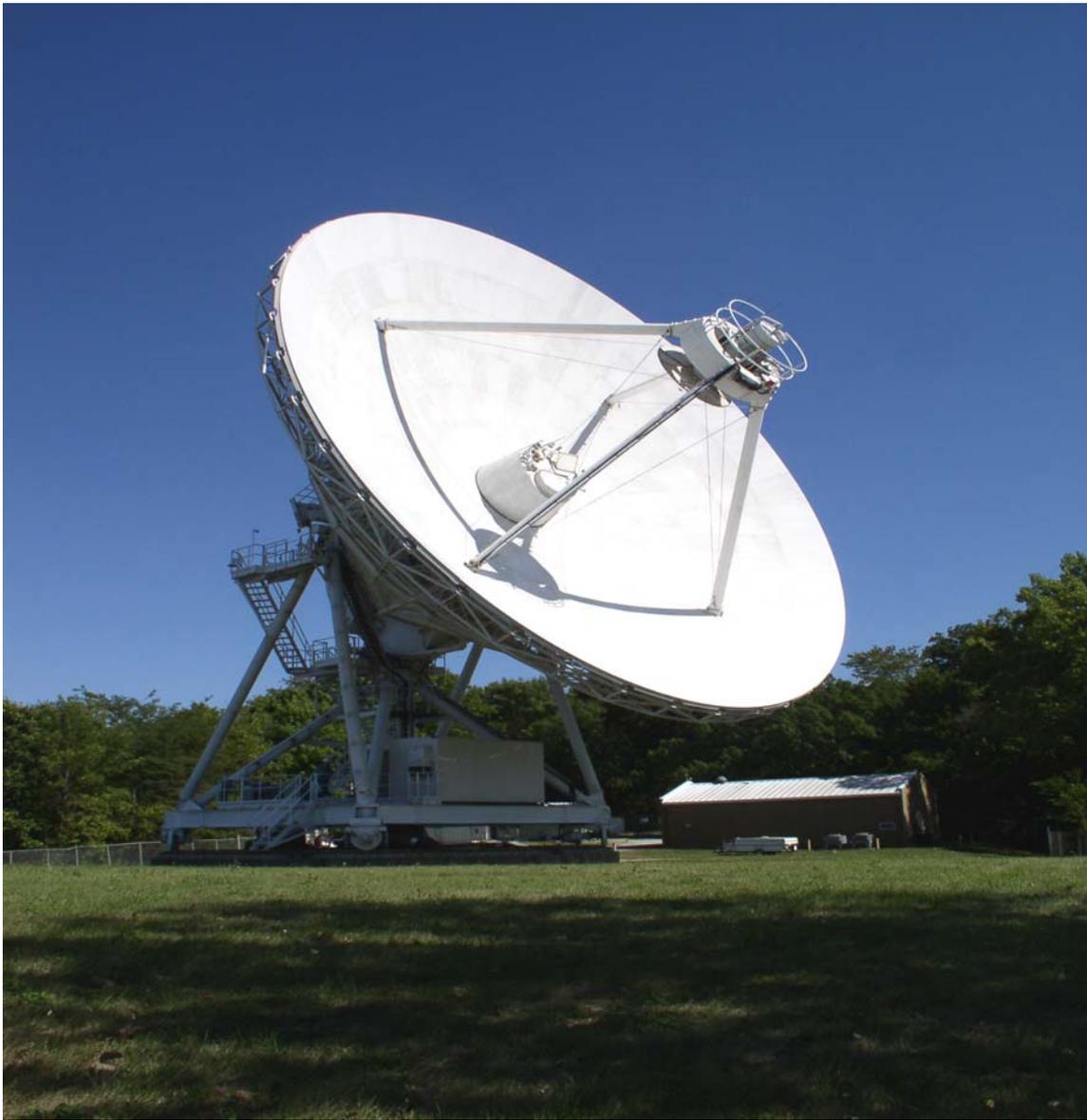


National Radio Astronomy Observatory
Socorro, New Mexico

VLBA Antenna Memo #51

North Liberty, Iowa VLBA Maintenance Visit September 10th thru 16/03.

