Calibration Report: Wind Sensor
S/N: 42635

26 March 2003

Bryan Fabbri
Analytical Services & Materials, Inc.
Hampton, Virginia

Summary

Calibration date: 26 March 2003 Next calibration date: 26 March 2005

A collection, analysis and calibration of data from a Wind Sensor instrument, S/N 42635, has been completed. The calibration was performed by the Wind Sensor manufacturer, R.M. Young, Inc. These data were collected by R.M. Young on 26 March 2003.

Model : 05103–5 Wind Monitor
Serial Number : 42635

The test data presented in chart and graphical format show the sensor to be within +/–3 degrees in determining wind direction and azimuth. The report also states that the sensor is within +/–3 m/s.

The following pages provide more detail into the calibration process and results.

Meteorological Instruments

YOUNG

Wind Speed Calibration Report

Customer: *Wyle Labs*

Test Number: 33909
Test Date: 26 March 2003

Customer PO: HMP013163
Sales Order: 6461

Test Sensor:
Anemometer: 05103-5 Wind Monitor
Serial Number: *42635*

Propeller: 08234
Serial Number: *69252*

Report of calibration comparison with National Institute of Standards and Technology calibrated anemometer in the R.M. Young Company 50 x 75 cm rectangular test section open return wind tunnel. The following data describe the relationship between test section wind speed, as determined by the NIST calibrated standard anemometer, and test anemometer rpm, as determined by it's output. Indicated wind speed is calculated using anemometer's published formula.

Wind Speed According to Standard Anemometer		Wind Speed According to Test Anemometer			
Model: 05103 / 08234		Anem: 05103-5		Prop: 08234	
Serial #: 00005		Serial #: 42635		Serial # 69252	
Nominal Speed m/s	Actual Speed m/s (1)	100 Second Pulse Count	Output Frequency	Propeller RPM (2)	Indicated Speed m/s (3)
30	29.8	30190	301.9	6038	29.6
25	24.8	25134	251.3	5027	24.6
20	19.8	20058	200.6	4012	19.7
16	15.9	16015	160.2	3203	15.7
14	13.9	14008	140.1	2802	13.7
12	11.9	11992	119.9	2398	11.8
10	9.9	9965	99.7	1993	9.8
8	7.9	7937	79.4	1587	7.8
6	6.0	5928	59.3	1186	5.8
5	5.0	4917	49.2	983	4.8
4	4.0	3925	39.3	785	3.8
3	3.0	2921	29.2	584	2.9
2	2.0	1888	18.9	378	1.9
1	1.0	853	8.5	171	0.8

National Institute of Standards and Technology Reference
Calibrated Standard Anemometer (4)
Test #: TN251034
Date: 9 Nov 1992
Model: 08234 Serial #: 00005

Environmental Conditions

Barometric Pressure (mm Hg)	743
Temperature (C):	26.0
Relative Humidity (%):	47.0

(1) Actual wind speed determined by relationship between tunnel fan rpm and NIST calibrated standar propeller rpm.
(2) Wind Monitor output is three (3) pulses per revolution: Rpm = Hz / 3 x 60 sec.
(3) Published calibration: Wind speed (m/s) = 0.00490 x propeller rpm.
(4) NIST Calibration accuracy is within 1%.

Tested By E. Chenoweth

R.M. YOUNG COMPANY 2801 Aero Park Drive, Traverse City, Michigan 49686 USA
Tel: 231-946-3980 Fax: 231-946-4772 Email: met.sales@youngusa.com

Wind Speed Calibration Report (page 2)

Test Number: 33909

Linear Regression

A linear regression is performed on the calibration data to determine the best fit straight line representing the relationship between propeller rpm and actual wind speed as determined by the NIST calibrated standard anemometer

Slope:	*0.00491*	meters per second per RPM
Intercept:	*0.14*	meters per second
Pitch:	29.43	centimeters per revolution
Correlation Coefficient:	1.00000	

Wind Speed =	Slope	x RPM +	Intercept	Slope	x Hz +	Intercept
m/s =	0.00491	x RPM +	0.14	0.09811	x Hz +	0.14
mph =	0.01097	x RPM +	0.32	0.21947	x Hz +	0.32
knots =	0.00953	x RPM +	0.27	0.19058	x Hz +	0.27
km/hr =	0.01766	x RPM +	0.51	0.35321	x Hz +	0.51

Threshold Measurements

	New Instrument	As Found	As Left
Start:		0.4 m/s	0.4 m/s
		0.8 mph	0.8 mph
	n/a		
Stop:		0.3 m/s	0.3 m/s
		0.6 mph	0.6 mph

