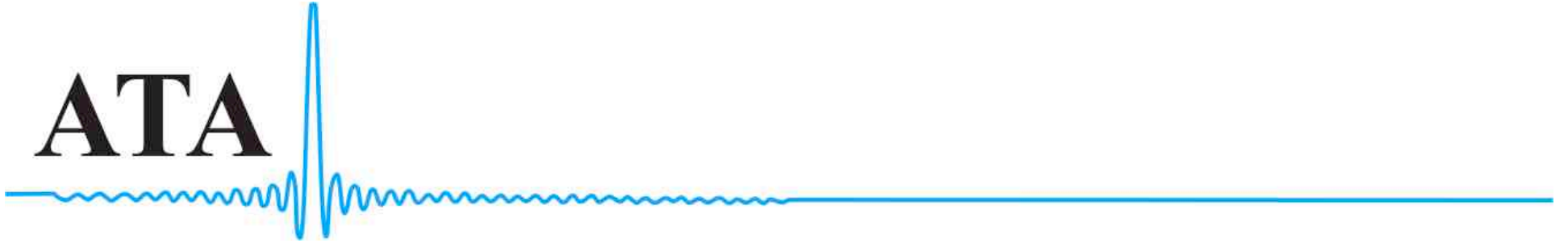


ATA



ATA's Nanoradian-Class Rotational Sensors

10 November 2009



ATA

ATA Overview



- Founded 1975 A-TECH Corporation, d.b.a. Applied Technology Associates
- Customers Include USAF, Sandia NL, US Army, MDA, NASA, US Navy, and Aerospace and Defense Companies
- Approximately 250 Employees

- Awards and Distinctions

- 2008 Minority Manufacturer of the Year
- 2004 SBA National Prime Contractor of the Year
- 2005 NM Innovator of the Year
- USAF Small Business R&D Awards
- SBA Administrator's Award
- Multiple Patented Technologies

- Operating Sites in New Mexico

- ATA 1300 Britt Street, Albuquerque, NM Headquarters
- Kirtland AFB – AFRL and Big Crow Support Sites
- North Oscura Peak, WSMR AFRL Laser Test Facility
- Las Cruces, NM WSMR Support Site

ATA is an Established Technology Company with a Proven Track Record

ATA

ATA Overview Cont'd

LOCKHEED MARTIN
MISSILES & SPACE CO.



Raytheon

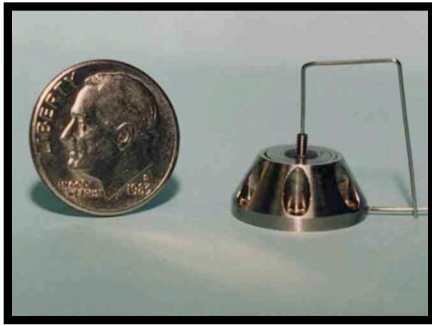


- ISO-9001 Certified
- Class 10,000 Clean Room
- Approved Vendor
 - Ball Aerospace
 - Lockheed Martin
 - Boeing
 - Raytheon
- Produced Space Qualified Hardware
 - Lockheed Martin
 - Boeing
 - Raytheon
 - Sandia National Laboratories

ATA

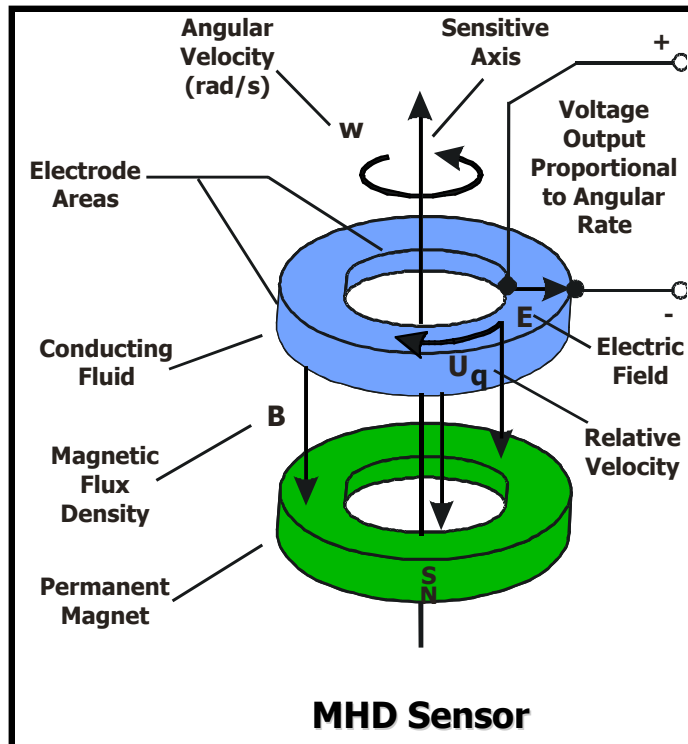
Overview

- ATA has a history of inventing sensors in response to customer requests or internally identified needs



