16 Typical Sample Test Data – ARW & In Run Bias

Please find below typical 200Hz sample test data for Noise and In-Run Bias from a production LandMark™ 30 IMU "LN Series" for user reference. The sample data depicted below is for a unit that contains standard rate range (350°/sec) gyros and low linear range (10g) accelerometers, so the user should be aware that lower or higher rate and accelerometer range units will have corresponding both lower or higher ARW Noise and peak-to-peak noise in their respective in-run charts. The charts are in run bias plots for the X, Y and Z channel gyros and accelerometers for SN150. The data was taken for 5 minutes after a 5 minute warm-up period at ambient temperature. The test conditions should be similar to what a user should likely have during initial setup. If the user is not obtaining laboratory test data similar to the data plots and charts below please contact the factory for consultation and assistance.

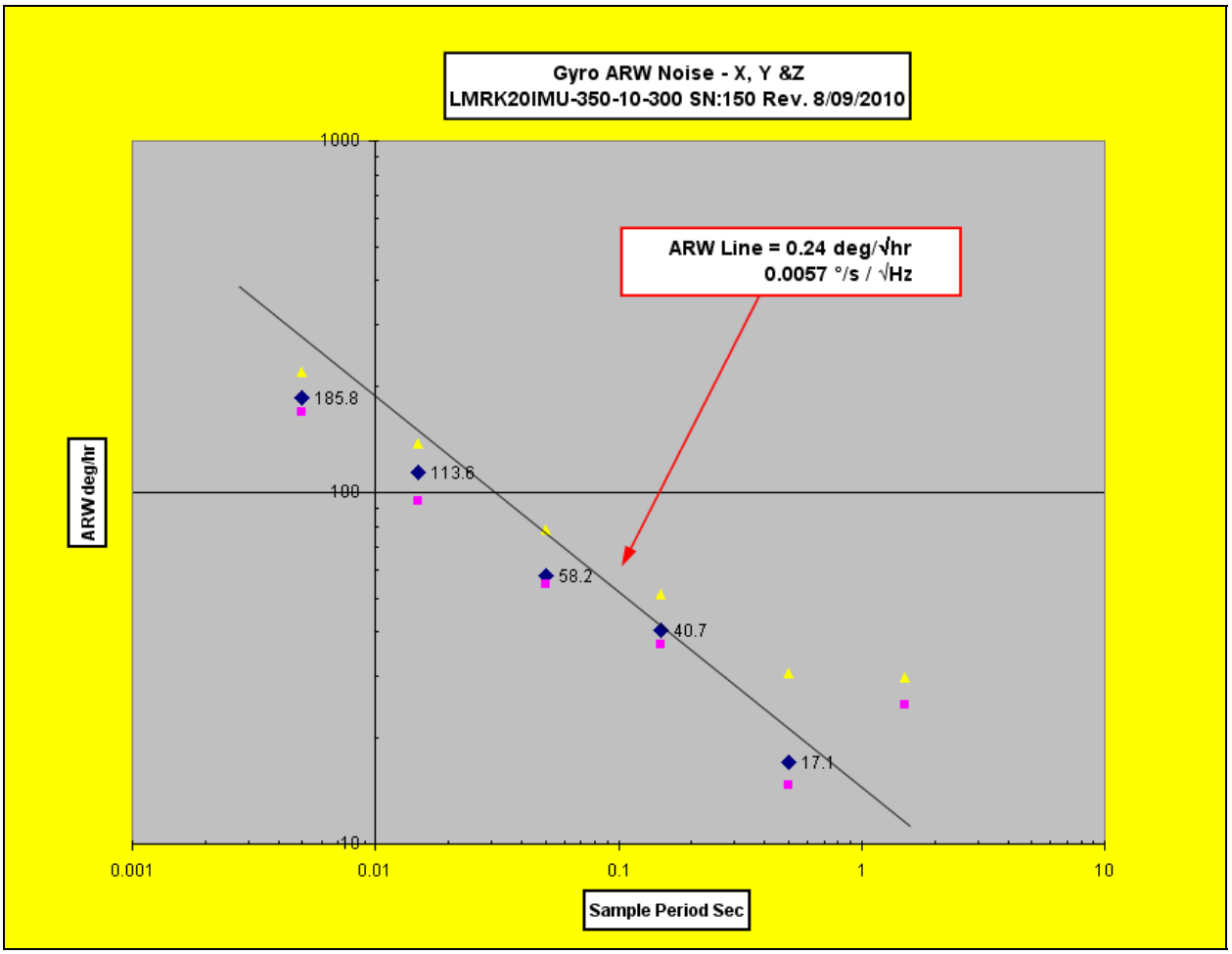

Figure 38: Gyro ARW Noise – X, Y, & Z

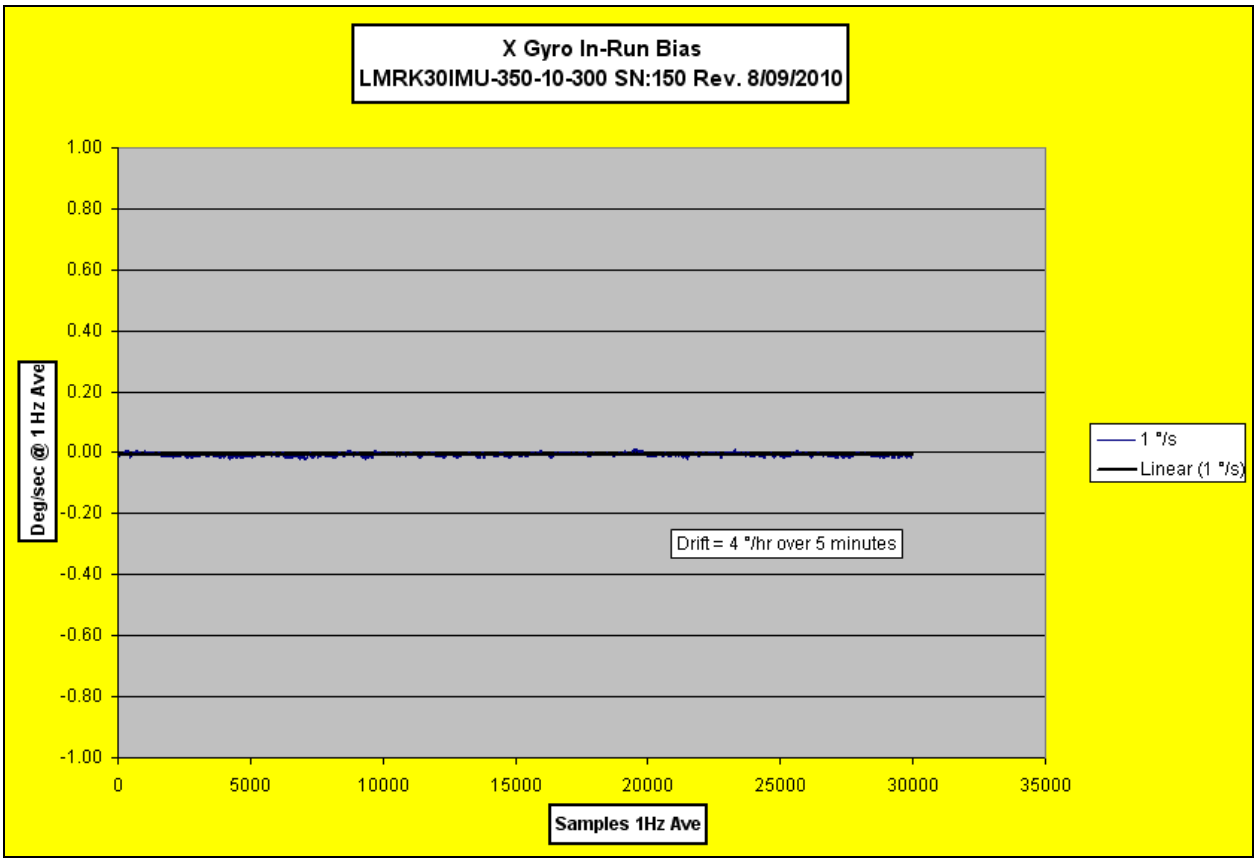

Figure 39: X Gyro In-Run Bias

