



## NAAPO (North American AstroPhysical Observatory)

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## **Scientists Seek Radio Frequencies**

*The Columbus Dispatch 3/25/90*

Like Picasso paintings and waterfront property, they're not making any more radio frequency bands. The spectrum is a finite resource — and a hot commodity.

In addition to the ubiquitous AM and FM stations and television broadcasters, there are now cellular telephones and mobile satellite services and all kinds of other gadgets that emit and receive radio waves.

With all these signals bouncing around an increasingly noisy planet, and with commercial operators such as Motorola and Geostar pressing the government for more and more radio bands, scientists fear there might not be enough frequencies left for them. For the past 29 years, the National Research Council's Committee on Radio Frequencies has been meeting to anguish over the electromagnetic spectrum and to protect the radio waves that scientists hold most dear.

The committee represents the interests of scientists who use radio waves, from the wildlife biologist who tracks wolves equipped with radio collars to the astronomer listening to the dim hum of intergalactic space.

Unlike Top 40 radio stations, scientific users are for the most part "passive," meaning they listen, rather than emit. Most are radio astronomers, who eavesdrop on the weak signals that arrive from space in the hope of understanding the formation and physical properties of stars, galaxies and gas clouds. These radio emissions can be picked up by antennas and analyzed.

The committee advises the Federal Communications Commission and the National Telecommunications and Information Administration about the needs of the scientific community.

The committee's chairman, Marcus Price, a professor of physics and astronomy at the University of New Mexico, is politically in a defensive position. Basically, the scientists hope to keep the frequencies they have. They also hope to get greater and perhaps exclusive access to a few radio frequencies associated with such entities as atomic hydrogen and the hydroxyl radical. Indeed, radio astronomers can get downright rhapsodic about the hydroxyl radical, an unstable molecule that is an

important constituent of the Milky Way.

In addition to protecting their bands, Price and his committee are concerned about radio noise. The noise that astronomers hate arrives in the form of stray signals from sources, such as computers, calculators and car ignition systems.

So noisy has the world become that astronomers seriously discuss moving their operation to the dark side of the moon.

Price said, "It might come to that."

### **Coordinator's Corner**

We come to the turn of another season. The dash to clean up our act for the NASA visit has left us in a state of quiet resign. We did a lot for the cause and had some exciting times with the engineering teams and the SERENDIP team while they ran their site survey. Earl Jackson gave us all lessons in packing and unpacking tons of gear. We now have to figure how to get his box of tools back to him.

Over the past few months it has become apparent that our volunteers have taken a dim view of Saturday morning meetings. This first came to the attention of the convenors of the meetings when a minor uprising occurred in the winter of 1989. After that flap blew over we began getting larger contingents in attendance and things seemed to begin to click. Then, we began seeing a tendency for many of the regulars to show up one-half to a full hour after the start of a meeting. Besides missing the routine reports they also were not on hand to fill in their contributions to the efforts of the past two or three weeks.

We tried to accommodate to the late rising time by scheduling the last sessions 30 minutes later. Of course, this meeting occurred during the annual spring break just following final exams. We should have scheduled the meeting for Fort Lauderdale instead of Big Ear. Reluctantly, we are returning to the regular 10 a.m. meeting time at the RO. "Be there, or be square."

It is important for those involved in on-going projects to keep the rest of us up-to-date on progress or specific needs. The word doesn't always get to the whole group from the weekly Dreese meetings. Tom van Horne is attempting a valuable service by providing a time frame for project tasks, both at the RO (please do not erase the

chalkboard) and at Dreese. I have requested him to fill out a simple form on his format so I can include copy in *Signals*. He may return from a two meeting hiatus with the form in hand.

One other topic of conversation taken up at the last meeting had to do with volunteer burn-out and the feeling of guilt for not getting tasks done when expected. We all urge that even if you are hung up on getting things done, **DO CONSIDER** continuing your contact through the working sessions. It is always possible someone will want to take on the task or even help you for the experience. We do not hold you as volunteers to a firm deadline. **EVERY BIT HELPS!** You can expedite the tasks just by being here and letting us know what might be holding you up. There are many volunteers just looking for ways to help.

Join us. We tend to get lonely when there are only a few here at a time.

### **Galileo Pictures**

The satellite Galileo, launched from the shuttle Atlantis on October, 18, has swung by the planet Venus. NASA personnel, wanting to test the cameras early, programmed the craft to snap some shots of the planet on the way by. All activities went off without a hitch, according to a NASA spokesman. Galileo is on a very round about flight path to the planet Jupiter, flying past Venus and Earth a couple of times before finally reaching Jupiter by December, 1995. The looping path was chosen to save on the amount of fuel necessary to send up with the satellite; the planets themselves will lend a gravity assist each time the craft passes one of them.

The camera tests follow in the wake of some earlier camera malfunctions that caused the shutter to snap uncontrollably. Fortunately, the problem seems to have been rectified.

