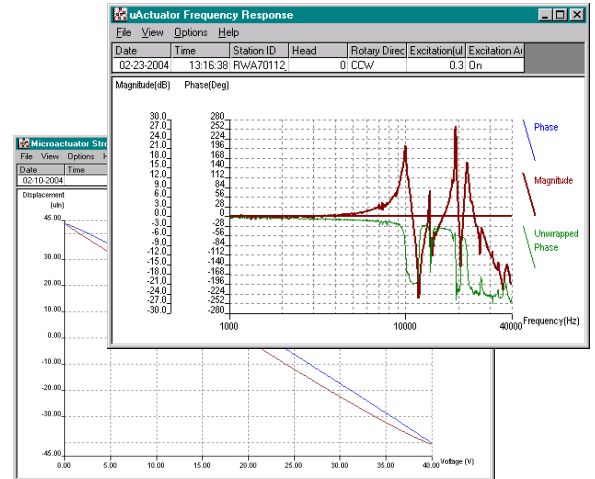


Micro Actuator Tests For Guzik V2002 Spinstands

- **Stroke Test**
- **Frequency Response Test**
- **Servo Loop with Bandwidth 2-3 kHz**



Micro Actuator is a device located on the suspension of a magnetic head that can transform applied voltage to radial displacement of the head.

Hardware and Software Requirements:

- Guzik RWA-2000 series with Servo Revision 3 or 4
- Guzik V2002 spinstand with Micro-Actuator Kit installed
- Guzik V2002 spinstand with Servo Controller 5 (P/N 330890) and Servo Driver 5 (P/N 330880) for Servo Loop
- WITE32 version 4.00 or later is recommended
- Micro-Actuator test license

Micro Actuator Stroke Test

Micro Actuator Stroke test shows the dependency of a head radial displacement in respect to the voltage applied to a Micro Actuator. The Micro Actuator Stroke Test sweeps a Micro Actuator voltage in forward and backward directions and measures the displacement, which allows observing the Micro Actuator range and the hysteresis.

