

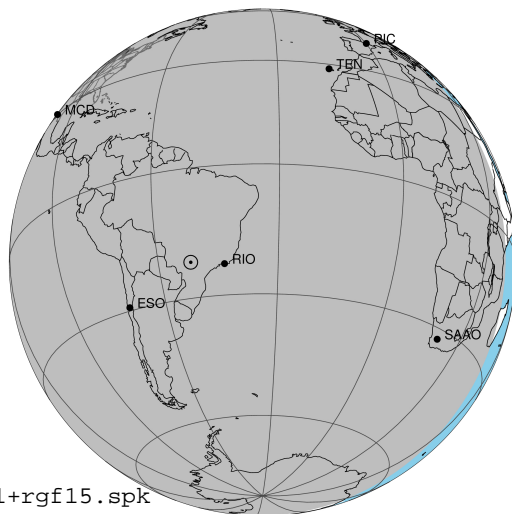
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-31T03:24:07.570
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116565143491899264
 2Mass ID (if available) : 17404196-2252297

Jupiter 2031-05-31T03:24:07 K9.73 G14.97 Pgt

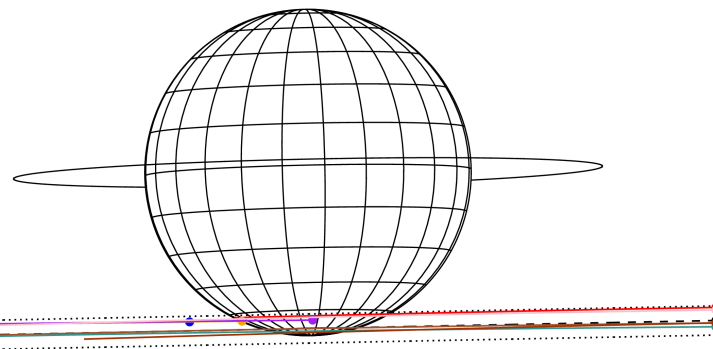
ICRS Star Coord at Epoch: 17h 40m 41.95050s -22:52:29.93226s

RUWE (>1.4 is poor) : 0.91
 K magnitude : 9.730
 G magnitude : 14.974
 RP magnitude : 13.693
 BP magnitude : 16.841
 DUPflag : 0
 Distance (au) : 4.306
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.24
 Sun-Target sep (deg) : 163.53
 Sun-Moon sep (deg) : 86.93
 B (ring opening deg) : -2.60
 PA of pole (deg) : 1.24
 Pole direction: RA (deg): 268.05693
 Dec (deg): 64.49651
 C/A sky separation (") : 21.887
 C/A sky separation (km) : 68348.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-31T03:24:07 K9.73 G14.97
 Pgt



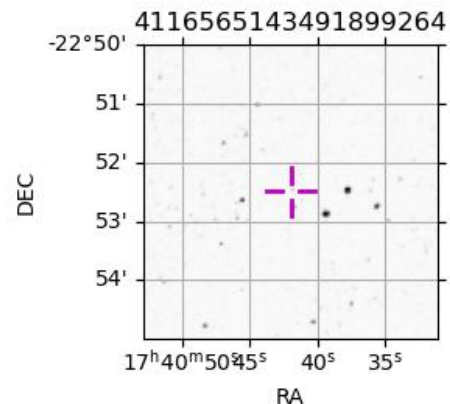
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO



2031-05-31T03:24:07.5700 α: 17 40 41.9505 δ: -22 52 29.932 C/A ***** PA 1.13 deg v_sky -15.24 km/s D 04.31 AU
 Credit: Styled after SORA/Lucky Star