## **Mailing List Needs Update**

Now that *Signals* is up and running again, it has been discovered that there are a few incorrect addresses among those of you are currently on the mailing list. In order to be sure that *Signals* is getting out to everyone interested, and to cut down on postal costs, it is requested that everyone please update their mailing address either electronically on RADOBS E-Mail, addressed to Barnhart-P, or please mail any changes of address to: NAAPO/Otterbein, Dept. of Physics and Astronomy, Otterbein College, Westerville, Ohio 43081. Your cooperation in this matter will be greatly appreciated.

## **Did Einstein Cheat?**

A group of historians, linguists and physicists have put forth a claim that there is a possibility that Dr. Einstein's findings may not have been entirely his own. They claim that they have found letters from the genius to his first wife, which elude to some of his work. Einstein's first wife was also a physicist. The claim is that she performed many of the crucial calculations pertinent to his work, and he gave her none of the credit for sharing in the work.

On the other side of the coin, defenders of Einstein's honor feel that his references to "our work" in his letters may have been meant in an emotional sense, rather than an intellectual one. As it turns out, his first wife got the monies from the Nobel prize anyway as part of the divorce settlement.

## **Refrigerator Sought**

The refrigerator on site to keep the pop cold and the cold cash cool has started heating the cans instead. We hope to have a donated refrigerator into the office area at the same time we move the 11/23 from Otterbein. There should be cold pop again by the next meeting at the RO.

## **Working Session Notes** **compiled by Earl Phillips**

### **3-March-90**

Those present were Dixon, Barnhart, Phillips, Tucker, Hanson, Sheets, Janis, Ferryman, VanHorne and Brown. The meeting began at 10 a.m., with many of the attendees tardy. Barnhart reports that he has gotten some interest in the Foster material, and is currently negotiating a deal with the interested respondents regarding availability of the materials as well as a fair price. If anyone else is interested in any of the remaining material, send a message to Dr. Barnhart to that effect.

Barnhart also reported some excitement at the site a few nights ago. The alarm was set off — apparently two boys who had been riding ATV's on the property had been curious as to what was in the focus room, and attempted to open the door, thus setting off the alarm. Barnhart found the boys hiding in some brush, and promptly interrogated them as to their reasons for being on the property, as well as their names, addresses etc. A report was filed with the police, who promised to follow up on the matter. It is not believed that this incident is related to the earlier break-ins at the focus room.

There was a discussion of moving the meeting time to 10:30 a.m. in an attempt to accommodate the chronically late; it is hoped that everyone will be on time from now on.

The trash situation still needs care; the dumpster has been removed, but there is still stuff to be thrown away. There was discussion of forming a work party to remove some of the material to the garage parking lot, thereby cleaning up the "external storage area."

Steve Brown reports the strip chart recorder is once again malfunctioning. He will do what he can to repair it once more, but if the repairs are not enough he may consider replacing it with one of the others around the RO building if they are operational.

Dixon reports that the Heath clock is now repaired and mostly functional. The

Sidereal clock has been delivered in a partially functional state. The ICOM receiver is not yet repaired and will be taken to a repair shop. The synthesizer does not work either, although Steve Brown has tried to repair it. Dixon further reports that there has been removal of equipment from Dreese lab, with more yet to be removed. There was a net profit of \$950.00 from the company that purchased some of the equipment.

Rodney Ferryman reports that software development is still ongoing, and is currently attempting to work out some bugs in the search program. Earl Phillips reports that he has lost the volunteers to paint the office building, and so painting has slowed to a snail's pace. If anyone would like to assist in finishing up the job, please let him know. He also presented his findings of the possible rfi sources to Dr. Dixon who will review the text. The meeting was adjourned at 11:45.

### **17-March-90**

The meeting came to order at 10:30 a.m. Those present were: Barnhart, Dixon, Phillips, Goins, Tucker, Ferryman and Hanson.

Barnhart reports on the March alarm snafu; stating that the police followed up as promised with visits to the offenders, and "scared the wits" out of them properly. It is generally believed that the boys meant no malice and will not return, and they have been notified that if they do, charges will be pressed. A promised response to Barnhart regarding some of the Foster inventory has not yet arrived. It is hoped that there will be more response in the future. Remember that if anyone is interested in any of the materials, send a message to Barnhart.

The Helwigs have offered to bring in a front end loader to help lift some of the old computer equipment currently in the "outdoor storage area." The idea is to carry it down to the garage parking lot, thus making it easier for RMI, the excess computer equipment purchasing firm, to collect what they have already paid for.

Dixon reports that he has just returned from Washington, where he left the cherry blossoms in a state of havoc, thus wrecking the usual tourist attraction for this time of year. Dixon also reports that Tom Hanson, a relatively new volunteer, has offered to put all the punch cards on a magnetic format, which is a daunting effort indeed!