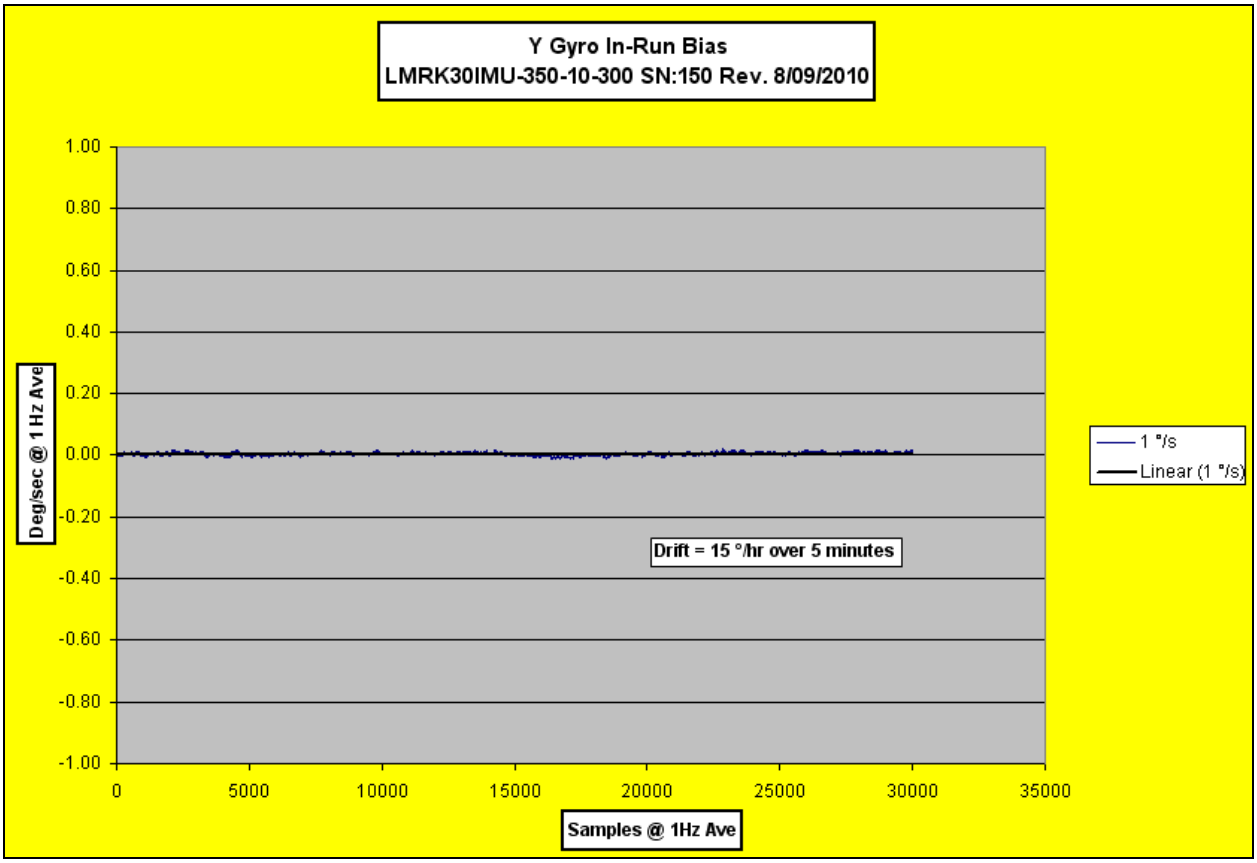

Figure 40: Y Gyro In-Run Bias

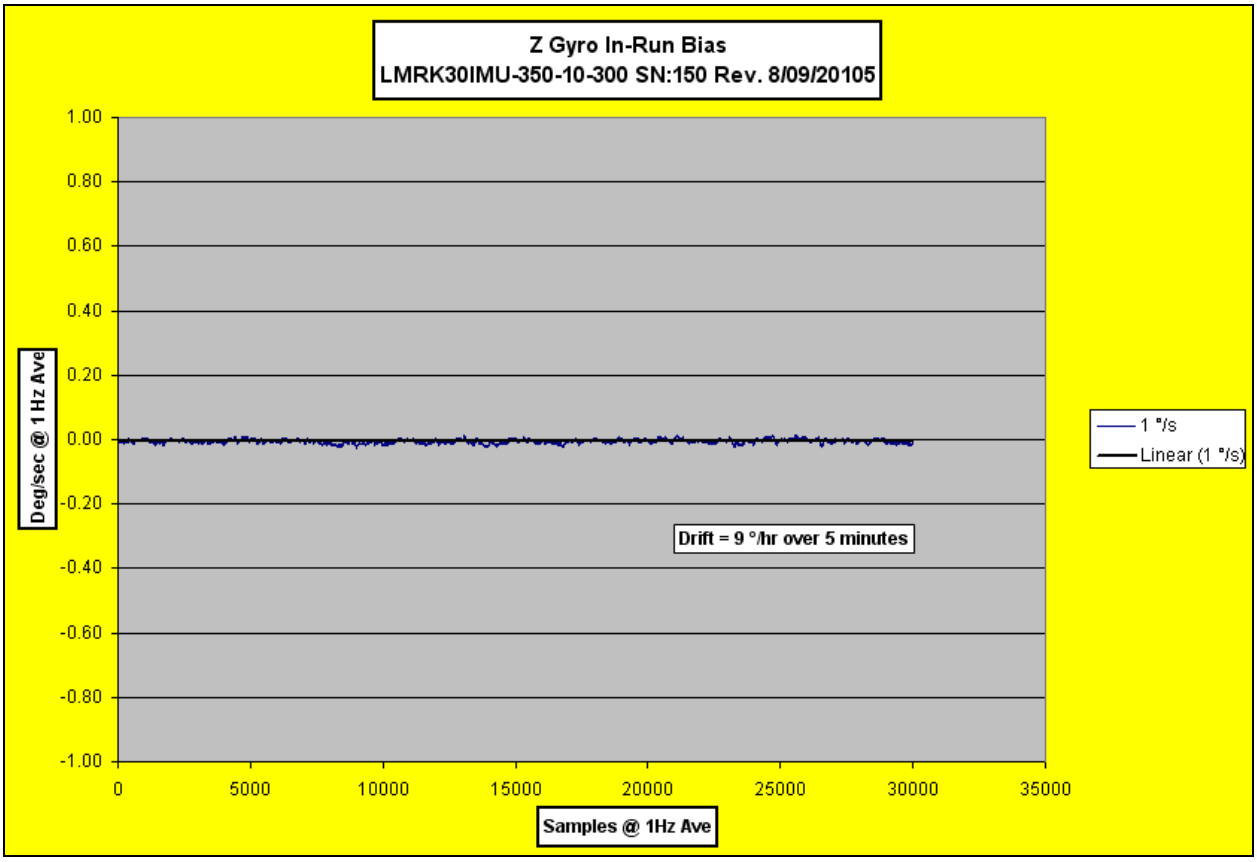

Figure 41: Z Gyro In-Run Bias

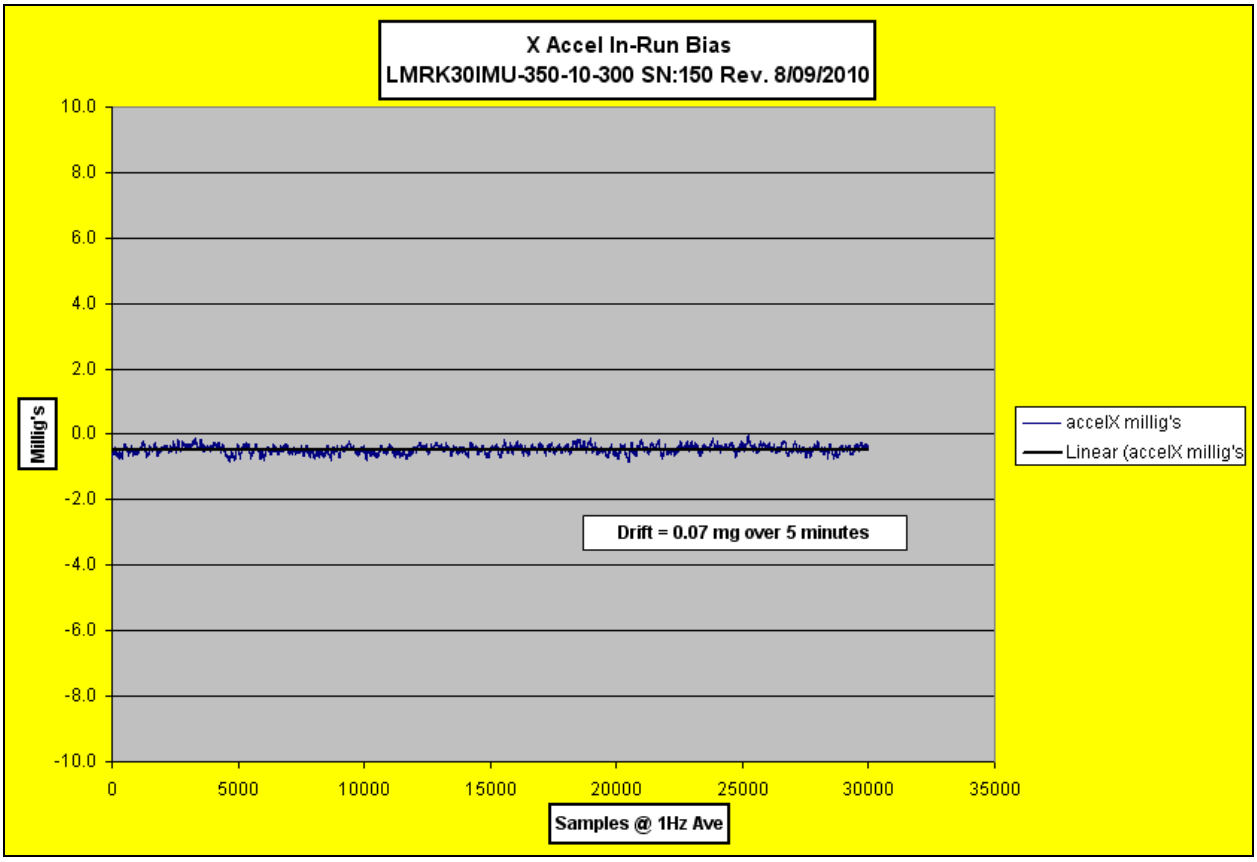

Figure 42: X Accel In-Run Bias

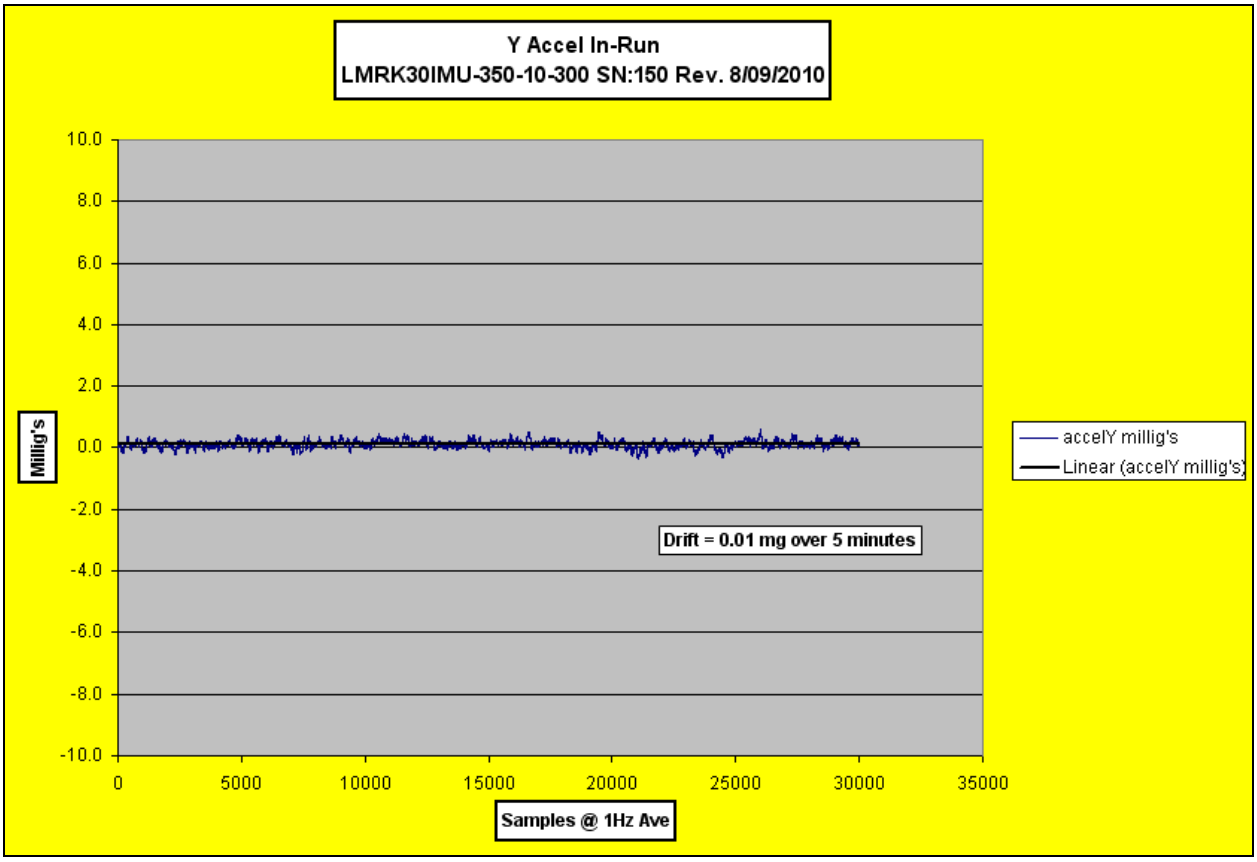

Figure 43: Y Accel In-Run Bias

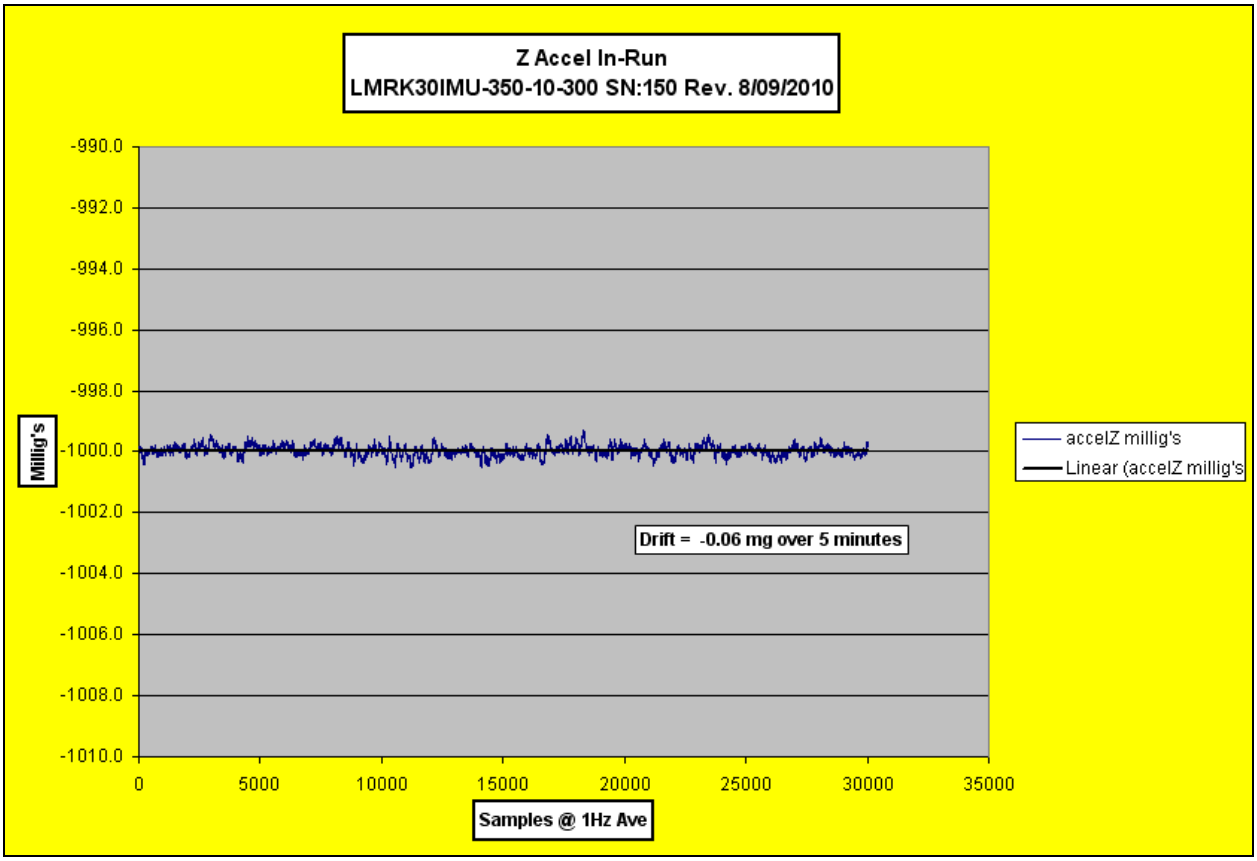

Figure 44: Z Accel In-Run Bias

17 Typical Test Data – Gyro Bias and Scale Factor over Temperature

Note that the solid curve line is the model stored in the sensor and residuals are from that line.

