North American
AstroPhysical Observatory

NAAPO (North American AstroPhysical Observatory)

"Signals"
Volume 4 Number 8
The NAAPO Newsletter
(November 21, 1988)

Edited by: John Ayotte, 528 Whitson Drive, Gahanna, Ohio 43230 [614-476-3834]

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

Amateurs as Professionals

by Jacqueline Milton
Editor of the Journal of the British Astronomical Association, the national society of amateur astronomers in the United Kingdom, and holder of a doctoral degree in astronomy from Cambridge University

Astronomy Magazine, November 88

For someone like me, a professional astronomer and an active amateur observer, it often seems that these two realms of astronomy are worlds apart. But the separation between the professional and the amateur is really an unnatural and unproductive — division that is now, fortunately, beginning to fade.

Echoing the concerns of several recent meetings that have addressed the issue of professional/amateur cooperation, the International Astronomical Union at its General Assembly last August in Baltimore, Maryland, passed a resolution that recognizes "the long-standing tradition of excellent and practical collaboration which has existed between amateur and professional astronomers" and calls for more communication between the two camps to promote cooperative projects.

The resolution acknowledges just how closely linked professionals and amateurs really are. Many professional astronomers, after all, started out as amateurs. Many other amateurs have passed through the stage of viewing the universe for fun to the point where they want the satisfaction of knowing their observations are scientifically useful. They really want to advance our understanding of the universe, if only a little.

Astronomy remains one of the few areas of science where amateurs can and do make worthwhile scientific contributions. The reason for this may lie in the fact that the basic equipment, when compared with that needed in other branches of science, is easy to obtain, cheap, and made to be used at home.

Historically many astronomers who would be classified as amateurs have been responsible for major discoveries. Perhaps the most notable is William Herschel, who was a professional musician when he discovered Uranus in 1781. It is clear that the transition from amateur to professional was not easy for him. The established

scientists of his day did not readily accept as one of their number someone entirely self-taught.

Perhaps the quality that earned Herschel a place among astronomy's greats was his enduring spirit of perseverance in building telescopes and using them on every possible occasion. It is these same attributes — observing skill and commitment to the task — that are exemplified by amateurs today who make contributions to science.

It's important to remember that the word "amateur," when applied to a dedicated observer, is not synonymous with "unprofessional." (Maybe amateur astronomers should be rechristened "voluntary" astronomers to avoid this stigma.) Many amateurs are scientists and engineers and pursue their observations with decidedly professional rigor.

The dedication and enthusiasm of amateurs, coupled with the fact that they have their own telescopes available every clear night, puts them in a special position for many kinds of systematic searching, monitoring, and surveying work. The discovery of a nova, supernova, or comet enhances significantly the value of subsequent observations, while long-term observations of a variable star or Jupiter, for example, may be essential for testing a theory that attempts to explain why particular changes are observed.

Although an individual observer may have only limited observing time, a number of amateur organizations around the world have accumulated extensive and valuable archives of data by pooling the observations made by members. Recently amateurs have been able to collect more and more sophisticated data as advanced technologies have become available. Amateurs are using electronic imaging, photoelectric photometry, and computer control that not long ago were the preserves of professionals.

What is needed now are ways to link amateur observers with researchers who could use the help and direct the endeavors of amateurs. More publicity should also be given to the existing collections of amateur data already available to scientists. If enough people can build on the goodwill that already exists between professionals and amateurs, the IAU's resolution might herald a new era of cooperation that can only benefit the whole of astronomy.

Working Session
5 Nov 88

PRESENT:
Barnhart, Mitchell, Dixon, Ellingson, Koch, Janis, Backus, Brackman, Steva-M (Student), Blount.

GENERAL ANNOUNCEMENTS:
1. **Susan and Jim Snider** brought members of her Upper Arlington Jr. High class to visit the observatory. They are seeking an opportunity to contribute to the RO in some manner. There are several projects we will explore for this group.

Megan Steva was unable to make the trip with the Sniders and I invited her to come today and join in our working session. We took about 45 minutes to tour the observatory before the meeting.

2. The alarm is disfunctional this morning. It should be checked out.

SOFTWARE GROUP (Dixon)
1. There is a possibility that a Macintosh II PC can be donated to the radio observatory. **Barnhart** will explore the possibility of obtaining some help in utilizing its capability.

2. We still need a FORTRAN prograrnmer!!! [NOTE: the bulletin board carried a message on 17 Nov that the SETI club has turned up an eager FORTRAN programmer. Great News!!!!)

ELECTRONICS GROUP (Bolinger)
In **Jim's** absence it was announced that he is working mightily on the project of documenting the electronics status of the RO. This is good news in light of the fact that **Jim** has gained employment at the Newark Air Force Lab. Though he will no longer serve as Chief Engineer for the Radio Observatory he will still be "in the neighborhood" and surely subject to harassing phone calls regarding glitches only he knows how to correct.

RFI GROUP (Ellingson)
1. The RFI project is looking into the frequency of occurrence of LARGE aircraft in

the vicinity to correlate with the peak RFI occurrences at the RO. He is convinced that much of the troublesome noise can be attributed to such traffic.

HEADQUARTERS GROUP (Barnhart)

1. The Gould saga continues. An arbitrary substitution of a NEW state-of-the-art ink recorder set us back, because the main advantage of the older unit lies in the thermal recording and large paper supply that was to come with it. It is back to the drawing board for another shot up through the management chain for approval. The new one was approved and ready for pickup, but now we wait again. ETA this time is early December.

2. Loss of volunteer **Crawford-S** has set back a bit the work of the Micro-Group. Things are beginning to stir again.

3. There has been a slip-up in **Barnhart's** handling of the travel voucher for **Dixon's** last trip. Apologies are tendered, but not all that useful.

