NRAO NM NEWS

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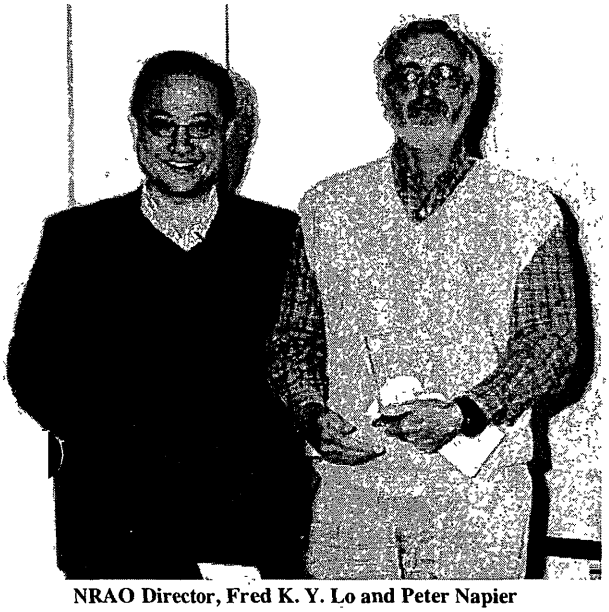
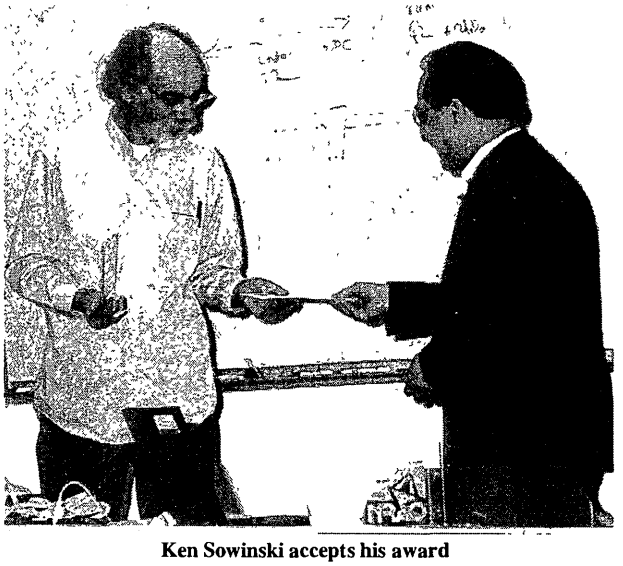
NOTES FROM THE AD

I'd like to take this opportunity to thank the three NRAO employees in New Mexico who received Distinguished Performance Awards this month. The awards, for long-term outstanding service to the Observatory, were awarded by the NRAO Director, Fred K. Y. Lo, during an all-hands meeting on February 9, 2004.



NRAO Director, Fred K. Y. Lo and Peter Napier

Peter Napier received one of the awards for his notable achievements. Among other things, he was a significant contributor to the building of the VLA, Division Head, Project Manager for most of the term of the VLBA construction project, and now is EVLA Project Manager. He also headed the ALMA Antenna Group for several years, and is a past President of the U.S. National Commission of the International Union of Radio Scientists (URSI).



Ken Sowinski accepts his award from NRAO Director, Fred K. Y. Lo

Ken Sowinski has been the key individual in constructing, modifying, and maintaining the real-time software of the VLA for more than 20 years. He has been on virtually constant call to assist several generations of telescope operators, helping save the data for hundreds of observers. Rather than just doing maintenance, he also has implemented a number of new capabilities. Among other things, these software enhancements have enabled reception of telemetry from Voyager at its Neptune encounter in 1989, the use of reference pointing and fast-switching for high-frequency observing, and implementation of the VLA-Pie Town link.

Rudy Latasa receives his award at a later time, from Jim Ulvestad, Dir., Socorro Operations.