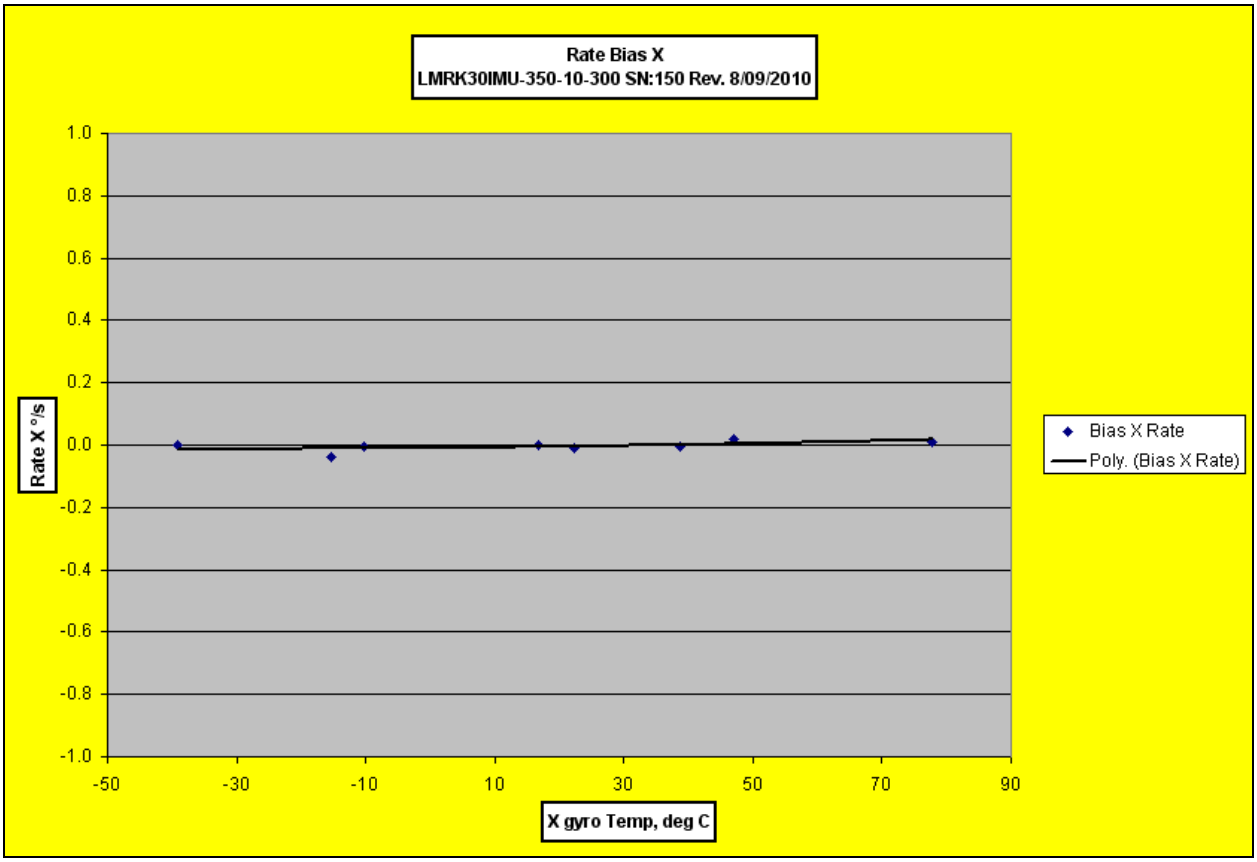

Figure 45: Rate X Bias Over Temperature

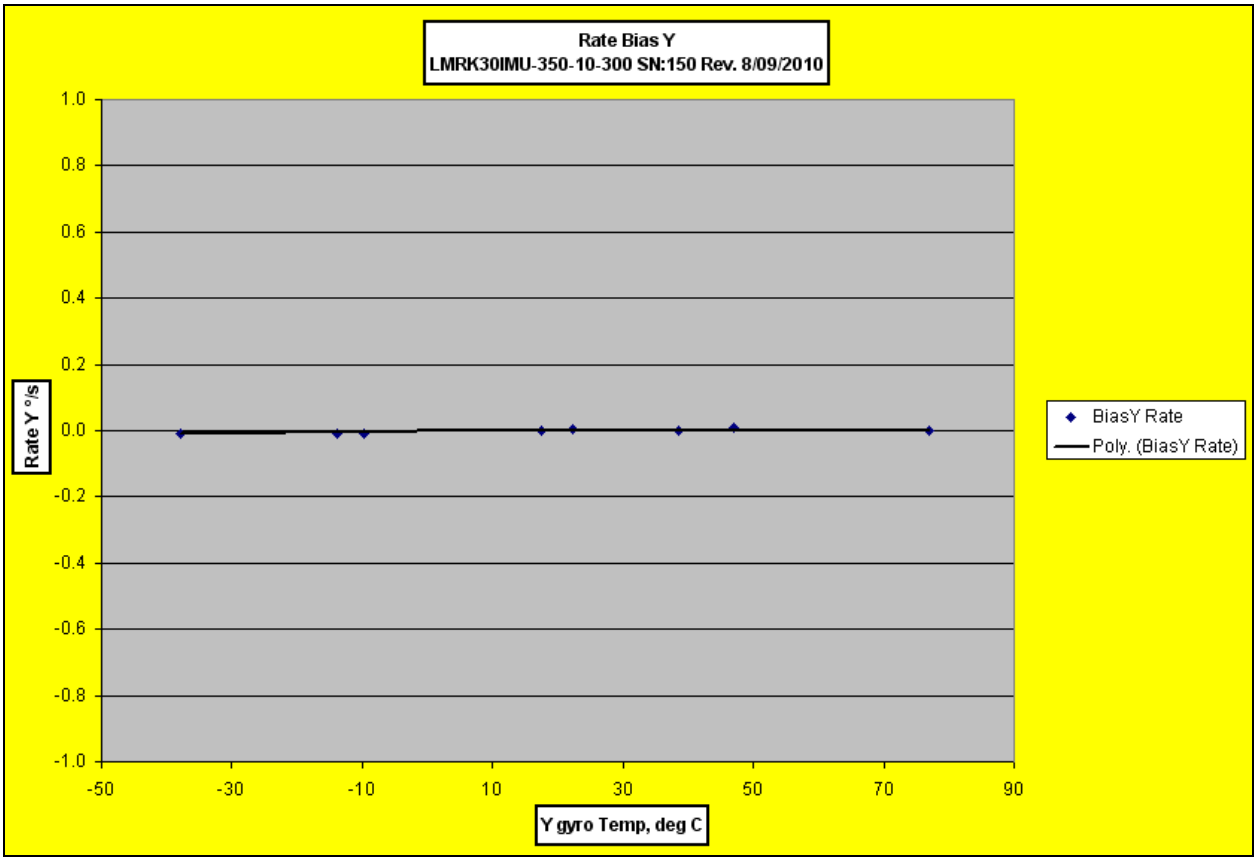

Figure 46: Rate Y Bias Over Temperature

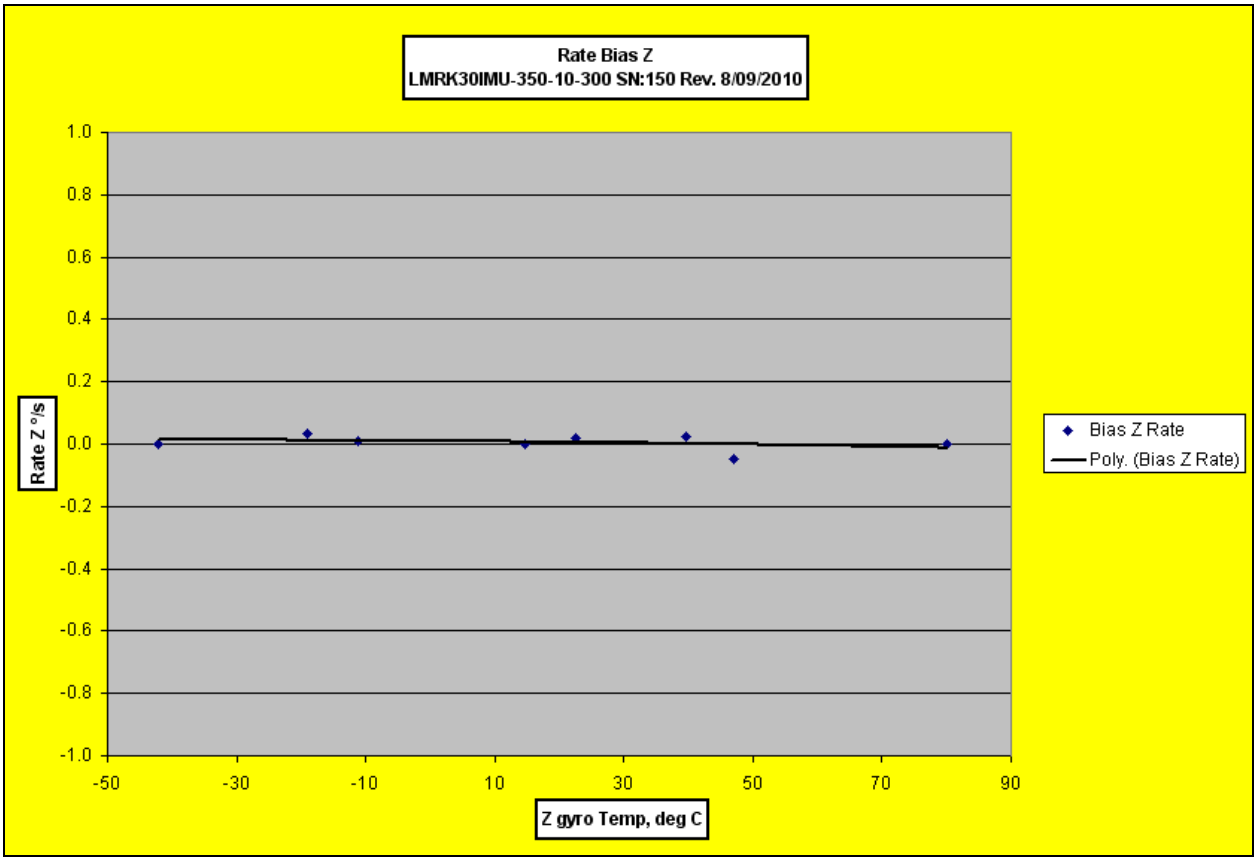

Figure 47: Rate Z Bias Over Temperature

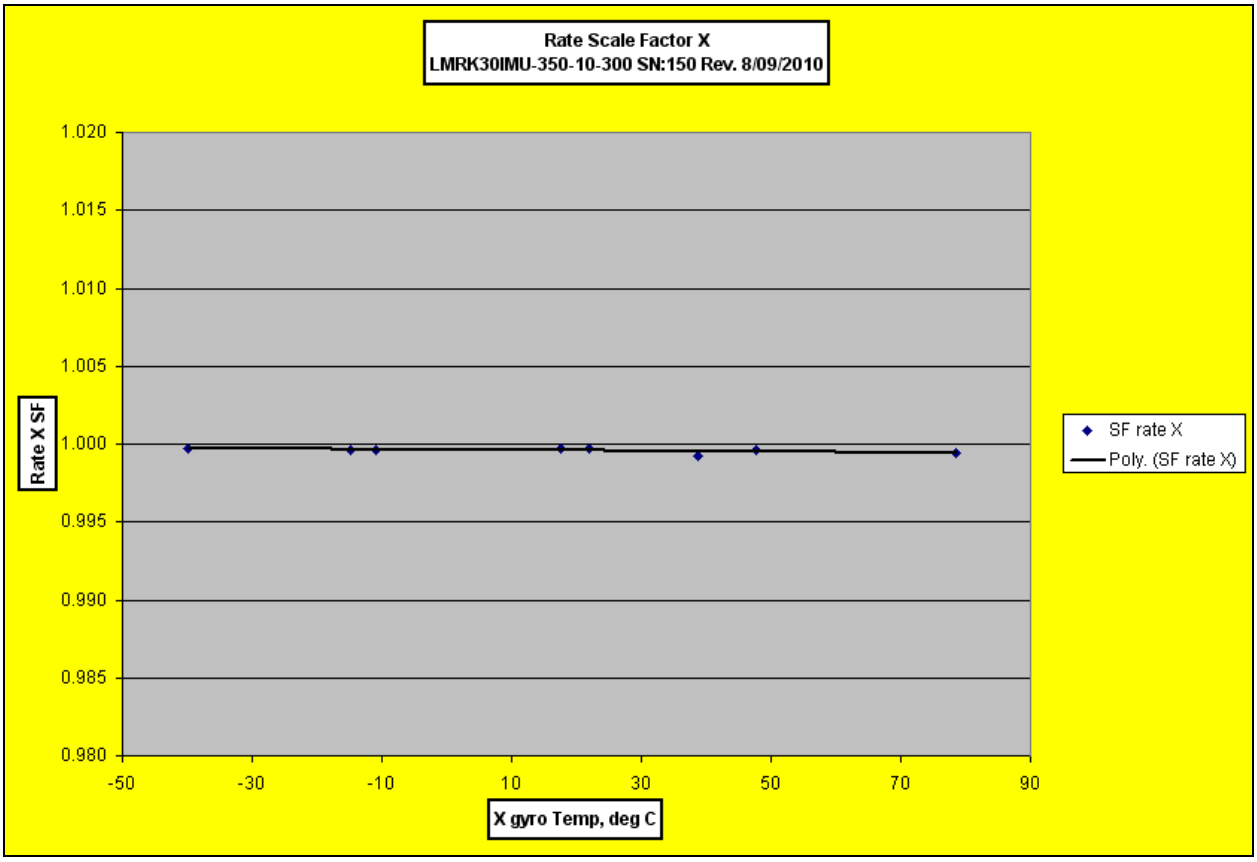

Figure 48: Rate X Scale Factor Over Temperature

