

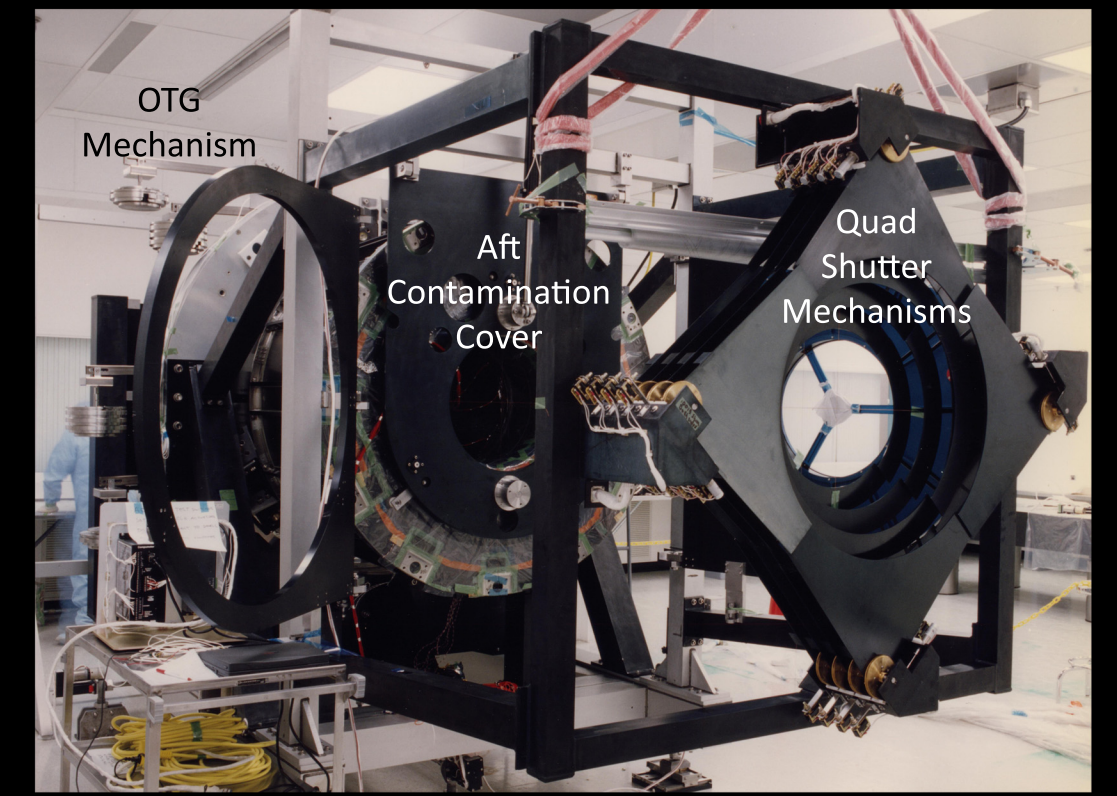
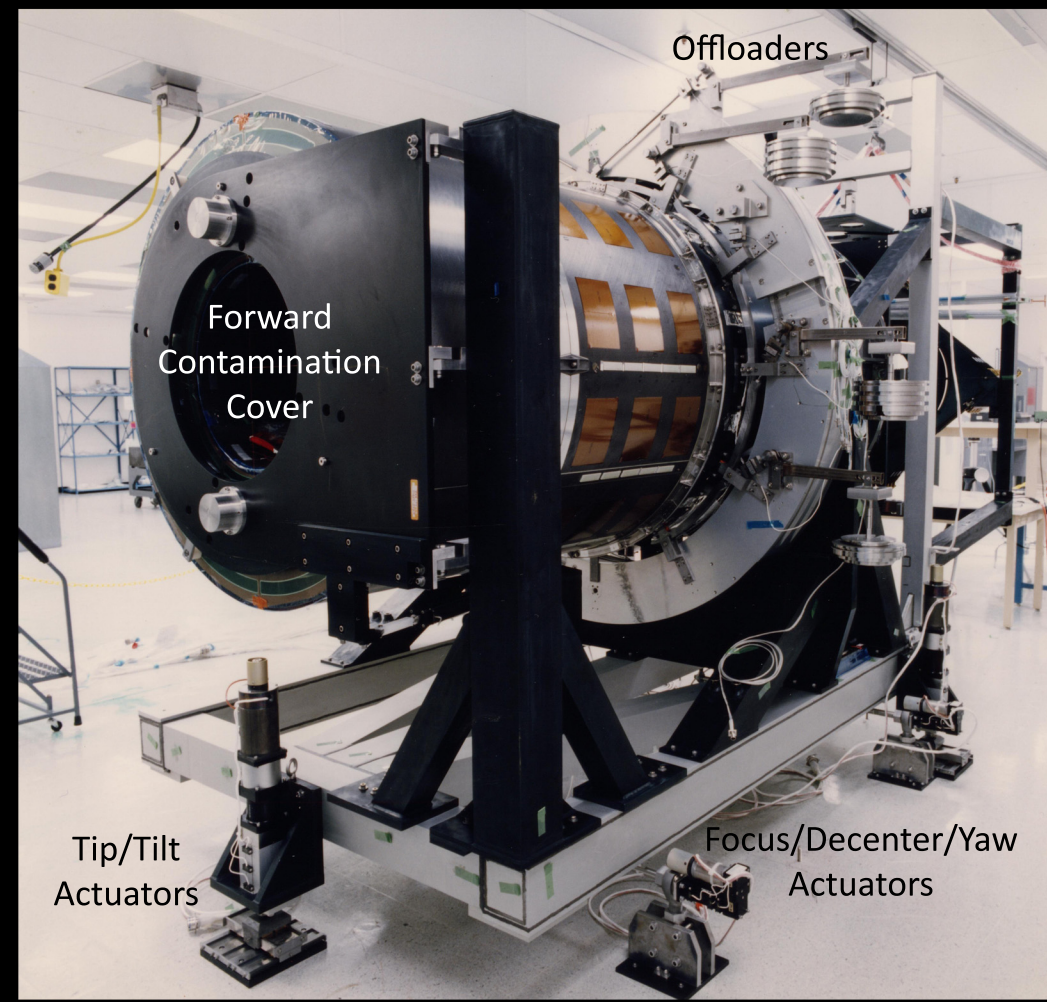
High Resolution Mirror Assembly (HRMA) X-ray Testing