Phillips reports that the refrigerator is doing a better job of heating than cooling, so a replacement is necessary. Ferryman said that his grandfather may have one, and we will make an attempt to procure it. If this plan should fail however, it is requested that anyone else who may have an old, battered, working refrigerator that they'd like to donate to the cause please send an electronic message to Phillips-e or Barnhart-p to that effect, or call Earl at 764-0476. Phillips also reports that the fence is in need of repair in spots, and there are some areas which require the removal of small trees and brush. There is a need for a chainsaw to perform the removal of the small trees. If anyone has one they might like to lend for a very limited time, please leave an electronic message to Phillips-e, or call him at 764-0476.

Tucker reports that we are in the black by over 3K, but there are some outstanding debts. The meeting was adjourned at 11:30 am. with the announcement that the next meeting will begin promptly at 10 am.

## **7-April-90**

The meeting began at roughly 10 a.m. Attending were Barnhart, Phillips, Dixon, Mitchell, Hanson, Ferryman, Brown, Backus, and Tom Janard.

Dixon reports that the CNN people have completed their information gathering for the story they're doing on the radio scope. They stated that it will probably air three times in one week on one of their short news segments. They'll let us know when it will be on.

Barnhart reports that the Helwigs will be returning to finish the job of removing stuff from the "outside storage area" to the garage parking lot. There will be a need for assistance, please watch e-mail for the announcement and help out if you can. More of the Foster inventory is being moved from Otterbein to the RO. This will be a long process, as there is much to be moved. If anyone is interested in any of the material, please contact Dr. Barnhart.

The fence post is still in need of repair. A fence post is required, along with a chain saw to remove the small trees damaging the fence in other places. There is also a need for the donation of a refrigerator, as the one currently in the RO office building is not working too well. If anyone has one that works and would like to donate it to the cause, please contact Barnhart or Phillips electronically, or Phillips at (614) 764-



0476.

Brown reports that the signal generator is re-installed and functional, although the PDP 11 does not yet recognize it. He also reports that the icom receiver has been repaired and returned. It will be re-installed this week.

Childers reports that he has nearly perfected the position sensing problem, using the slide wire. The computer now knows where the horn cart is to within 1/4 inch, with very minimal drift. After sufficient testing, the next step should be to give the computer control enough to move the cart on command. He also reports that the ground plane requires repair in several places where the foil has been lifted off by high winds. The contractors performing the repair will do the actual work as soon as weather permits.

The meeting was adjourned at 11:30.

## **21-April-90**

The meeting came to order at 10 a.m. Present were: Barnhart, Dixon, Mitchell, Phillips, Tucker, Schumacher, Brown, Goodall and Janis.

Barnhart reports that he has volunteered to give a talk at the meeting of the Columbus Amateur Radio Astronomers. He promises to represent us well. He also reports that the dump situation is still there, but being lessened every day. We may be burning the paper left there in order to facilitate removal. Bring your own marshmallows!

The RMI people have returned and taken the old equipment from the garage parking lot. There is still more stuff being brought up from Otterbein from the Foster grant. It is planned that eventually all that is not sold will reside here on-site. Barnhart also reports that a student from Otterbein wants to help out with the PC scan project, as well as other PC related projects.

Dixon reports that there is a group of HAMS visiting us from Iowa next Saturday, and that there is a need for volunteers to show them around upon arrival. Dixon also reports that we were to receive a report from NASA in January which has not arrived yet. He has been in communication with them, and we are now awaiting the

report.

Brown reports that the SETI receiver is next on his agenda to analyze. The icom receiver has been replaced, and needs to be re-cabled to the computer. The cause of its initial failure is unknown, though it is speculated that heat may have been a contributor. It may become necessary to install a fan to prevent future failures.

Janis reports that we have received a donation of \$300.00 from Dave Reynolds, a former volunteer. Many thanks to Dave for his generosity!

Phillips brought a potential new volunteer from the Columbus Astronomical Society, Phil Schumacher. Phil is a long-time Fortran programmer, and thought we could utilize his talents in many areas. Dixon has agreed to "show him the ropes" of the PDP's in the focus room after the meeting.

The meeting adjourned at 11:30 a.m.

## **French Rocket Explodes**

The French suffered a setback in their space program when an unmanned Ariane rocket exploded shortly after liftoff. The payload was two Japanese communications satellites. The cause is believed to be a fire in the propulsion system. This explosion comes after 17 successful launches.

Arianespace is a consortium of European companies which took over the old Ariane program from the European Space Agency in 1980.

Ariane's launches had, up until this setback, become almost routine, with many successful launches. This situation is slightly reminiscent of our own NASA, who had many successful launches before suffering failure, though in the European's case there was no loss of life. Ariane currently holds over fifty percent of the international launch market.

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Designed by Jerry Ehman

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