NAAPO (North American AstroPhysical Observatory)

"NAAPO News"
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OUTSTANDING OPPORTUNITY
SEPT. 20 1986
WORKING SESSION

THIS IS A SHORT NOTICE ANNOUNCEMENT!!! GET WITH YOUR INTERESTED COLLEAGUES AND MAKE A TRIP TO BIG EAR FOR THE SEPTEMBER 20 WORKING SESSION AND DEMONSTRATION. THIS OPPORTUNITY IS OPEN TO ANY INSTITUTION THAT WANTS TO TAKE ADVANTAGE OF A YOUNG TECHNOLOGY.

Starting late afternoon (about 4:00 pm) at the radio observatory, Lee Lubbers, S. J. of Creighton University, Omaha, Nebraska will demonstrate his SCOLA Molniya tracking system.

A few quick definitions:

MOLNIYA — Soviet satellites (4) similar in concept to the Clarke orbit geosynchronous satellites parked over the equator. Most of the Soviet Union is so far north that the Clarke orbit satellites are too low for effective monitoring. Thus by placing communications satellites in highly elliptical orbits with apogee points above latitude 60 degrees and orbital planes separated by 6 hours in longitude, there will always be a satellite over Siberia. There will also be one always over Hudson Bay (approximately). These satellites then carry domestic Russian programming to cover the whole northern hemisphere. Quality sound and color video.

SCOLA — A consortium of universities worldwide. It is a near acronym for Satellite Communications for Learning World-Wide based at Creighton U.

Lee Lubbers will demonstrate his system for a fee, deducted from the $20,000 cost of the installation when purchased. His fee has been picked up for this visit (not by NAAPO) and the offer is out to anyone interested in seeing the system work.

We would like to encourage any of you to bring your language people, your a-v people or any one else you can think of to this event. There are posibilities for collaboration in using such a system when set up and the advantages of direct cultural interchange are very great. The program that starts off the Soviet day (about 4:00 pm local time) is their version of Good Morning America.

Come join the crowd. The Radio Observatory working session will be convened at 1:30 in the afternoon and should be finished before the demonstration begins. There will be plenty for all to do if they choose not to attend the working session. You can even come after the OSU football game and get in on the SCOLA program.

If you decide to come, be sure to give me a call (614-898-1516) within a day or two of the event to be sure all plans are still on. If you have any questions feel free to call me. I will try to let you know all I know about what is happening.

FALL CONSORTIUM MEETING

I am presently starting to plan the Fall Consortium meeting. I have not selected a date yet, but I think the topic for discussion will be the nature of research programs the consortium members can carry out at their home base. This does not imply that there are no slots left for research programs at Big Ear, but that we need to address the needs of the member institutions to get their students working on projects to gain skills and understanding of some of the problems they will be facing when they do get to the telescope.

Suggested topics covered will include survey intercomparisons, antenna and receiver measurement reduction, sensitivity evaluation and antenna responce as a function of declination.

More information will be sent as soon as plans are developed.

EXCESS EQUIPMENT AT BIG EAR

The decision to clear out the observatory electronic shop means that some electronics equipment needs to be disposed of. This is miscellaneous stuff and may be of no value to anyone. Bob Dixon and I will be shuffling through it in the next few weeks and will have a list of available things before long. Meanwhile, if you happen to be around on other business ask us what is available and you might be able to do us the service of carrying off the stuff right then. It looks like many things will be down the tubes before the room is vacated.

KRAUS STUDENT MAKES NEWS

Science magazine for 22 August 1986 carried a note about very early stages of star formation. The note (copy below) refers to the work of a group including Chris Walker. Chris is an OSU Radio Astronomy graduate, having done his master's thesis with John Kraus 5 years ago.

