

Graphics of Asteroid Occultation Observations

February 2017

Introduction

These plots of the occultation observations include those observations with fit quality code 2 or greater.

The names of the individual plots concatenate the asteroid number, asteroid name or provisional designation, and occultation date. The table of contents provides links to the individual plots. The heading for each plot gives the following information:

Line 1

Object identification, event date, ellipse size and orientation, and associated uncertainties.

Line 2

The offset of the shadow from the center of the earth, and associated uncertainty values.

Line 3 [Only when a double star is involved.]

The separation and Position angle of the components of the double star, with associated uncertainty.

Important. In all lines, an uncertainty value is only given if there has been a meaningful calculation of the particular quantity. Where there is no uncertainty value, usually the particular value has been assumed.

The coding used in the plots is as follows:

Event type

- * Disappearance events are plotted as red points.
- * Reappearance events are plotted as green points.
- * Miss events are plotted as grey lines.
- * For some events, the predicted central path is plotted.
This is drawn using a purple dashed line.

Observing method

- * Events recorded visually are plotted with a '+'
- * Video/CCD observations are plotted with a small square.
- * Miss events are plotted with an 'x'.

Plot style

The plot is drawn in a manner that depends on the detail that is derived from the observations.

* For the best-observed events, the observations are drawn without any best-fit ellipse, or joining pairs of observations. This better enables the irregularities in the asteroid profile to be visible.

* For well-observed events, a best-fit ellipse is drawn through the observations. The ellipse illustrates the shape of the asteroid.

* For poorly-observed events, a gray line joins the events of each observer. That is, it shows the time during which the star was invisible to the observer.

Note: In a few cases, if the observed chord indicates that the diameter of the asteroid was larger than expected, a plot with only a single chord may show a circle fitted to the ends of the chord. Ordinarily a fit will not be made to a single chord.

Double stars.

For a small number of events, a double star is involved. When this occurs, the plot includes a representation of the double star, drawn on the same projected scale as the plot of the asteroid.

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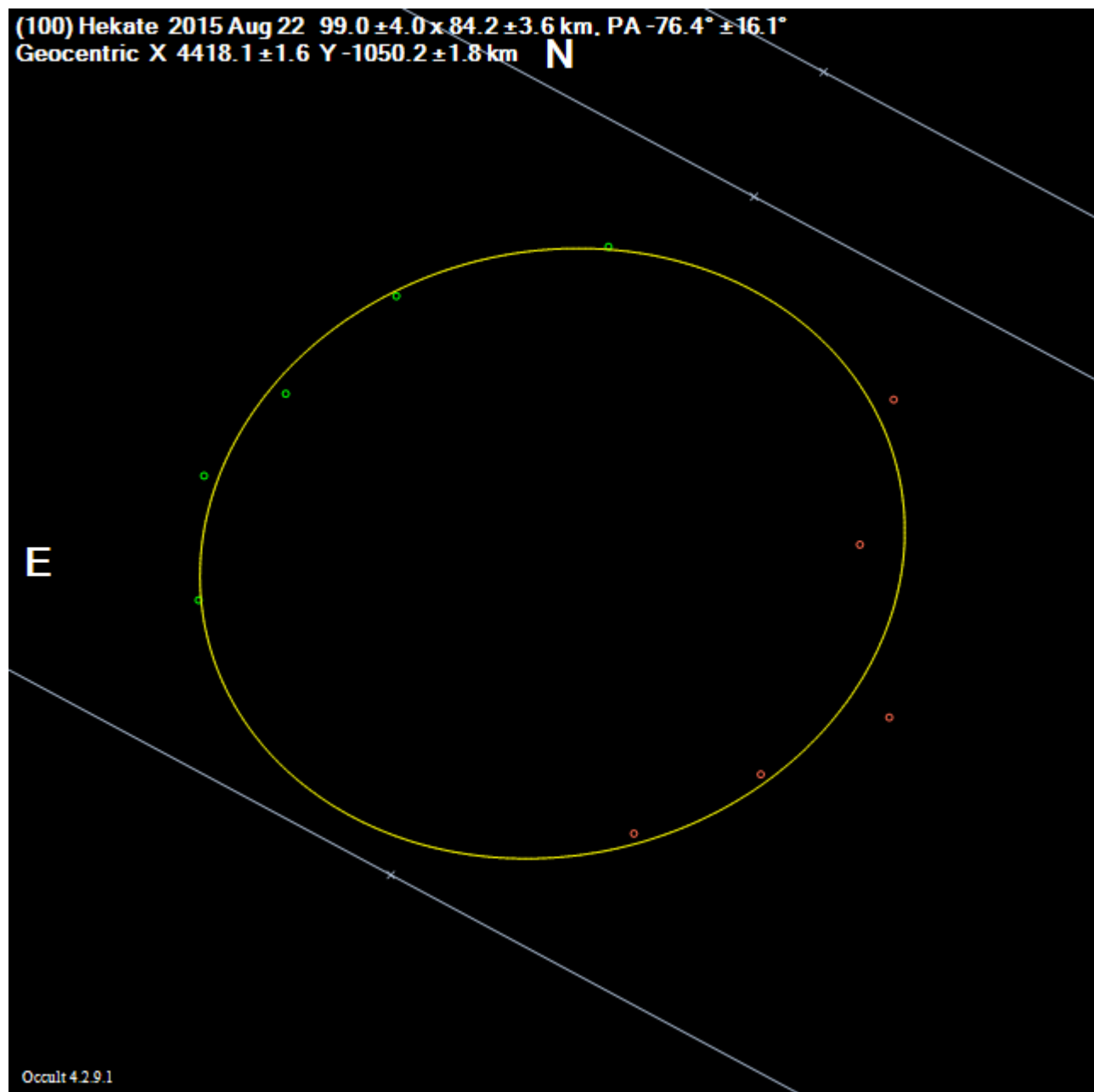
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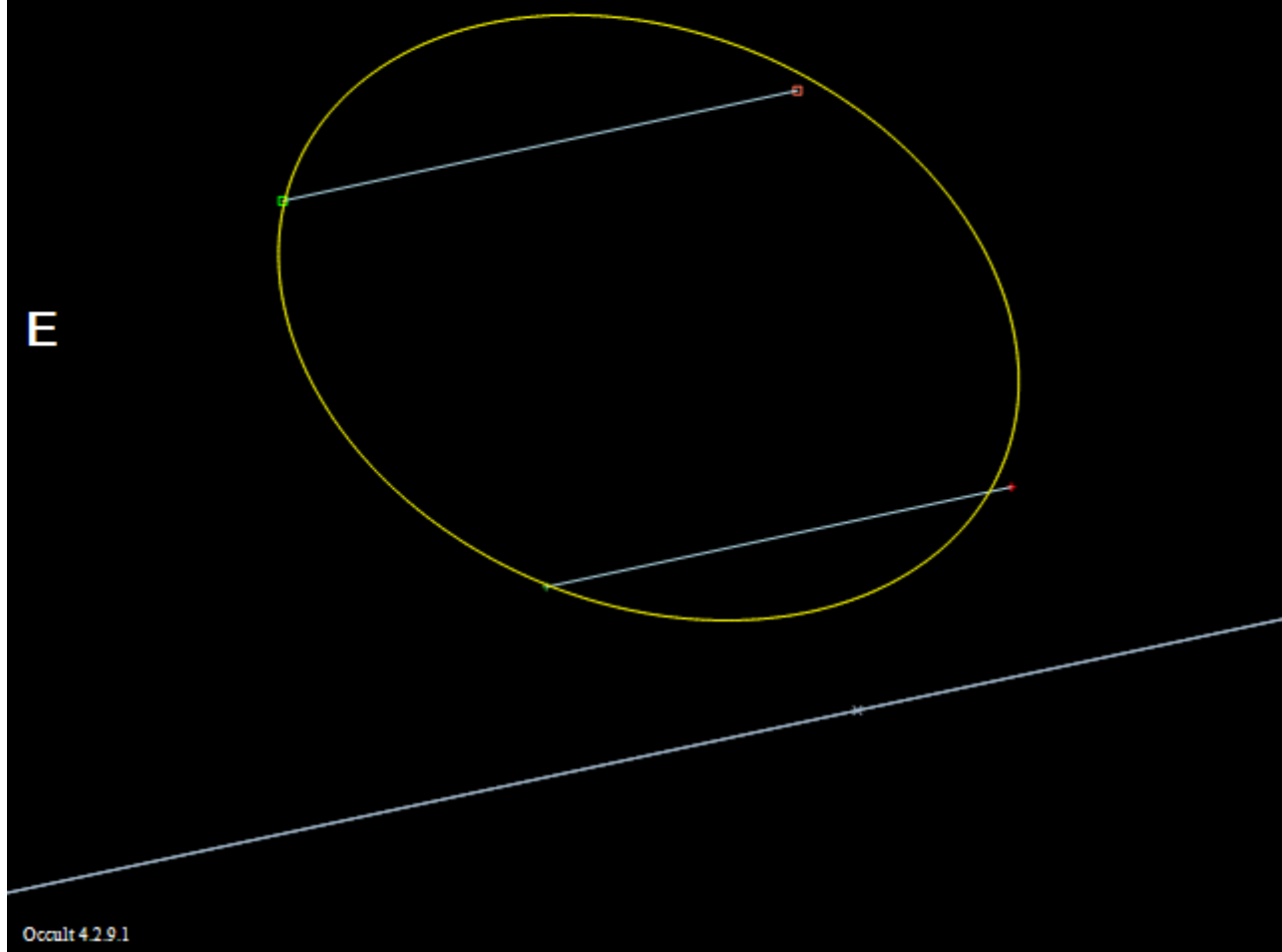
100hekate2015aug22

(100) Hekate 2015 Aug 22 $99.0 \pm 4.0 \times 84.2 \pm 3.6$ km, PA $-76.4^\circ \pm 16.1^\circ$
Geocentric X 4418.1 ± 1.6 Y -1050.2 ± 1.8 km **N**

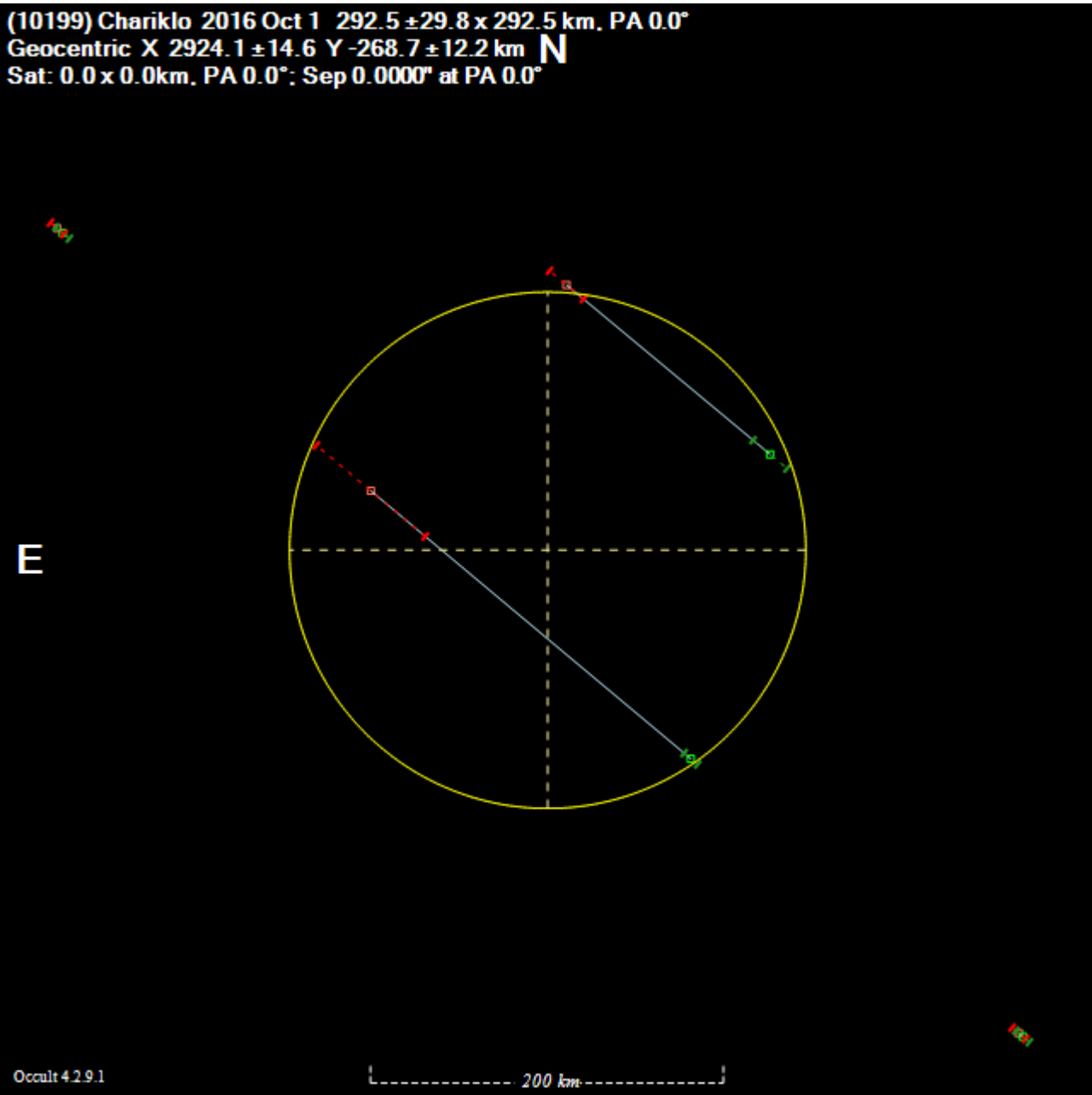


1010marlene2015jan08

(1010) Marlene 2015 Jan 8 51.0 x 38.0 km, PA 67.0° ±48.5°
Geocentric X -4568.3 ±1.0 Y 2620.4 ±1.5 km **N**

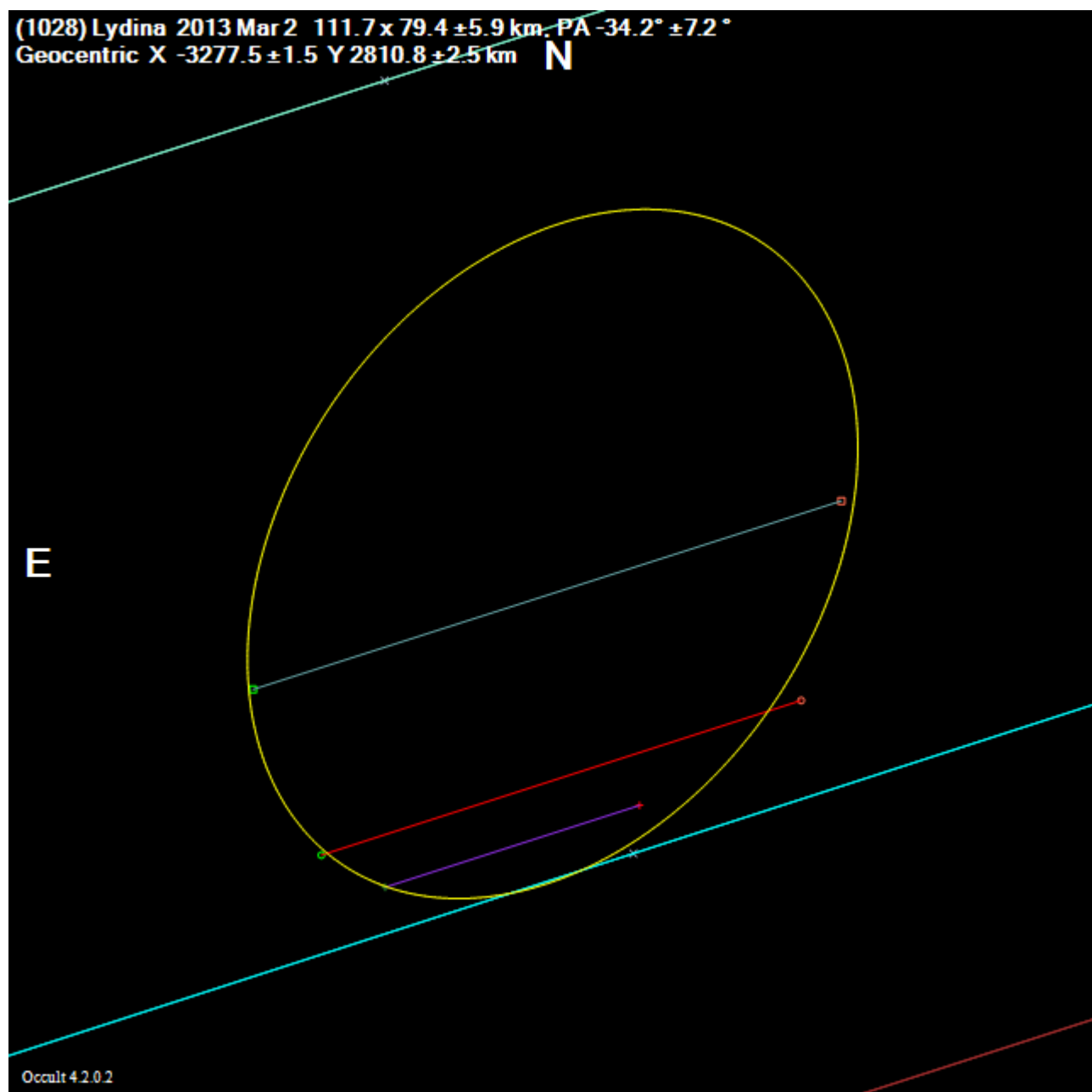


10199Chariklo2016Oct01



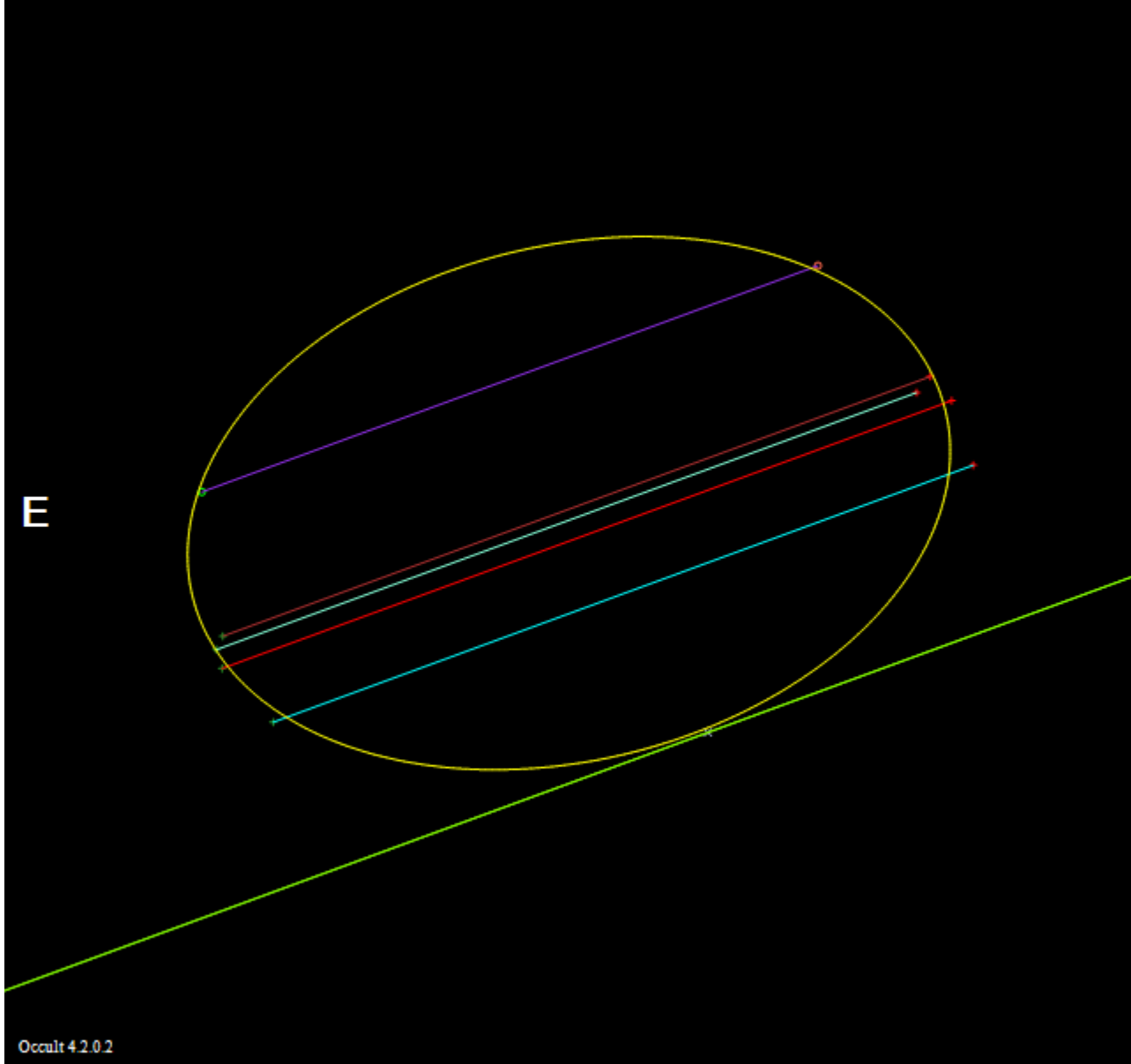
1028lydina2013mar02

(1028) Lydina 2013 Mar 2 111.7 x 79.4 \pm 5.9 km PA -34.2° \pm 7.2°
Geocentric X -3277.5 \pm 1.5 Y 2810.8 \pm 2.5 km **N**



102miriam2000feb15

(102) Miriam 2000 Feb 15 $95.0 \pm 1.0 \times 63.0 \pm 1.4$ km, PA $-76.0^\circ \pm 1.7^\circ$
Geocentric X 4209.7 ± 0.5 Y 3209.3 ± 0.5 km **N**



102miriam2002may24

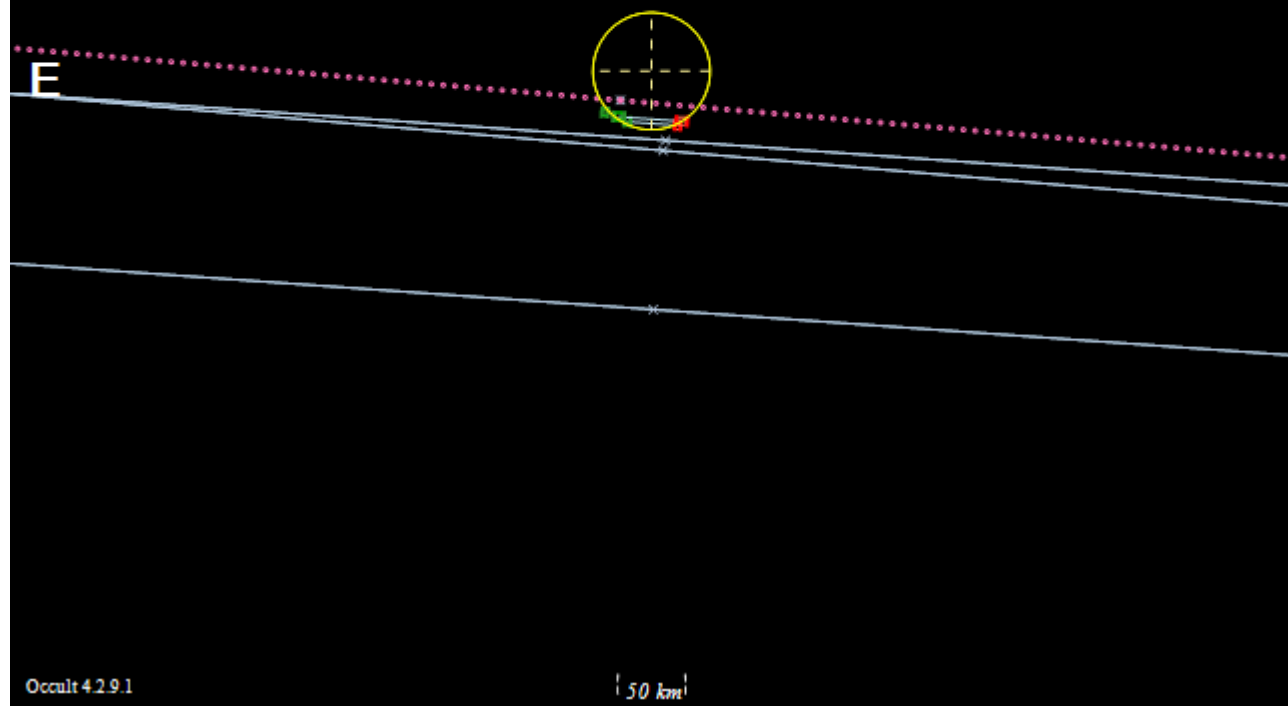
(102) Miriam 2002 May 24 $95.3 \pm 0.4 \times 95.3$ km, PA 0.0° °
Geocentric X -3730.8 ± 0.0 Y 4517.1 ± 0.1 km **N**

E



102Miriam2016Dec29

(102) Miriam 2016 Dec 29 87.0 x 87.0 km. PA 0.0°
Geocentric X 3004.0 ± 1.4 Y 3404.8 ± 1.0 km N

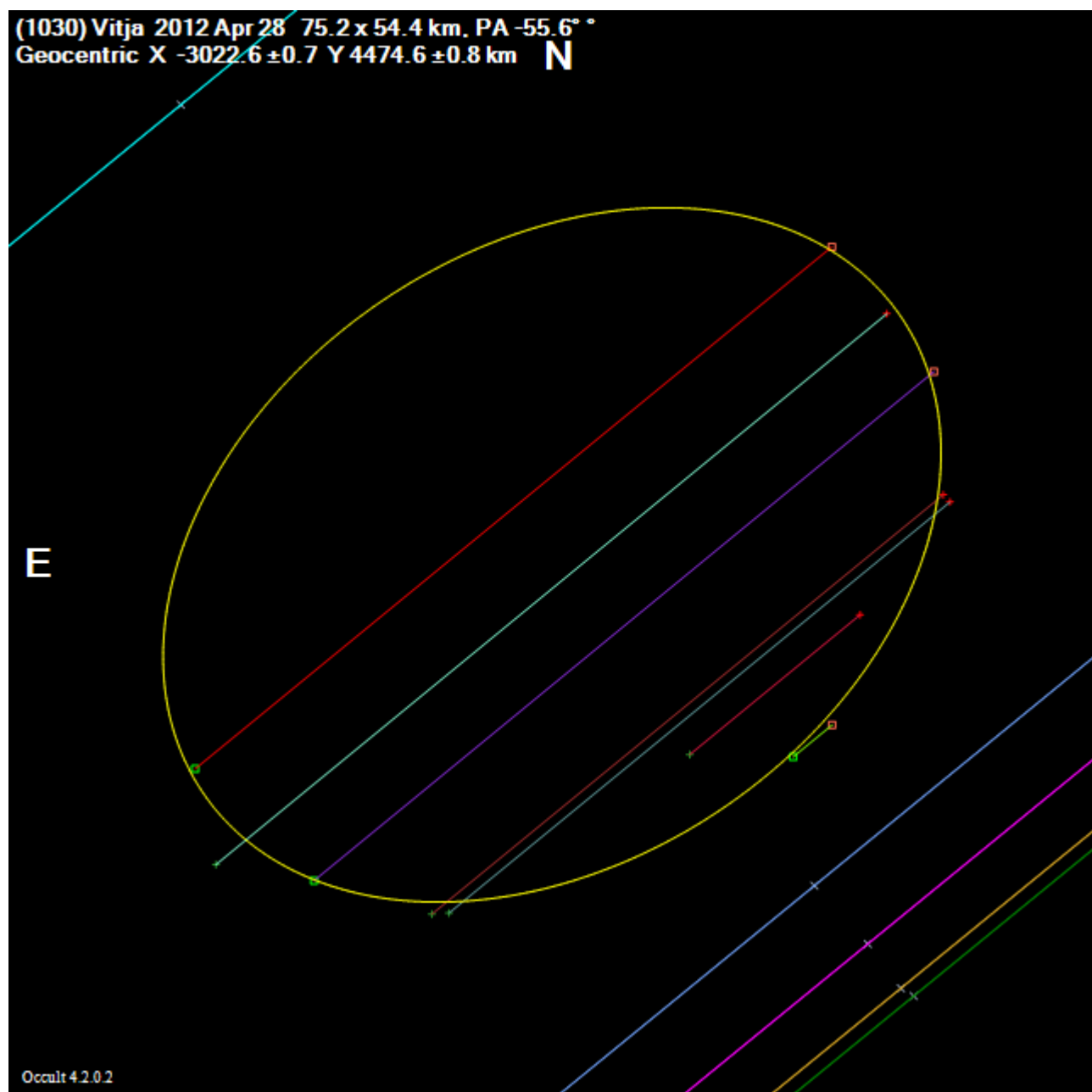


(1030) Vitja 2007 Aug 11 64.0 x 64.0 km, PA 0.0°
Geocentric X 2682.4 ± 0.7 Y 5138.0 ± 0.5 km **N**

Occult 4.2.0.2

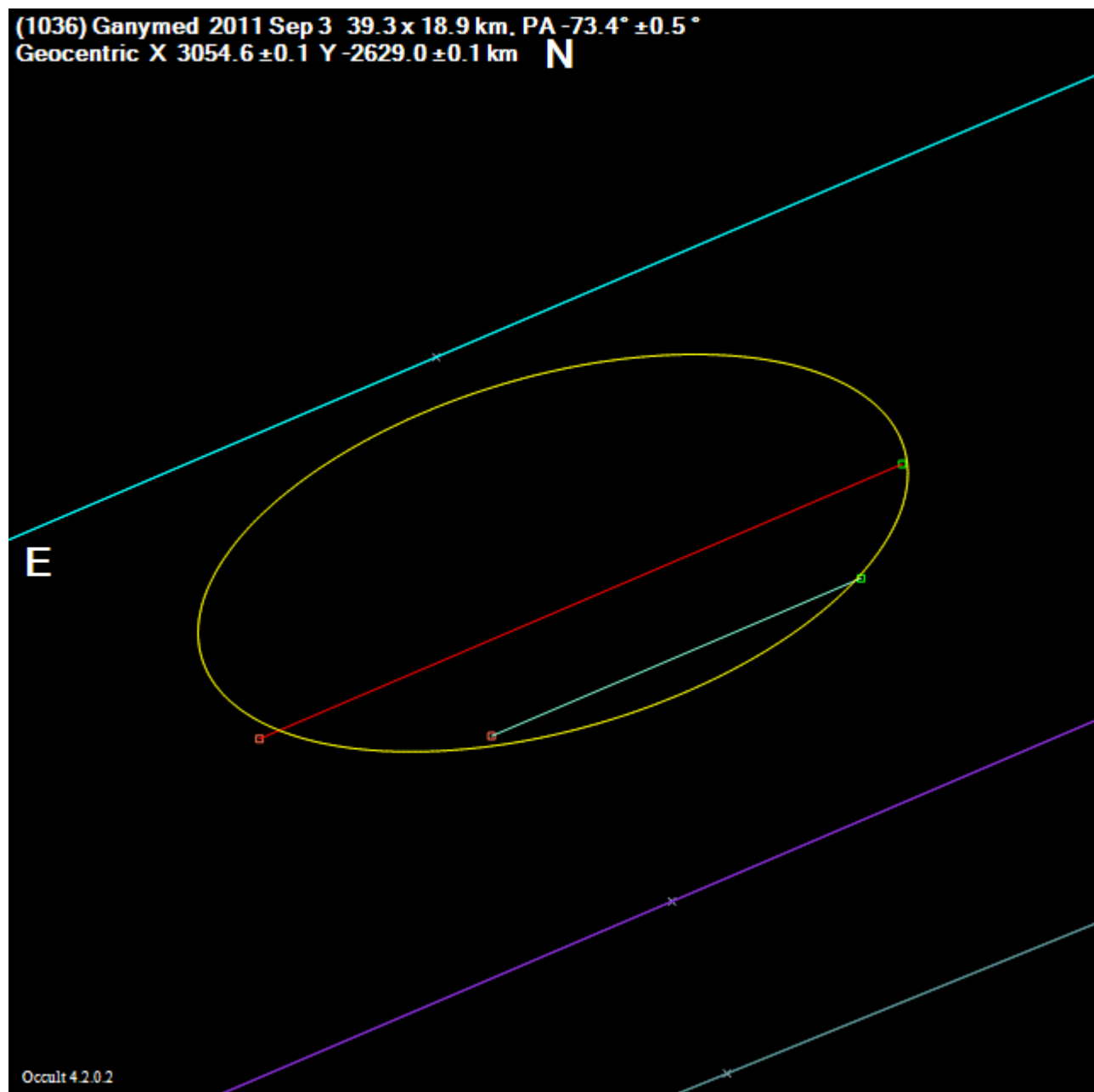
1030vitja2012apr28

(1030) Vitja 2012 Apr 28 75.2 x 54.4 km. PA -55.6° °
Geocentric X -3022.6 ± 0.7 Y 4474.6 ± 0.8 km **N**



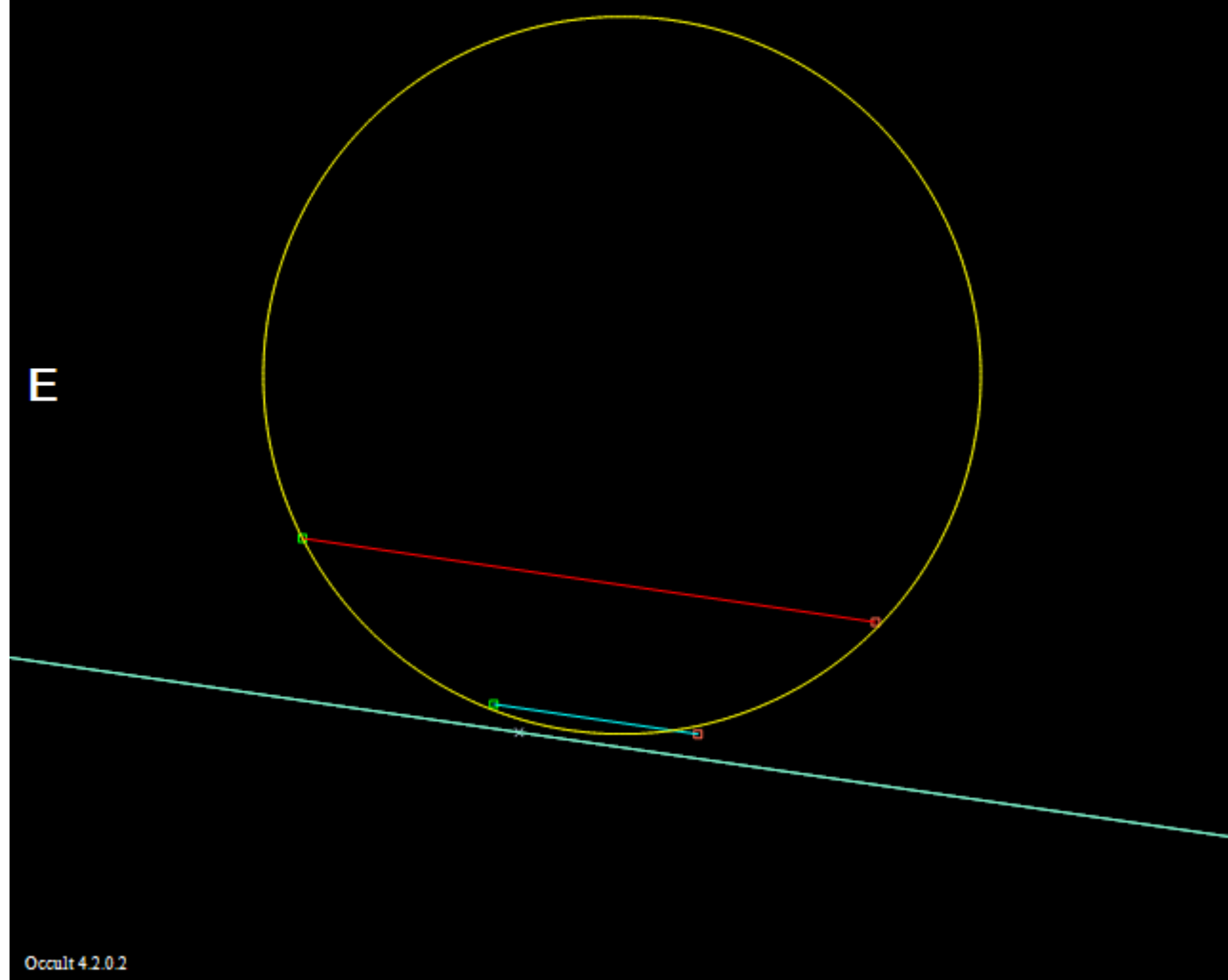
1036ganymed2011sep03

(1036) Ganymed 2011 Sep 3 39.3 x 18.9 km, PA -73.4° ± 0.5°
Geocentric X 3054.6 ± 0.1 Y -2629.0 ± 0.1 km **N**



103hera2006nov22

(103) Hera 2006 Nov 22 $89.1 \pm 2.3 \times 89.1$ km, PA 58.6°
Geocentric X 1579.6 ± 0.7 Y 2955.9 ± 0.7 km **N**



103hera2014jul30

(103) Hera 2014 Jul 30 113.0 x 76.0 km, PA $71.7^\circ \pm 11.6^\circ$
Geocentric X -369.3 ± 5.4 Y 350.7 ± 2.2 km **N**

E

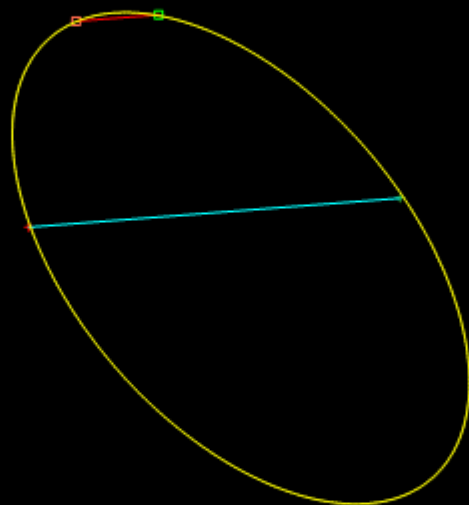


1048feodosia2002mar25

(1048) Feodosia 2002 Mar 25 53.1 x 30.3 km, PA 40.9° °
Geocentric X 2664.2 Y 464.3 km

N

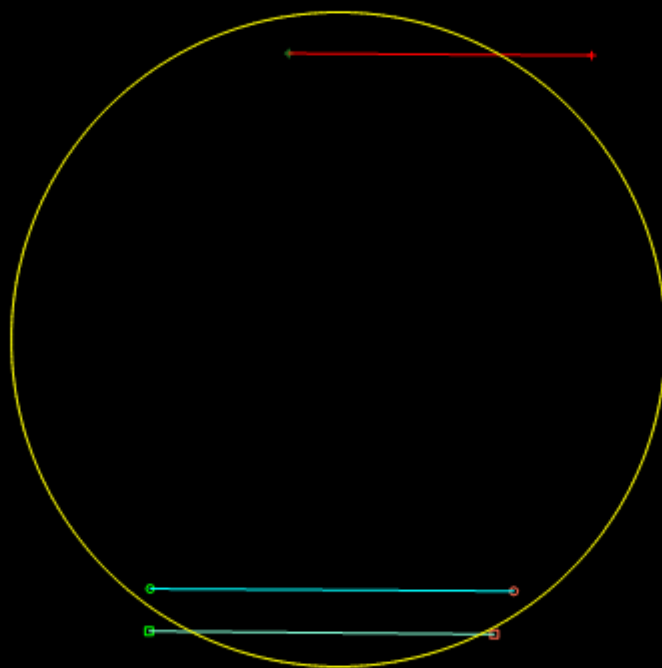
E



1048feodosia2005nov22

(1048) Feodosia 2005 Nov 22 $59.6 \pm 2.7 \times 59.6$ km, PA 0.0° °
Geocentric X 853.8 ± 1.3 Y 1499.0 ± 1.2 km **N**

E

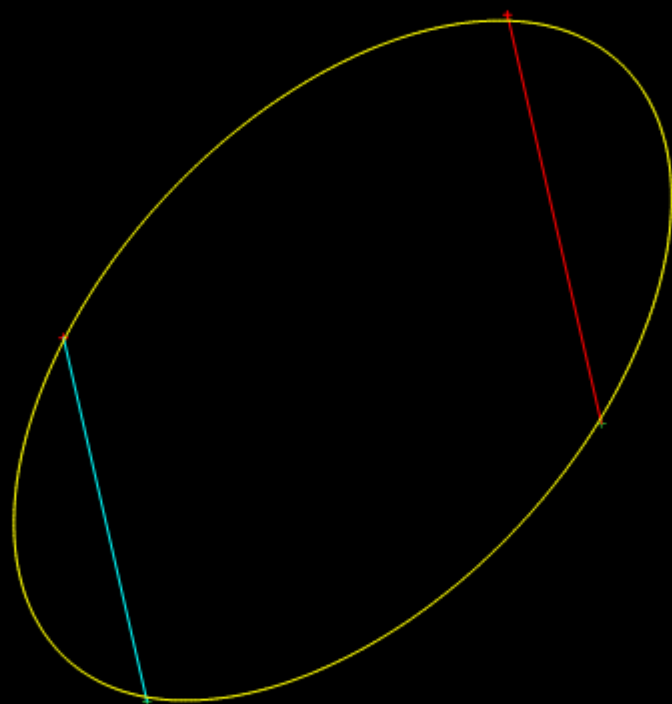


1051merope2002feb02

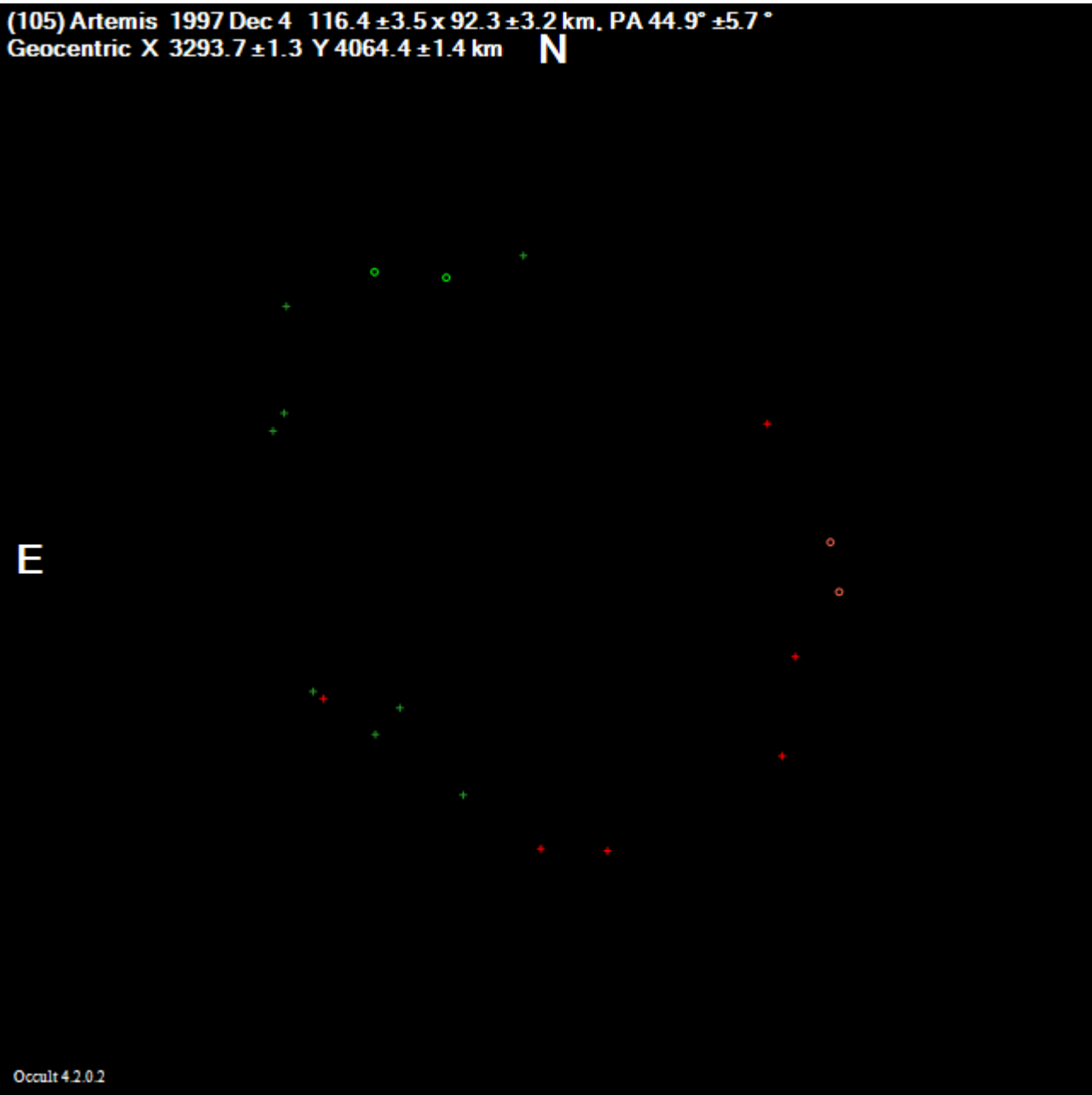
(1051) Merope 2002 Feb 2 70.9 x 42.1 km, PA -43.0° °
Geocentric X 2021.3 Y 5161.5 km

N

E



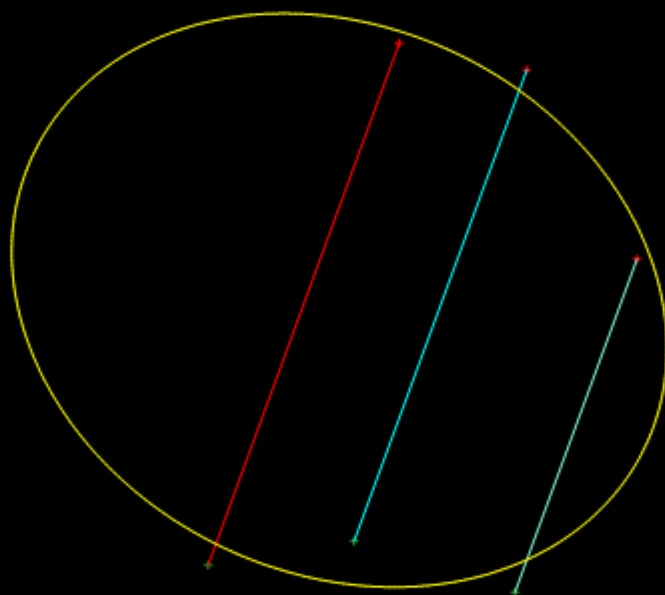
105artemis1997dec04



105artemis1998feb12

(105) Artemis 1998 Feb 12 105.0 x 84.6 \pm 4.5 km. PA 64.2° \pm 16.7°
Geocentric X 3139.7 \pm 4.0 Y 3156.5 \pm 2.4 km N

E

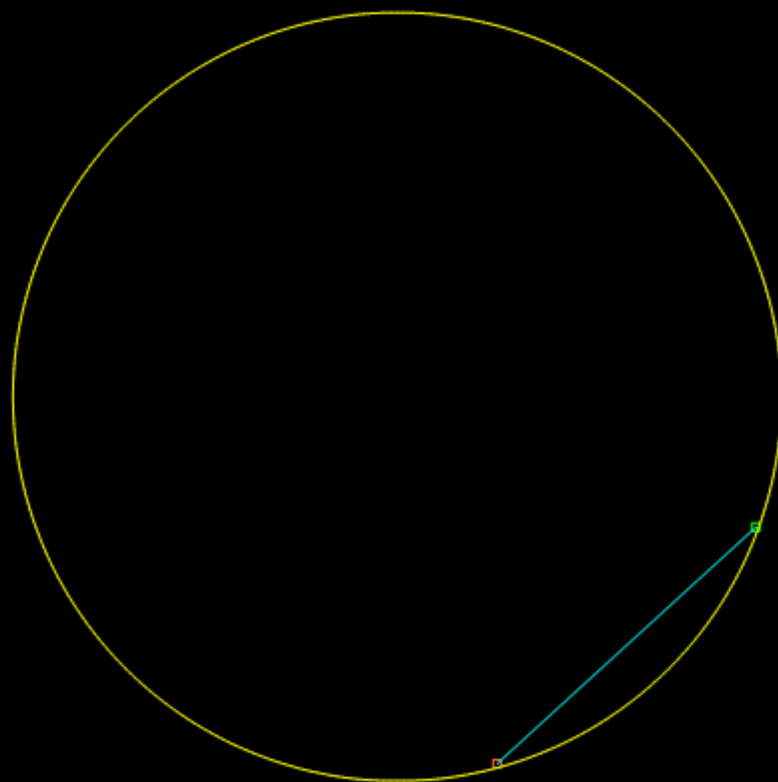


105artemis2008oct11

(105) Artemis 2008 Oct 11 116.0 x 116.0 km, PA 0.0° °
Geocentric X -3223.3 ± 0.1 Y 3908.1 ± 0.1 km **N**

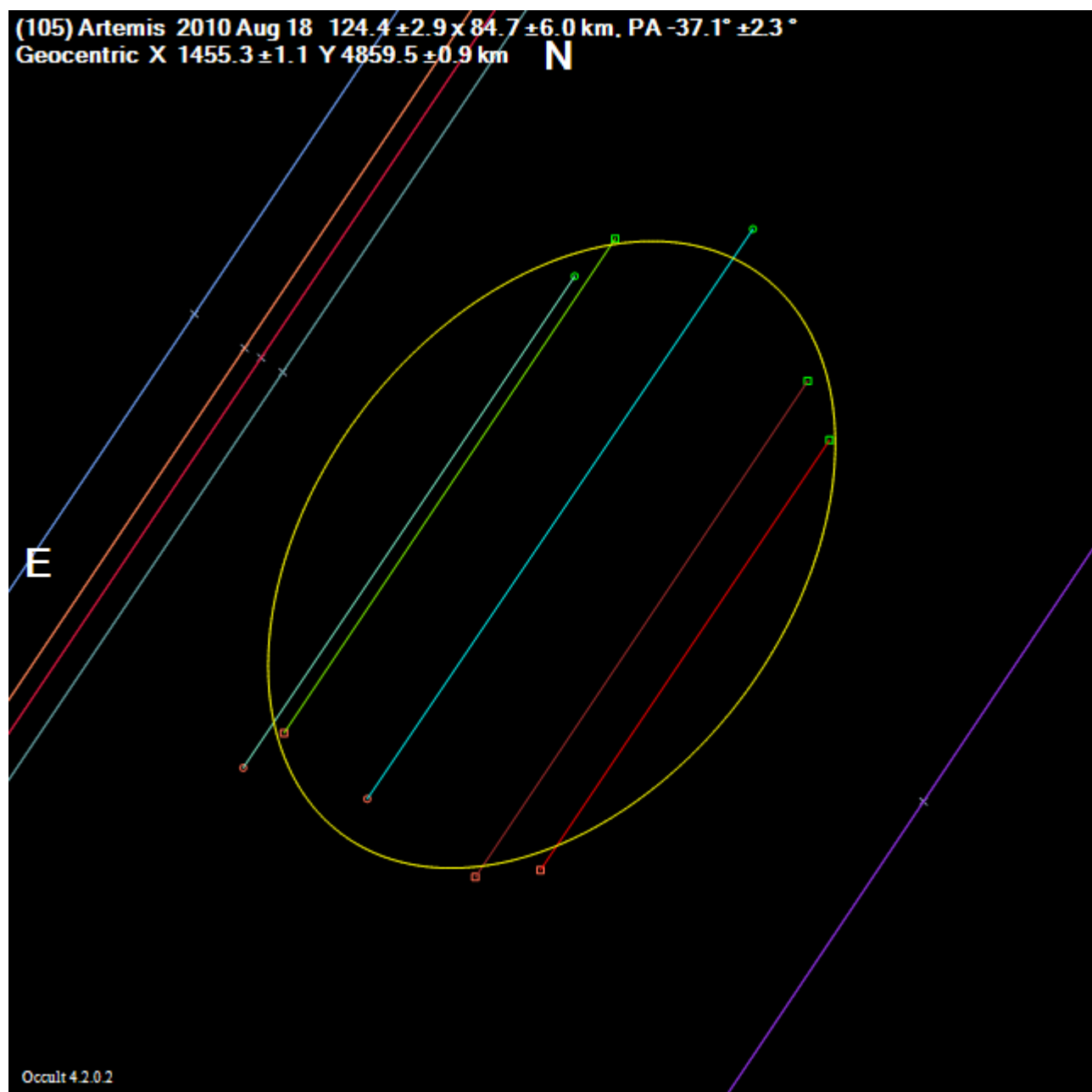
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Occult 4.2.0.2



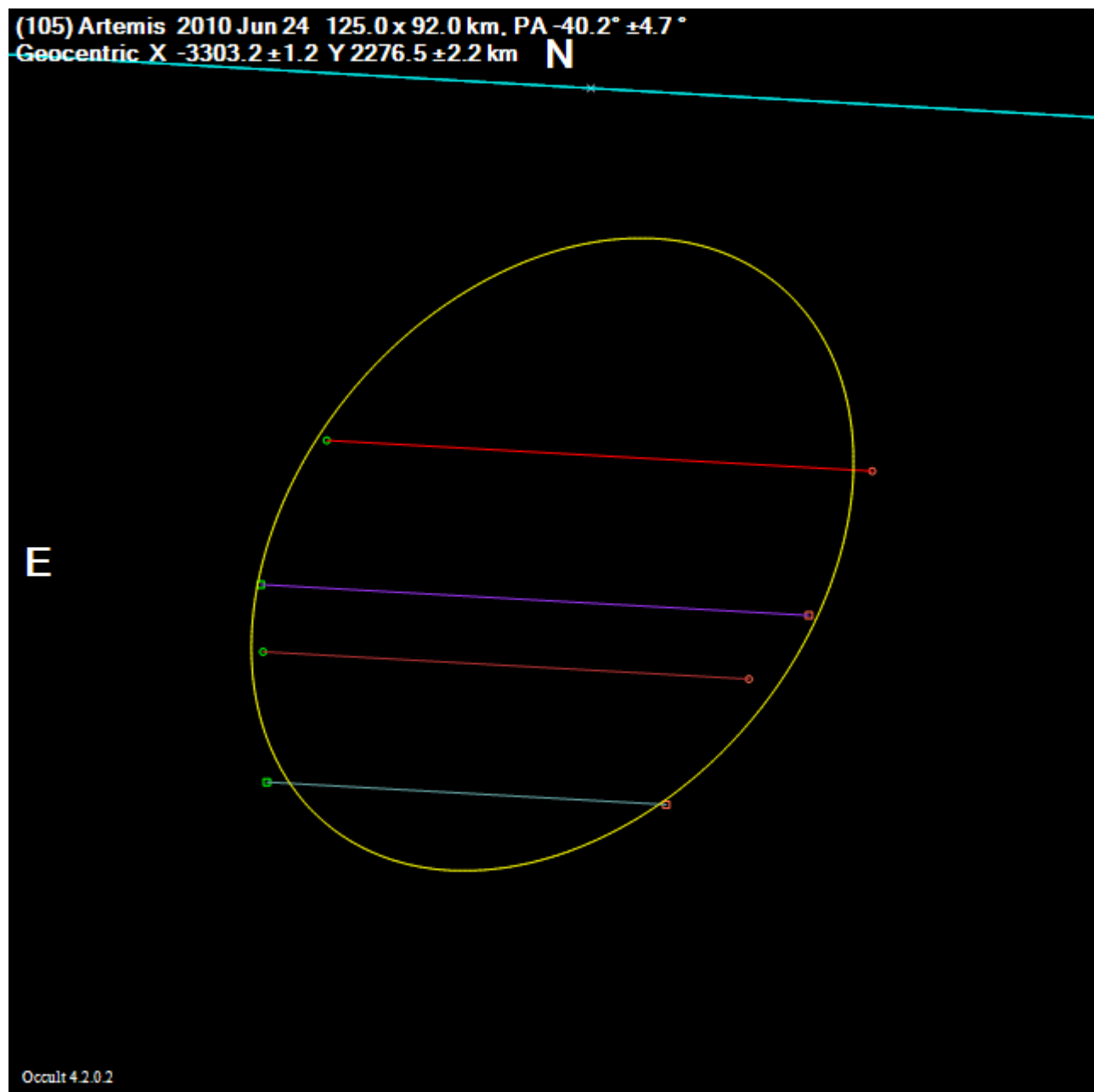
105artemis2010aug18

(105) Artemis 2010 Aug 18 $124.4 \pm 2.9 \times 84.7 \pm 6.0$ km, PA $-37.1^\circ \pm 2.3^\circ$
Geocentric X 1455.3 ± 1.1 Y 4859.5 ± 0.9 km **N**



105artemis2010jun24

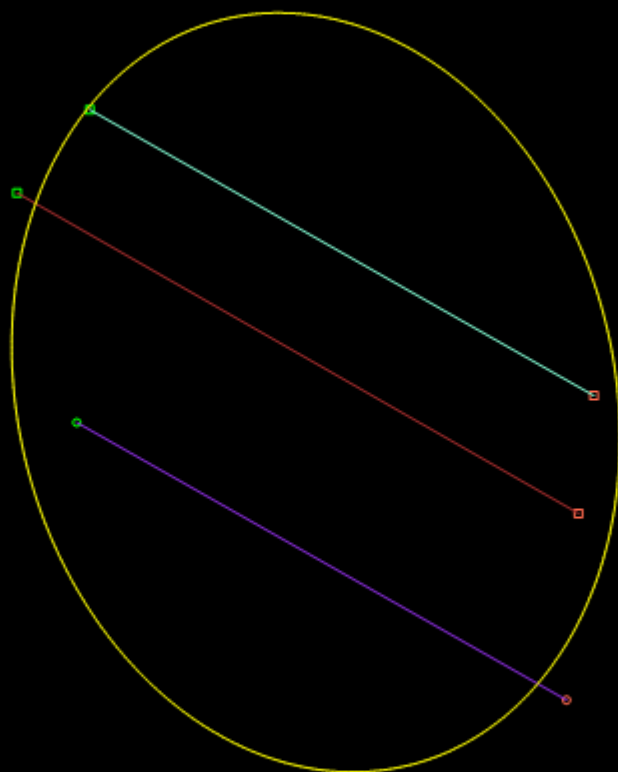
(105) Artemis 2010 Jun 24 125.0 x 92.0 km, PA $-40.2^\circ \pm 4.7^\circ$
Geocentric X -3303.2 ± 1.2 Y 2276.5 ± 2.2 km **N**



105artemis2014jul27

(105) Artemis 2014 Jul 27 116.0 x 90.0 km, PA $14.3^\circ \pm 10.7^\circ$
Geocentric X -2163.2 ± 2.5 Y 3205.8 ± 5.7 km **N**

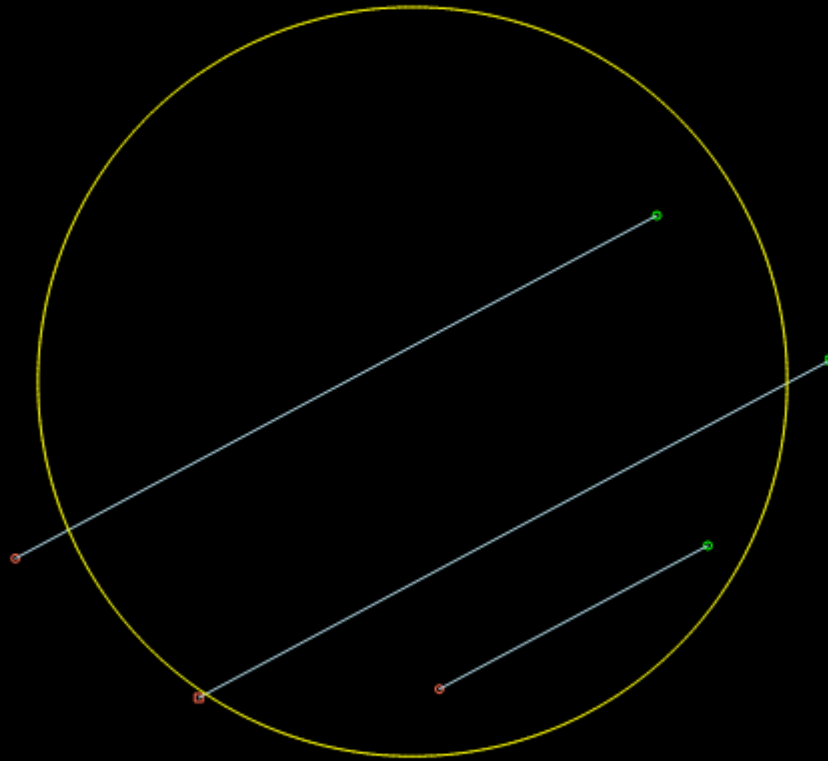
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105artemis2015sep05

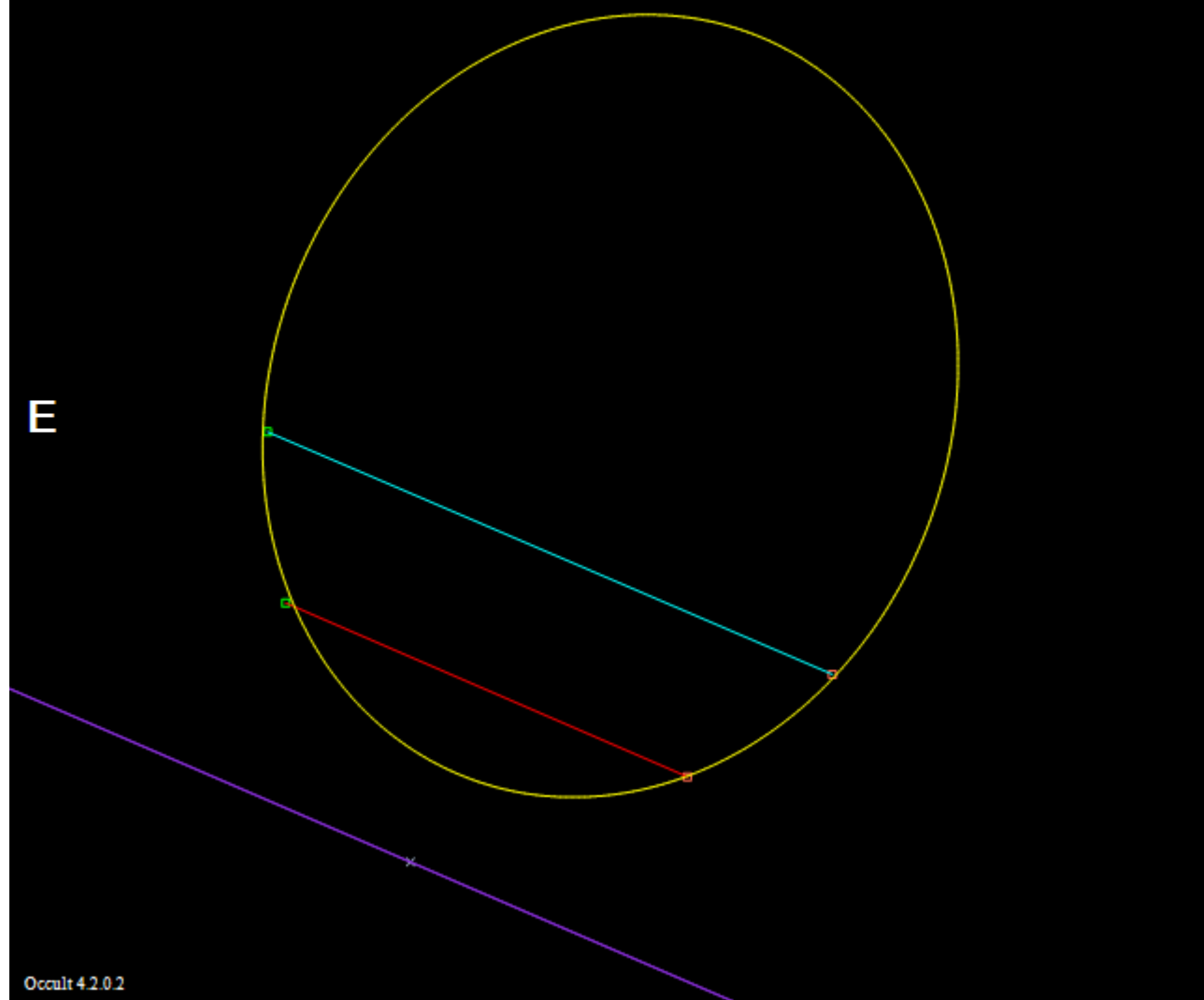
(105) Artemis 2015 Sep 5 116.0 x 116.0 km, PA 0.0°
Geocentric X -5119.3 ± 4.6 Y -2830.3 ± 6.0 km **N**

E



1062ljuba2010jan28

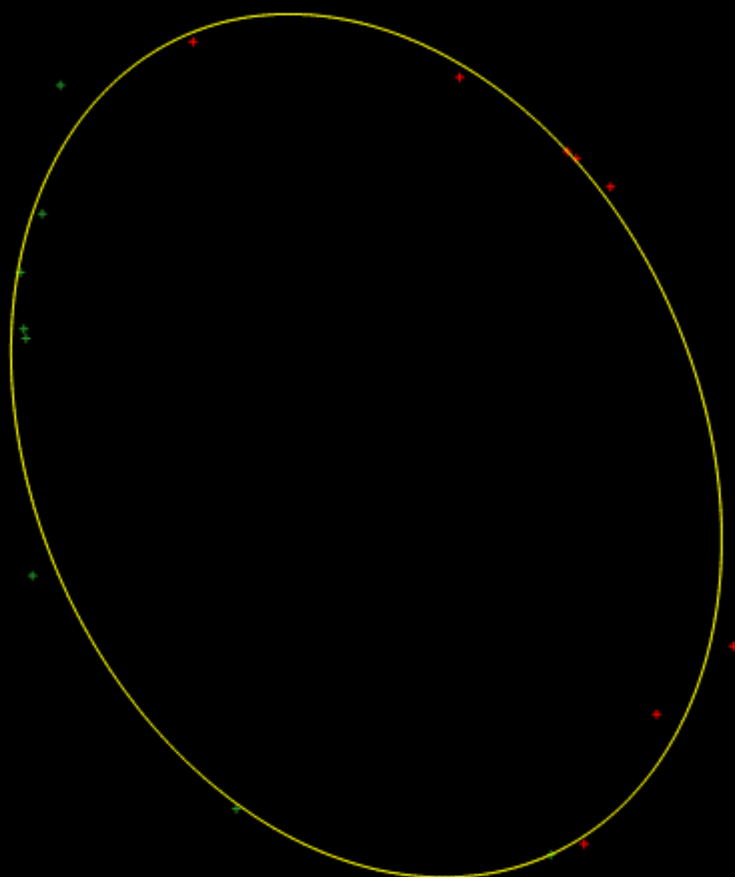
(1062) Ljuba 2010 Jan 28 $61.0 \pm 3.8 \times 52.0$ km, PA -21.0°
Geocentric X -3397.6 ± 0.5 Y 1142.9 ± 1.3 km **N**



106dione1983jan19

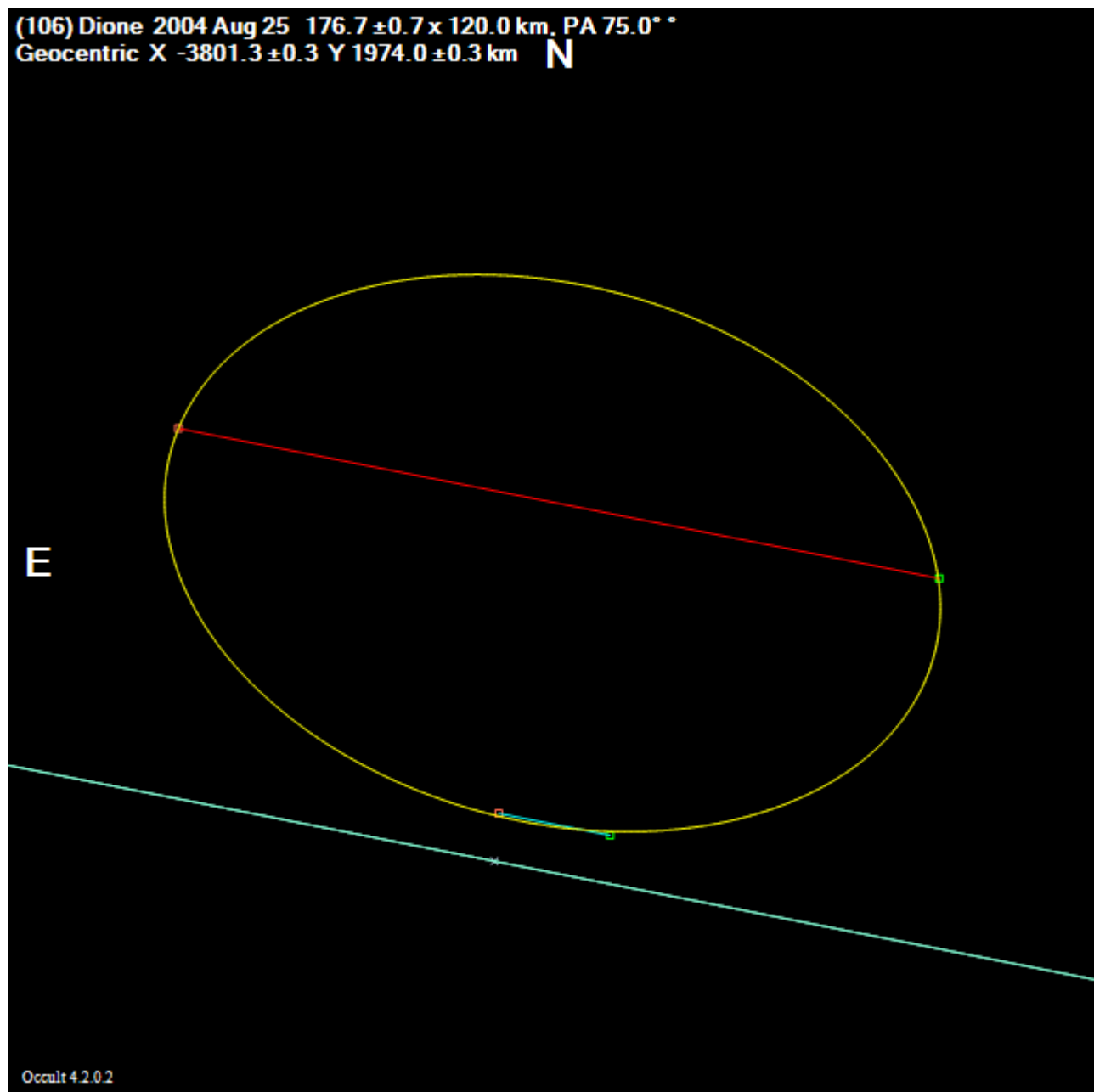
(106) Dione 1983 Jan 19 170.4 x 126.8 km. PA 24.0° ± 2.8°
Geocentric X -3541.4 ± 1.0 Y 4284.9 ± 1.3 km **N**

E



106dione2004aug25

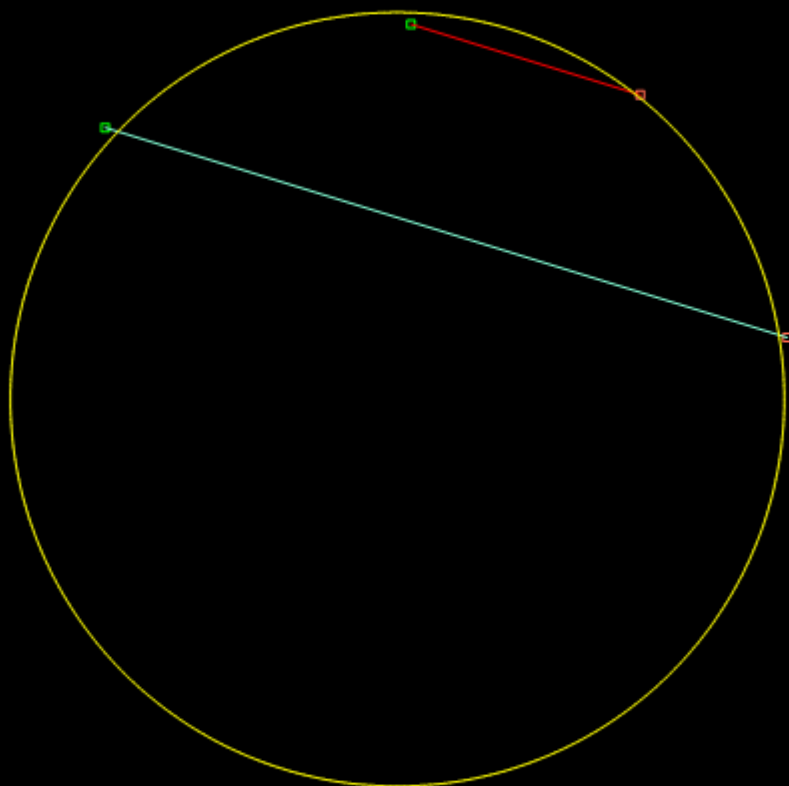
(106) Dione 2004 Aug 25 $176.7 \pm 0.7 \times 120.0$ km, PA 75.0° °
Geocentric X -3801.3 ± 0.3 Y 1974.0 ± 0.3 km **N**



106dione2009sep26

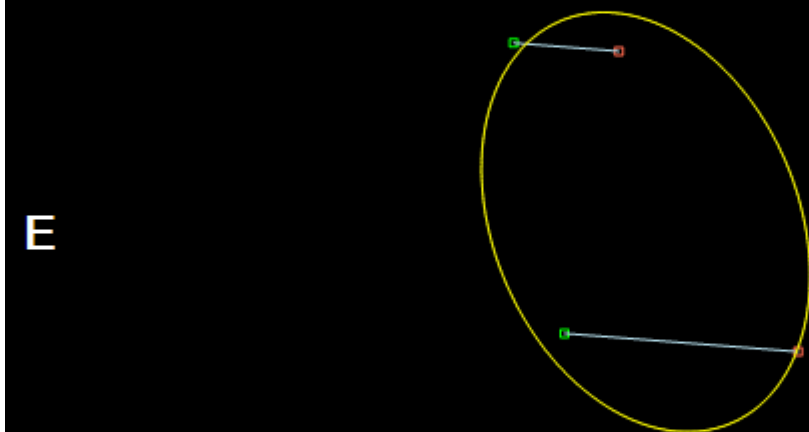
(106) Dione 2009 Sep 26 147.0 x 147.0 km, PA 0.0° °
Geocentric X 3967.5 ± 1.2 Y -3102.5 ± 1.2 km **N**

E



1075helina2015oct31

(1075) Helina 2015 Oct 31 43.0 x 30.0 km, PA 23.0°
Geocentric X -1843.6 ± 1.3 Y 4996.8 ± 1.3 km **N**

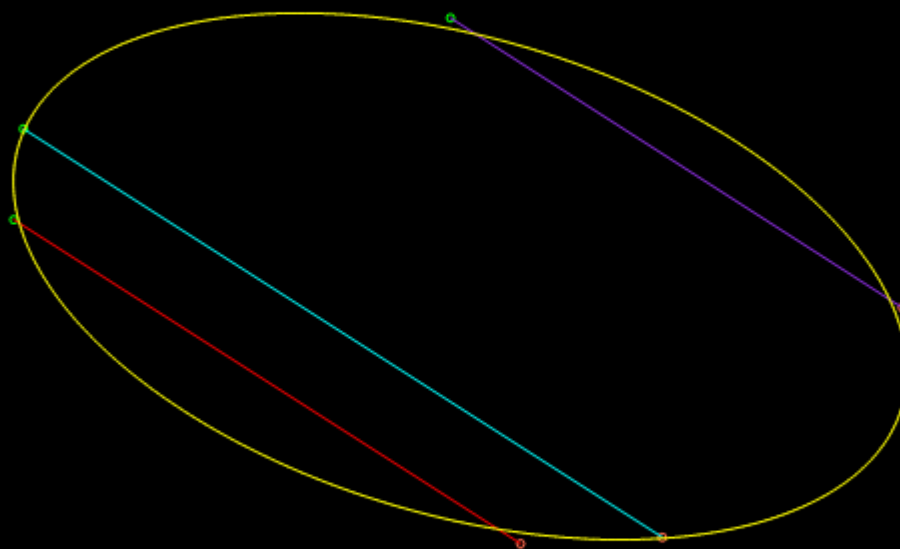


Occult 4.2.9.1

107camilla2004sep05

(107) Camilla 2004 Sep 5 $267.3 \pm 0.7 \times 138.3 \pm 1.0$ km, PA $73.5^\circ \pm 0.4^\circ$
Geocentric X 1375.8 ± 0.3 Y 3817.1 ± 0.2 km **N**

E

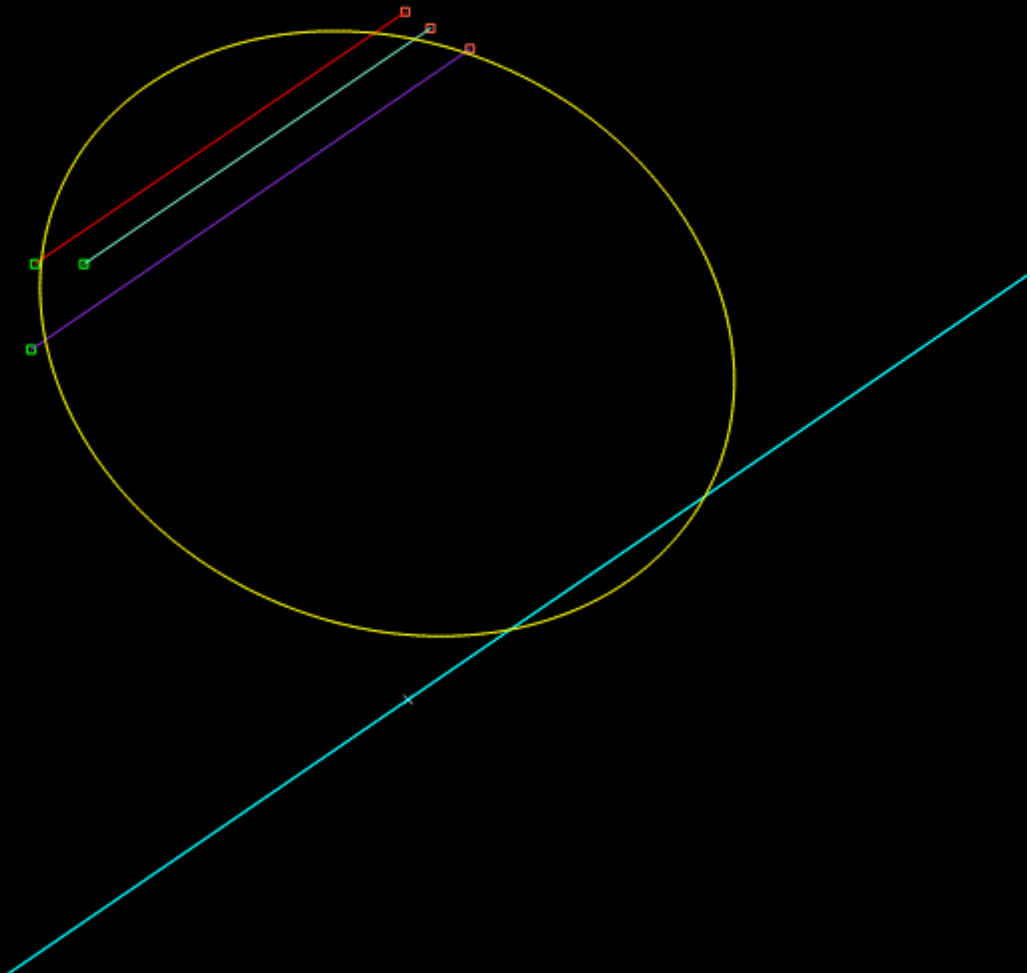


107camilla2014mar13

(107) Camilla 2014 Mar 13 337.0 x 274.0 km, PA 66.0° °
Geocentric X 1787.1 ± 6.0 Y -4495.4 ± 6.2 km **N**

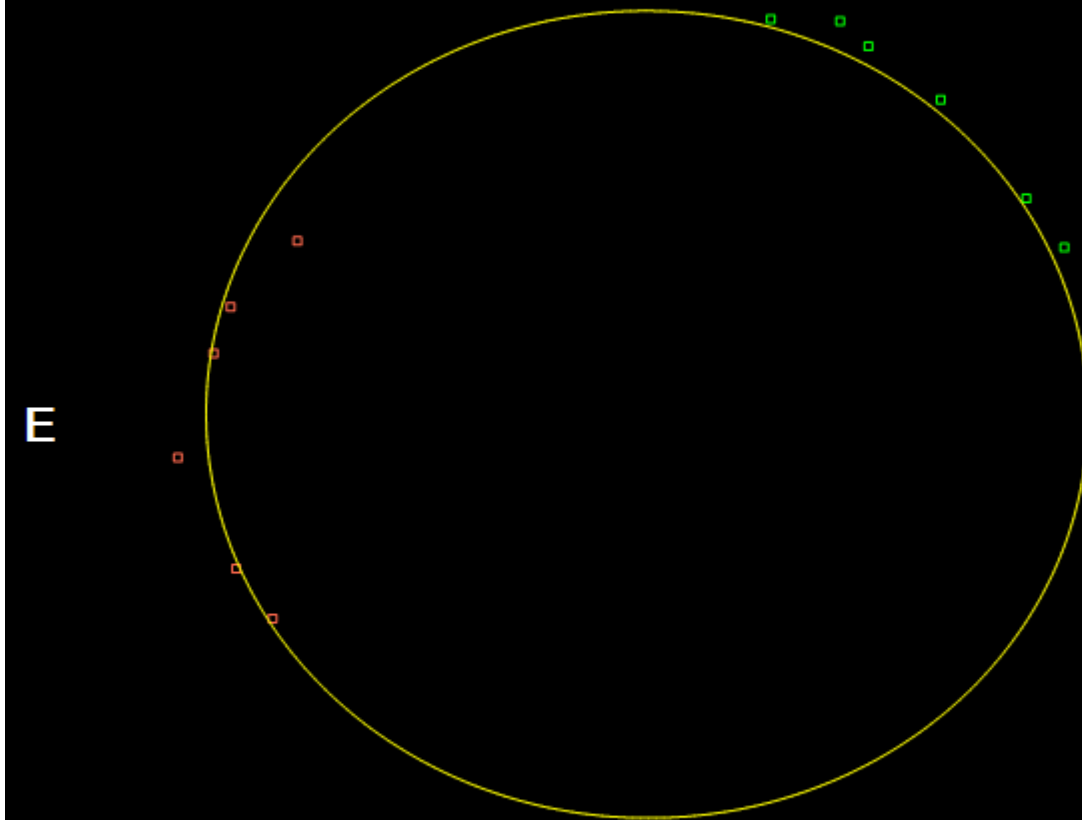
E

Occult 4.2.0.2



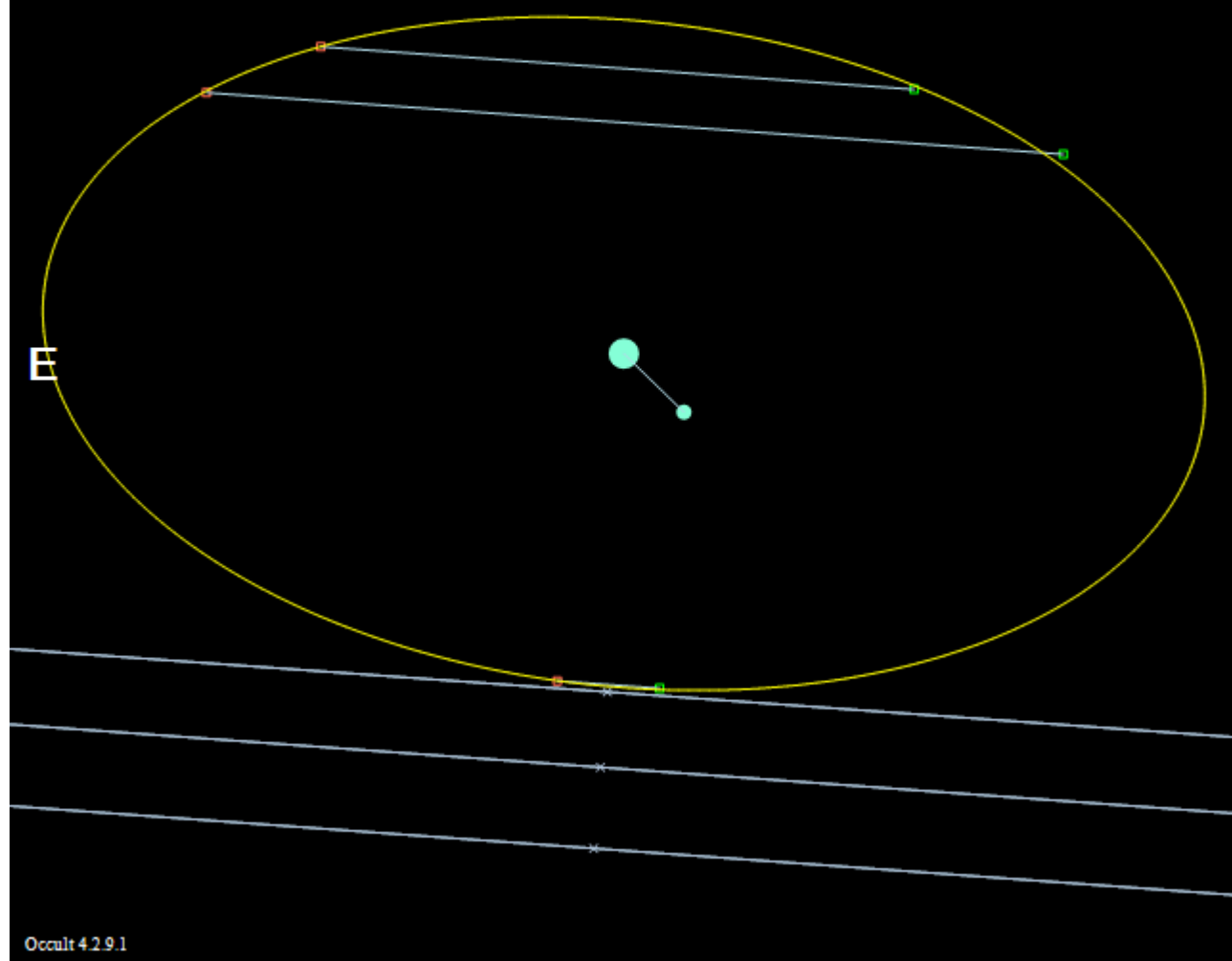
107camilla2015aug23

(107) Camilla 2015 Aug 23 $251.3 \pm 7.7 \times 230.0$ km, PA $89.1^\circ \pm 16.2^\circ$
Geocentric X 2723.8 ± 3.6 Y 5089.7 ± 3.4 km **N**



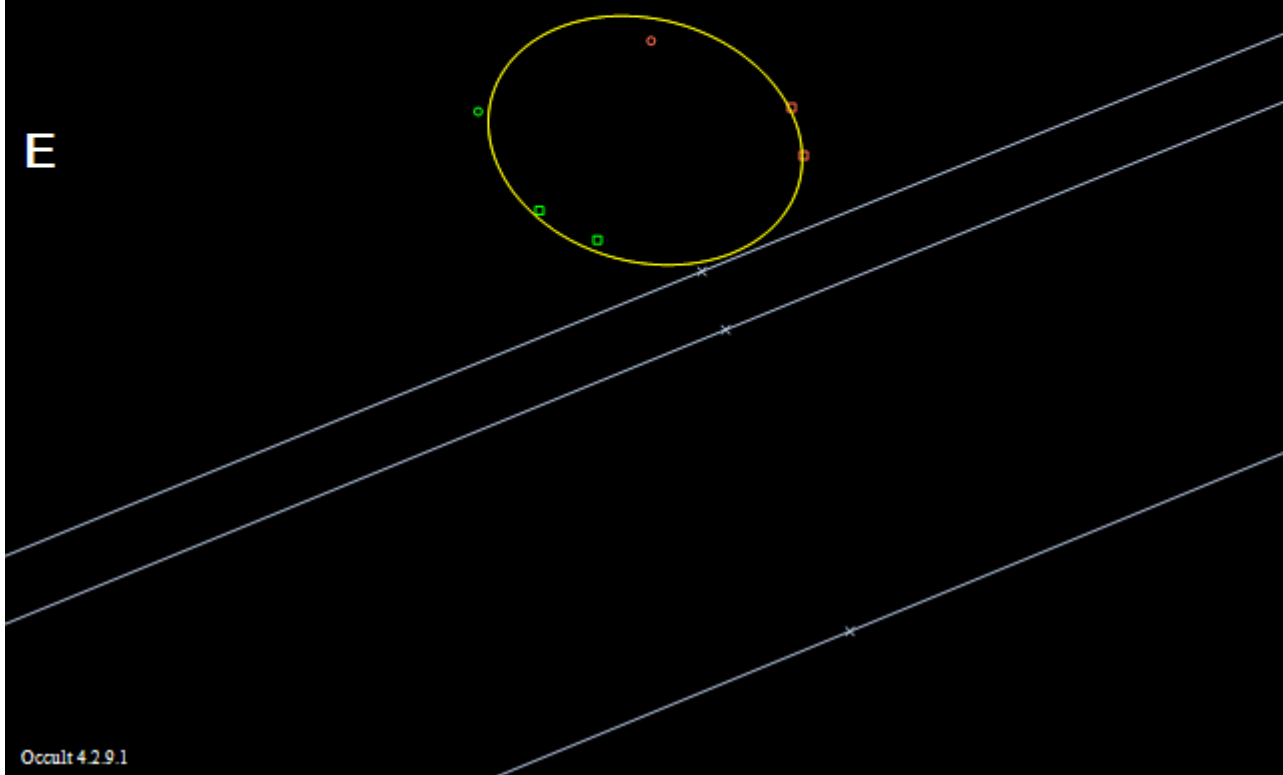
107camilla2015feb12

(107) Camilla 2015 Feb 12 347.5 x 198.3 km, PA 83.8°
Geocentric X -3145.7 ± 1.4 Y 4506.7 ± 0.3 km **N**
Double : Sep $0.0100 \pm 0.0005''$, PA $225.8^\circ \pm 2.5^\circ$



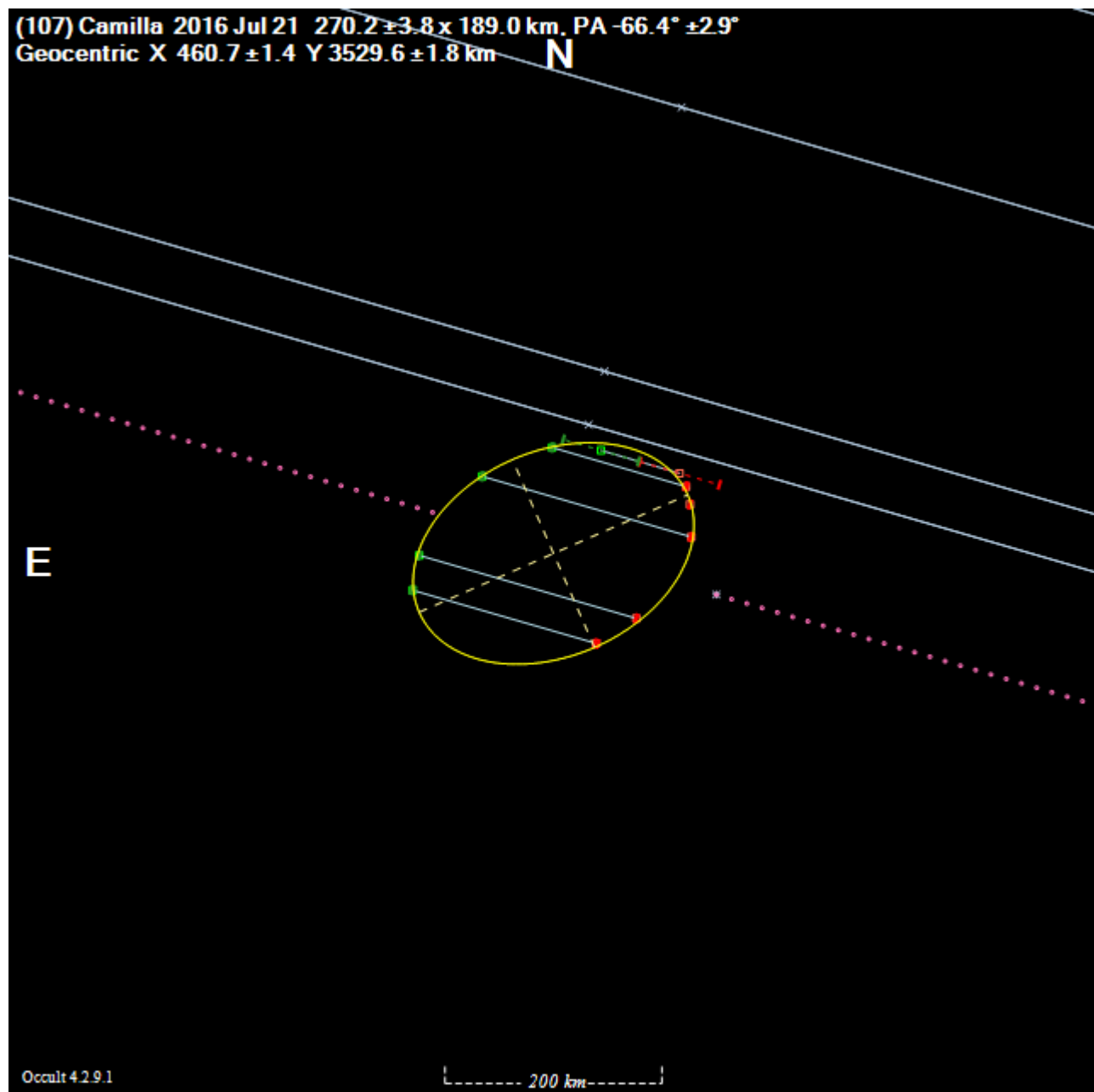
107camilla2015may06

(107) Camilla 2015 May 6 287.0 x 218.0 km. PA 74.0°
Geocentric X -1215.6 ± 5.9 Y 4289.7 ± 6.7 km **N**



107Camilla2016Jul21

(107) Camilla 2016 Jul 21 $270.2 \pm 3.8 \times 189.0$ km. PA $-66.4^\circ \pm 2.9^\circ$
Geocentric X 460.7 ± 1.4 Y 3529.6 ± 1.8 km



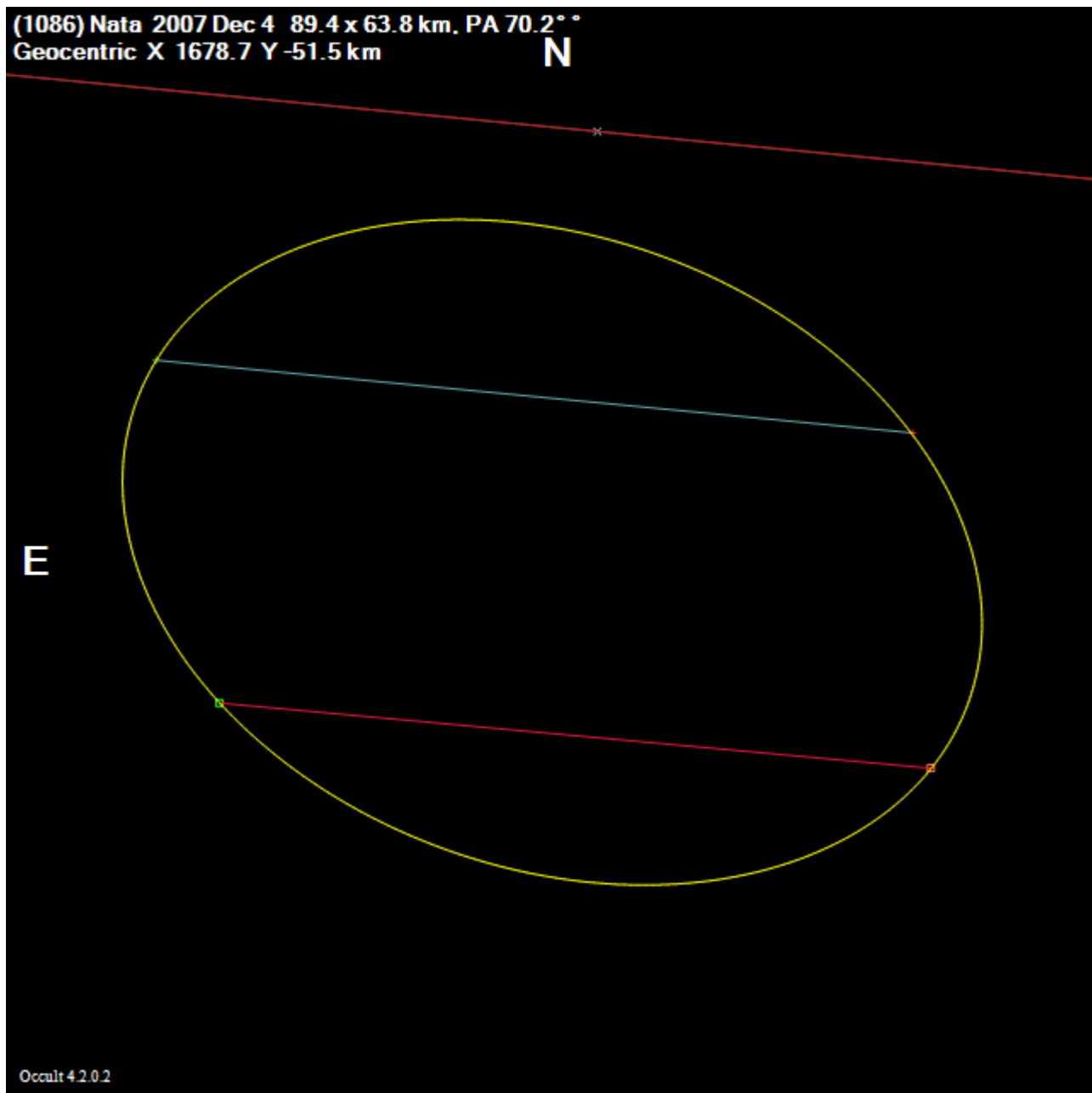
1086nata2007dec04

(1086) Nata 2007 Dec 4 89.4 x 63.8 km, PA 70.2° °
Geocentric X 1678.7 Y -51.5 km

N

E

Occult 4.2.0.2

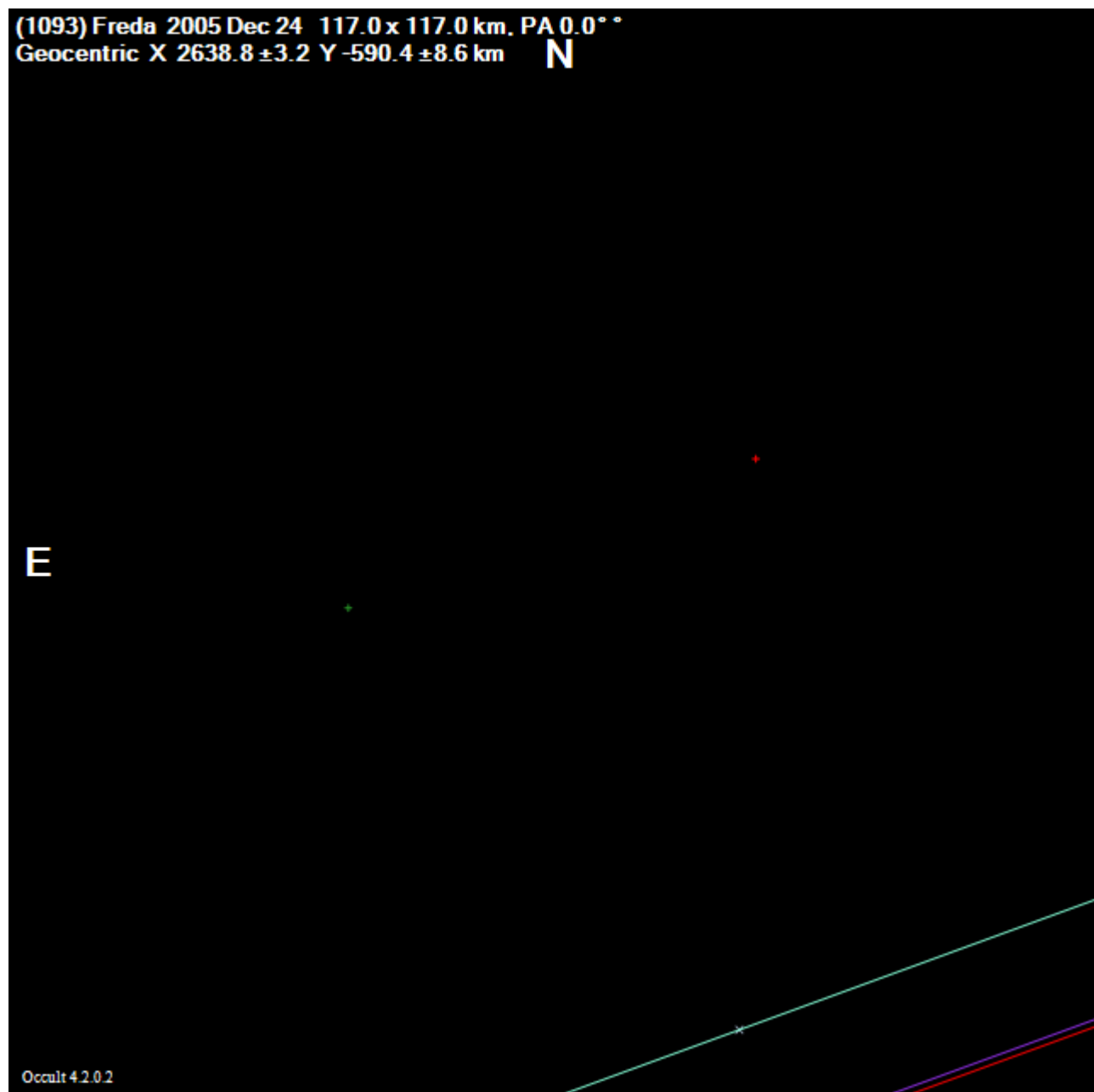


1093freda2005dec24

(1093) Freda 2005 Dec 24 117.0 x 117.0 km, PA 0.0° °
Geocentric X 2638.8 ± 3.2 Y -590.4 ± 8.6 km N

E

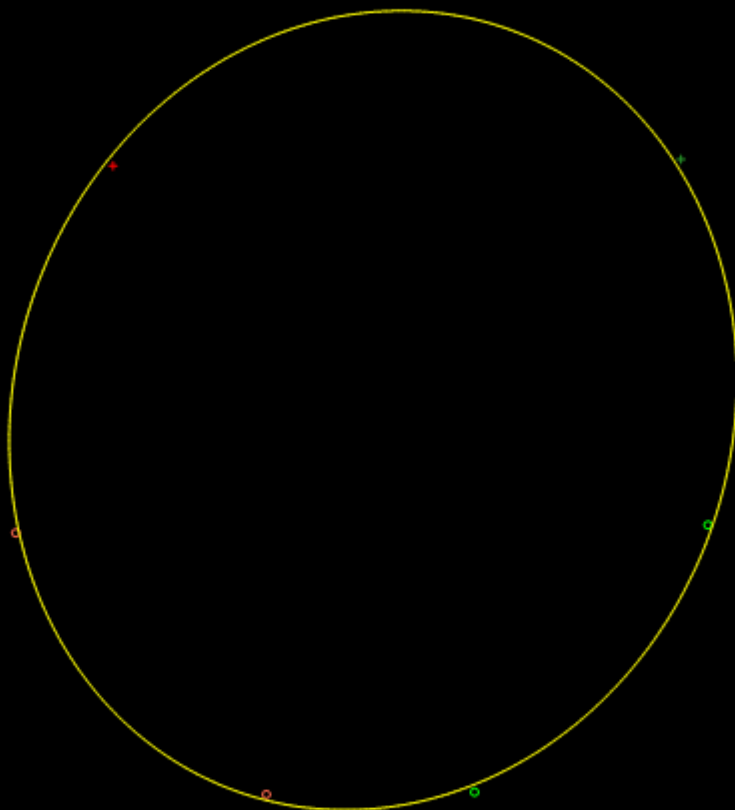
Occult 4.2.0.2



109felicitas2003mar29

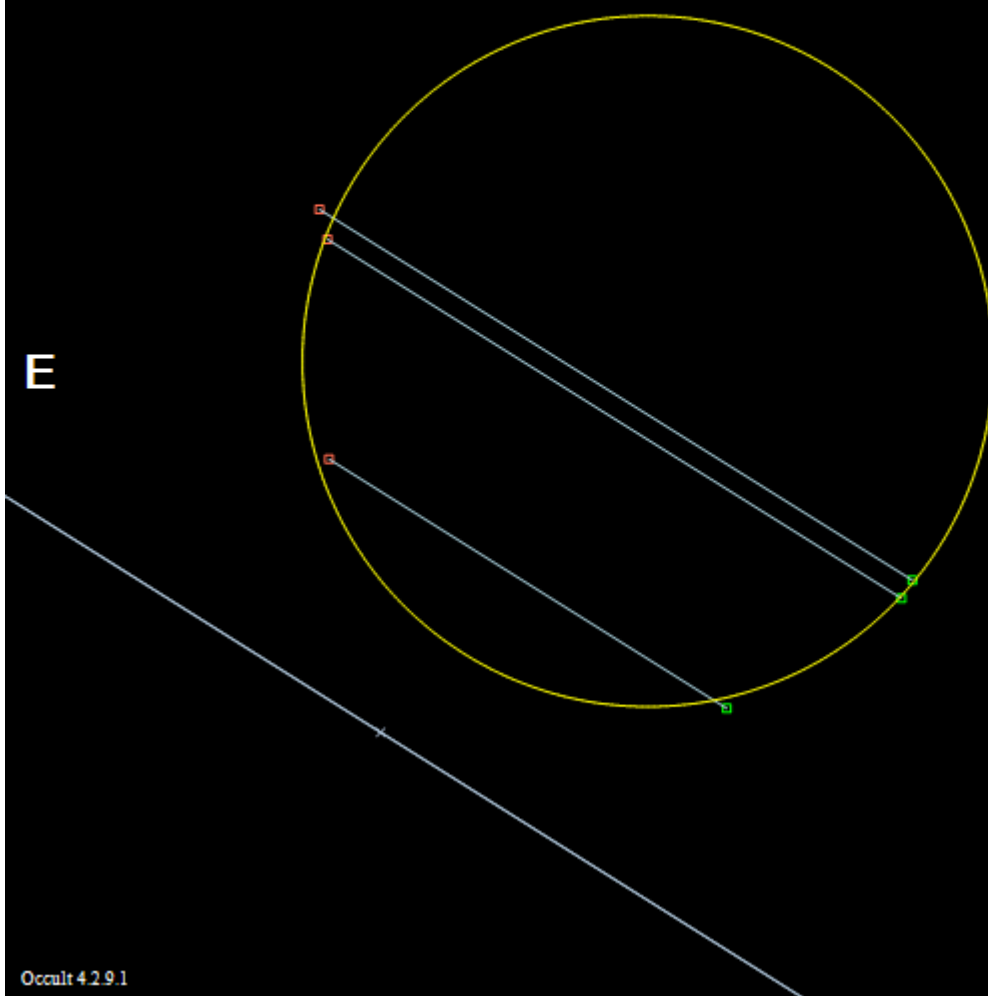
(109) Felicitas 2003 Mar 29 $93.7 \pm 1.8 \times 83.0 \pm 1.0$ km, PA $-19.7^\circ \pm 5.6^\circ$
Geocentric X 4056.0 ± 0.5 Y 1556.3 ± 0.8 km **N**

E



109felicitas2015dec05

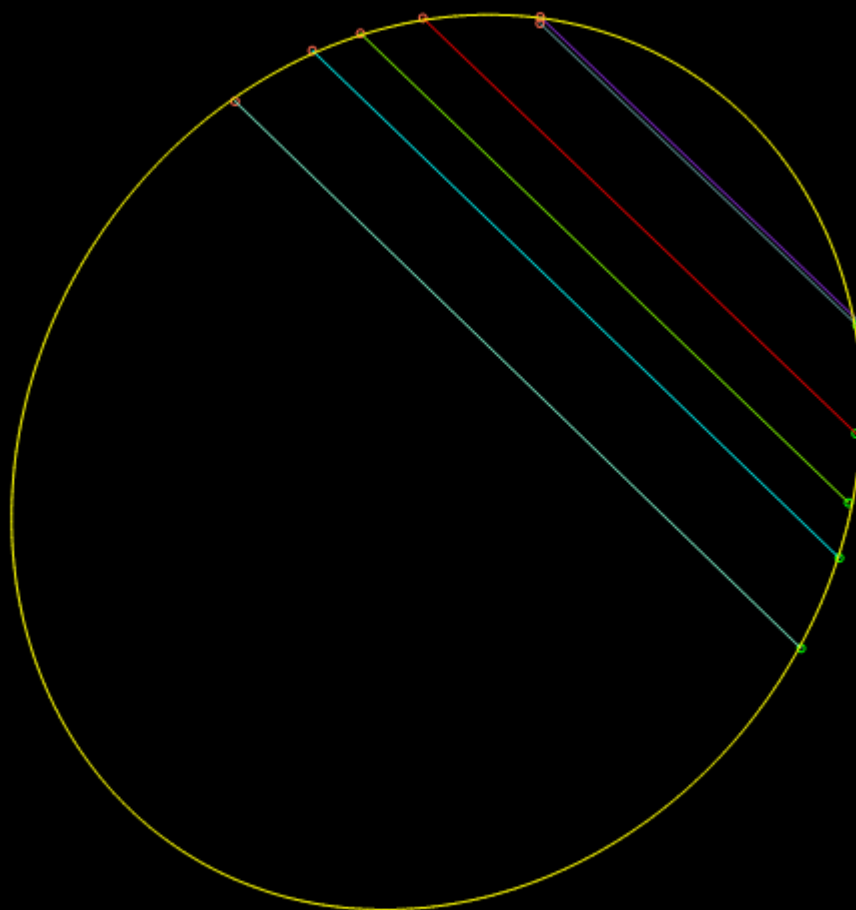
(109) Felicitas 2015 Dec 5 80.0 x 80.0 km, PA 0.0°
Geocentric X 3555.7 ± 0.7 Y 4274.1 ± 0.9 km **N**



10hygiea2002sep07

(10) Hygiea 2002 Sep 7 $492.2 \pm 37.1 \times 430.4 \pm 8.8$ km, PA $-33.8^\circ \pm 5.1^\circ$
Geocentric X -4930.7 ± 11.6 Y 3095.7 ± 12.8 km **N**

E

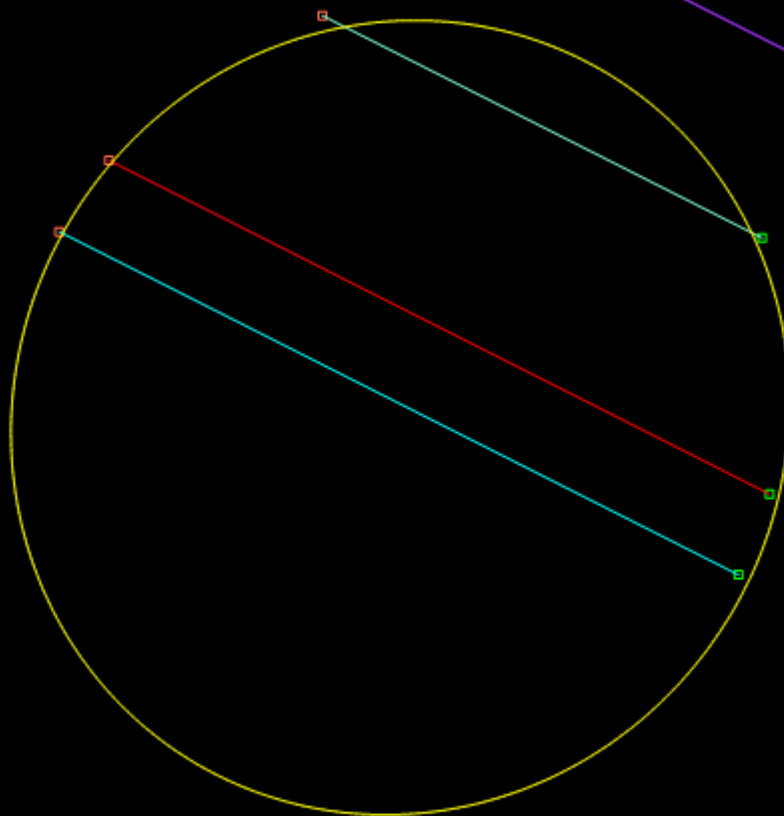


10hygiea2013aug10

(10) Hygiea 2013 Aug 10 447.4 x 428.4 ± 6.1 km, PA $-31.3^\circ \pm 28.6^\circ$
Geocentric X -2961.6 ± 3.7 Y -4534.0 ± 5.1 km **N**

E

Occult 4.2.0.2



10hygiea2014sep05

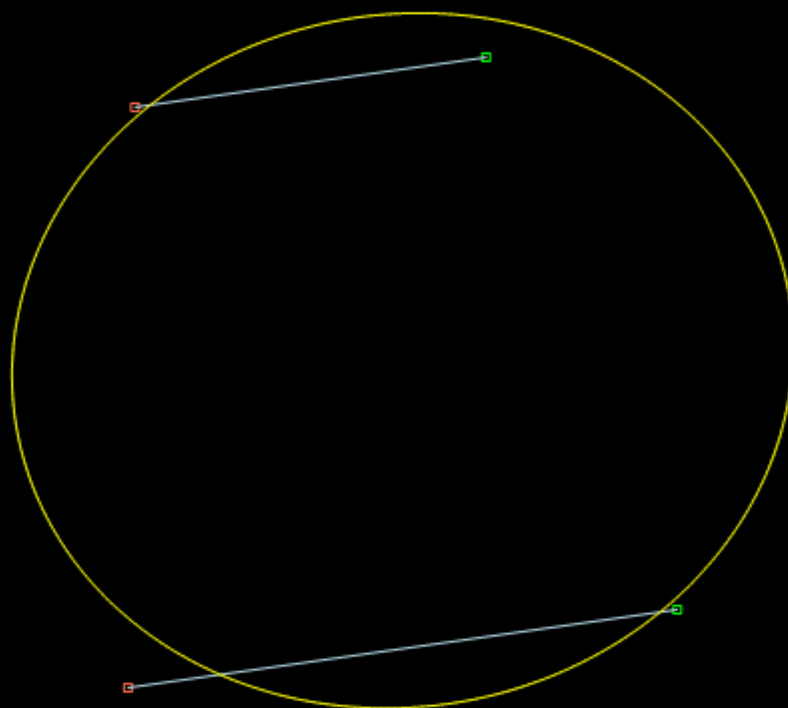
(10) Hygiea 2014 Sep 5 $464.0 \pm 86.3 \times 383.3 \pm 47.5$ km, PA $45.0^\circ \pm 37.3^\circ$
Geocentric X -3563.5 ± 12.0 Y 3136.3 ± 44.0 km



10hygiea2015may14

(10) Hygiea 2015 May 14 462.0 x 408.0 km, PA -80.0°
Geocentric X 4547.3 ± 18.3 Y 3505.3 ± 11.9 km **N**

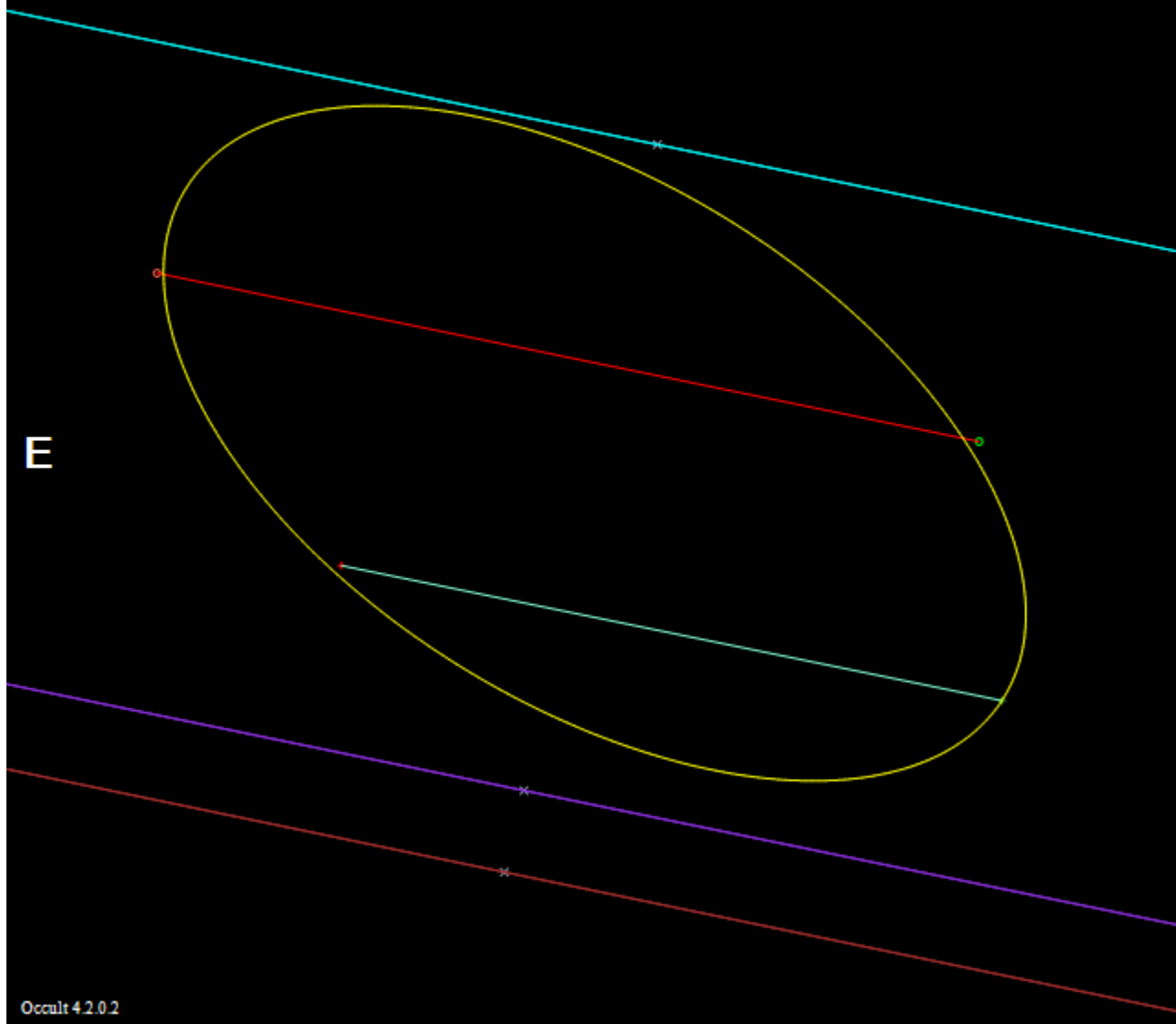
E



Occult 4.2.9.1

1107lictoria2002mar09

(1107) Lictoria 2002 Mar 9 108.2 x 58.5 km, PA 58.0° °
Geocentric X 694.8 ± 0.0 Y 2648.0 ± 0.0 km **N**

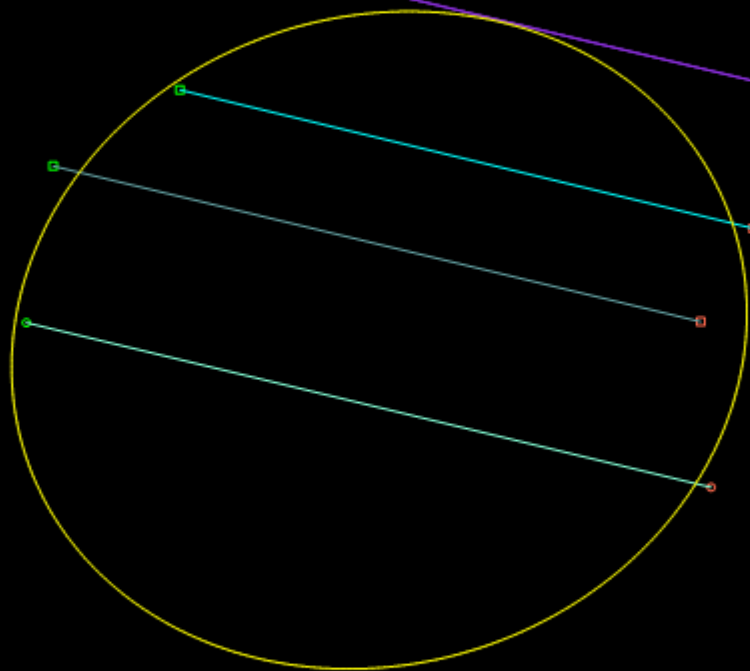


1107lictoria2010jul04

(1107) Lictoria 2010 Jul 4 $91.0 \pm 12.9 \times 79.2 \pm 22.9$ km, PA $-71.9^\circ \pm 94.6^\circ$
Geocentric X -944.9 ± 3.5 Y 5610.7 ± 8.2 km

N

E

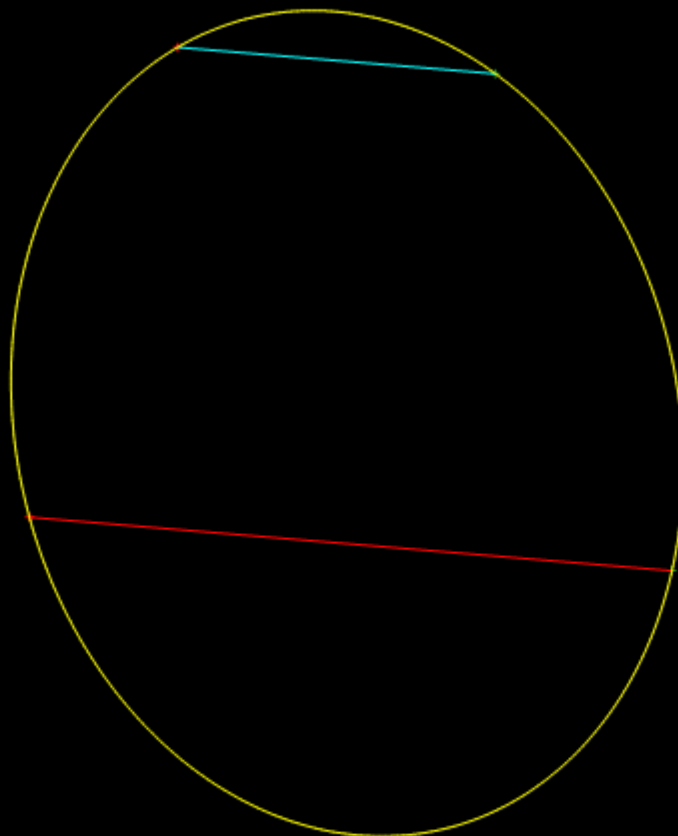


110lydia1999sep18

(110) Lydia 1999 Sep 18 93.3 x 74.1 km, PA 13.3° °
Geocentric X -3883.3 Y 4216.4 km

N

E

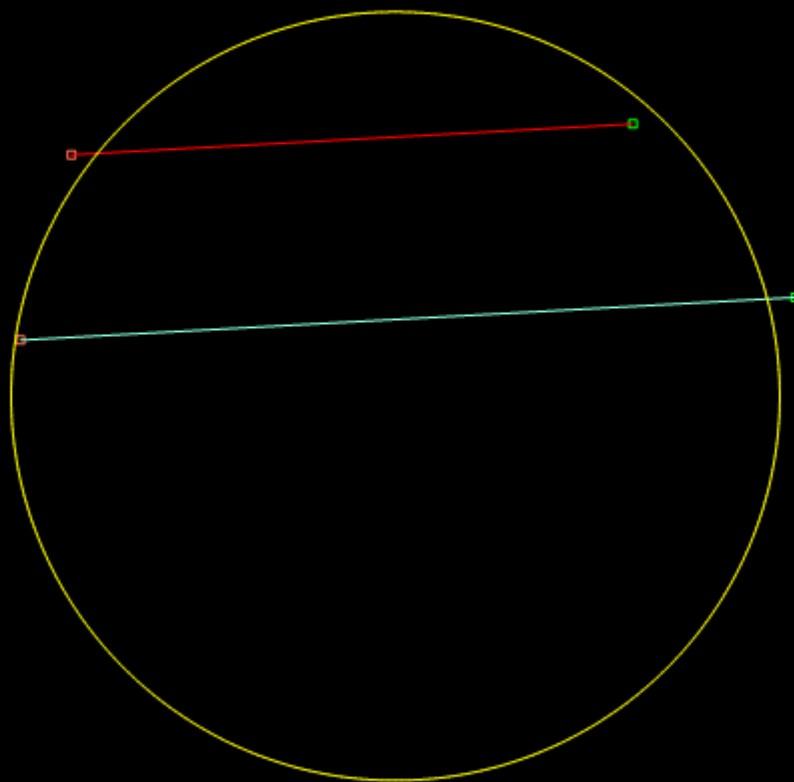


110lydia2009mar23

(110) Lydia 2009 Mar 23 86.0 x 86.0 km, PA 0.0°°
Geocentric X 1788.1 ± 1.3 Y 2152.5 ± 2.3 km

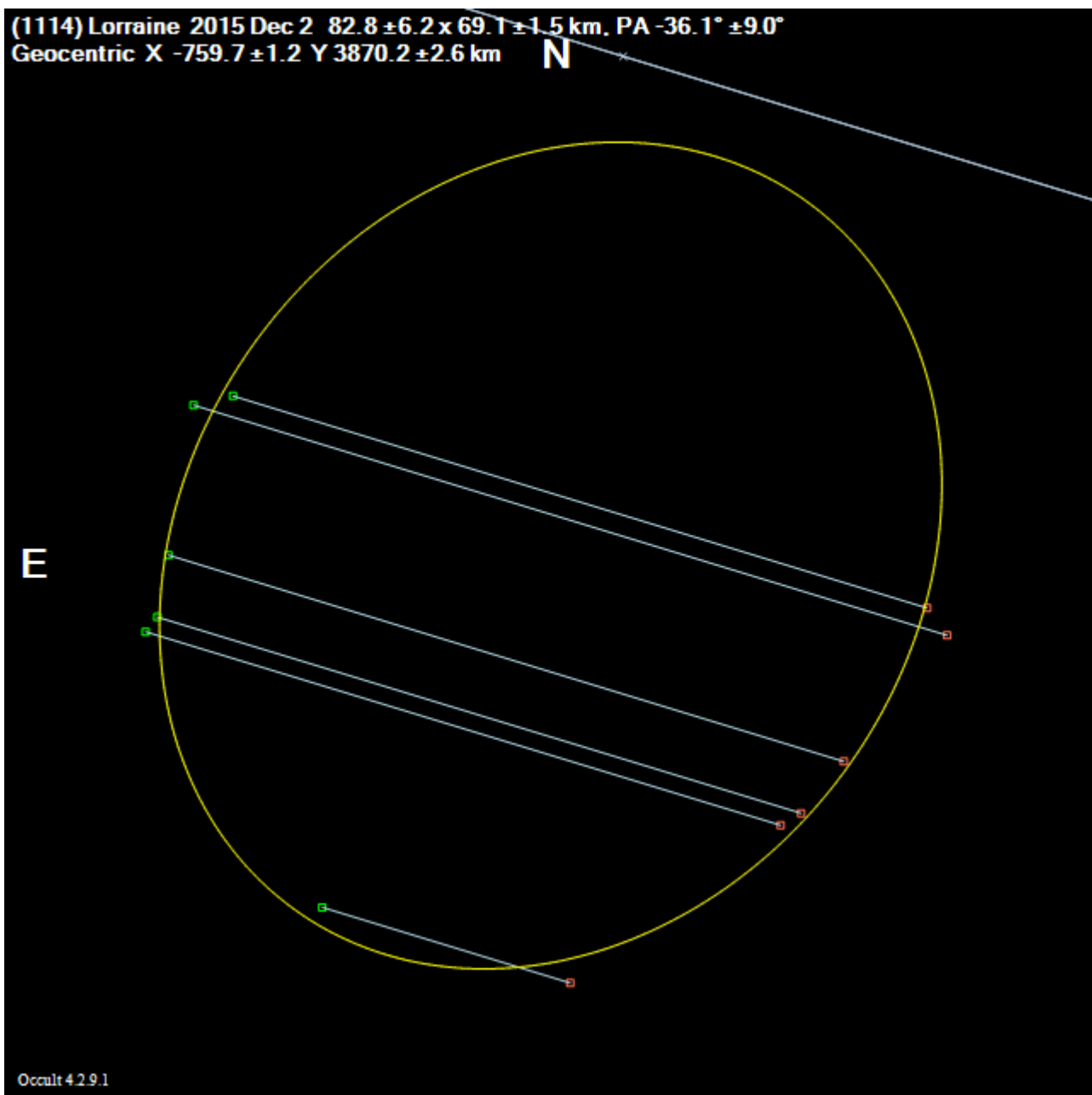
N

E



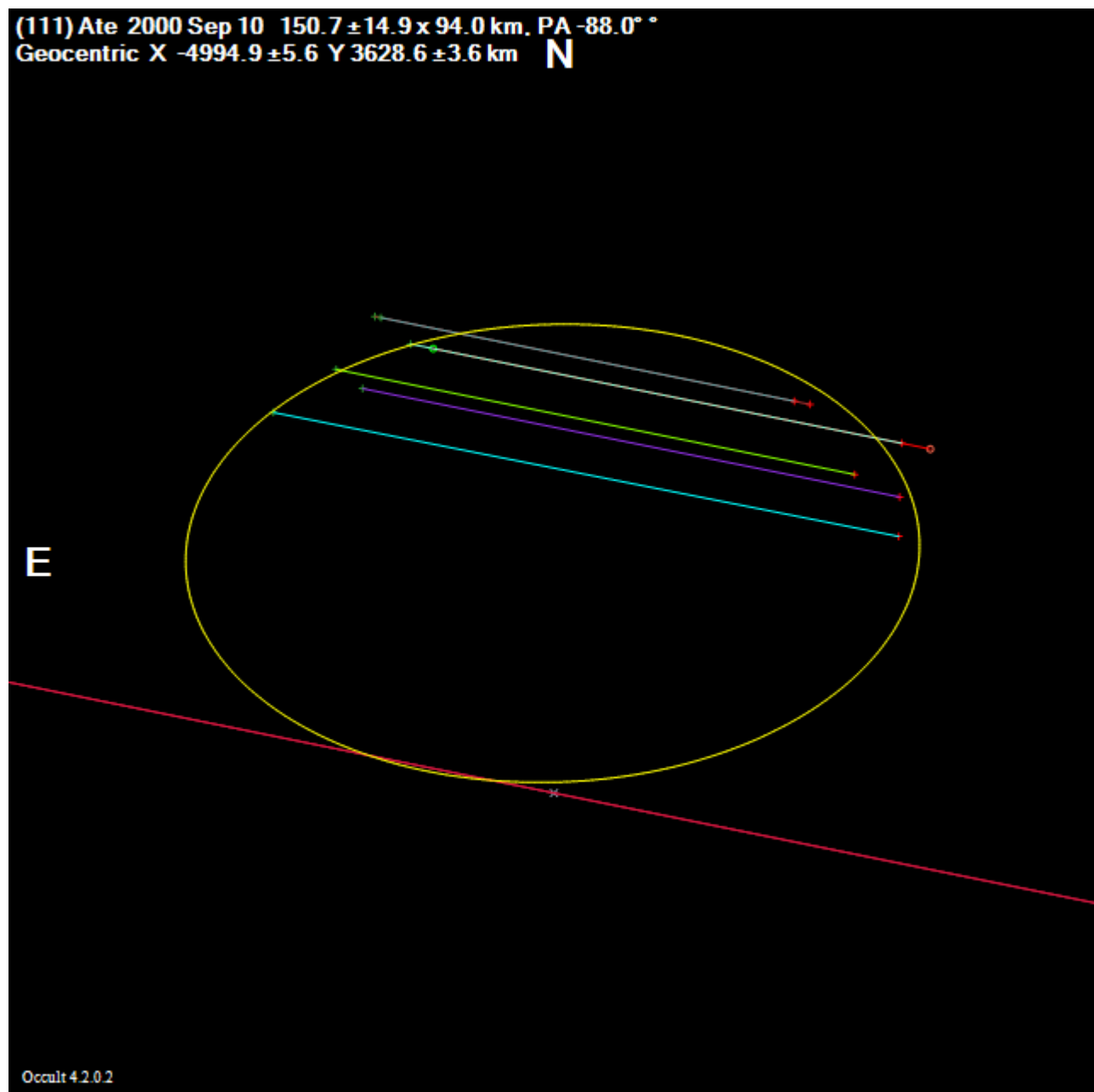
1114lorraine2015dec02

(1114) Lorraine 2015 Dec 2 $82.8 \pm 6.2 \times 69.1 \pm 1.5$ km, PA $-36.1^\circ \pm 9.0^\circ$
Geocentric X -759.7 ± 1.2 Y 3870.2 ± 2.6 km



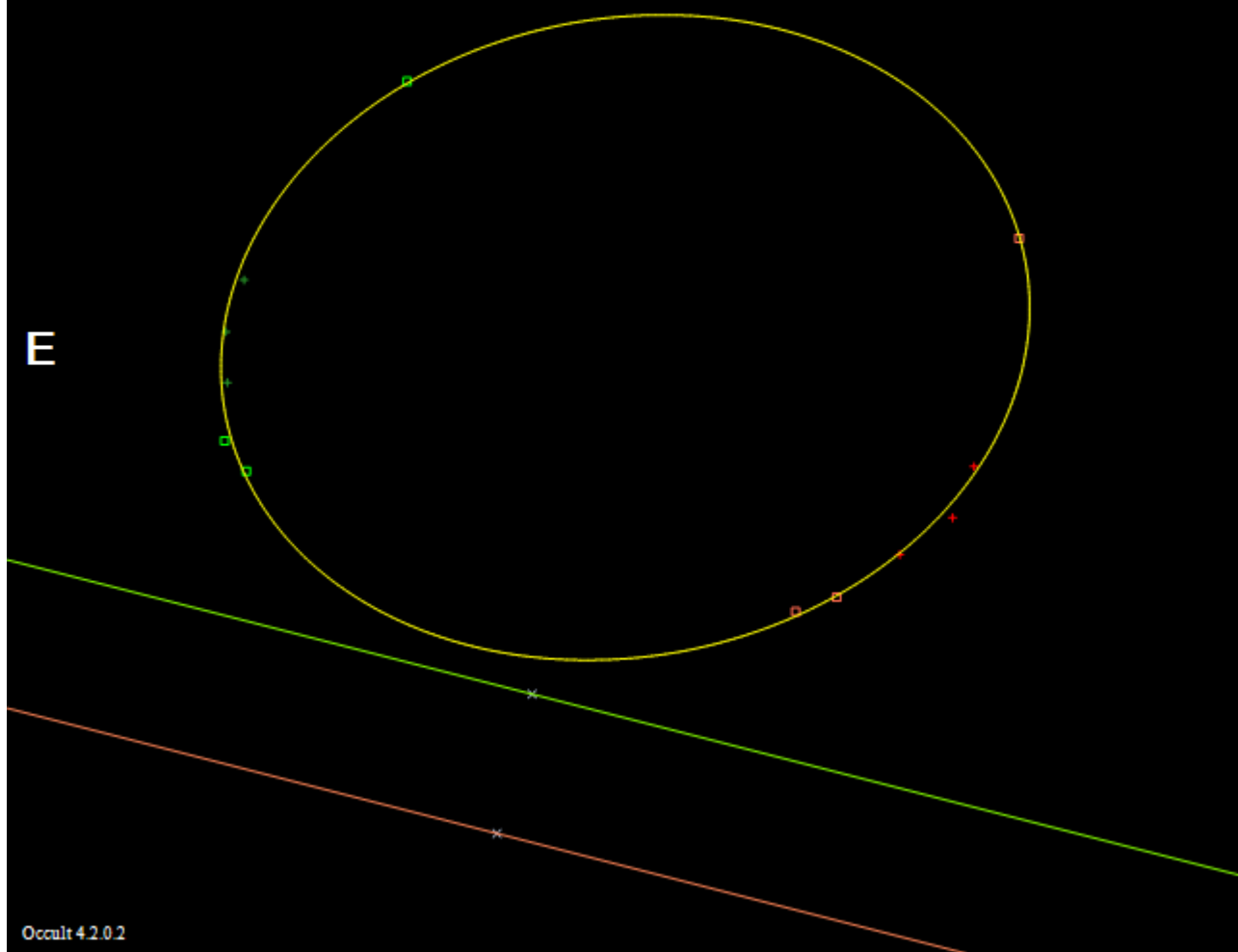
111ate2000sep10

(111) Ate 2000 Sep 10 $150.7 \pm 14.9 \times 94.0$ km, PA -88.0°
Geocentric X -4994.9 ± 5.6 Y 3628.6 ± 3.6 km **N**



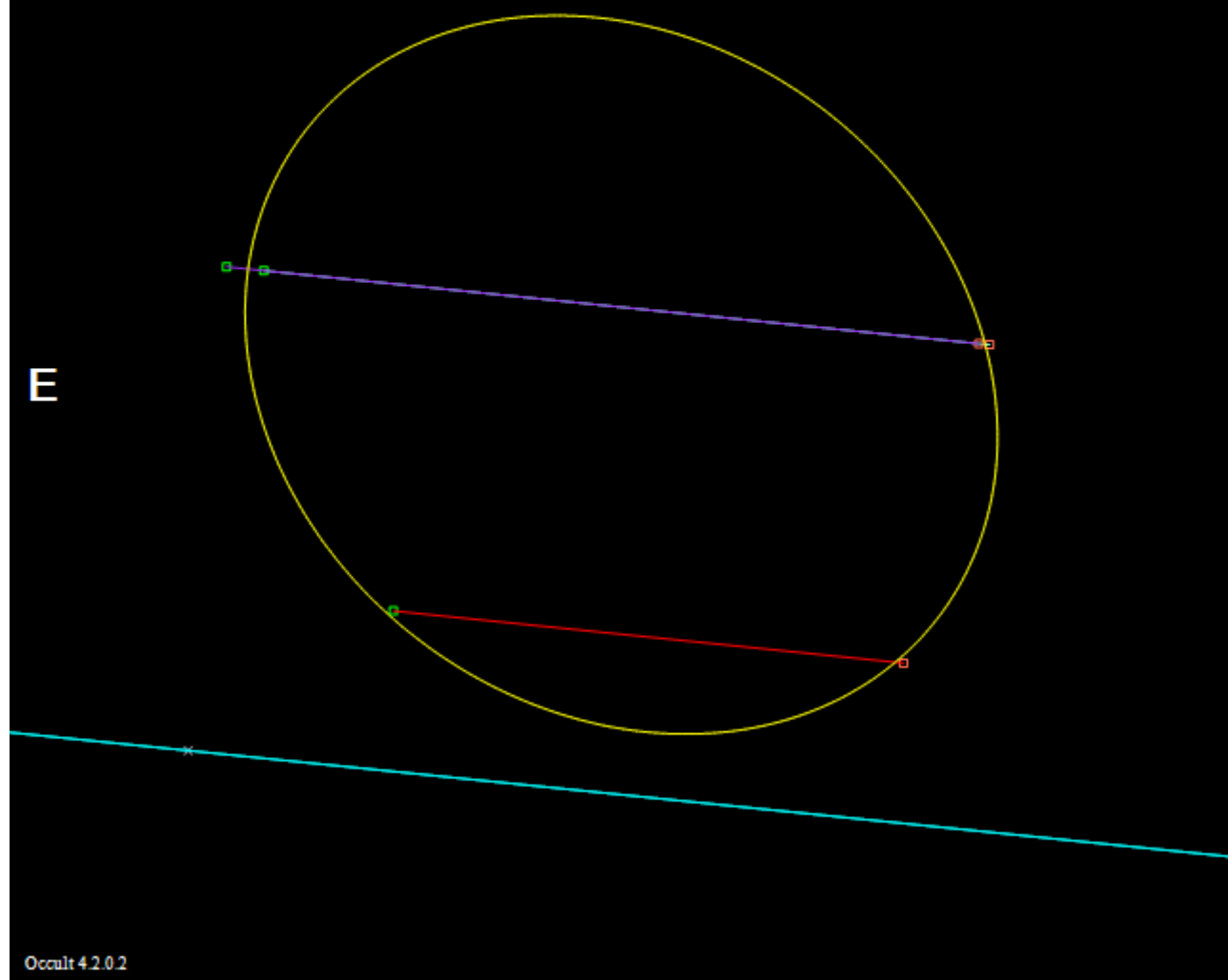
111ate2008aug24

(111) Ate 2008 Aug 24 $147.4 \pm 0.8 \times 115.4 \pm 1.8$ km, PA $-78.9^\circ \pm 3.4^\circ$
Geocentric X -2341.8 ± 0.4 Y 5529.6 ± 0.5 km **N**



111ate2009dec11

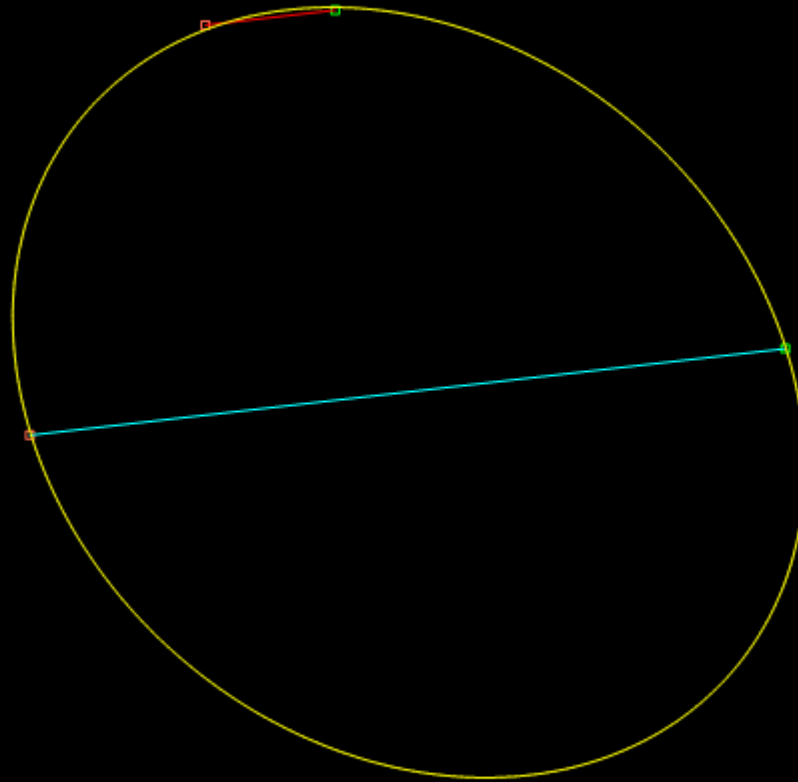
(111) Ate 2009 Dec 11 146.0 x 122.0 km, PA 52.5° ± 3.0°
Geocentric X 3445.6 ± 0.5 Y -4974.3 ± 1.1 km **N**



111ate2010mar28

(111) Ate 2010 Mar 28 149.0 x 122.1 \pm 2.6 km, PA 49.1° \pm 4.0°
Geocentric X 1437.5 \pm 0.5 Y -4972.5 \pm 1.3 km **N**

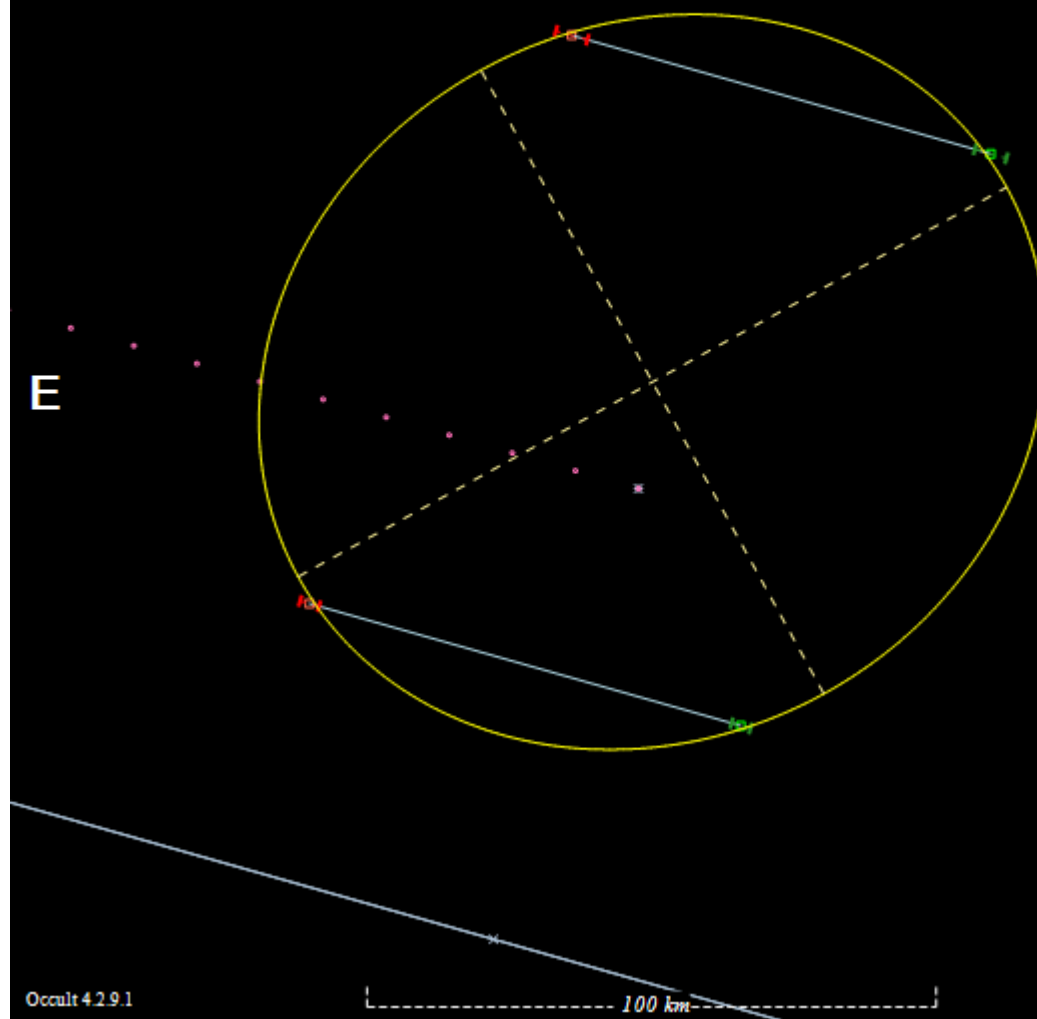
E



Occult 4.2.0.2

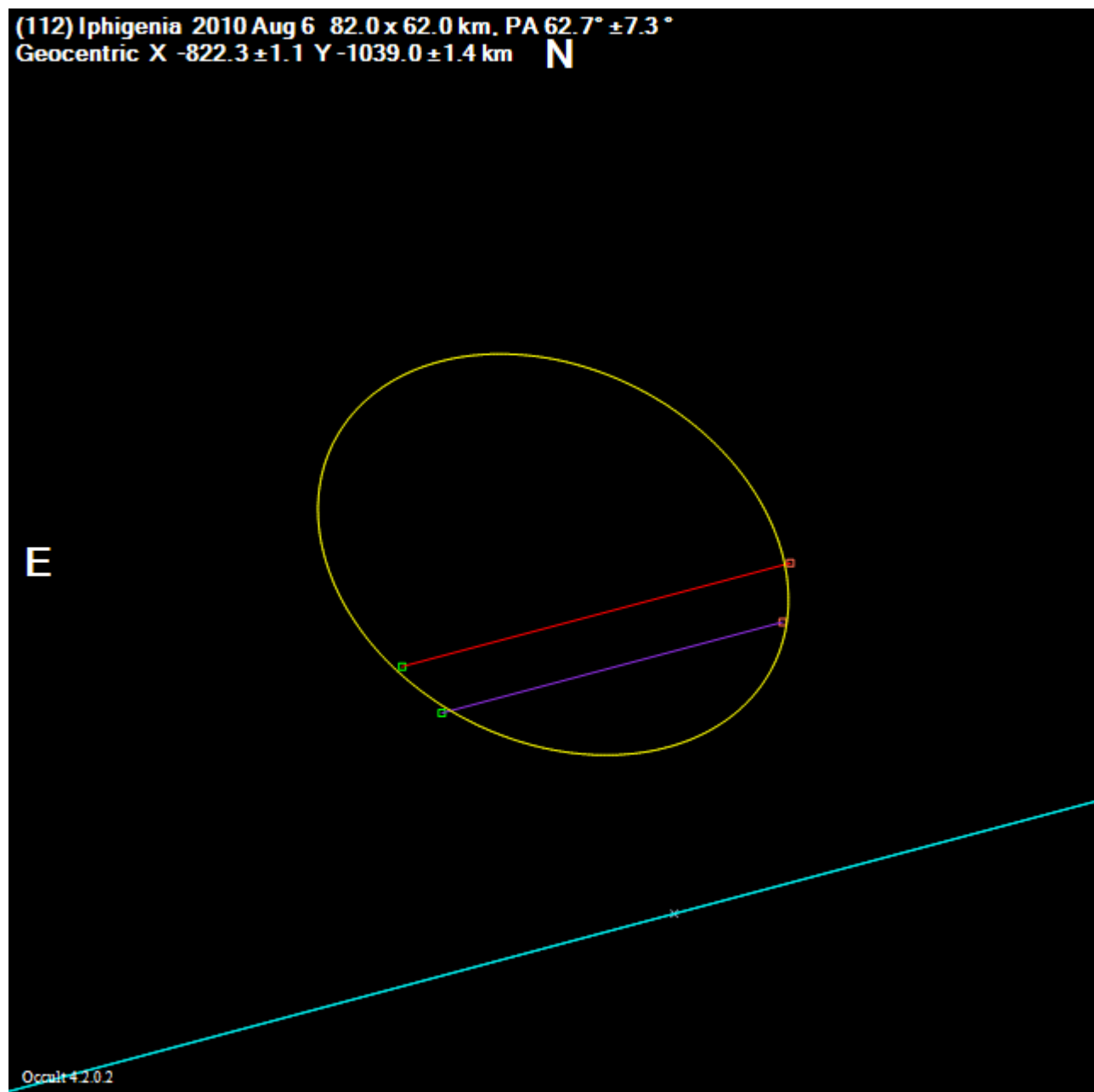
111Ate2016Oct09

(111) Ate 2016 Oct 9 142.0 x 125.0 km. PA $-61.2^\circ \pm 6.7^\circ$
Geocentric X 1114.7 ± 0.5 Y 5430.5 ± 0.4 km **N**



112iphigenia2010aug06

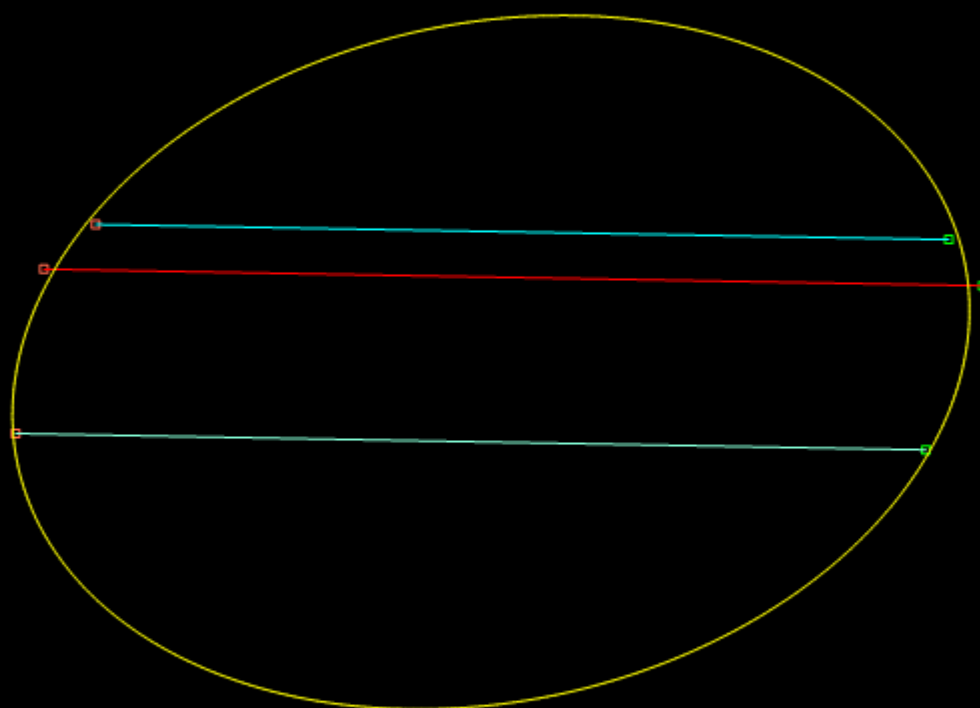
(112) Iphigenia 2010 Aug 6 82.0 x 62.0 km, PA 62.7° ± 7.3°
Geocentric X -822.3 ± 1.1 Y -1039.0 ± 1.4 km **N**