ATA

MHD ARS Sensing Concept



High Performance

High Bandwidth: $> 1,000$ Hz

Low Noise Floor: < 100 nrad NEA (1-1kHz)

High Dynamic Range: > 100 dB

Low Cross-Axis Sensitivity

Simple Design

Small Size: 1.0 x 1.0 x 1.3"

Low Weight: 100 grams

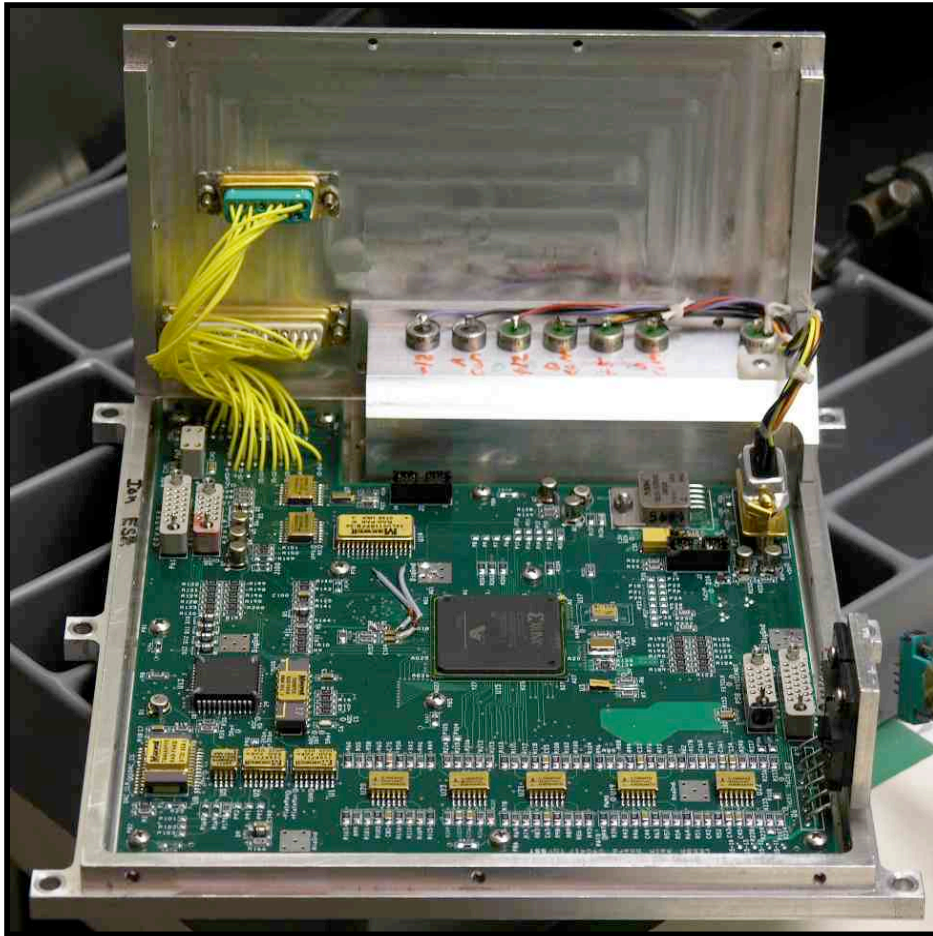
Low Power: < 0.3 Watts

Rugged Design: $> 1,000$ g

- The MHD concept resulted from an Air Force request for alternate angular sensing techniques

