Instrument Setup

Michael (Mike) Brohart
Environment and Climate Change Canada (ECCC)

17th WMO-GAW Brewer Operator Course
14th Inter-comparison Campaign of the Regional Brewer Calibration Center-Europe
June 17-28, 2019

Brewer Spectrometer Unpacking Instructions

All Brewer Models

1. Remove Brewer from the shipping case
2. Remove the Brewer cover.
3. Remove the piece of foam over the control panel and place it in the zip-lock bag that was also at the control panel
4. Remove the piece of foam under the spectrometer case, between the spectrometer case and base or heat sink assembly and place it in the zip-lock bag.
5. Remove foam on the top part of the split-gear in the zenith drive and place it in the zip-lock bag.
6. Replace the Brewer cover.
7. Remove the piece of foam over the zenith prism window and place it in the zip-lock bag.
8. Remove the UV dome protector cap on the UV dome after the Brewer has been installed onto the tracker.
9. Put the zip-lock bag into the Brewer shipping case before storing.

1. Remove Brewer from the shipping case

The Brewer will arrive in wooden cases or aluminum cases

Wooden Case:

- Remove foam that from the top of the Brewer and the top half of the foam pieces on the sides of the case.
- Have two people access the side handles to remove the Brewer from the shipping case.

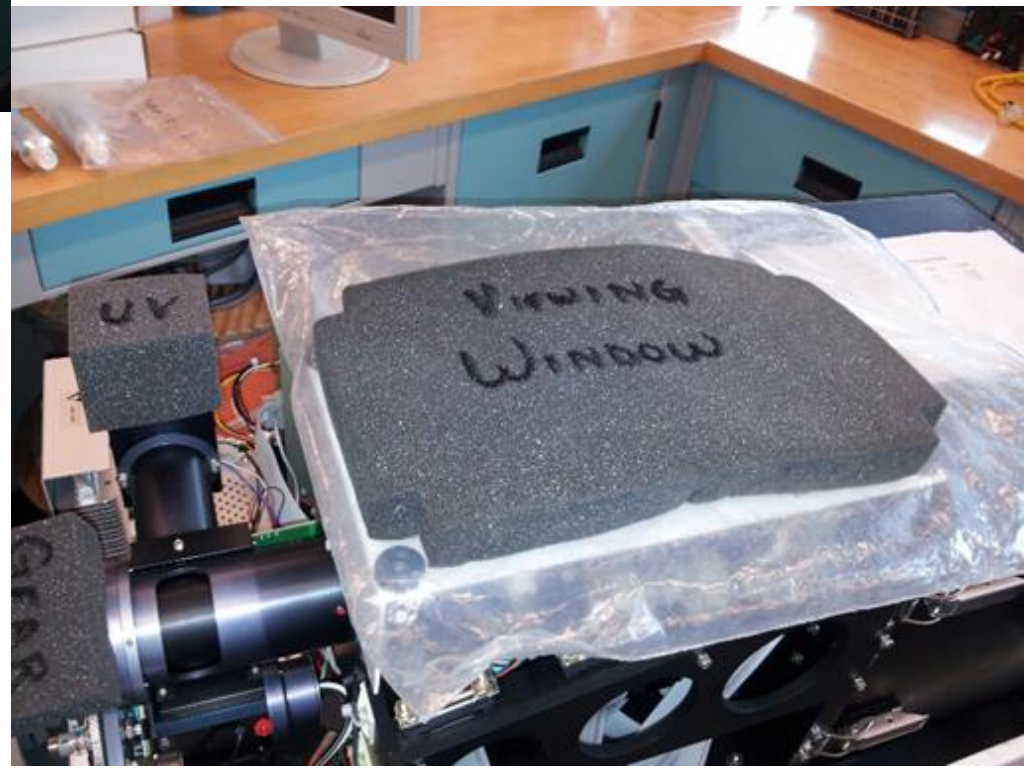
Metal Case:

Open the packing case, remove the straps and frame to access the Brewer.

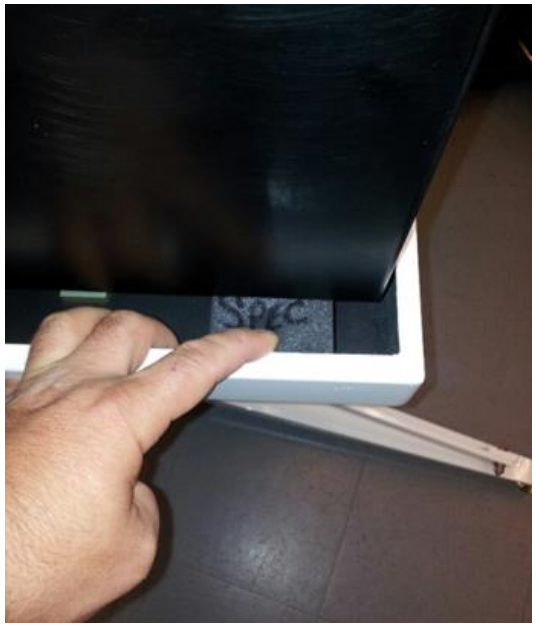
Have two people access the side handles to remove the Brewer from the shipping case.

