MODS Front AGW Focus Data Sheet

General Description
The MODS Front AGW Focus mechanism is required to maintain focus on the guide camera as the Front AGW X-Y stage scans guide pickoff mirror across the spherical MODS focal surface. The MODS focal surface has a “sag” of 19.5mm when the pickoff prism is placed at the extreme corner of the off-axis guide field.

Rendering of Front AGW Focus Asm.
**Drive Motor**

Motor Type: Size 17 Step motor, 200 steps per revolution, double ended shaft  
Part #: Applied Motion # HT17-075-D  
Rated Current: 1.7 amps/phase parallel (RMS)  
Rated Holding Torque: 62 in*oz  
Rated Torque at operating Speed: 35 in*oz @ 70 volts

Motor Connections

A Orange & Black/Wht (pin13)  
A Orange/Wht & Black (pin12)  
B Yellow & Red/Wht (pin10)  
B Red & Yellow/Wht (pin11)

**Motor Controller Specifications**

Manufacturer & Model: IMS MicroLYNX 7 (#MX-CS100-701)  
Rated Current: 5amps RMS/phase, 7 amps peak/phase  
Rated Voltage: 24 to 75 VDC  
Daughterboards: None

**Motor Controller Settings**

MSEL = 10  
MUNIT = 2000  
MAC = 50  
MRC = 34  
MHC = 0  
ACLT=1  
ACCL=DECL = 50  
LDECL = 500  

Overtravel at Limit = ScrewPitch * VM^2/(2*LDECL) = 0.05mm (pitch =2mm and VM=5  

Beware overtravel when seeking limits, must not decelerate hard into limits  
Maximum Permitted Overtravel ~ 0.5mm ~ 0.020"

VM= 5 running speed (rev/sec)  
VM= 0.5 Homing speed to assert limits

**Motor Controller I/O Connections**

Vpull: not used  
GND: 24 volt Gnd  
I/O 21: CW LIMIT sensor (CW shaft rotation as viewed from motor front)  
I/O 22: CCW LIMIT sensor  
I/O 23: not used  
I/O 24: not used  
I/O 25: not used  
I/O 26: not used

**Input Sensors**

Model: P&F # NJ0.8-5GM25-E  
5mm Inductive proximity sensor, Normally Open Sinking output (Type E0), 24 VDC supply  
Used for CW Limit, CCW limit
Output Devices
None

Drive Mechanics
The Front AGW Focus mechanism uses a THK Model KR2602A+150L0-0000 linear actuator with a 2mm pitch ballscrew. This screw is directly coupled to the 200 fullstep/rev motor described above.

Position Datum       Away from motor end of actuator   (CCW End of Travel)
Range of Motion      ~65mm    (19.5mm required for “focus compensation” plus an offset)
Axis Resolution      10 microns per motor fullstep = (2mm)*(1/200)

Performance
Maximum Travel Time   3 seconds    (30mm* 1rev/2mm * 1sec/5revs)
Position Repeatability ?? micron error
Position Hysteresis   ?? micron

Software Notes
The position of the Front AGW focus stage must be computed based on the X-Y position of the stage and and focus offset value.
The radius of curvature of the LBT Gregorian focal surface is 1040mm