



## Information on Submitted Observing Requests

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### Motivation:

LCOGT's many telescopes, distributed over multiple sites, offer many opportunities to observe science targets. However, one disadvantage of such a complex network is that it is difficult to track where and when requests get observed and why some requests do not get observed at all. Some LCOGT users are dissatisfied with the information on observing requests that's available through the observatory portal. In particular, labeling uncompleted requests as "Unschedulable" is frustrating, because users are uncertain whether the label indicates errors on their part (i.e. in the composition of the request) or factors beyond their control (i.e. competition for the available Network resources). The scheduling software is notified of many Network conditions (bad weather, internet outages, instruments offline for repair) that affect the likelihood that a request will get scheduled. We are now trying to provide better feedback to users about the current and past status of their observing requests.

### Overview:

A richer set of information on any submitted observing request is now available in the [observatory portal](#). By clicking on an observing request, users can see where and when a target is observable, the status of the relevant telescopes, and if and when the request is scheduled to be observed. Instructions on how to obtain this information programmatically via an API will be available soon at LCOGT's [Developers page](#).

### New Features:

Requests that cannot be granted because they are not possible within the constraints specified by the user will be rejected at the point of submission. An exception will be returned stating that the request's duration did not fit into any visible windows, giving the duration and the size of the largest visible window for reference. The user can then choose to either shorten the request, shift or expand the observing window, or select a different instrument and resubmit. For Sidereal

targets, the [visibility tool](#) can be used to show which telescopes can see a target on a given date.

In the [observatory portal](#), on the page showing the list of a user's submitted requests, the four major "Request state" categories are now Completed, Canceled, In Progress, or Not Observed. The "In Progress" state doesn't necessarily mean that an observation is currently underway; it means that not all observations created as part of that request have reached a final state. The "child" requests could be in a mixture of states: scheduled, not scheduled, etc.

Clicking on a particular request in the submitted request list takes the user to a new page. Basic information about the request (information provided by the submitter) is shown in the top left and top right corners. Included are the time that the request was submitted and the request tracking number (from the page's url). Individual observations are represented by bars across the page which show the Request ID numbers, the latest status of the requests, and (if a request was completed) the option to download the data from the science archive. The color of a bar reflects its request status. **Clicking on a bar expands it to reveal a set of detailed information about the request.**

#### **Request Details:**

Request details include the constraints of the request, the starting and ending times of the observing window, the selected camera type, filters, exposure times, and numbers of exposures. This is the information that was available in the previous version of the observatory portal.

#### **Scheduled Block History Plot:**

This plot (see Figure 1) shows the history of the times the observing request ("block") was inserted into the network schedule. If the request has not yet been (or was never) scheduled, the plot will be blank. **The presence of a bar of any color indicates that the request was scheduled.** Each row of the plot shows the result of one run of the scheduling software. A new row is displayed, with its corresponding run number, only when the status of a scheduled block changes, i.e. it is scheduled with a new location or time. The length of a bar shows the duration of the observing request. The color of a bar indicates the status of the scheduled request, and the meaning of each color is shown by expanding (clicking on) the "Scheduled Block History Legend" below the graph. A block labeled as "scheduled in the past" (brown) was scheduled before the next run of the scheduling software, but information about whether the request was completed or failed hasn't yet been received, perhaps because of a disrupted internet connection. 'Superseded by new schedule' indicates the normal operation of the scheduler to

reschedule all pending blocks after each run.