Rudy Latasa is the long-time Head of the Cryogenics Group in the Electronics Division. He leads a team that maintains several hundred cryogenic systems spread over 38 antennas and the entire United States. Along with maintaining our arrays of 25-m antennas, Rudy also has contributed significant innovations that have improved the overall reliability of these systems, and provided observers with the lowest noise data possible. It is fitting that on the day the awards were presented, Rudy was unable to be present at the Array Operations Center because of his commitment to repair faulty systems in the field with the least possible data loss.

All three of these individuals have in common the theme of building and maintaining robust facilities, and providing the best possible data to many hundreds of observers on the VLA and/or the VLBA. On behalf of all these astronomers, I wish to express my thanks to them for their long-term meritorious service, and congratulate them on their well-deserved awards.

Jim Ulvestad

The National Radio Astronomy Observatory is a facility of the National Science Foundation operated under cooperative agreement by Associated Universities Inc.

More Congratulations to:

David Medcalf, VLBA array operations supervisor, completed his master's degree from the New Mexico Tech Biology department. His thesis, titled "Diversity Consequences of a Spatially Explicit Allopatric Speciation Model" described the results of a computer simulation (written by David) that demonstrate how a species can diversify and occupy overlapping and adjacent ecological niches.

Peggy Perley

Jeffrey S. Kern with ALMA, successfully defended his Ph.D thesis entitled "Dispersion, Scatter Broadening and the Instrinsic Structure of Crab Pulsar Giant Radio Pulses," on January 23, 2004. Jeff has been working with Tim Hankins, Jean Eilek and Jim Weatherall of the NM Tech pulsar group, to determine the radio emission mechanism for pulsars. With the collaboration of the NRAO Engineering staff, Jeff and his colleagues have developed new data acquisition systems that have allowed the clear detection of 2-nanosecond pulses from the Crab pulsar. These pulses appear to be the signature of a collapsing soliton model first proposed by JimWeatherall.

Tim Hankins

Ian Hoffman, a pre-doctoral student at the AOC, gave a successful dissertation defense of his pre-doctoral research on January 30, 2004 at the University of New Mexico in Albuquerque. Among the committee members were W. M. Goss, Crystal Brogan, and Mark Claussen. Ian's work involved MERLIN and VLBA polarization observations of 6-cm formaldehyde masers in star-forming regions and of 1720-MHz OH masers in supernova remnants.

These observations have provided reliable constraints on the intrinsic angular and spectral nature of the maser emission. In the case of the formaldehyde masers, the observations indicate that the maser gain is far higher than previously suggested for the formaldehyde maser pump. In the case of the OH (1720 MHz) SNR masers, using observations of the Zeeman effect in circular polarization and of the position angle and fraction of linearly polarized emission, relatively robust constraints have been determined for the magnitude and direction of the magnetic field in the maser gas.

Miller Goss

Welcome Aboard

William Powers, John Verdugo, ALMA; Azmat Bhatty, Basic Research; Gregory Worrell, Electronics; Kurt Caviggia, Jennifer Dugan, Ephraim Ford, EVLA.

At the VLA

The Site & Wye Group has been busy. Grounds/Fiber crew is on the last stretch of fiber optic cable installation. They have completed the north arm installation and will finish the south arm in late February.

Track Crew is in the process of building a concrete track intersection timber. Jon Thunborg helped with the design when Paul Savedra brought it to his attention. We expect to have the first two poured soon.

Charley Chavez has been installing sound-soak board between rooms at the Guest house. He should be done sometime next week. Now all can sleep (or party) in peace.

The Auto Shop is still putting out fires. We finally have a new mechanic (Dennis Mobley) on board. Jimmy has been out for more than three months due to an injury but he should be back soon. Sure hope so, anyway!

