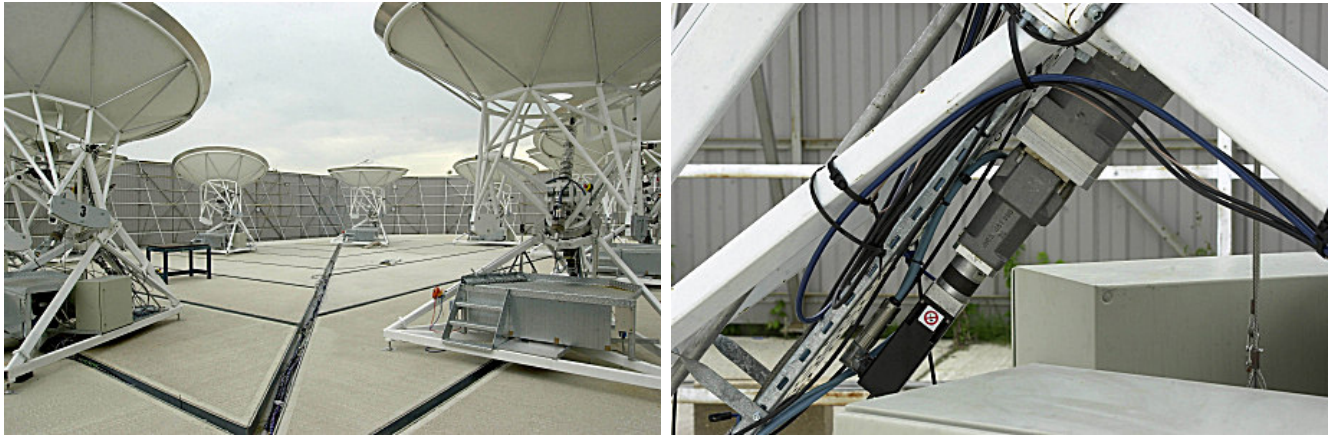


## High Ratio Gearboxes track the stars



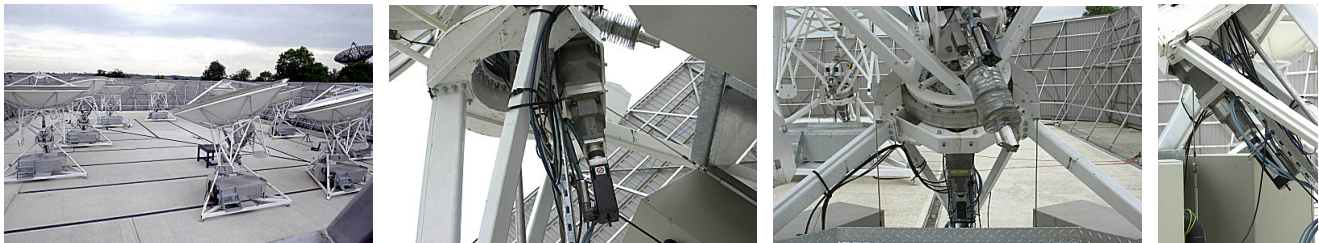
ZF's Precision Planetary Gearheads provide the high levels of torque and accuracy required for Cambridge University's radio telescope installation, designed to find signs of some of the earliest detectable galaxy clusters. The installation comprises five pairs of 4m diameter parabolic dish antennae whose movement is controlled by a high reduction ratio servomotor system. A small servo geared motor, drives 2 close coupled ZF Precision Planetary Gearheads. In conjunction with the final drive, the system achieves an overall reduction ratio of almost 100,000:1.

Cambridge University's AMI installation is a series of ten antenna dishes that enables staff and students to survey the sky searching for signs of some of the earliest galaxy clusters, which are detected as 'silhouettes' against the backdrop of the CMB. The AMI system will combine a large field of view with high sensitivity to faint objects, making it ideal for surveying the sky for the galaxy imprints and measuring the angular sizes of the objects in arcminutes rather than degree scales.

From the servo motor speed range of 70 to 3500 r/min, a slewing speed from 15 degrees per hour (for tracking) to a maximum of 12.5 degrees per minute (for positioning) was required. As well as the slow speed, the level of accuracy required from the drive system is in the order of 20 seconds of arc with an encoder resolution of 10 seconds of arc.

The use of grease as a lubricant, rather than oil, enables the gearboxes to be mounted in any orientation on the equipment and, being sealed for life, allows the antennae to operate in all weathers without the need for maintenance. Their compact size also makes them the ideal choice for the application, which was, due to the need to constantly reposition the ten antenna dishes.

The system utilizes ZF Precision Planetary Gearboxes PG 50, PG 100, PG 200, PG 500 and IMS Planetary Gearboxes PM 52.



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