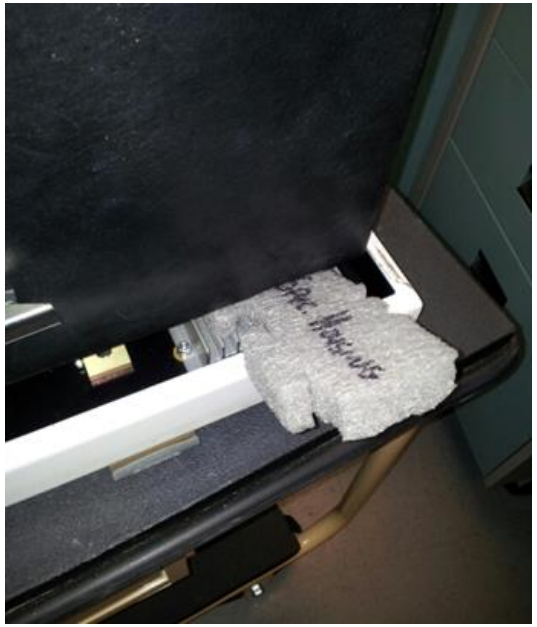
2. Remove the Brewer cover

3. Remove the piece of foam over the control panel and place it in the zip-lock bag that was also at the control panel

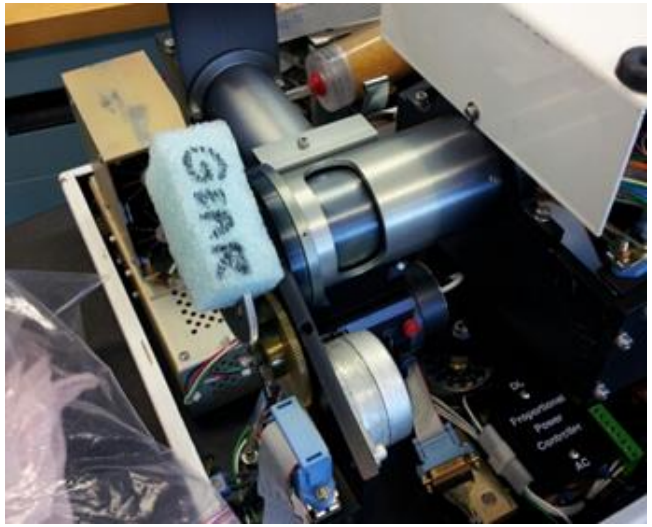


4. Remove the piece of foam under the spectrometer case, between the spectrometer case and base or heat sink assembly and place it in the zip-lock bag



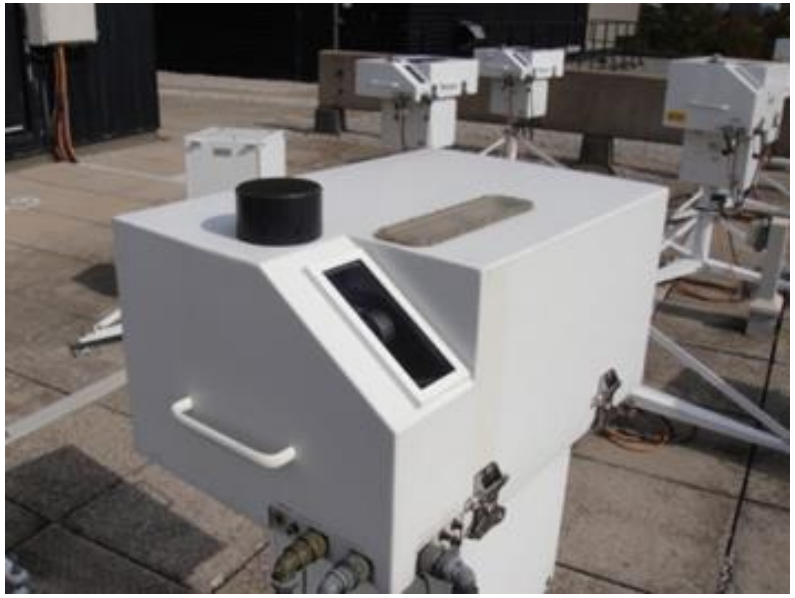


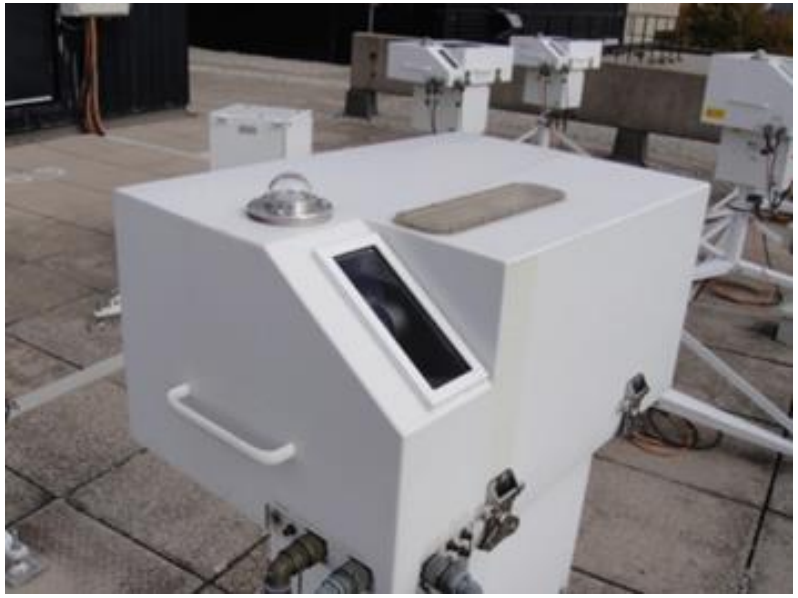
5. Remove foam on the top part of the split-gear on the zenith drive and place it in the zip-lock bag.