Gary Matthews (ITT), Kathy Rapp (ITT), Tom Scorse (ITT), Scott Texter (NGAS), Jon Arenberg (NGAS), Roger Carlson (SpaceX)

Marshall Space Flight Center (MSFC) X-ray Calibration Facility with its 520m X-ray Tube



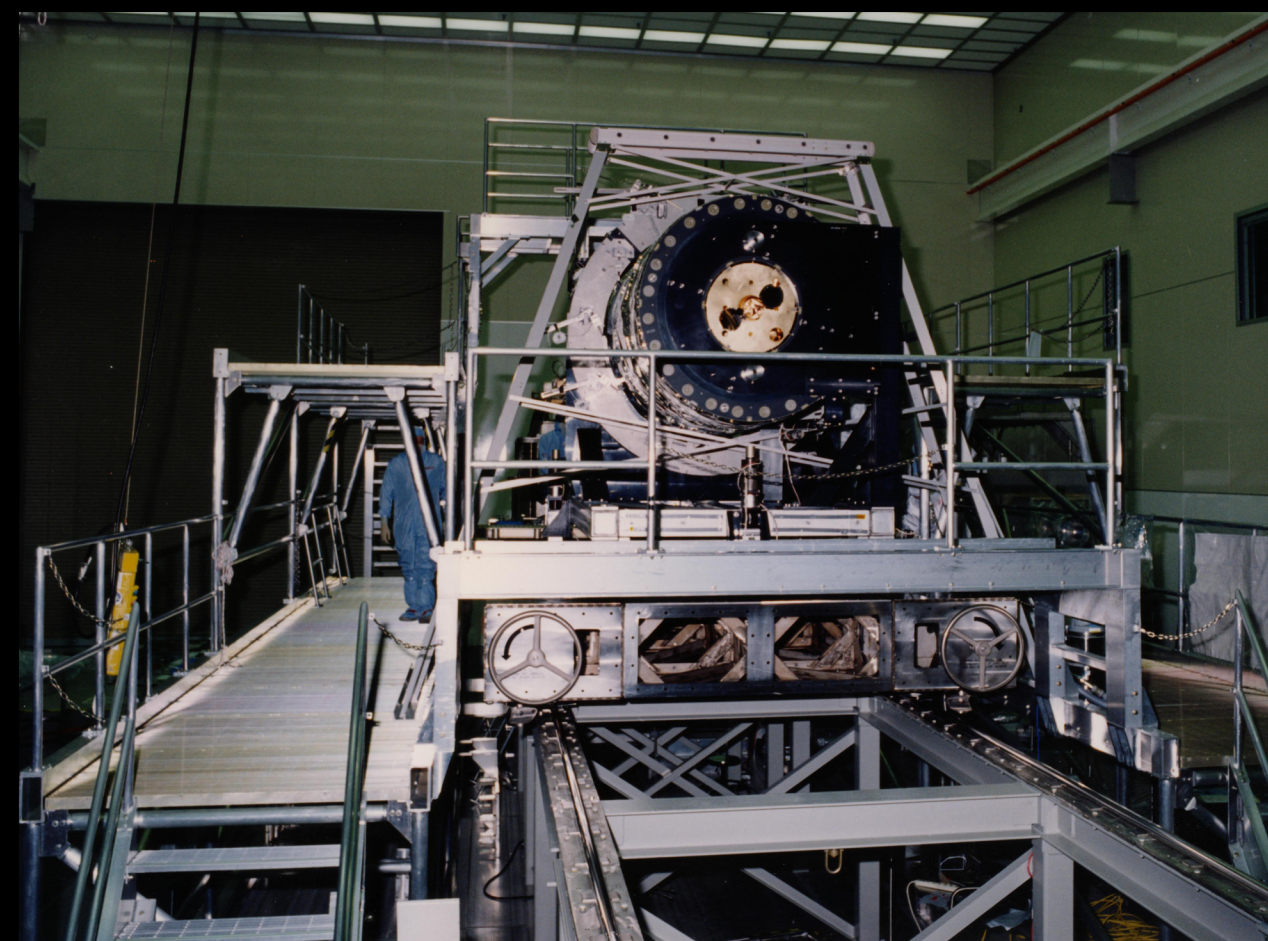
HRMA Simulator on XRCF Test Stand



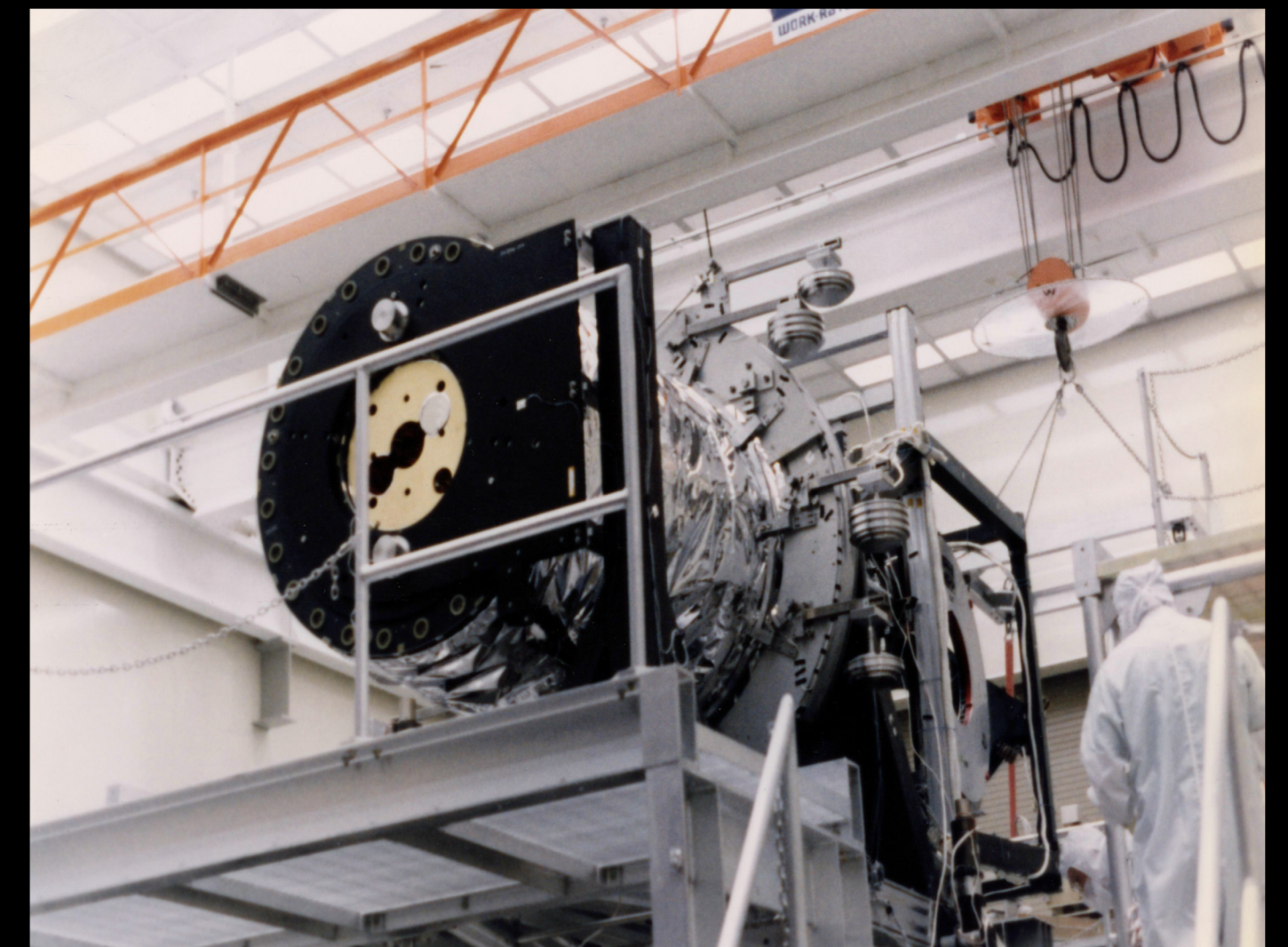
HRMA Offloaders being positioned prior to test