A TEACHER AFFECTS ETERNITY; HE CAN NEVER TELL WHERE HIS INFLUENCE STOPS.
- - Henry Adams

NAAPO HEADQUARTERS

Please address your comments and questions (and material for the Newsletter) to:

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WORKING SESSION
SEPT 6 1986
at Big Ear

In attendance: Dixon, Bolinger, Abel, Ave, Huck, Barnhart, Kraus and Malcolm Wilkinson — a special guest from Melbourne, Australia, currently at Calgary, Alberta, Canada.

General Reports:

1. Telescope Status — Now that we are back on the air bugs are being flushed out of the equipment. The low noise amplifiers are functioning well. The receivers are all working. The principal glitch seems to be the result of a mouse that chose the IBM disc drive as a nest site. The result has been the crash of the read/write head which uses the air flow for ground effect suspension over the disc surface. It seems the mouse nest restricted the flow allowing the record head to contact the disc surface destructively. Unguaranteed repair will cost in the neighborhood of $1500. In light of the imminent replacement of the IBM computer at the focus room it has been decided not to repair the disc drive and accelerate the installation of the DEC PDP 11/23. With the 50 channel receiver no longer needed at the focus room, the work involved in testing the computer can be speeded up by taking the 50 channel receiver to Dreese Lab.

Observation will continue by recording only the continuum level for the purpose of system calibration and checking of likely anomalous sources.

Installation of the 11/23 is projected for three to six months.

The ESL long-wire antenna has been installed and the contract for repair of the ground plane has been let. This work should start and be completed soon.

The fence around the ground plane is more than half complete. The security system sent two apparent false alarms in the past few weeks. Barnhart is to check the false alarm procedure with Teamguard this week.

Dixon has ordered padlocks for the observatory key to be placed on the east ground plane gate and the instrument cover. The instrument cover will be installed before the next working session.

Dixon has issued keys to the chains and focus room for the fire department. Kraus reports that the Emory Freight bill has been sent to the University to be paid.

Bulbs in the outside lights near the focus room and on the ground plane should be checked. Huck reports they were not working the other night when he tried to get into the focus room after dark.

2. System Status — Bolinger reports that the HP synthesizer interface design is now complete along with the software to run it and Huck and Ave will be building it over the next 6 to 8 weeks. Packaging of the 11/23 has not been started because the 11/40 has not been picked up by the aeronautical people who have promised to take it away. Hardware construction WILL BE THE HOLD UP in this area. If anyone would like to get in on the construction end of this, just let us know and we can get the parts to you and instructions as to what it is and how it is to go together.

Ave is rebuilding the synchronous detector. It should take about two weeks. Abel is programming at home. It seems to be working out well, as his time to work on these things is about two hours a day and that is the round trip walking time to the radobs office. Remote access is a great invention.

Huck rehung the WWV antenna lead. He is also engaged in a round of mouseproofing the focus room. The suggestion of importing snakes seems to repel the humans more than it is likely to repel mice. Application is being made of mouse poison which the mice seem to have found on the storage shelf. They have chewed their way in, so at least they have a taste for it.

Work is going on with the a/d convertors. It was found that two 30 MHz IF amplifiers have been burned out because someone in the past reversed the +28 volt wire and the ground wire into the modules. This procedure is not recommended.

A change in the September 20 Working Session meeting time was announced. (See article in another part of this newsletter.)

The meeting adjouned at 12.28 pm.

MALCOLM WILKINSON
Big Ear Guest

Dr. Malcolm Wilkinson dropped in at the Sept. 6 working session at the invitation of John Kraus. Dr. Wilkinson, from Melbourne, Australia is in the medical sciences with an interest in breathing patterns and disorders. He also has become an authority on radio emission from Jupiter, which he monitors on very simple equipment.

He has worked out a computer program for predicting the onset of Jupiter radio noise and ways of plotting the position of Io with respect to the Jovian central meridian. For those of you who might be interested in such a program for use at your institution, let us know here at the NAAPO office and we will see if we can get you together with descriptive materials to get you started.

Dr. Wilkinson will be staying in Calgary, Alberta for some time into the future.