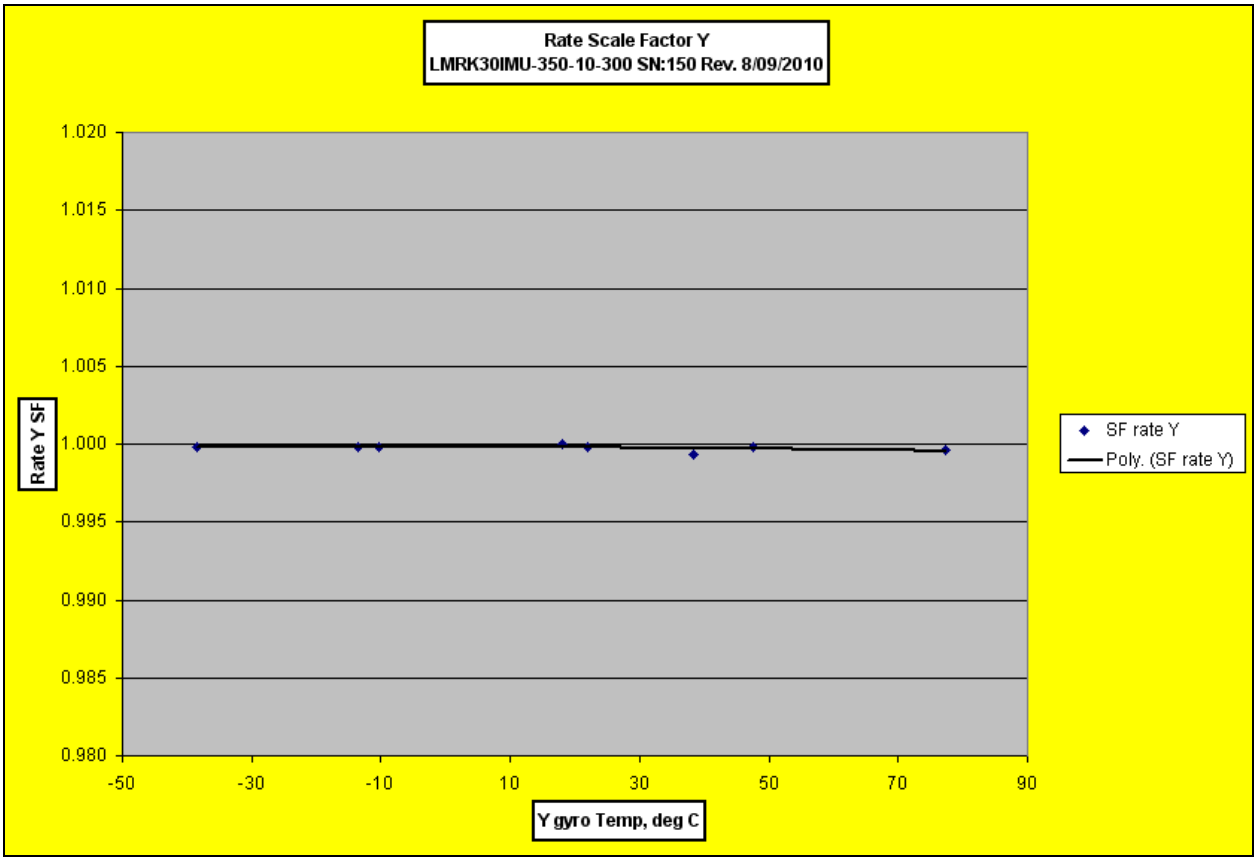

Figure 49: Rate Y Scale Factor Over Temperature

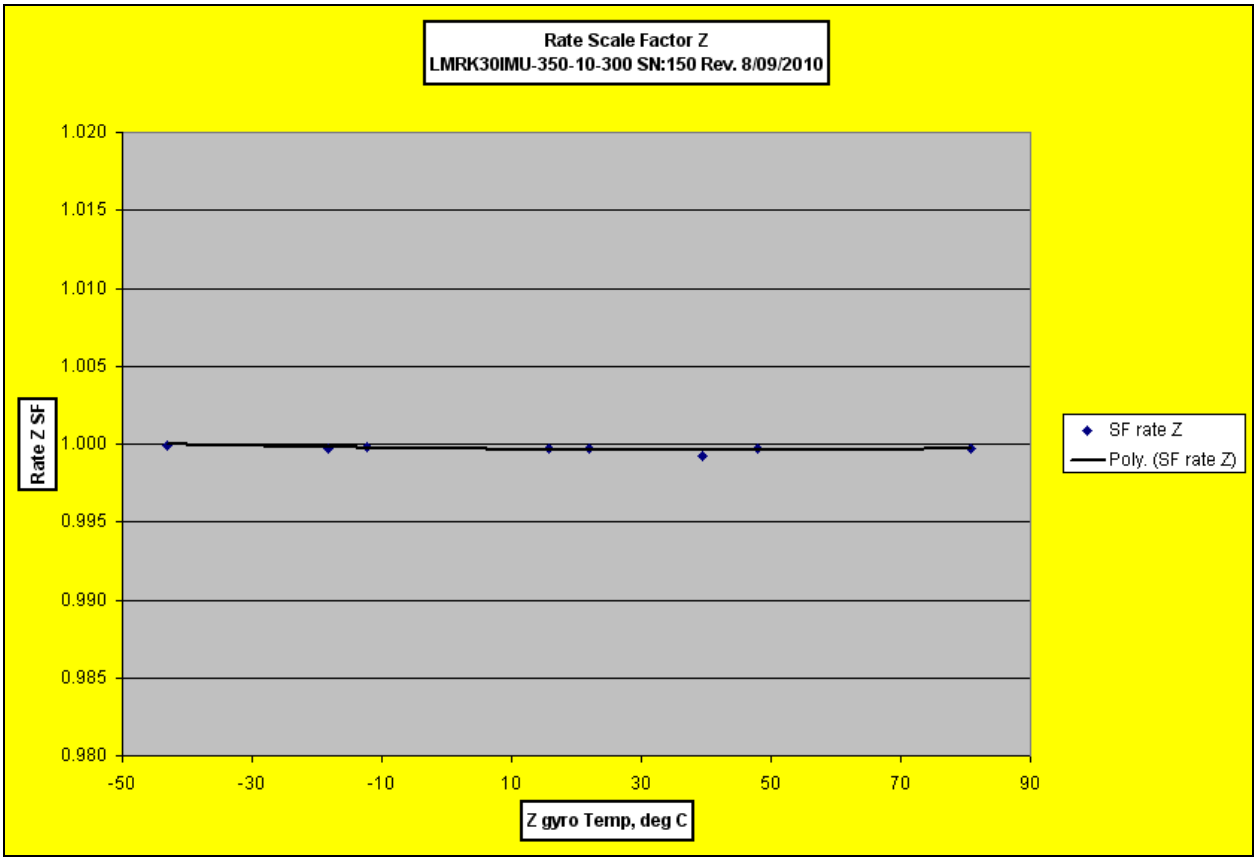

Figure 50: Rate Z Scale Factor Over Temperature

18 Typical Test Data – Accelerometer Bias and Scale Factor over Temperature

Note that the solid curve line is the model stored in the sensor and residuals are from that line.