HRMA at X-ray Calibration Facility (XRCF) on Test Rails



HRMA at XRCF on Test Rails

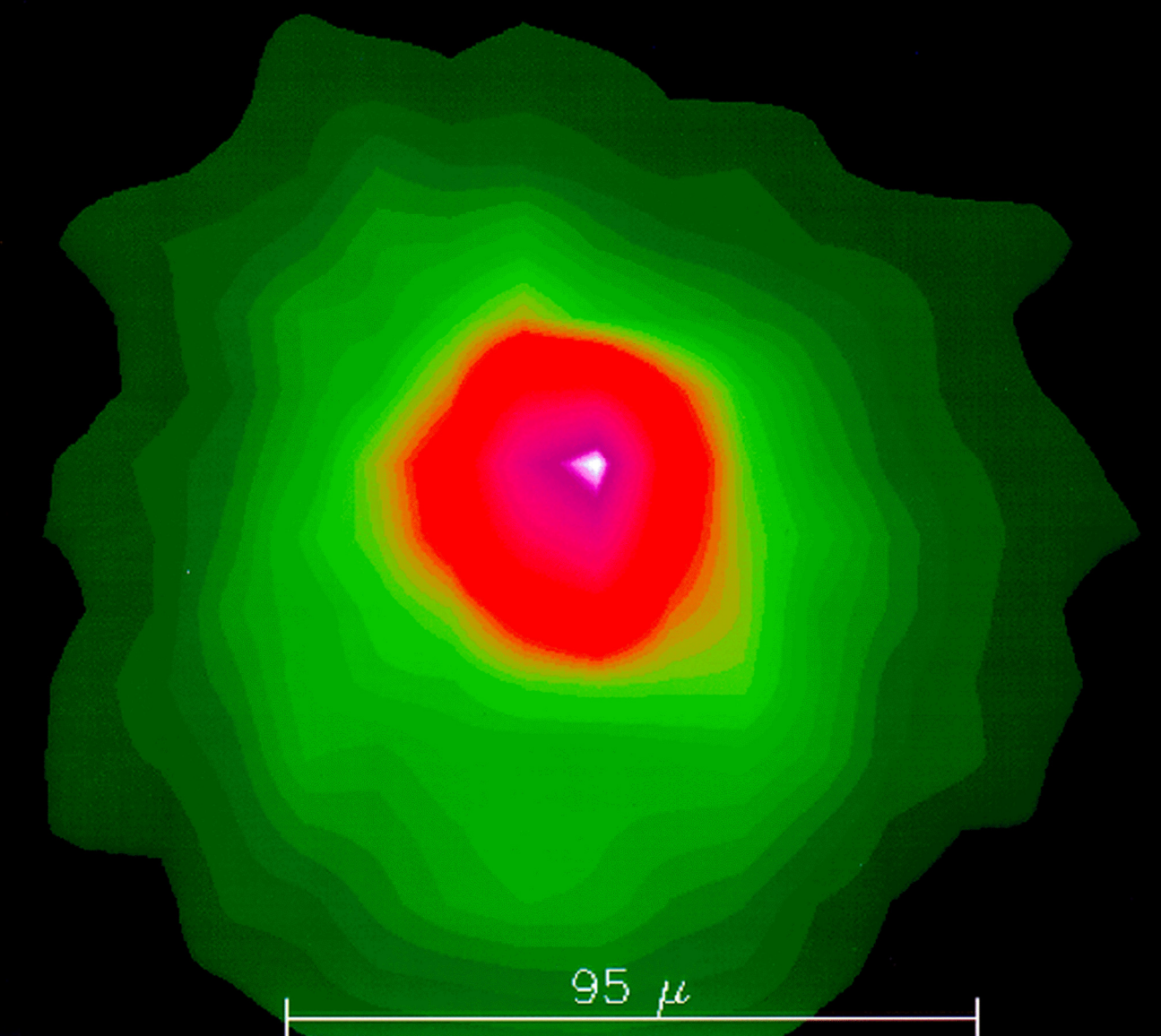


Flying Assembly Personnel
"Whatever it takes"