Team members consisted of Nelson Antencio, Steve Aragon, Eric Carlowe Ramon Gutierrez and Ken Lakies. VLBA Site Technicians DJ Beard and Mike Burgert assisted in all areas of maintenance during the visit. A task list and action item list is attached.





Subreflector paint is stained but otherwise in good condition.



A new ladder and fall arrest was installed. Techs were trained on using the new fall arrest. Quad legs have a lot of surface rust.



The FRM INA bearing zirks were installed. A 2nd screw and guide rod bellows were replaced during the FRM PM. Both focus motor encoder couplings were broken. These were replaced with the new encoder coupling modification. Apex j-boxes and cables are in good condition.

FRM INA BEARING CHECK 50LBS PULL ON PRIMARY SIDE

Primary Travel:	+0.001	Secondary Side:	-0.001
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FRM INA BEARING CHECK 50LBS PULL ON SECONDARY SIDE

Primary Travel:	-0.001	Secondary Side:	+0.001
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90/50 FE cables and connectors are in good condition. Subreflector drain holes are clear. Dipole is in good condition. Apex has lots of surface rust.



Dichroic reflector needs to be replaced. Elipsoid is in good condition.



Feed cone needs spot sealed and painted. FE windows are in good condition. Insulation on top of the feed cone has been removed by the site techs. The insulation was retaining water and leaking into the vertex room.



Dish panels are in good condition. Quad legs and guys wire have surface rust. Quad leg bases should be wire brushed and painted with chem-prime.



Feed cone and vertex room. FE and rack cables are neat, orderly and secure.



Elevation #1 motor was replaced. Ken and Steve lowering the old motor.



Elevation bearing grease trays were installed. A new stow pin tray and interlock switch were installed.



Elevation #1 gearbox, 1st and 2nd stage gear inspection.



Steve measures $\sim .0015$ of wear with a feeler gauge. Elevation #1 gearbox is in good condition. Both elevation gearboxes oil was changed. Fish eyes and flow gauges were cleaned. Elevation #2 was not opened for inspection.



Azimuth #2 gearbox, 1st and 2nd stage gear inspection.



Steve measures $\sim .001$ of wear with a feeler gauge. Azimuth #2 gearbox is good condition. Both azimuth gearboxes oil was changed. Fish eyes and flow gauges were cleaned. Azimuth #1 was not opened for inspection.



AZ #2 motor was replaced. AZ# 1 rear motor bearing seal was replaced.

AZIMUTH BEARING GREASE INSPECTION

	INNER BEARING	OUTER BEARING
D1	Clean, smooth races.	Clean, a few metal flakes.
D2	Dark, with metal glitter.	Dark, with metal glitter.
I1	Clean, small hole in race.	Clean, smooth races.
I2	Clean, linear scratches on race.	Clean, smooth races.
Azimuth drive #2 wheel assembly needs to be replaced.		