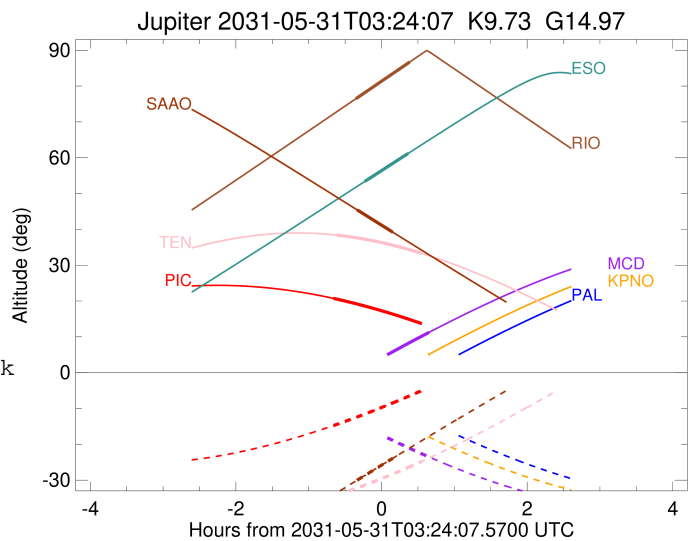
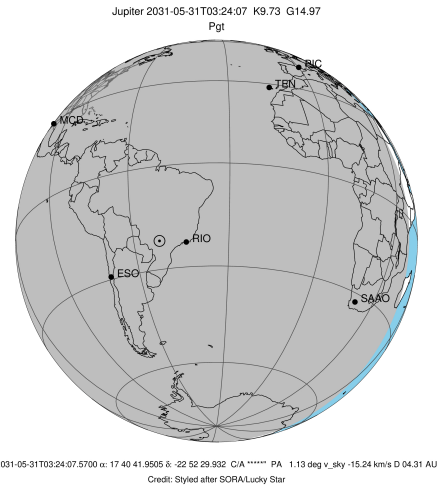
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAY 31 02:44 - MAY 31 02:44	Pin
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAY 31 04:03 - MAY 31 04:03	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAY 31 04:03 - MAY 31 04:03	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	MAY 31 02:47 - MAY 31 03:57	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 31 03:03 - MAY 31 03:47	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAY 31 03:10 - MAY 31 03:46	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 31 03:04 - MAY 31 03:33	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-31T03:21:07.250
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PIC
Location             : Pic du Midi
Latitude (deg)       : 42.93656
E. Longitude (deg)   : 0.14231
Altitude (km)        : 2.890
Gaia source ID       : 4116565143491899264
2Mass ID (if available) : 17404196-2252297
ICRS Star Coord at Epoch: 17h 40m 41.95050s -22:52:29.93226s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.730
G magnitude          : 14.974
RP magnitude         : 13.693
BP magnitude         : 16.841
DUPflag             : 0
Distance (au)        : 4.306
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.24
Sun-Target sep (deg) : 163.53
Sun-Moon sep (deg)   : 87.23
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.24
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 20.111
C/A sky separation (km) : 62801.2
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

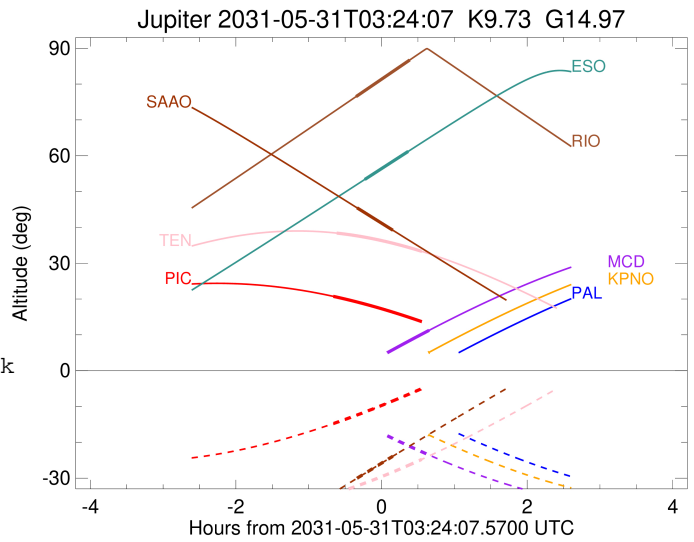
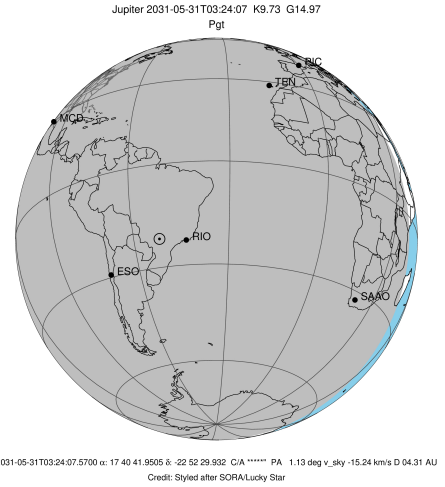


