

Transit Finder Guide for Project EXPLORE

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The following describes the use of a transit finder to determine which targets on the TTV Target List produce transits on a user-specified night or range of nights. The transit finder can be found at <https://astro.swarthmore.edu/transits/transits.cgi>. The following are recommended entries under each section of the transit finder's web page. Generally, only entries in item 3. need to change from night to night.

1. Target List: Choose NASA Exoplanet Archive.
2. Observatory. Select a known observatory in the list or choose "Manual coordinate entry" at the end of the list. If the latter, enter your latitude/longitude/timezone. Above the observatory location, select either UTC or local times to be displayed on the result page(s).
3. Date window. Select the beginning date of interest and the number of days following it, as well as the number of days prior to the beginning date.
4. Constraints. Select constraints on elevation values for ingress and egress. Since we are looking for full transits – i.e., that both the ingress and egress are viewable - select the AND constraint.
5. Hour angle: Enter -12 and 12.
6. Out-of-transit baseline: 1 hour is recommended, however, 0.5 hours may be needed to increase target opportunities for rare transit events. Check "Extend baseline..."
7. Depth: Enter 1.0 to get results for all of the candidates on the TTV Target List, otherwise enter the smallest depth that you believe your observatory is capable of detecting.
8. V magnitude. Enter 14, which should cover all targets in the TTV Target List.
9. Name: Copy and paste the following plain text Perl expression:

HAT-P-7 b|HAT-P-13 b|HAT-P-18 b|K2-19 b|Qatar-1 b|TOI-216.01|TOI-1130 c|TrES-3 b|WASP-4 b|WASP-12 b|WASP-19 b|WASP-43 b|WASP-148 b

NOTE: the above Perl expression should be modified as TTV targets are added or removed.
10. Keep all other default entries.
11. Click on Submit.

One or more pages will then be displayed that show, for a given observing evening, the target(s) from the TTV Target List whose transits are observable that evening or into the next day. These results are based on the previously user-entered timeframe and elevation constraints.

Some of the information that will then be displayed for each predicted transit includes: the V magnitude of the target star; the Start time, Midpoint, and End times in either UTC or local time (based on the user's prior selection); the target's ingress, midpoint, and egress times in BJD_TDB form; elevation angles of the target at the Start, Midpoint, and End times; the RA and DEC of the target; and the predicted depth of the transit.

In addition, other information is shown that should help the user determine the target's observability, such as the % of the transit that will be observable, as well as the azimuth and hour angle (HA) at the Start, Midpoint, and End times.

Finally, under the Name column to the left, there are links to other useful sites, such as finding charts and sites that provide more detailed information about each displayed target exoplanet.