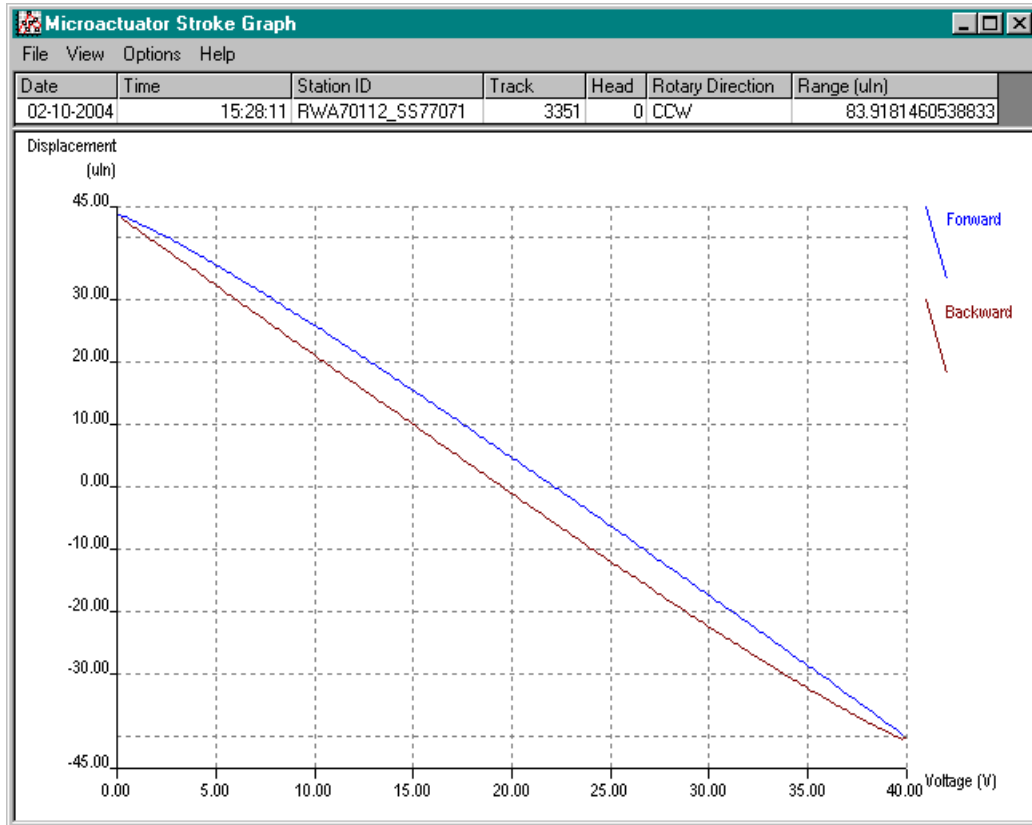


Figure 1: Example of Micro Actuator Stroke Plot

Micro Actuator Frequency Response Test

Micro Actuator Frequency Response test measures the mechanical frequency response of a Micro Actuator. It applies the sinusoidal excitation to a Micro Actuator and measures the response using the servo feedback. The frequency of the sinusoidal excitation is swept in the user specified range. The Micro Actuator Frequency Response test displays the result in the form of the Bode plot.

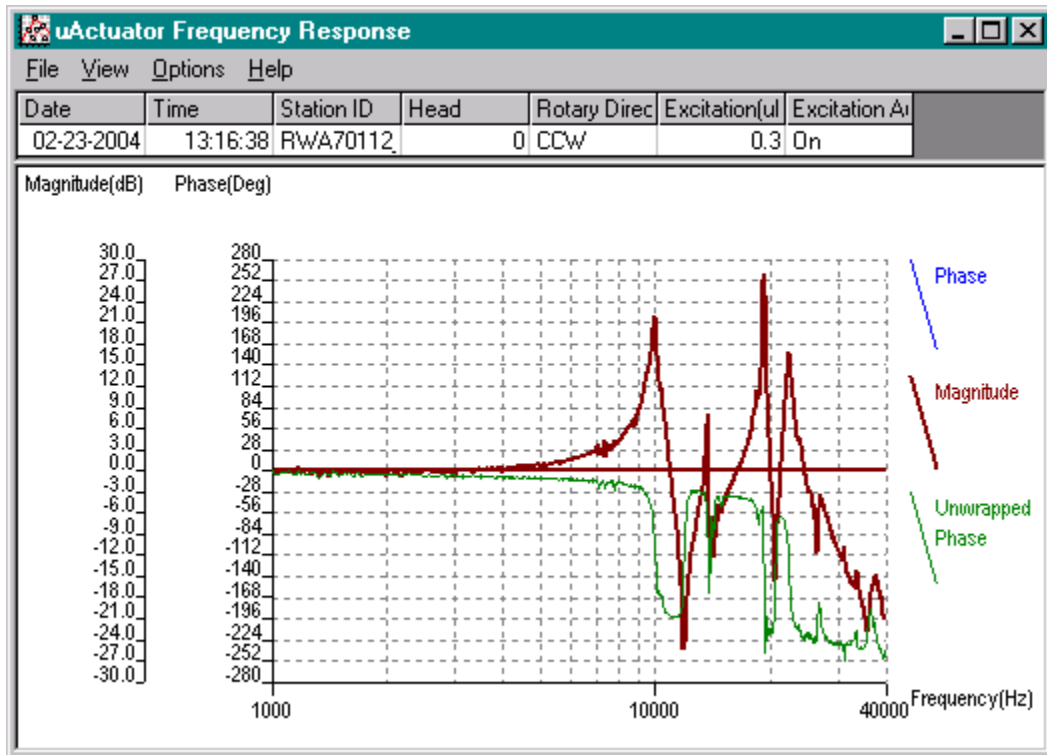


Figure 2: Example of Micro Actuator Frequency Response Plot

Micro Actuator Servo Loop

The Micro-Actuator piezo can be used for servo positioning of a head. The typical servo bandwidth, when using the Micro-Actuator, is in the range of 2–3 kHz. This allows for non-repeatable run-out reduction and improvement of the test results. Figures 3 and 4 compare positioning performance for the following cases:

1. Head positioning is performed in non-servo mode
2. Head positioning is performed in standard servo mode, the main piezo-actuator of V2002 spindastand is used.
3. Head positioning is performed in high-bandwidth servo mode, the micro-actuator piezo on suspension is used.