SETI CLUB (Koch)

A new volunteer is in our group today out of the SETI Club. **Matthew Brackman**, a major in Slavic Languages is seeking ways to provide help and encouragement. Welcome to **Matt**.

NEWS FLASH

NAAPO Headquarters has taken on a student intern, **Erin Connell**, to serve for the next six months as office manager and accountant for the consortium operations. His primary tasks will include establishing an accounting program on the PC, developing a routine for the office, managing communication for the coordinator and generally making things easier on the staff of the headquarters office.

Erin will begin attending working sessions in December where he will begin to become acquainted with the regulars on the RO staff. He is a Business Administration major with a Computer Science Minor.

Coordinator's Corner
by Phil Barnhart

It is harsh news that the NRAO 300-foot dish collapsed this week. It serves as a reminder that we have felt the need for some time to see to the maintenance and repair of the telescope under our care. A flat move this week is being carried out to document the procedure. However, there are still problems with the brake system that need attention if the moves are to be carried out in a safe and smooth manner.

Of further concern is the deterioration of the depression pit linings. Cement and block degradation is causing the walls to collapse inward. It will require considerable labor to shore these up and return them to sound structural integrity. This will require doing the work while the weather is warm, the water is out of the pits and the flat is tilted fairly high. It would be nice if we could entice a cement contractor to donate some slushy cement when we are ready to pour.

I can announce that the sale of a number of terminals donated to the consortium has resulted in modest income for the observatory. We may have underpriced them, because the amateur radio enthusiasts in central Ohio just recently discovered the advantage of having packet radio capability in the midst of a 10-meter contest. Through a deal with my colleague **Lou Arnold** (K9ALP), we realized about $400 for NAAPO and a similar amount for the radio amateur club here on campus. Thanks again to Oberlin College Computing Center and AT&T for donation of about 20 terminals.

There seems to be intrigue in all aspects of radio Astronomy in Central Ohio. The latest is in connection with the donation of 20 or 30 power poles to the radio observatory by the local power company. It seems that the donation was specifically made to the observatory for ". . . the purpose of scientific research." **Bob Dixon** confronted a band of nefarious characters sawing up our poles and hauling them away for unusual and obviously nonscientific purposes. When confronted by an obviously knowledgeable research scientist, the churlish team fled without expressing an apology. The sheriff is checking the license number to find out if there was collusion with the company contracting to take the poles out of the ground. The net result could be a supply of longer poles delivered to the RO by that contractor — if we are lucky.

It is good to see that a distinction is finally being made between traditional 'amateur' astronomers and the tremendously important category of VOLUNTEER astronomers working effectively alongside and in support of professional astronomers. More power to us!!!

Collect Calls from the Cosmos

By Nancy Ross-Flanigan
Free Press Science Writer

Detroit Free Press (Oct 27, 1988)

Scientists reach out to touch some beings

"The first landing will be from the planet Myton in the Pleiades star cluster, about 1,000 light years from here... They're a very peaceful, advanced race of human beings. You couldn't tell them from us if they were walking down the street, except they'd be radiating peace and love."
-Tom Reed, librarian for Unarius Academy of Science, El Cajon, Calif.

E.T. is coming in 13 years, and he's bringing a crowd.

If you believe Tom Reed and his fellow Unariuns, earthlings soon can expect a visit from 1,000 friendly extraterrestrial scientists in a five-mile-long spaceship.

Reed is a follower of Ruth Norman (a.k.a. Uriel, Cosmic Visionary), leader of the Unariuns. Norman, who poses for Unarius publications in star-studded tiaras, winged helmets and gaudy robes with glittery sunburst necklines, says she can "tune in mentally" to messages from extraterrestrials.

Mental messages — not to mention winged helmets — are too far-fetched for real scientists to accept. But some of them, too, dream of tuning in to extraterrestrials.

In this 50th anniversary year of "The War of the Worlds" radio broadcast, which terrorized the nation with its fake scenario of Martians landing on Earth, scientists are talking seriously about scanning the heavens for radio signals of quite another kind: messages from intelligent civilizations who-knows-where in the universe.

NASA scientists have proposed a 10-year eavesdropping project, beginning in the 1990s. By hooking up existing radio telescopes to sophisticated computers, they'll be able to monitor thousands of channels at once, discarding static and signals from pulsar stars, satellites and planes, and locking onto anything that seems more mysterious.

As one NASA statistician told the Reuters news service earlier this year; "What we are trying to do is the equivalent of roaming through every word in the Encyclopedia Britannica, but with all the letters scrambled, and then hope we can find a 'Hello there' in it somewhere."

The NASA effort may be the most elaborate attempt to listen in on our cosmic cousins, but it won't be the first. Driven by scientific curiosity spiked with imagination, researchers in dozens of SETI (Search for Extraterrestrial Intelligence) programs worldwide have made more modest tries.

No one can claim a "Hello there," but there have been tantalizing incidents, like the "WOW" event at Ohio State University's radio observatory. There, a researcher going over the previous day's data was so startled by one strange signal that he scribbled "WOW" in the margin of the printout.

But the WOW signal, like other mysterious ones, was never picked up again, said Robert Dixon, assistant director of the observatory, where a shoestring program has been going on since the early 1970s.

Maybe the unexplained signals are coming from super secret military satellites; maybe they're bouncing off space junk, or maybe they're E.T.'s long-distance calls. Until scientists find a continuous signal, they can't narrow the possibilities, Dixon said.

"This may be one of the most difficult tasks that man has ever attempted. Even though we've been doing this for years, we all know we're just scratching the surface of what may be required," Dixon said. "Until we know there is life elsewhere, or have a good understanding that there isn't life, we have to keep doing this."

Why? Because to Dixon and other searchers, it seems too darned unlikely that we're

alone in the universe.