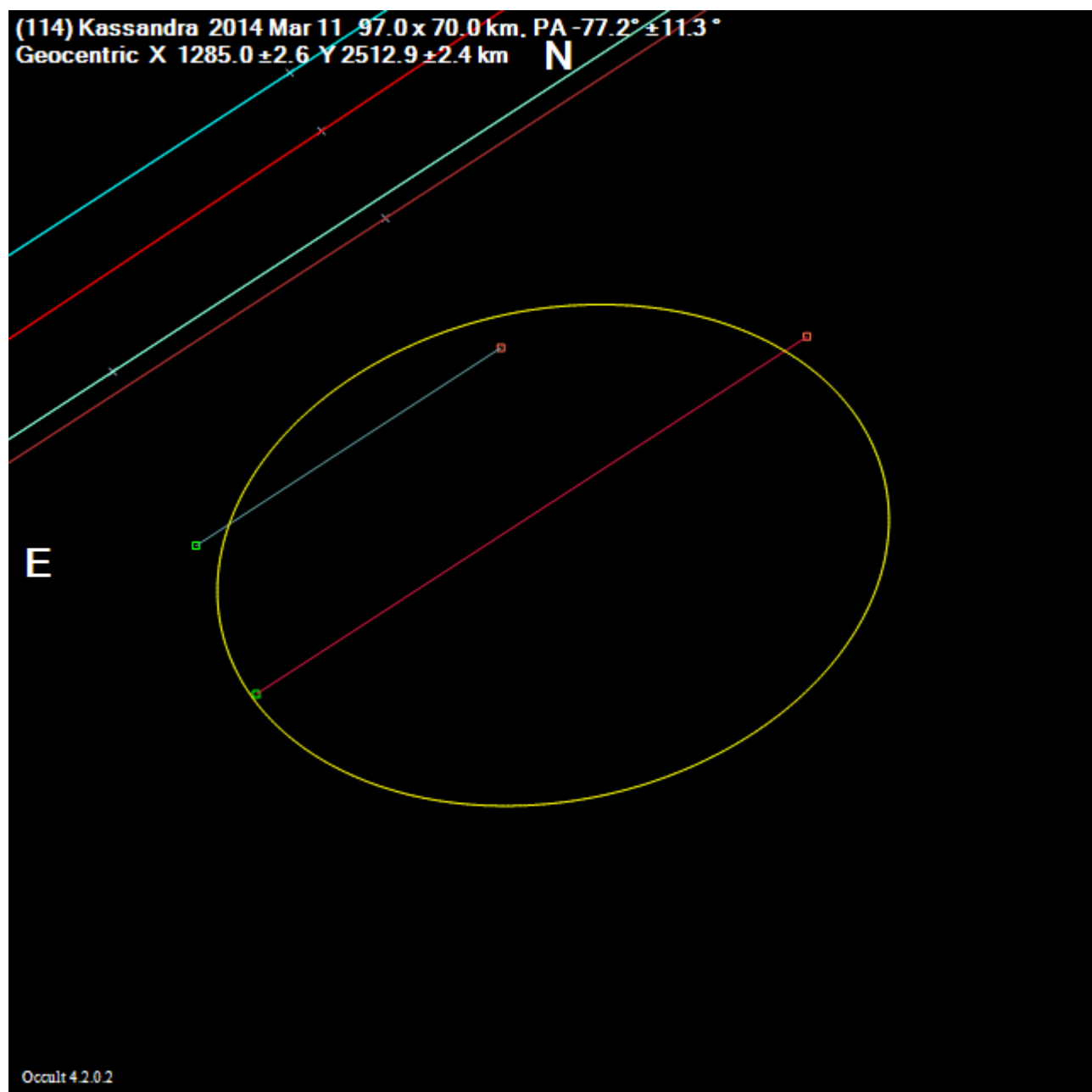
1149volga2008nov15

(1149) Volga 2008 Nov 15 $69.3 \pm 0.9 \times 48.5$ km, PA $-77.6^\circ \pm 2.7^\circ$
Geocentric X 3595.4 ± 0.4 Y 3094.1 ± 0.8 km **N**

E



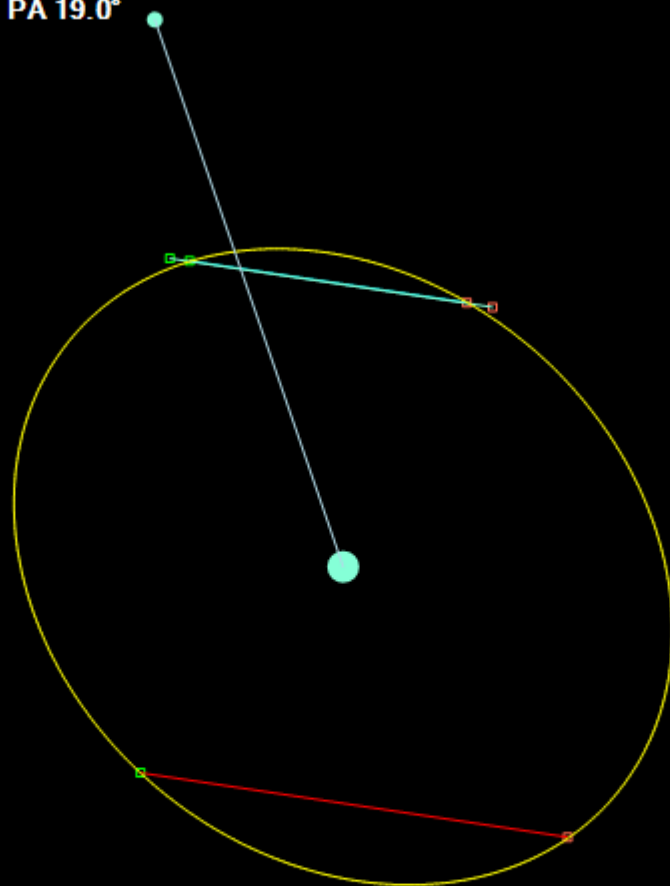
114kassandra2014mar11



1157arabia2009sep09

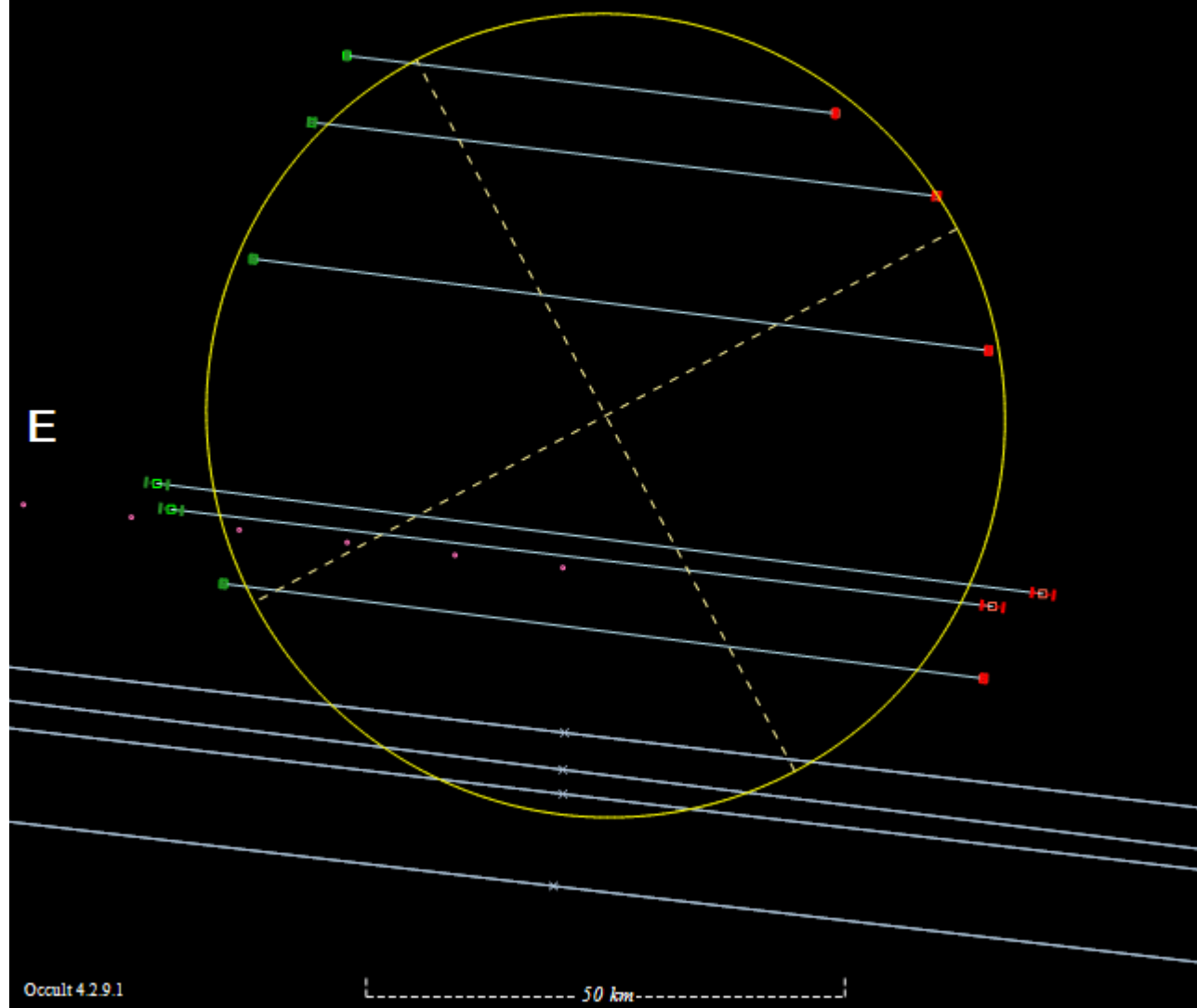
(1157) Arabia 2009 Sep 9 30.5 x 24.8 km, PA 49.9° °
Geocentric X -3291.5 ± 0.2 Y 4078.0 ± 0.1 km **N**
Double : Sep 0.0178", PA 19.0°

E



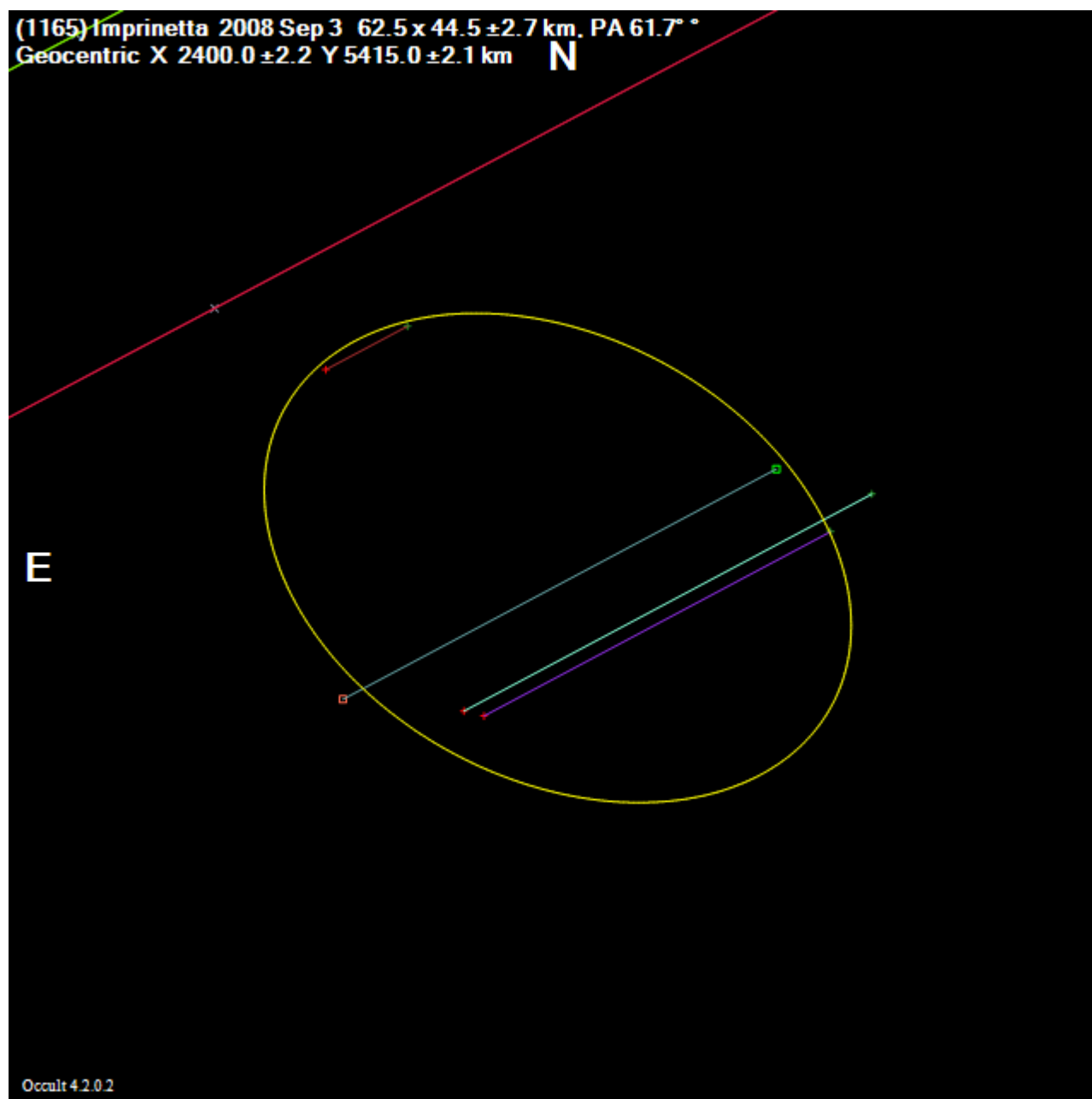
115Thyra2016Jan22

(115) Thyra 2016 Jan 22 $84.2 \pm 6.8 \times 83.2 \pm 3.0$ km, PA $28.0^\circ \pm 337.7^\circ$
Geocentric X -2672.0 ± 1.1 Y 1663.0 ± 2.7 km **N**



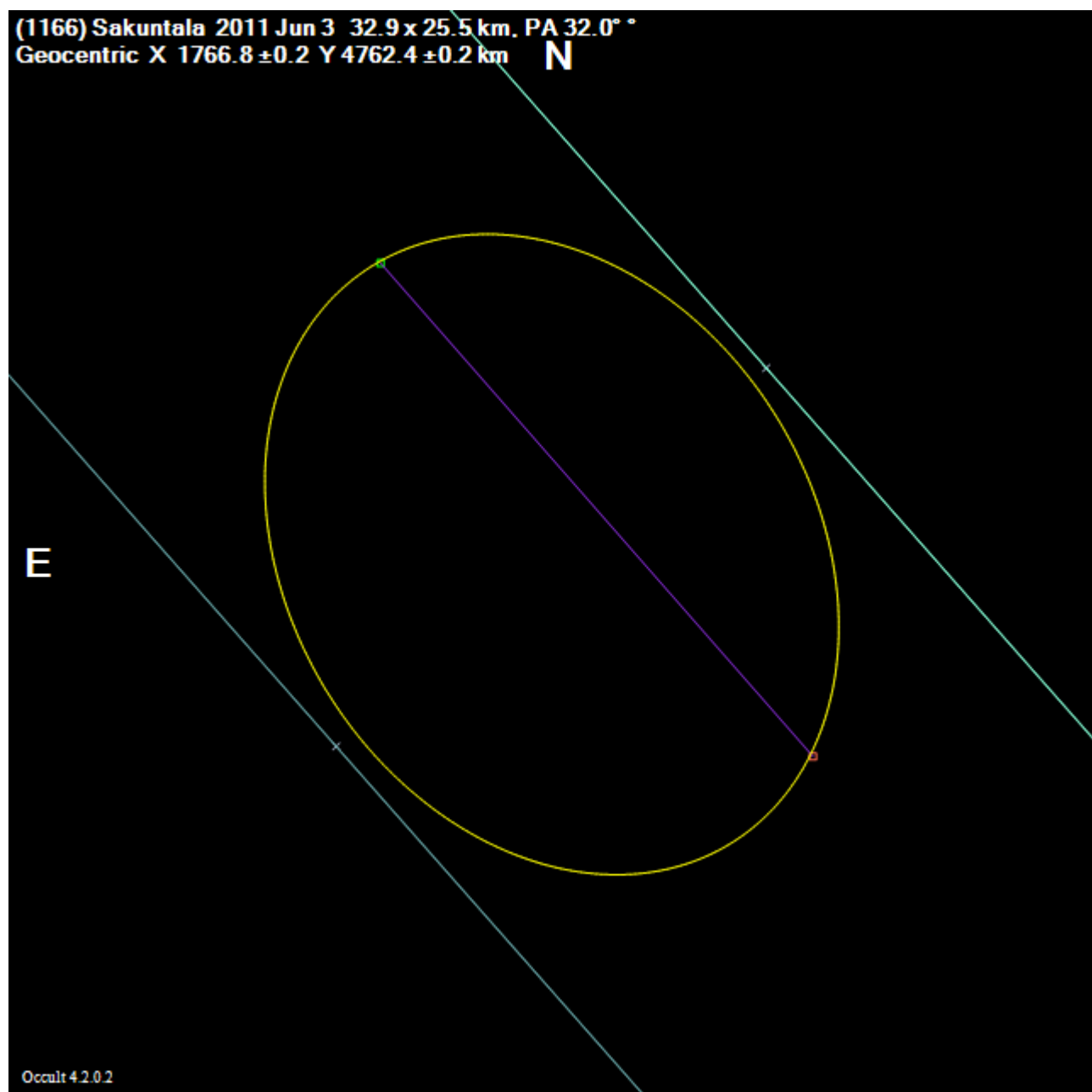
1165imprinetta2008sep03

(1165) Imprinetta 2008 Sep 3 $62.5 \times 44.5 \pm 2.7$ km, PA 61.7°
Geocentric X 2400.0 ± 2.2 Y 5415.0 ± 2.1 km **N**



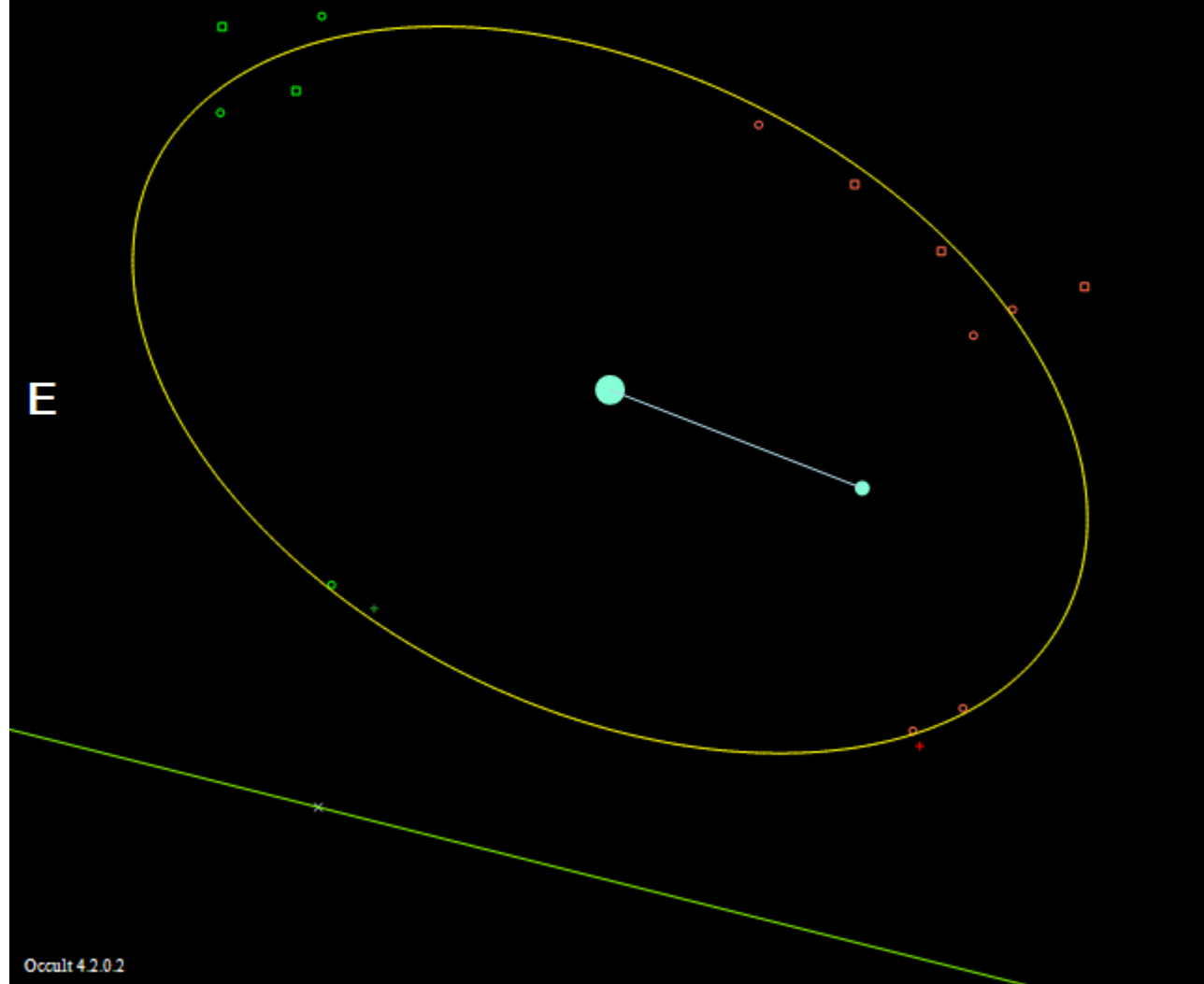
1166sakuntala2011jun03

(1166) Sakuntala 2011 Jun 3 32.9 x 25.5 km, PA 32.0° °
Geocentric X 1766.8 ± 0.2 Y 4762.4 ± 0.2 km **N**



116sirona2005nov11

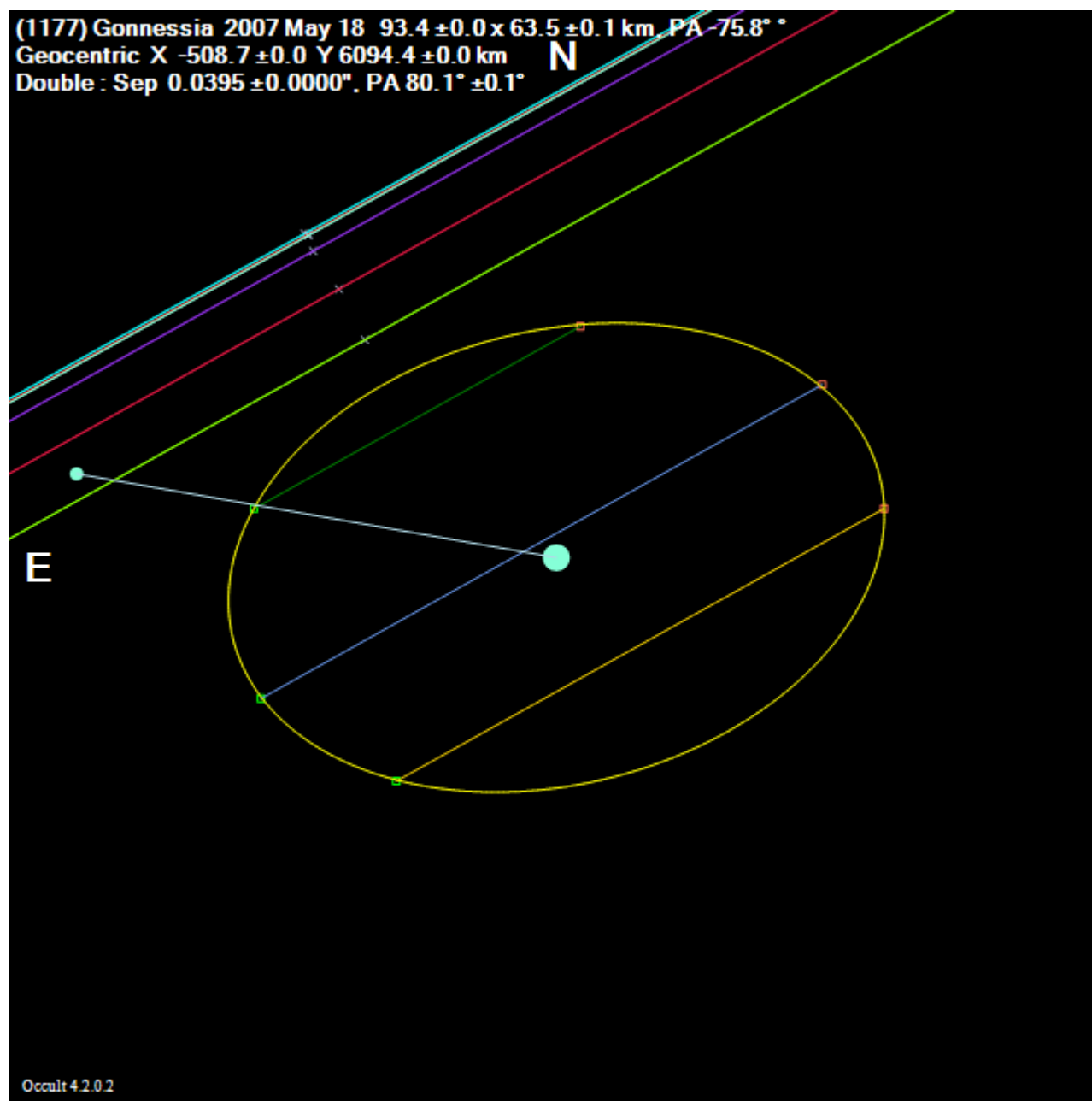
(116) Sirona 2005 Nov 11 $101.8 \pm 4.8 \times 64.0 \pm 3.5$ km, PA $63.9^\circ \pm 4.5^\circ$
Geocentric X -645.0 ± 2.6 Y 2558.9 ± 1.8 km **N**
Double : Sep $0.0188 \pm 0.0020''$, PA $248.7^\circ \pm 4.7^\circ$



Occult 4.2.0.2

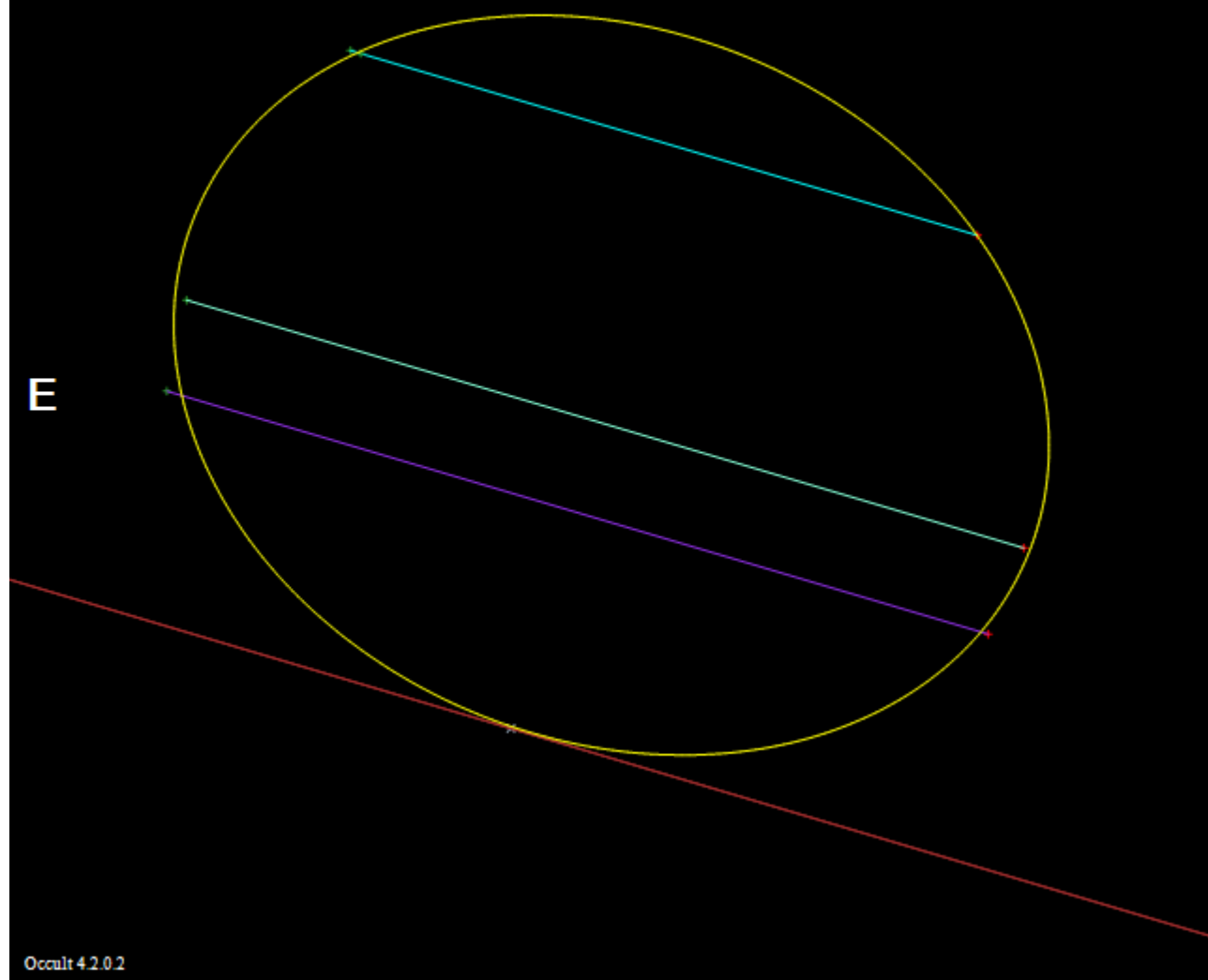
1177gonnessia2007may18

(1177) Gonnessia 2007 May 18 $93.4 \pm 0.0 \times 63.5 \pm 0.1$ km PA -75.8°
Geocentric X -508.7 ± 0.0 Y 6094.4 ± 0.0 km
Double : Sep $0.0395 \pm 0.0000''$, PA $80.1^\circ \pm 0.1^\circ$



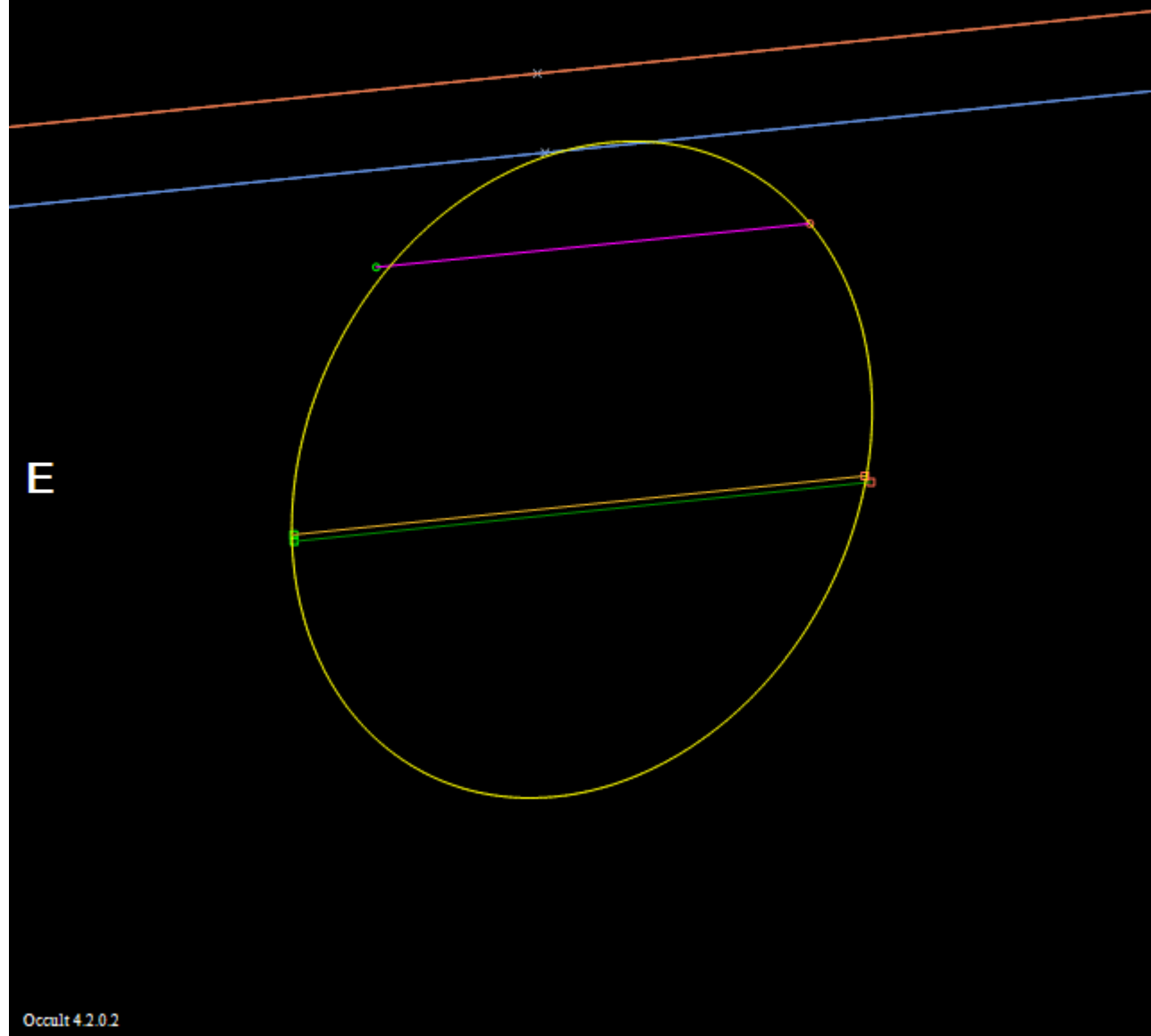
117lomia2003mar17

(117) Lomia 2003 Mar 17 $184.7 \pm 1.6 \times 145.8 \pm 1.7$ km, PA $67.9^\circ \pm 2.2^\circ$
Geocentric X 4242.9 ± 0.7 Y 3835.7 ± 0.7 km **N**



117lomia2013jan11

(117) Lomia 2013 Jan 11 183.0 x 147.0 km, PA $-27.7^{\circ} \pm 2.3^{\circ}$
Geocentric X -2451.3 ± 0.6 Y 1017.7 ± 1.1 km **N**



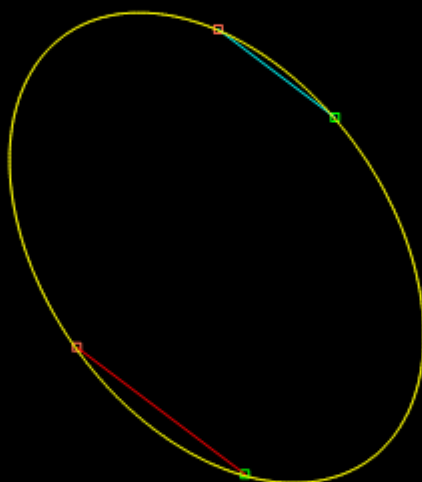
1184gaea2008aug09

(1184) Gaea 2008 Aug 9 $13.6 \times 9.0 \pm 0.0$ km. PA $35.6^\circ \pm 0.7^\circ$
Geocentric X 1374.4 ± 0.0 Y 61.2 ± 0.0 km

N

E

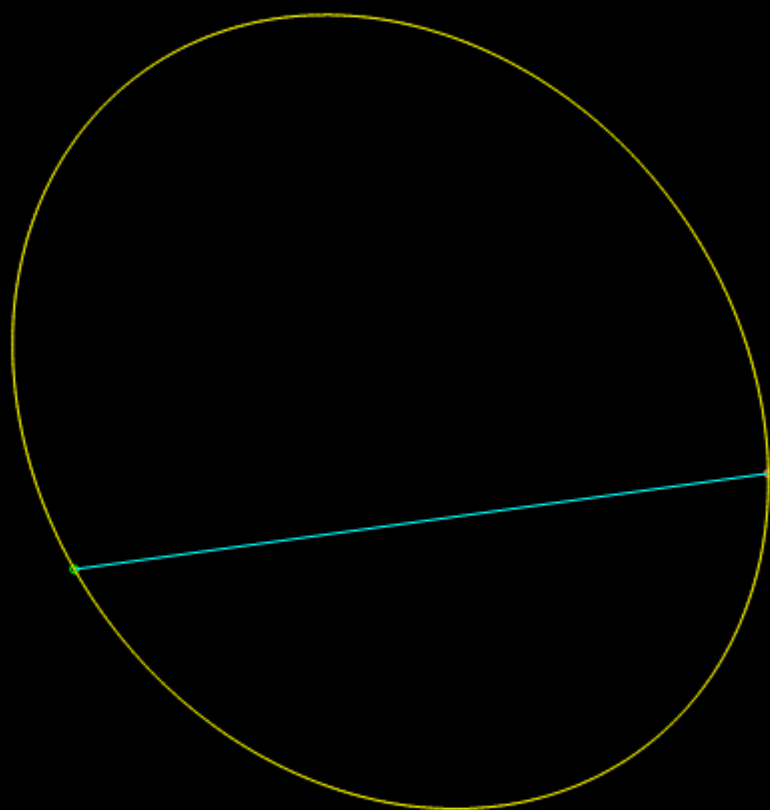
Occult 4.2.0.2



1199512002kx142012apr26

(119951) 2002 KX14 2012 Apr 26 498.0 x 416.0 km, PA 37.0° °
Geocentric X -935.7 ±0.0 Y 4904.7 ±0.1 km N

E

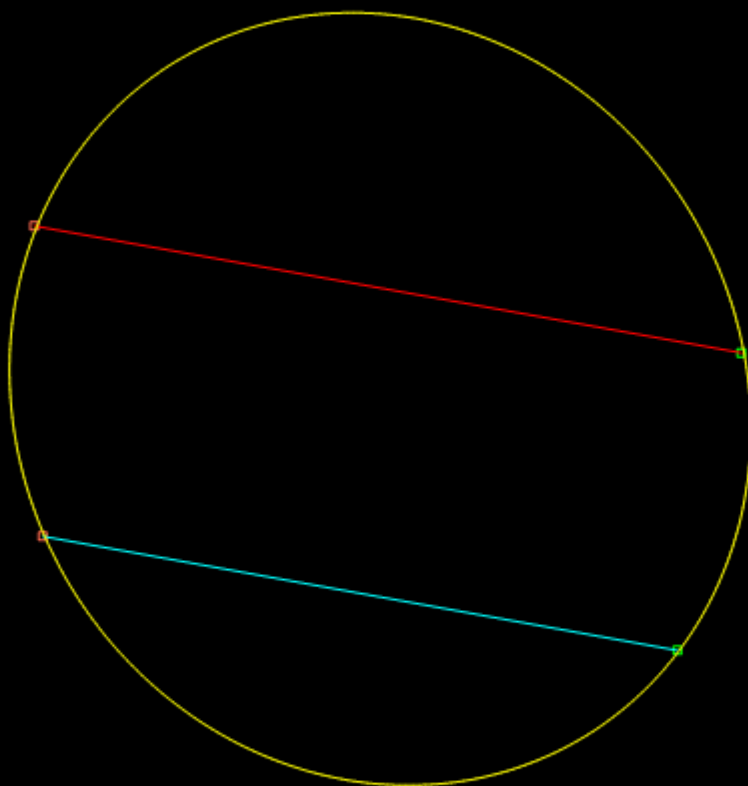


11parthenope2010mar10

(11) Parthenope 2010 Mar 10 $157.1 \pm 1.1 \times 144.1 \pm 0.6$ km, PA $30.8^\circ \pm 5.1^\circ$
Geocentric X 382.5 Y 3164.2 km

N

E



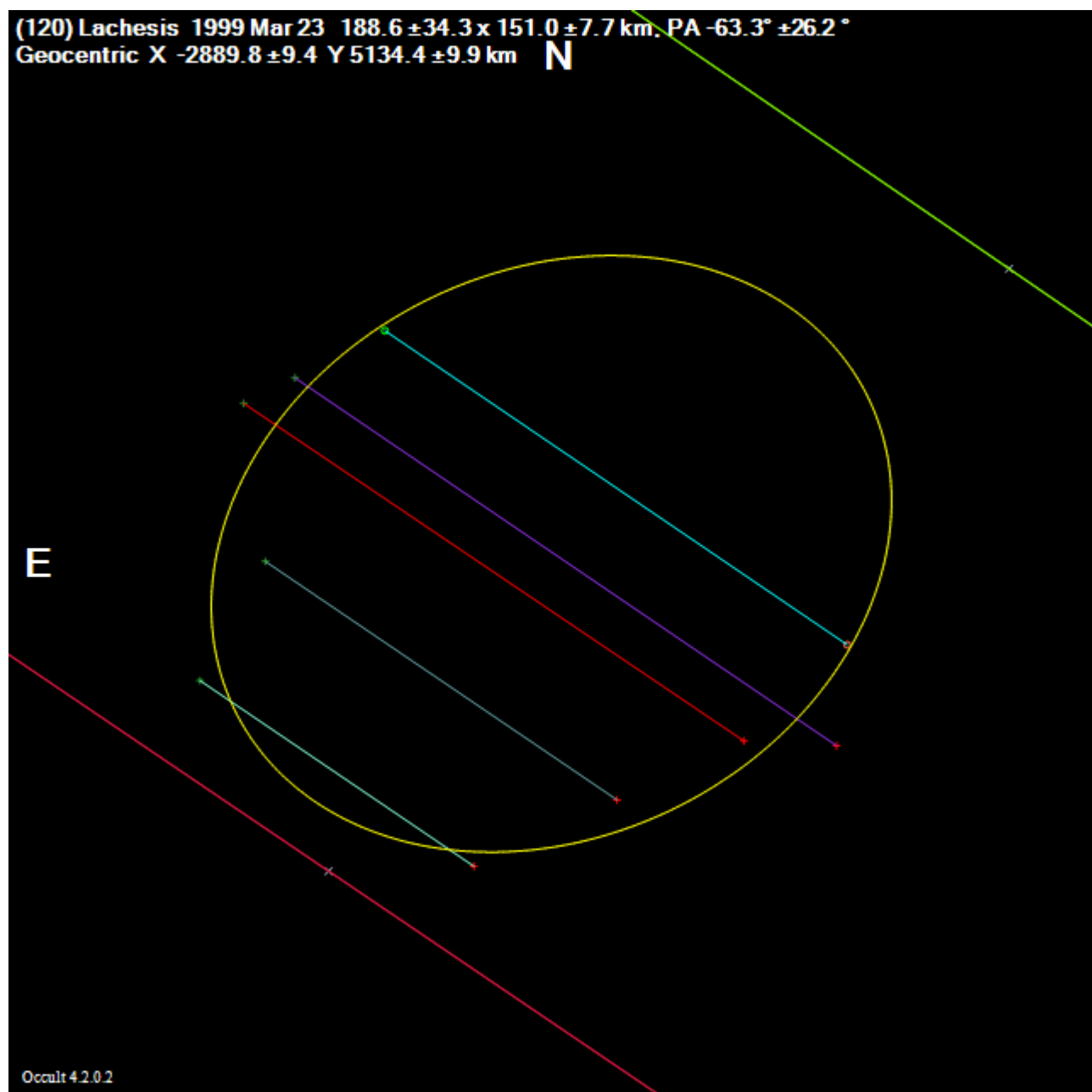
11parthenope2011jan26

(11) Parthenope 2011 Jan 26 $151.2 \pm 2.4 \times 145.8 \pm 1.5$ km, PA $11.9^\circ \pm 17.3^\circ$
Geocentric X -2041.1 ± 0.7 Y 3741.7 ± 1.0 km **N**



120lachesis1999mar23

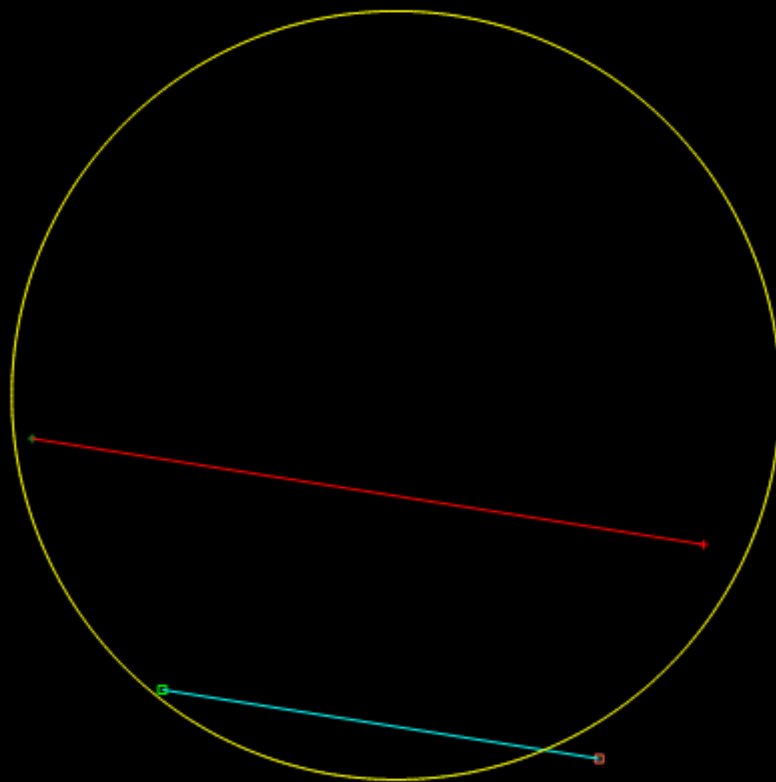
(120) Lachesis 1999 Mar 23 $188.6 \pm 34.3 \times 151.0 \pm 7.7$ km, PA $-63.3^\circ \pm 26.2^\circ$
Geocentric X -2889.8 ± 9.4 Y 5134.4 ± 9.9 km **N**



1212francette2005jun27

(1212) Francette 2005 Jun 27 82.0 x 82.0 km, PA 0.0°
Geocentric X 3266.6 ± 1.9 Y 4145.3 ± 2.3 km **N**

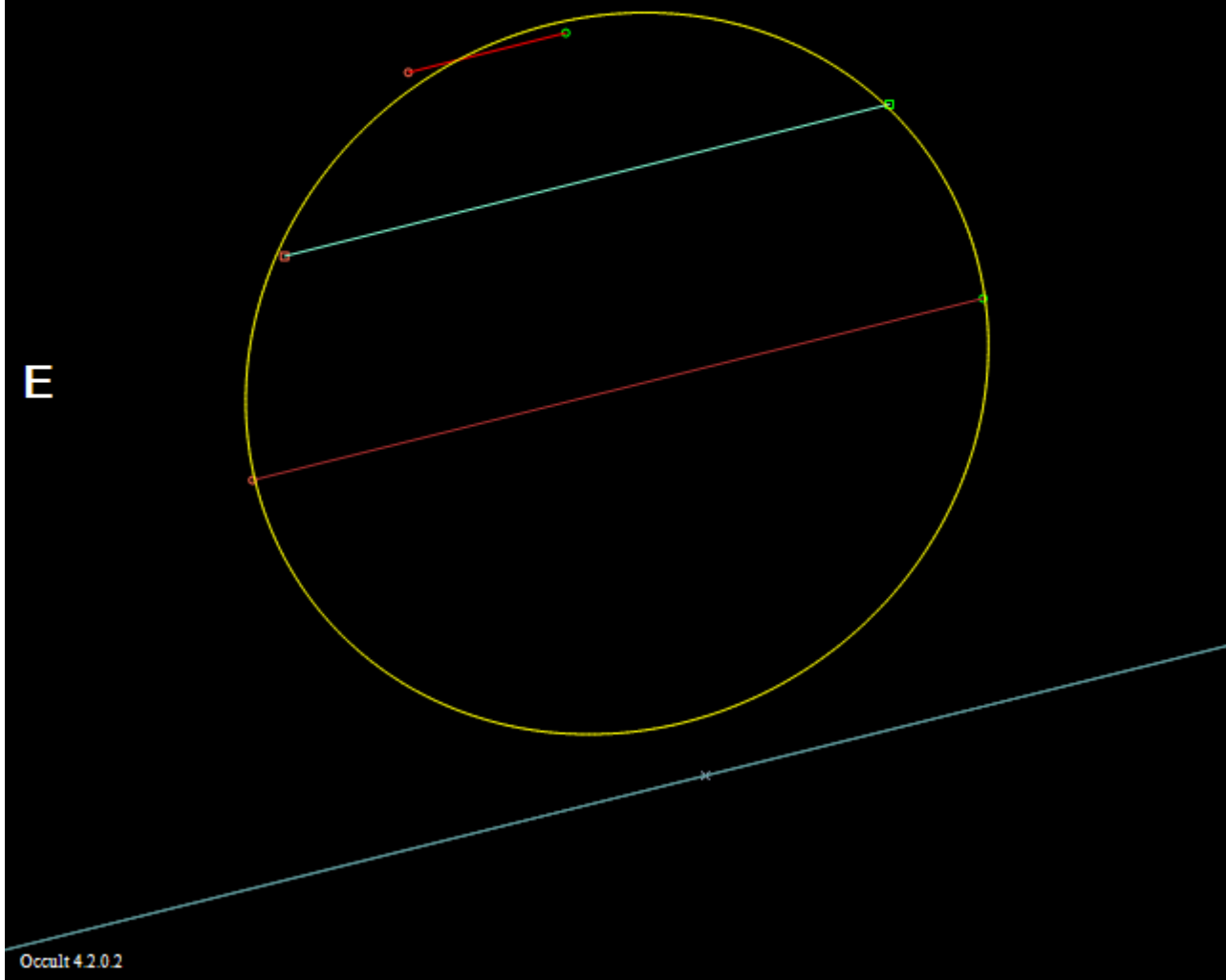
E



Occult 4.2.0.2

1212francette2010oct14

(1212) Francette 2010 Oct 14 $85.0 \pm 2.1 \times 78.4 \pm 5.8$ km, PA $-55.2^\circ \pm 23.8^\circ$
Geocentric X -4647.8 ± 0.8 Y 2682.7 ± 3.0 km **N**



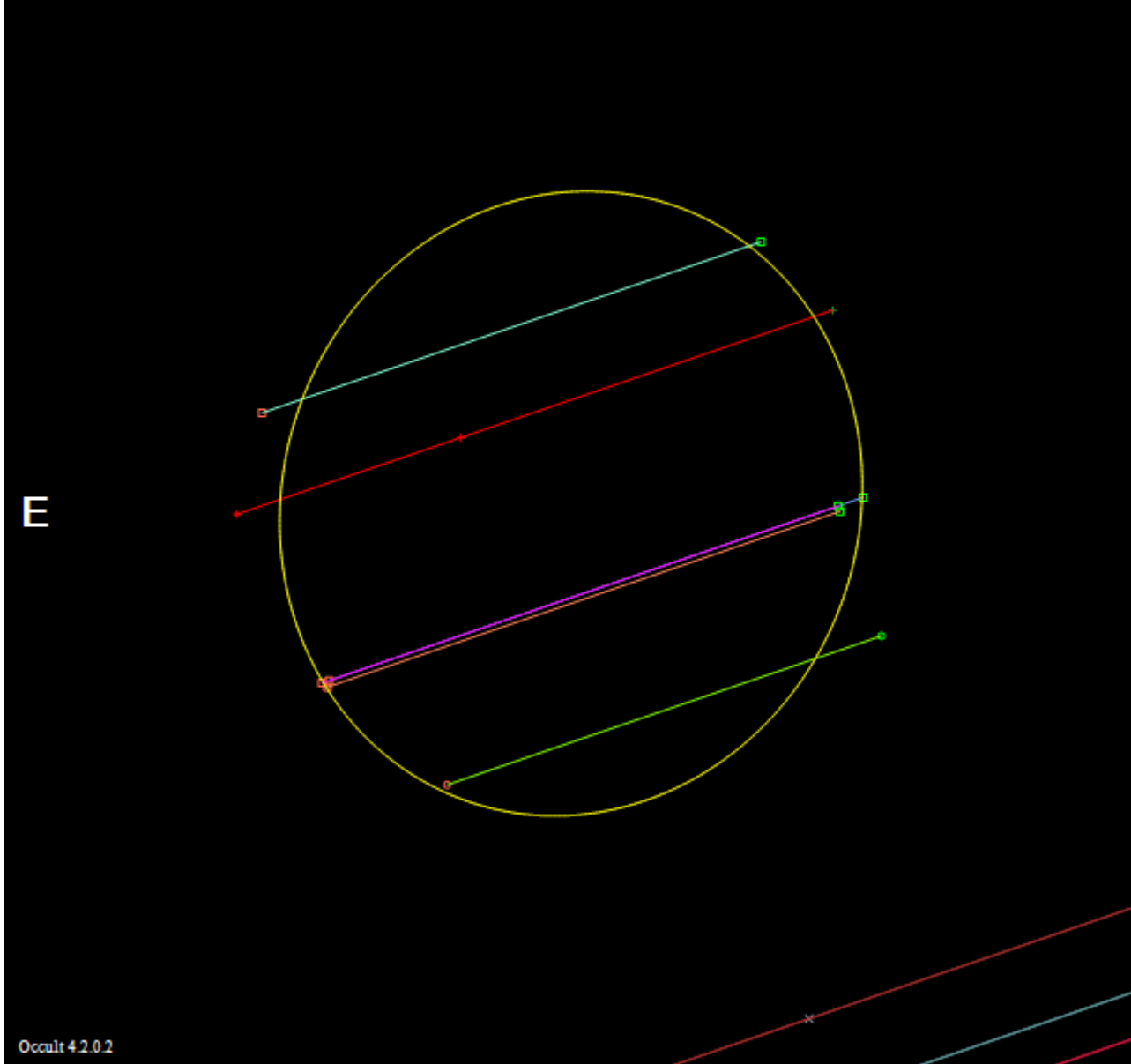
121hermione2004feb16

(121) Hermione 2004 Feb 16 $164.0 \pm 6.3 \times 164.0$ km, PA 0.0°
Geocentric X 1364.8 ± 5.1 Y 1636.9 ± 2.9 km N



121hermione2005dec12

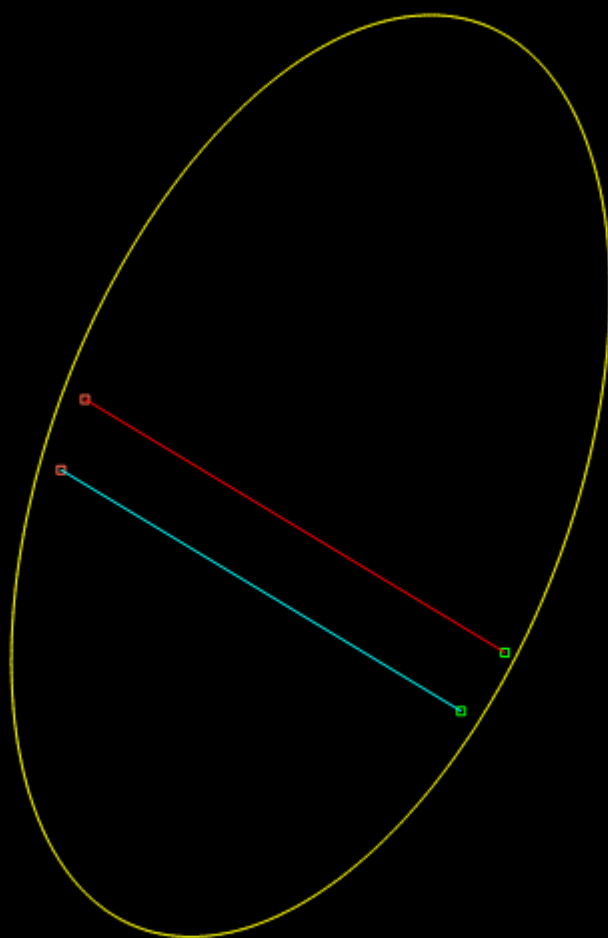
(121) Hermione 2005 Dec 12 $213.6 \pm 17.3 \times 195.3 \pm 10.1$ km, PA $-19.5^\circ \pm 50.3^\circ$
Geocentric X -2549.8 ± 3.4 Y 5383.4 ± 6.2 km **N**



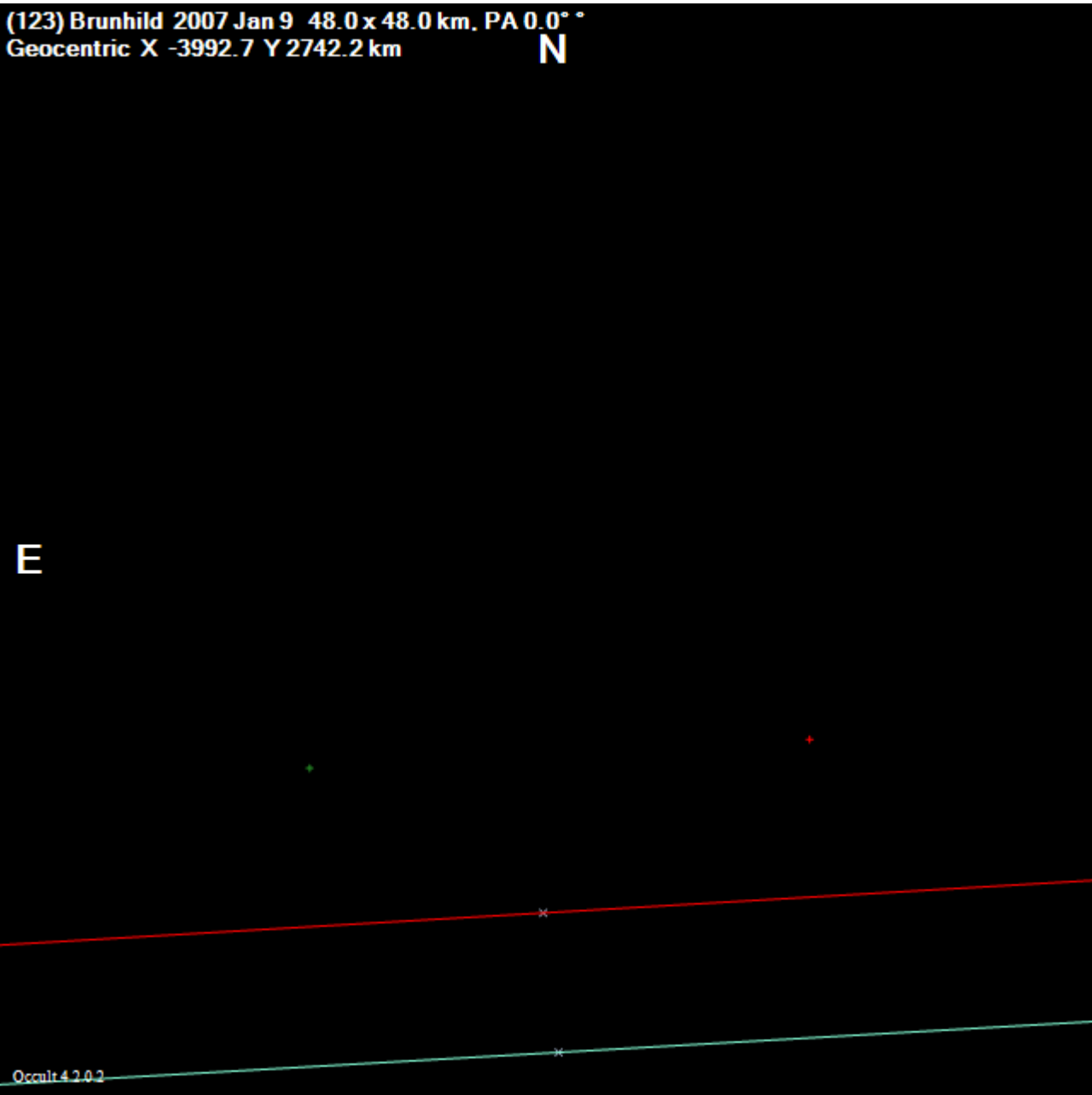
121hermione2014oct17

(121) Hermione 2014 Oct 17 244.0 x 132.0 km, PA -21.0° °
Geocentric X 4986.1 ± 6.5 Y -2407.8 ± 13.7 km **N**

E



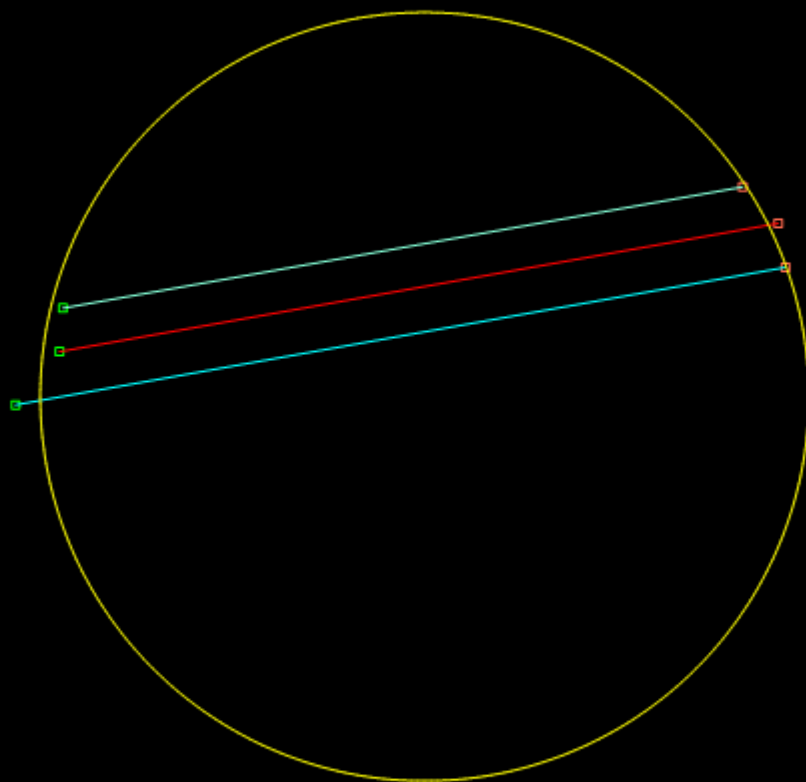
123brunhild2007jan09



1241dysona2013aug18

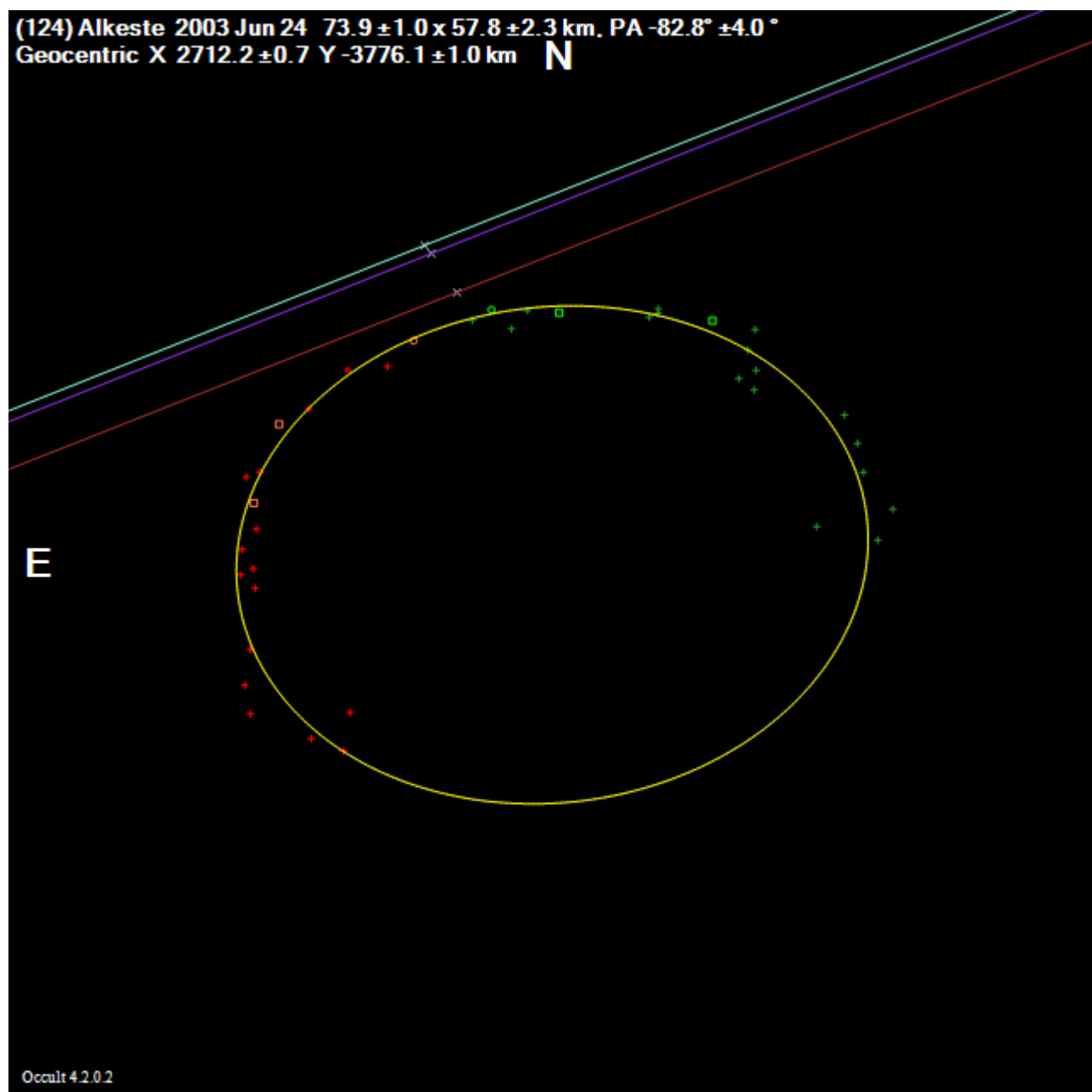
(1241) Dysona 2013 Aug 18 77.0 x 77.0 km, PA 0.0° °
Geocentric X -4648.6 ± 0.7 Y -2882.6 ± 1.9 km **N**

E



124alkeste2003jun24

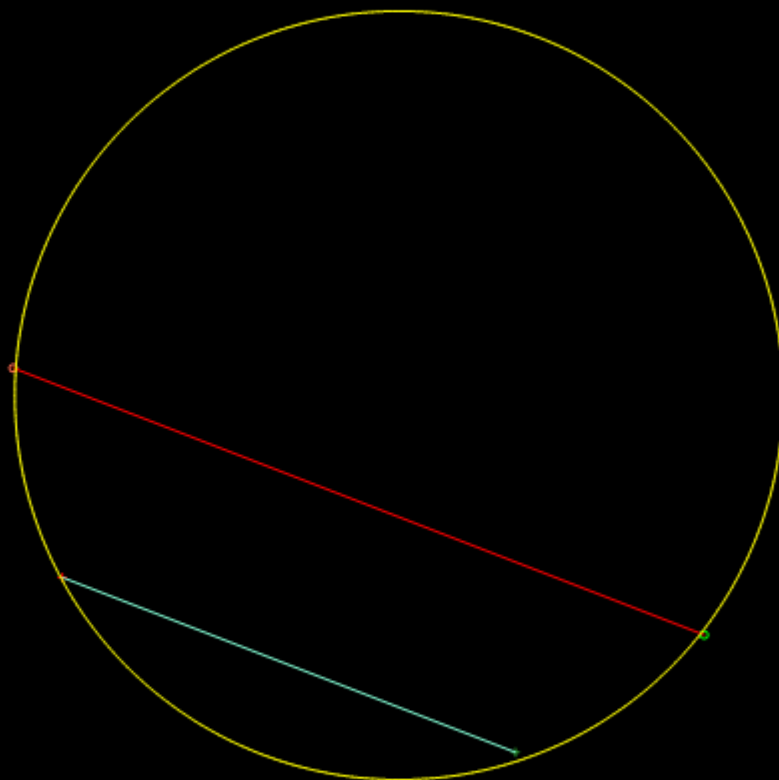
(124) Alkeste 2003 Jun 24 $73.9 \pm 1.0 \times 57.8 \pm 2.3$ km, PA $-82.8^\circ \pm 4.0^\circ$
Geocentric X 2712.2 ± 0.7 Y -3776.1 ± 1.0 km **N**



124alkeste2004may12

(124) Alkeste 2004 May 12 76.0 x 76.0 km. PA 0.0° °
Geocentric X -1430.0 ±0.3 Y 5150.1 ±0.5 km **N**

E



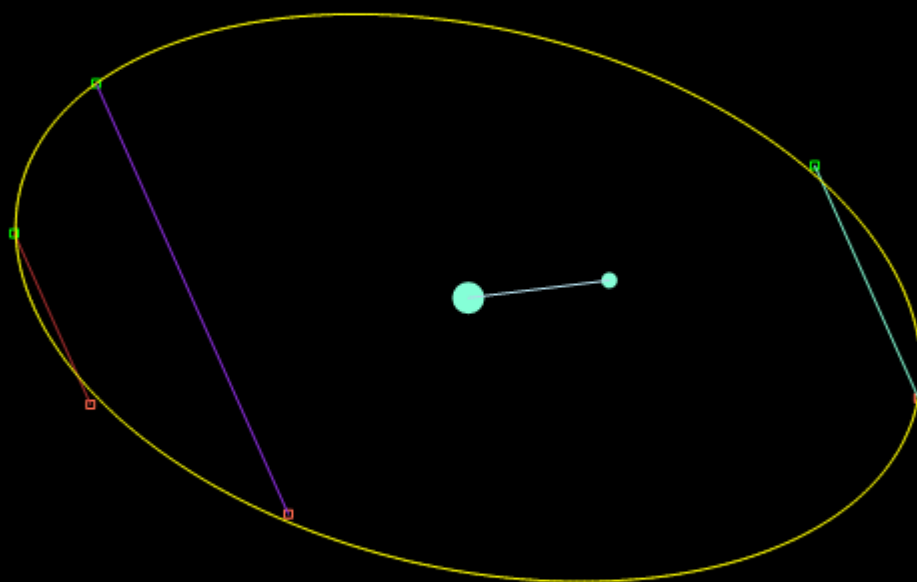
1258sicilia2008jan14

(1258) Sicilia 2008 Jan 14 58.1 x 34.0 km, PA 76.4° °
Geocentric X 1025.0 Y 618.7 km
Double : Sep 0.0051", PA -82.9°

N

E

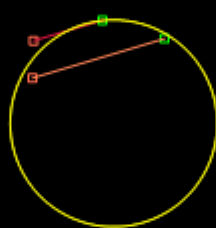
Occult 4.2.0.2



1258sicilia2014mar08

(1258) Sicilia 2014 Mar 8 58.0 x 58.0 km, PA 0.0° °
Geocentric X 1807.9 ± 1.9 Y 3344.2 ± 1.5 km **N**

E

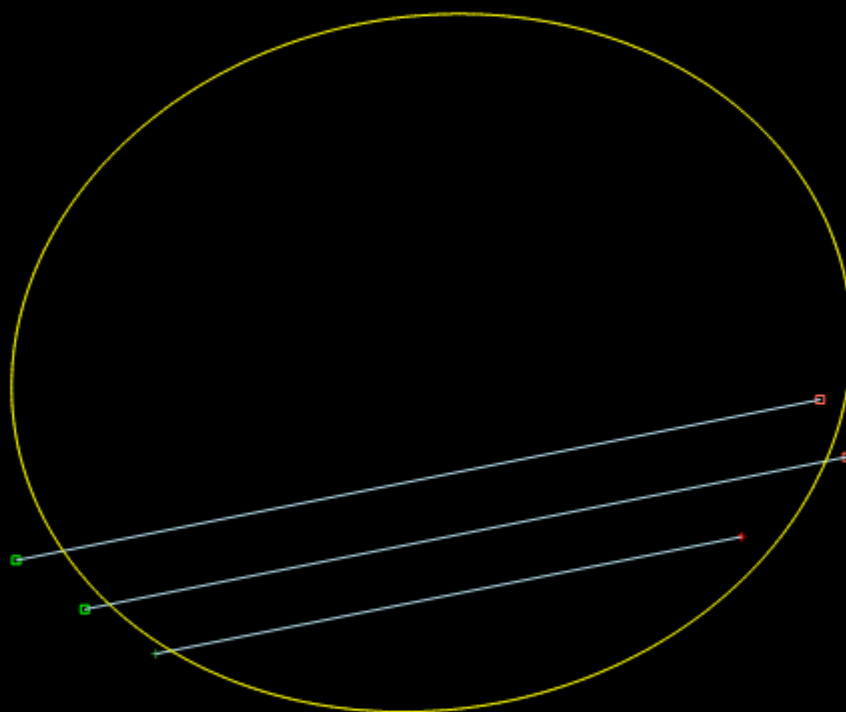


Occult 4.2.0.2

125liberatrix2015jan23

(125) Liberatrix 2015 Jan 23 67.0 x 55.0 km, PA -80.0°
Geocentric X 1543.2 ± 1.0 Y 787.3 ± 1.6 km **N**

E



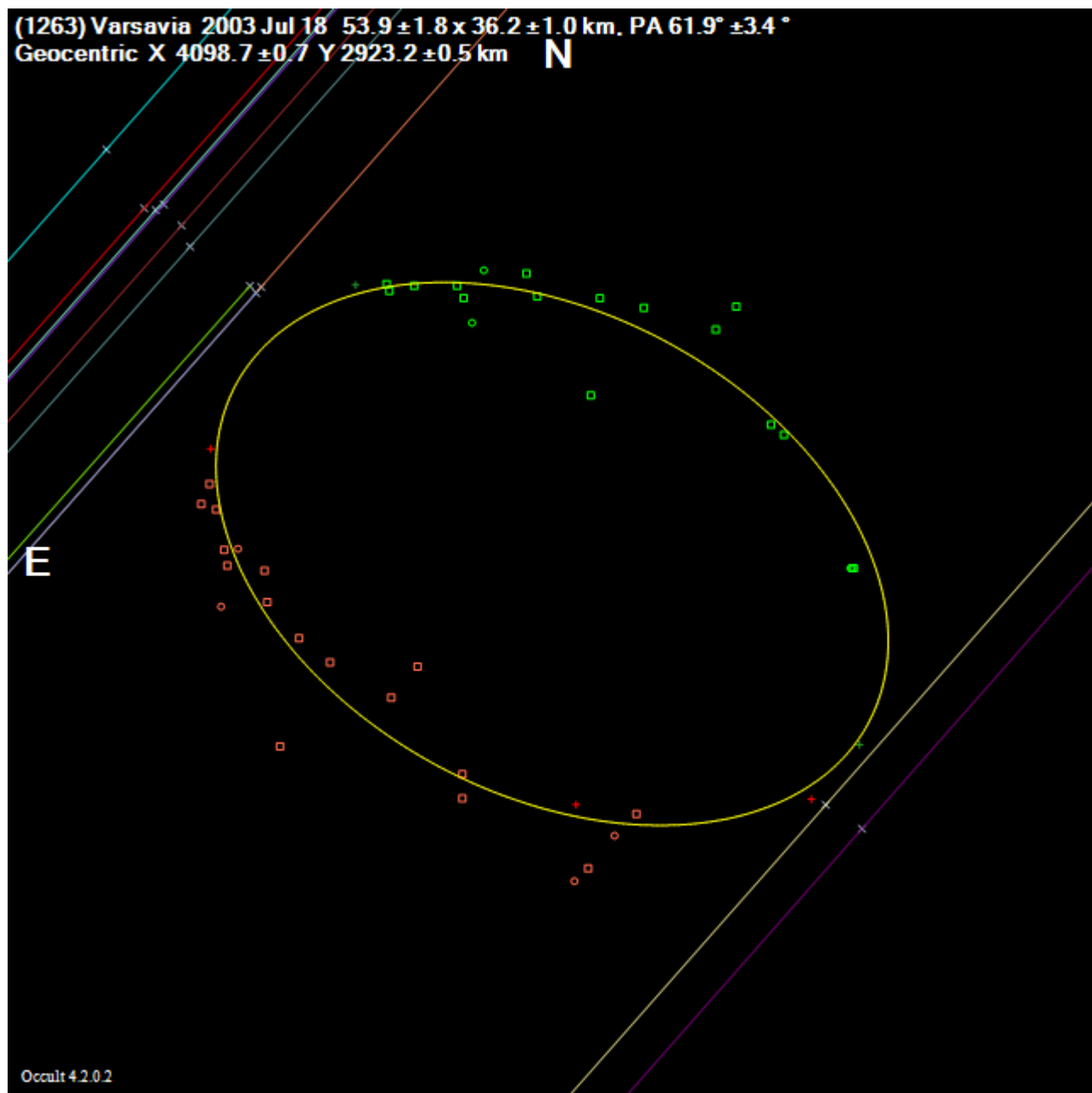
1263varsavia2003jul18

(1263) Varsovia 2003 Jul 18 $53.9 \pm 1.8 \times 36.2 \pm 1.0$ km, PA $61.9^\circ \pm 3.4^\circ$
Geocentric X 4098.7 ± 0.7 Y 2923.2 ± 0.5 km

N

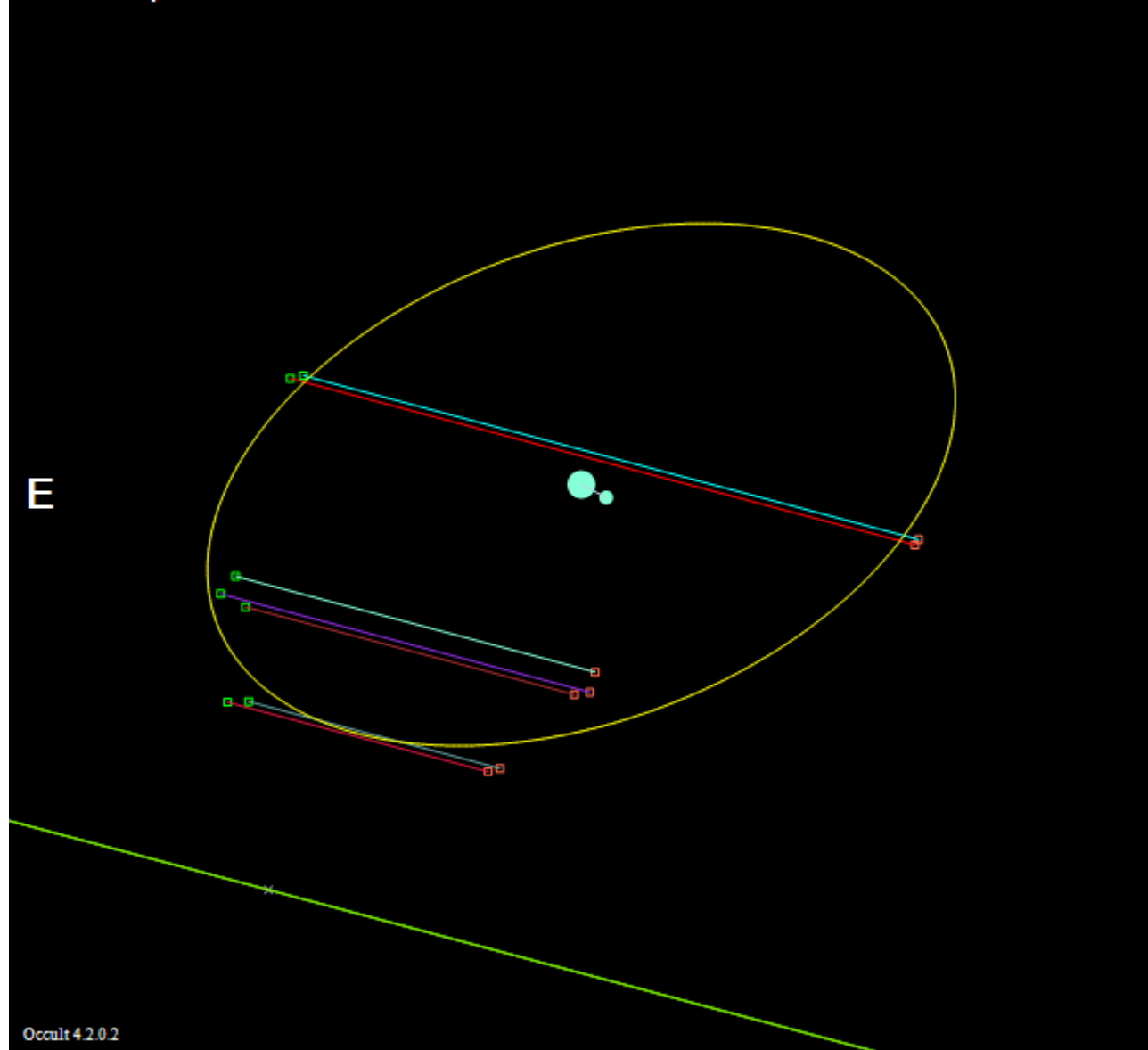
E

Occult 4.2.0.2



1271isergina2013jul24

(1271) Isergina 2013 Jul 24 $62.3 \times 37.8 \pm 2.3$ km, PA $-69.1^\circ \pm 5.1^\circ$
Geocentric X 2180.9 ± 1.2 Y 5388.1 ± 1.4 km **N**
Double : Sep $0.0013 \pm 0.0009''$, PA $242.3^\circ \pm 44.7^\circ$

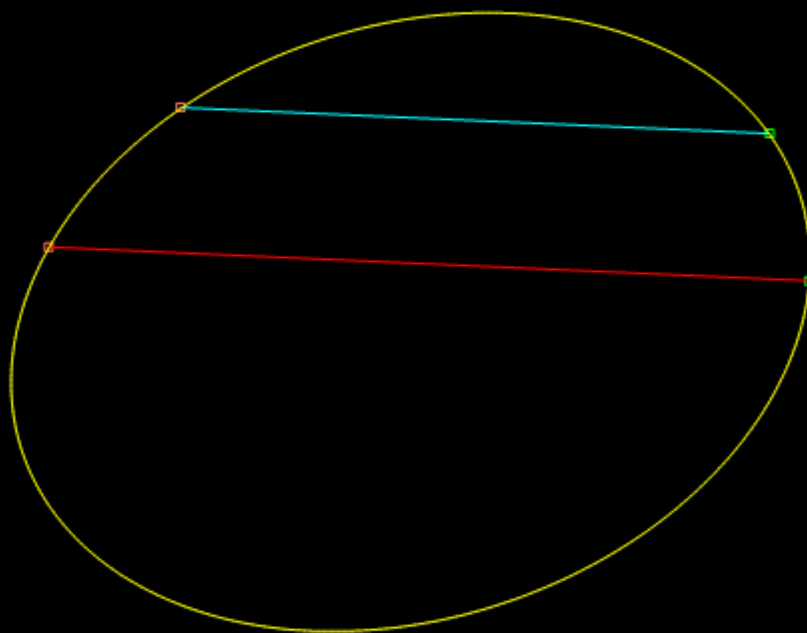


127johanna2006feb08

(127) Johanna 2006 Feb 8 133.2 x 96.3 km, PA -71.5° °
Geocentric X 2955.1 Y 1013.0 km

N

E

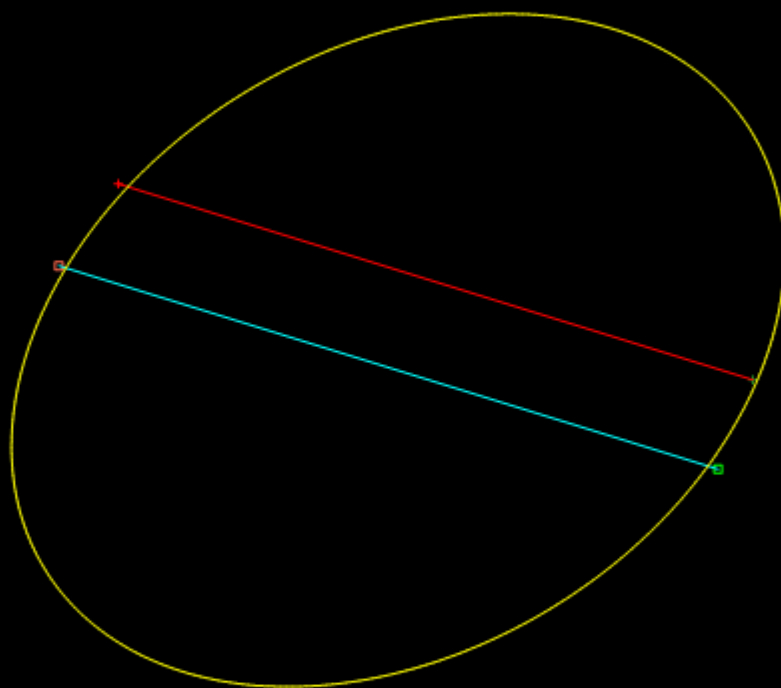


127johanna2008sep29

(127) Johanna 2008 Sep 29 $133.0 \pm 9.6 \times 96.0 \pm 3.0$ km, PA 122.0°
Geocentric X 4019.5 ± 3.0 Y -1031.0 ± 4.7 km **N**

E

Occult 4.2.0.2



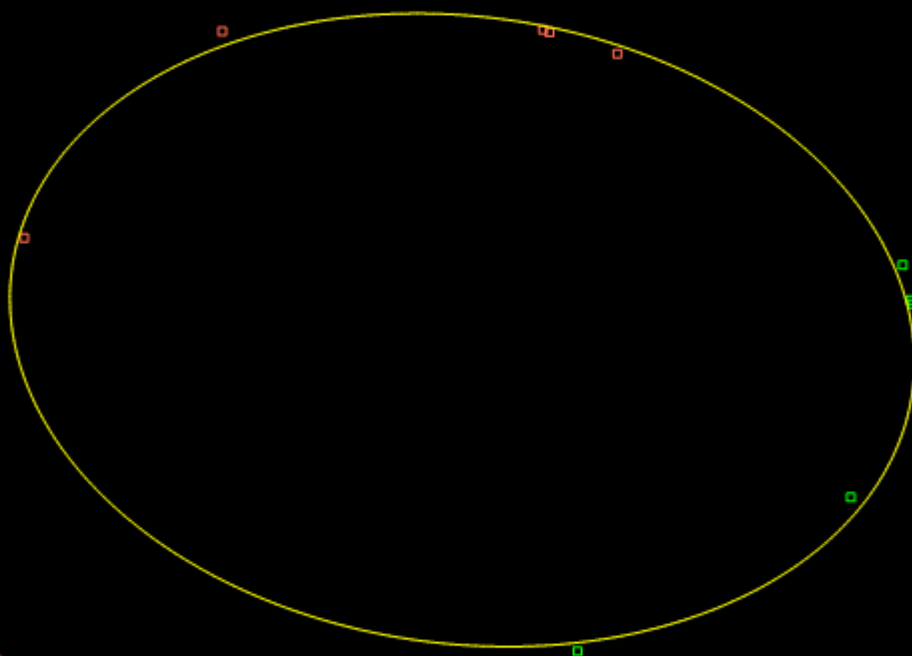
127johanna2014sep08

(127) Johanna 2014 Sep 8 $134.8 \pm 1.4 \times 93.0 \pm 1.7$ km, PA $82.3^\circ \pm 2.6^\circ$
Geocentric X 840.1 ± 0.8 Y 1450.7 ± 0.7 km

N

E

Occult 4.2.0.2

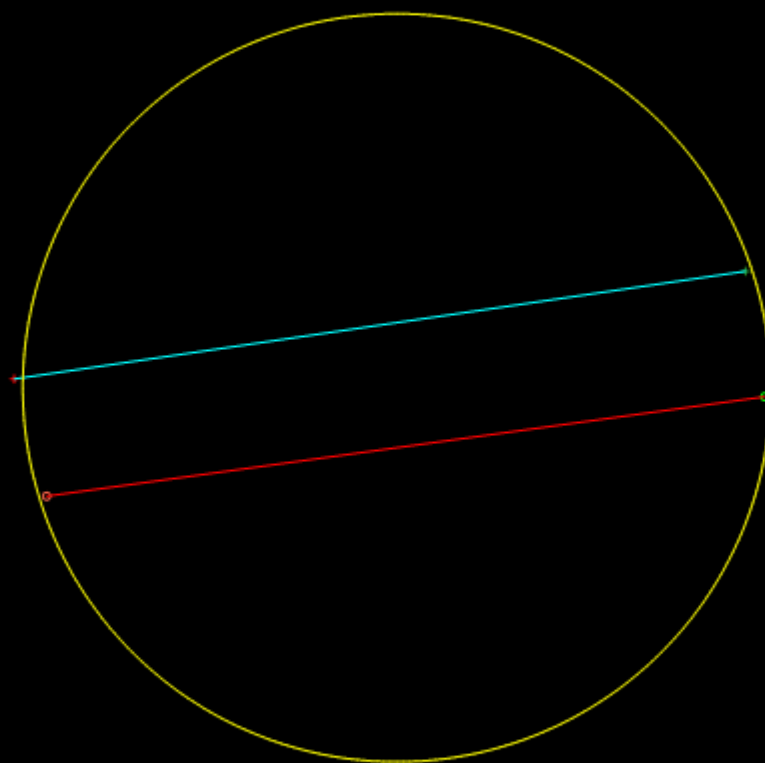


128nemesis2005nov18

(128) Nemesis 2005 Nov 18 $183.0 \pm 30.3 \times 183.0$ km, PA 0.0°
Geocentric X 96.5 ± 1.1 Y 3302.0 ± 5.4 km

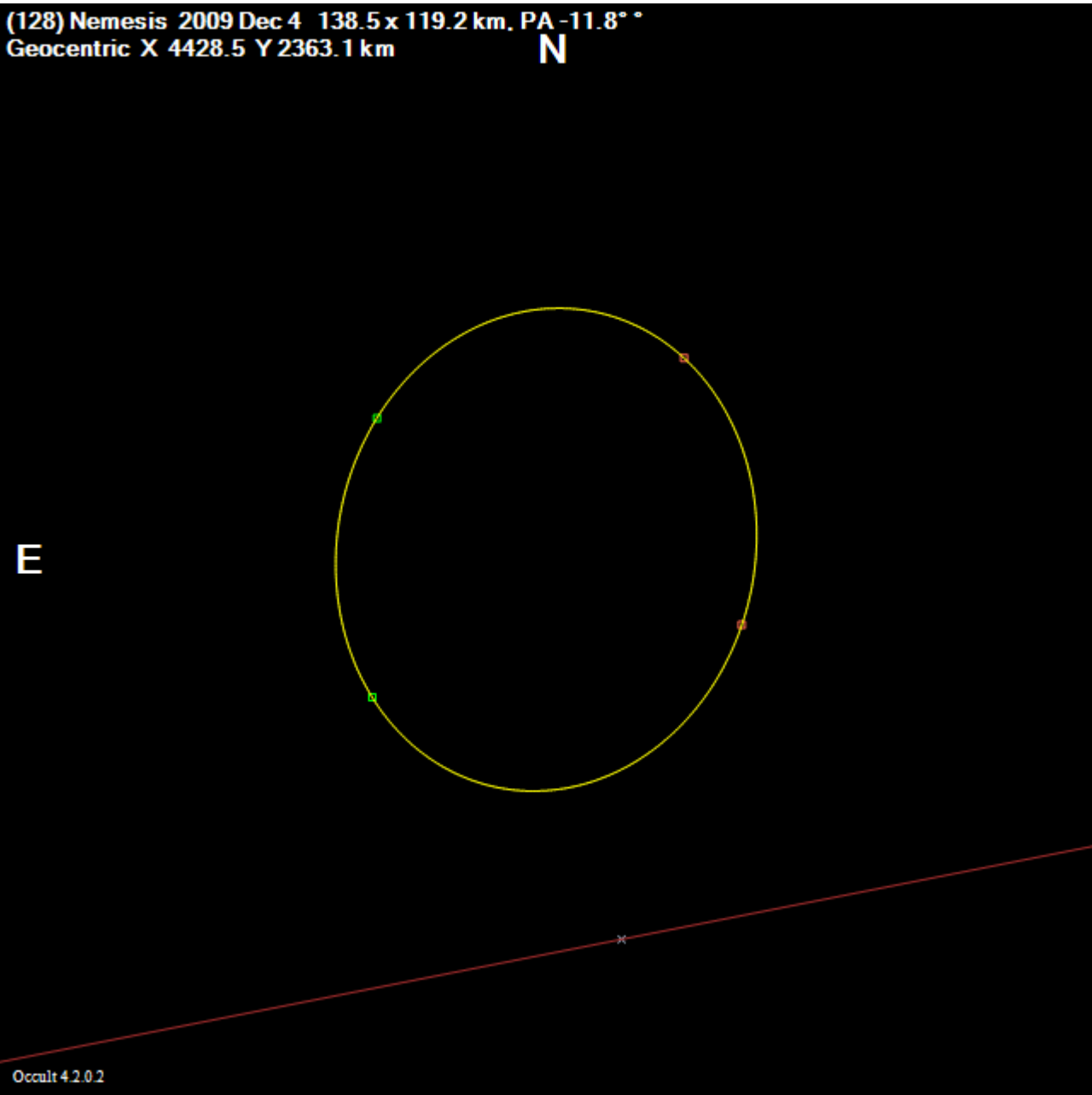
N

E



128nemesis2009dec04

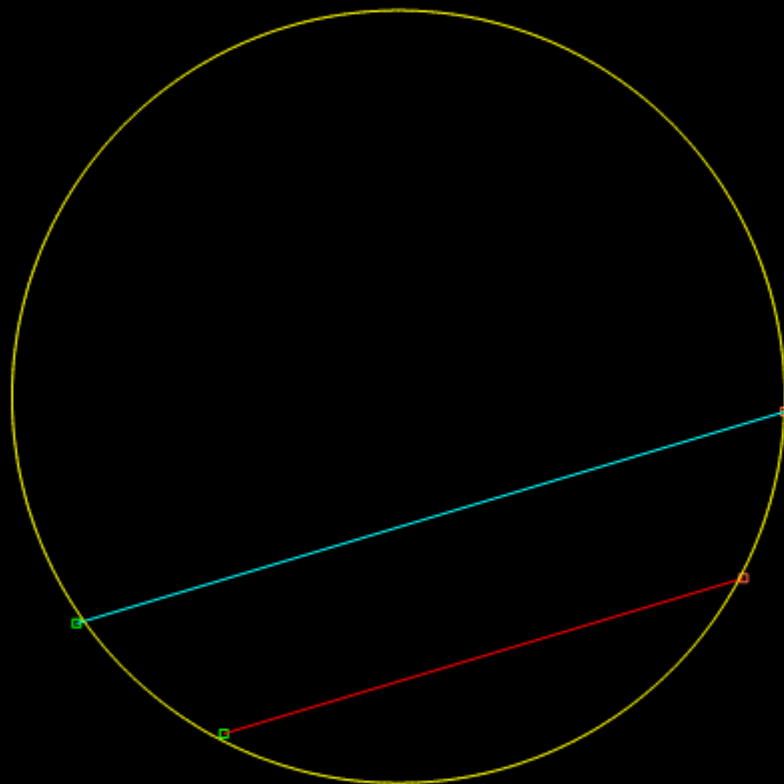
(128) Nemesis 2009 Dec 4 138.5 x 119.2 km, PA -11.8° °
Geocentric X 4428.5 Y 2363.1 km



128nemesis2009nov22

(128) Nemesis 2009 Nov 22 188.0 x 188.0 km, PA 0.0° °
Geocentric X 359.2 ± 0.8 Y 1678.1 ± 1.1 km **N**

E



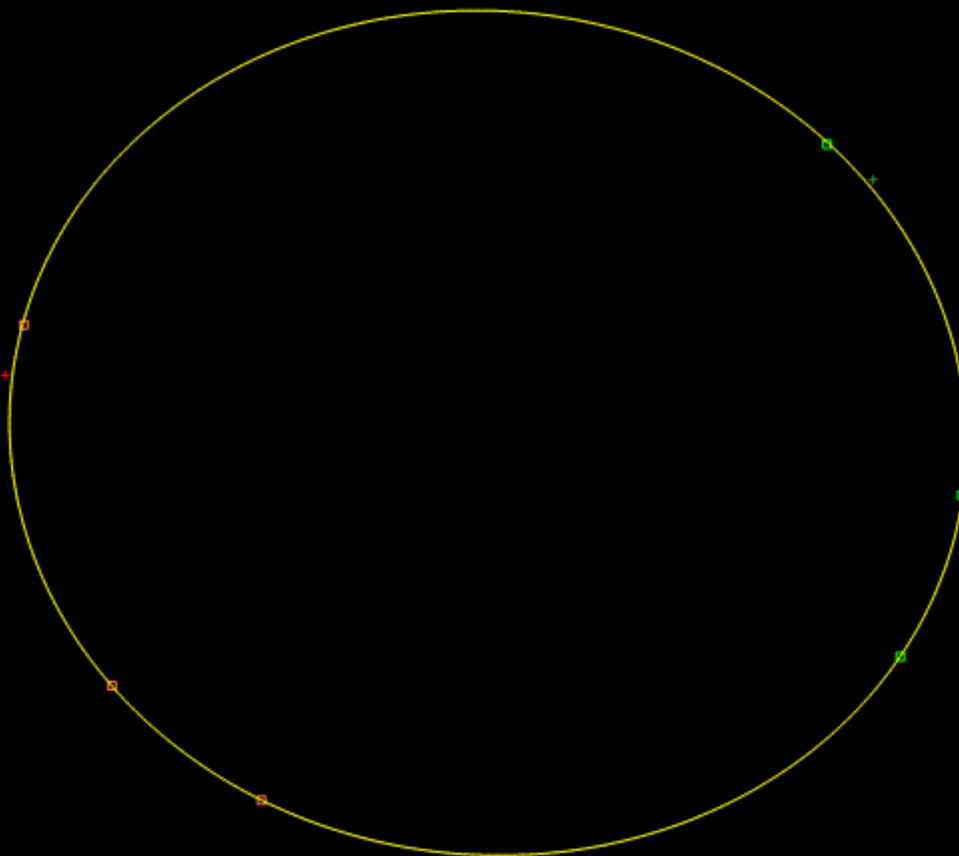
128nemesis2012mar30

(128) Nemesis 2012 Mar 30 $173.3 \pm 0.7 \times 152.6 \pm 1.9$ km, PA $84.5^\circ \pm 3.0^\circ$
Geocentric X -77.4 ± 0.3 Y -676.0 ± 0.5 km

N

E

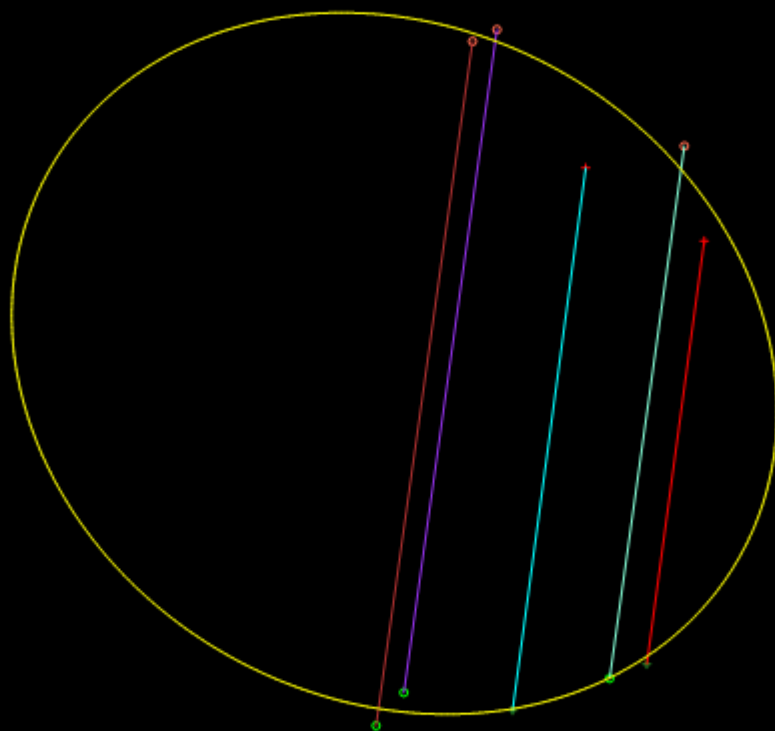
Occult 4.2.0.2



129antigone1985apr11

(129) Antigone 1985 Apr 11 $128.7 \pm 50.0 \times 109.3 \pm 8.1$ km, PA $61.2^\circ \pm 42.0^\circ$
Geocentric X 109.2 ± 19.1 Y 2053.7 ± 4.7 km **N**

E

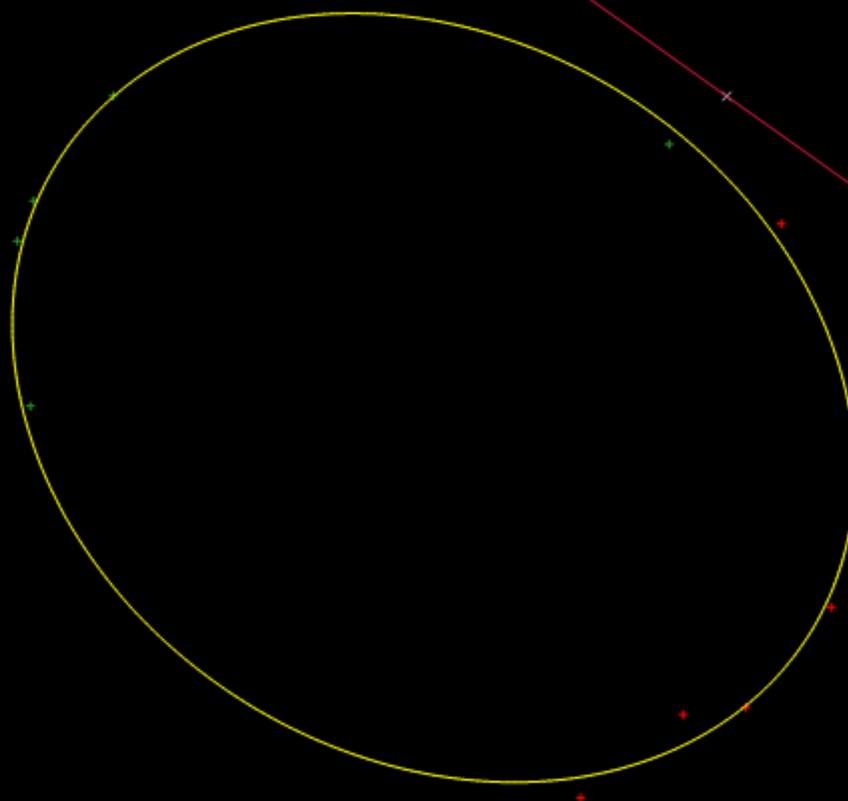


129antigone2001sep09

(129) Antigone 2001 Sep 9 $144.4 \pm 2.1 \times 116.5 \pm 3.5$ km, PA $57.8^\circ \pm 5.2^\circ$
Geocentric X -3586.1 ± 1.1 Y 4196.7 ± 1.3 km **N**

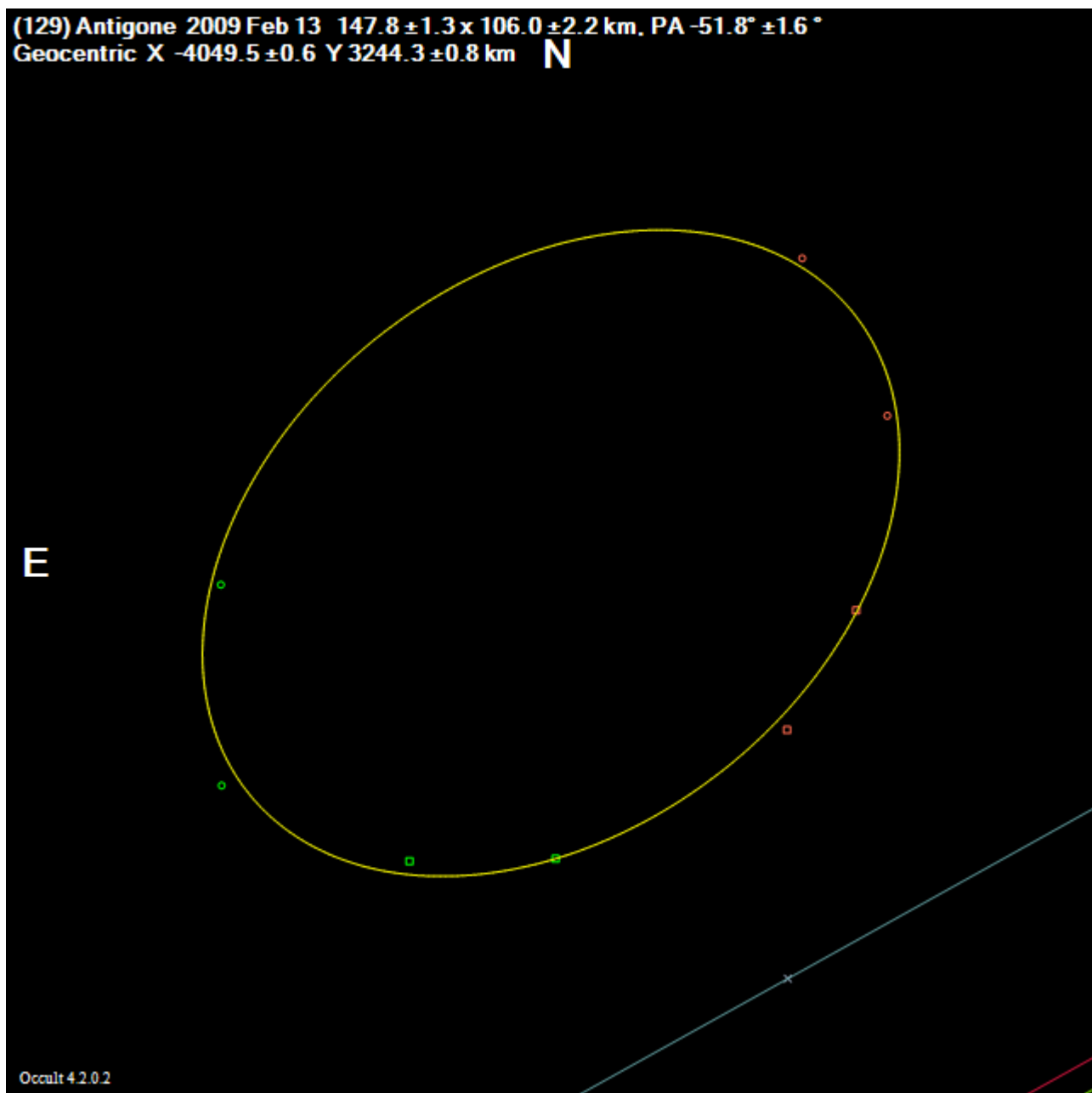
E

Occult 4.2.0.2



129antigone2009feb13

(129) Antigone 2009 Feb 13 $147.8 \pm 1.3 \times 106.0 \pm 2.2$ km, PA $-51.8^\circ \pm 1.6^\circ$
Geocentric X -4049.5 ± 0.6 Y 3244.3 ± 0.8 km **N**

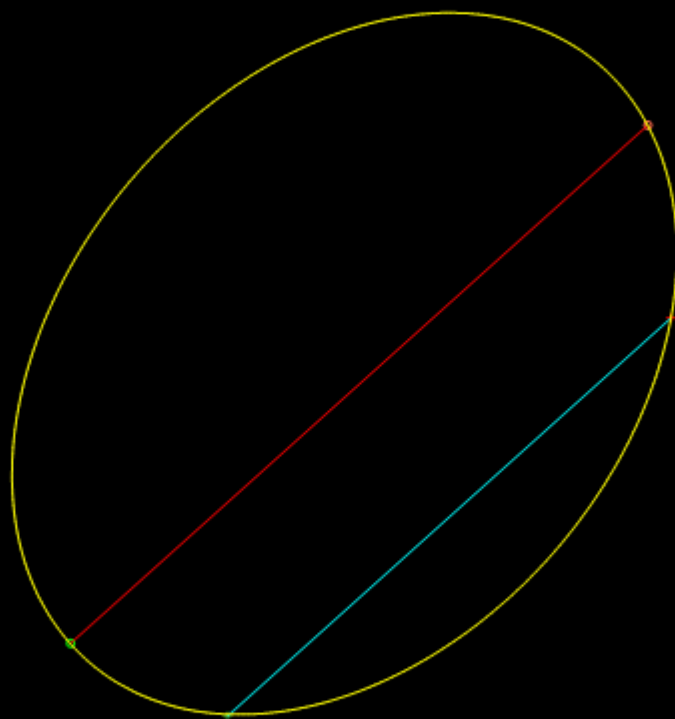


1303luthera2001dec15

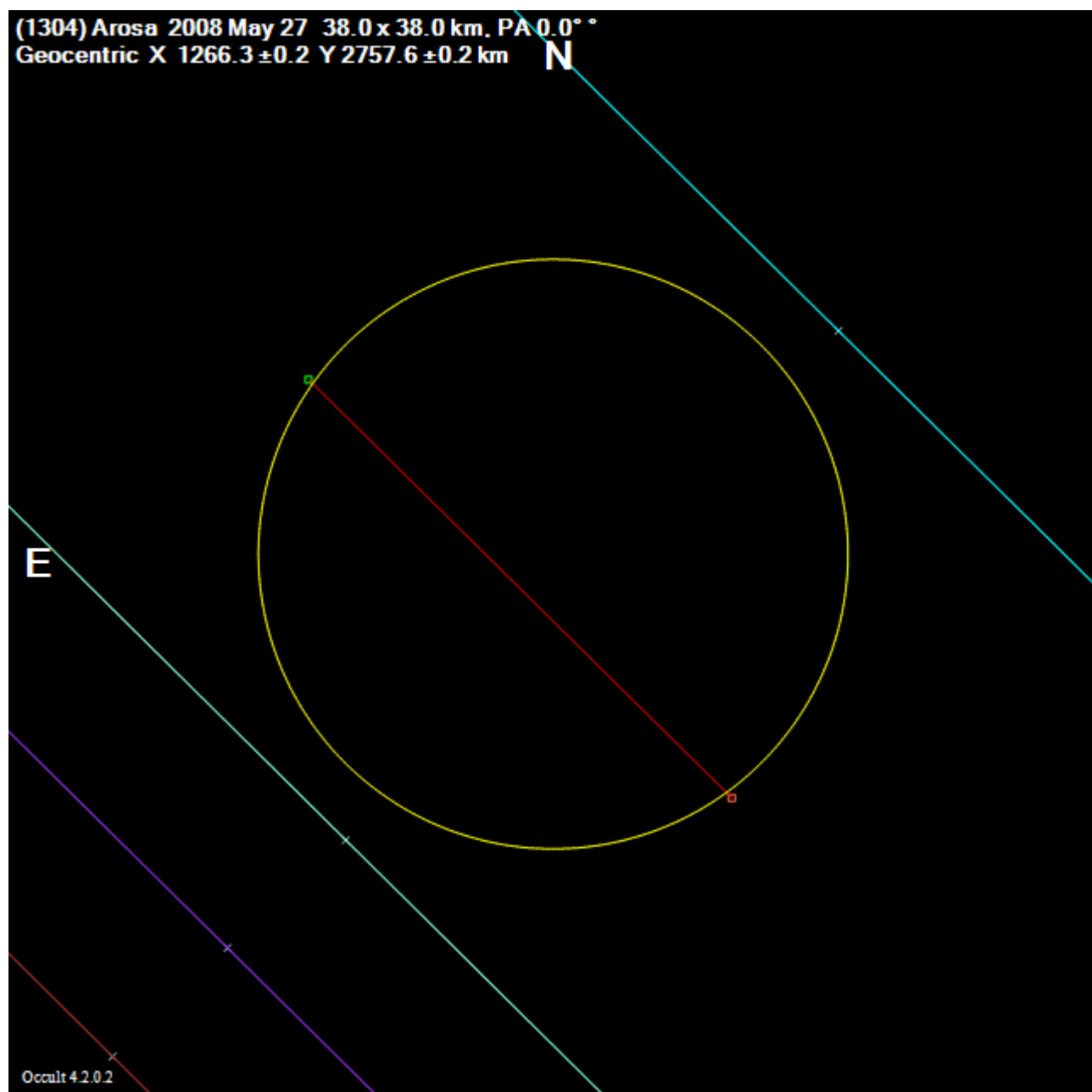
(1303) Luthera 2001 Dec 15 86.9 x 62.3 km, PA -40.2° °
Geocentric X -1777.5 Y 671.6 km

N

E



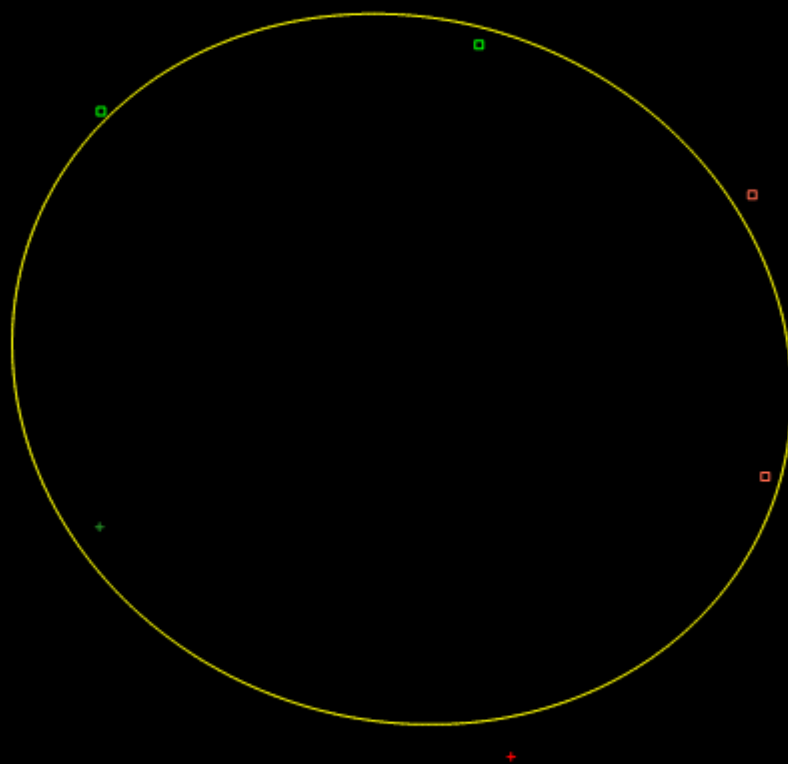
1304arosa2008may27



1309hyperborea2012nov24

(1309) Hyperborea 2012 Nov 24 $59.5 \pm 1.5 \times 52.9 \pm 1.9$ km, PA $71.0^\circ \pm 13.4^\circ$
Geocentric X 1481.8 ± 0.8 Y 3697.2 ± 0.8 km **N**

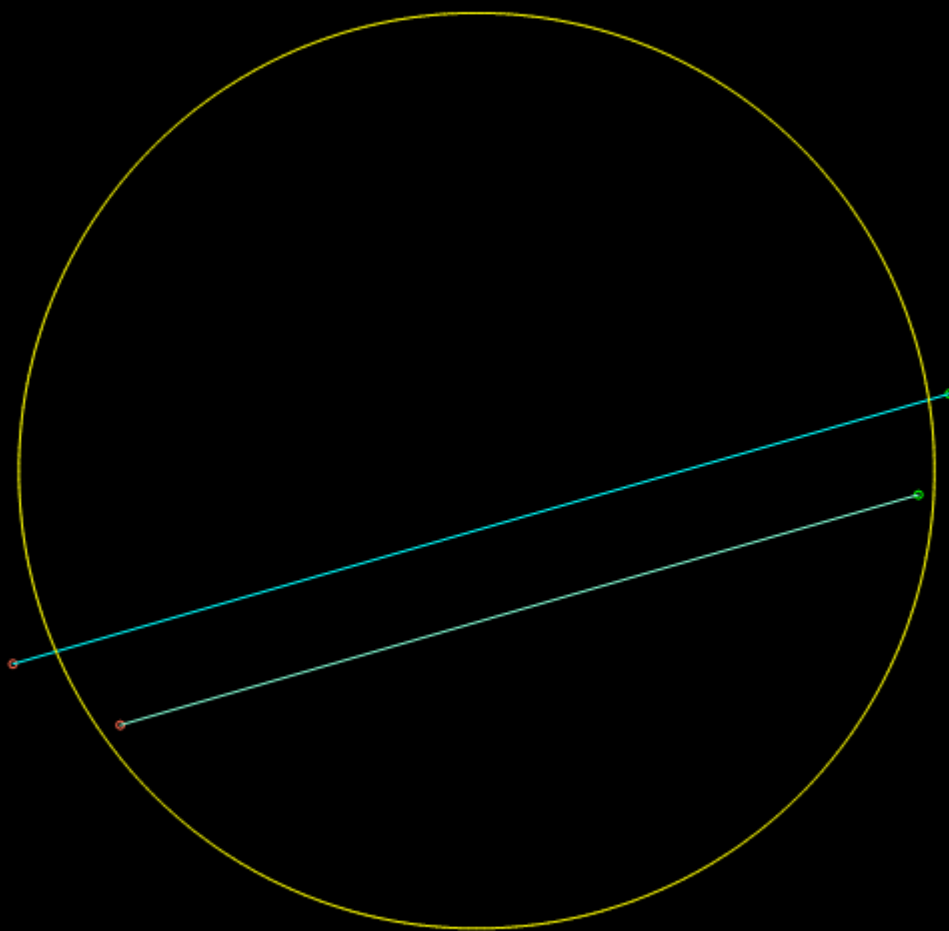
E



130elektra2007nov01

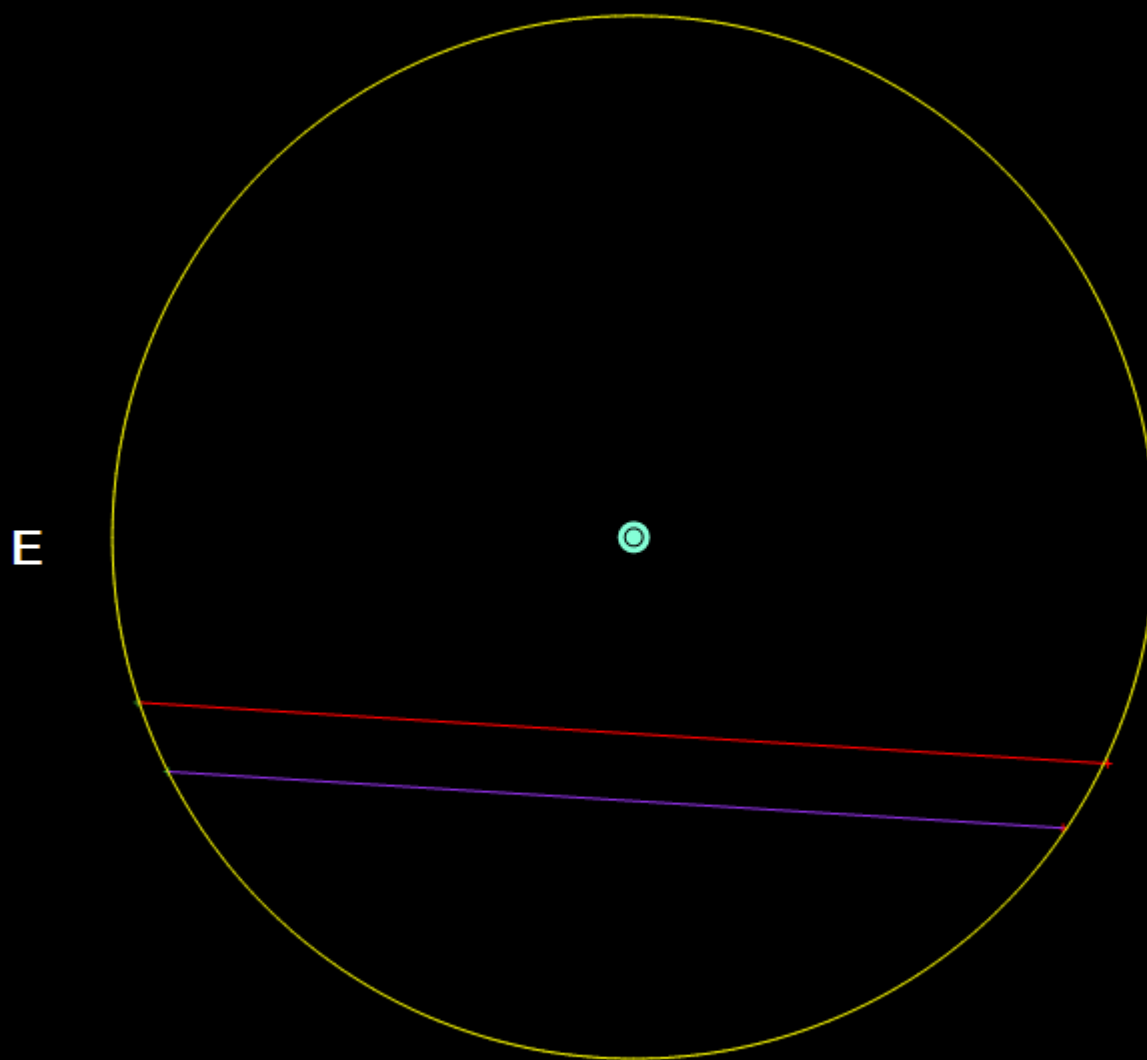
(130) Elektra 2007 Nov 1 $216.8 \pm 109.7 \times 216.8$ km, PA 0.0° °
Geocentric X 4950.9 ± 5.2 Y 3662.8 ± 32.7 km **N**

E



130elektra2009dec01

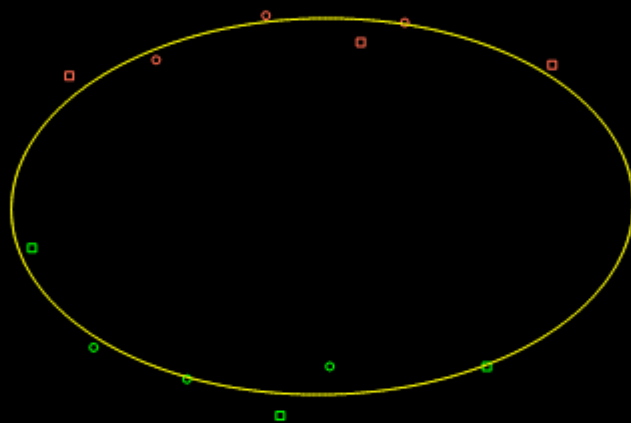
(130) Elektra 2009 Dec 1 247.0 x 247.0 km, PA 0.0° °
Geocentric X -936.2 ±0.3 Y 4952.1 ±0.7 km **N**
Double : Sep 0.0000", PA 0.0°



130elektra2010feb20

(130) Elektra 2010 Feb 20 $255.4 \pm 13.3 \times 154.5 \pm 4.5$ km, PA $90.8^\circ \pm 3.0^\circ$
Geocentric X 1299.2 ± 5.3 Y 4518.3 ± 2.0 km **N**

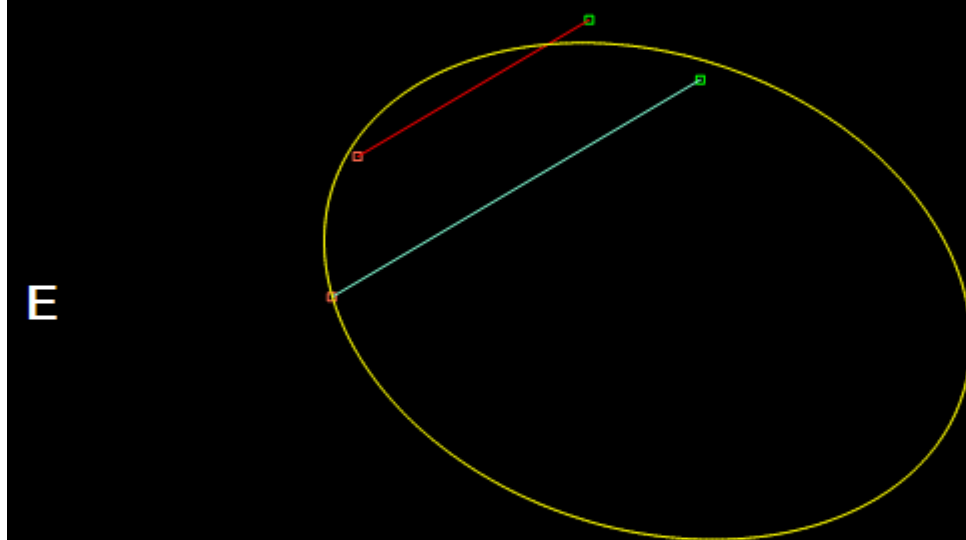
E



Occult 4.2.0.2

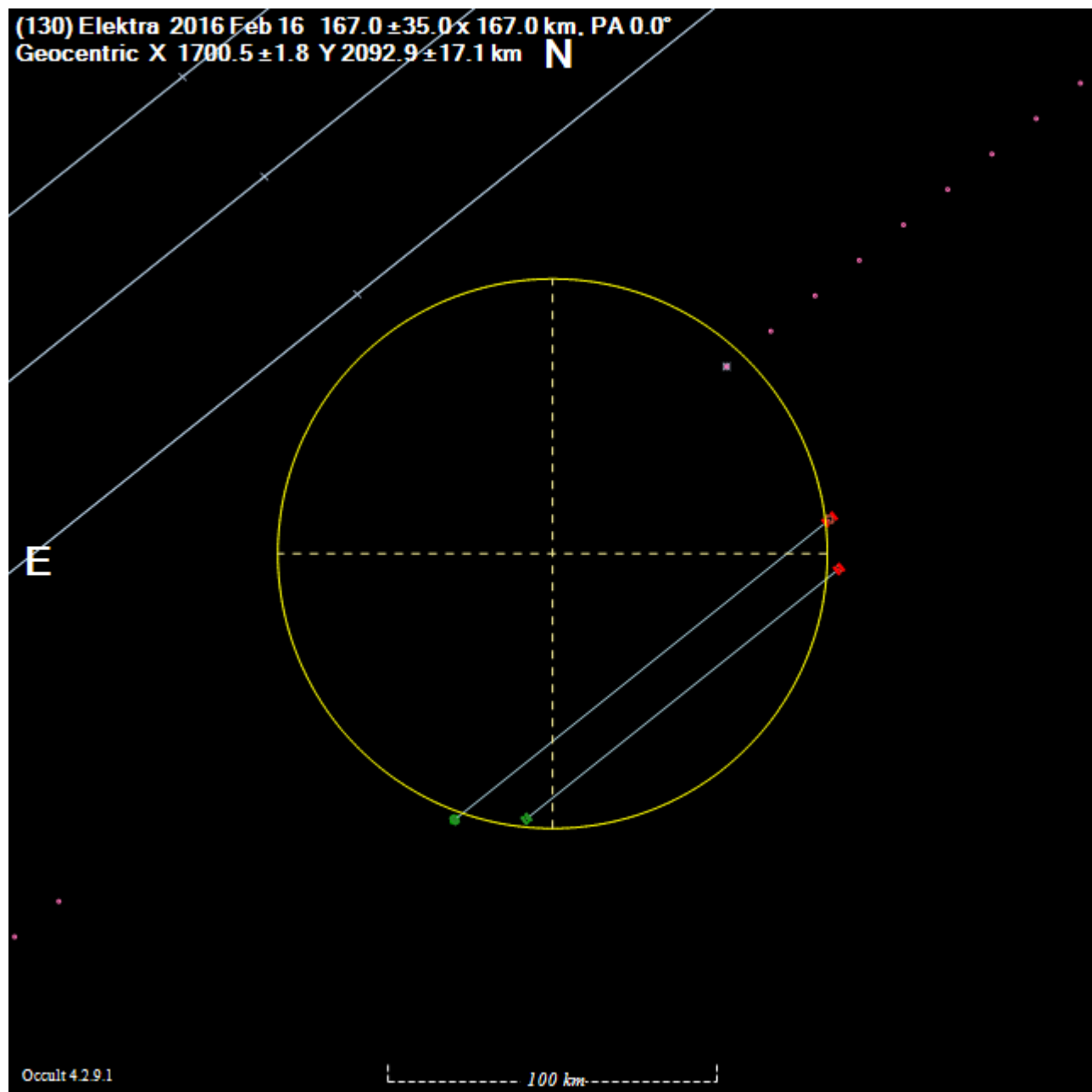
130elektra2013oct05

(130) Elektra 2013 Oct 5 292.9 x 209.4 km, PA 71.4° °
Geocentric X 3754.9 ± 5.2 Y -1701.7 ± 4.6 km **N**



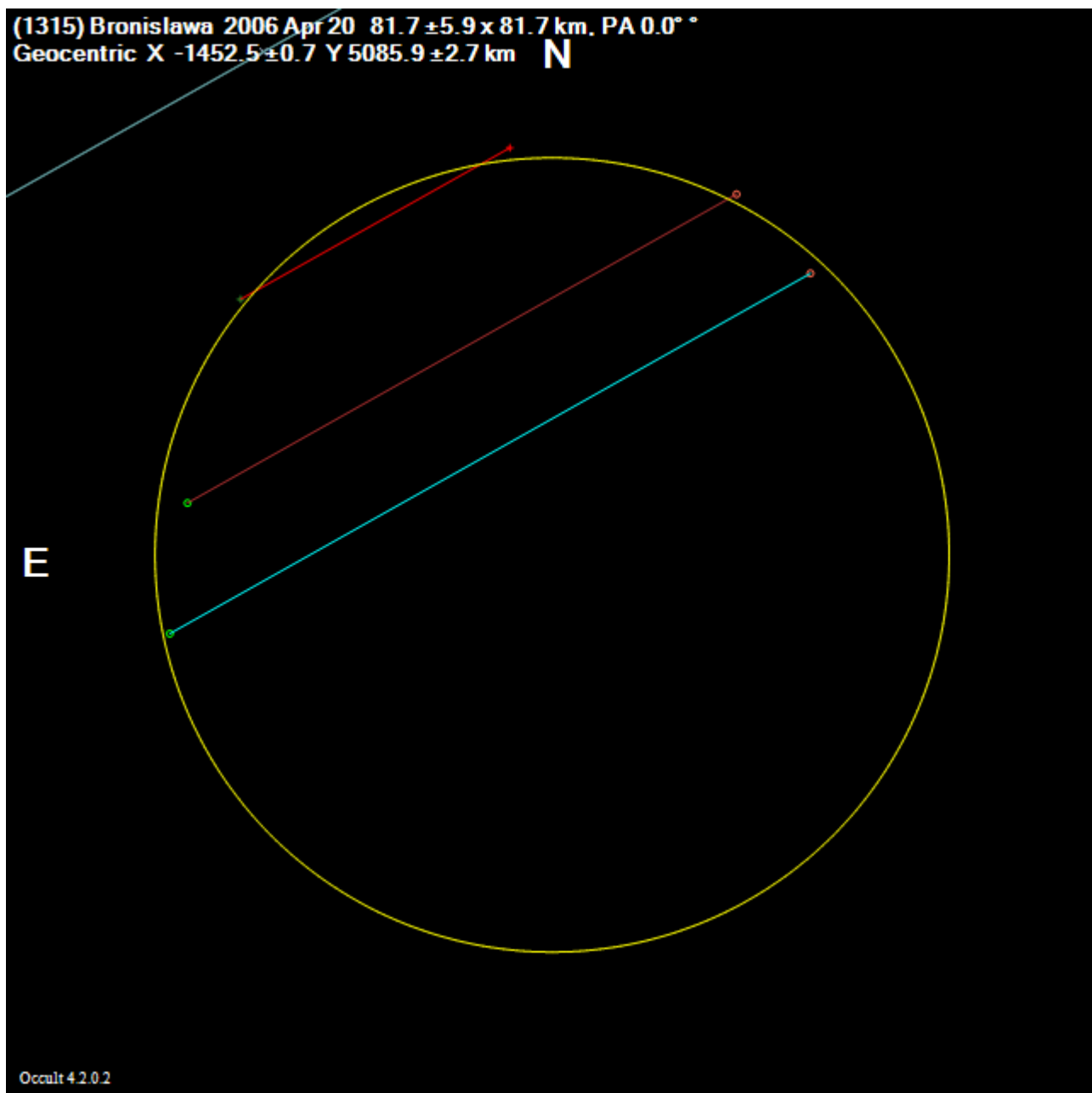
130Elektra2016Feb16

(130) Elektra 2016 Feb 16 $167.0 \pm 35.0 \times 167.0$ km, PA 0.0°
Geocentric X 1700.5 ± 1.8 Y 2092.9 ± 17.1 km **N**



1315bronislawawa2006apr20

(1315) Bronislawawa 2006 Apr 20 $81.7 \pm 5.9 \times 81.7$ km, PA 0.0° °
Geocentric X -1452.5 ± 0.7 Y 5085.9 ± 2.7 km **N**



1329eliane2008feb11

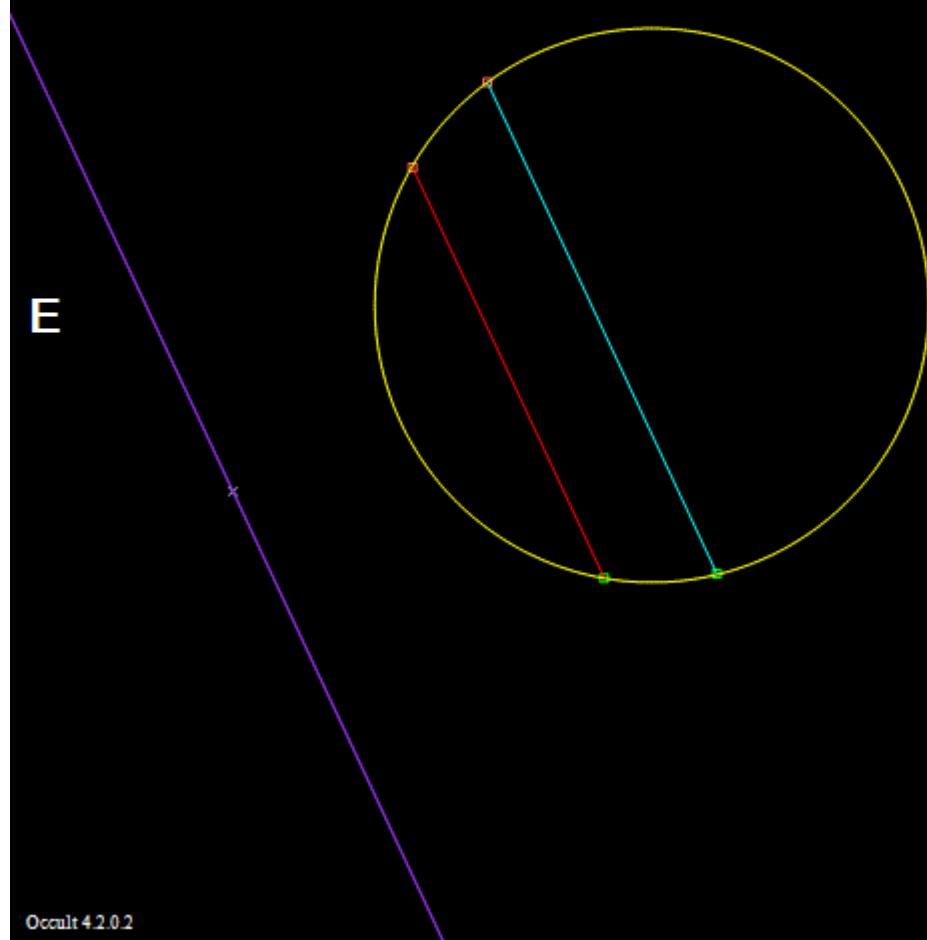
(1329) Eliane 2008 Feb 11 $27.0 \pm 2.3 \times 27.0$ km, PA 0.0° °
Geocentric X -1092.0 ± 0.3 Y 3255.4 ± 0.8 km **N**

E



132aethra2004apr20

(132) Aethra 2004 Apr 20 $31.0 \pm 0.1 \times 31.0$ km, PA 0.0° °
Geocentric X -1758.2 ± 0.0 Y 4914.1 ± 0.0 km **N**



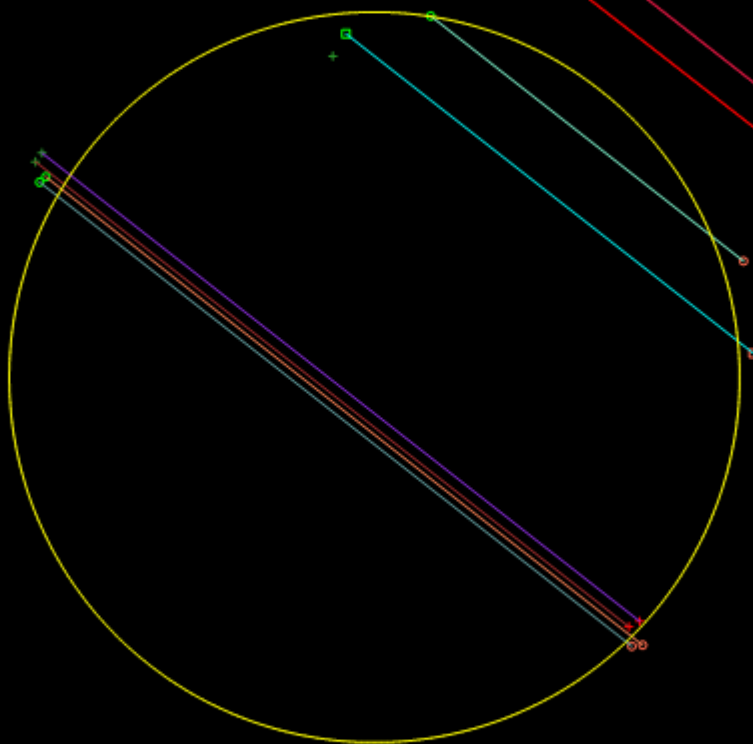
Occult 4.2.0.2

1330spiridonia2007sep16

(1330) Spiridonia 2007 Sep 16 $63.3 \pm 1.3 \times 63.3$ km. PA 0.0° °
Geocentric X 2212.8 ± 0.5 Y 5313.7 ± 0.6 km

N

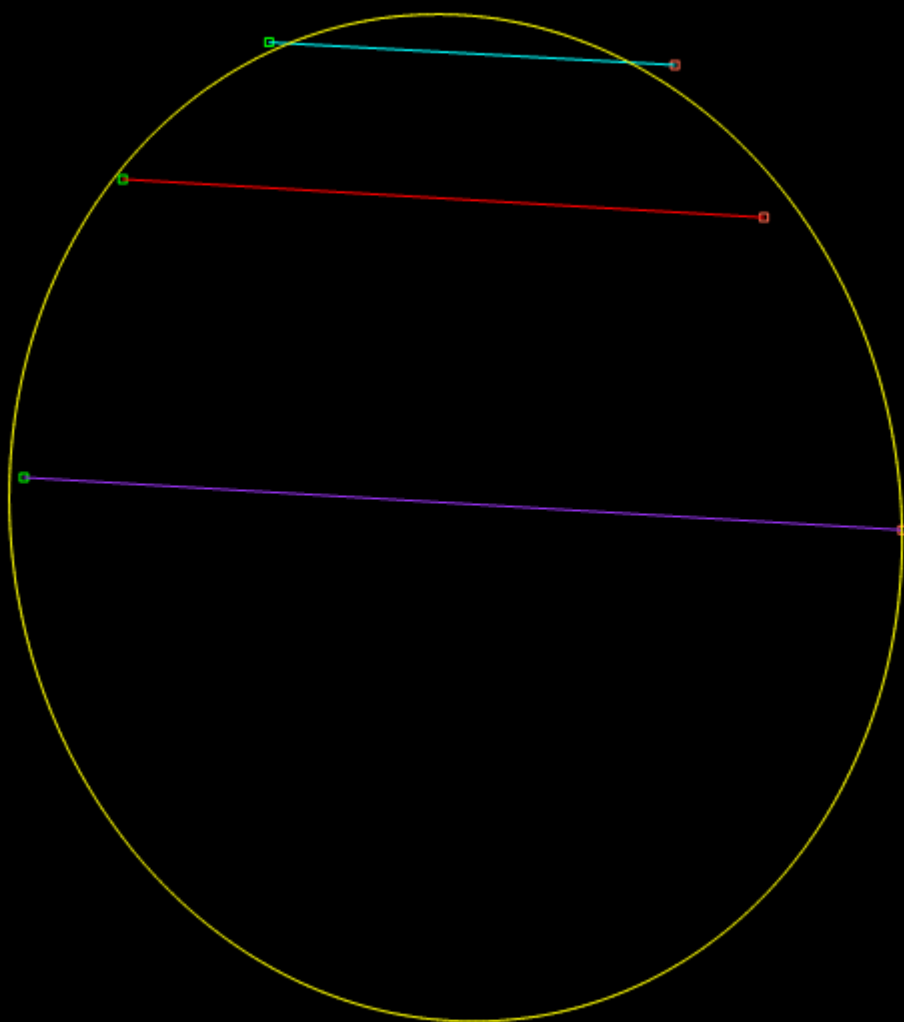
E



133cyrene2012aug05

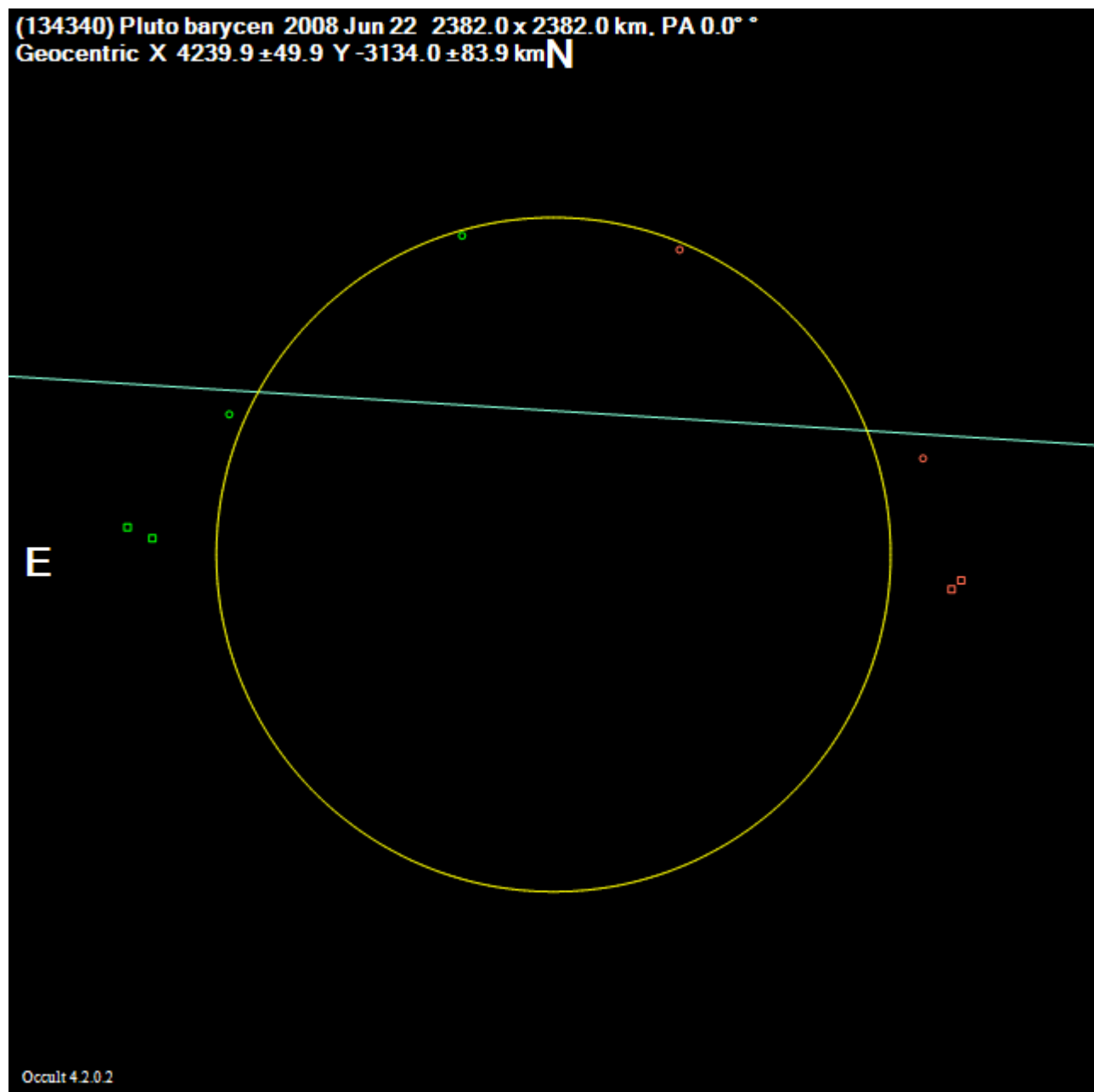
(133) Cyrene 2012 Aug 5 92.0 x 81.0 km, PA 9.4° ± 12.0°
Geocentric X -457.3 ± 1.1 Y 5672.7 ± 1.0 km **N**

E



134340plutobarycen2008jun22

(134340) Pluto barycen 2008 Jun 22 2382.0 x 2382.0 km, PA 0.0° °
Geocentric X 4239.9 ± 49.9 Y -3134.0 ± 83.9 km **N**



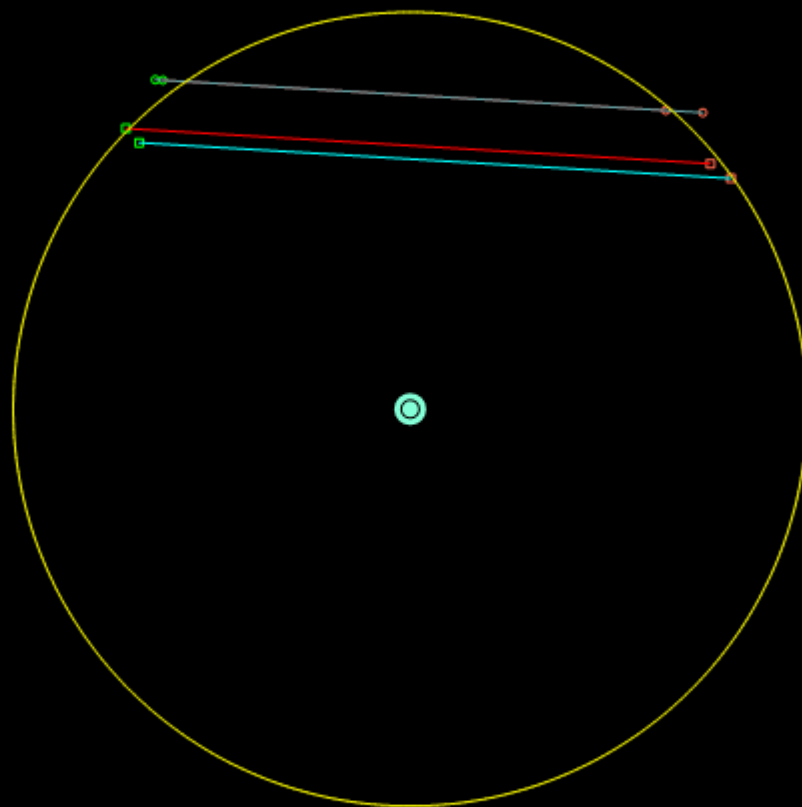
134340plutobarycen2010jun04

(134340) Pluto barycen 2010 Jun 4 2382.0 x 2382.0 km, PA 0.0°

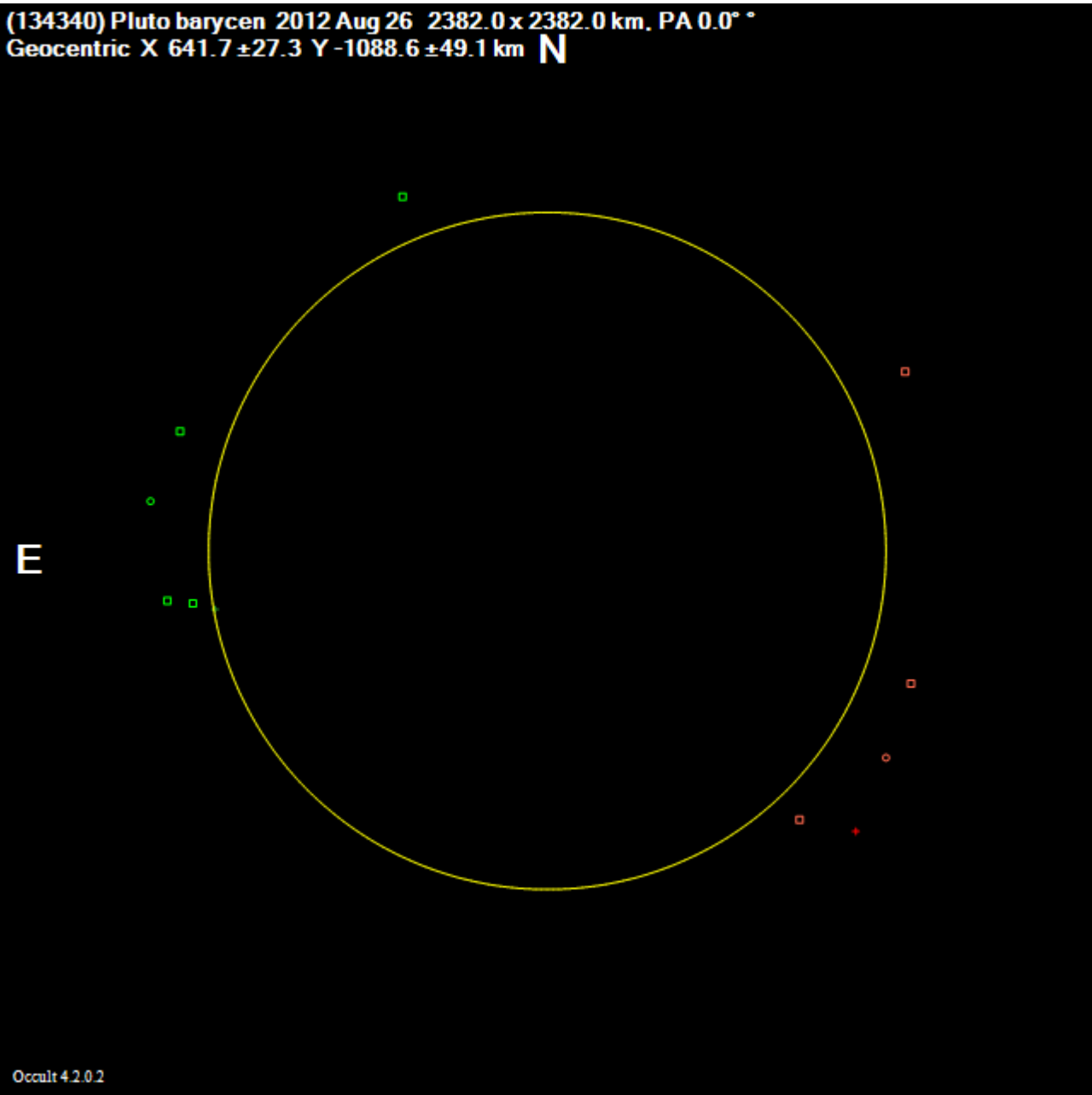
Geocentric X 2708.6 ± 18.6 Y -3550.2 ± 19.7 km **N**

Double : Sep 0.0000", PA 0.0°

E



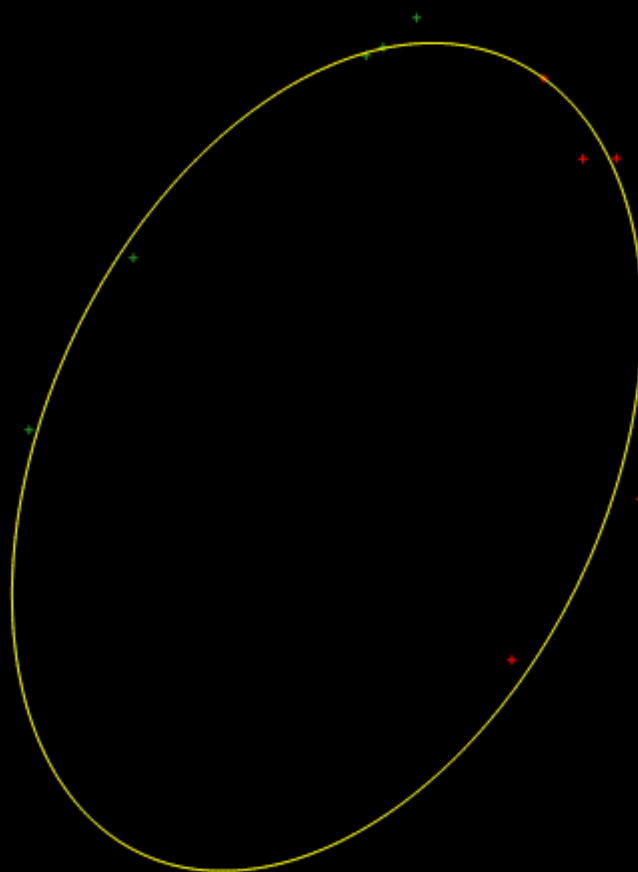
134340plutobarycen2012aug26



134sophrosyne1980nov24

(134) Sophrosyne 1980 Nov 24 $140.2 \pm 14.1 \times 89.9 \pm 2.5$ km, PA $-25.2^\circ \pm 3.1^\circ$
Geocentric X -1528.3 ± 3.1 Y 831.1 ± 6.0 km **N**

