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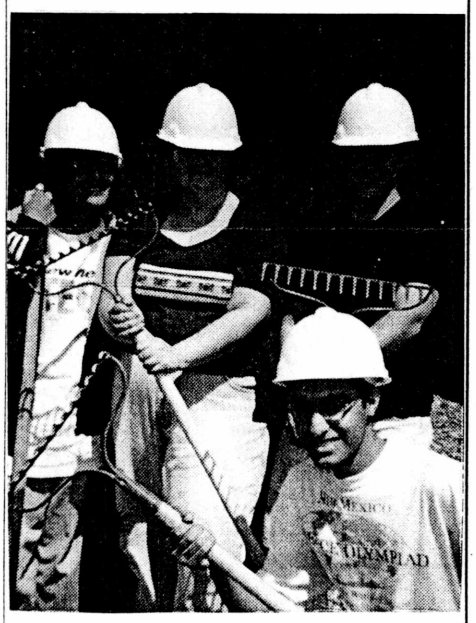
VLA/VLBA NEWSLETTER

From the World's Premier Centimeter Wave Radio Synthesis Telescopes

AROUND THE VLA

SYEP workers in July were Amir Alam, Jacob Claussen, Dora Villareal, and Lucy Zamora. Amir and Jacob are both college engineering students, Amir at University of Illinois and Jacob at University of Oklahoma. Dora plans to start at UNM in the fall. Lucy has another year of high school to go. The workers cleaned up weeds, removed some of that pesky black plastic ground cover sticking through the gravel, and painted parking barriers. They also helped Godin Otero and Johnny Gonzalez trim hedges, shampooed the VSQ carpets for Ellen, entered data for Gene Cole, inventoried drawings for Emma Rice, cleaned up Boneyard Storage for the Warehouse, and the list goes on. This was one of the best SYEP teams ever and we wish them well in school this fall; their last day is August 12.



Renee Saxton, a VLA operator, left for graduate school; good luck Renee.

During the move to A configuration earlier this summer, Transporter Operator Marlin Smith completed a full configuration cycle of antenna moves. The Transporter Crew also points out that the new transporter control panels provided by the Servo Shop worked great.

In the Tall Tales of the Wild West Department, ask Chester about the "naked" coyote heard to be lurking about the Plains of San Augustin.

The VLA site receptionist is also the AOC receptionist. Unanswered phones roll over to the AOC, dialing 0 during voice mail rings the AOC, and extension 7000 is given as the information number at the Visitor Center. You can help our receptionist, normally Josette Chavez but others substitute, by informing her when you will be absent. Call x7000 or e-mail aocrecep. Set up an alias in your e-mail to send your schedule information to aocrecep, jcason, plindsey, your supervisor, and others with a single message.

VLBA MAINTENANCE

Wear on the VLBA drive motor commutators is a maintenance concern especially since the damage to the motor at Pie Town in 1997 (See Newsletter Vol. 1 No. 7). A recent survey by Tom Baldwin shows that grooves appear in commutators regularly at 4 VLBA stations, and have occurred at least once at 9 stations. Brushes that wipe on the commutators cause the wear, but just exactly why wear occurs on some armatures and not others is not understood. An armature is the rotating part of the motor assembly which includes the commutators. The copper commutators are cleaned by holding a dressing stone on them as the armature turns. Without the cleaning, resistance to current flow through the brushes and commutators could cause loss of torque.

Sometimes a damaged armature can be turned on a lathe; other times, it must be replaced. A new armature assembly costs $2500, so that cleaning off grooves before the damage becomes severe is important. Good motor maintenance includes checking for brush wear, adjusting the brush holders, setting the electrical neutral point, checking for armature wear by measuring mica undercut and armature diameter, and knowing when motor components need replacement. We need to better define which maintenance tasks can be performed by the site tech, the acceptable coarseness of grit for the dressing stones, the training required to use the stones successfully, and specifications for maintenance in general. A memo on the subject is planned when the details are worked out. Also, the subject of motor maintenance and commutator dressing will be included on the agenda for the VLBA site tech workshop tentatively scheduled for October.

T. Frost

HOLOGRAPHY AND VLBA PAINTING

Jim Ruff is developing a ray trace for the VLA antenna optics that will permit comparison of last year's photogrammetry measurements with VLA holographic measurements. In addition, Vivek Dhawan is investigating the use of an in-line corrector for VLBA subreflector astigmatism (see Newsletter Vol. 2, No. 5). Jon Thunborg is reporting on the results of the Leica computerized theodolite system in VLBA Antenna Memo No. 21.

Antenna panels at the VLA are set using holography(see Newsletter, April '97); but for holography, the antenna spacing must be smaller than the thermal cells that cause RF phase disturbances -- a few kilometers. Holography was attempted for the VLBA, but the results were too "noisy" because of the loss of phase measurements. An "outrigger" antenna that could be moved between VLBA sites for maintaining phase reference during VLBA holographic measurements is a possibility. Such a system could copy the phase interferometer

(Newsletter, February 1997) and promises to be cheaper and more accurate than either photogrammetry or computerized theodolites.