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T02:44:31.638	20.73	-14.76	71484.9	-61.25	-64.23
Jupiter	E	2031-05-31T03:57:46.686	13.63	-4.94x	71484.8	-61.53	-64.48

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-31T03:30:38.450
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : KPNO
Location              : Kitt Peak Natl Obs
Latitude (deg)        : 31.96333
E. Longitude (deg)    : 248.40000
Altitude (km)         : 2.120
Gaia source ID        : 4116565143491899264
2Mass ID (if available) : 17404196-2252297
ICRS Star Coord at Epoch: 17h 40m 41.95050s -22:52:29.93226s
RUWE (>1.4 is poor) : 0.91
K magnitude            : 9.730
G magnitude           : 14.974
RP magnitude          : 13.693
BP magnitude          : 16.841
DUPflag              : 0
Distance (au)         : 4.306
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.24
Sun-Target sep (deg)  : 163.53
Sun-Moon sep (deg)    : 86.85
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.24
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 20.763
C/A sky separation (km) : 64839.5
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

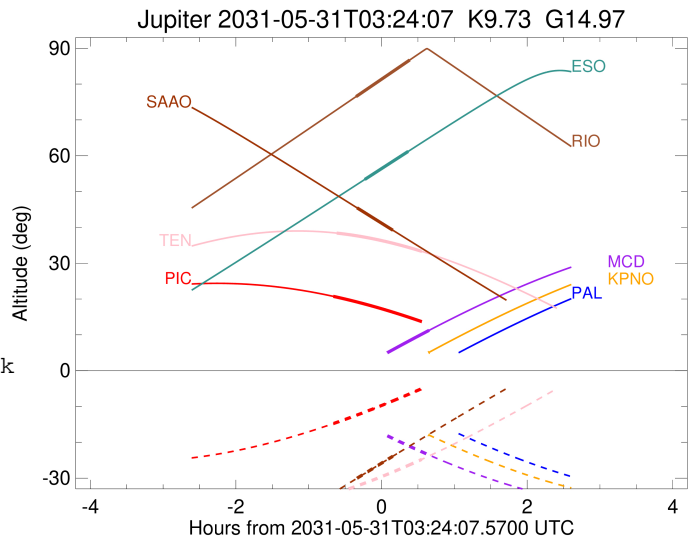
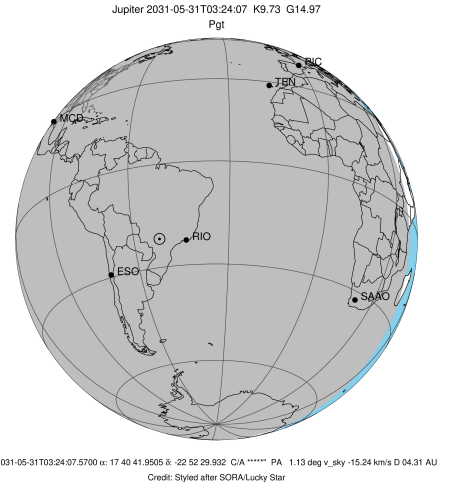


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T02:57:52.034	-7.35x	-6.76	71484.3	-65.65	-68.27
Jupiter	E	2031-05-31T04:03:17.202	5.11	-17.98	71484.5	-64.31	-67.05

