# **TROUBLESHOOTING - GOSUN**

### + Return to TROUBLESHOOTING

When in MANUAL mode the sensor head should point to the sun when the GOSUN option is selected. The proper alignment is shown in the Cimel Set-up section of this website. [Setup] If the GOSUN alignment is off:

- Verify the Cimel time is in UTC time and accurate to +/- 10 seconds (One can acquire accurate time from the web link on this website [UTC time])
- Verify the Latitude Longitude parameters are correct for the given location (Correct parameters will be provided or can be calculated with the program on this website [Lat params])
- Verify the MANUALLY parked Cimel sensor head is level and the zenith nut under the central bubble level is firmly tight (see Cimel installation images)
- Verify the robot itself is level (see Cimel installation images)
- Verify the sensor head is attached correctly to the robot arm--sometimes it is attached correctly except for being rotated 180 degrees.



Correctly attached



Reversed

# **TROUBLESHOOTING - TRACK Procedure**

# + Return to TROUBLESHOOTING

The GOSUN procedure will point the sensor head to the approximate sun position based on the time and location, then the fine alignment will occur using the tracking algorithm and the 4-quadrant detector (the small dark window on the face of the sensor head, opposite the collimators)



Sensor Head Face

If, in the MANUAL mode, the GOSUN procedure points to the sun properly, but the TRACK procedure does not work:

• Detach the sensor head cable from both the sensor head and cimel control box, and then firmly re-attach. If a connection is not being made properly between the sensor head and control box the tracking will not function correctly



Attaching the Data Cable

• Verify that the 4-quadrant detector window is unobstructed and clean

# **TROUBLESHOOTING - Wet Sensor**

### + Return to TROUBLESHOOTING

There are various problems that can be associated with the wet sensor. The wet sensor has 2 statuses, active or non-active ('0' or '1').

To view the current status:

- Select VIEW then BAT from the Cimel control box display
- Press the red button repeatedly until it reads HH
- Observe whether the screen is displaying a '0; or a '1'. '1' is for an activated (wet) sensor.
- If '0', wet the sensor and observe whether the HH status changes to '1' within a minute

Sometimes the wet sensor is continuously active (falsely) which inhibits normal AUTO Cimel operation. Possible causes include

- Contaminant on sensor surface such as salt--> Clean sensor with fresh water
- wet sensor cable is bent or pinched
- The wet sensor is located where water can accumulate

Morning messages can also be routinely missed if the wet sensor is covered with dew. Place the sensor where it will be in morning sunlight to promote evaporation

If the sensor never activates:

• Adjust the wet sensor tip gently to ensure contact is being made between the sensor plate and the sensor cable

If none of these solutions help, the sensor may be damaged

• Contact Goddard for a replacement sensor



Wet Sensor

### + Return to TROUBLESHOOTING

#### **Almucantar Scenerio**

The alumucantar scenerio is the procedure where an direct sun observation is taken initially, then while maintaining the same solar zenith angle, a range of azimuth positions are measured as the sensor rotates on its axis. The latest software version allows the Cimel to divide this procedure into 2 steps--scanning 180 degrees on one side, then 180 degrees on the other, rather than performing a full rotation. Binding may still result when the rotating robot is inhibited by its cables rubbing on or catching on an obstruction (typically binding on the robot body itself). These measurements are taken at a range of airmasses, with greater frequency at the beginning an end of the day.

• Observe a pair of azimuth scans and verify that the cables are not impeding the motion

A second possibility is that there is an obstruction of some kind in one of the collimators, e.g., a spider web.

• Remove the collimator and look through it toward the sun to verify that it is free of contamination

### To Initiate an Almucantar

In MANUAL mode:

- Enter the scenario (SCN) mode
- Scroll until PARK is displayed, then press GO
- Scroll to GOSUN, then press GO
- Scroll to TRACK, then press GO
- Once the sensor is aligned on the sun, scroll to ALMUC, then press GO

The Cimel should begin the automated almucantar procedure. Observe that the full rotation of the sensor head is not being inhibited by its cables contacting the robot body. Sometimes, the gray enclosure box needs to be moved closer to the robot to allow sufficient cable length for free movement.

- After a few complete scans, scroll to OFF, then press GO. NOTE: The MANUAL almucantar procedure will continue indefinitely until terminated.
- Scroll to PARK, then press GO.
- Return the instrument to AUTO mode

### **TROUBLESHOOTING - Low Cimel Battery**

#### + Return to TROUBLESHOOTING

The cimel makes use of two batteries: an external 12V battery (the smaller of the two 12V batteries) and an internal (inside the control box) 5.0V battery. Both of these are charged by the smaller solar panel (typically a 5W panel) which is connected at the connector panel of the control box.

If the batteries are low:

- Verify the orientation of the solar panel. For maximizing the year-round power, the solar panel should be tilted toward the Equator at an inclination equal to the local latitude + 15 degrees
- Verify that the solar panel is clean. It should be rinsed regularly with clean water



5 Watt solar panel for Cimel

• Verify that the phone-type connector is undamaged and properly attached on the control panel where it is marked 'SP'

If only the 12V battery is low:

- Verify that the battery's green 3-pin connector is undamaged and properly attached to the connector panel
- Verify that the connectors have not loosened from the positive and negative

terminals of the Cimel battery



Cimel external battery



Cimel internal battery (removed)

# **TROUBLESHOOTING - Robot Not Responding**

## + Return to TROUBLESHOOTING

If the robot does not respond to commands from the Control box in MANUAL mode:

- The external 12V battery is low
- The battery 3-pin connector is loose
- The AZ or ZN cables are not properly attached to the connector panel (loose or reversed)



Cimel connector panel with cables attached