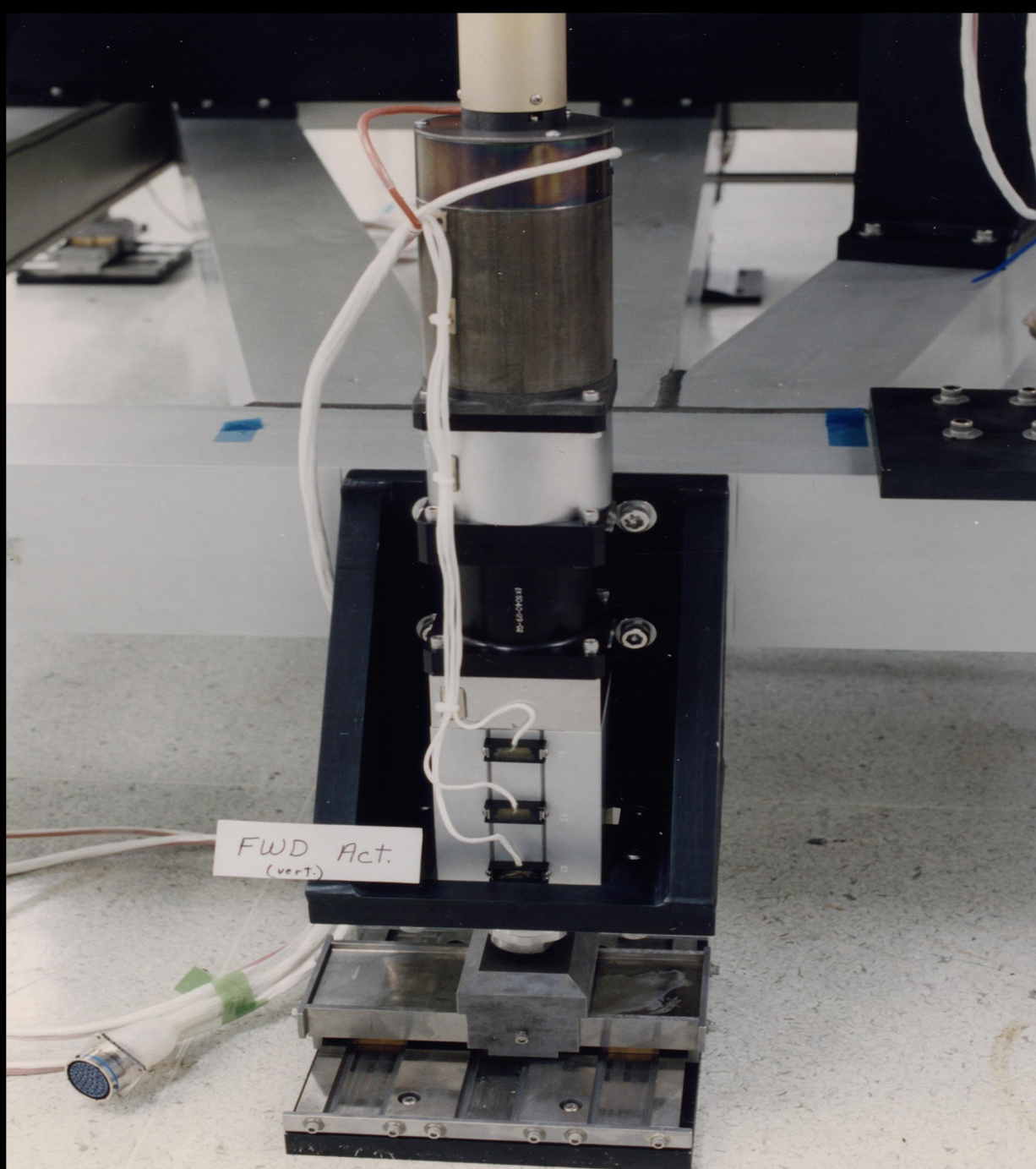


Testing Verified Excellent Optical Performance from the High Resolution Mirror Assembly.
Much better than 1 arcsec Performance Requirement