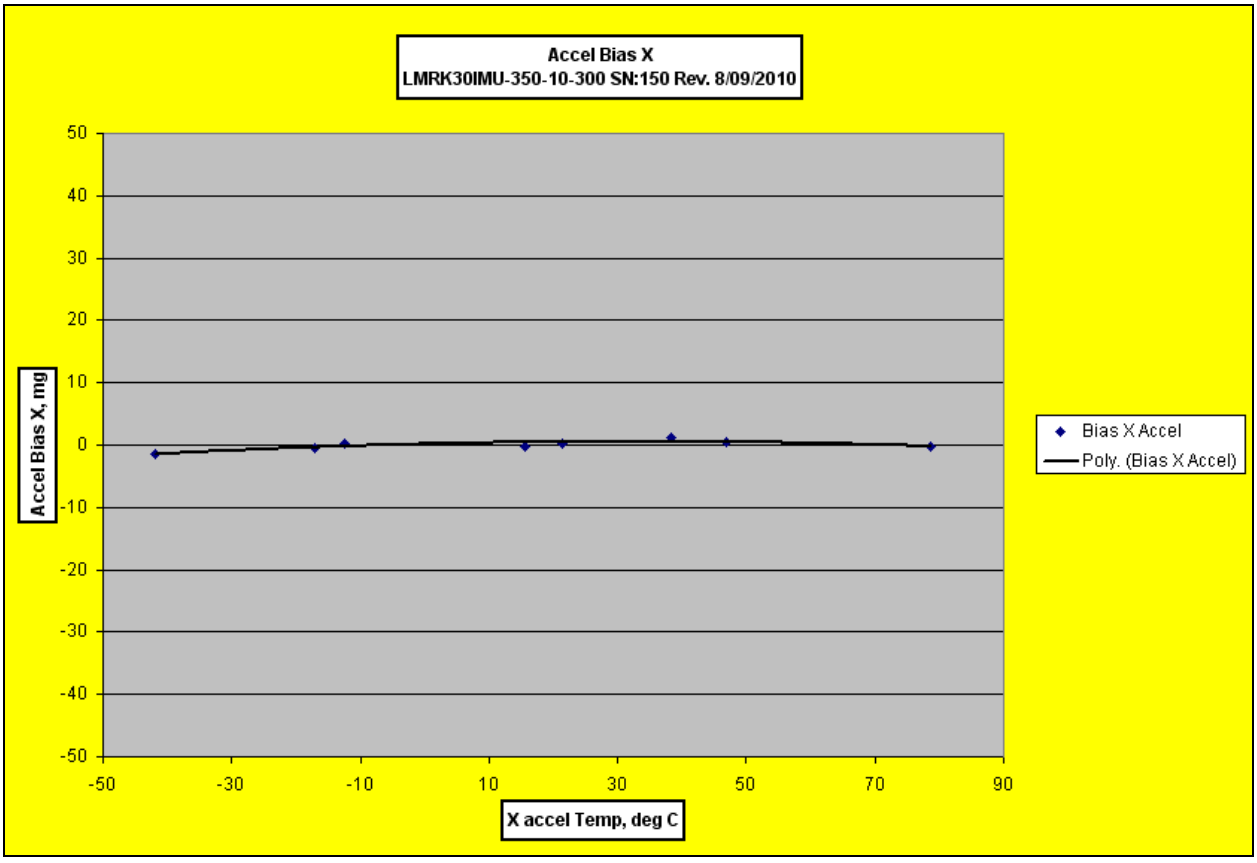

Figure 51: Accel Bias X Over Temperature

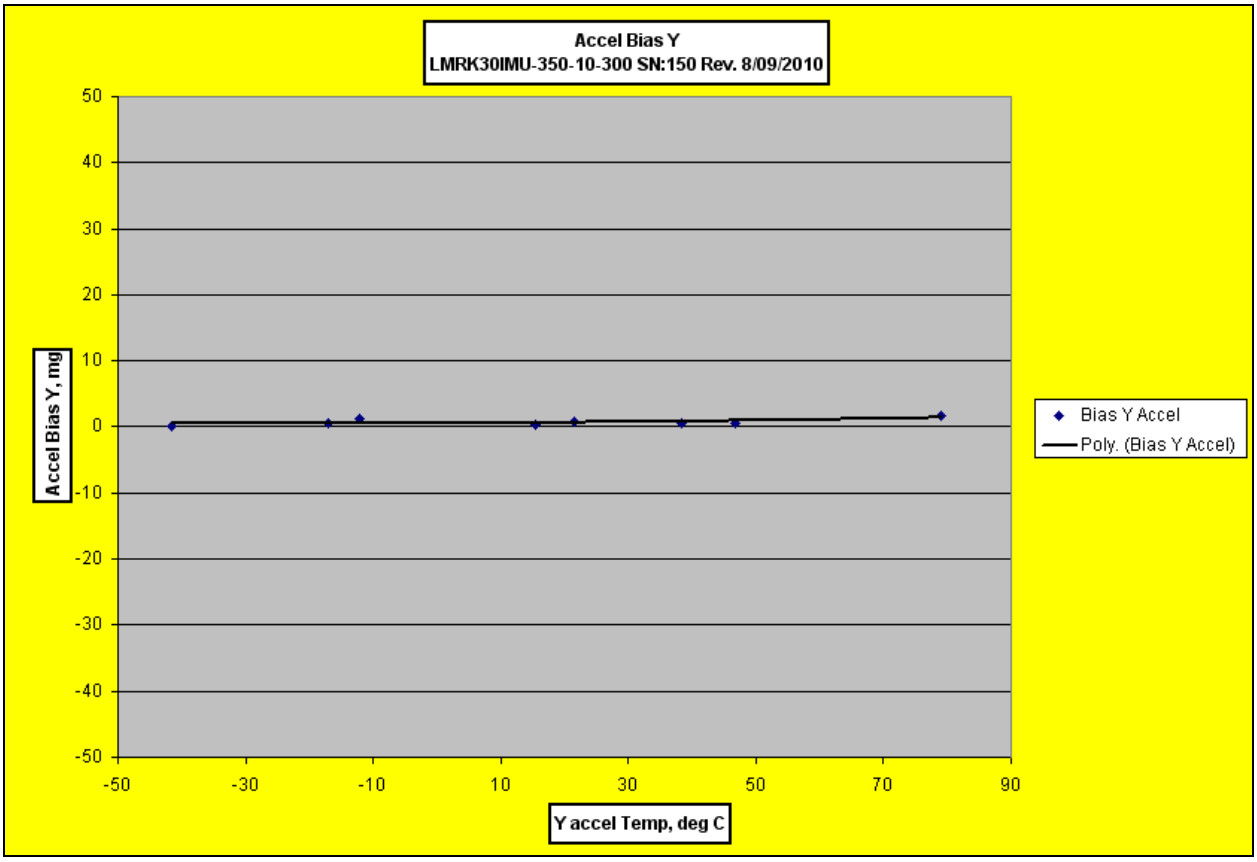

Figure 52: Accel Bias Y Over Temperature

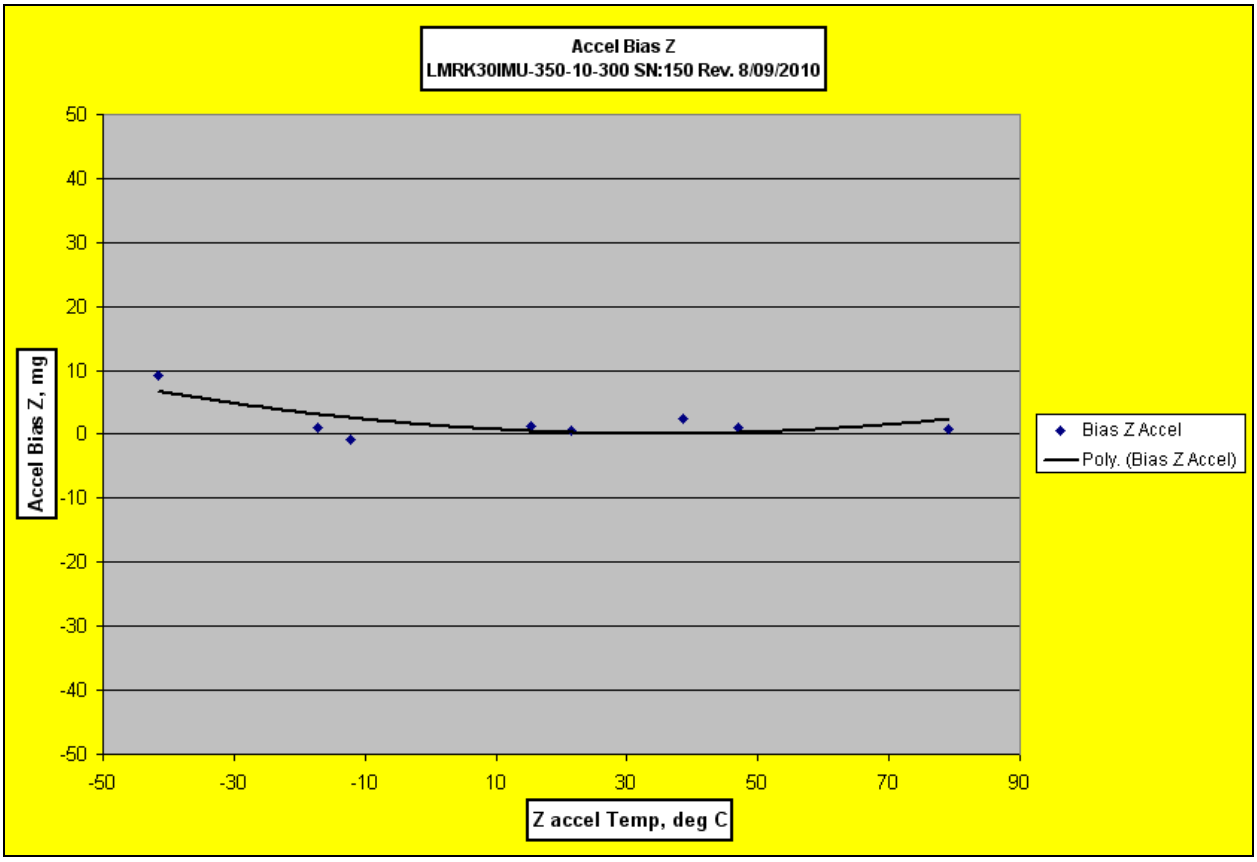

Figure 53: Accel Bias Z Over Temperature

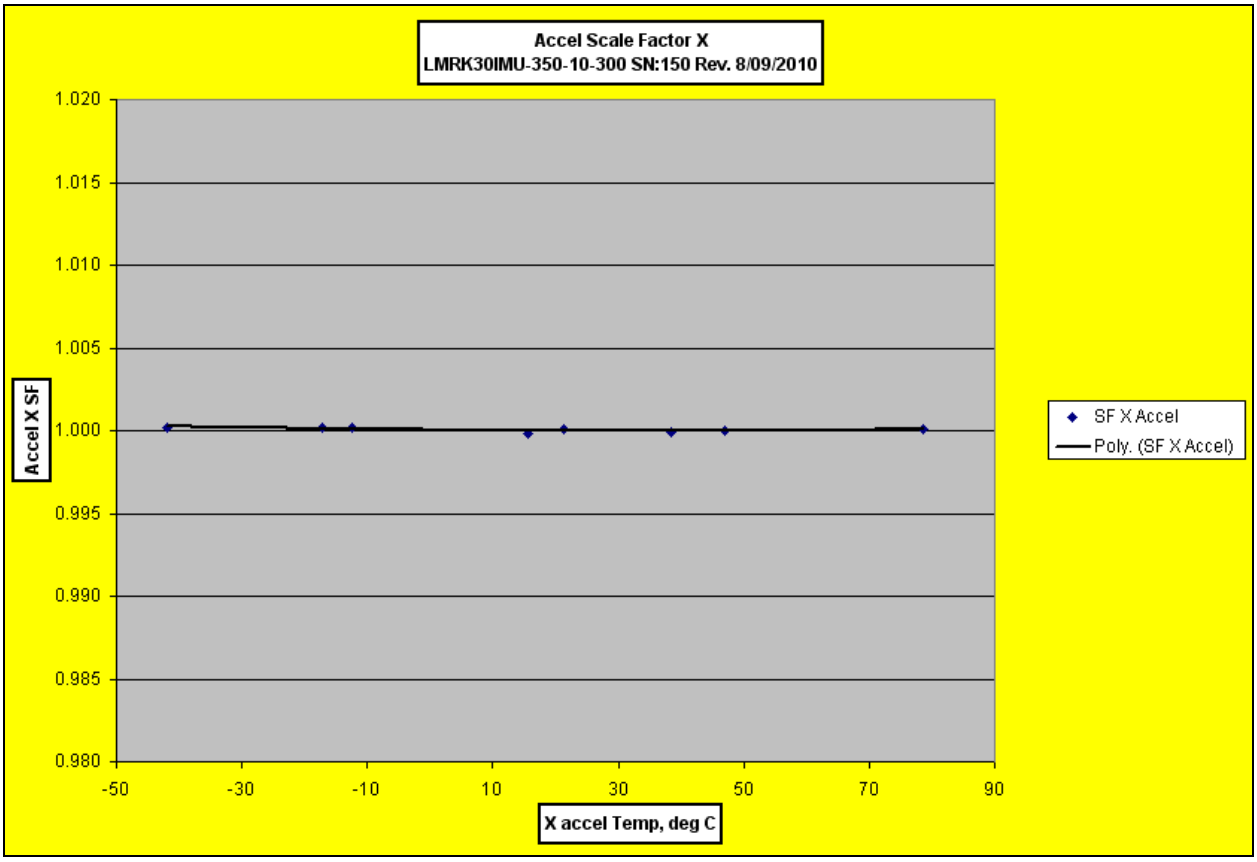

Figure 54: Accel Scale Factor X Over Temperature

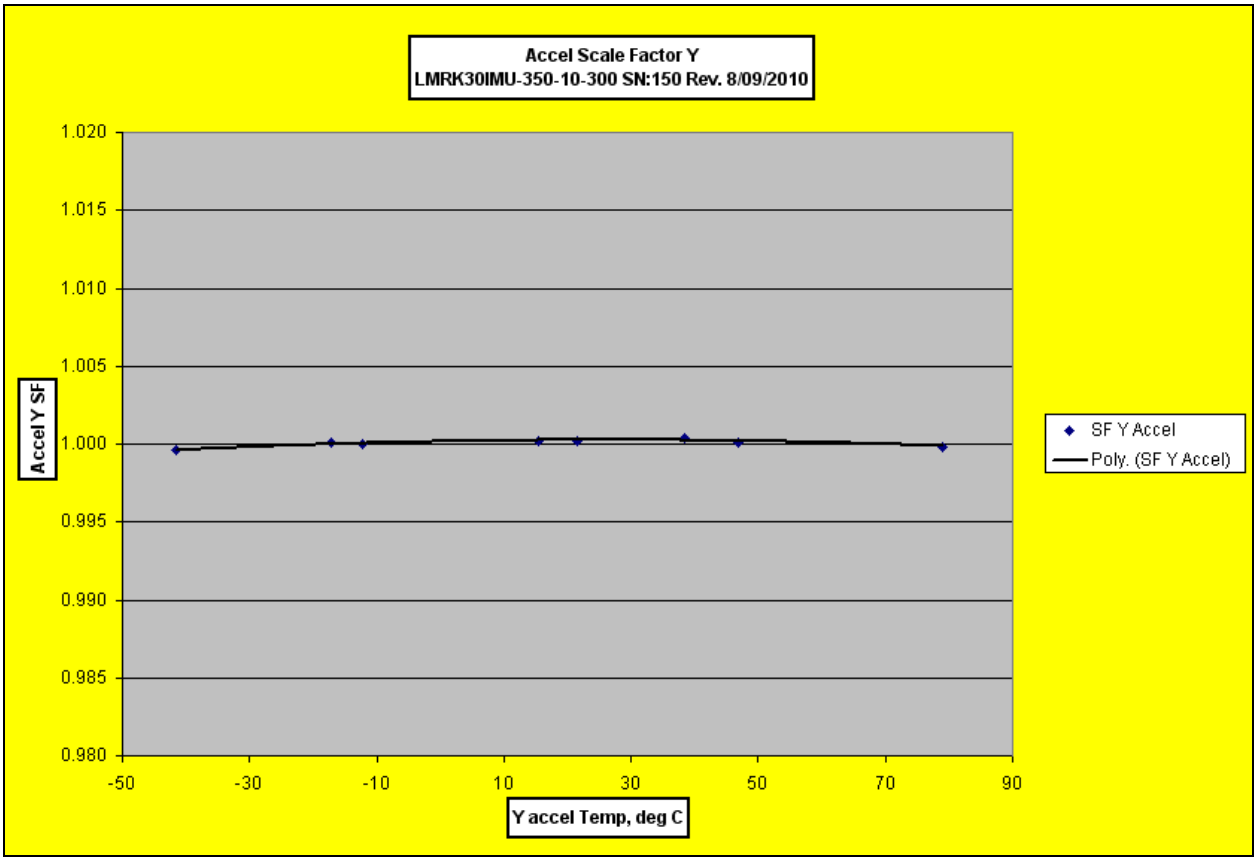

Figure 55: Accel Scale Factor Y Over Temperature