6. Replace the Brewer cover.

7. Remove the piece of foam over the zenith prism window and place it in the zip-lock bag.

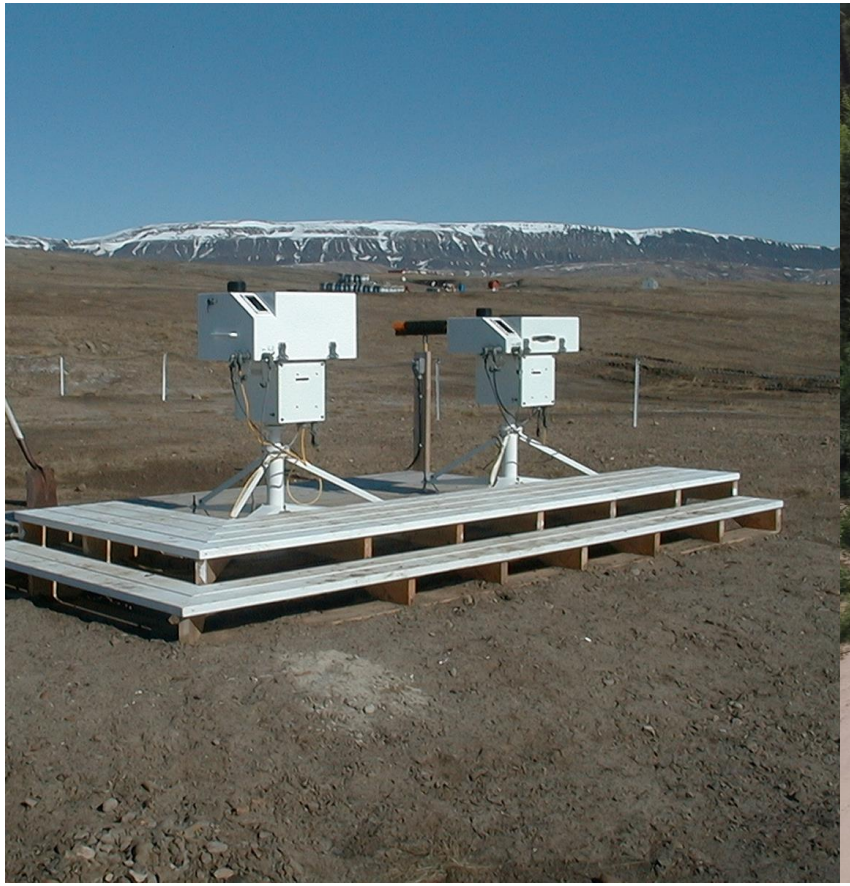




8. Remove the UV dome protector cap on the UV dome after the Brewer has been installed onto the tracker.

Proper Site Selection for the Brewer Spectrophotometer

Select a site with an open horizon

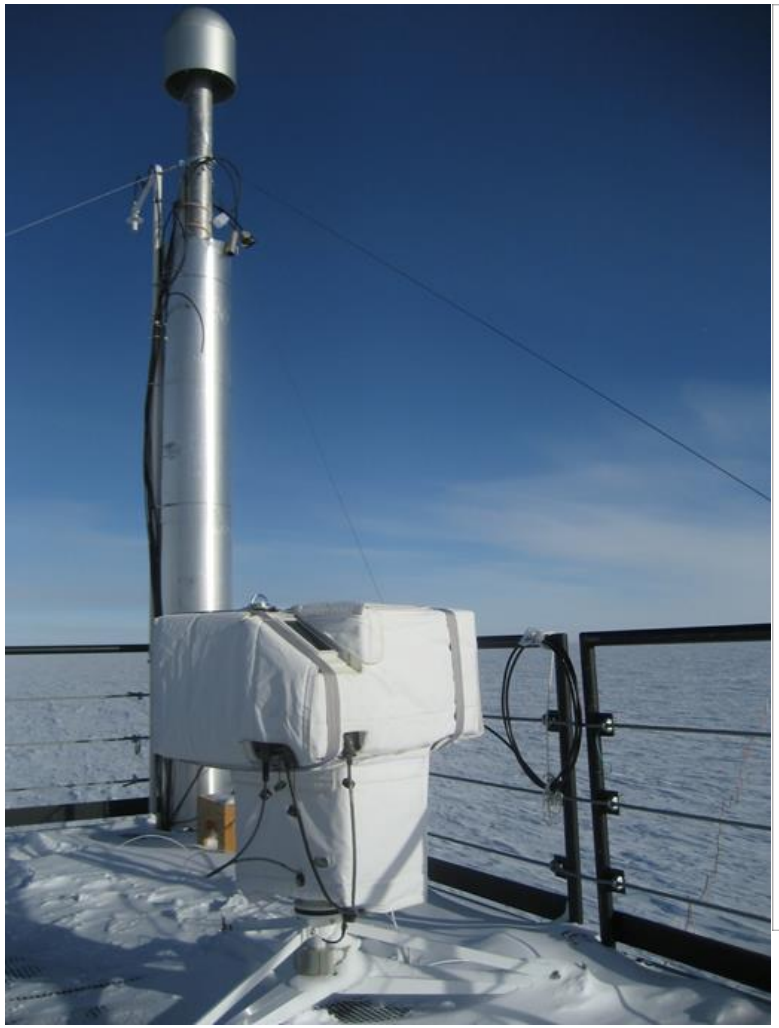


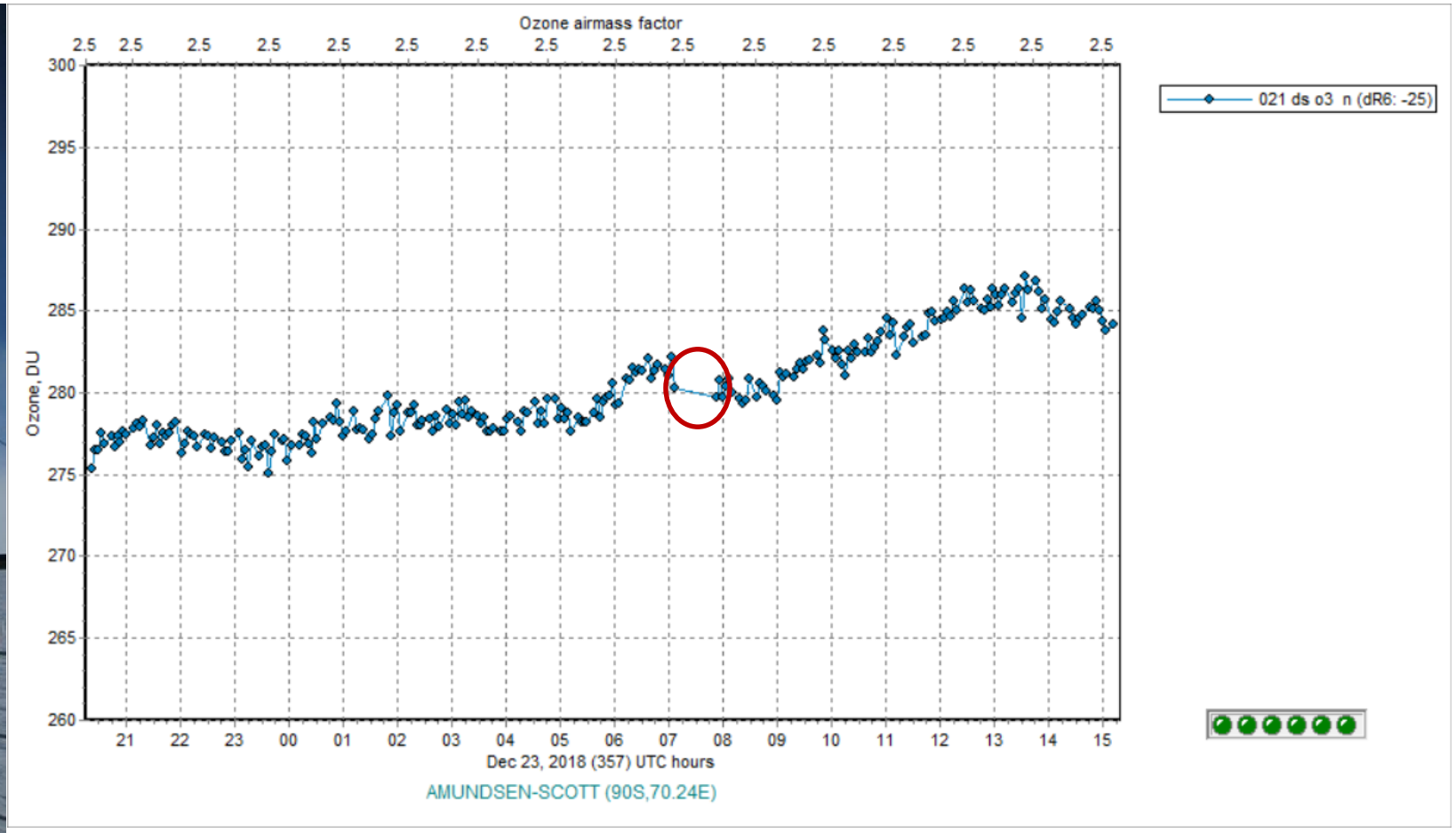
Eureka, Ellesmere Is, NU Can.

Goose Bay, NL, Can.

Amundsen-Scott (SPO)

Instrument location will affect the data





Securing the Brewer against wind or accidental shifting

Tripod Installation Instructions

1. If the tripod is not already at the instrument platform, assemble the tracker and orient one leg toward the Equator.

Tracker Installation Instructions

1. Place the Delrin (plastic) disk on the tripod aligning 3 of the holes with the holes in the tripod mounting plate.

2. Use the larger hardware to assemble the tracker to the tripod. The smaller socket cap screws will be used later. Orient the Equator Label on the tracker shaft to the Equator facing tripod leg. If your tracker has the “N” indicator, it should be on the opposite side, facing away from the Equator facing tripod leg.