ATA

Augmenting Sensors with Other Technologies

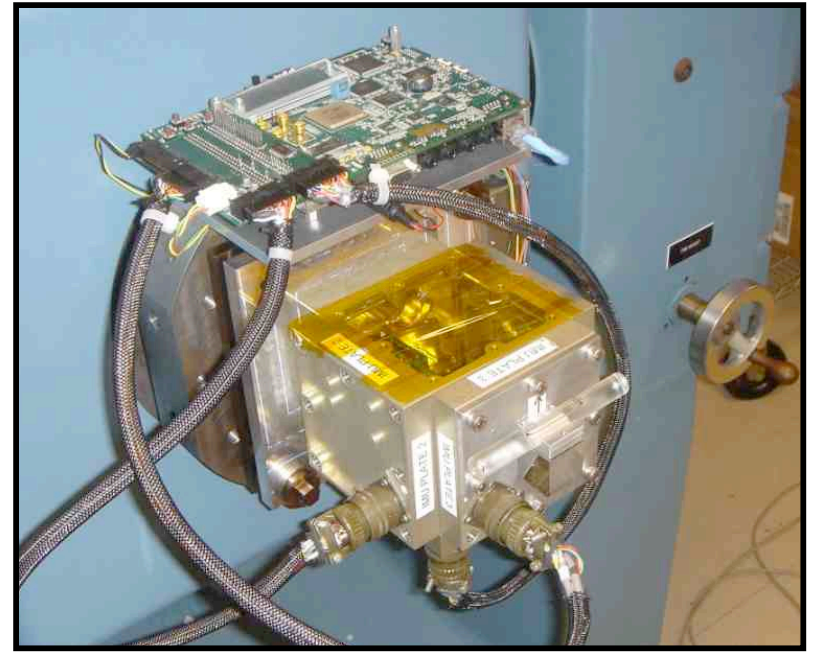
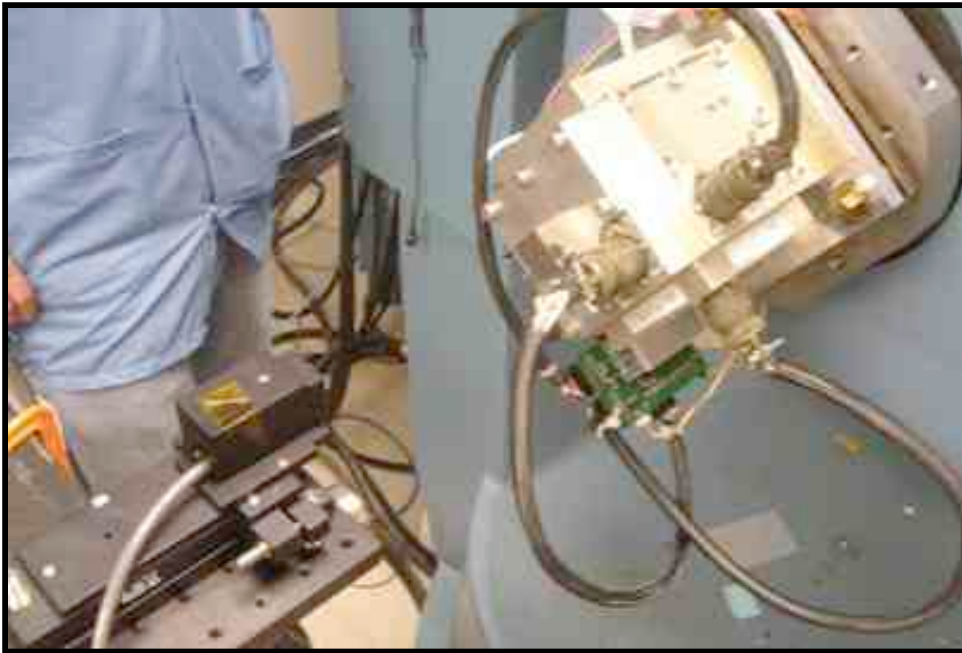


- Radiation-tolerant design (100Krad environment)
- ATA designed and implemented FPGA processing architecture, collaborated in board design

ATA

Microradian-Class Testing

- ATA has developed test facilities and techniques suitable for a range of motion profiles



