

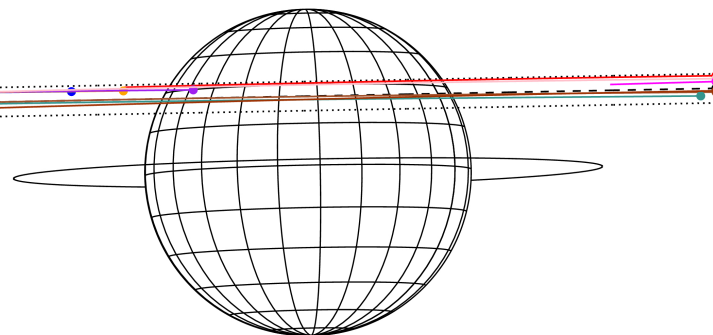
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-30T02:32:53.090
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116928119760688768
 2Mass ID (if available) : 17411340-2252054

Jupiter 2031-05-30T02:32:53 K7.81 G14.56 Pgt

ICRS Star Coord at Epoch: 17h 41m 13.39044s -22:52:05.76565s
 RUWE (>1.4 is poor) : 1.41
 K magnitude : 7.807
 G magnitude : 14.559
 RP magnitude : 12.892
 BP magnitude : 17.670
 DUPflag : 0
 Distance (au) : 4.311
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.07
 Sun-Target sep (deg) : 162.41
 Sun-Moon sep (deg) : 100.26
 B (ring opening deg) : -2.61
 PA of pole (deg) : 1.19
 Pole direction: RA (deg): 268.05693
 Dec (deg): 64.49651
 C/A sky separation (") : 10.704
 C/A sky separation (km) : 33465.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



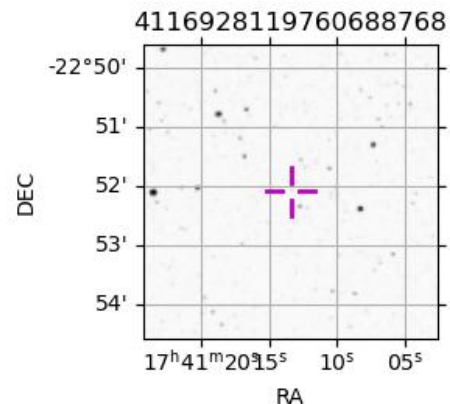
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 SAAO



2031-05-30T02:32:53.0900 a: 17 41 13.3904 s: -22 52 05.766 C/A ***** PA 181.09 deg v_sky -15.07 km/s D 04.31 AU
 Credit: Styled after SORA/Lucky Star