"The sun is just a very average star, and there are billions — as Carl Sagan would say — and billions of other stars that are just like the sun," Dixon said. "And we think that many of them have planets, some with the same composition as the Earth."

Add to that the knowledge that molecules like the ones that gave rise to life on Earth are scattered throughout the universe, and it's hard to believe Earth is the only place where the right combination of chemicals and atmosphere came together, some scientists say. (Others, it should be noted, argue that life on Earth is a fluke.)

Scientists involved in the search for extraterrestrials talk about radio frequencies, interstellar distances and mathematical formulas to predict the probability that aliens exist. Pretty staid stuff. But ask them it they've ever imagined what extraterrestrials might look like, and they show another side.

Bernard Oliver, chief of the program office at NASA's Ames Research Center in Mountain View, Calif., envisions bilaterally symmetrical aliens. That means they'll have the same number of arms, legs, eyes, antennae, horns or whatever on each side of the body — like people, centipedes and most other earthly creatures. Stereophonic hearing, stereoscopic vision and paired hands to manipulate objects are some of the advantages of such a body plan. Oliver also thinks aliens would have most of their sensory organs high above the ground, as people have.

But will they look like people?

"I would expect them to be evolved creatures, but not necessarily humanoids," said Oliver. Whatever they may be, what makes people want to believe in aliens?

We're afraid not to believe in them, says former aerospace engineer Frank Apsi-Ridolfo. What really drives us is "a sort of primal fear, the realization that there is no one else out there, we're all that there is," he said in a telephone interview.

Another explanation is the "saviors from space" theory.

"It 's the yearning for some omnipotent being or beings to come and tell us what the proper course for our lives should be," said Kendrick Frazier, editor of the Skeptical

Inquirer, a magazine dedicated to debunking pseudo scientific and paranormal claims.

Nonsense to primal fear and space saviors, said Marcello Truzzi, an Eastern Michigan University professor who studies the sociology of science and is director of the independent Center for Scientific Anomalies Research in Ann Arbor.

"Do you know anybody who goes around saying. 'I'm so lonely; I want to encounter an extraterrestrial'?" Truzzi asked. He said he knows of only one study that goes beyond speculation to explain why people believe in space creatures. That study, published in a psychological journal, showed that people who believe in extraterrestrials tend to have high "need affiliation." In other words, they crave the company of other people.

That's not to say that they crave the company of extraterrestrials.

"The fact that people express high belief (in aliens) doesn't mean that they want them to be there," Truzzi said. People who say they've been abducted by aliens wouldn't wish the experience on a lab rat, which is what they say they felt like as parchment-skinned extraterrestrials poked and examined them. So unsettling are these reported experiences that therapy groups have sprung up to treat abductees, using methods similar to those used on rape victims and people suffering post-traumatic stress disorder, said David Jacobs, a Temple University associate professor of history who has studied reports of UFOs and alien abductions.

Even eavesdropping on cosmic conversations may not tell us whether extraterrestrials are loving space neighbors or cold-hearted experimenters who see us as specimens. So that raises a question scientists already are debating:

If E.T. leaves a message on our answering machine, should we call back?

Radobs Notes

Sun 2 Oct 88 12:57:04-EDT
Bob Dixon
11/23 status

I worked on the 11/23 software for some time yesterday, to get things back somewhat on track. Because the floppy drive had not been working, disk dl1: filled up completely and this bombed a number of things. Also the clock is somehow way off. The system clock is close, but the data acquisition programs are getting times 3 days off. I suspect this is due to the GTSC clock being off. Whatever it is, it must be fixed ASAP. This has caused the recent continuum files to be very strange. Their labeled dates may be wrong. Some of them run on continuously for several days, making huge files. I think all the data is there, but it will be more difficult for someone to analyze later.

To fix the dl1: overload, I archived all possible data off onto floppies. I also moved all of Steve Ellingson's program and data files onto the new disk dl2:, and made his default dl2: Thus Steve should see no difference for his work, except that he now has lots of extra disk space. He is the only one on dl2:. Steve: If you have specific disk names in your software, they need to be changed to dl2:, but otherwise all is OK. Disk dl1: now has several thousand free blocks, although the largest contiguous portion is only about 800.

Some of the continuum, SETI and RFI data files were not closed properly, probably because the program creating them was aborted in mid stream at some point. I was able to save most of those, but a few incomplete RFI data files may have been lost. The aborts may have been caused by lack of disk space. In any case, it sure makes a mess when a disk fills up like that!

Mon 3 Oct 88 10:57:12-EDT
BOLINGER-J
11/23 clock

Who set the system clock the last time ???

I just finished working on my heath clock program, and when I first logged in I

found that the system time was over 4 hours behind what it should be.

It looks as if whomever it was set the clock using their wrist watch instead of the WWV clock. The system keeps time in UTC, not EDST.

I set the time according to my watch, which has a dual time zone that I keep set to UTC, and which is no more than 10 or 15 seconds off. I will set the time more accurately when I get up to the RO the next time.

To whomever it was: I think your watch is off by 9 minutes. the system time said 10:11 and it would have been 14:20. EDST-UTC would not account for the extra 9 minutes.

Mon 3 Oct 88 13:25:53-EDT
Bob Dixon
11/23 status

Jim is right that logical units can be reassigned. However, this can apparently occur at different levels and differently with FORTRAN and DCL programs (we have both). I have never been able to spend enough time to totally figure this out enough to be confident in doing it. Perhaps if someone would compose a short very relevant tutorial on how to do it, we could all benefit. The manuals are too all-encompassing and mostly deal with things we are not interested in.

Regarding the clock, I'm not sure my point was understood yet. I did not set any clock at all. The system clock was a little off, but no big deal.

The BIG deal is that the data acquisition programs, which get their time from the GTSC clock, are WAY off (several days). Therefore I suspect the GTSC clock is way off. If not, then something more serious has gone wrong. Perhaps the GTSC clock is defective, or its battery needs replacing, or whatever.

