Week 6 Demo

(Humidity)

Harrison Chapter 6
Brock Chapter 5
Stull Chapter 4

Tim Chui

Learning Goals (from Monday)

	By the end of today's class, you should be able to:
1	List 4 or more types of hygrometers and describe how they work and how you use them.
2	Calculate and plot the hygrometer response (voltage, resistance, size, temperature, etc.) vs. humidity.
3	Describe the advantages, disadvantages, and typical errors of each type of hygrometer, and describe how you can calibrate the hygrometer.
4	Select the appropriate hygrometer and associated infrastructure for any measurement program.
5	Convert between different humidity units.

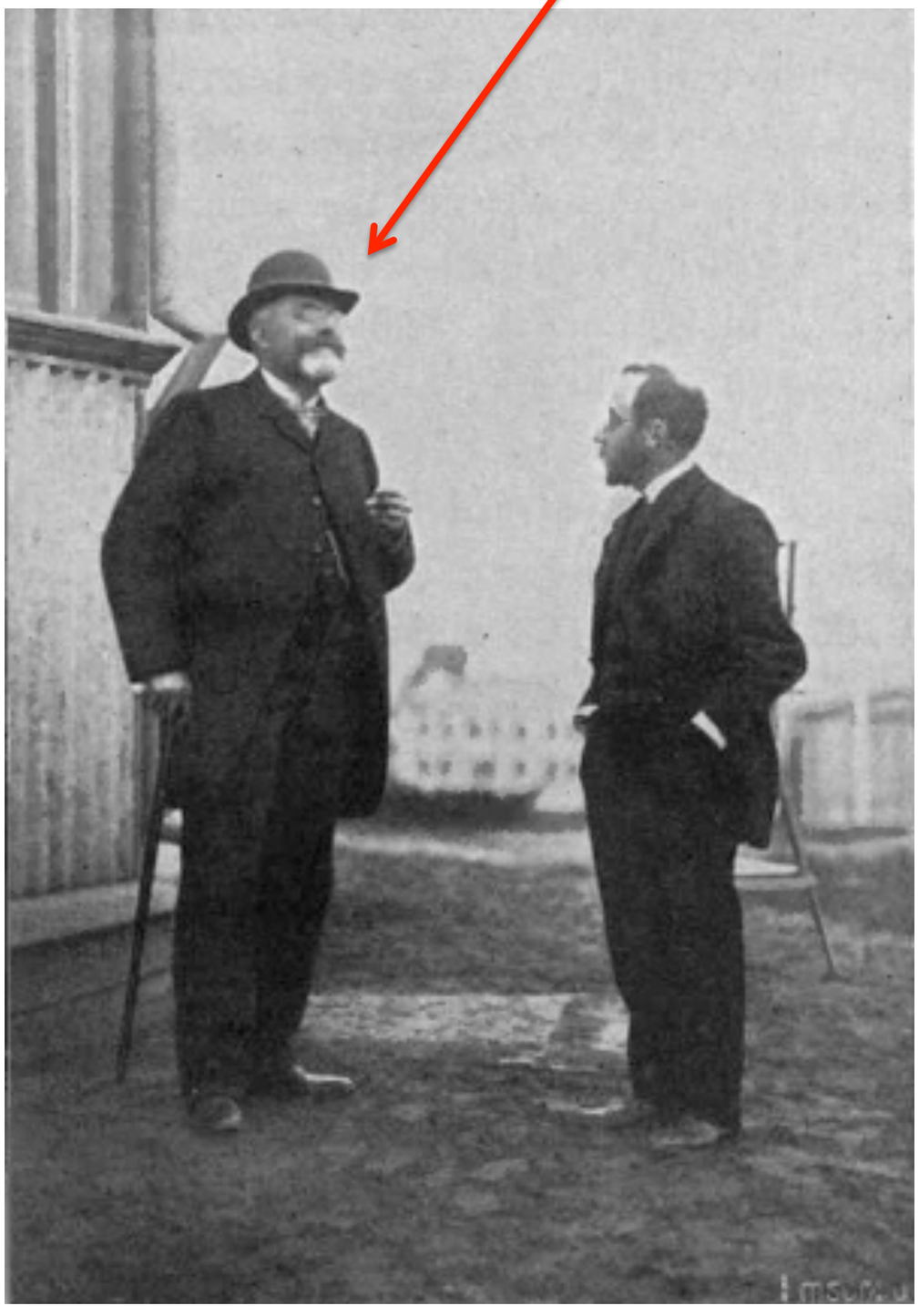
Demo Worksheet

Demo - Comparison of humidity sensors
Worksheet by Rosie Howard
Edited by Tim Chui
Date of demo: 12 February 2020