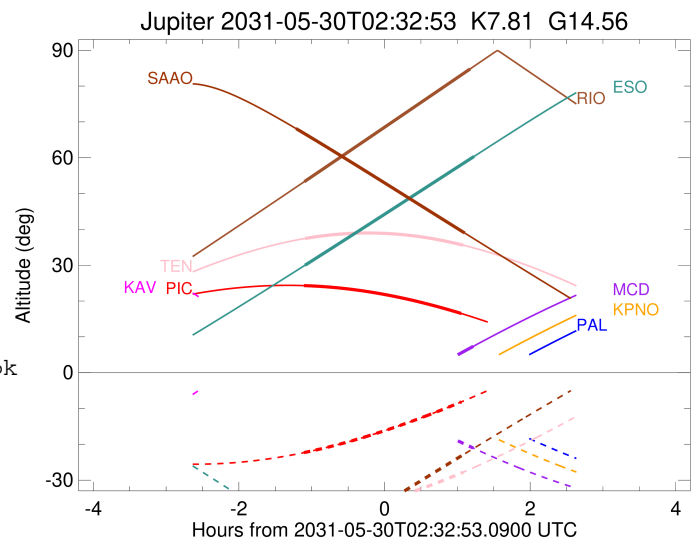
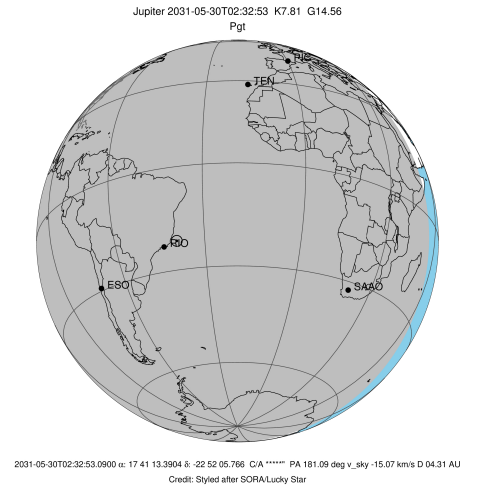
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	MAY 30 01:26 - MAY 30 03:36	Pie
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			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 30 03:45 - MAY 30 03:45	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	MAY 30 01:27 - MAY 30 03:37	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 30 01:26 - MAY 30 03:43	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAY 30 01:27 - MAY 30 03:46	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 30 01:20 - MAY 30 03:38	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-30T02:31:21.470
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        : 4116928119760688768
2Mass ID (if available) : 17411340-2252054
ICRS Star Coord at Epoch: 17h 41m 13.39044s -22:52:05.76565s
RUWE (>1.4 is poor)  : 1.41
K magnitude           : 7.807
G magnitude           : 14.559
RP magnitude          : 12.892
BP magnitude          : 17.670
DUPflag              : 0
Distance (au)         : 4.311
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.07
Sun-Target sep (deg)  : 162.41
Sun-Moon sep (deg)   : 100.55
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 12.534
C/A sky separation (km) : 39187.2
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
    
```

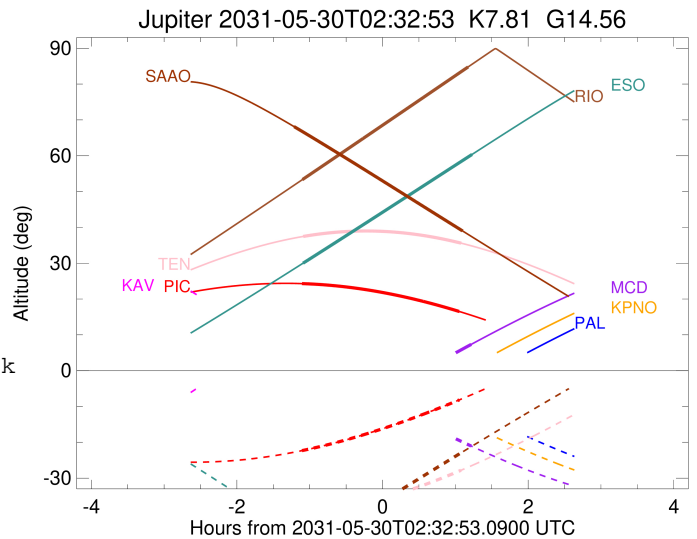
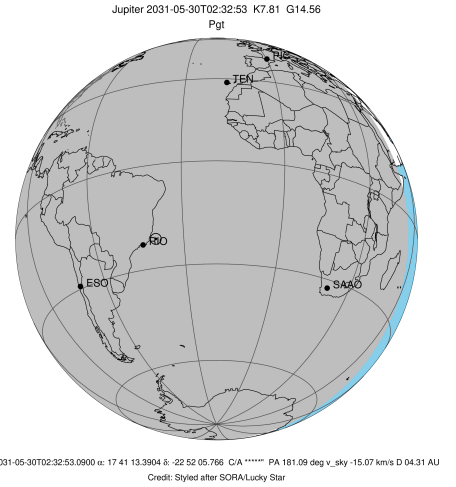


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T01:26:36.126	24.30	-22.31	71489.2	33.19	36.71
Jupiter	E	2031-05-30T03:36:12.961	16.51	-8.15	71489.2	33.08	36.61

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-30T02:38:32.980
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     : 4116928119760688768
2Mass ID (if available) : 17411340-2252054
ICRS Star Coord at Epoch: 17h 41m 13.39044s -22:52:05.76565s
RUWE (>1.4 is poor) : 1.41
K magnitude        : 7.807
G magnitude        : 14.559
RP magnitude       : 12.892
BP magnitude       : 17.670
DUPflag           : 0
Distance (au)     : 4.311
f0 (km)           : 0.00
g0 (km)           : 0.00
skyplane vel. (km/s) : -15.07
Sun-Target sep (deg) : 162.41
Sun-Moon sep (deg) : 100.29
B (ring opening deg) : -2.61
PA of pole (deg)  : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 11.717
C/A sky separation (km) : 36632.4
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
    
```