Pat Lewis

VLBA Digital Tachometers

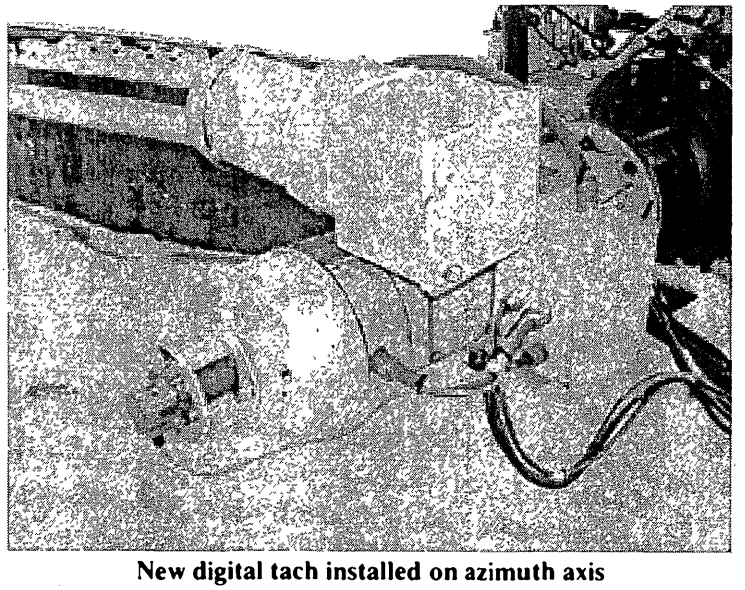
The VLBA Servo System has a long history of problems with tachometers and blowing fuses. The tachometers tell the Servo electronics what speed and direction the drive motors are operating. This information is used to control the current, and velocities, of the drive motors that position the antenna. Analog tachometers are generators with a DC output voltage that is linearly proportional to motor speed. They have been proven to generate AC noise that is coupled onto the DC output.

After investigations revealed that the VLBA Servo System is very sensitive to tachometer noise and incoming power line fluctuations that occur during periods of maximum antenna slewing, it became apparent that the analog tachometer-generators were a major contributor to the system problems.

The cost for each analog tachometer-generator is about $500 and $49 for fuses. Each VLBA antenna has a total of four tachometers, and 16 fuses. In 2003, the total cost of tachometers and fuses shipped from the VLA site Warehouse was $12,350.00. This represents a significant portion of the annual Servo Shop budget.

In 2000, as part of an electronic course design project, Doug Whiton, the Station Manager at the Hancock VLBA Station submitted a design for a digital tachometer upgrade. Several Engineers reviewed Doug's design, and made some suggestions for improvement prior to a formal design review. In June of 2002 a prototype digital tach was fabricated and taken to Hancock VLBA Station for testing. Because of mechanical failures it didn't work as anticipated, and was shelved as other urgent projects took priority.

In the summer of 2003, the project was resurrected under the guidance of Eric Carlowe, with assistance from the Servo Group. A digital tachometer prototype system was built using Doug's design and an optical encoder that was specified by Bob Broilo. Nelson Atencio, from the VLBA Pie Town station, modified the Servo Interface Board wire wraps and tested the circuit boards. The Servo Group provided spares and parts



New digital tach installed on azimuth axis

for the prototype.

The Azimuth axis was chosen for the prototype installation, as it is most susceptible to current spikes because of their high current demands. The digital tachometers were installed shortly before Thanksgiving at Pie Town and Hancock. After several weeks of testing, pointing and observations, no instances of fuse blowing or Servo problems were noted.

Shortly before Christmas, the digital tachometers were installed on the

ation axis at both Sites. Pie Town and Hancock are now fully gital, and have been through several Crustal Dynamics Project (CDP) observations without failure. CDP observations are the 'worst case' for the Servo System because the antenna is only on source for a few seconds, and then high speed slews to a new source. This puts maximum stress on the Servo system, and tachometers, as any AC noise is pled into the current command.

