

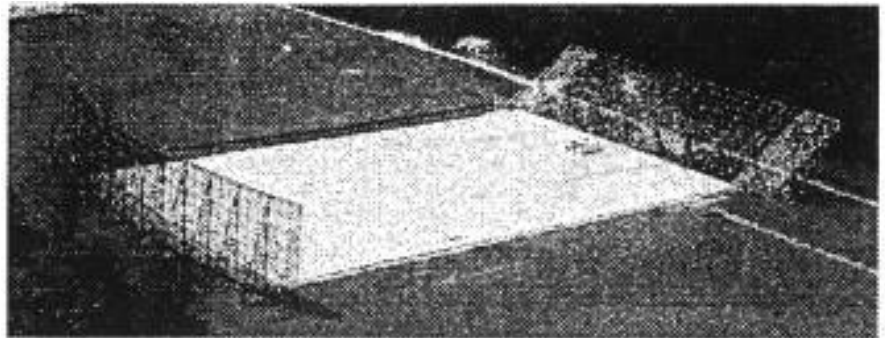


NAAPO (North American AstroPhysical Observatory)

"Signals"
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SIGNALS

Visit us on the web! <http://www.bigear.org>.



NAAPO

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COORDINATOR'S CORNER

Phil Barnhart

Yes, I am aware that it has been a long time since we last spread the word about NAAPO and the world without BIG EAR. The reasons are not very important and they all relate to my state of mind, not to the involvement and eagerness of the volunteers. We are active and we are making progress.

I want to thank the friends of NAAPO who have prodded me for information over the past six months. It reminds me that there are still those who have our interests in mind.

And, I would like to share with you some of the highlights of the first half of this year to give a bit of the flavor of what we are doing.

It was a real surprise to find myself describing the ARGUS concept to Charles Townes at the Austin meeting of the American Astronomical Society. He is backing the Optical SETI program now but was suitably intrigued by the idea of an all-sky microwave receiver. So, how might one hope to convert a Nobel Prize-winning expert on interferometric technique to the advantages of a timed array and microwave scanning of the whole sky? Ideas welcomed!

We are undergoing some transitional changes. This issue of *SIGNALS* is the first for a new editor, Sue Oakes, who originally came to us seeking a souvenir section of the BIG EAR screen. She is an adjunct English instructor at Ohio State University who already has proven to be a great help in framing the text of the planned historical marker.

I hope that she can do as well at fusing my split infinitives and rearranging my

dangling participles. While welcoming Sue aboard, I must also express my deep gratitude for the long and faithful service of Earl Phillips who has carried the editorship for several years on top of his regular employment as Web-page designer and Internet guru. Earl has been exceedingly resilient and able to put up with my foibles and disorder with unusual patience. I will miss his deadline prodding and efficient rendering of camera-ready copy when demanded. We will keep him in the loop and eventually get him back into active roles, I hope. Being observationally oriented, Earl feels like a fish out of water when he is without a telescope.

The Radio Observatory website – www.bigear.org – has been accessed with increasing frequency. Webmaster Cindy Brooman reports 15,000 to 25,000 visits to the site over the past few months. People are curious and show a wide range of interest in what is going on in the quest to demonstrate that we are not alone. Pay us a visit!

Much has happened since the last report from our group. New volunteers have arrived, massive tasks have been carried out, ... and our coffers are depleted. Not since the era of apartment building have we seen the bottom of the barrel so clearly. We continue to operate only because our friends continue to support our efforts. We do not have the luxury of tapping SETI Institute funds for our volunteer operation; we still have to gain our support from gifts from those interested in our mission.

I hope that this renewed publication with its revised format will keep our friends better informed of the precise nature of that mission as well as the progress we are making. Welcome back into the communications loop.

-P.B.-

UPCOMING EVENTS...

Regularly scheduled meetings: 1st & 3rd Saturdays at 10 a.m., at the OSU SatComm facility.

Directions to the Facility may be obtained by calling the Volunteer Coordinator at (614) 882-6711.

CHIEF OBSERVER'S REPORT

Russ Childers

Mission — Analysis and reduction of accumulated data.

Progress this period — There being no telescope in operation since December 1997, it falls to the group to examine and analyze the data obtained in the previous five-year period. LOBES data (3000 channels, each 100 KHz wide) has been archived on CD-ROMs and continuum data (a few MHz around 1400 MHz) is available on Zip disk and in stripchart printout form.

