillips brings some 8" diskette protectors he is donating, as well as a couple of years worth of "***The Spacewarn Bulletin***" he donates to the archives. He reports that the ***Electronic Journal of the Astronomical Society of the Atlantic*** will carry a blurb on the RO, allowing readers of that journal to obtain Signals on a regular basis in exchange for some sort of donation, as well as how to purchase sets of ***Cosmic Search***. He has also obtained a piece of mathematical software that solves equations that he will donate to the cause.

Ken Ayotte has constructed a 600MHz helix array, and brings charts and pictures of it.

Mrs. McKay reports that her daughter Malinda is safely off to Japan, and that her husband has begun assisting Tom Hanson on the card-to-tape project from his home.

Childers reports that he and O'Connor has been working on the guy wire project since roughly 8:15am today, and has completed the connections to the ground anchors. Much welding was necessary, but all there is left to do now is to hang and connect the replacement guy wires. He also brings a new photo of the mystery source, as well as a graph of the hydrogen cloud he's been observing.

O'Connor reports that he is now ready to tackle other projects.

The meeting broke at roughly 11:30am. A tour was directed by Dr. Dixon for the **Mid-Ohio Research Associates**, a group interested in UFO research.

COORDINATOR'S CORNER
By: P.E. Barnhart

A busy summer has occupied the RO staff and an exciting fall is just around the corner. Our two student interns, Malinda and Chris, have had their taste of good hard work. Not surprising that they learned that sometimes the course of true science involves an entire day to track down a single hex nut to secure an RF connector to a portable antenna. Valuable measurements of the feed horn antenna pattern were carried out with their able assistance. They both gained valuable experience in rf field strength measurement, surveying, mast building (to get the test antenna closer to the middle of the parabola thus to the middle of the horn pattern) and data analysis and display.

Chris left on the last day of July to prepare to start the fall term at Clarkson College in Potsdam, New York. Malinda left the 5th of August for a trip to Japan where she will watch for the anticipated spectacular Perseid meteor shower. She has also indicated she will check out the Japanese radio astronomy situation, at least from the standpoint of the knowledge of the average Japanese citizen. We anticipate her return before the start of the fall school term and expect her to continue her volunteer work with us through the coming year.

For those of you who read this Corner last issue, I would like to mention that **NAAPO** chose to grant **KEN AYOTTE** seed money to explore new technology amplifiers for possible use on his home built radio antenna. We have begun to receive reports at our Saturday working sessions on his progress. Among other things he reported last week is a 4 element helix array. The pictures he presented demonstrate a rapid advance in skill and speaks well for the commitment **KEN** is bringing to his project. We will publish his project report early this fall so you can all get the straight scoop on what he is attempting and the progress he is making.

A number of tasks are coming around this fall. The horn pattern project, the H cloud scans (requiring total power detection leaving the pattern recognition and **LOBES** programs on standby) and the antenna temperature and aperture efficiency measurements using Cass. A are drawing to a close. The instrument will return shortly to the survey mode and **SETI** data will again take the majority of the observing time. Russ Childers has the data processing programs humming along.

The PC simulated strip chart recorder is now running without a glitch. It did shut down every midnight for a time. The reason was not clear and the fix (found serendipitously by Chris Slack) was to insert an innocuous inquiry statement into the program. The statement asked the program to do nothing and the glitch disappeared as long as the statement was in. Upon removing the statement from the program the machine stopped at midnight. Since reinserting the statement the recorder has run without a hitch. Great power of suggestion.

Next issue we look forward to a report from **BOB DIXON** on his presentation at the Santa Cruz **SETI** conference. He is presenting a paper on the **RO ARGUS** Project and its application to **SETI** and all of radio astronomy. Many volunteers came together in the last few weeks to help get this paper ready for the conference. Special thanks should be expressed to **CHUCK KLEIN** and **RUSS CHILDERS** for generating new graphics, **JOHN AYOTTE** for a simulated **ARGUS** display, **BILL MILLER** for overhead transparencies and slides and **STEVE BROWN** for new data on the computer load requirements. Much of the material is being sent to Santa Cruz after Bob's departure from central Ohio.

ADDRESS LABEL HINT

Last issue I indicated a desire to pare back a bit on the SIGNALS mailing list. Most of our readers are committed to supporting our effort, either with their good wishes or in more tangible ways. Donation of time and/or money is always greatly appreciated, though sometimes not adequately acknowledged.

In an attempt to assess the commitment of those from whom we have not heard in a long time it was suggested last issue that an opportunity exists to freshen your contact with **NAAPO**, the radio observatory or an individual working with us.

Our intrepid editor kind of messed up my illustrative mailing label which is designed to give a hint to the people from whom we have not heard in a while. I repeat that label here in hopes that Earl will get it right;

Dr. P. E Barnhart *
Dept. Phys/Astron *
Otterbein College *
Westerville, OH 43081 *

That little straight row of *'s at the right end of the label indicates that we think we have not heard from you for a sufficiently long time that we begin to wonder if you are really just wrapping fish in the newsletter. Let us hear from you before the clock starts to wind down. It is too good a deal for you to pass up. I realize it is probably too small an issue over which I should expose my little *!

MARS OBSERVER BEGINS PHOTOGRAPHING ITS TARGET
By: Ron Baalke

NASA's Mars Observer spacecraft returned its first image of Mars taken last week when the spacecraft was 3.6 million miles (5.8 million kilometers) from the red planet.

The photograph was taken using the **Mars Observer Camera's** (MOC) high resolution narrow-angle telescope as a technical check-out of the camera, the data management system and other systems on board the spacecraft and on Earth, including **NASA's Jet Propulsion Laboratory**, Pasadena, California, and the MOC operations facility at **Malin Space Science Systems, Inc**, San Diego.

Mars Observer will orbit Mars on August 24 and global mapping operations will begin December 16.

The Other Paper, August 12-18, 1993

The London *Daily Telegraph* reported in November that the new state-of-the-art telescope operated by NASA and the Vatican Observatory in Arizona will be used to search distant galaxies for signs of intelligent life so that, if any humans are discovered, the Catholic Church will be prepared to baptize them.

[Back to List of Issues in Volume 9] | [Back to List of Volumes] | [HOME]

E-mail Webmaster

Designed by Jerry Ehman
Last modified: March 5, 2004