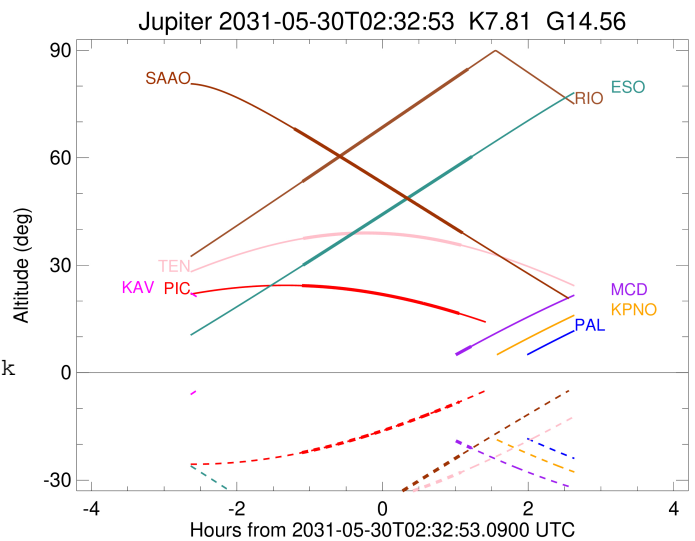
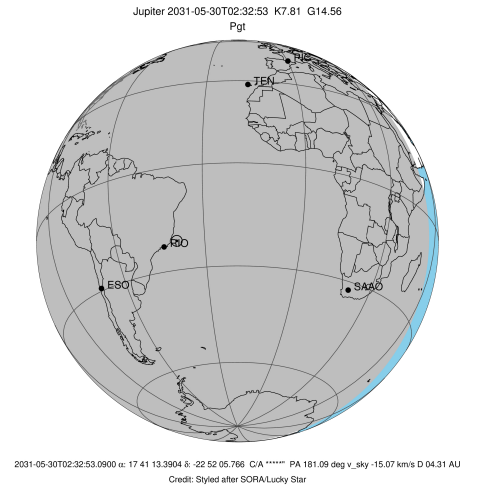


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T01:30:35.893	-19.40x	3.39x	71489.7	30.11	33.48
Jupiter	E	2031-05-30T03:45:57.530	7.33	-21.03	71489.5	31.45	34.90

