Arecibo Observatory Upgrade

Customer:
Cornell University
Ithaca, New York 14853

The Arecibo Observatory telescope in Arecibo, Puerto Rico, the largest and most sensitive single dish radio telescope in the world, got a good deal more sensitive. Thanks to ADC!

In April 2004 the telescope got a new “eye on the sky” that helped turn the huge dish, operated by Cornell for the National Science Foundation, into the equivalent of a seven-pixel radio camera. The complex new addition to the Arecibo telescope was hauled 150 meters (492 feet) above the telescope’s 1,000-footdiameter (305 meters) reflector dish starting in the early morning hours. The device, the size of a washing machine, took 30 minutes to reach a platform inside the suspended Gregorian dome, where ultimately it was cooled and then connected to a fiber optic transmission system leading to ultra-high-speed digital signal processors.

ADC’s part included designing a large turntable, capable of positioning the receiver heads to within .5 mm (taking into consideration the weight budget and achieving the required velocity). ADC also designed the positioning systems for the tertiary sub-reflector and the eight new receiver heads. This project was part of a $25 million upgrade to the Arecibo facility. A Gregorian reflector system now hangs from the main detector area 137 meters (450 feet) above the main reflector dish. The Gregorian dome contains two reflector dishes, a radar transmitter, and microwave receivers. The secondary and tertiary reflectors channel the signal from the main reflector into the receivers.