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-31T03:30:27.870
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)        : 30.67158
E. Longitude (deg)    : 255.97844
Altitude (km)         : 2.075
Gaia source ID        : 4116565143491899264
2Mass ID (if available) : 17404196-2252297
ICRS Star Coord at Epoch: 17h 40m 41.95050s -22:52:29.93226s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.730
G magnitude           : 14.974
RP magnitude          : 13.693
BP magnitude          : 16.841
DUPflag              : 0
Distance (au)         : 4.306
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.24
Sun-Target sep (deg) : 163.53
Sun-Moon sep (deg)   : 86.96
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.24
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 20.711
C/A sky separation (km): 64675.3
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
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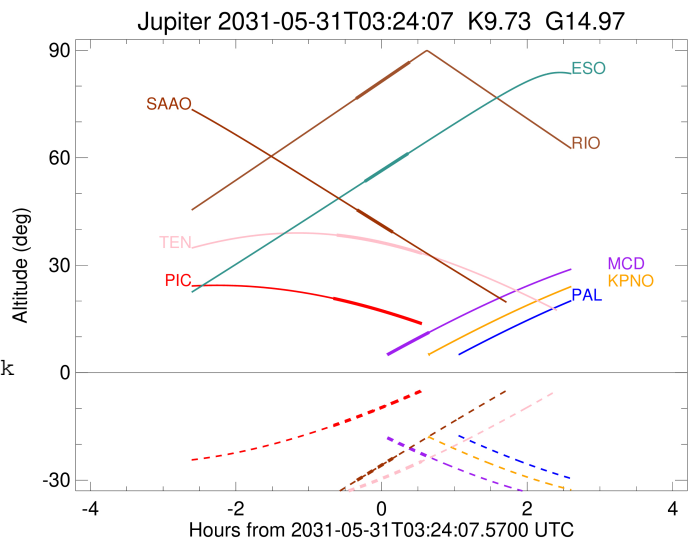
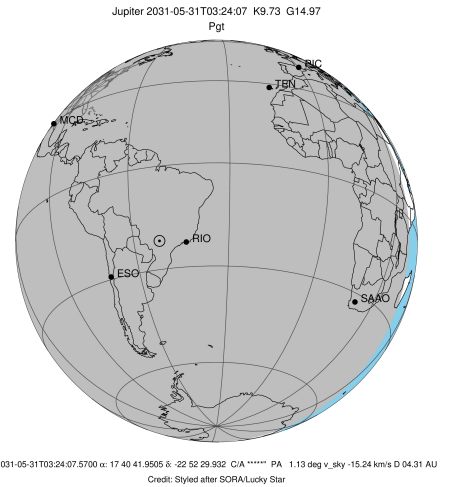


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T02:57:25.603	-0.99x	-12.82	71484.3	-65.33	-67.98
Jupiter	E	2031-05-31T04:03:22.579	11.26	-23.55	71484.5	-64.02	-66.78

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-31T03:22:15.190
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)        : 28.30050
E. Longitude (deg)    : 343.48909
Altitude (km)         : 2.395
Gaia source ID        : 4116565143491899264
2Mass ID (if available) : 17404196-2252297
ICRS Star Coord at Epoch: 17h 40m 41.95050s -22:52:29.93226s
RUWE (>1.4 is poor)  : 0.91
K magnitude           : 9.730
G magnitude           : 14.974
RP magnitude          : 13.693
BP magnitude          : 16.841
DUPflag              : 0
Distance (au)         : 4.306
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -15.24
Sun-Target sep (deg)  : 163.53
Sun-Moon sep (deg)    : 87.50
B (ring opening deg)  : -2.60
PA of pole (deg)      : 1.24
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 20.322
C/A sky separation (km) : 63460.1
NAIF SPICE kernels    : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
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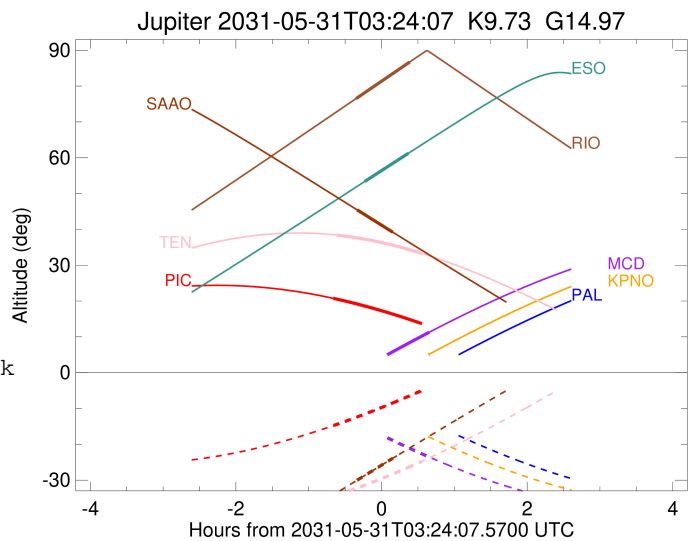
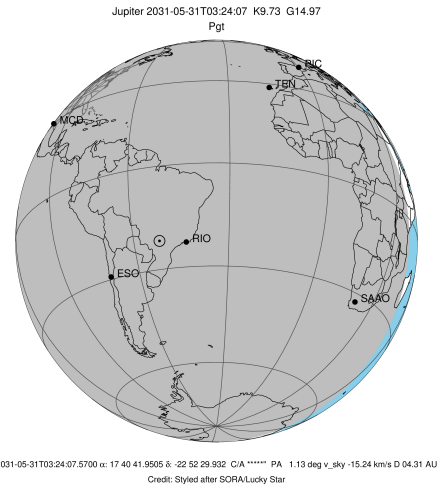