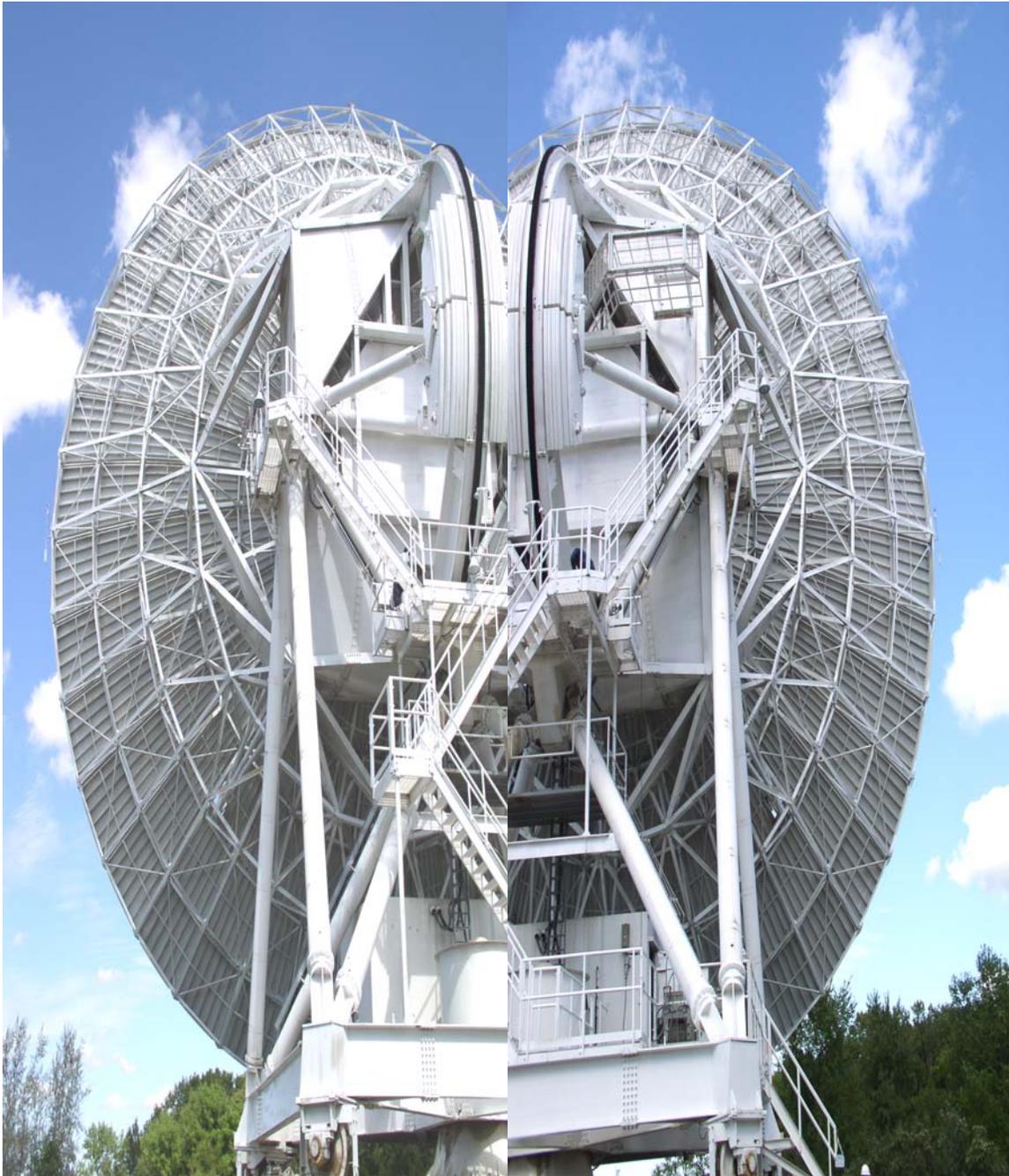


ELEVATION BEARING GREASE INSPECTION

Encoder	Good grease with no metal flakes.
Synchro	Good grease with no metal flakes.

Elevation bearings are well lubricated. Site Techs should remove grease from the encoder side bearing more frequently to keep grease out of encoder electronics. Elevation axle has no visible signs of cracks. Pintle bearing is well greased with no metal flakes.





The antenna has a lot of rust and peeling paint almost everywhere you look. This summer the Site Techs should clean up and spot paint affected areas they can safely get to with chem prime. VLBA OPS should also dump water out of the antenna before an observation as recommended by Ramon and Jon for the SCVLB antenna.



DJ and Nelson retrofitted the ACU with the new power supply upgrade.



The area inside the fence is neat and orderly.