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-30T02:32:37.240
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       : 4116928119760688768
2Mass ID (if available) : 17411340-2252054
ICRS Star Coord at Epoch: 17h 41m 13.39044s -22:52:05.76565s
RUWE (>1.4 is poor) : 1.41
K magnitude           : 7.807
G magnitude           : 14.559
RP magnitude         : 12.892
BP magnitude         : 17.670
DUPflag              : 0
Distance (au)        : 4.311
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.07
Sun-Target sep (deg) : 162.41
Sun-Moon sep (deg)   : 100.82
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 12.289
C/A sky separation (km): 38422.1
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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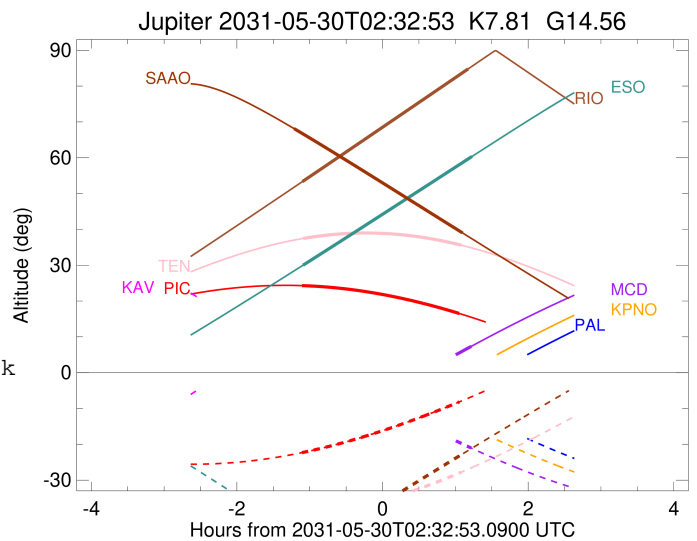
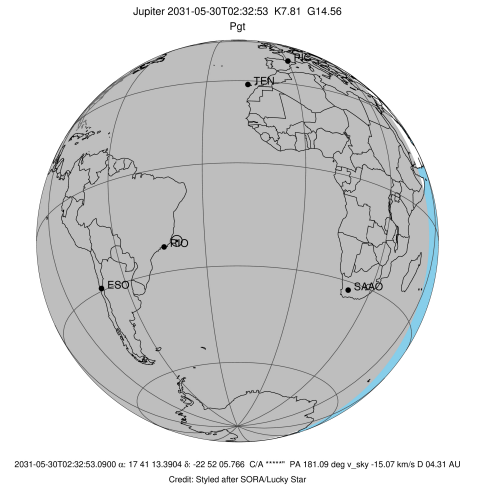


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T01:27:37.774	37.47	-39.82	71489.3	32.30	35.79
Jupiter	E	2031-05-30T03:37:36.519	35.59	-27.80	71489.3	32.47	35.97

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-30T02:35:13.800
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       : 4116928119760688768
2Mass ID (if available) : 17411340-2252054
ICRS Star Coord at Epoch: 17h 41m 13.39044s -22:52:05.76565s
RUWE (>1.4 is poor) : 1.41
K magnitude          : 7.807
G magnitude          : 14.559
RP magnitude         : 12.892
BP magnitude         : 17.670
DUPflag             : 0
Distance (au)        : 4.311
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.07
Sun-Target sep (deg) : 162.41
Sun-Moon sep (deg)   : 101.18
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 10.640
C/A sky separation (km): 33265.6
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
    
```

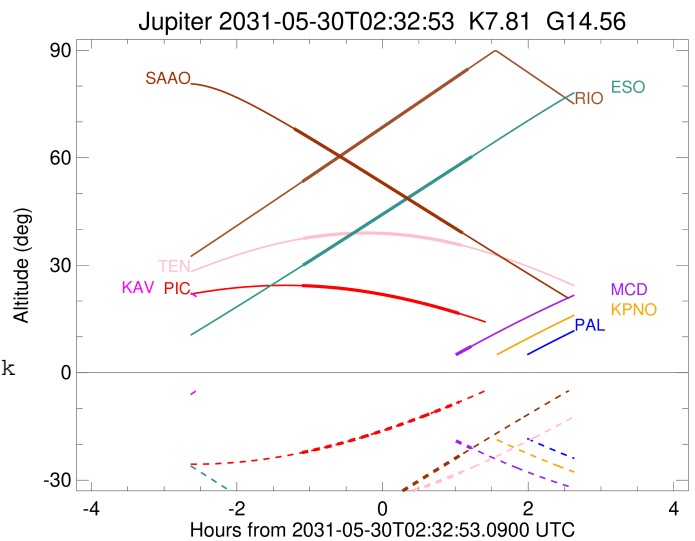
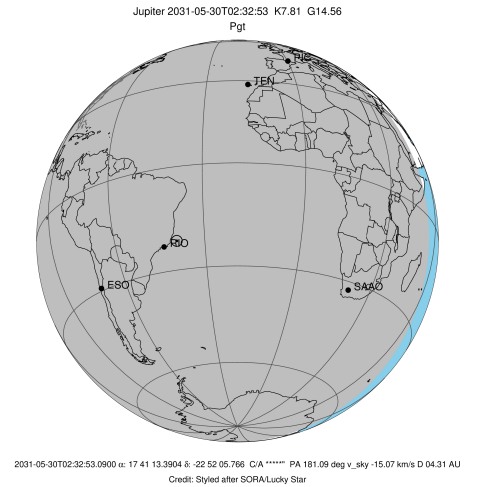


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T01:26:50.128	53.32	-70.65	71490.0	27.26	30.46
Jupiter	E	2031-05-30T03:43:22.694	84.76	-77.70	71490.0	27.97	31.21

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-30T02:37:16.500
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       : 4116928119760688768
2Mass ID (if available) : 17411340-2252054
ICRS Star Coord at Epoch: 17h 41m 13.39044s -22:52:05.76565s
RUWE (>1.4 is poor) : 1.41
K magnitude           : 7.807
G magnitude           : 14.559
RP magnitude         : 12.892
BP magnitude         : 17.670
DUPflag              : 0
Distance (au)        : 4.311
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.07
Sun-Target sep (deg) : 162.41
Sun-Moon sep (deg)   : 101.02
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 10.216
C/A sky separation (km) : 31942.5
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
    
```

