GBT Systems Report on Project Coordination for October 2000
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The major activity at the GBT during the month of October was the outfitting of the telescope with NRAO equipment. All electronics racks (prime focus, motor, LO, IF, and fiber interface) and the L, S, C, X, and Ku-band receivers along with their power supplies were installed in the Receiver Room. Interconnecting coaxial cables were routed between the racks and receivers. A feed pressurization manifold was also installed in the Receiver Room. MCB cables were connected to equipment in the Receiver Room so that the equipment could be monitored with M&C software. Connectors were installed and splices were made on the optical fibers that run between the Receiver Room and Servo Room. Servo racks and the servo UPS were installed in the Servo Room. Transnet power supplies were installed in the Actuator Control Room. All six sets of cryogenic lines were pressure tested, and two sets of lines were evacuated and cold-trapped. The L-band receiver was cooled down. Portions of the asphalt road leading to the GBT site warehouse were removed in preparation for the installation of a fence around the GBT.

Lockheed Martin and NRAO finalized plans for the replacement of the nine rusty bearings on the azimuth wheels. Seven of the bearings will be replaced by a Lockheed Martin subcontractor during the month of May 2001. The subcontractor, FEMCO, is a subdivision of Manitowoc and was recommended by the bearing manufacturer. NRAO determined that the two remaining bearings can still be used and will replace them at a future date if necessary. NRAO will also implement an aggressive grease inspection program to ensure that all bearings remain in good condition. Since the wheel trucks will be elevated on hydraulic jacks, the telescope cannot be moved during bearing replacement. As the bearings are removed, the bearing inner race needs to be inspected for rust and pitting because it was inaccessible during the initial inspection when the bearings were mounted on the wheels. Once the rusty bearings are removed, they will remain the property of NRAO. It is possible that some of these bearings may be reconditioned for use as spares. Four pancake jacks that will be purchased and used by FEMCO to level the telescope corner weldment during the truck jacking process will become the property of NRAO. Lockheed Martin will purchase the nine new bearings from SKF. These bearings are identical to the originals manufactured by FAG. It is possible that Lockheed Martin will construct a ramp to the azimuth track to facilitate bearing replacement.

NRAO asked Lockheed Martin to secure the azimuth track wear strips in the final punchlist for the GBT. In doing this, Lockheed Martin found that the caps or heads of the bolts which secure the wear strips to the track base plates had come off about 25 percent of the 672 bolts in the track. (There are 48 wear strips with 14 bolts in each strip). Upon further inspection, it was found that the wrong bolts had been installed in the track. The track design called for high strength, SAE grade 8 bolts, but the bolts installed in the track were low strength, SAE grade 5. All bolts will be replaced by Lockheed Martin.

During the negotiations for modified final acceptance of the GBT, Lockheed Martin agreed to investigate the implementation of a "soft-stop" for the telescope. The soft-stop is considered to

be preferable to the hard-stop test that is required by the telescope's servo acceptance procedure. After reviewing what would be required for a soft-stop, Lockheed Martin determined that is was too costly and recommended that we proceed with hard-stop testing. NRAO will implement the soft-stop in the near future.

Lockheed Martin completed its optical alignment of the subreflector, Receiver Room, and prime focus boom. The Kollmorgen motors that position the subreflector and prime focus boom were then returned to the manufacturer for repairs.

The finite element model of the GBT showed that two structural members in the box structure can become overstressed in one of the more severe design loads for the telescope (ice on the structure). Lockheed Martin proposed a modification to the members that halves the effective length of the members, and thereby increases their allowable stress by a factor of two. The proposed modification is under review.