The new digital tachs are optical based and therefore don't have any brushes that contribute AC noise, plus they have bearings that are specified for more than 1.5 billion cycles. We are also replacing the flexible coupling that connects the tachometer to the drive motor shaft. The current couplings cost $125 each from our Warehouse and are relatively fragile;the new couplings cost $49 each and are very robust.

We plan to retrofit the rest of the VLBA Sites during upcoming Maintenance Team visits in 2004 – 2006, at a cost of $2,700.00 for each Site. The Servo Group will assemble the upgrade kits, and Nelson Atencio will modify Drive Cabinet Interface Boards as the old boards become available.

Tom Frost

Relay 2004 - Call for Volunteers

Relay For Life is the American Cancer Society's signature fundraising event. Last year the Socorro Relay raised over $28,000 with the NRAO team contributing over $2,250. Not too shabby for a rookie team! This year we would like to leave that total in the dust. To do that, we need your support. Last years' team co-captains Emma Baca and Tami Hale moved on to be Event Co-Chair and Treasurer so **WE NEED A VOLUNTEER TO KEEP THIS TEAM GOING**. This year's Relay promises to be a lot of fun for the whole family. For more information or if you have questions, call Emma at ext. 7143 or Tami ext. 7221

Tami Hale

Small Potatoes Investment Club

It has been two years since an article appeared in this newsletter about Small Potatoes, the NRAO investment club. Since then, many new employees have joined who may not be aware of this club's existence.

The main purpose is to learn about the stock market without risking a lot of money (hence the name). During our monthly meetings, which take place at the AOC during the lunch break, we decide which stocks to buy or sell. Members invest $20 per month to participate in the club.

During the five years of its existence Small Potatoes has had its ups and downs. As many others, we suffered when the Tech boom finished, though we were clever (or lucky) enough not to get involved with true Internet stocks (dot.coms). We had better luck with some of our investment in the retail, financial, and medical sectors, and overall we have managed to do a little bit better than the S&P 500. Overall, we realize the true success of the club is not measured in dollars won, but in valuable experience gained.

There are currently 15 members, and New Mexico law limits us to 20. So, we still have some open slots for other partners. Membership is not limited to NRAO employees. Friends or family are also welcome. It's a great way to learn about investing without risking one's retirement! If you are interested in joining, or would like to learn more, please see Paul Rhodes (President), Peggy Perley (Vice President),Gayle Rhodes (Secretary), or Gustaaf van Moorsel (Treasurer).

SPUDS

Cigna Medical ID Card information

If you need to replace your medical ID card for your CIGNA coverage please dial the following number: 1-800-622-5579

This number will take you to RxPrime's automated answering system. Due to HIPAA Privacy laws, you will be asked to verify and re-verify various pieces of personal information. Please follow the steps given until you are asked to wait for a customer service representative. You can order your card from the representative at that time.

This is a fairly cumbersome process, requiring you to repeat information several times, but is done for the protection of your privacy.

If you haven't done so already, we encourage you to go to https://my.cigna.com to set up an online account with Cigna. With the account, you will have access to your claim and summary information about your plan. Once your account is set up, you will have the ability to order replacement cards on-line. In addition, you will also be able to print a temporary Cigna identification card.

If you have any questions, feel free to contact Allen or Theresa in the HR office.

Alan Lewis and Theresa McBride

Local Weather at your Fingertips

Every wonder what the Socorro weather is? Now you can find out, from anywhere in the world! Just point your browser to:
www.wunderground.com
and type in '87801' in the box at the top labeled 'Fast Forecast'. Scroll to the bottom of this page, and you'll find a box labeled 'Personal Weather Stations Providing my uplink isn't broken, the current temperature, dewpoint, wind, air pressure (corrected to sea level) etc. are there, and are updated every five minutes. If you click on the link labeled 'Historical Graphs', you'll see a nice plot of all these data since midnight.