Some VLBA subreflectors need paint touch-up as part of the 86 GHZ upgrade (see Newsletter Vol 2, No. 4). Loose paint scatters the RF and causes noisy data. Uneven paint also causes problems. Vivek Dhawan estimates the subreflector paint must be even within 16 mils. We should be able to apply paint in the field accurate to within 7 mils, so it looks like we will be touch up painting VLBA subreflectors in 2000.

C. Janes

VLBA SITE TECH WORKSHOP

A VLBA Station Technician Workshop is planned for October 18-22. Agenda topics include servo motor maintenance, HVAC modifications and documentation, electrical safety training and qualification, test of a new VLBA fall arrest system, and CPR training. One tech from each VLBA site will be invited to attend. P.Rhodes

WATER AND FLOWERS

Shane Baca, Johnny Gonzalez, and Godin Otero set up a temporary water supply for the VLBAPT in July when supply from the Pie Town water system failed. Guy Stanzione and Pat Lewis are studying a permanent back-up system.

About 100 feet of "outside" track (the side away from the antennas) on the west arm past W8 was damaged in July when heavy rains washed out ballast (the rock that cushions the rail) and dirt. The Track Crew was spiking the last of the 3800 new ties on the north arm, but stopped to repair the flooding damage. Then access to the north arm got too muddy for passage. The flowers are pretty, anyway.

C. Janes

FIRE ALARM

Tom Baldwin, a master electrician, has prepared a plan for re-locating the fire alarm annunciator in the VLA CB control room. The plan calls for improved lightning protection. Tom expects to have the project completed by 1 October.

C. Janes

TRUCK SAVES BACKS

An easily accessible storage bin on that "new" '78 Dodge truck will allow the Servo Shop to load ACUs and other heavy chassis with less risk of back injury. Richard Murillo and Chad Jones picked up the surplus vehicle at Fort Huachuca, the Auto Shop mounted the utility bins, and Marlin Smith gave the whole outfit a classy paint job. Servo's brown carry-all will replace the WWII ambulance used for waveguide work, and the ambulance goes to disposal.

C. Janes

DEFYING GRAVITY

Where's the gravity? That's the fundamental issue in a fall arrest design explains Jim Ruff in a recent internal memo (VLBA Antenna Memo No. 19, July 22, 1999). A fall from a vertical ladder is straight down, but a fall from an inclined ladder is to the side. Thus, the fall arrest system must be different for vertical and inclines. For a vertical ladder, a longer tether and a system that releases when leaning back is appropriate; but for an incline a short tether and a system that locks only when forced sideways is necessary.

Jim designed and successfully tested a "sideways" locking fall arrest trolley on a VLA antenna. Detailed certifying tests are planned for this fall. Following approval, the system will be installed on all VLA antennas. Deployment on VLBA antennas will be discussed during the site tech workshop in October.

As part of the fall arrest system, a hand rail has been installed around the apex of antenna 24. The rail will be installed on all VLA antennas during overhaul. A similar system is under construction in the Weld Shop for installation on VLBAPT. If approved, the rail will be installed at all VLBA antennas during maintenance visits. The light weight design does not contribute significantly to balance problems.

Jim Ruff has been invited to New Orleans this fall to present his ideas on fall arrest to the national conference of The National Safety Council.

C. Janes

FILTERING OUT THE SLIME

Slime appears in the news, but slime is something we have at the VLBA sites, too. It is in the drive gear boxes. New oil in the gear boxes is almost clear, but after a short time in use, dirty oil obscures the site and flow glasses and feels slimy in the hand (see Newsletter, January 1998 and April 1998). Although not verified to date by chemical analysis, the slime is thought to be carbon deposits.

We are not currently aware of any accelerated wear leading to the slime, but that is the concern. Shane Baca, Guy Stanzione, and John Wall installed a filter in the hydraulic line downstream of the pump for one of the azimuth gear boxes at VLBAPT to study the slime problem, but the slime passed through even a 3 micron filter. Though there have been problems with the azimuth drive bearings, they are lubricated separately, and the azimuth bearing problem is thought to be from high thrust loads, not slime (see Newsletter, October 1997). The oil in the gear boxes is circulated, by the way, to continually wet gear box components. A suction filter upstream from the hydraulic pump collects large particles. A paper filter downstream, the so-called "twist-lock" filters, are being considered.

The site glasses at VLBAFD stayed clean for four months so far after the site techs at that station cleaned their suction filters with diesel, Electrotech spray, and brushes until the plates were clear. Then they flushed the gearboxes and site glasses with clean oil for several hours, an expense of 10 gallons which was re-used for further flushing. Guy Stanzione has been studying gear box materials and talking with Sumitomo, the gear box manufacturer, to determine alternative solvents for flushing gear boxes to save oil.

At VLBA site manager Gary Tobias' suggestion, a bypass valve for the suction filter is being considered for installation at each site to simplify filter and gear box cleaning. Slime and what to do about it is a candidate topic for the Site Tech Workshop in October.

C. Janes