As I have said before, we need some software person to look into ALL the clocks, tie them together software, and unify all observatory time-keeping. I had assigned this to some of the new volunteers, but nothing has been done. Until this is done, there will continue to be time-keeping problems like this.

Wed 5 Oct 88 09:30:25-EDT

BOLINGER-J
11/23 clocks

I spent several hours at the RO yesterday working on the clock problem.

It turned out that the GTSC clock was stuck in the 'hold' mode, which is what is used to keep the clock from changing itself when being set. This I traced to some bugs in Marc Abel's clock setting program.

The bugs are so stupid, in fact, that I am surprised that someone with Marc's level of skill would do such things.

The first one was that a bit in a register was being set by adding a number to the register instead of ORing or ANDing (to reset). The other bug created a 1.66% probability of getting stuck in an infinite loop, which would require that the program be aborted from another terminal.

If the program is prematurely aborted it would leave the clock stuck in the 'hold' mode.

I also wrote a little program that can be used to check that the GTSC clock is running properly. Plans for more elaborate programs that would compare all clocks and decide what the correct time is are in the planning stage.

Mon 10 Oct 88 09:20:44-EDT
BOLINGER-J
11/44 status

The SYSGEN is nearing completion, with difficulty.

One of the 'new' rk07 drives has intemtittent data errors and another one has an undetermined error condition that drops it off-line.

We still have three other drives that we can try. The tape drive was getting write errors when I tried it last week. I do not know if it can read tapes or not, as I don't have a tape (yet) that I can try.

I have not tried the line printer or the versatec.

Tue 11 Oct 88 10:47:12-EDT
BOLINGER-J
focus room status

The power has been restored. I do not know what the problem was because the power company did not call back, at least not when I was still here.

I restarted the system and everything seems to be OK, but the air conditioner ran for only a short time and then shut off. This may be OK because the room was somewhat cool with the system shut off. A quick check of the A/C showed no obvious electrical or mechanical problems.

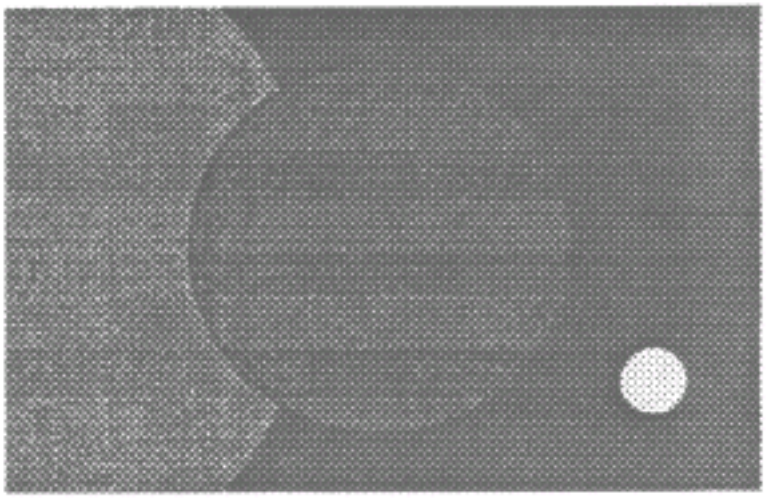
The fan in one of the cabinets is rubbing against its guard screen and should be remedied, as it makes a lot of noise. It is the rack with the heath clock on top.

As for the heath clock, when I turned everything back on it was not working properly. When listening to the loudspeaker there was a lot of garbagey noise. Pounding on the circuit boards caused the noise to go away, and the clock started working and quickly set itself.

Tue 11 Oct 88 10:54:15-EDT
Bob Dixon
Toronto SETI Conference

The conference went well. I presented the paper by Tom Van Horne and myself, and the videotape of the telescope in operation. The video was the only one at the conference, and I have never seen any at any previous conferences. The quality of the projection was not as good as it could be, so the computer screen shots were a little difficult to read. We received several congratulatory comments immediately after the paper, and others later. Some of the Planetary Society people are very interested in our work, and we may be able to obtain greater support from them in the future. Jon Lomberg, well-known scientific artist for NASA, etc, asked for a Flag of Earth to present to some Soviet colleagues. I gave him one.

Tue 11 Oct 88 11:04:04-EDT
Bob Dixon
Flag of Earth at RO


The Flag of Earth ©1970 James W. Cadle

Tom Van Horne suggests we fly the big Flag of Earth at the RO constantly. I did that originally, until it got stolen. He suggests we now fly it such that theft made very difficult, by tying the flagpole rope very high on the pole, with a ladder. This sounds fine to me. Let's try to do that this Saturday.

Tue 18 Oct 88 08:31:07-EDT
Bob Dixon
Telephone Pole Status

No change. The power crews have long since left. The wires are mostly moved to the new poles, except where this appears difficult because the wire would have to be made longer. In those cases, BOTH poles are still there, and maybe they will just leave it that way (argh!). None of the old poles have been removed from the ground. I keep watching every day.

Wed 19 Oct 88 11:47:12-EDT
Bob Dixon
Flag of Earth

The Flag of Earth is now flying permanently (we hope) at the RO. Long May it Wave!

Wed 19 Oct 88 20:10:20-EDT
Steve Ellingson
diffraction information

I am currently trying to work out the receiving pattern of Big Ear (using a combination of diffraction and classical antenna theory), and I think that the results

will probably point us in the right direction.