For the impatient, the following link will take you directly to this graphical display.
http://www.wunderground.com/weatherstation/WXDailyHistory.asp?ID=KNMSOCOR1

From this page, you can also plot the week's data, and the month's data.

Rick Perley

Safety Corner Tips for Safer Work Areas

Do you have a rocket in your work area? An unsafe condition may exist in some of the work areas at both the AOC and the VLA site. This would be Compressed Gas Cylinders without the protective cap or cylinders that are not attached to a wall or other secure spots. These cylinders or bottles can contain over 1000 pounds per square inch of pressure and the valve attached to the bottle is its weakest point. If one of these bottles without the protective cap is knocked over and the valve hits just right, the valve assembly can snap off. **What happens next you've got to see to believe!** The bottle's pressure is explosively released through the small opening and the bottle takes off **like a bullet or rocket** in the opposite direction. This can **kill** or **maim** anyone in its path and will cause tremendous damage in the area until the bottle stops flying around bouncing off the walls. It can literally tear out a cinder block wall or seriously injury someone. **Not a** pretty picture!

What do we do?

Check all bottles in your area right now, to see if they have the protective cap and if they are in use, that they are attached to a wall or a secure spot.

If you have bottles without protective caps, use them first so that they can be exchanged.

All employees who have compressed gas cylinders, in their areas of work should be aware that EXTRA caution must be used when handling them. Be very careful not to drop, knock them over or let them bang into anything.

Venders should be asked not to deliver unsafe bottles, you want bottles with protective caps only.

Store all your bottles together secured to a wall with rope or chain **Bungi cords are not recommended to support the weight of a bottle**.

See the Site Safety Officer for additional safety training on this topic.

James B Sullivan, Safety Officer

February Skies

The grand evening parade of planets continues this month with both Venus and Jupiter getting brighter and higher in the sky. Venus, at magnitude –4.2, lingers in the western sky for up to 3.5 hours before setting. Through a small telescope you should be able to watch its phase shrink from three-quarters to two-thirds.

Jupiter rises at 8:30 p.m., early in the month and just after sunset by the end of the month. While not as bright as Venus it is nevertheless of respectful brightness at magnitude –2.5!

On 22 Feb., at about 11:00 p.m., a small telescope will reveal an unusual compact grouping of Jupiter's moons Io, Europa and Callisto. Look for Jupiter in the constellation Leo, the lion.

Saturn is now high enough at nightfall so that clear steady views of the ringed planet are possible as soon as it gets dark. Shining at magnitude 0.0, it is located near the feet of Gemini, the twins. Saturn's rings continue to be open and favorable for amateurs to probe for the subtle gaps in the ring system.

Mars is still with us but fading. Again, the best pictures of Mars will be those sent to us by the Mars Rovers, now roaming its surface. At mid-month, Mars can be found about halfway between Venus and the star Aldebaran in Taurus, the bull.

A nearly full Moon will shine near Saturn during the night of 2-3 Feb. The Moon will be full on the 6th, last quarter on the 13th, new on the 20th and first quarter on the 27th. The moon will again be near Saturn for a second time this month on the 29 Feb. Happy Leap Year!

During February, there are three star parties curre[illegible] scheduled for Etscorn Campus Observatory. Various groups will [illegible] visiting us on the 2nd, 7th and 13th and all of these events will begin at 7:00 p.m. local time. As always, the public is cordially invited to all Etscorn star parties. To reach the Etscorn Campus Observatory, take Canyon Road past the golf course pro shop. Turn right on Buck Wolfe Drive and follow the signs to the observatory.

Jon Spargo, New Mexico Tech Astronomy Club

Articles and photos for the VLA/VLBA Newsletter are always welcomed. If you have something to share, please contact Terry Romero, at <tromero@nrao.edu>, or extension 7315.

This newsletter is published every other month. Copies of the VLA/VLBA Newsletters, starting with 2002 are available at:

http://www.aoc.nrao.edu/nrao-only/nm-news/