

**GBT Systems Report on Project Coordination for November 2000**  
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Lockheed Martin fabricated and installed a new mount for the elevation encoder. The new mount is more massive than the old one; therefore, variations in encoder readings due to thermally-induced motions of the mount should be much smaller than those previously recorded. The new mount also allows for independent alignment of the encoder and the torque-tube support bearing. Lockheed Martin also installed a permanent enclosure for the mount to shield the encoder from direct sunlight.

The Kollmorgen motors that position the subreflector and prime focus receiver were repaired by the manufacturer. The motors were reinstalled on November 14.

After the bolts in the azimuth track wear strips were replaced, the wear strips moved circumferentially as the telescope was rotated in azimuth. The strips continued to move despite increasing the torque on the bolts from 550 ft-lbs to 800 ft-lbs. Lockheed Martin is consulting design engineers at Loral to determine the cause of this problem. It may be partially due to an anti-fretting compound (a rust inhibitor) that was applied between the wear strips and the azimuth track base plates. The compound may have the undesirable property of reducing the coefficient of friction between the strips and base plates.

Lockheed Martin is revising the elevation cable wrap to allow for a larger bend radius on the cables in that location. The large glycol hoses at the cable wrap have been shortened to avoid tangling with other cables. The glycol hoses have also shown premature deterioration, and they will be replaced with hoses made from an "anti-ozone" material.

Most of the month of November was dedicated to the alignment of the elevation bullgear. To ensure that the gear teeth were perpendicular to the drive pinions, the gear segments had to be aligned in the same arc, the gap between segments could not slope, and the twist of an individual gear segment had to be minimized. The gap between segments also had to be set to a tight tolerance. Once the difficult chore of aligning the bullgear was completed, Kirksite, a metal alloy of low melting point and low thermal expansion that is used similarly to grout, was installed at the joints of the gear segments to secure them in place. The Kirksite occupies the space between the alignment bolts on consecutive segments (a block that is roughly two inches high by nine inches long and five inches wide). Metal stops were welded on either end of the assembled gear to press the individual segments together. The keys between consecutive segments will also be tack-welded in place.

Although access to the tipping structure was very limited due to the alignment of the elevation bullgear, some outfitting activities on the GBT were completed in November. All twenty power supplies for the surface actuator motors were installed in the Actuator Control Room (ACR), so the outfitting of the ACR is essentially complete. IRIG and Ethernet signals were connected to the ACR, and the LVDT readings from all 2209 actuators were recorded in preparation for an

additional setting of the reflector surface. The K-band receiver was installed in the Receiver Room. The pulsar receiver that was used during the GBT dedication was removed and prime focus receiver 1 was installed in its place. Weather station 2 was installed at its permanent location on the north side of the telescope. A total of six servo warning lights were installed at the telescope; one at each azimuth truck and one on either side of the elevation bullgear. The machine shop fabricated three RFI door latches. Lockheed Martin has installed the latches on the doors of the Receiver Room, Servo Room, and ACR. An RFI enclosure for the GBT telephone PBX was fabricated in the machine shop and was installed in the Servo Room. Telephone wires are being routed to the Servo Room. The local telephone company will install the PBX in the RFI enclosure and terminate telephone wires beginning the first week of December. A transport cart for prime focus receiver 1 was also fabricated in the machine shop.

With most of the cabling in the Receiver Room complete and electrical power provided to the racks and receivers, the simulated pointing observations that were conducted in the mockup with the monitor and control software were resumed on November 10.