3. Attach the Brewer data and power cables to the tracker shaft bulkheads. The connectors are “keyed” and are different. The data is a 10 contact socket connector (female) and the power is a 6 contact socket connector (female). Observe the cable connectors and the labeled bulkheads on the tracker shaft to ensure the cables are installed at the proper locations.

Brewer Installation Instructions

1. Place the Brewer on the tracker. The power button of the tracker should be below the power button on the Brewer. You should feel the alignment pins on the tracker mate up with the shock mount bolts. The rubber feet of the Brewer will mate up to the 90 degree metal tabs on the tracker. Note how straight the bolt lines up through the hole in the 90 degree metal tab. A slight shift of the Brewer may be needed to allow the socket cap screws to thread properly. Install all 4 screws loosely, and then secure all 4 screws. This reduces the chances of cross-threading the bolts. Fully thread the bolts into the Brewer foot but use light torque to secure. Do not over-tightened. Too much pressure will cause the rubber feet to split.

2. Remove the Cable and Bulkhead protective caps

3. Attach the Brewer power, data and azimuth cables to the Brewer bulkheads. The connectors are “keyed” and are different. The data is a 10 contact socket connector (female); the power is a 6 contact socket connector (female) and the azimuth is a 10 contact pin connector (male). Observe the cable connectors and the labeled bulkheads on the brewer to ensure the cables are installed at the proper locations.