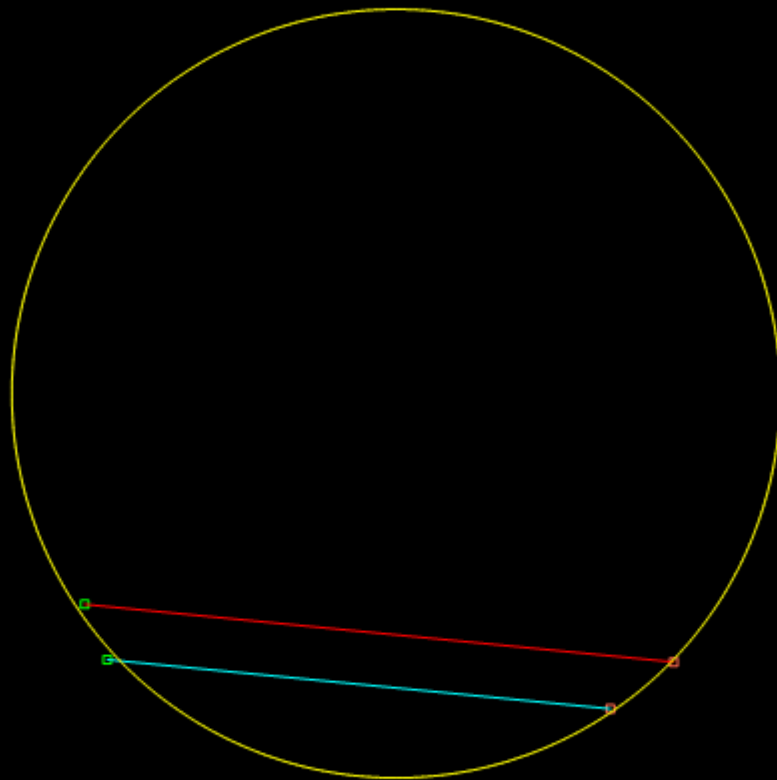
E



134sophrosyne2009dec11

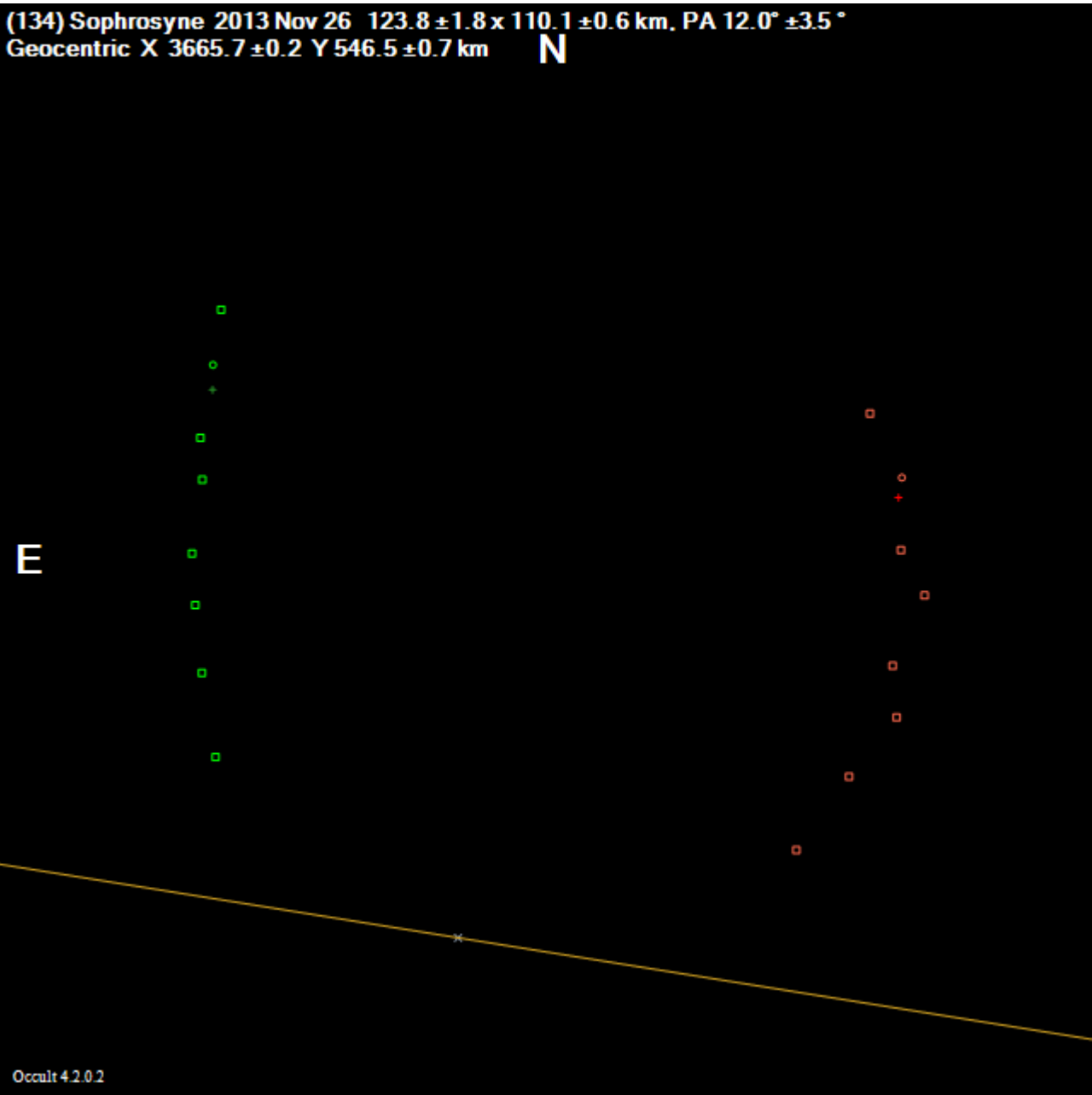
(134) Sophrosyne 2009 Dec 11 123.0 x 123.0 km, PA 0.0°
Geocentric X 2887.4 ± 0.7 Y 1403.9 ± 0.7 km **N**

E

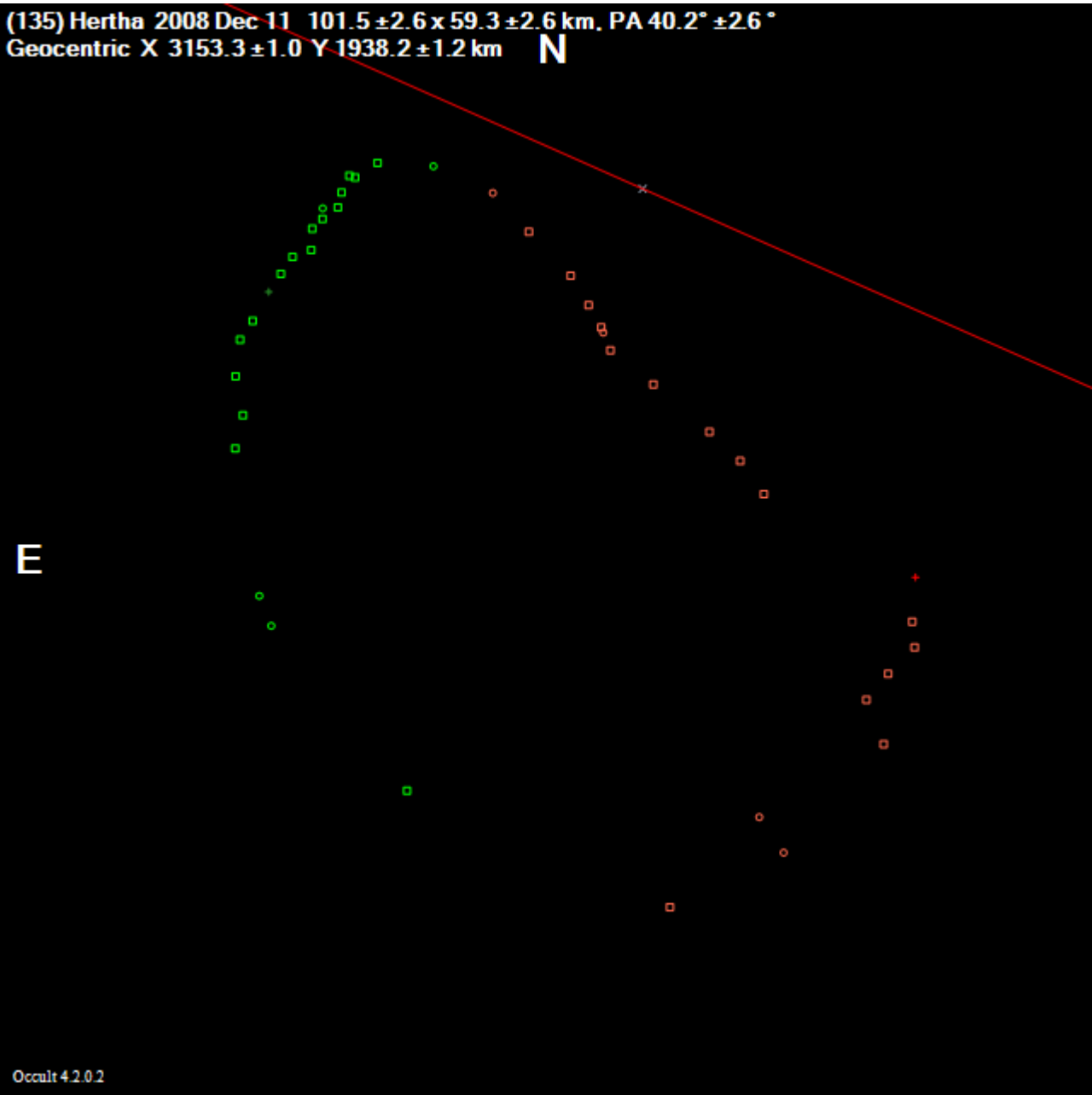


134sophrosyne2013nov26

(134) Sophrosyne 2013 Nov 26 $123.8 \pm 1.8 \times 110.1 \pm 0.6$ km, PA $12.0^\circ \pm 3.5^\circ$
Geocentric X 3665.7 ± 0.2 Y 546.5 ± 0.7 km

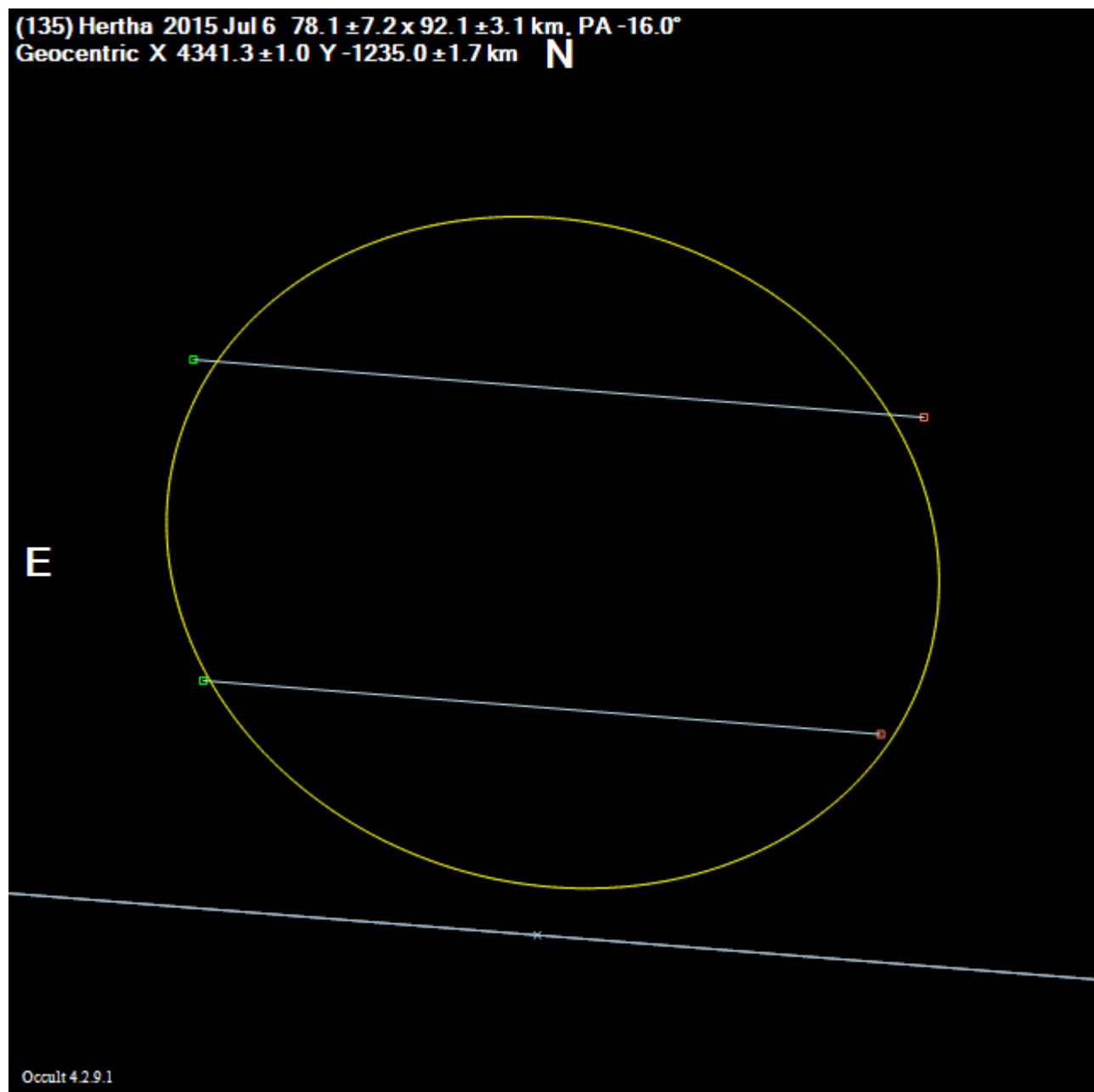


135hertha2008dec11



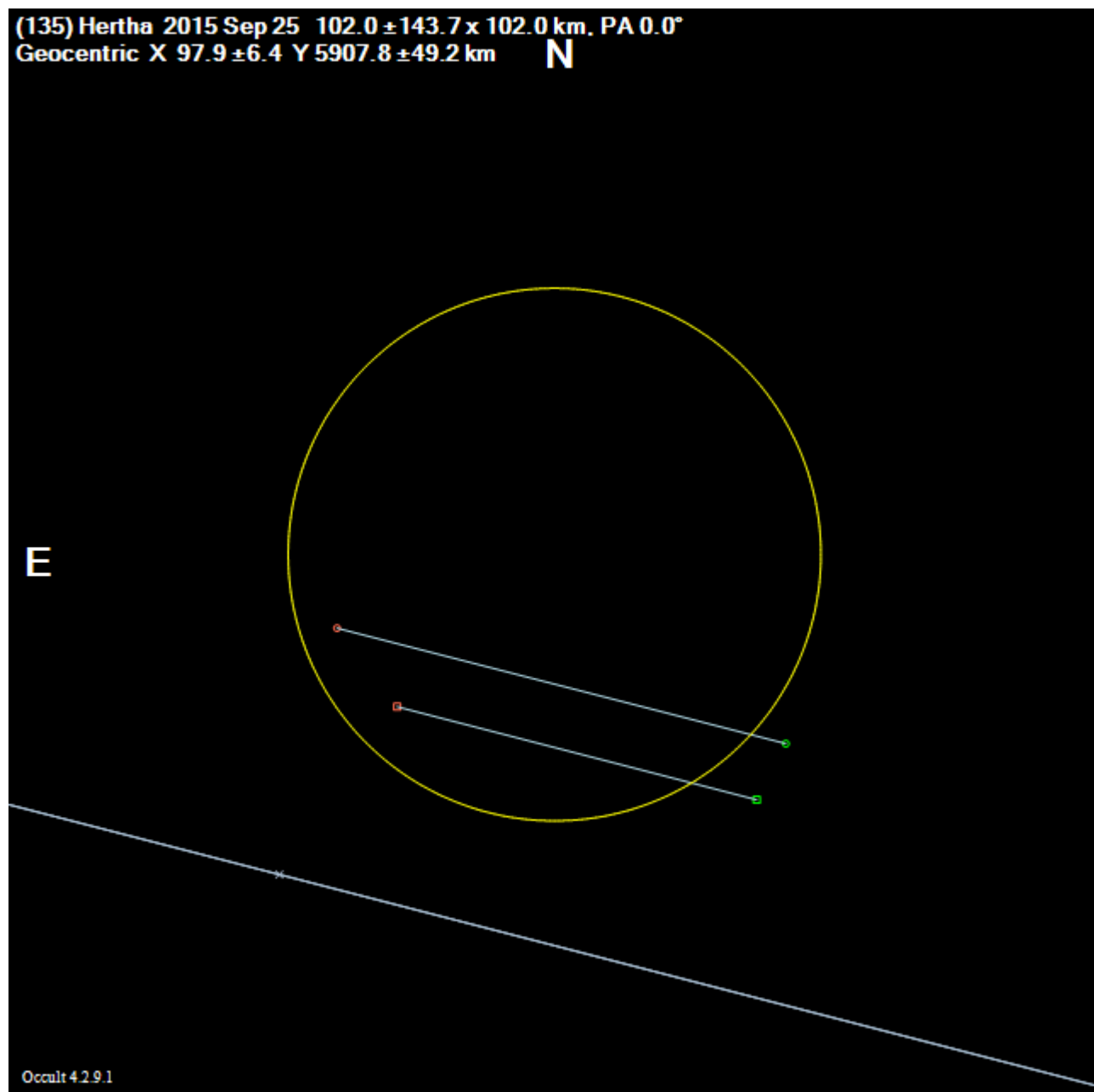
135hertha2015jul06

(135) Hertha 2015 Jul 6 $78.1 \pm 7.2 \times 92.1 \pm 3.1$ km, PA -16.0°
Geocentric X 4341.3 ± 1.0 Y -1235.0 ± 1.7 km **N**

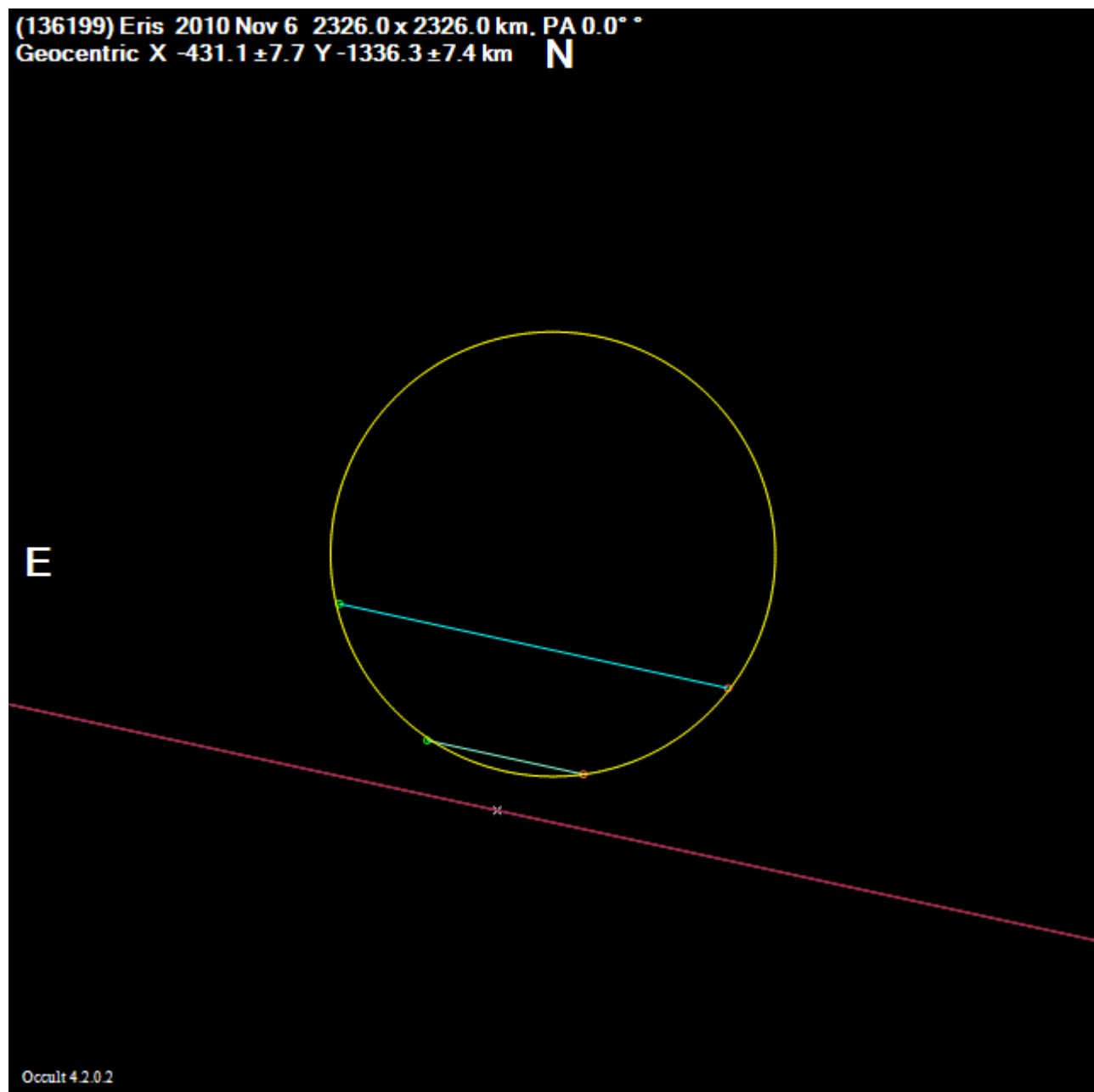


135hertha2015sep25

(135) Hertha 2015 Sep 25 $102.0 \pm 143.7 \times 102.0$ km, PA 0.0°
Geocentric X 97.9 ± 6.4 Y 5907.8 ± 49.2 km **N**



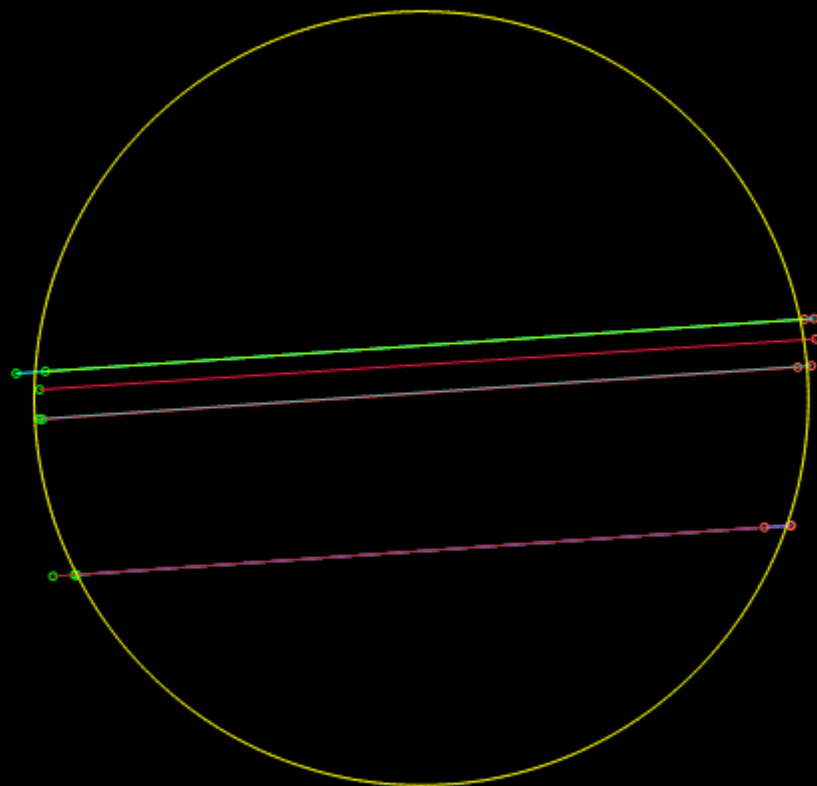
**(136199) Eris 2010 Nov 6 2326.0 x 2326.0 km, PA 0.0°
Geocentric X -431.1 ± 7.7 Y -1336.3 ± 7.4 km N**



136472makemake2011apr23

(136472) Makemake 2011 Apr 23 1430.0 \pm 206.9 x 1430.0 km, PA 0.0° °
Geocentric X -1543.1 \pm 5.5 Y -4884.2 \pm 41.3 km **N**

E

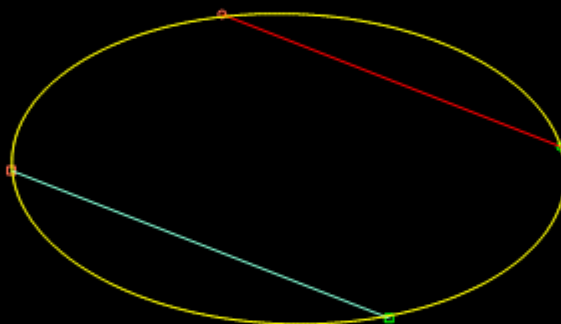


1364safara2008sep08

(1364) Safara 2008 Sep 8 20.9 x 11.7 km, PA 88.1° °
Geocentric X -5292.9 Y 3004.1 km

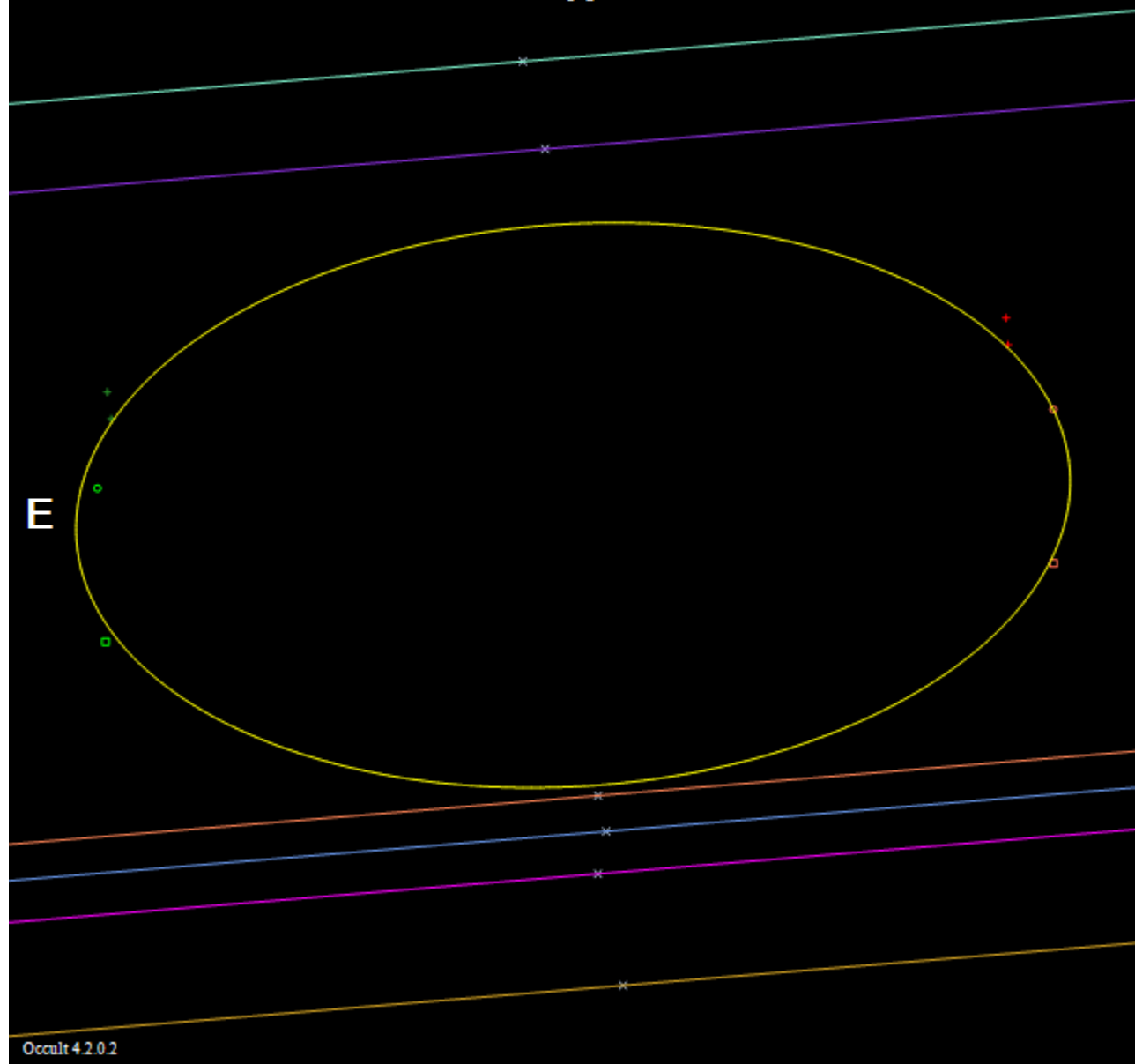
N

E

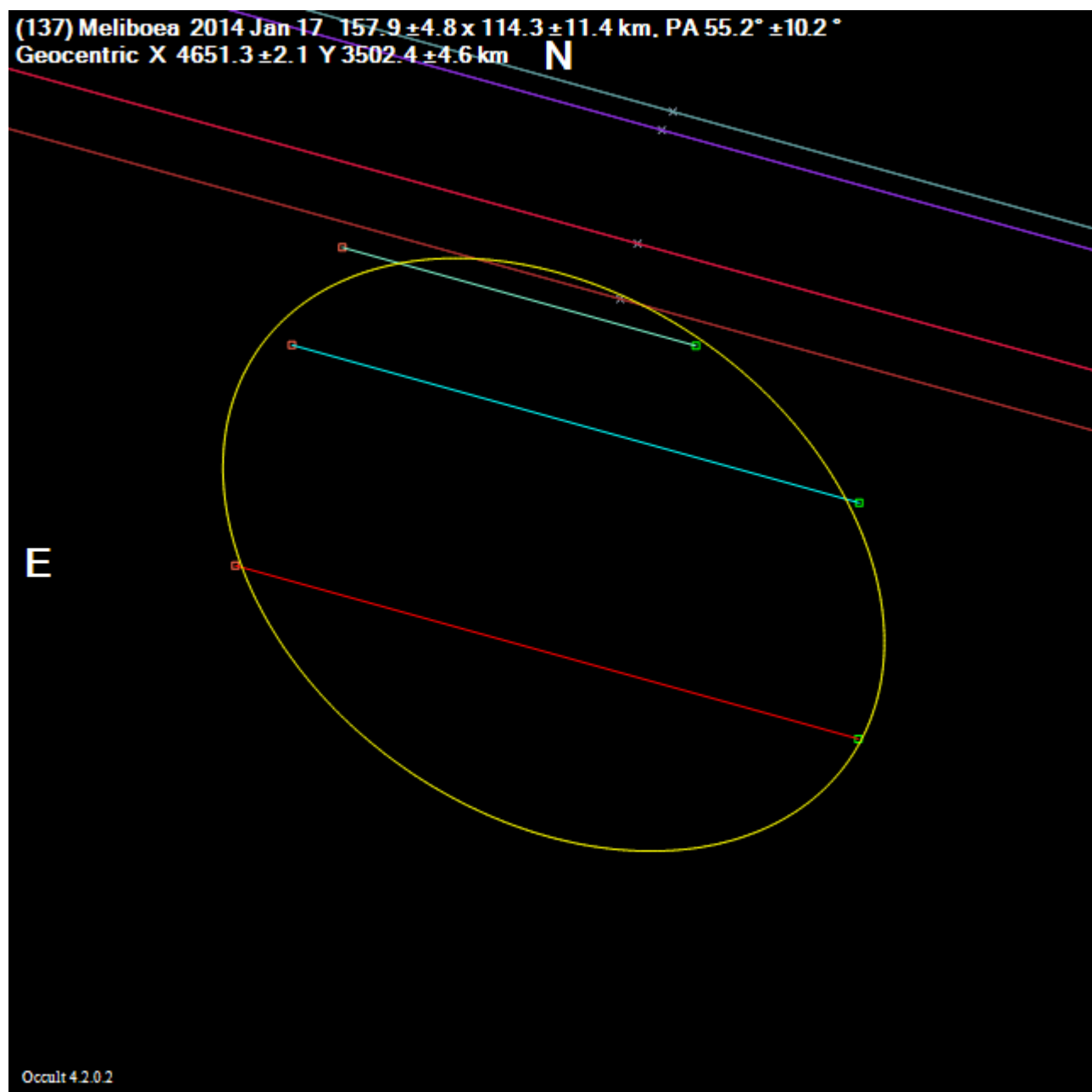


1366piccolo2003apr28

(1366) Piccolo 2003 Apr 28 $39.7 \pm 0.3 \times 22.4 \pm 0.6$ km, PA $-86.0^\circ \pm 1.0^\circ$
Geocentric X 2465.5 ± 0.1 Y 4021.6 ± 0.2 km **N**



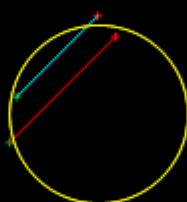
137meliboea2014jan17



1384kniertje2010jan17

(1384) Kniertje 2010 Jan 17 28.0 x 28.0 km, PA 0.0° °
Geocentric X -1913.2 ± 0.9 Y 3300.5 ± 0.8 km **N**

E

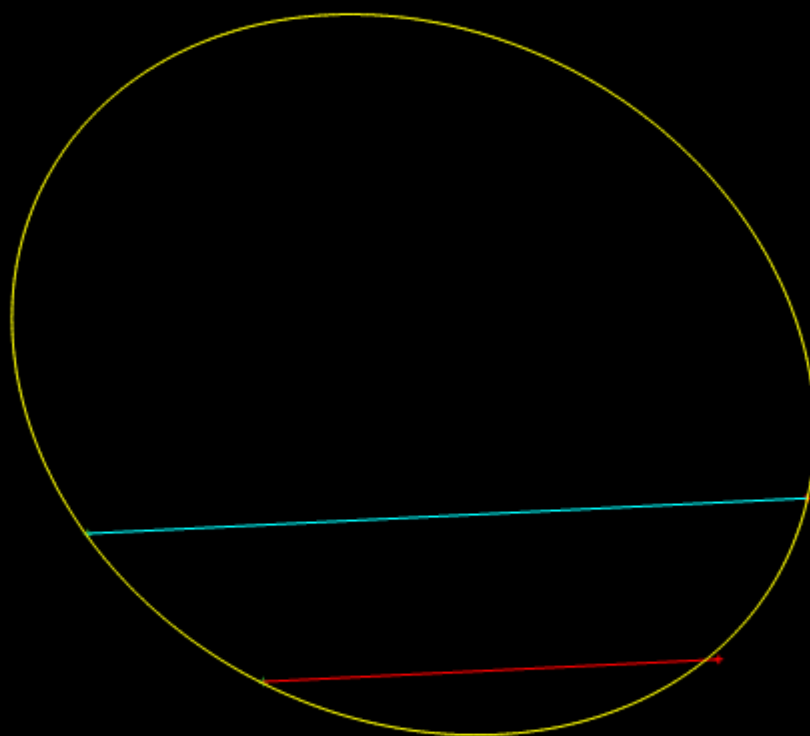


139juewa1988apr21

(139) Juewa 1988 Apr 21 168.9 x 139.4 km, PA 62.3° °
Geocentric X -3378.3 Y -1623.4 km

N

E



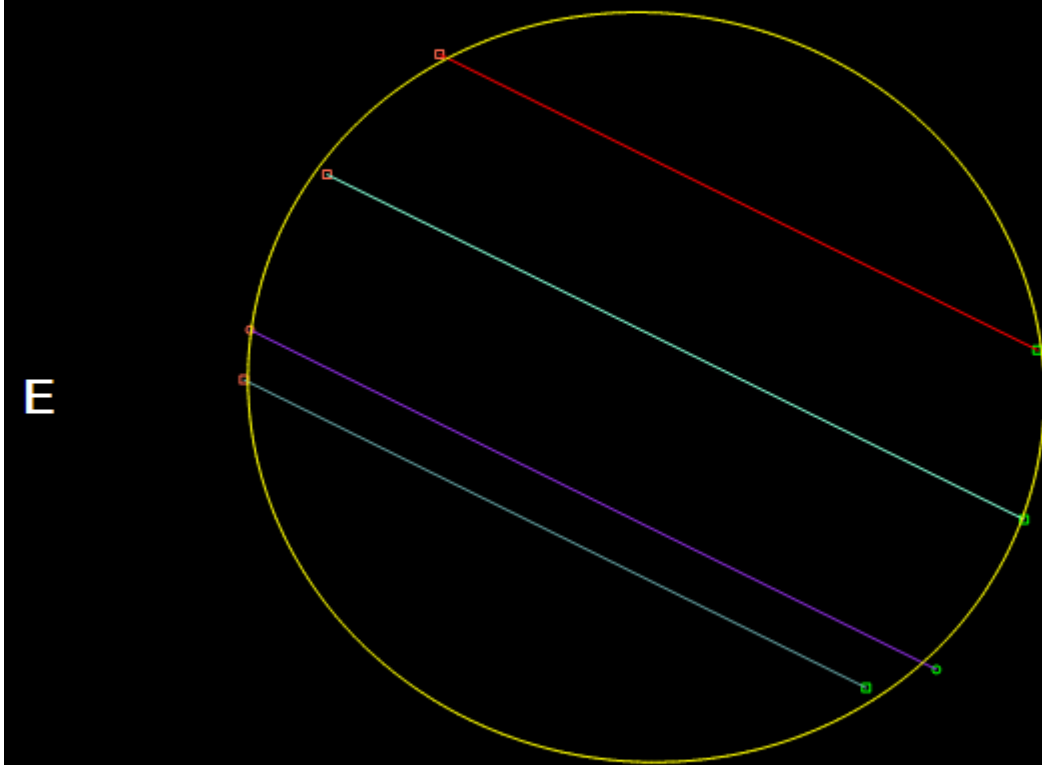
139juewa2002apr20

(139) Juewa 2002 Apr 20 $170.3 \pm 4.0 \times 150.7 \pm 4.8$ km, PA $54.1^\circ \pm 10.0^\circ$
Geocentric X -367.2 ± 0.6 Y 5390.2 ± 3.0 km **N**

E



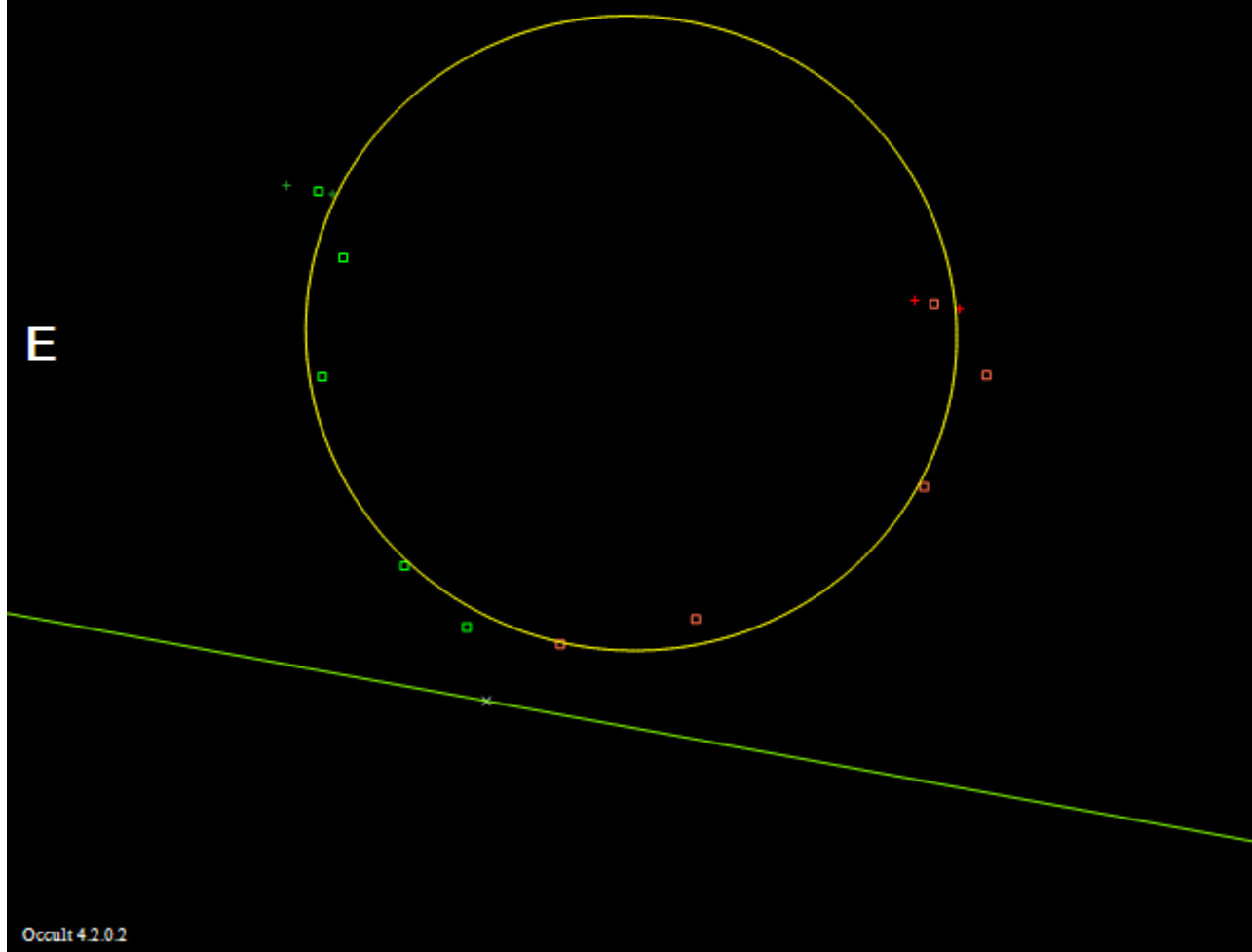
(139) Juewa 2009 Jun 28 $154.7 \pm 0.9 \times 145.1 \pm 4.3$ km, PA $80.2^\circ \pm 10.7^\circ$
Geocentric X -4755.8 ± 0.5 Y 3293.0 ± 0.7 km **N**



Occult 4.2.0.2

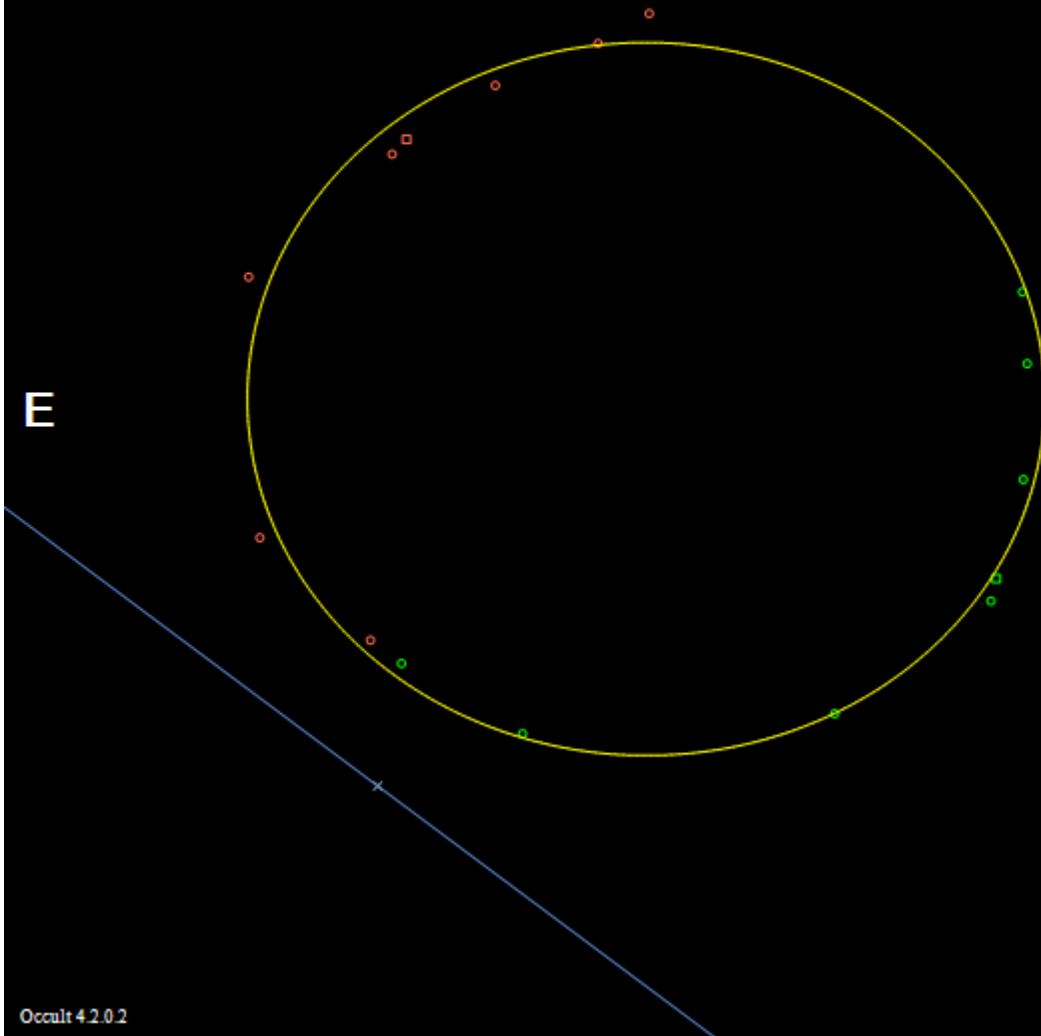
139juewa2013aug31

(139) Juewa 2013 Aug 31 $147.9 \pm 2.4 \times 143.9 \pm 9.7$ km, PA $79.0^\circ \pm 43.9^\circ$
Geocentric X -1646.7 ± 1.2 Y -3648.5 ± 4.2 km **N**



13egeria2008jan22

(13) Egeria 2008 Jan 22 $214.8 \pm 1.9 \times 192.0 \pm 2.0$ km, PA $89.7^\circ \pm 4.1^\circ$
Geocentric X 2092.7 ± 0.8 Y 2753.3 ± 0.8 km **N**



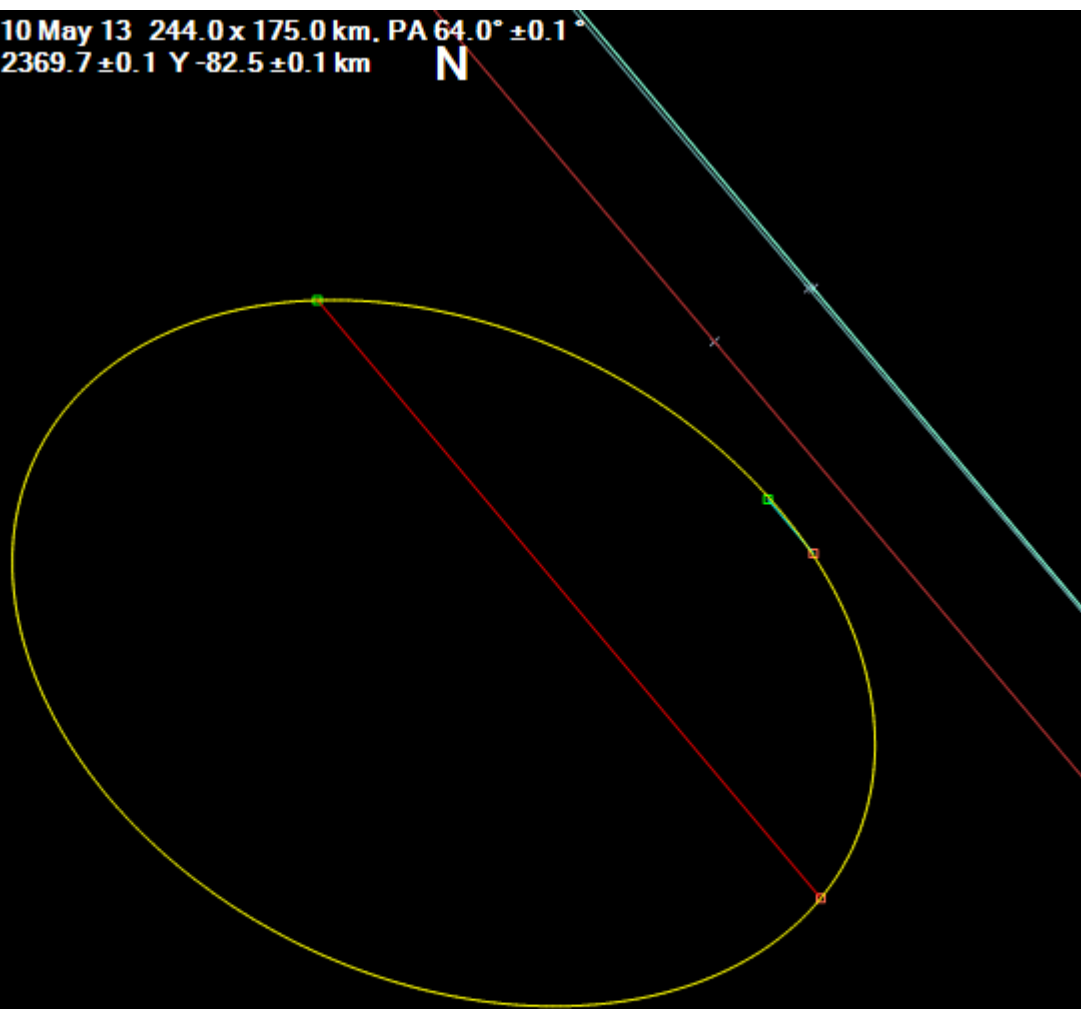
Occult 4.2.0.2

13egeria2010may13

(13) Egeria 2010 May 13 244.0 x 175.0 km. PA 64.0° ± 0.1°
Geocentric X 2369.7 ± 0.1 Y -82.5 ± 0.1 km

N

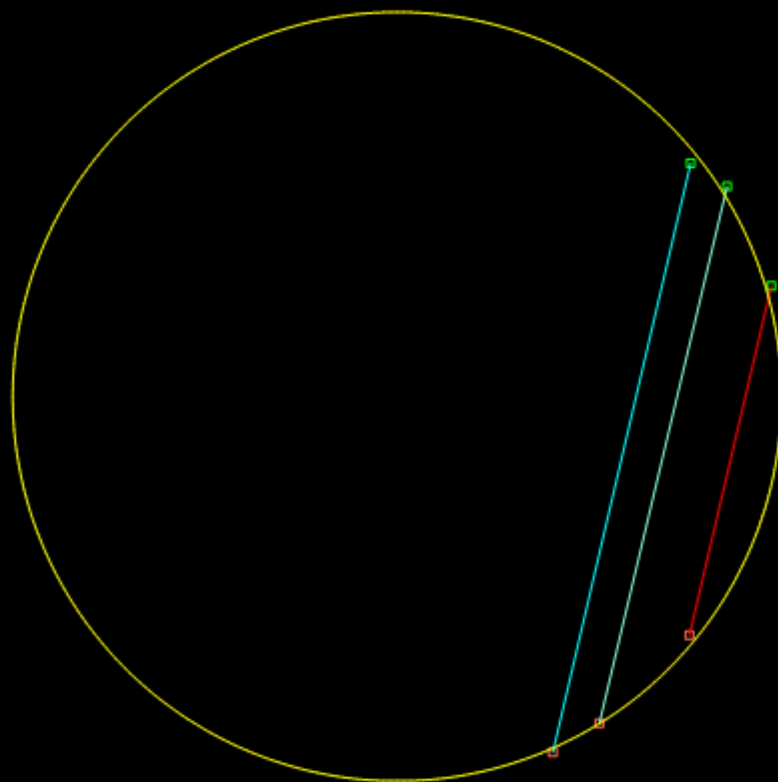
E



13egeria2013mar26

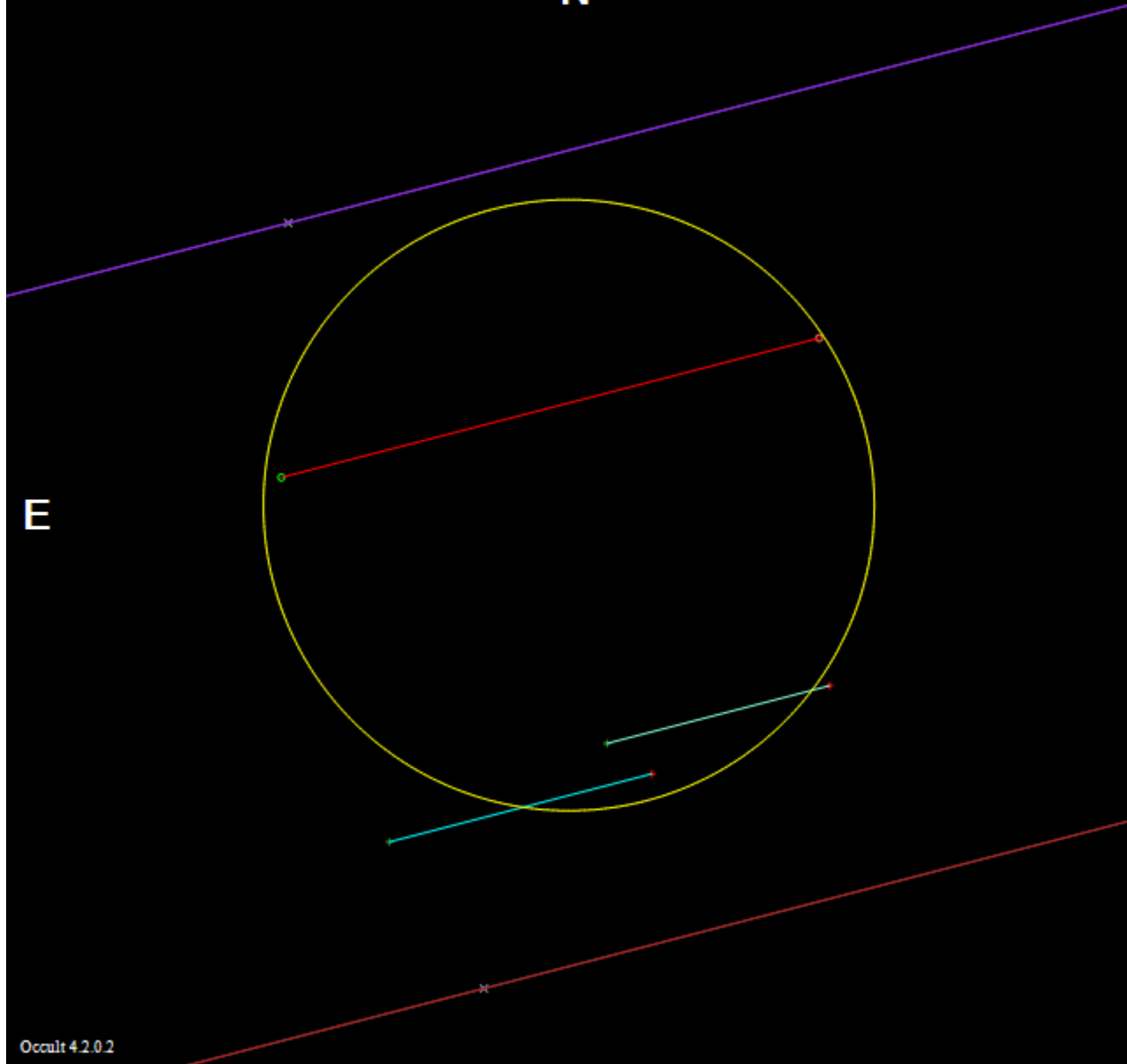
(13) Egeria 2013 Mar 26 215.1 x 215.1 km, PA 0.0° °
Geocentric X 4021.3 ± 1.0 Y 3771.1 ± 1.0 km **N**

E



140siwa2006dec17

(140) Siwa 2006 Dec 17 $99.7 \pm 16.0 \times 99.7$ km, PA 0.0° °
Geocentric X -4066.8 ± 4.0 Y 2381.8 ± 6.4 km **N**

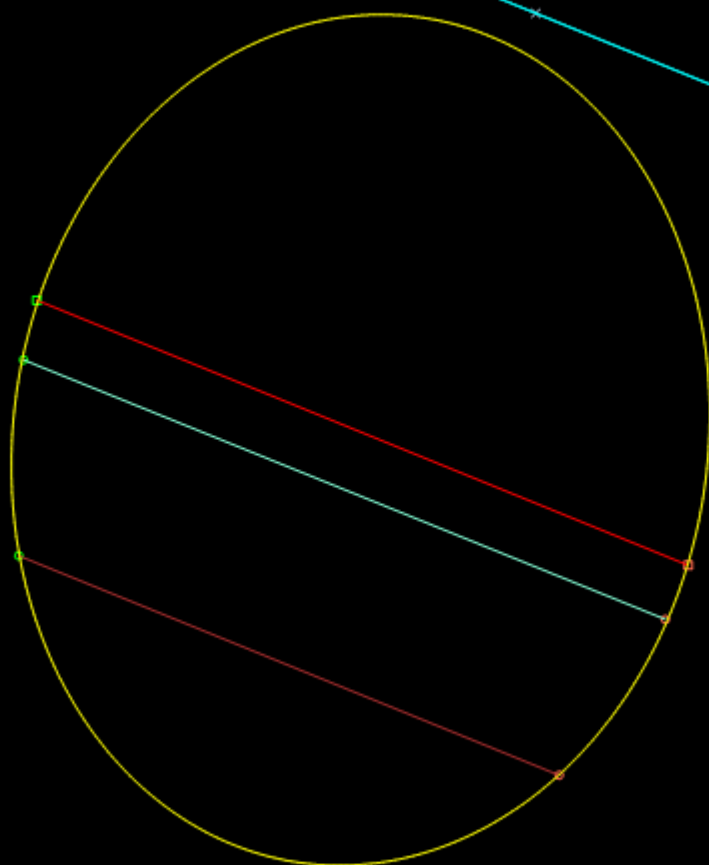


140siwa2009aug09

(140) Siwa 2009 Aug 9 121.1 x 98.5 \pm 0.2 km, PA -8.4° \pm 0.8°
Geocentric X -1508.2 \pm 0.1 Y 5261.5 \pm 0.3 km **N**

E

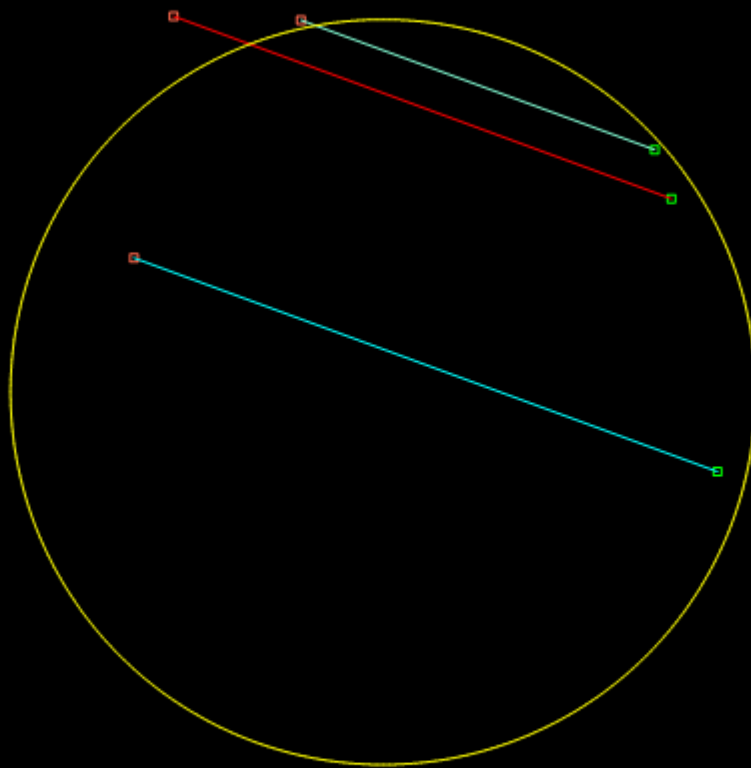
Occult 4.2.0.2



140siwa2009nov25

(140) Siwa 2009 Nov 25 110.0 x 110.0 km. PA 0.0°°
Geocentric X 723.0 ±2.0 Y 3993.1 ±2.6 km **N**

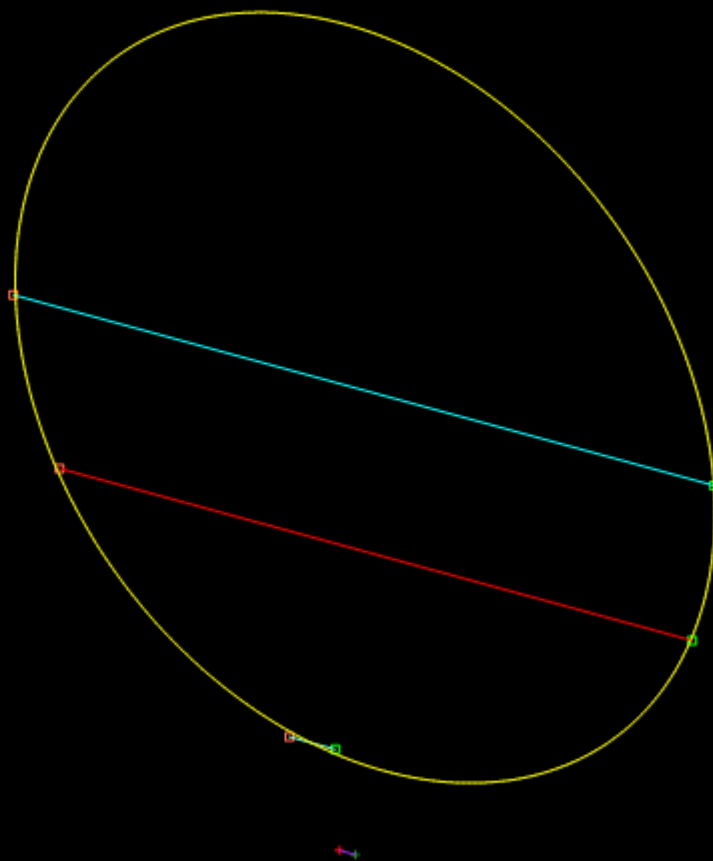
E



140siwa2009oct02

(140) Siwa 2009 Oct 2 $119.7 \pm 39.2 \times 86.4 \pm 20.6$ km, PA $36.1^\circ \pm 37.0^\circ$
Geocentric X 404.0 ± 3.7 Y 5478.9 ± 23.7 km **N**

E



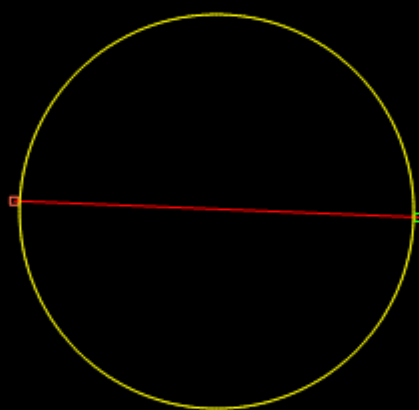
Occult 4.2.0.2

1411brauna2009mar15

(1411) Brauna 2009 Mar 15 39.0 x 39.0 km, PA 0.0° °
Geocentric X 3337.2 Y 2487.1 km

N

E

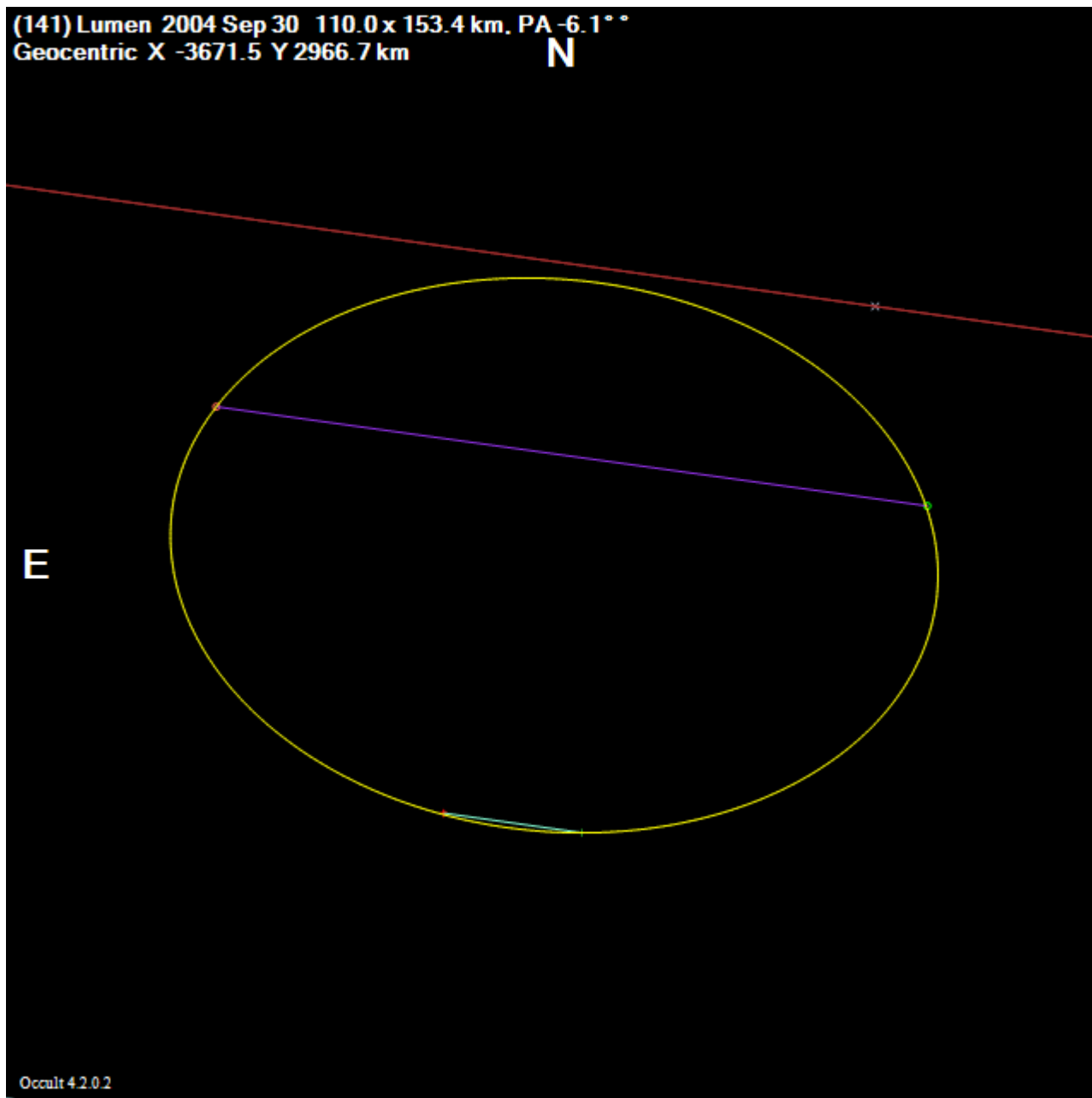


141lumen2004sep30

(141) Lumen 2004 Sep 30 110.0 x 153.4 km, PA -6.1°
Geocentric X -3671.5 Y 2966.7 km

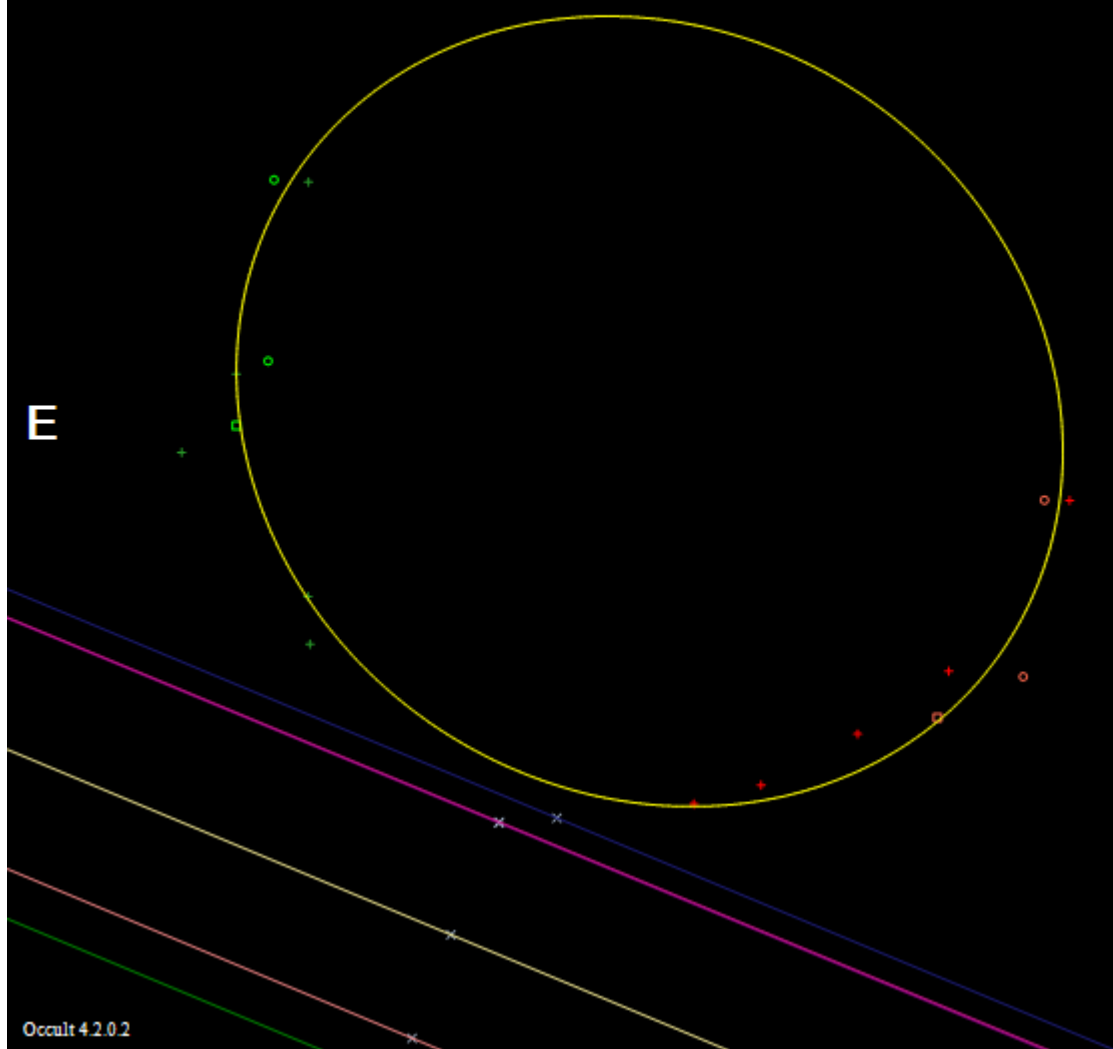
N

E



141lumen2005jan05

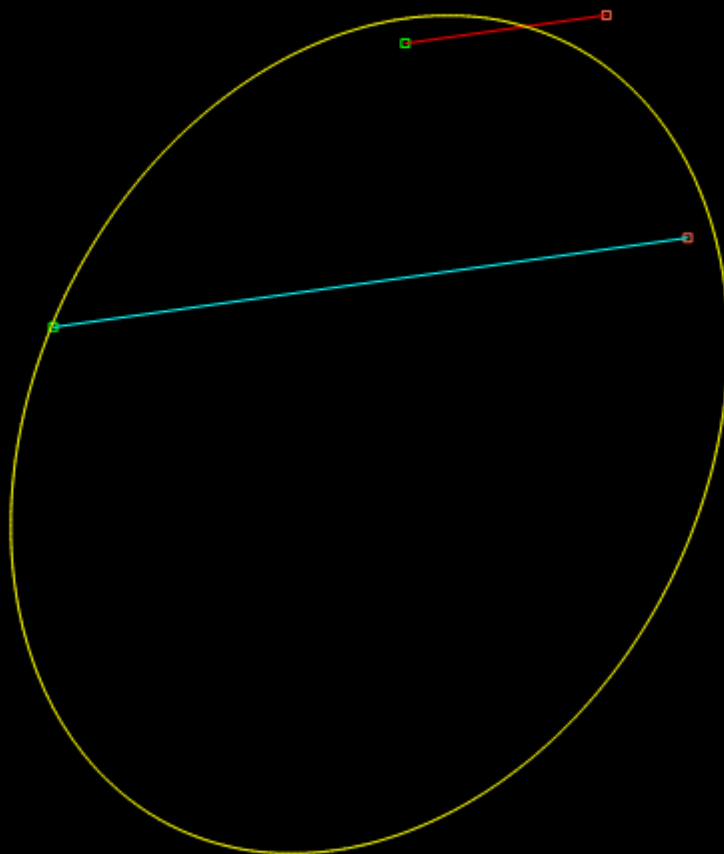
(141) Lumen 2005 Jan 5 $145.3 \pm 2.1 \times 129.9 \pm 10.4$ km, PA $56.8^\circ \pm 12.0^\circ$
Geocentric X -1097.9 ± 1.5 Y 227.1 ± 3.3 km **N**



141lumen2010feb16

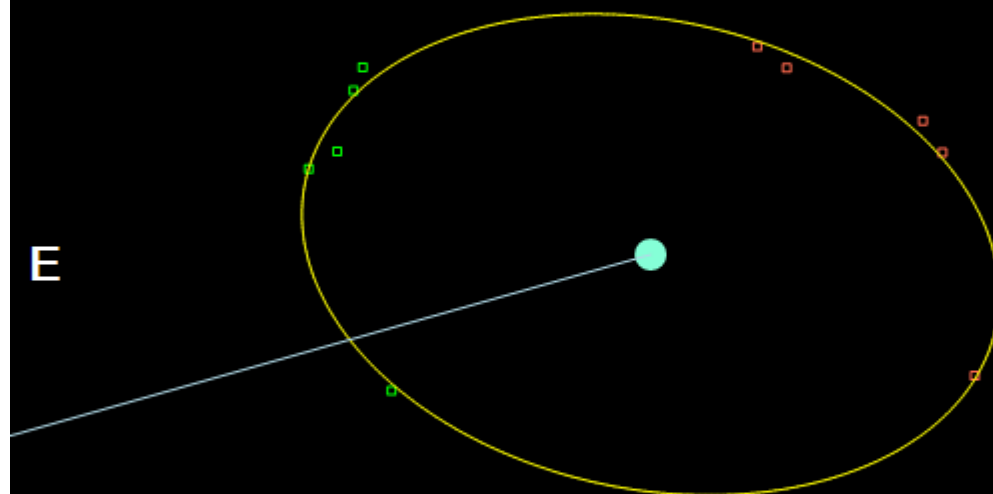
(141) Lumen 2010 Feb 16 165.5 x 126.2 km, PA $-27.2^\circ \pm 14.1^\circ$
Geocentric X 1113.7 ± 4.5 Y -4102.2 ± 4.1 km **N**

E



141lumen2013dec28

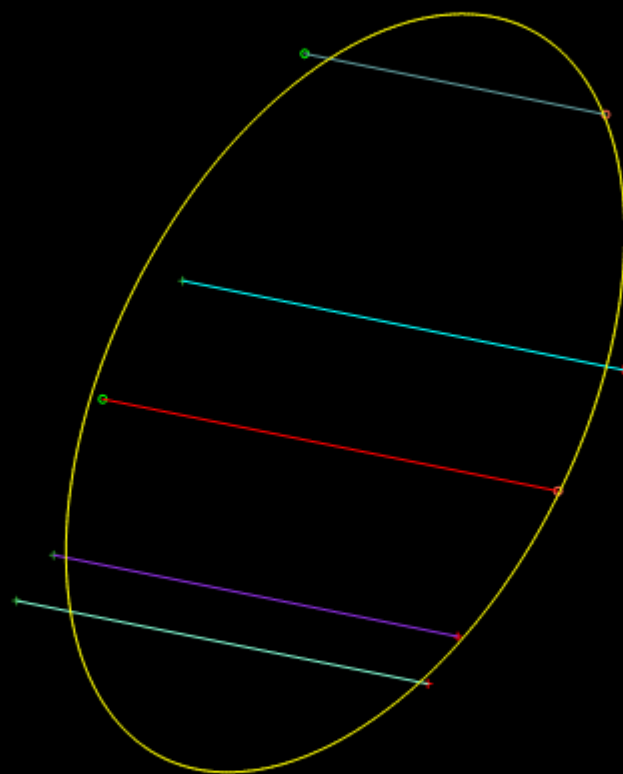
(141) Lumen 2013 Dec 28 $156.4 \pm 3.4 \times 103.9 \pm 4.6$ km, PA $78.1^\circ \pm 3.4^\circ$
Geocentric X 4189.7 ± 2.1 Y 1861.0 ± 4.1 km
Double : Sep $0.1529 \pm 0.0016''$, PA $105.8^\circ \pm 1.3^\circ$



1437diomedes1997nov07

(1437) Diomedes 1997 Nov 7 $174.0 \times 100.6 \pm 4.1$ km, PA $-26.8^\circ \pm 3.0^\circ$
Geocentric X -4844.8 ± 2.0 Y 2010.7 ± 3.4 km **N**

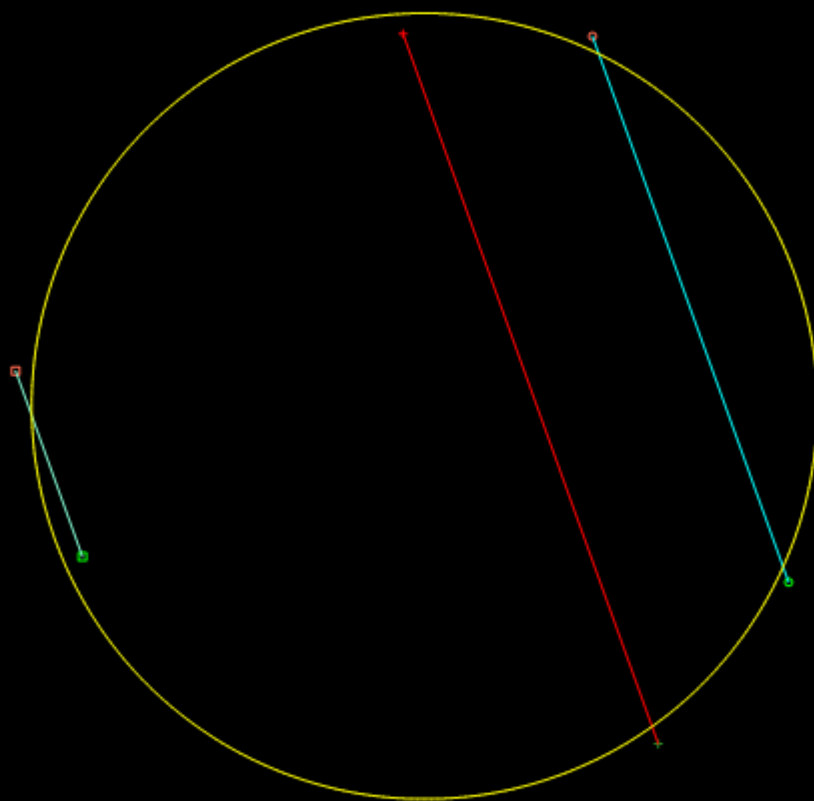
E



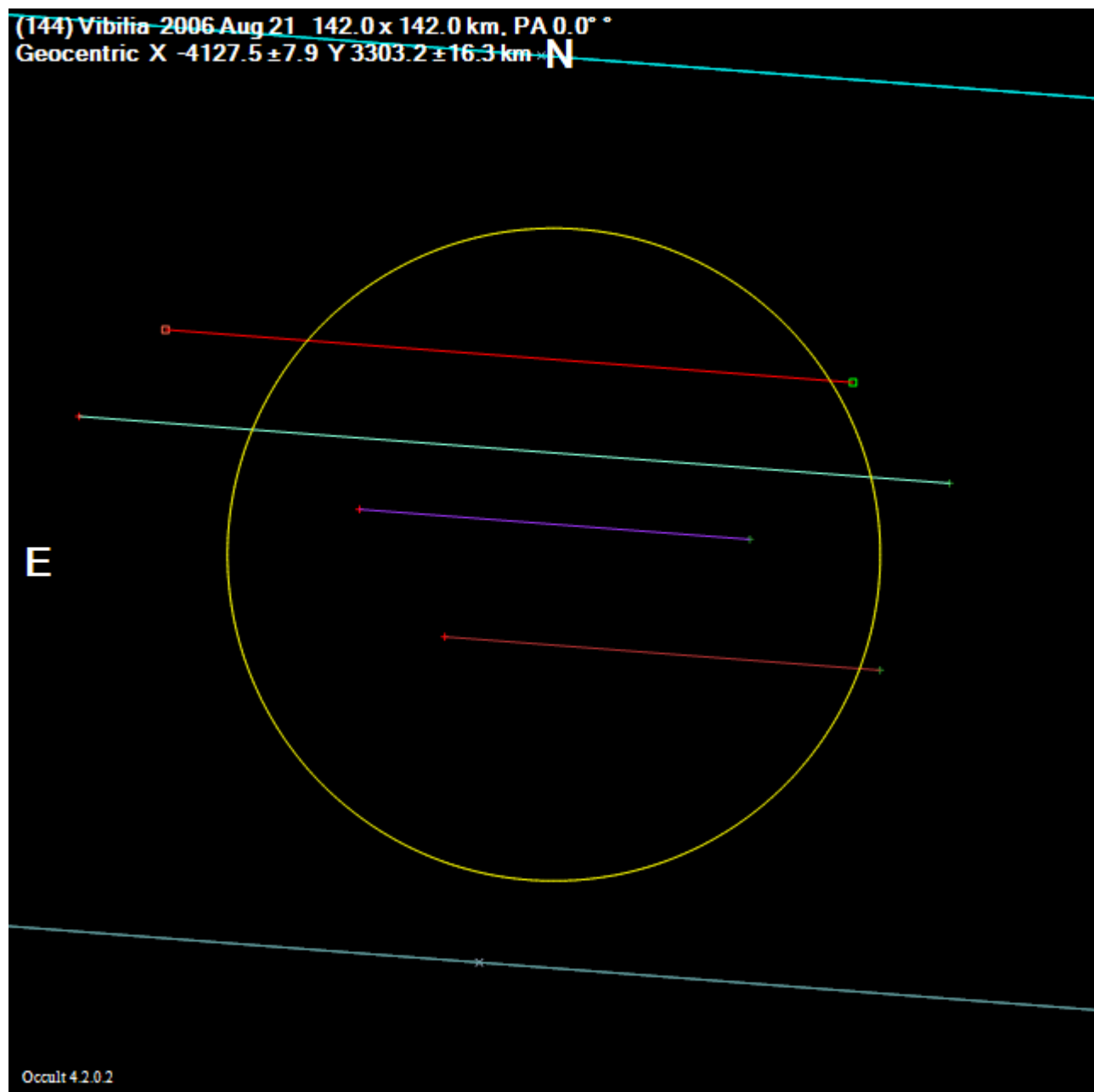
143adria2000aug21

(143) Adria 2000 Aug 21 $91.0 \pm 2.3 \times 91.0$ km. PA 0.0° °
Geocentric X 1108.2 ± 0.6 Y 5781.1 ± 0.9 km **N**

E



144vibilia2006aug21



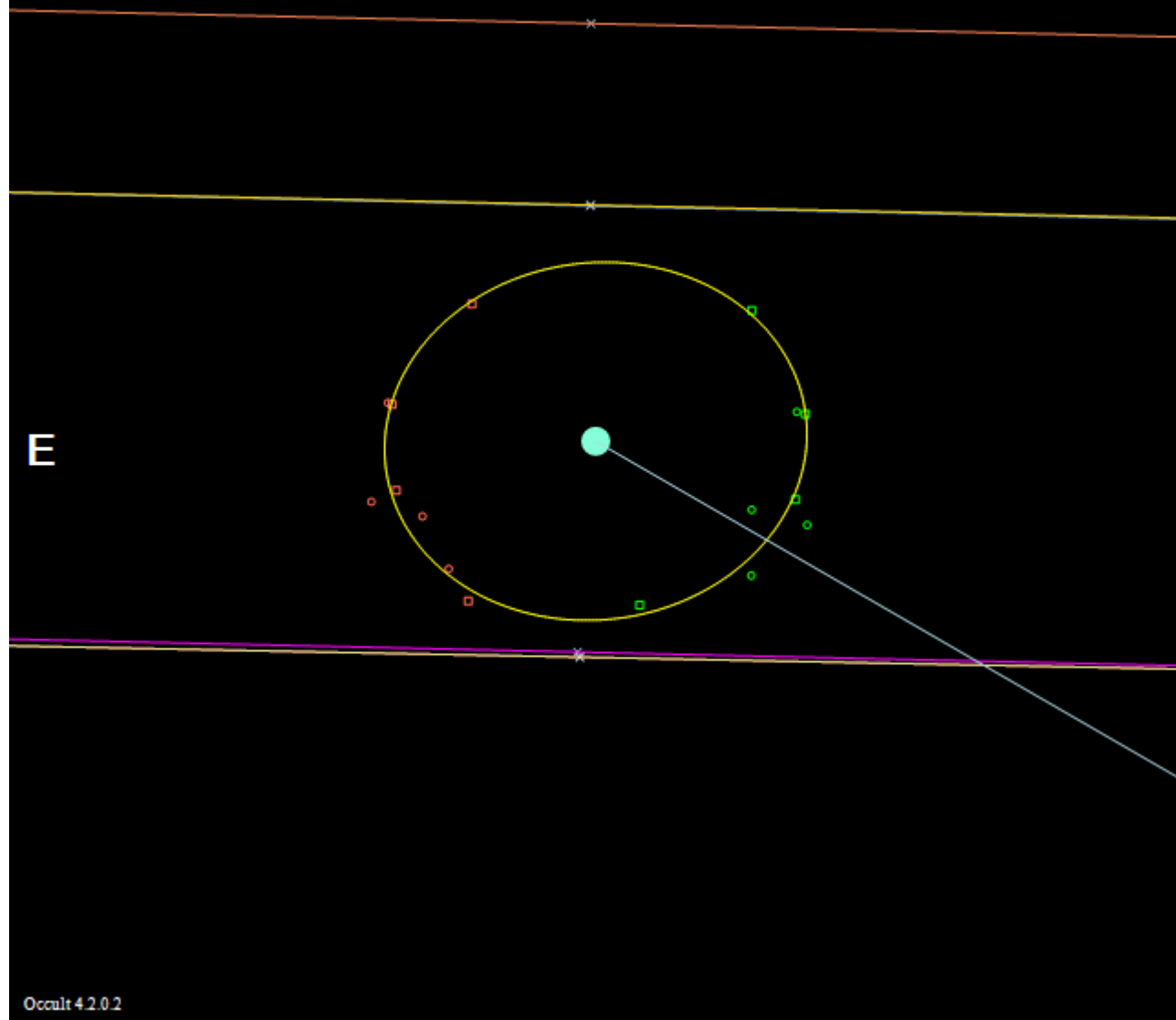
144vibilia2006sep15

(144) Vibia 2006 Sep 15 $119.8 \pm 2.9 \times 160.1 \pm 1.6$ km, PA $7.4^\circ \pm 1.9^\circ$
Geocentric X -4749.0 ± 0.6 Y 2700.3 ± 0.7 km **N**



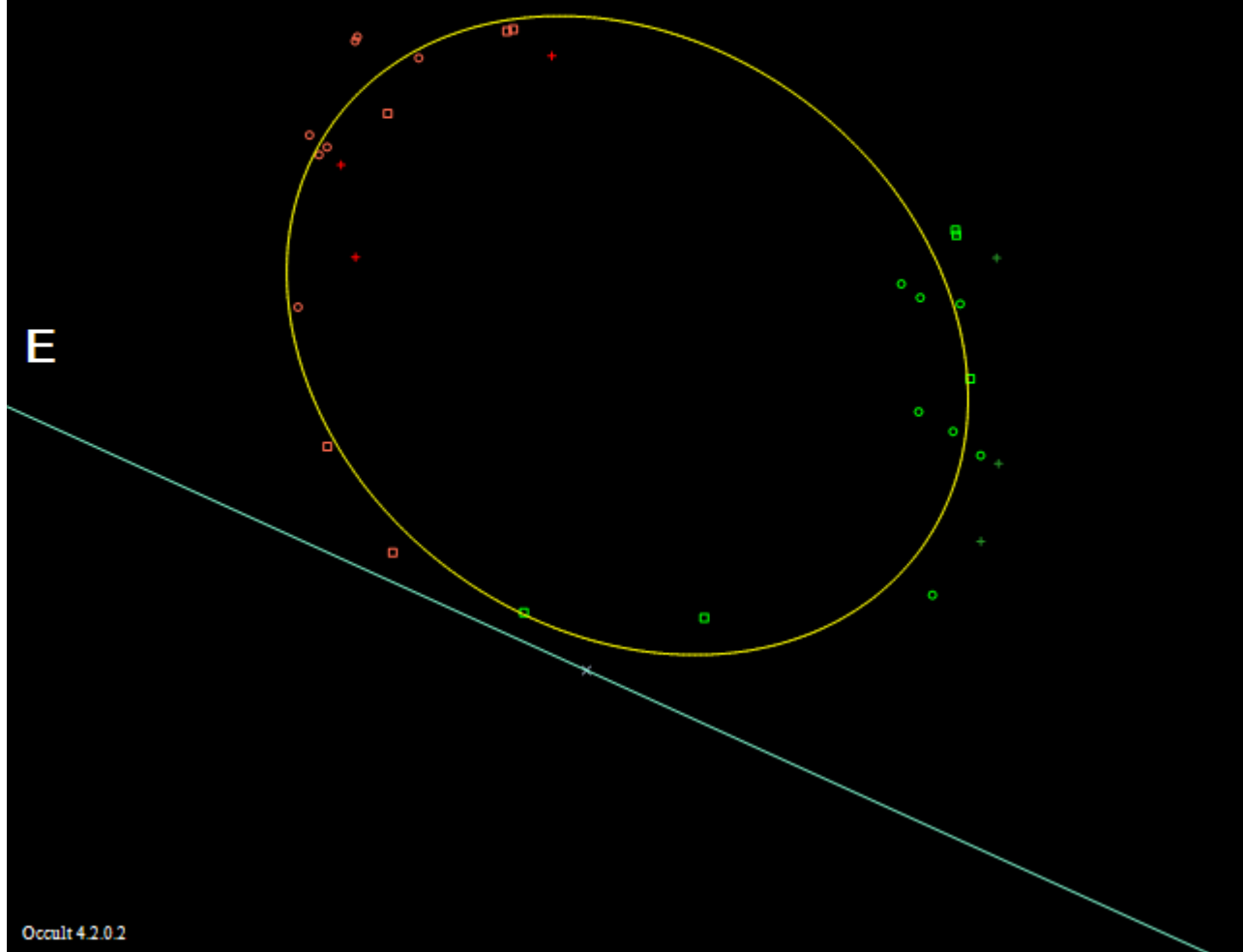
144vibilia2006sep19

(144) Vibia 2006 Sep 19 $134.5 \pm 3.6 \times 159.5 \pm 2.1$ km, PA $7.3^\circ \pm 4.8^\circ$
Geocentric X -5051.0 ± 1.2 Y 3413.7 ± 4.1 km **N**
Double : Sep $0.2619 \pm 0.0015''$, PA $240.0^\circ \pm 0.5^\circ$



144vibilia2011jan25

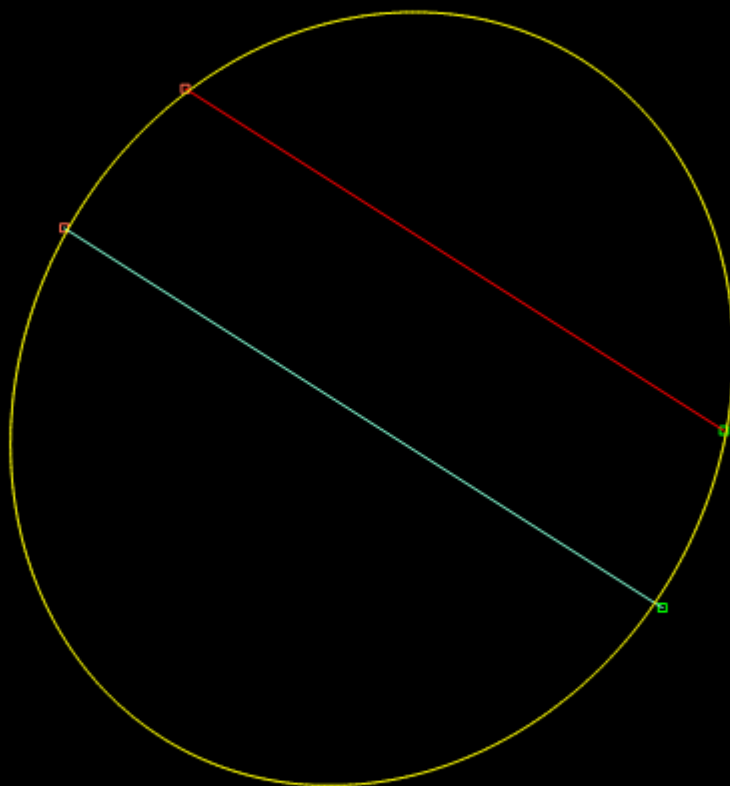
(144) Vibia 2011 Jan 25 $156.2 \pm 4.4 \times 126.5 \pm 5.8$ km, PA $54.0^\circ \pm 7.7^\circ$
Geocentric X -1523.0 ± 1.8 Y 2684.1 ± 2.3 km **N**



144vibilia2014nov29

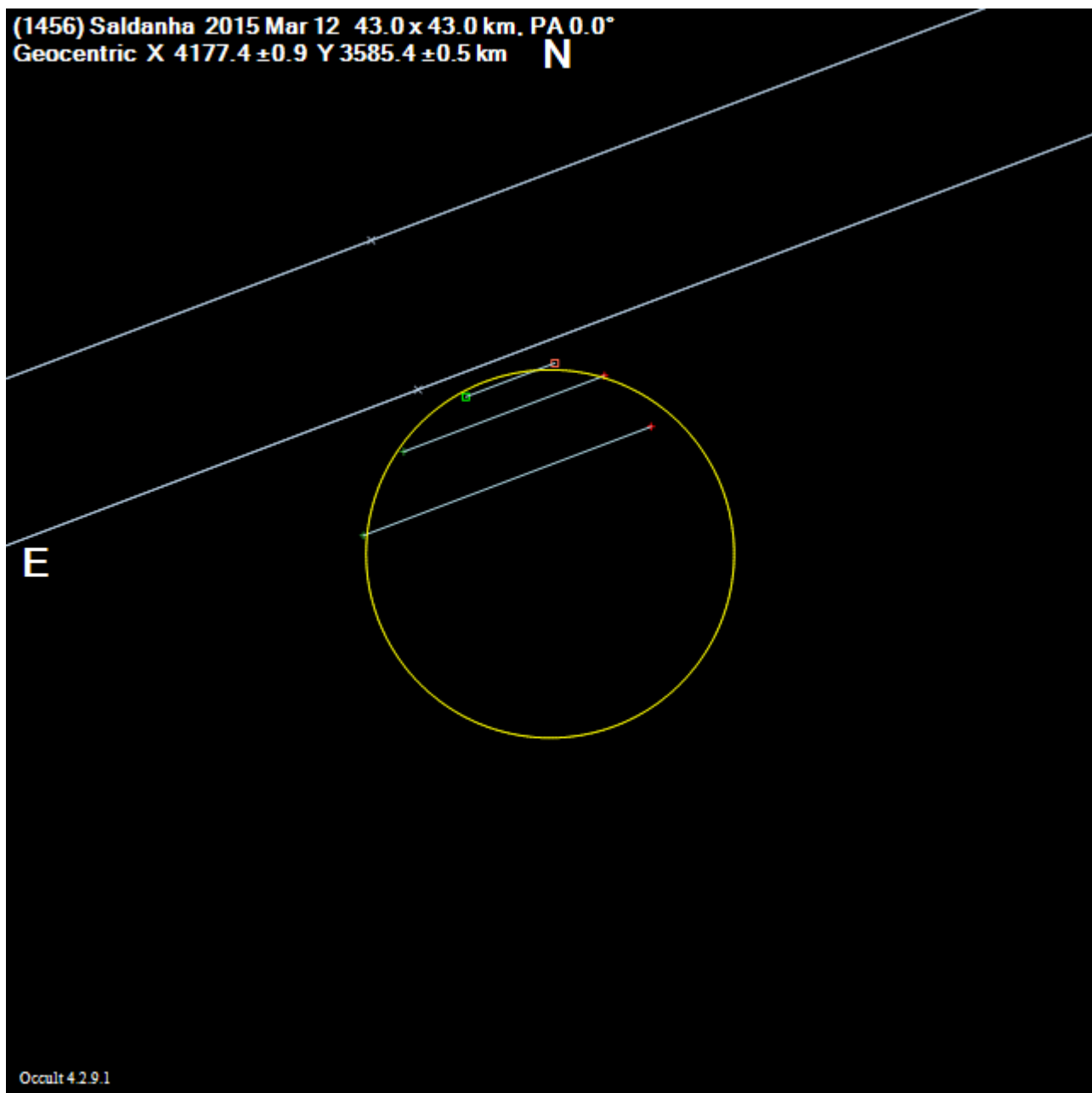
(144) Vibia 2014 Nov 29 166.0 x 145.0 km, PA -30.0°
Geocentric X 4273.5 ± 0.9 Y 4015.7 ± 1.4 km **N**

E



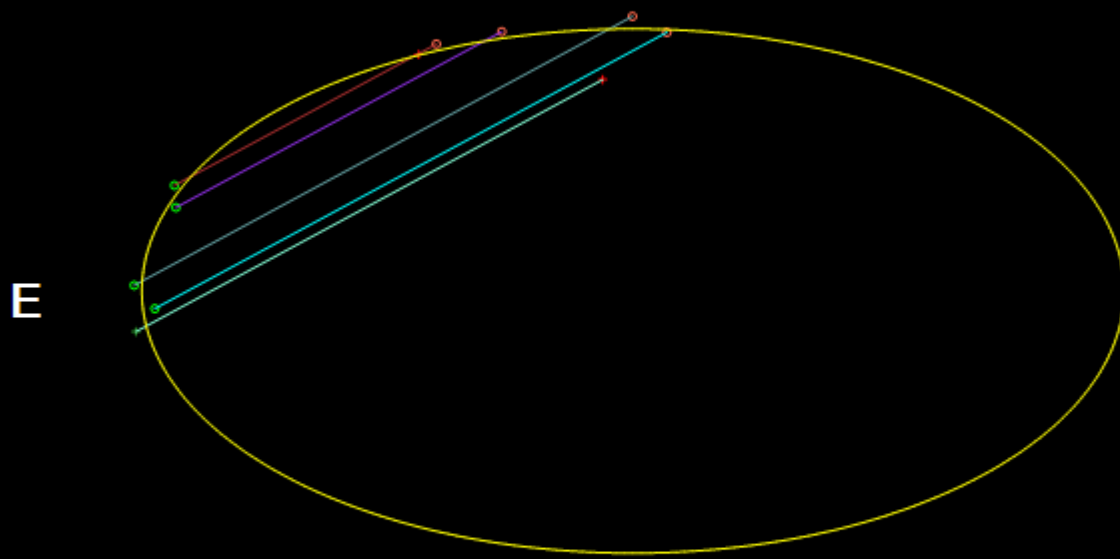
1456saldanha2015mar12

(1456) Saldanha 2015 Mar 12 43.0 x 43.0 km. PA 0.0°
Geocentric X 4177.4 ± 0.9 Y 3585.4 ± 0.5 km **N**

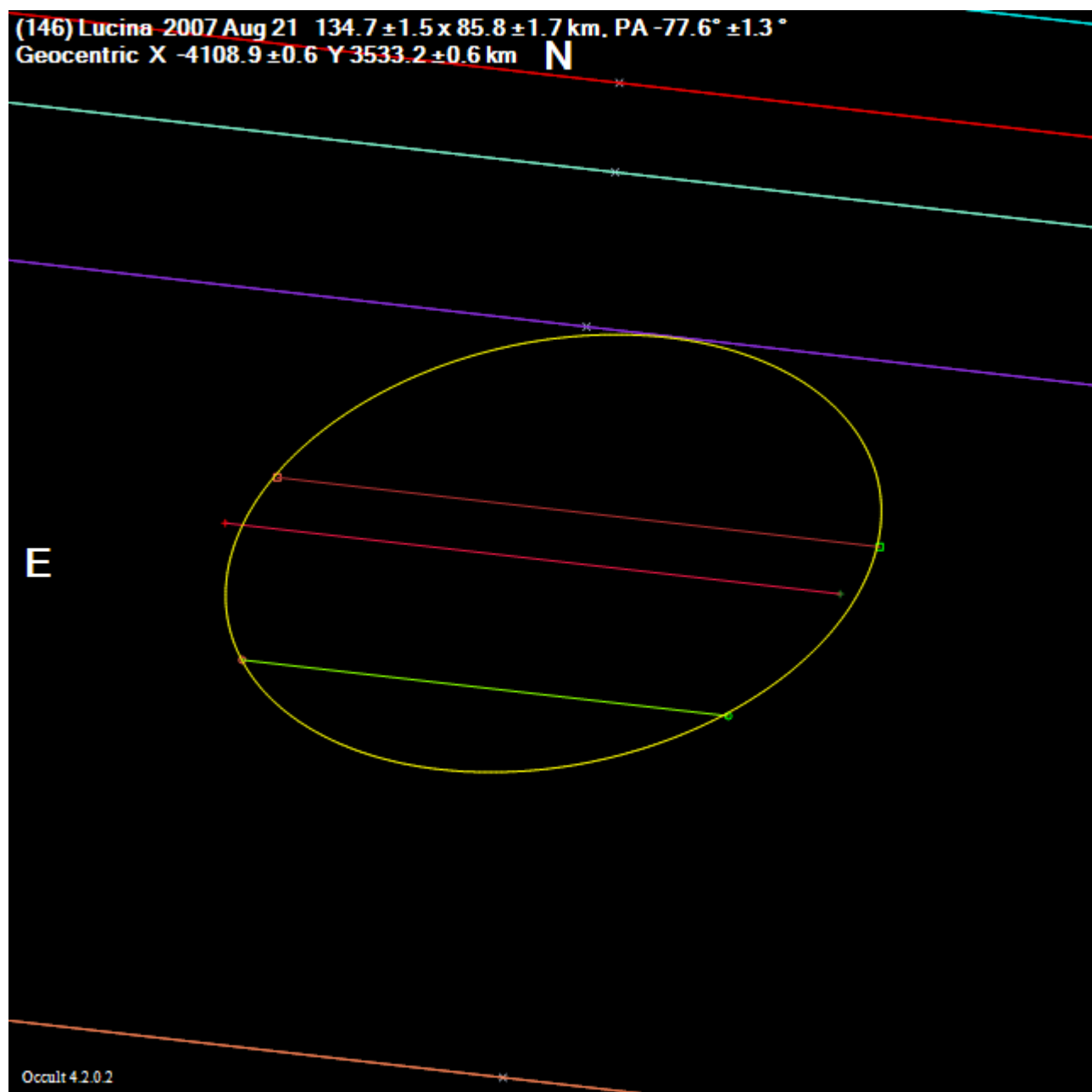


145adeona2005feb02

(145) Adeona 2005 Feb 2 $193.0 \pm 23.9 \times 103.0 \pm 13.2$ km, PA 90.0° °
Geocentric X 5078.2 ± 11.7 Y 2268.7 ± 5.9 km **N**

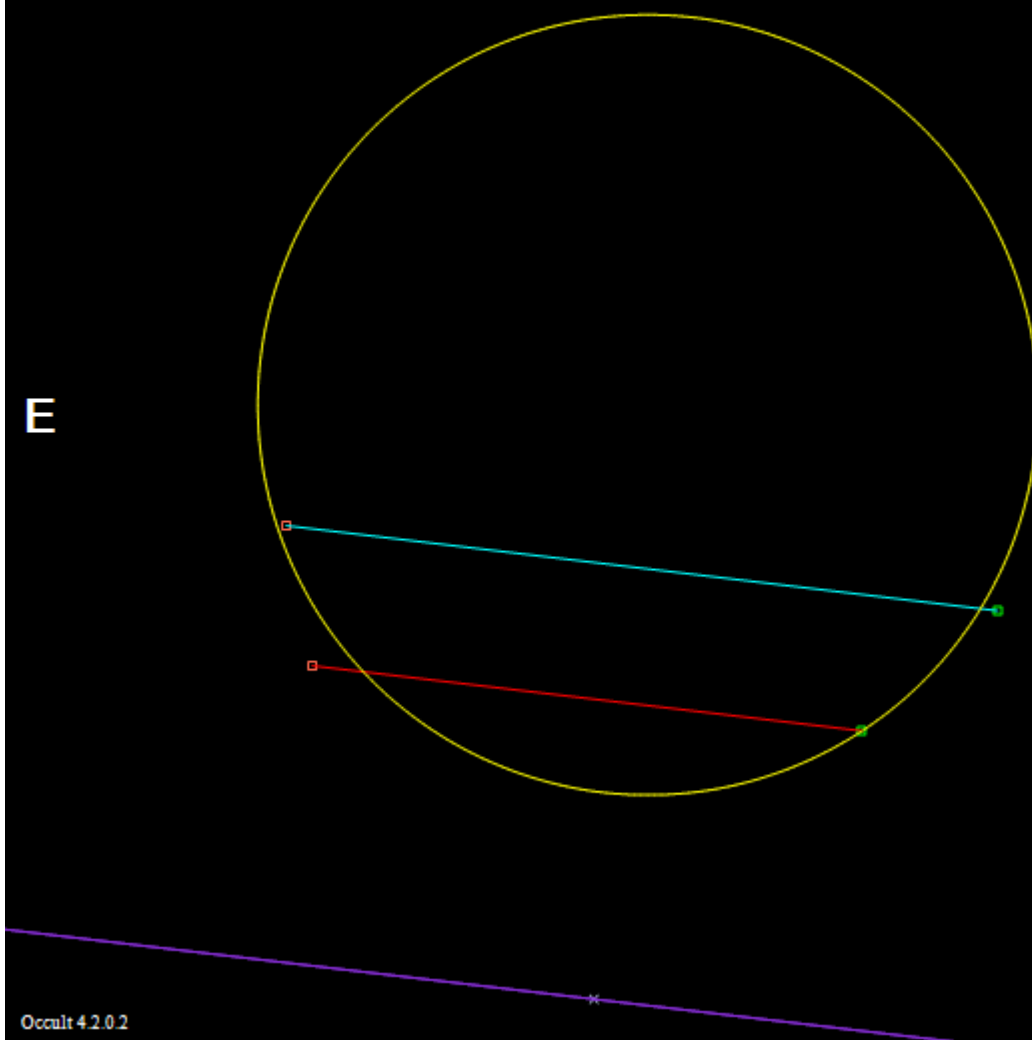


146lucina2007aug21



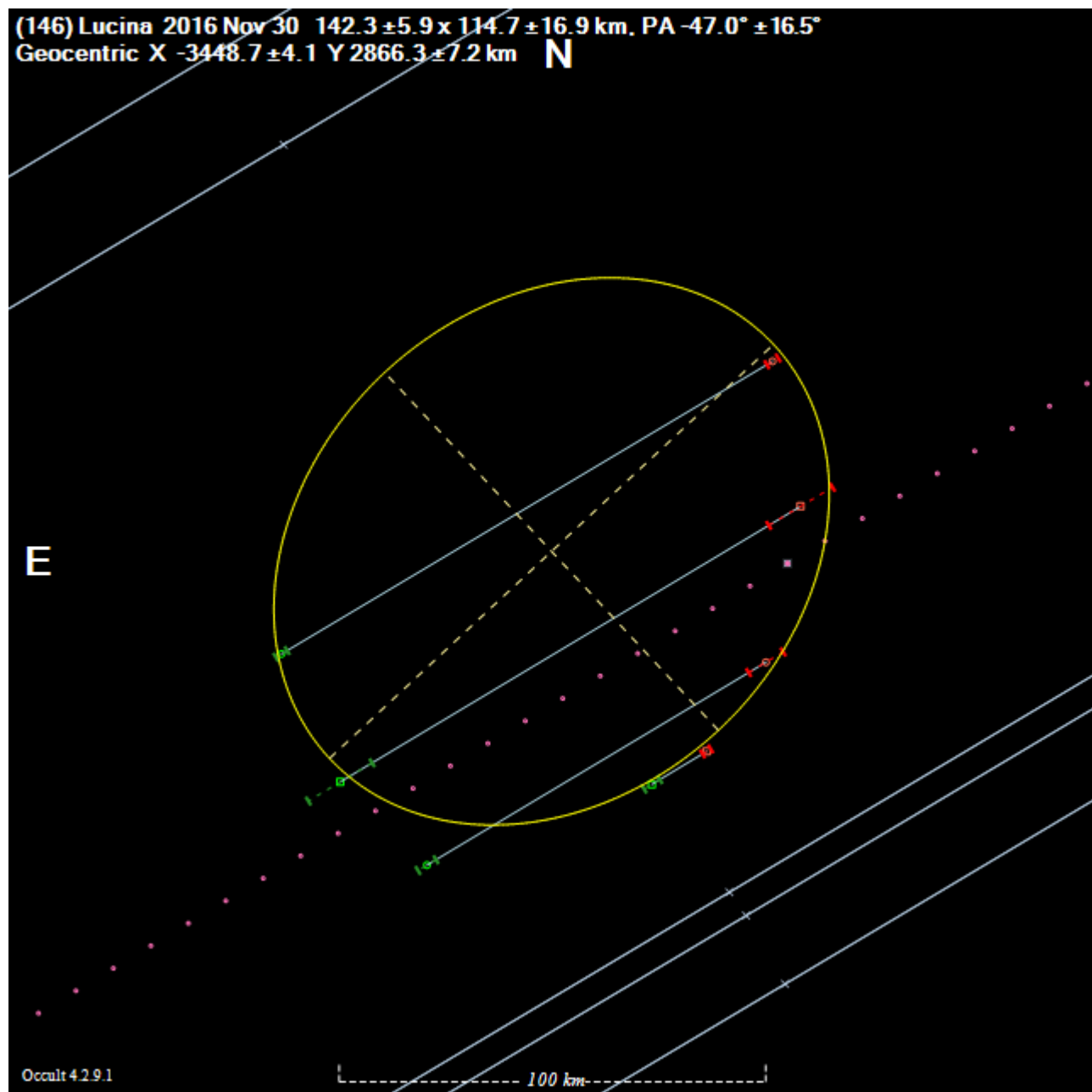
146lucina2007sep20

(146) Lucina 2007 Sep 20 $134.0 \pm 16.0 \times 134.0$ km. PA 0.0° °
Geocentric X -4232.8 ± 1.0 Y 2827.3 ± 5.6 km **N**



146Lucina2016Nov30

(146) Lucina 2016 Nov 30 $142.3 \pm 5.9 \times 114.7 \pm 16.9$ km, PA $-47.0^\circ \pm 16.5^\circ$
Geocentric X -3448.7 ± 4.1 Y 2866.3 ± 7.2 km **N**



1477bonsdorffia2004nov11

(1477) Bonsdorffia 2004 Nov 11 $39.6 \pm 0.7 \times 39.6$ km, PA 0.0° °
Geocentric X -2286.6 ± 0.3 Y 2389.9 ± 0.3 km **N**



Occult 4.2.0.2

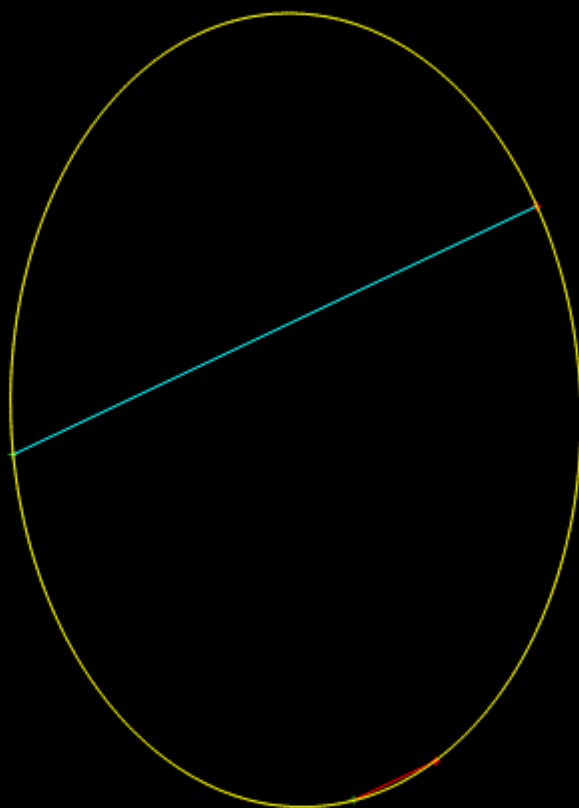
14irene1996jan24

(14) Irene 1996 Jan 24 188.0 x 135.0 km, PA 2.0° °
Geocentric X 1918.8 Y 1075.3 km

N

E

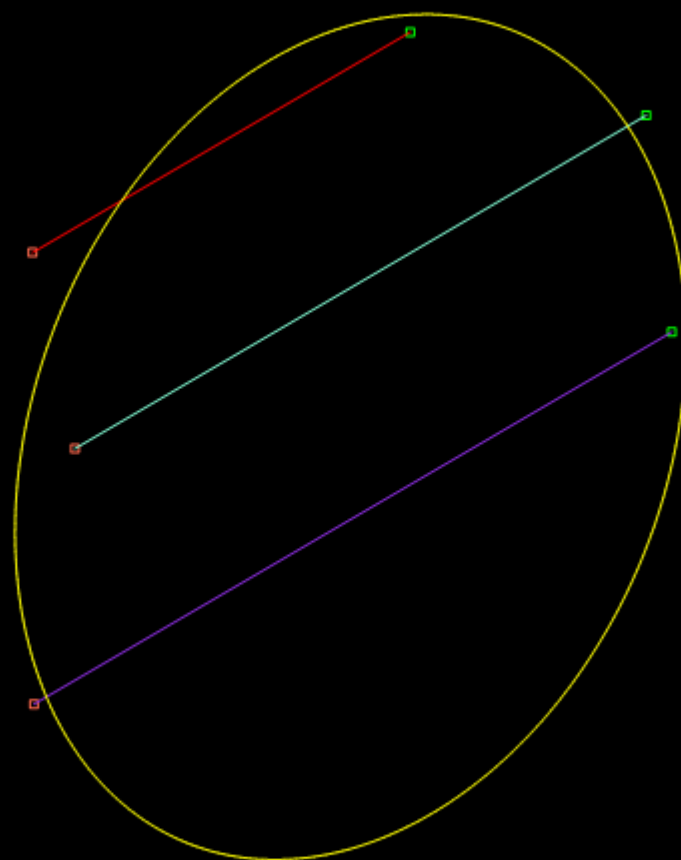
Occult 4.2.0.2



14irene2013aug02

(14) Irene 2013 Aug 2 $164.0 \pm 21.5 \times 118.3 \pm 17.2$ km, PA $-22.0^\circ \pm 23.8^\circ$
Geocentric X 4412.2 ± 4.3 Y 3677.7 ± 13.2 km **N**

E



Occult 4.2.0.2

1512oulu2002may07

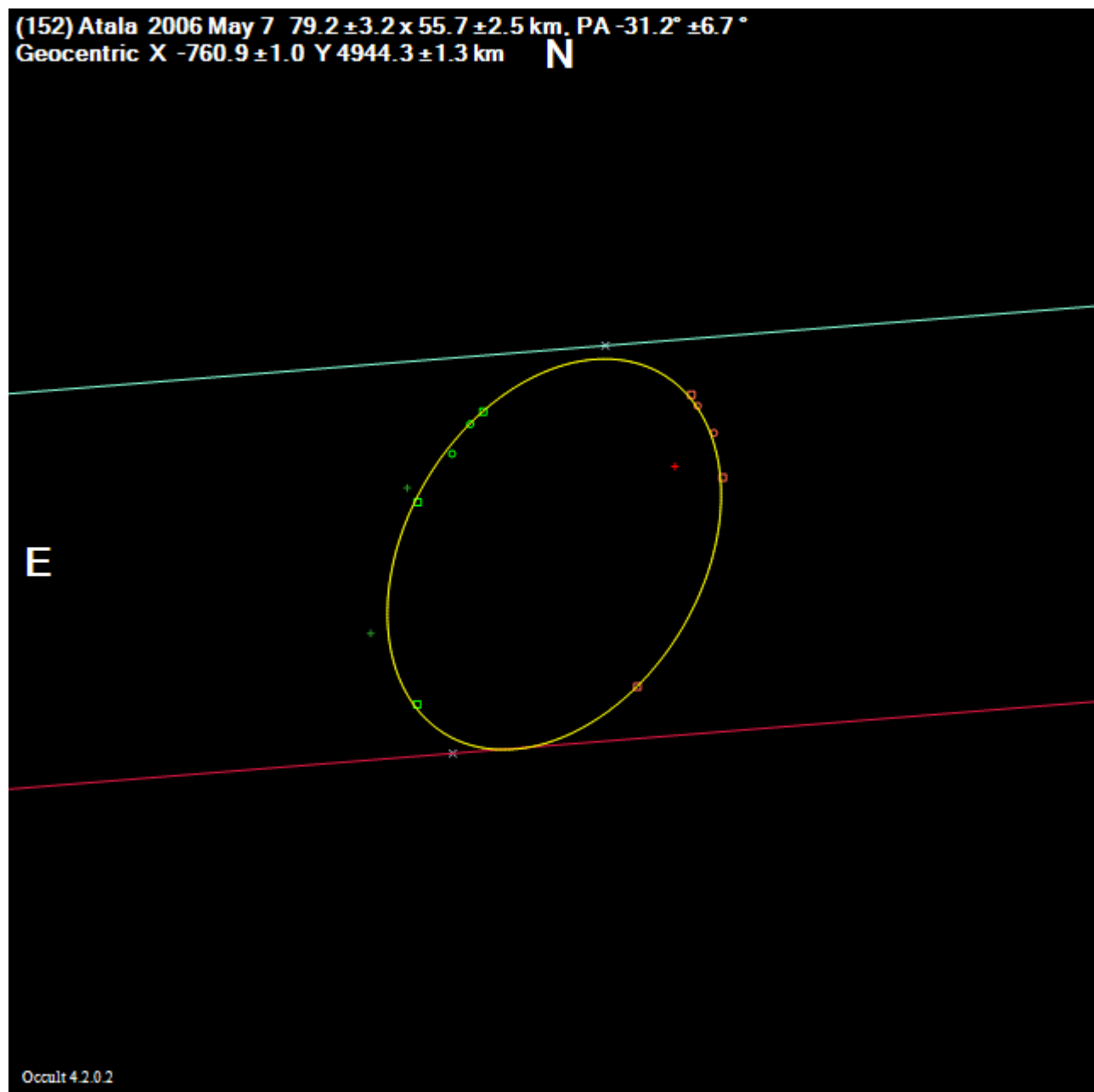
(1512) Oulu 2002 May 7 $85.9 \pm 0.9 \times 49.1 \pm 2.5$ km, PA $86.3^\circ \pm 1.4^\circ$
Geocentric X -1174.8 ± 0.5 Y -1031.3 ± 1.0 km **N**

E



152atala2006may07

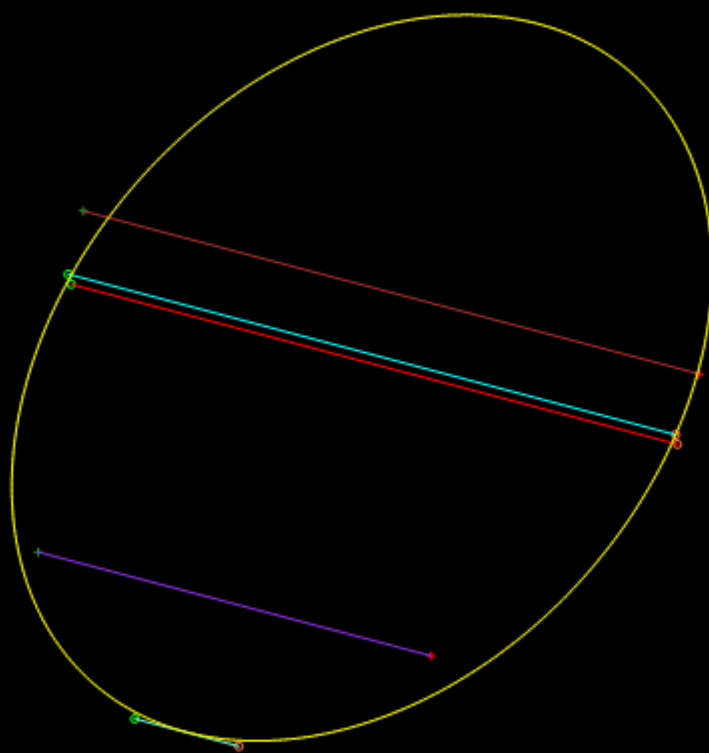
(152) Atala 2006 May 7 $79.2 \pm 3.2 \times 55.7 \pm 2.5$ km, PA $-31.2^\circ \pm 6.7^\circ$
Geocentric X -760.9 ± 1.0 Y 4944.3 ± 1.3 km **N**



153hilda2002dec31

(153) Hilda 2002 Dec 31 180.0 x 131.9 ± 4.2 km, PA -41.6° ± 6.8°
Geocentric X -2683.0 ± 1.7 Y 2593.2 ± 2.5 km **N**

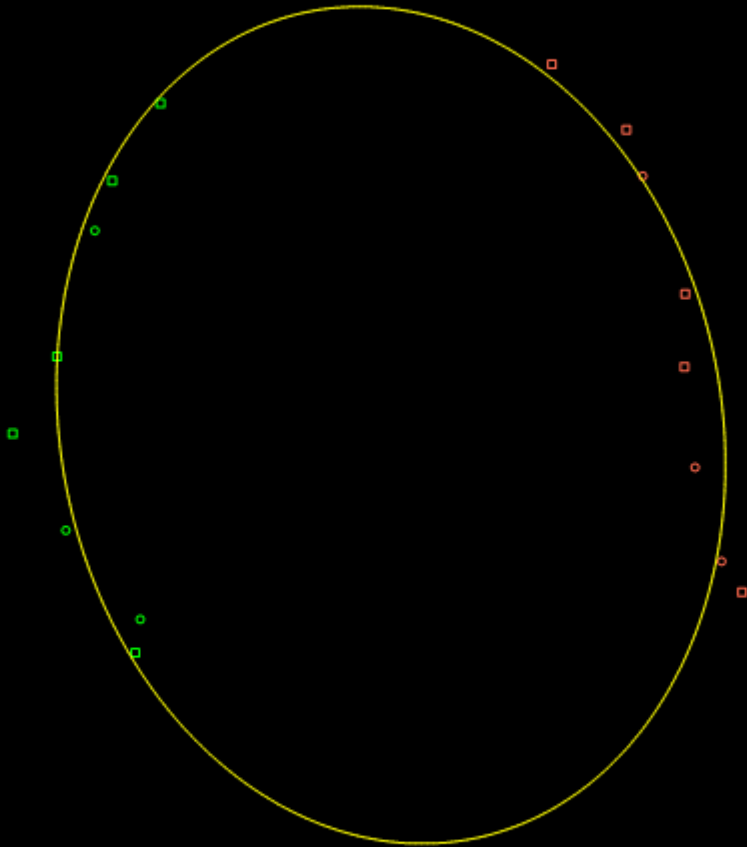
E



153hilda2007jul20

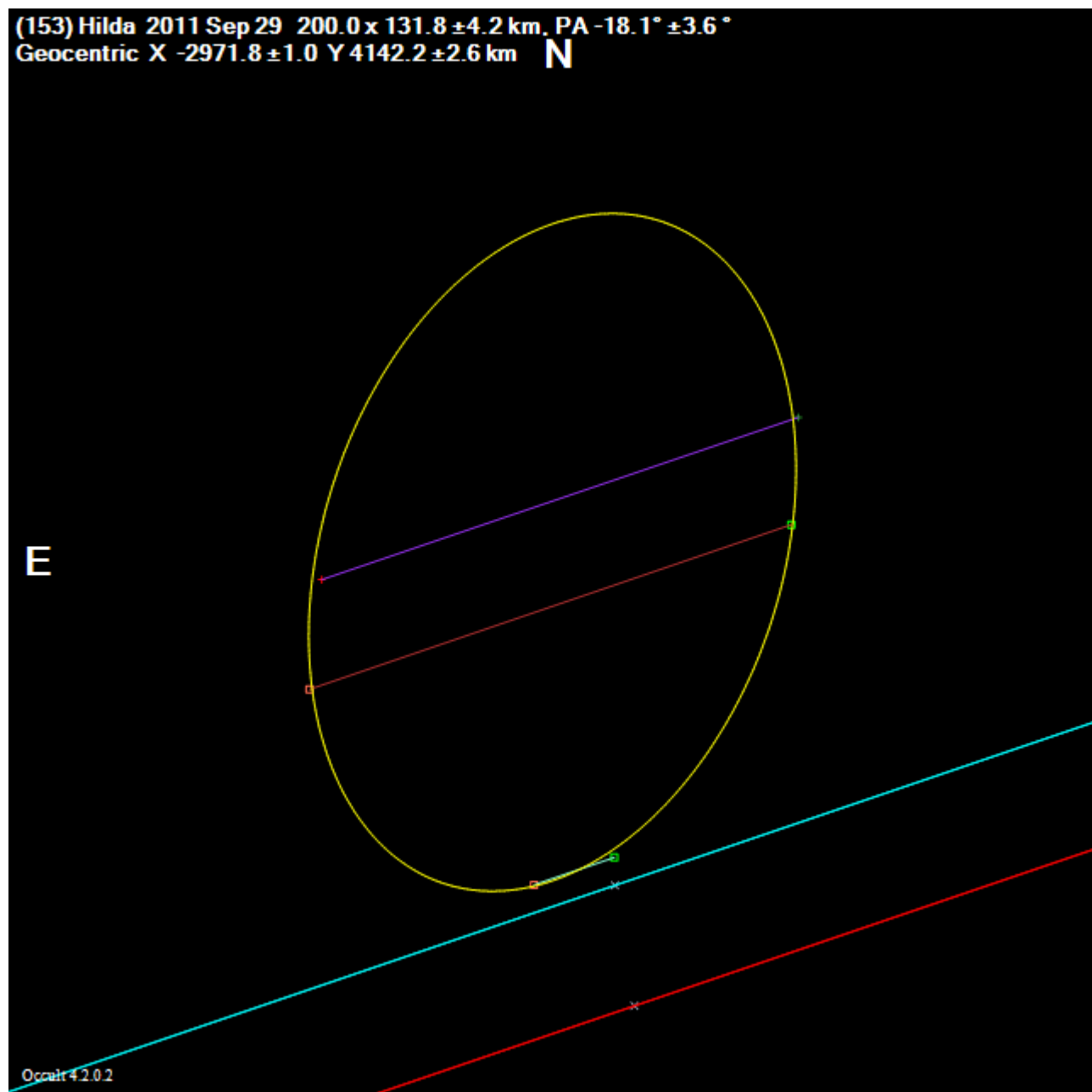
(153) Hilda 2007 Jul 20 186.5 ± 7.1 x 146.2 ± 1.7 km, PA 11.3° ± 2.4 °
Geocentric X 2194.6 ± 0.7 Y 5455.2 ± 2.1 km **N**

E



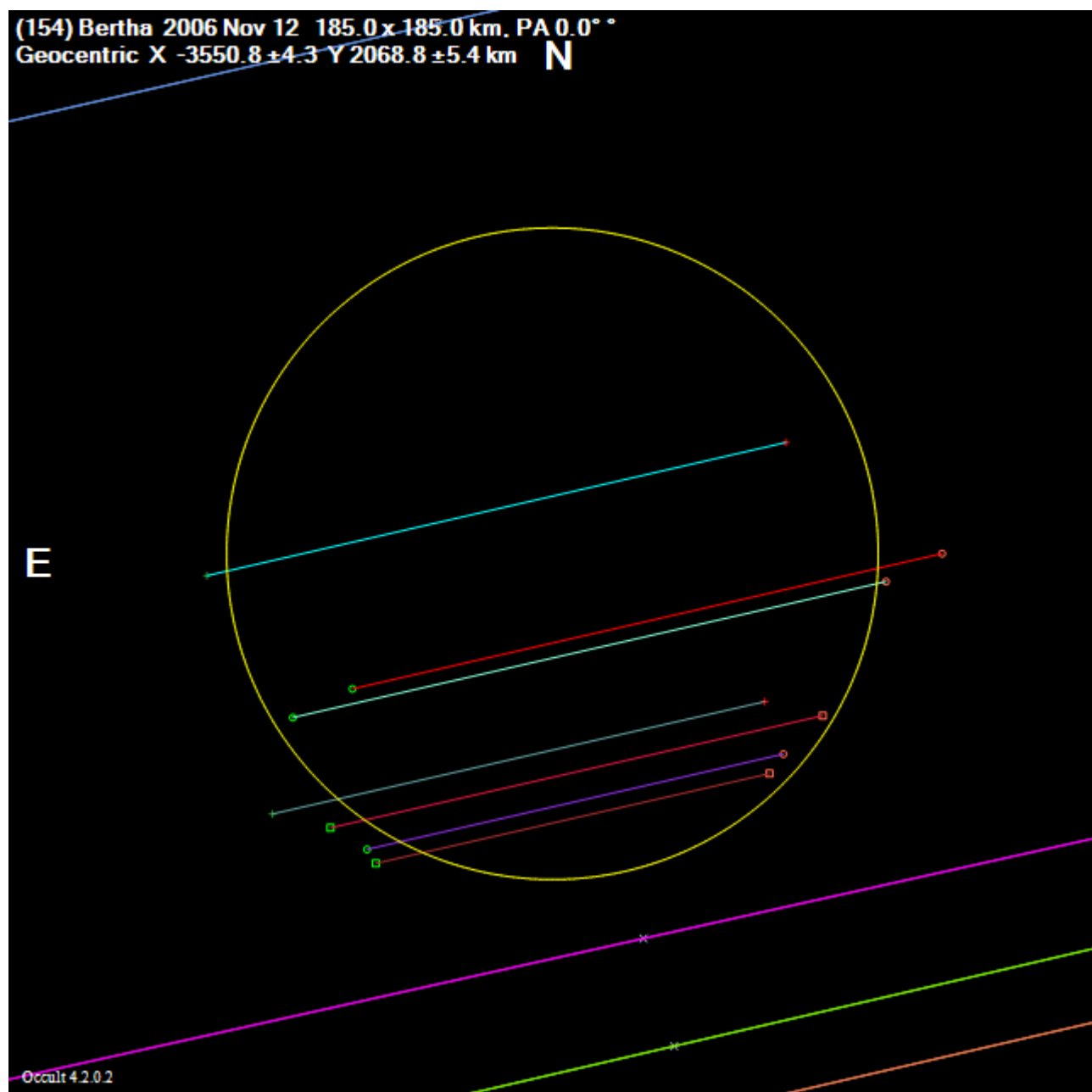
153hilda2011sep29

(153) Hilda 2011 Sep 29 200.0 x 131.8 ± 4.2 km, PA -18.1° ± 3.6°
Geocentric X -2971.8 ± 1.0 Y 4142.2 ± 2.6 km **N**

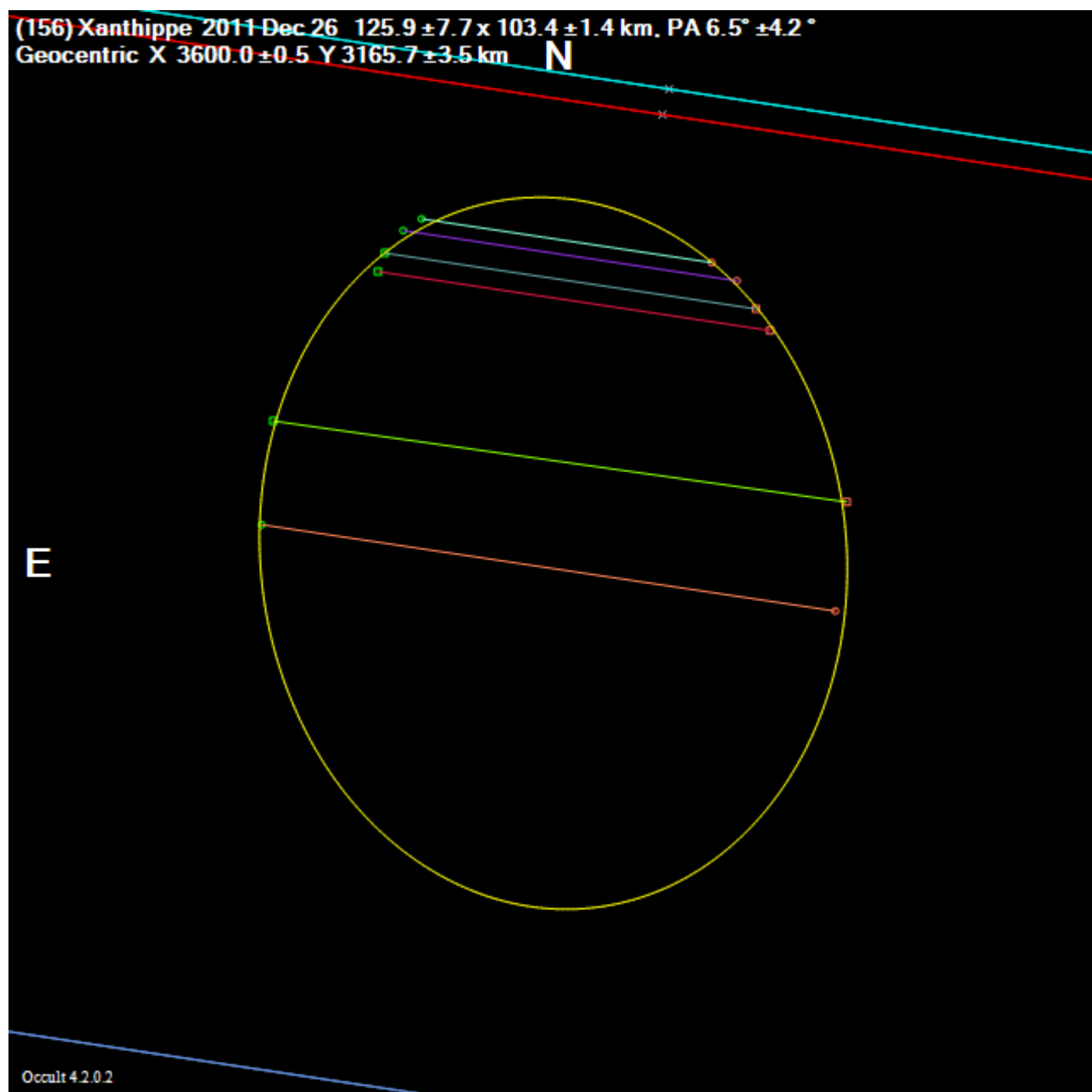


154bertha2006nov12

(154) Bertha 2006 Nov 12 185.0 x 185.0 km. PA 0.0° °
Geocentric X -3550.8 ± 4.3 Y 2068.8 ± 5.4 km **N**

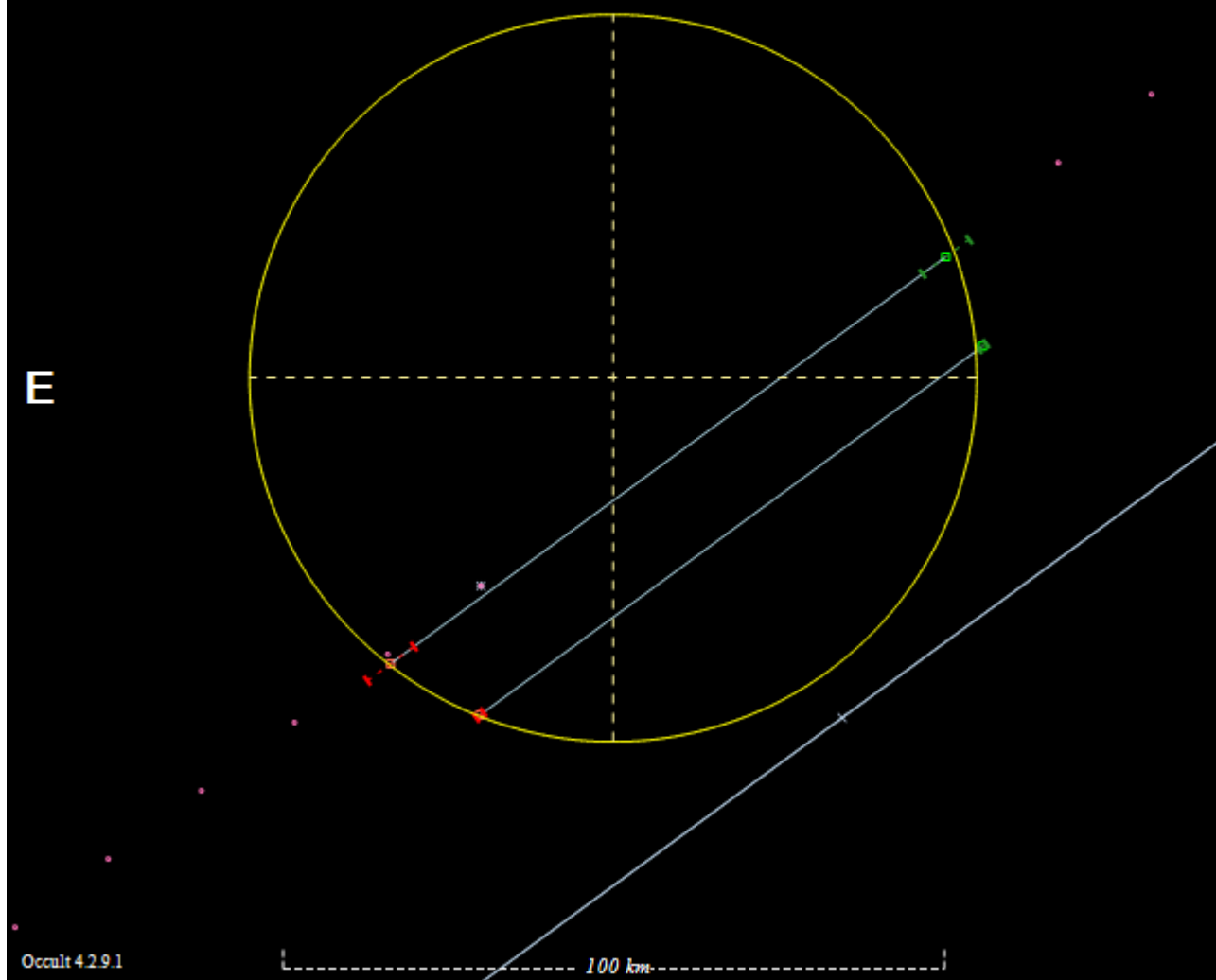


156xanthippe2011dec26



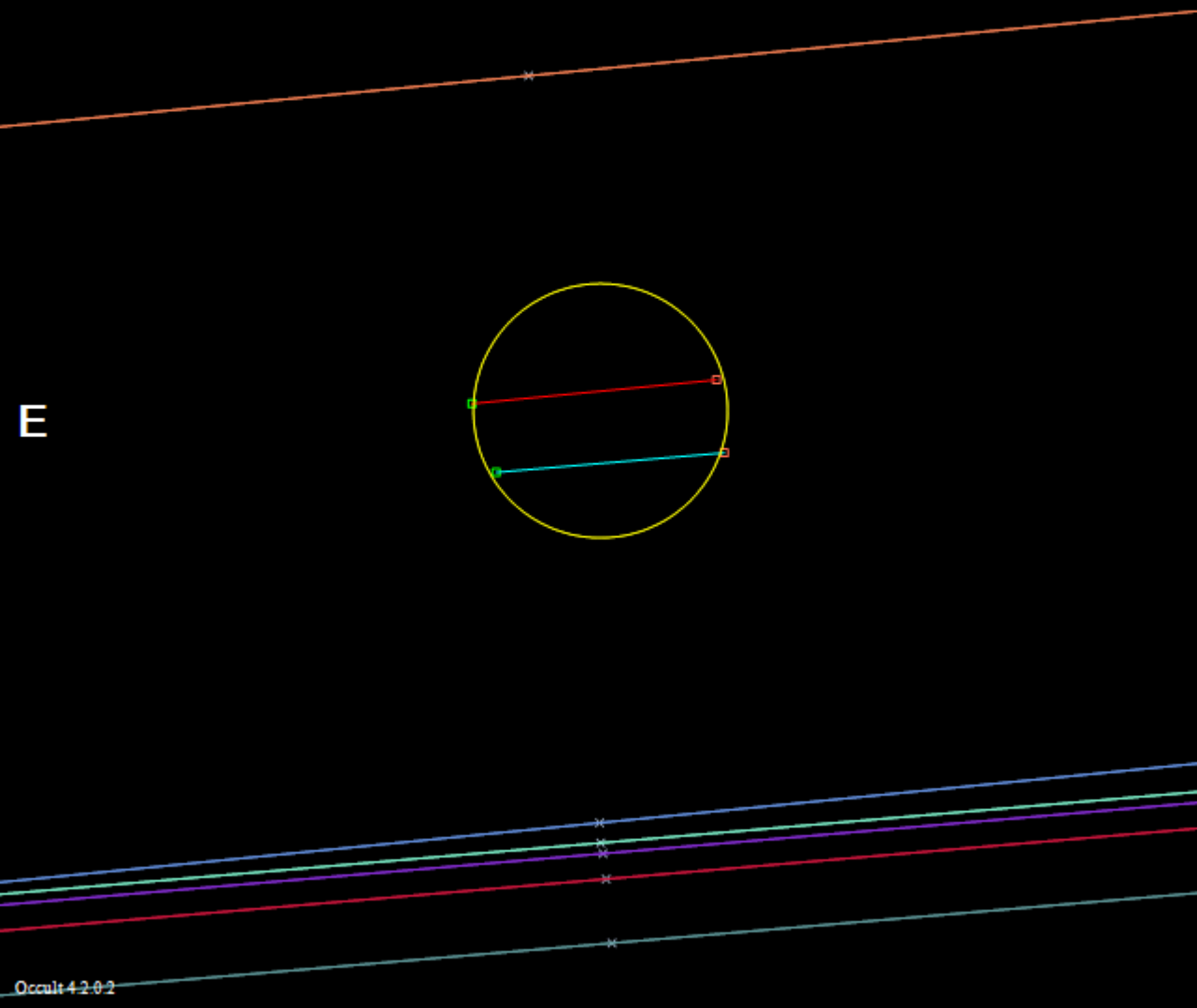
156Xanthippe2016Nov15

(156) Xanthippe 2016 Nov 15 110.0 x 110.0 km, PA 0.0°
Geocentric X -1618.1 ± 0.7 Y 3903.0 ± 0.9 km **N**

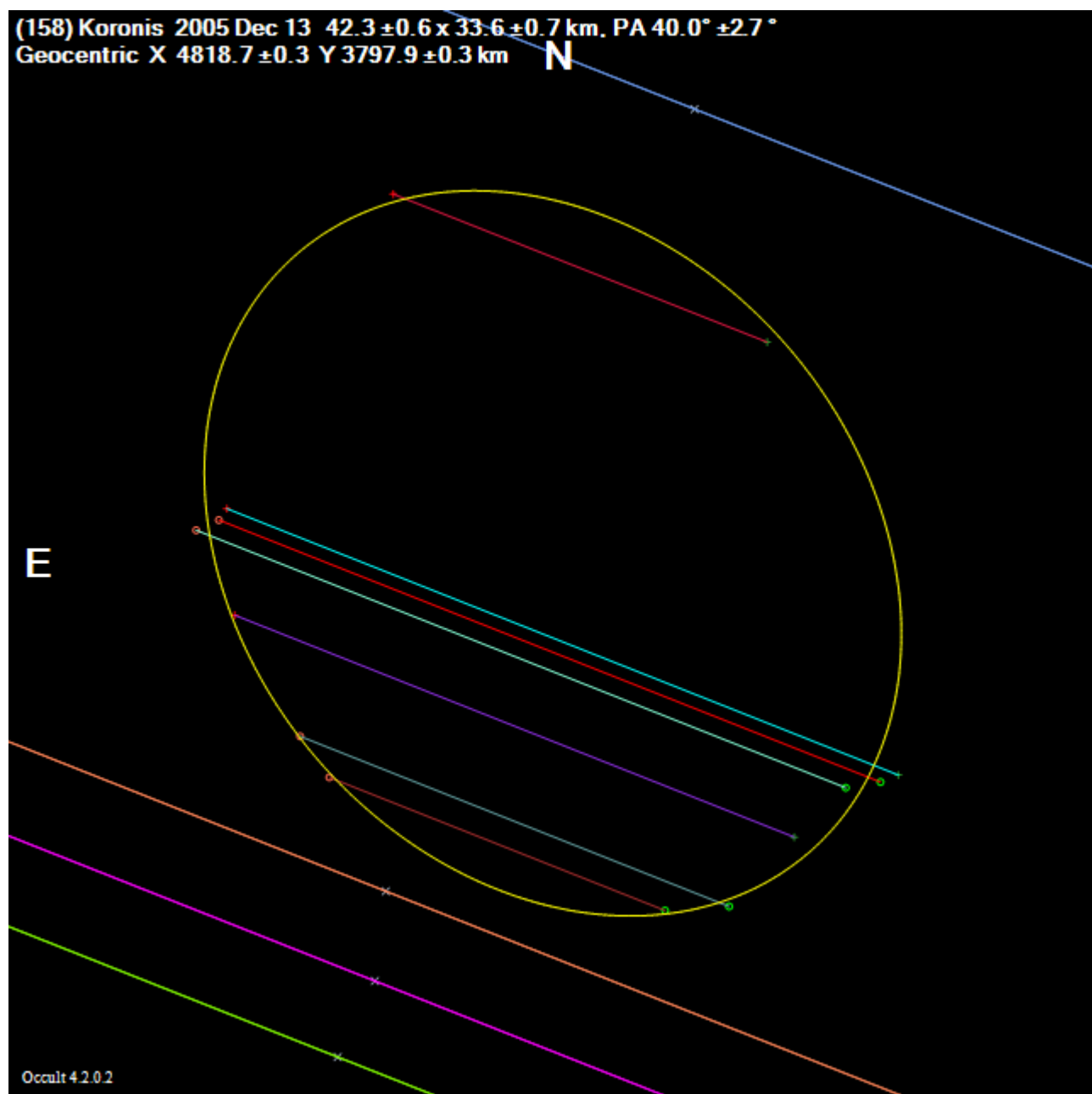


1579herrick2013jan01

(1579) Herrick 2013 Jan 1 52.7 x 52.7 km, PA 0.0° °
Geocentric X 4935.3 ± 0.5 Y 3483.0 ± 1.5 km N

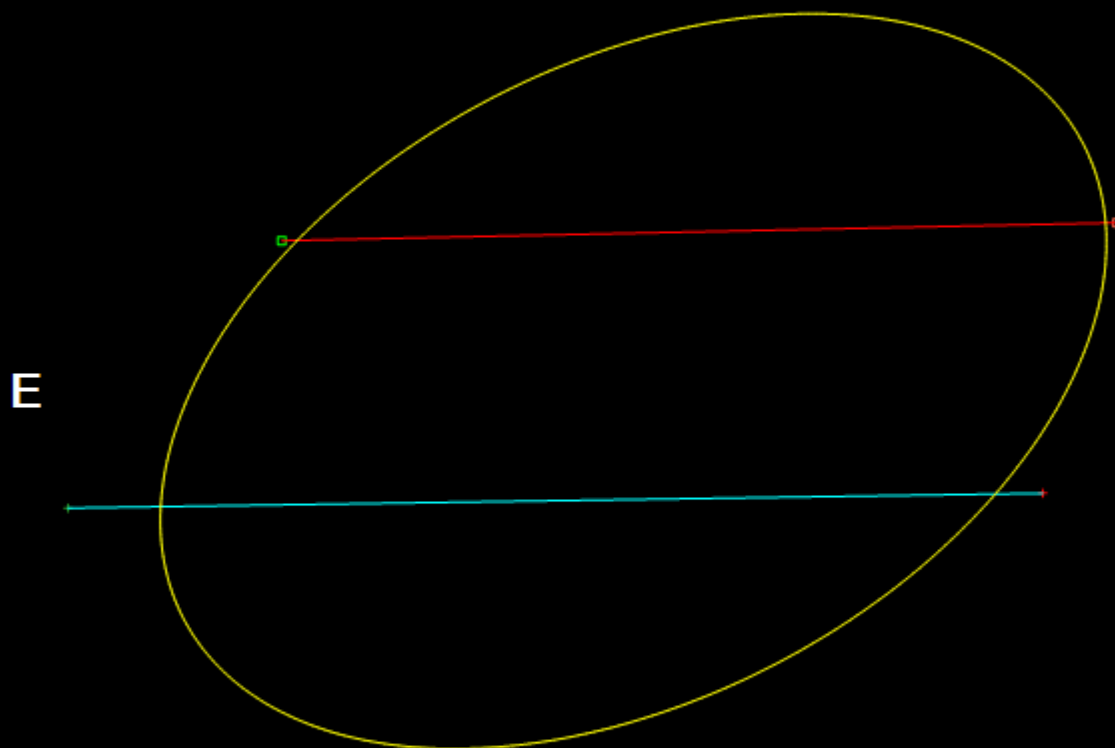


158koronis2005dec13



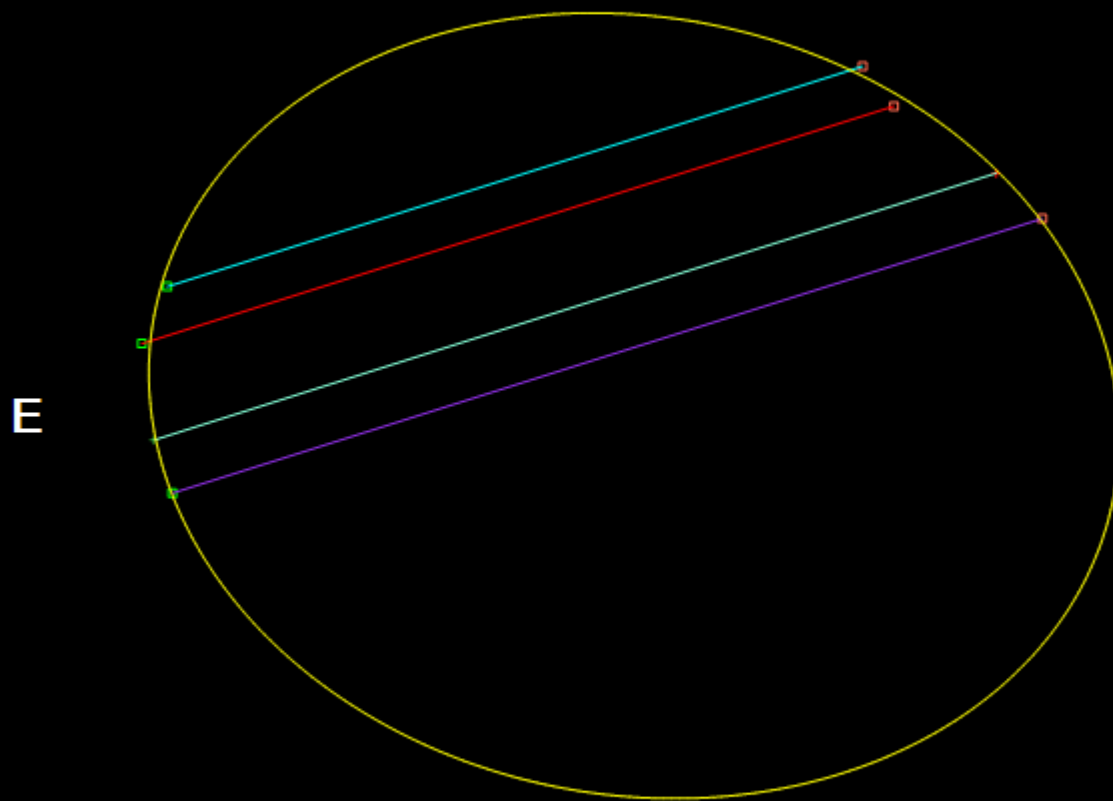
158koronis2012jan19

(158) Koronis 2012 Jan 19 45.0 x 28.0 km, PA -62.0° °
Geocentric X 1630.7 ± 1.0 Y -5453.8 ± 1.9 km **N**

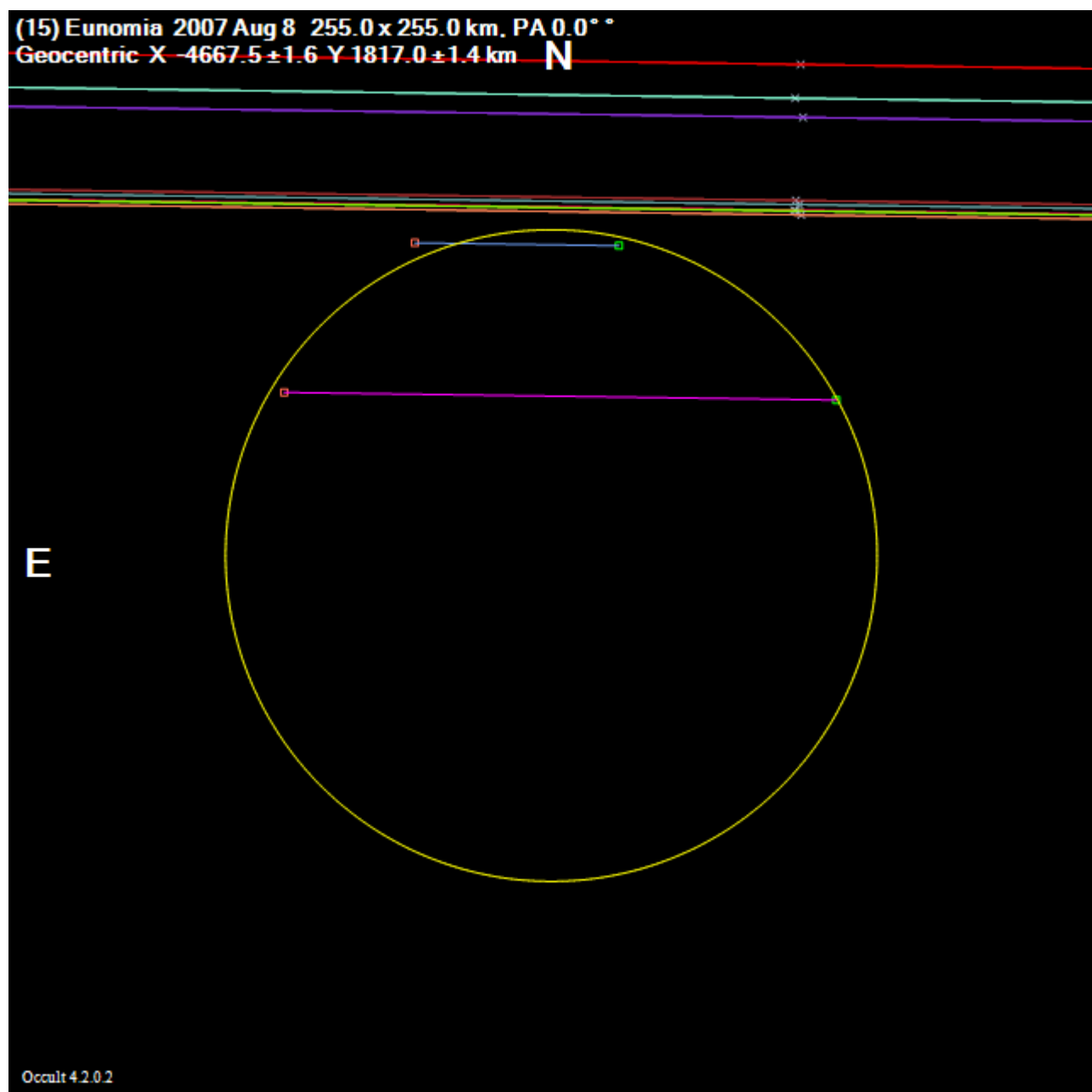


159aemilia2009may02

(159) Aemilia 2009 May 2 $158.8 \pm 2.2 \times 126.5 \pm 3.0$ km, PA 79.3° °
Geocentric X -2402.4 ± 1.0 Y 4681.5 ± 1.6 km **N**



