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NAAPO (North American AstroPhysical Observatory)

"Signals"
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1/2/93 MEETING NOTES

The meeting began at roughly 10:05am. Those in attendance were Phillips, Barnhart, Ayotte & Son, Campanella, Childers, Stephens, Don James, Janis, and Brown.

Don James offered to volunteer some of his valuable time during the day hours. Campanella gave him a copy of an electronic strip-chart simulator; Don will determine its worth to the project.

Barnhart was visited by Steve Willard on 12/31. Steve took measurements & pictures of the feed horns, etc. Steve mentions that he feels automating the flat will not be a big problem(!)

Stephens is awaiting materials to complete the shed-building project for the newly donated tractor.

Childers has electronically patched the Dicke switch output for more reliable detection. He also has his SETI software running again. All 50 channels of the receiver are now working, thanks to a repair done by he & Brown. A repair on the signal squirter has that functioning again as well.

Brown is still working on his thesis. He will also have a final draft of the wish list for Steve Willard by next week.

Ayotte is still working on the real-time display project. He has also printed out some of the master radio catalogue to show how it must be manipulated to port into his display software.

Campanella has been working on the RFI calculation discussed during the last meeting.

The meeting broke at roughly 11:28am, with most going off to their respective tasks.

1/16/93 MEETING NOTES

The meeting began at roughly 10:08am. Those in attendance were Phillips, Barnhart, Dixon, Stephens, Janis, Hanson, Brown, James, Campanella, and Larry Splaine, a new visitor.

Barnhart brings pictures of the RO from the Open House, as well as the latest Signals. We need a new supply of 60 watt bulbs for the meeting room. The heaters in the meeting room are dysfunctional. He also brings materials for the shed building project.

Brown has worked on automating the backup procedure for the 11/23. He has also sent a copy of the wish-list. He & Russ will soon move the flat to its upper declination limit.

Dixon has been contacted by a company on Pollock Road near the observatories, regarding installing a frontage road to Highway 23 for safer access. He will attend a lunch meeting on the 25th on the subject. He has also attended a lecture held by the Center for Cognitive Studies, on SETI decoding problems. Their contention was that, even if we did receive intelligent signals, we would not be able to decipher them. Dixon gave his view that, even if we could not decode them, the act of receiving them was significant itself. A good general discussion on perception, technology, intelligence, etc ensued.

Phillips reports that he has been invited to give a talk on SETI & the RO in March, to the Cincinnati Amateur Astronomy Group.

Campanella has done more work on some of the Argus problems, and has written a conclusion.

James has been studying the software Campanella gave him at the last meeting, & reports that he sees merit in using it. He has also been scrutinizing the commercially available A/D converters, and feels positive on what's available.

The meeting broke at roughly noon, with most going off to their respective tasks.

NEWS FROM THE FRONT

From:Russ Childers.
Date: 1 /20/93.

After today's regular Saturday meeting, a couple of exciting events occurred.

First, Steve Brown & I moved the antenna declination to +54 degrees 30 minutes. We chose this declination because there is a strong pulsar at 54 degrees 34 minutes declination, 03 hours 33 minutes right ascension. (I found these data in the Astronomical Almanac. The coordinates are for Epoch 2000.0, but should be close to the current coordinates because of the OSURO's relatively large beam.) The pulsar is 1500 Janskys at 400 MHz and has a period of around 0.7 seconds. Hopefully, the current receiver will be able to detect this pulsar. This declination is just a stop on the way to +63 degrees — the most northerly declination in the Ohio Survey. The bottoms of the "ferris wheels" are now in the "bathtubs".

Second, Bob Stephens completed construction of the horn cart railway. This is a milestone in the history of Big Ear. Bob's craftsmanship in this project is extremely laudable. His initiative to commandeer the railway project should draw praise from all corners of the radobs community. There was also a cherry on top of the accomplishments of the day. When all track welding was finished, the LNAs were turned on, as was the strip chart recorder. As Bob Stephens and I were conversing in the Focus Room, the continuum pattern match algorithm came to life, reporting that it saw a 0.4 Jansky (at 1415 MHz) source. After consulting Ohio Survey V, it was confirmed that there indeed was a source close to the reported right ascension & declination. However, looking at the strip chart record, which was set to a high resolution, one would have to have a very good eye or a lot of personal conviction to say that one saw a source. Hooray for the basic mathematics of the continuum pattern match algorithm, which produces few false alarms and many strikes.

Hooray also for Steve Brown, climber of flat reflector ladders, postponer of familial engagements, and harborer of a nasty cold. Hooray for Bob Stephens, seeker of intelligent life and welder extraodinaire.

From: Steve Willard.
Subject: Newsletter.
BULLETIN! BULLETIN!

And now for the news from out here in cyberspace — where virtual reality, isn't. Here is all the news that is fit to print from Washington. WHOOPS!! There is none. Oh well — on to things that are closer to us. Lest ye think we are all saved, "they" just paid me what most folks would consider an obscene amount of money to stand around and do absolutely zip for several days "JUST IN CASE" the White House photo lab needed a fix that the regular staff couldn't handle. All I saw going through were equal amounts of photos of Bill and what's her name. Heaven forbid that we couldn't get our 8x10 autographed glossy of Bill and what's her name in a timely manner. ENOUGH ALREADY!!

In a totally unrelated story it has come to this reporter's attention that there are 10 (yes ten) PDP 11/750's setting in the hallway at UMASS waiting to be scrapped. Do we need memory or cpu cards or power supplies or? They were on a cluster controller so they have almost no I/O but if we need something our "advocate mole" will box it up and send it to us for 0 bucks. What say someone-please??

