VLBA Antenna Memo Series No. 15

Trip Report: Wheel Changing in the Garden of Eden

Jim Ruff
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Attachment: D52502M025 - VLBA Azimuth Drive Wheel/Axle

The Tiger Team found metal in the grease from the inside bearing of Az #2 drive. A team was sent to Brewster to replace the wheel assembly. This is the first installation of the new design drive assembly.

The crew consisted of Ramon Gutierrez, Chester Moeller, Tom Frost, and Jim Ruff.

Before leaving, we had the site techs measure fit-up dimensions on the antenna. These measurements showed the wheel was not assembled to print. The distance between the gearbox hub face and the wheel was approx. 1" less than the design dimension. To make the new wheel fit, we band sawed 1.3" off the end of the gear hub and axle.

In the future, we should give the Tiger Teams a set of measurements to take on wheels needing replacement.
This will help ensure smooth sailing for the wheel change crew.

9/17
RG and CM left for Brewster pulling a trailer with the wheel and tools.

9/21
RG, CM & JR on site. Got the antenna at 11:00. We had some trouble disabling Az #1. The breaker settings that finally worked were:

Motor Armature 1	OFF
Motor Armature 2	ON
Motor 1 Elec.	OFF
Motor 1 Blower	OFF
Motor 1 Field	OFF
Az Brake	ON
Logic Power	ON
Motor 2 Elec.	ON
Motor 2 Blower	ON
Motor 2 Field	ON
Main Field Supply 1	OFF
Cab Fans	ON

Set up the Theodolite and jacked up the wheel. Mounted the wheel mirror. (Note: We should build a more convenient mirror mount!) Ran the wheel position procedure to find radius & antenna centerline. Radius determined to be 300.106".

9/22
Ran another set of position measurements. Radius was determined to be 300.106". Axle vertical slope was 3° 20' 53", compared to design of 3° 26' 23" +/- 2'. Axle horizontal error was 40".

Started wheel swap at 8:00. The new assembly was in by 10:30. Spent the rest of the day aligning coupling hubs and setting axle height and tilt angle.
Final results:

Horizontal Hub TIR:	0.004"
Vertical Hub TIR:	0.004"
Horizontal Angle error:	2' 49" *
Vertical Angle error:	0' 07" (wow!)
Wheel Radius:	300.078"

* Note: We would have had to burn off a stop block from the front pillowblock mounting plate to improve horizontal angle error. Fear of disturbing the other settings persuaded us to leave it alone.

9/23
TF arrives for servo test.
Took a final set of position measurements. Ran the antenna with the inside pillowblock loose to allow it to seat. Tightened the inside PB and brought coupling bolts up to full torque. Greased gear hub and added grease to pillowblocks. Turned the show over to Tom for servo test.
Servo test indicated an increase of 0.1 Hz in resonant frequency.
As a final check, we asked Operations to run an observe file to make sure the antenna tracks properly.

The wheel crew would like to thank Mark and Bob for their cheerful help and cooperation. I would like to personally thank them for their patience in repeating the same wheel-to-hub measurement for me 4 times!