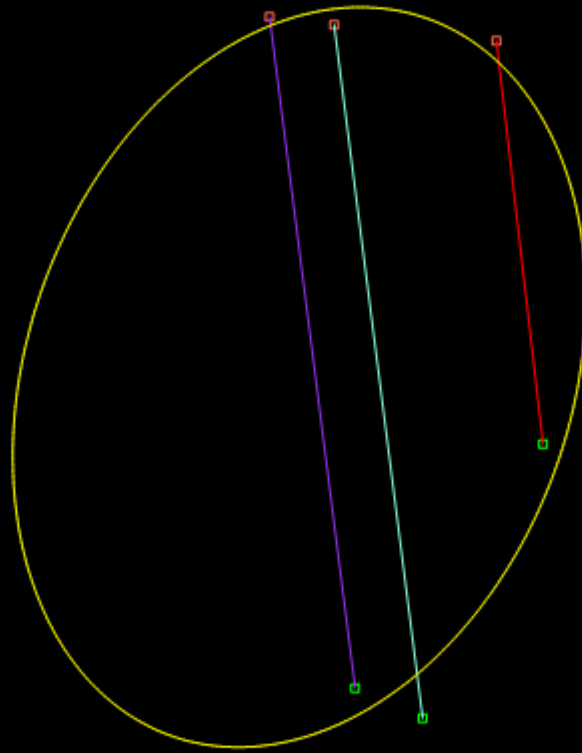
15eunomia2007aug08



15eunomia2010aug20

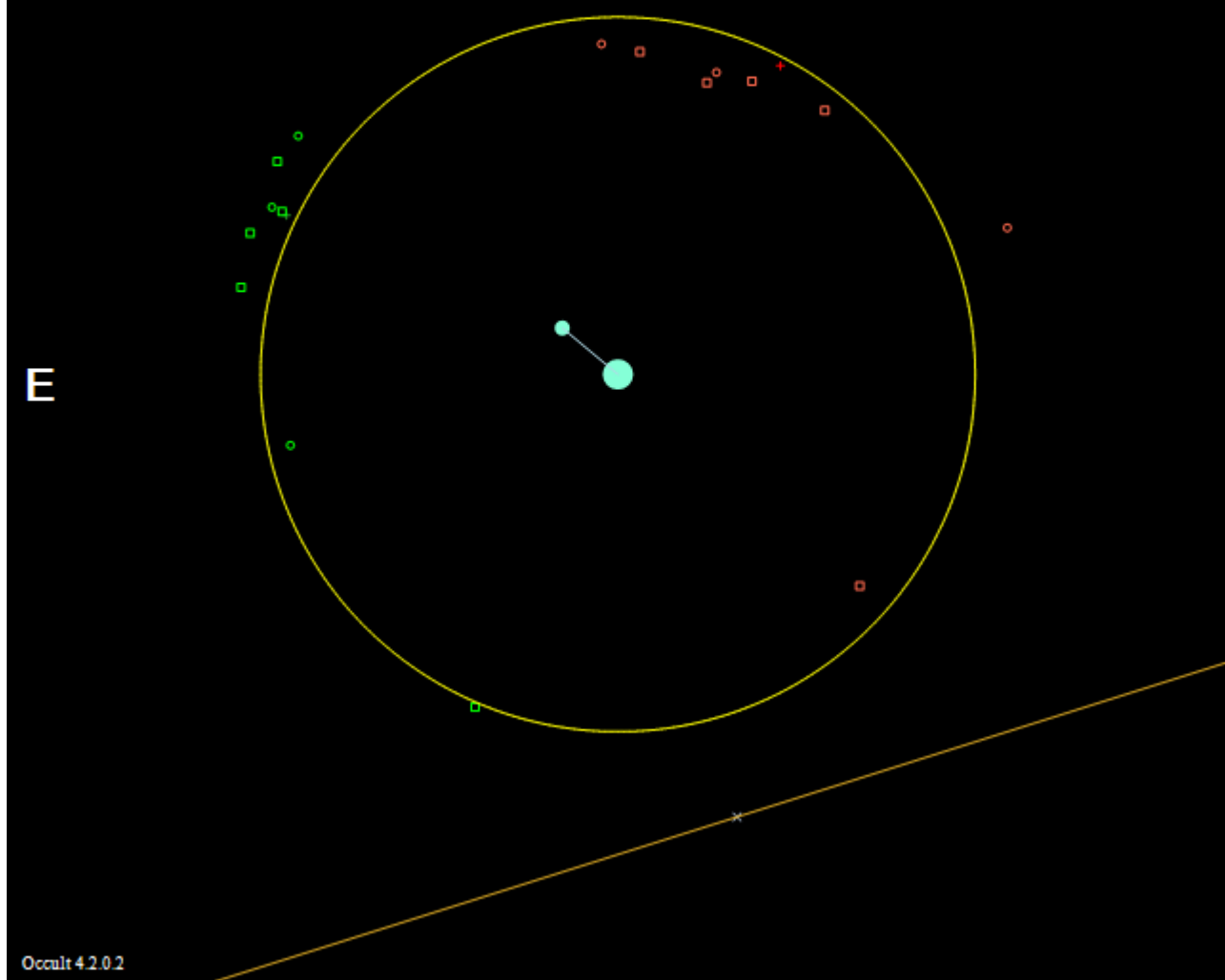
(15) Eunomia 2010 Aug 20 $252.7 \pm 27.0 \times 180.5$ km. PA $-19.8^\circ \pm 12.1^\circ$
Geocentric X 3136.1 ± 10.6 Y 4939.8 ± 9.5 km **N**

E



160una2011jan24

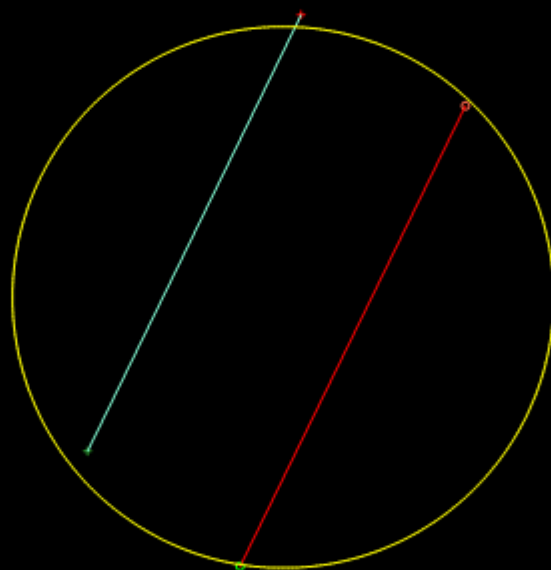
(160) Una 2011 Jan 24 $79.0 \pm 4.5 \times 79.0$ km, PA 0.0°
Geocentric X -2172.6 ± 1.5 Y 2534.0 ± 1.8 km **N**
Double : Sep $0.0065 \pm 0.0021''$, PA $50.2^\circ \pm 23.3^\circ$



1614goldschmidt2008feb09

(1614) Goldschmidt 2008 Feb 9 $32.4 \pm 1.1 \times 32.4$ km, PA 0.0° °
Geocentric X 660.6 ± 1.2 Y 3170.0 ± 0.7 km **N**

E



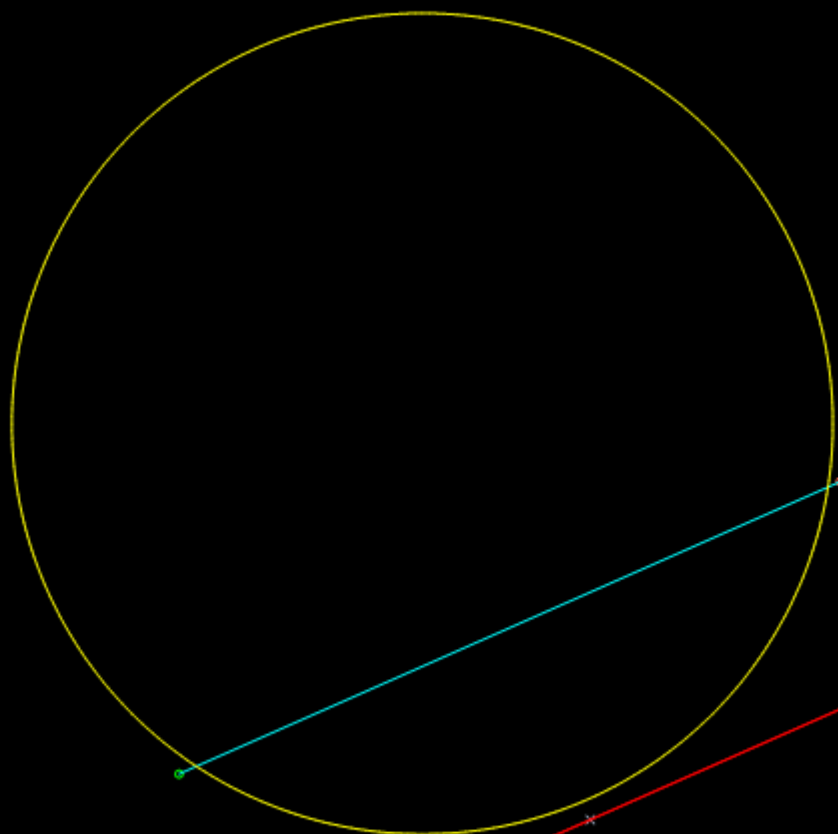
161athor2002oct15

(161) Athor 2002 Oct 15 47.0 x 47.0 km, PA 0.0° °
Geocentric X -3958.1 Y 1347.2 km

N

E

Occult 4.2.0.2

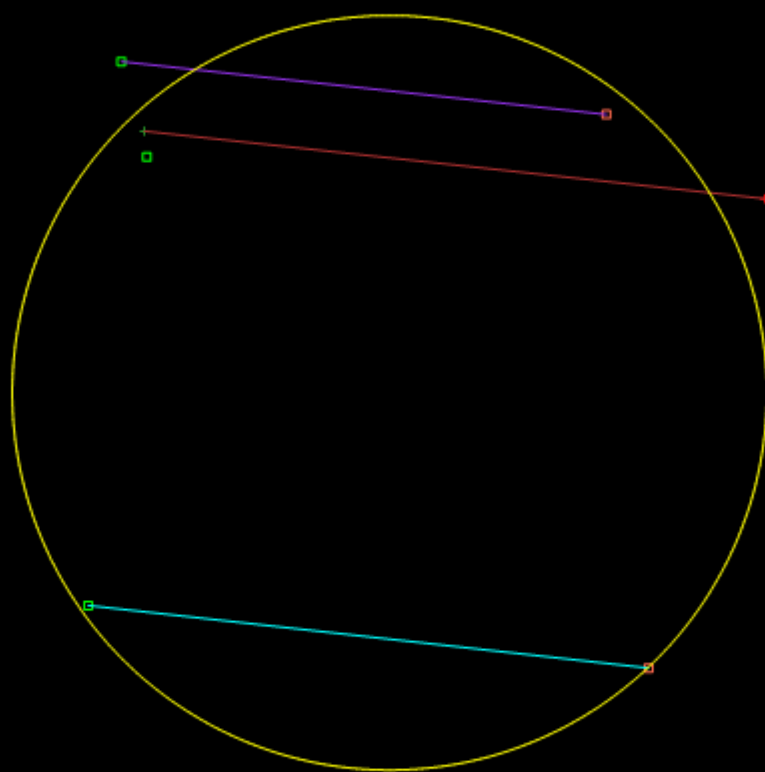


162laurentia2005dec01

(162) **Laurentia** 2005 Dec 1 $97.2 \pm 6.6 \times 97.2$ km, PA 0.0°
Geocentric X 778.1 ± 2.2 Y 930.6 ± 2.4 km

N

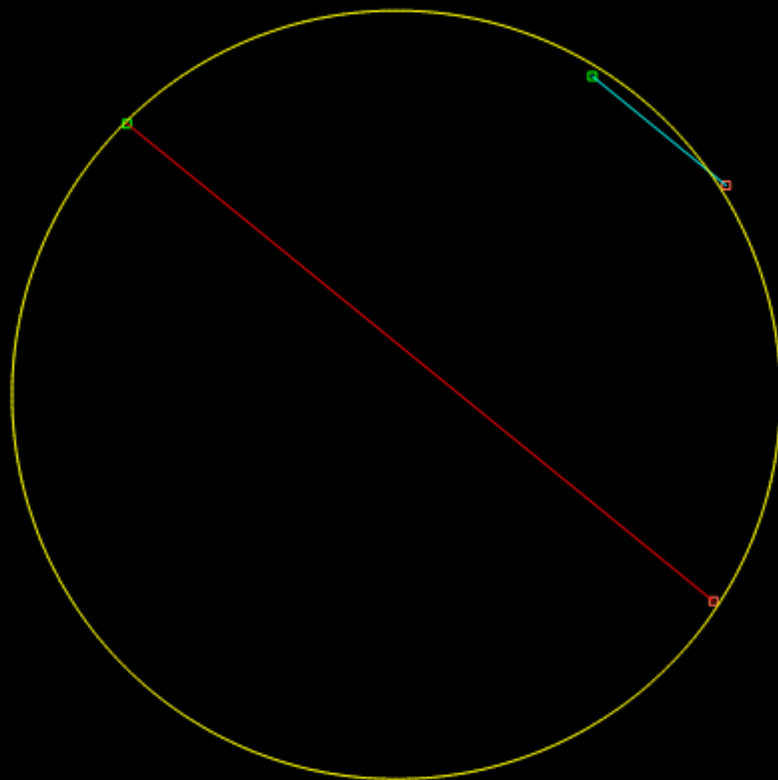
E



16368cittadialba2014jan15

(16368) Citta di Alba 2014 Jan 15 17.0 x 17.0 km, PA 0.0°
Geocentric X -1907.7 ± 0.1 Y 235.4 ± 0.1 km **N**

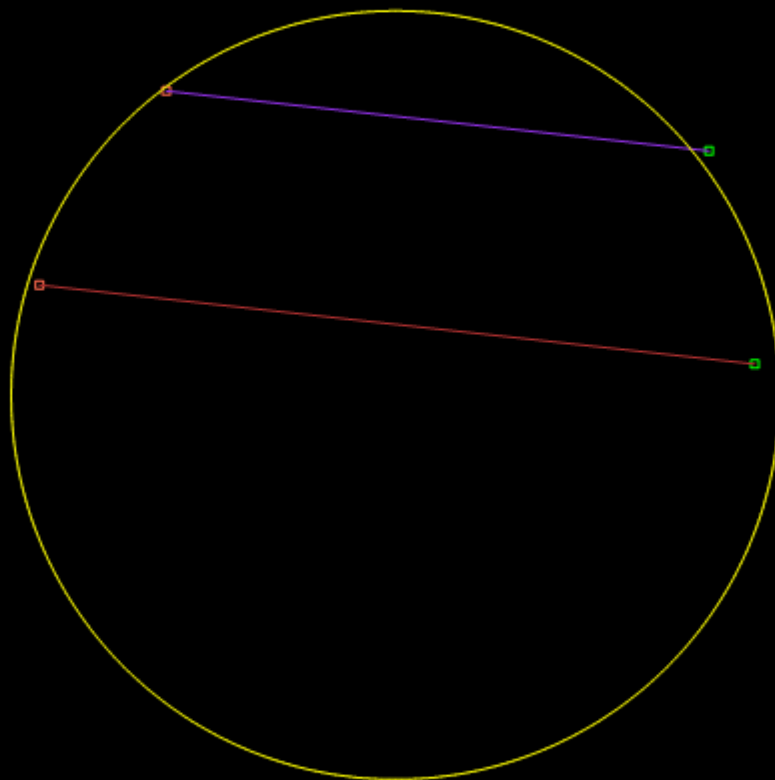
E



1637swings2010nov02

(1637) Swings 2010 Nov 2 45.0 x 45.0 km. PA 0.0° °
Geocentric X 5313.4 ± 0.5 Y -2753.7 ± 0.7 km **N**

E

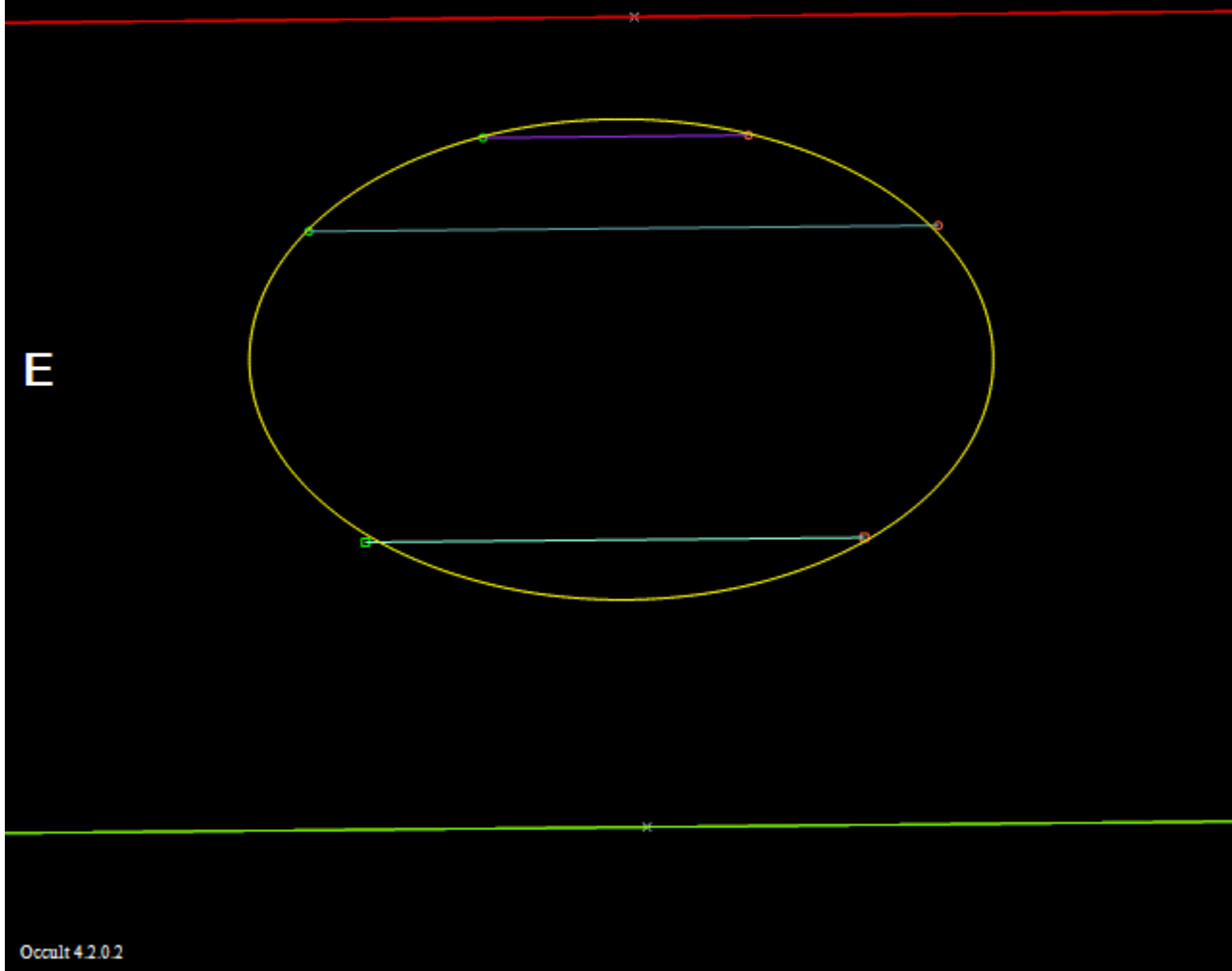


1645waterfield2002may20



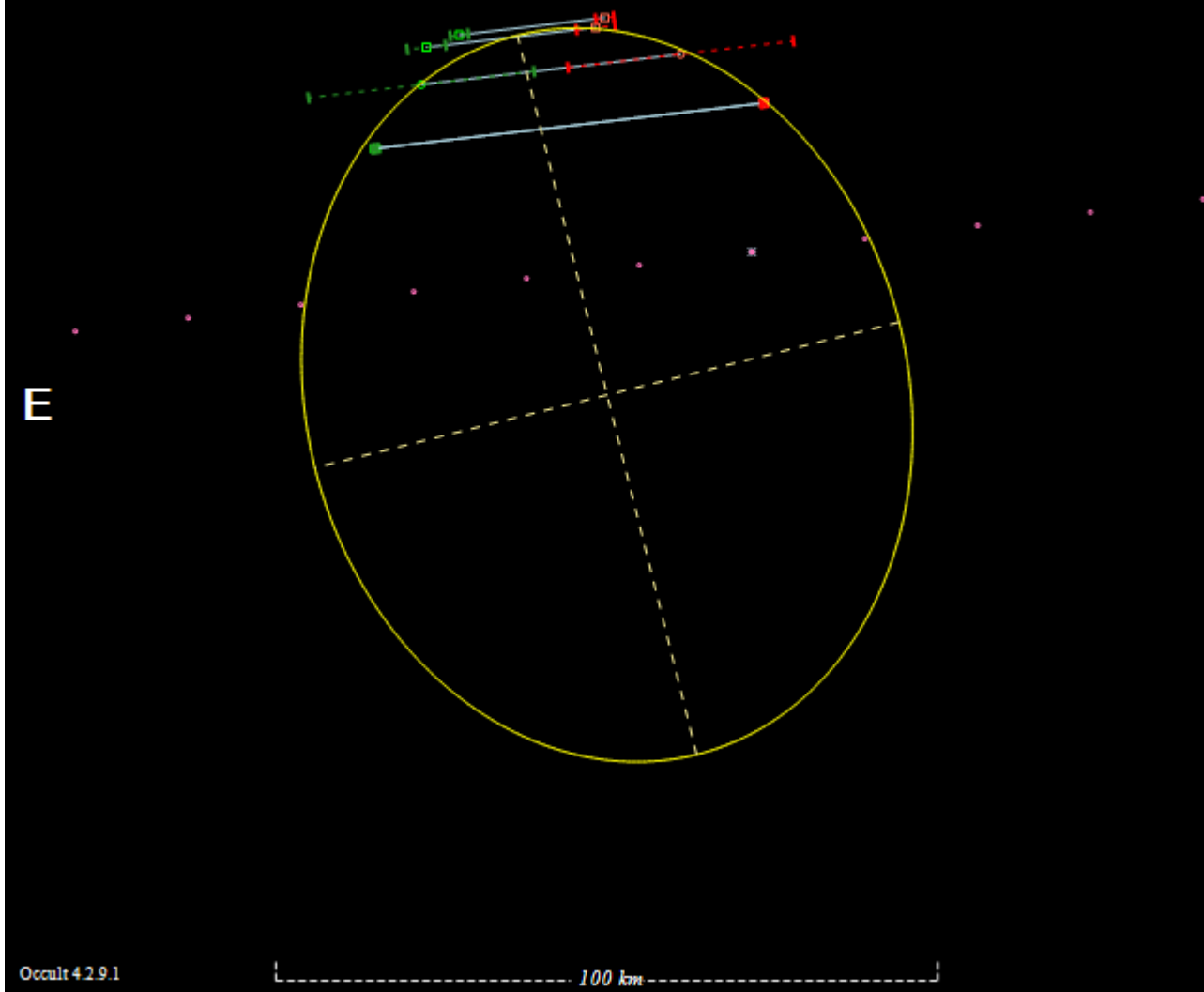
164eva2004apr22

(164) Eva 2004 Apr 22 $125.1 \pm 1.0 \times 80.8 \pm 0.7$ km, PA 90.0° °
Geocentric X 91.5 ± 0.3 Y 5186.1 ± 0.2 km **N**



164Eva2016Apr11

(164) Eva 2016 Apr 11 112.0 x 91.0 km, PA 14.0°
Geocentric X -2363.0 ± 1.0 Y 2144.0 ± 0.7 km **N**



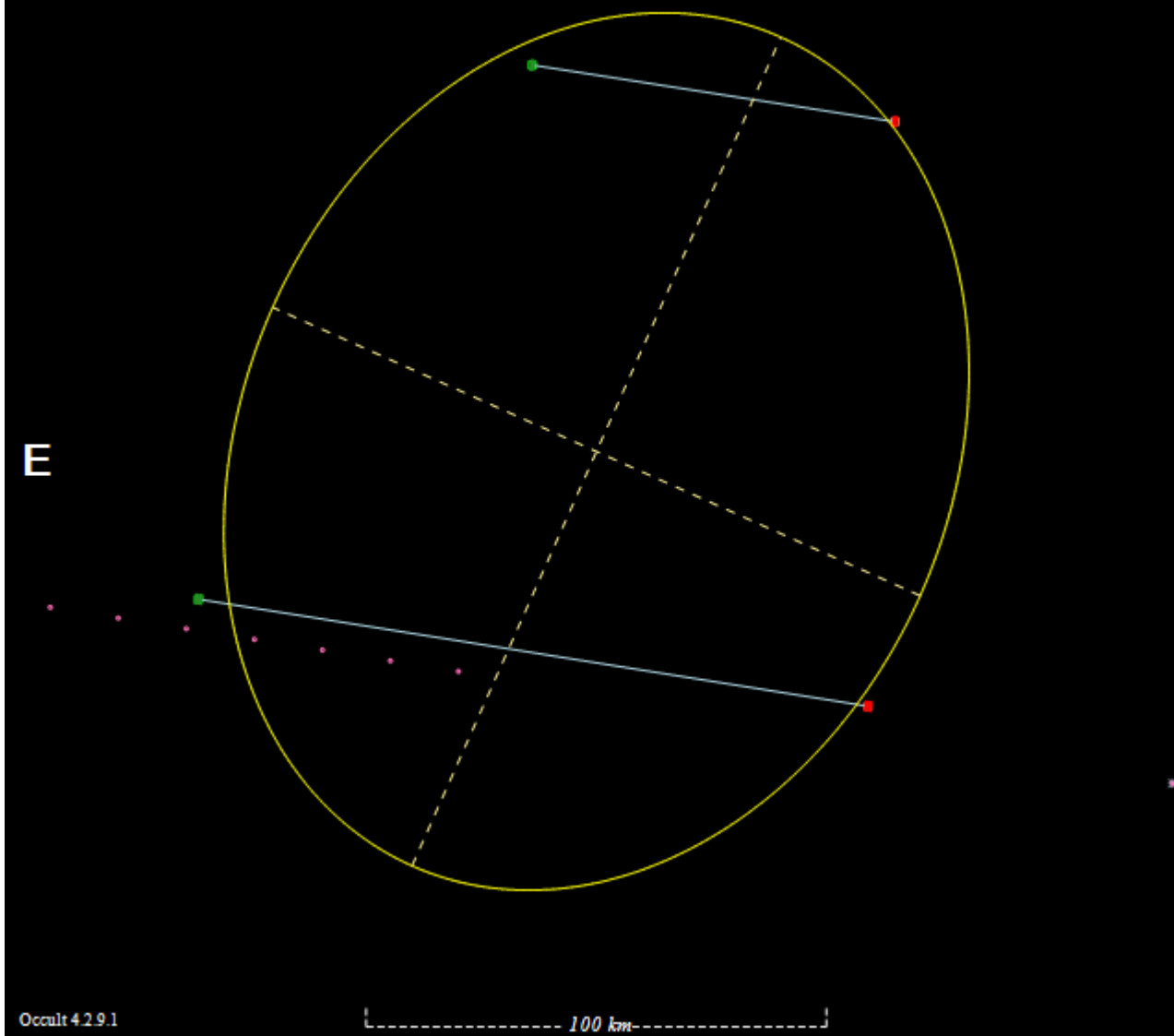
165loreley2009jun29

(165) Loreley 2009 Jun 29 $208.3 \pm 1.7 \times 167.2 \pm 0.6$ km, PA $45.1^\circ \pm 1.7^\circ$
Geocentric X -4674.6 ± 0.7 Y 3743.6 ± 0.3 km **N**



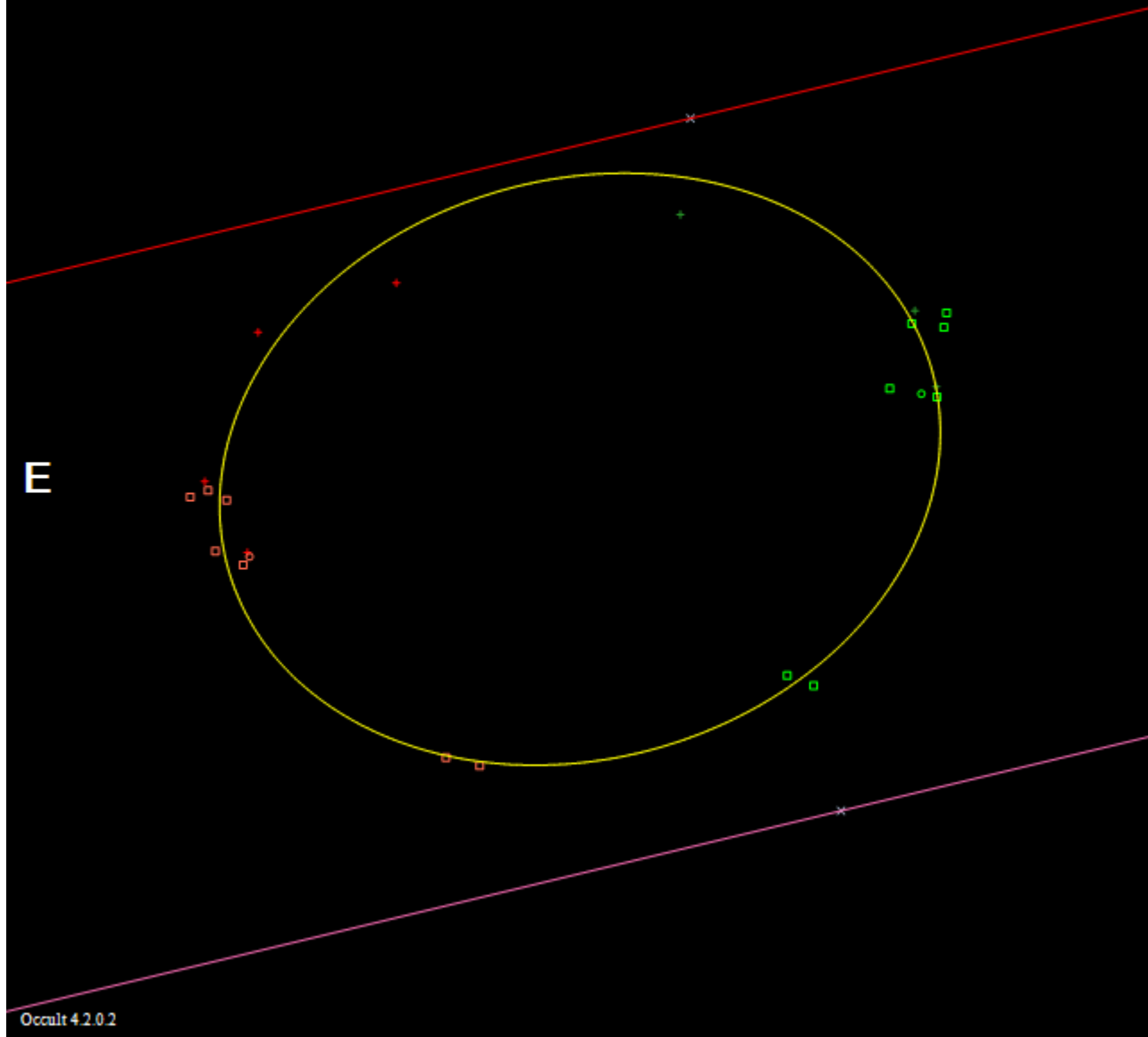
165Loreley2016Dec10

(165) Loreley 2016 Dec 10 197.0 x 154.0 km, PA -24.0°
Geocentric X 2635.2 ± 2.7 Y 1585.8 ± 3.4 km **N**



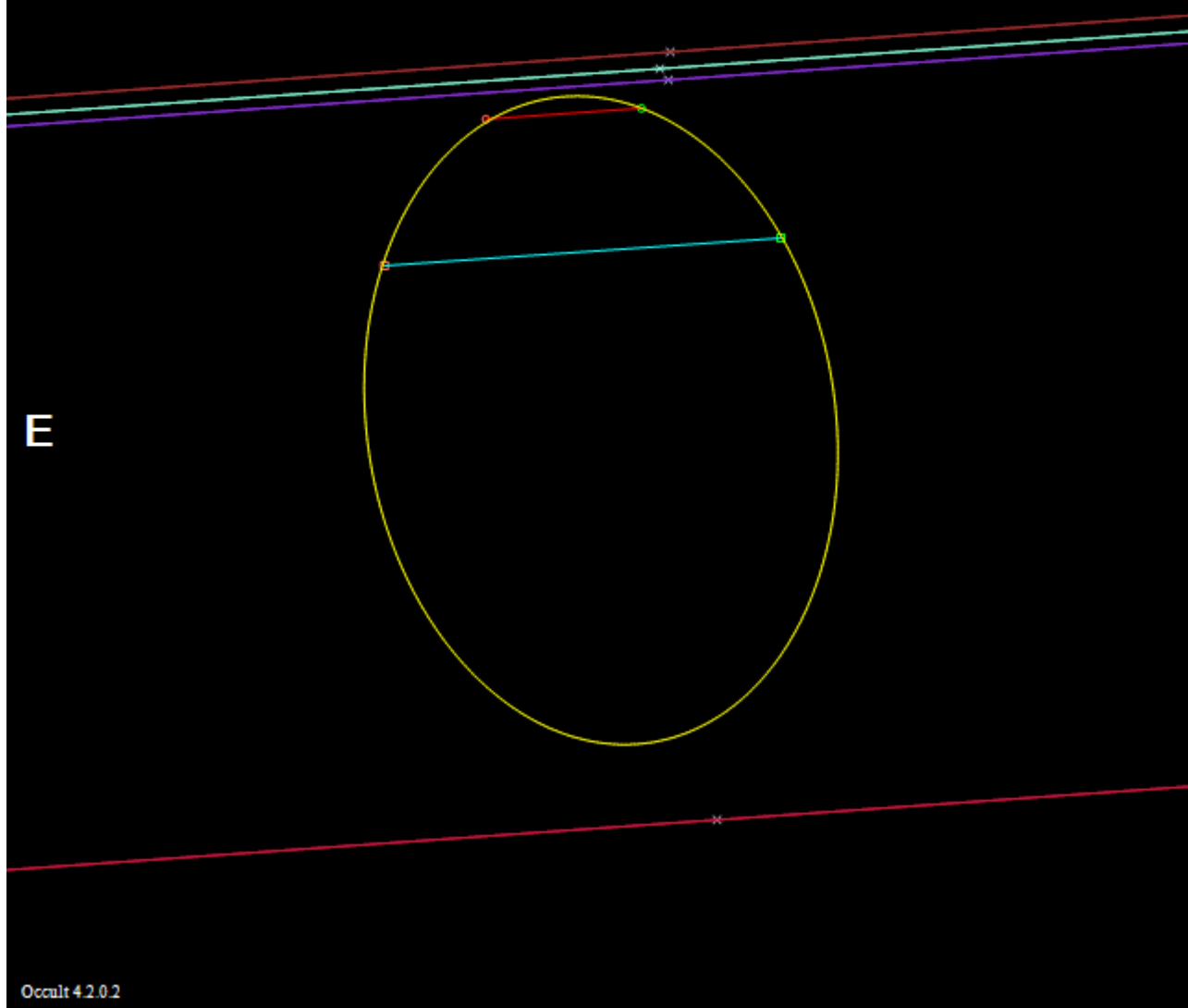
166rhodope2005oct19

(166) Rhodope 2005 Oct 19 $63.9 \pm 1.0 \times 50.6 \pm 2.6$ km, PA $-73.9^\circ \pm 7.0^\circ$
Geocentric X -4576.5 ± 0.5 Y 3412.4 ± 1.1 km **N**



166rhodope2010apr22

(166) Rhodope 2010 Apr 22 64.0 x 46.0 km, PA 8.8° ± 2.3°
Geocentric X 2379.1 ± 0.4 Y 3505.7 ± 0.1 km **N**

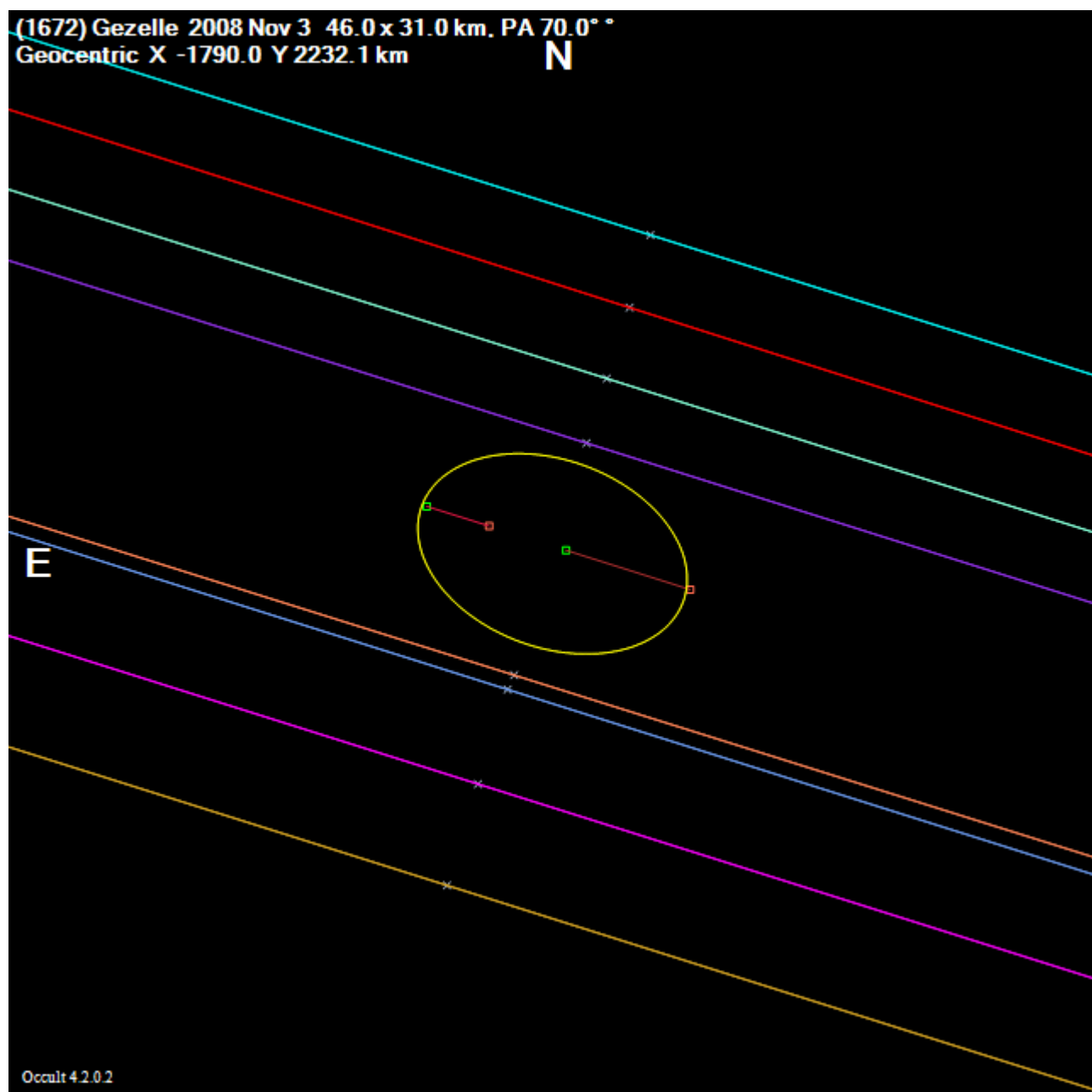


166rhodope2015jan30

(166) Rhodope 2015 Jan 30 68.0 x 60.0 km, PA $-43.7^{\circ} \pm 4.2^{\circ}$
Geocentric X 3023.3 ± 0.3 Y 3634.1 ± 0.3 km **N**

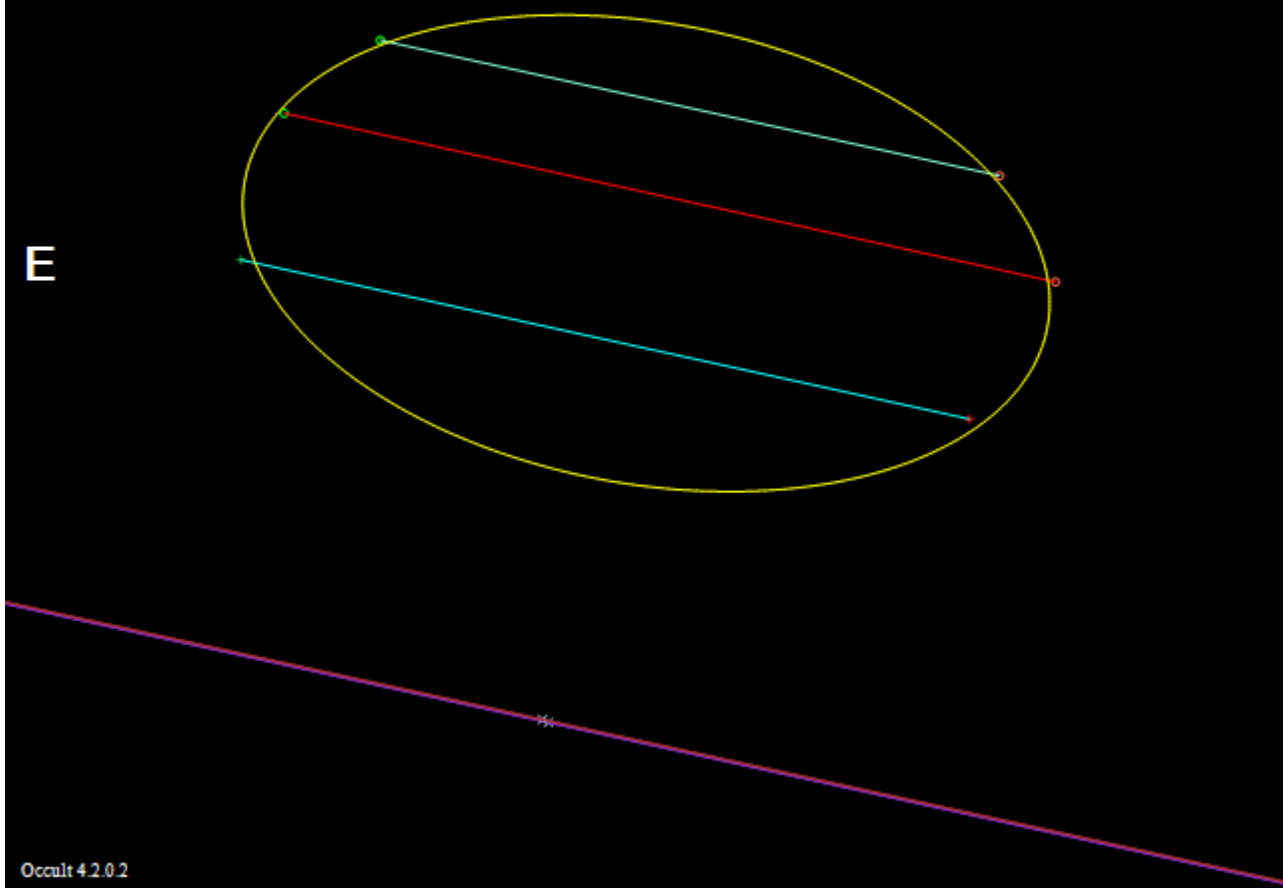


1672gezelle2008nov03

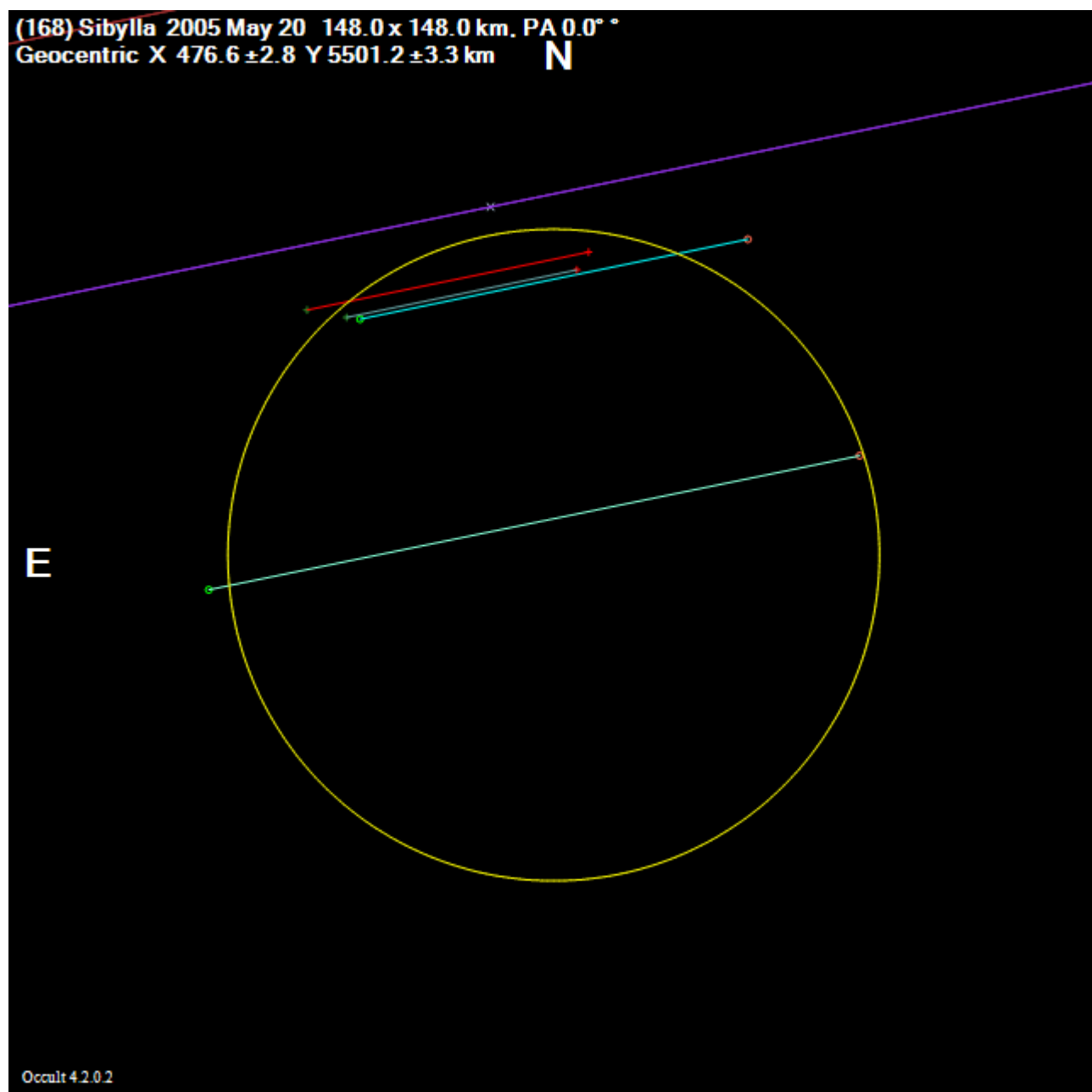


167urda2001jul23

(167) Urda 2001 Jul 23 $41.4 \pm 0.5 \times 23.4 \pm 1.8$ km, PA $79.7^\circ \pm 1.8^\circ$
Geocentric X -1434.8 ± 0.3 Y 5279.2 ± 0.4 km **N**

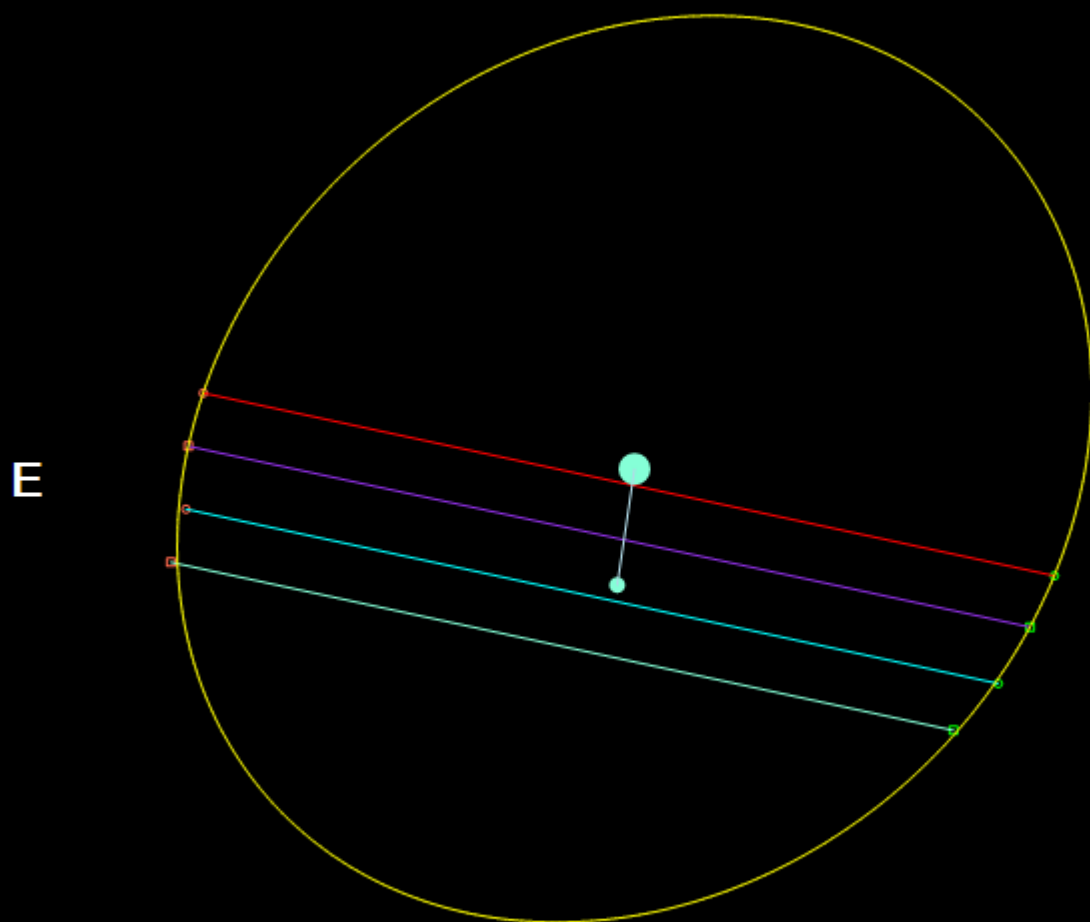


(168) Siblylla 2005 May 20 148.0 x 148.0 km, PA 0.0°
Geocentric X 476.6 ± 2.8 Y 5501.2 ± 3.3 km **N**



168sibylla2012nov25

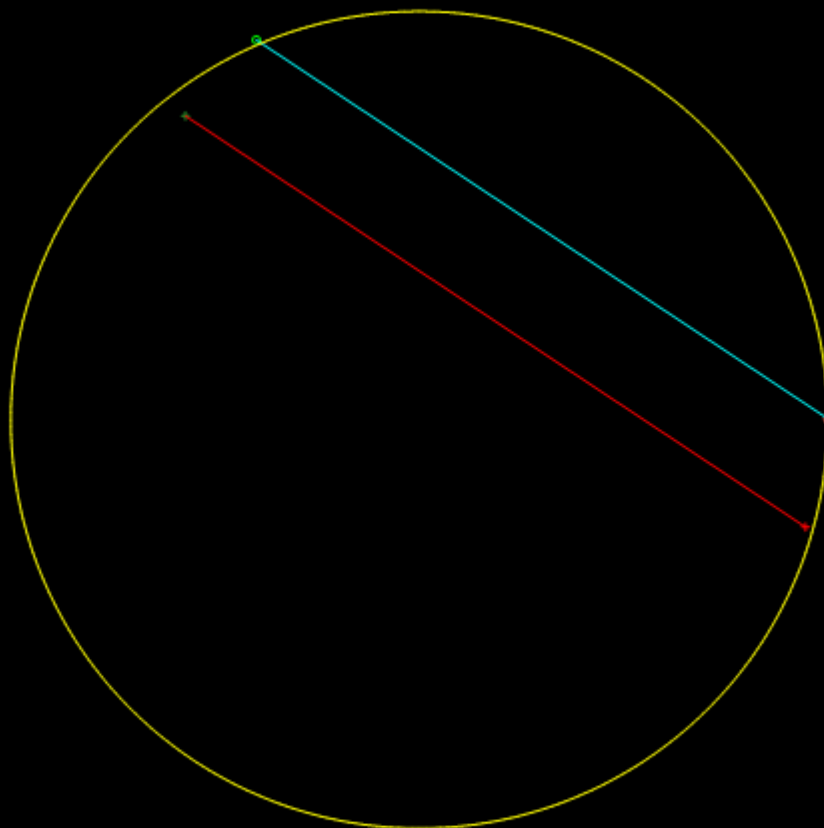
(168) Sibylla 2012 Nov 25 187.1 x 157.6 km, PA -46.5° °
Geocentric X 4110.7 ± 1.3 Y 3754.8 ± 3.3 km **N**
Double : Sep 0.0092 ± 0.0015", PA 171.5° ± 2.4°



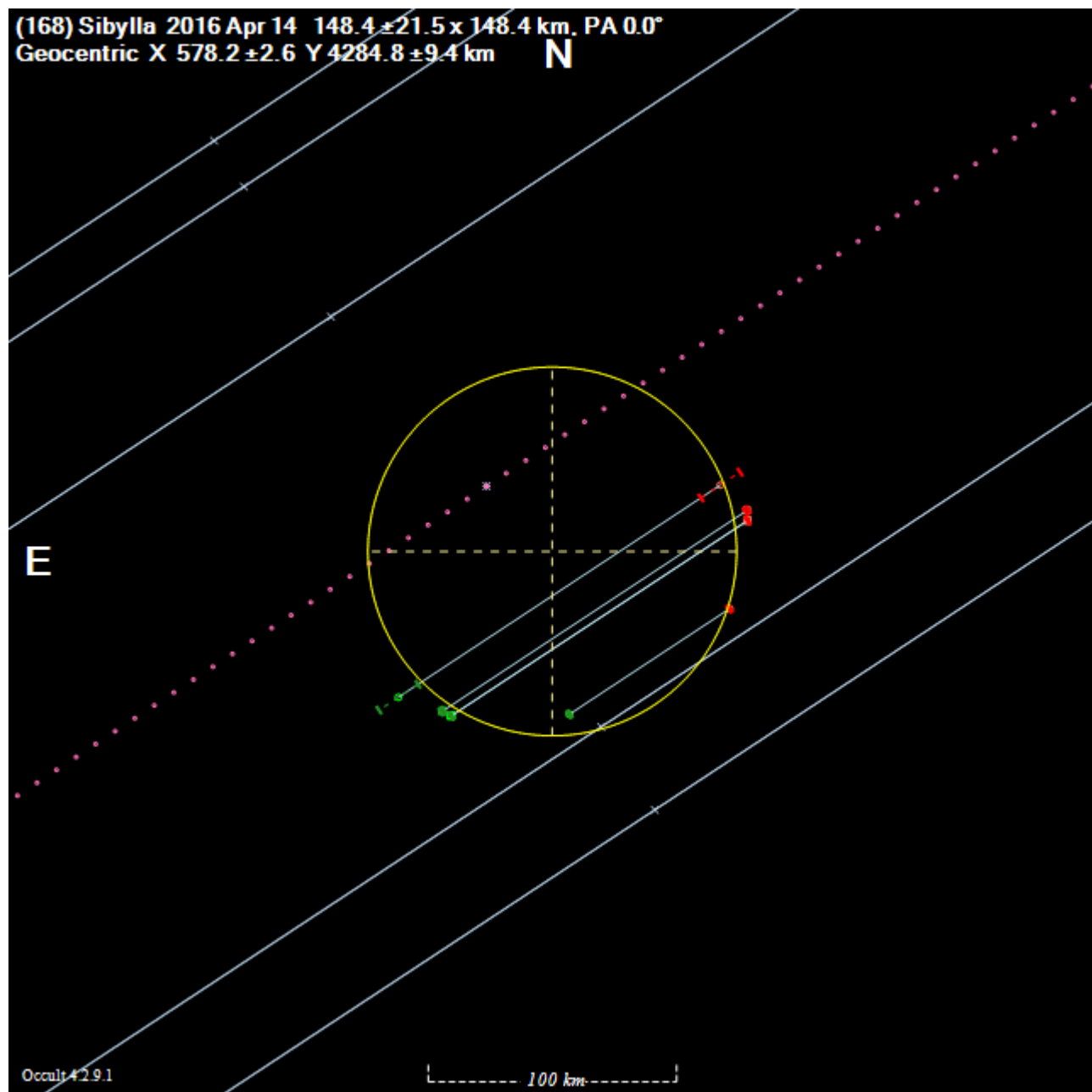
168sibylla2013dec08

(168) Sibylla 2013 Dec 8 $155.2 \pm 22.8 \times 155.2$ km, PA 0.0° °
Geocentric X 3647.1 ± 1.7 Y 4321.2 ± 10.6 km **N**

E



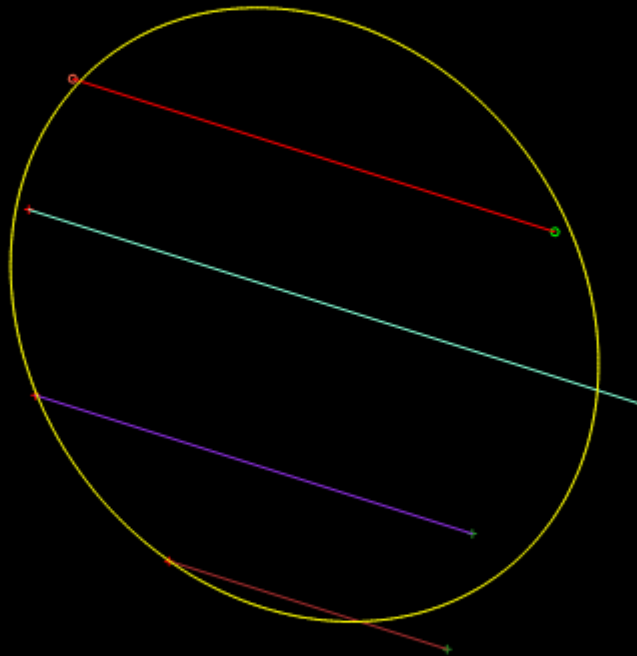
168Sibylla2016Apr14



16psyche2004may16

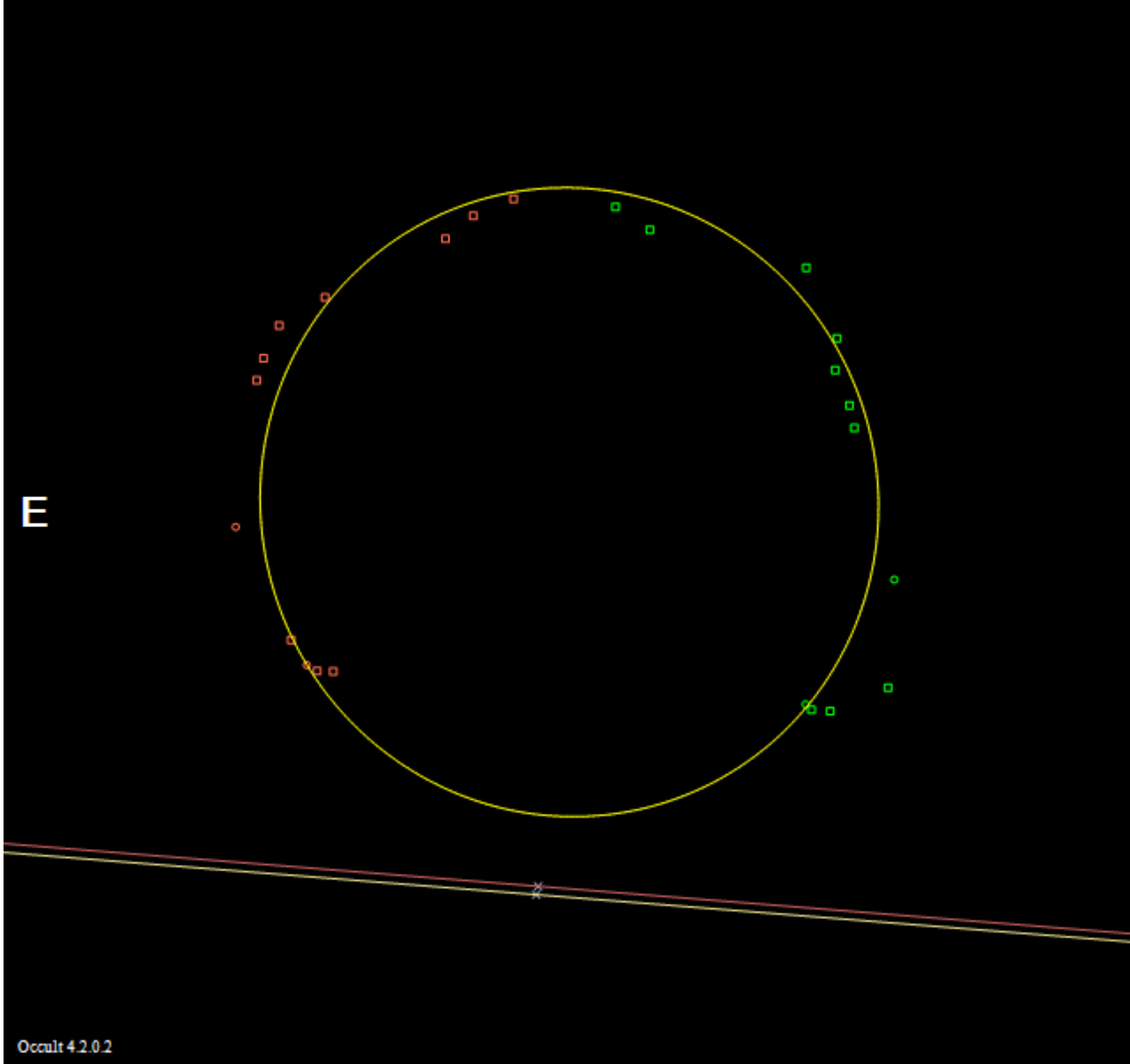
(16) Psyche 2004 May 16 $213.7 \pm 11.3 \times 180.6 \pm 13.5$ km, PA $37.5^\circ \pm 27.9^\circ$
Geocentric X -1691.0 ± 4.3 Y -2281.4 ± 7.3 km **N**

E



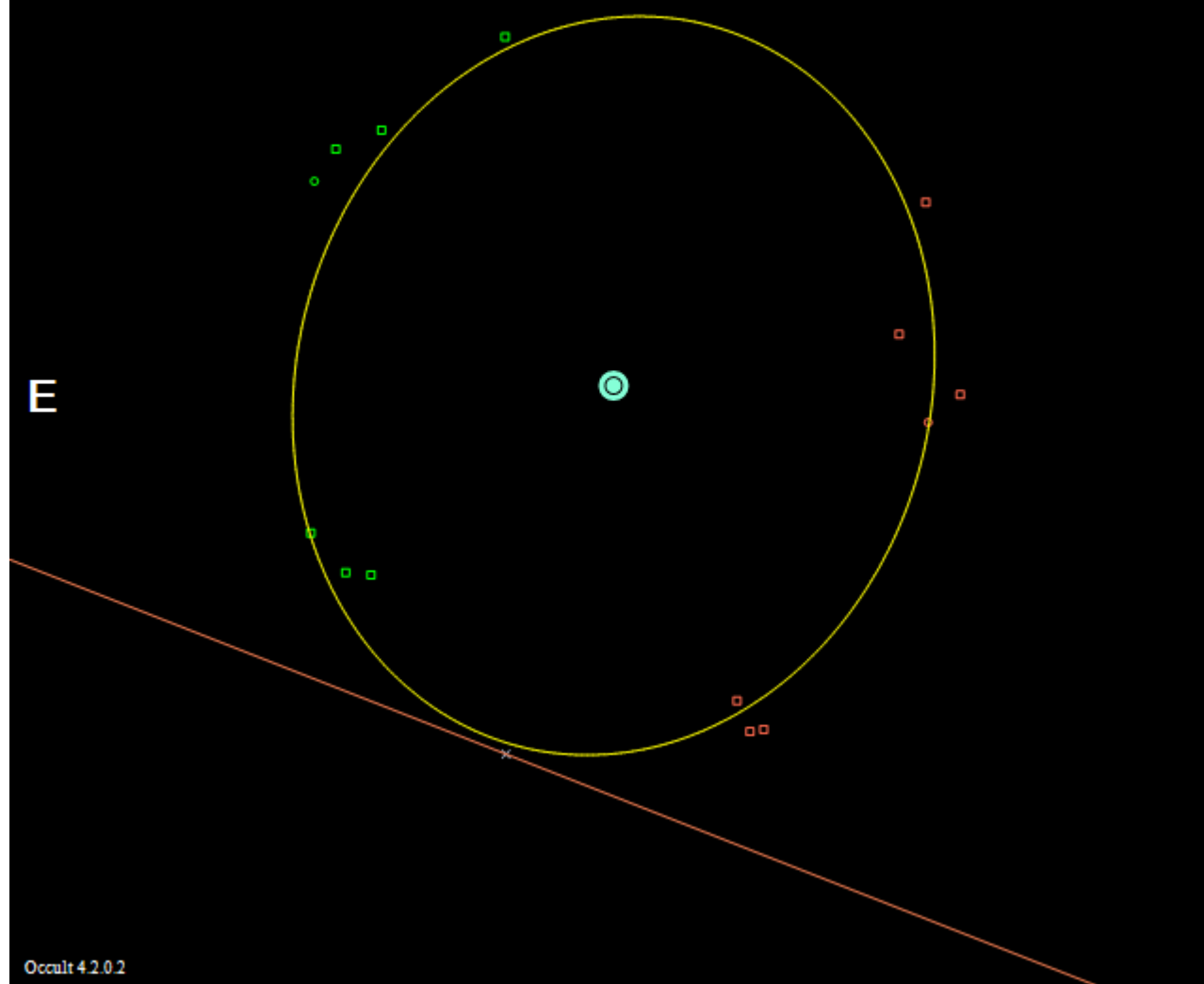
16psyche2010aug21

(16) Psyche 2010 Aug 21 $235.4 \pm 7.9 \times 230.4 \pm 4.9$ km, PA $19.1^\circ \pm 62.2^\circ$
Geocentric X -2646.1 ± 2.0 Y 2287.8 ± 3.2 km **N**



16psyche2014jul22

(16) Psyche 2014 Jul 22 213.3 x 181.2 km, PA -15.1° °
Geocentric X -1316.8 ± 2.4 Y 5384.2 ± 3.5 km **N**
Double : Sep 0.0000", PA 0.0°



16psyche2015sep10

(16) Psyche 2015 Sep 10 256.0 x 197.0 km, PA 10.0°
Geocentric X -2999.5 ± 4.7 Y 3206.4 ± 7.7 km **N**

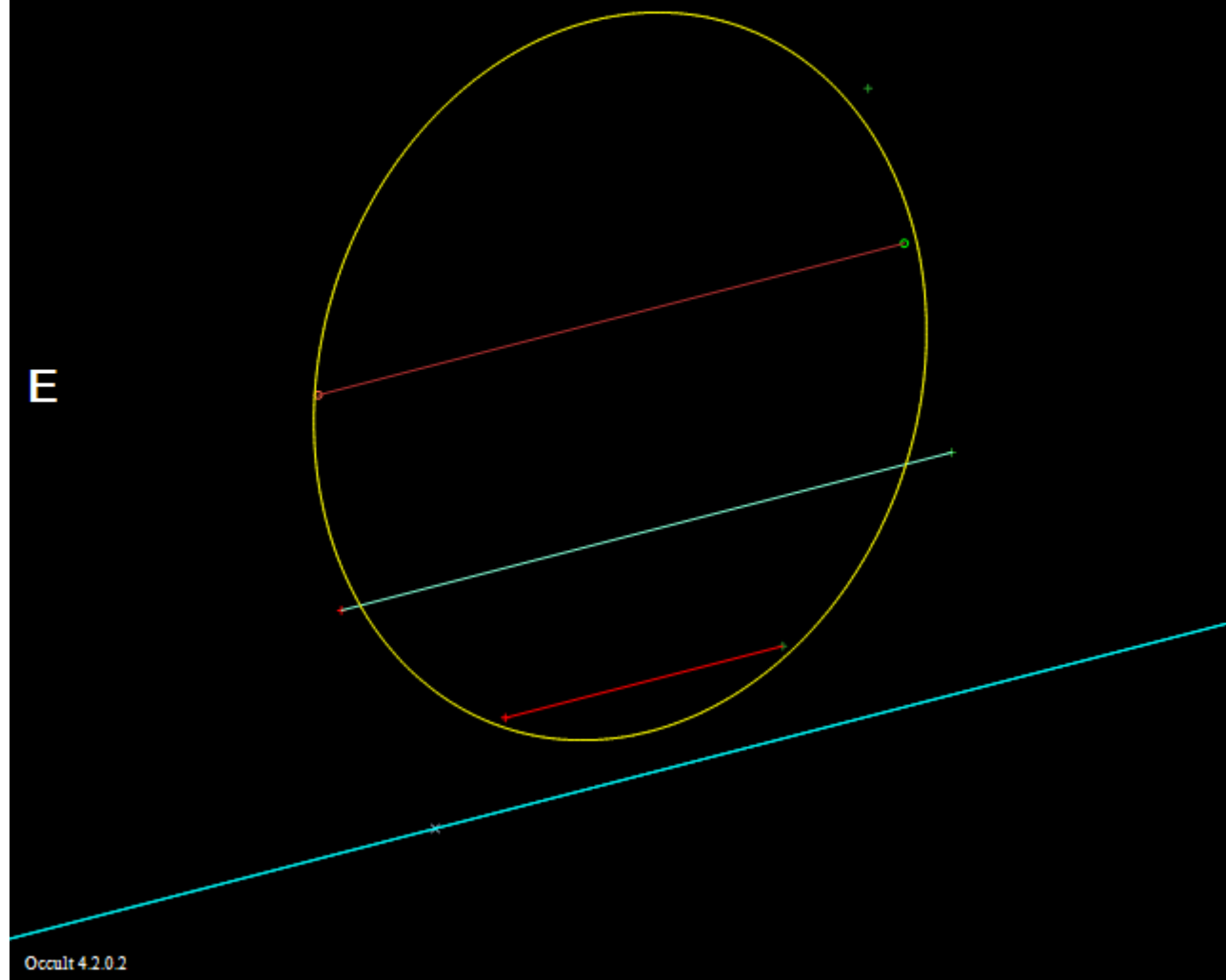
E



Occult 4.2.9.1

173ino2011jun07

(173) Ino 2011 Jun 7 $155.8 \pm 12.7 \times 125.9 \pm 5.9$ km. PA $-17.7^\circ \pm 17.5^\circ$
Geocentric X 3773.3 ± 1.9 Y 4706.6 ± 6.2 km **N**



173ino2015apr09

(173) Ino 2015 Apr 9 $152.1 \pm 28.2 \times 132.0 \pm 2.2$ km. PA $-8.6^\circ \pm 10.4^\circ$
Geocentric X 2884.2 ± 2.3 Y 3503.5 ± 9.9 km **N**

E

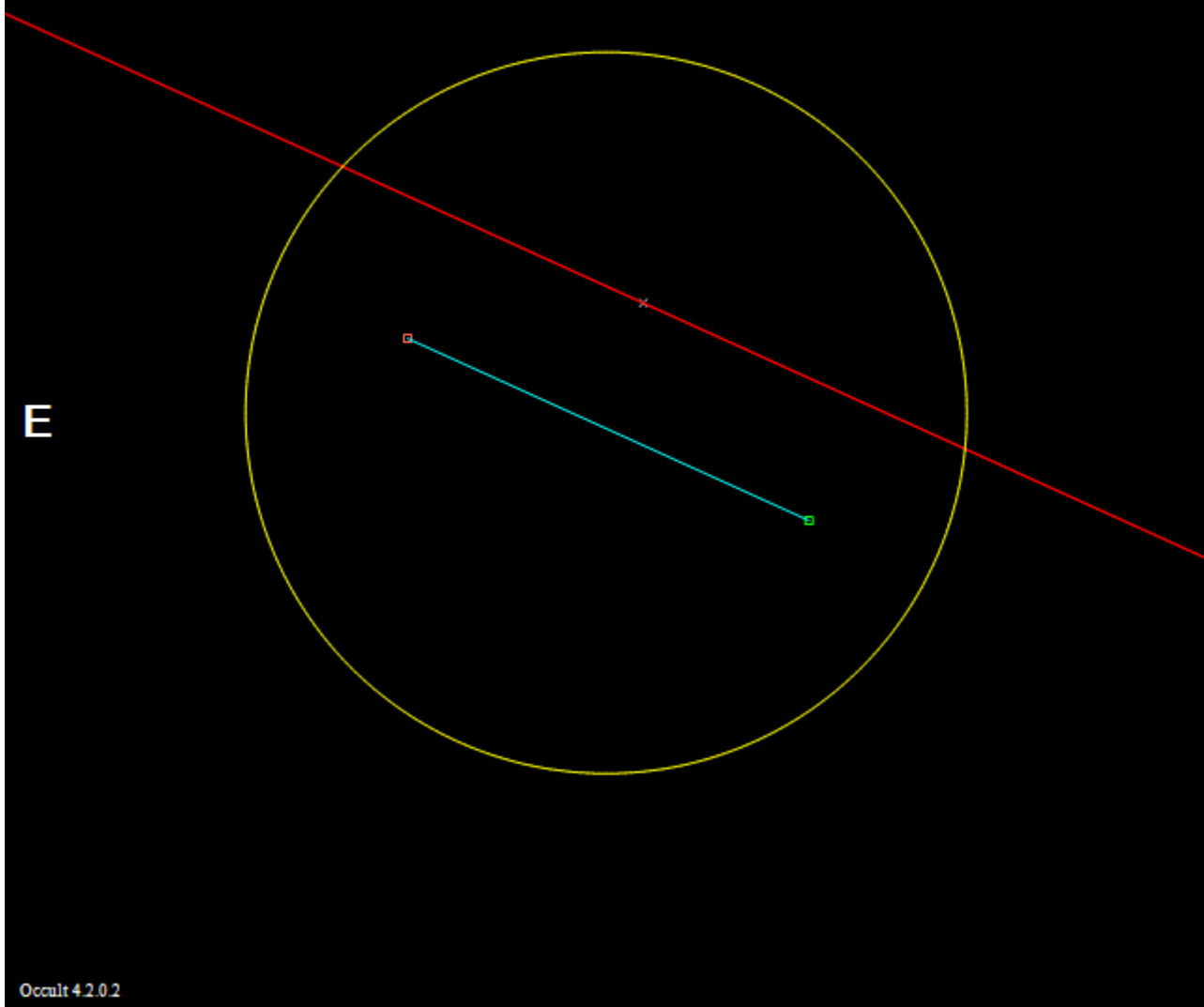


The diagram illustrates the occultation geometry. A large yellow circle represents the occultation disk. Red squares indicate the path of the asteroid, and green squares indicate the path of the occulted star. The diagram is oriented with North (N) at the top and East (E) on the left.

Occult 4.2.9.1

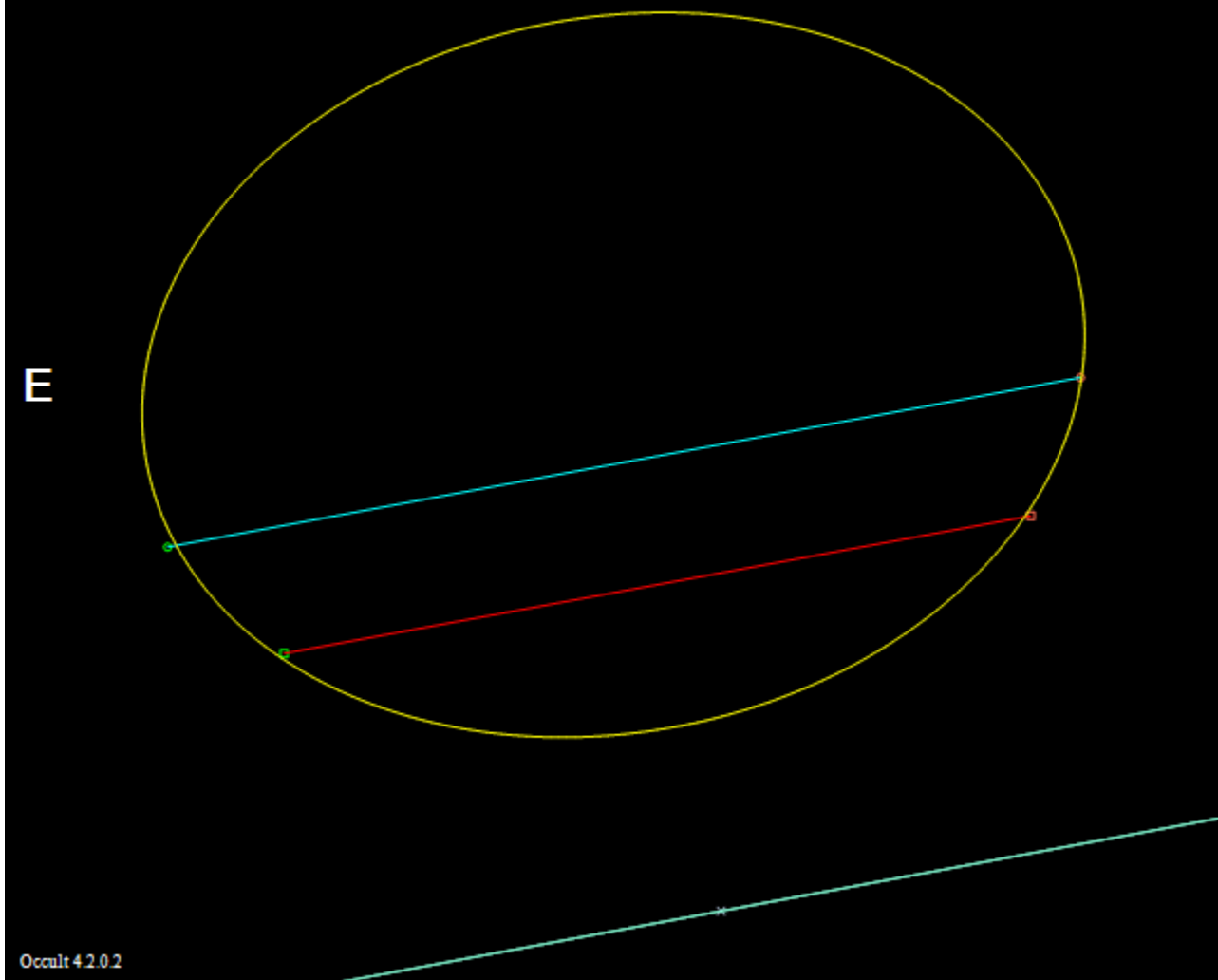
174phaedra2007sep23

(174) Phaedra 2007 Sep 23 69.0 x 69.0 km, PA 0.0° °
Geocentric X 758.9 ± 0.4 Y 5866.8 ± 0.4 km N



175andromache2012jan06

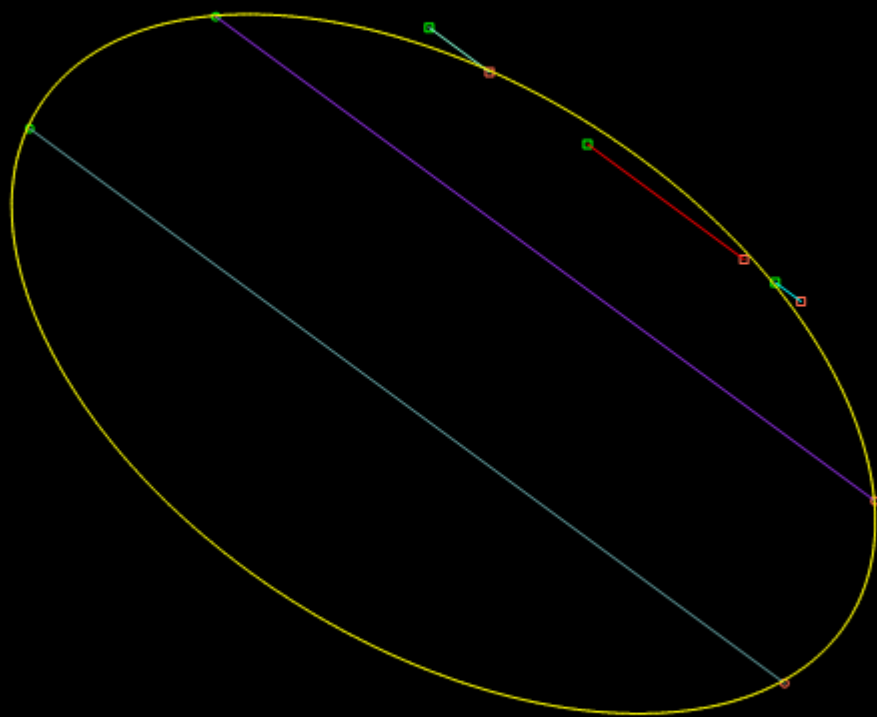
(175) Andromache 2012 Jan 6 125.0 x 94.0 km, PA -79.0° °
Geocentric X 2157.7 ± 0.5 Y 1008.2 ± 0.7 km **N**



176iduna2007aug22

(176) Iduna 2007 Aug 22 $150.9 \pm 0.9 \times 88.5 \pm 2.3$ km, PA $57.6^\circ \pm 0.7^\circ$
Geocentric X -1388.7 ± 0.8 Y 2887.4 ± 0.8 km **N**

E

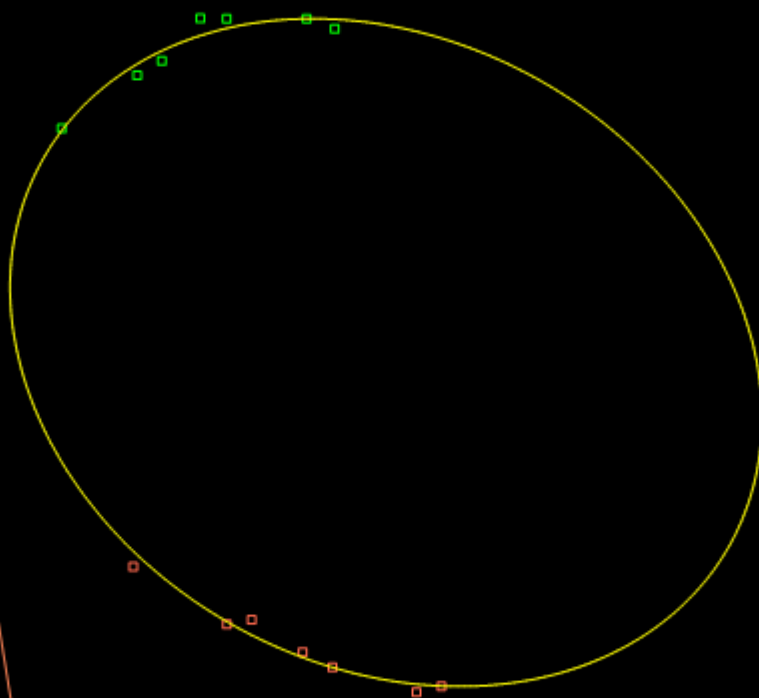


176iduna2013nov09

(176) Iduna 2013 Nov 9 $142.5 \pm 12.5 \times 113.1 \pm 5.1$ km, PA $60.7^\circ \pm 12.8^\circ$
Geocentric X 1261.6 ± 5.7 Y 3773.7 ± 0.8 km **N**

E

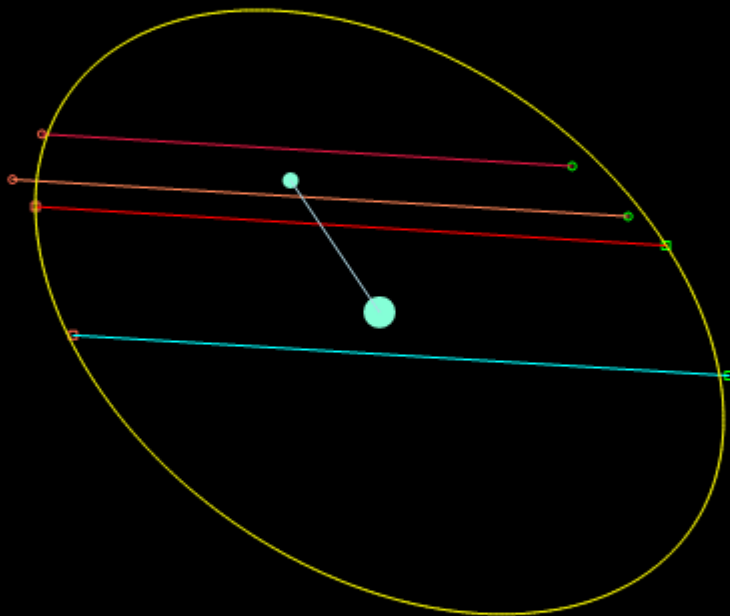
Occult 4.2.0.2



177irma2011sep13

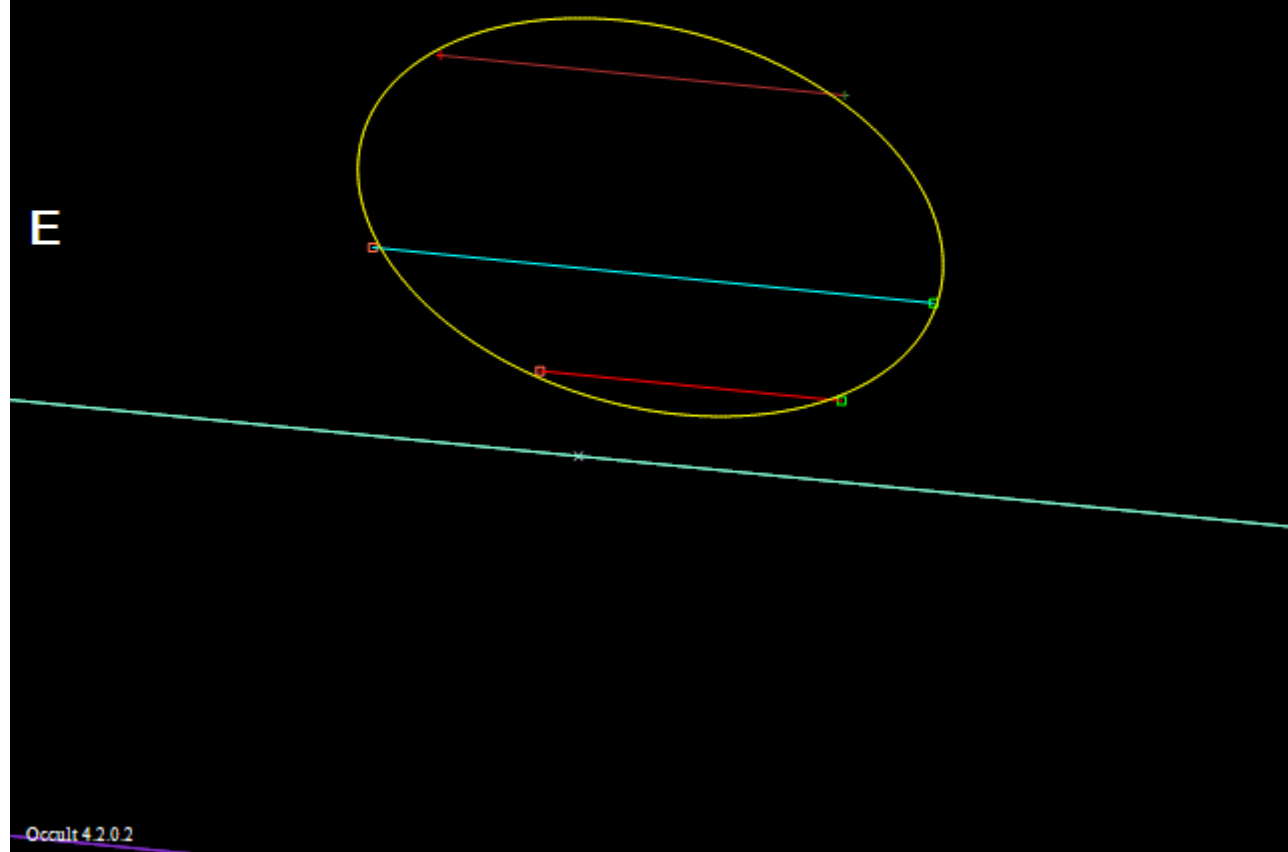
(177) Irma 2011 Sep 13 89.0 x 60.0 km, PA 55.1° ± 1.4°
Geocentric X -4491.8 ± 0.4 Y 3075.2 ± 0.9 km **N**
Double : Sep 0.0125", PA 34.0°

E



1796riga2011dec18

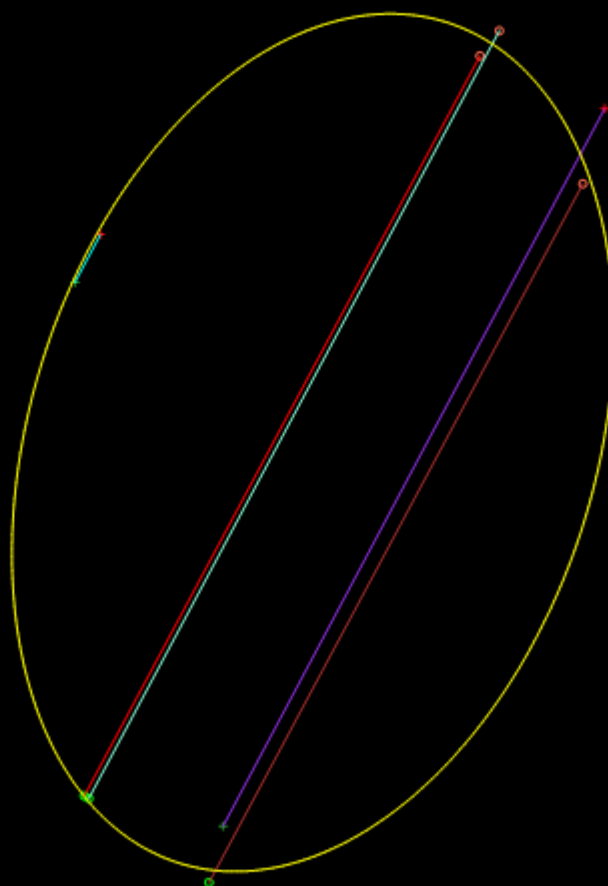
(1796) Riga 2011 Dec 18 $66.2 \pm 0.9 \times 41.8 \pm 1.1$ km, PA $74.3^\circ \pm 1.9^\circ$
Geocentric X 945.9 ± 0.5 Y 5214.0 ± 0.5 km **N**



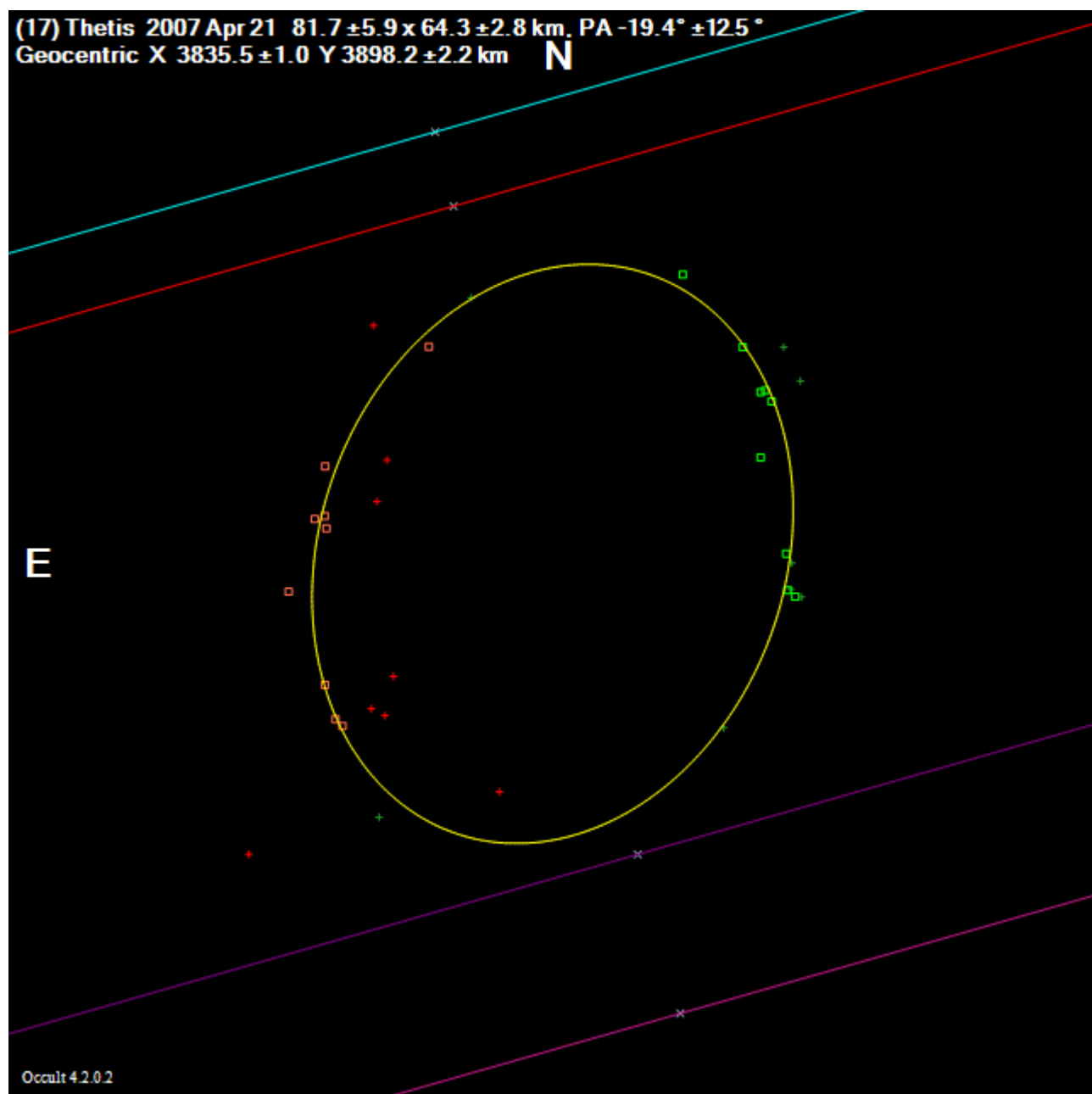
179klytaemnestra2003jun08

(179) Klytaemnestra 2003 Jun 8 $88.4 \pm 1.4 \times 56.6 \pm 2.7$ km, PA $-17.8^\circ \pm 3.2^\circ$
Geocentric X 3912.6 ± 0.8 Y 4350.2 ± 0.8 km **N**

E

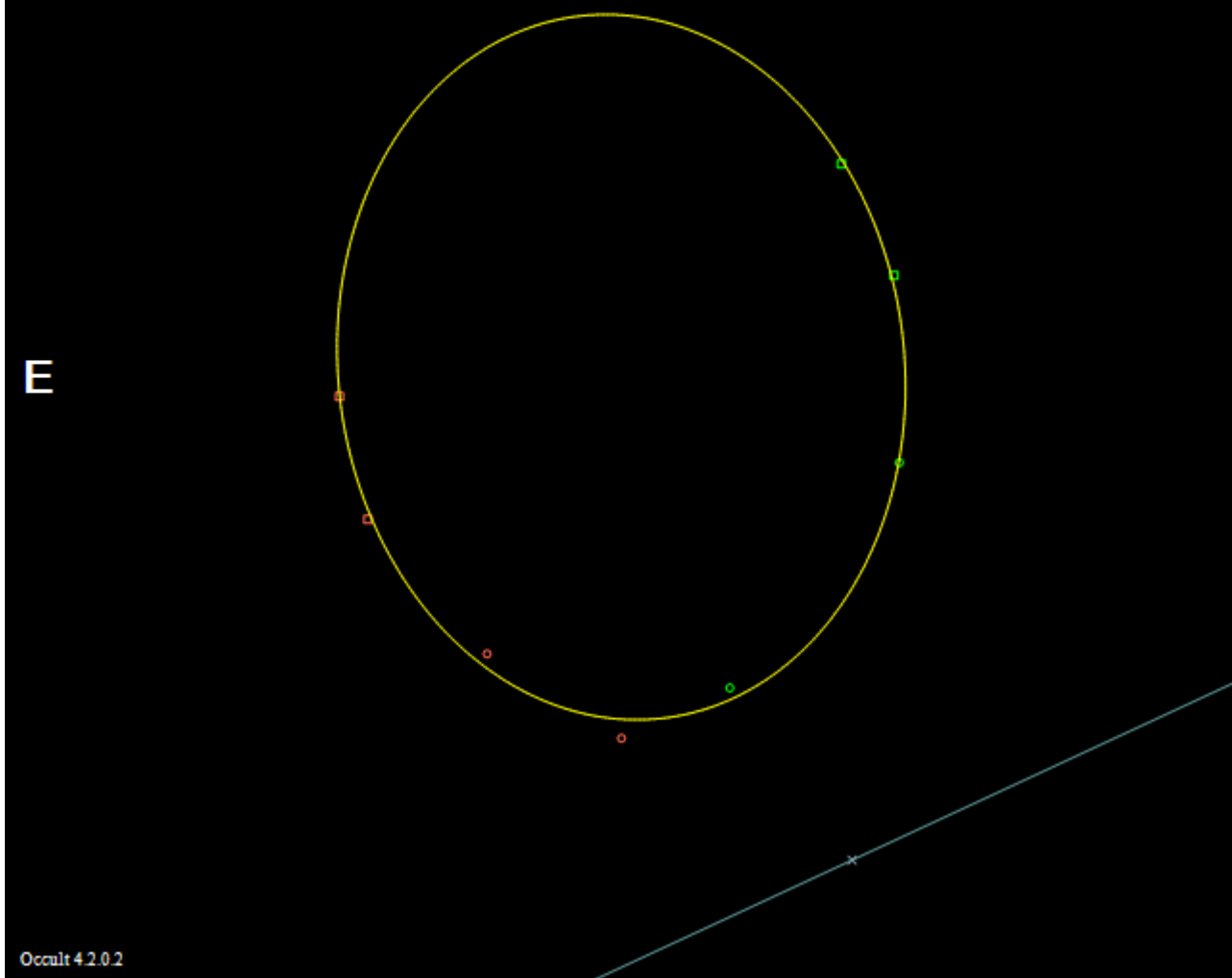


17thetis2007apr21



17thetis2011apr22

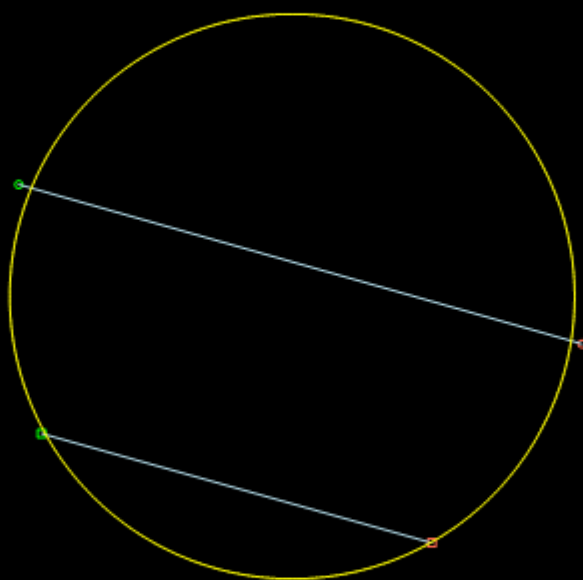
(17) Thetis 2011 Apr 22 $78.6 \pm 2.2 \times 62.9 \pm 0.5$ km, PA $7.0^\circ \pm 3.1^\circ$
Geocentric X 4808.7 ± 0.4 Y 3556.2 ± 0.9 km **N**



185eunike2015jun13

(185) Eunike 2015 Jun 13 168.0 x 168.0 km. PA 0.0°
Geocentric X -1010.0 ± 1.0 Y 4015.0 ± 1.5 km **N**

E



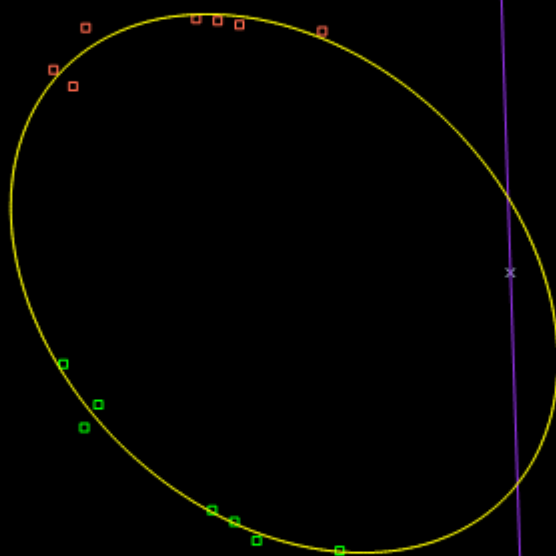
1867deiphobus2007may13

(1867) Deiphobus 2007 May 13 $145.8 \pm 4.4 \times 108.8 \pm 3.9$ km, PA $46.6^\circ \pm 4.8^\circ$
Geocentric X 391.5 ± 1.8 Y 5446.8 ± 1.6 km

N

E

Occult 4.2.0.2



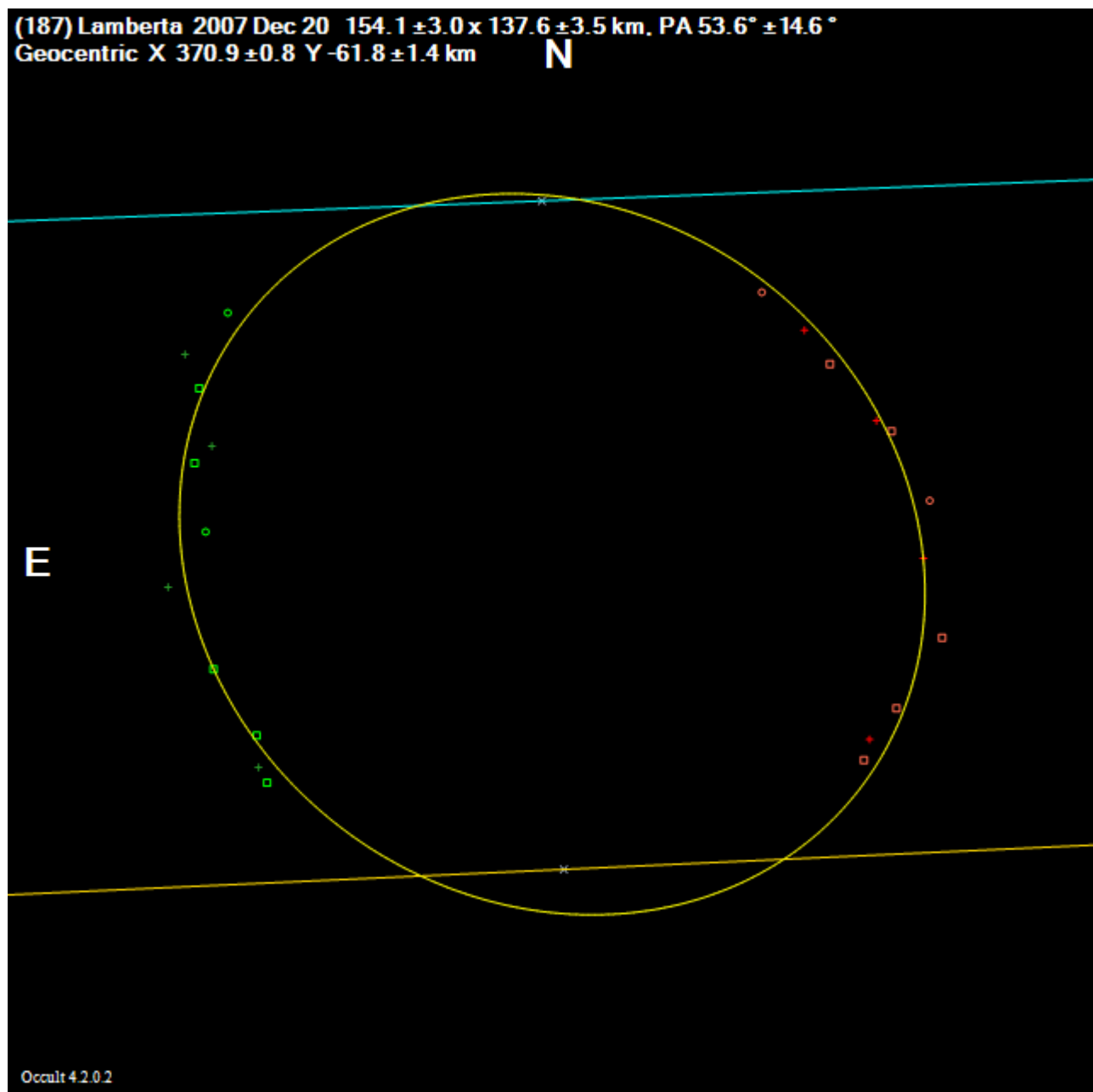
187lamberta2007dec20

(187) Lamberta 2007 Dec 20 $154.1 \pm 3.0 \times 137.6 \pm 3.5$ km, PA $53.6^\circ \pm 14.6^\circ$
Geocentric X 370.9 ± 0.8 Y -61.8 ± 1.4 km

N

E

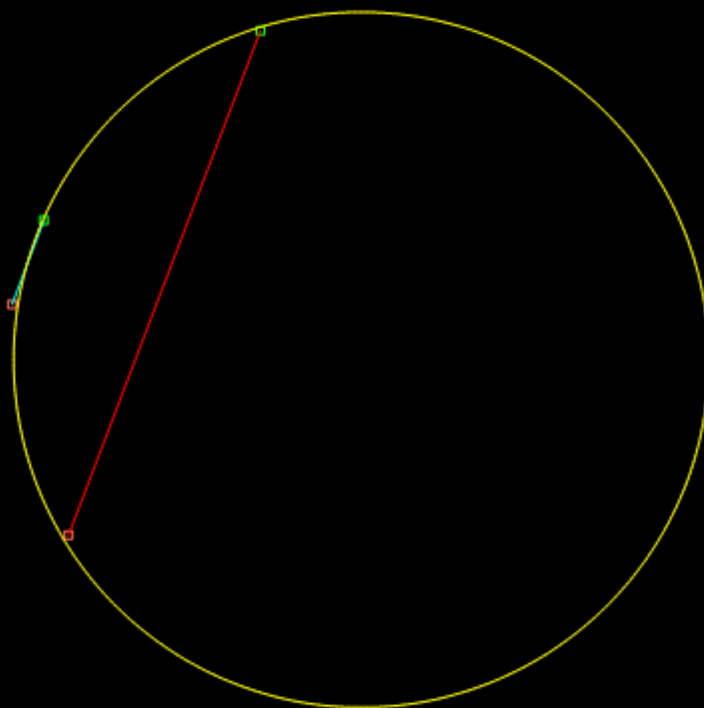
Occult 4.2.0.2



189phthia2012oct17

(189) Phthia 2012 Oct 17 38.0 x 38.0 km, PA 0.0°
Geocentric X 3227.0 ± 0.2 Y -2353.0 ± 0.2 km **N**

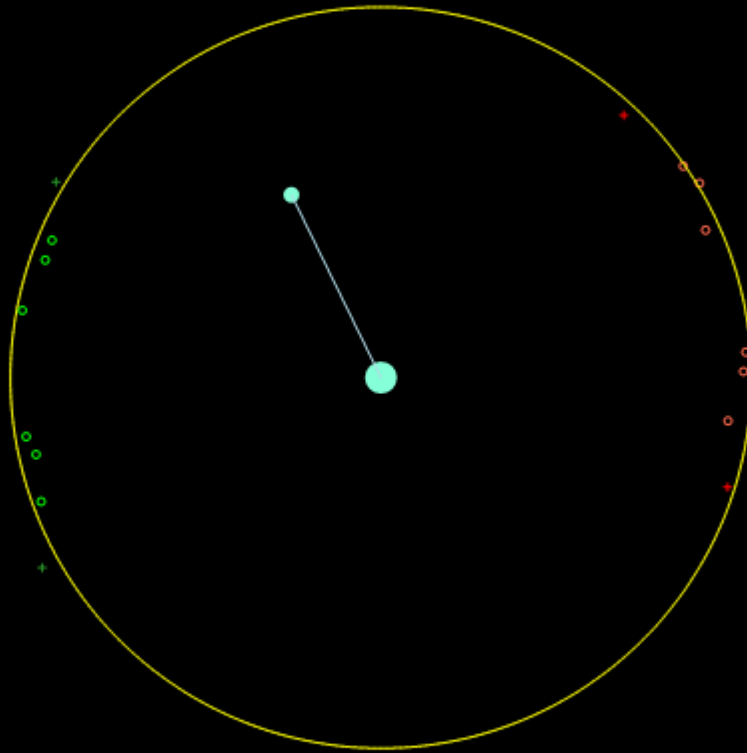
E



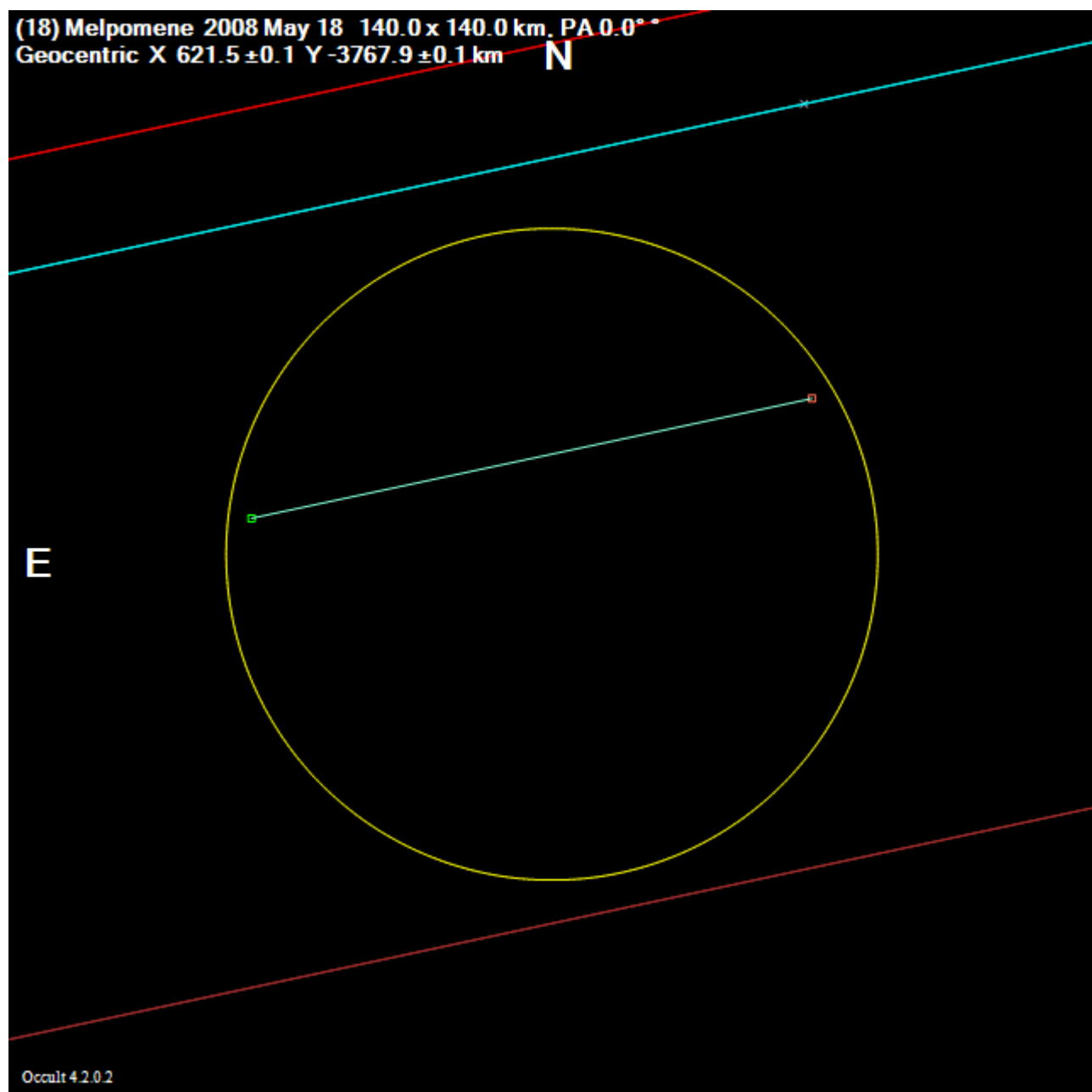
18melpomene1978dec11

(18) Melpomene 1978 Dec 11 $135.0 \pm 9.4 \times 135.0$ km, PA 0.0° °
Geocentric X 3354.6 ± 0.7 Y 3528.6 ± 2.5 km **N**
Double : Sep $0.0459 \pm 0.0037''$, PA $26.1^\circ \pm 2.5^\circ$

E



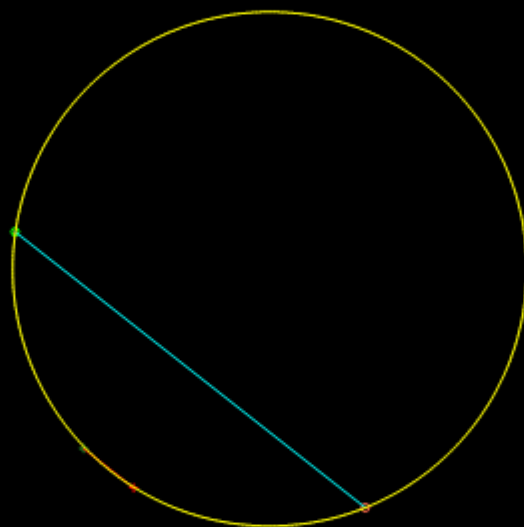
18melpomene2008may18



1903adzhimushkaj2004aug21

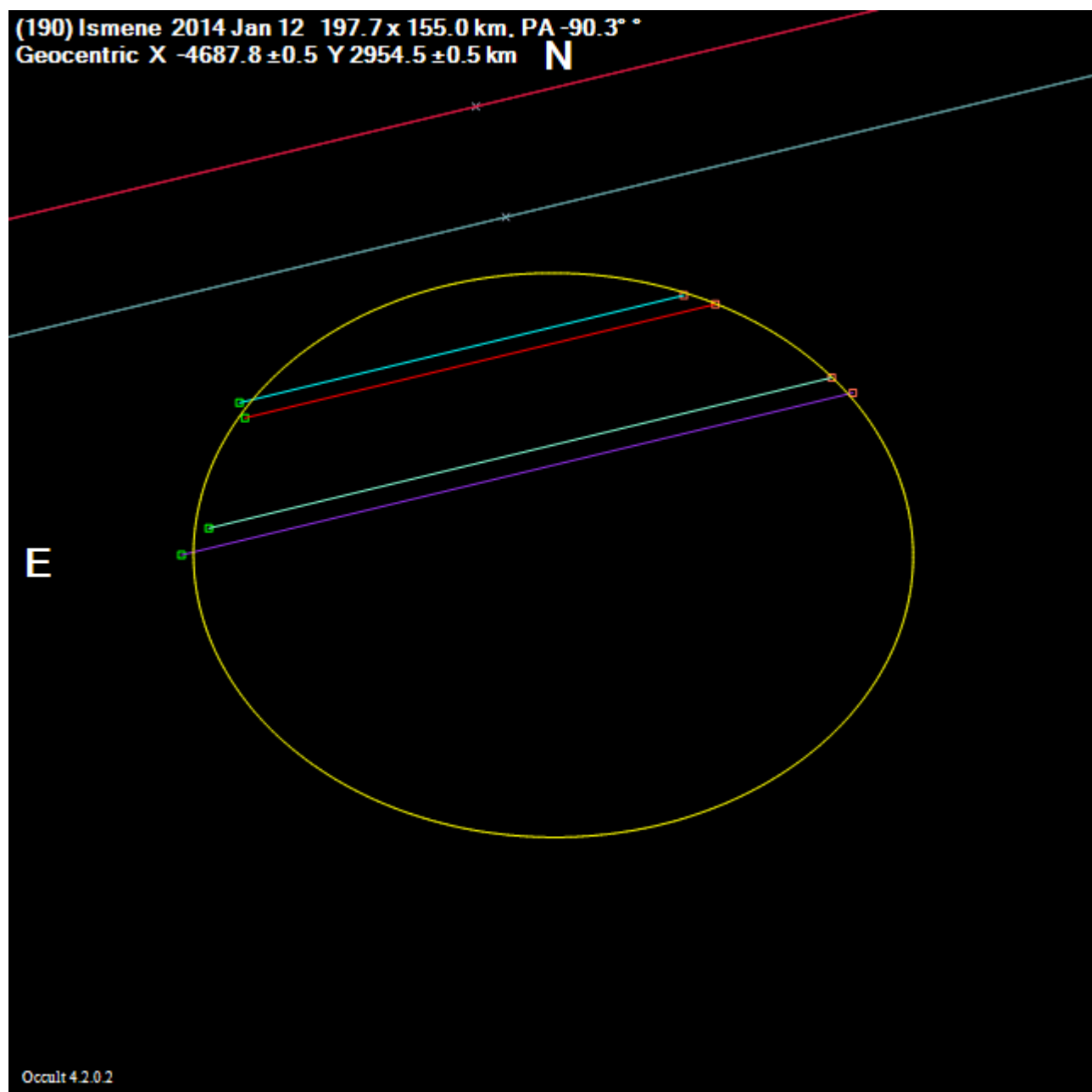
(1903) Adzhimushkaj 2004 Aug 21 $19.4 \pm 0.3 \times 19.4$ km, PA 0.0° °
Geocentric X -923.5 ± 0.0 Y 5249.1 ± 0.1 km **N**

E



190ismene2014jan12

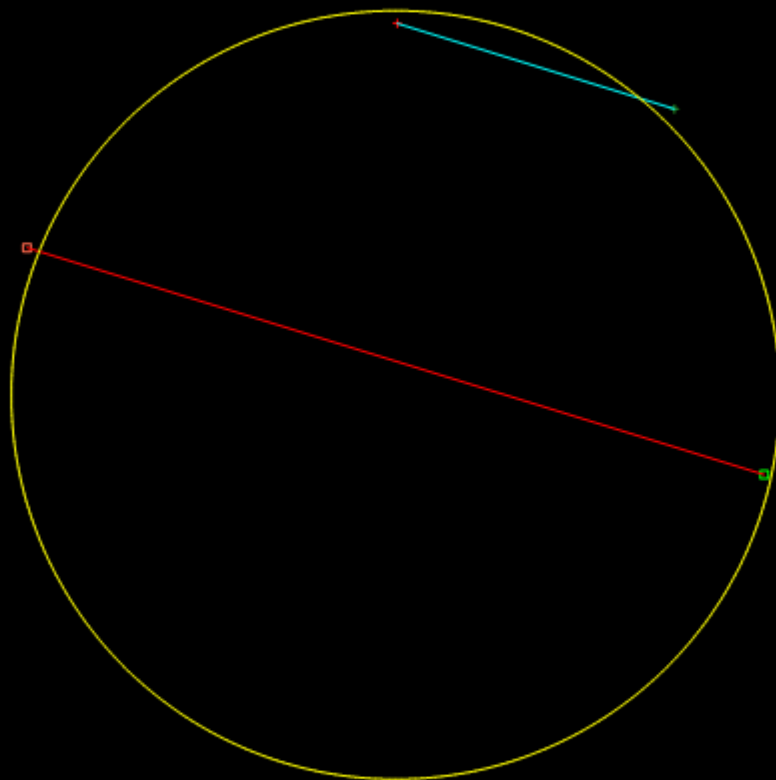
(190) Ismene 2014 Jan 12 197.7 x 155.0 km, PA -90.3° °
Geocentric X -4687.8 ±0.5 Y 2954.5 ±0.5 km **N**



191kolga2008mar26

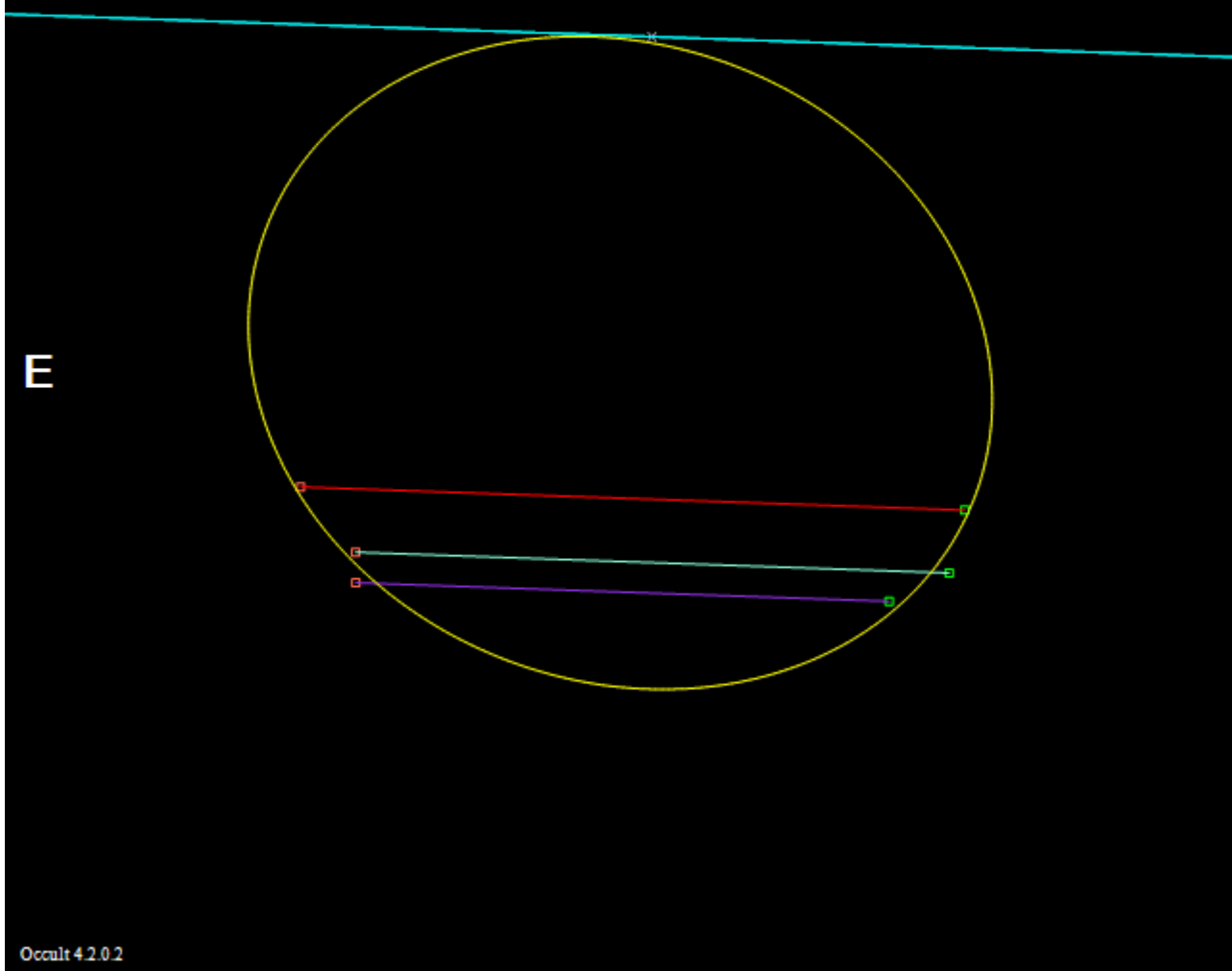
(191) Kolga 2008 Mar 26 101.0 x 101.0 km, PA 0.0°
Geocentric X 3199.5 ± 0.6 Y 2400.2 ± 1.2 km **N**

E



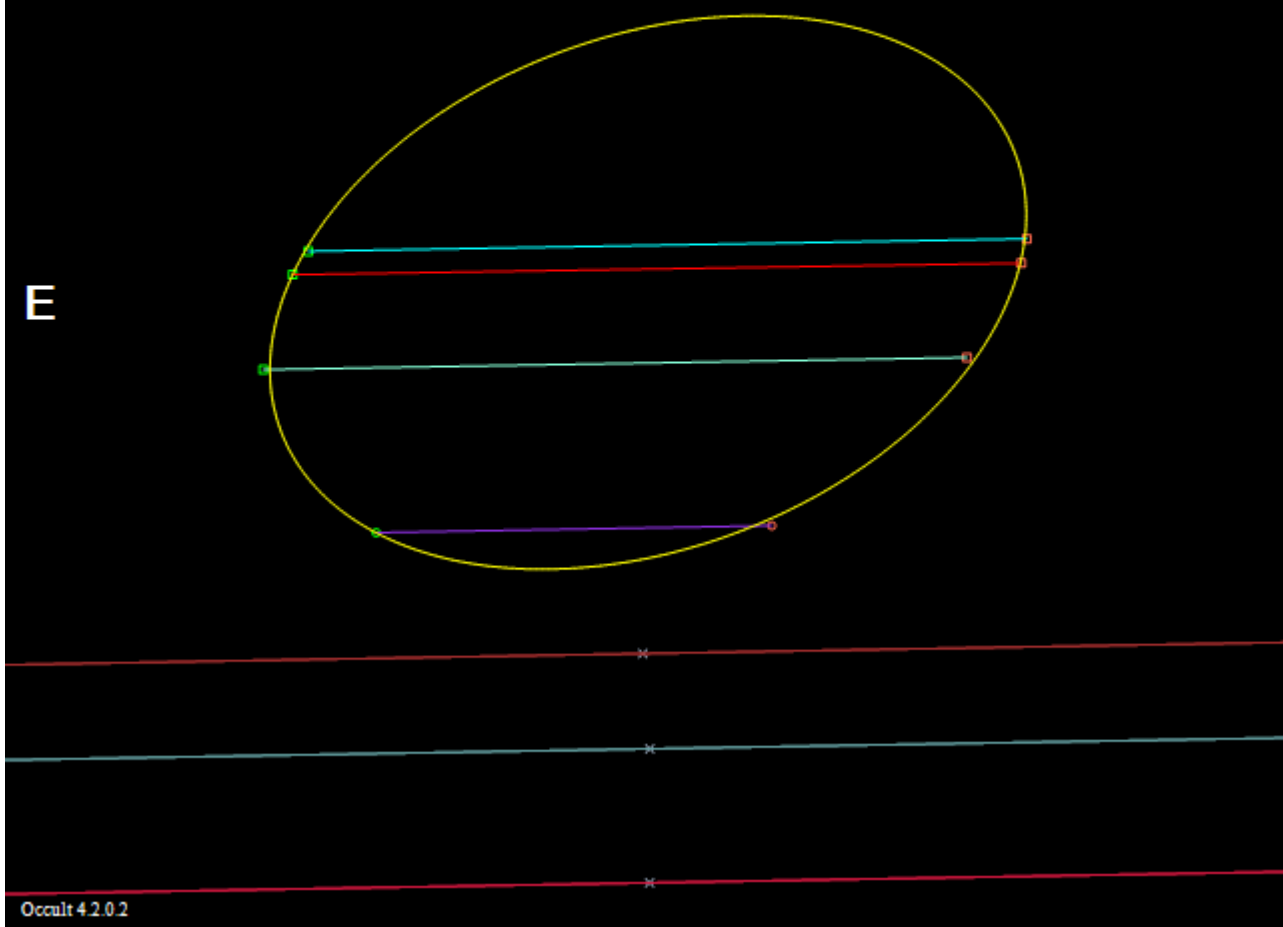
191kolga2010feb05

(191) Kolga 2010 Feb 5 $103.7 \pm 67.9 \times 87.1 \pm 137.8$ km, PA $69.4^\circ \pm 159.4^\circ$
Geocentric X -2726.1 ± 8.8 Y 4245.4 ± 70.3 km **N**



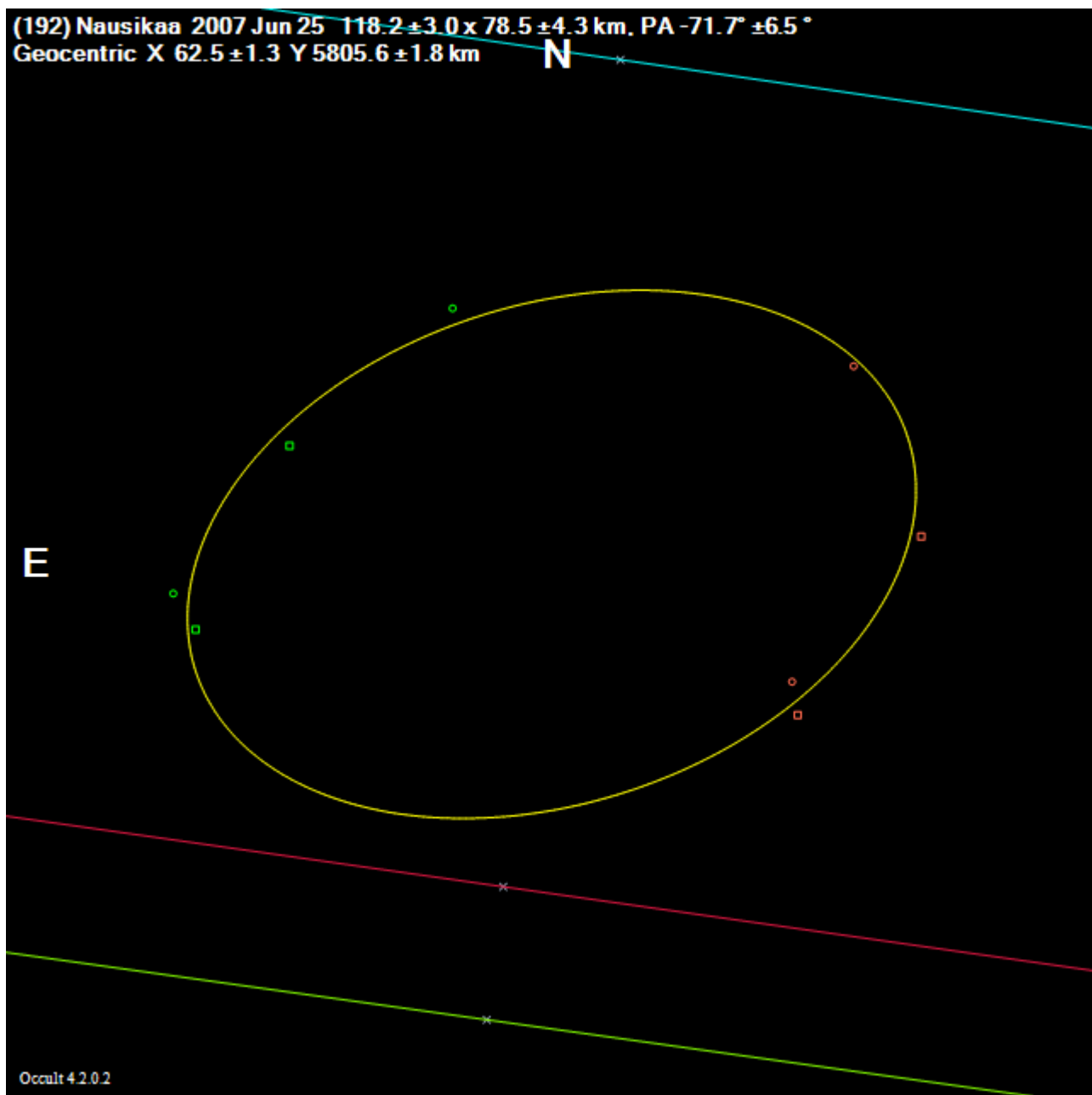
192nausikaa2007jul10

(192) Nausikaa 2007 Jul 10 $105.2 \pm 0.7 \times 68.6 \pm 1.3$ km, PA $-69.3^\circ \pm 1.4^\circ$
Geocentric X -1317.3 ± 0.3 Y 5668.0 ± 0.6 km **N**

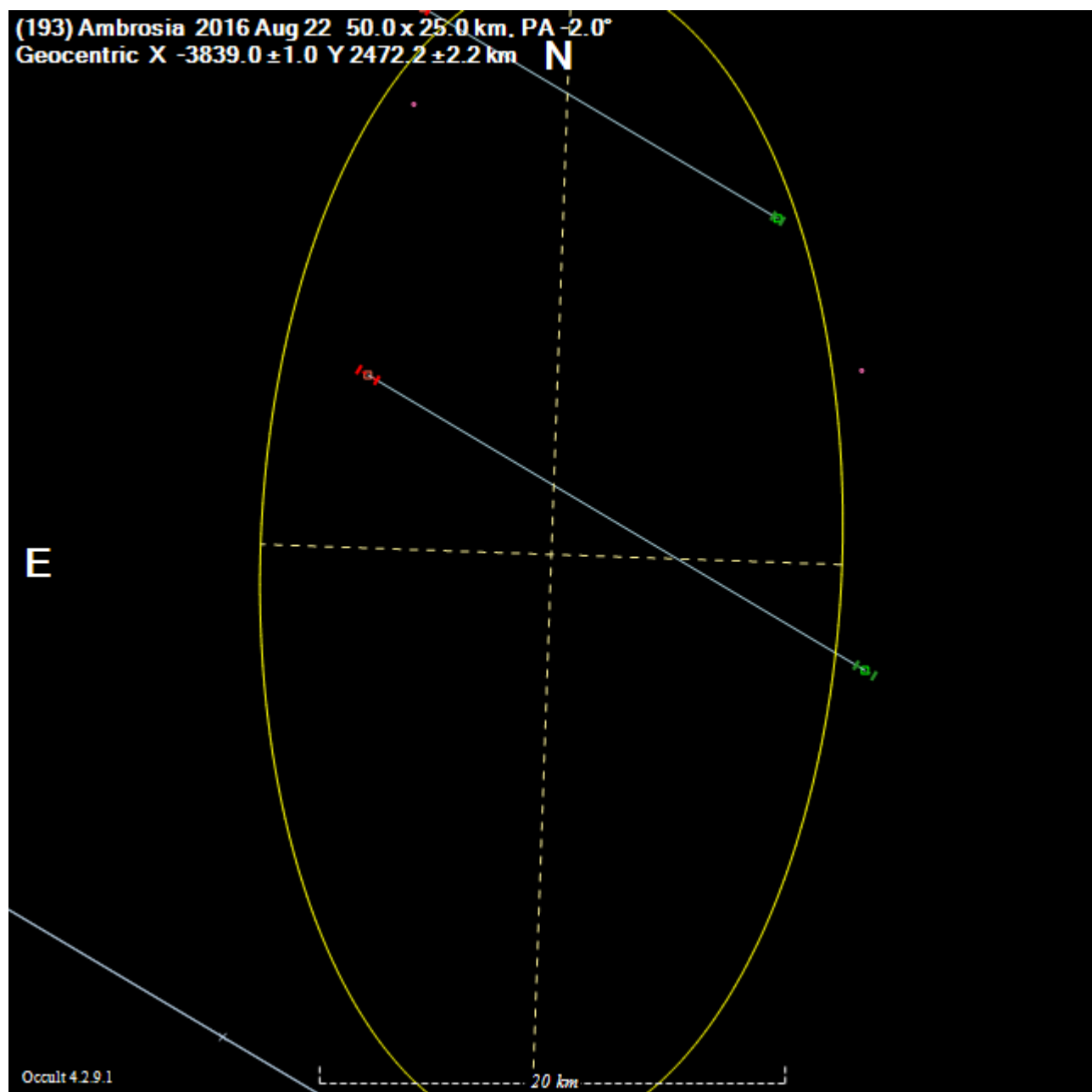


192nausikaa2007jun25

(192) Nausikaa 2007 Jun 25 $118.2 \pm 3.0 \times 78.5 \pm 4.3$ km, PA $-71.7^\circ \pm 6.5^\circ$
Geocentric X 62.5 ± 1.3 Y 5805.6 ± 1.8 km

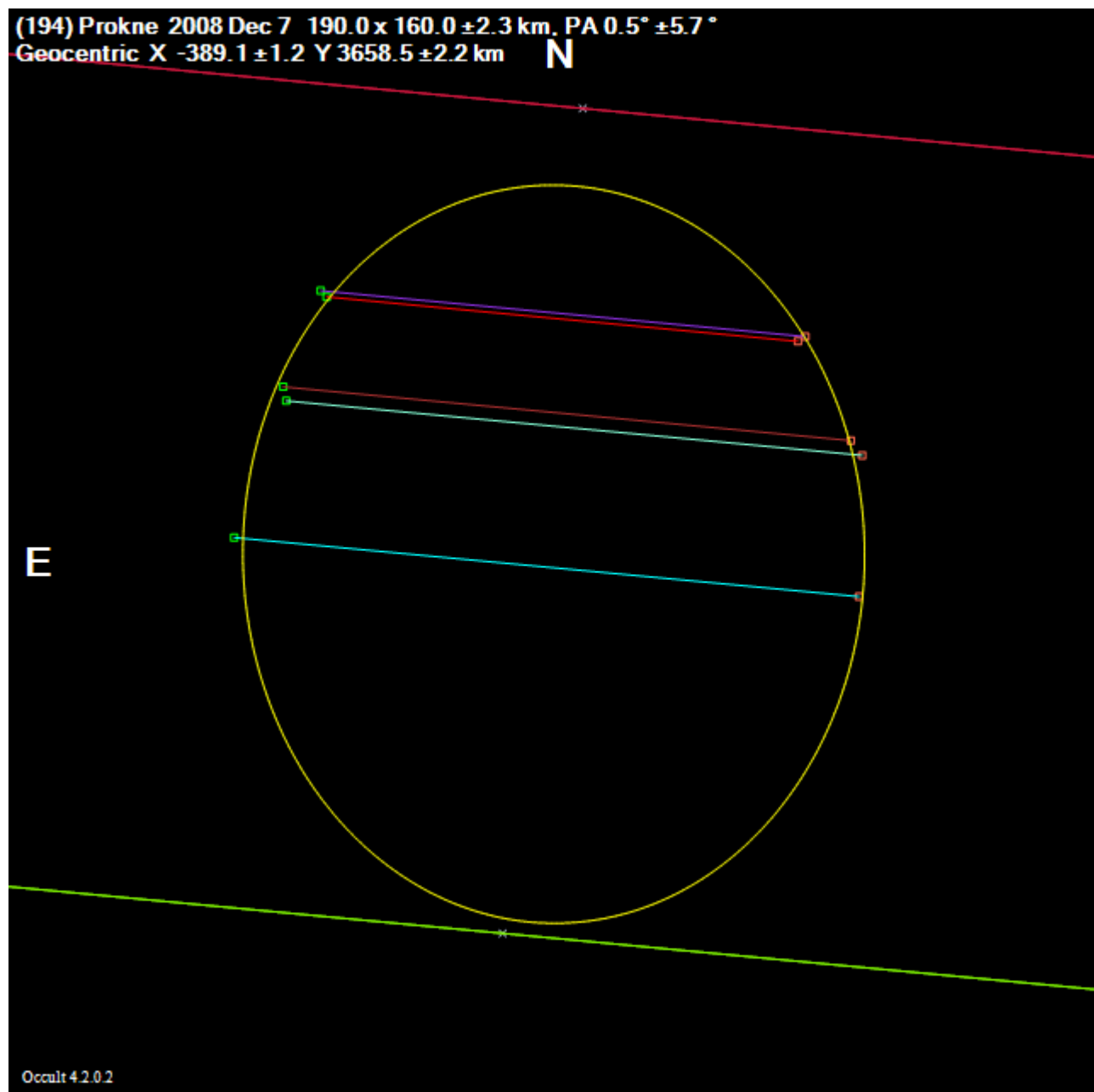


193Ambrosia2016Aug22



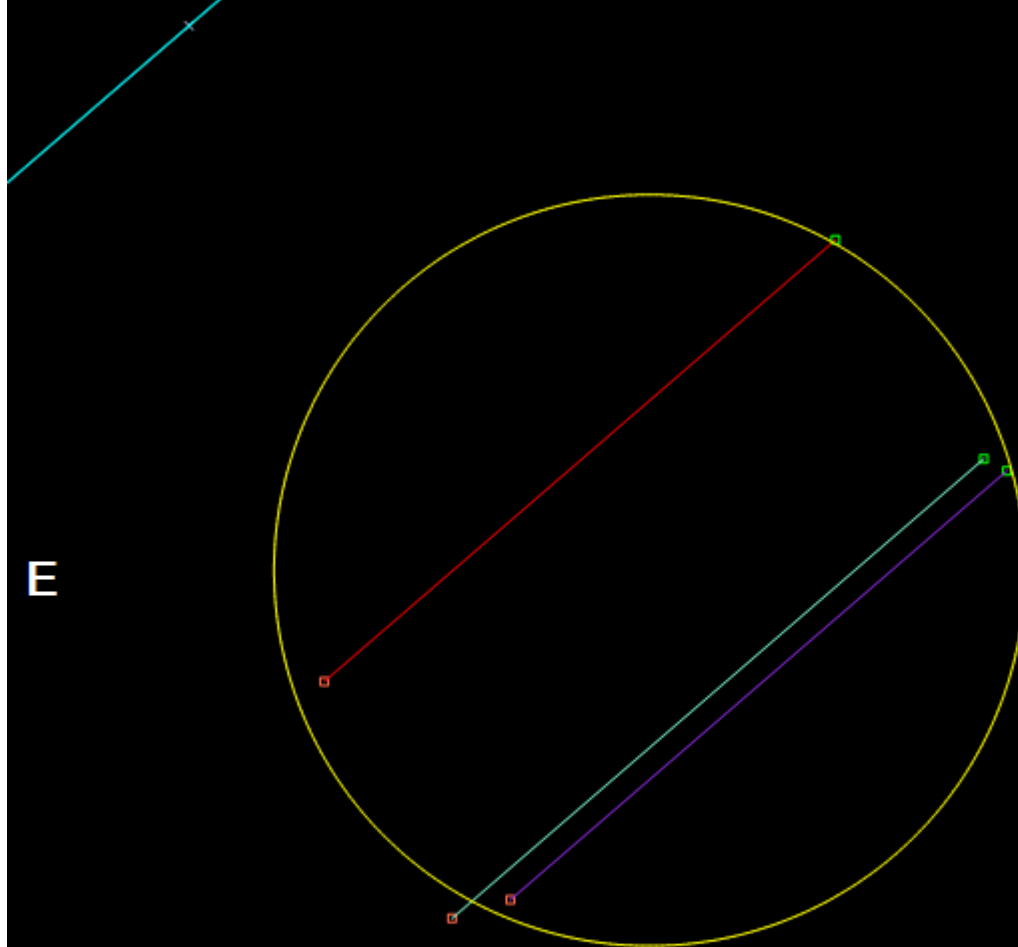
194prokne2008dec07

(194) Prokne 2008 Dec 7 $190.0 \times 160.0 \pm 2.3$ km, PA $0.5^\circ \pm 5.7^\circ$
Geocentric X -389.1 ± 1.2 Y 3658.5 ± 2.2 km **N**



194prokne2008oct19

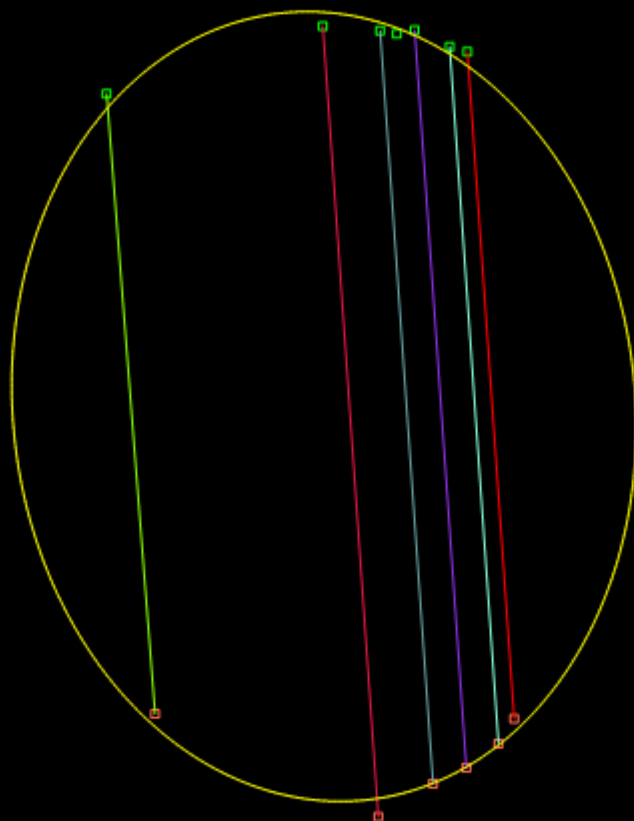
(194) Prokne 2008 Oct 19 $164.2 \pm 3.2 \times 164.2$ km, PA 0.0° °
Geocentric X 211.0 ± 1.6 Y 3682.5 ± 1.9 km **N**



194prokne2011aug06

(194) Prokne 2011 Aug 6 $173.0 \pm 1.2 \times 136.0 \pm 3.4$ km, PA $6.3^\circ \pm 1.4^\circ$
Geocentric X 2560.6 ± 0.7 Y 4036.4 ± 0.4 km **N**

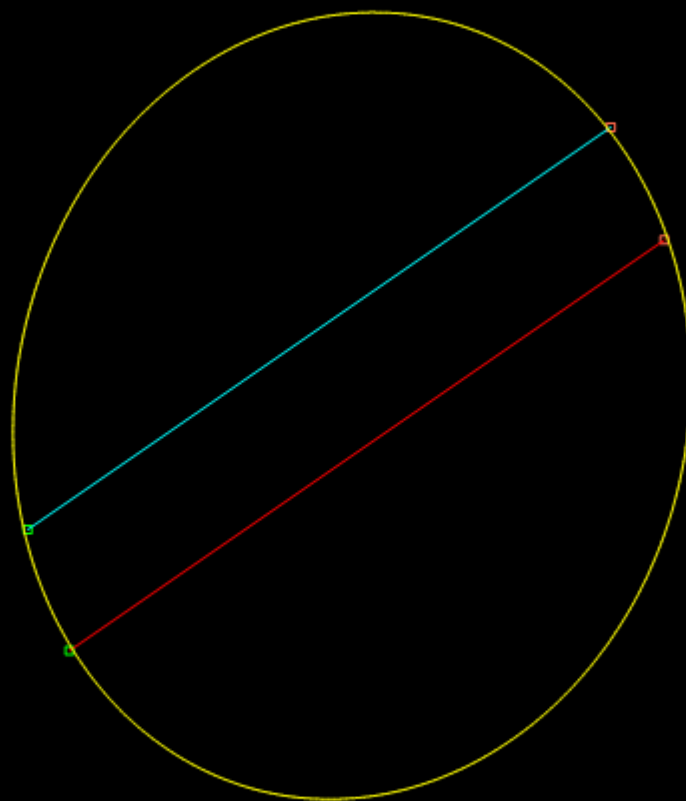
E



194prokne2011jun01

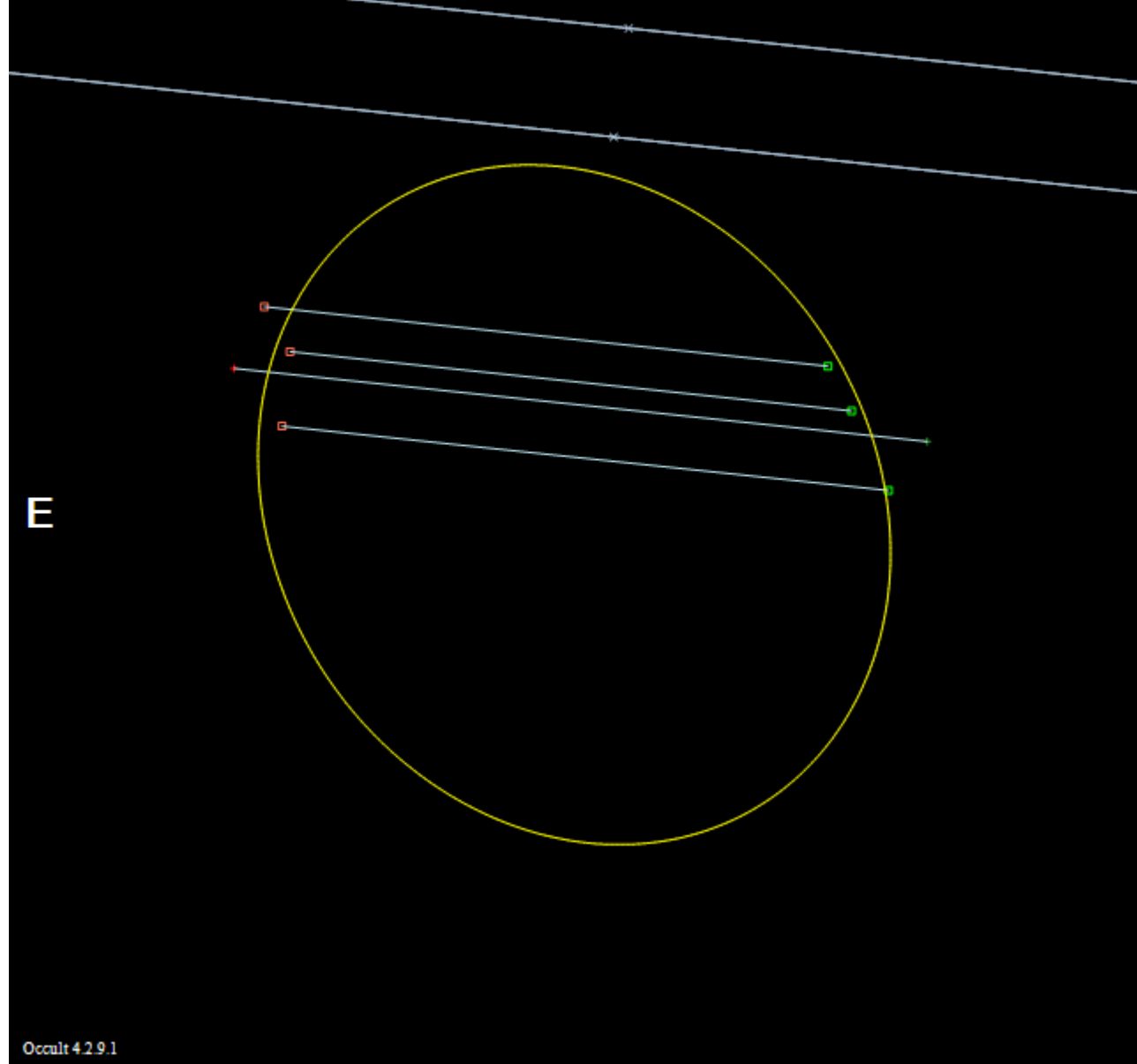
(194) Prokne 2011 Jun 1 173.0 x 147.0 km. PA $-11.9^\circ \pm 1.9^\circ$
Geocentric X -1666.5 ± 1.0 Y -4080.6 ± 2.1 km **N**