AZIMUTH DRIVE WHEEL ALIGNMENT

	Spec.	D1	D2
Horizontal error	0d00'00" (~1'30")	1'35"	Needs replaced
Vertical error	3d26'23" (~1'30")	3d25'05"	Needs replaced
Radius error	300.002" (+/- .25)	300.21"	Needs replaced



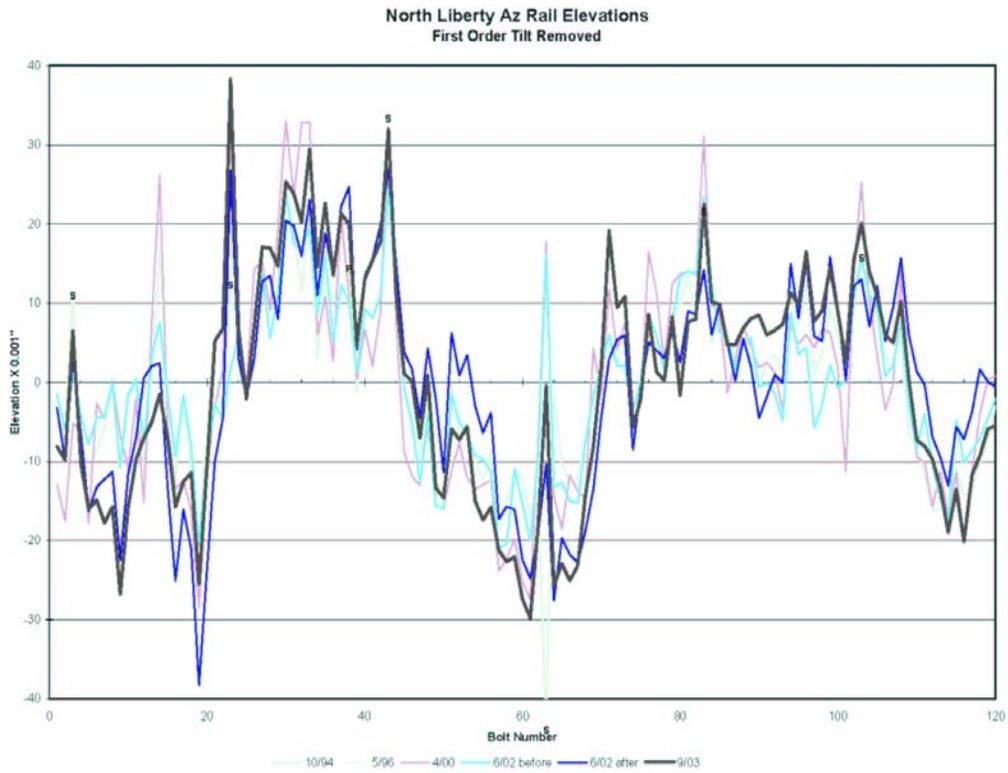
Vulchem is rapidly deteriorating from this rail splice and all the others.



Rail is in good condition. Vulchem is deteriorating off all of the rail clips.



The guy's tightening loose rail splices. All splices were loose.



ACTION ITEMS

1. REPLACE FRM X/FORMER CONTROL CABLE.
2. REPLACE AZIMUTH #2 DRIVE WHEEL ASSEMBLY.
3. REPLACE ELEVATION MOTOR #2.
4. REPLACE AZIMUTH MOTOR #1.
5. REPLACE AND ALIGN DICHROIC REFLECTOR.
6. SEAL AND PAINT FEED CONE WITH ELASTOMERIC.
7. REPLACE VERTEX ROOM DOOR.
8. COMPLETE TT SERVO TESTS.
9. REPLACE ELIPSOID ACTUATOR POWER CABLE.

A maintenance team consisting of, Steve Aragon, Ramon Gutierrez, Jon Thunborg, and Eric Carlowe returned to the NLVLBA site for 4 days in October 20-23. With the help of site techs DJ Beard and Mike Burgert the maintenance team was able to complete action items 1 thru 8. The ellipsoid actuator was also repaired. Action item 9 was completed by site tech Mike Burgert prior to the maintenance team arrival.