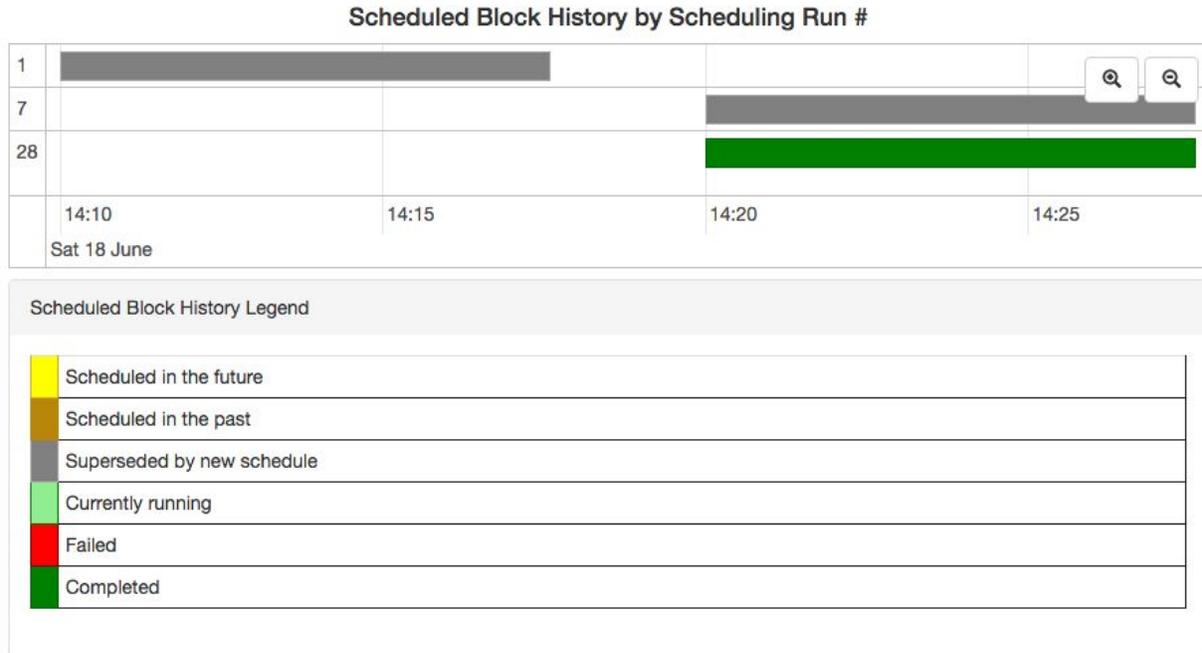


Figure 1: The Scheduled Block History plot. In this example, a request was initially scheduled to start at 14:10 UT, but a subsequent (automatic) scheduling run rescheduled the request to 14:20. It was later executed and successfully completed at that planned time.

### **Visibility (Airmass) Plot:**

This plot (see Figure 2) shows the visibility of the science target at the **eligible** Network sites over the duration of the observing window. Visibility is shown as the change in airmass of the target with time, and each site is coded with a different color. “Eligible” sites are those that have the type of telescope (e.g. 2-meter) or instrument (e.g. Sinistro) requested by the user. Only telescopes with visibility above the airmass limit of the request (default = 2.0), and within the window of the request, are shown.

### **Telescope Status Plot:**

This plot shows the status of each eligible telescope over the duration of the observing window (see Figure 2). The condition of each telescope is indicated by a color (click to expand the Telescope Status Legend). Times when a telescope is available for science observations are indicated in blue. The reasons why a telescope is not available are (a) the site is closed for bad weather (purple), (b) the telescope/instrument is out-of-service (orange), or (c) the internet connection to the site has been disrupted (black). The time when a request was actually carried out is coded in green. This plot is linked to the visibility plot above it, and the appearance of both can be changed simultaneously by scrolling (or clicking the buttons) to zoom, or by clicking and

dragging to pan.