ATA

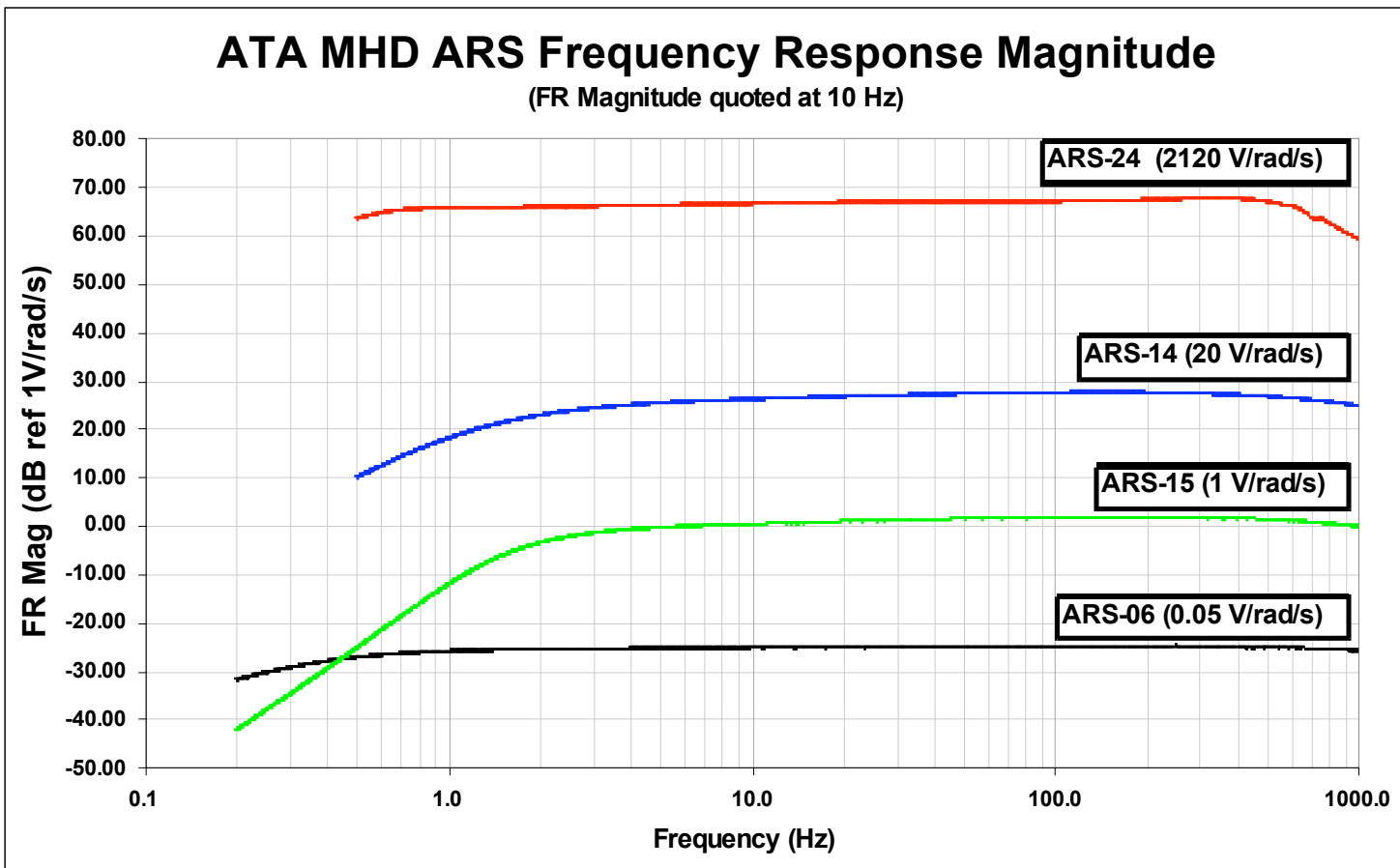
ARS Specifications



Model	ARS-06	ARS-15	ARS-14	ARS-24
Range	± 200 rad/s	± 10 rad/s	± 0.5 rad/s	± 0.005 rad/s
Scale Factor	50mv/rad/s	1 V/rad/s	20 V/rad/s	2120 V/rad/s
-3dB Bandwidth	0.4 - 1kHz	4 - 1kHz	1 - 1 kHz	1 - 675 Hz
Rate Noise, 1-1kHz	4.7 mrad/s	27 μ rad/s	5 μ rad/s	1 μ rad/s
Displ. Noise, 1-1kHz	50 μ rad	0.8 μ rad	50 nrad	8 nrad
Dimensions (inches)	0.7 x 1	0.8 x 0.8 x 1.2	1 x 1.3 x 2.9	2 x 2 x 4
Mass (grams)	35	60	200	2000