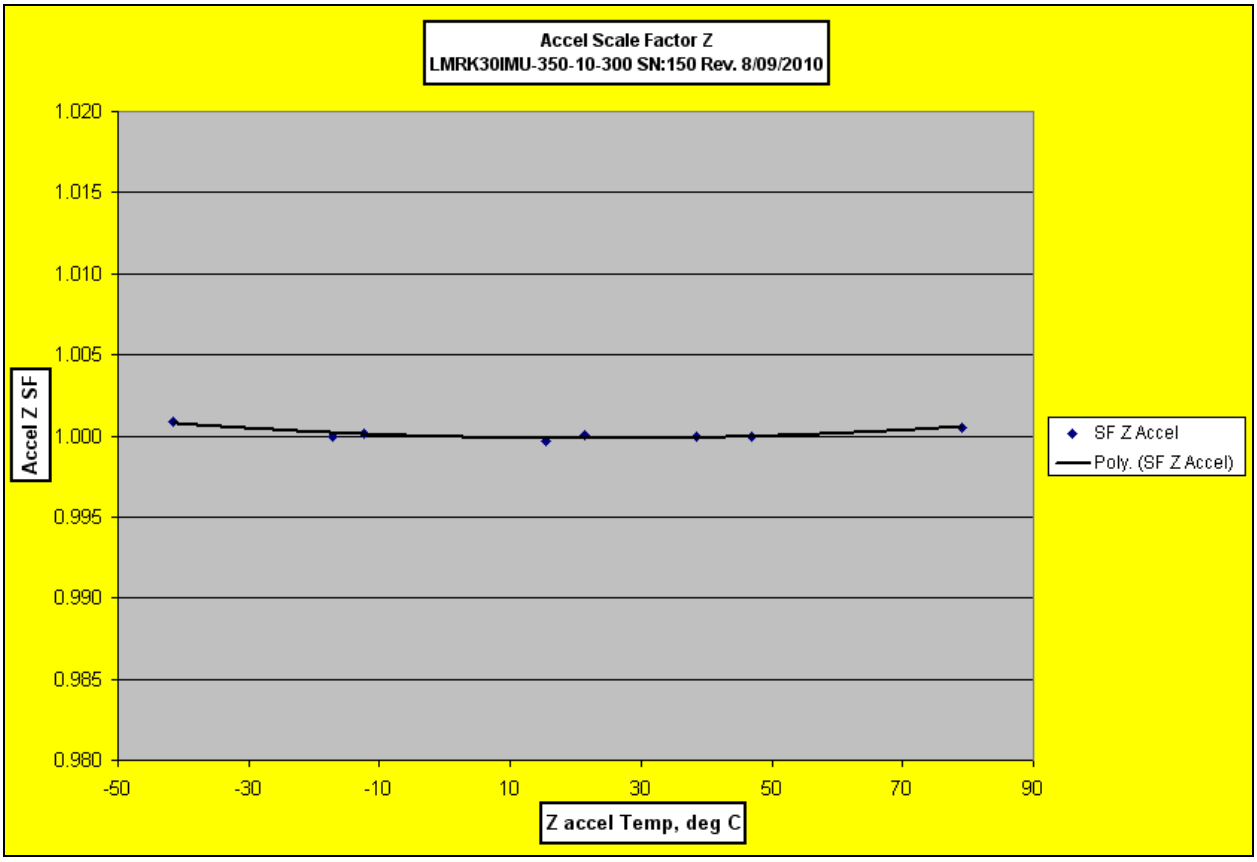

Figure 56: Accel Scale Factor Z Over Temperature

19 ATP – Rate Spin Test

Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
RSF Norm	1.000001	0.999983	1.00003				Temp °C
							29.24
Gyro Mis-Align *(deg/sec)*				Input Rate			
x		0.04	0.00	x			
y	0.04		0.00	y			
z	-0.02	0.00		z			
Gyro Mis-align *(mrad)*				Input Rate			
x		0.30	0.00	x			
y	0.31		0.00	y			
z	-0.14	-0.03		z			

Figure 57: ATP - Rate Spin Test

20 ATP – Temperature Tumble Test T[3]

Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
Bias °/s,mg	-0.01	0.00	0.00	0.23	0.15	0.19	29.21
ASF Norm				1.0000	1.0000	1.0001	Temp °C
			Input g =	Accel In g's			
Gyro °/s /g							
x	0.00	0.01	0.00	x			
y	0.00	0.00	0.00	y			
z	0.00	0.00	0.00	z			
					Accel		
					Mis-Align	mrads	Accel In
					-0.32	0.29	x
				-0.26		0.13	y
				0.10	-0.27		z

Figure 58: ATP Accelerometer Temperature Tumble Test T[3]