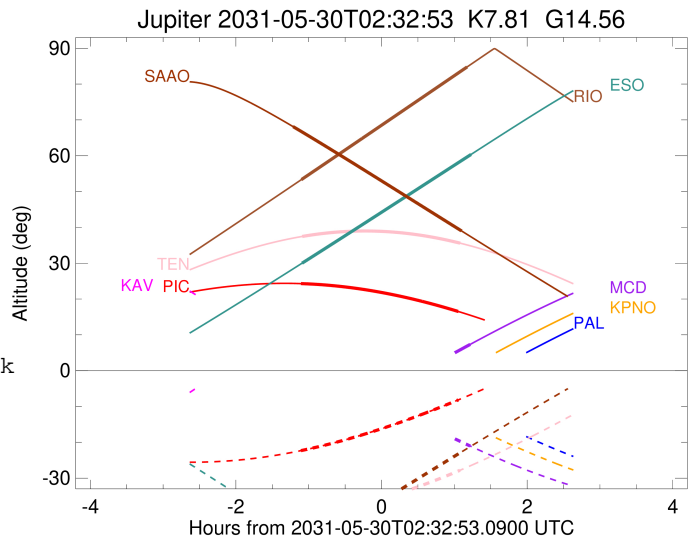
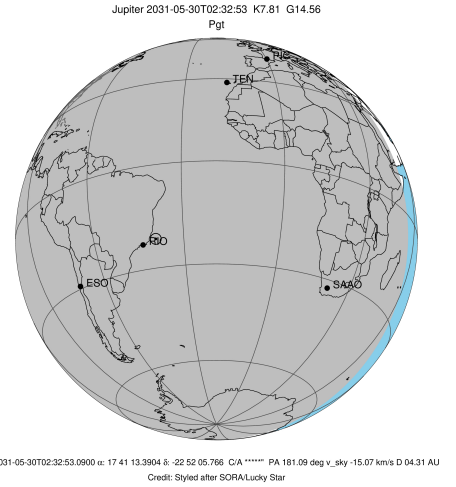


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T01:27:28.383	30.01	-46.11	71490.2	25.90	29.00
Jupiter	E	2031-05-30T03:46:37.563	60.34	-75.81	71490.1	27.00	30.18

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-30T02:29:15.510
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      : 4116928119760688768
2Mass ID (if available) : 17411340-2252054
ICRS Star Coord at Epoch: 17h 41m 13.39044s -22:52:05.76565s
RUWE (>1.4 is poor) : 1.41
K magnitude          : 7.807
G magnitude          : 14.559
RP magnitude         : 12.892
BP magnitude         : 17.670
DUPflag             : 0
Distance (au)       : 4.311
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.07
Sun-Target sep (deg) : 162.41
Sun-Moon sep (deg)  : 100.90
B (ring opening deg) : -2.61
PA of pole (deg)    : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 10.236
C/A sky separation (km) : 32002.6
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	2031-05-30T01:20:02.802	68.11	-51.85	71490.1	26.74	29.90
Jupiter	E	2031-05-30T03:38:46.250	39.02	-22.70	71490.2	26.25	29.37