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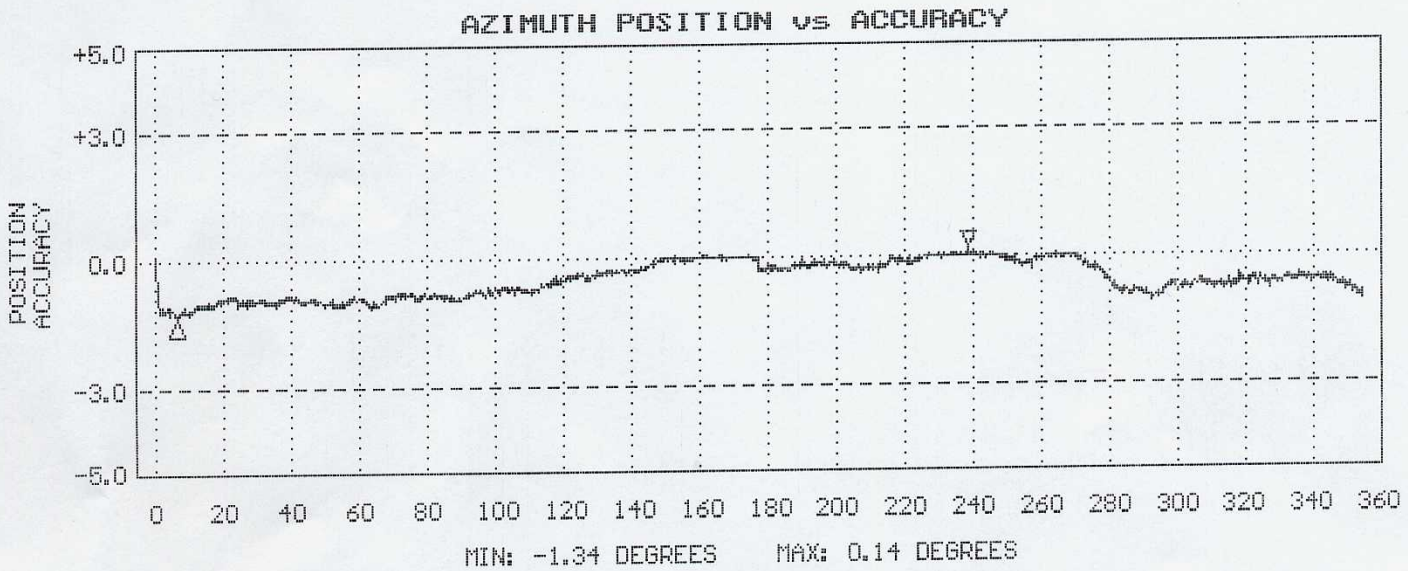
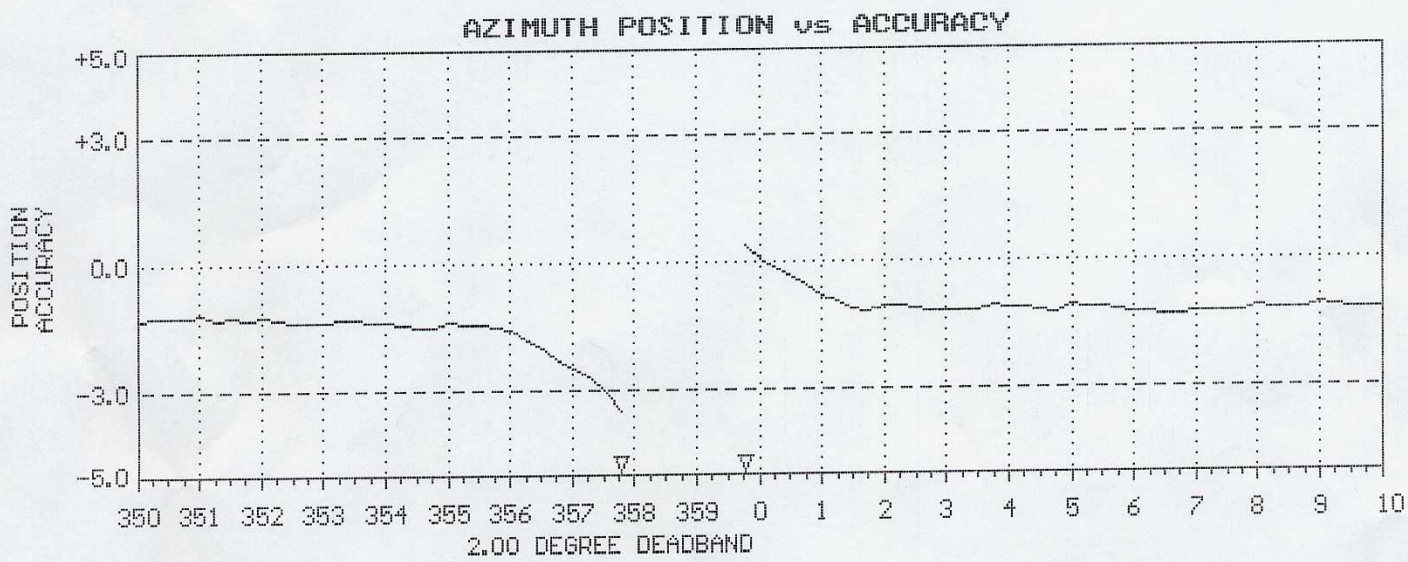
R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

SENSOR: 05103-5 WIND MONITOR
SENSOR SERIAL NUMBER: 42635
BEARINGS: SEALED/GREASE LUBE
DATE: MAR 26 2003
WIND SPEED THRESHOLD TEST: PASS
LOW WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
HIGH WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
VANE TORQUE TEST: PASS
SPECIAL NOTES:
SPECIAL NOTES:





NOTE: Azimuth Position vs Accuracy graphs are accurate to within 0.5 degrees. The accuracy shown in the potentiometer deadband region between 355 and 0 degrees is the result of no resistance change while position changes. The gap represents the actual deadband (open circuit).