FLASH-IT'S OFFICIAL!!!
(Shelburne Mass) In an act of unsurpassed mediocrity it was announced, by officials of TGRAO (Two Guys Radio Astronomy Observatory) billed as "The smallest radio observatory on the planet?" that an IBM compatible 286-16MHz computer with 2 megs of memory, floppy and hard drives, and a blazing math-coprocessor would be donated to NAAPO on or about the 1st of February, 1993. When contacted for details, director Chris Slack said "now what am I going to do for a computer to run our instrument". Flunky gofer Steve Willard commented in a BFO (blinding flash of the obvious), "we will get another one". It is said to have the latest in operating system and is loaded with nifty software including microsecond to hours timing routine library and a Microsoft "C" development system. Reportedly there is a full sky tracking program with full screen graphics for tracking any and all orbiting "noisemakers". TGRAO wishes to publicly thank the NAAPO and OSU engineers, astronomers, and administrators for their assistance and generosity in sharing the great body of knowledge that is NAAPO.

THEORETICAL THING-A-MA-JIG REPORT

This story just in from that great chasm between theory and reality... (Milford Conn). The first build of the F.A.S.T. (Flat Angle Sensing Transducer) project is proceeding without a visible hitch. All preliminary, and obligatory, meetings with the ME's have been endured and the first build id now taking shape. It looks very promising. When asked how it works, project leader "Crazy Person" Willard refused to comment on the grounds that "if it goes in the dumper I would look like a fool". With sincere apologies to Dr. Klein, Willard said he wanted to get a little peek at the concept in action before wasting others valuable time. He did say however, that it is completely digital, non-temperature sensitive, and has absolute serial output that is accurate and repeatable to 1 minute. Drawings disclosing electrical and mechanical aspects of the device will be made available to NAAPO and Dr. Klein the first week of February. This reporter thinks he is bluffing but time will certainly tell. He might accidentally be onto something. Along the same line it has been learned that 4 sweepable LNA's do exist and are being tested in a VHF-UHF-Microwave Ham contest, reportedly being conducted in this galaxy, this weekend. Details surrounding this strange device are sketchy but it has leaked out that "gains in excess of 35db" have been reported with very low noise. The source of this info, who refuses to be identified, said "I'll see it when I believe it". Disclosure and preliminary performance reports will be available to the NAAPO gurus shortly for dissection and mastication.

That's it for now folks. Remember: we print all the news that fits??

WISH LIST

Some of the general items:

* The control computers for our receivers is a DEC 11/23. Although it's fairly reliable, we do all of our own maintenance, so we are always interested in spare parts for this computer. We would particularly like to get spares for the A/D boards in it.

* We are interested in L-band RF gear, particularly test equipment, such as signal generators, spectrum analyzers, and frequency counters. We need a synthesized signal generator for the 1-2 GHz range.

* I would like to supplement our stock of ordinary electrical test equipment as well. We need another portable oscilloscope in particluar.

* We are always eager to accept working chart recorders, provided they come with a supply of paper.

* We can use computer equipment such as terminals, printers, and modems.

* We use a couple of IBM PCs and clones for various purposes. We would like more of these, either as spare parts or complete systems. I'll elaborate on our computer equipment needs below.

* We'd like to have a copy machine and an answering machine at the observing site.

* We need a stereo tape recorder for recording the audio SETI data. It must be stereo because we record the receiver output on one channel and WWV output on the other, to time-stamp the data. It must have either mechanical controls or a timer switch, so that it can be remotely controlled.

* We are presently unable to cryogenically cool our low-noise amplifiers (LNAs). We used to have the LNAs in an enclosure which could be immersed in a Dewar of liquid nitrogen. However, the stainless steel coaxial cables which fed the RF signal into and out of the enclosure became faulty. We would like to get either material or donated expertise to repair the enclosure.

* Even better, we'd like to get refrigeration equipment to eliminate the need for the liquid nitrogen bath altogether. A couple of Stirling cycle refrigeration units would be ideal.

* There is also room for improvement with our LNAs themselves. They achieve a noise temperature of about 75 degrees Kelvin without cryogenic cooling, which is good but not quite state-of-the-art anymore. (They're several years old.) We'd very much like to get a pair of newer, HEMT LNAs suitable for the 1.4-1.7 GHz band. We have several other projects which we'd like to see implemented.

* We'd like to update the measurement of our feed horn pattern. This was last done about 20 years ago and the equipment no longer exists. To do this requires a portable, low power transmitter which is carried around a large circle centered on the feed horns, while we monitor the received signal at the feed horns. The transmitter could be a battery powerd signal generator, or one which ran off DC, or

it could be noise diode coupled to a broadband amp. The main thing is that it doesn't run off AC, so we don't have to drag 500' of extension cord.

* There is a low-noise electronic switch which connects the receiver to the 2 feed horns which we need to replace.

* We'd like to see an automated system implemented for monitoring RFI at the observatory. We have most of the receiving equipment in place for this task, so it's mostly a matter of implementing a database. This could be done on the 11/23, but we'd rather dedicate a PC to it and leave the 11/23 free for data collection. (This is the same separation of tasks used for our automatic SETI monitoring system.) The PC would need graphics capability, and a fairly large harddisk for the database.

* One of our volunteer staff is presently working on software to graphically display the radio sky (as measured during the Ohio Survey) and dynamically show the area covered by our beam. It will also label sources, from the Master Source List, which are in or near the beam at any given moment. The software is being developed on a Mac; we want to get a Mac to install this software permanently at the observing site.

ed. note:

Due to space restrictions, the rest of the "wish list" and Coordinator's Corner will appear in the next issue. If you would like to donate items in answer to the wish list, please contact us!

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