HORIZONS Web-Interface
This tool provides a web-based limited interface to JPL's HORIZONS system which can be used to generate ephemerides for solar-system bodies. Full access to HORIZONS features is available via the primary telnet interface. HORIZONS system news shows recent changes and improvements. A web-interface tutorial is available to assist new users.

Current Settings

- Ephemeris Type: OBSERVER
- Target Body: Comet C/1880 C1 (Great southern comet)
- Observer Location: La Paz, Bolivia (68°10'58.8''W, 16°31'01.2''S)
- Time Span: Start=1879-12-08, Stop=1880-01-26, Step=1d
- Table Settings: QUANTITIES=1,4,9,20,23,24

Object Data Page

<table>
<thead>
<tr>
<th>JPL/HORIZONS</th>
<th>Great southern comet (C/1880 C1)</th>
<th>2006-Jun-03 04:44:38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rec #</td>
<td>900921</td>
<td>Soln.date: -</td>
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</tbody>
</table>

FK5/J2000.0 helio. eclip. TWO-BODY elements (AU, DAYS, DEG, period=Julian yrs):

- EPOCH= 2407742.6182 != 1880-Jan-28.1182000 (CT)
- RMSW= n.a.
- EC= 1.045494
- QR= 86.2486
- IN= 144.6666
- A= 9.999999E99
- ADISP= 9.999999E99
- PER= 9.999999E99
- ANOMOM= 0.01803187
- DAN= 0.01031
- DDA= 0.01176
- L= 282.3725324
- B= 35.2464159
- TP= 1880-Jan-28.1182000

Physical & non-grav parameters (KM, SEC; A1,A2,A3=AU/d^2; DT=days):

- GM= n.a.
- RAD= n.a.
- A1= n.a.
- A2= n.a.
- A3= n.a.
- DT= n.a.
- M1= n.a.
- M2= n.a.
- k1= n.a.
- k2= n.a.
- PHCOF= n.a.

COMET comments
1: soln ref.= SAO_2005, data arc: 1880-Feb-06 to 1880-Feb-20
2: USED, TWO_BODY;time units are UT, but set to ET; original epoch not defined, assumed

Results

***********************************************************************************************
Ephemeris / WWW_USER Sat Jun 3 04:44:39 2006 Pasadena, USA / Horizons
***********************************************************************************************
Target body name: Great southern comet (C/1880 C1) {source: SAO 2005}
Center body name: Earth (399) {source: DE405}
Center-site name: (User Defined Site)
***********************************************************************************************
Start time : A.D. 1879-Dec-08 00:00:00.0000 UT
Stop time  : A.D. 1880-Jan-26 00:00:00.0000 UT
Step-size : 1440 minutes
***********************************************************************************************
Center geodetic : 291.817000, -16.5170, 0.00{E-lon(deg),Lat(deg),Alt(km)}
Center cylindric: 291.817000, 6116.6009, -1801.65{E-lon(deg),Dxy(km),Dz(km)}
Center pole/equ : High-precision EOP model {East-longitude +}
Center radii : 6378.1 x 6378.1 x 6356.8 km {Equator, meridian, pole}
Target pole/equ : No model available
Target radii : (unavailable)
<table>
<thead>
<tr>
<th>Date</th>
<th>HHR</th>
<th>RA (ICRF/2000.0)</th>
<th>Dec Az (a-apper) Klev</th>
<th>T-mag</th>
<th>N-mag</th>
<th>delta</th>
<th>deldec</th>
<th>S-O/r</th>
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$SOE$

### Column meaning:

**WARNING**

The initial state available for this object was a Keplerian two-body orbital element set, not osculating elements. This means the orbit is probably very poorly determined. Predictions for times many months or years from the epoch may not be suitable for high-accuracy applications or expectations.
Since the epoch is inside or within ~30 days of the relatively short data arc, the elements (such as they are) were numerically propagated with perturbations, just as if they were osculating elements.

**TIME**

Prior to 1962, times are UT1. Dates thereafter are UTC. Any 'b' symbol in the 1st-column denotes a B.C. date. First-column blank (' ') denotes an A.D. date. Calendar dates prior to 1582-Oct-15 are in the Julian calendar system. Later calendar dates are in the Gregorian system.

The uniform Coordinate Time scale is used internally. Conversion between CT and the selected non-uniform UT output scale has not been determined for UTC times after the next July or January 1st. The last known leap-second is used over any future interval.

**NOTE:** "n.a." in output means quantity "not available" at the print-time.

**SOLAR PRESENCE**

Time tag is followed by a blank, then a solar-presence symbol:

- 's' Daylight (refracted solar upper-limb on or above apparent horizon)
- 'C' Civil twilight/dawn
- 'N' Nautical twilight/dawn
- 'A' Astronomical twilight/dawn
- ' ' Night OR geocentric ephemeris

**LUNAR PRESENCE**

The solar-presence symbol is immediately followed by a lunar-presence symbol:

- 'm' Refracted upper-limb of Moon on or above apparent horizon
- ' ' Refracted upper-limb of Moon below apparent horizon OR geocentric ephemeris

**R.A. (ICRF/J2000.0)_DEC =**

J2000.0 astrometric right ascension and declination of target. Corrected for light-time. Units: HMS (HH MM SS.ff) and DMS (DD MM SS.f)

**Azi_(a-appr)_Elev =**

Airless apparent azimuth and elevation of target. Corrected for light-time, the gravitational deflection of light, stellar aberration, precession and nutation. Azimuth measured North(0) -> East(90) -> South(180) -> West(270), elevation with respect to plane perpendicular to local zenith direction. TOPOCENTRIC ONLY. Units: DEGREES

**T-mag N-mag =**

Comet’s approximate apparent visual total magnitude ('T-mag') and nuclear magnitude ('N-mag') by following definitions:

- T-mag = M1 + 5*log10(delta) + k1*log10(r)
- N-mag = M2 + 5*log10(delta) + k2*log10(r) + phcof*beta

Units: none

**delta deldot =**

Target apparent range ('delta') and range-rate ('delta-dot') relative to observer at print-time. "deldot" is a projection along the line-of-sight from the coordinate center and indicates direction of motion. A positive deldot means the target is moving away from the observer/coordinate-center. A negative deldot means the target is moving towards the observer. Units: AU and KM/S

**S-O-T /r =**

Sun-Observer-Target angle; target’s apparent solar elongation seen from observer location at print-time. If negative, the target center is behind the Sun. Angular units: DEGREES.

The '/r' column is a Sun-relative code, output for observing sites with defined rotation models only.

- '/T' indicates target trails Sun (evening sky)
- '/L' indicates target leads Sun (morning sky)

**NOTE:** The S-O-T solar elongation angle is the total separation in any direction. It does not indicate the angle of Sun leading or trailing.

**S-T-O =**

Sun-Target-Observer angle; target’s apparent PHASE ANGLE as seen at observer’s location at print time. Units: DEGREES

Computations by...

Solar System Dynamics Group, Horizons On-Line Ephemeris System
4800 Oak Grove Drive, Jet Propulsion Laboratory
Pasadena, CA  91109   USA

Information: http://ssd.jpl.nasa.gov/

Connect : telnet://ssd.jpl.nasa.gov:6775 (via browser)
telnet ssd.jpl.nasa.gov 6775 (via command-line)

Author : Jon.Giorgini@jpl.nasa.gov

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