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T02:47:13.703	38.40	-34.10	71484.7	-62.49	-65.37
Jupiter	E	2031-05-31T03:57:18.689	33.30	-24.76	71484.7	-62.55	-65.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-31T03:25:18.140
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : RIO
Location             : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)   : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 4116565143491899264
2Mass ID (if available) : 17404196-2252297
ICRS Star Coord at Epoch: 17h 40m 41.95050s -22:52:29.93226s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.730
G magnitude           : 14.974
RP magnitude         : 13.693
BP magnitude         : 16.841
DUPflag              : 0
Distance (au)        : 4.306
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.24
Sun-Target sep (deg) : 163.53
Sun-Moon sep (deg)   : 87.86
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.24
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 21.896
C/A sky separation (km) : 68377.9
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
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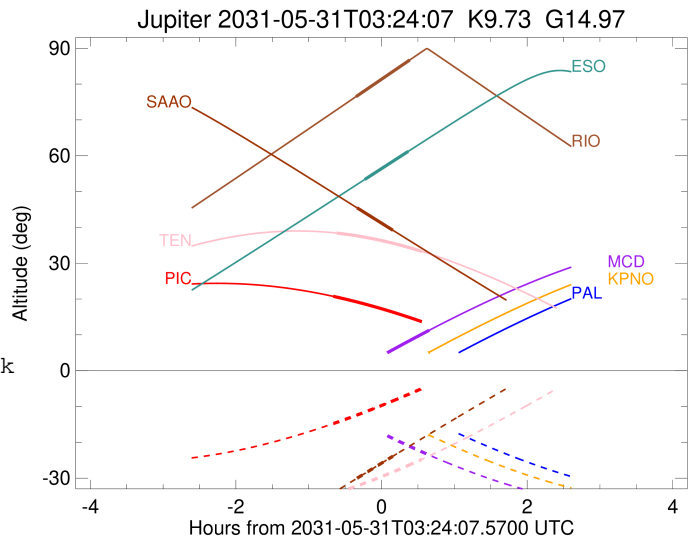
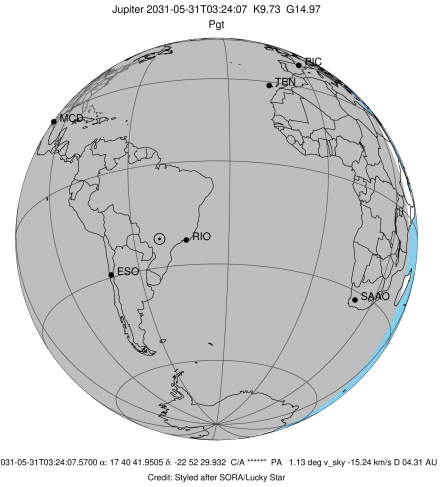