Ange Campanella has begun reading the LOBES archive to determine what is necessary to complete the analysis. He is able to display the full screen LOBES data, but so far has not succeeded in implementing the beam-matching routine or other data analysis programs included on the disk.

New volunteer Paul Oakes has agreed to attempt a transfer of the pattern-match routine for the continuum data from its original Macintosh platform to the PC.

A visual examination of the continuum stripchart record is being carried out by Danielle Douglas (a Westerville South High School Senior engaged in a mentoring program with Phil Barnhart).

The purpose is to determine how closely the data can be read from the charts, what information is available on the charts, and whether new transient events can be detected from the continuum data.

Childers has listed an interesting array of RFI signatures for the LOBES data. This information will be included in an analysis manual for new users.

Needs — *A Manual of Operation* needs to be compiled for use by volunteers so that users new to the archive can begin to log effectively LOBES "hits", anomalous continuum sources, and interesting transient sources.

Interested volunteers would be able to work at remote sites but must be able to come to Columbus for initial training and later consultation.

Sign of Local Intelligence Noted!

Russ Childers reports seeing "a red car with license-plate number **6EQUJ5** (this is, of course, the "Wow!" signal)." Russ noted, "I had to think, 'Where have I seen that jumble of letters and numbers before?'" Does anyone know who owns this vehicle? Is it one of our readers? We're curious!

ARGUS ANTENNA DESIGN

Bob Dixon, Jerry Ehman

Mission — To synthesize antenna patterns, efficiencies, and impedences for a variety of proposed wide-beam frequency-independent configurations for use in an ARGUS-type array.

Progress this period — Computation proceeded on the MiniNec program to simulate a bi-filar wound conical helix to operate between 600 and 1600 MHz. The complexity of the program for a helical antenna ran into long computing times and extensive difficulty since the helix had to be approximated by a fairly large number of straight line elements. The computations were put on hold in order to compare the computed field patterns with that of a real antenna element to see if the numbers were really telling us what we needed to know.

Construction was begun in January of a bi-filar conical antenna to assess the effectiveness of the computations.

Needs — Actual antennas in order to determine how closely the software is able to match real antennas.

ARGUS COMPUTER SOFTWARE DEVELOPMENT

Campanella, Hanson, Kitchen, Tournoux

Mission — To develop and implement beam-forming programs to be tested on the Audio ARGUS test bed.

Progress this period — Programs have been written, but are awaiting ARGUS audio hardware installation.

Needs — Copies of the beam-forming routines need to be installed on the PC in preparation for the hard- **[Error! Last part of sentence not printed.]**

ARGUS COMPUTER HARDWARE DEVELOPMENT

Campanella, Hanson, Tournoux

Mission — To provide a computer system that can access three separate receivers and perform the beam-forming operation.

Progress this period — A new A/D card and a precise timing board are now on hand although not yet installed in the PC selected to do the beam-forming.

Needs — Installation of the A/D card and timing clock.

ARGUS ANTENNA CONSTRUCTION TESTING

Ayotte, Barnhart, Dixon, Ehman, Ellingson, Hanson

Mission — To fabricate and test various antenna configurations for possible inclusion in an ARGUS array; to assess the completeness and reliability of the antenna simulation done by the Antenna Design Group.

Progress this period — Dixon attempted to fabricate a wooden pyramid support for a helical cone. He was able to illuminate areas of conflict and the problems of designing a structure adequate to the task. It became obvious that many more than four legs would be necessary to support the antenna elements close to the desired shape.

Hanson located a source of a sturdy plastic sheeting capable of formation into a cone. WHIPS (White High ImPact Styrene) is capable of being bent into surprisingly small radii without breaking. A 4' x 8' x 1/16" sheet was purchased and Ehman, Hanson, and Barnhart fabricated three cones to test the construction and mounting of a suitable antenna. The problem of bending and holding the 1/16" material in a tight cone proved daunting. After three tries and the achievement of one nearly-satisfactory structure, Barnhart sought a thinner sheet. He obtained a sheet of 1/32" WHIPS and was able to form a cone and mount RG58 coax on it to serve as a test antenna.

Ellingson and Ken Ayotte are field-testing a 64-element folded-dipole array designed to operate at 1400 MHz.

Work is not proceeding on construction of a hexapole array although design specs

are set for a 300 - 900 MHz array.

Needs — in the near future we will need to set up in a compact range the bi-filar cone in order to assess the pattern of the antenna along with its impedences.

SETI News Notes....