	Instrument	What is it made of?	Principle	What variable(s) does it measure?	Details
1	**Psychrometer**	Two liquid-in-glass thermometers and a wick	Water evaporating from wet wick causes decrease in temperature Drier environment causes greater cooling		Assmann psychrometer is aspirated Must use distilled water
2	**Campbell Scientific HC-S3-XT**	Conductor-polymer sandwich		Relative humidity	Ideal for longterm, unattended applications RH vs. capacitance is slightly nonlinear
3	**MetOne 083D**		Sorption of water causes change in **capacitance**	Relative humidity	RH vs. capacitance is slightly nonlinear
4	**Vaisala "humicap"**	Conductor-polymer sandwich	Sorption of water causes change in **capacitance**	Relative humidity	
5	**Kestrel humidity sensor**	Conductor-polymer sandwich	Sorption of water causes change in **capacitance**		Secondary thermistor to improve accuracy and response time
6	**Moisture-content meter (Feuchte-Gehaltsmesser)**		Sorption of water causes **size change**	Relative humidity	Also measures temperature outputting absolute humidity
7	**Carbon hygristor**	Carbon		Relative humidity	Used in old radiosondes

Assmann Psychrometer

Richard Aßmann (Assmann)

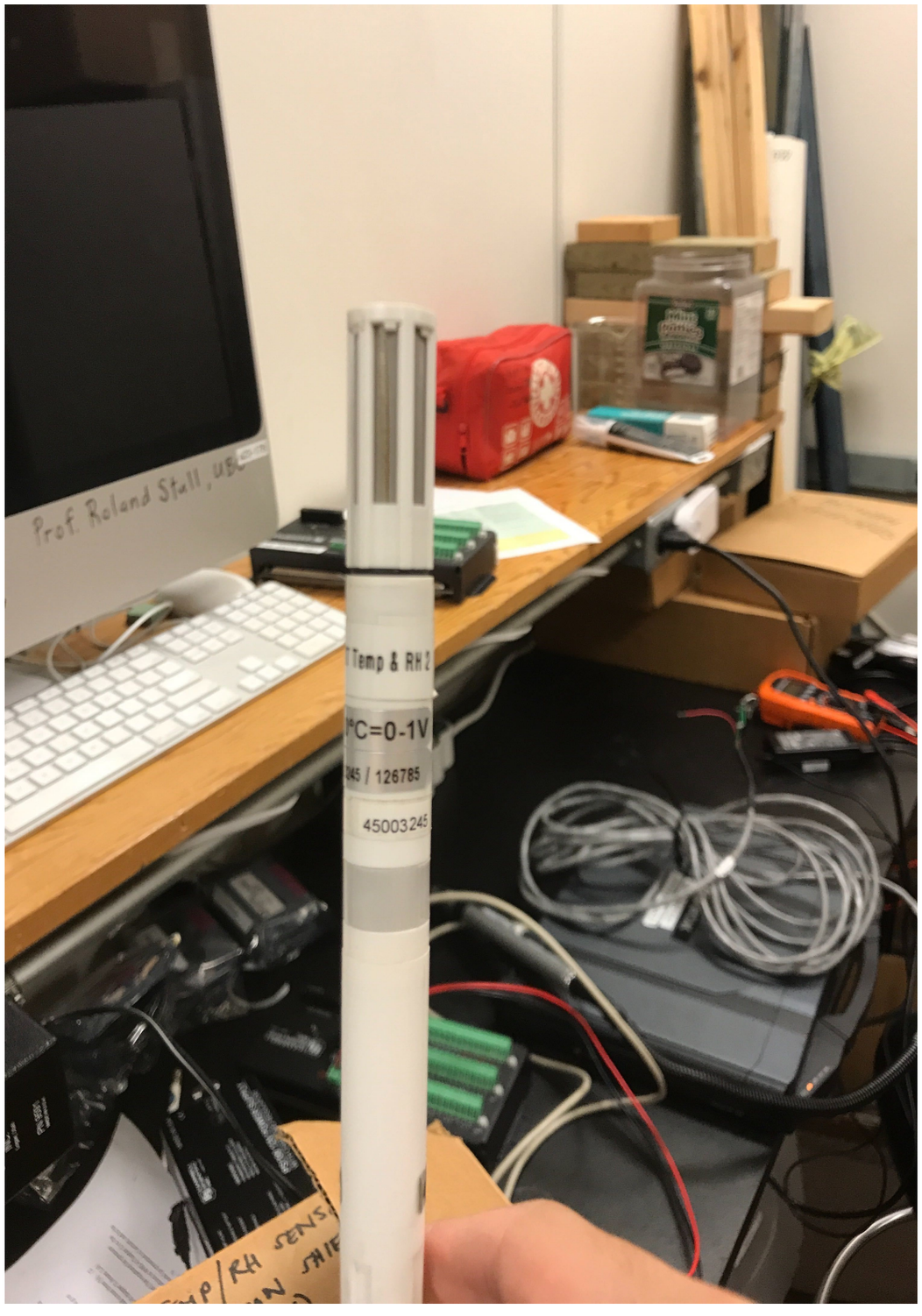


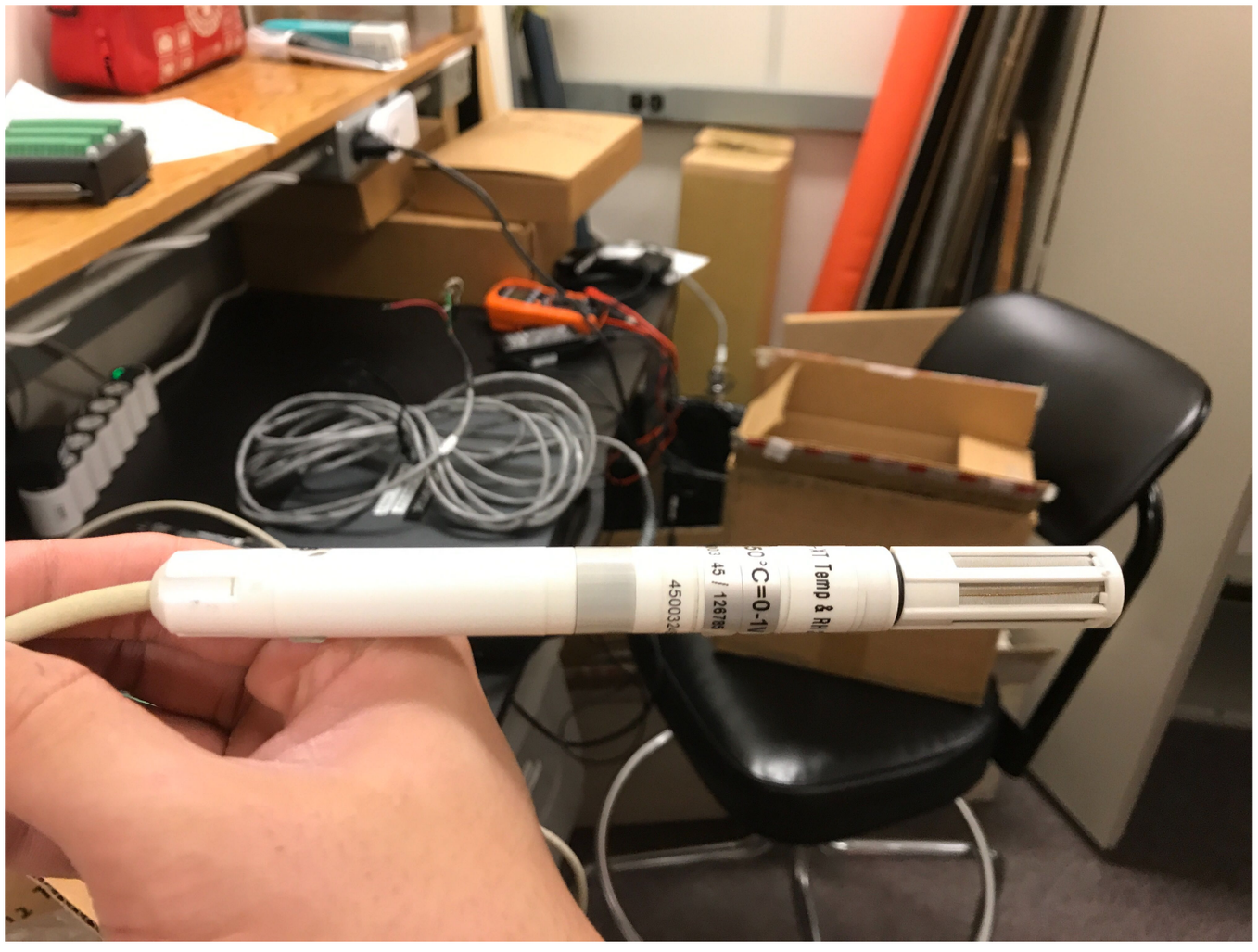
https://en.wikipedia.org/wiki/Richard_Assmann

Also co-discoverer of the stratosphere (alongside Leon Teisserenc de Bort)