E



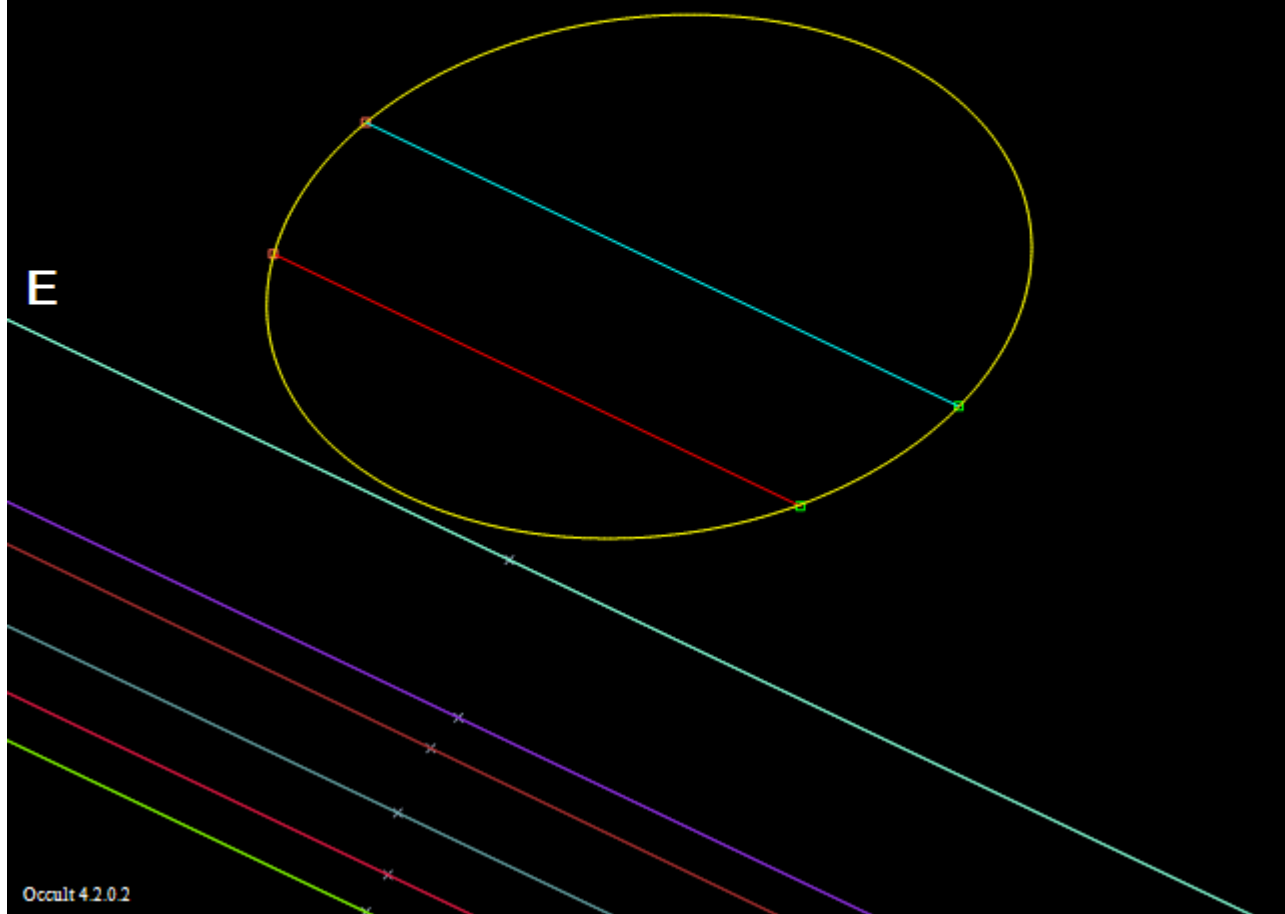
194prokne2015jan28

(194) Prokne 2015 Jan 28 176.0 x 150.0 km. PA $31.6^\circ \pm 22.9^\circ$
Geocentric X -4511.8 ± 3.0 Y 3345.9 ± 10.9 km **N**



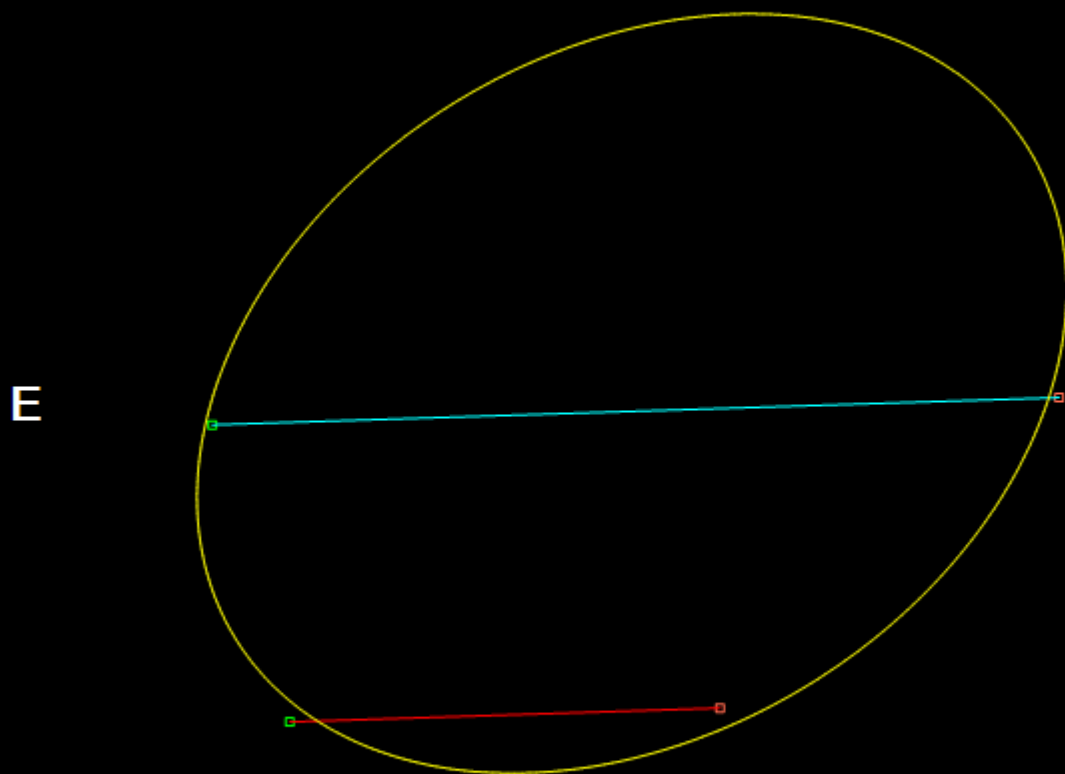
1963bezovec2009jan09

(1963) Bezovec 2009 Jan 9 50.3 x 33.9 km, PA 97.8° ± 0.1°
Geocentric X -968.3 ± 0.0 Y 1819.0 ± 0.0 km **N**



196philomela2014dec18

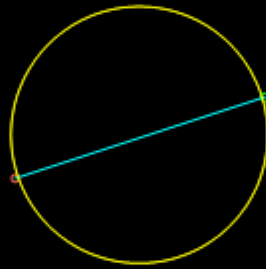
(196) Philomela 2014 Dec 18 171.0 x 125.0 km, PA -58.2° ± 4.2°
Geocentric X 4172.3 ± 1.6 Y -4644.3 ± 2.1 km **N**



197arete2009apr21

(197) Arete 2009 Apr 21 40.0 x 40.0 km. PA 0.0°°
Geocentric X 3899.2 ± 0.5 Y 4112.8 ± 1.4 km **N**

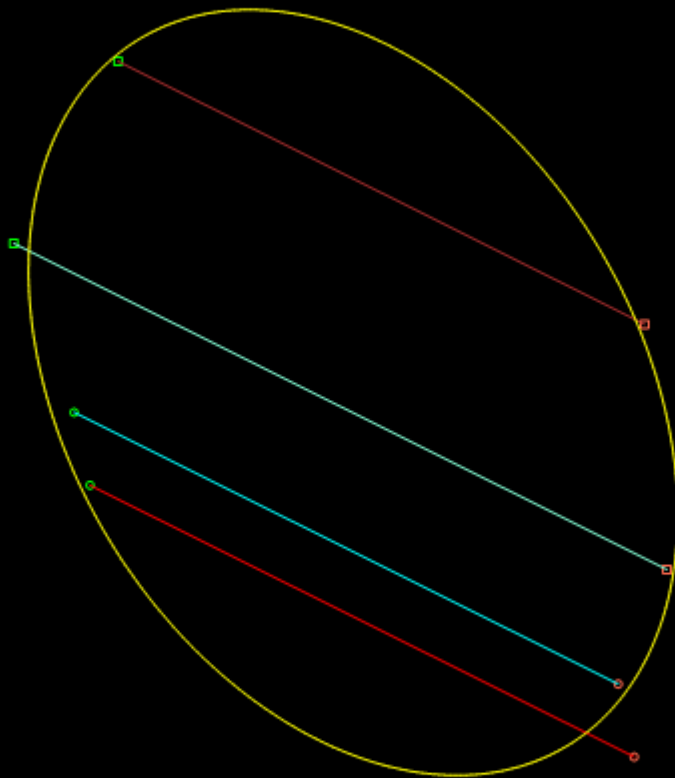
E



198ampella2011dec29

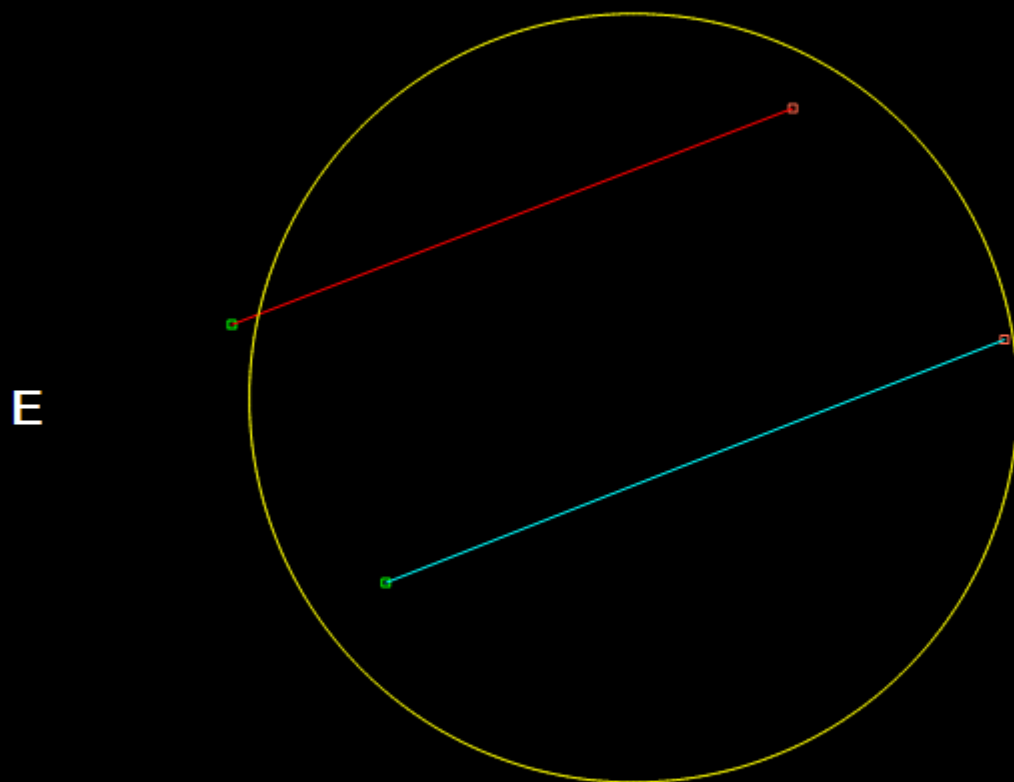
(198) Ampella 2011 Dec 29 $64.5 \pm 2.8 \times 44.5 \pm 2.7$ km, PA $31.3^\circ \pm 9.1^\circ$
Geocentric X 3828.2 ± 0.6 Y 3287.0 ± 1.4 km **N**

E



198ampella2014jun25

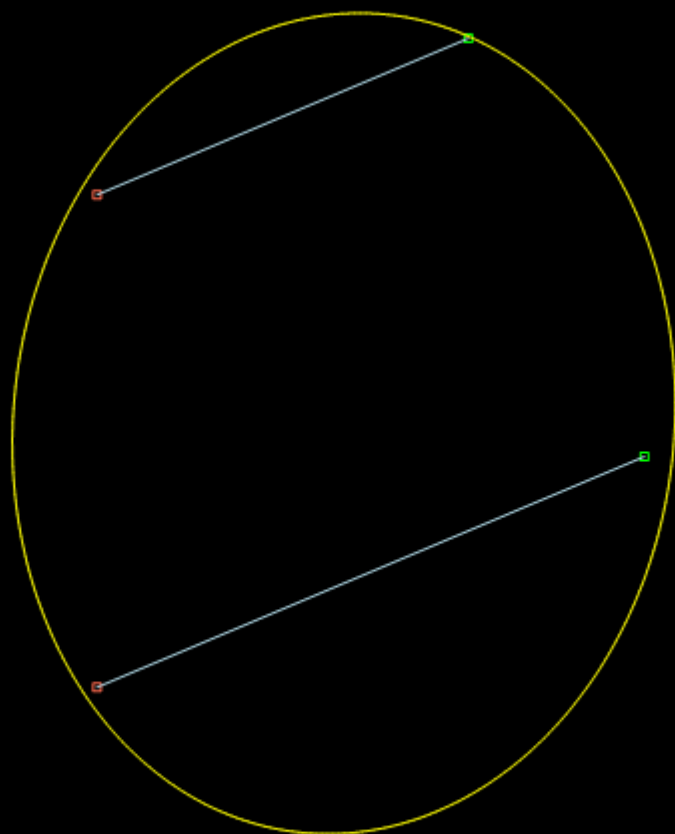
(198) Ampella 2014 Jun 25 60.0 x 60.0 km. PA 0.0°
Geocentric X 1977.9 ± 2.0 Y -721.3 ± 3.2 km N



198ampella2015oct22

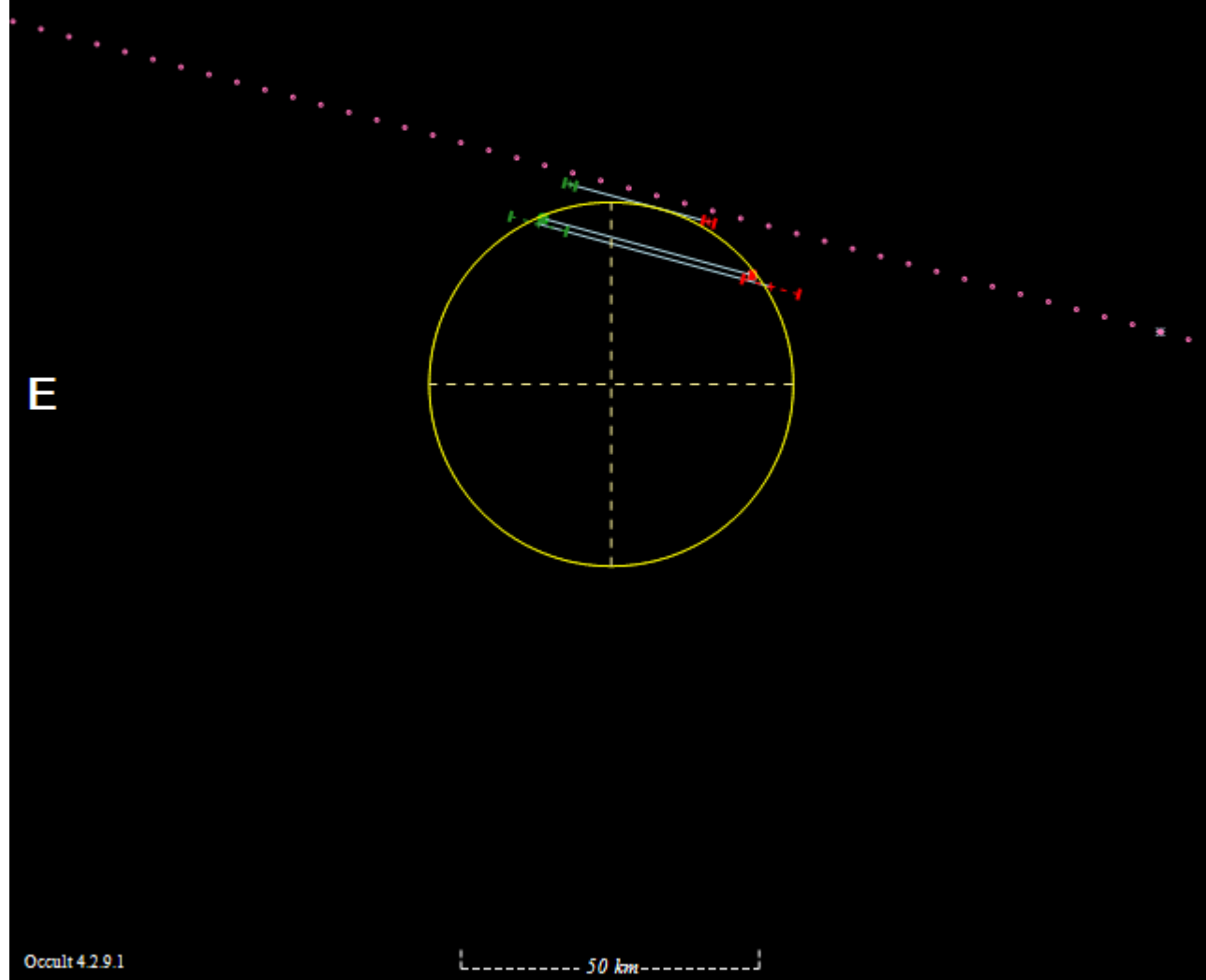
(198) Ampella 2015 Oct 22 61.0 x 49.0 km, PA $-6.3^\circ \pm 4.8^\circ$
Geocentric X -3933.9 ± 0.4 Y 2769.7 ± 0.6 km **N**

E



198Ampella2016Feb05

(198) Ampella 2016 Feb 5 61.0 x 61.0 km. PA 0.0°
Geocentric X 1792.9 ± 1.1 Y 2176.0 ± 0.8 km **N**



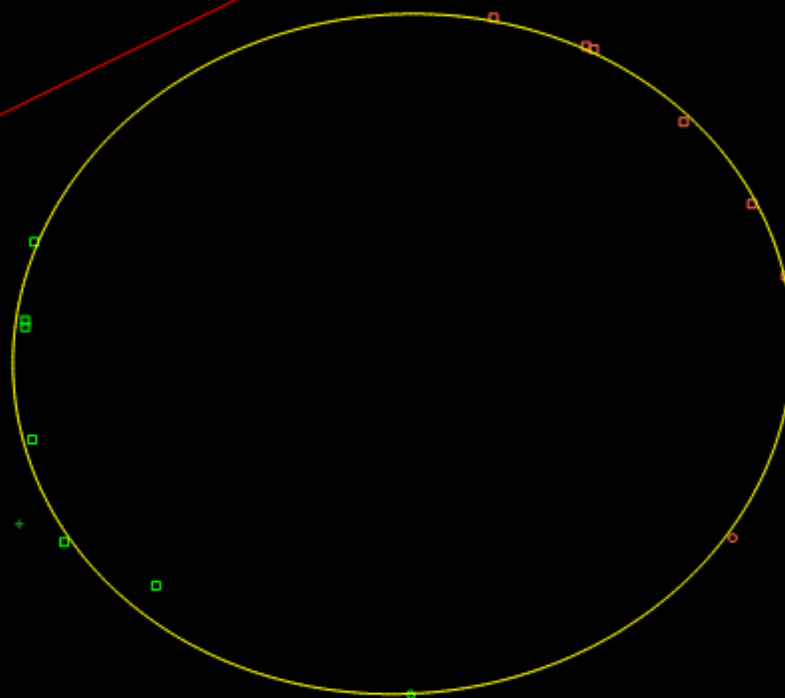
19fortuna2007apr13

(19) Fortuna 2007 Apr 13 $224.4 \pm 3.3 \times 195.3 \pm 5.2$ km, PA $-84.4^\circ \pm 6.5^\circ$
Geocentric X 2059.6 ± 1.5 Y 3653.0 ± 1.7 km

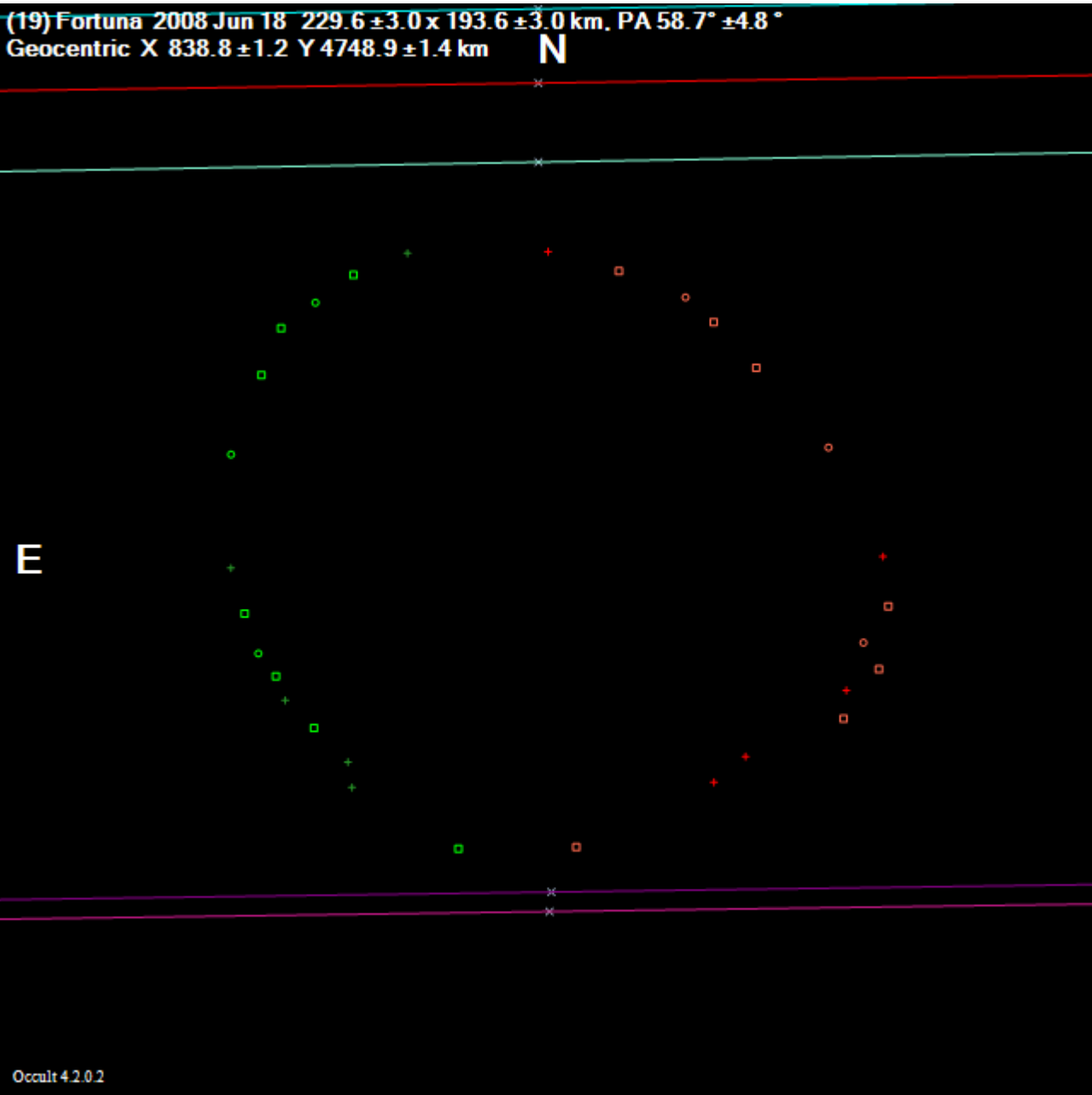
N

E

Occult 4.2.0.2

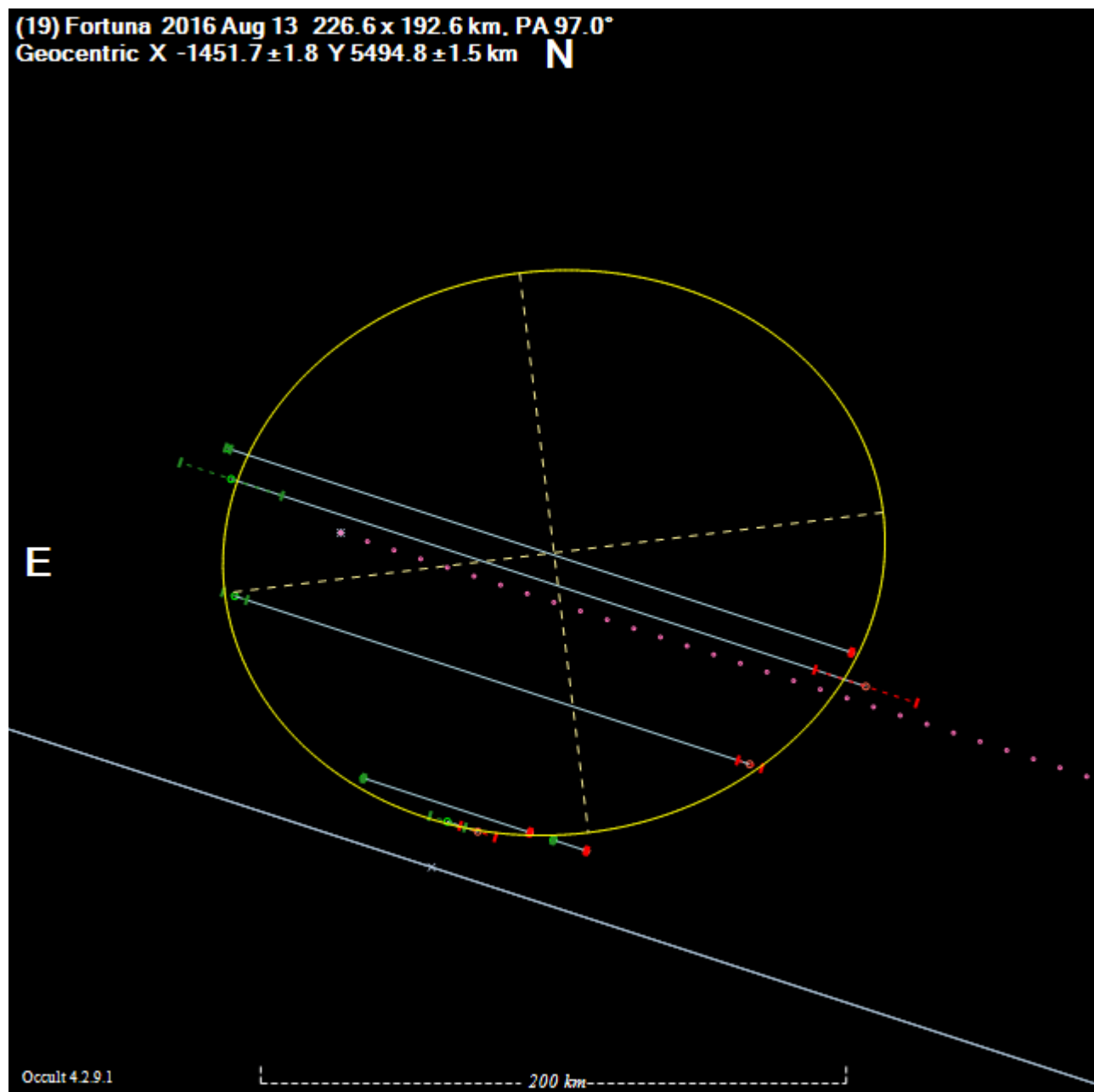


19fortuna2008jun18



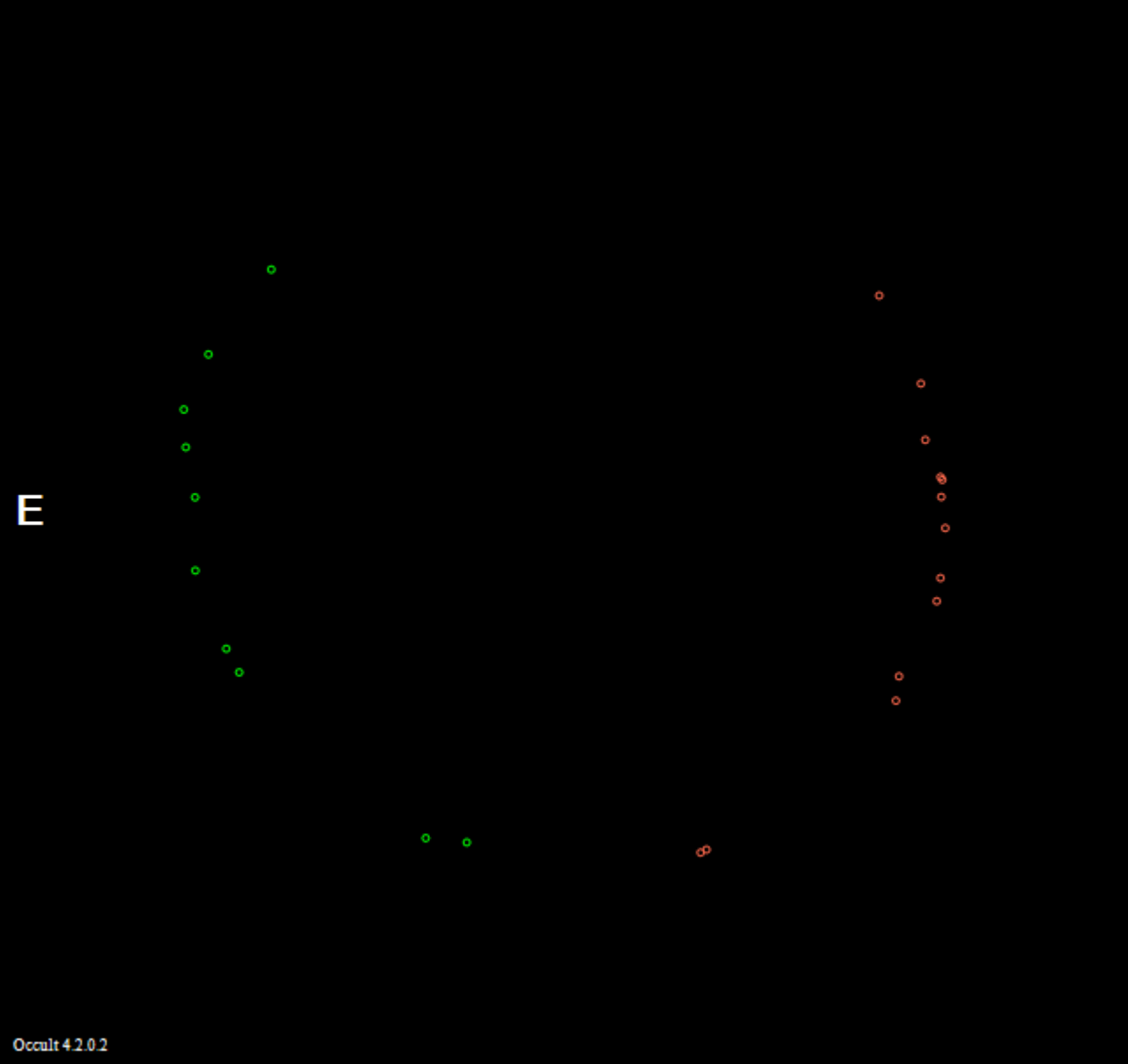
19Fortuna2016Aug13

(19) Fortuna 2016 Aug 13 226.6 x 192.6 km, PA 97.0°
Geocentric X -1451.7 ± 1.8 Y 5494.8 ± 1.5 km **N**



1ceres1984nov13

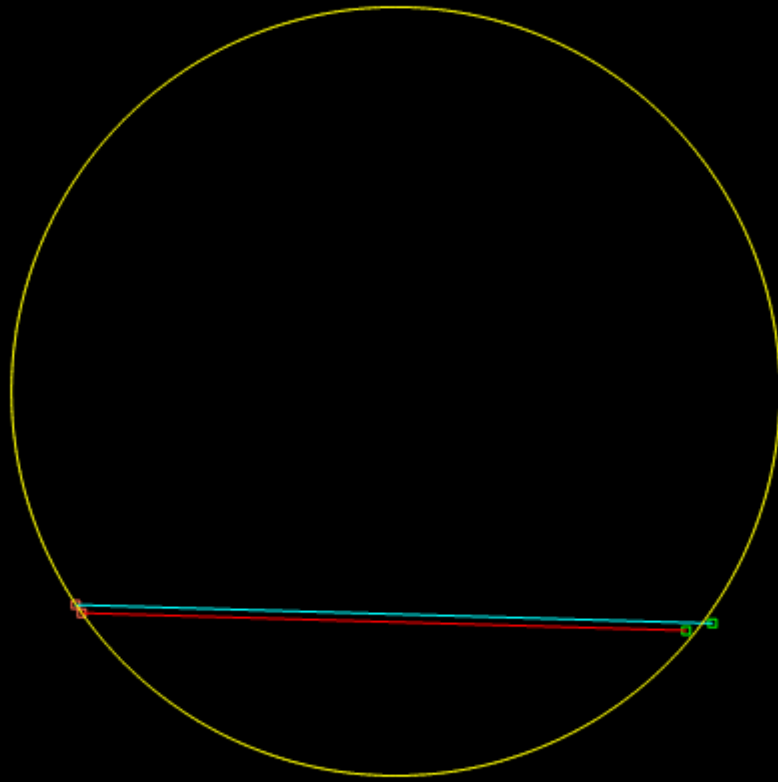
(1) Ceres 1984 Nov 13 959.5 ± 2.3 x 908.0 ± 4.2 km, PA 62.1° ± 3.0°
Geocentric X -123.4 ± 0.8 Y 1835.1 ± 1.9 km



1ceres2010oct30

(1) Ceres 2010 Oct 30 960.0 x 960.0 km. PA 0.0° °
Geocentric X 3634.0 ± 4.5 Y -2487.0 ± 6.1 km **N**

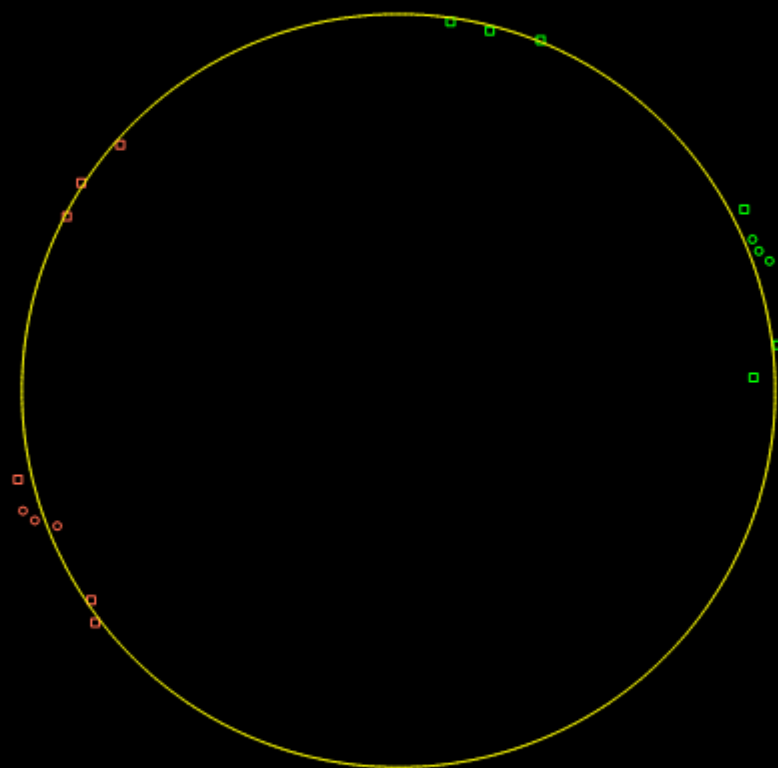
E



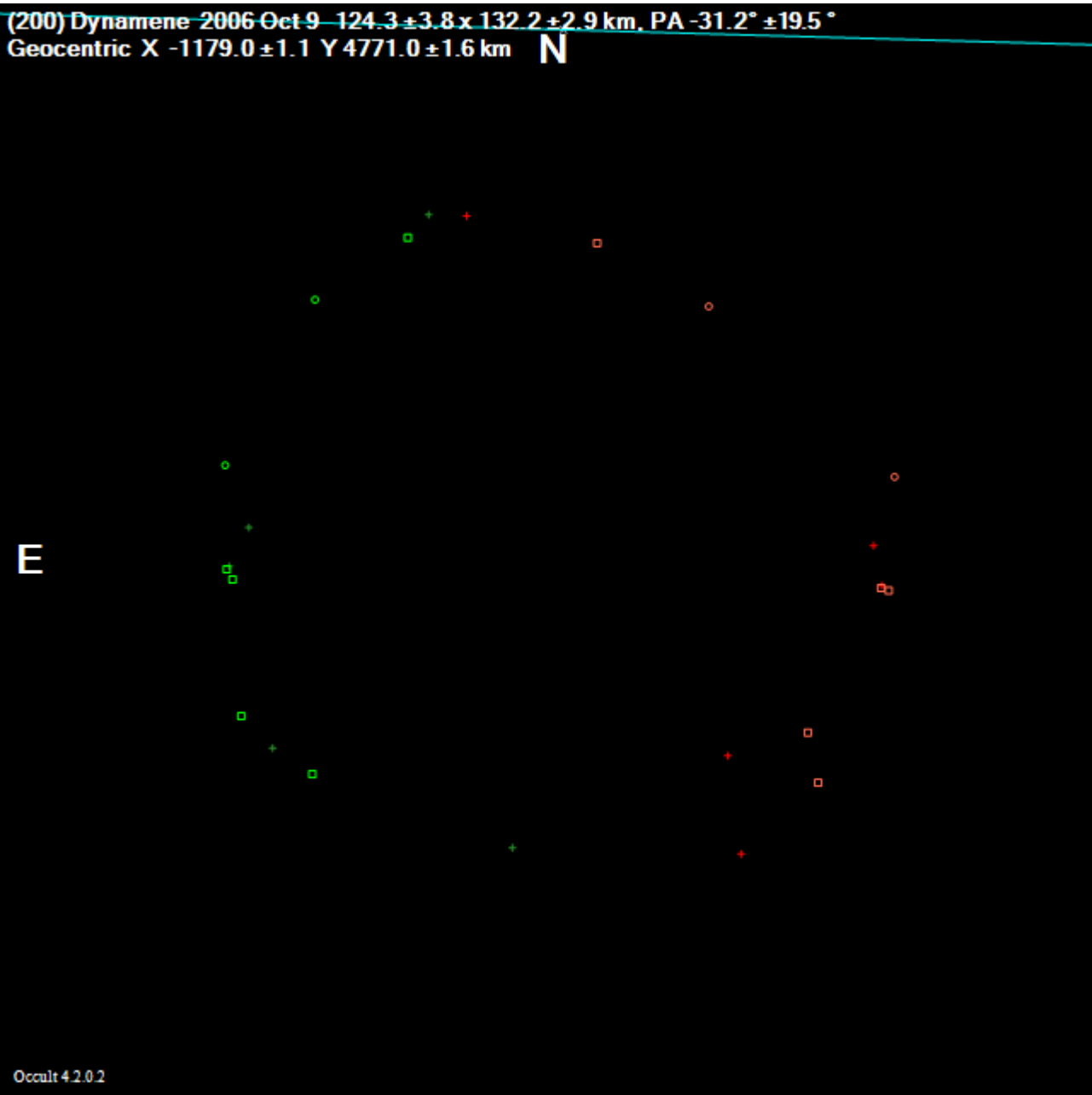
1ceres2013oct25

(1) Ceres 2013 Oct 25 $940.8 \pm 21.9 \times 940.8$ km, PA 0.0° °
Geocentric X -4780.6 ± 4.3 Y 3722.5 ± 9.1 km **N**

E



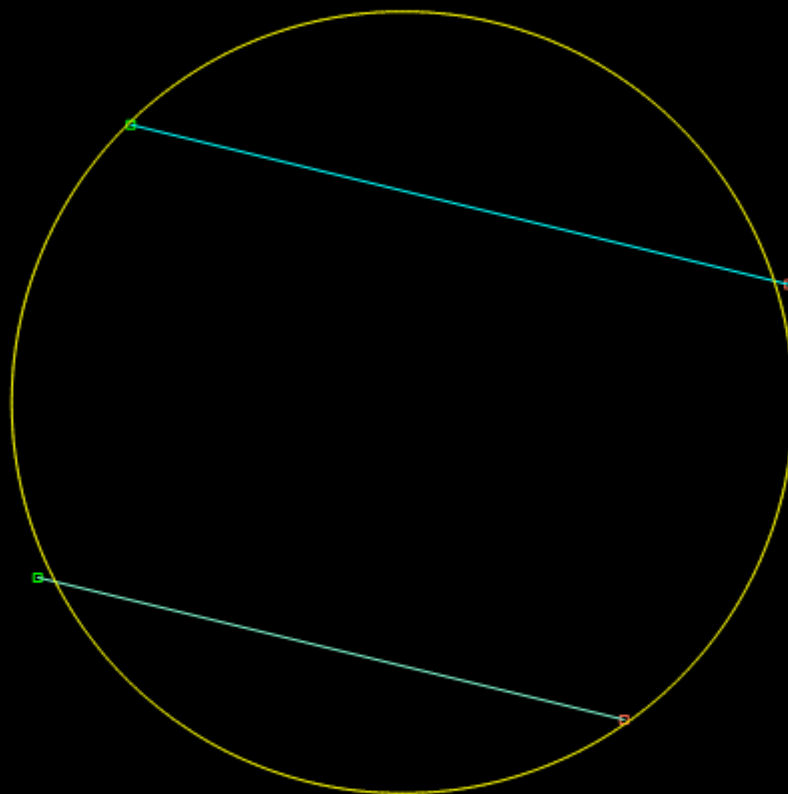
200dynamene2006oct09



200dynamene2008feb10

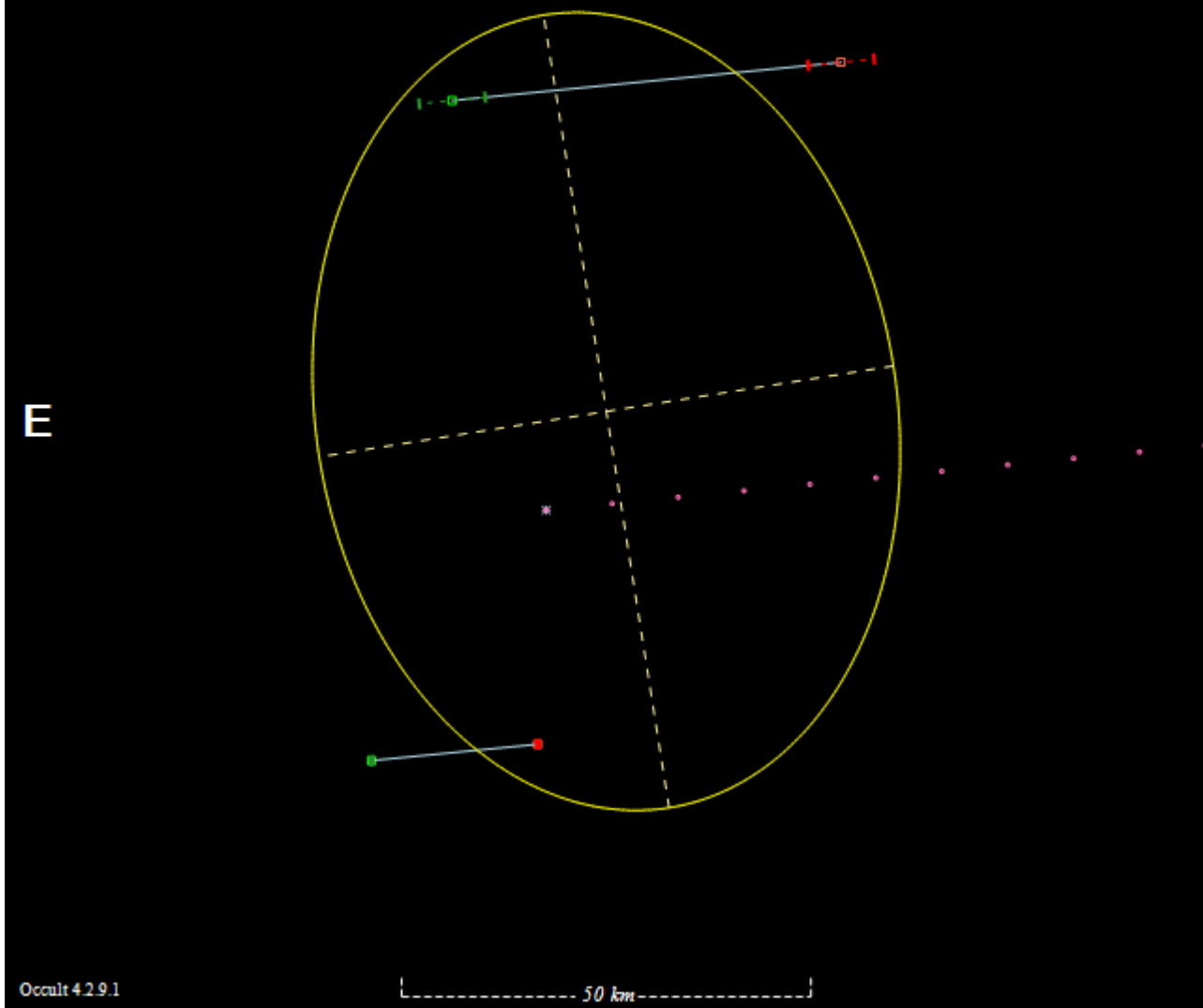
(200) Dynamene 2008 Feb 10 $130.2 \pm 1.6 \times 130.2$ km, PA 0.0°
Geocentric X -2038.1 ± 0.4 Y 1210.2 ± 0.6 km **N**

E



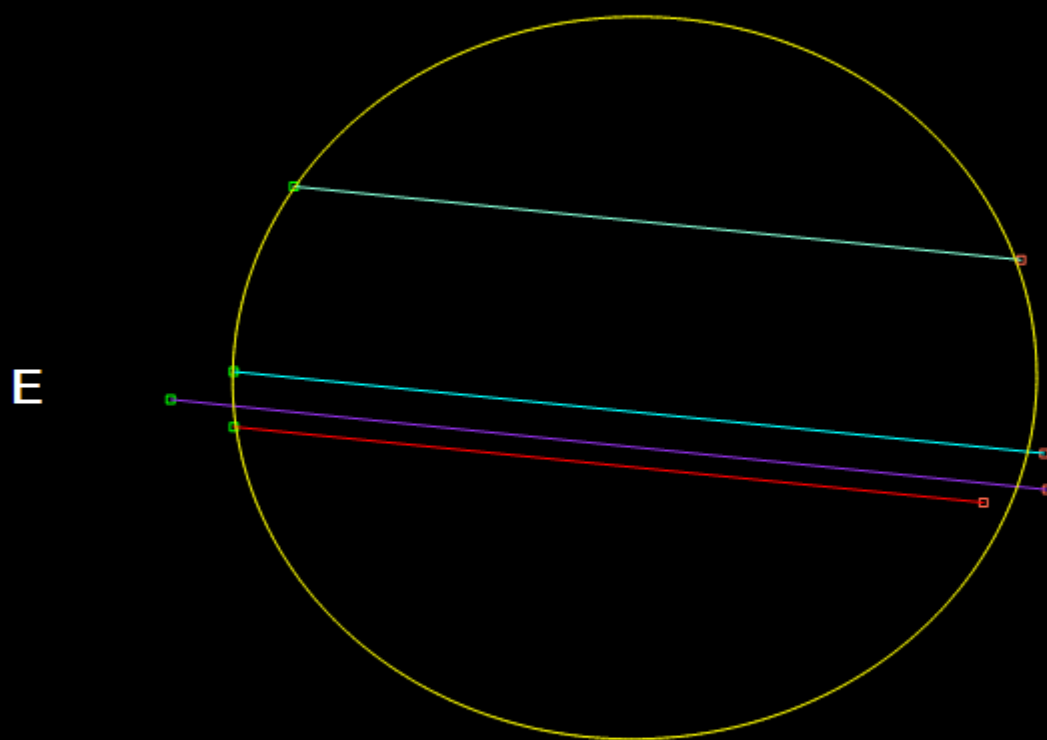
201Penelope2016Dec09

(201) Penelope 2016 Dec 9 98.0 x 71.0 km, PA 9.0°
Geocentric X 4180.6 ± 6.3 Y 3021.9 ± 5.6 km **N**



203pompeja2012jan08

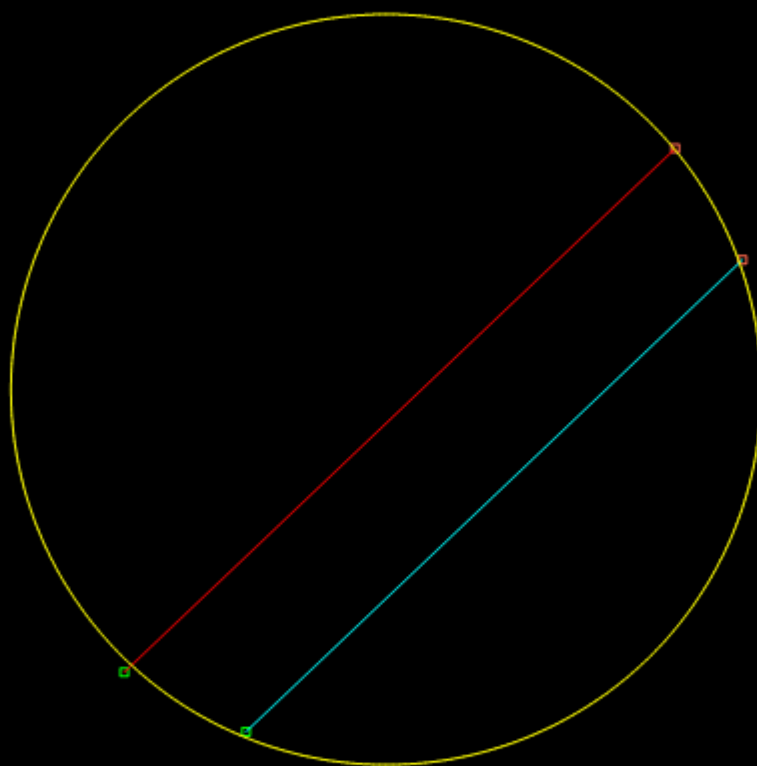
(203) Pompeja 2012 Jan 8 113.0 x 101.5 \pm 17.0 km, PA 91.8° °
Geocentric X -3035.8 \pm 1.4 Y 1998.9 \pm 4.2 km **N**



203pompeja2014aug20

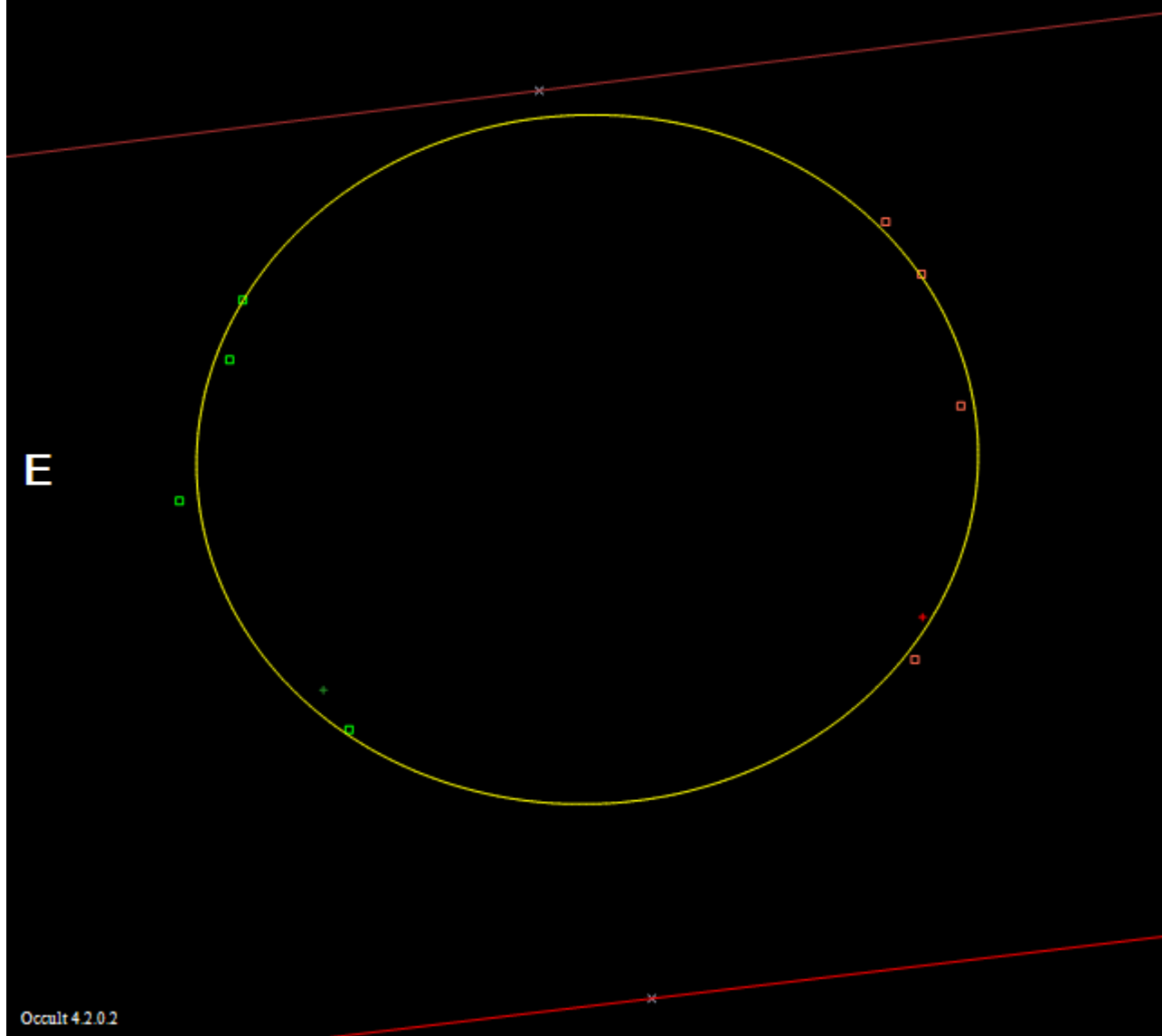
(203) Pompeja 2014 Aug 20 108.0 x 108.0 km, PA 0.0° °
Geocentric X -762.9 ± 1.0 Y -1846.0 ± 1.0 km **N**

E



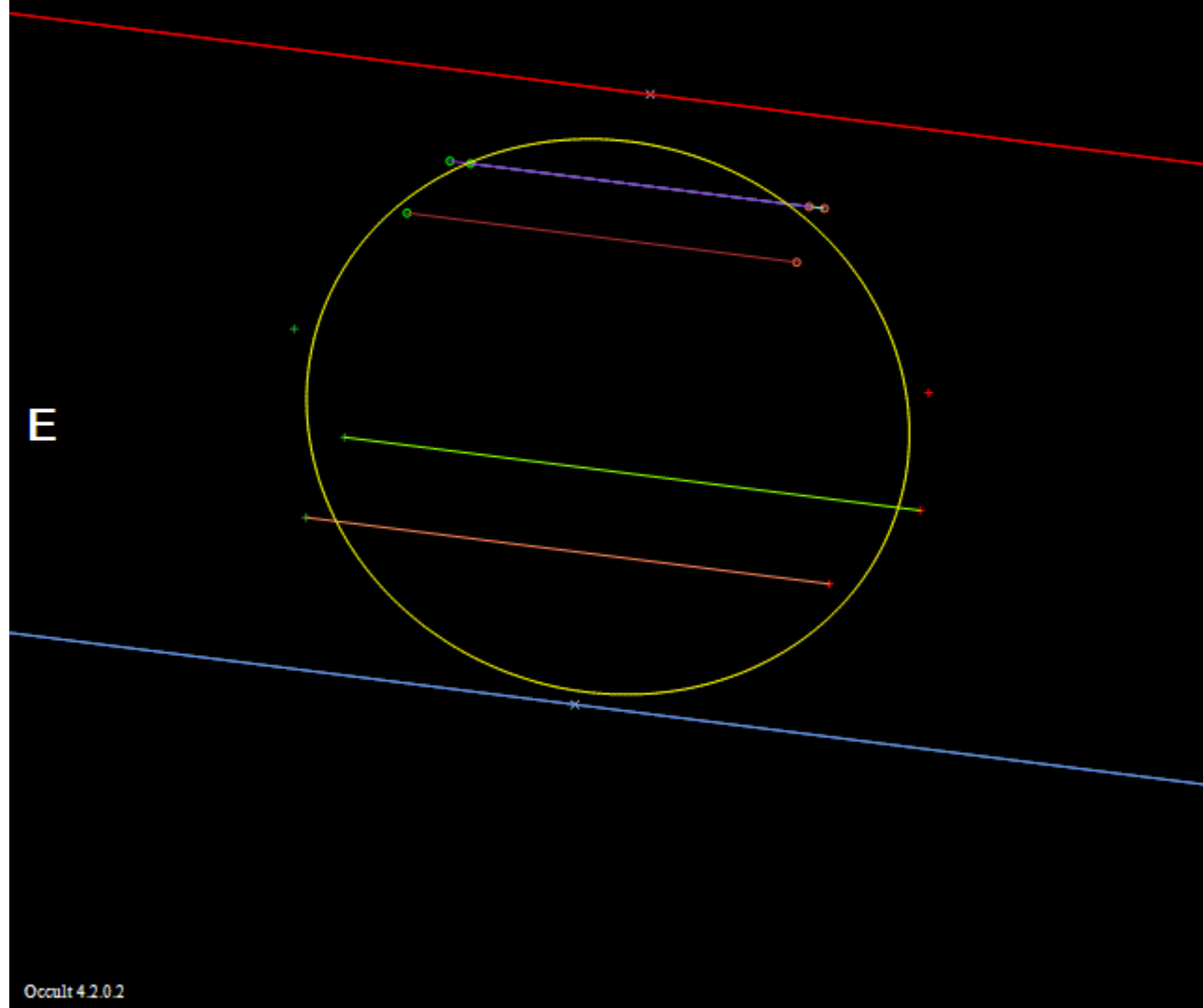
204kallisto2005jul12

(204) Kallisto 2005 Jul 12 $47.6 \pm 2.3 \times 54.0 \pm 1.0$ km, PA $3.2^\circ \pm 6.1^\circ$
Geocentric X 1022.3 ± 0.3 Y 4135.5 ± 0.5 km **N**



205martha2003jul17

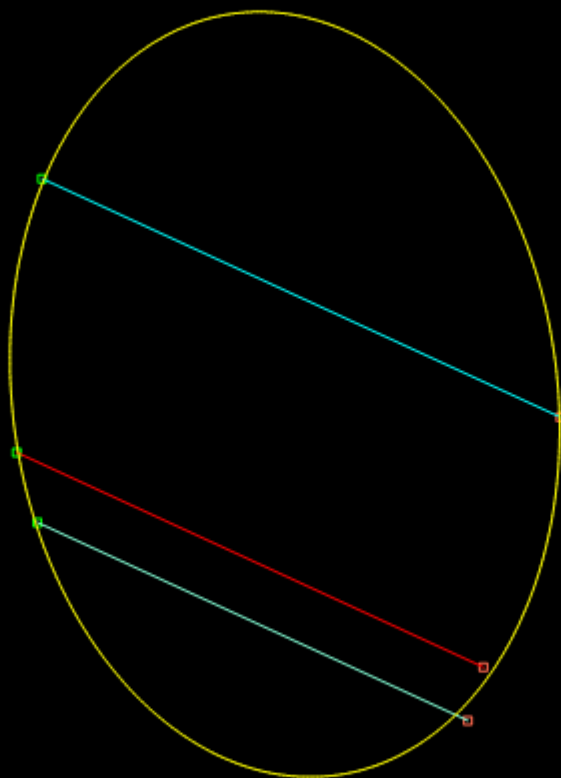
(205) Martha 2003 Jul 17 $61.2 \pm 8.6 \times 67.8 \pm 3.7$ km, PA $-18.4^\circ \pm 25.9^\circ$
Geocentric X -449.5 ± 1.5 Y 4822.0 ± 3.1 km **N**



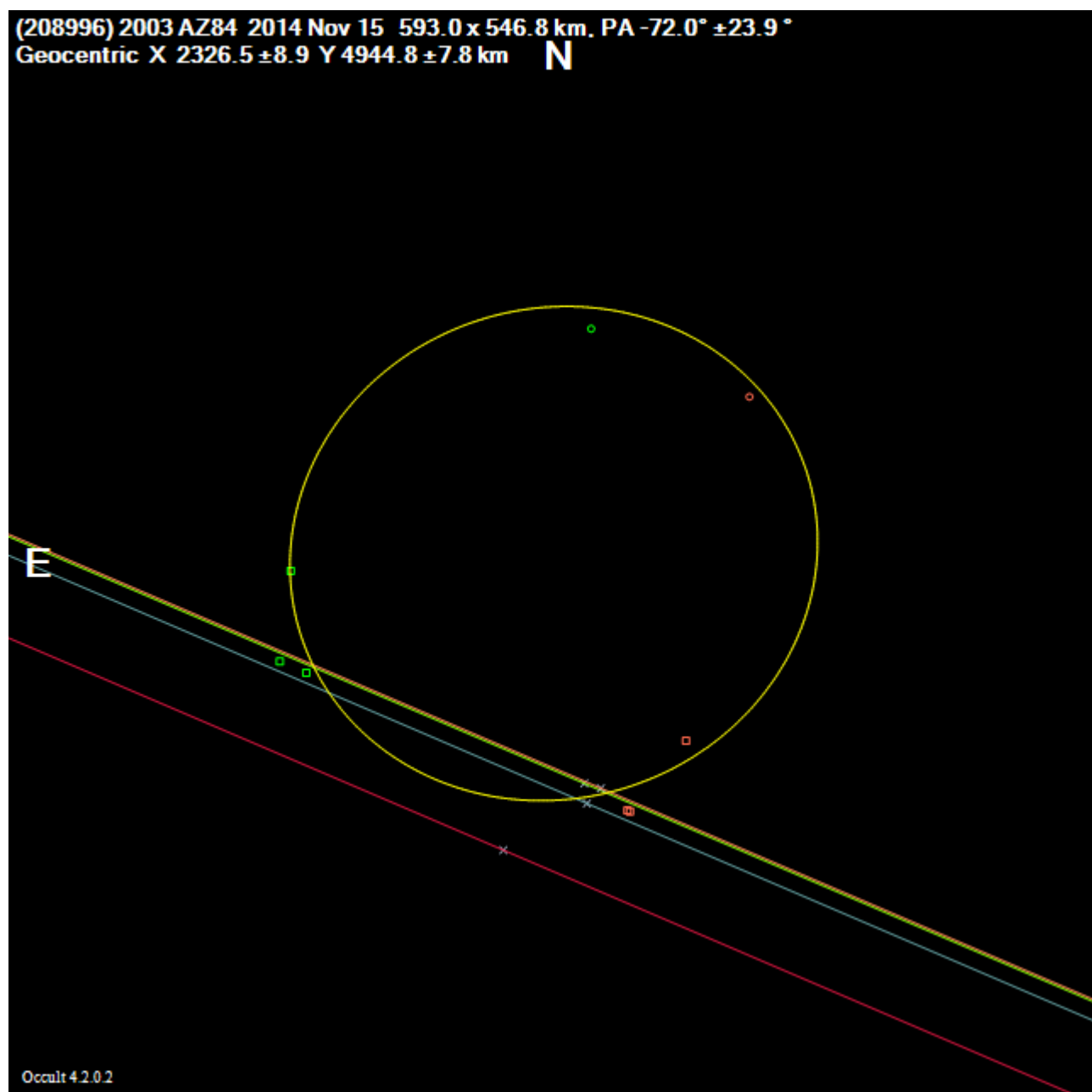
205martha2009nov20

(205) Martha 2009 Nov 20 78.0 x 55.3 \pm 0.9 km, PA 7.7° \pm 2.2°
Geocentric X -3717.2 \pm 0.4 Y 4800.1 \pm 0.8 km **N**

E

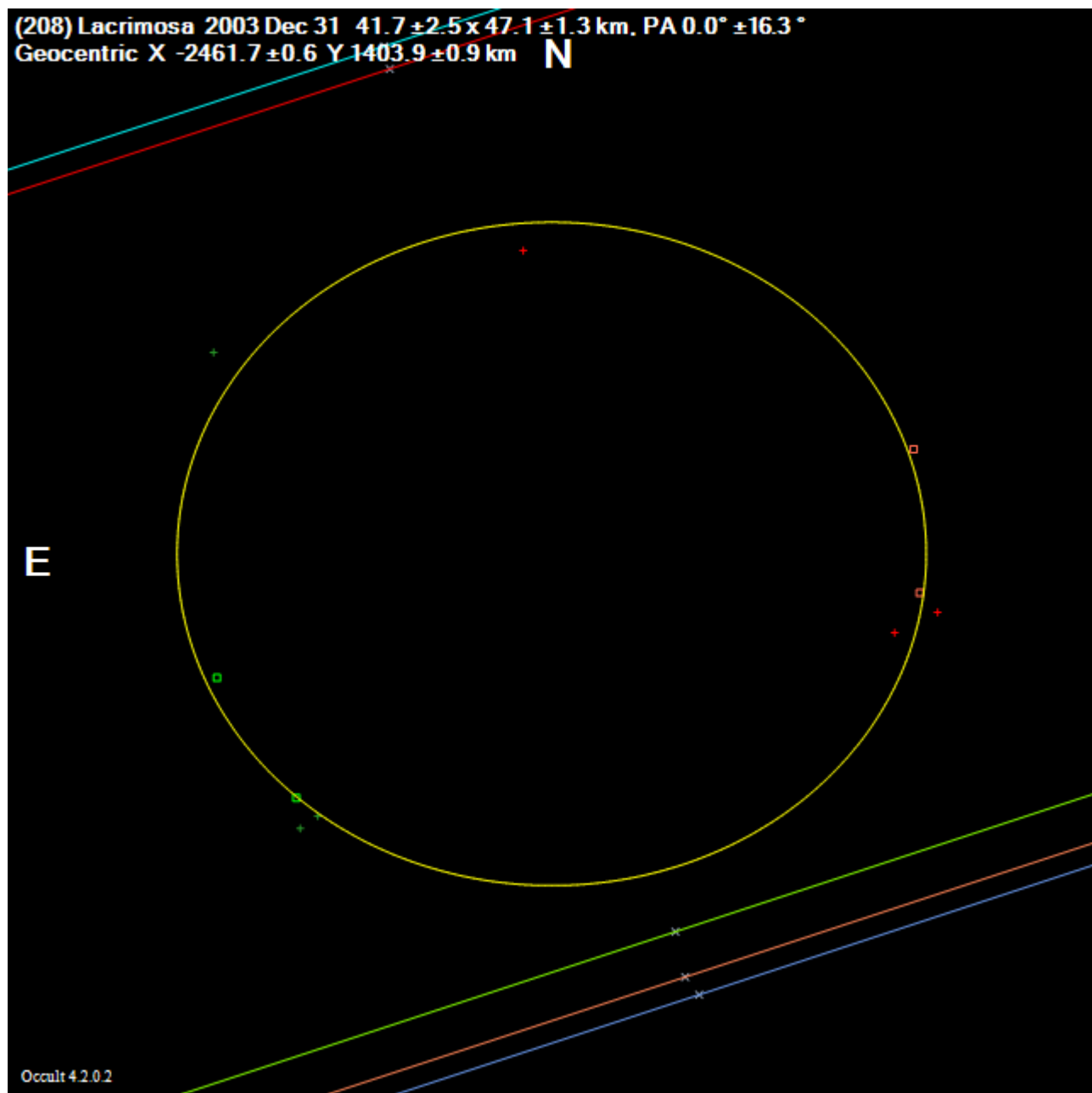


(208996) 2003 AZ84 2014 Nov 15 593.0 x 546.8 km, PA -72.0° ± 23.9°
Geocentric X 2326.5 ± 8.9 Y 4944.8 ± 7.8 km **N**



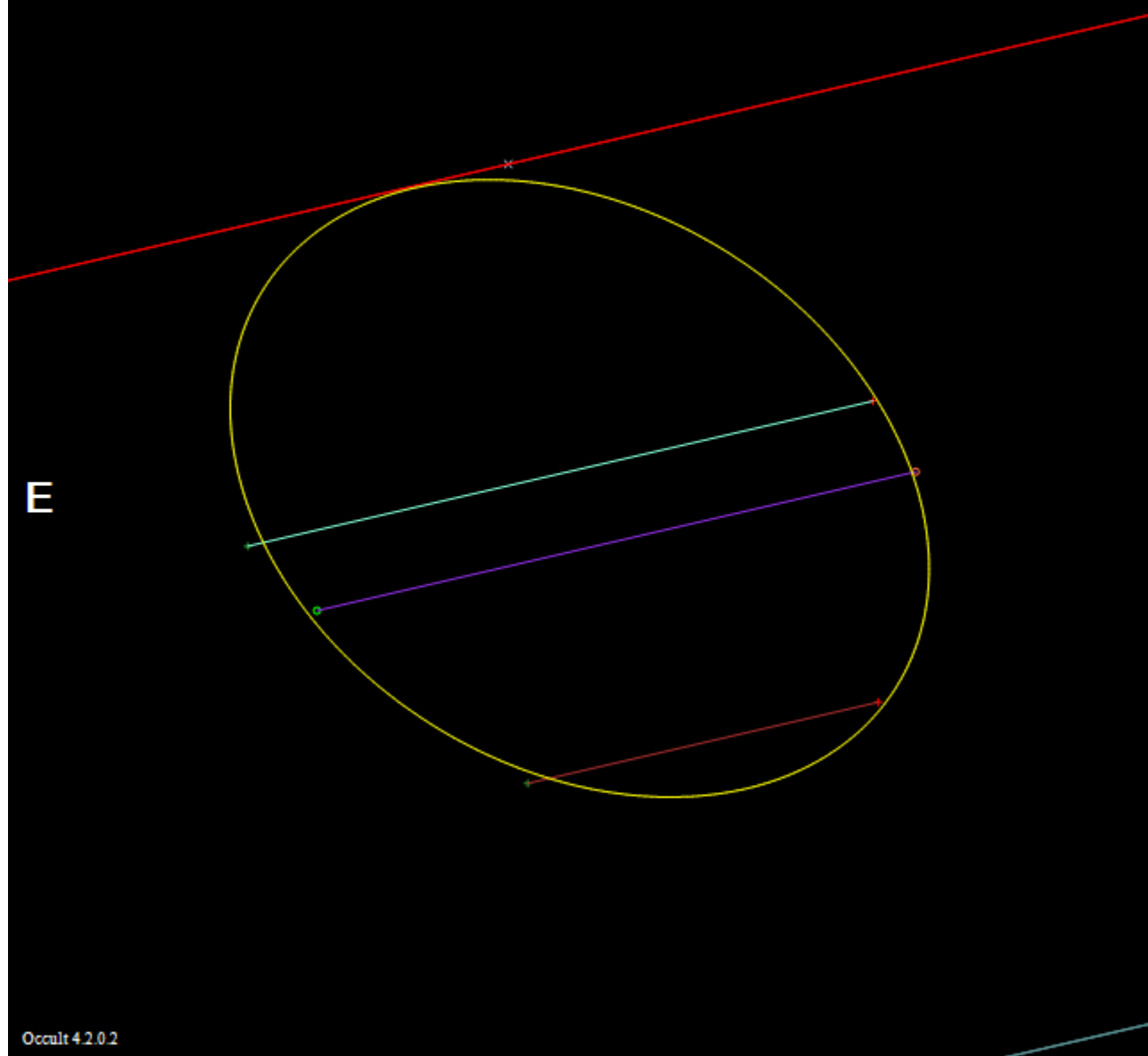
208lacrimosa2003dec31

(208) Lacrimosa 2003 Dec 31 $41.7 \pm 2.5 \times 47.1 \pm 1.3$ km, PA $0.0^\circ \pm 16.3^\circ$
Geocentric X -2461.7 ± 0.6 Y 1403.9 ± 0.9 km **N**



209dido2005mar10

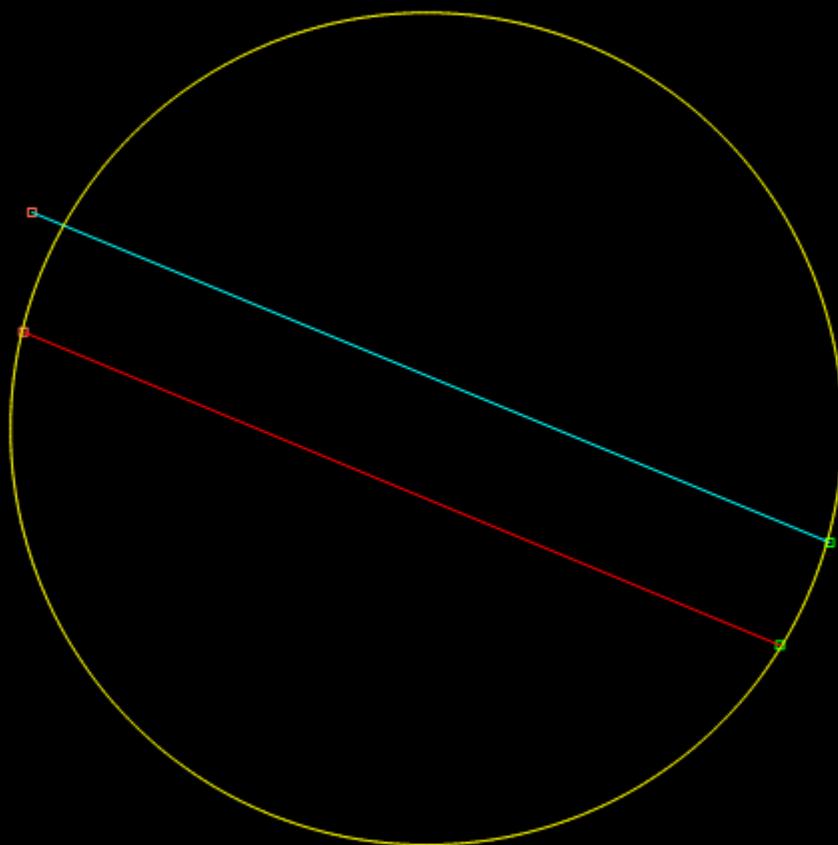
(209) Dido 2005 Mar 10 $179.6 \pm 3.5 \times 133.9 \pm 3.0$ km, PA $57.8^\circ \pm 2.2^\circ$
Geocentric X 1823.5 ± 1.1 Y 4854.9 ± 0.9 km **N**



20massalia2009apr22

(20) Massalia 2009 Apr 22 157.0 ±15.1 x 157.0 km, PA 0.0° °
Geocentric X -5069.0 ±4.1 Y 3742.8 ±9.4 km **N**

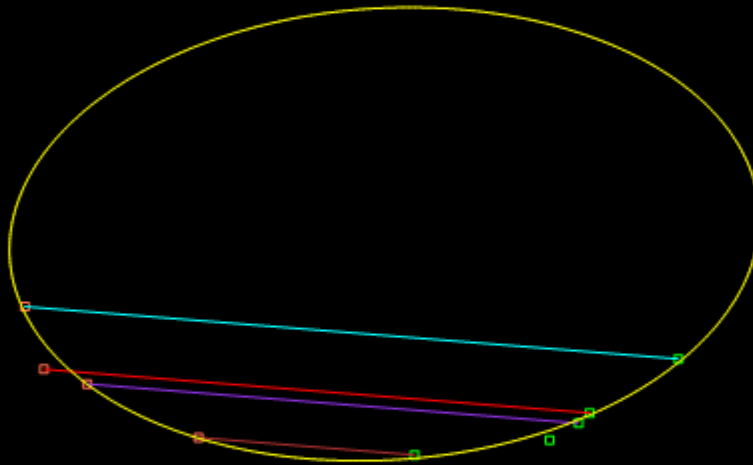
E



20massalia2012oct09

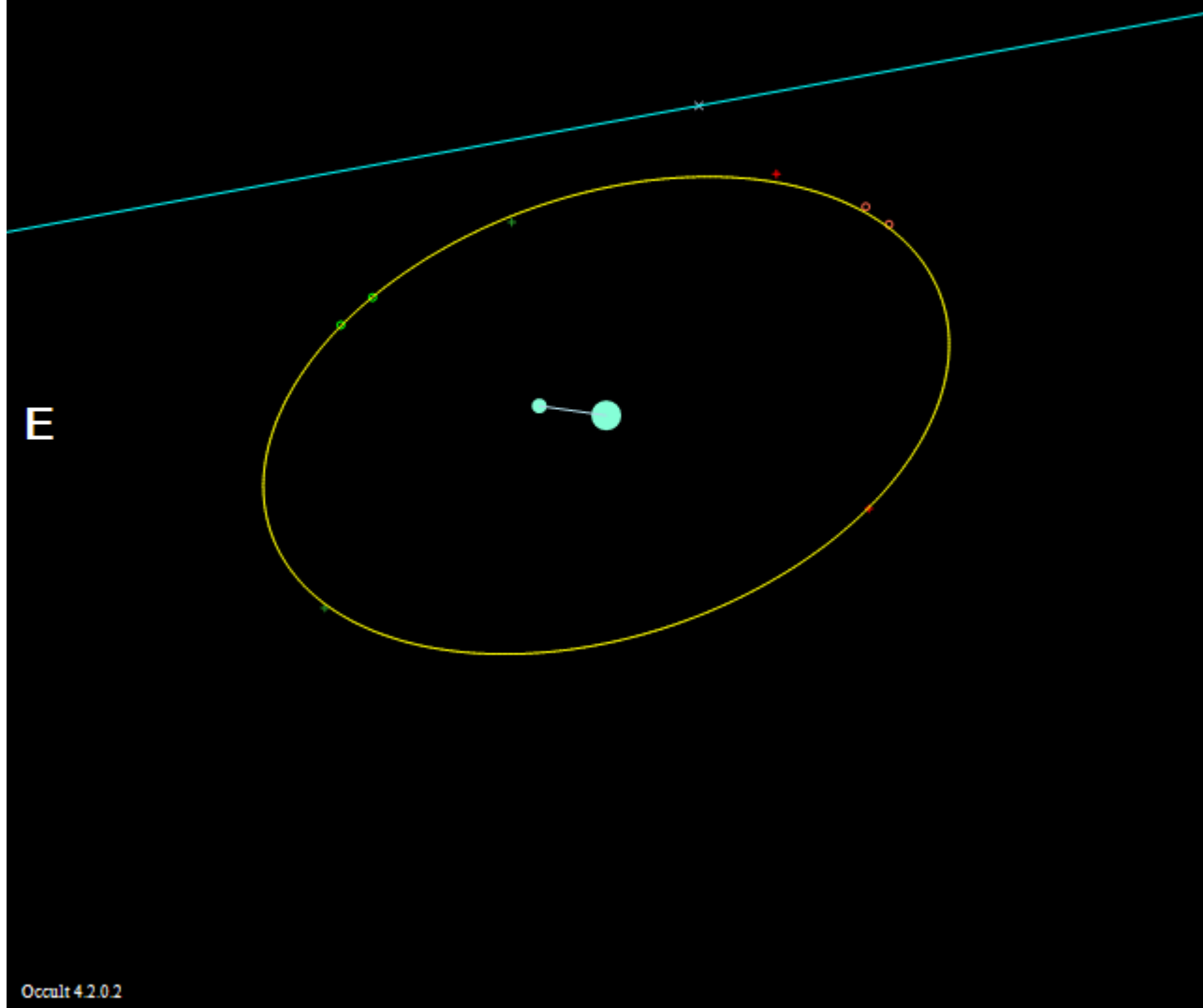
(20) Massalia 2012 Oct 9 $128.0 \pm 5.4 \times 77.0 \pm 8.0$ km, PA $93.7^\circ \pm 2.5^\circ$
Geocentric X 2805.8 ± 1.8 Y 5051.2 ± 3.9 km **N**

E



210isabella2003apr21

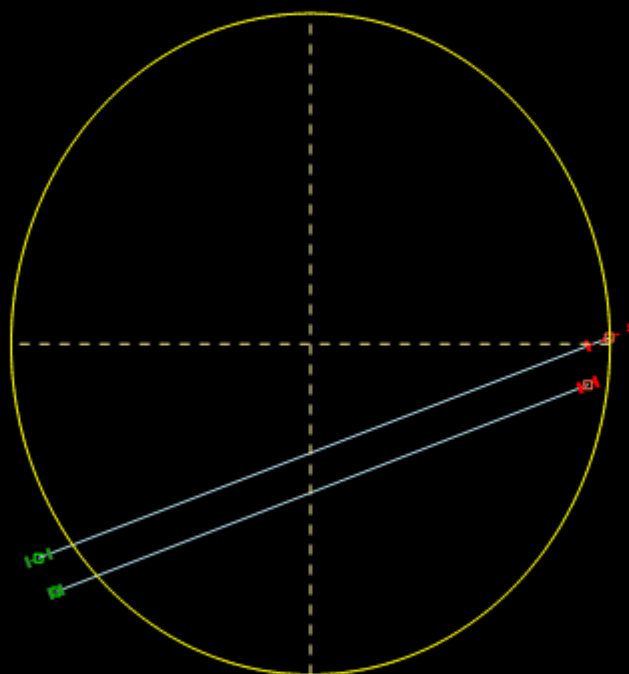
(210) Isabella 2003 Apr 21 $84.9 \pm 0.8 \times 52.6 \pm 1.0$ km, PA $-70.6^\circ \pm 1.1^\circ$
Geocentric X -4756.8 ± 0.3 Y -3073.6 ± 0.3 km **N**
Double : Sep $0.0054 \pm 0.0003''$, PA $81.9^\circ \pm 2.2^\circ$



210Isabella2016Feb21

(210) Isabella 2016 Feb 21 74.0 ± 96.9 x 67.0 km. PA 0.0°
Geocentric X -3967.0 ± 2.2 Y -3642.9 ± 28.4 km **N**

E

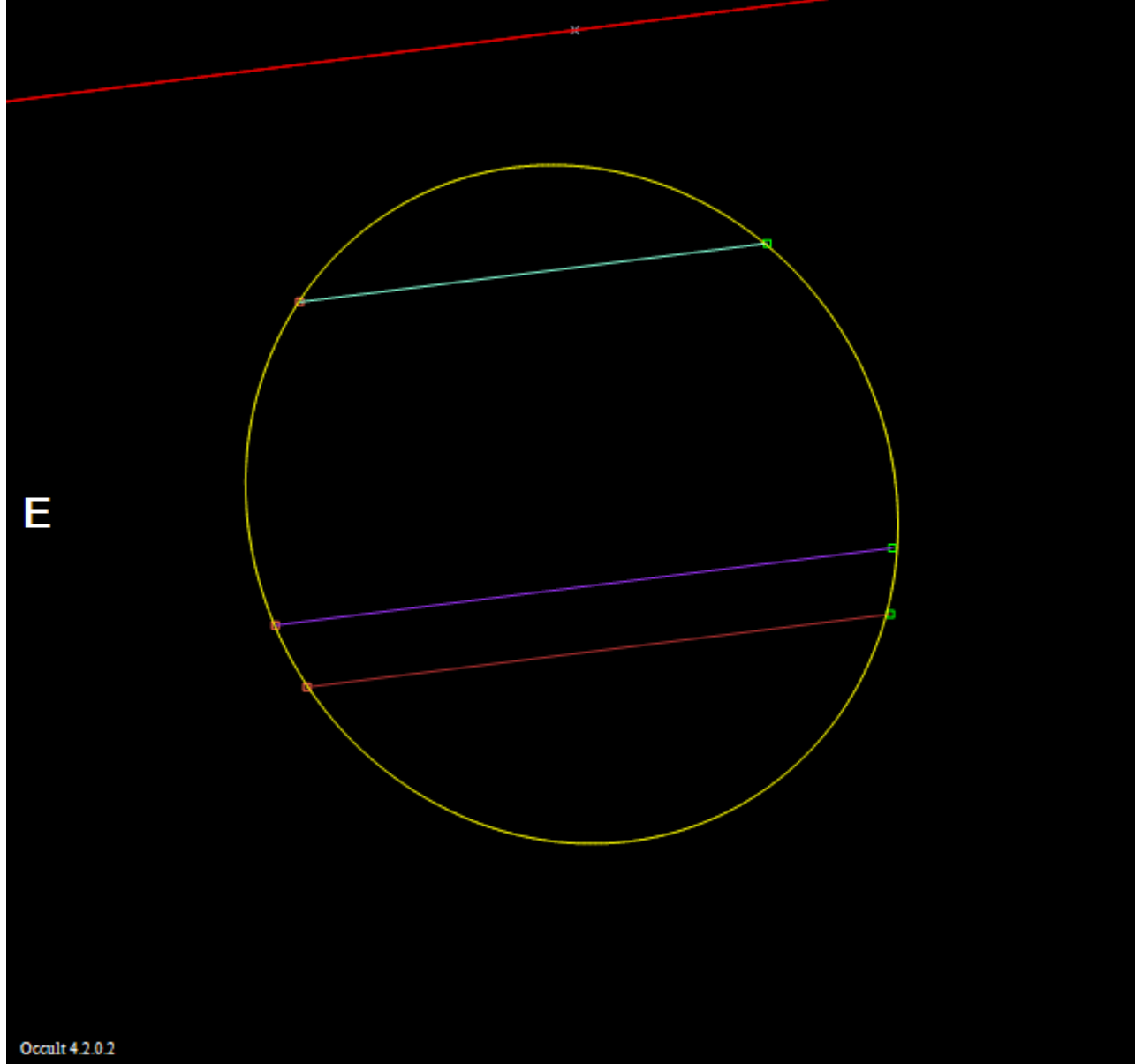


Occult 4.2.9.1

----- 50 km -----

211isolda2012sep27

(211) Isolda 2012 Sep 27 155.4 x 144.5 km, PA 28.4° ± 3.8°
Geocentric X -3808.3 ± 0.3 Y -4527.5 ± 0.5 km **N**

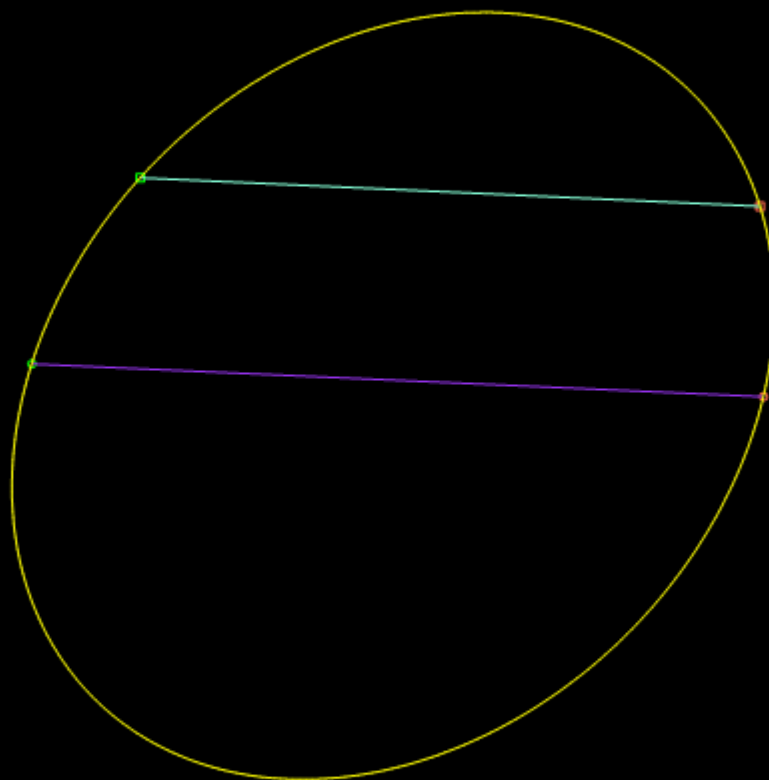


211isolda2013jan20

(211) Isolda 2013 Jan 20 169.4 x 132.9 km, PA -44.3°
Geocentric X -3313.8 Y 1567.1 km

N

E



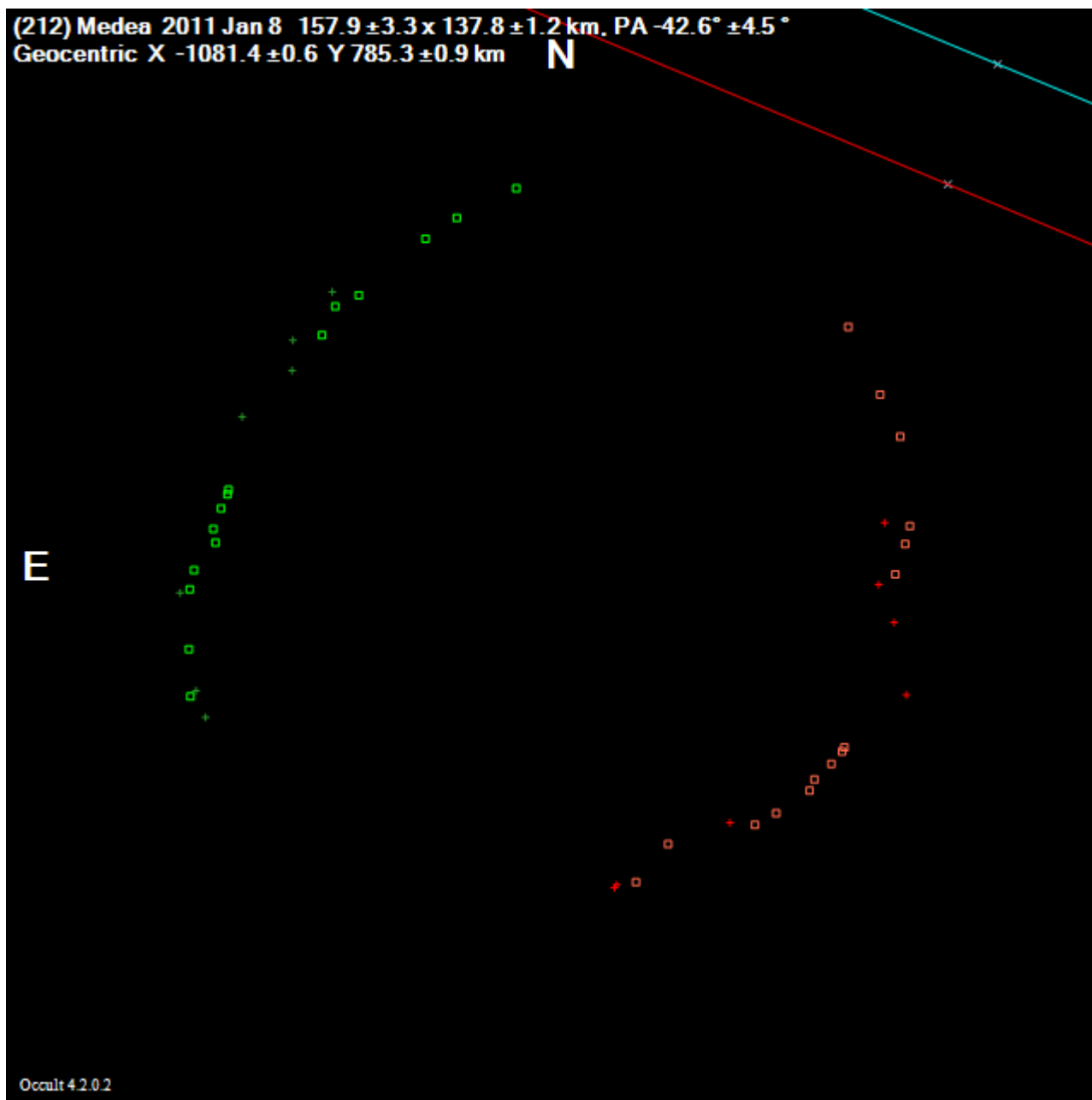
212medea2011jan08

(212) Medea 2011 Jan 8 $157.9 \pm 3.3 \times 137.8 \pm 1.2$ km, PA $-42.6^\circ \pm 4.5^\circ$
Geocentric X -1081.4 ± 0.6 Y 785.3 ± 0.9 km

N

E

Occult 4.2.0.2

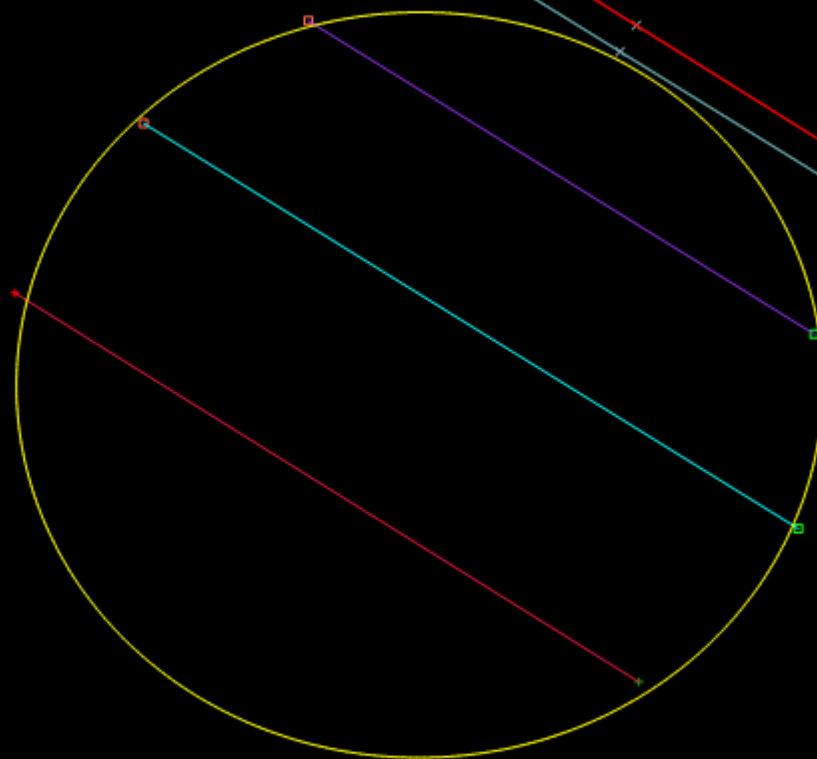


213lilaea2005dec31

(213) Lilaea 2005 Dec 31 $80.5 \pm 2.6 \times 87.1 \pm 1.5$ km, PA $0.7^\circ \pm 16.3^\circ$
Geocentric X 3761.9 ± 0.7 Y 4277.3 ± 0.9 km **N**

E

Occult 4.2.0.2



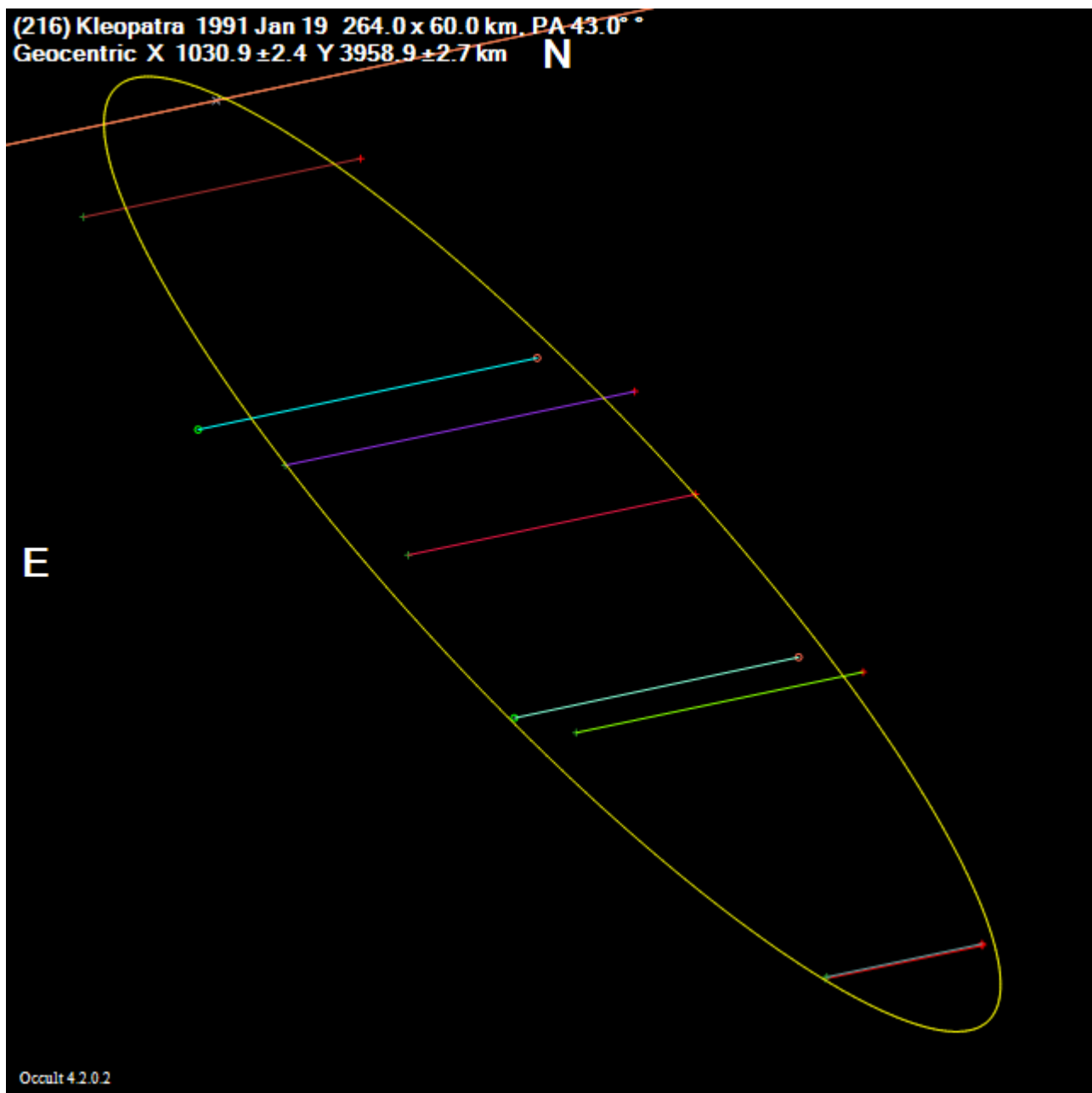
216kleopatra1980oct10

(216) Kleopatra 1980 Oct 10 $123.7 \pm 10.8 \times 88.2 \pm 8.6$ km, PA $-81.7^\circ \pm 10.9^\circ$
Geocentric X 1423.1 ± 4.4 Y 4547.8 ± 3.2 km **N**



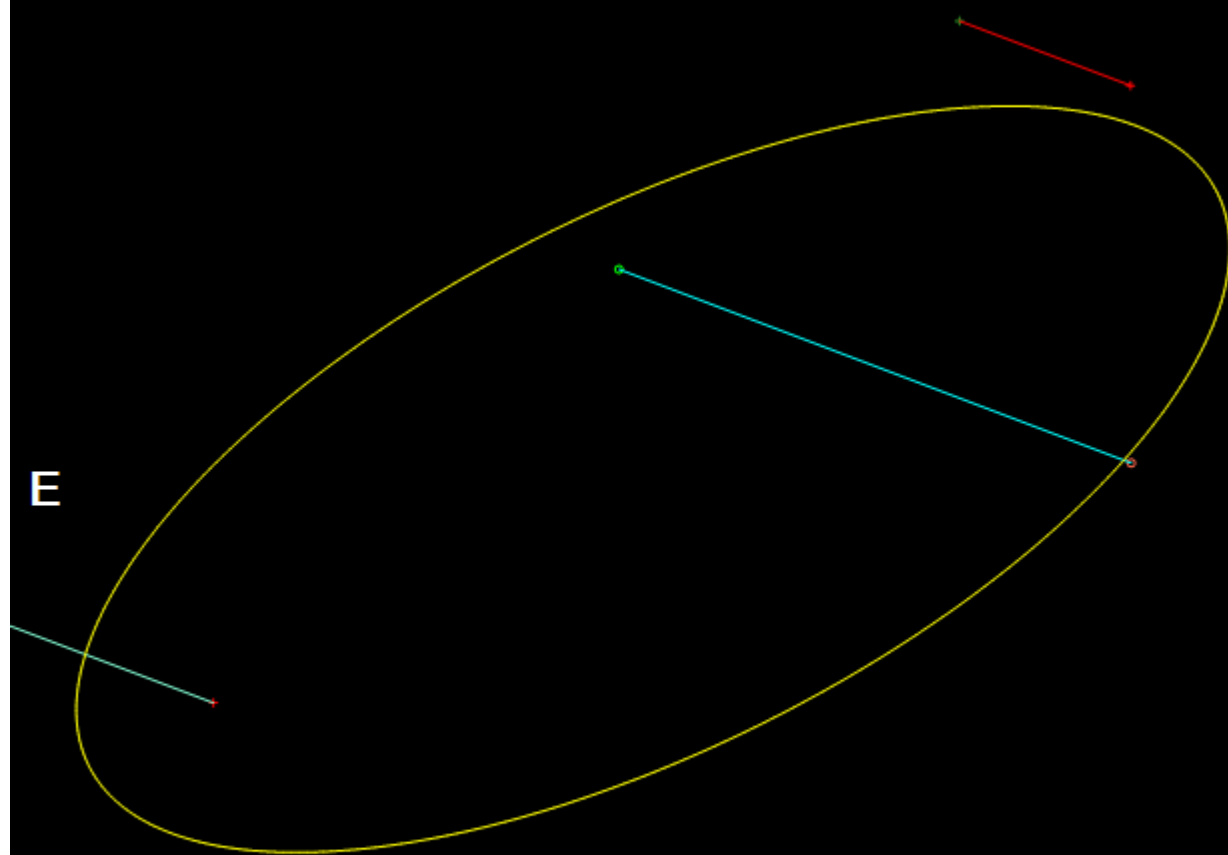
216kleopatra1991jan19

(216) Kleopatra 1991 Jan 19 264.0 x 60.0 km, PA 43.0°
Geocentric X 1030.9 ± 2.4 Y 3958.9 ± 2.7 km **N**

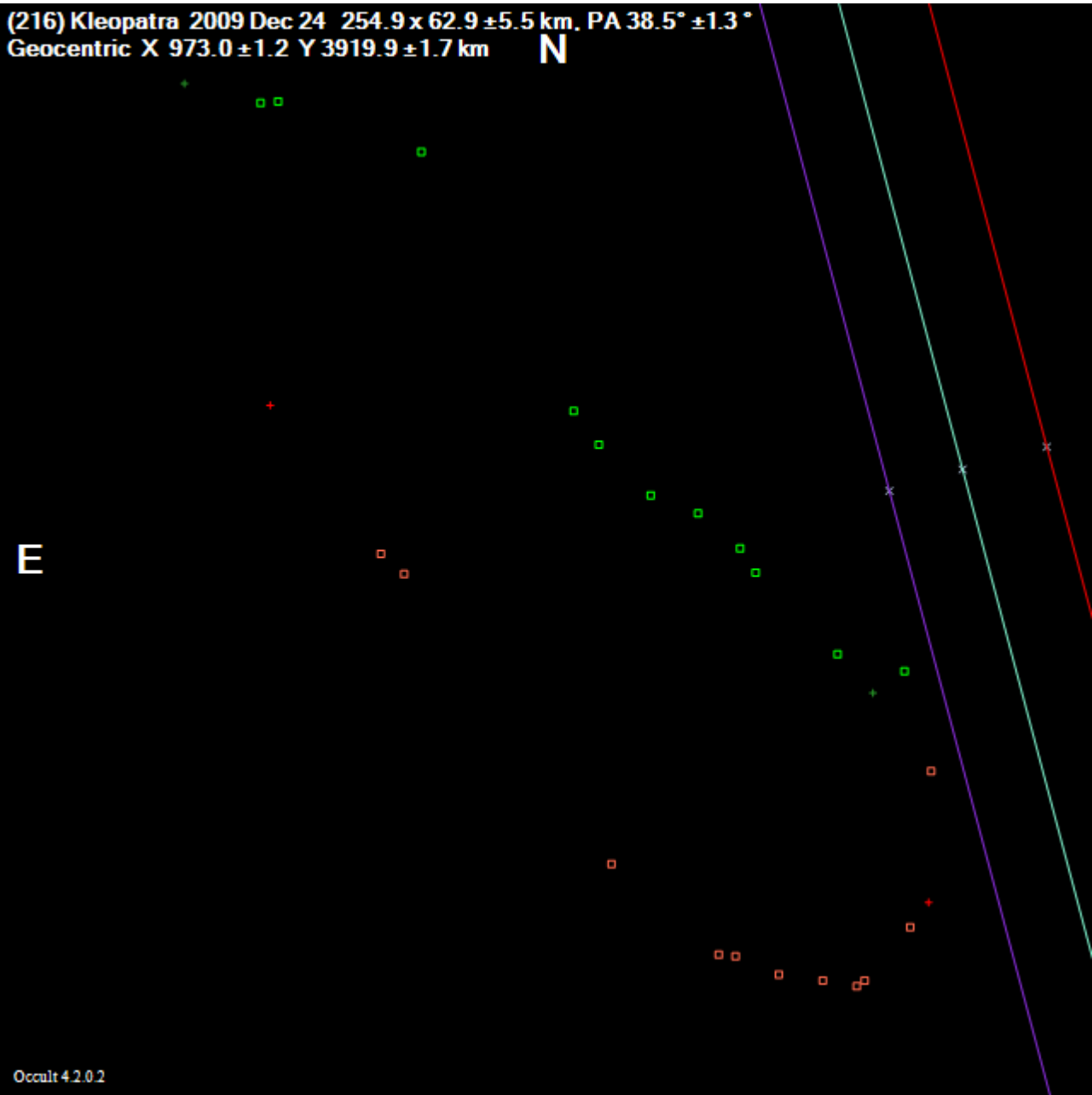


216kleopatra2003aug10

(216) Kleopatra 2003 Aug 10 $222.3 \pm 31.5 \times 93.9 \pm 22.6$ km, PA -63.0° °
Geocentric X -601.6 ± 12.6 Y -3536.3 ± 9.2 km **N**

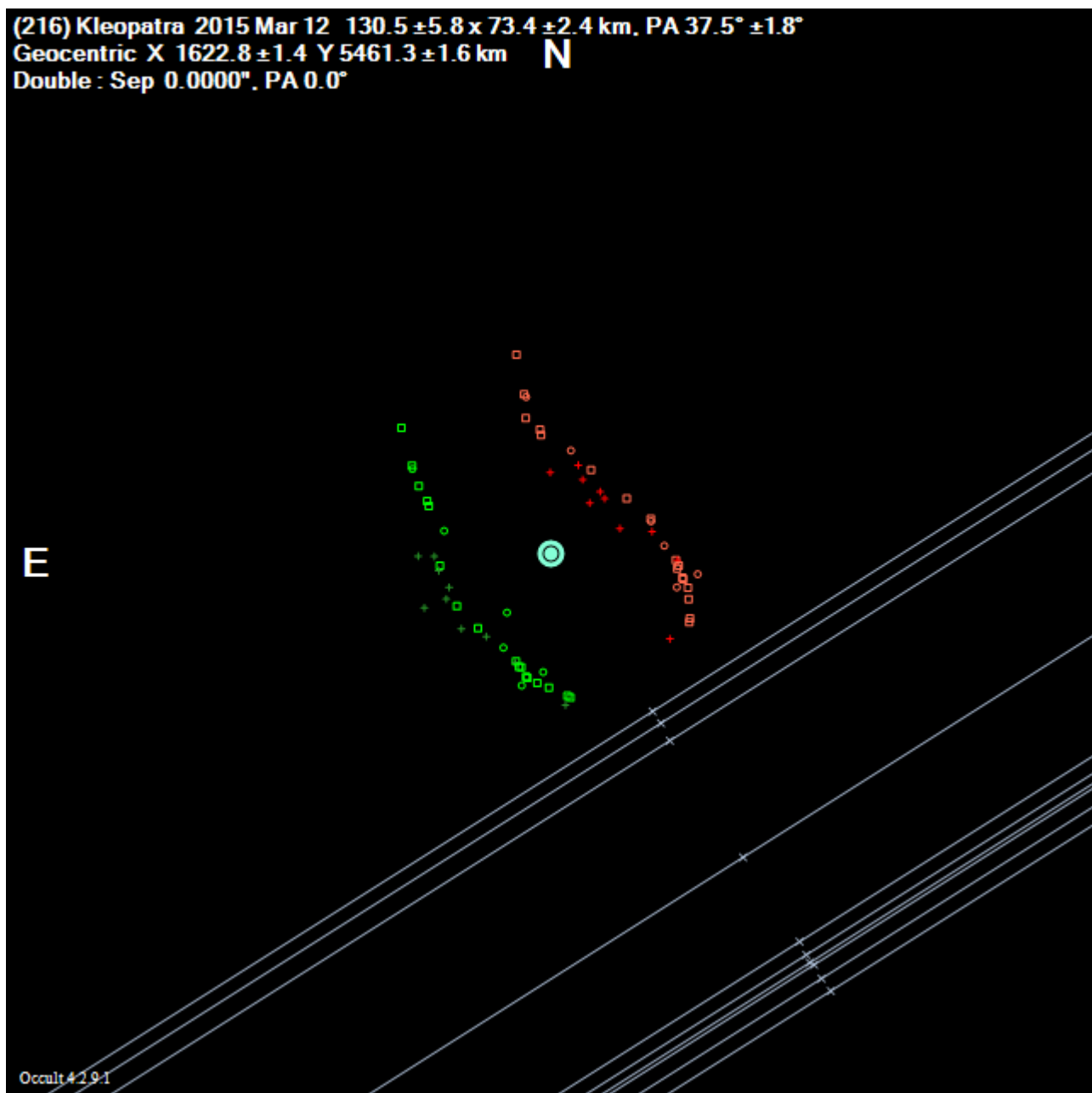


216kleopatra2009dec24



216kleopatra2015mar12

(216) Kleopatra 2015 Mar 12 $130.5 \pm 5.8 \times 73.4 \pm 2.4$ km, PA $37.5^\circ \pm 1.8^\circ$
Geocentric X 1622.8 ± 1.4 Y 5461.3 ± 1.6 km **N**
Double : Sep $0.0000''$, PA 0.0°



Occult 4.2.9.1

216Kleopatra2016Apr05

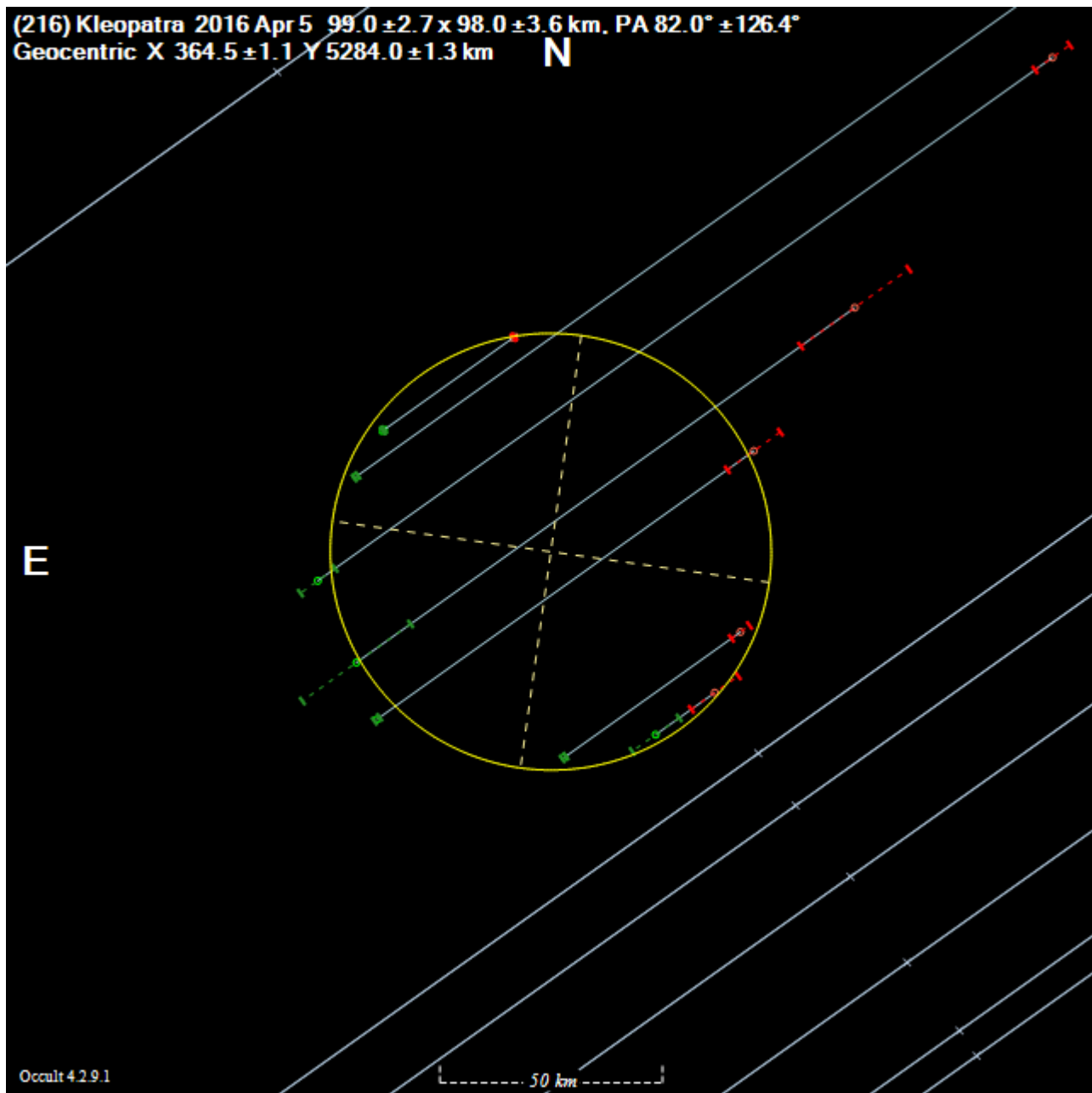
(216) Kleopatra 2016 Apr 5 $99.0 \pm 2.7 \times 98.0 \pm 3.6$ km, PA $82.0^\circ \pm 126.4^\circ$
Geocentric X 364.5 ± 1.1 Y 5284.0 ± 1.3 km

N

E

Occult 4.2.9.1

50 km



2184fujian2007jul23

(2184) Fujian 2007 Jul 23 26.0 x 26.0 km, PA 0.0° °
Geocentric X 437.6 ± 3.7 Y -2699.0 ± 16.0 km N

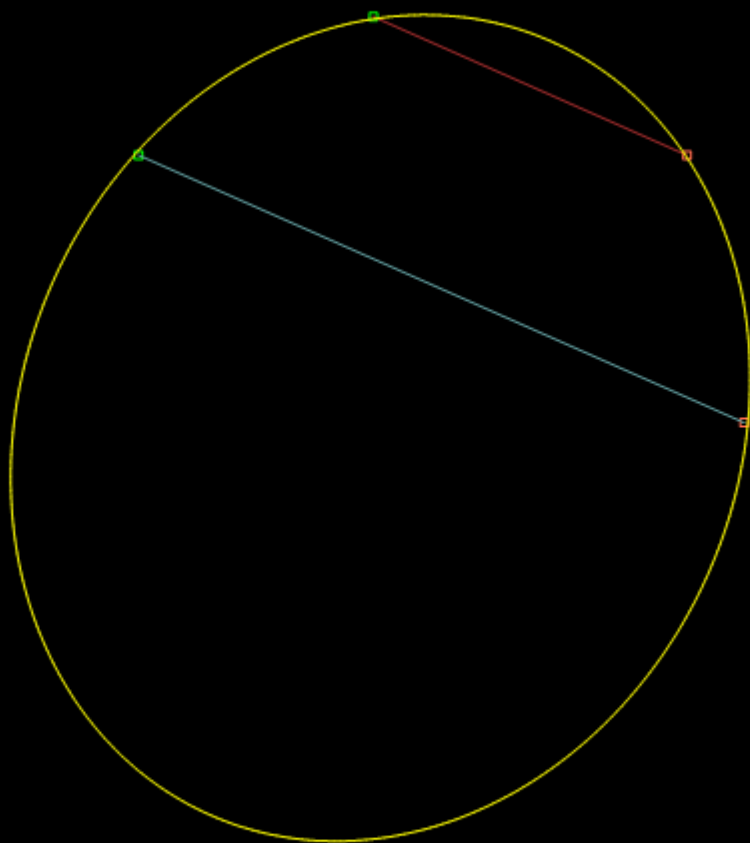
E

218bianca2010jul03

(218) Bianca 2010 Jul 3 66.0 x 56.0 km, PA $-23.6^{\circ} \pm 1.7^{\circ}$
Geocentric X 3941.5 ± 0.1 Y 3911.8 ± 0.1 km **N**

E

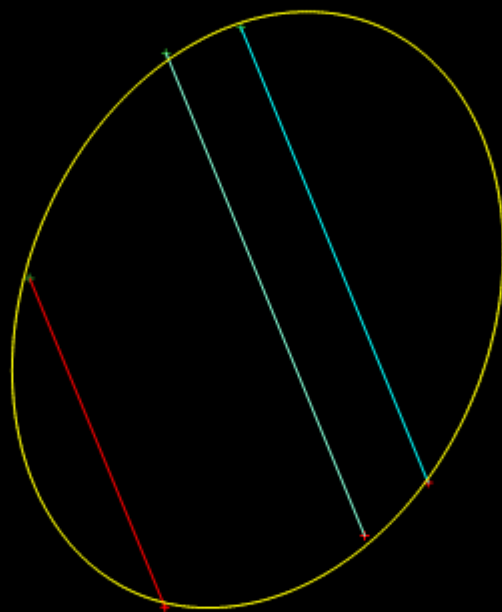
Occult 4.2.0.2



219thusnelda2003oct18

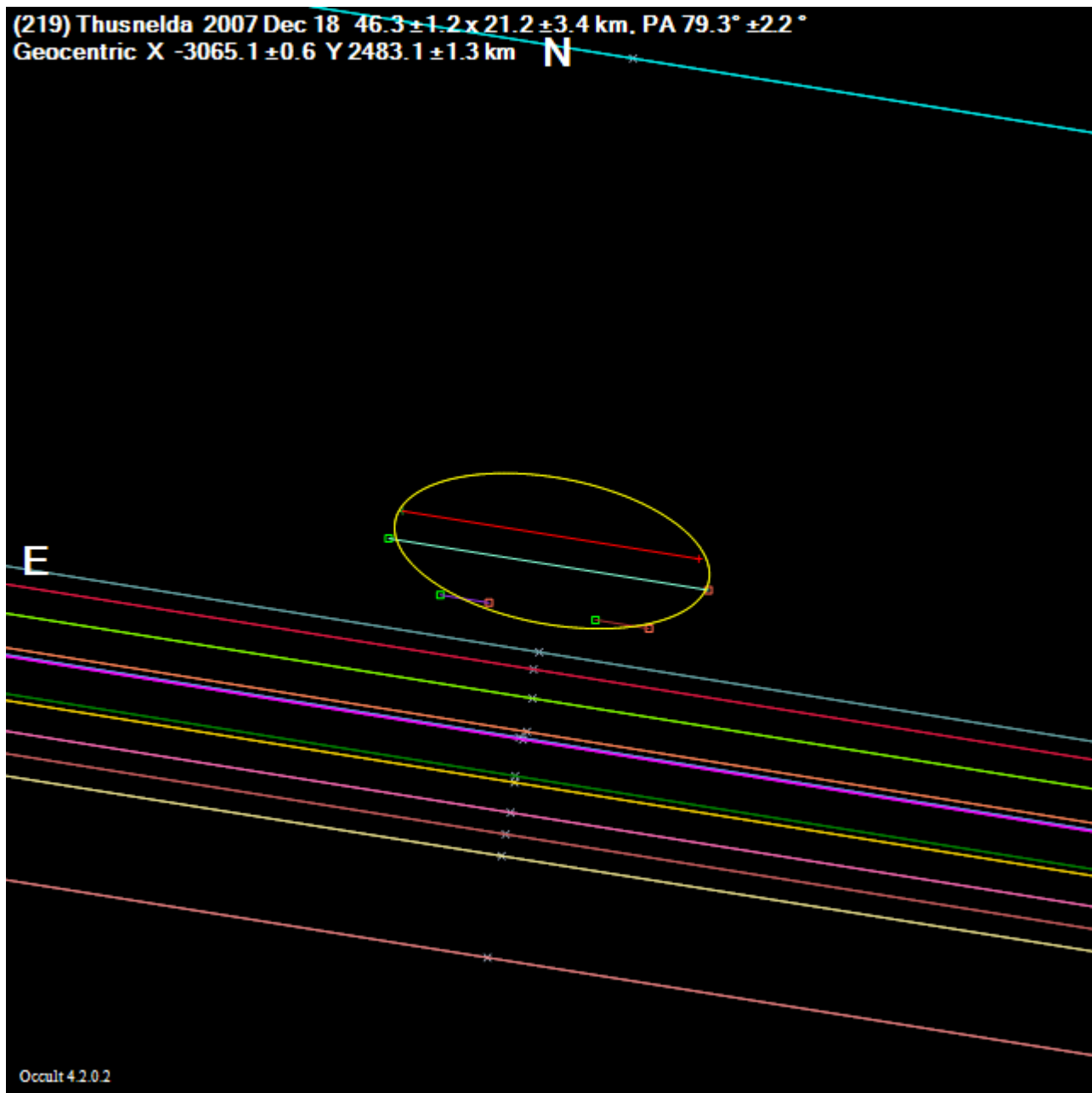
(219) Thusnelda 2003 Oct 18 $32.1 \pm 0.5 \times 24.2$ km. PA -23.0° °
Geocentric X -1521.4 ± 0.3 Y -5096.4 ± 0.2 km **N**

E



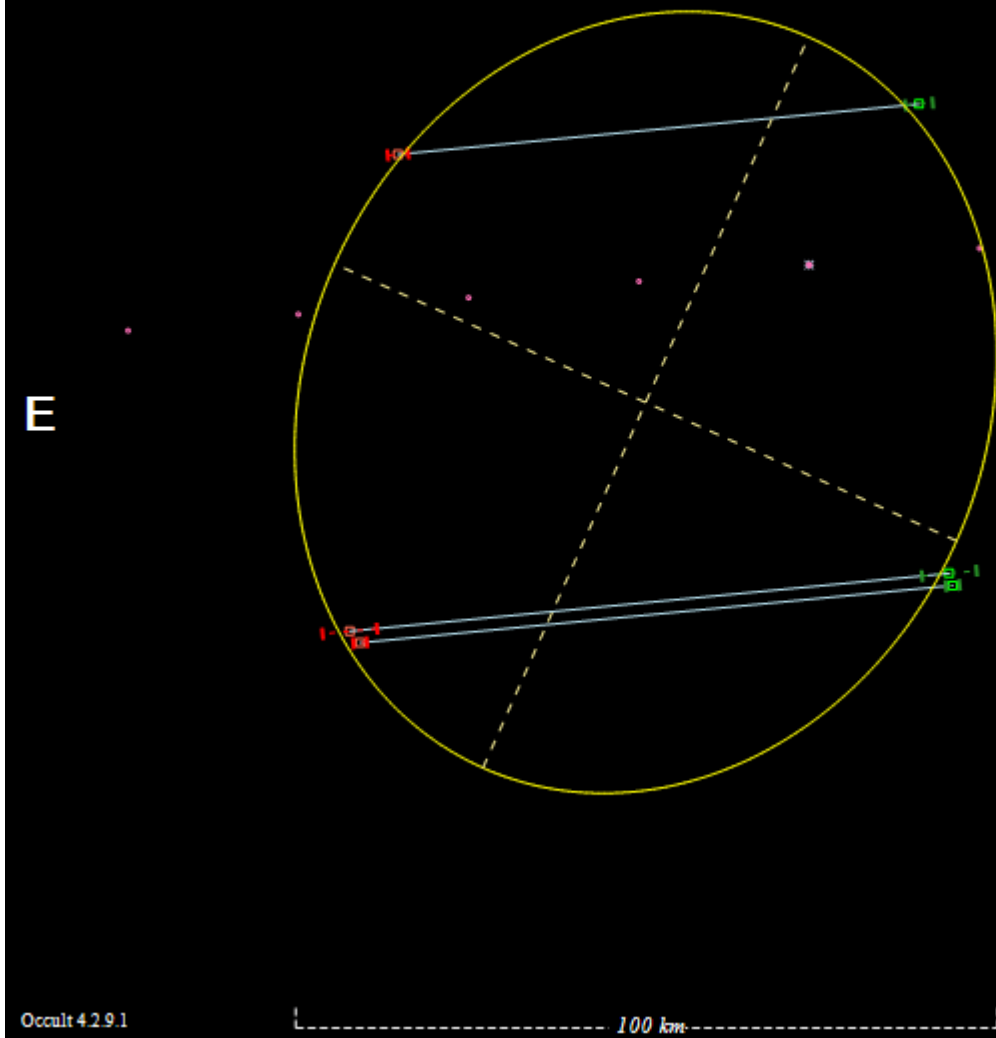
219thusnelda2007dec18

(219) Thusnelda 2007 Dec 18 $46.3 \pm 1.2 \times 21.2 \pm 3.4$ km, PA $79.3^\circ \pm 2.2^\circ$
Geocentric X -3065.1 ± 0.6 Y 2483.1 ± 1.3 km

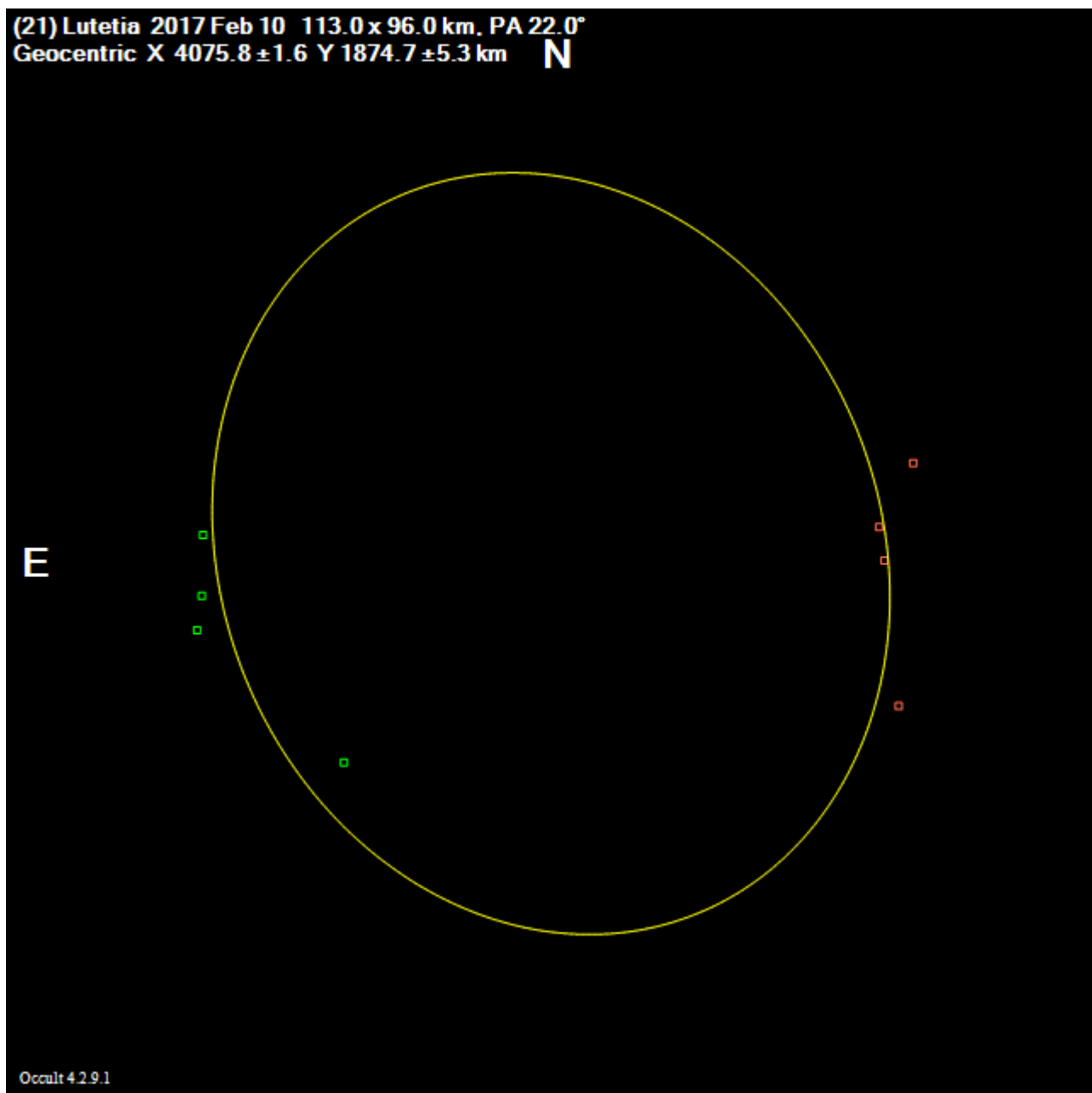


21Lutetia2016Sep24

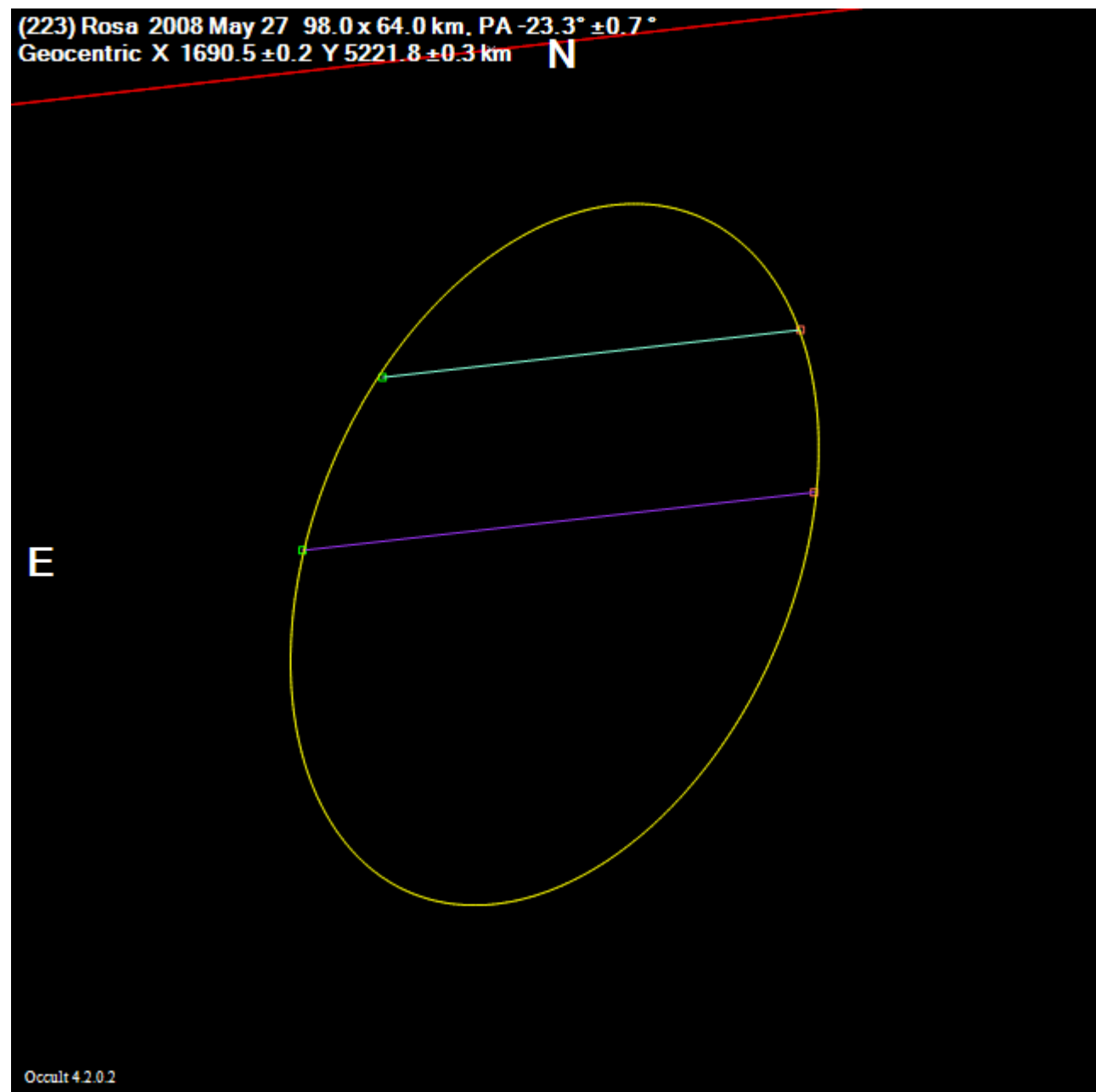
(21) Lutetia 2016 Sep 24 114.0 x 97.0 km, PA -24.0°
Geocentric X -3812.1 ± 0.8 Y 3988.7 ± 1.1 km **N**



(21) Lutetia 2017 Feb 10 113.0 x 96.0 km, PA 22.0°
Geocentric X 4075.8 ± 1.6 Y 1874.7 ± 5.3 km **N**

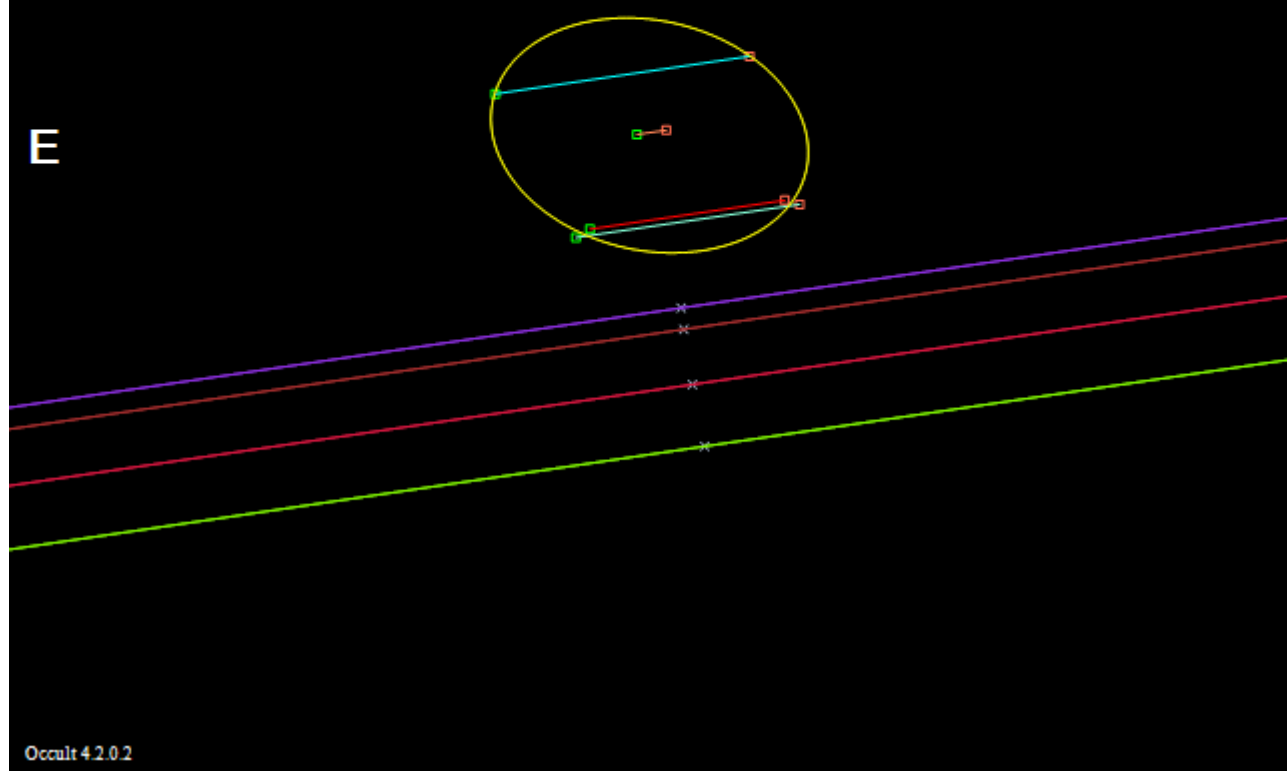


(223) Rosa 2008 May 27 98.0 x 64.0 km. PA $-23.3^{\circ} \pm 0.7^{\circ}$
Geocentric X 1690.5 ± 0.2 Y 5221.8 ± 0.3 km N



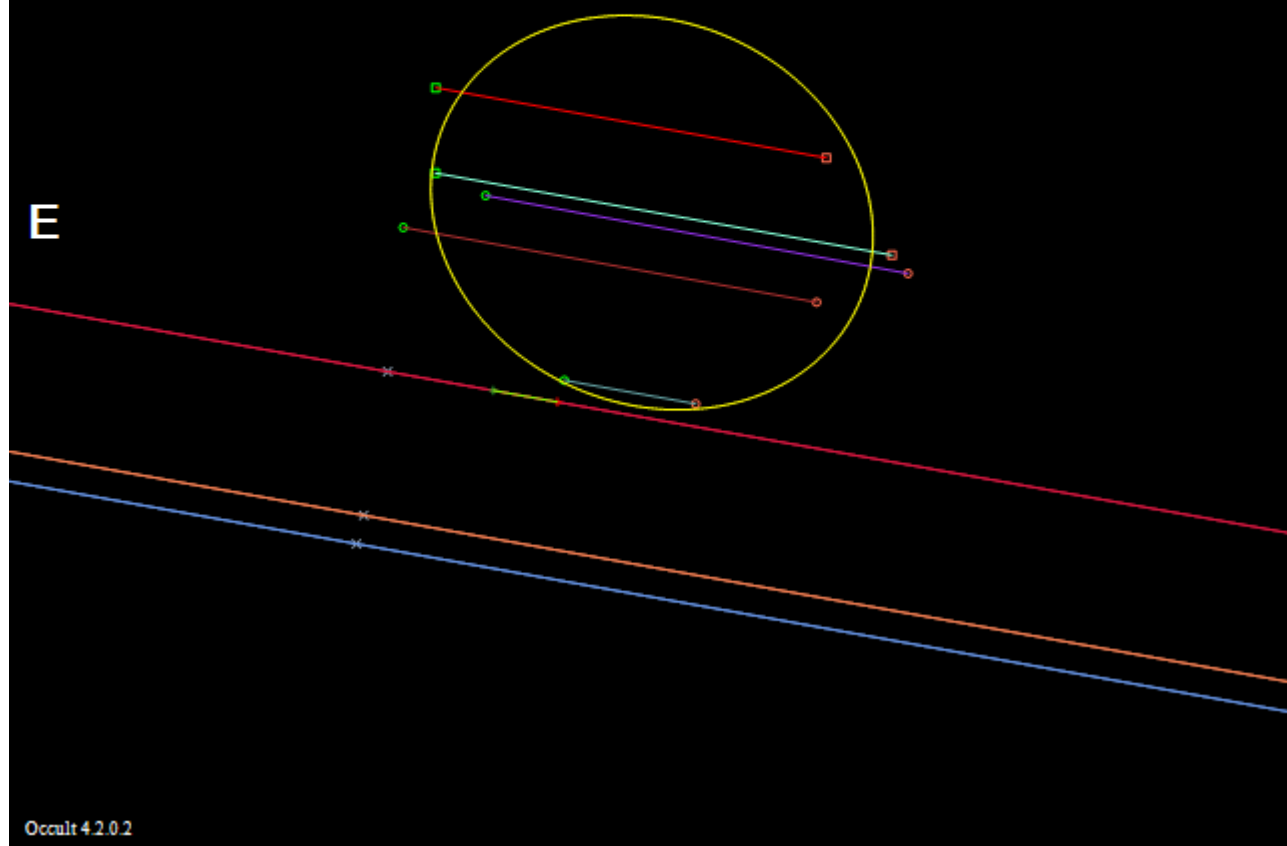
2258viipuri2013aug03

(2258) Viipuri 2013 Aug 3 $30.3 \pm 1.0 \times 21.7 \pm 1.0$ km, PA 77.4° °
Geocentric X -243.3 ± 0.5 Y 5740.1 ± 0.5 km **N**
Sat: 2.7×2.7 km, PA 58.0° ; Sep $0.0887''$ at PA 255.5°



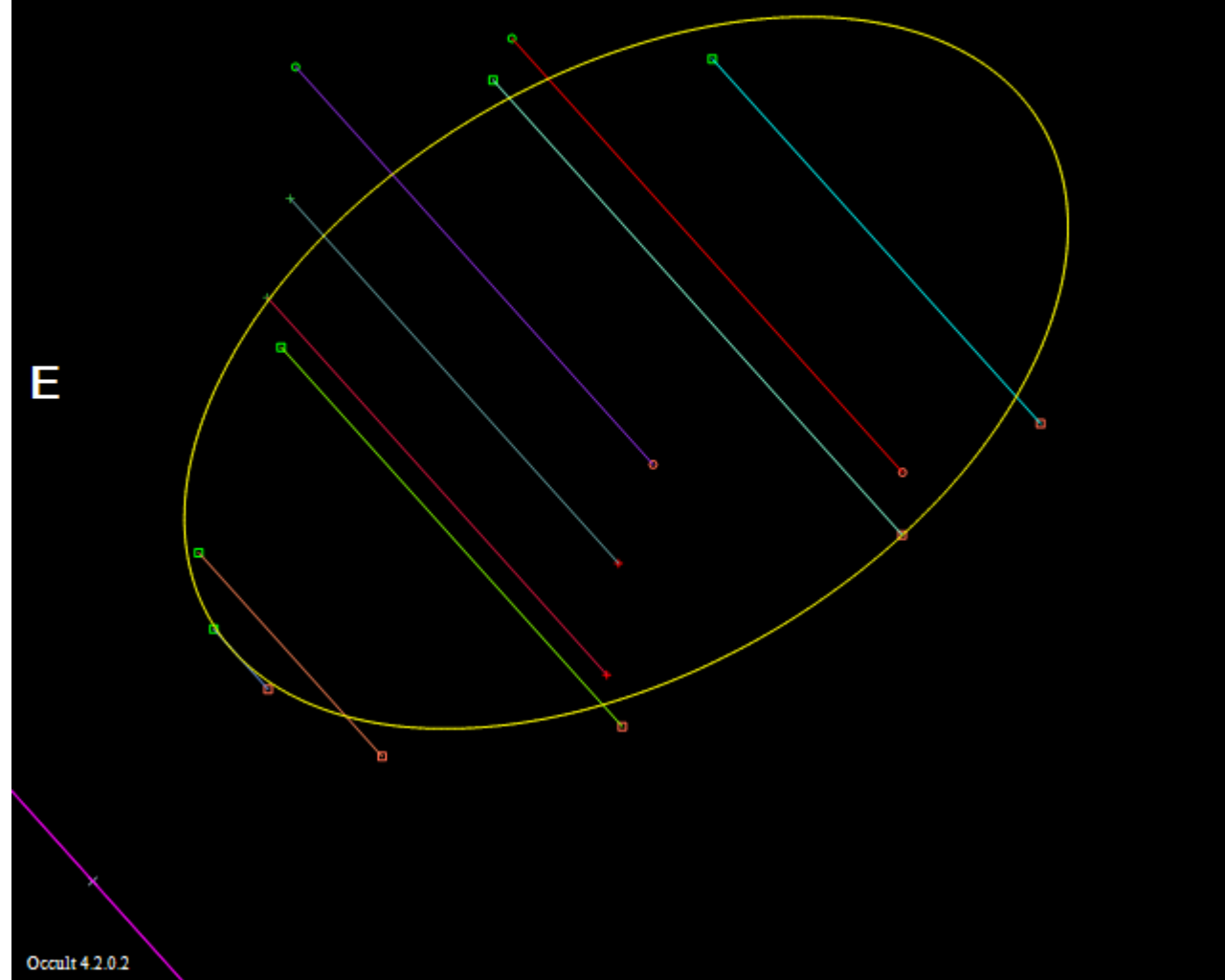
225henrietta2007jul16

(225) Henrietta 2007 Jul 16 $114.4 \pm 6.7 \times 96.9 \pm 14.5$ km, PA $66.9^\circ \pm 30.6^\circ$
Geocentric X 1125.2 ± 2.6 Y 3448.4 ± 6.6 km **N**



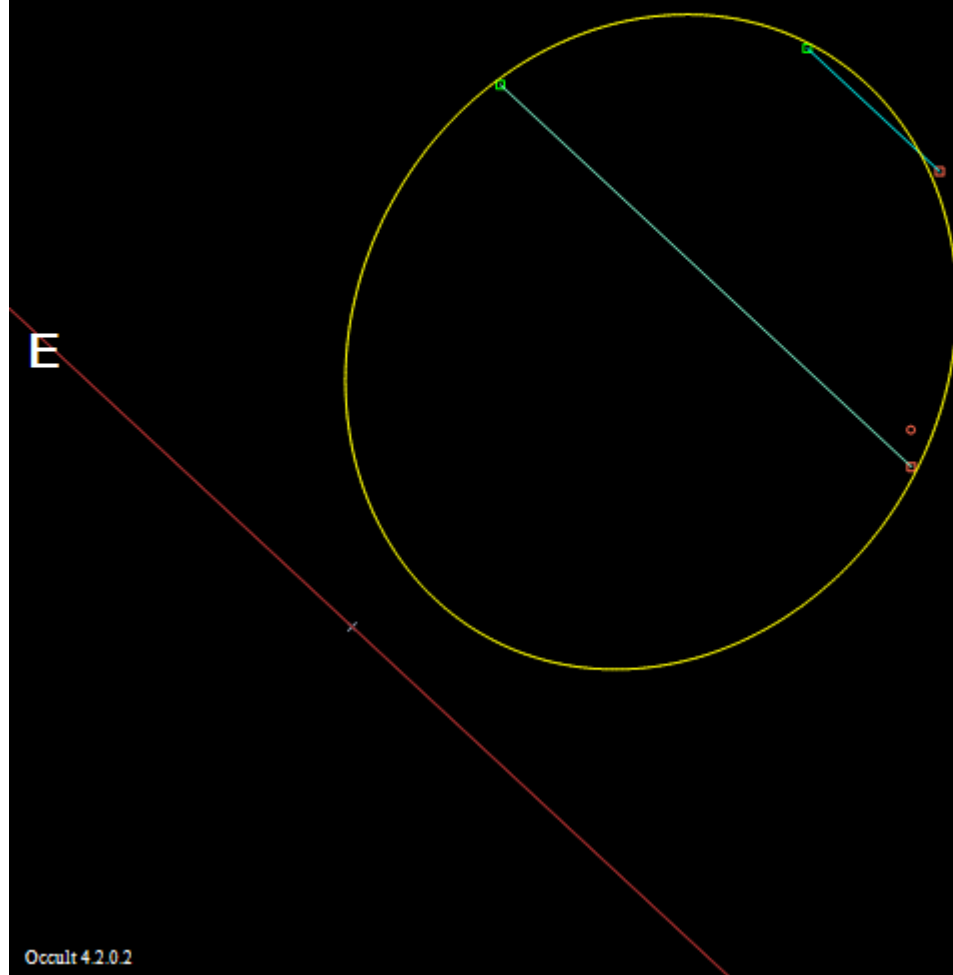
225henrietta2008oct10

(225) Henrietta 2008 Oct 10 $157.8 \pm 22.1 \times 96.8 \pm 8.4$ km, PA $-59.0^\circ \pm 7.3^\circ$
Geocentric X -554.2 ± 8.4 Y 3458.3 ± 6.2 km **N**



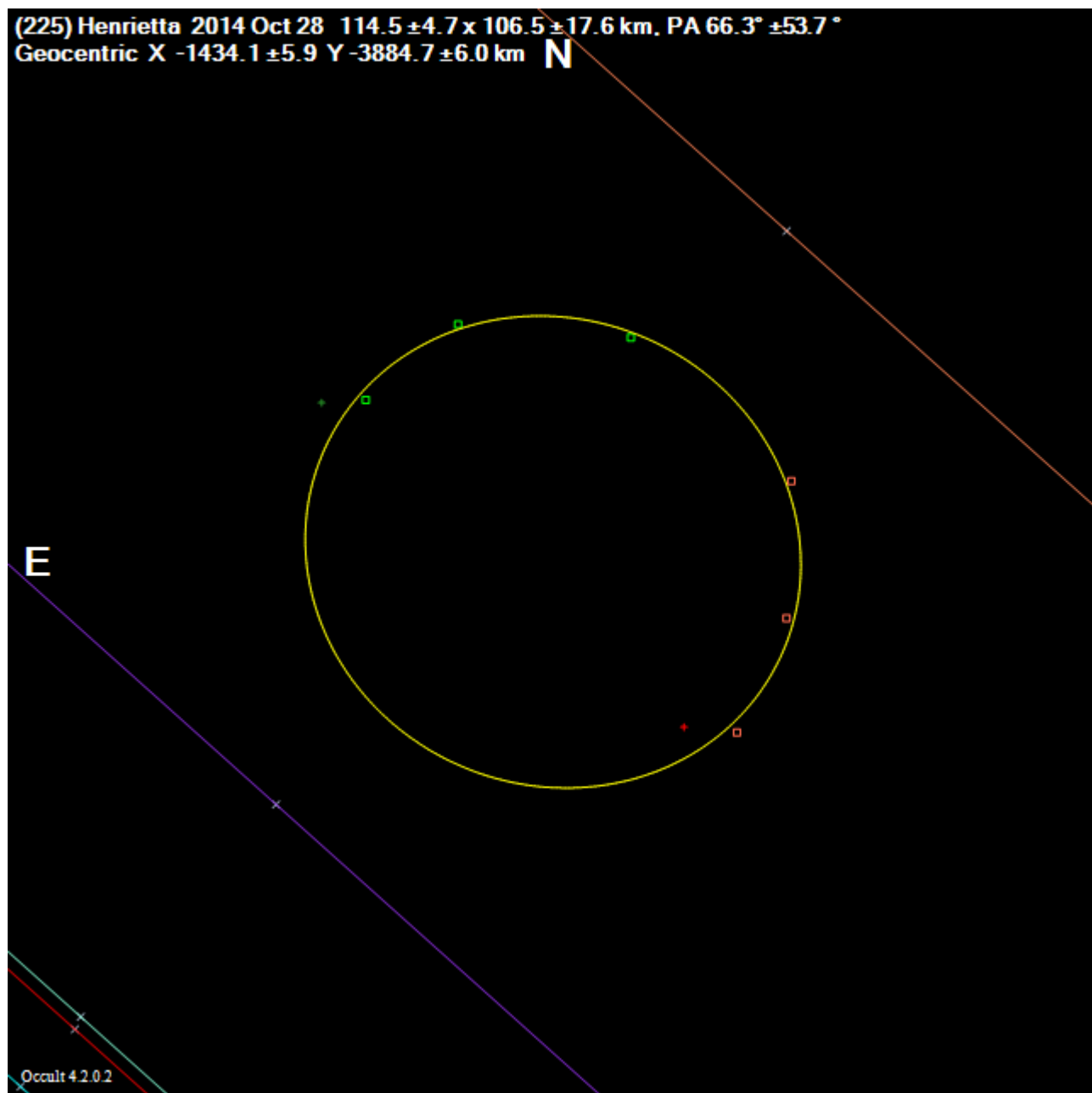
225henrietta2014oct21

(225) Henrietta 2014 Oct 21 130.9 x 114.2 km, PA -29.9° °
Geocentric X -3945.3 ± 1.1 Y 3631.2 ± 1.3 km **N**



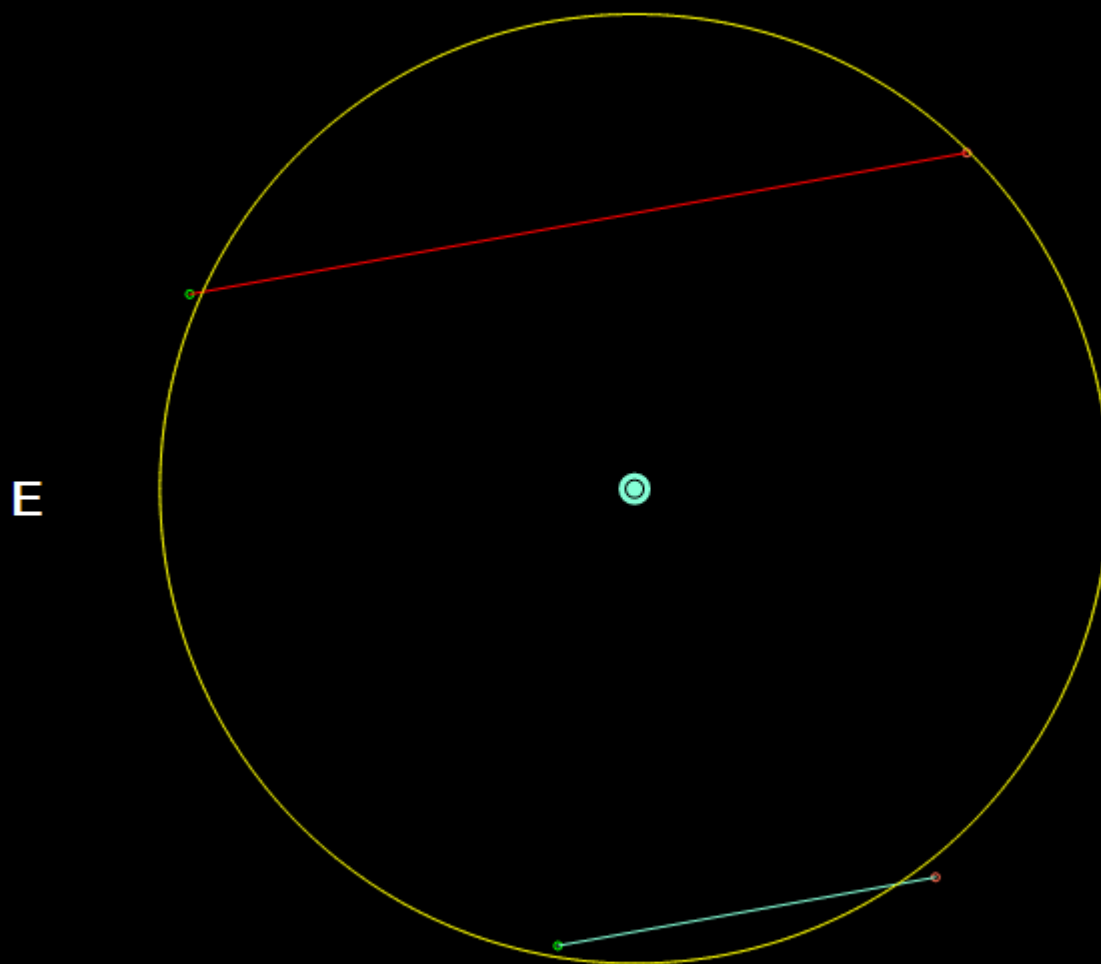
225henrietta2014oct28

(225) Henrietta 2014 Oct 28 $114.5 \pm 4.7 \times 106.5 \pm 17.6$ km, PA $66.3^\circ \pm 53.7^\circ$
Geocentric X -1434.1 ± 5.9 Y -3884.7 ± 6.0 km **N**