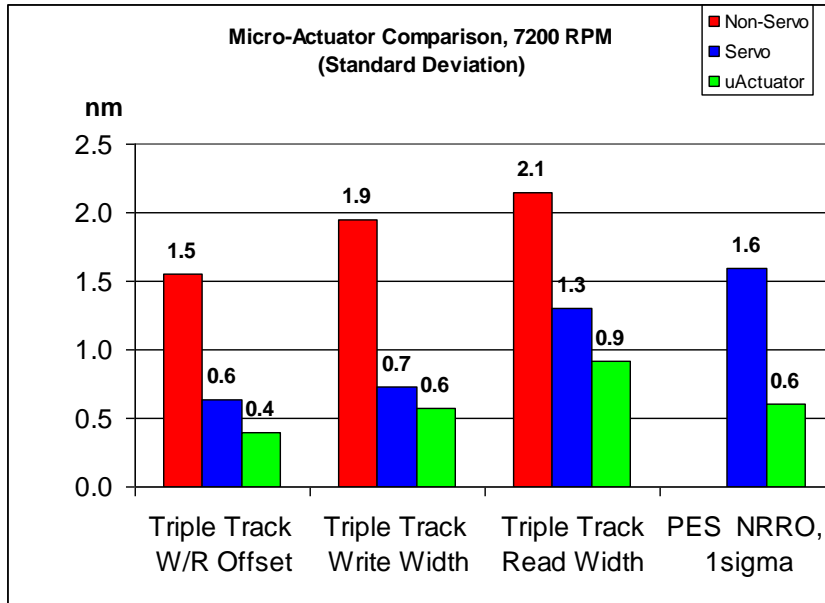


Figure 3: Position Error Reduction and Triple Track Results Improvement (Measurement Conditions: 20 Runs of The Same Head)

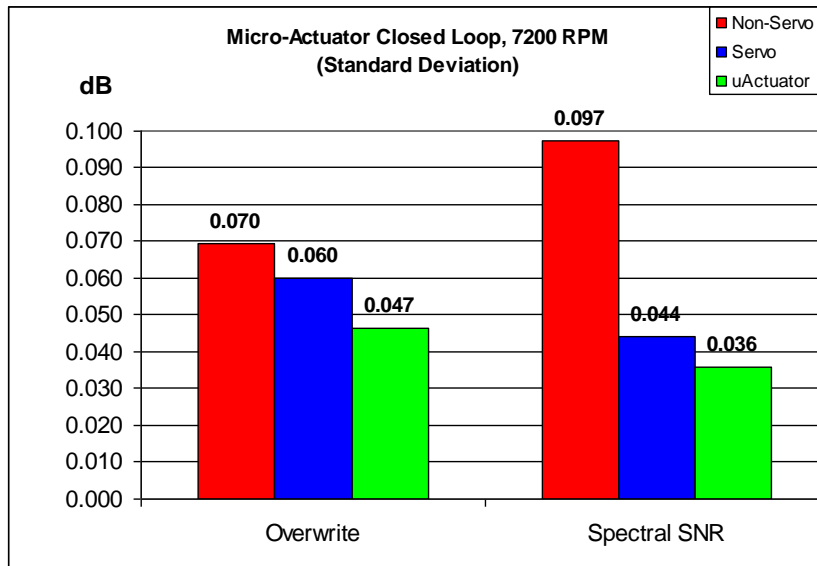


Figure 4: Overwrite and SNR Results Improvement (Measurement Conditions: 20 runs of the same head)