Since the subject has come up, however, I can't help but to say something about it. Most of the technical people reading this know that the receiving and transmitting pattern of an antenna are (usually) the same. One way to identify side lobes, then, is to consider what would happen if we were to transmit instead of receive, and then consider diffraction effects. The strongest diffractions would be from the edges of the paraboloid, and the signals involved would be diffracted most strongly to the north. Part of this diffraction is going to be reflected by the flat (corrupting the main beam, creating minor lobes), part will continue past the flat (creating a major lobe, I would guess), and part will be diffracted again by the edge of the flat. Consider that this can happen on both the east and west sides, and suddenly you have a flurry of interfering signals. Thus, it is unwise to blame the mystery signal on a specific effect without further study.

As far as horn cart motion, consider that moving the horns to one side causes an edge to be more strongly illuminated than before, causing stronger diffractions from that edge. Thus not only does the main beam shift, but the whole side lobe pattern changes. Right now, I couldn't even begin to guess what combination of effects might cause what we're seeing!

P.S. Also note that the receiving pattern is volumetric, i.e. 3-dimensional. This means we also have lobes pointing at various points in the sky!

Sat 22 Oct 88 19:43:27-EDT
Bob Dixon
Rotating the RFI antenna

I have found the info sheets for the antenna rotator. From looking at the schematic, it would seem that the following computer controls are needed:

1. Contact closure to turn on and off the 115 vac input.

2. 2 contact closures, to select clockwise or counterclockwise rotation. Must somehow be interlocked so they cannot ever both be energized at once, or the motor may bum out. This is some low voltage AC, current unknown. (All voltages and currents can easily be measured in advance so we know what to plan for).

3. A/D input, rectified to read the pulsing position indicator. This pulses for a fraction of a second every 5 degrees of rotation. This occurs about once per second.

The program which controls the rotator must carefully keep track of the position and not try to rotate past the end of travel in either direction. One check should be to see if a pulse occurs once a second, and if not shut off the AC power because something is wrong.

If the computer loses synch with the rotator (such as due to power off, etc). the computer can regain synch by rotating in one direction until the pulses stop. This means the end of travel has been reached. Then the computer should rotate in the opposite direction and count pulses until they stop at the other end of travel. If the number of pulses is correct, the computer can assume everything is working correctly again. This process will have to be followed every time the computer power or control program is started. There is no way for the computer to sense the absolute position of the antemua.

Presumably in normal operation the antenna will be rotated for maximum signal strength as read by the current a/d indicator of the S meter reading.

Mon 24 Oct 88 11:25:03-EDT
Steve Ellingson
Directional RFI

Thanks to Bob for his input on the Rotator control problem. This is an independent sub-project which could, and should, be attacked concurrently with the rest of the project.

The rotator control system should be as versa-tile as possible, since we would like to operate the system in at least two different modes, i.e." survey" mode and "SETI" (search-and-destroy) mode. Survey mode should not be very demanding as far as the rotator control is concerned; just continually sweep +/- 360 in azimuth and reverse at the end of travel. Everything else can be taken care of after the fact, when the data is processed.

The search-and-destroy mode will be much more difficult. Great care will have to be taken to avoid burning out motors with continually changing directions, etc.

The search-and-destroy mode presents another problem not specifically involving the rotator: beam width. JDK suggests the corner reflector will give us a 30 deg. beam width (I assume this is HPBW). This may make it quite difficult to isolate a source, since the signal may also be coming in through the fringe of the main beam or a side lobe. Slope detection (peak detection, some call it) will fail if the signal comes in through a side lobe; in this case, one would have to scan in azimuth and chose the direction corresponding to the biggest peak, and assume it was due to the main lobe.

This problem should not be as serious in survey mode, however, since we can always attempt to de-convolve the data to remove the effects of a non-unidirectional antenna. Deconvolution in real time, however, does not seem practical, at least at this stage of the game.

Wed 26 Oct 88 07:57:08-EDT
Steve Ellingson
SETI club flyers

I noticed the SETI club flyers in the hall today. They look really slick! Congratulations to Ron K. and Tom V. (who I assume are responsible).

The only suggestion I would make is that instead of calling for "FORTRAN programmers with PDP-11 experience", I would say simply "FORTRAN programmers". Terms like "PDP-11" frighten younguns like myself. Besides, learning the PDP-11/23 is easy compared to learning to be a proficient FORTRAN programmer.

Please let me know if there is anything I can do to help out with the SETI organization.

Wed 26 Oct 88 13:53:26-EDT
Phil Barnhart
Equipment Negotiations

1. Gould is getting closer and farther away. I was shifted this week to another person who has to work his way through the file. This one is (note that "IS") packaging things up. It is too bad he did not check with me earlier because he is no

longer dealing with the machine they had for us, but a new state of the art machine with the same features. Had he checked I could have asked for FEWER and WIDER display channels. Oh well, it is hard to beat the price. There was also talk of more readable paper. More next week when I hope to be on the road to pick it up.

2. The Foster grant (not sunglasses you nerds) is now in the stage of when the " . . . court says go, it is yours!" It seems the lawyers have to get their cut so George has taken it to the court. His secretary says it is unlikely that there will be a transfer of material before 1 January. She does re-iterate " . . it is ours!").

Susan Leach Snider, her husband and two students spent a cool afternoon at the RO last Saturday. Another of her students will attend the first part of our Working session on the 5th! Look smart!

Wed 26 Oct 88 14:29:21-EDT
Ron Koch
club

Thanks to Tom Van Horne and John Ayotte who took the time to prepare the flyers; they look great.

Wed 26 Oct 88 17:58:50-EDT
Steve Ellingson
Strength of Aircraft Reflections

After crunching some numbers, I have come to believe that many of the signals appearing in the RFI survey actually ARE reflections from aircraft. Using a range of values for different variables in the problem, I get best and worst case incident signal power densities of 2 x 10-to-the-minus-10 and 1 x 10-to-the-minus-14 watts/ square meter, respectively. These signals are well within the sensitivity of the RFI system.