2260neoptolemus2010dec24

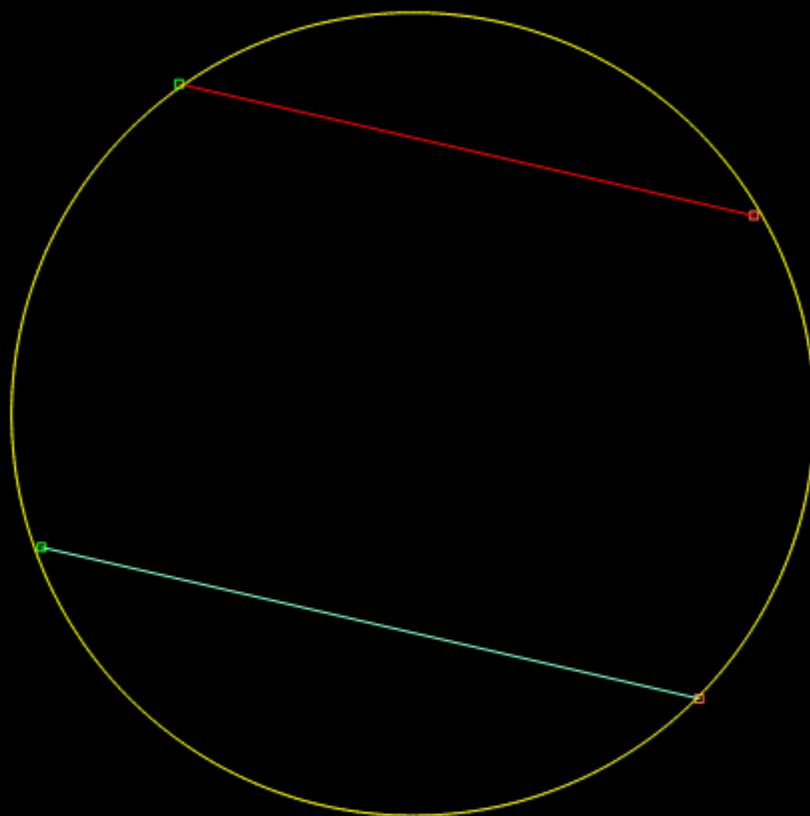
(2260) Neoptolemus 2010 Dec 24 $87.7 \pm 2.0 \times 87.7$ km, PA 0.0° °
Geocentric X 1527.6 ± 0.8 Y 1879.8 ± 0.8 km **N**
Double : Sep $0.0000''$, PA 0.0°



2297622007uk1262014nov15

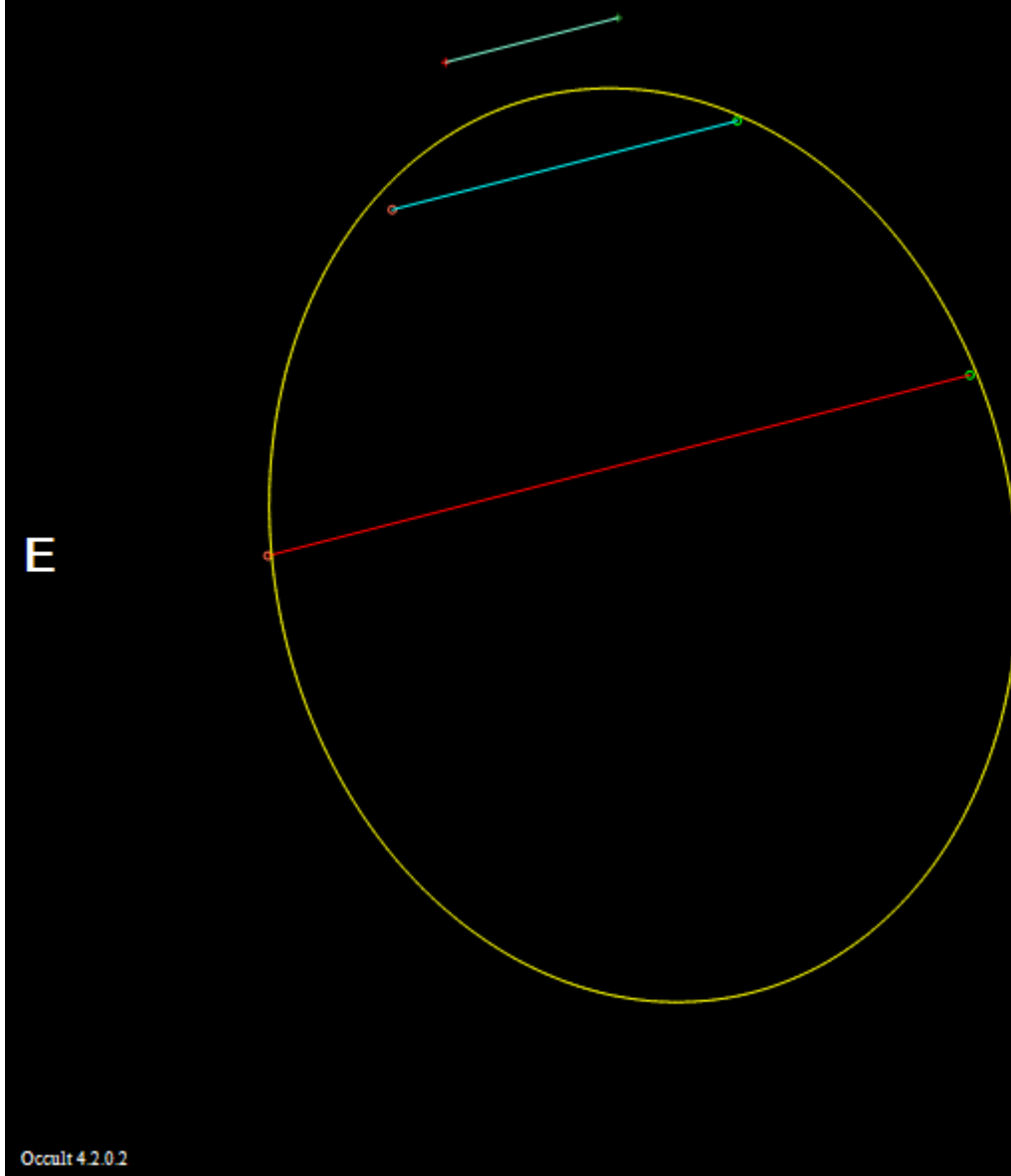
(229762) 2007 UK126 2014 Nov 15 $625.9 \pm 8.9 \times 625.9$ km, PA 0.0°
Geocentric X 703.1 ± 2.4 Y 3532.1 ± 3.2 km **N**

E



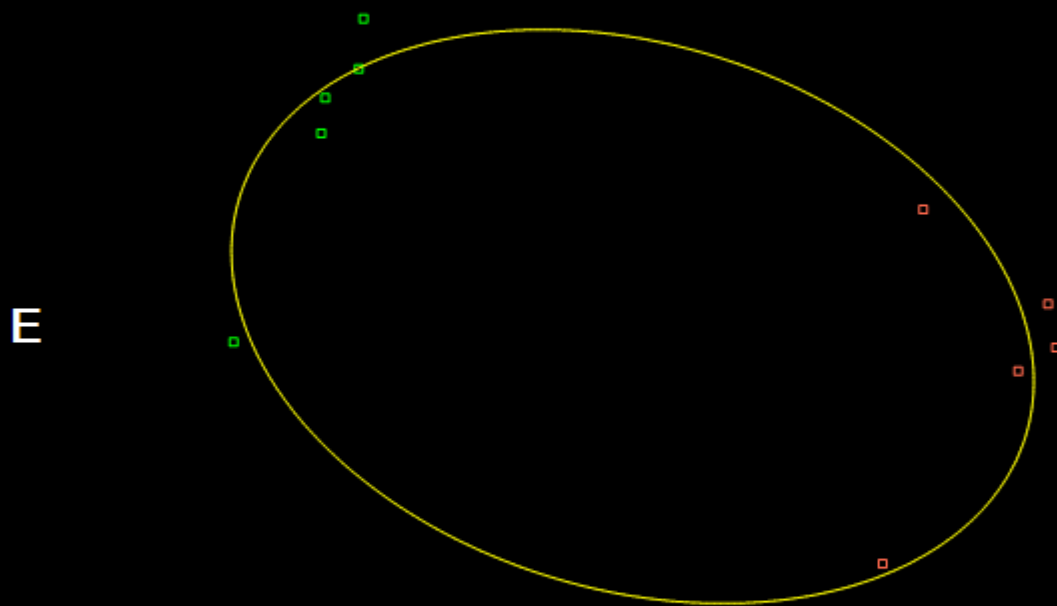
229adelinda2004oct20

(229) Adelinda 2004 Oct 20 $112.0 \pm 228.4 \times 90.0 \pm 27.9$ km, PA 12.0° °
Geocentric X -5199.7 ± 23.8 Y 2680.2 ± 104.7 km



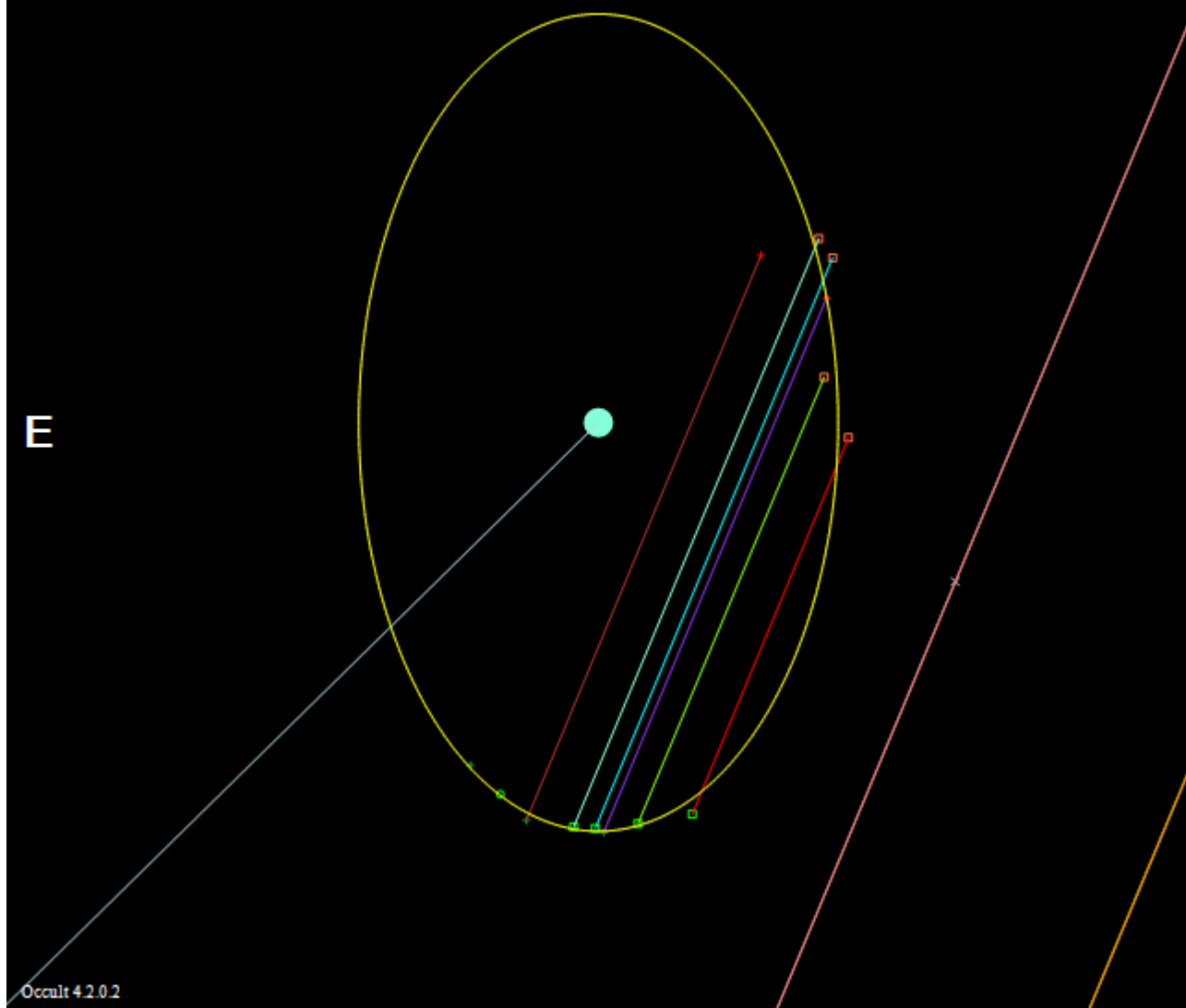
229adelinda2015oct21

(229) Adelinda 2015 Oct 21 $113.3 \pm 4.4 \times 75.3 \pm 9.0$ km, PA $73.3^\circ \pm 4.4^\circ$
Geocentric X 5088.3 ± 1.7 Y 3428.3 ± 1.8 km **N**



22kalliope2006nov07

(22) Kalliope 2006 Nov 7 $208.5 \pm 15.2 \times 122.3 \pm 7.5$ km, PA 0.0° °
Geocentric X 2592.5 ± 3.3 Y 1414.9 ± 7.4 km **N**
Double : Sep $0.2470''$, PA 134.5°



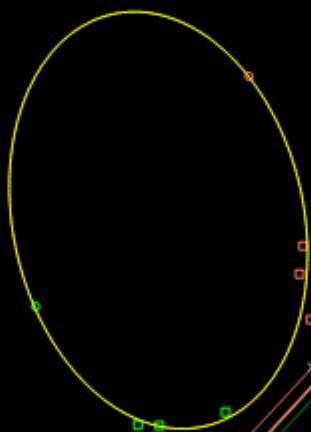
22kalliope2011nov22

(22) Kalliope 2011 Nov 22 $183.6 \pm 13.7 \times 126.4 \pm 3.4$ km, PA $12.6^\circ \pm 5.9^\circ$
Geocentric X 811.9 ± 3.5 Y 2301.6 ± 5.5 km

N

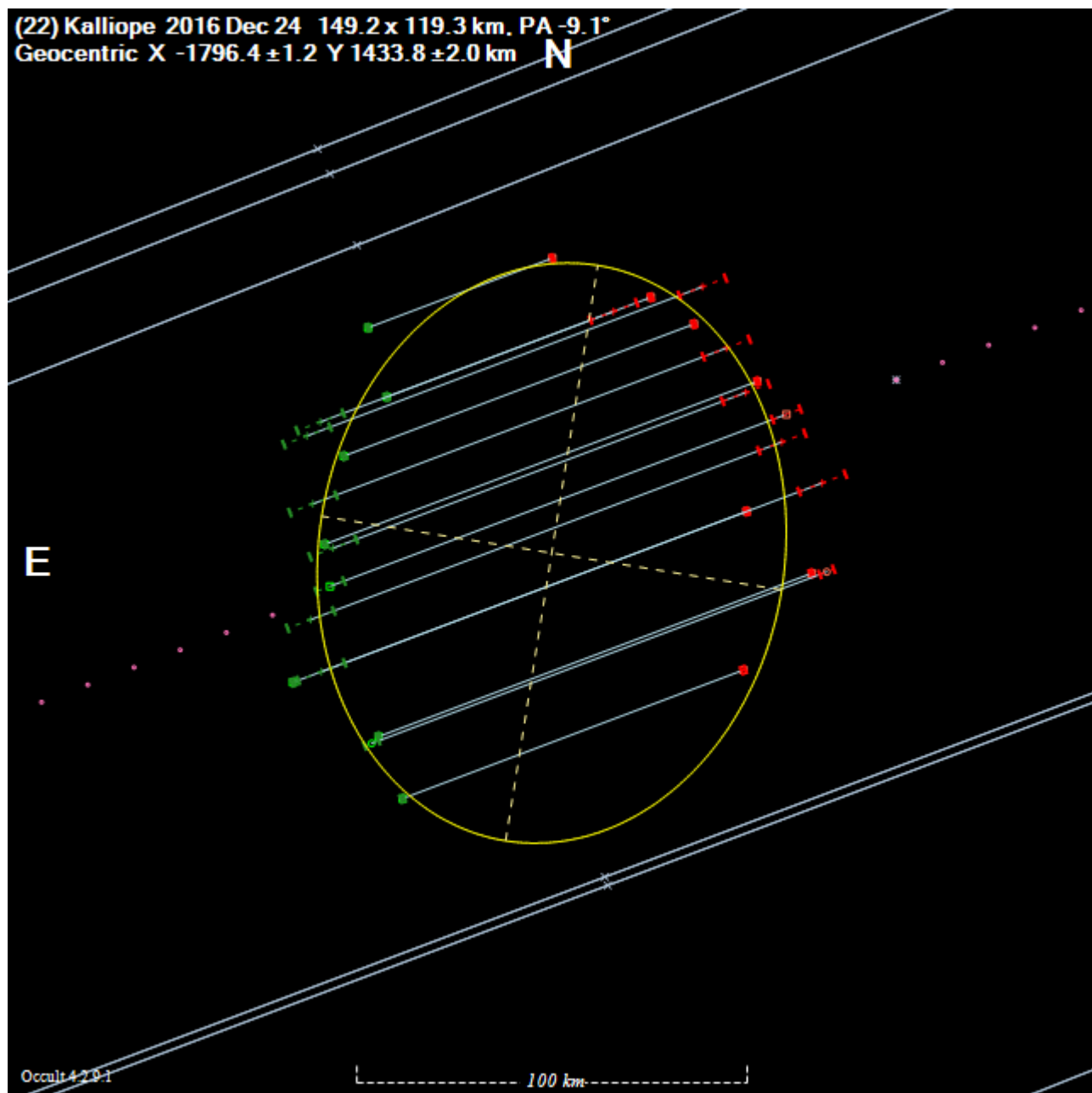
E

Occult 4.2.0.2



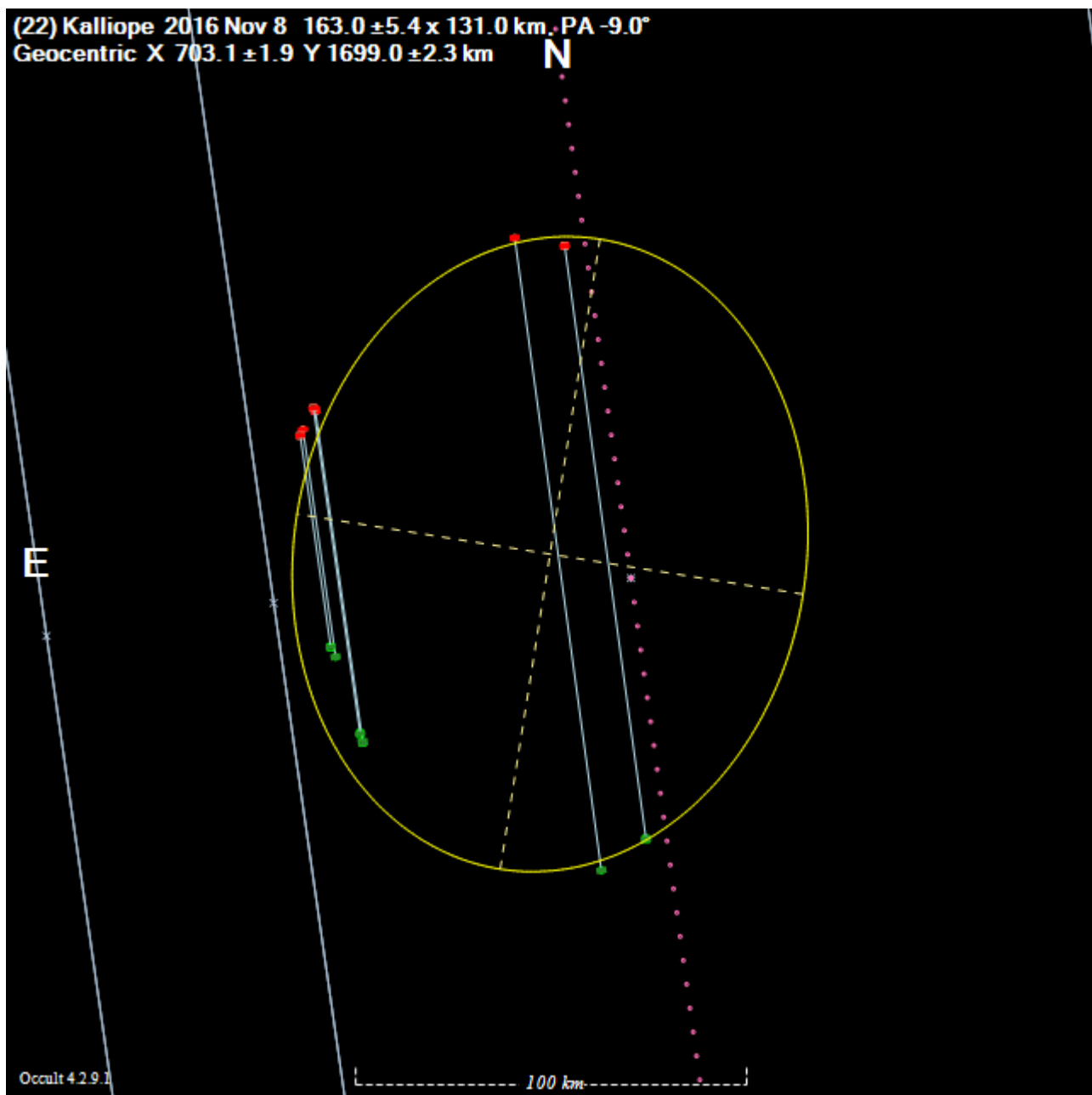
22Kalliope2016Dec24

(22) Kalliope 2016 Dec 24 149.2 x 119.3 km, PA -9.1°
Geocentric X -1796.4 ± 1.2 Y 1433.8 ± 2.0 km



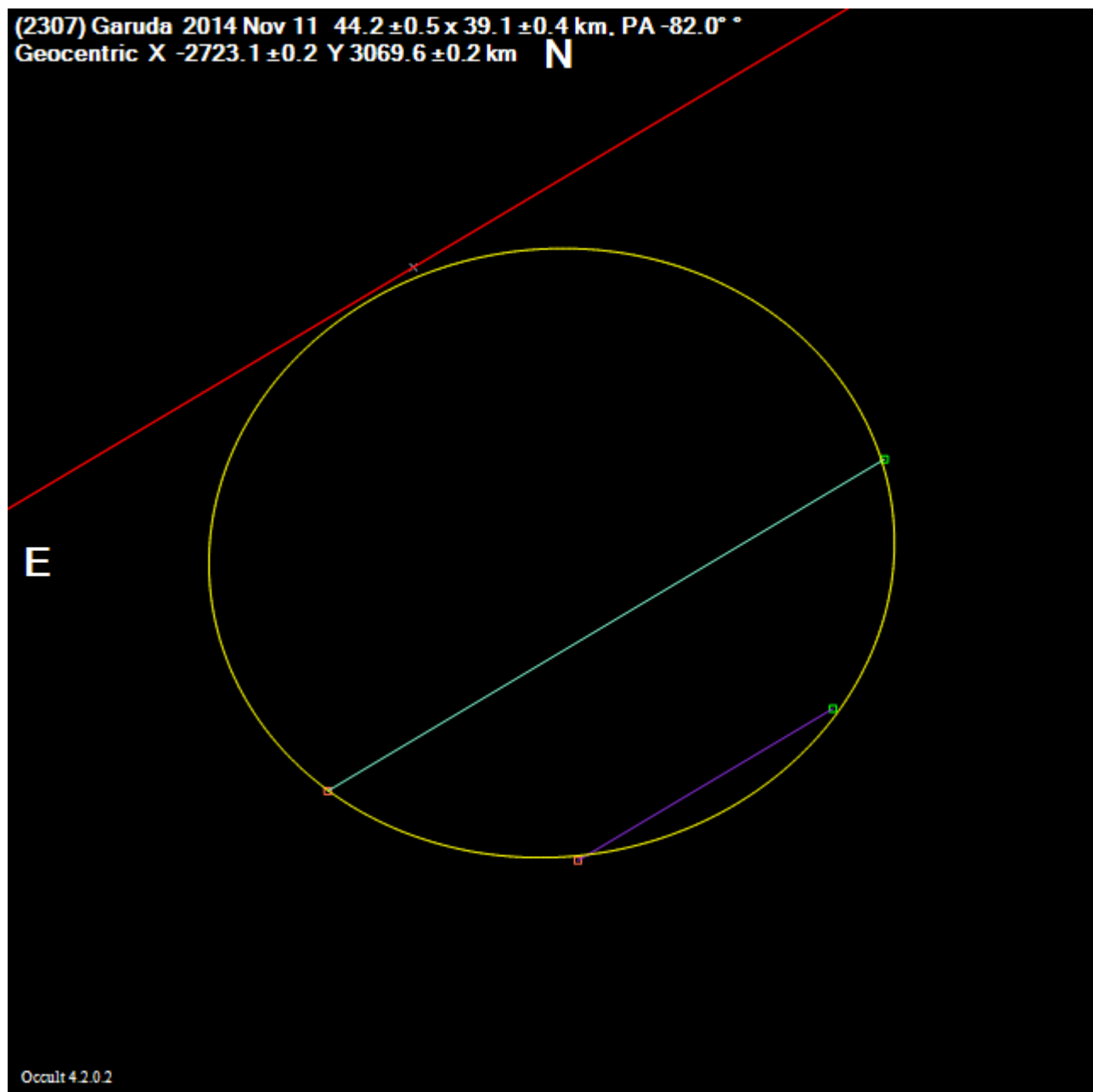
22Kalliope2016Nov08

(22) Kalliope 2016 Nov 8 $163.0 \pm 5.4 \times 131.0$ km, PA -9.0°
Geocentric X 703.1 ± 1.9 Y 1699.0 ± 2.3 km



2307garuda2014nov11

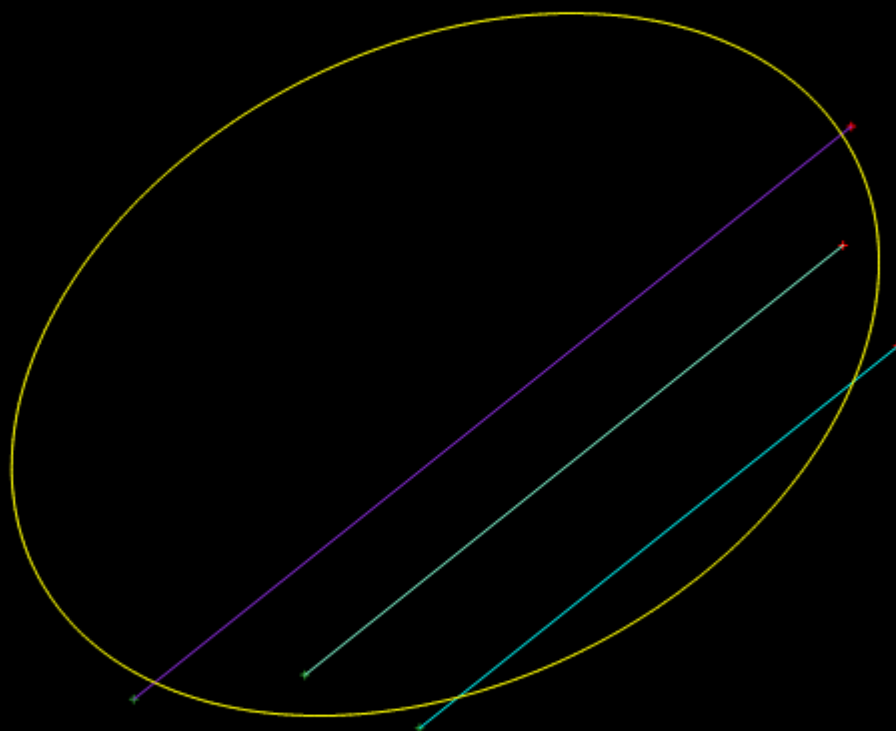
(2307) Garuda 2014 Nov 11 $44.2 \pm 0.5 \times 39.1 \pm 0.4$ km, PA -82.0°
Geocentric X -2723.1 ± 0.2 Y 3069.6 ± 0.2 km **N**



230athamantis1984may11

(230) Athamantis 1984 May 11 $130.2 \pm 7.7 \times 90.0$ km, PA -63.0° °
Geocentric X -2617.9 ± 3.8 Y -1340.5 ± 2.7 km **N**

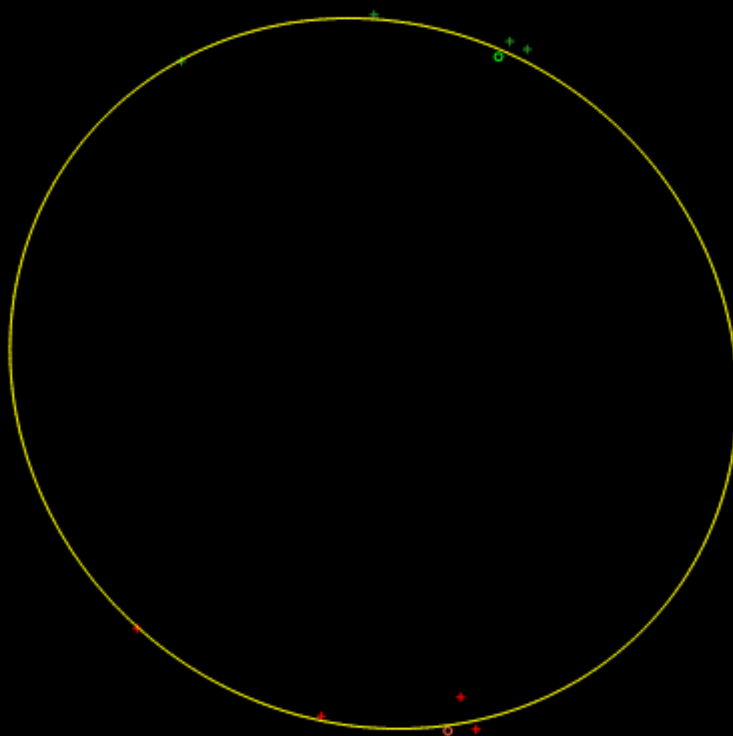
E



230athamantis1991jan21

(230) Athamantis 1991 Jan 21 $105.6 \pm 9.9 \times 98.2 \pm 2.4$ km, PA $54.5^\circ \pm 51.3^\circ$
Geocentric X 1075.6 ± 2.4 Y 5123.5 ± 0.7 km **N**

E



230athamantis2014oct08

(230) Athamantis 2014 Oct 8 128.3 x 114.3 km, PA 29.0° °
Geocentric X 2372.5 ± 0.7 Y 4565.3 ± 2.3 km **N**

E

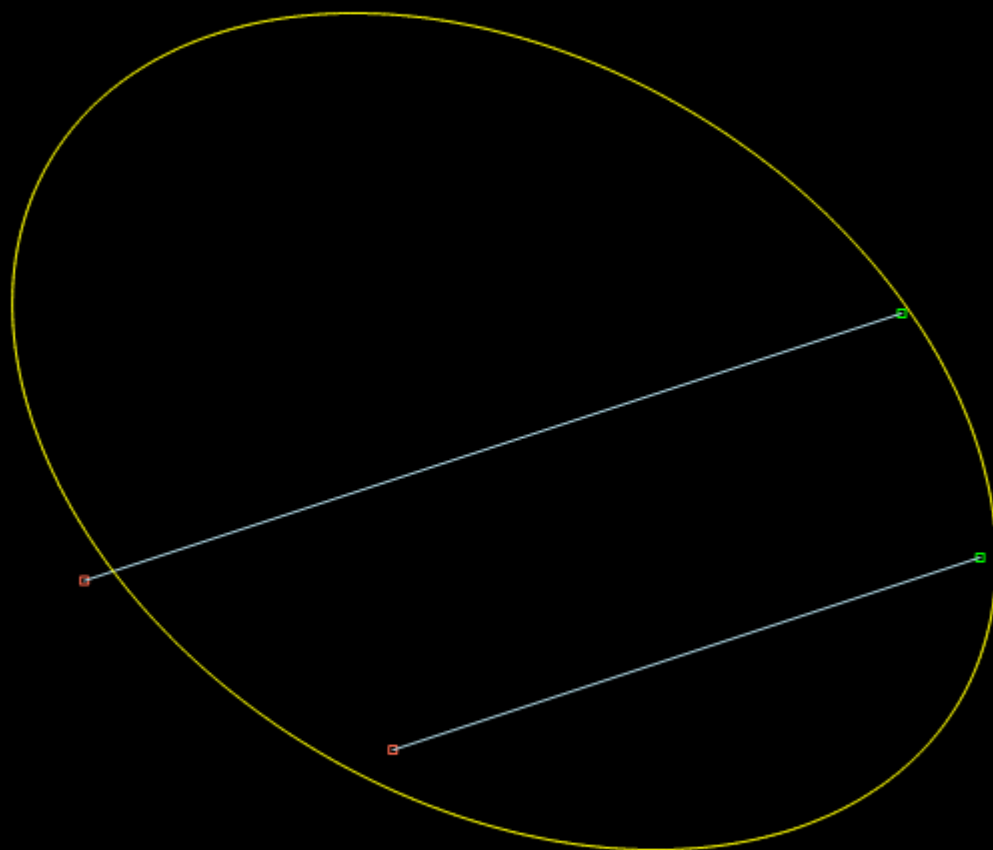


233asterope2015oct02

(233) Asterope 2015 Oct 2 136.3 x 95.4 km, PA 59.0°
Geocentric X -2046.6 Y 2457.0 km

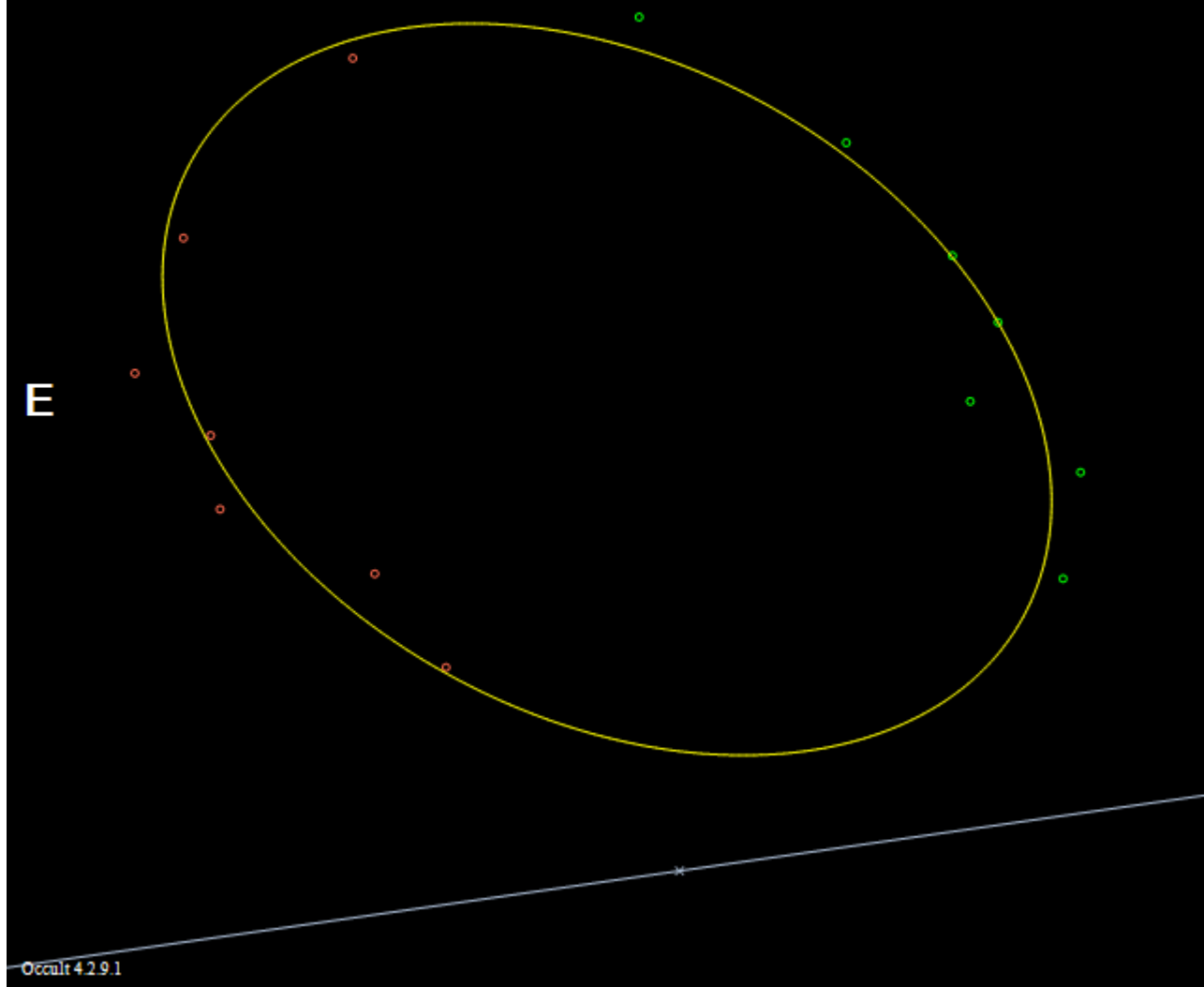
N

E

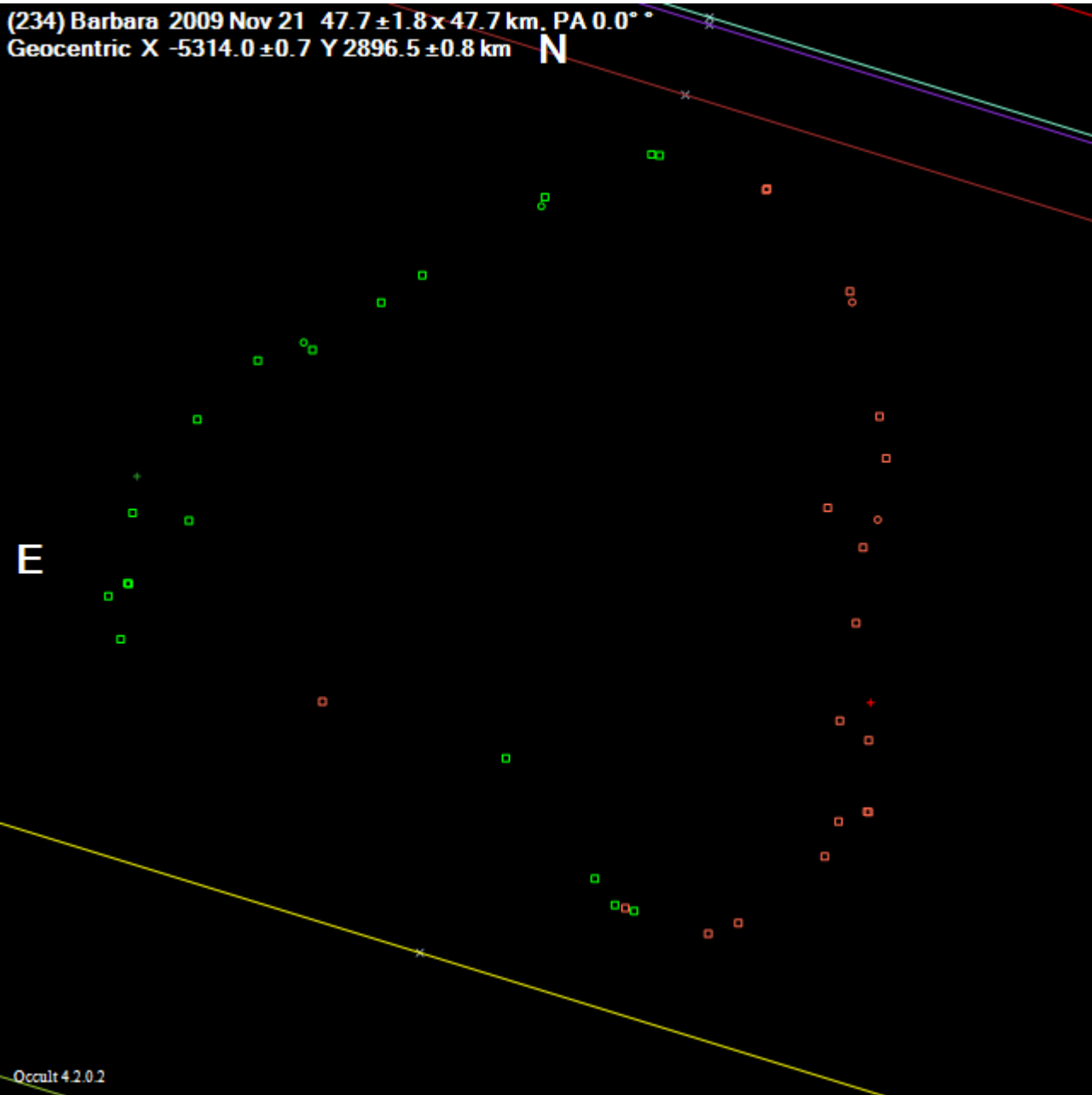


233asterope2015sep11

(233) Asterope 2015 Sep 11 $130.4 \pm 4.9 \times 89.7 \pm 3.8$ km, PA $61.3^\circ \pm 5.5^\circ$
Geocentric X -2262.8 ± 1.6 Y -3934.5 ± 2.2 km **N**

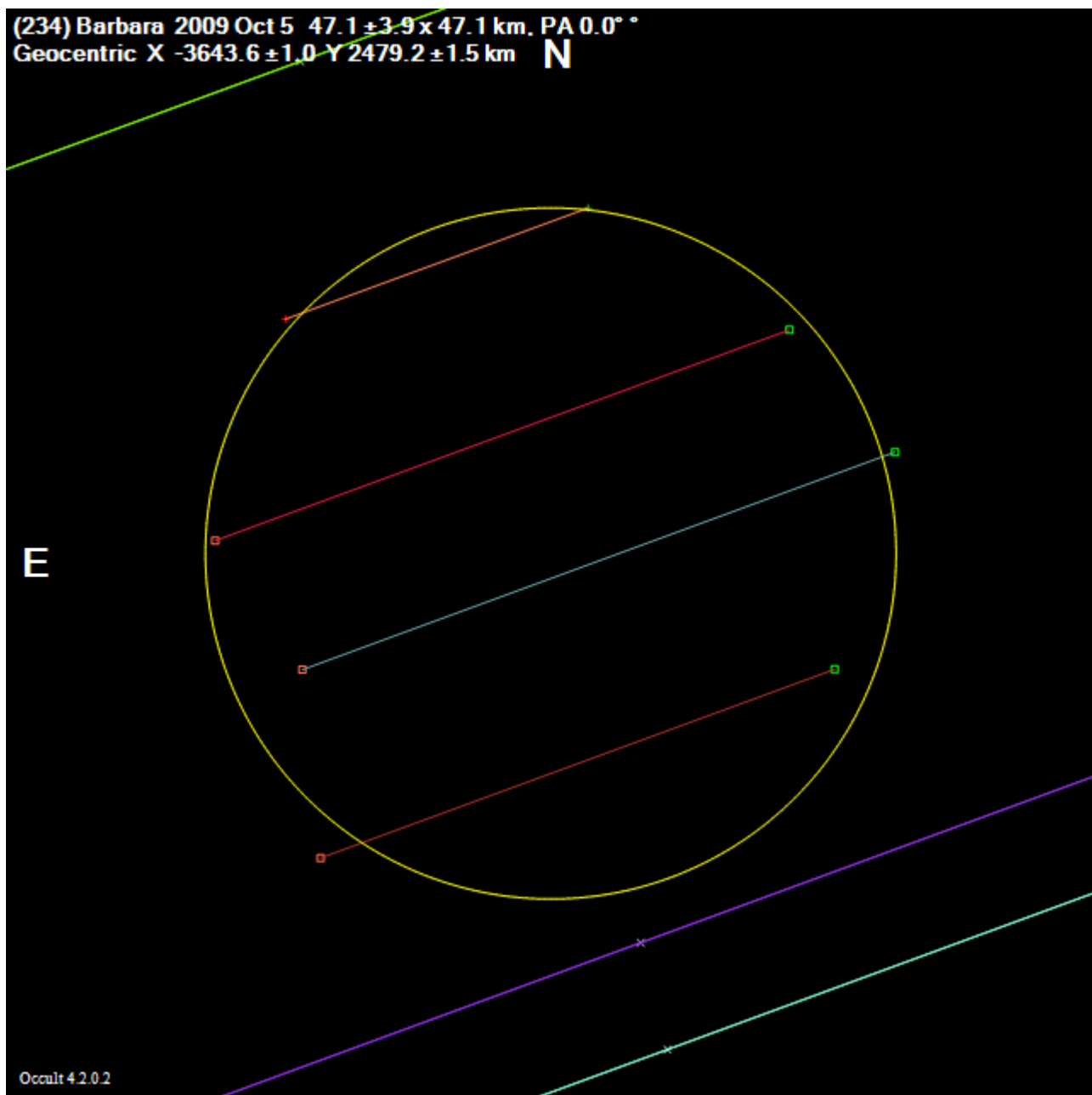


234barbara2009nov21



234barbara2009oct05

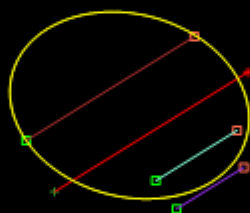
(234) Barbara 2009 Oct 5 $47.1 \pm 3.9 \times 47.1$ km, PA 0.0° °
Geocentric X -3643.6 ± 1.0 Y 2479.2 ± 1.5 km **N**



234barbara2010jan17

(234) Barbara 2010 Jan 17 $51.1 \pm 7.1 \times 38.4 \pm 2.4$ km, PA $75.0^\circ \pm 22.9^\circ$
Geocentric X -1071.3 ± 3.1 Y 2986.4 ± 3.0 km **N**

E



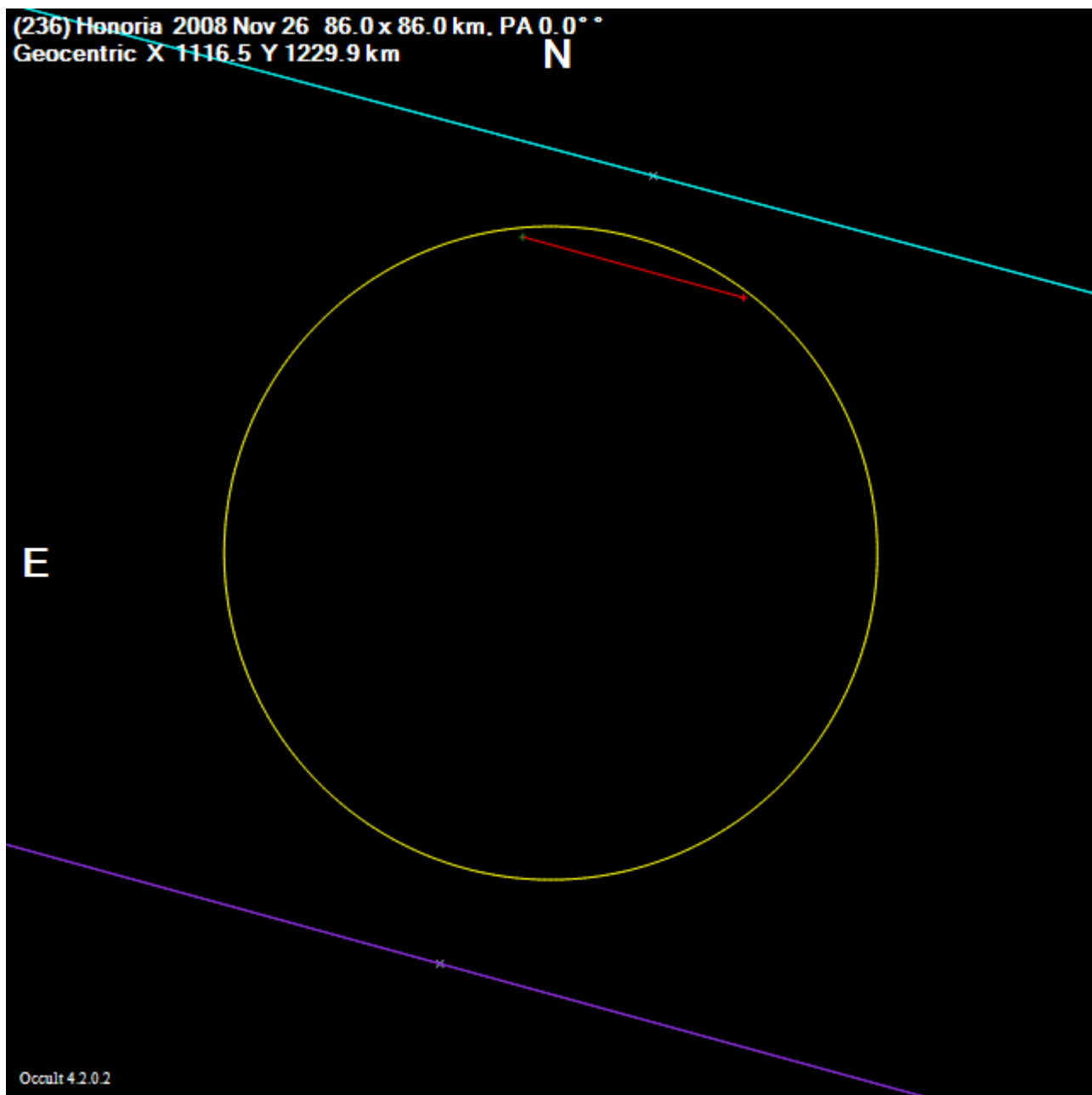
236honoria2008nov26

(236) Honoria 2008 Nov 26 86.0 x 86.0 km, PA 0.0°
Geocentric X 1116.5 Y 1229.9 km

N

E

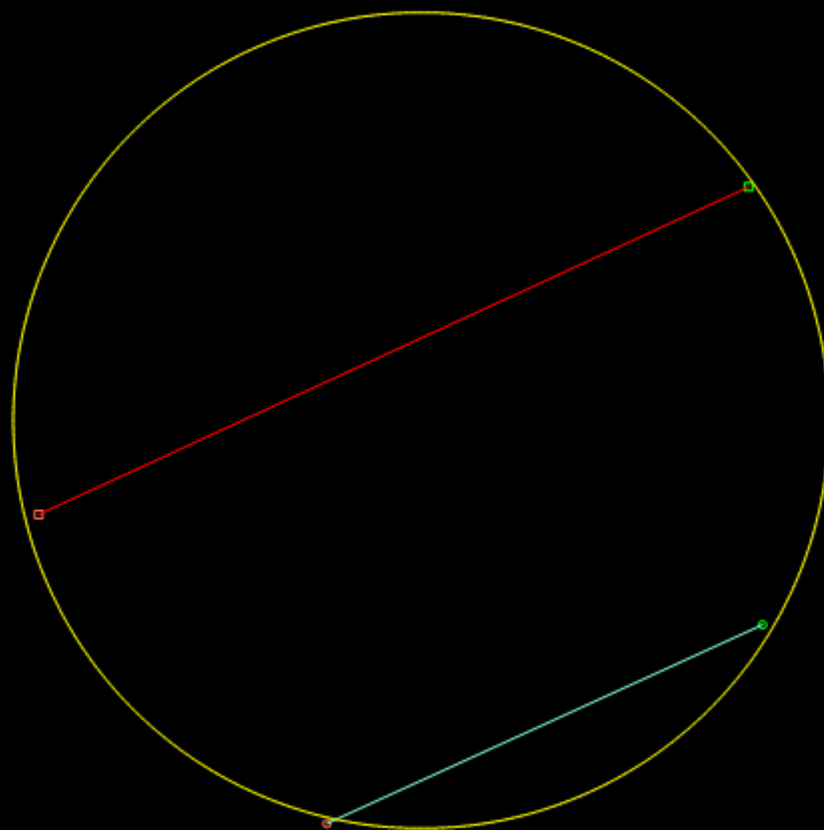
Occult 4.2.0.2



236honoriam2008oct11

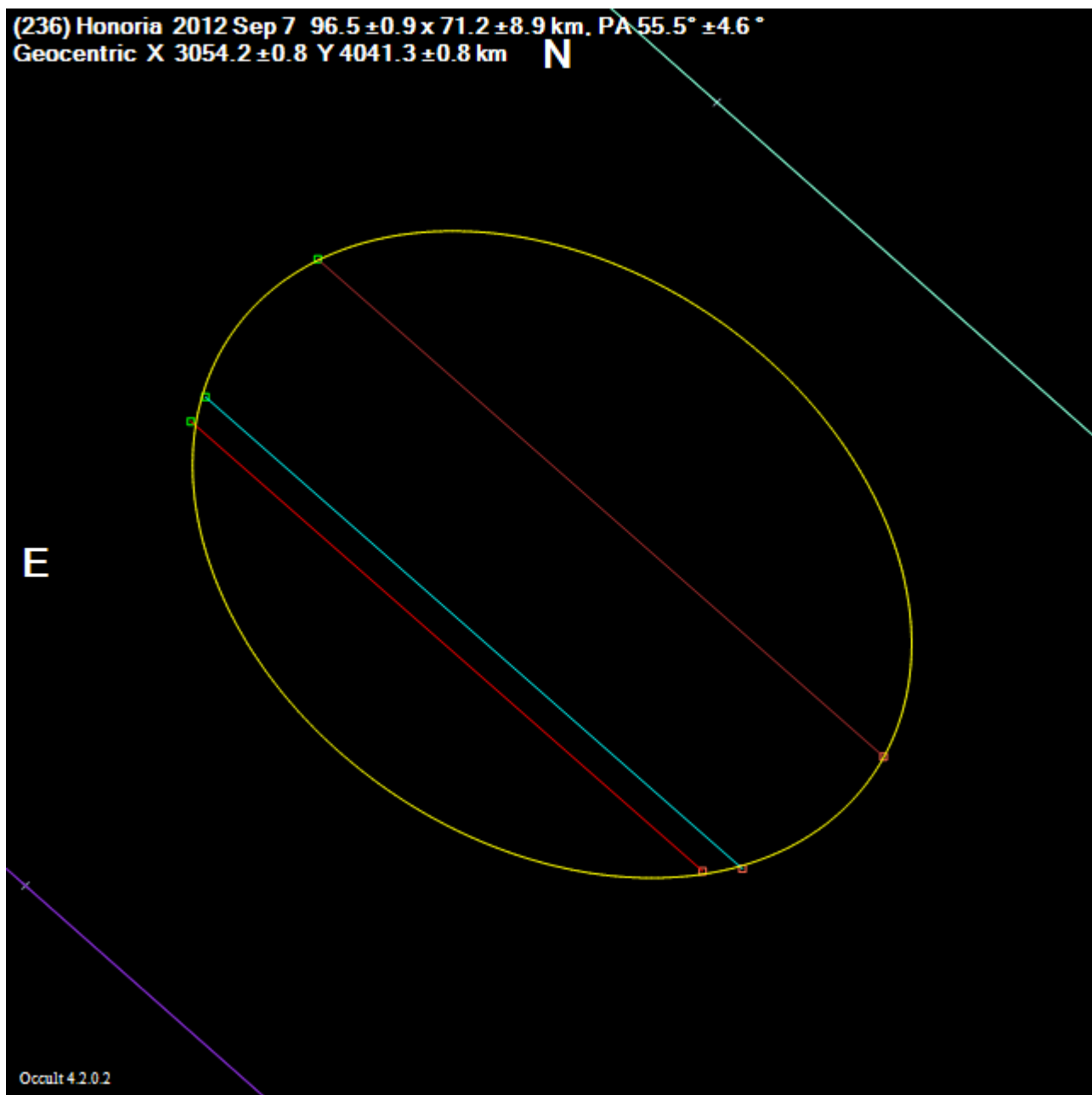
(236) Honoria 2008 Oct 11 $91.3 \pm 2.4 \times 91.3$ km, PA 0.0° °
Geocentric X -2498.7 ± 0.6 Y 2906.2 ± 1.0 km **N**

E



236honoriam2012sep07

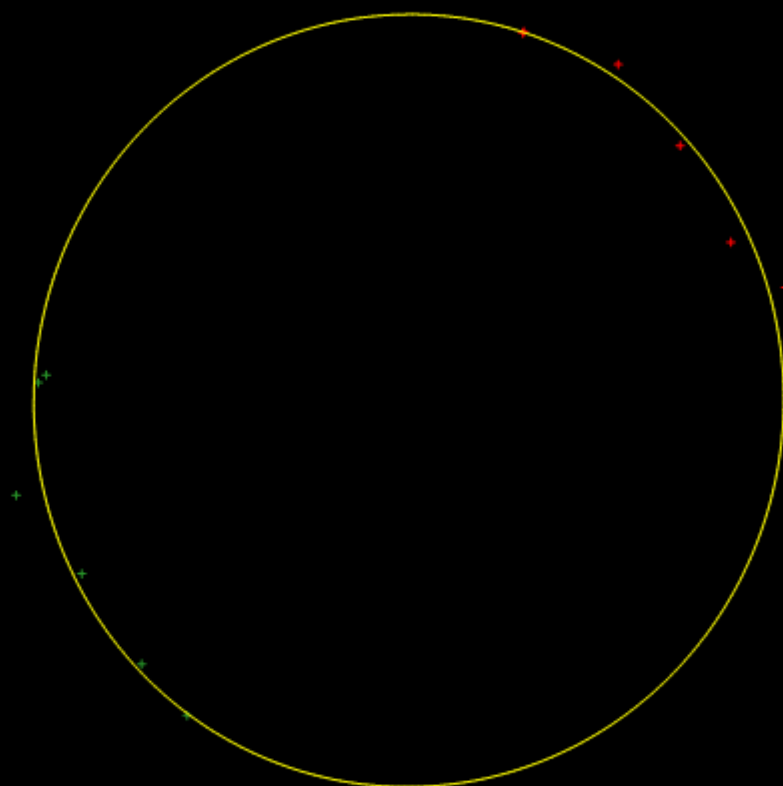
(236) Honoria 2012 Sep 7 $96.5 \pm 0.9 \times 71.2 \pm 8.9$ km, PA $55.5^\circ \pm 4.6^\circ$
Geocentric X 3054.2 ± 0.8 Y 4041.3 ± 0.8 km **N**



238hypatia2001mar06

(238) Hypatia 2001 Mar 6 $148.8 \pm 8.4 \times 144.4 \pm 5.3$ km, PA $-4.4^\circ \pm 101.4^\circ$
Geocentric X 1293.9 ± 2.0 Y 3111.0 ± 2.8 km **N**

E

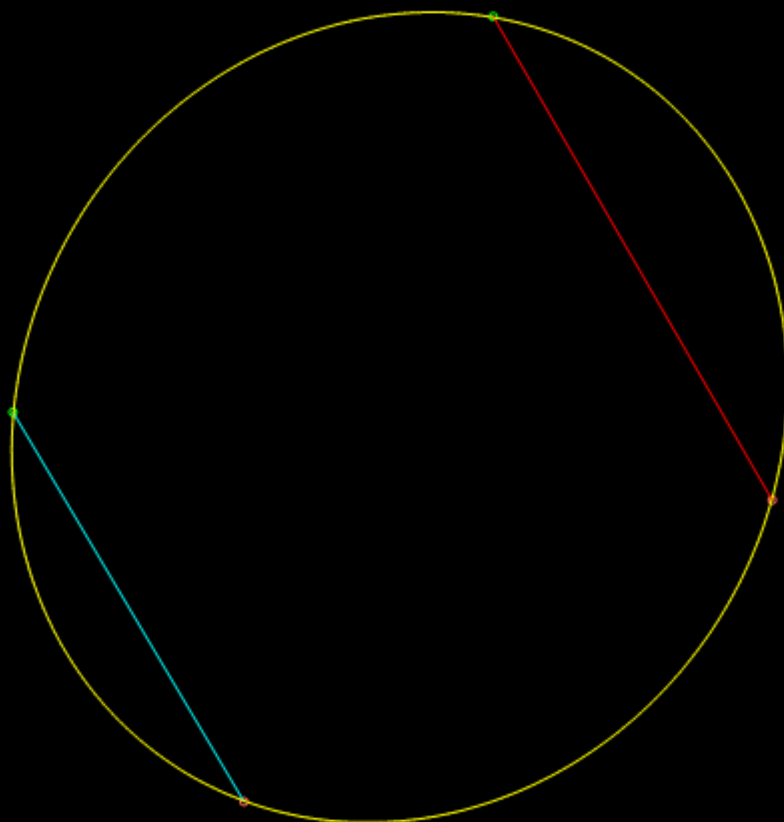


238hypatia2004nov11

(238) Hypatia 2004 Nov 11 159.8 x 145.4 km, PA -31.3° °
Geocentric X -2890.7 Y -3868.7 km

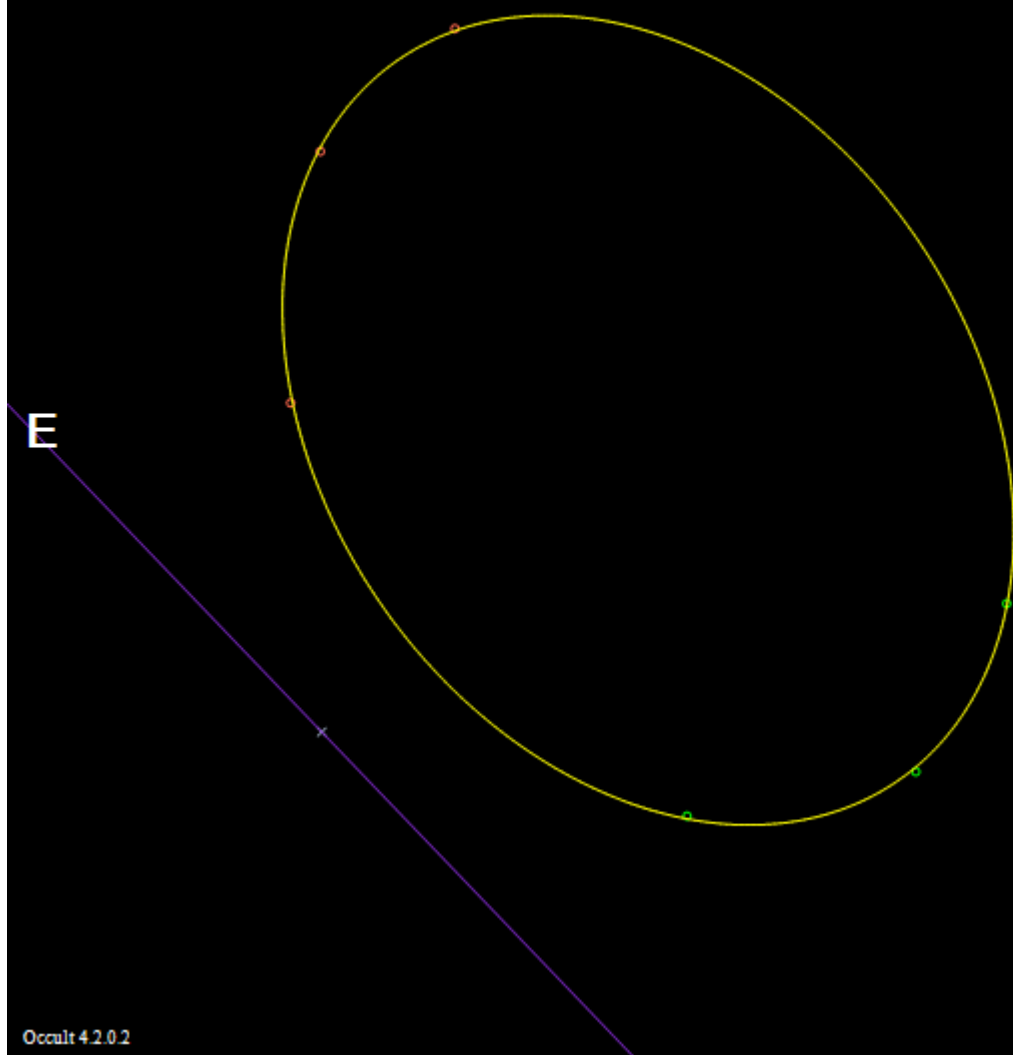
N

E



238hypatia2005feb23

(238) Hypatia 2005 Feb 23 $168.9 \pm 0.4 \times 124.9 \pm 1.0$ km, PA $34.9^\circ \pm 0.5^\circ$
Geocentric X 4856.5 ± 0.2 Y 3615.4 ± 0.2 km **N**

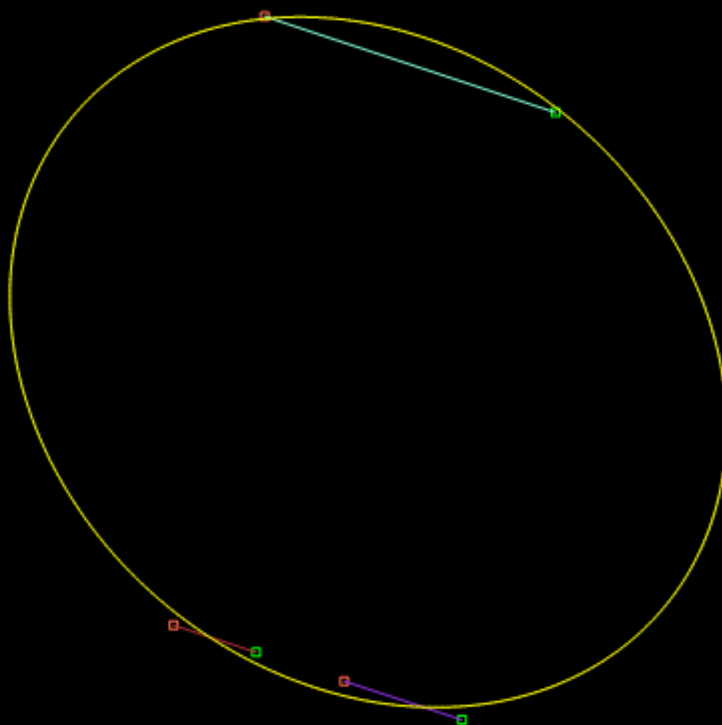


238hypatia2014jan17

(238) Hypatia 2014 Jan 17 169.0 x 139.0 km, PA 50.6° ± 5.4°
Geocentric X 2607.3 ± 2.9 Y 3615.6 ± 1.3 km **N**

E

Occult 4.2.0.2

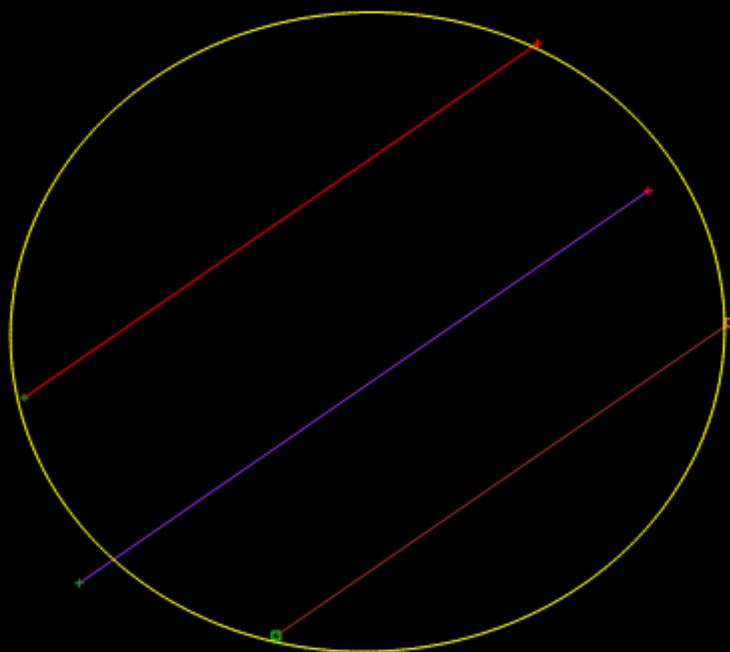


239adrastea2009feb23

(239) Adrastea 2009 Feb 23 $38.1 \pm 1.5 \times 34.1 \pm 1.9$ km, PA 93.2°
Geocentric X -709.4 ± 0.8 Y 1273.7 ± 0.9 km

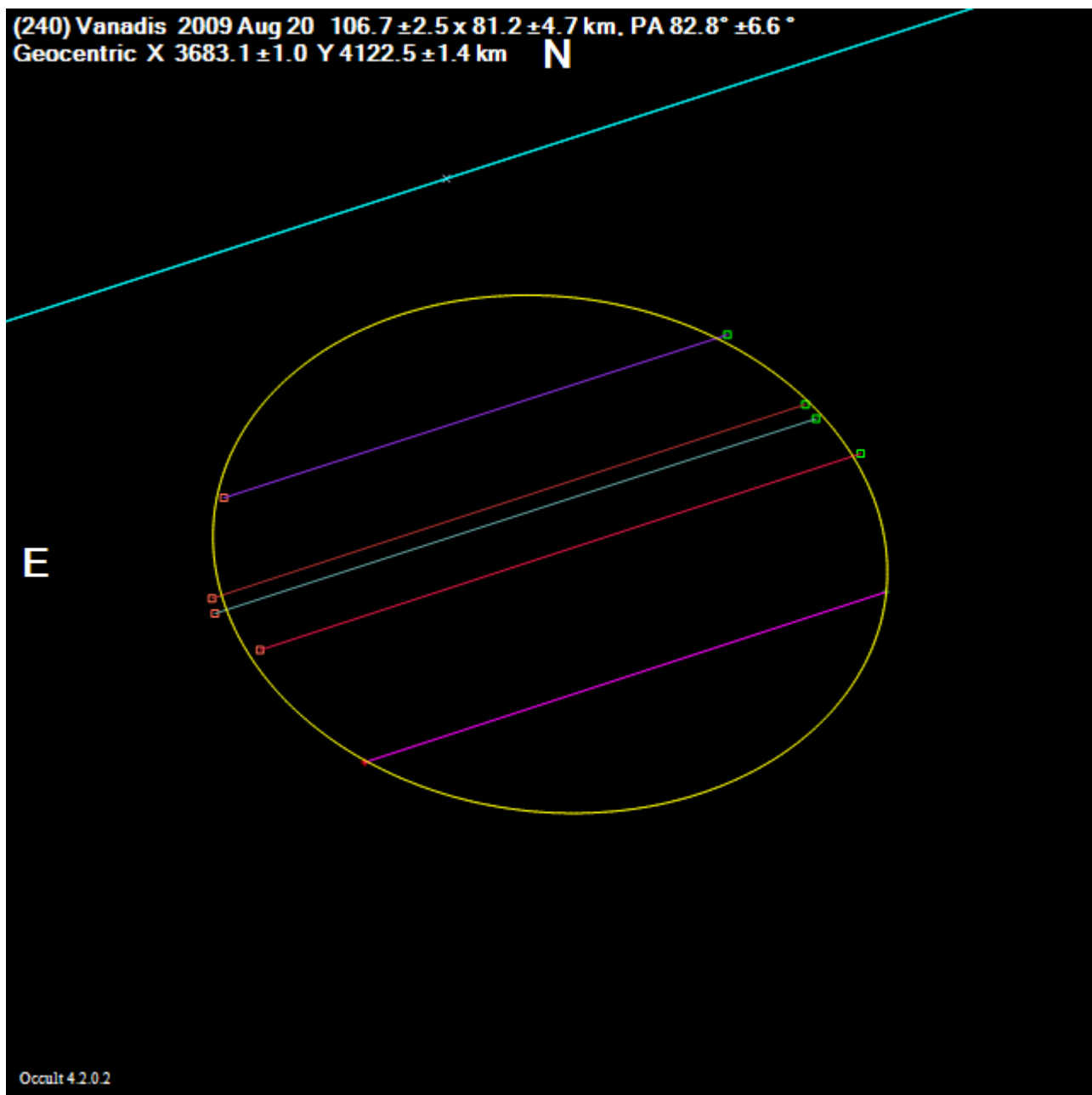
N

E



240vanadis2009aug20

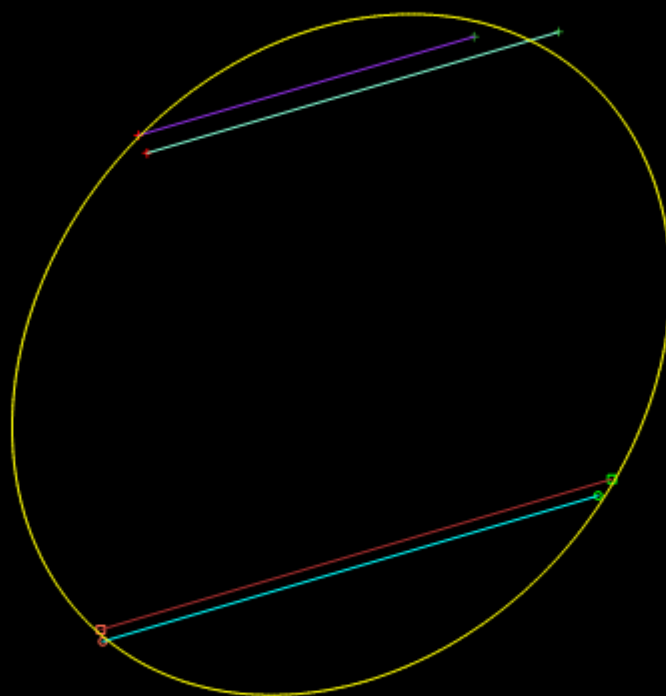
(240) Vanadis 2009 Aug 20 $106.7 \pm 2.5 \times 81.2 \pm 4.7$ km, PA $82.8^\circ \pm 6.6^\circ$
Geocentric X 3683.1 ± 1.0 Y 4122.5 ± 1.4 km **N**



240vanadis2012may23

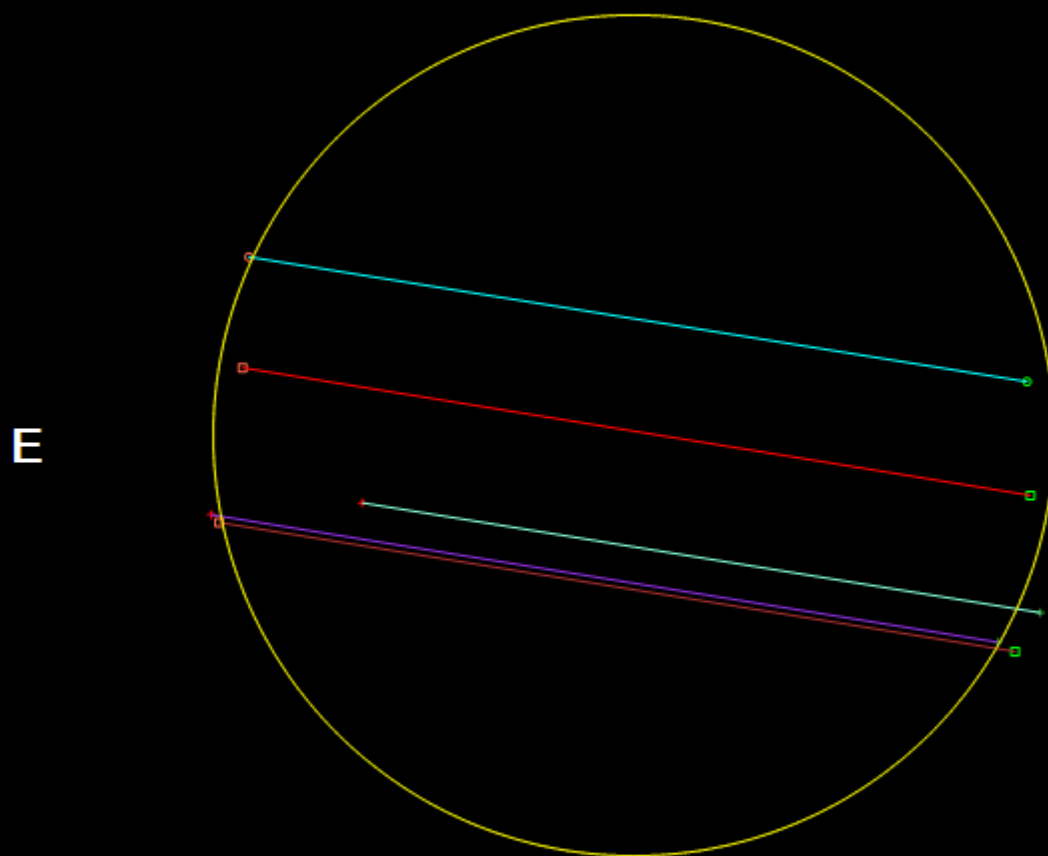
(240) Vanadis 2012 May 23 $102.8 \pm 2.9 \times 82.6$ km, PA $-40.5^\circ \pm 29.6^\circ$
Geocentric X 3839.4 ± 1.1 Y 4189.4 ± 2.1 km **N**

E



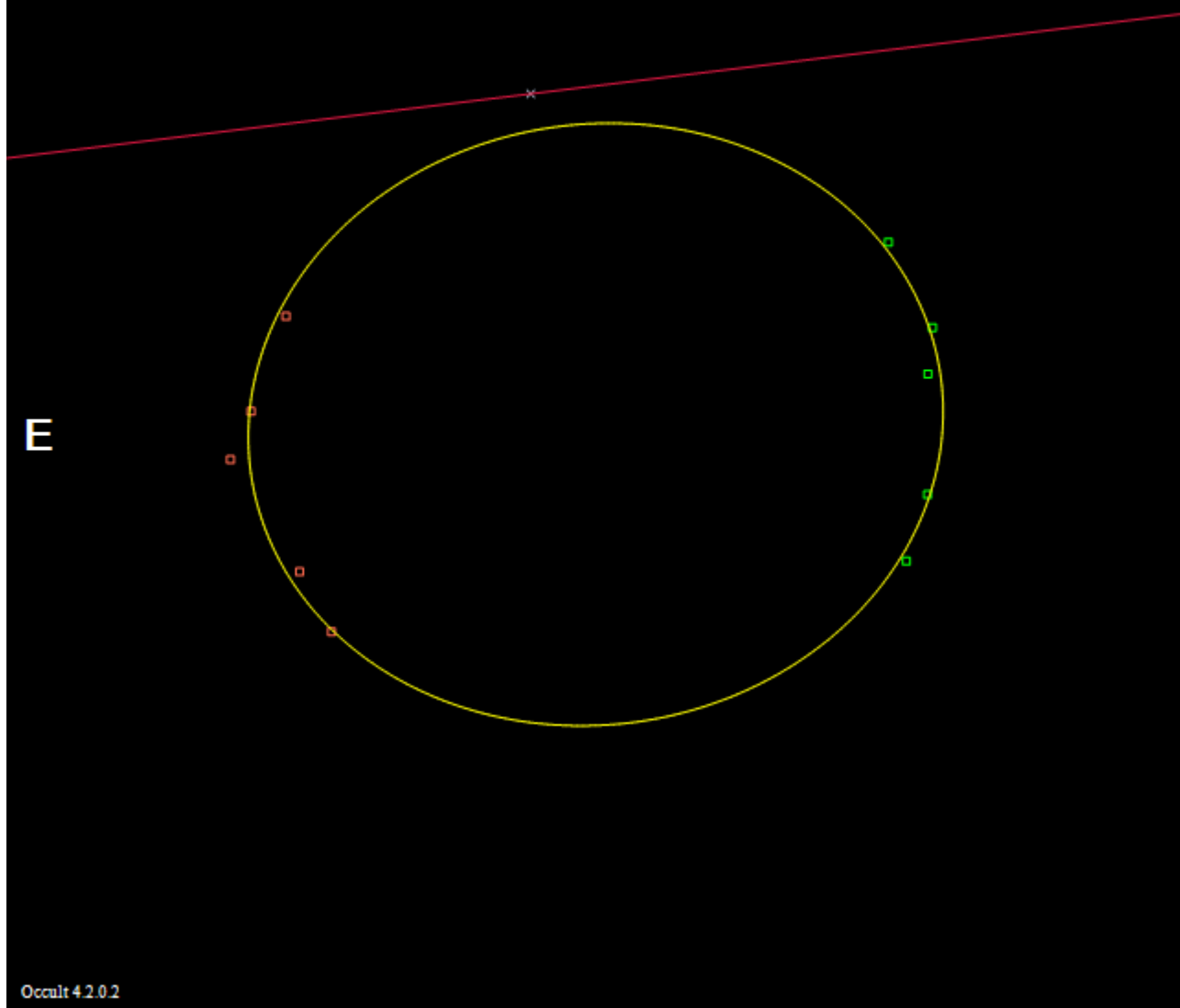
241germania2008mar15

(241) Germania 2008 Mar 15 $183.8 \pm 56.3 \times 183.8$ km, PA 0.0° °
Geocentric X 4979.9 ± 3.5 Y 1231.7 ± 12.6 km **N**



241germania2014apr18

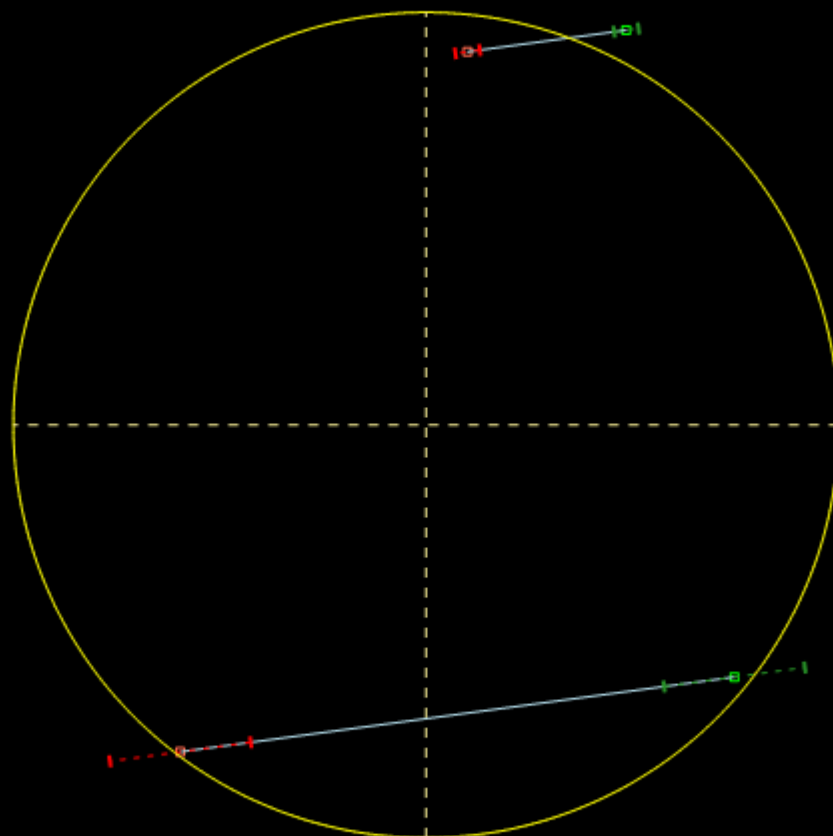
(241) Germania 2014 Apr 18 $181.6 \pm 2.4 \times 156.6 \pm 10.2$ km, PA $-81.9^\circ \pm 5.0^\circ$
Geocentric X 3691.8 ± 0.8 Y 4038.8 ± 1.8 km **N**



2426Simonov2016Sep01

(2426) Simonov 2016 Sep 1 29.0 x 29.0 km, PA 0.0°
Geocentric X 3600.1 ± 0.8 Y 5026.6 ± 0.5 km **N**

E



Occult 4.2.9.1

20 km

247eukrate2009aug26

(247) Eukrate 2009 Aug 26 157.0 x 121.5 \pm 5.0 km. PA -10.6° \pm 5.6°
Geocentric X 4244.0 \pm 2.3 Y 1660.1 \pm 2.0 km **N**



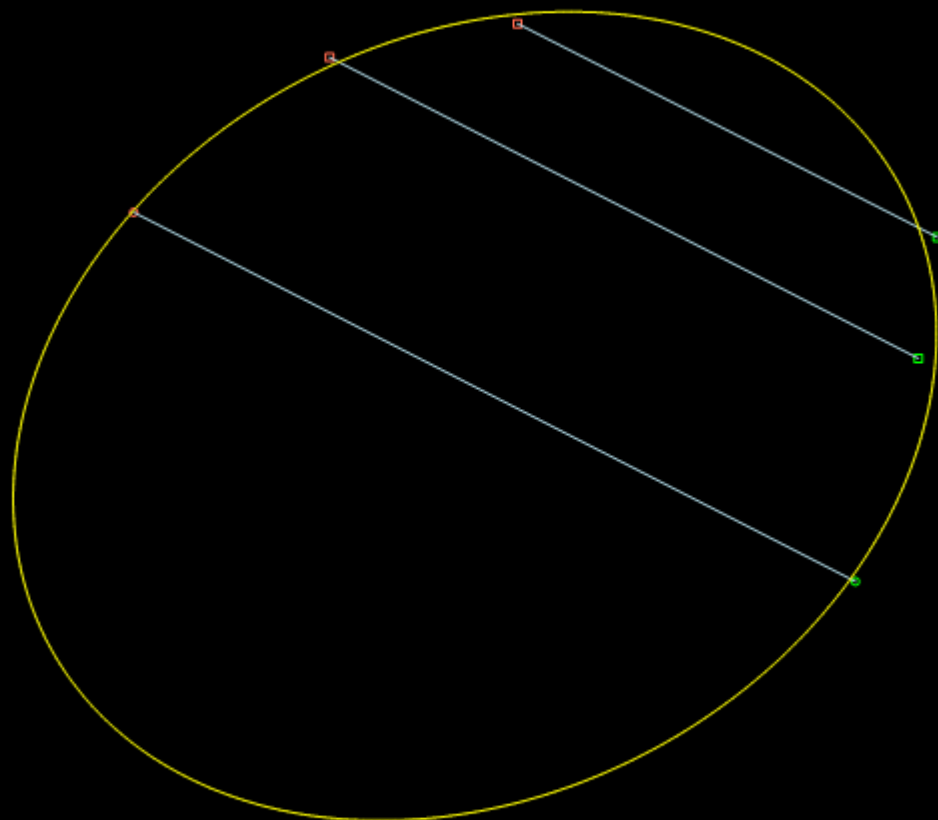
247eukrate2015oct22

(247) Eukrate 2015 Oct 22 168.6 x 131.8 ± 3.5 km, PA -61.5° ± 4.9°
Geocentric X -3452.5 ± 1.2 Y 66.0 ± 2.0 km

N

E

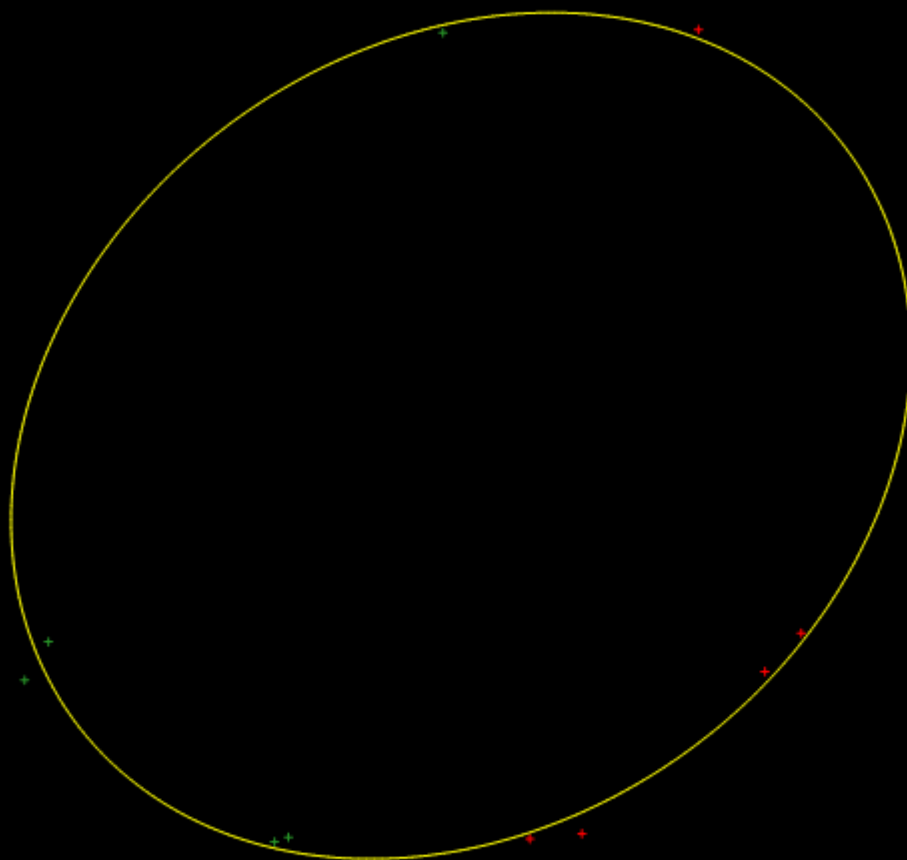
Occult 4.2.9.1



248lameia1998jun27

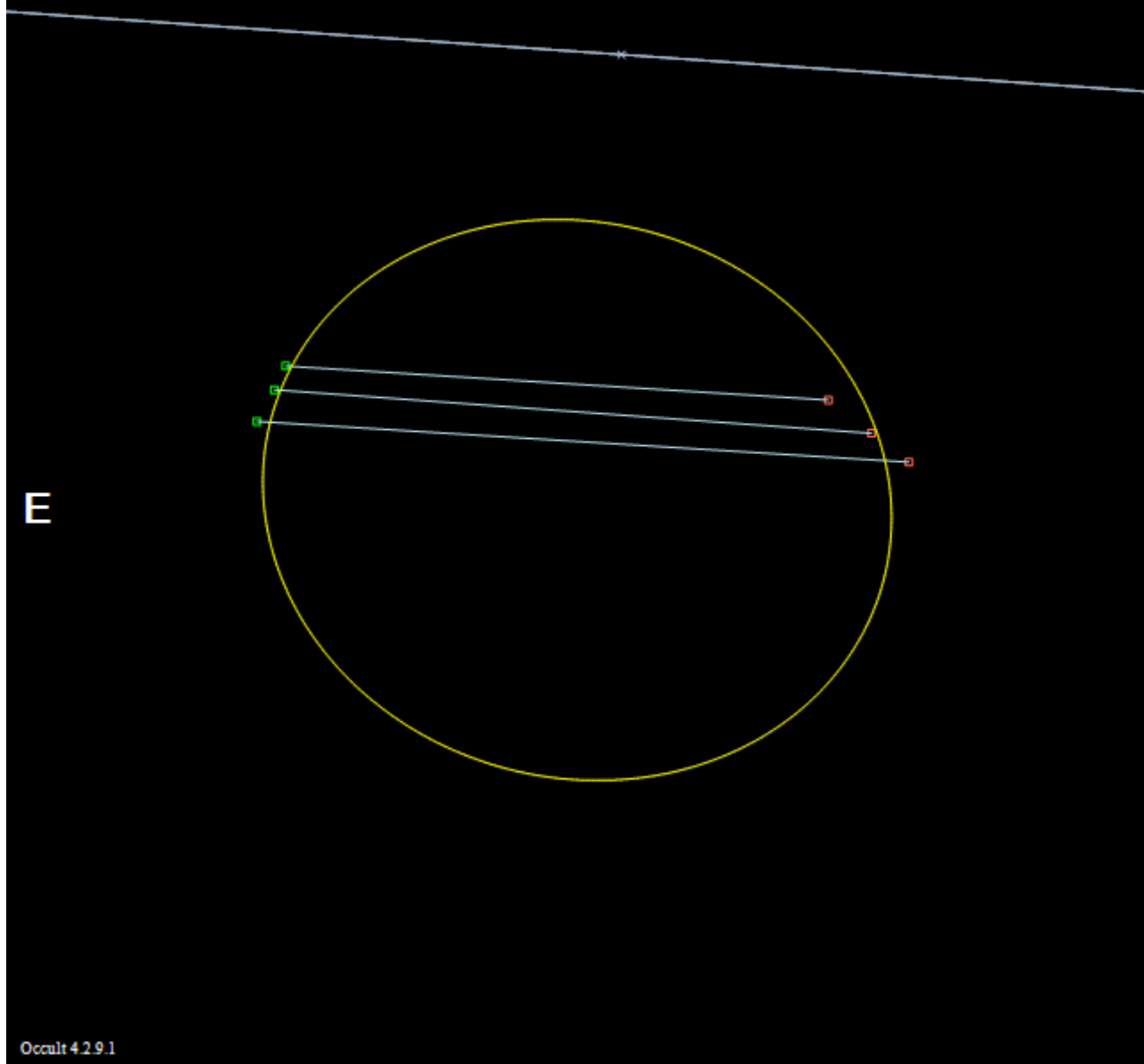
(248) Lameia 1998 Jun 27 $60.0 \pm 1.4 \times 48.5 \pm 1.2$ km, PA $-53.5^\circ \pm 4.1^\circ$
Geocentric X -3647.3 ± 0.7 Y -1445.0 ± 0.4 km **N**

E



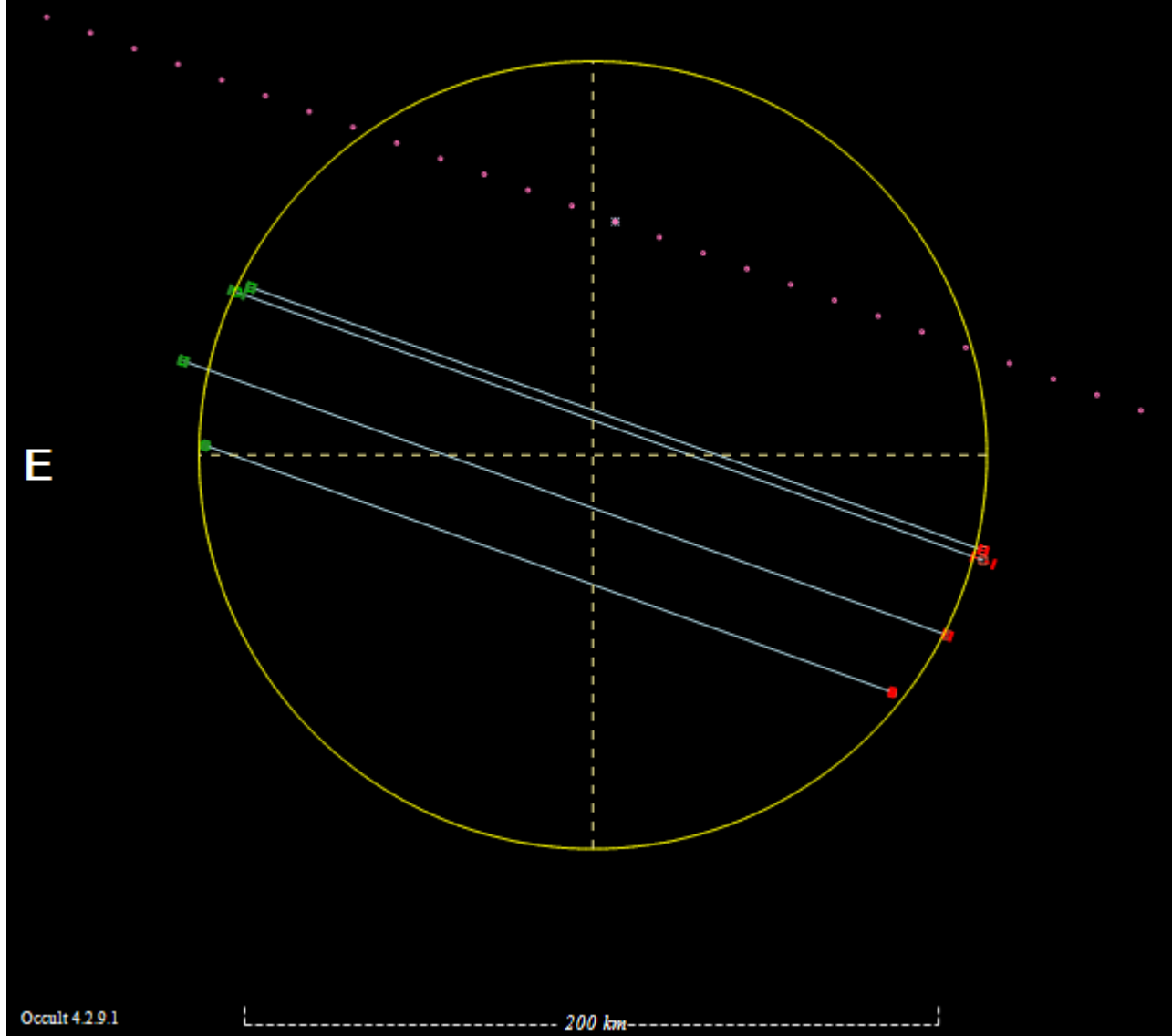
24themis2015apr30

(24) Themis 2015 Apr 30 187.0 x 164.0 km, PA 75.3° ± 49.3°
Geocentric X -3065.5 ± 6.2 Y 4845.4 ± 10.4 km **N**



24Themis2016Jul31

(24) Themis 2016 Jul 31 227.0 x 227.0 km, PA 0.0°
Geocentric X 1819.5 ± 2.6 Y 5598.3 ± 6.5 km **N**

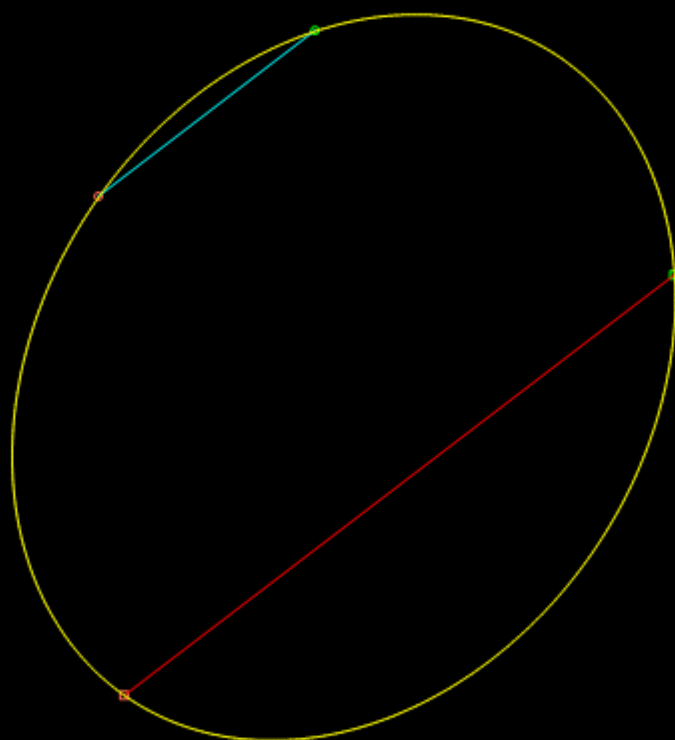


253mathilde2005aug24

(253) Mathilde 2005 Aug 24 58.3 x 45.9 km, PA -33.7°
Geocentric X 355.6 Y 5304.6 km

N

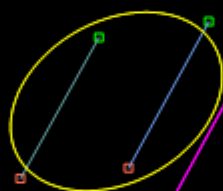
E



2562chaliapin2014mar24

(2562) Chaliapin 2014 Mar 24 21.0 x 15.0 km, PA $-60.5^\circ \pm 14.4^\circ$
Geocentric X 726.4 ± 0.6 Y 2228.0 ± 0.4 km **N**

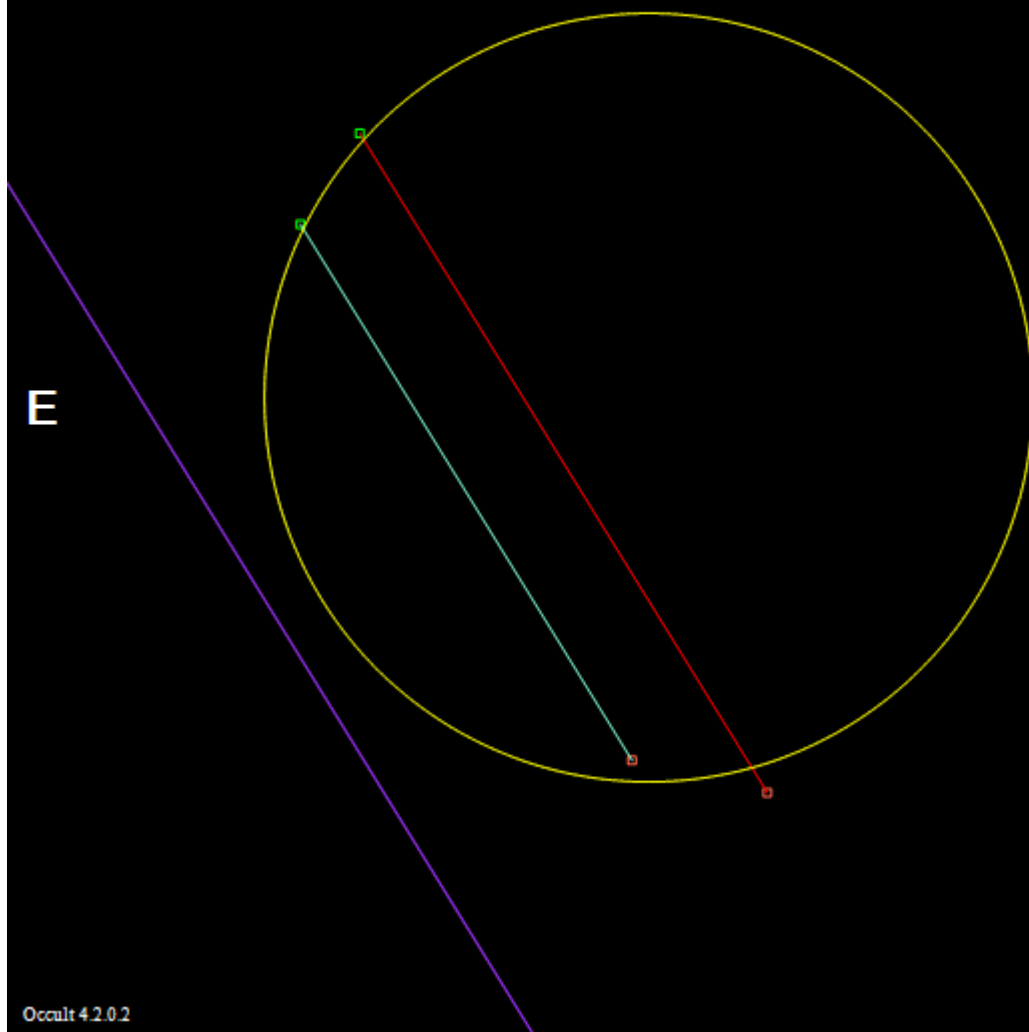
E



Occult 4.2.0.2

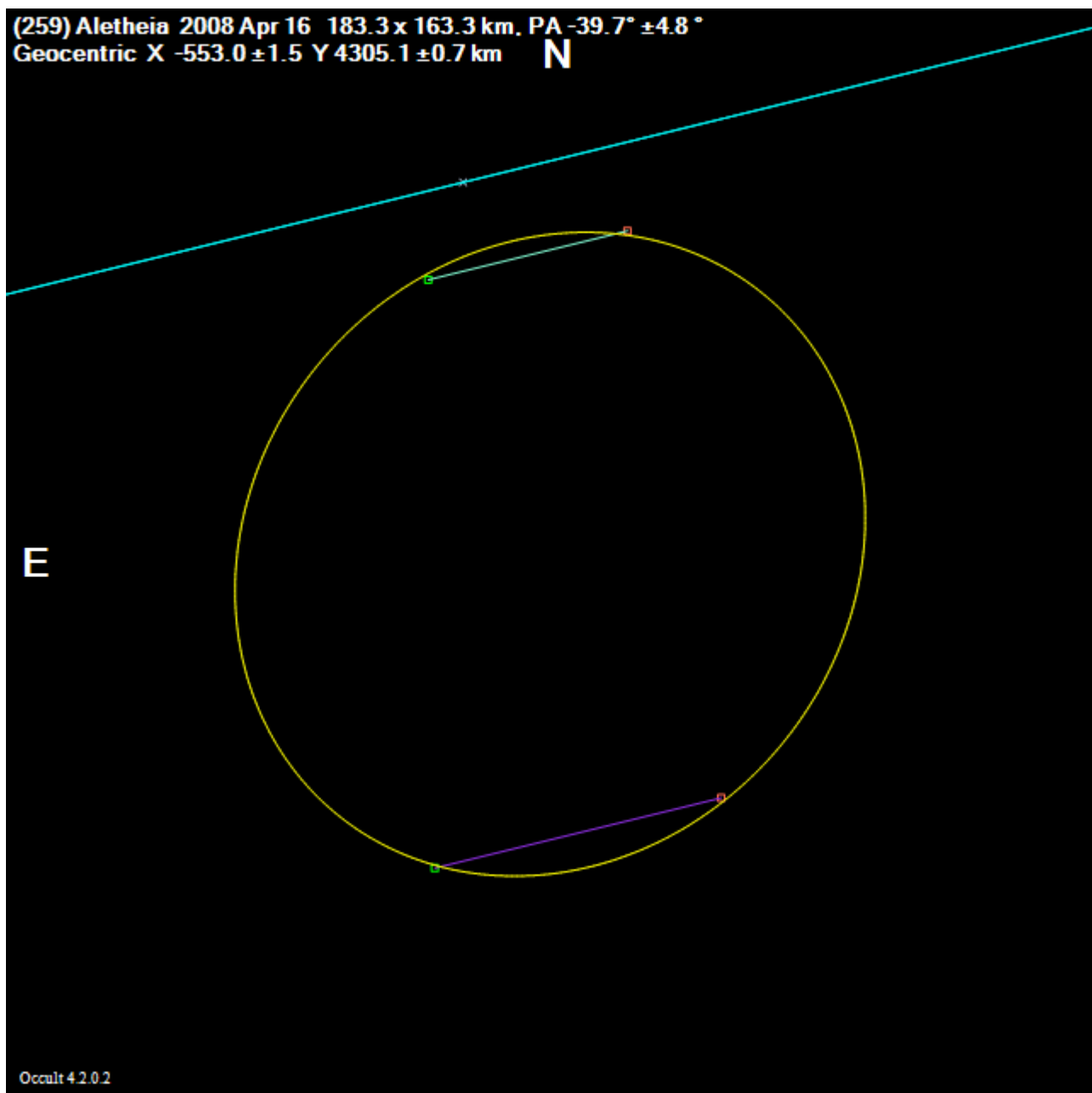
258tyche2014oct01

(258) Tyche 2014 Oct 1 64.0 x 64.0 km, PA 0.0° °
Geocentric X -2716.2 ± 0.7 Y 4329.1 ± 0.6 km **N**



259aletheia2008apr16

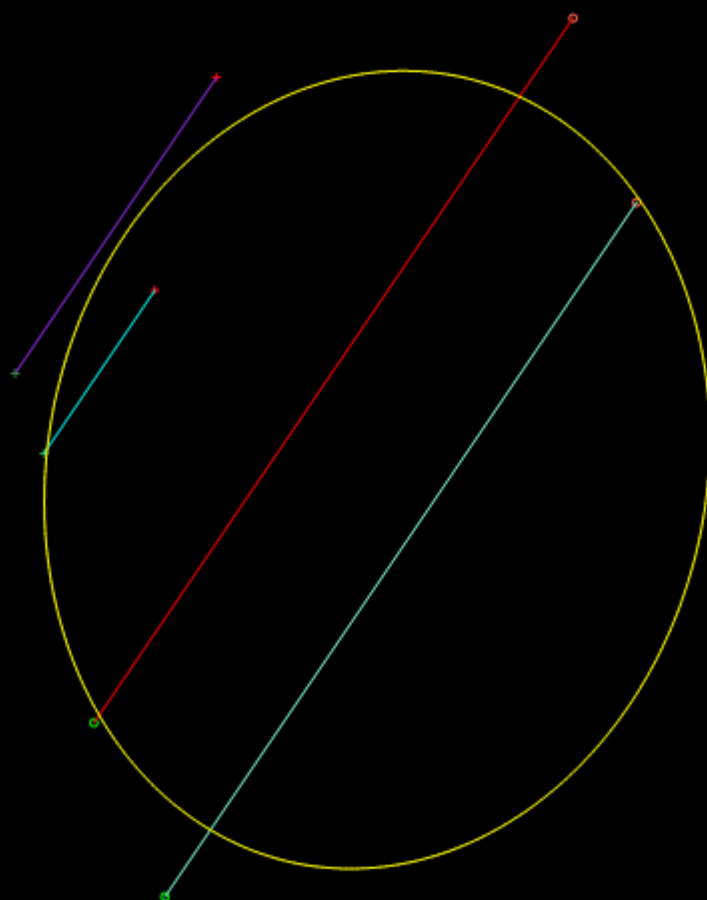
(259) Aletheia 2008 Apr 16 183.3 x 163.3 km. PA $-39.7^{\circ} \pm 4.8^{\circ}$
Geocentric X -553.0 ± 1.5 Y 4305.1 ± 0.7 km **N**



25phocaea1998may13

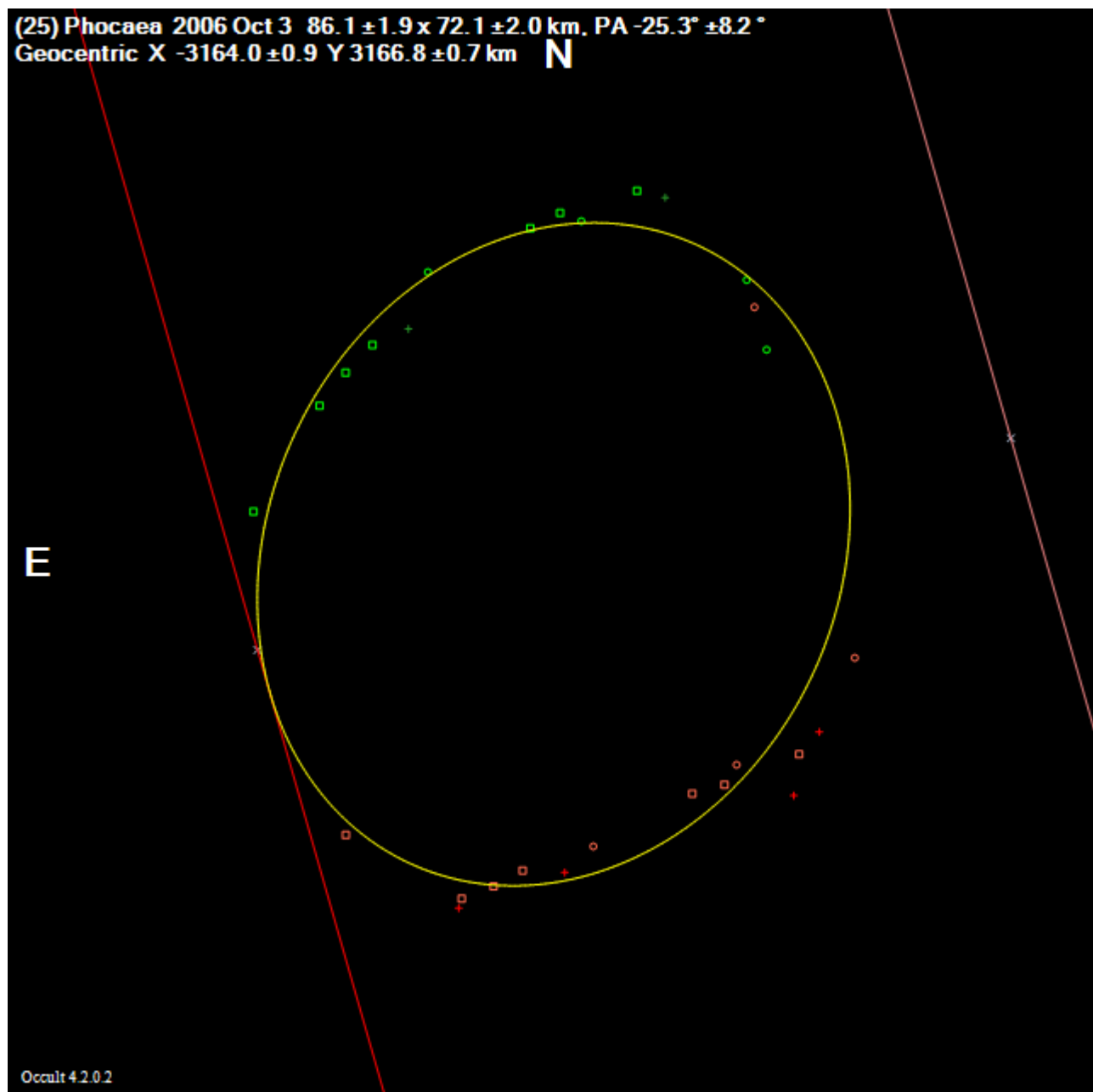
(25) Phocaea 1998 May 13 $78.4 \pm 5.1 \times 64.3 \pm 9.6$ km, PA $-11.9^\circ \pm 24.6^\circ$
Geocentric X -3851.5 ± 3.7 Y 3856.3 ± 3.6 km **N**

E



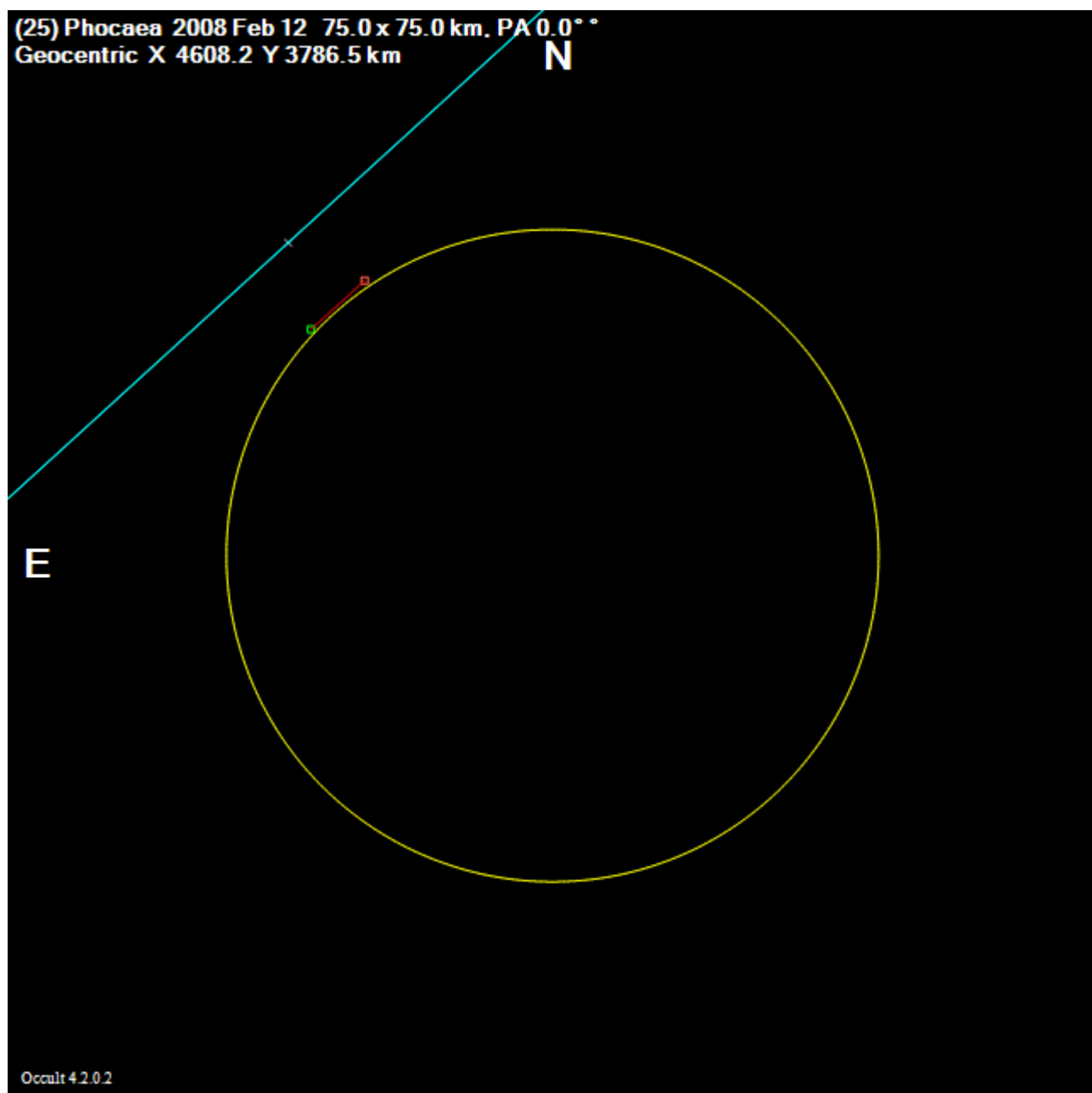
25phocaea2006oct03

(25) Phocaea 2006 Oct 3 $86.1 \pm 1.9 \times 72.1 \pm 2.0$ km, PA $-25.3^\circ \pm 8.2^\circ$
Geocentric X -3164.0 ± 0.9 Y 3166.8 ± 0.7 km **N**



25phocaea2008feb12

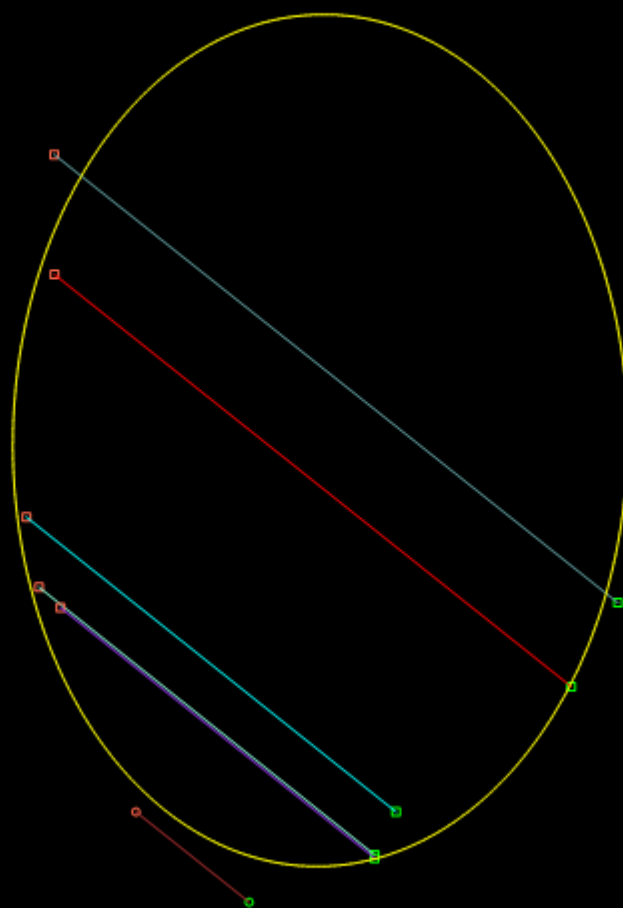
(25) Phocaea 2008 Feb 12 75.0 x 75.0 km, PA 0.0°
Geocentric X 4608.2 Y 3786.5 km



25phocaea2012apr16

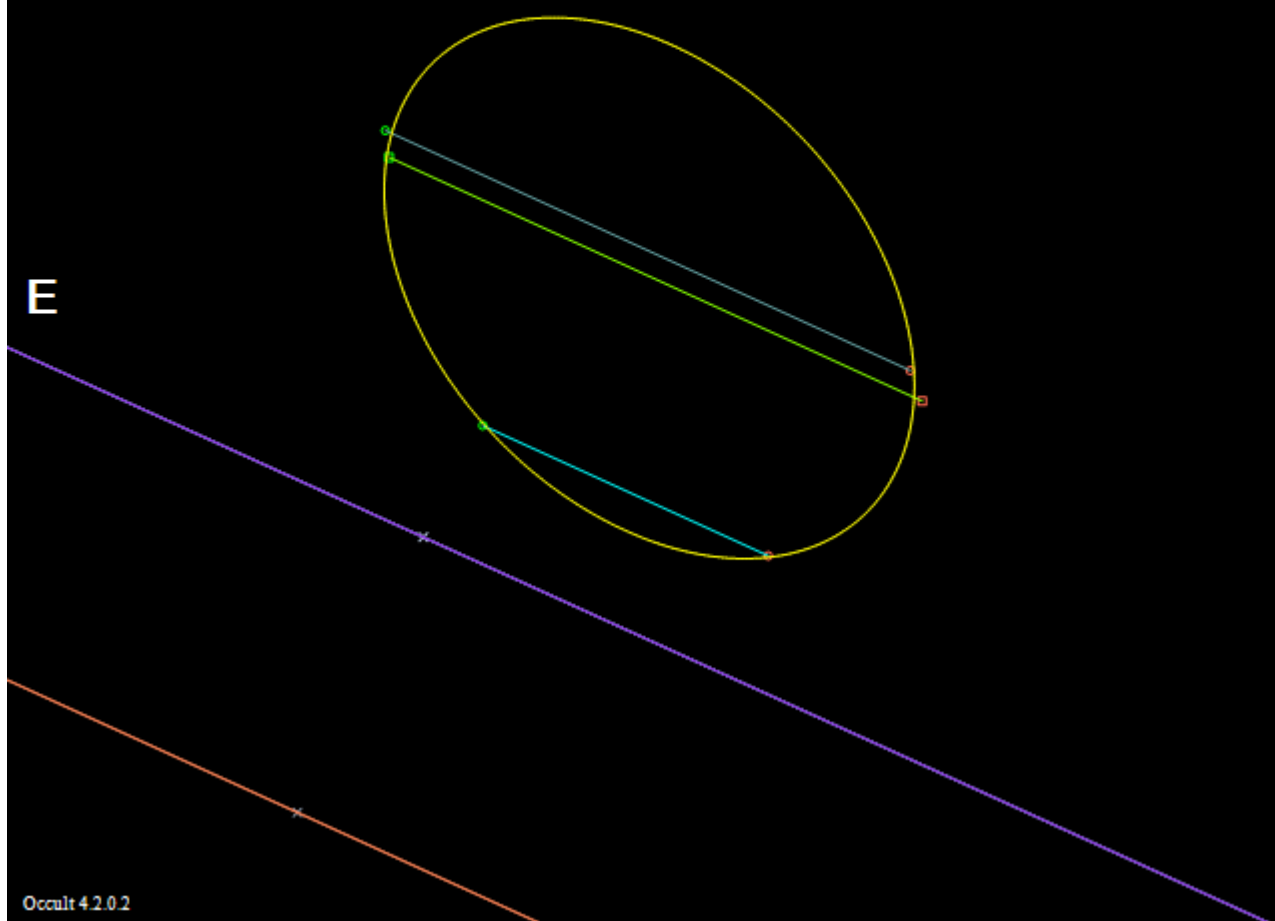
(25) Phocaea 2012 Apr 16 $92.0 \times 66.4 \pm 2.9$ km, PA $-0.9^\circ \pm 6.0^\circ$
Geocentric X 3371.4 ± 1.3 Y 4383.0 ± 1.2 km **N**

E



260huberta2007aug13

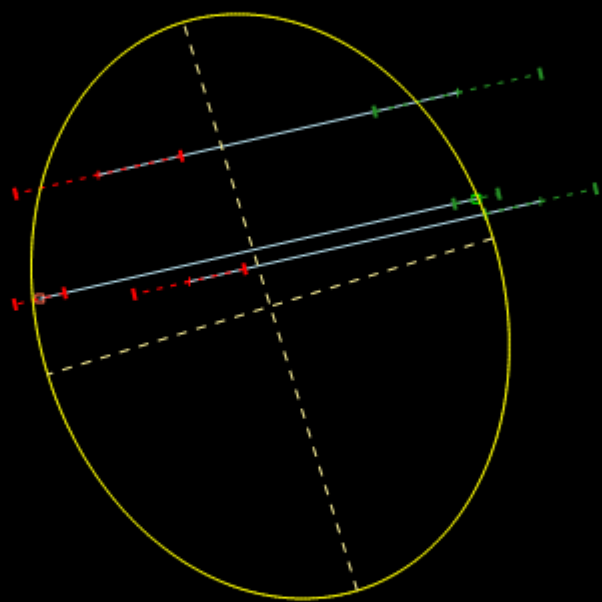
(260) Huberta 2007 Aug 13 $97.5 \pm 2.9 \times 66.8 \pm 7.2$ km, PA $43.4^\circ \pm 10.2^\circ$
Geocentric X -383.0 ± 0.7 Y 5416.0 ± 4.5 km **N**



264Libussa2016Feb10

(264) Libussa 2016 Feb 10 60.0 x 47.0 km, PA 17.0°
Geocentric X -2379.8 ± 4.1 Y 5370.2 ± 11.6 km **N**

E



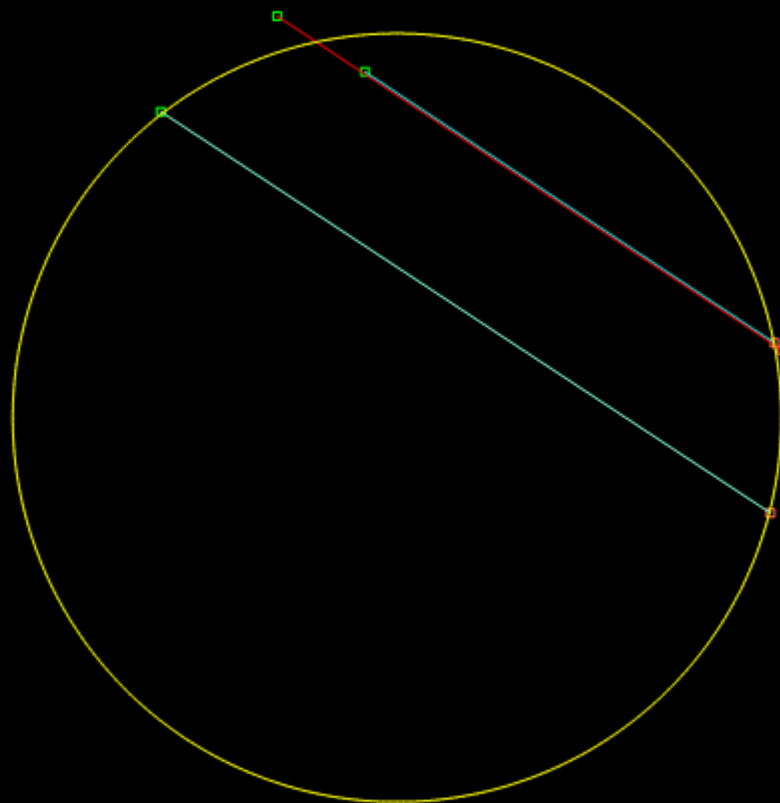
Occult 4.2.9.1

50 km

266aline2010sep04

(266) Aline 2010 Sep 4 125.0 x 125.0 km, PA 0.0° °
Geocentric X 4002.7 ± 1.0 Y 3082.5 ± 1.1 km N

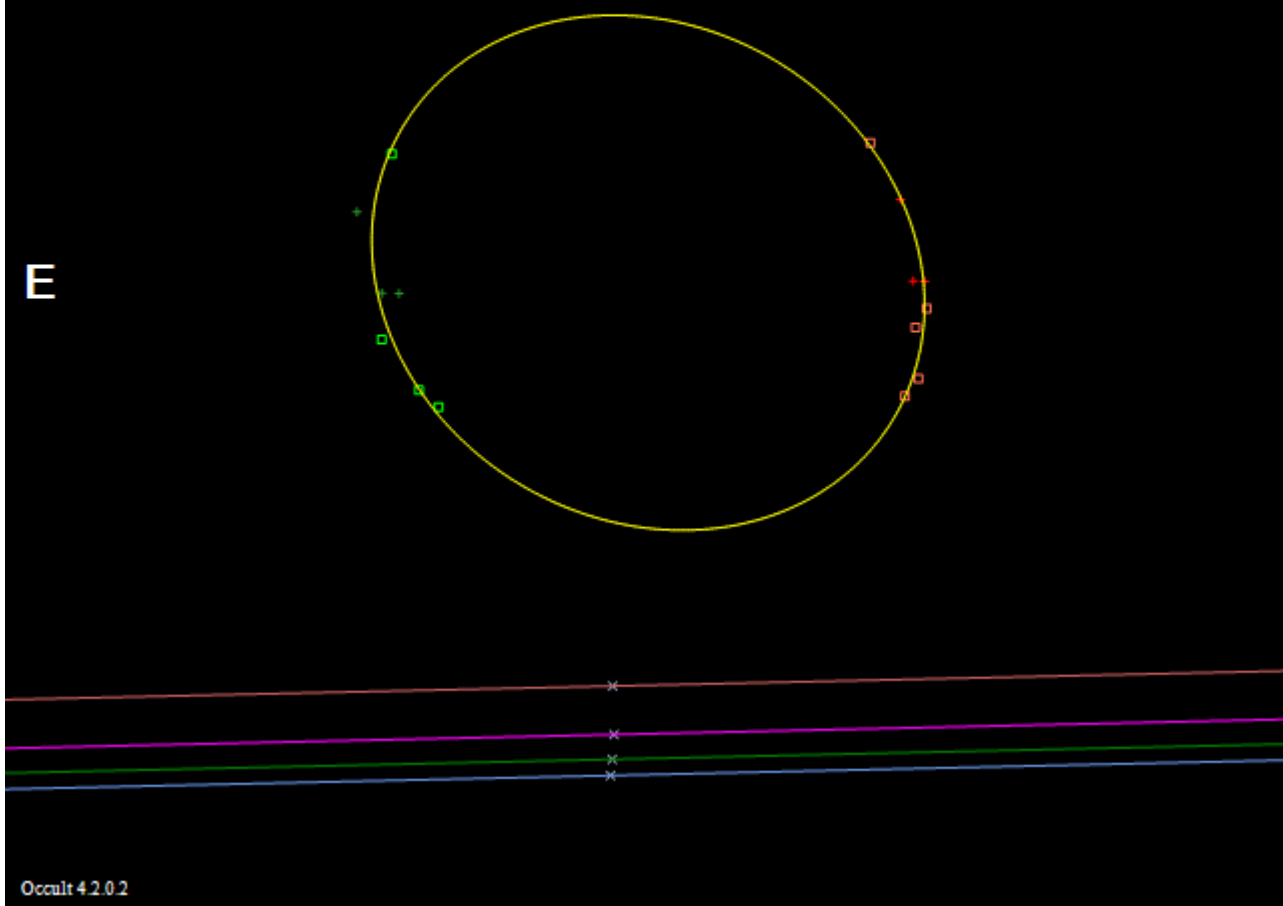
E



Occult 4.2.0.2

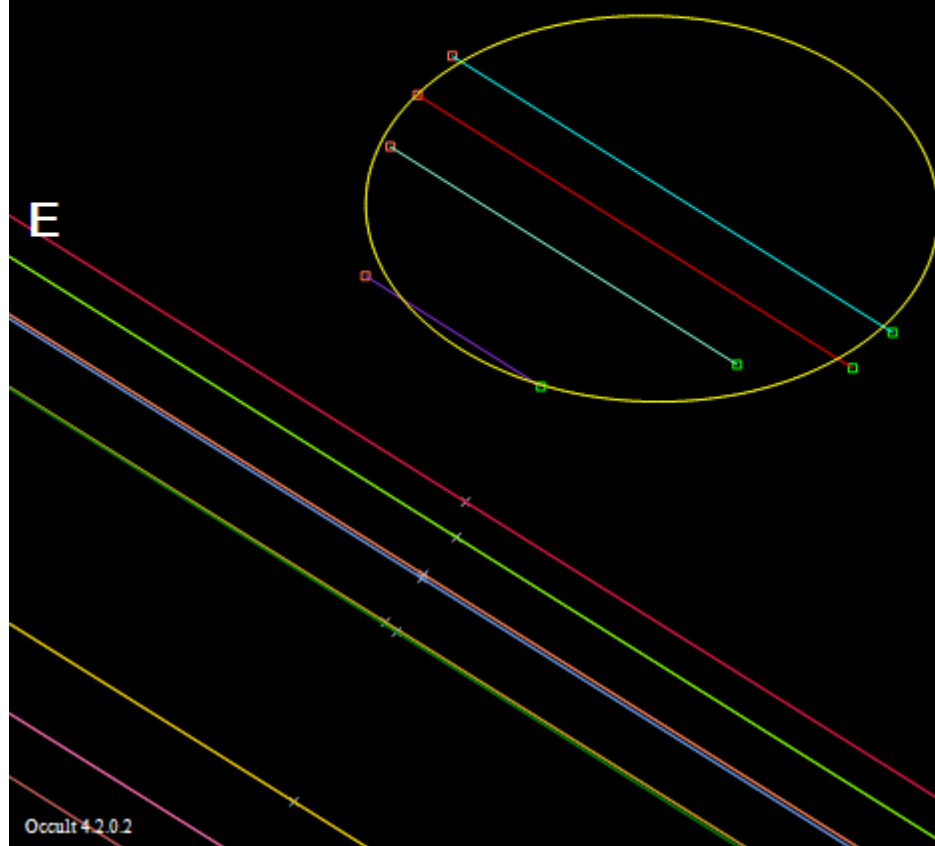
266aline2012jan17

(266) Aline 2012 Jan 17 $111.5 \pm 1.4 \times 96.6 \pm 2.6$ km, PA $59.9^\circ \pm 9.1^\circ$
Geocentric X 1404.0 ± 0.3 Y 3167.2 ± 0.7 km **N**



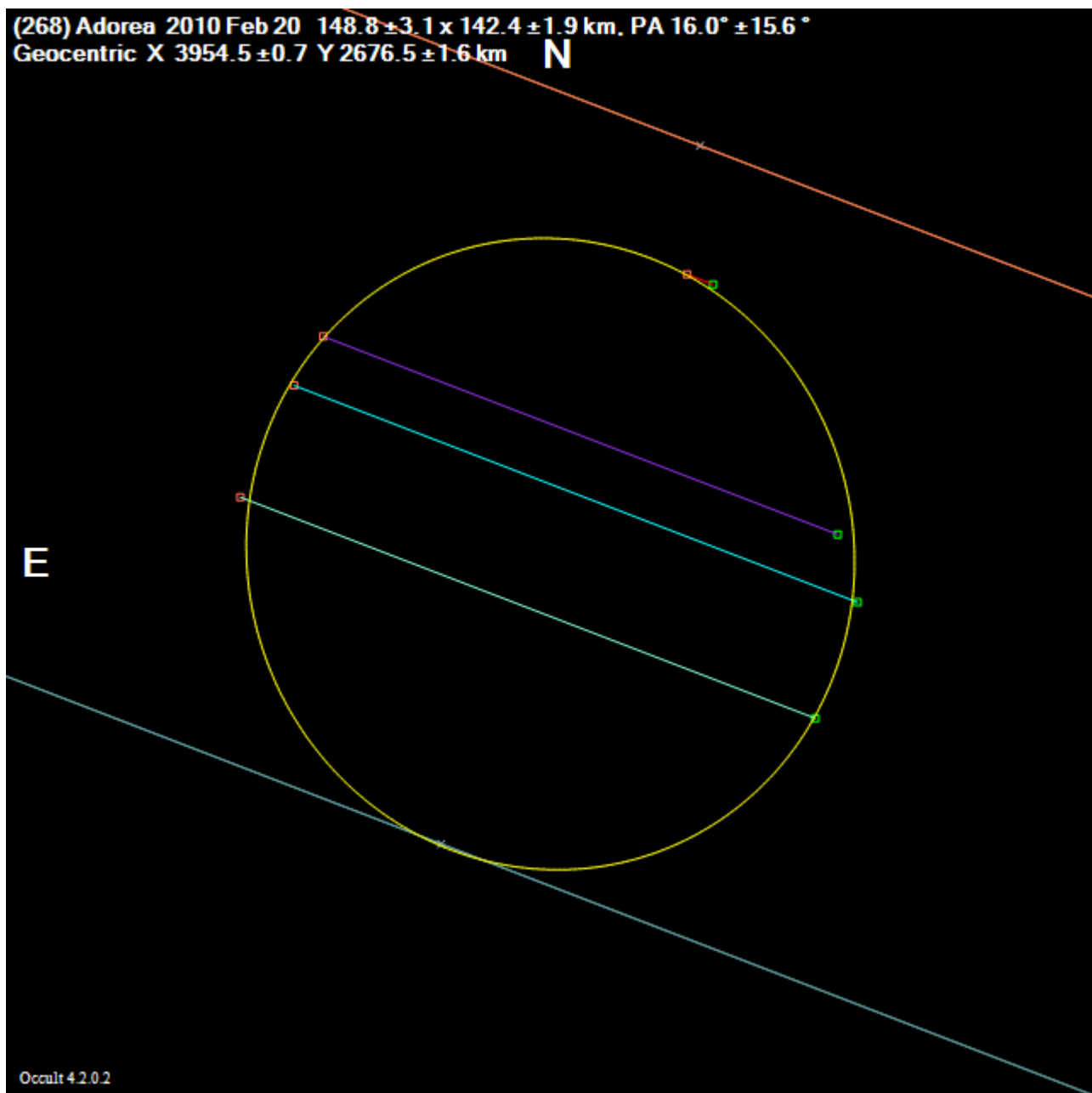
267tirza2008dec29

(267) Tirza 2008 Dec 29 60.0 x 40.4 ± 3.6 km, PA 88.3° ± 6.2°
Geocentric X 2299.8 ± 1.3 Y 4112.8 ± 1.4 km **N**



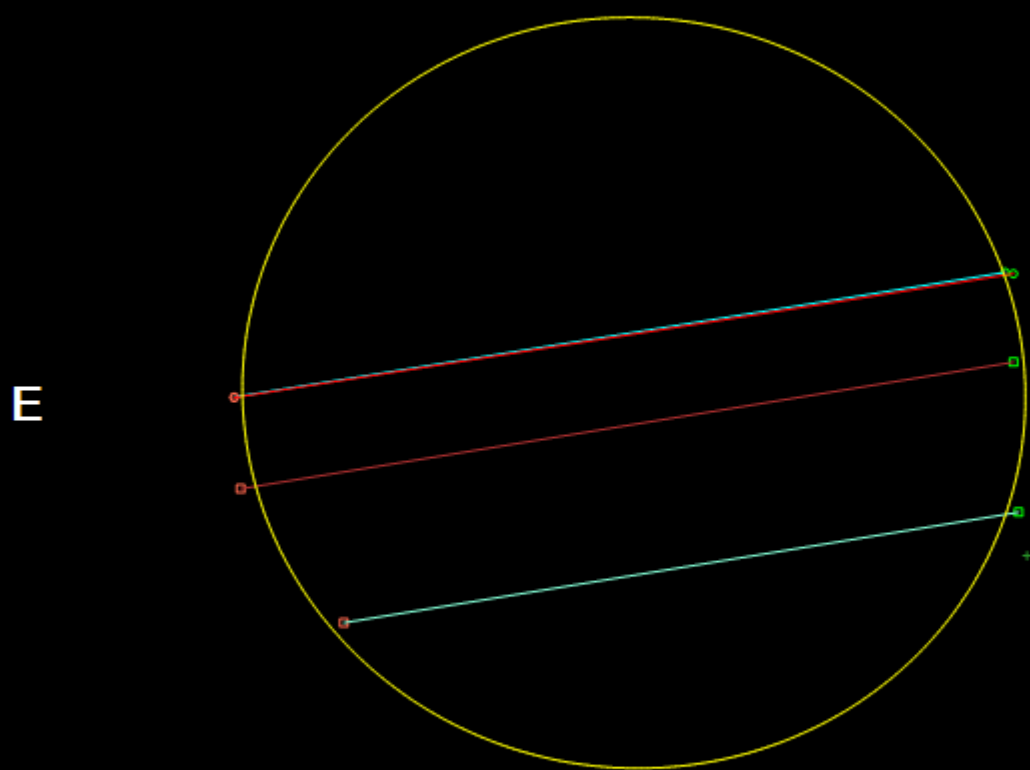
268adorea2010feb20

(268) Adorea 2010 Feb 20 $148.8 \pm 3.1 \times 142.4 \pm 1.9$ km, PA $16.0^\circ \pm 15.6^\circ$
Geocentric X 3954.5 ± 0.7 Y 2676.5 ± 1.6 km **N**



268adorea2010oct21

(268) Adorea 2010 Oct 21 141.7 x 135.7 km. PA $82.8^\circ \pm 24.4^\circ$
Geocentric X -2777.7 ± 1.0 Y 1725.4 ± 2.8 km **N**

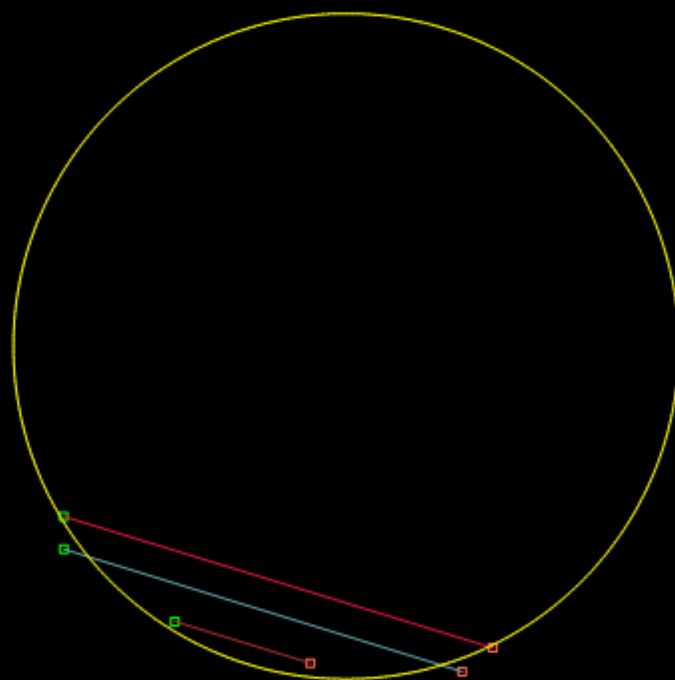


268adorea2013aug10

(268) Adorea 2013 Aug 10 136.0 x 136.0 km, PA 0.0° °
Geocentric X -2242.3 ± 1.6 Y 5531.1 ± 1.1 km

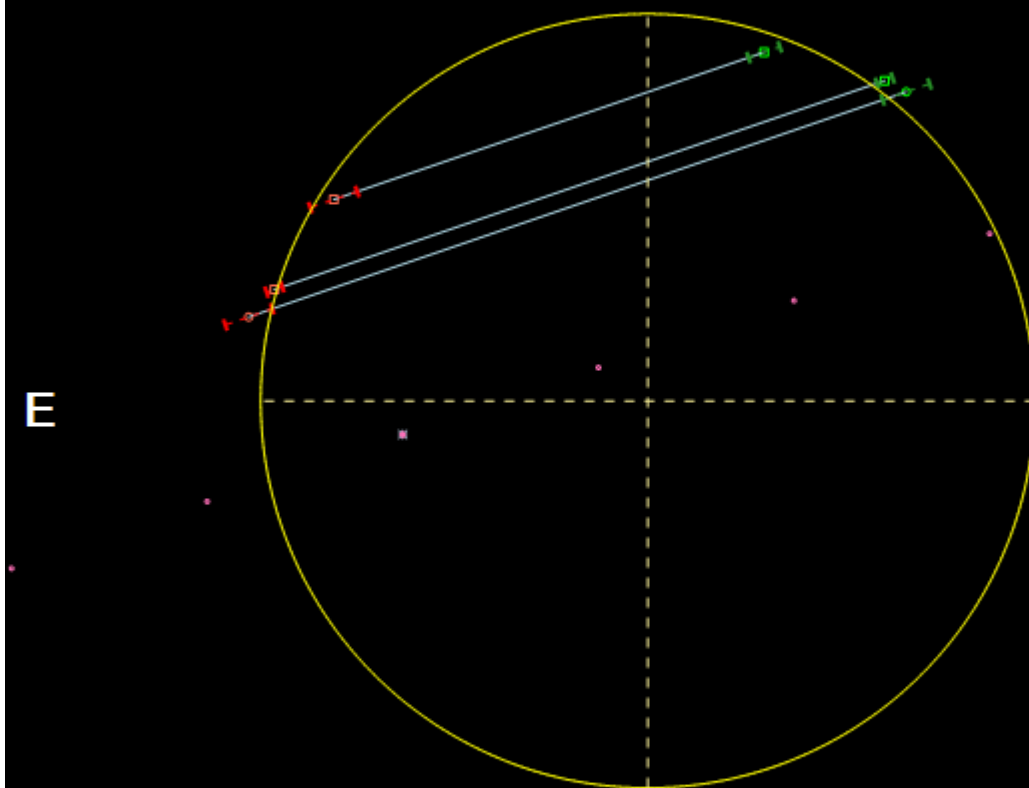
N

E



268Adorea2016Oct09

(268) Adorea 2016 Oct 9 141.0 x 141.0 km. PA 0.0°
Geocentric X -3413.3 ± 1.5 Y 4369.0 ± 1.7 km **N**



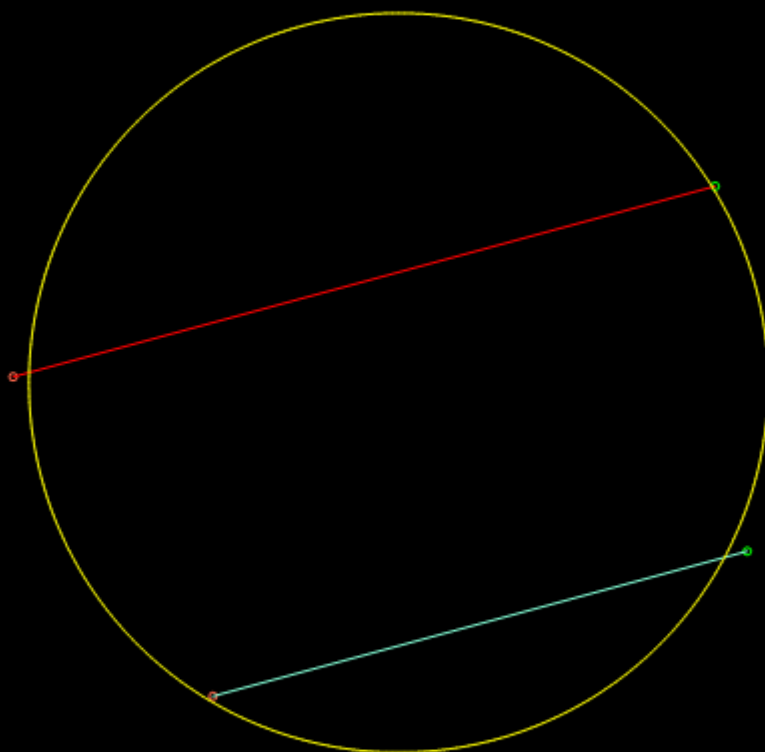
Occult 4.2.9.1

100 km

270anahita2008oct27

(270) Anahita 2008 Oct 27 $48.1 \pm 2.0 \times 48.1$ km, PA 0.0° °
Geocentric X -4250.3 ± 0.4 Y 4095.3 ± 0.8 km **N**

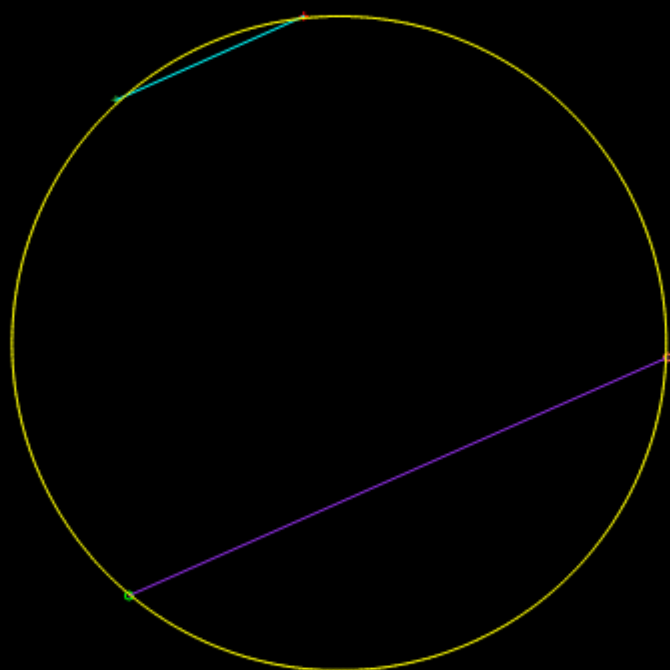
E



275sapiencia1985apr15

(275) Sapiencia 1985 Apr 15 103.0 x 103.0 km. PA 0.0° °
Geocentric X -3840.6 ± 0.1 Y 4672.8 ± 0.1 km **N**

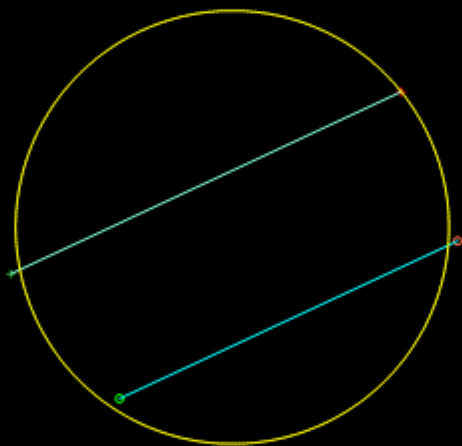
E



275sapiencia2003feb08

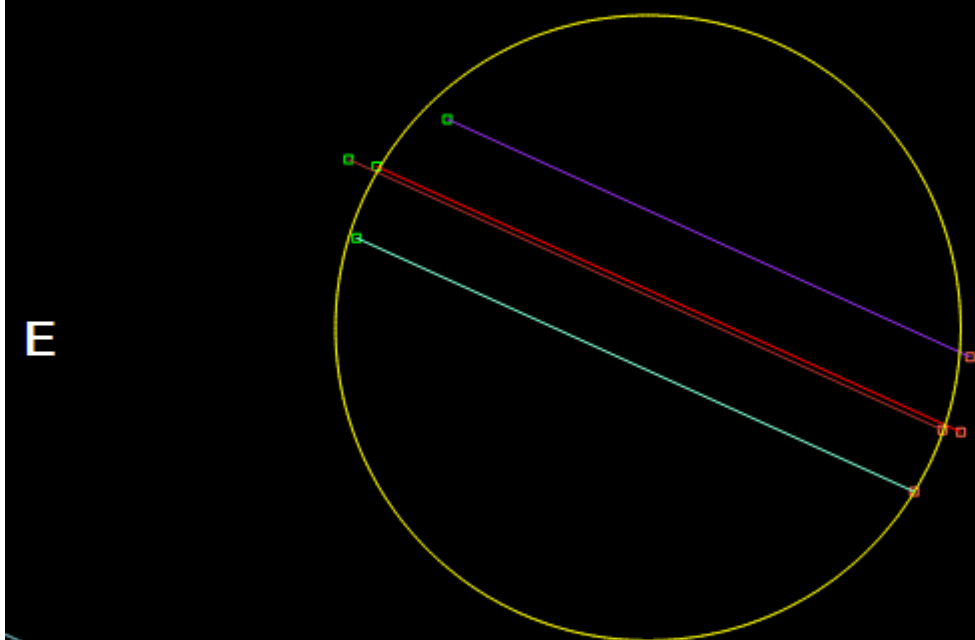
(275) Sapiencia 2003 Feb 8 $99.0 \pm 4.6 \times 99.0$ km, PA 0.0° °
Geocentric X 2048.2 ± 0.9 Y 2201.8 ± 2.0 km **N**

E



275sapiencia2014sep02

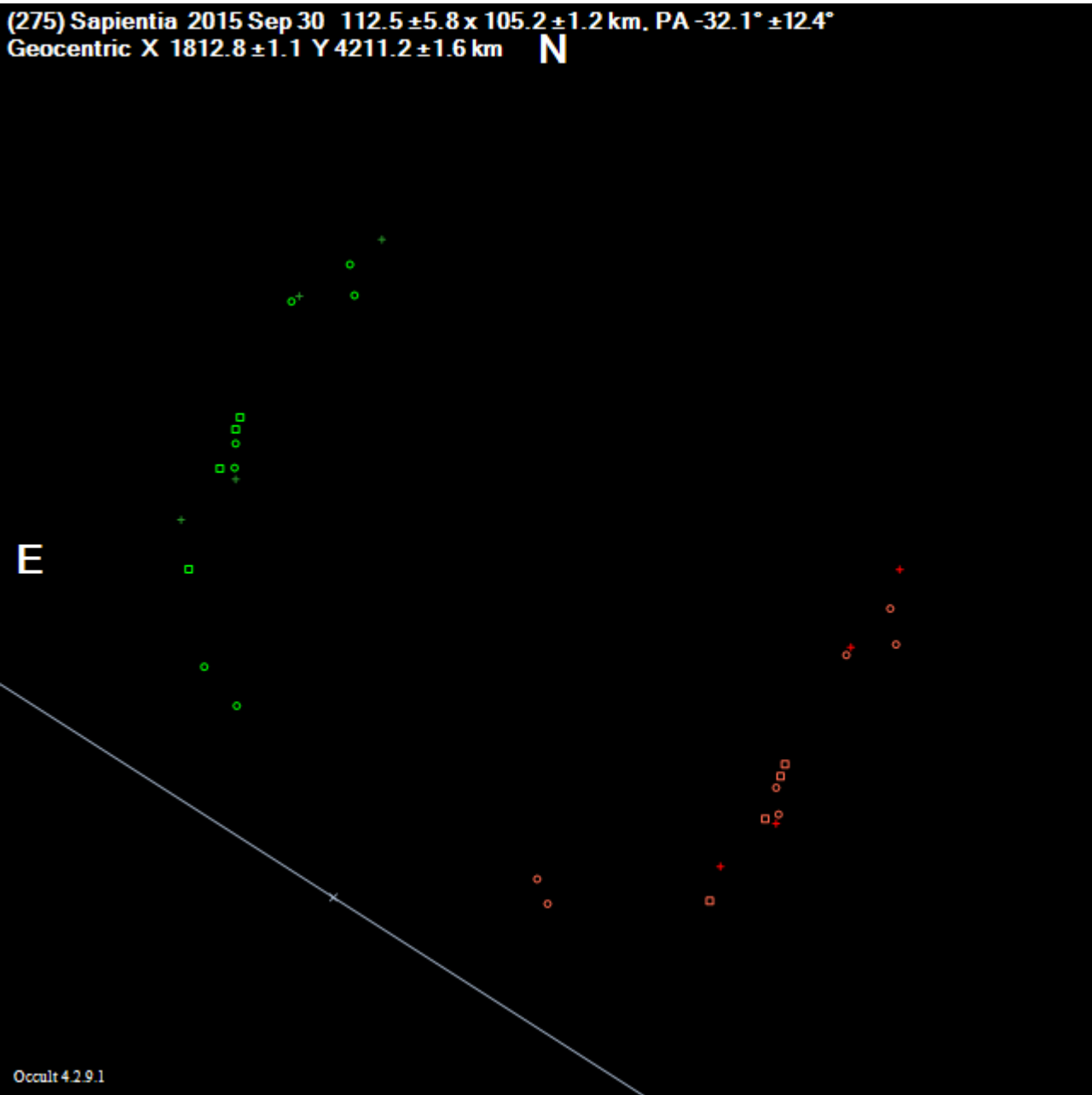
(275) Sapiencia 2014 Sep 2 $96.0 \pm 8.4 \times 96.0$ km, PA 0.0° °
Geocentric X 3261.5 ± 2.1 Y 4895.5 ± 4.7 km **N**