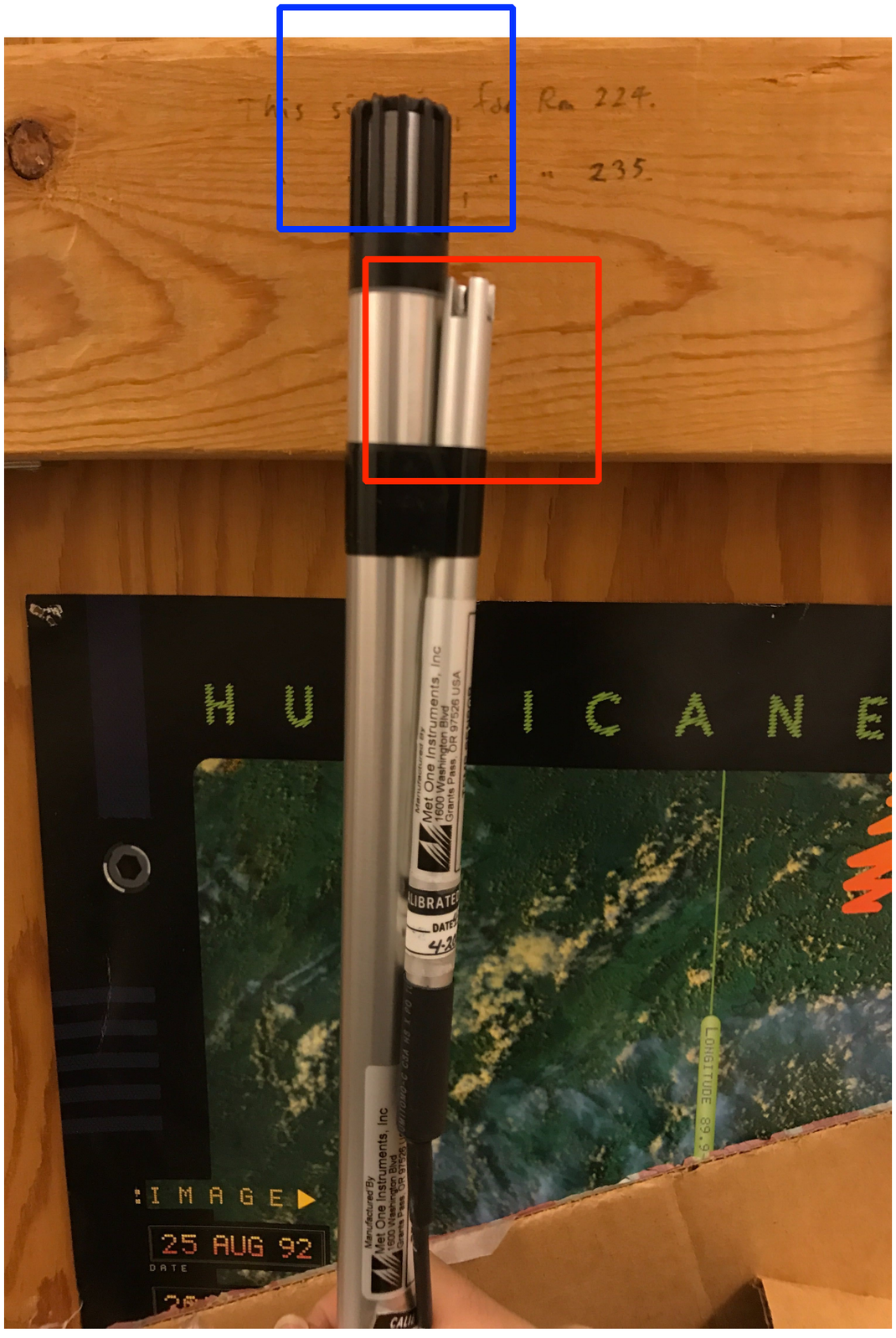
Assmann Psychrometer

Campbell Scientific HC-S3-XT





MetOne 083D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Grants