Instrument Communications and Power

Communications

- RS232 - Rated for 23 meters
- RS422 - Rated for 1500 meters
- USB to Serial devices commonly used
  - SerialGear - Robust / No external Power / RS232-RS422 switchable

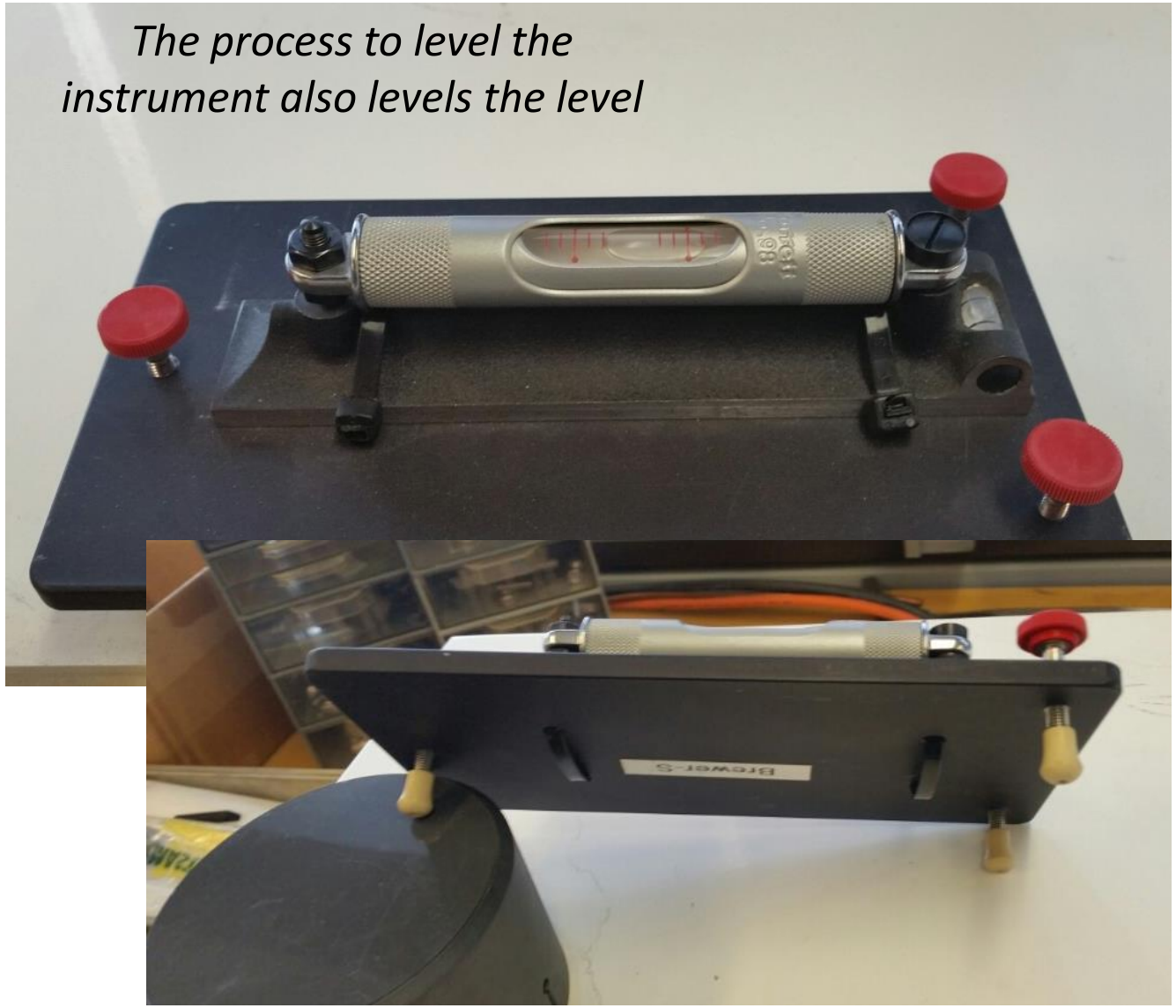
Power

- 120/240 switching power supplies
- Normal power usage < 50W
- Cold weather options (heaters)
  - Total wattage of the heaters would need to be added to calculate total power requirements

➢ All Cables should be temperature rated for the yearly temperature conditions of the site.

Instrument Level

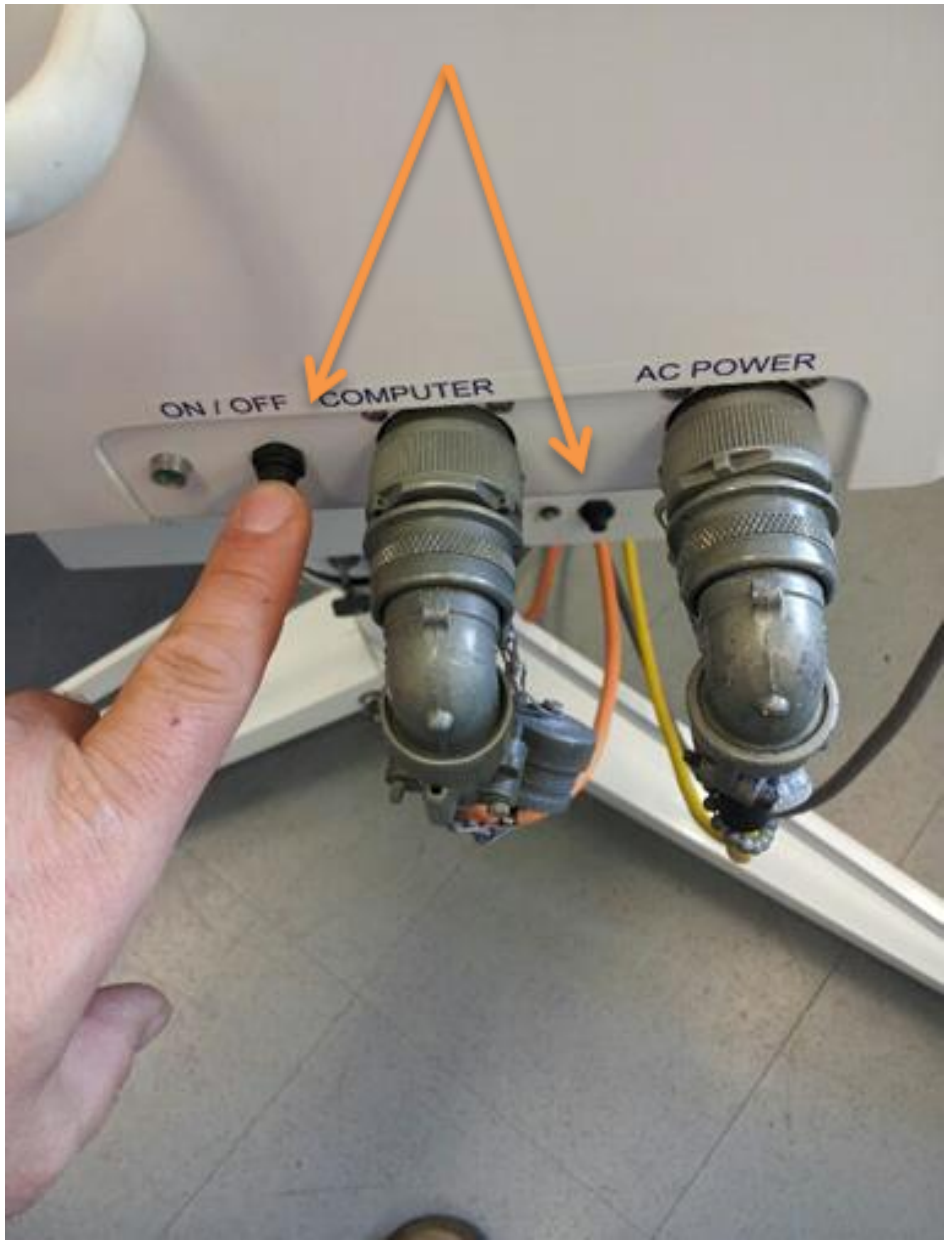
The process to level the instrument also levels the level