COORDINATOR'S CORNER

The past three weeks have been a bit depressing. Vital work that had been progressing so well so long as the two summer interns were here have ground to a sluggish flow. I find that not only were they able to keep me alert and active, but they accomplished so much on their own that I am suffering deprivation shock now that they are back pursuing normal lives.

Also in this interval, I took time out to prepare our house and the ranch surrounding it for the wedding of our daughter. This is an activity everyone should experience at least once, but I guarantee will not become habit forming. The process of education and difficult decision making seems almost like a vacation. We are ready to get back to the business at hand — out of self defense.

I was very surprised following the mailing of the last newsletter. I had gotten behind schedule in the printshop and missed the afternoon mail so thought there would be at least a day delay in everyone's receiving their issue. It was a great surprise when first thing Wednesday morning I began receiving responses from the newsletter. I guess I owe a big thanks to our mailroom attendants for getting the mailing to the post office after closing time to make the last mail pickup of the day. I also owe big thanks to those who responded so quickly to our appeals for help.

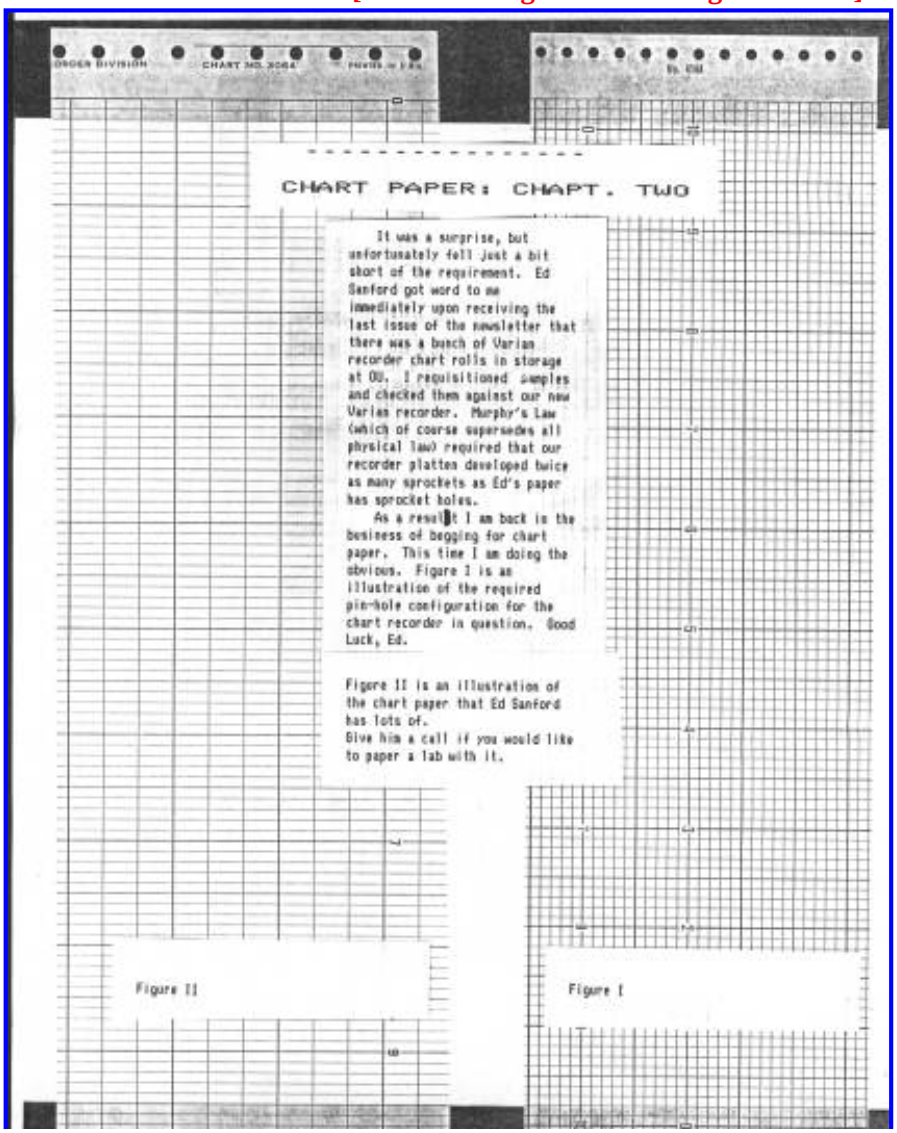
Ed Sanford got to me at once with an offer of Varian chart recorder paper. In trying to get back to him I discovered Ohio University has messed with their phone system and the numbers I had are no longer useful. I will appreciate it if those of you who experience changes in address of phone numbers try to remember to get such changes to me without too much delay. In the next couple weeks I will have an intern in the office again to try to bring some order out of the chaos of my mailing list. See, I am really devoutly lazy.