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T03:03:09.058	76.49	-86.95	71483.5	-73.12	-75.03
Jupiter	E	2031-05-31T03:47:26.457	86.72	-76.82	71483.5	-72.65	-74.61

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-31T03:28:09.460
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : ESO
Location            : European Southern Obs. (3.6m)
Latitude (deg)      : -29.26097
E. Longitude (deg)  : 289.26831
Altitude (km)       : 2.400
Gaia source ID      : 4116565143491899264
2Mass ID (if available) : 17404196-2252297
ICRS Star Coord at Epoch: 17h 40m 41.95050s -22:52:29.93226s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.730
G magnitude          : 14.974
RP magnitude         : 13.693
BP magnitude         : 16.841
DUPflag             : 0
Distance (au)       : 4.306
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.24
Sun-Target sep (deg) : 163.53
Sun-Moon sep (deg)  : 87.70
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.24
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 22.257
C/A sky separation (km) : 69504.0
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

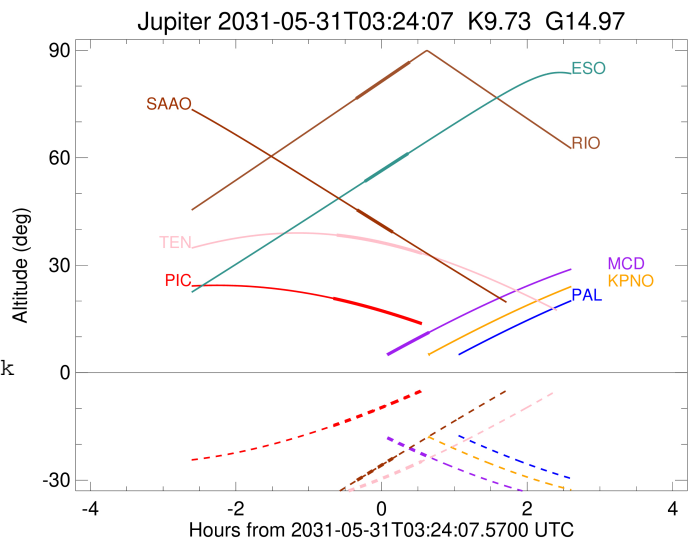
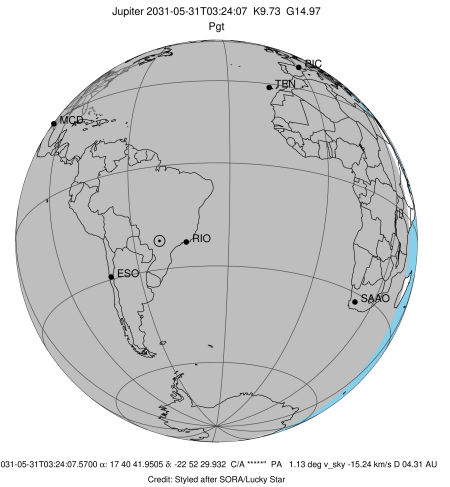


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T03:10:16.923	53.35	-68.43	71483.2	-76.72	-78.25
Jupiter	E	2031-05-31T03:46:00.548	61.17	-75.74	71483.3	-75.80	-77.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-31T03:18:46.490
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : SAAO
Location             : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)       : -32.37953
E. Longitude (deg)   : 20.81070
Altitude (km)        : 1.768
Gaia source ID       : 4116565143491899264
2Mass ID (if available) : 17404196-2252297
ICRS Star Coord at Epoch: 17h 40m 41.95050s -22:52:29.93226s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.730
G magnitude           : 14.974
RP magnitude          : 13.693
BP magnitude          : 16.841
DUPflag              : 0
Distance (au)        : 4.306
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.24
Sun-Target sep (deg) : 163.53
Sun-Moon sep (deg)   : 87.58
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.24
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 22.465
C/A sky separation (km) : 70155.0
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```



x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T03:04:01.646	45.44	-30.02	71483.1	-78.33	-79.68
Jupiter	E	2031-05-31T03:33:32.435	39.19	-23.87	71483.1	-78.97	-80.25