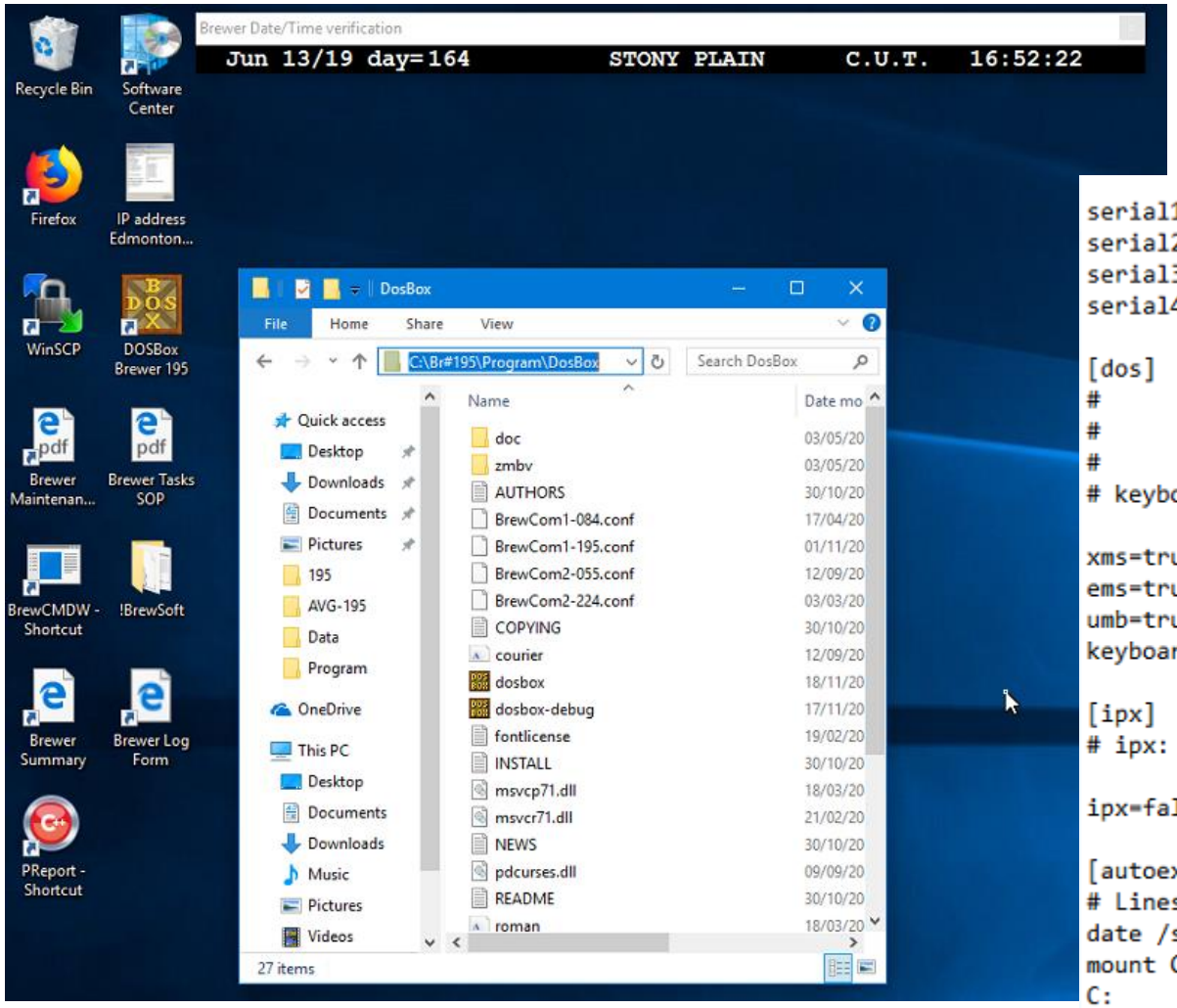
The Brewer is been designed to have a slight crown in the lid. That is, the middle of the top is supposed to be higher so water does not pool on the instrument.
The instrument top is not flat so adjustment feet are needed on the level to correct for the uneven lid.

An unlevelled instrument will not track the sun properly resulting in poor and missing data.