Pass, OR 97526 USA
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Met One Instruments, Inc
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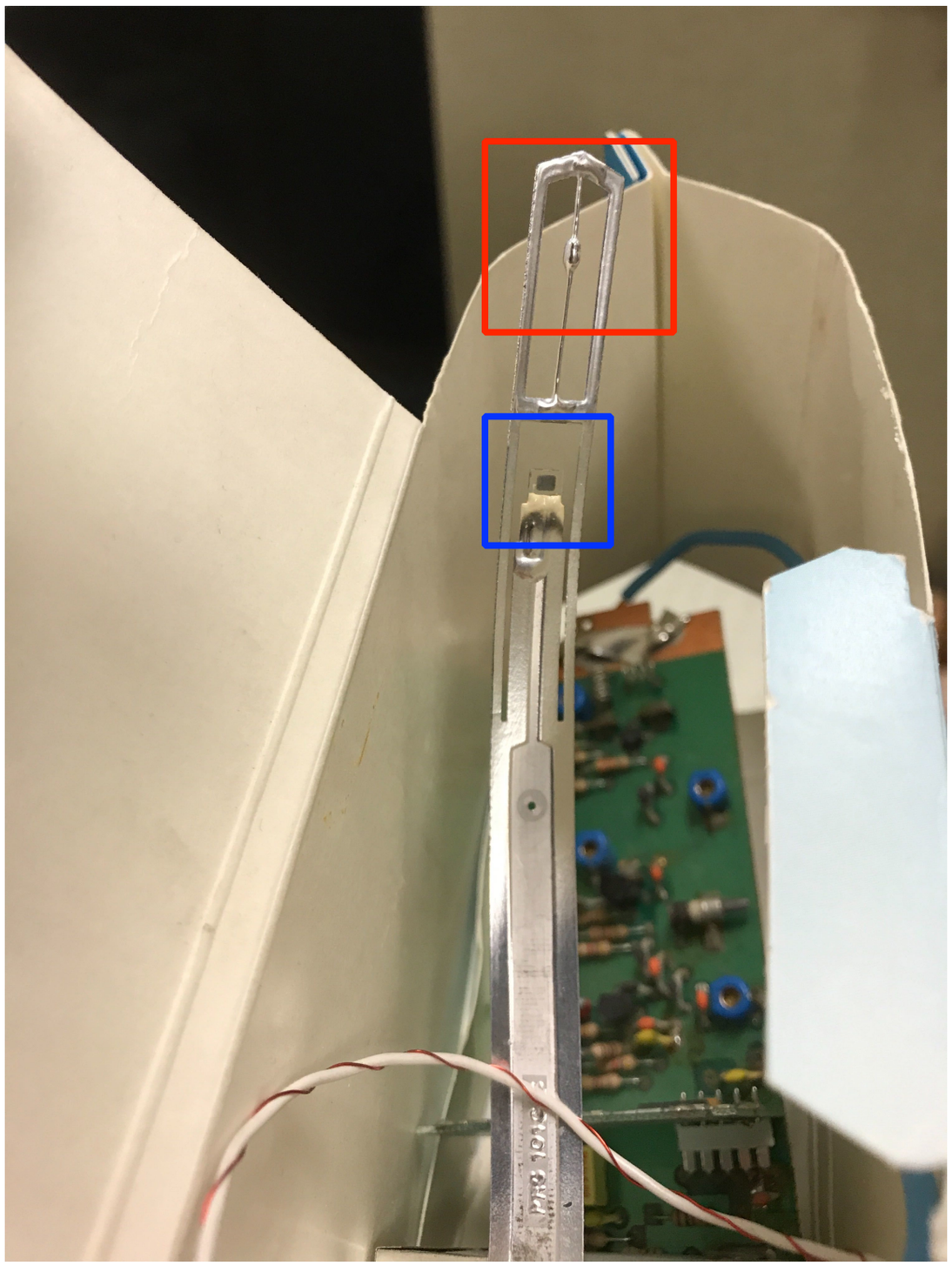
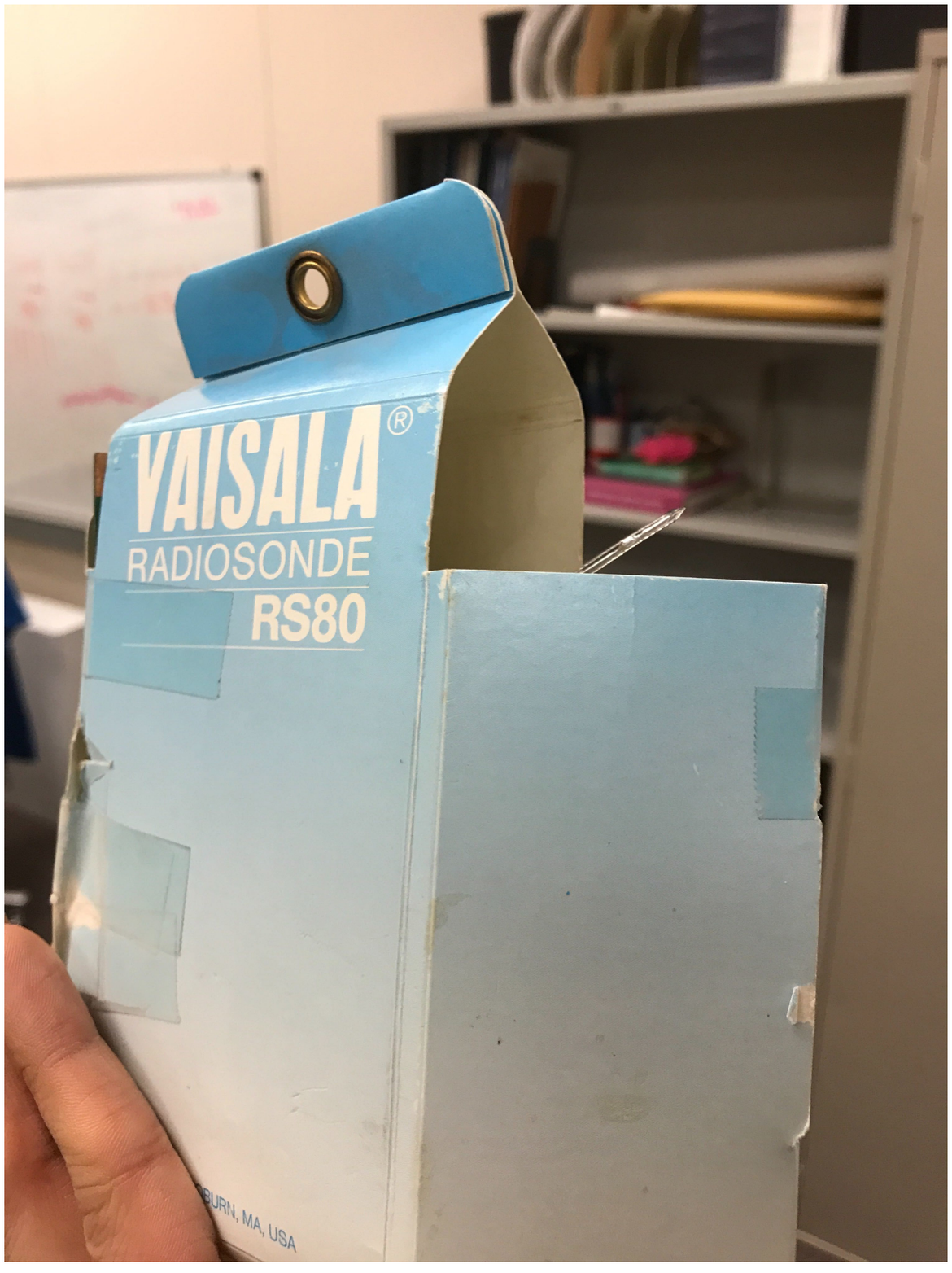
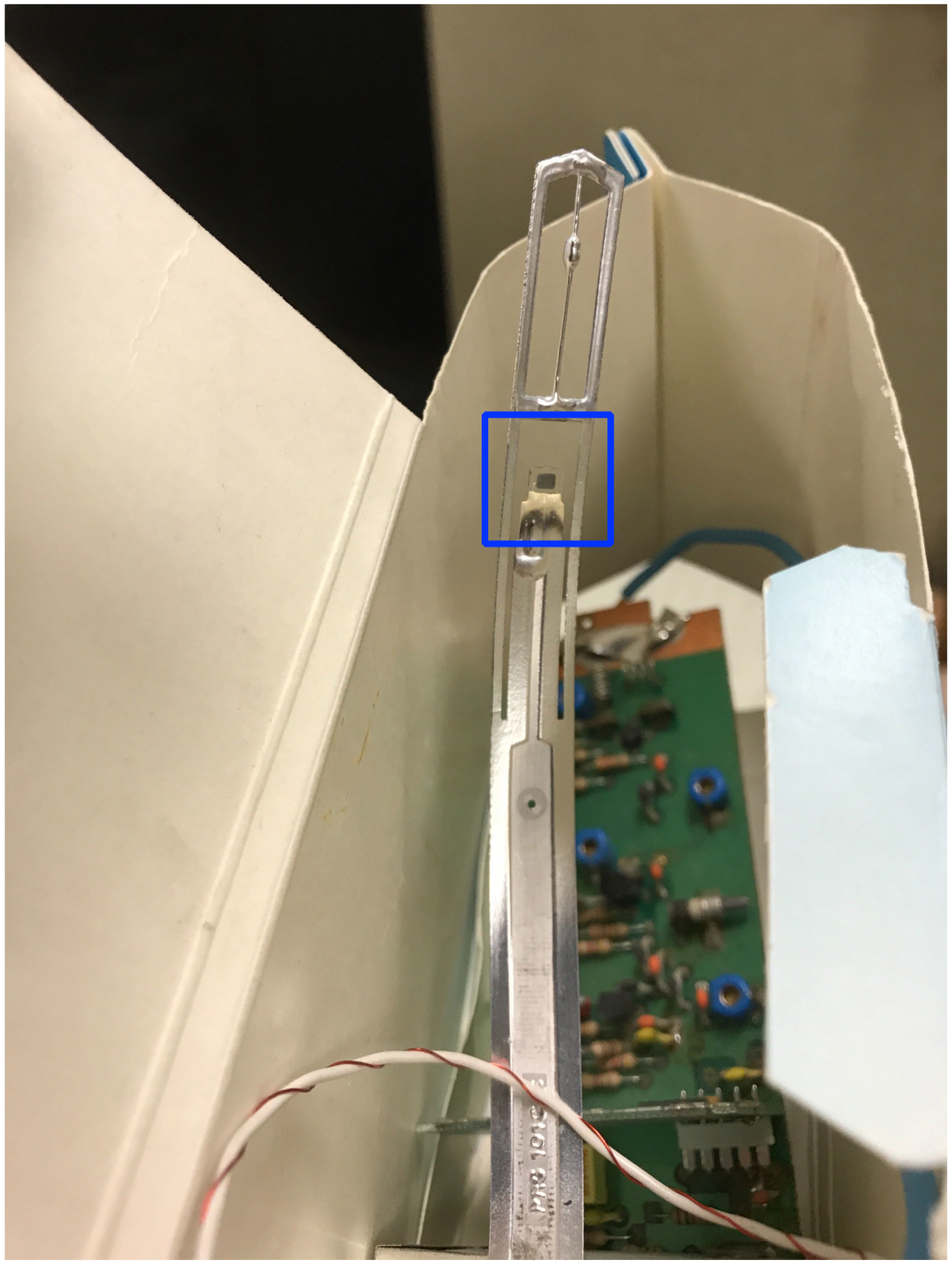
Vaisala Humicap