HRMA Full Raw Image
Almost all counts within 100 microns (2 arcsec)



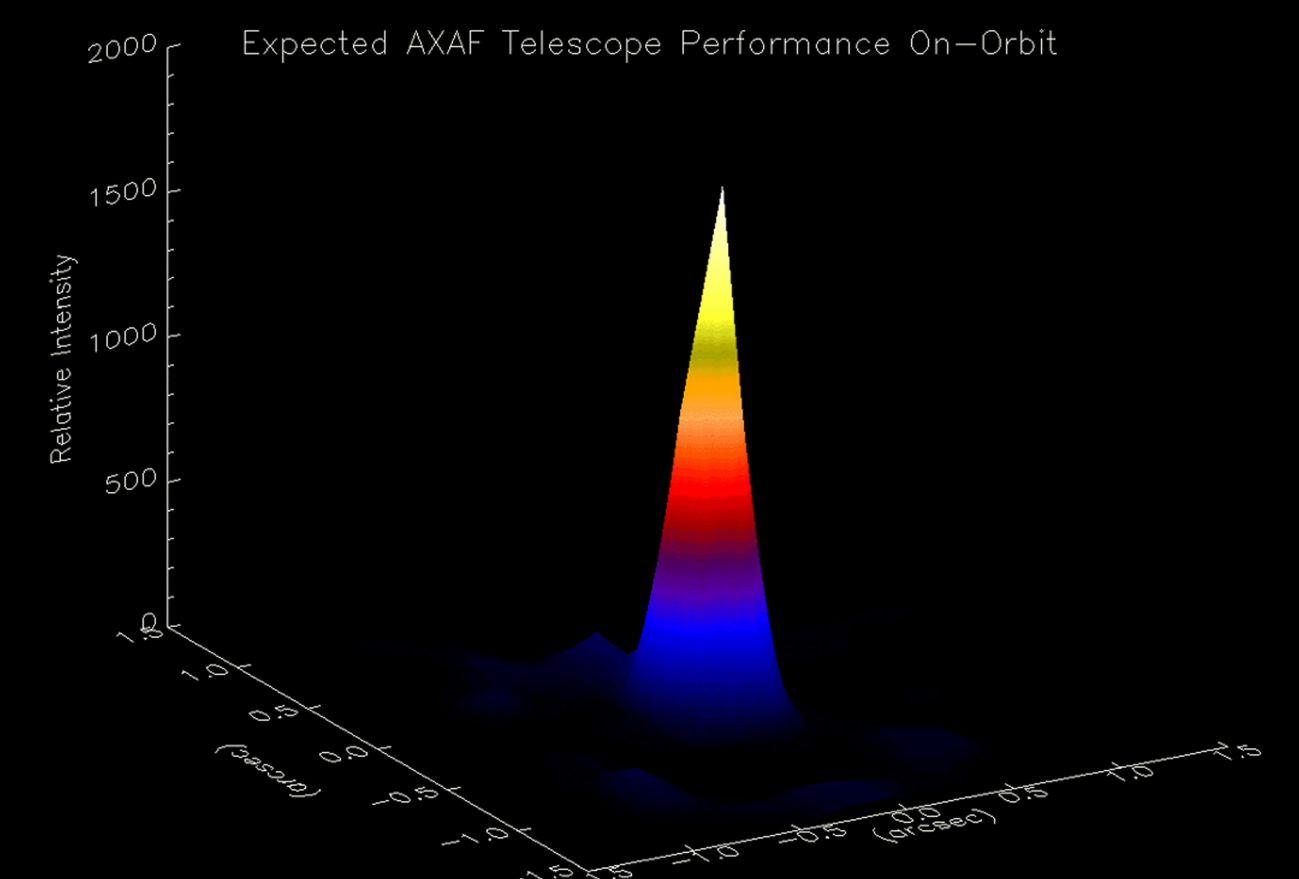
Vertical HRMA Alignment Actuator



Offloaders during assembly



70% Intensity within 1 arcsec



Actuators failed due to high loads and vacuum bakeout of lubrication.
System repaired with rebuilt actuators and new offloading system.