For those who are interested, I used the Friis transmission equation assuming a radar 40 km away pumping out between 800 kW and 5 mW [sic; "5 mW" probably should read "5 MW"; megawatts, not milliwatts]. The signal reflects off an aircraft well above the horizon, having an RCS between 40 and 100 square meters (typical bistatic values for large aircraft). The power incident on the aircraft was modified to

account for...the directionality of the radar antenna.

This makes the air traffic pattern data Ron K. is working on even more important. It will be very interesting to sit down with some detailed traffic information and try to correlate it with the RFI data!

Mon 31 Oct 88 12:51:15-EST
Bob Dixon
Letter from John Glenn

I got a letter from Sen. Glenn today, in regards to SETI funding at NASA. He says the NASA SETI budget was not approved again, but he will help in the future.

Mon 31 Oct 88 12:52:40-EST
Bob Dixon
Detroit Free Press Article

A nice article about SETI just appeared in the Detroit Free Press newspaper. We are quoted prominently. I'll give the article to Steve J. for inclusion in the Publicity file. Is it time for another publicity mailing?

Tue 1 Nov 88 15:47:09-EST
BOLINGER-J
Re. Nugen

This would be a good time to remind everyone. If you disconnect from the dec20 without explicitly logging off, you are still logged on and will continue to nun up a bill. You MUST log of before disconnecting your modem.

If something happens that knocks off the connection, just reconnect and log back on. You will be asked if you want to connect to the 'other task' (don't remember the exact wording). Answer yes. Finish your business and then log off properly.

Tue 1 Nov 88 21:49:57-EST
Tom Van Horne
Sky & Telescope

For those of you who don't subscribe to S&T, the November issue is a special issue

devoted to amateur astronomy. It is very interesting and positive, pointing out not only the extraordinary contribution that amateurs have made to the science historically, but also that relations between amateur and professional astronomers are healthier than they have ever been and that amateurs are making invaluable contributions to research that supplements and compliments the activities of professionals throughout the field.

The issue contains an article on amateur radio astronomy which is illustrated by two of the photos taken (specifically to answer S&T's request) last summer of our group of eager volunteers. The article points out how limited amateur radio astronomy is compared to its optical counterpart but says that currently, amateur radio astronomers listen to Jupiter, the sun, and some of the most powerful pulsars and that volunteers also do much of the work on OSU's SETI project.(paraphrased from memory, go buy the issue if you want it more exact).

I was pleased to note that: 1. we are portrayed as a professional effort operating with volunteer support — a sterling example of amateur/professional cooperation, and 2. our activities were portrayed as the most important scientific work being undertaken by nonprofessional RA volunteers.

Thu 3 Nov 88 17:11:23-EST
Bob Dixon
Mac 2

There is a possibility that Apple will give us a free new Mac 2. That is a powerful high-end work-station with great graphics, hard disk, etc. They want to showcase in high-tech labs at OSU so maybe we can swing this. But I need specific suggestions of just what we would do with it. Ideas???

Fri 4 Nov 88 09:05:14-EST
Bob DIxon
Mac2

The machine would have to be used at the RO, as part of the research program. Perhaps it could be used to display real-time spectral plots of SETI and RFI data. Perhaps it could be dedicated to the RFI project, and used to manage its archive. It has great graphics.

Fri 4 Nov 88 11:03:44-EST
Steve Ellingson
Mac 2 uses

As far as displays, one could go far beyond plotting power spectral densities. Imagine being able to plot azimuth scans from the directional RFI system, similar to the way it is done for air traffic control radar displays. This could be done in real-time (or just playback old data to reobserve events, etc) with signal strength on the radial axis.

Mon 7 Nov 88 12:22:02-EST
Ron Koch
SETI Club

The first meeting of the SETI Club went well. We had 10 to 15 people show up. One of them came to the Sat. meeting. We think more may have come if it weren't for the pole moving party.

Tue 8 Nov 88 08:51:23-EST
Bob Dixon
Telephone Poles

We have now been officially notified to come and pick up the poles. The poles still left standing are awaiting action by the telephone company to move their wires, and that times unknown.

Tue 8 Nov 88 10:51:26-EST
Phil Barnhart
Growing Roster

As names are added to the roster it increases the number of individuals floating around NOT receiving issues of SIGNALS.

I will add new names to the mailing list, either at the request of the individual or by nomination of one already on the list. We have a few copies for distribution to interested parties without volunteering or paying for a subscription.

I am generally easy to get along with. I will not put them on without direct request.

Thu 10 Nov 88 12:31:21-EST
Bob Dixon
Jim Bolinger Leaving our Employment

Jim Bolinger has been hired by the Newark Air Force Base in Newark, Ohio. He has resigned his position at the RO effective Nov 18. He will still be in the area and hopefully he will be able to help us thru the rough spots. We will miss him greatly and he will not be easy to replace. His position is now open and I would appreciate any suggestions or applications from prospective candidates.

Sat 12 Nov 88 08:30:31-EST
Bob Dixon
Pole Party still ON

I could not reach my contact at the power company until after 5 pm Friday, as he was in meetings. He confirmed there was no change in the pole grant to us, and suspected foul play. I called the Sheriff, who came to my house and I filed a formal complaint of pole theft. The Sheriff is investigating, and I gave them the license number from the pickup truck. The Sheriff Deputy hinted that the construction crew hired by the Power Company had caused other problems. They may have made some "deal" with the guys who took the poles. At least now the Sheriff may be watching, but we need to get the rest of the poles out today. I'd be willing to drop the theft charges if the crew obtained 10 replacement poles and delivered them later to the RO for us!