In March, Lou Friedman reported to the Radio Observatory Group listserv: "A strong signal was recorded in our SETI program. Unfortunately, it was the antenna crashing to the ground. The Oak Ridge radio telescope at Harvard used in the BETA SETI program toppled in a windstorm ... and is badly damaged ... the extent of which and cost to repair it remains to be determined. Paul Horowitz is thinking that it might be possible to restore it and keep it at a fixed meridian for not too much money."

EDUCATION, PUBLICATIONS, PUBLIC RELATIONS

Barnhart, Brooman, Oakes, Phillips

Mission — To communicate our mission and progress to our constituency and the general public.

Progress this period — The Historical Marker Committee is preparing a proposal to the Ohio Bicentennial Commission for a roadside marker on Route 23 to commemorate BIG EAR. Text for a two-sided marker is in the final editing stage.

December: A press release announcing the SETI Institute grant received little notice in the community and OSU press. A brief (and distorted) account of it appeared in David Lore's column in the *Columbus Dispatch* as part of an article about Stewart Kingsley's Optical SETI project.

January: Bob Dixon and Steve Ellingson were prevented from leaving Columbus to attend the Boulder meeting at which papers were to be presented on ARGUS and Array Analysis. The great winter storm of 1999 was responsible for the transportation difficulties that cancelled their participation.

Having left by auto just prior to the onset of the storm, Barnhart was able to present a poster display paper on the demise of BIG EAR and the development of the ARGUS program at the Austin, Texas, meeting of the American Astronomical Society. Considerable interest was shown in the project, and a number of people asked questions about progress and expressed dismay at the loss of the large antenna.

March: Dixon decided to withdraw his paper from the Netherlands Square Kilometer Array Conference in April. Ellingson and his ElectroScience Lab colleague Brian Baertlein attended, thus maintaining our presence in this organization. We have chosen not to join the U. S. Square Kilometer Array working group officially, largely because we do not have the \$3,000 annual dues to maintain a formal membership.

April: Changes are being implemented in *SIGNALS*. After years of dedicated service, Earl Phillips is stepping down from the task of editing and layout of the newsletter. Sue Oakes, a new volunteer and adjunct English instructor at Ohio State, has agreed to take on the editorial duties. This will be her first issue and will reflect a format change that has been in the works for some time before she signed on.

Needs — We need some way to increase funding for NAAPO in order to support this very important phase of our mission.

FACILITY MAINTENANCE

All Volunteers

Mission — To maintain and preserve the property and assets of the Radio Observatory and maintain the good relationship with the ElectroScience Laboratory that provides our shelter.

Progress this period — **October:** The Radio Observatory Group received an eviction notice from the Department of Electrical Engineering. After 40 years of occupying it, we were required to clear Room 817 in Dreese Hall by the end of December 1998. Various options were explored for the preservation of the irreplaceable data obtained over the entire history of Radio Astronomy at Ohio State University.

An offer by the Chairman of EE to use some Dreese Hall storage space and emeritus offices was subsequently withdrawn when the promised "closet" was found to be full and the reassignment of emeritus offices was implemented.

December: Finally, NAAPO leased a 45-foot semi-trailer and a massive transfer of the entire contents of Dreese 817 was accomplished before the middle of December. The dedicated efforts of volunteers made possible a one-day move using two trucks, vans and pickup trucks, and a moving crew from Gray Brothers Moving Company

(which earlier had helped us move out of the BIG EAR site).

The costs of the move (\$1100) and of leasing the trailer (\$95/month) are putting a serious strain on the NAAPO budget.

January/February: A pair of storms breached the weather seal on the storage trailer. Water soaked the large box containing the collection of Analog magazines upon which a number of other boxes were resting. The pile collapsed against the door making it very difficult to open. Six boxes (most labelled for inside storage) fell to the ground when the door was finally pried open. Subsequent clean-up and relocation indicates no loss of materials. Even the Analog magazines survived, due to the careful waterproof wrapping that had been done by Tom Hanson.

Some shelves and equipment were moved to the other storage trailer, and a reshelving and rearranging effort — along with the installation of a work desk in the trailer — has gotten everything up off the floor.

March: Three storage cabinets were moved into the corridor of the SatComm Facility from the office/meeting room, thus freeing up much-needed work-space there.

Needs — A work party needs to be formed to file carefully and rearrange logically the materials in the storage trailer. These are still in enough disarray that finding specific items is not easily possible. In addition, repair needs to be effected on the leaking door of the storage trailer.

[\[Back to List of Issues in Volume 15\]](#) | [\[Back to List of Volumes\]](#) | [\[HOME\]](#)

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Designed by Jerry Ehman

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