4. Turn on the Brewer and the tracker.

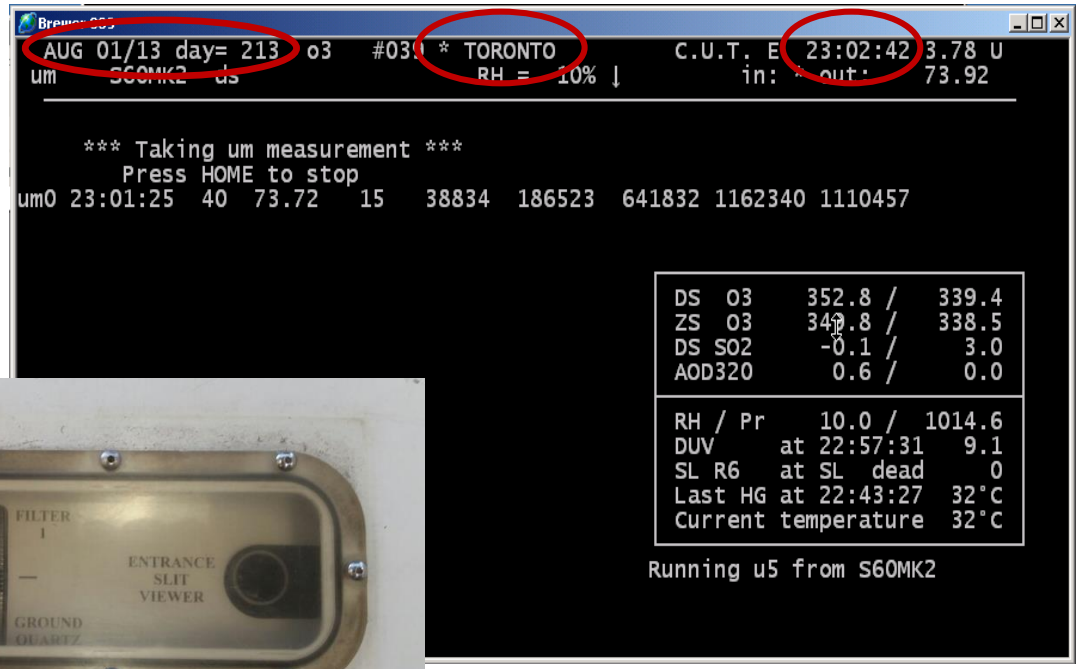


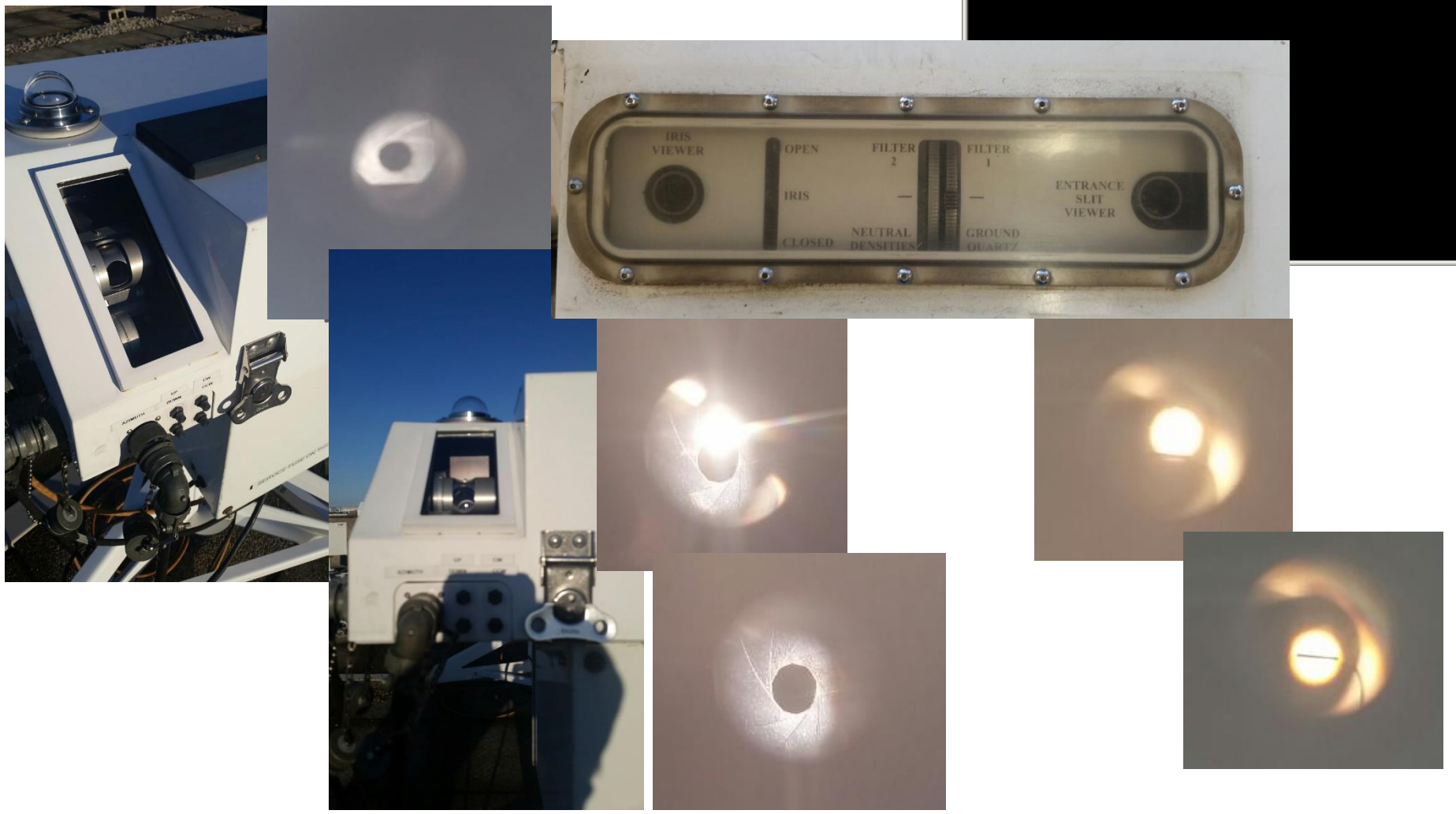
Install, setup and configure the Brewer software for your instrument




```
serial1=directserial realport:COM6
serial2=disabled
serial3=disabled
serial4=disabled

[dos]
#            xms: Enable XMS support.
#            ems: Enable EMS support.
#            umb: Enable UMB support.
# keyboardlayout: Language code of the keyboard layout (or none).

xms=true
ems=true
umb=true
keyboardlayout=auto

[ipx]
# ipx: Enable ipx over UDP/IP emulation.

ipx=false

[autoexec]
# Lines in this section will be run at startup.
date /s
mount C C:\
C:
cd \Br#195\program
brewer.bat
```