Occult 4.2.0.2

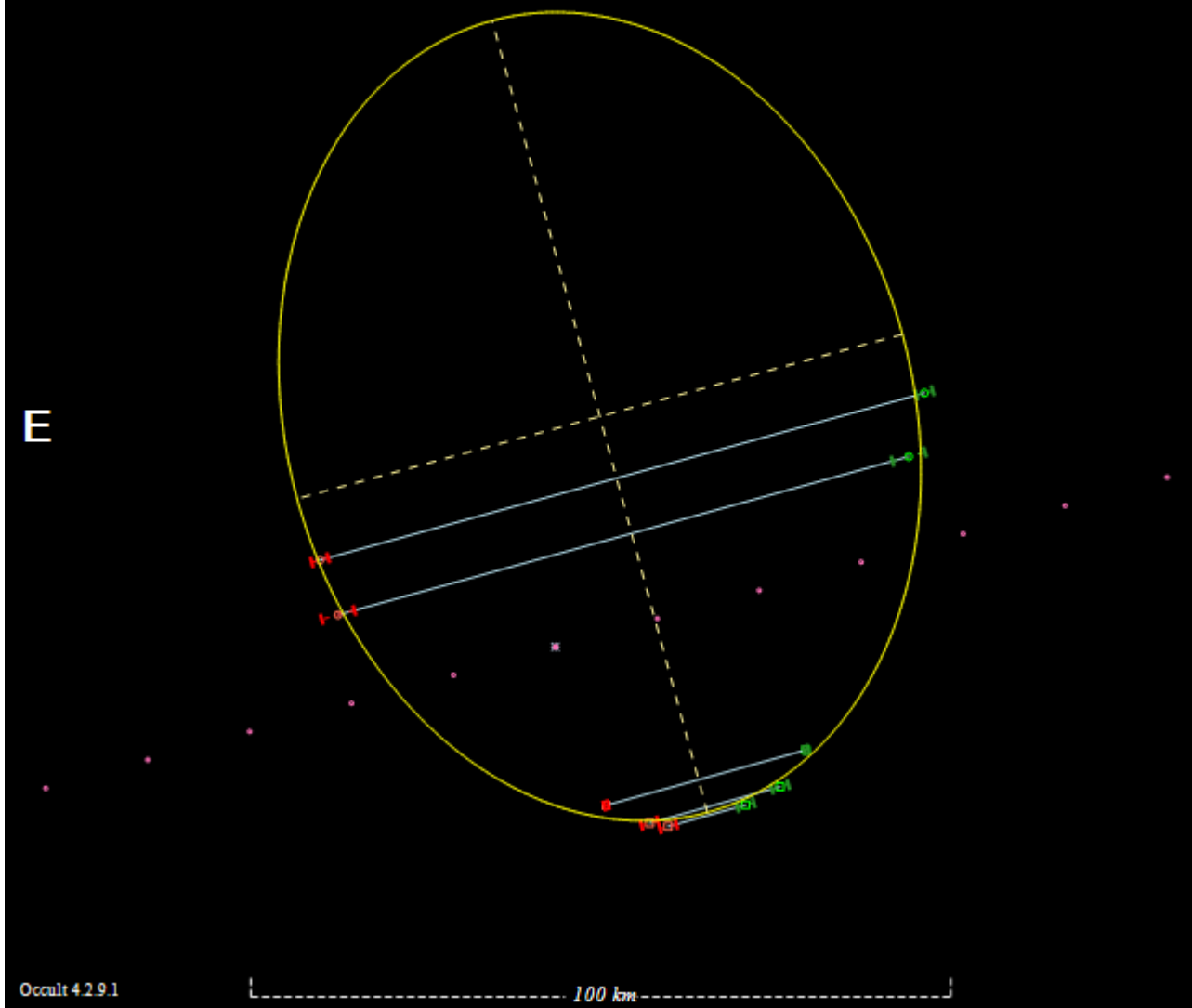
275sapientia2015sep30

(275) Sapientia 2015 Sep 30 $112.5 \pm 5.8 \times 105.2 \pm 1.2$ km, PA $-32.1^\circ \pm 12.4^\circ$
Geocentric X 1812.8 ± 1.1 Y 4211.2 ± 1.6 km



275Sapientia2016Dec03

(275) Sapientia 2016 Dec 3 $117.2 \times 89.6 \pm 1.2$ km, PA $15.2^\circ \pm 5.0^\circ$
Geocentric X -3553.8 ± 0.8 Y 4479.6 ± 0.5 km **N**

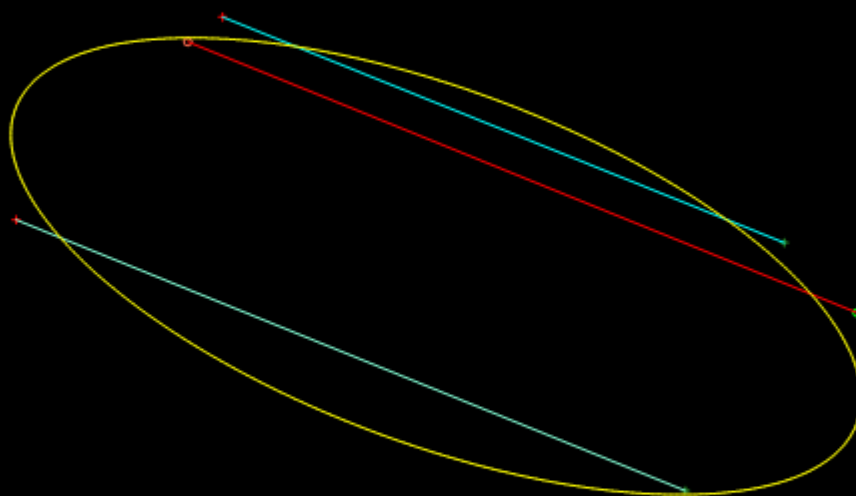


276adelheid2002mar09

(276) Adelheid 2002 Mar 9 $55.7 \pm 10.4 \times 141.4 \pm 8.0$ km, PA $-20.5^\circ \pm 3.6^\circ$
Geocentric X 4184.6 ± 1.8 Y 3564.2 ± 1.3 km **N**

E

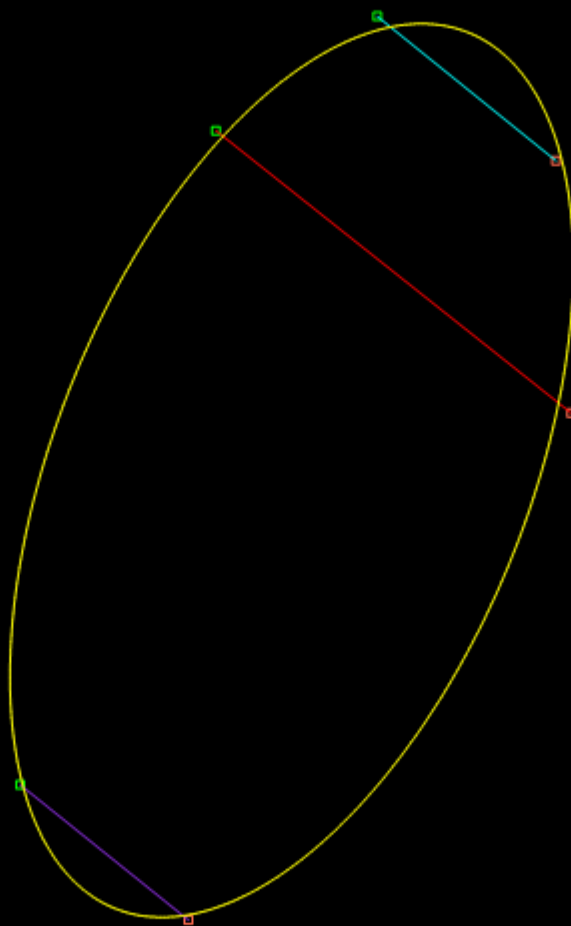
Occult 4.2.0.2



276adelheid2012nov21

(276) Adelheid 2012 Nov 21 $165.9 \pm 0.7 \times 83.1 \pm 0.9$ km, PA $-22.0^\circ \pm 0.3^\circ$
Geocentric X -5410.0 ± 0.2 Y -2619.3 ± 0.3 km **N**

E

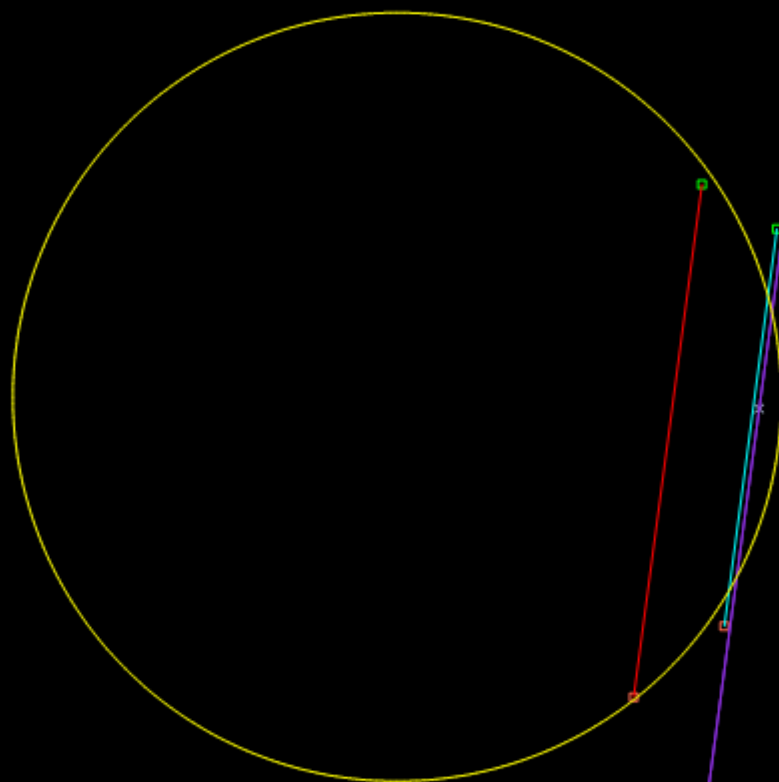


2797teucer2014jun01

(2797) Teucer 2014 Jun 1 114.0 x 114.0 km. PA 0.0° °
Geocentric X 5005.8 ± 1.6 Y 2676.8 ± 2.5 km **N**

E

Occult 4.2.0.2



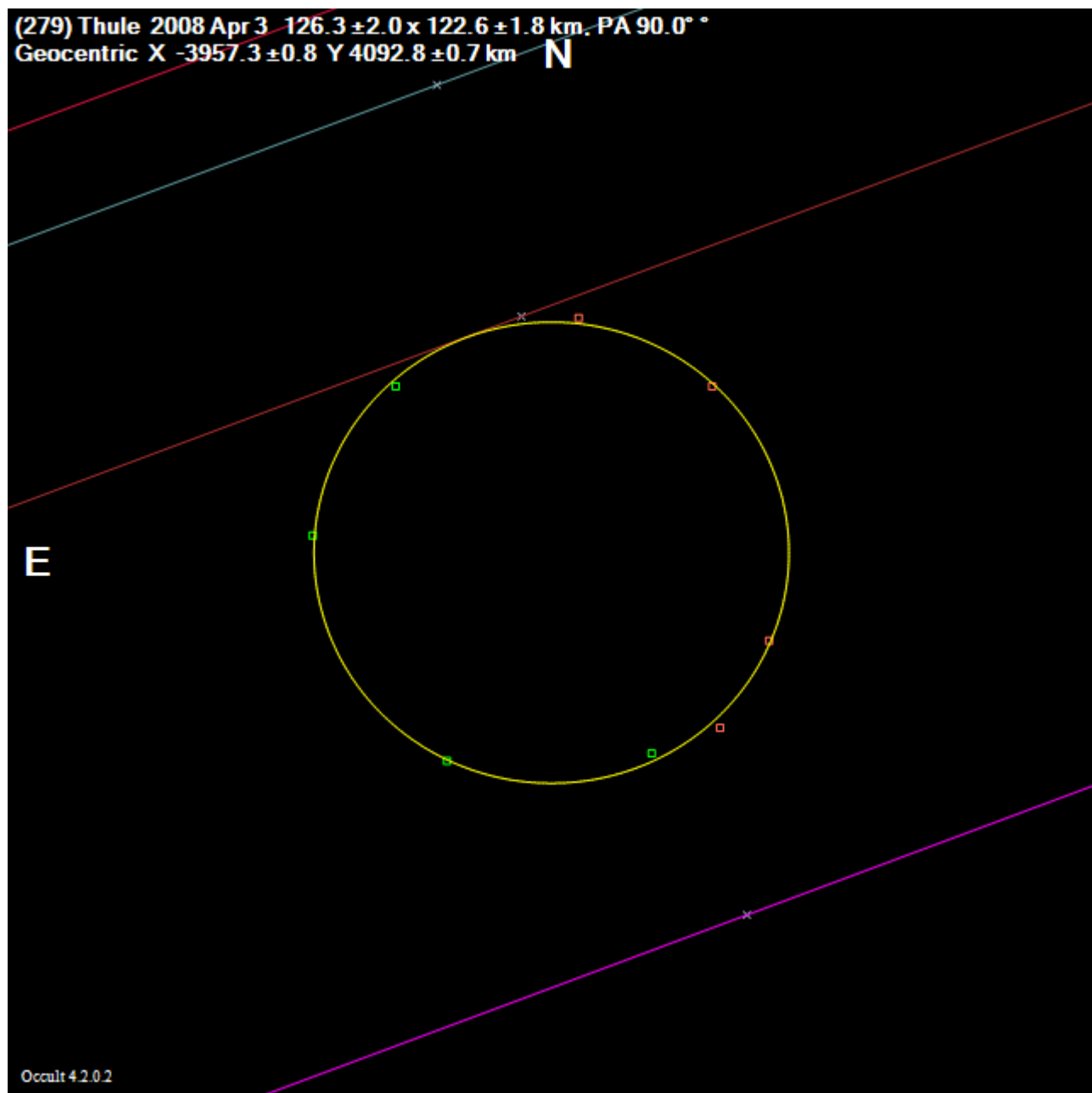
279thule2008apr03

(279) Thule 2008 Apr 3 $126.3 \pm 2.0 \times 122.6 \pm 1.8$ km, PA 90.0° °
Geocentric X -3957.3 ± 0.8 Y 4092.8 ± 0.7 km

N

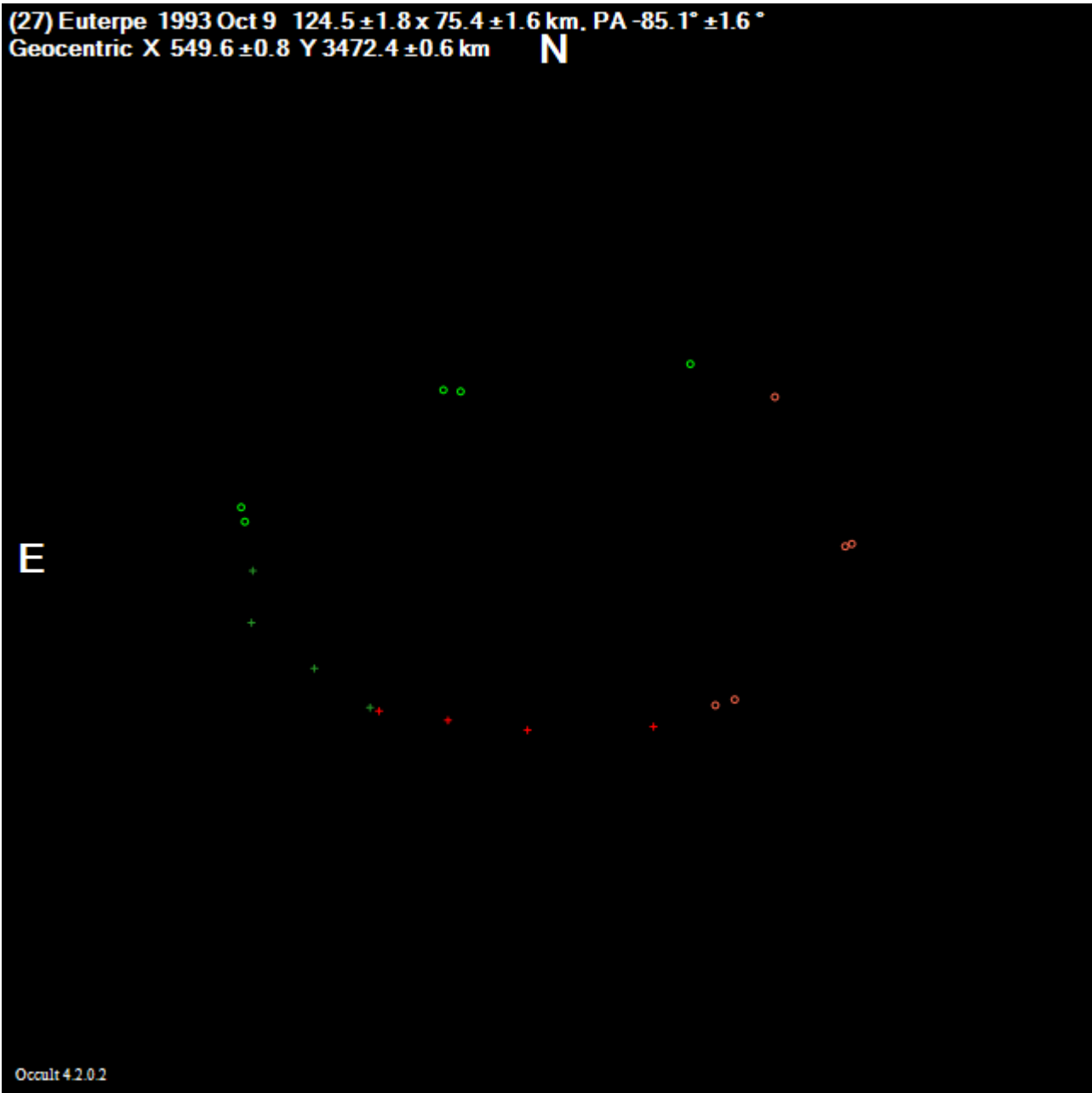
E

Occult 4.2.0.2



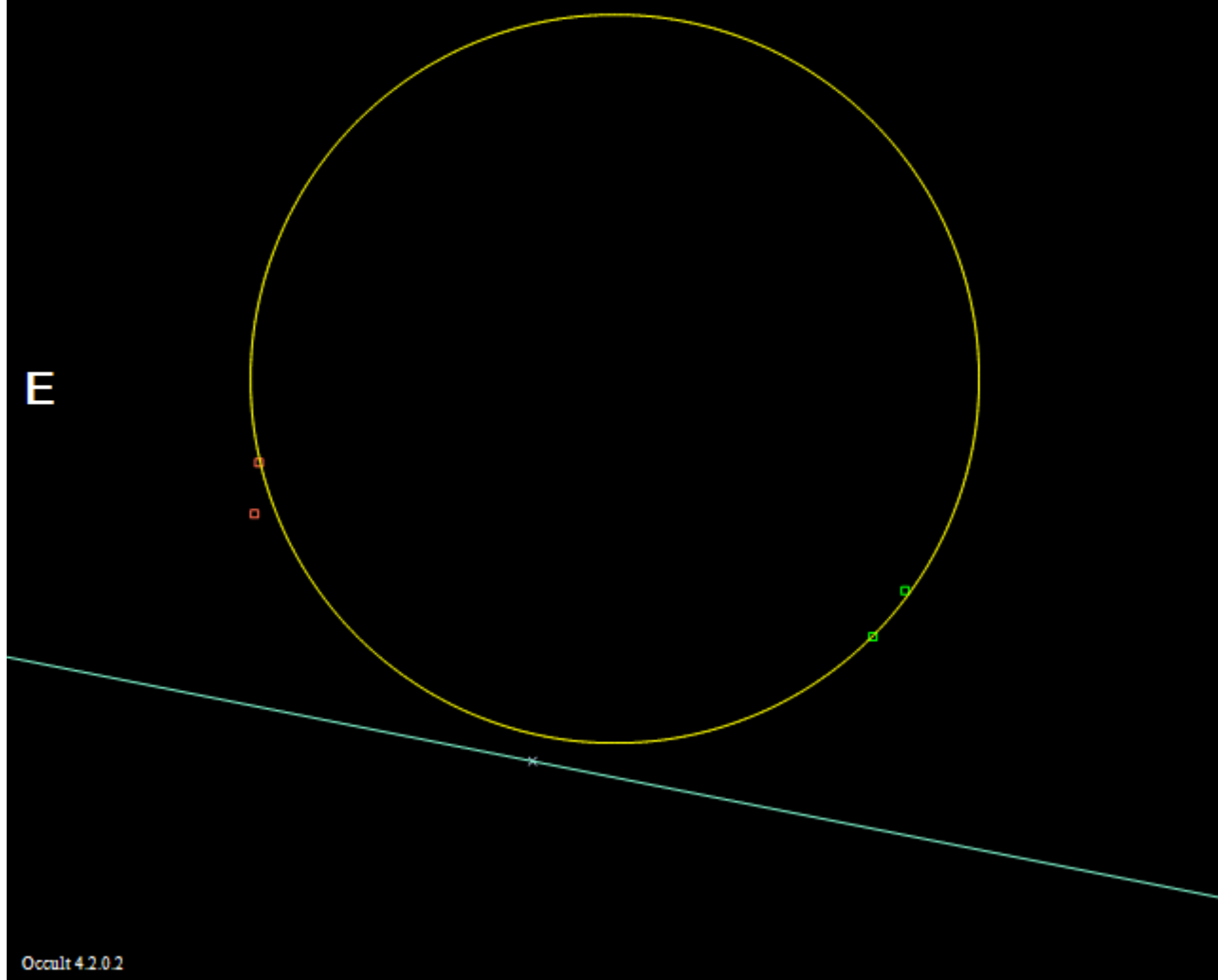
27euterpe1993oct09

(27) Euterpe 1993 Oct 9 124.5 ± 1.8 x 75.4 ± 1.6 km. PA -85.1° ± 1.6°
Geocentric X 549.6 ± 0.8 Y 3472.4 ± 0.6 km

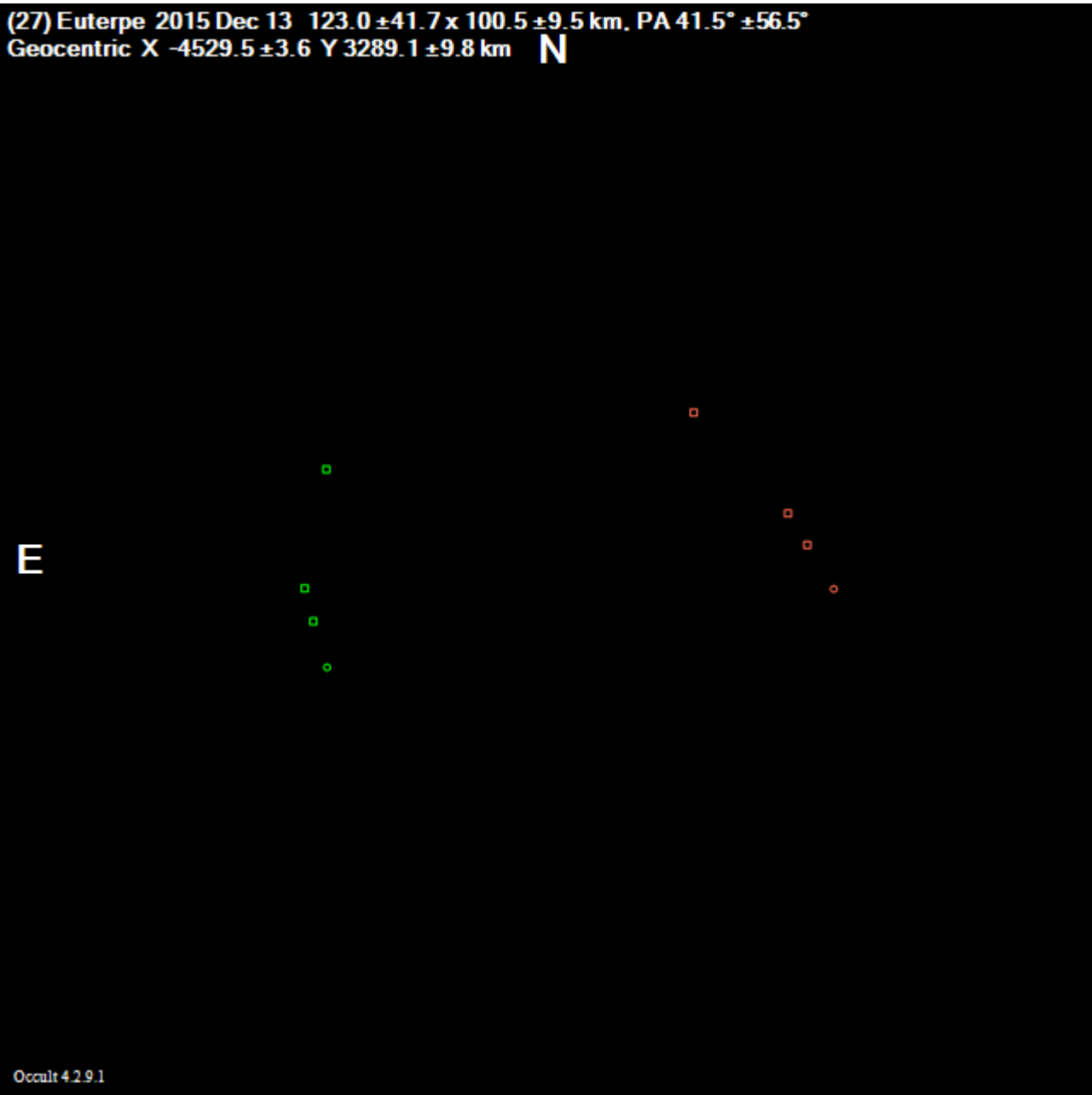


27euterpe2014oct05

(27) Euterpe 2014 Oct 5 125.0 x 125.0 km, PA 0.0° °
Geocentric X 3875.2 ± 1.0 Y 4877.7 ± 1.7 km **N**

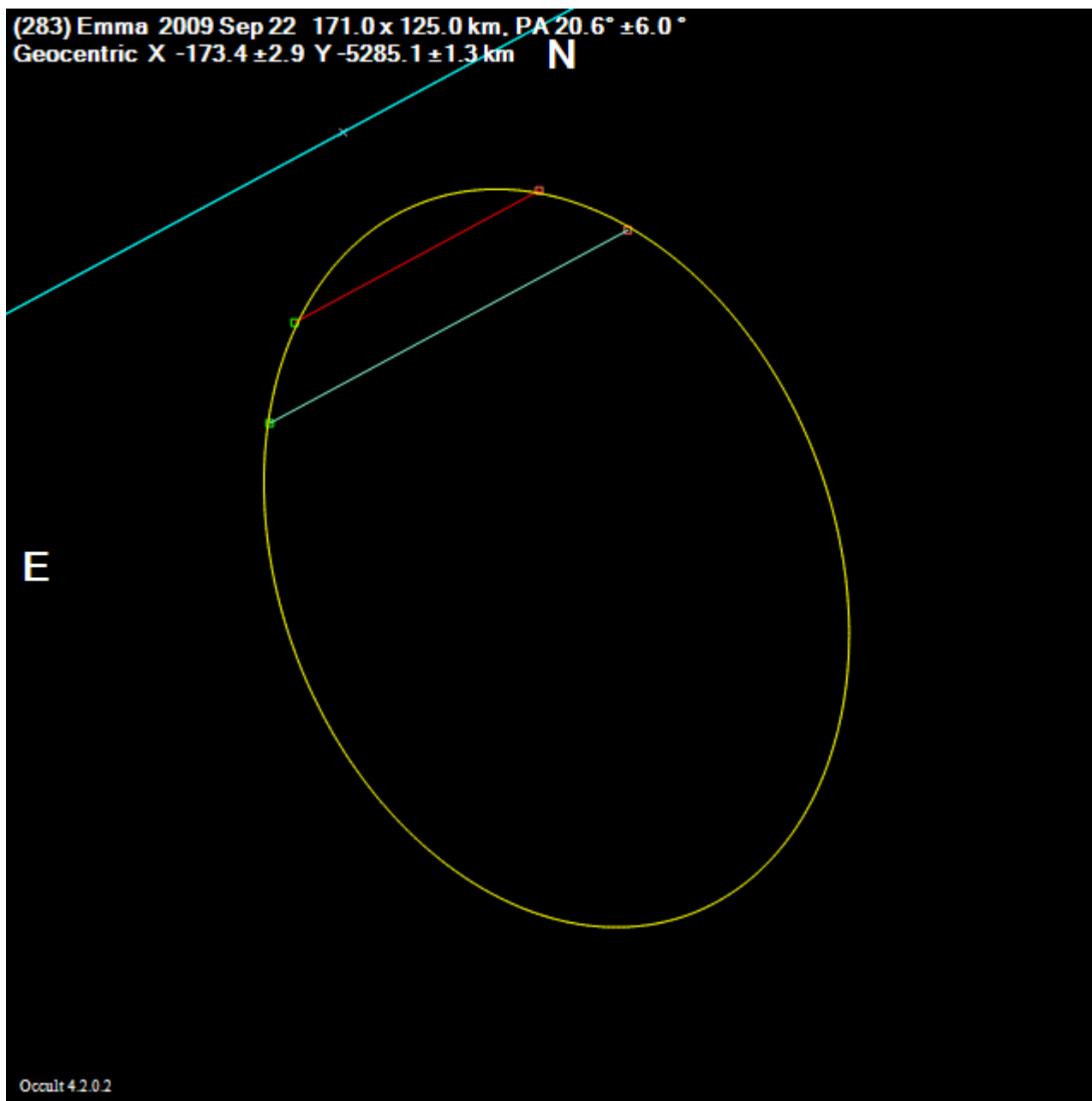


27euterpe2015dec13



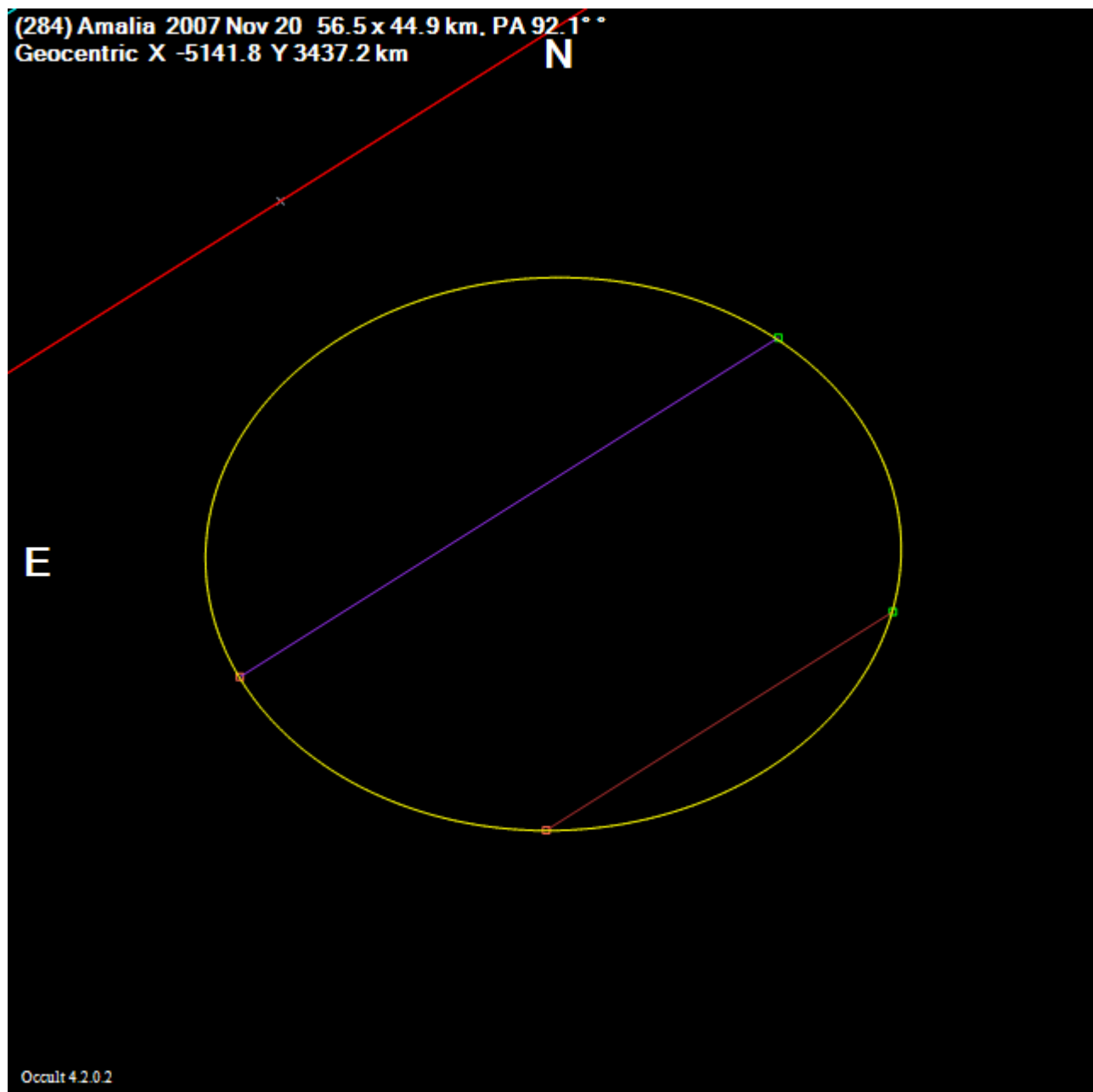
283emma2009sep22

(283) Emma 2009 Sep 22 171.0 x 125.0 km, PA 20.6° ± 6.0°
Geocentric X -173.4 ± 2.9 Y -5285.1 ± 1.3 km **N**



284amalia2007nov20

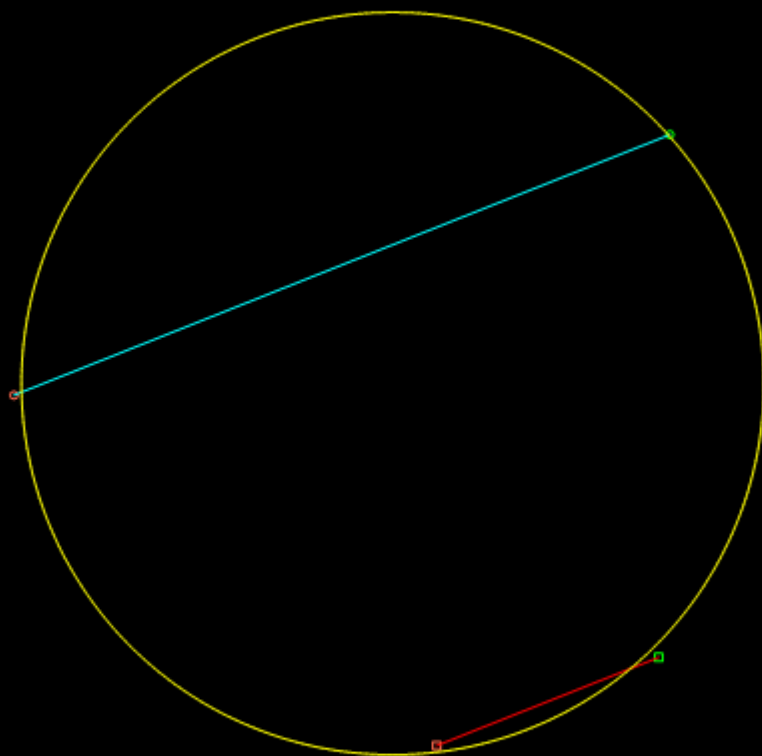
(284) Amalia 2007 Nov 20 56.5 x 44.9 km, PA 92.1°
Geocentric X -5141.8 Y 3437.2 km



284amalia2007sep26

(284) Amalia 2007 Sep 26 51.2 x 51.2 km, PA 0.0° °
Geocentric X -5410.8 ± 0.2 Y 3222.8 ± 0.2 km **N**

E

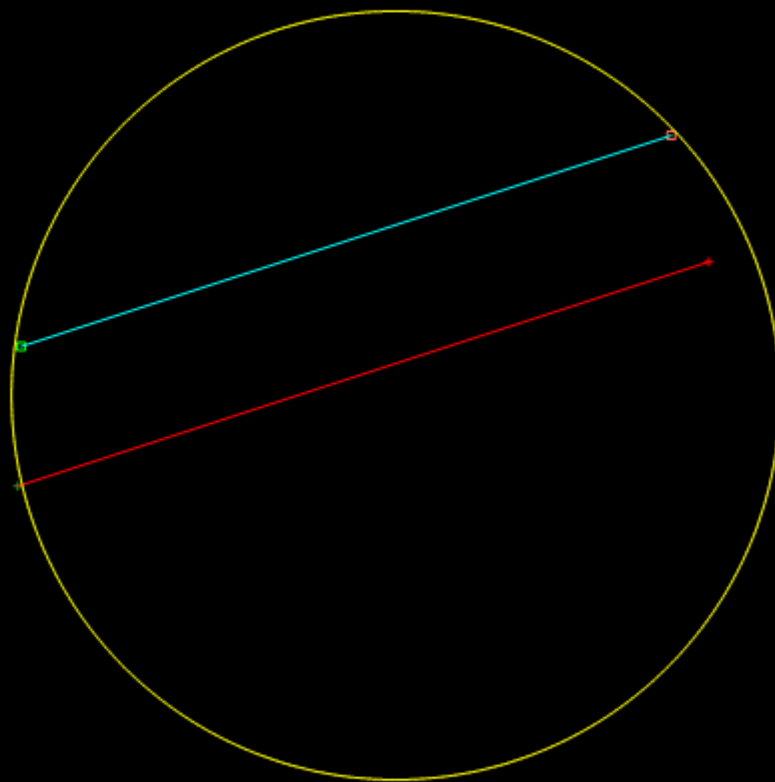


285regina2008jun13

(285) Regina 2008 Jun 13 $45.0 \pm 12.8 \times 45.0$ km. PA 0.0° °
Geocentric X -1147.0 ± 0.7 Y 1764.1 ± 4.1 km **N**

E

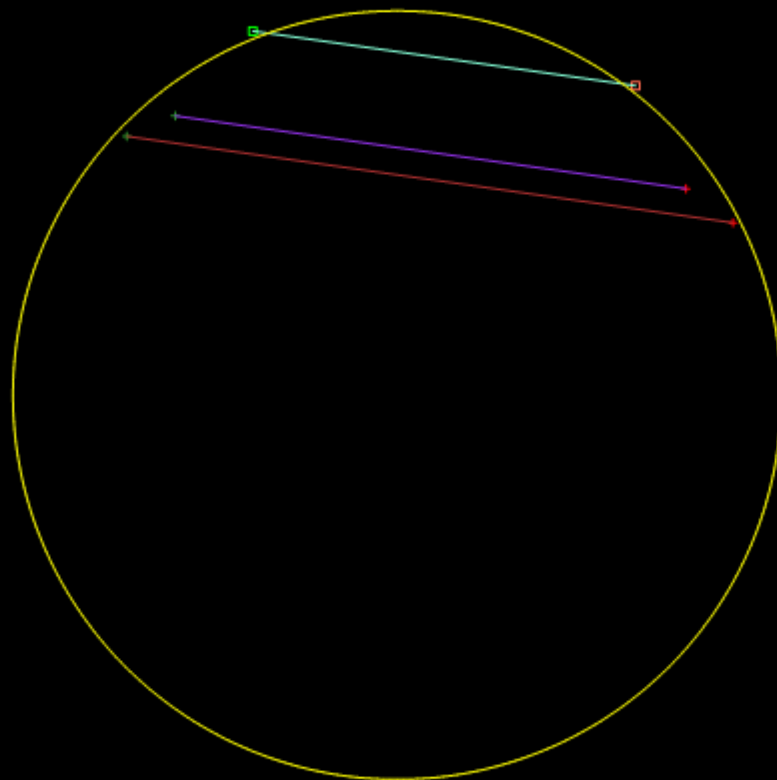
Occult 4.2.0.2



286iclea2008jun15

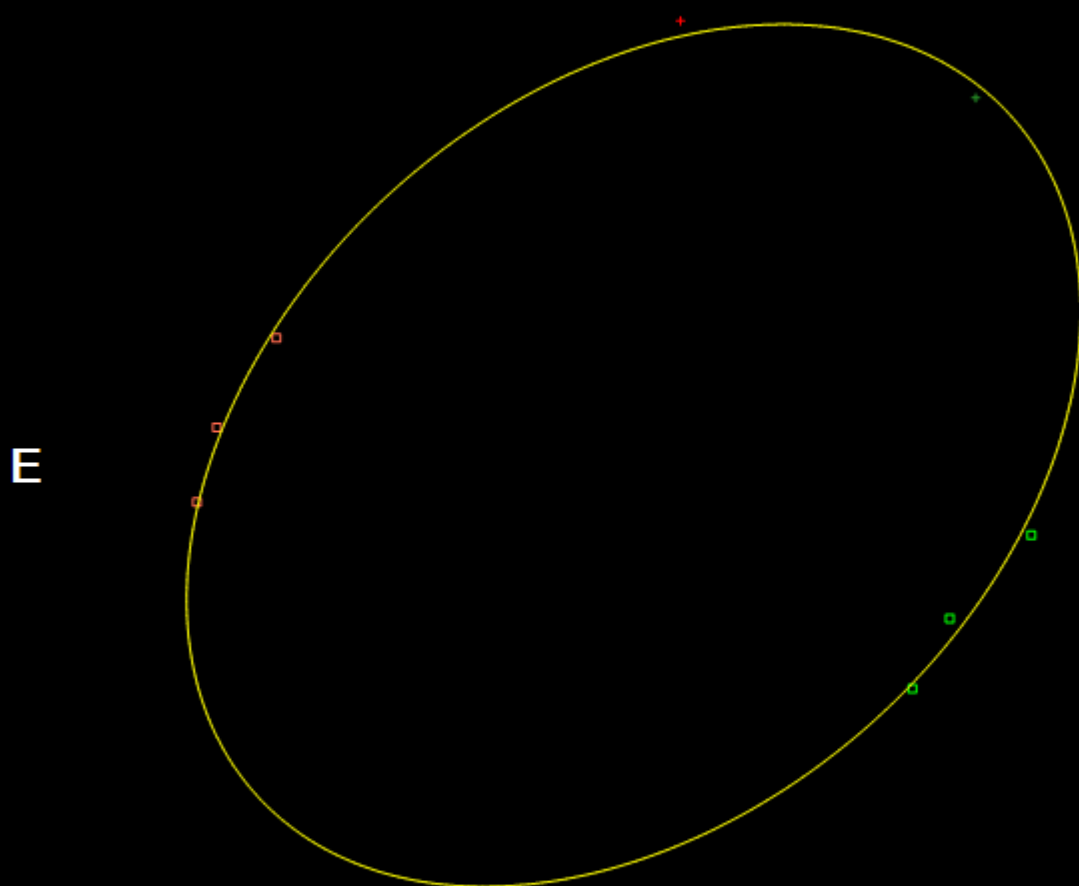
(286) Iclea 2008 Jun 15 $94.0 \pm 14.0 \times 94.0$ km, PA 0.0°
Geocentric X -4406.0 ± 1.1 Y -3041.6 ± 5.9 km **N**

E



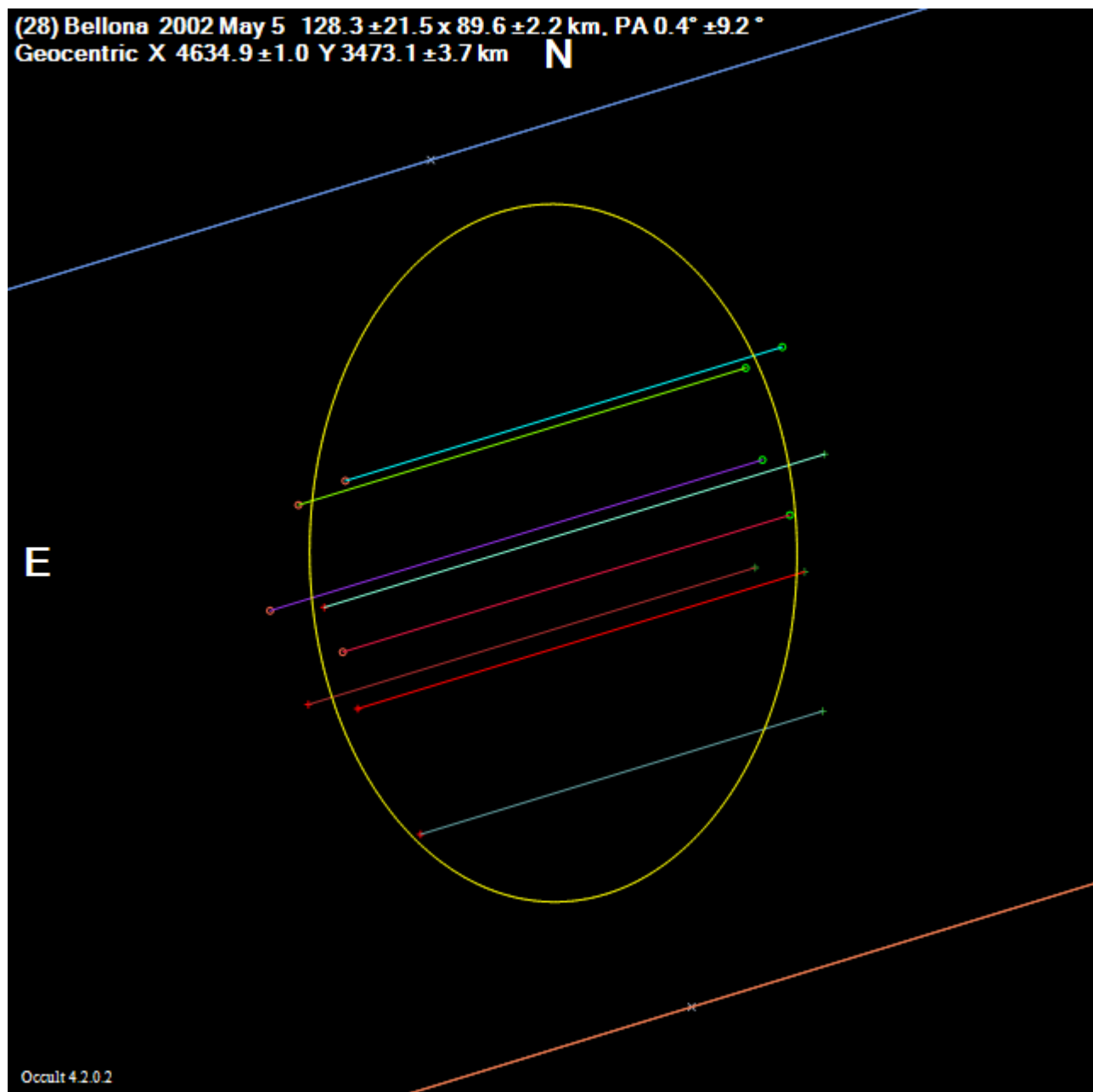
287nephthys2008may11

(287) Nephthys 2008 May 11 $88.5 \pm 4.1 \times 62.4 \pm 1.3$ km, PA $-48.1^\circ \pm 4.7^\circ$
Geocentric X -2288.3 ± 1.0 Y 5355.2 ± 1.7 km **N**



28bellona2002may05

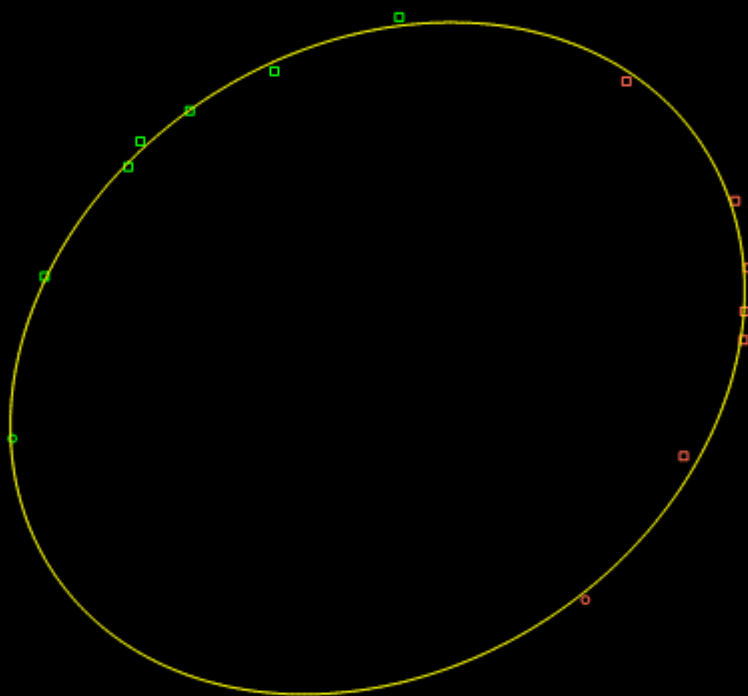
(28) Bellona 2002 May 5 $128.3 \pm 21.5 \times 89.6 \pm 2.2$ km, PA $0.4^\circ \pm 9.2^\circ$
Geocentric X 4634.9 ± 1.0 Y 3473.1 ± 3.7 km **N**



29amphitrite2015nov11

(29) Amphitrite 2015 Nov 11 $229.5 \pm 3.5 \times 183.7 \pm 2.1$ km, PA $-56.9^\circ \pm 3.2^\circ$
Geocentric X -1151.2 ± 1.0 Y 1681.1 ± 1.6 km **N**

E



2pallas1978may29

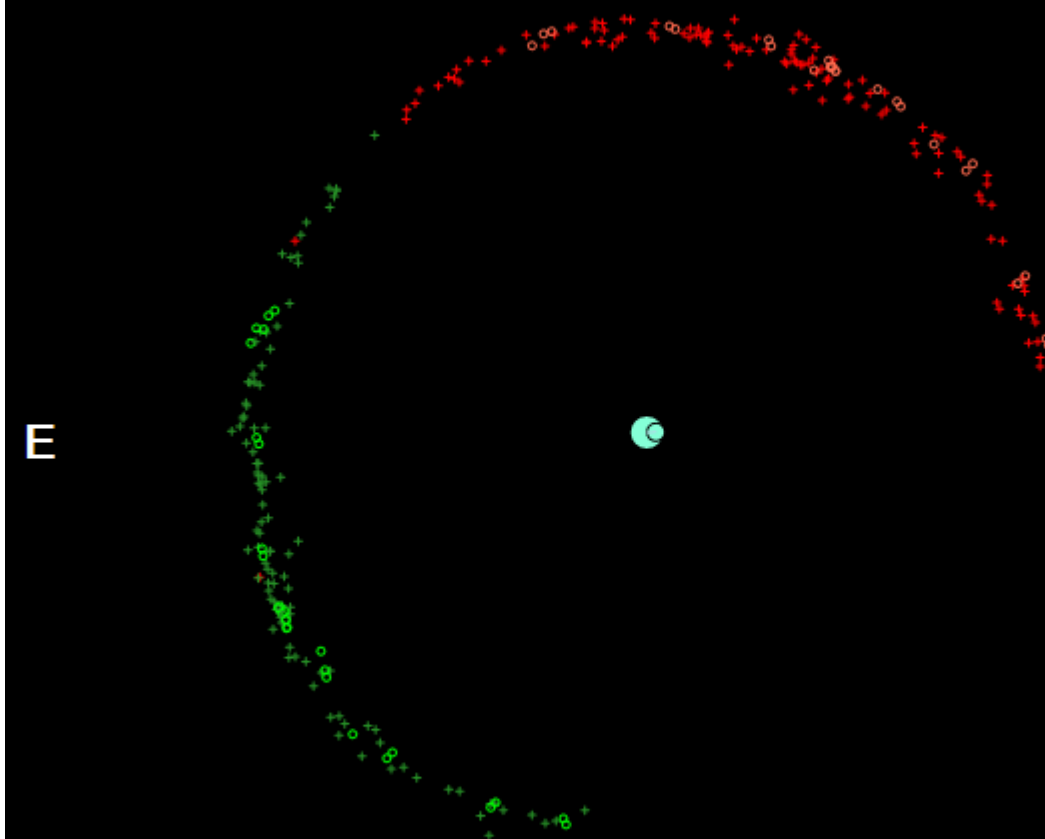
(2) Pallas 1978 May 29 $553.5 \pm 3.1 \times 528.4 \pm 7.7$ km, PA $-39.0^\circ \pm 13.3^\circ$
Geocentric X -523.8 ± 1.5 Y 1429.1 ± 2.9 km **N**

E



2pallas1983may29

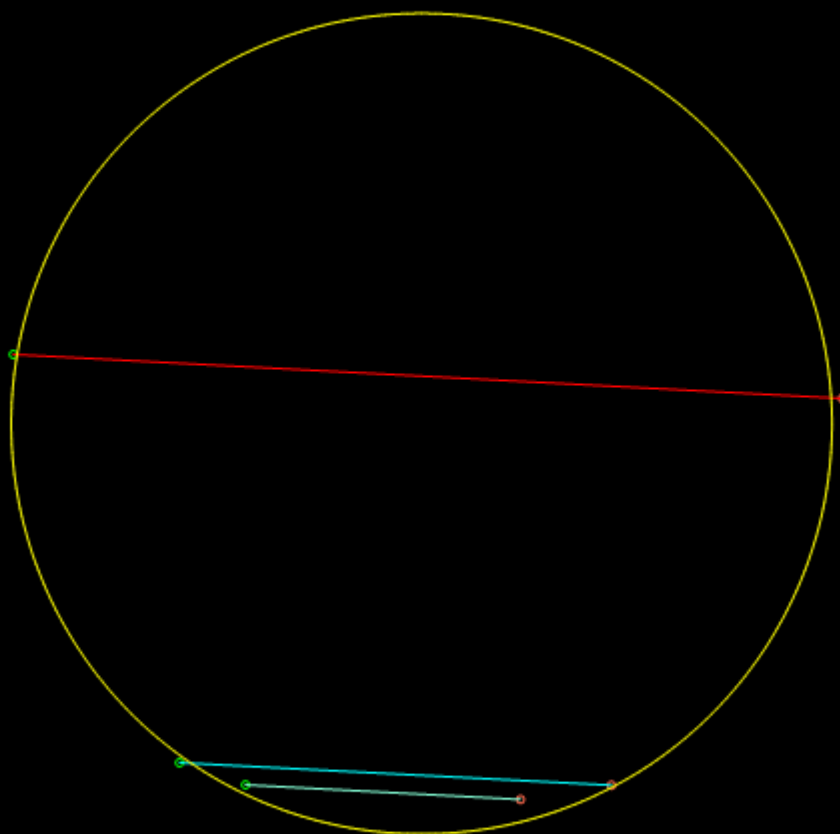
(2) Pallas 1983 May 29 $528.6 \pm 1.3 \times 512.3 \pm 3.4$ km, PA $-31.7^\circ \pm 5.3^\circ$
Geocentric X -5331.0 ± 1.0 Y 2389.5 ± 1.1 km **N**
Double : Sep $0.0030 \pm 0.0008''$, PA $-88.0^\circ \pm 17.1^\circ$



2pallas2001jun09

(2) Pallas 2001 Jun 9 $531.8 \pm 68.3 \times 531.8$ km, PA 0.0° °
Geocentric X 3849.0 ± 4.3 Y 1790.9 ± 30.5 km **N**

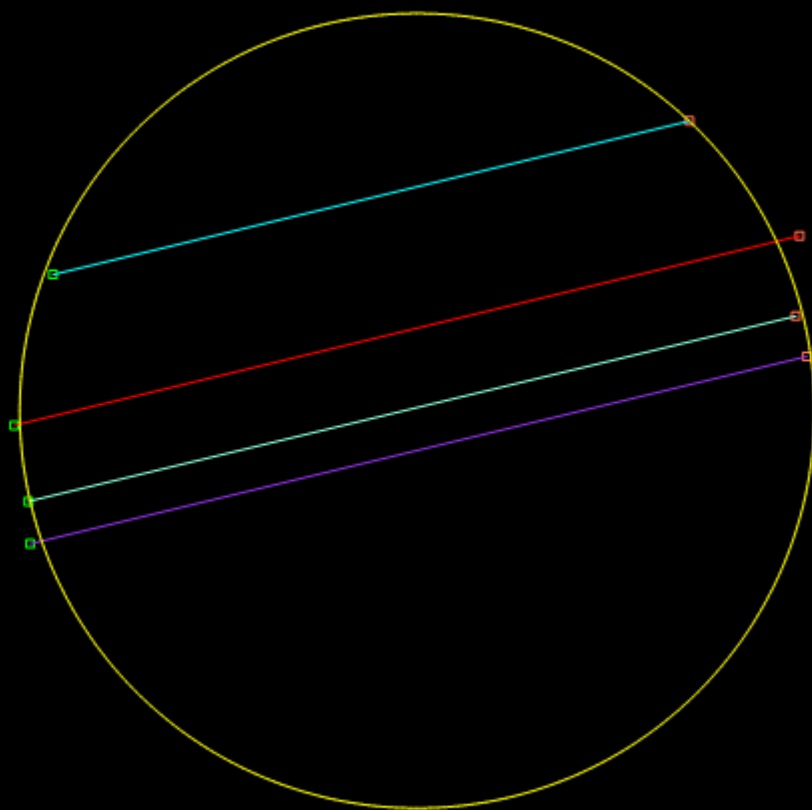
E



2pallas2006jun12

(2) Pallas 2006 Jun 12 515.0 x 515.0 km, PA 0.0° °
Geocentric X 2673.5 ± 2.9 Y 1147.5 ± 7.4 km **N**

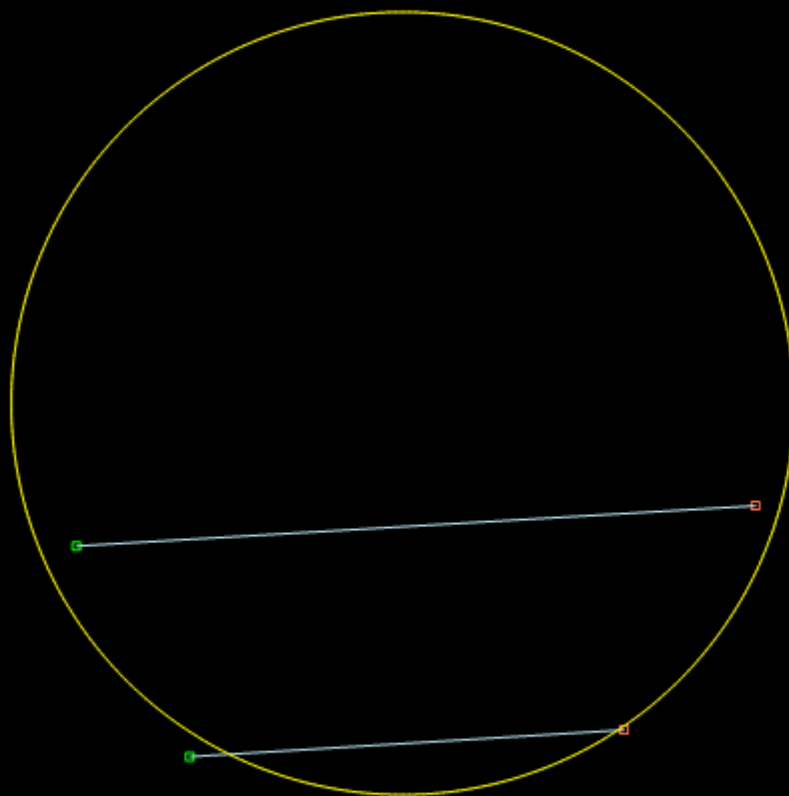
E



2pallas2015jun12

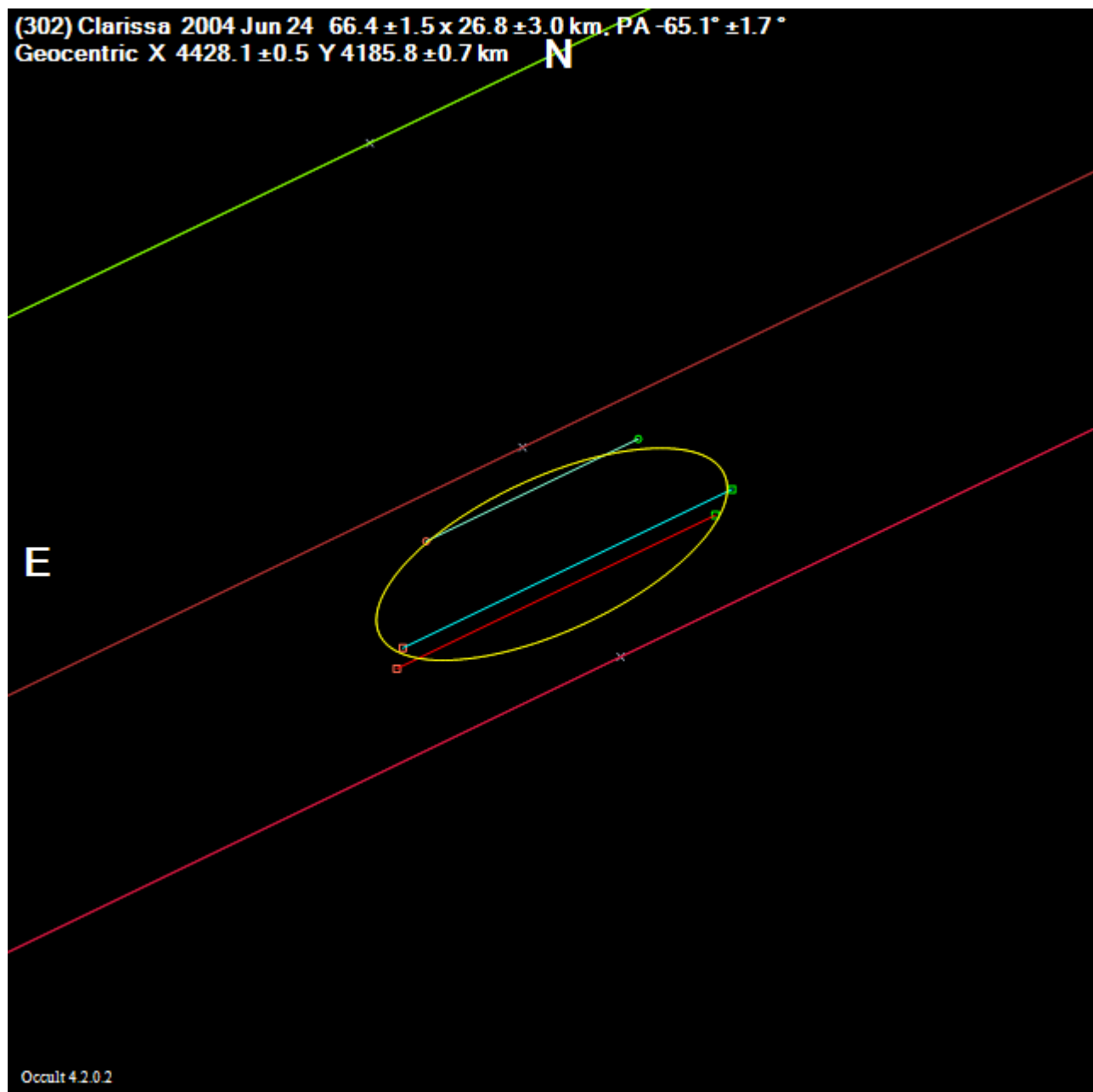
(2) Pallas 2015 Jun 12 554.0 x 554.0 km, PA 0.0°
Geocentric X -2700.0 ± 10.3 Y 1013.4 ± 12.2 km **N**

E



302clarissa2004jun24

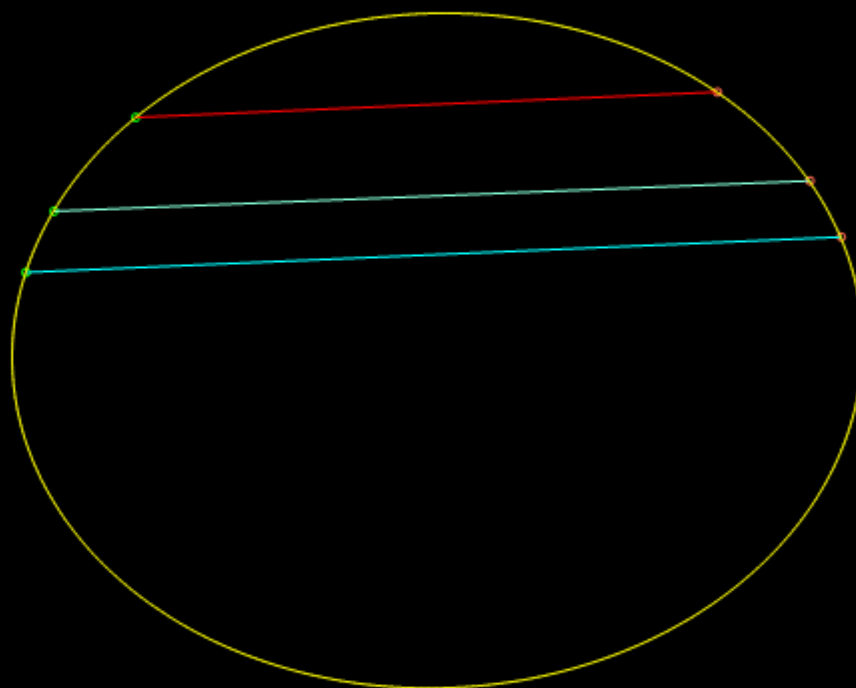
(302) Clarissa 2004 Jun 24 $66.4 \pm 1.5 \times 26.8 \pm 3.0$ km, PA $-65.1^\circ \pm 1.7^\circ$
Geocentric X 4428.1 ± 0.5 Y 4185.8 ± 0.7 km



303josephina2005nov18

(303) Josephina 2005 Nov 18 $86.9 \pm 0.9 \times 109.6 \pm 0.2$ km, PA $2.3^\circ \pm 0.2^\circ$
Geocentric X -594.4 ± 0.0 Y 136.4 ± 0.4 km **N**

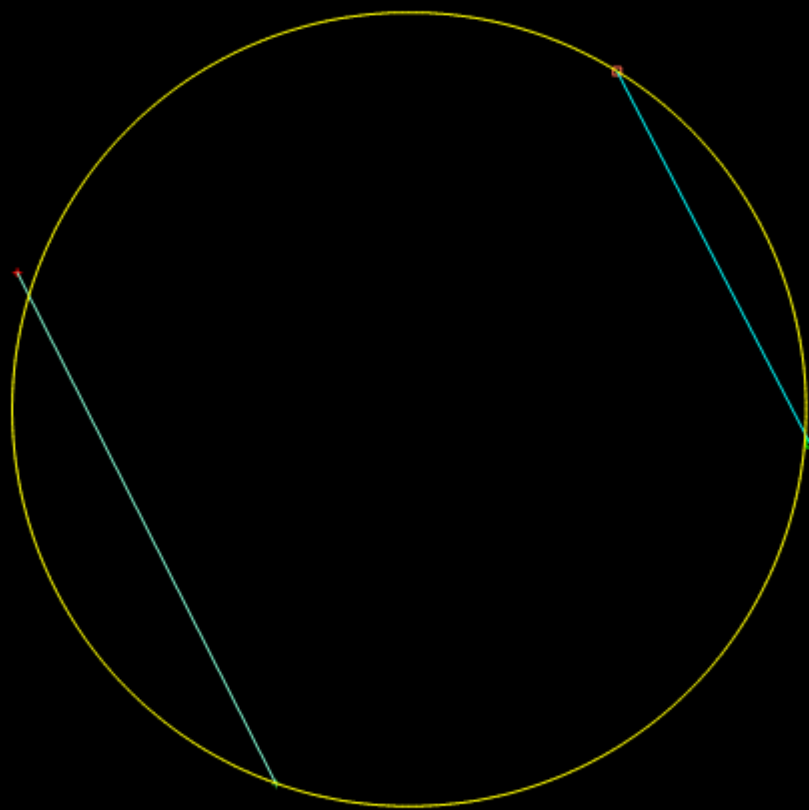
E



304olga2008nov27

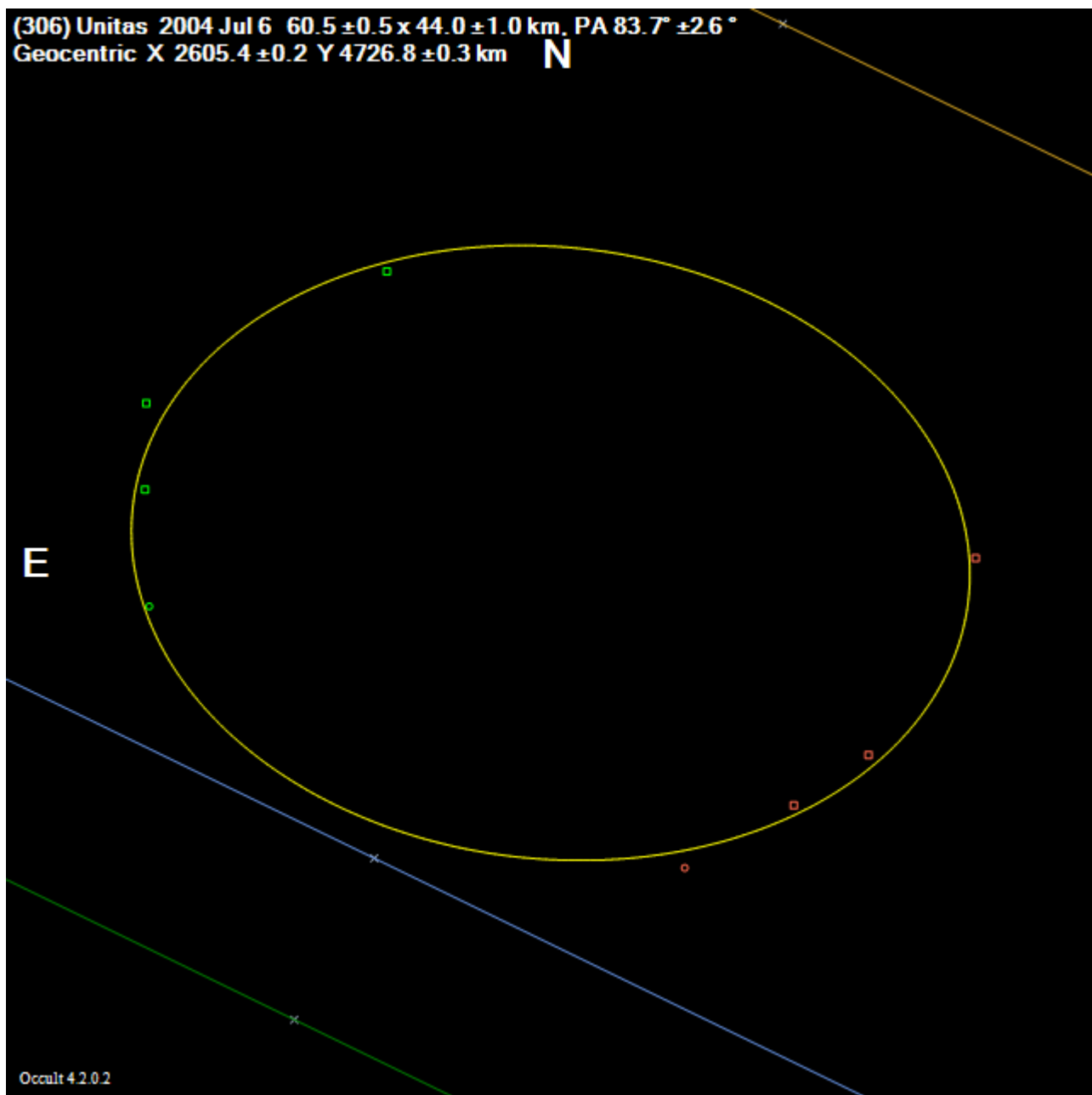
(304) Olga 2008 Nov 27 $69.2 \pm 0.9 \times 69.2$ km, PA 0.0° °
Geocentric X 1622.1 ± 0.3 Y 5328.6 ± 0.4 km **N**

E



306unitas2004jul06

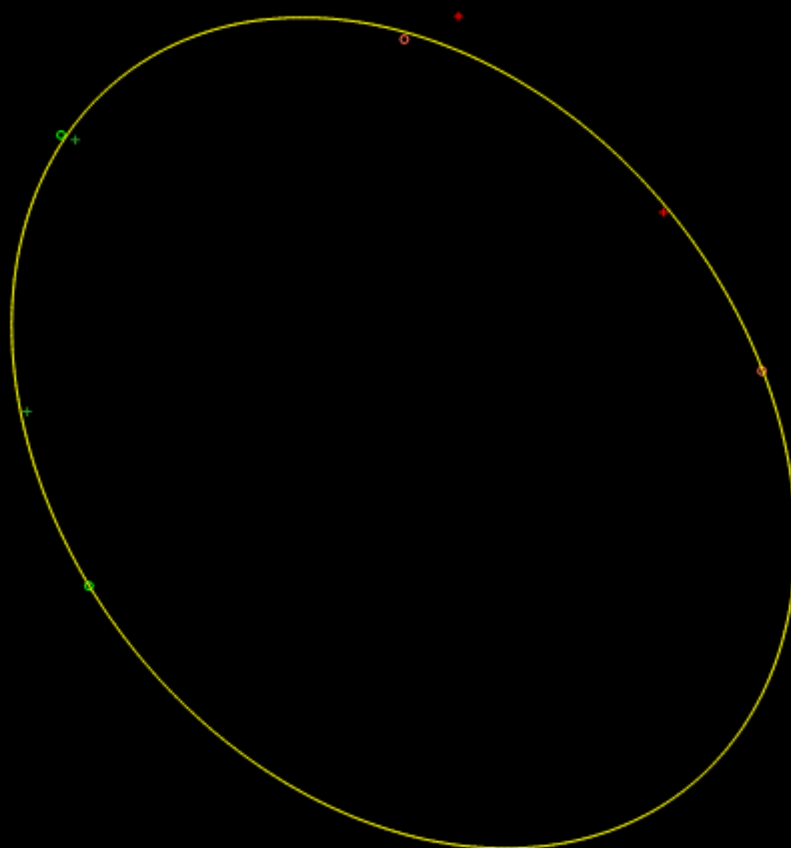
(306) Uitas 2004 Jul 6 $60.5 \pm 0.5 \times 44.0 \pm 1.0$ km, PA $83.7^\circ \pm 2.6^\circ$
Geocentric X 2605.4 ± 0.2 Y 4726.8 ± 0.3 km **N**



308polyxo2000jan10

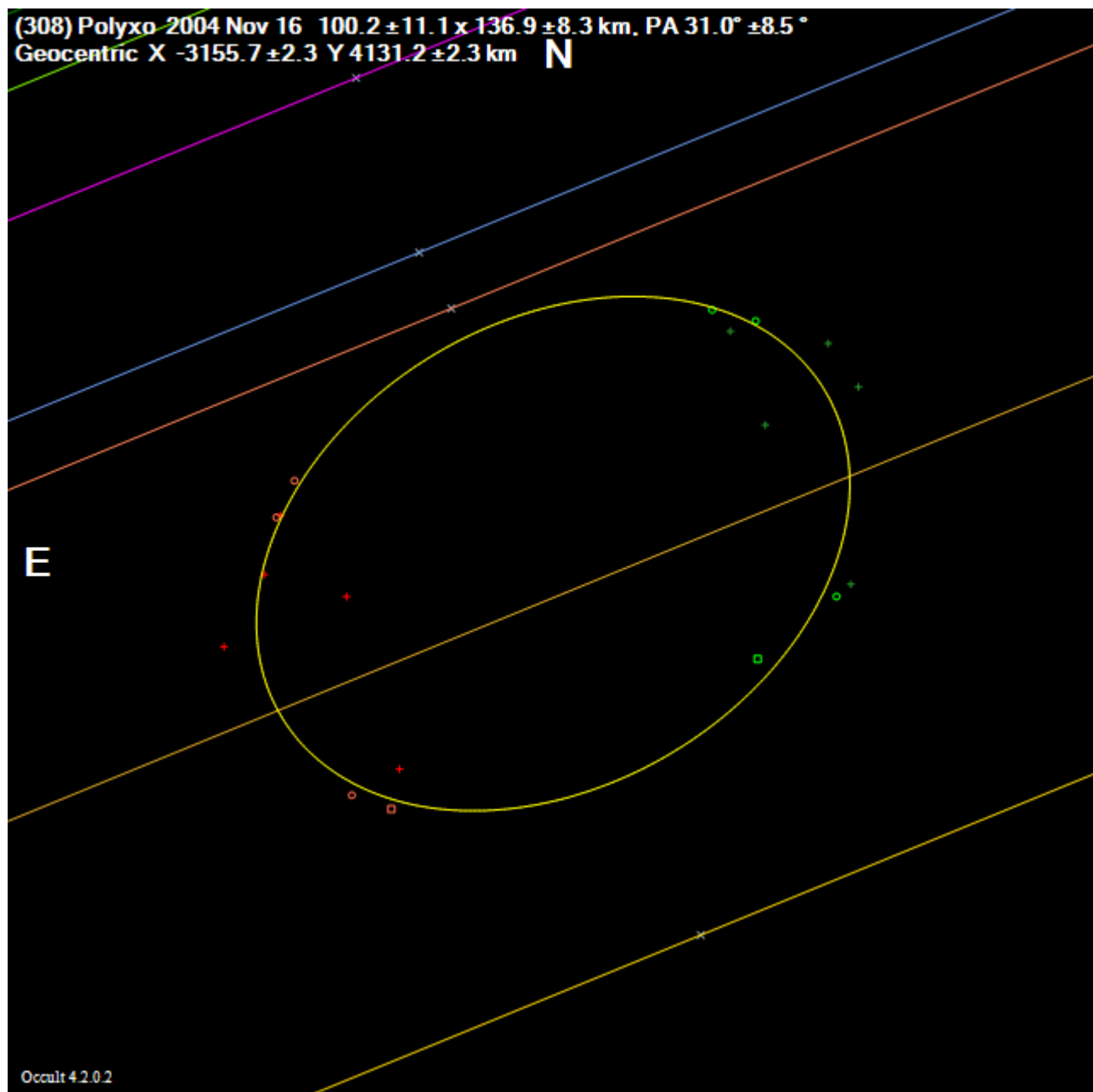
(308) Polyxo 2000 Jan 10 $165.5 \pm 25.6 \times 126.1 \pm 2.6$ km, PA $38.7^\circ \pm 10.7^\circ$
Geocentric X -4497.8 ± 5.4 Y 3351.4 ± 10.5 km **N**

E



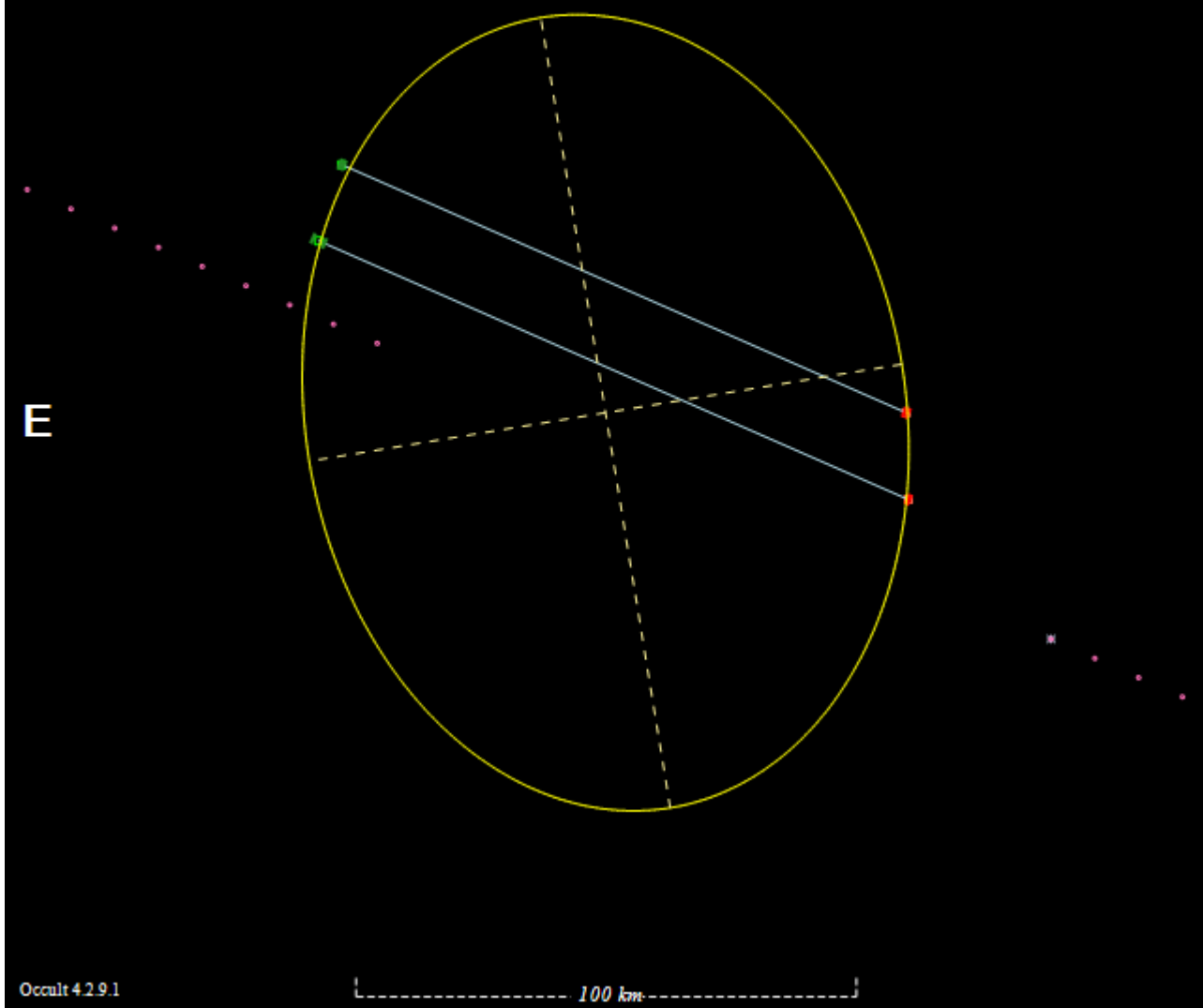
308polyxo2004nov16

(308) Polyxo 2004 Nov 16 $100.2 \pm 11.1 \times 136.9 \pm 8.3$ km, PA $31.0^\circ \pm 8.5^\circ$
Geocentric X -3155.7 ± 2.3 Y 4131.2 ± 2.3 km **N**



308Polyxo2016Nov13

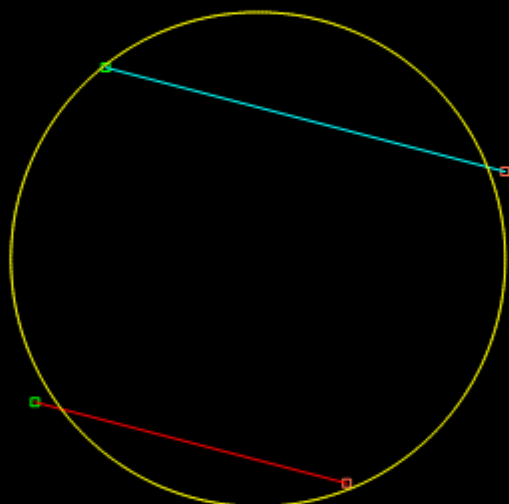
(308) Polyxo 2016 Nov 13 160.0 x 120.0 km, PA 9.3° ± 2.4°
Geocentric X 4376.5 ± 0.5 Y 3661.9 ± 3.0 km **N**



312pierretta2012nov11

(312) Pierretta 2012 Nov 11 $45.5 \pm 1.8 \times 45.5$ km, PA 0.0° °
Geocentric X -1931.6 ± 0.7 Y 2315.6 ± 0.7 km **N**

E

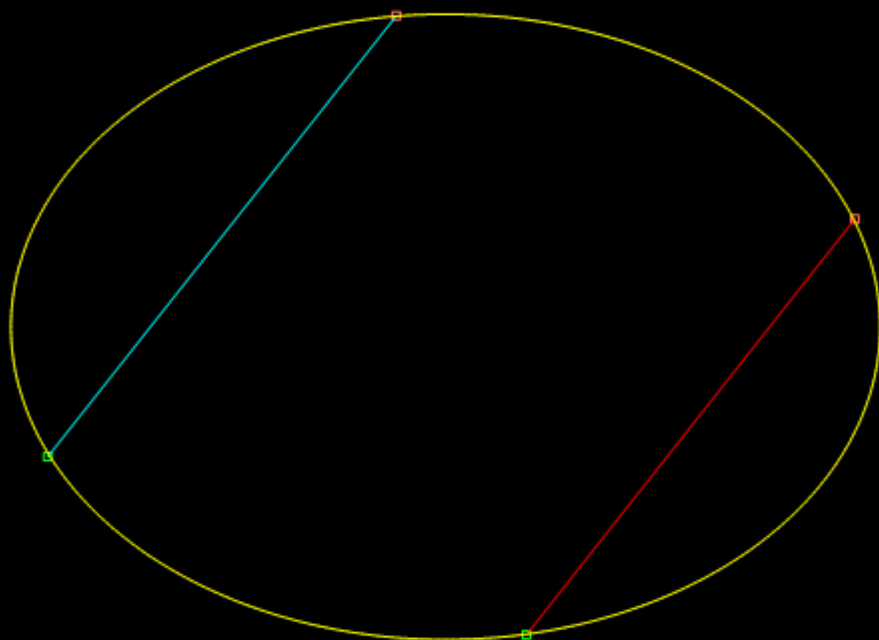


Occult 4.2.0.2

313chaldaea2014mar07

(313) Chaldaea 2014 Mar 7 $106.3 \pm 0.0 \times 76.5 \pm 0.0$ km, PA 90.0° °
Geocentric X -4472.5 ± 0.0 Y 3616.8 ± 0.0 km **N**

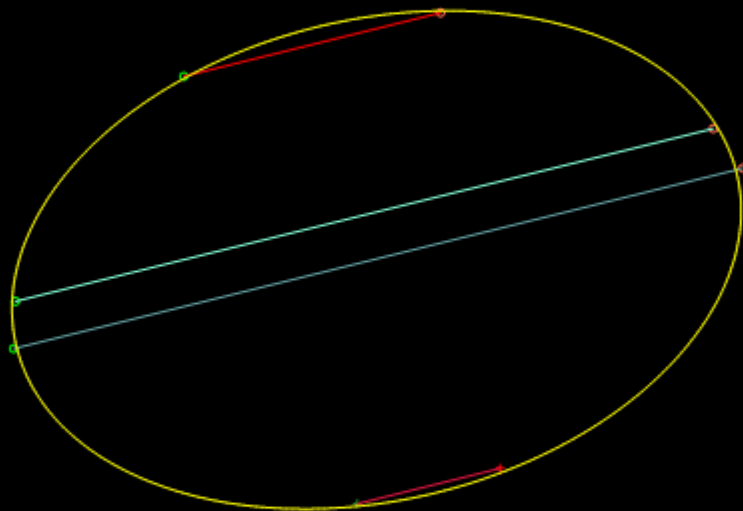
E



3171wangshouguan2002oct16

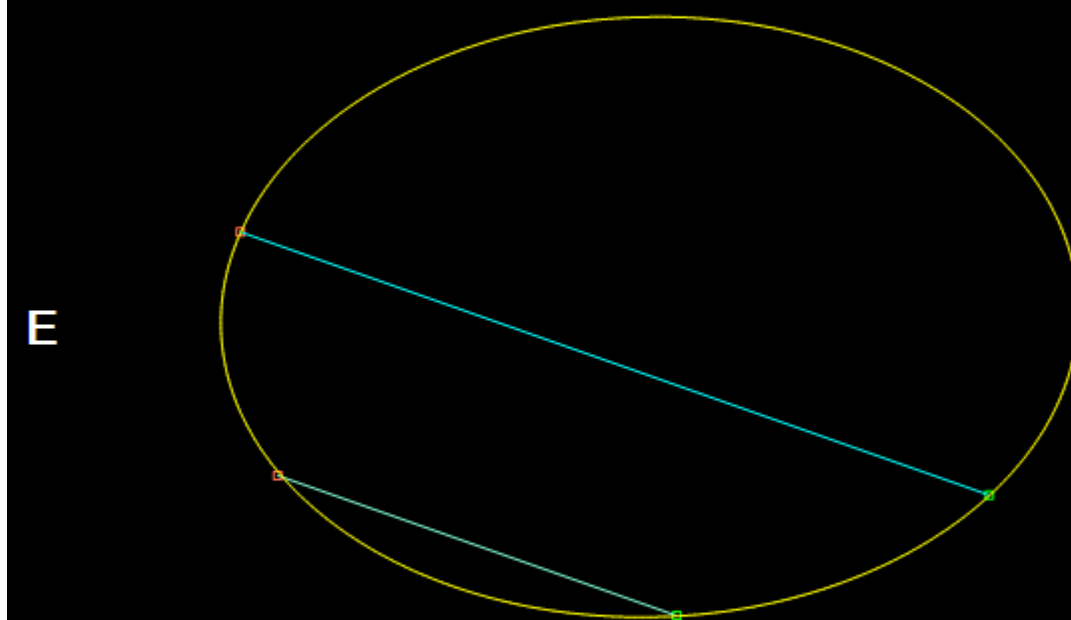
(3171) Wangshouguan 2002 Oct 16 $29.4 \pm 0.4 \times 45.3 \pm 0.2$ km, PA $13.4^\circ \pm 1.9^\circ$
Geocentric X -4198.1 ± 0.1 Y 4040.5 ± 0.2 km **N**

E



31euphrosyne2012mar15

(31) Euphrosyne 2012 Mar 15 $308.0 \pm 0.3 \times 215.5 \pm 0.5$ km, PA 91.5° °
Geocentric X 4772.7 ± 0.1 Y 3497.5 ± 0.2 km **N**

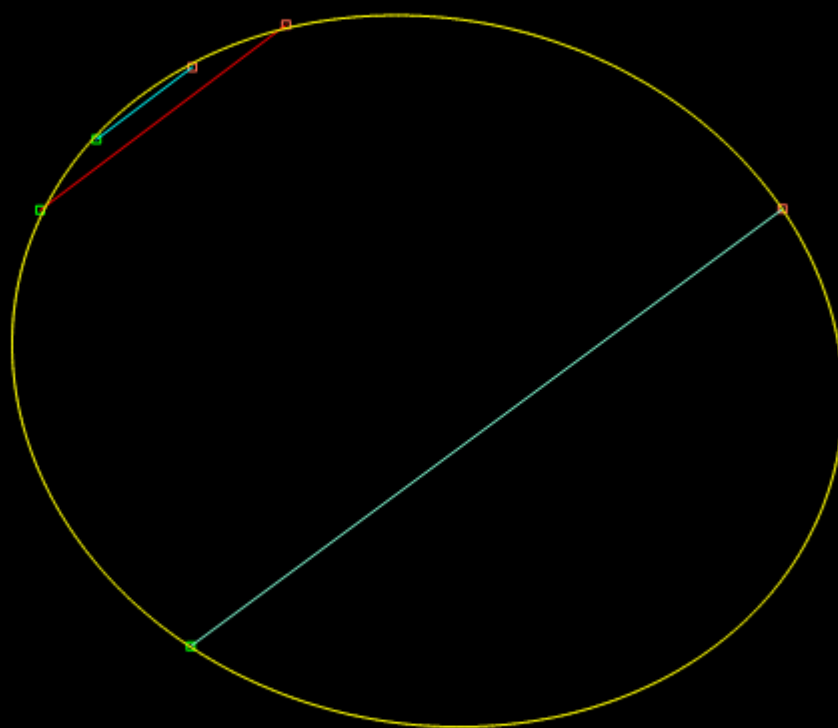


Occult 4.2.0.2

31euphrosyne2013feb06

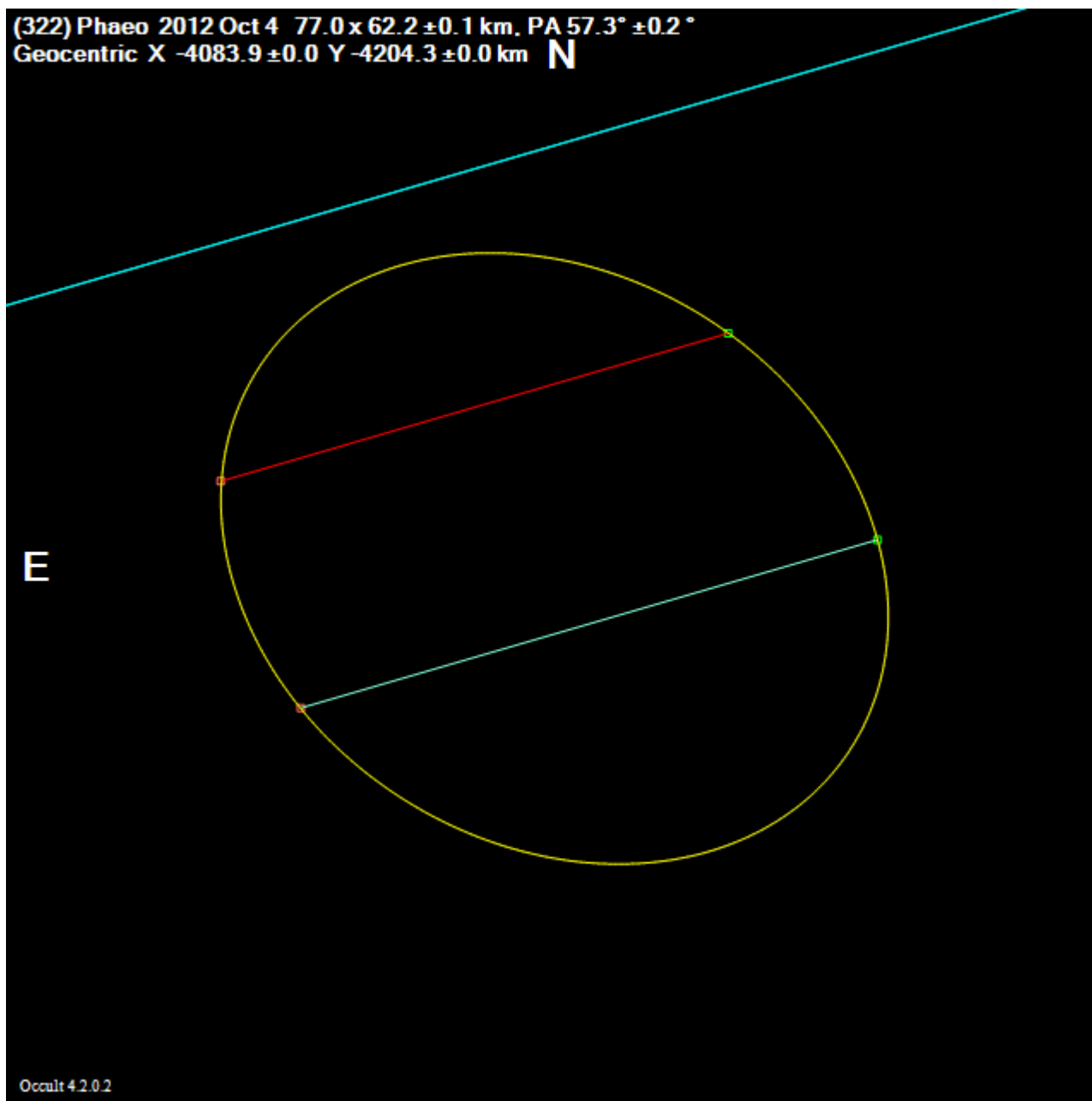
(31) Euphrosyne 2013 Feb 6 $300.7 \pm 2.4 \times 252.9 \pm 1.6$ km, PA 77.0° °
Geocentric X -1654.0 ± 0.8 Y 2432.0 ± 0.7 km **N**

E



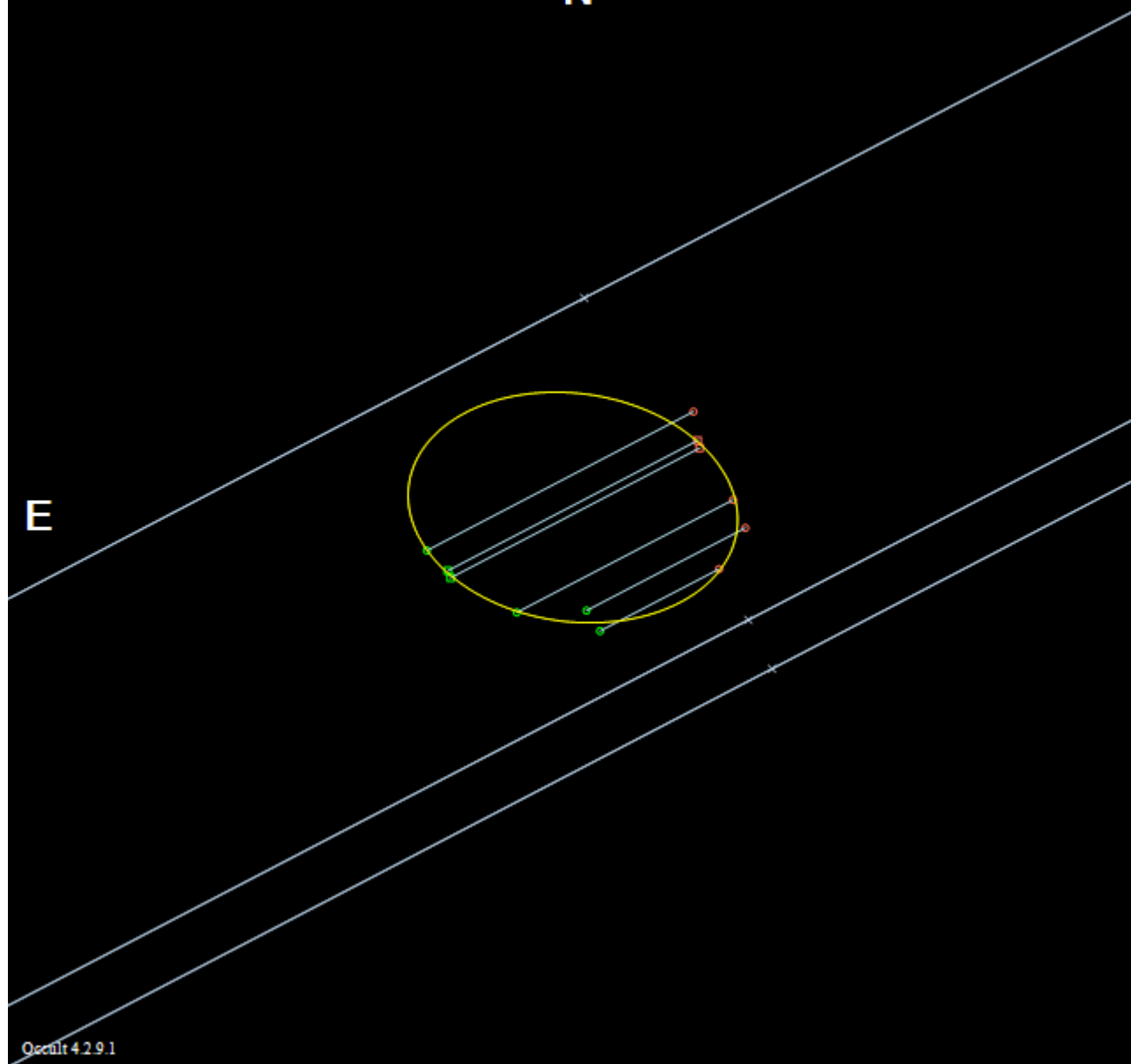
322phaeo2012oct04

(322) Phaeo 2012 Oct 4 77.0 x 62.2 ± 0.1 km, PA 57.3° ± 0.2°
Geocentric X -4083.9 ± 0.0 Y -4204.3 ± 0.0 km **N**



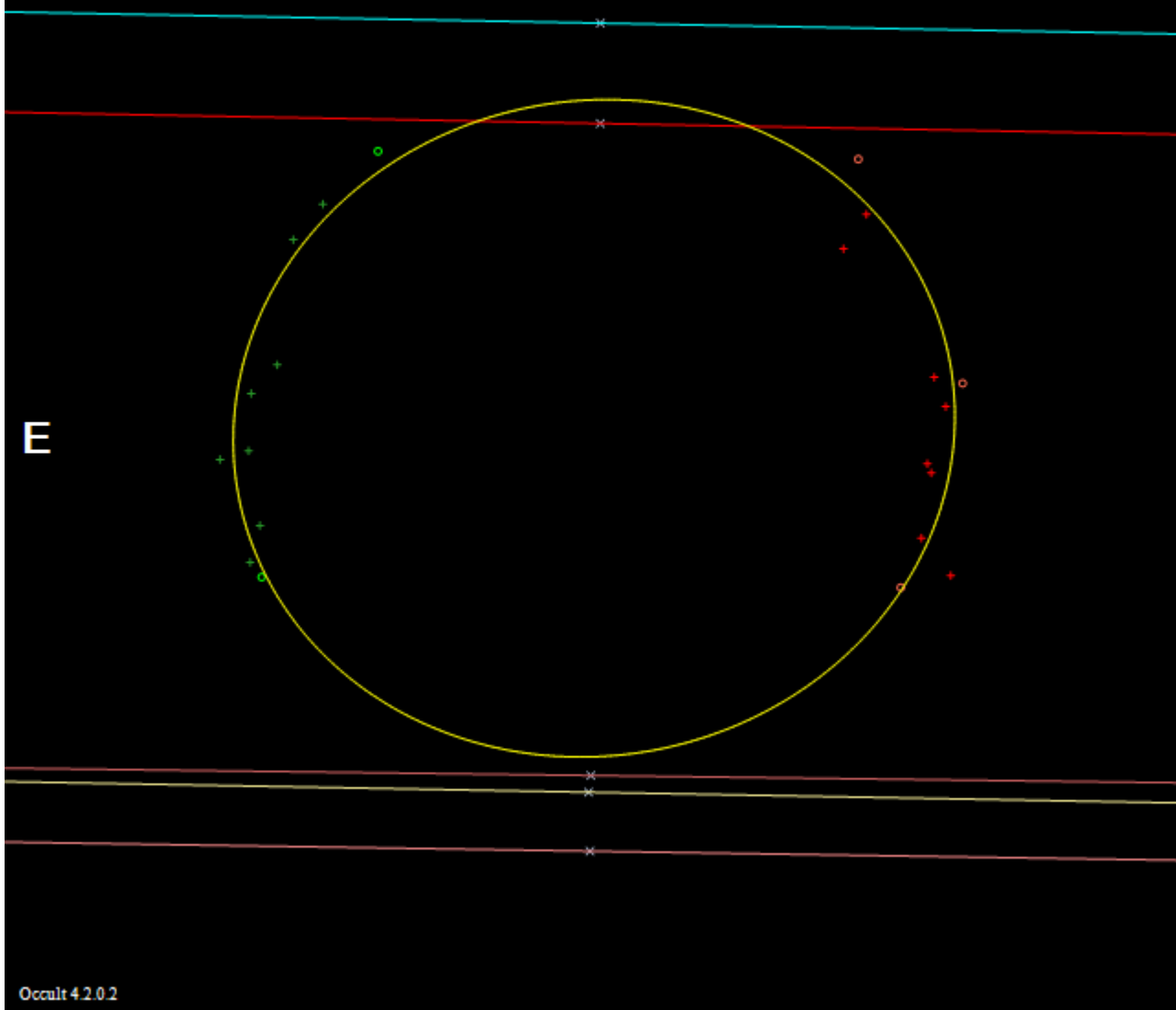
322phaeo2015jun04

(322) Phaeo 2015 Jun 4 $83.9 \pm 9.9 \times 57.8 \pm 6.1$ km, PA $82.0^\circ \pm 14.6^\circ$
Geocentric X -654.7 ± 4.7 Y 5681.4 ± 4.1 km **N**



324bamberga1987dec08

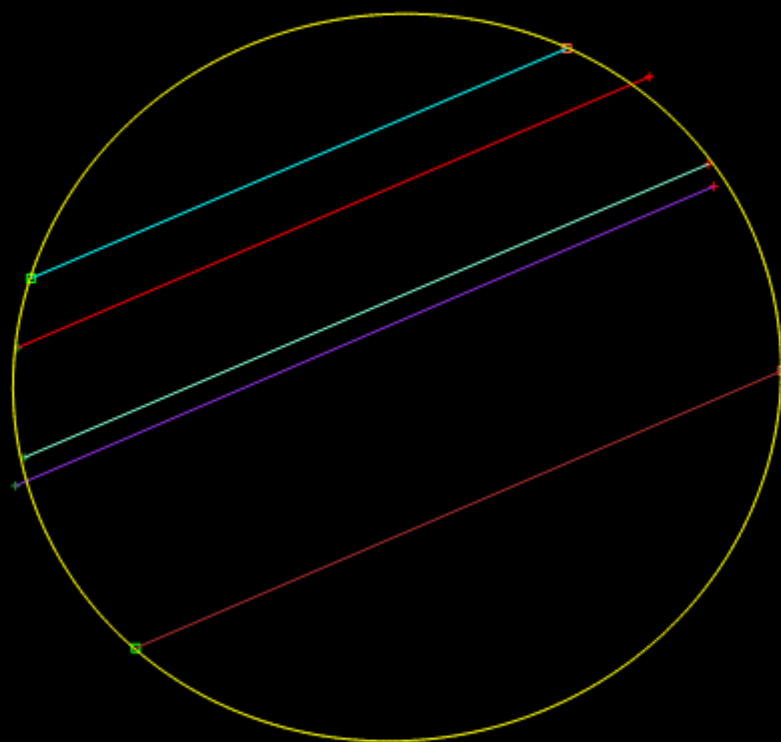
(324) Bamberga 1987 Dec 8 $235.3 \pm 3.1 \times 212.9 \pm 7.5$ km, PA $-79.3^\circ \pm 9.0^\circ$
Geocentric X 5214.2 ± 1.3 Y 1107.8 ± 2.9 km **N**



324bamberga2007apr20

(324) Bamberga 2007 Apr 20 $229.4 \pm 2.8 \times 216.2 \pm 10.0$ km, PA $-78.5^\circ \pm 14.2^\circ$
Geocentric X -4407.2 ± 1.2 Y -2949.6 ± 2.0 km **N**

E

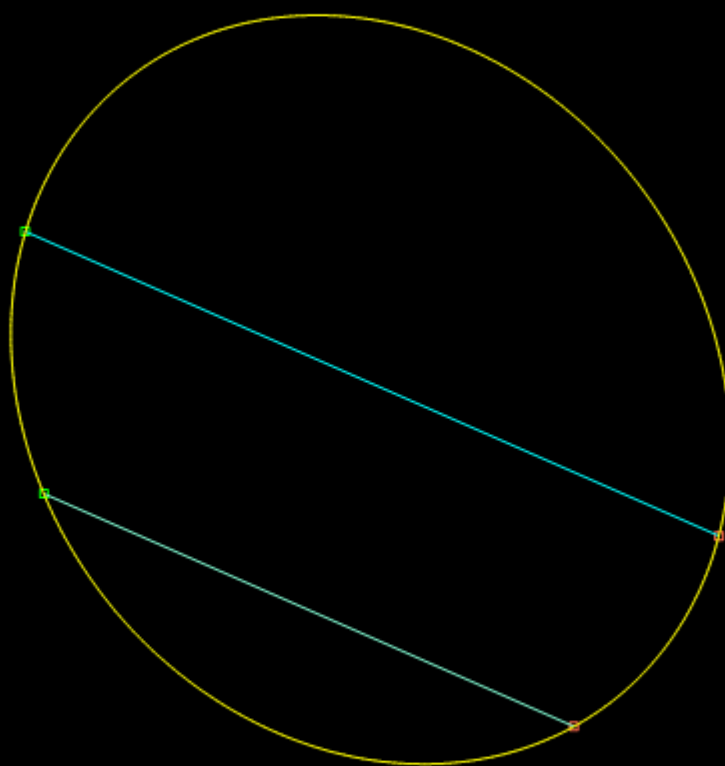


324bamberga2010jan08

(324) Bamberga 2010 Jan 8 235.0 x 201.2 km, PA 37.4° °
Geocentric X -1615.9 Y -1305.6 km

N

E

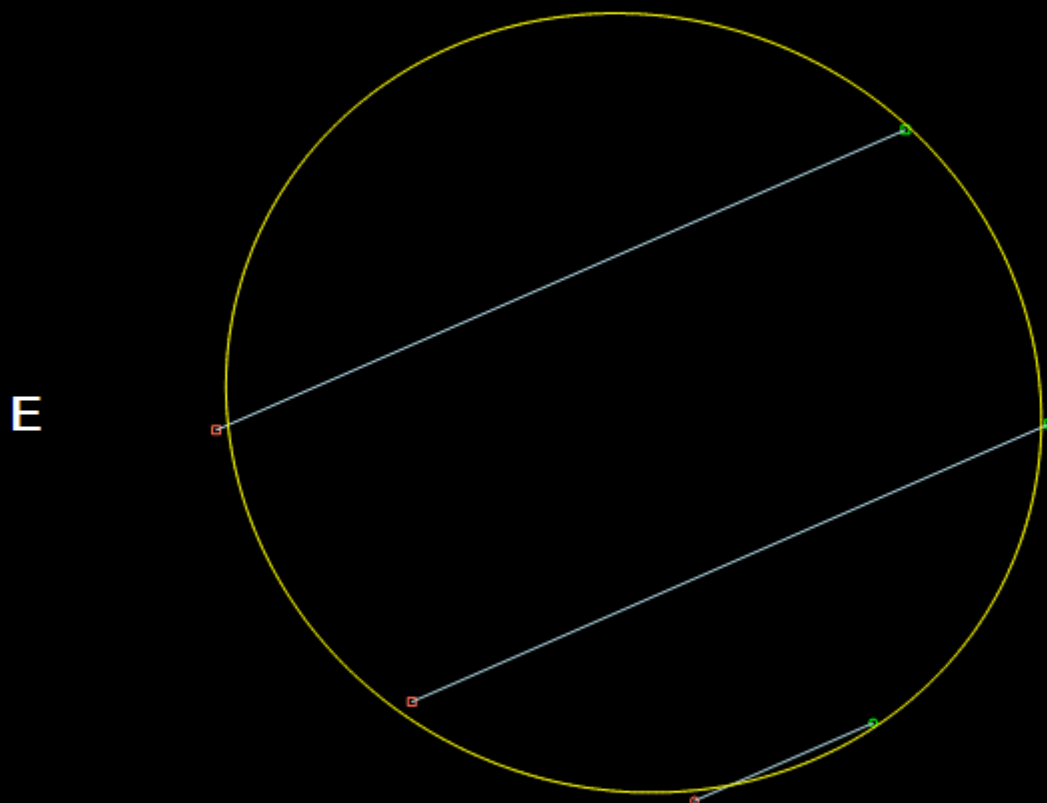


(324) Bamberga 2010 Jan 24 242.5 ± 3.9 x 155.4 ± 8.2 km, PA 37.5° ± 2.1°
Geocentric X -1022.9 ± 2.2 Y -147.2 ± 2.4 km **N**

Occult 4.2.0.2

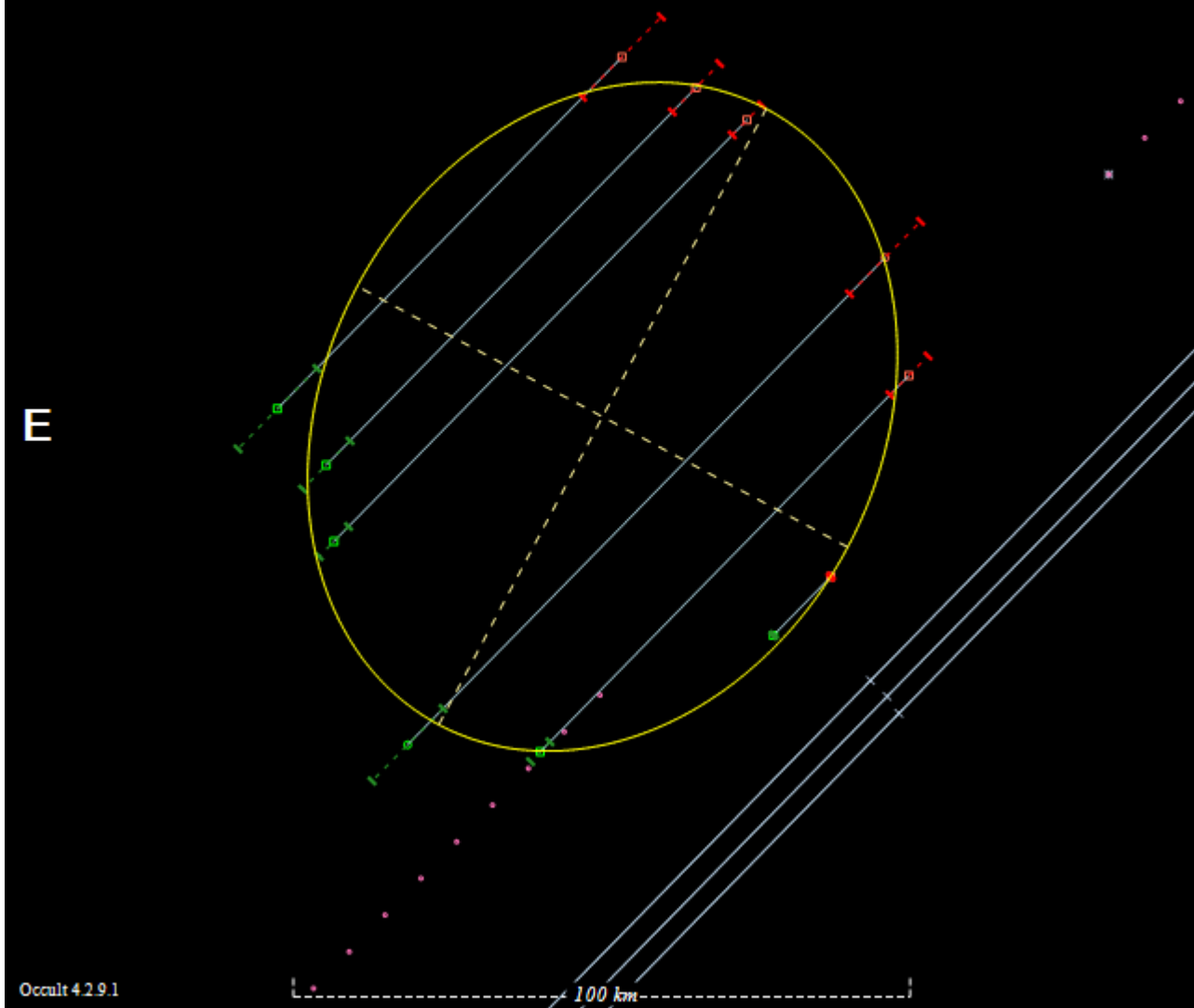
324bamberga2015may31

(324) Bamberga 2015 May 31 245.0 x 230.0 km. PA $67.9^\circ \pm 15.2^\circ$
Geocentric X 4055.9 ± 1.8 Y 3945.7 ± 2.1 km **N**



328Gudrun2016Nov13

(328) Gudrun 2016 Nov 13 $113.1 \pm 3.4 \times 90.1 \pm 3.7$ km, PA $-28.0^\circ \pm 7.8^\circ$
Geocentric X 1942.5 ± 1.5 Y -472.5 ± 1.6 km **N**



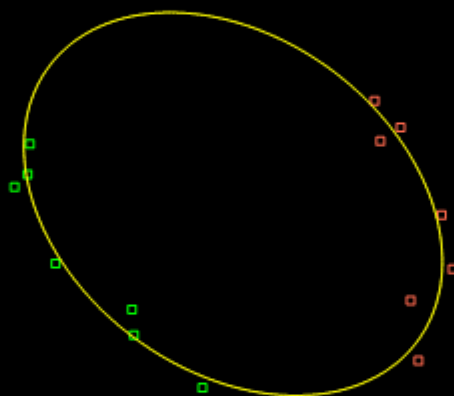
329svea2011dec28

(329) Svea 2011 Dec 28 $83.3 \pm 4.7^\circ \times 60.3 \pm 2.4^\circ$ km. PA $53.2^\circ \pm 9.8^\circ$
Geocentric X 565.4 ± 1.1 Y 3809.1 ± 2.1 km

N

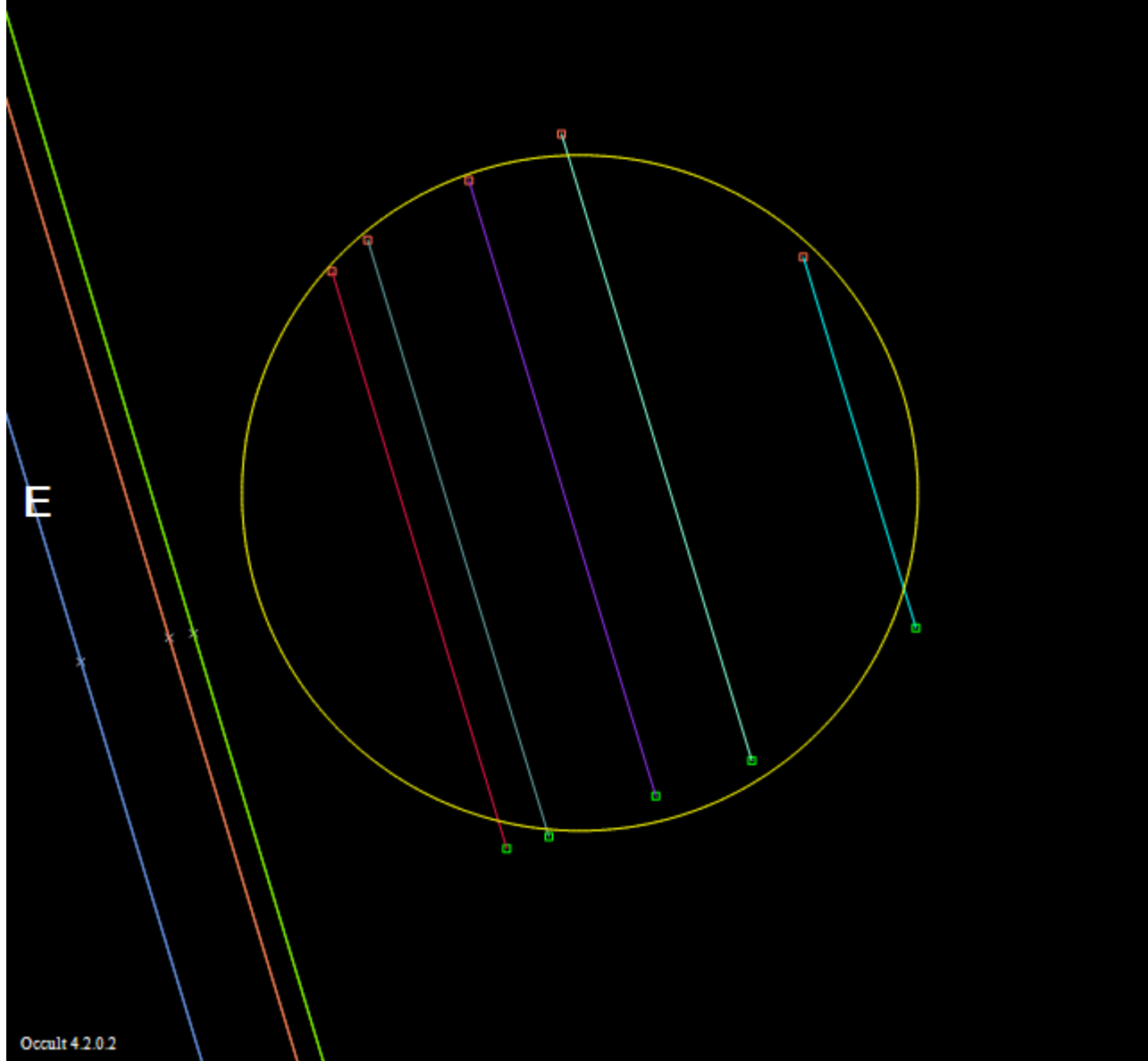
E

Occult 4.2.0.2



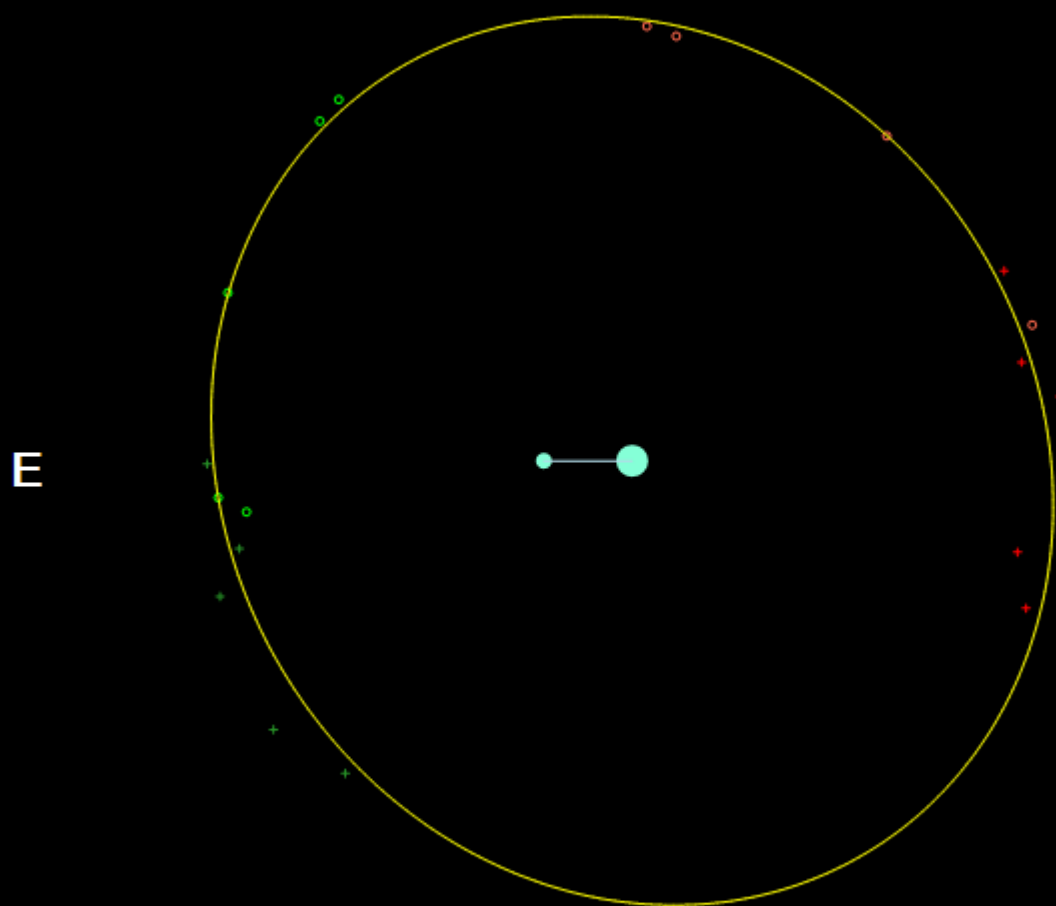
329svea2013mar07

(329) Svea 2013 Mar 7 $68.9 \pm 1.5 \times 68.9$ km, PA 0.0° °
Geocentric X 893.4 ± 1.1 Y 3763.5 ± 0.7 km **N**



334chicago2002dec24

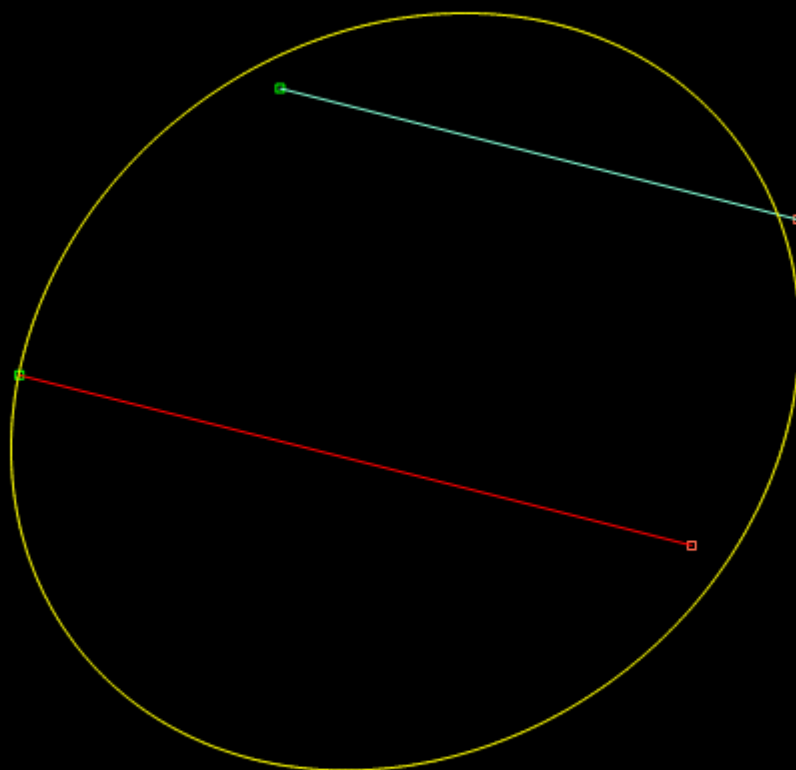
(334) Chicago 2002 Dec 24 $184.2 \pm 8.1 \times 164.4 \pm 2.6$ km, PA $30.7^\circ \pm 9.6^\circ$
Geocentric X 3686.6 ± 1.5 Y 2725.1 ± 3.5 km **N**
Double : Sep $0.0079 \pm 0.0014''$, PA 90.0°



334chicago2014jul14

(334) Chicago 2014 Jul 14 199.0 x 170.0 km, PA -52.5° ± 15.7 °
Geocentric X 4329.1 ± 3.5 Y -3041.3 ± 5.3 km **N**

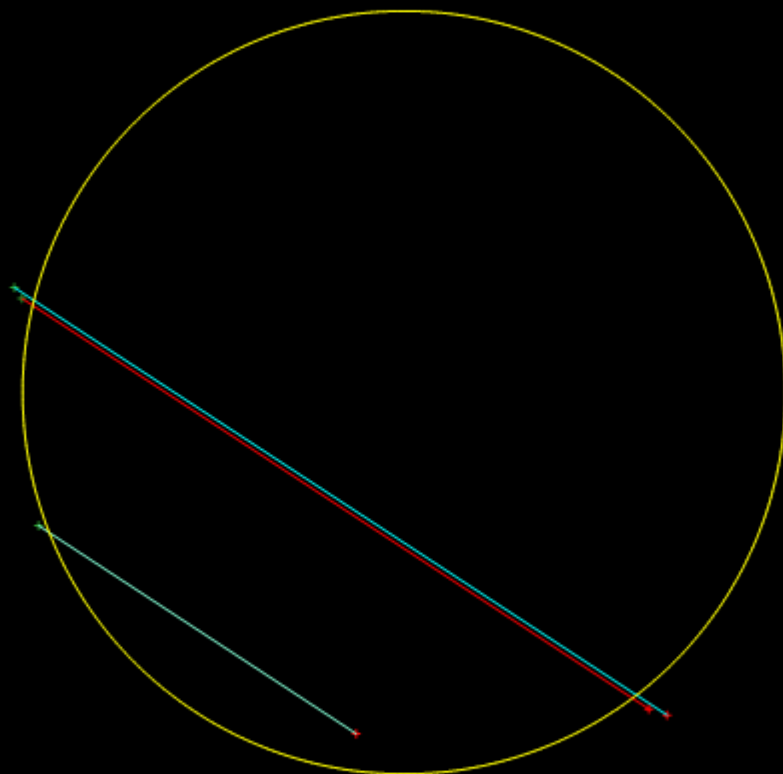
E



336lacadiera2000sep21

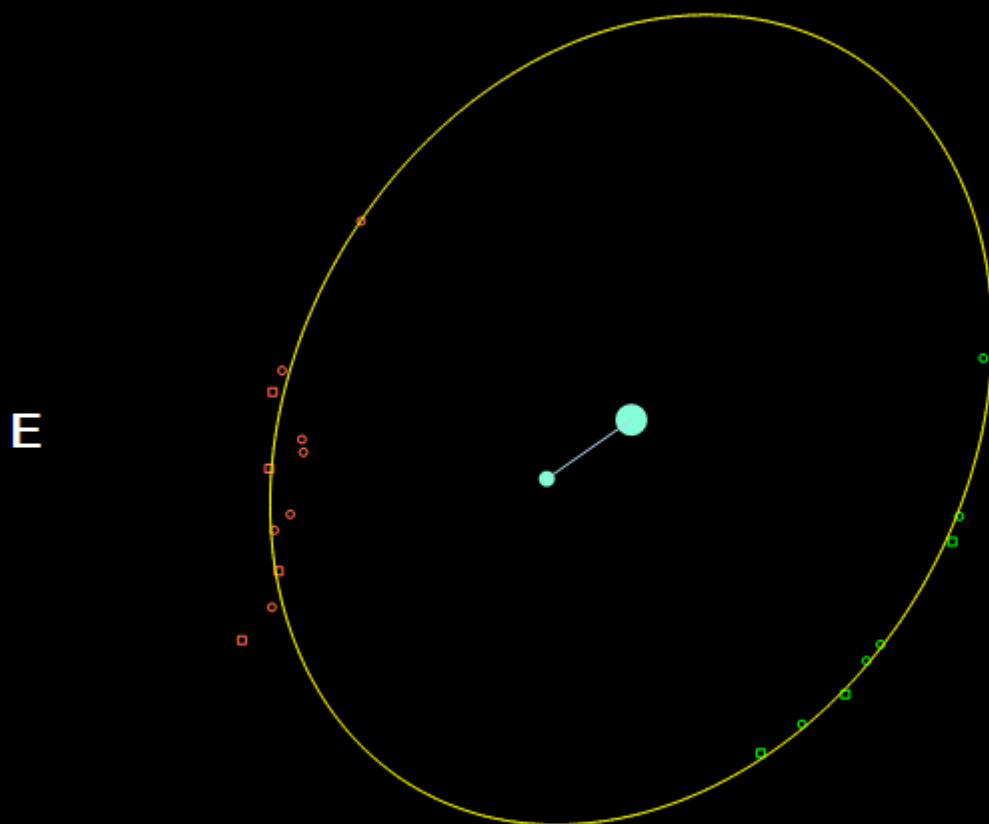
(336) Lacadiera 2000 Sep 21 $68.5 \pm 10.5 \times 68.5$ km, PA 0.0° °
Geocentric X 3529.5 ± 1.3 Y 4042.6 ± 4.6 km **N**

E



336lacadiera2009apr16

(336) Lacadiera 2009 Apr 16 $76.6 \pm 10.5 \times 60.2 \pm 1.4$ km, PA $-30.6^\circ \pm 10.9^\circ$
Geocentric X 3908.3 ± 1.0 Y 3810.8 ± 2.6 km **N**
Double : Sep $0.0075 \pm 0.0014''$, PA $124.9^\circ \pm 9.8^\circ$



337devosa2014dec11

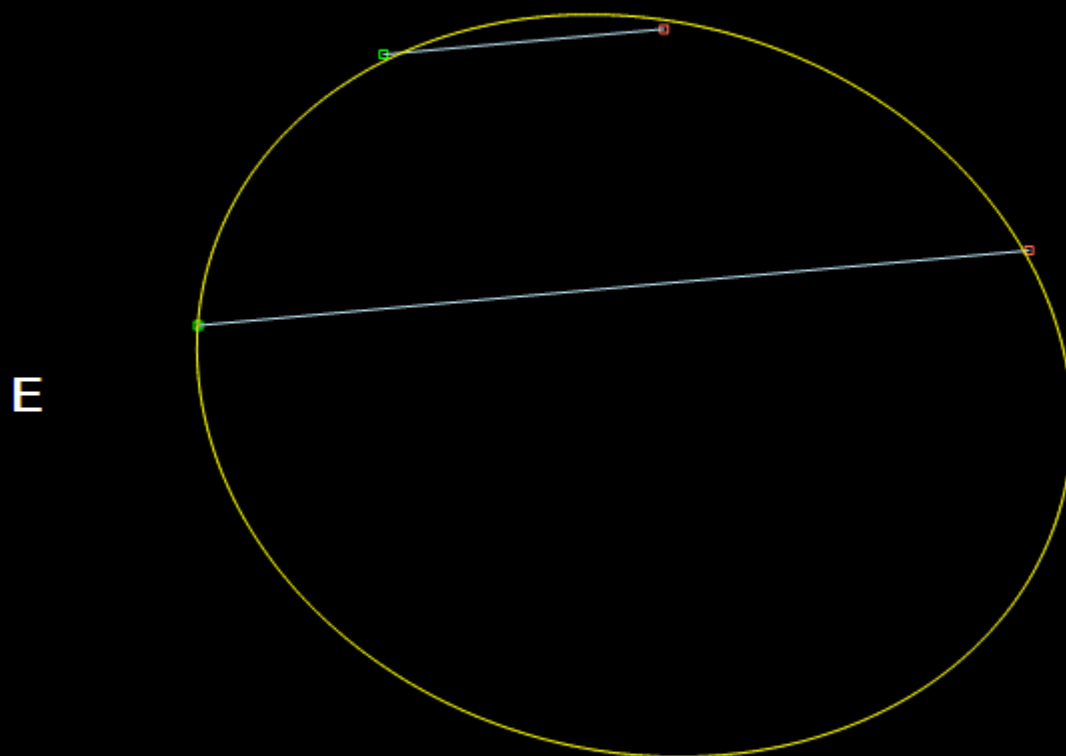
(337) Devosa 2014 Dec 11 $80.0 \pm 1.5 \times 52.0 \pm 0.5$ km, PA $77.0^\circ \pm 1.7^\circ$
Geocentric X -1522.6 ± 0.5 Y 783.8 ± 0.2 km **N**

E



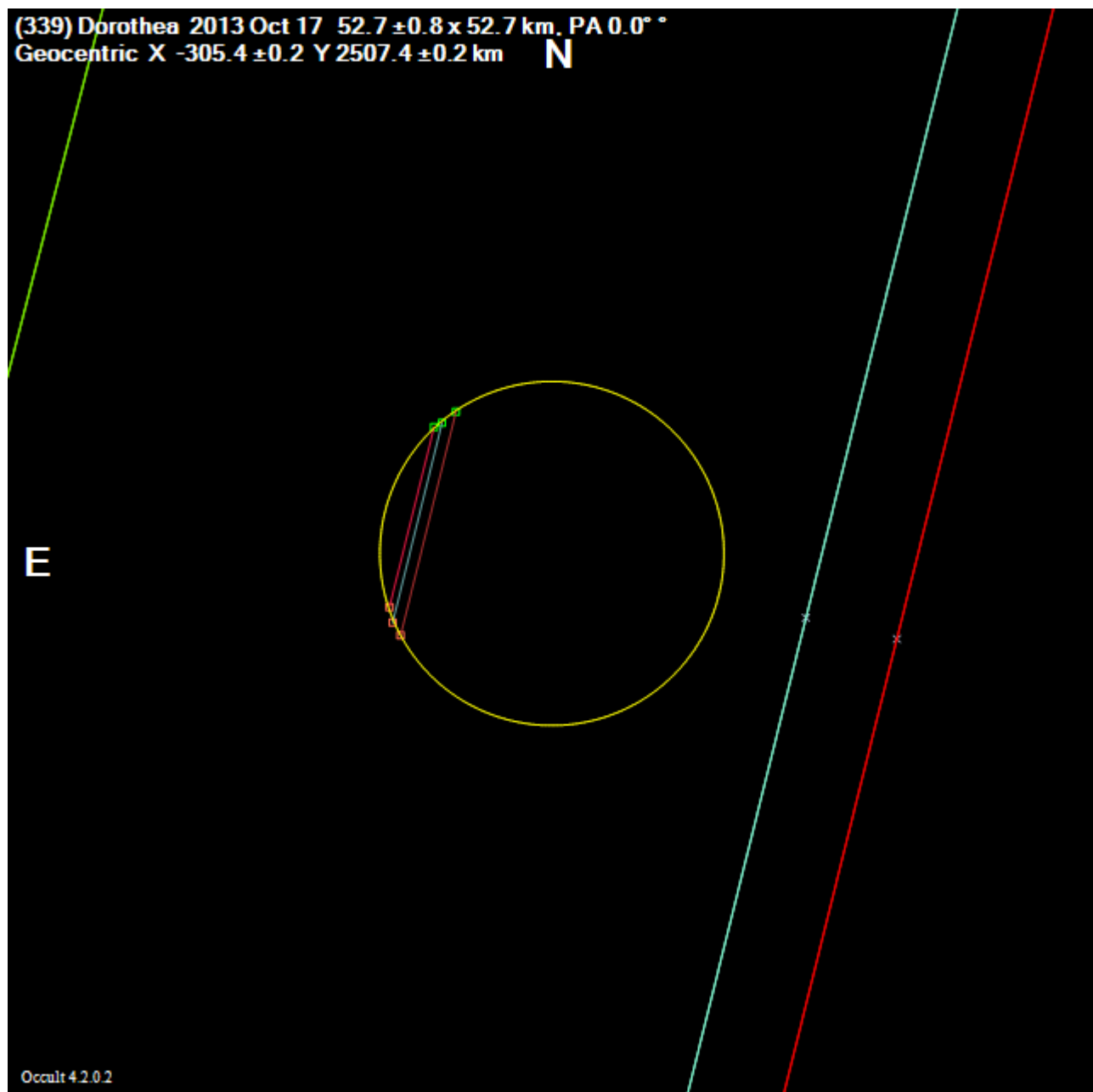
337devosa2015jan17

(337) Devosa 2015 Jan 17 68.0 x 56.0 km, PA 74.1° ± 3.5°
Geocentric X 2629.3 ± 0.4 Y 2712.9 ± 0.3 km **N**



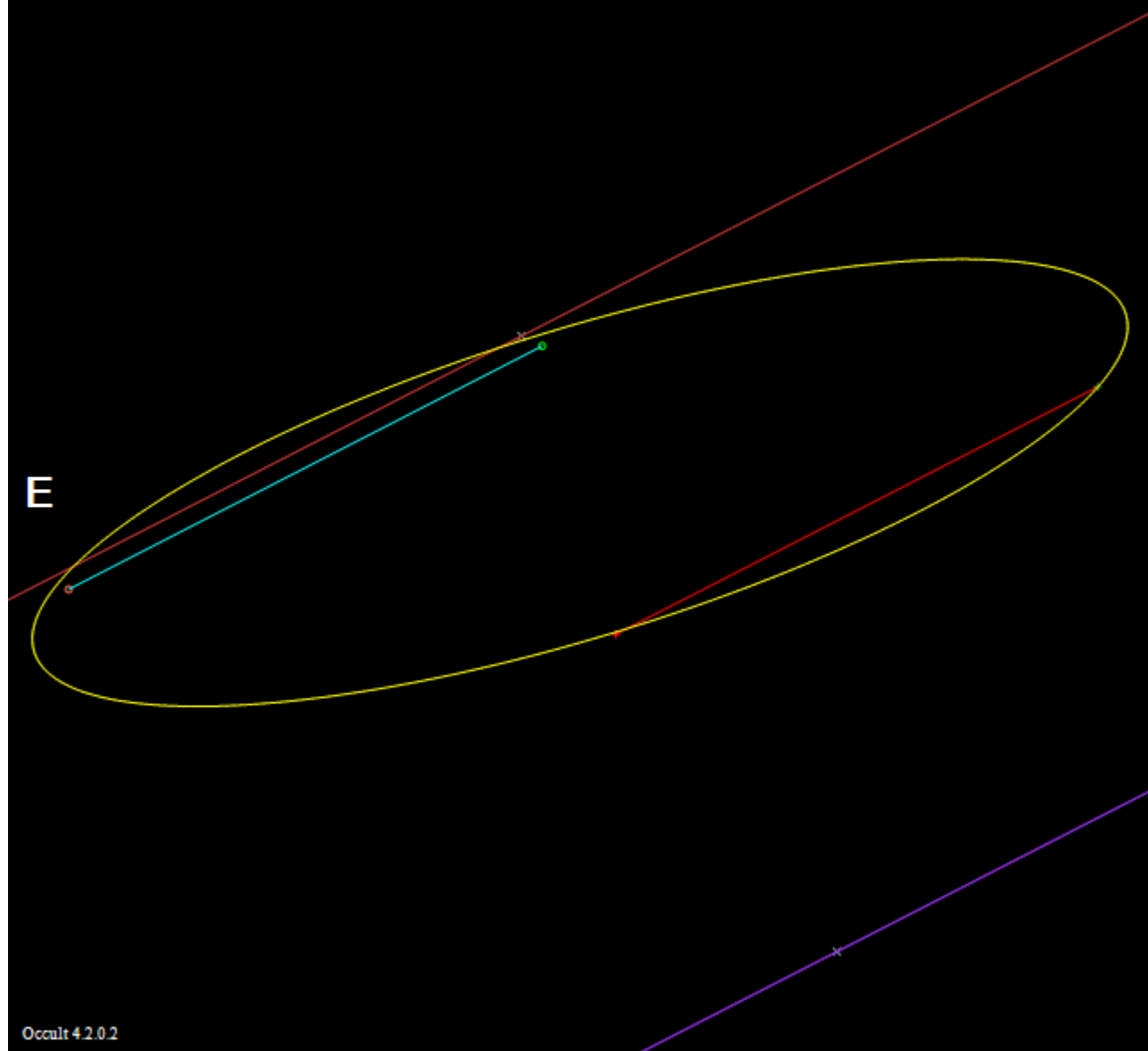
339dorothea2013oct17

(339) Dorothea 2013 Oct 17 $52.7 \pm 0.8 \times 52.7$ km, PA 0.0° °
Geocentric X -305.4 ± 0.2 Y 2507.4 ± 0.2 km **N**



344desiderata2004aug08

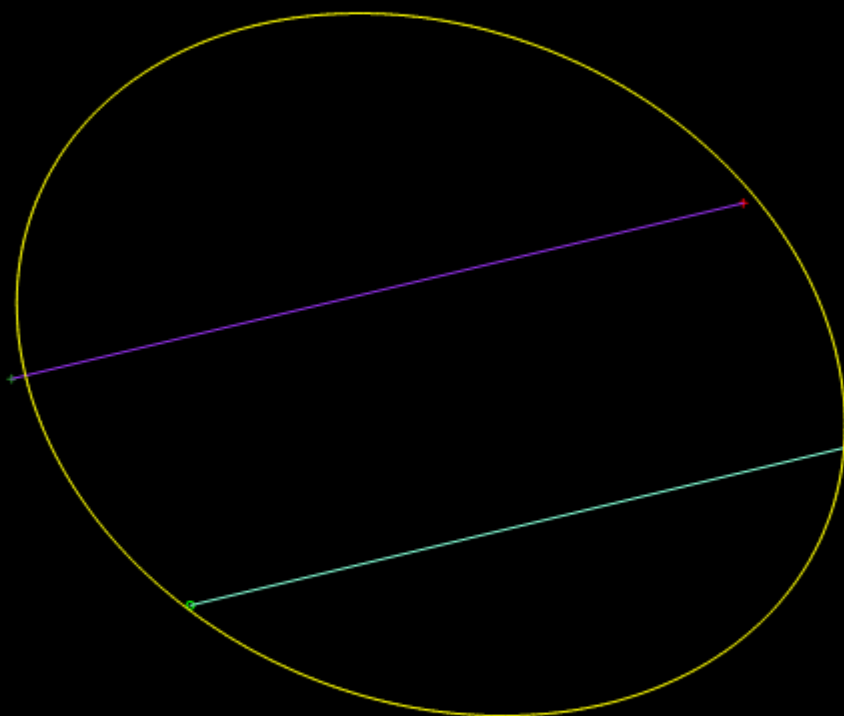
(344) Desiderata 2004 Aug 8 $220.0 \pm 8.3 \times 59.0 \pm 4.0$ km, PA $-72.8^\circ \pm 1.4^\circ$
Geocentric X 2164.7 ± 1.4 Y -494.2 ± 2.5 km **N**



344desiderata2009dec05

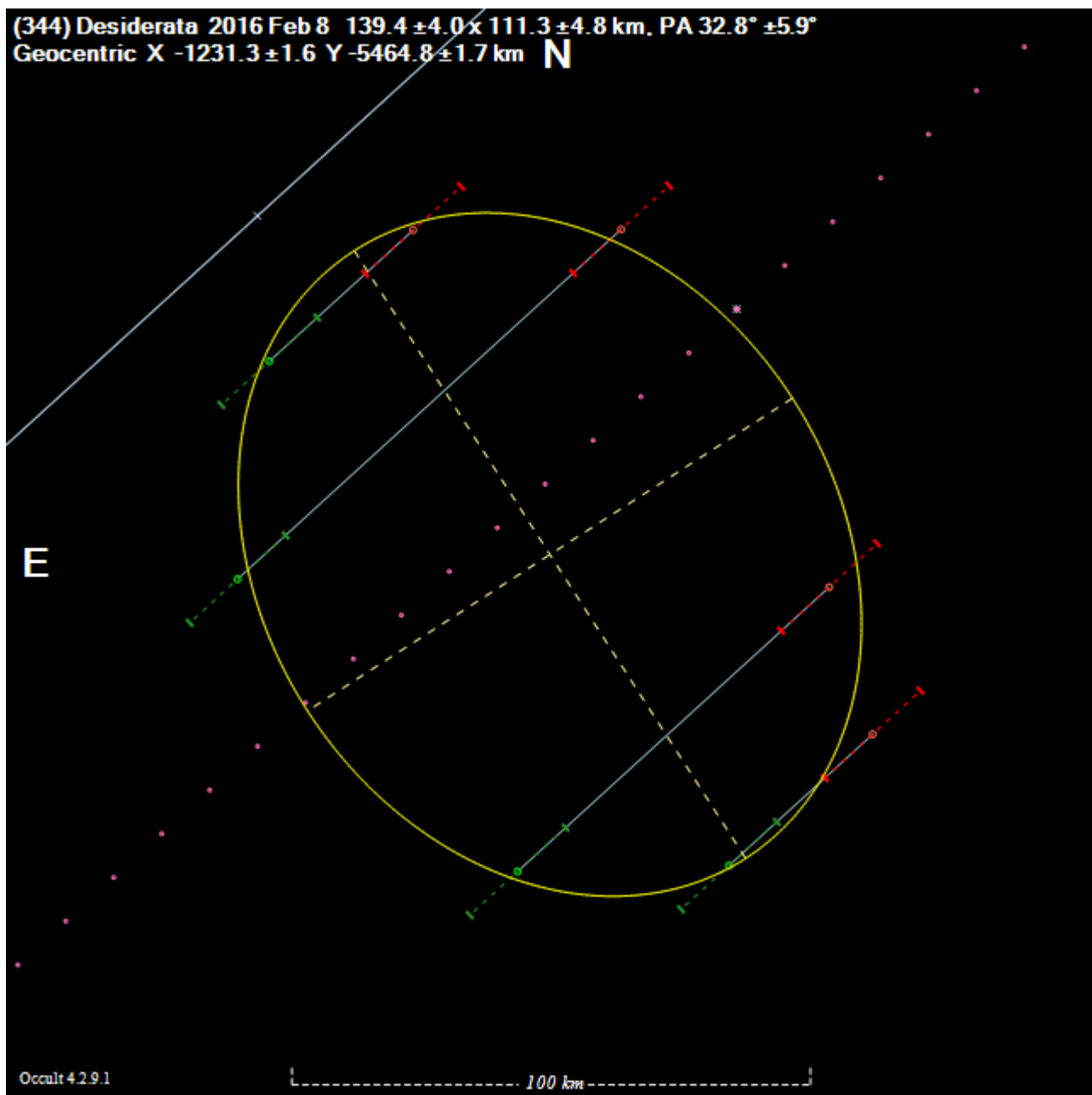
(344) Desiderata 2009 Dec 5 140.0 x 110.0 km, PA 66.8° ± 5.8°
Geocentric X -2623.8 ± 1.2 Y 3382.7 ± 1.9 km **N**

E



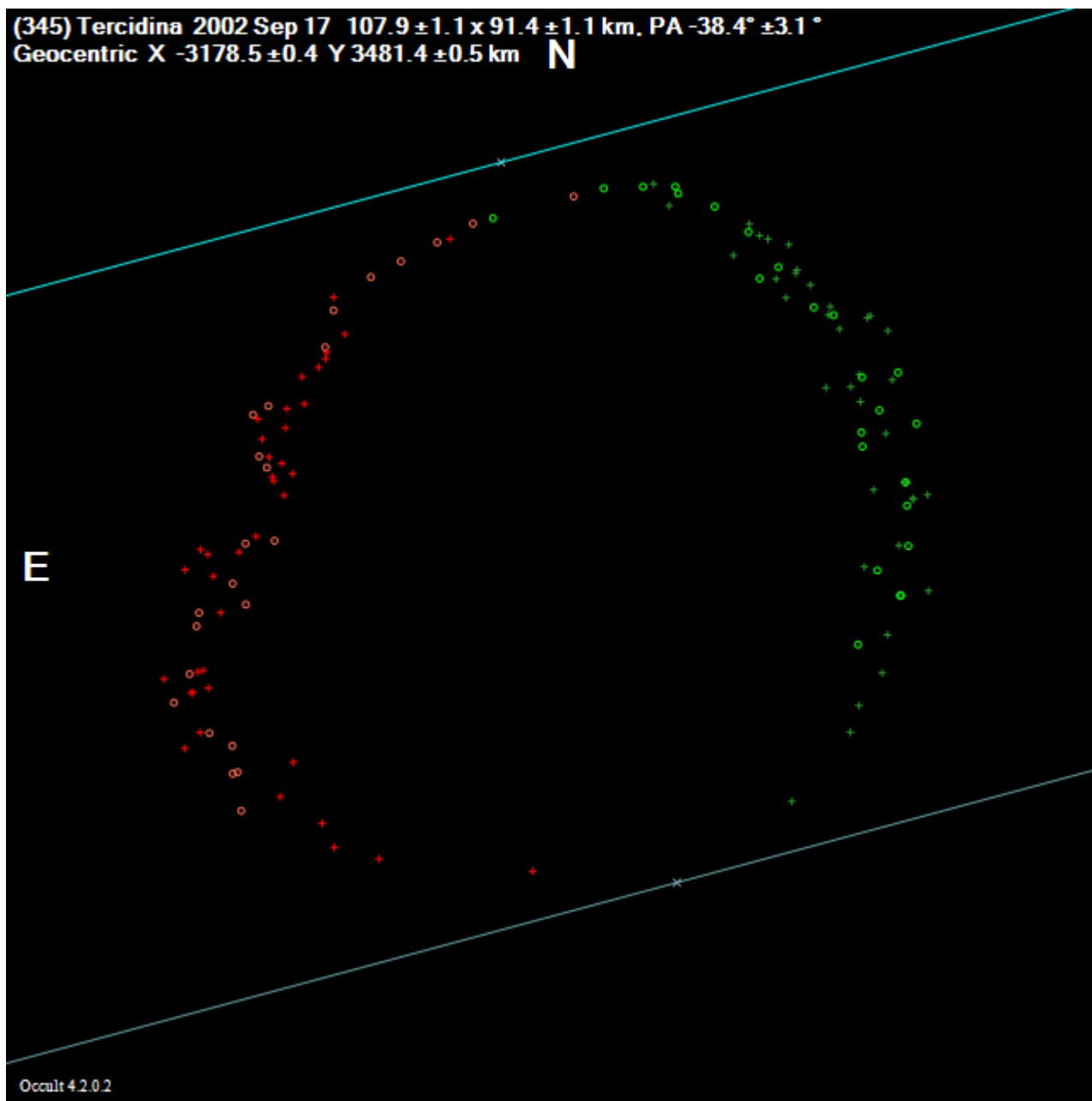
344Desiderata2016Feb08

(344) Desiderata 2016 Feb 8 $139.4 \pm 4.0 \times 111.3 \pm 4.8$ km, PA $32.8^\circ \pm 5.9^\circ$
Geocentric X -1231.3 ± 1.6 Y -5464.8 ± 1.7 km **N**