Two final comments. If you wish me to send extra copies of the newsletter for your colleagues or students or superiors, just let me know and I will enter that information into the mailing list program.

The academic year is beginning. As you generate ideas for meaningful activities for your students and yourselves, keep NAAPO in mind and help us get on with the important task of research and education to which we are committed. Send us your ideas, plans and interns.

CHART PAPER: CHAPT. TWO

[Click on image to view a larger version.]

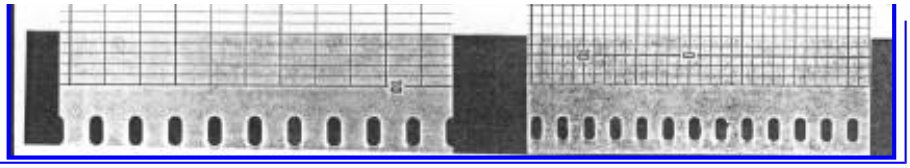


It was a surprise, but unfortunately fell just a bit short of the requirement. Ed Sanford got word to me immediately upon receiving the last issue of the newsletter that there was a bunch of Varian recorder chart rolls in storage at OU. I requisitioned samples and checked them against our new Varian recorder. Murphy's Law (which of course supersedes all physical law) required that our recorder platten developed twice as many sprockets as Ed's paper has sprocket holes.

As a result I am back in the business of begging for chart paper. This time I am doing the obvious. Figure I is an illustration of the required pin-hole configuration for the chart recorder in question. Good Luck, Ed.

Figure II is an illustration of the chart paper that Ed Sanford has lots of.

Give him a call if you would like to paper a lab with it.



WEEDS AT BIG EAR

Our Zanesville contact, H. J. Lewis, responded immediately to our comment about the weeds over-running parts of the telescope. He included a devastating recipe for weed killer that sounds like it will shrivel the toughest vine and perhaps even do in some of our mice. We are still waiting to see if the spray job the University grounds crew begins to do anything before we try it out. If things don't start wilting by the next working session I intend to go for the Lewis Sauce and really do in the weeds.

MICROCOMPUTER ASTRONOMY PROGRAMS

I have a listing of available microcomputer programs relating to astronomy which was published in the Winter 85/86 issue of Journal of Computers in Mathematics and Science Teaching. The list was compiled for the Microcomputer Workshop of the Pacific Planetarium Association in November 1983 and revised in November 1985.

I will be happy to send this listing to anyone interested. It also includes an offer for all Apple software in the public domain (six disc sides) at a cost of $5 if you supply your own discs ($10 if you do not).

Contact me at the NAAPO office.
- - - Phil Barnhart

NAVAL OBSERVATORY OFFERS FLOPPY ALMANAC

The attached information sheet describes the U.S.Naval Observatory Floppy Almanac, an IBM compatible PC program offering a number of useful tables and catalogs. This should be a good addition to your library holdings.