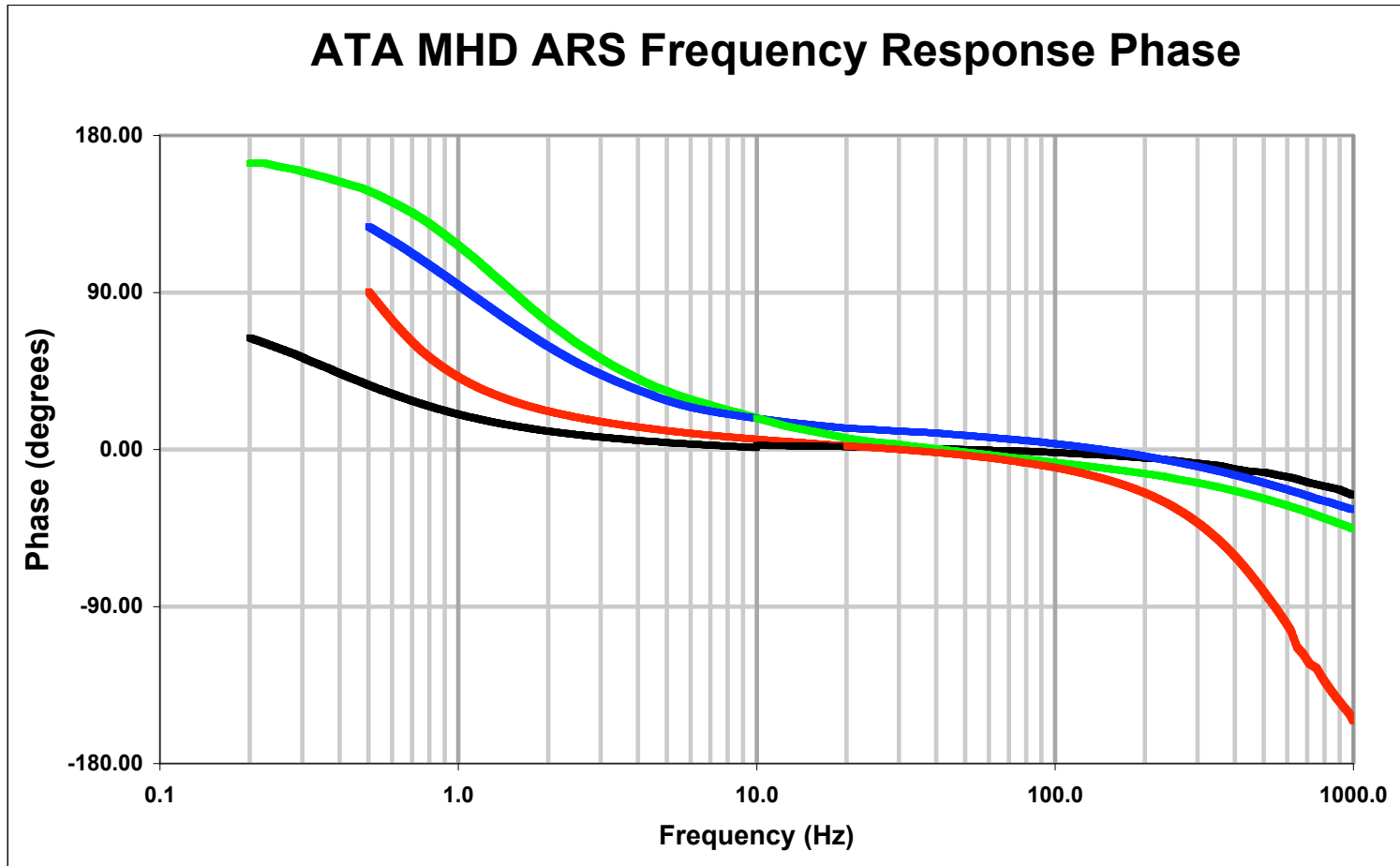
ATA

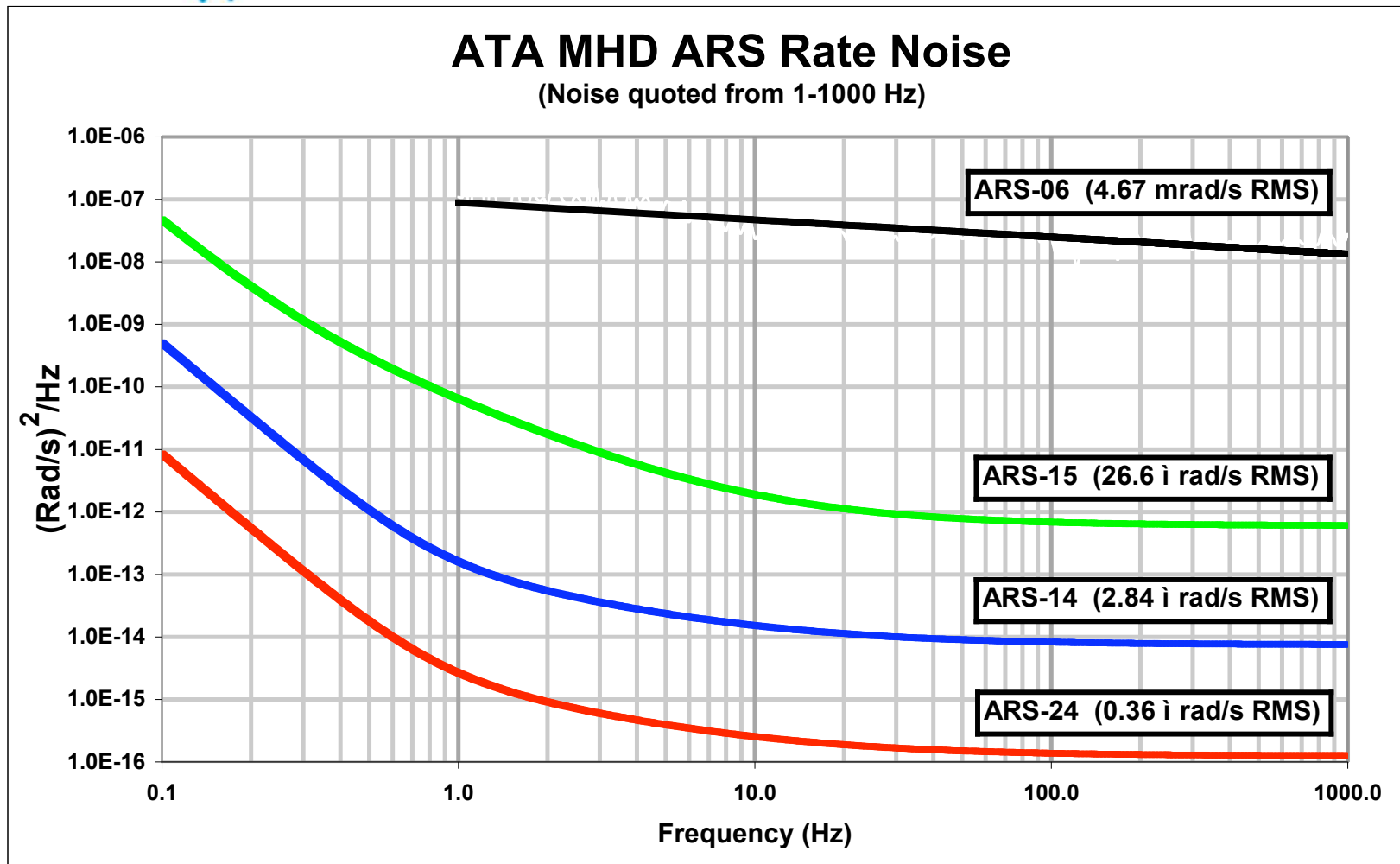
Frequency Response Magnitude



ATA

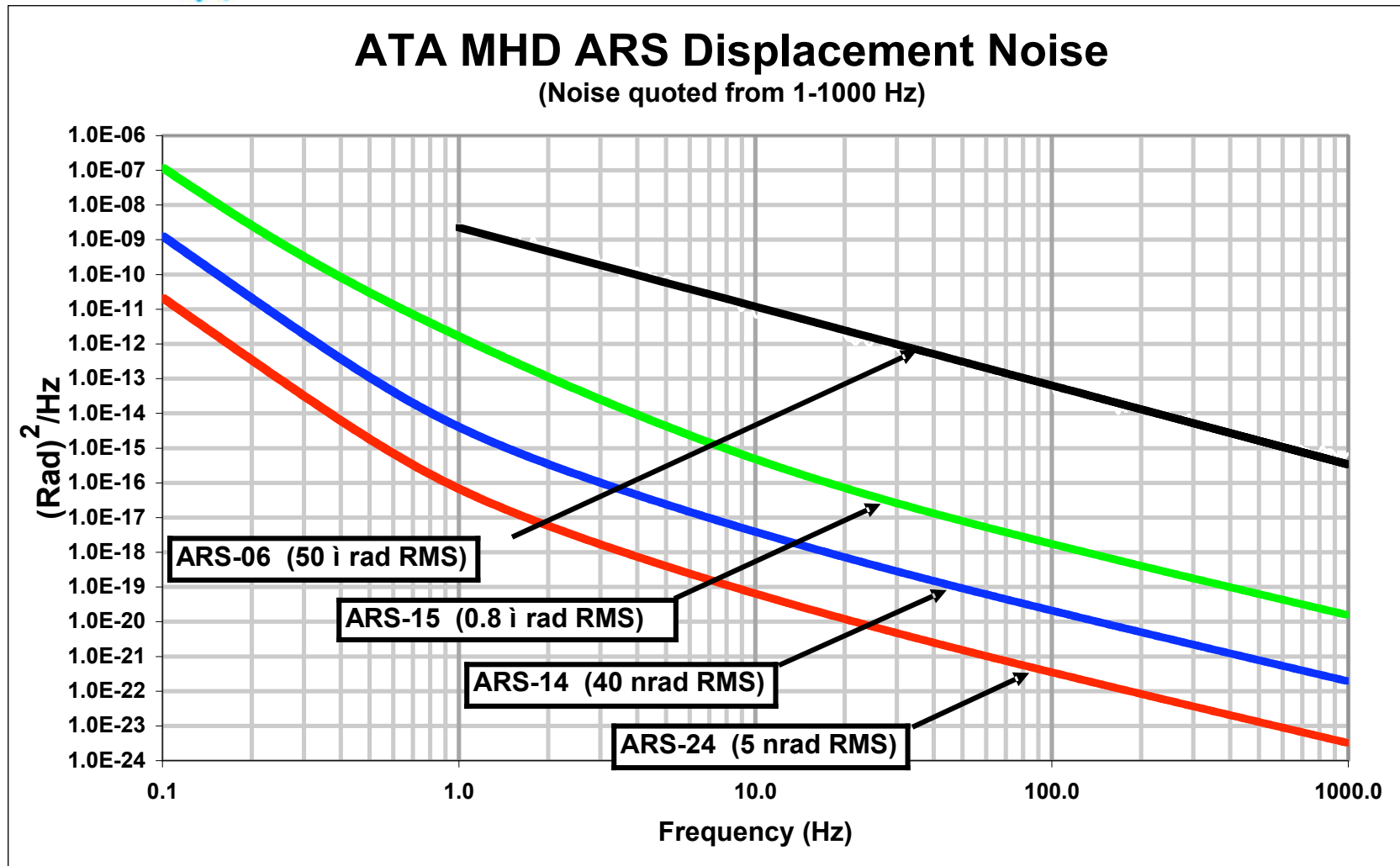
Frequency Response Phase





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