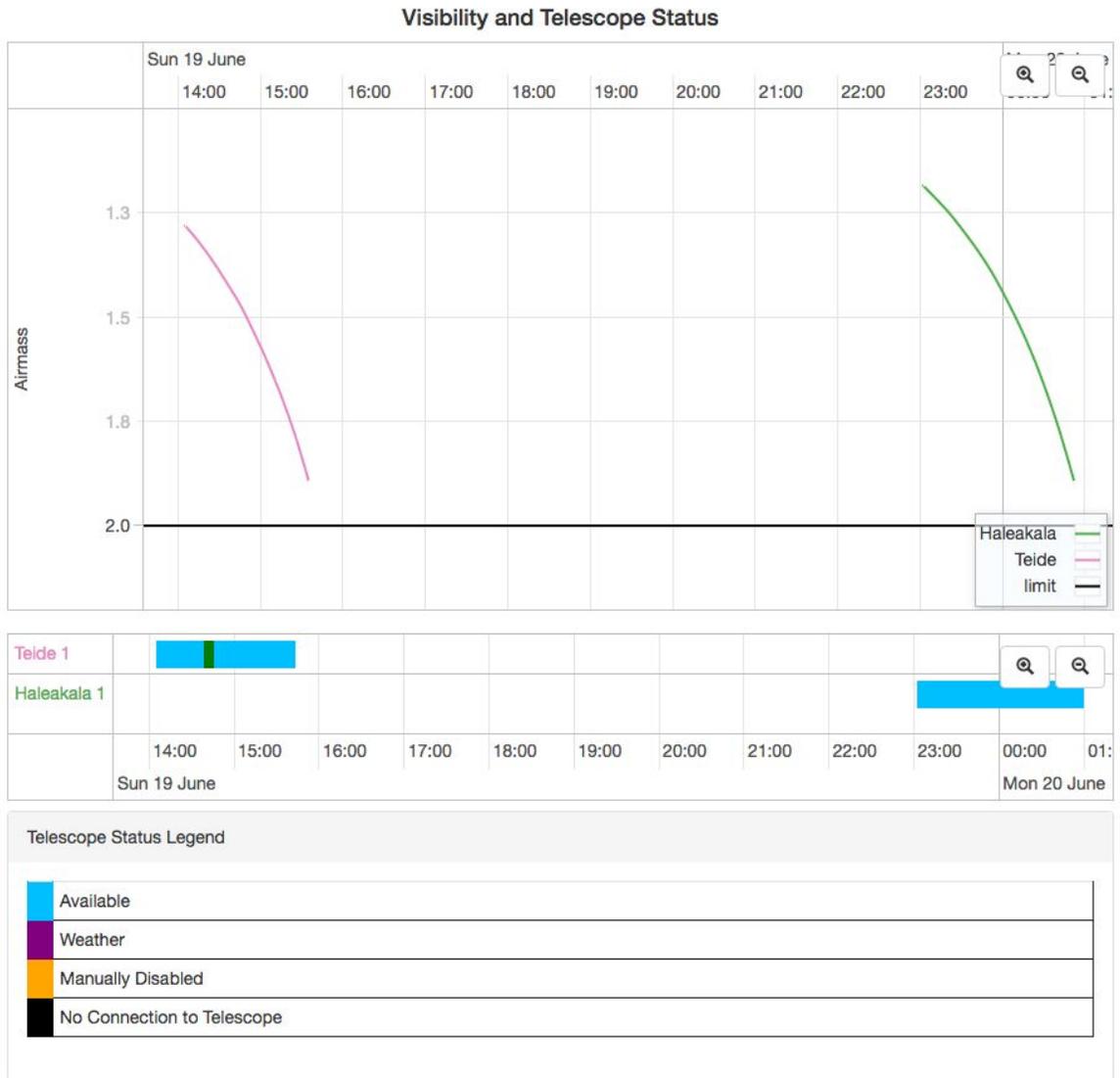


Figure 2: The Visibility (Airmass) Plot (top) and Telescope Status Plot (bottom). Here the target was visible (and setting) from the Teide and Haleakala sites, both of which were available in their respective observability windows. The observation was executed and completed successfully in the middle of the Teide observability window.

### **Exposure Thumbnails**

Thumbnail images of the exposures acquired by this request.

### **An example of how to use the new information:**

Consider that the “Request State” of a request is labeled “Not Observed” in the list of submitted requests. By selecting the request from the list, you are taken to the request’s tracking page,

where the request's latest status ("Requested Window Has Passed") is shown in the gray bar next to the Request ID. Clicking on the Request ID expands that request's details, and the scheduled block history plot shows you that the request *was scheduled* (gray bars) during some iterations of the scheduler. Checking the telescope status plot, however, might reveal that eligible telescopes were not available during all or part of the interval when the target was observable. For example, if all the bars in the telescope status plot are purple, then those sites were closed due to bad weather. However, if the telescope status plot indicates that some telescopes were available (blue) during the time when a target was observable, then it is likely that the request was displaced by another that had higher-priority.

**Further information:**

If users would like assistance understanding the new information available in the observatory portal, we encourage them to email [science-support@lcogt.net](mailto:science-support@lcogt.net). We hope that users find the new features useful.