FLOPPY ALMANAC INFORMATION SHEET

1. INTRODUCTION

The Floppy Almanac is an integrated package of software and astronomical data on one floppy disk that brings the benchmark standards of The Astronomical Almanac, The Nautical Almanac and The Air Almanac to microcomputers. Using this interactive system, high precision astronomical and navigational data for one year's time can be calculated for specific times and locations.

The "Floppy Almanac" diskette will be useful for professional and amateur astronomers, navigators, surveyors, meteorologists, engineers, and others who regularly need accurate information on the positions and motions of the Sun, Moon, planets and stars. Use of the 5 1/4 inch diskette will require a microcomputer compatible with the IBM* PC. (Specifically, the "Floppy Almanac" is being designed for use in any IBM PC-compatible machine with at least 256k bytes of memory running MS-DOS**; an 8087 arithmetic coprocessor is strongly recommended.)

The Floppy Almanac draws upon ten years of experience producing the Almanac for Comouters, an annual publication of the Nautical Almanac Office, which provides astronomical formulas and algorithms for small computers and calculators. In contrast, the data from the "Floppy Almanac" will be immediately available to anyone with a microcomputer and the diskette; no programming or detailed knowledge of computers is required. Ease of use has been a specific design goal.

2. AVAILABLE DATA

(1) Apparent and Astrometric geocentric places of Sun, Moon, planets, and stars,
(2) Heliocentric longitude and latitude of solar system objects;
(3) Barycentric equatorial rectangular coordinates of solar system objects;
(4) Physical ephemerides of Moon and planets;
(5) Topocentric rise, set, and transit times of any object for any location on Earth;
(6) Navigation information;
(7) Greenwich and Local Sidereal Times;
(8) A catalog of 1536 Bright stars and a catalog of 233 compact radio sources;
(9) User may establish catalogs of special objects.

3. SUPPORTING INFORMATION

The Floppy Almanac disk contains a file titled READ.ME which contains detailed instructions and examples for using the Floppy Almanac. This file does not contain an explanation of what the computed quantities are; familiarity with the published almanacs is assumed. Additional explanatory information and sources, and additional astronomical data are available in the standard publications of the Nautical Almanac Office titled The Astronomical Almanac, The Nautical Almanac, The Air Almanac, The Astronomical Phenomena and Planetary and Lunar Coordinates — 1984-2000.

4. AVAILABLE FORMATS

The Floppy Almanac is available as a 5 1/4 inch DSDD disk for MS-DOS based microcomputers. To run the Floppy Almanac, the system requirements are: 8086/8087, 8088/8087, 80186/80187, or 80286/80287 processors installed, MS-DOS 2.0 or higher, at least 256k bytes of RAM, and at least one floppy disk drive. Version 1.0 of the Floppy Almanac does not use any graphics features, so a monochrome monitor is sufficient. A version that does not require a numerical co-processor is also available, but due to the extreme number of double precision calculations, execution times are much slower. A 3 1/2 inch disk version that does not require a numeric co-processor is available for portable computers.
* IBM is a trademark of International Business Machines Inc.
** MS-DOS is a trademark of Microsoft Corporation.

5. ORDERING INFORMATION

The Floppy Almanac is available from the U. S. Naval Observatory. Please send the order form at the bottom of this sheet accompanied by a check for $20.00 per disk payable to the U. S. Naval Observatory.

MAIL TO:
NAUTICAL ALMANAC OFFICE
CODE FA
U.S. NAVAL OBSERVATORY
34TH A MASSACHUSETTS AVENUE, N.W.
WASHINGTON, D. C. 20390-5100

Enclosed is $_____ (check or money order for exact amount) for Floppy Almanac(s) of following format:

_____ 1986

_____ 1987

_____ 5 1/4 Inch DSDD disk, with 8087 support.

_____ 5 1/4 inch DSDD disk, without 8087 support.

_____ 3 1/2 inch disk, without 8087 support.

NAME:
_____

STREET OR BOX:
_____

CITY, STATE AND ZIP (Postal) Code:
_____

COUNTRY (IF NON-U.S.):
_____

PKS:wij 5/86