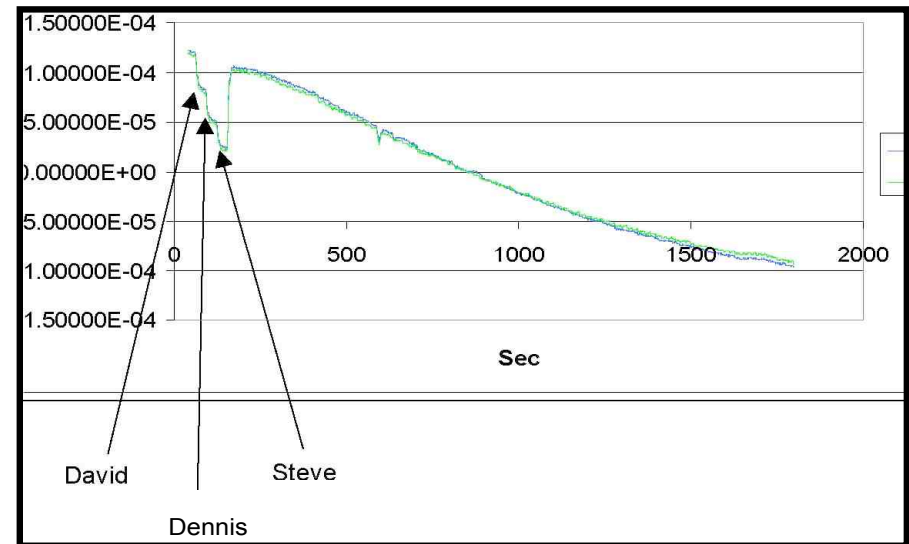
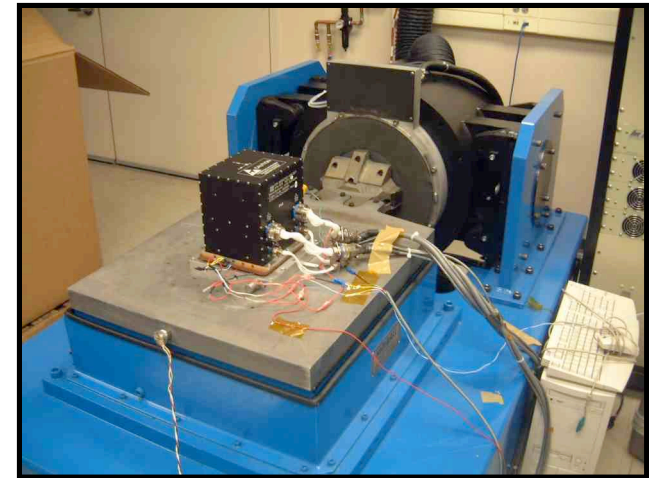
Displacement Noise



ATA

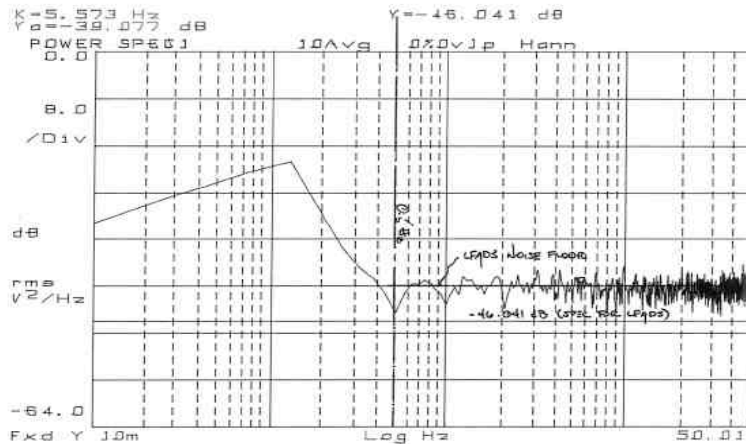
0.1 μG Accelerometer

- These radiation hardened DC accelerometer units can