Sat 12 Nov 88 19:03:25-EST
Bob Dixon
Pole Party a Success, and to Continue

We moved 7 good poles to the RO. We worked on an 8th, but it was too long and we had to throw it back in the ditch. There are 7 good ones left and the sentiment of the group is to get them next Saturday. 7 is about the capacity of the trailer and of the work crew. A minimum of 6 people are needed, or it is not possible to get the poles into the trailer. The Helwigs provided the trailer and ingenious mechanism to help move and lift the poles. Those present were Steve Ellingson, Tom Van Horne

(who came despite poor health), Ron Huck, Rick Helwig, Dick Helwig and myself. The move was followed by a Submarine Sandwich fest at my house.

Mon 14 Nov 88 09:51:14-EST
BOLINGER-J
flat moving documentation

This Tuesday and Thursday Ron Huck and I will be at the RO attempting to move the flat and documenting the procedure on video tape.

We will recommend that as many other people be there as possible.

There is no definite time as yet, except that it will be in the afternoon and possibly as early as 11 or 11:30. We will want to be back on campus Tuesday for the staff meeting at 5:00.

This will NOT be a 'committee meeting' or a training session. The purpose is to document the moving procedure, but anyone who attends should be able to pick up a few pointers.

Wed 16 Nov 88 09:40:41-EST
BOLINGER-J
radio club

They have not finished projects from previous years.

The ones that come to mind are the 11/23 printer and the lights on top of the flat. What about the awning on the office building? Or hauling away the trash in the parking lot near the shop?

By the way, Bob, is Vic aware that the 2mtr repeater antenna is broke?

It would also be nice to have the leaves raked and the downed limbs picked up. What about mowing the grass around the office building and telescope bays, and removing the weeds and bushes around the bathtubs?

Wed 16 Nov 88 09:43:37-EST
BOLINGER-J

flat move documenting

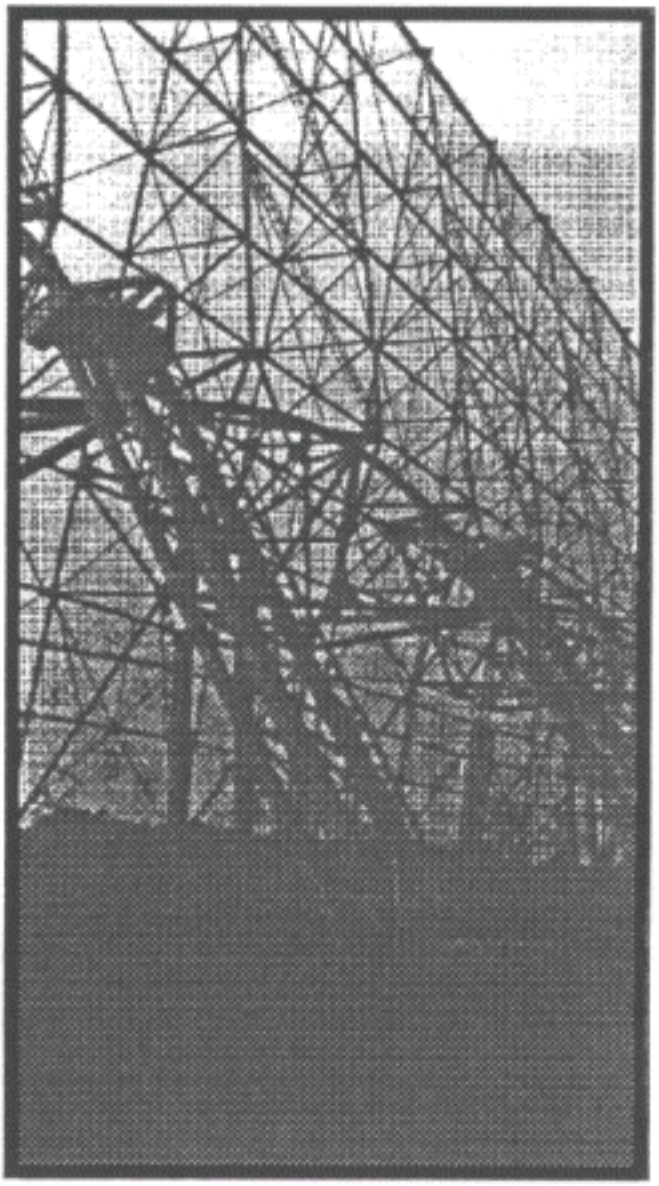
Everything went as well as could be expected, but due to the expected unexpected problems (try parsing that one!) we did not finish the operation.

We will attempt to continue Thursday, if anyone wants to observe.

Wed 16 Nov 88 19:03:23-EST
Tom Van Horne
Radio Club comment

I would suggest weed cutting and turning over the soil about 1 foot around all objects, but not hauling away cut branches. putting them in a big pile might be better in light of John Ayotte's machine that can turn such waste into fine mulch at no cost. We could then build this up around the edges of grass where weeds grow to suppress growth.

Wed 16 Nov 88 21:33:42-EST
Ron Koch
Club



The OSU SETI Club had another meeting tonight. We had four people show. Among them was a FORTRAN programmer, who wishes to do just that, and a bright young engineer who, in addition to involving himself with technical projects is a licensed landscaper who may be helping with the weed problems I hope to get these people involved with something as soon as possible. We have two potential observers thus far and Tom V. is going to try to set up an intro fan fold/chart read session with these two.

I think the low turn out might be due to the similarity of the flyers to those of last time. John A. suggested the next meeting have a topic. I think this is fine.

Fri 18 Nov 88 10:05:17-EST
BOLINGER-J
Flat Move

The flat has been moved to -29 50, and the procedure documented on video tape.

The documentation is by no means comprehensive, as there are many problems that can occur with no clear solution for them. You just have to know what things to try, one at a time, until the problem is corrected.

Two people are definitely needed for a flat move, and one one them must not be afraid of climbing.

Moving up is a lot easier than moving down. It may be possible to have only one person do an up move.