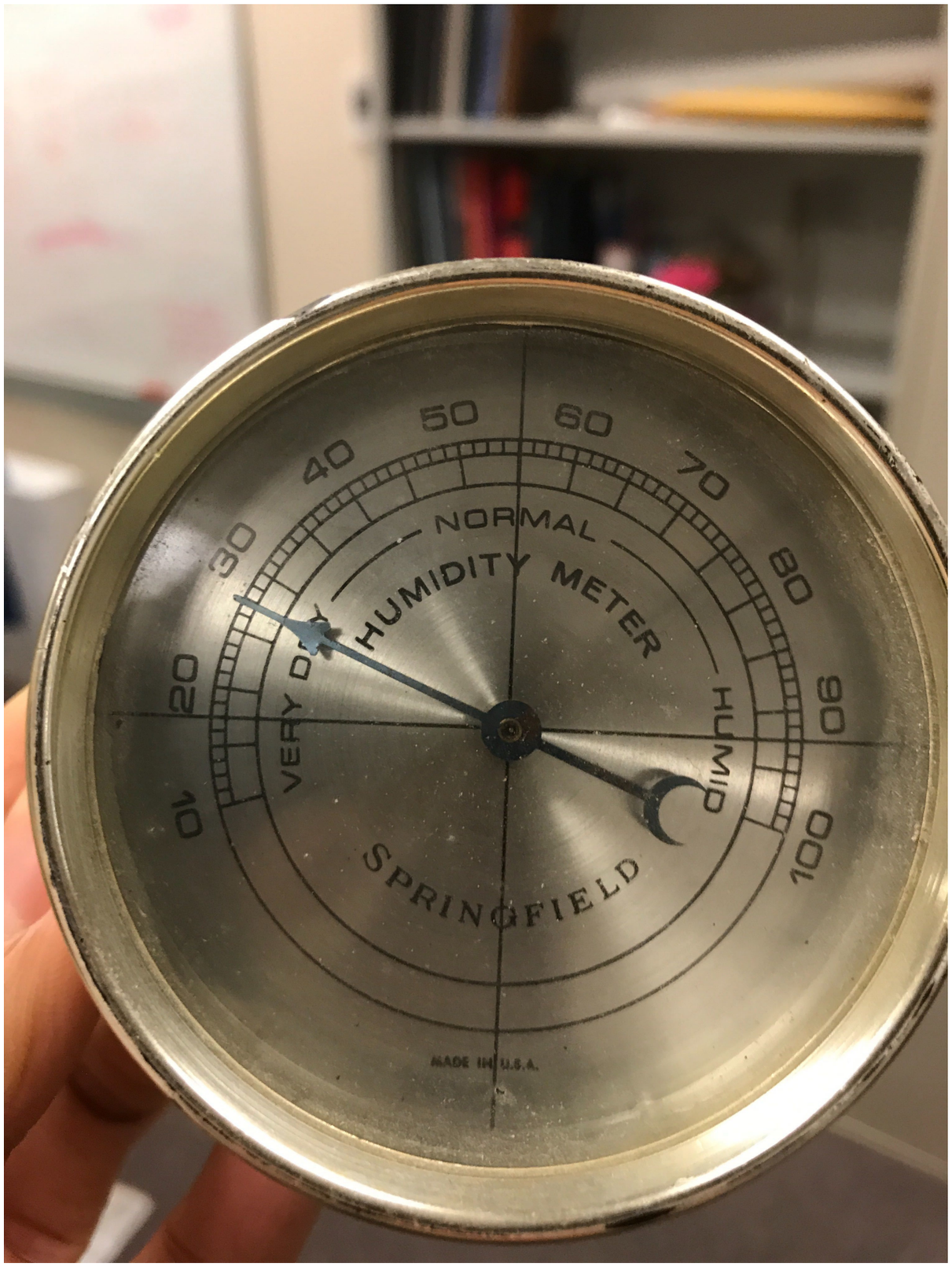
Vaisala Humicap



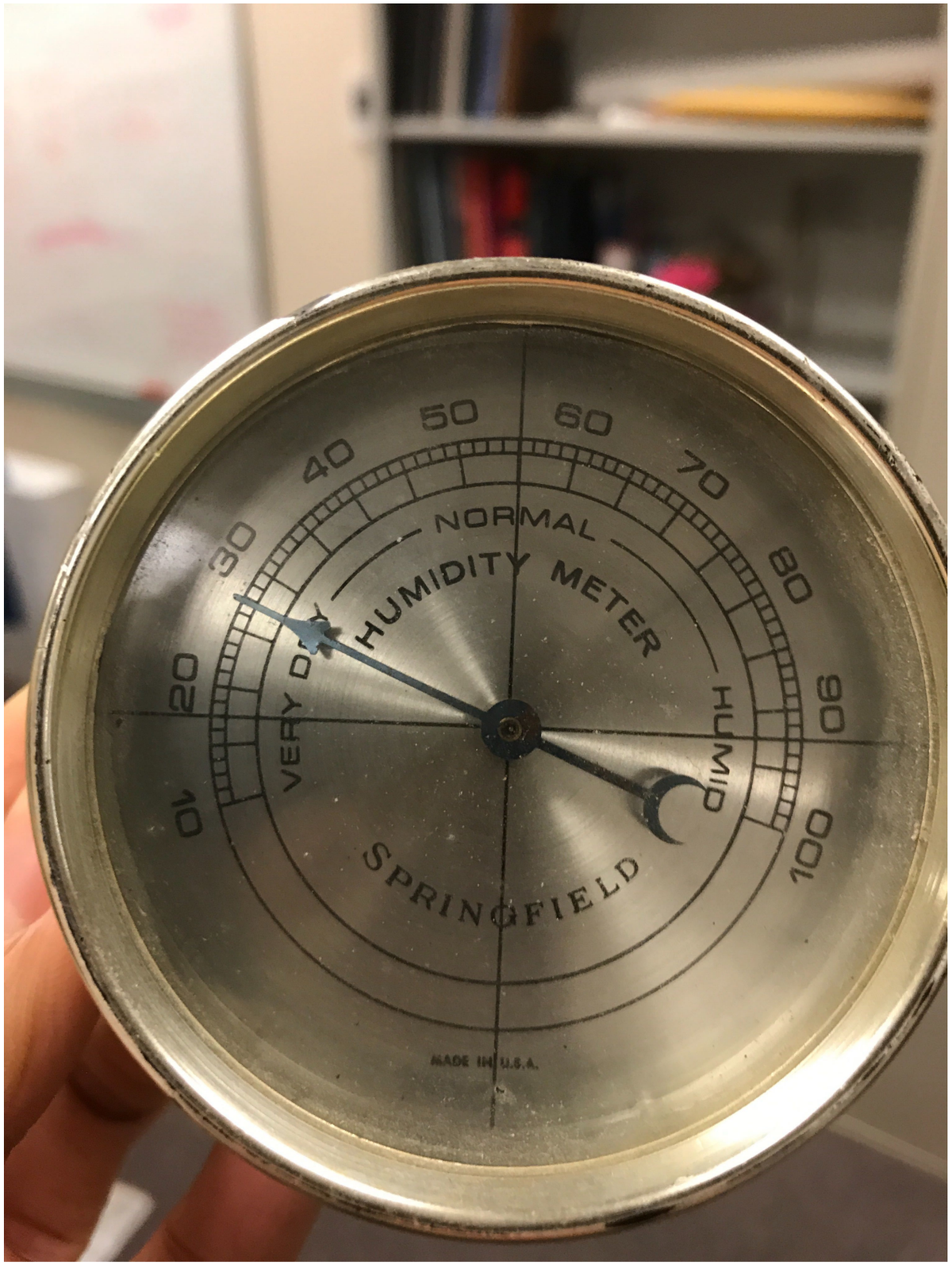
Kestrels

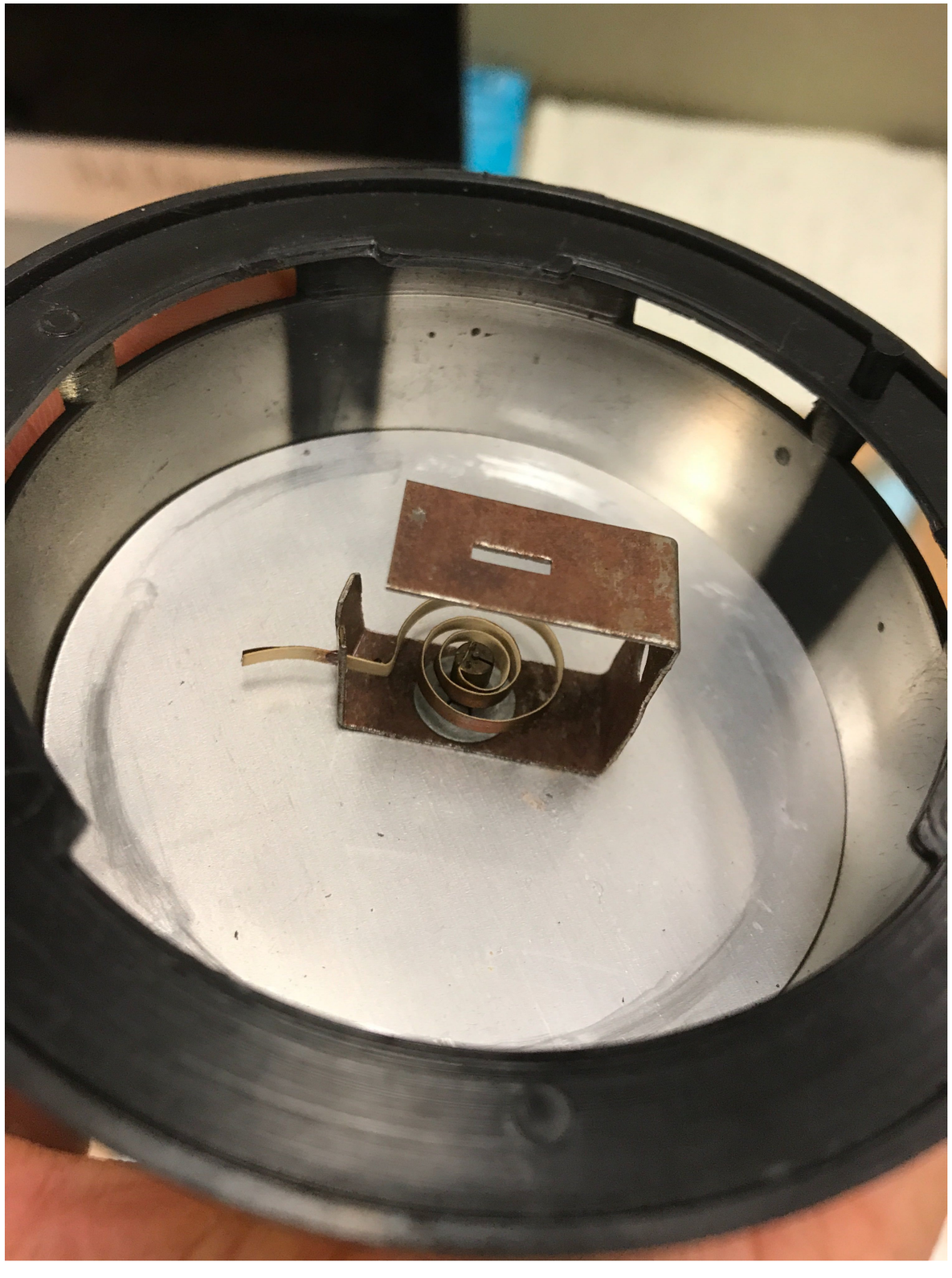

Kestrel
HUMIDITY
25.1
4000
Pocket Weather Tracker
Kestrel
HUMIDITY
28.4
FIRE WEATHER PRO

Moisture-Content Meter



Moisture-Content Meter





Carbon Hygristor