measure microradian-level tilts in the presence of strong background acceleration (0.25g rms +).

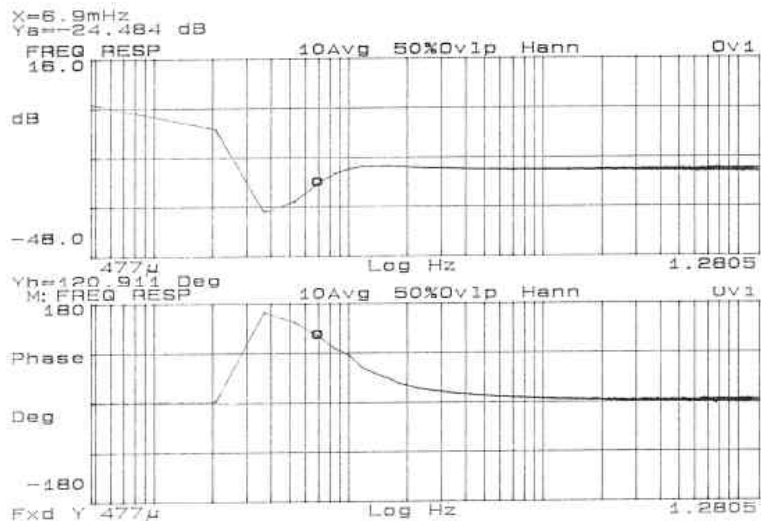


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Seismically Stable Platform Tilt Sensor (1990)



Noise
-174 dB rad



Corner
6.9 mHz



ATA

Northfinder

- Current effort underway to develop a 1 mrad Northfinder
- Based on modulating earth rate onto the ARS-14 by rotating a horizontal sensor in the earth's rotation field