I would suggest moving the flat down to its extreme position (this would take

several days) at the beginning of the winter (like maybe a month ago?) and do only up moves until spring, due to fewer problems that can occur, mainly with the upper brakes. Of course it is too late to do that now.

Stephens' SETI Program Back on the Air!

Bob Stephens with the ARO 60' dish.

With the unfortunate shutdown of operations at the Hay River Radio Observatory last May due to a lack of funding, Robert Stephens' hope to continue a Canadian SETI program became uncertain. Now, just six months later, this program will again be tuning in on the heavens thanks in part to the Canadian National Research Council (NRC).

Stephens, who's past six years work and determination has impressed department heads at the NRC, Herzberg Institute of Astrophysics, Radio Astronomy Section in Ottawa, has been awarded a part-time staff position as a technologist to maintain the 32 element Solar Array Radio telescope at the Algonquin Radio Observatory. This facility, not unlike NRAO, Greenbank, WV., in its resemblance to a self sufficient small town, is home to a number of impressive radio telescopes including the famed 46 meter (150 foot). ARO is located in Algonquin Provincial Park at Lake Traverse

in northeastern Ontario.

In addition to being able to earn a modest living, Stephens has also been given full use of the old University of Toronto, fully steerable 60 foot az-el antenna and support building at ARO Site #4 for his private SETI program. NRC will support SETI by paying the heat and electricity at the site. An available 10 to 15 Kelvins cryogenic refrigerator and receiver dewar for the prime-focus feed station will make a total system temperature (including aperture spillover and other noise contributions) of 25 to 40 Kelvins an attainable goal. This is the equivalent in sensitivity of an 85 foot dish with a good room temperature GaAs FET receiver.

Bob would welcome a visit from any technically inclined NAAPO supporters who could make the trip (6 1/2 hr drive from Toronto) and help in setting up this new program. He can offer a comfortable spare bedroom in his rented bungalow at ARO. An ICOM IC-R7000 VHF-UHF communications receiver and an IBM compatible PC-AT with VGA color monitor are major items on his wish list required for the new program but beyond his means. Cash donations are also being solicited. Bob may be contacted at his new address: Robert W. Stephens, SETI Program Site #4, Algonquin Radio Observatory, Lake Traverse, Ontario, Canada, K0A-2L0. Phone 613-735-0141 business hours only. You will probably have to leave a message for him to return your call. Please advise that collect is OK if you can. Bob will be paying just for his moving expenses for the next 6 months.

Alarm System Follow-up

Barnhart contacted Teamgarde through a long, circuitous route to get satisfaction on the malfunctioning security system in the focus room. All leads had disappeared. The company that took over Teamgarde from Mitsubishi has filed for bankruptcy and Teamgarde moved to a new location. After long searching, both physically and by phone they were tracked down and an appointment was set up to meet their technician at the RO this coming Friday at 2 PM. We should be back on line shortly.

Seed Money Available But Not Accessible

Steve Janis reports that the seed money provided to the RO by Research VP Jack Hollander is available but not yet accessible because the University system does not know where to put it. Steve is following up this issue and will let us know when it can be tapped.

Volunteer Needed!

The Observatory is in dire need of a volunteer to work on the 11/40 card reader, and get it in working order. Contact Phil Barnhart, or Bob Dixon for details.

IBM 1130's Available

We have a bunch of IBM 1130's to get rid of. Anyone who can make use of them can arrange to haul them off. They will otherwise be trashed. They are old, clumsy, large, and very reliable. Interested individuals may contact either Bob Dixon or Phil Barnhart for more information.

Letters

I was very pleasantly surprised to see your photograph in the November issue of **Sky and Telescope** magazine. Seeing the picture of the radio telescope brought back many wonderful memories of my association with the brilliant people at the Radio Observatory.

I don't know if I properly conveyed my appreciation to you and Dr. Kraus for the opportunity to work with you on the SETI project. The experience was certainly the highlight of my short career at Ohio State, and I am very proud to have made a small contribution to the effort.

Please accept my deepest thanks for allowing me to take part in your endeavor. Best wishes for continued health and success; my thoughts are with you all.

Regards,
Michael A. Mraz
15526 SE 50th Street
Bellevue, Washington 98006

This letter is from a former student volunteer at the Radio Observatory. This is not an unusual attitude among the student staff. The observatory provides great practical experience not otherwise available to may students. -Bob Dixon-

---

Thank you for mentioning my paper "A Self-Organizing Pattern Retrieval System and Its Applications" in Signals, the NAAPO Newsletter. The paper is published in the *Proceedings of the Third Annual Rocky Mountain Conference on AI, Denver, Colorado, 1988*. A longer version is available as Technical Report UCSC-CRL 88-3 from our computer research lab.

A paper of mine, coauthored with Daniel Helman and Edward Oswalt, that will probably be of even more interest to your readers is, "Intelligent Signal Analysis and Recognition Using a Self-Organizing Database", in *Proceedings of the First International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems, ACM, 1988*. It is available as Technical Report USCS-CRL 87-25 [sic; "USCS" should probably be "UCSC"].

Please keep me on your mailing list, if possible.

Thank you again.

Robert Levinson
University of California, Santa Cruz
Computer & Information Sciences Board of Studies
319 Applied Sciences Building
Santa Cruz, CA 95064

We certainly will keep you on our mailing list for as long as possible. If anyone is interested in reading the papers mentioned by Dr. Levinson, Phil Barnhart and I have copies. -ja-

Future Working Session Schedule

3 December
(Lecture Room @ Perkins)

17 December
7 January 89
21 January
4 February
18 February
4 March
18 March

(10-12 @ the RO office building unless otherwise noted)

[Back to List of Issues in Volume 4] | [Back to List of Volumes] | [HOME]

E-mail Webmaster

Designed by Jerry Ehman
Last modified: January 20, 2004