- Ensure the date and location is correct
- Ensure the correct time (in GMT)
- Sighting on the sun – likely a large correction



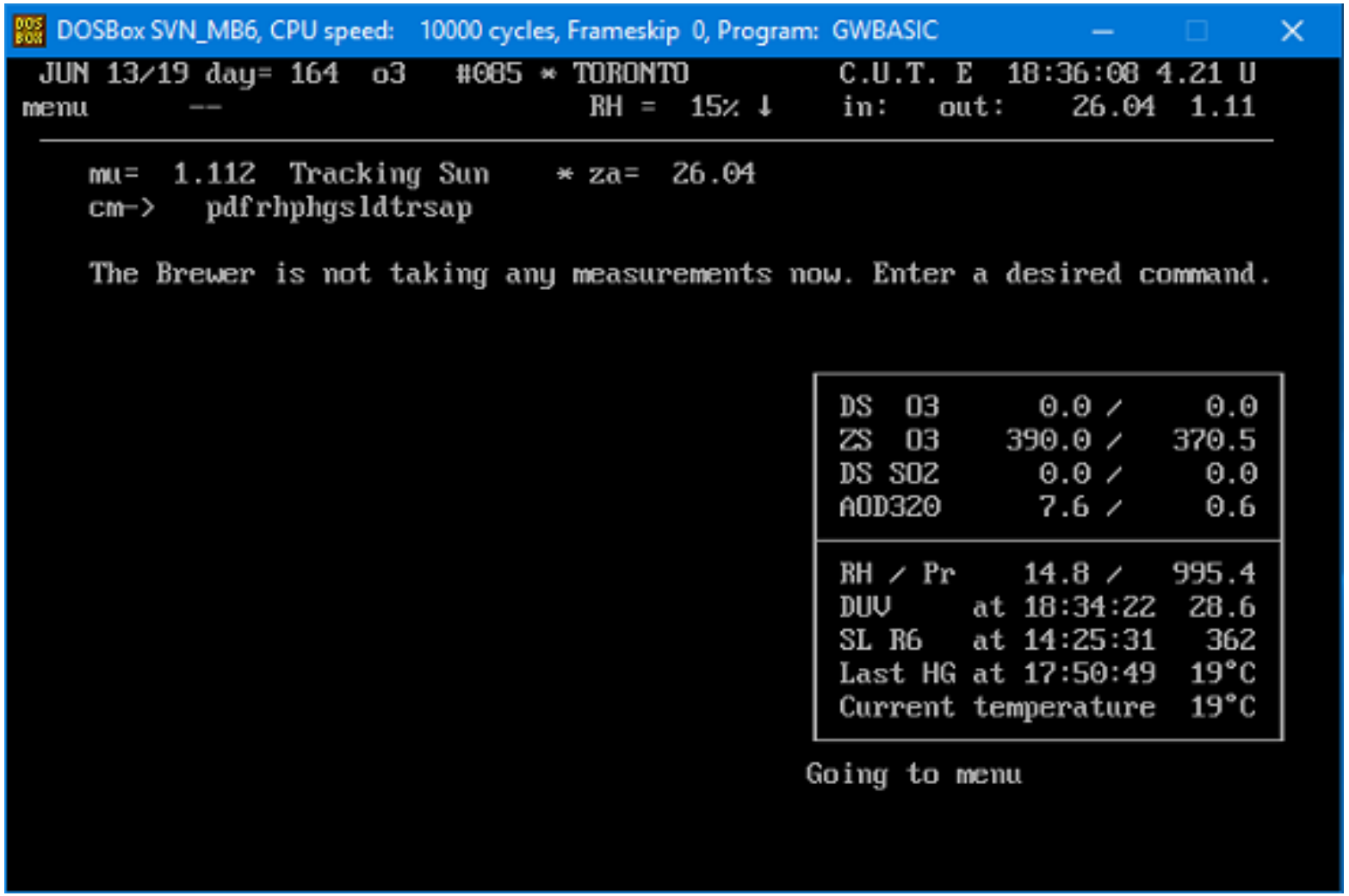


Test the instrument functionality before attempting to run a schedule

Review diagnostics tests to ensure the instrument is capable of making good measurements

The string does the following:

Pd – Write the results to the “D” File
Fr – Run the micrometer(s) to the optical switch and back to the operating position
Hp – Position bottom micrometer to top micrometer to optimize intensity
Hg – Perform a scan on the hg reference line and adjust for any change in instrument temperature
Sl – scan the standard lamp and calculate ratios
Dt – run a dead time test
Rs – run a run/stop test
Ap – pole and record the voltages from the A/D card



Questions, Comments, Other Thoughts?