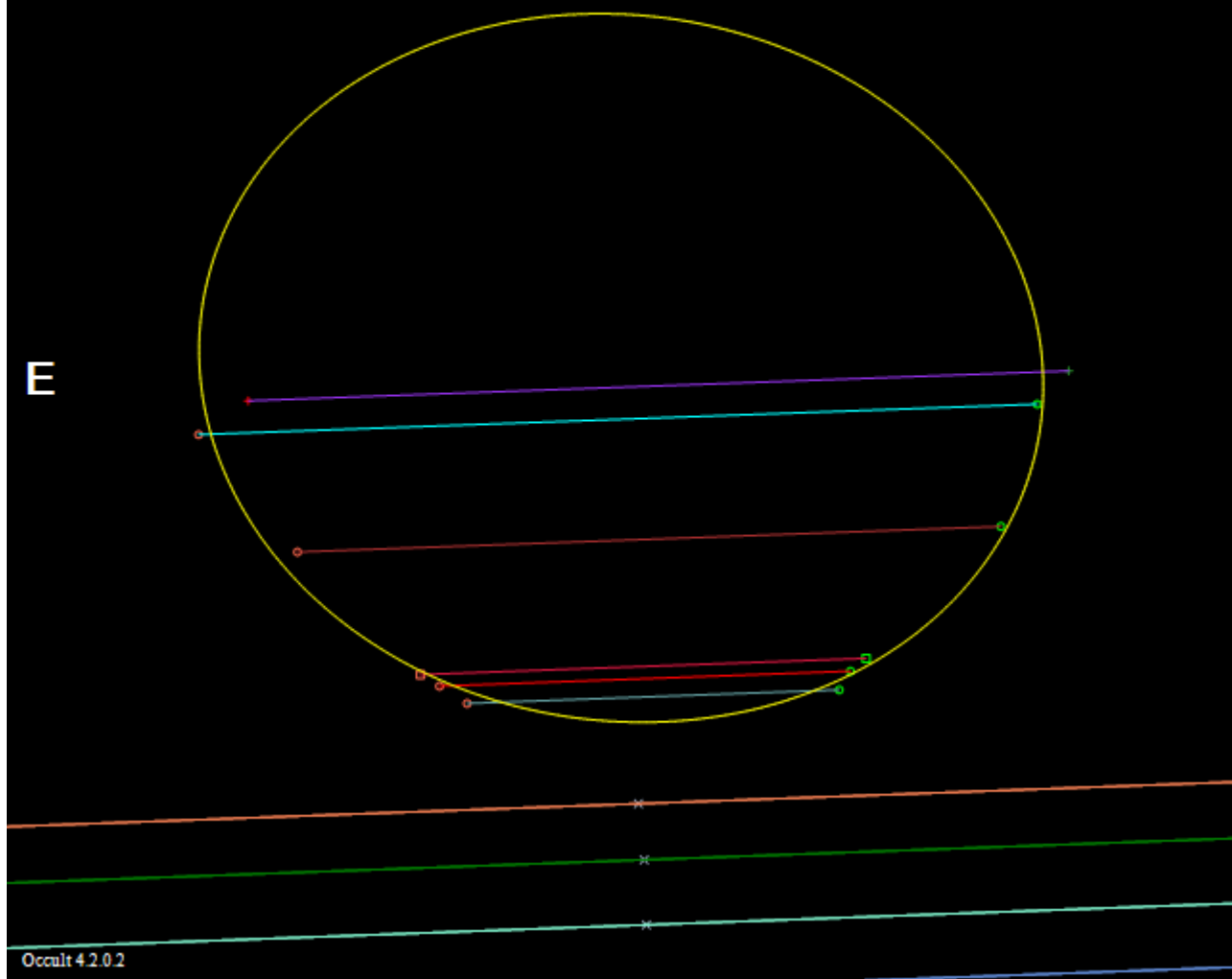
345tercidina2002sep17

(345) Tercidina 2002 Sep 17 $107.9 \pm 1.1 \times 91.4 \pm 1.1$ km, PA $-38.4^\circ \pm 3.1^\circ$
Geocentric X -3178.5 ± 0.4 Y 3481.4 ± 0.5 km **N**



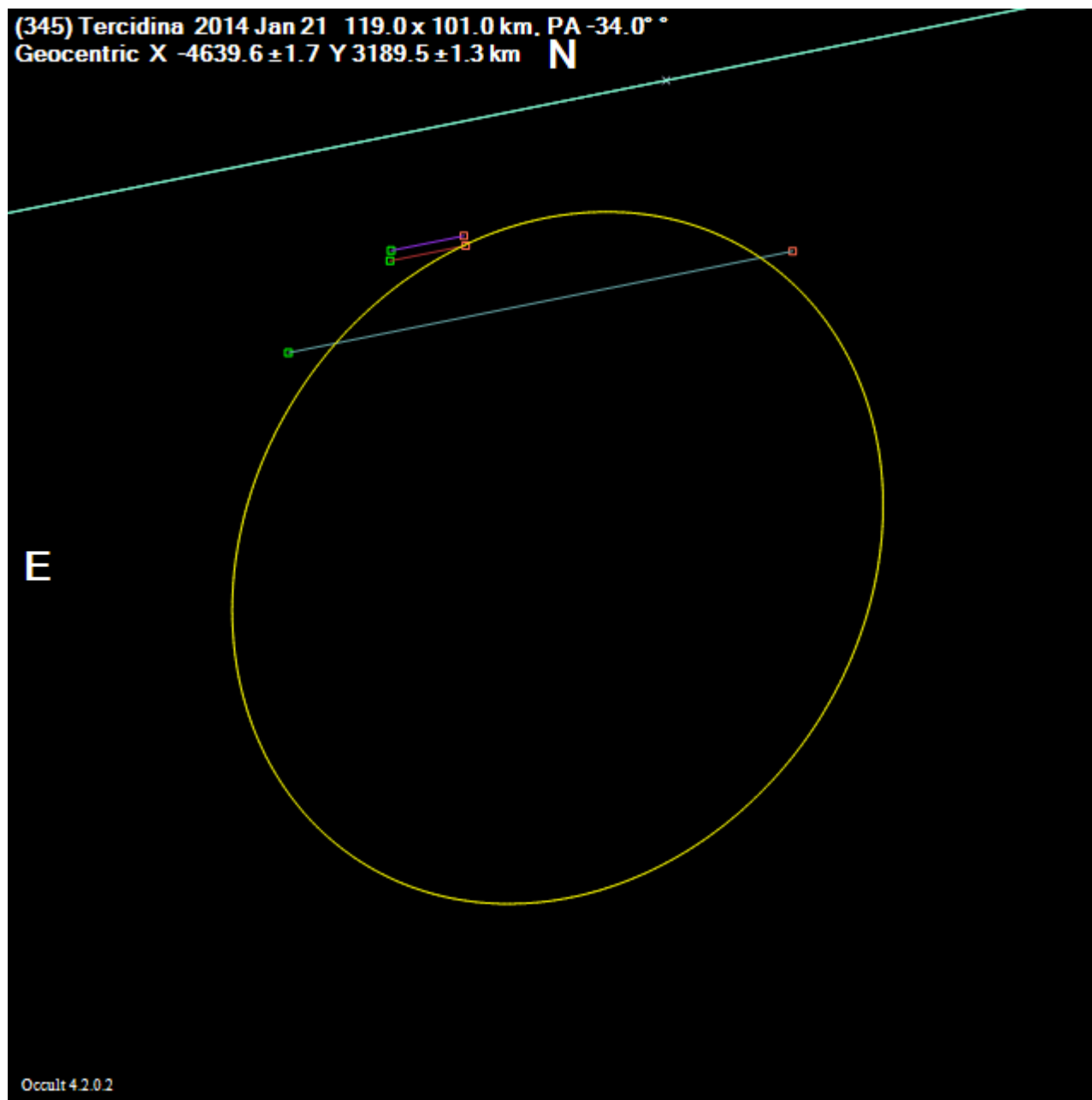
345tercidina2005nov15

(345) Tercidina 2005 Nov 15 108.0 x 90.0 km, PA 82.1° ± 8.2°
Geocentric X 3959.4 ± 1.4 Y 4222.7 ± 0.9 km **N**



345tercidina2014jan21

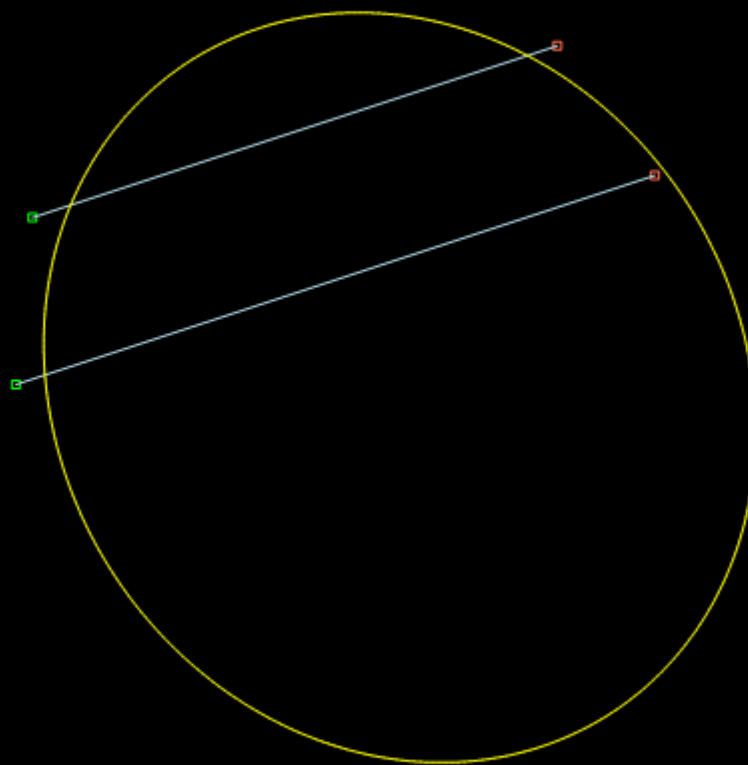
(345) Tercidina 2014 Jan 21 119.0 x 101.0 km. PA -34.0° °
Geocentric X -4639.6 ± 1.7 Y 3189.5 ± 1.3 km **N**



345tercidina2015jun04

(345) Tercidina 2015 Jun 4 100.0 x 88.0 km. PA 33.0°
Geocentric X 2868.2 ± 1.4 Y -1961.4 ± 2.1 km **N**

E



347Pariana2016Mar26

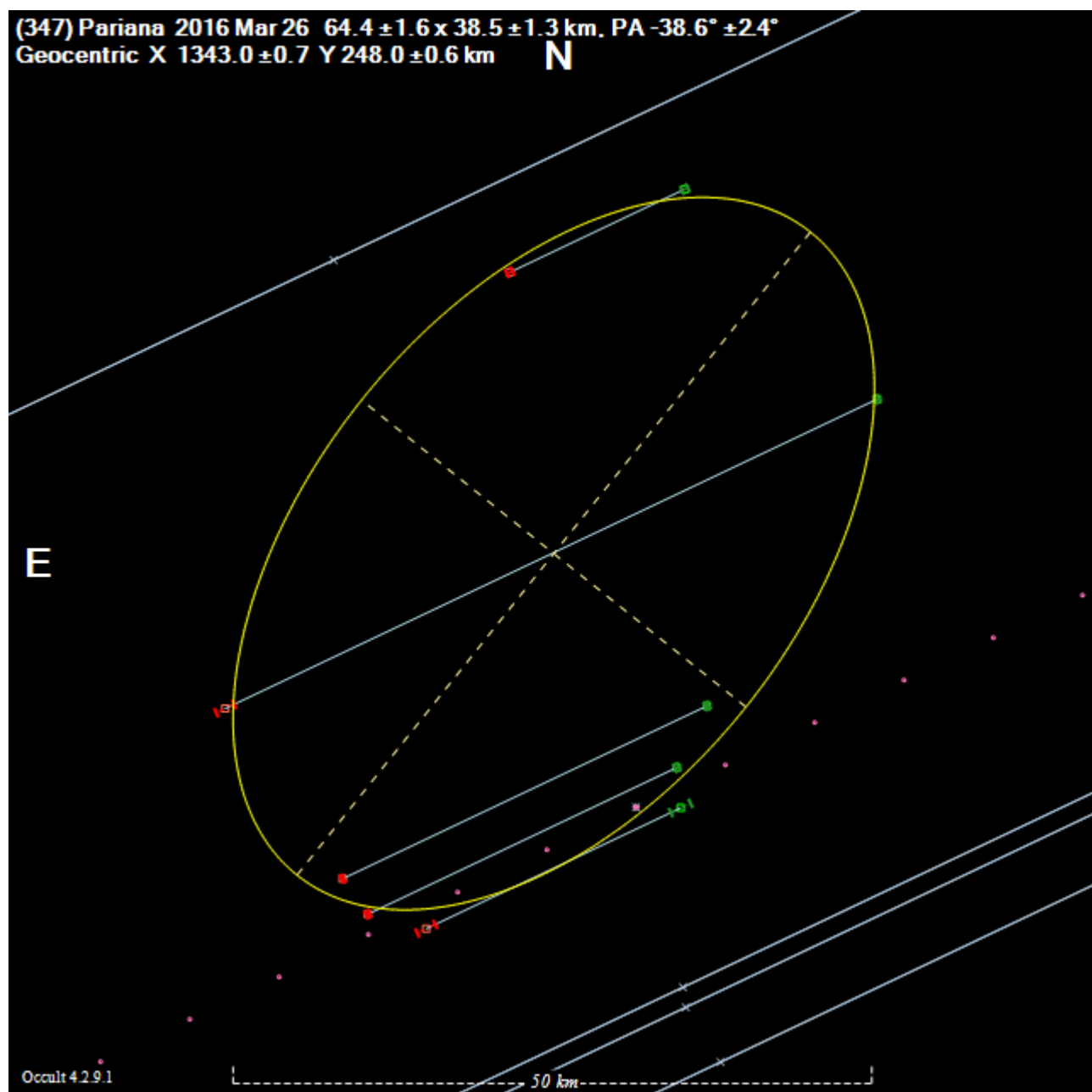
(347) Pariana 2016 Mar 26 $64.4 \pm 1.6 \times 38.5 \pm 1.3$ km, PA $-38.6^\circ \pm 2.4^\circ$
Geocentric X 1343.0 ± 0.7 Y 248.0 ± 0.6 km

N

E

Occult 4.2.9.1

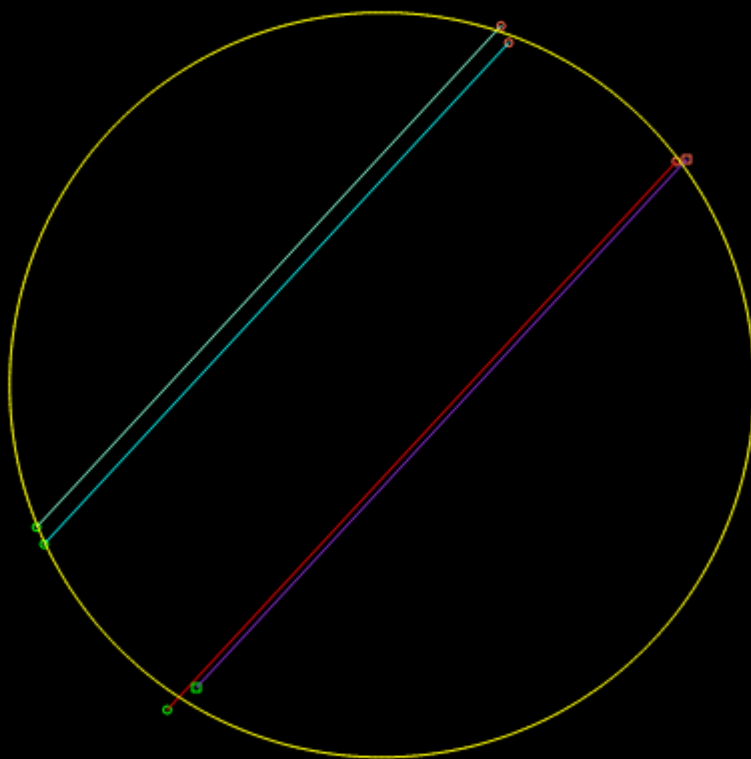
50 km



34circe2004feb10

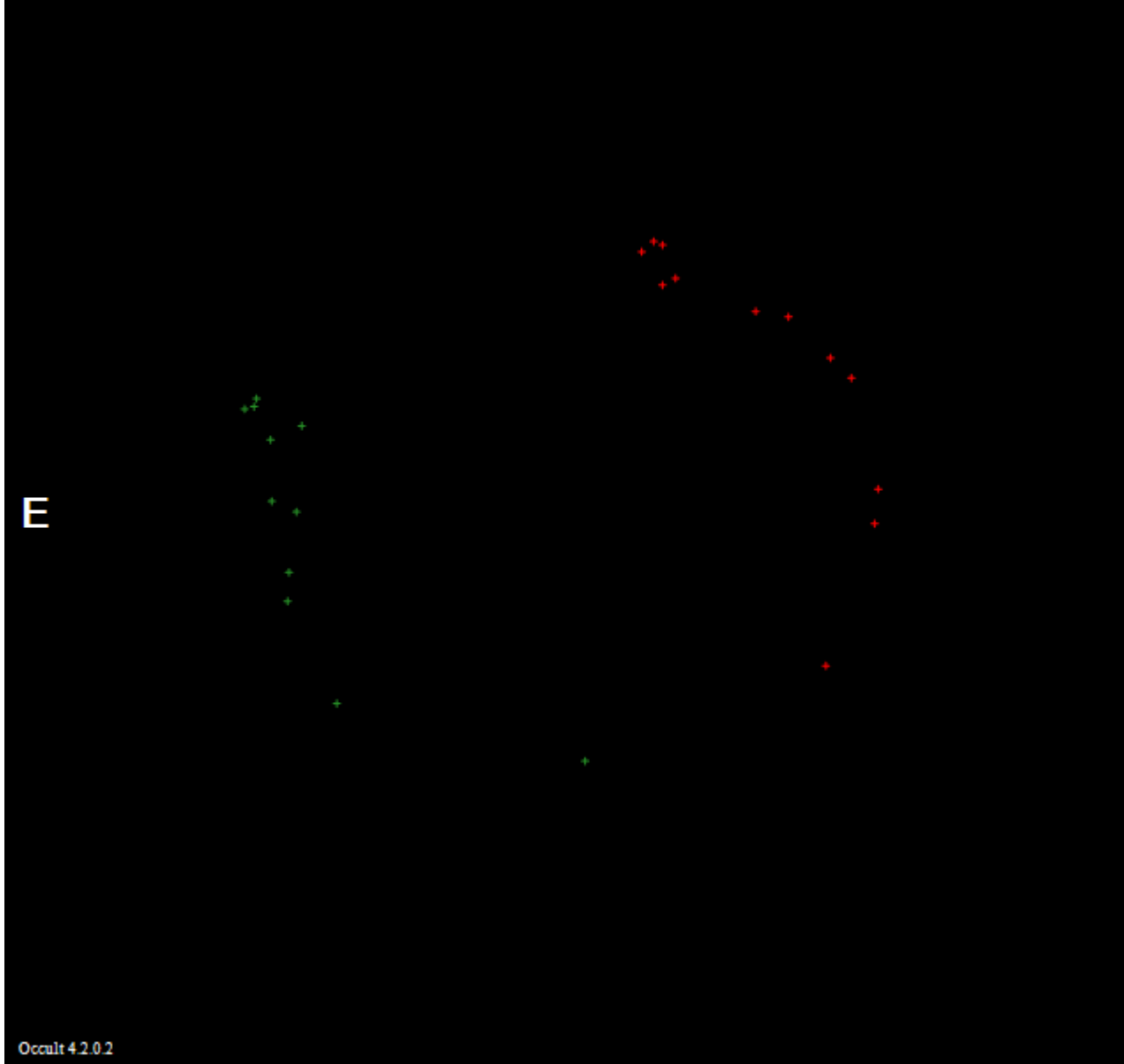
(34) Circe 2004 Feb 10 $109.5 \pm 0.9 \times 109.5$ km, PA 0.0° °
Geocentric X 3959.1 ± 0.6 Y 2832.3 ± 0.6 km **N**

E



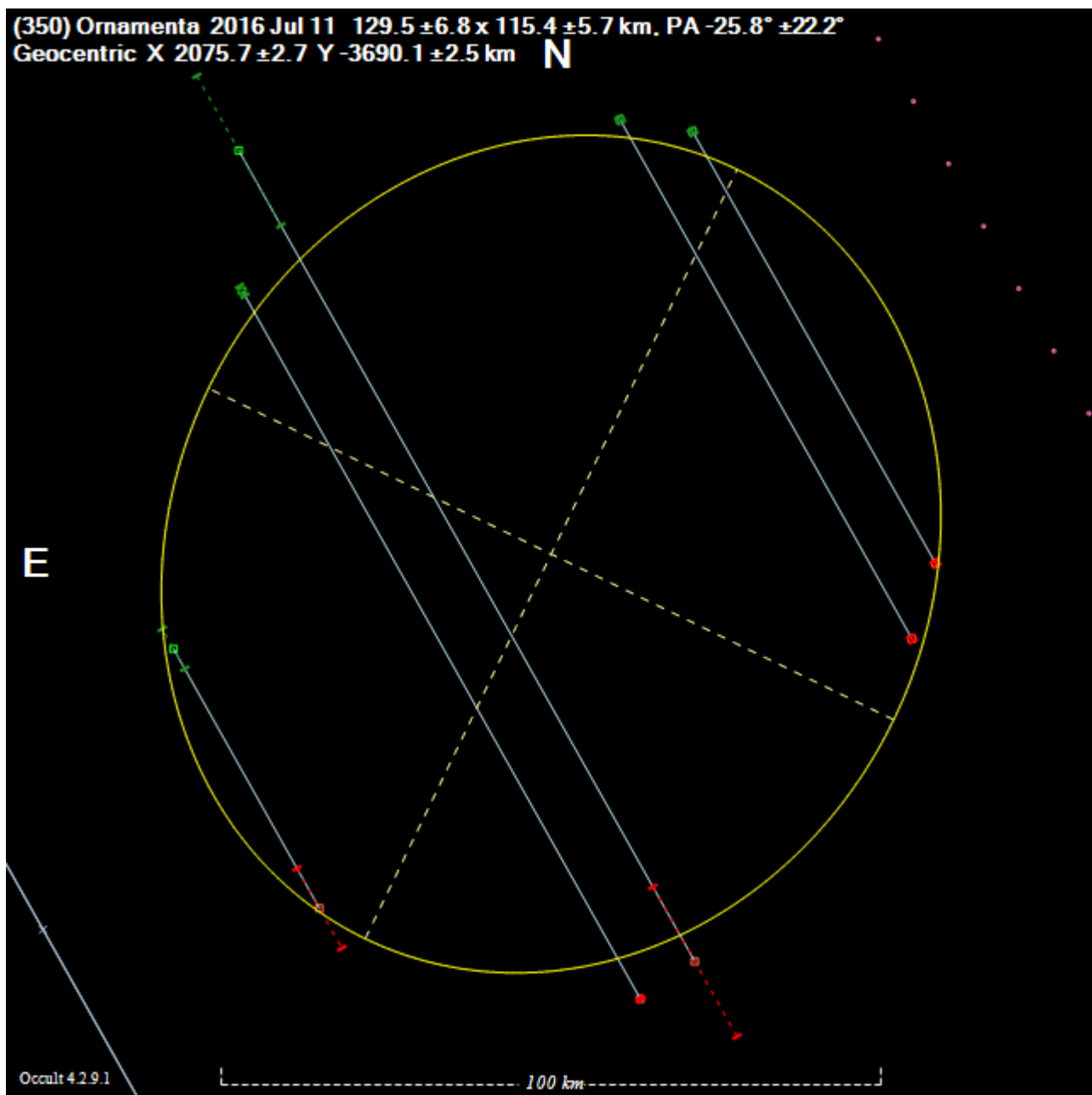
350ornamenta2002nov14

(350) Ornamenta 2002 Nov 14 $108.3 \pm 2.1 \times 91.3 \pm 2.7$ km, PA $79.8^\circ \pm 8.2^\circ$
Geocentric X -2139.8 ± 0.9 Y 2907.2 ± 1.2 km **N**



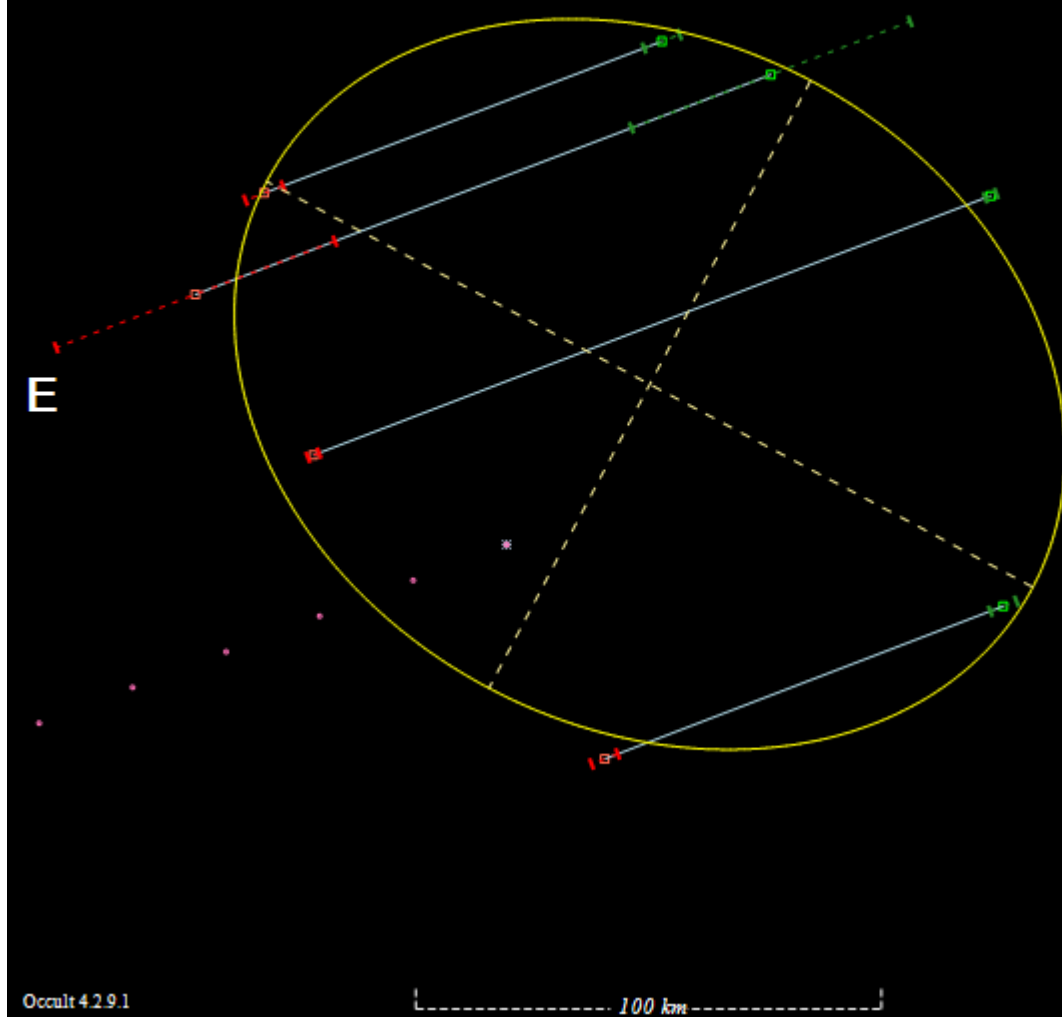
350Ornamenta2016Jul11

(350) Ornamenta 2016 Jul 11 $129.5 \pm 6.8 \times 115.4 \pm 5.7$ km, PA $-25.8^\circ \pm 22.2^\circ$
Geocentric X 2075.7 ± 2.7 Y -3690.1 ± 2.5 km **N**



354Eleonora2016Oct05

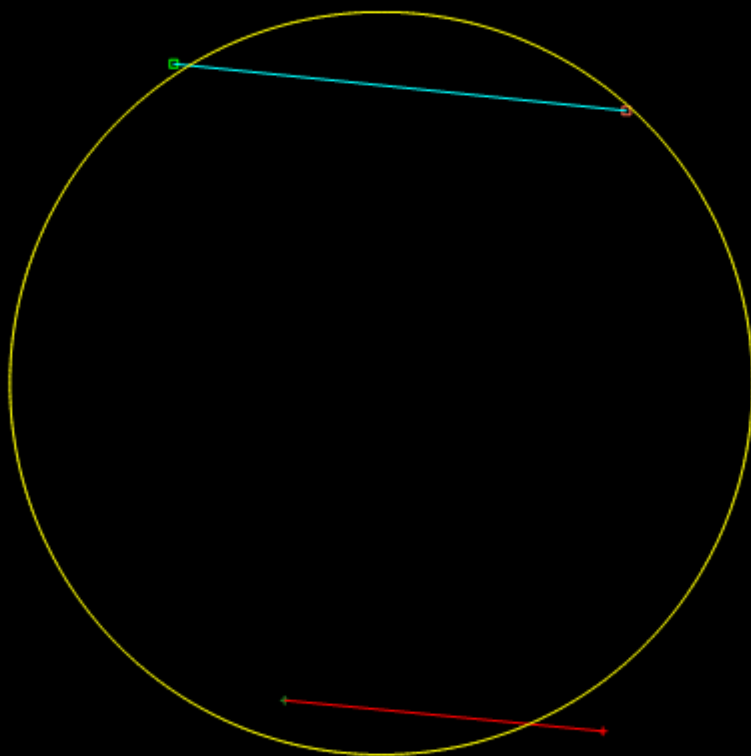
(354) Eleonora 2016 Oct 5 $186.1 \pm 7.4 \times 147.6 \pm 6.3$ km, PA $62.1^\circ \pm 10.8^\circ$
Geocentric X 2947.8 ± 3.2 Y 4840.2 ± 3.0 km **N**



356liguria2006nov15

(356) Liguria 2006 Nov 15 $126.6 \pm 8.3 \times 126.6$ km, PA 0.0° °
Geocentric X -3324.3 ± 4.3 Y 1431.7 ± 3.4 km **N**

E

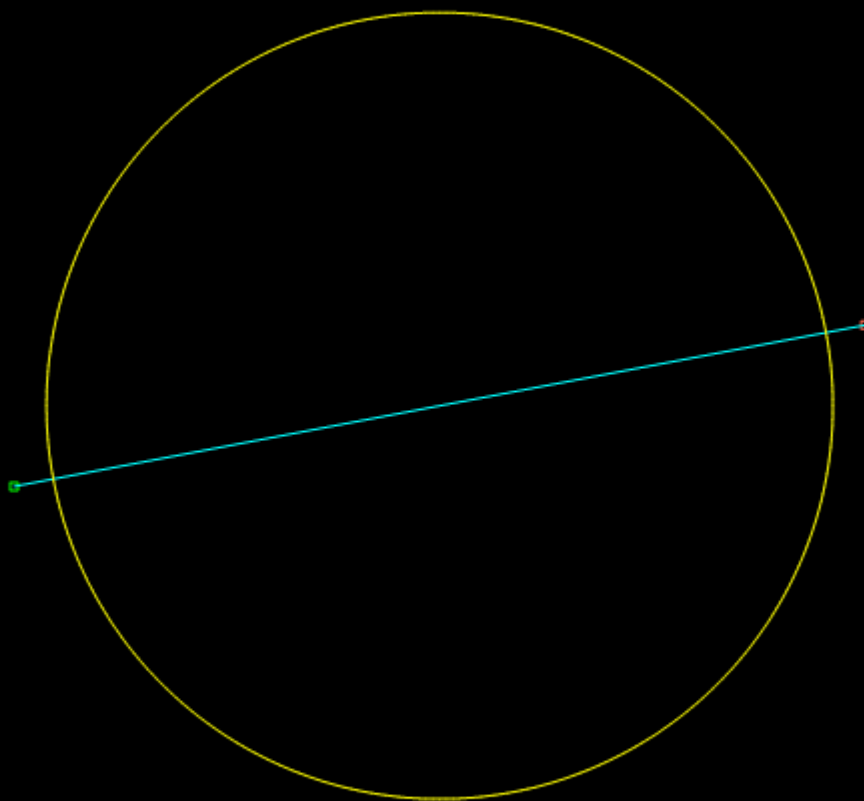


359georgia2007aug09

(359) Georgia 2007 Aug 9 44.0 x 44.0 km, PA 0.0° °
Geocentric X 2402.6 Y 5091.0 km

N

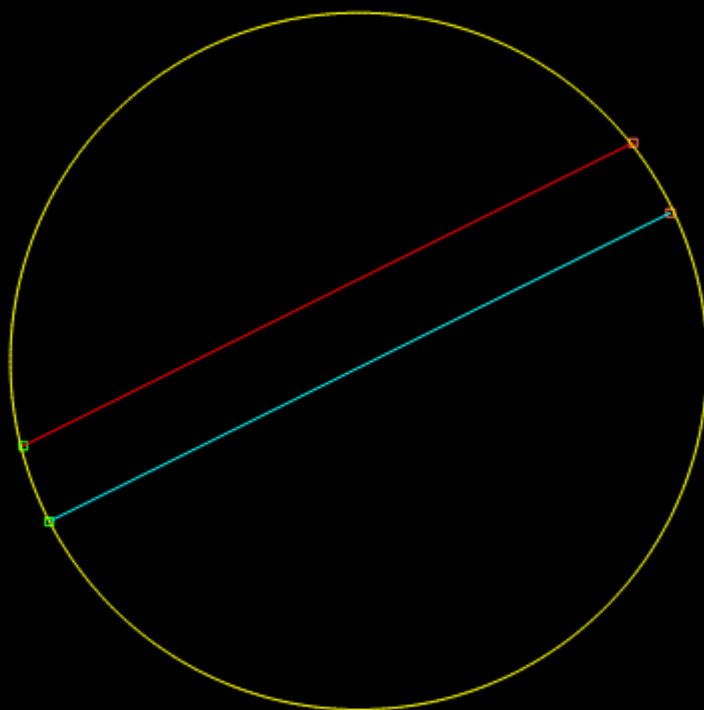
E



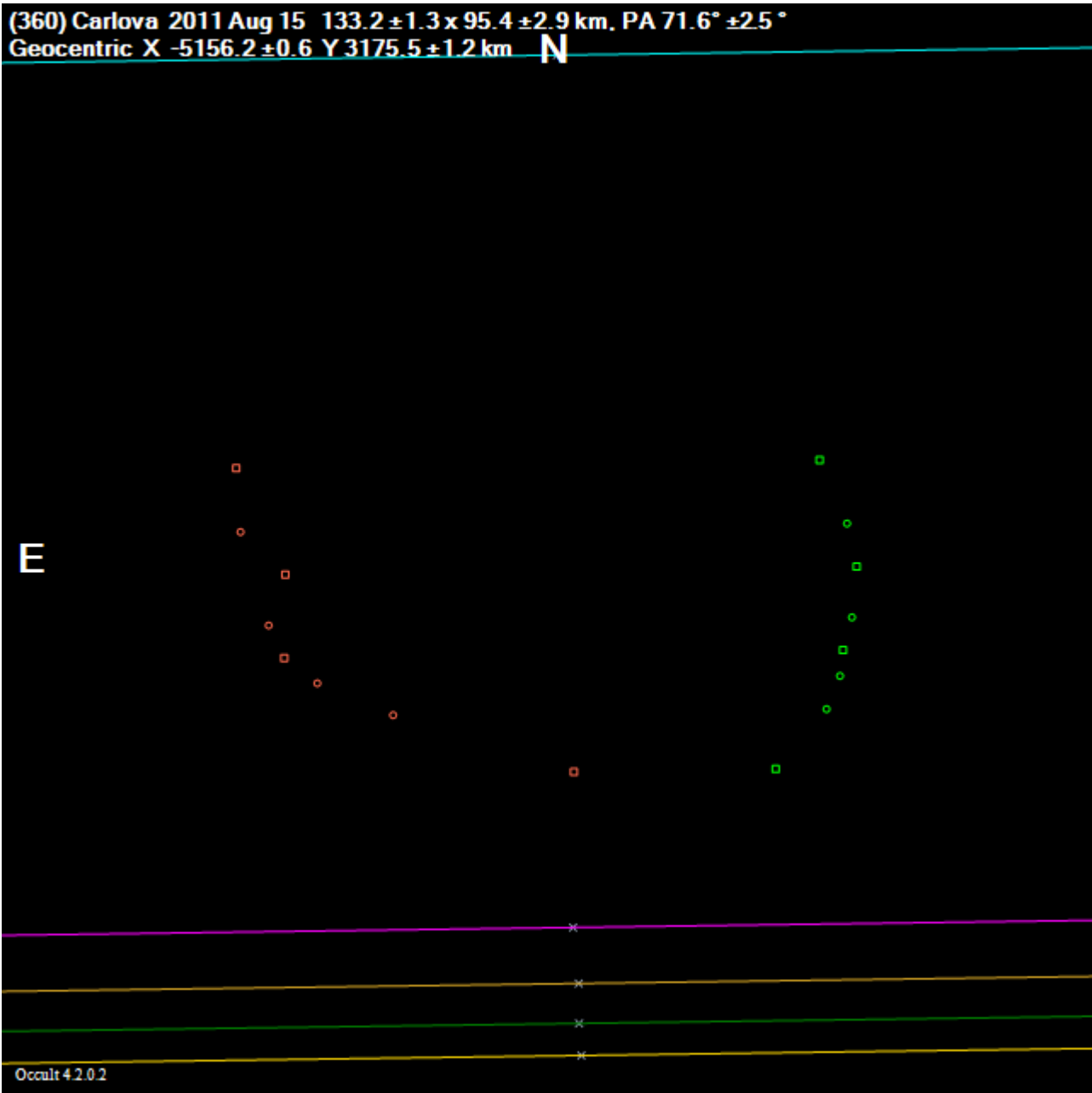
35leukothea2011jun19

(35) Leukothea 2011 Jun 19 93.4 x 93.4 km, PA 0.0° °
Geocentric X -4067.8 ± 0.5 Y -1143.1 ± 0.9 km **N**

E



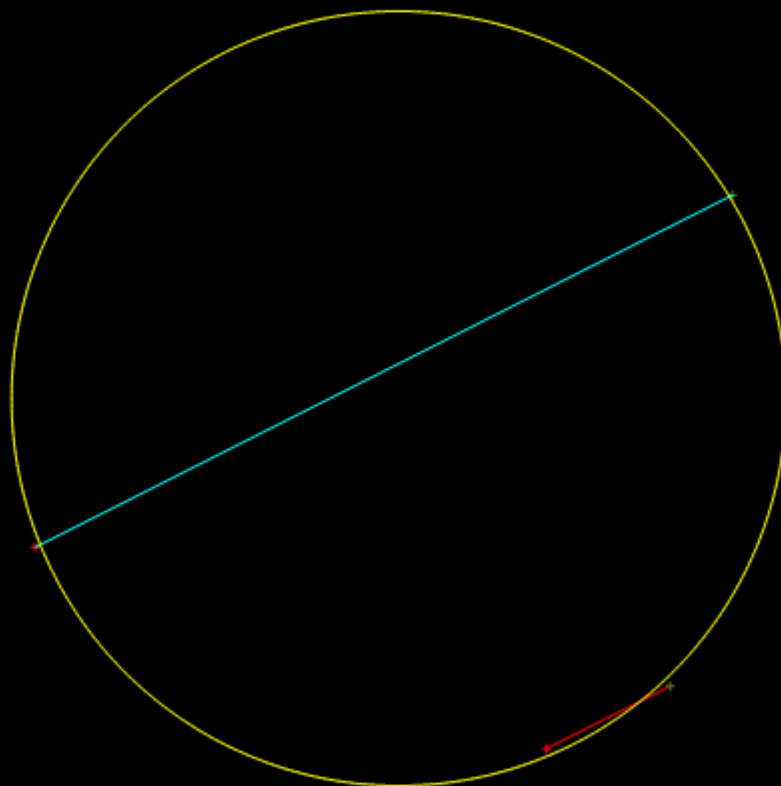
360carlova2011aug15



361bononia2004jan25

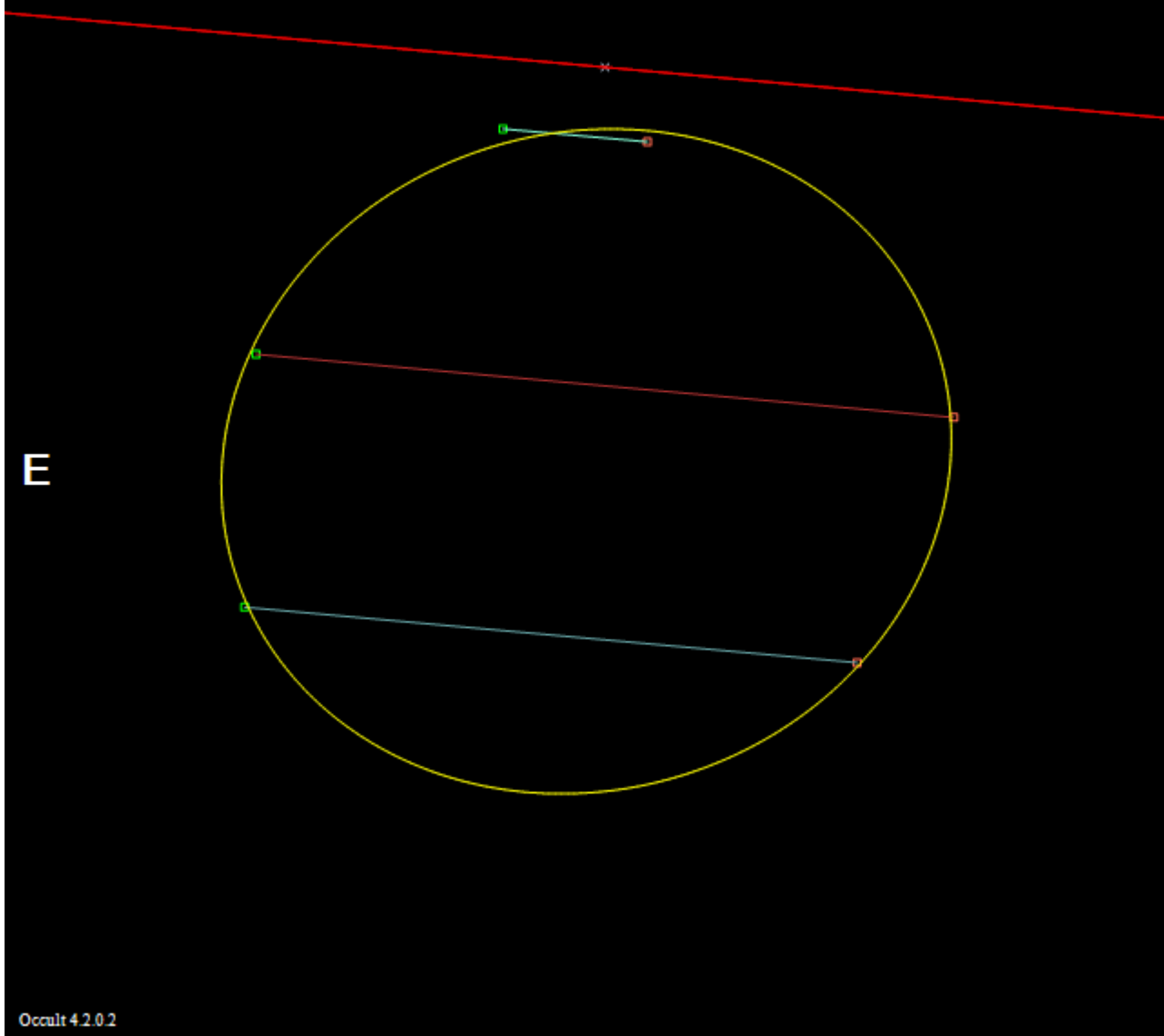
(361) Bononia 2004 Jan 25 $142.1 \pm 5.0 \times 142.1$ km. PA 0.0° °
Geocentric X -2279.8 ± 1.1 Y 5666.4 ± 1.7 km **N**

E



365corduba2013dec16

(365) Corduba 2013 Dec 16 $108.9 \pm 1.7 \times 97.0 \pm 2.0$ km, PA -72.0° °
Geocentric X 4095.2 ± 0.7 Y 3062.6 ± 0.9 km **N**



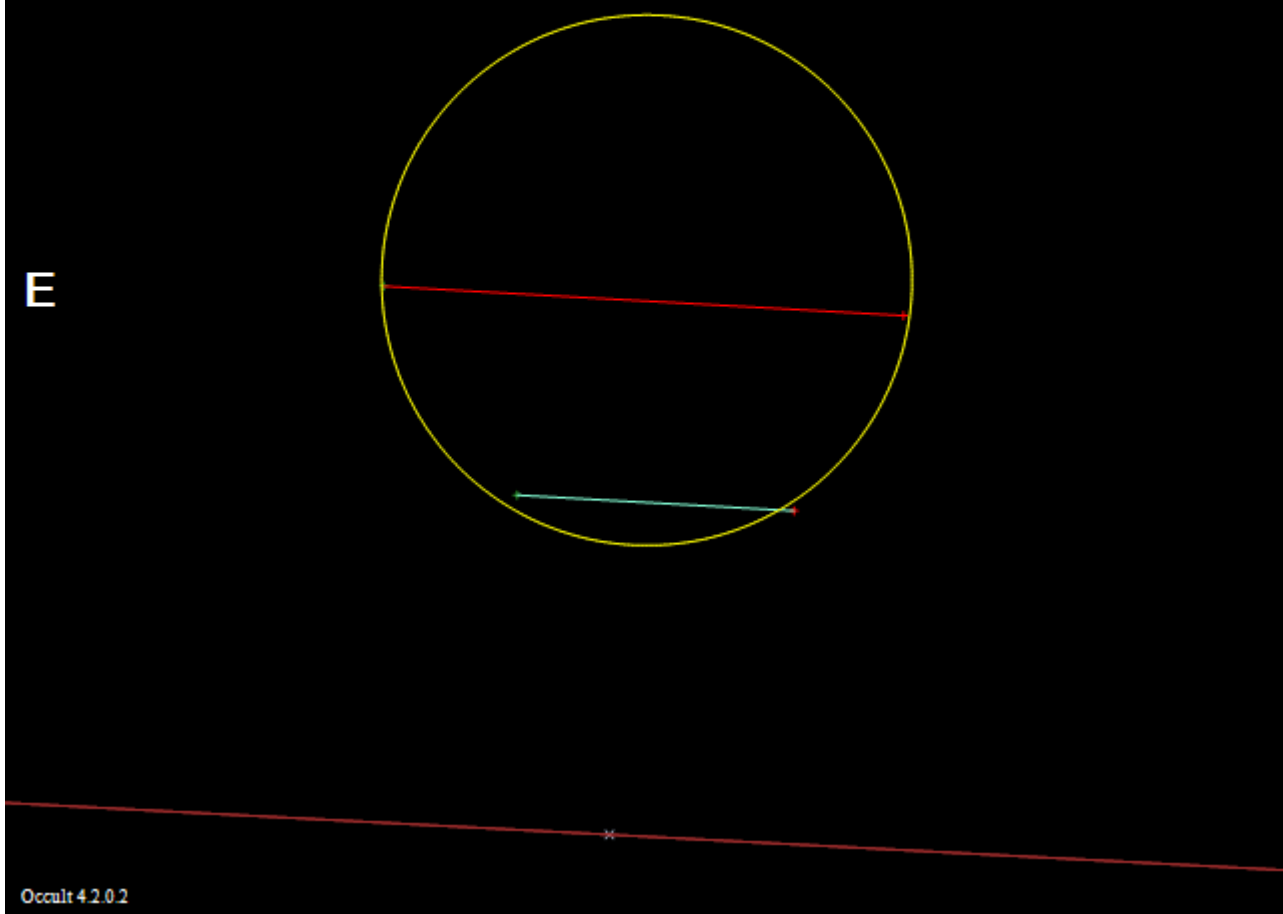
366vincentina2004may18

(366) Vincentina 2004 May 18 $85.0 \pm 13.2 \times 85.0$ km, PA 0.0° °
Geocentric X 2248.3 ± 4.7 Y -4774.4 ± 6.8 km **N**



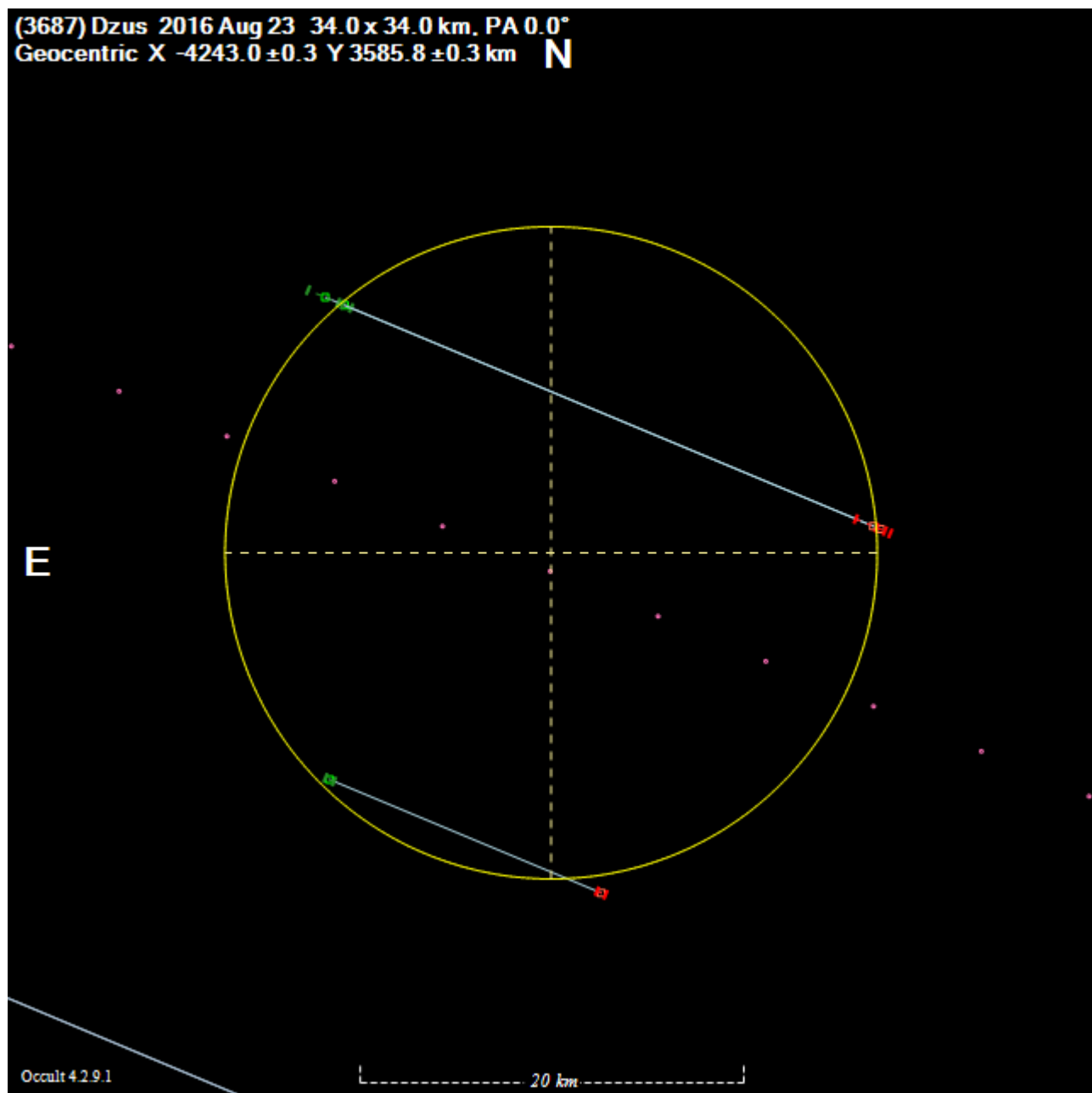
366vincentina2009feb03

(366) Vincentina 2009 Feb 3 $82.0 \pm 29.9 \times 82.0$ km, PA 0.0° °
Geocentric X -39.7 ± 0.9 Y -156.5 ± 12.6 km **N**



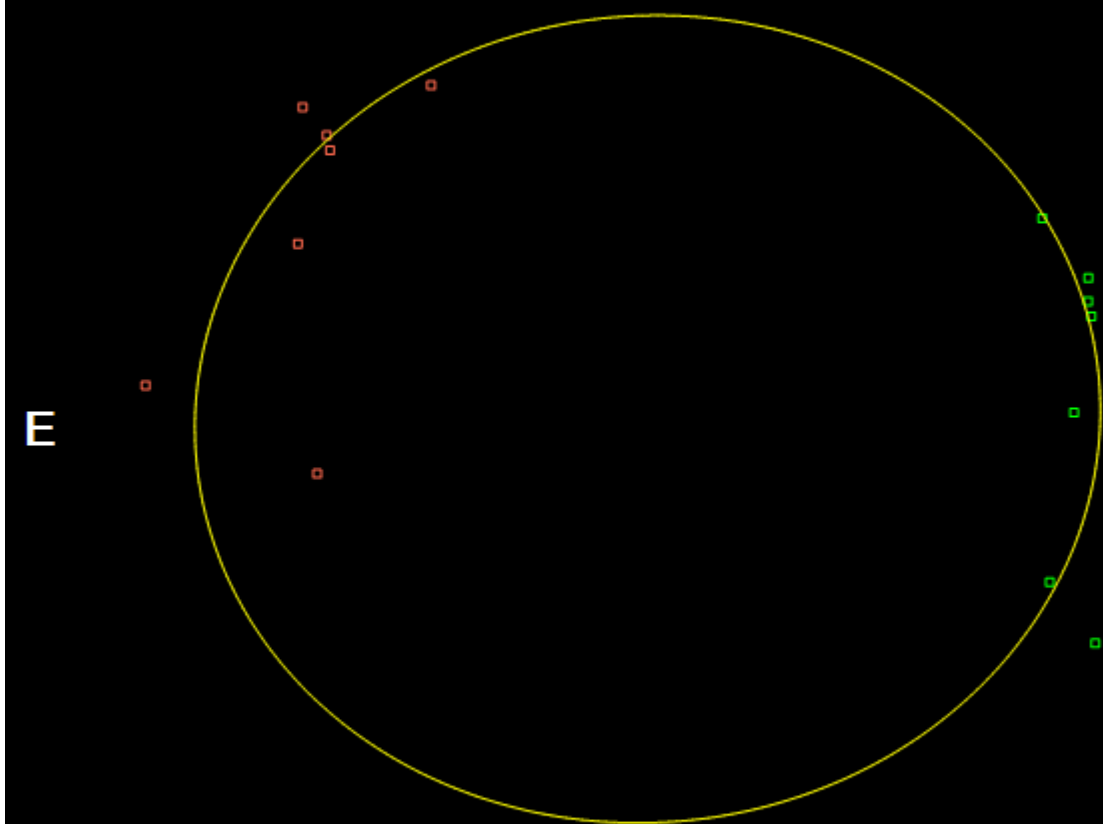
3687Dzus2016Aug23

(3687) Dzus 2016 Aug 23 34.0 x 34.0 km, PA 0.0°
Geocentric X -4243.0 ± 0.3 Y 3585.8 ± 0.3 km **N**

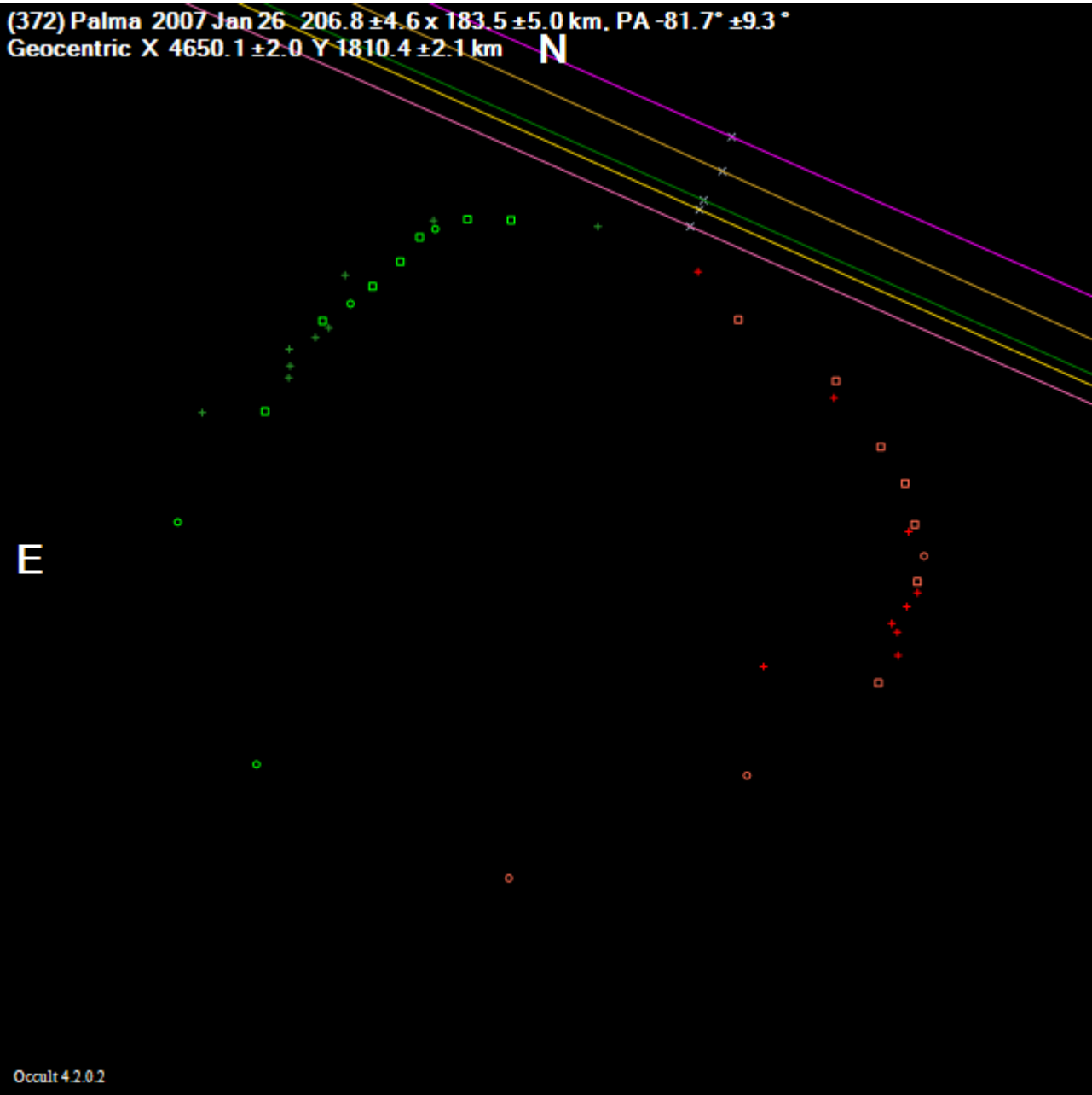


36atalante2011mar05

(36) Atalante 2011 Mar 5 $123.8 \pm 3.2 \times 110.2 \pm 15.3$ km, PA $95.3^\circ \pm 26.9^\circ$
Geocentric X 4694.1 ± 1.7 Y 1628.6 ± 4.3 km **N**

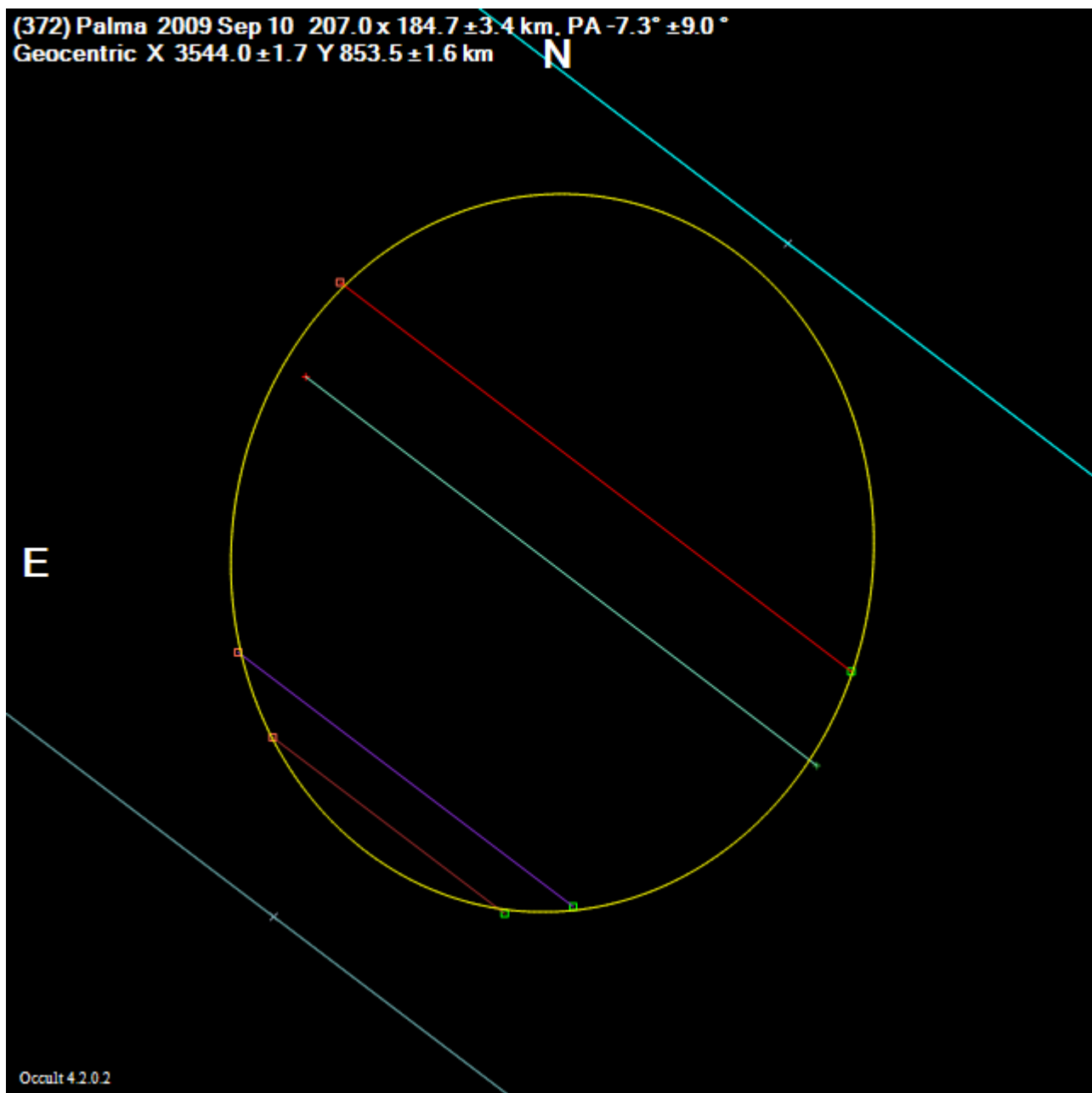


372palma2007jan26



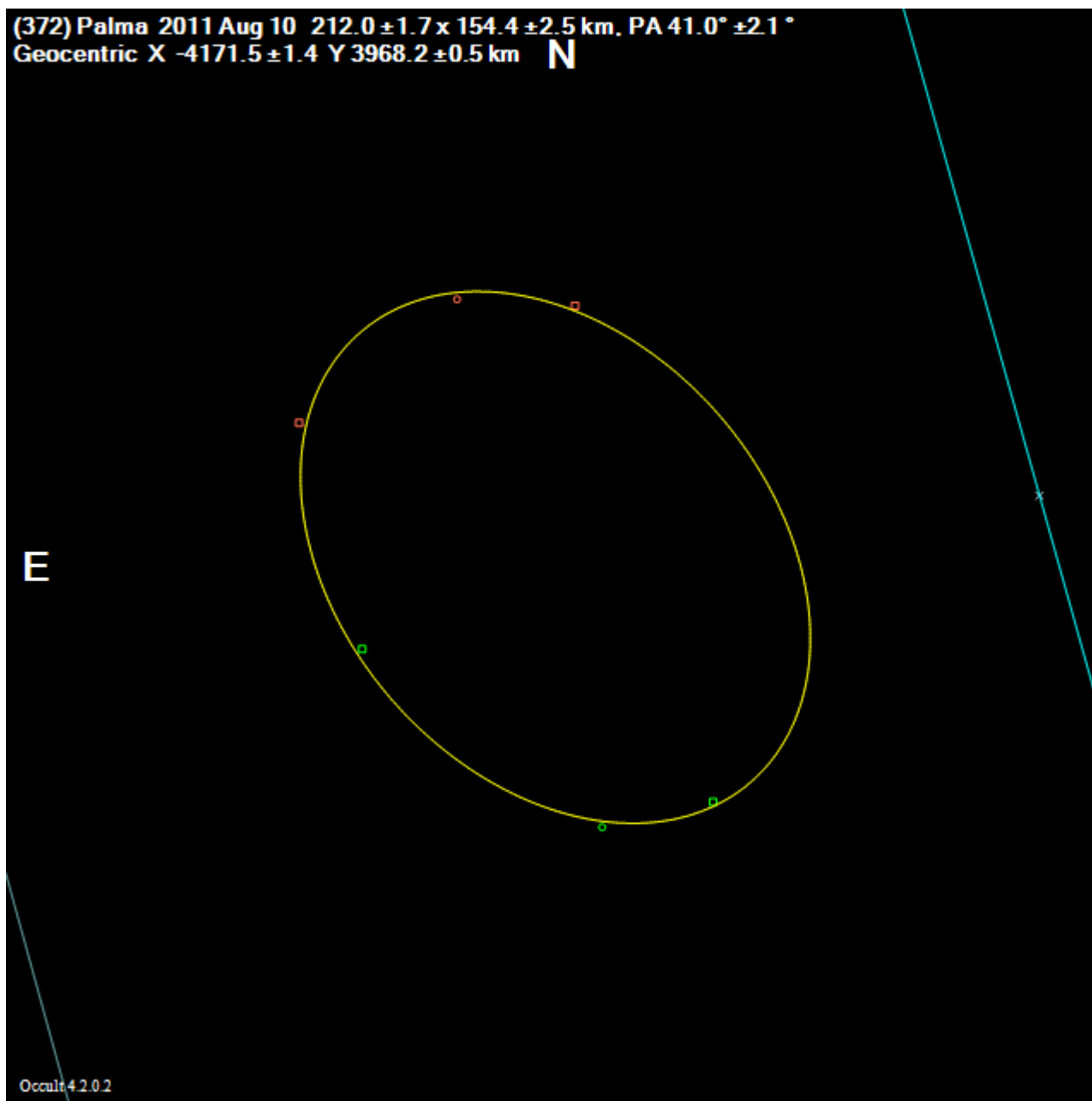
372palma2009sep10

(372) Palma 2009 Sep 10 207.0 x 184.7 ± 3.4 km, PA -7.3° ± 9.0°
Geocentric X 3544.0 ± 1.7 Y 853.5 ± 1.6 km



372palma2011aug10

(372) Palma 2011 Aug 10 $212.0 \pm 1.7 \times 154.4 \pm 2.5$ km, PA $41.0^\circ \pm 2.1^\circ$
Geocentric X -4171.5 ± 1.4 Y 3968.2 ± 0.5 km **N**



375ursula1982nov15

(375) Ursula 1982 Nov 15 216.0 x 216.0 km. PA 0.0° °
Geocentric X 4881.3 ± 1.5 Y 2032.8 ± 2.9 km **N**

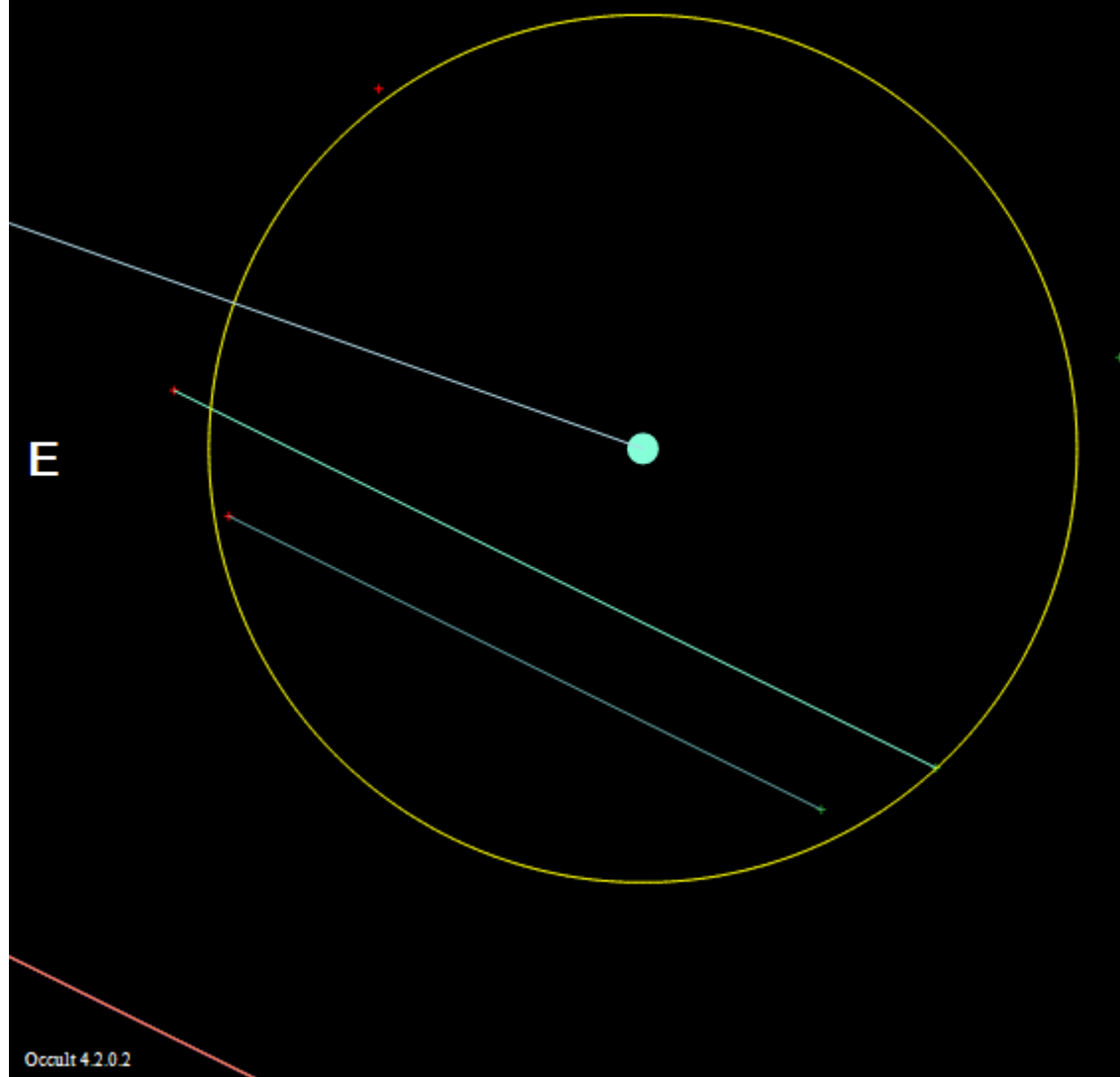
E

Occult 4.2.0.2



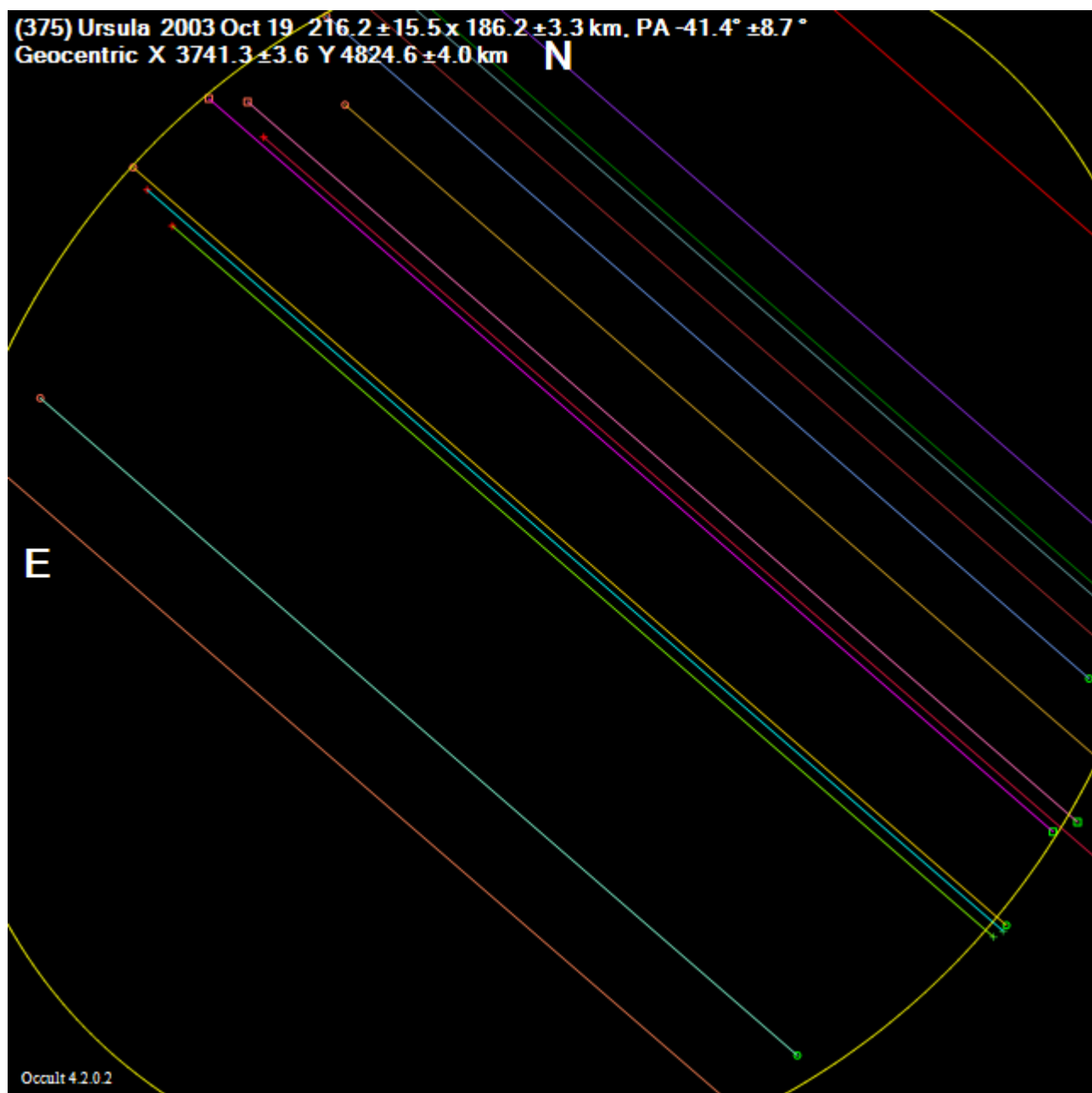
375ursula1999sep21

(375) Ursula 1999 Sep 21 $146.2 \pm 9.4 \times 146.2$ km, PA 0.0° °
Geocentric X -1204.5 ± 3.4 Y 177.8 ± 7.4 km **N**
Double : Sep $0.0575 \pm 0.0023''$, PA $70.4^\circ \pm 3.9^\circ$



375ursula2003oct19

(375) Ursula 2003 Oct 19 $216.2 \pm 15.5 \times 186.2 \pm 3.3$ km, PA $-41.4^\circ \pm 8.7^\circ$
Geocentric X 3741.3 ± 3.6 Y 4824.6 ± 4.0 km



(375) Ursula 2010 Dec 4 220.2 ±4.3 x 188.2 ±2.3 km, PA -41.1° ±5.3°
Geocentric X 4832.0 ±0.7 Y 1123.2 ±2.2 km **N**

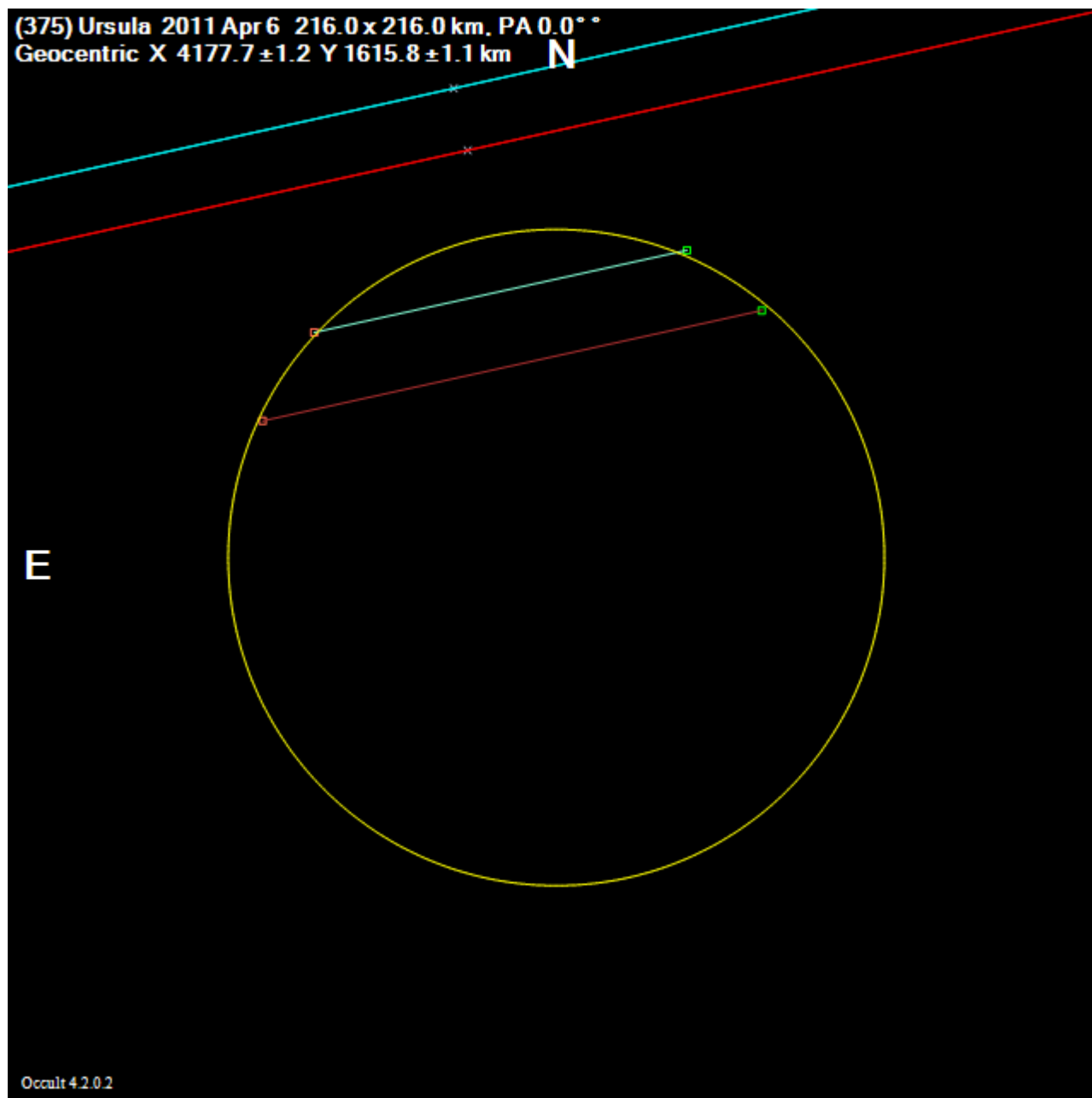


375ursula2011apr06

(375) Ursula 2011 Apr 6 216.0 x 216.0 km, PA 0.0°°
Geocentric X 4177.7 ± 1.2 Y 1615.8 ± 1.1 km

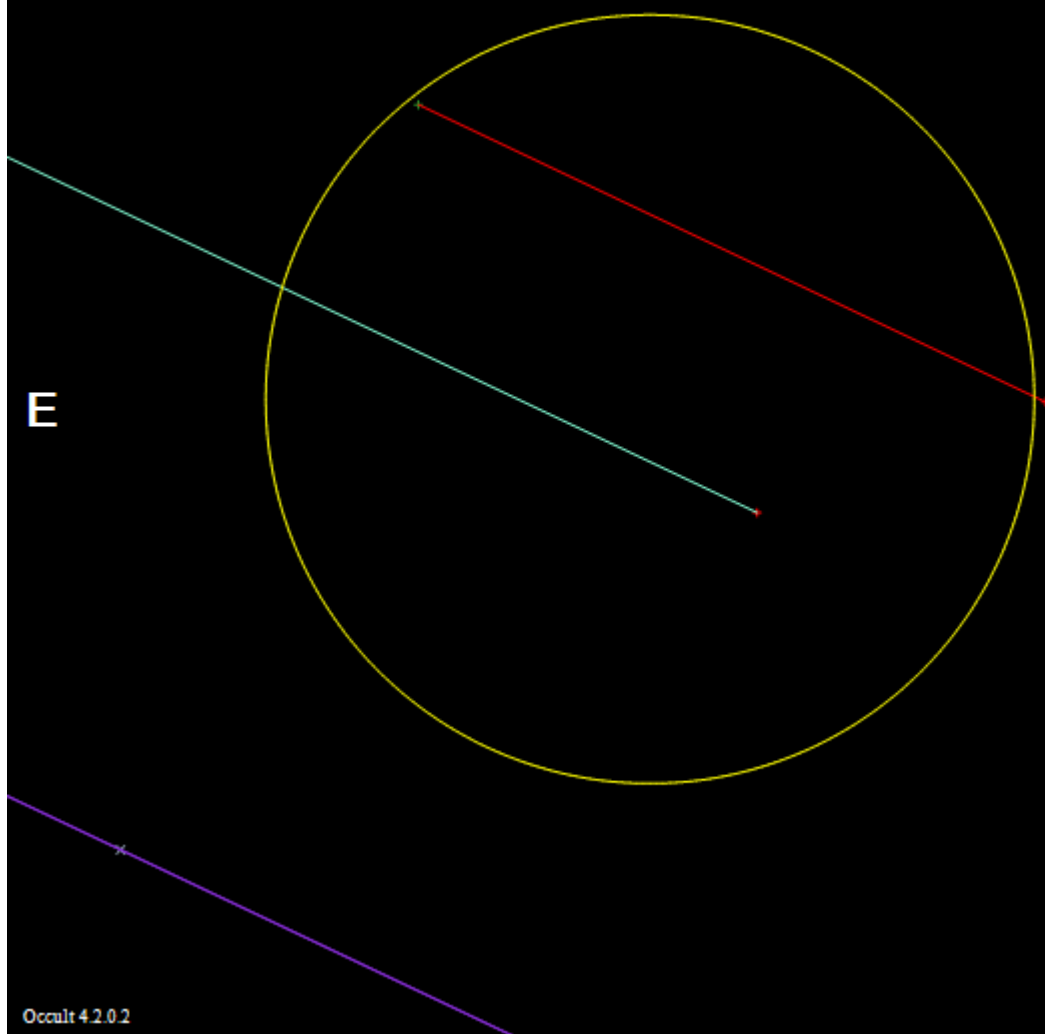
N

E



377campania2008nov16

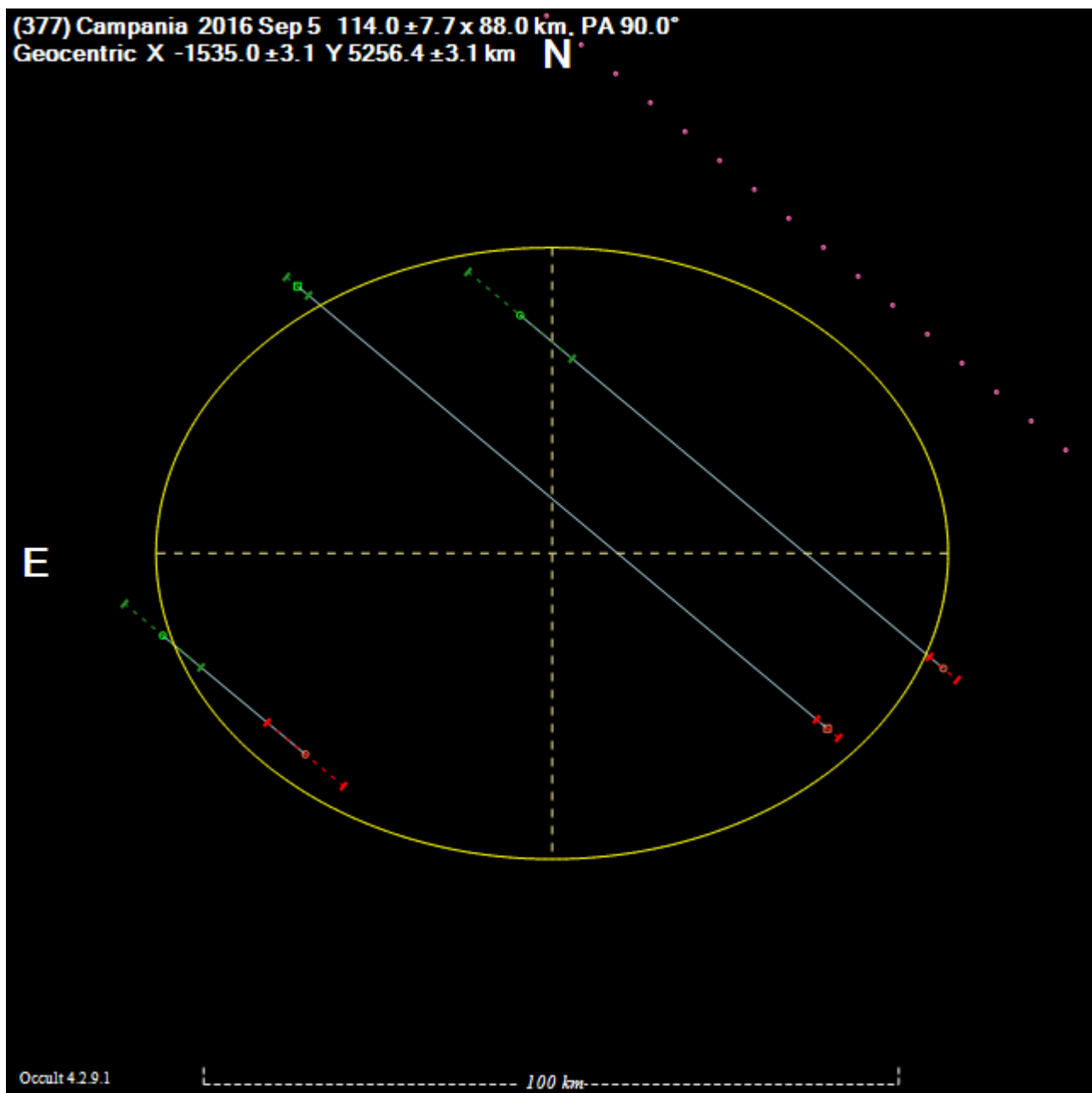
(377) Campania 2008 Nov 16 $91.0 \pm 74.9 \times 91.0$ km, PA 0.0° °
Geocentric X 1768.9 ± 26.4 Y 3506.9 ± 38.8 km **N**



Occult 4.2.0.2

377Campania2016Sep05

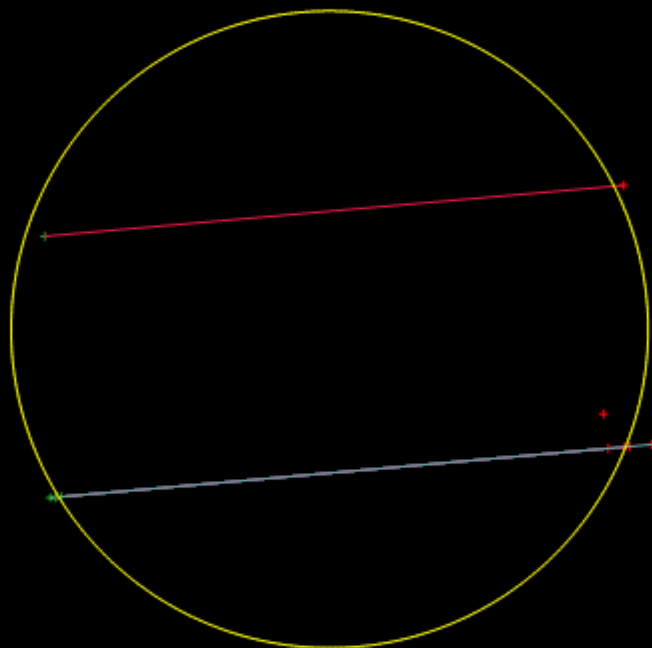
(377) Campania 2016 Sep 5 $114.0 \pm 7.7 \times 88.0$ km, PA 90.0°
Geocentric X -1535.0 ± 3.1 Y 5256.4 ± 3.1 km **N**



37fides1996aug12

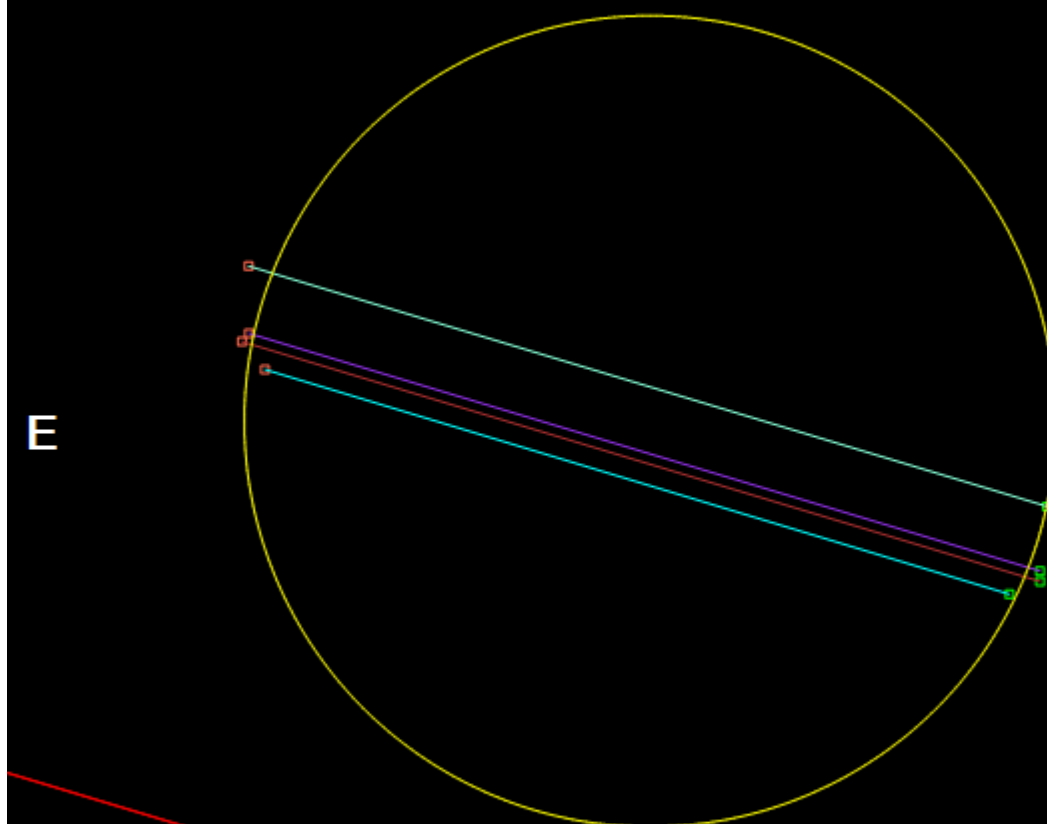
(37) Fides 1996 Aug 12 $89.5 \pm 9.2 \times 89.5$ km, PA 0.0° °
Geocentric X -747.5 ± 0.7 Y 5916.9 ± 2.1 km **N**

E



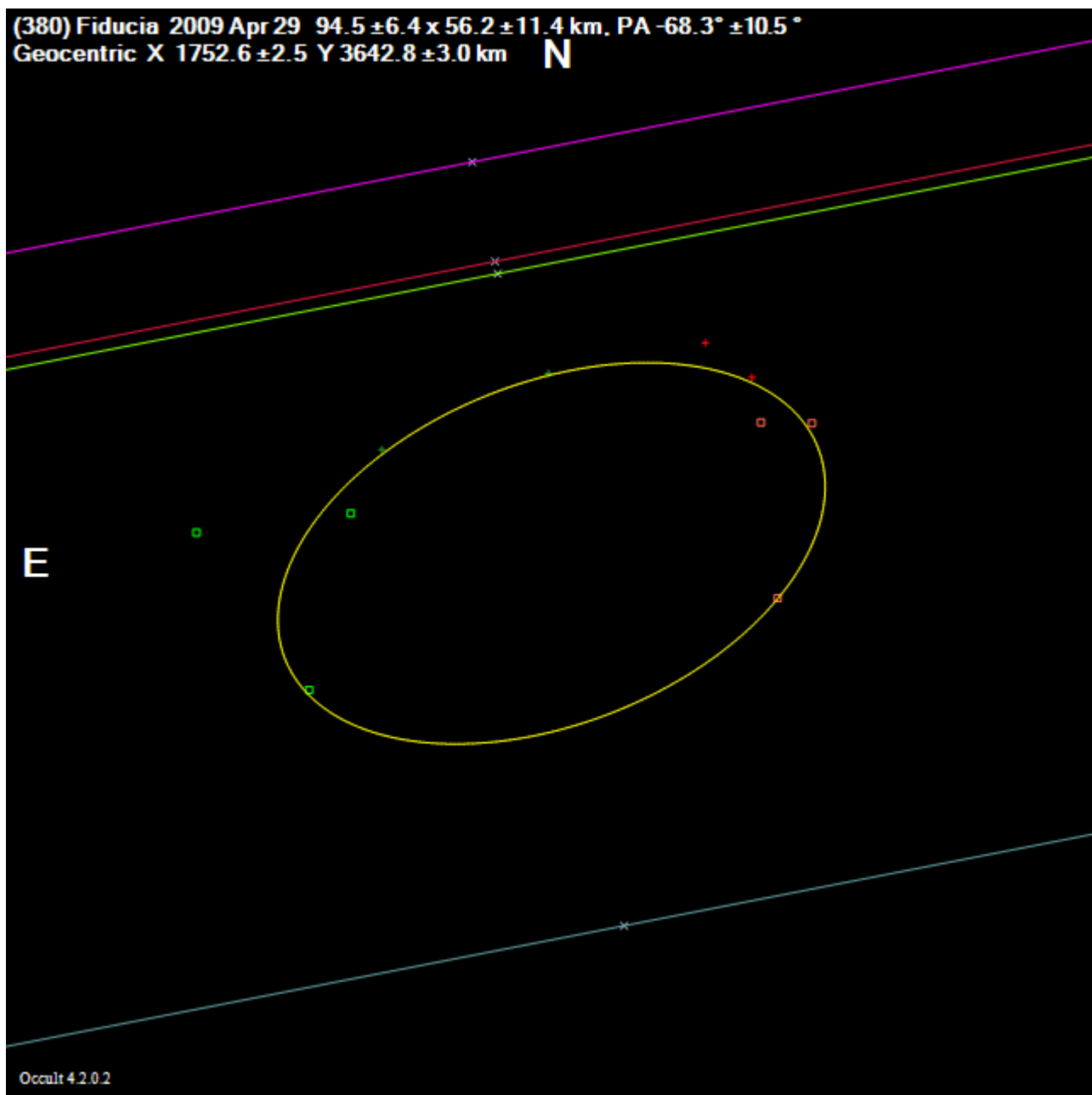
37fides2010sep01

(37) Fides 2010 Sep 1 114.0 x 114.0 km. PA 0.0° °
Geocentric X -3606.0 ± 1.8 Y 3240.0 ± 5.5 km **N**



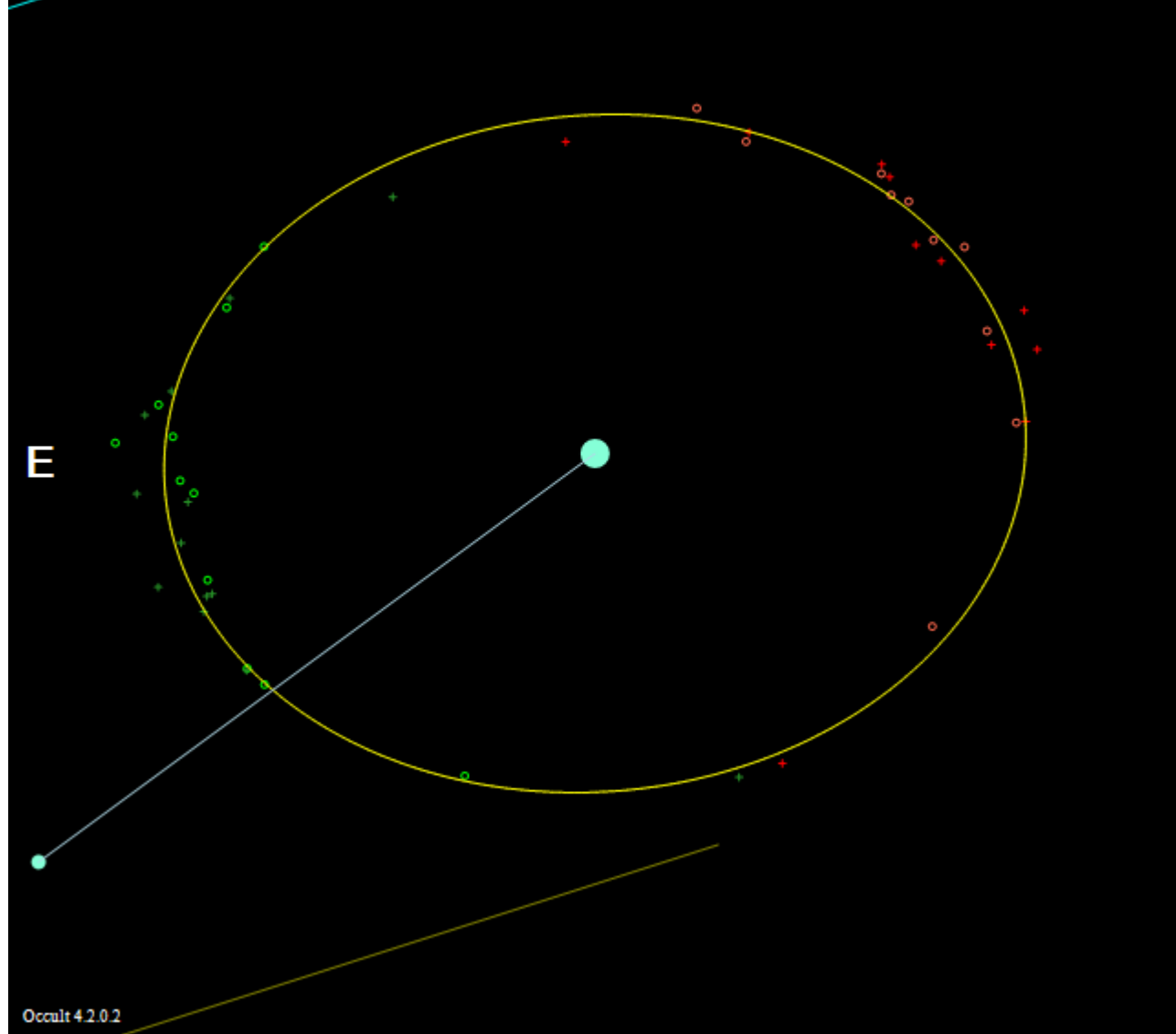
380fiducia2009apr29

(380) Fiducia 2009 Apr 29 $94.5 \pm 6.4 \times 56.2 \pm 11.4$ km, PA $-68.3^\circ \pm 10.5^\circ$
Geocentric X 1752.6 ± 2.5 Y 3642.8 ± 3.0 km **N**



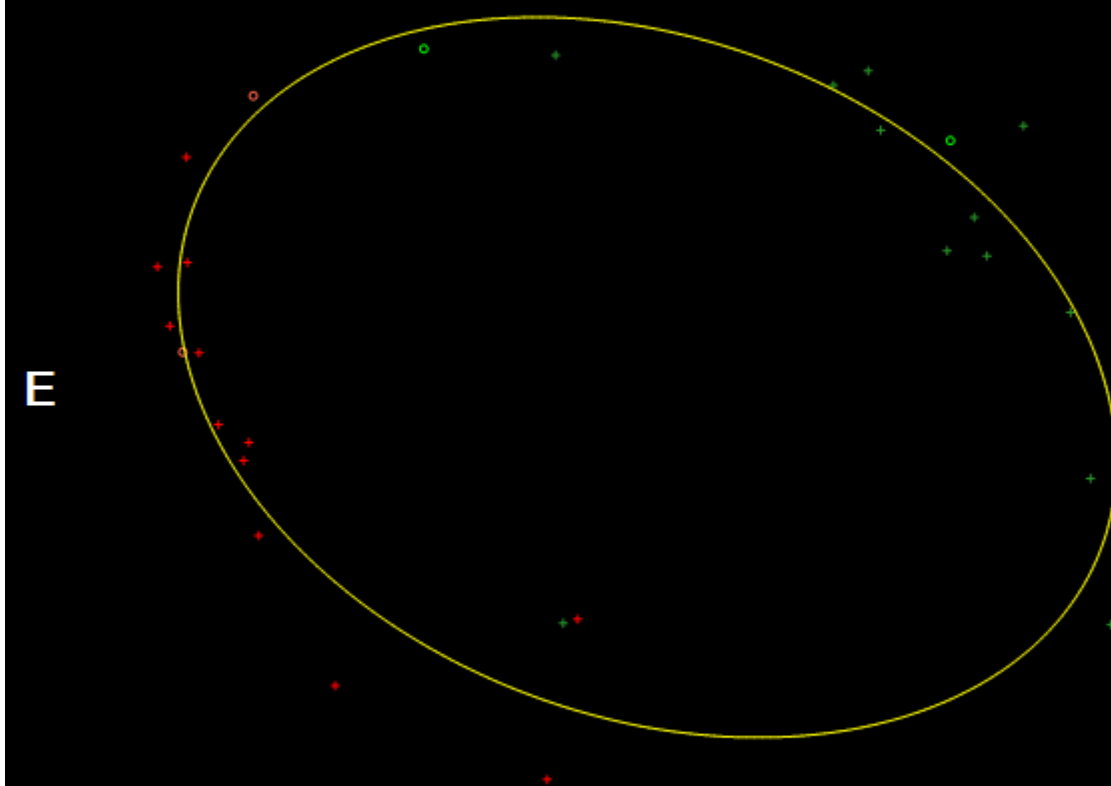
381myrrha1991jan13

(381) Myrrha 1991 Jan 13 $147.5 \pm 1.1 \times 115.6 \pm 1.7$ km, PA $-84.6^\circ \pm 2.0^\circ$
Geocentric X -2471.5 ± 0.5 Y 2257.5 ± 0.6 km **N**
Double : Sep $0.0634 \pm 0.0010''$, PA $126.3^\circ \pm 4.7^\circ$



386siegena1999oct25

(386) Siegena 1999 Oct 25 $208.2 \pm 7.0 \times 145.4 \pm 5.4$ km, PA $69.3^\circ \pm 4.1^\circ$
Geocentric X 3183.0 ± 2.8 Y 3977.0 ± 2.7 km **N**

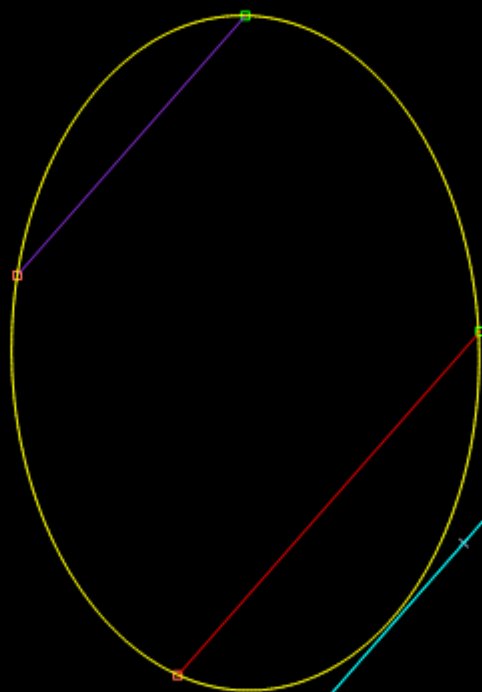


386siegena2010aug30

(386) Siegena 2010 Aug 30 $182.7 \pm 1.9 \times 126.5$ km, PA $1.0^\circ \pm 4.0^\circ$
Geocentric X -2685.5 ± 0.4 Y 3427.0 ± 0.8 km **N**

E

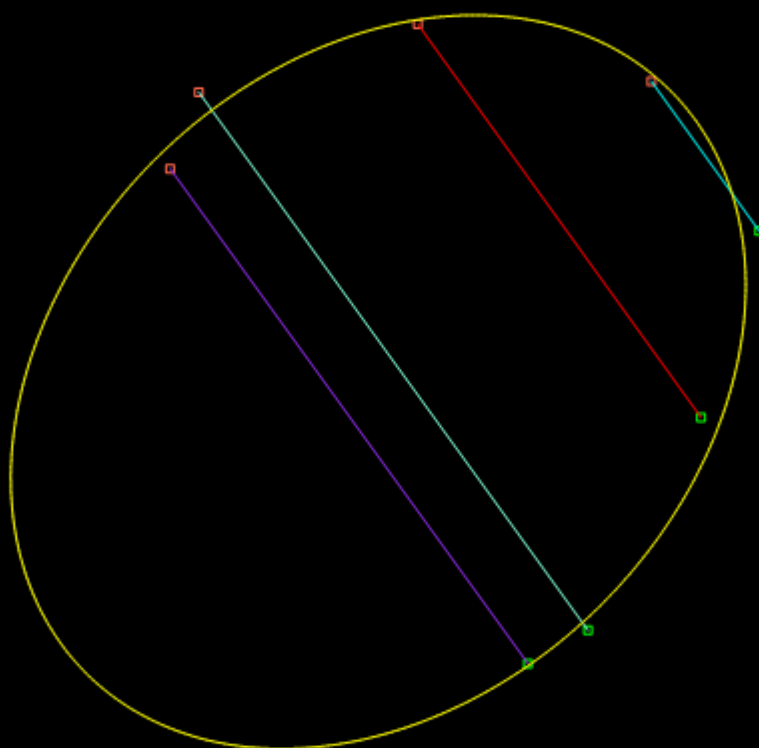
Occult 4.2.0.2



386siegena2010dec30

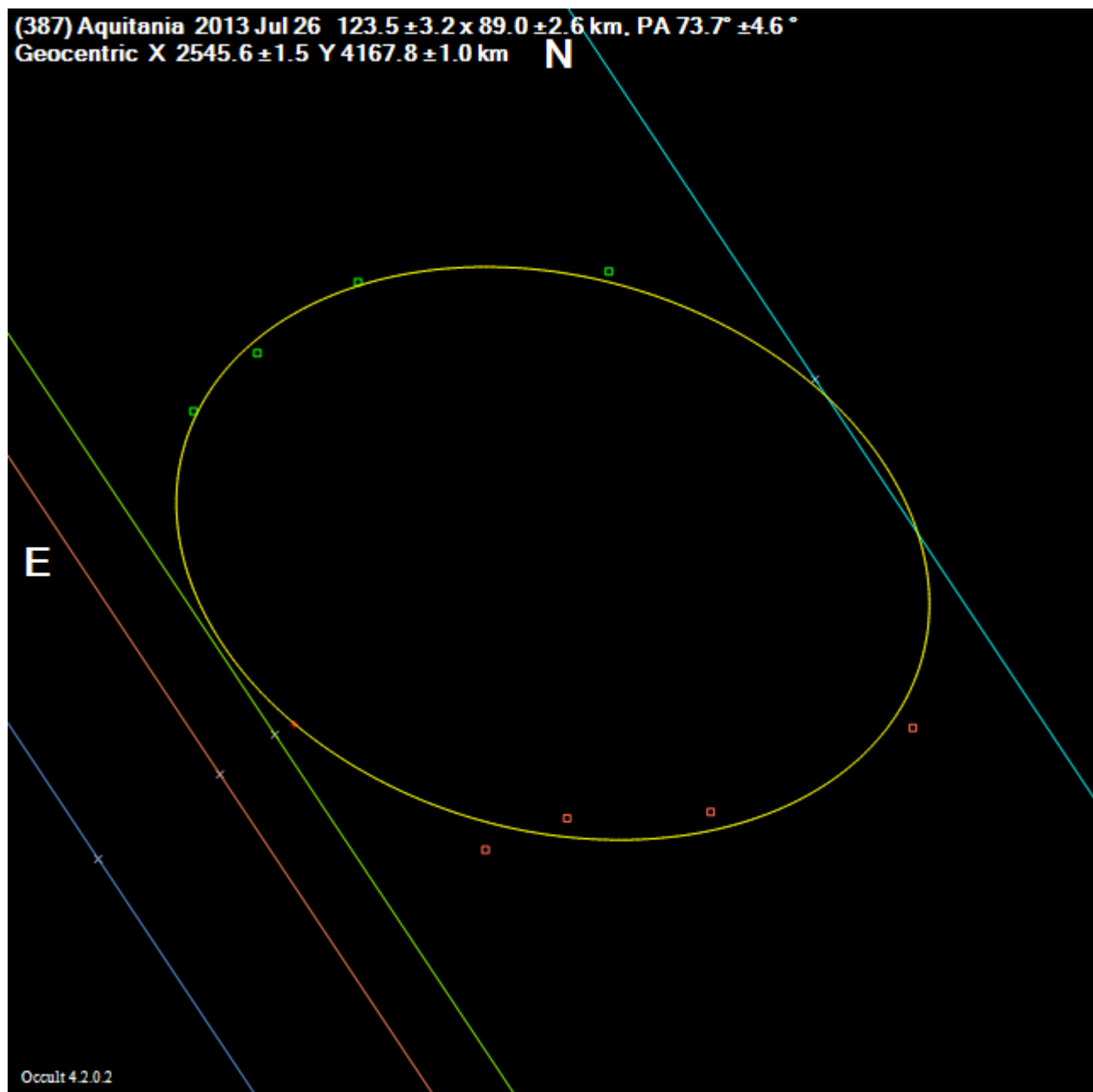
(386) Siegena 2010 Dec 30 $223.3 \pm 32.3 \times 170.6 \pm 3.9$ km, PA $-45.2^\circ \pm 6.9^\circ$
Geocentric X 716.4 ± 11.4 Y -1943.8 ± 9.4 km **N**

E



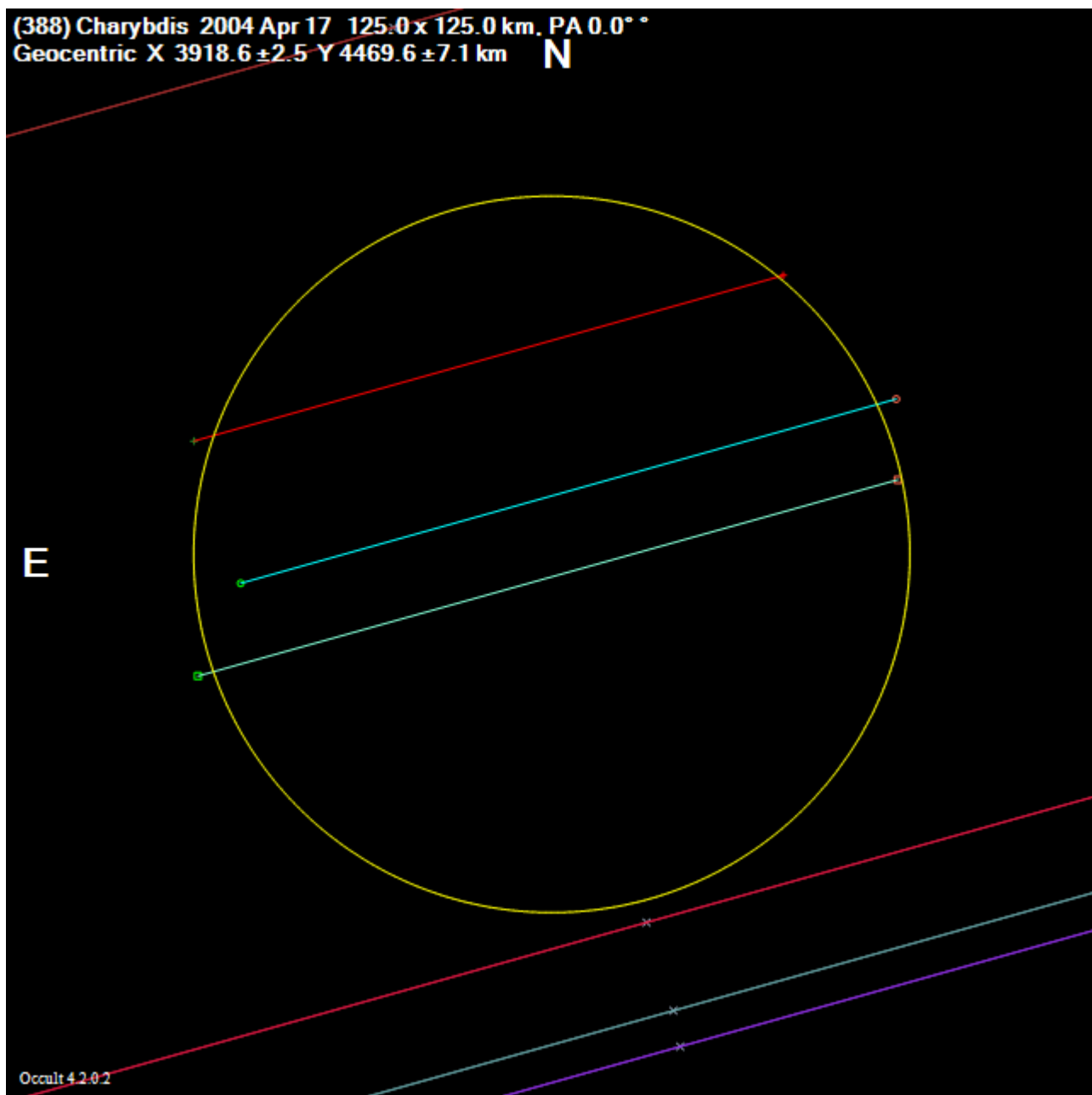
387aquitania2013jul26

(387) Aquitania 2013 Jul 26 $123.5 \pm 3.2 \times 89.0 \pm 2.6$ km, PA $73.7^\circ \pm 4.6^\circ$
Geocentric X 2545.6 ± 1.5 Y 4167.8 ± 1.0 km **N**



388charybdis2004apr17

(388) Charybdis 2004 Apr 17 125.0 x 125.0 km, PA 0.0° °
Geocentric X 3918.6 ± 2.5 Y 4469.6 ± 7.1 km **N**

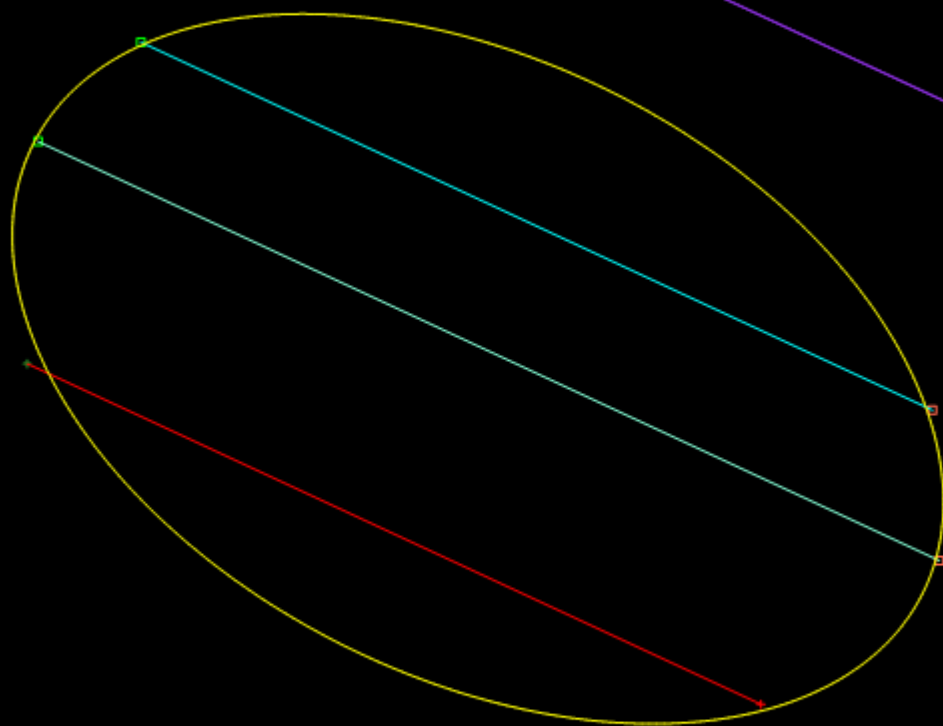


388charybdis2005jun11

(388) Charybdis 2005 Jun 11 $147.8 \pm 0.9 \times 91.2 \pm 3.3$ km, PA $63.1^\circ \pm 0.9^\circ$
Geocentric X -1260.3 ± 0.4 Y 5681.2 ± 0.6 km **N**

E

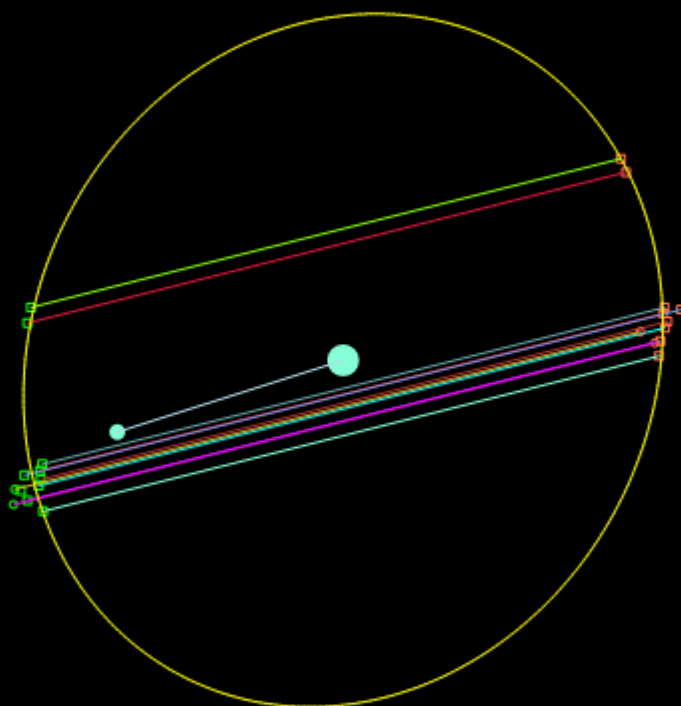
Occult 4.2.0.2



388charybdis2012dec03

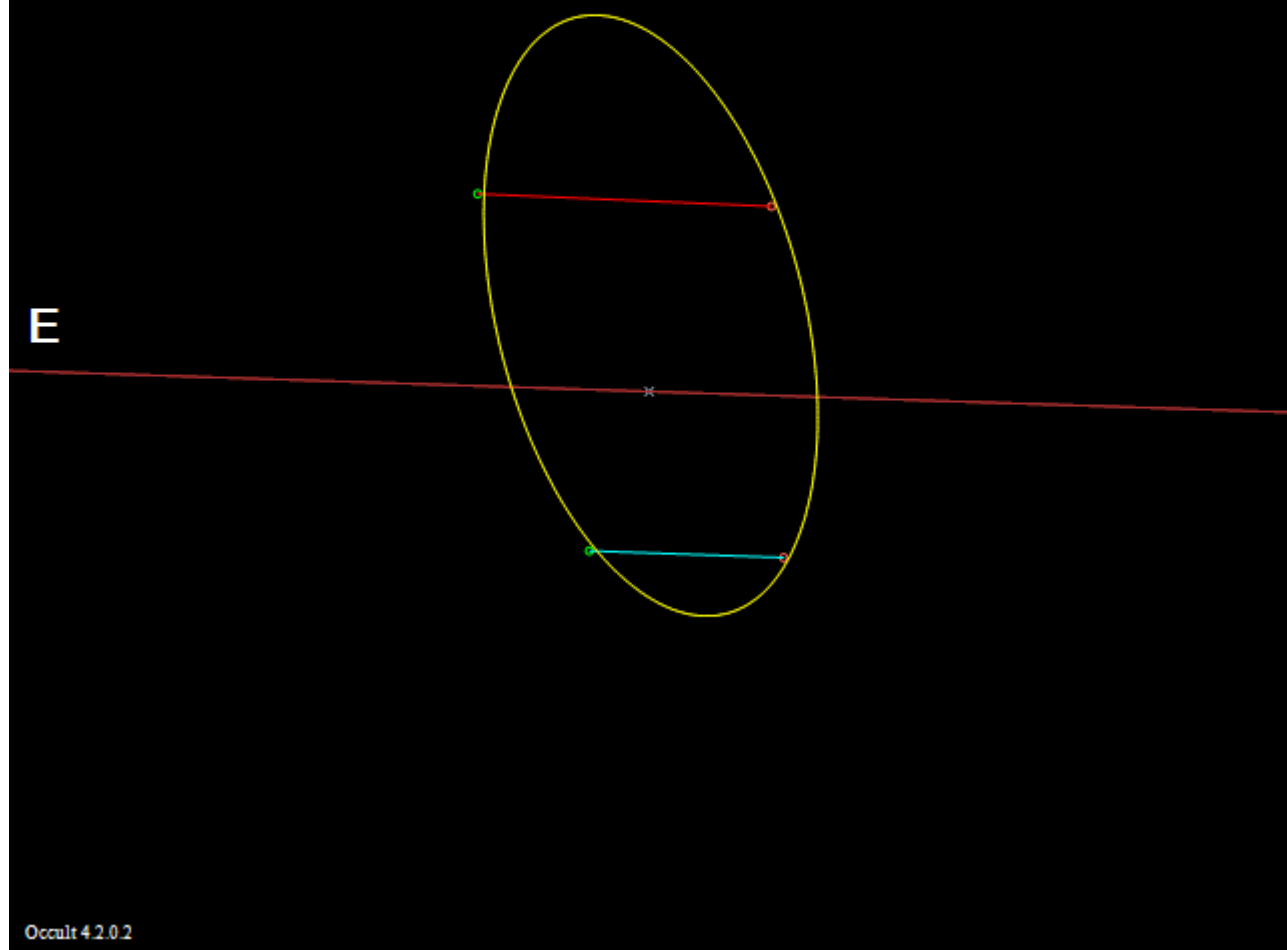
(388) Charybdis 2012 Dec 3 135.6 x 118.9 ± 3.8 km, PA -26.0° ± 10.0°
Geocentric X -1996.8 ± 0.8 Y 1281.7 ± 3.7 km **N**
Double : Sep 0.0282 ± 0.0008", PA 107.6° ± 6.0°

E



38leda1986oct04

(38) Leda 1986 Oct 4 92.0 x 46.0 km, PA 14.2° °
Geocentric X 1969.4 ± 0.8 Y 1034.7 ± 1.4 km **N**

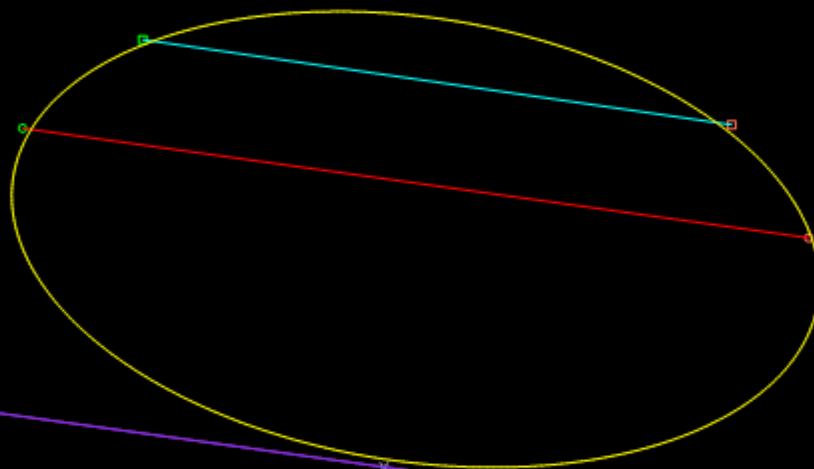


392wilhelmina2002dec27

(392) Wilhelmina 2002 Dec 27 65.7 x 35.8 km, PA 81.2° °
Geocentric X 5021.3 Y 3428.9 km

N

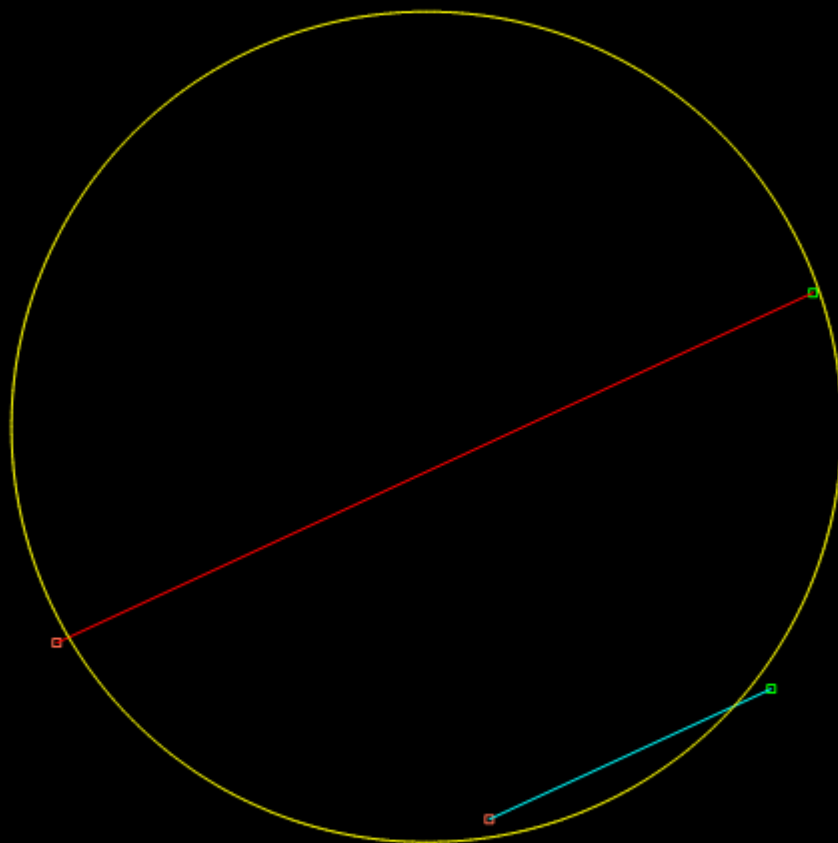
E



392wilhelmina2007sep22

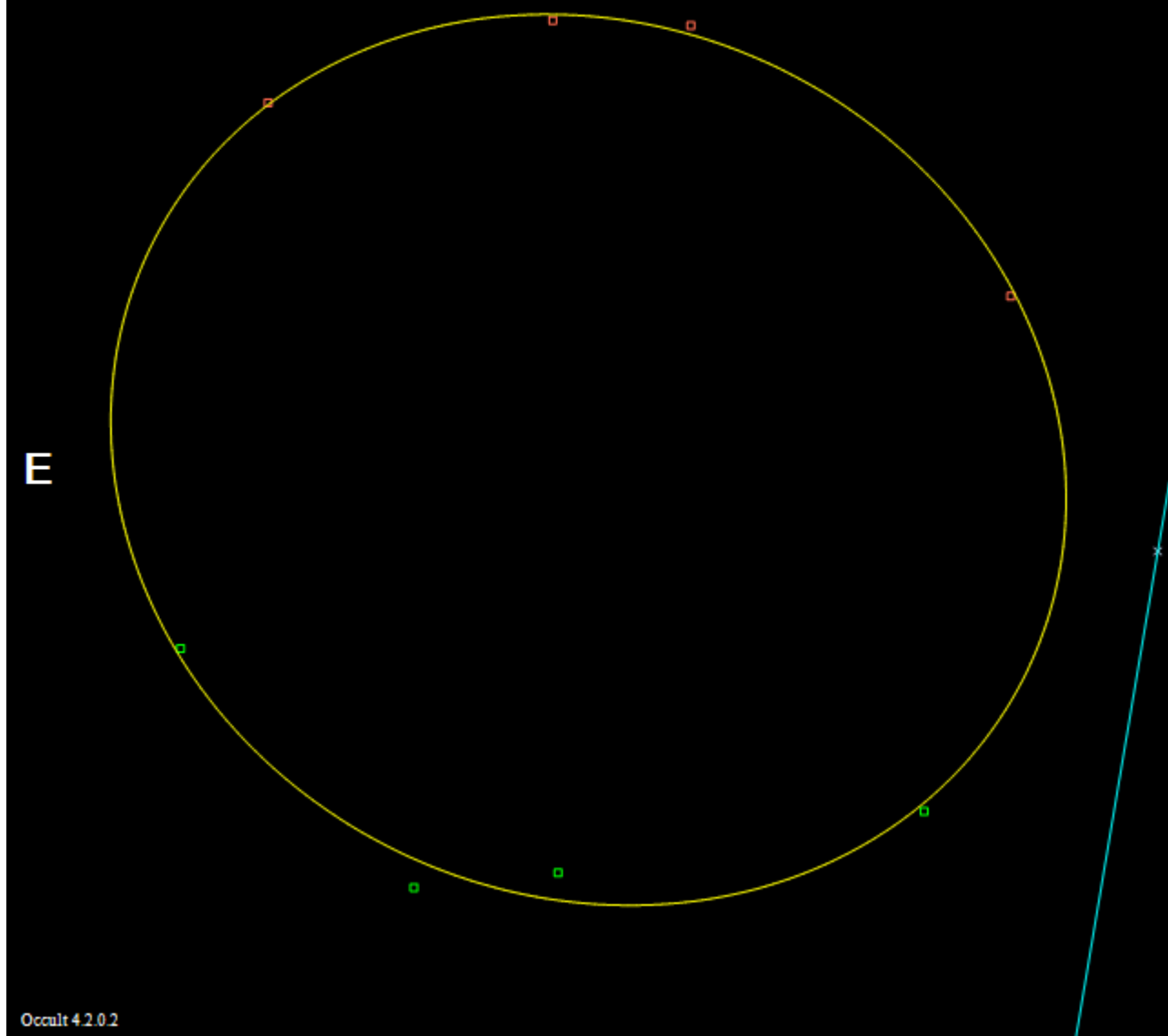
(392) Wilhelmina 2007 Sep 22 67.0 x 67.0 km, PA 0.0° °
Geocentric X -1459.0 ±0.4 Y 2261.9 ±0.4 km **N**

E



393lampetia2009may07

(393) Lampetia 2009 May 7 $133.8 \pm 3.5 \times 119.7 \pm 2.1$ km, PA $64.4^\circ \pm 8.3^\circ$
Geocentric X -4173.7 ± 1.3 Y 3123.6 ± 0.9 km **N**



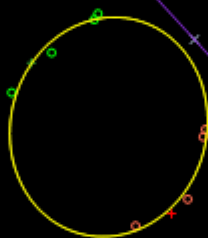
393lampetia2014aug24

(393) Lampetia 2014 Aug 24 $115.7 \pm 8.0 \times 102.7 \pm 2.6$ km, PA $-14.7^\circ \pm 24.5^\circ$
Geocentric X 1420.3 ± 1.8 Y 884.6 ± 1.9 km

N

E

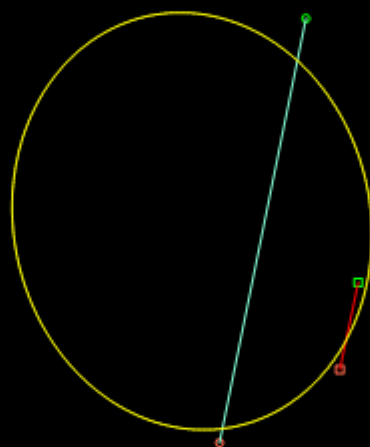
Occult 4.2.0.2



393lampetia2014oct29

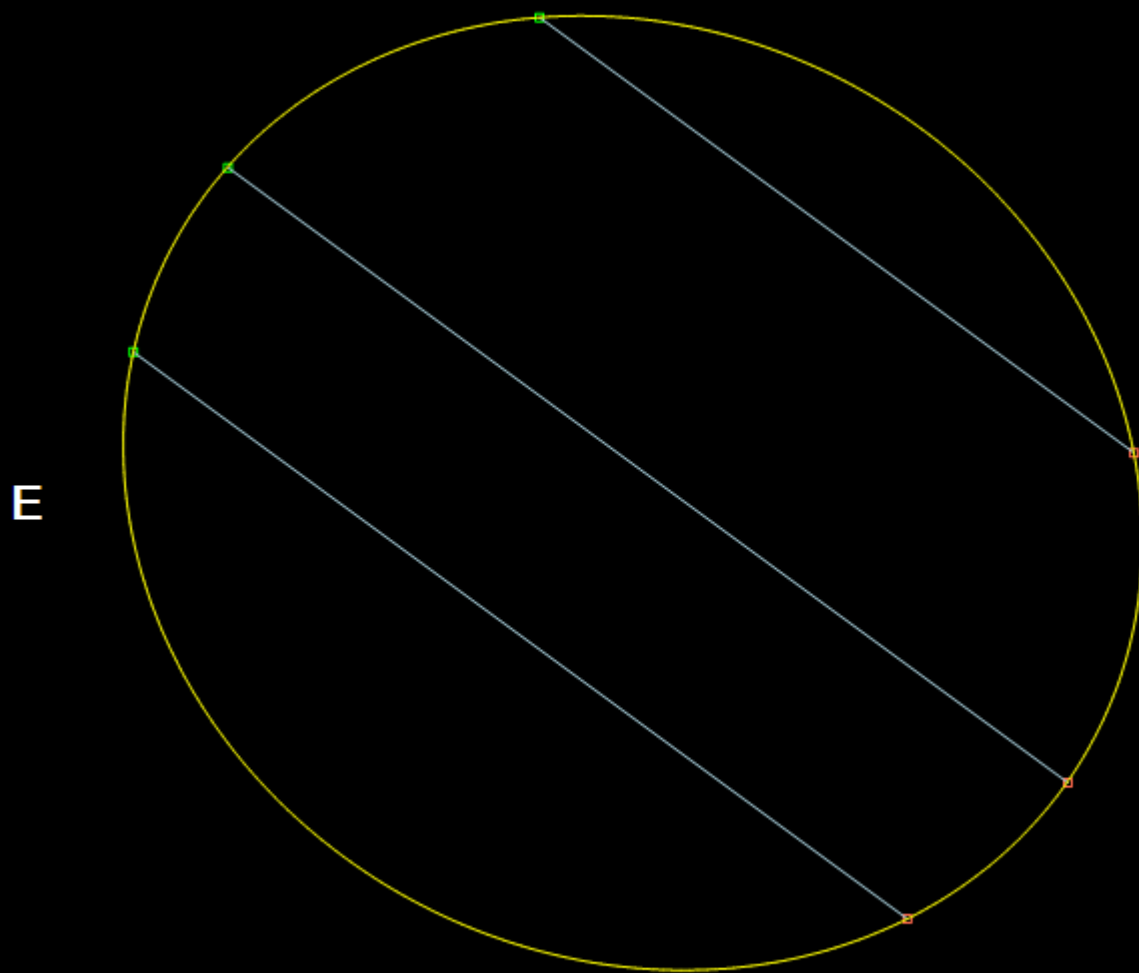
(393) Lampetia 2014 Oct 29 147.0 x 125.0 km, PA 12.0°
Geocentric X -3554.2 ±4.2 Y 3626.5 ±4.1 km **N**

E



393lampetia2015nov15

(393) Lampetia 2015 Nov 15 $130.5 \pm 0.1 \times 115.7 \pm 0.3$ km, PA $61.6^\circ \pm 0.3^\circ$
Geocentric X -4402.3 ± 0.1 Y -3687.0 ± 0.1 km **N**



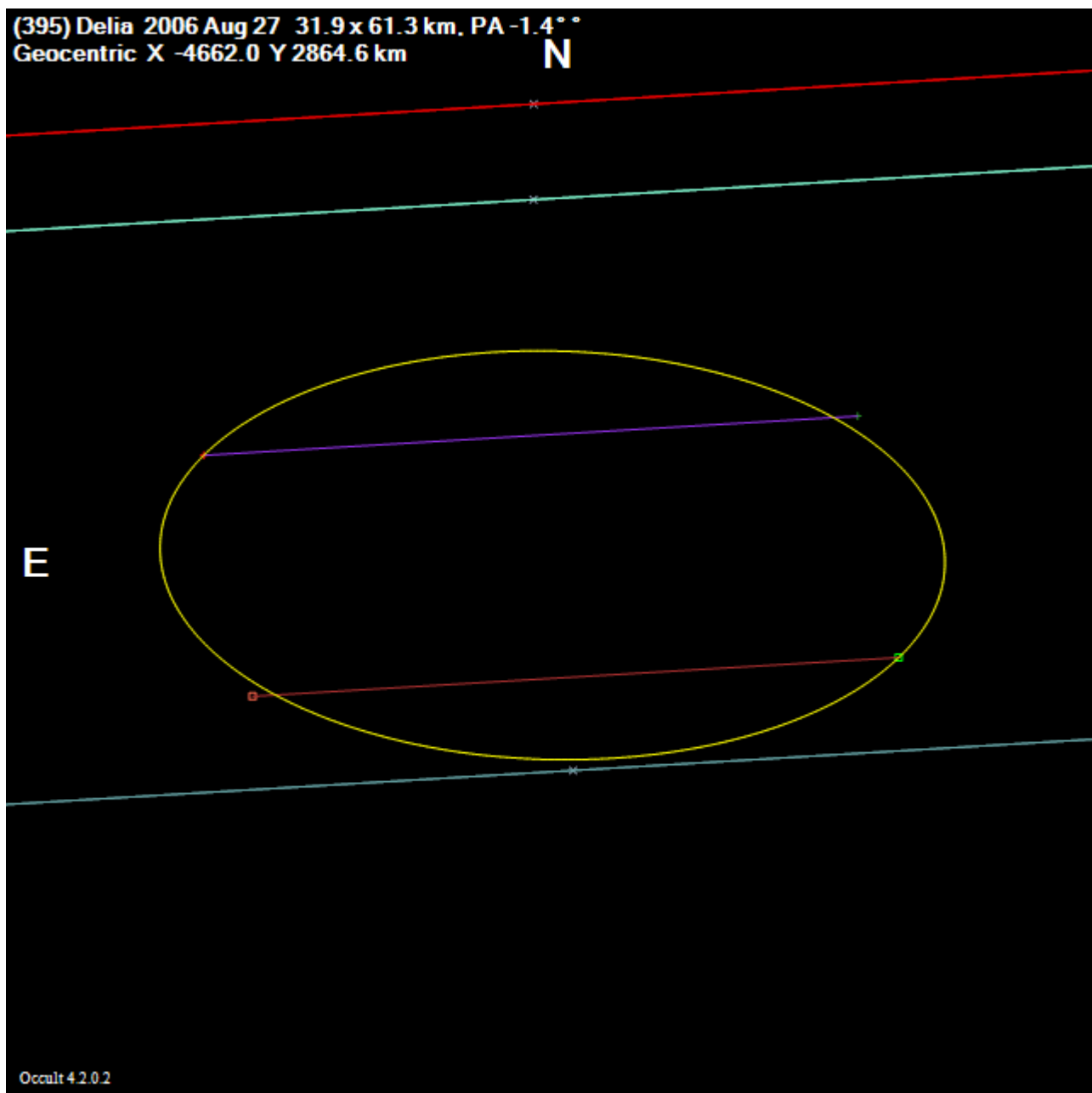
395delia2006aug27

(395) Delia 2006 Aug 27 31.9 x 61.3 km, PA -1.4° °
Geocentric X -4662.0 Y 2864.6 km

N

E

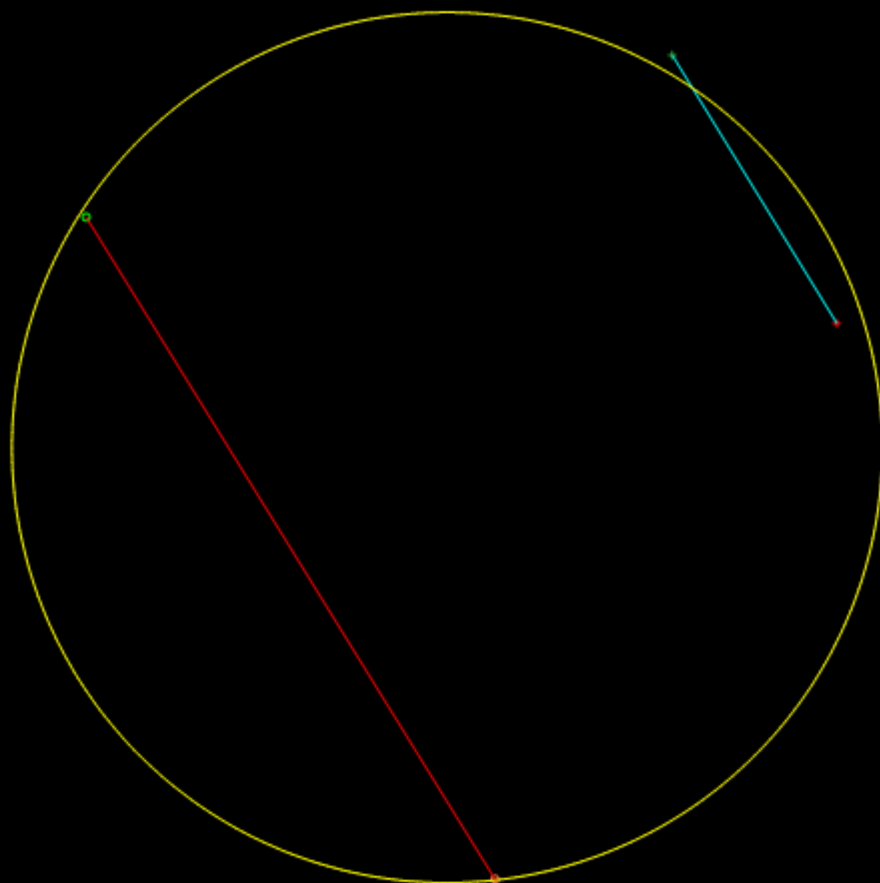
Occult 4.2.0.2



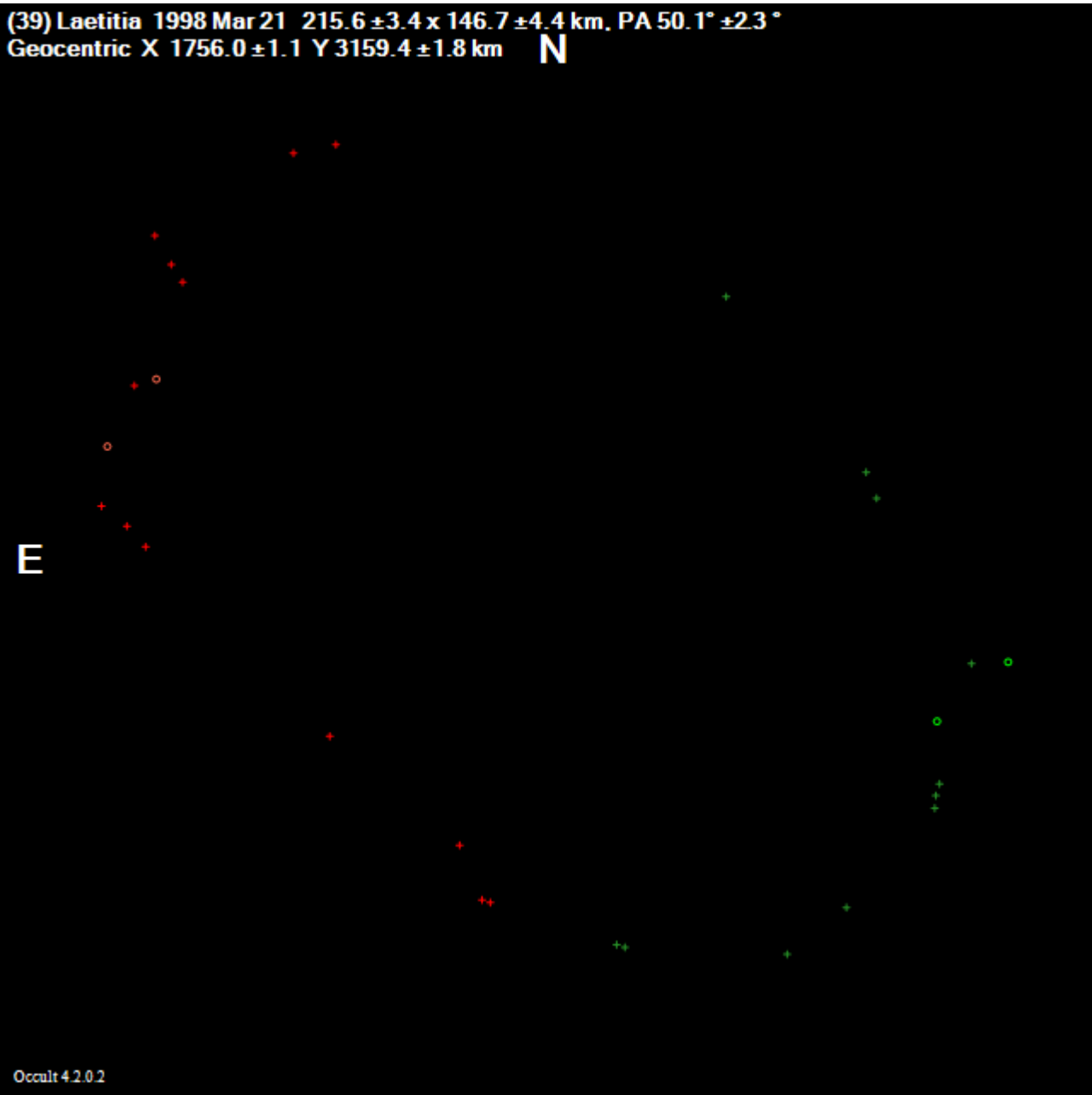
397vienna2005oct05

(397) Vienna 2005 Oct 5 $48.7 \pm 1.0 \times 48.7$ km. PA 0.0° °
Geocentric X -3024.1 ± 0.5 Y 3437.5 ± 0.5 km **N**

E



39laetitia1998mar21

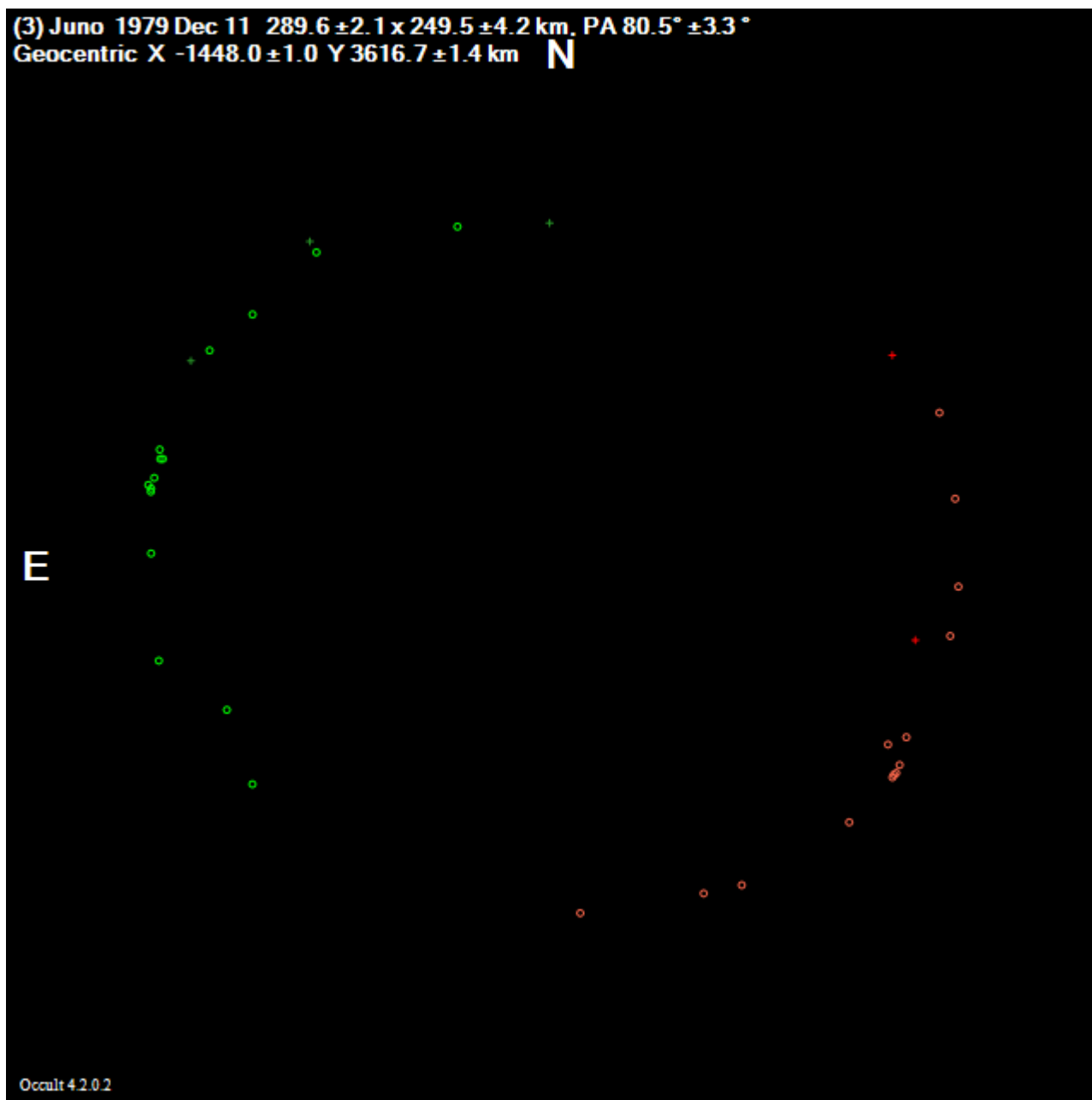


3juno1979dec11

(3) Juno 1979 Dec 11 $289.6 \pm 2.1 \times 249.5 \pm 4.2$ km, PA $80.5^\circ \pm 3.3^\circ$
Geocentric X -1448.0 ± 1.0 Y 3616.7 ± 1.4 km **N**

E

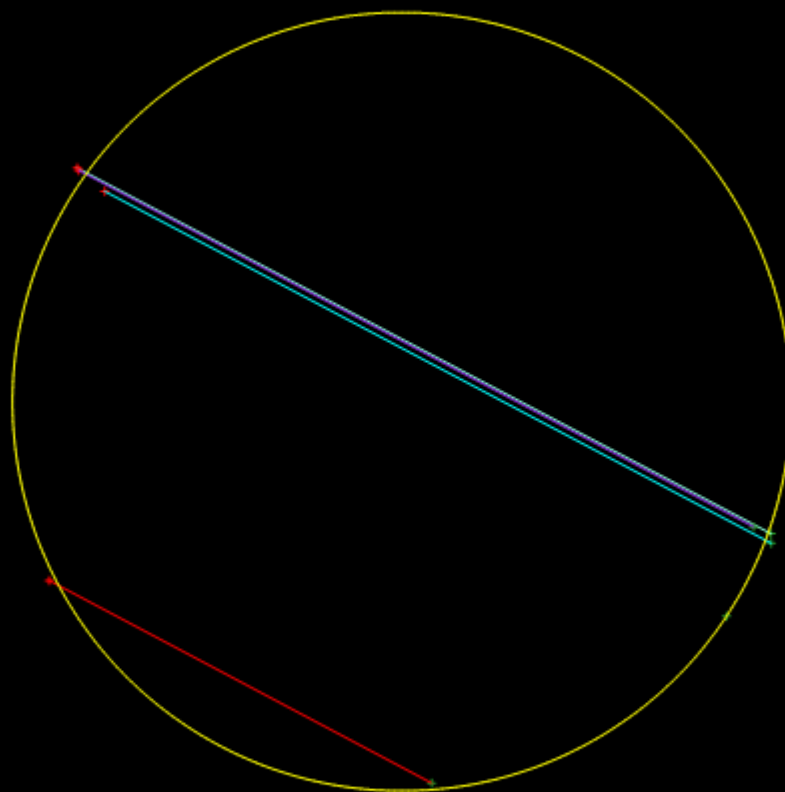
Occult 4.2.0.2



3juno2000may24

(3) Juno 2000 May 24 236.0 \pm 6.8 x 236.0 km. PA 0.0° °
Geocentric X -4009.9 \pm 2.0 Y 4844.4 \pm 3.1 km **N**

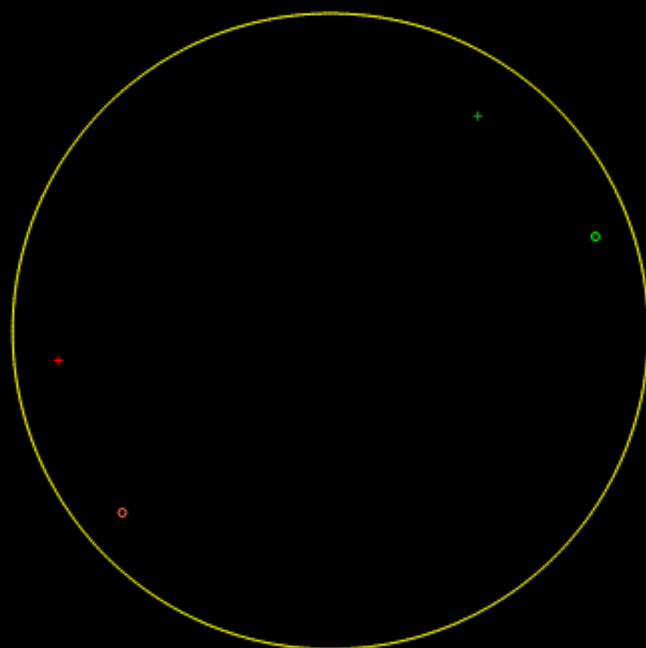
E



3juno2014nov20

(3) Juno 2014 Nov 20 290.0 x 290.0 km, PA 0.0°°
Geocentric X -3876.1 ±3.8 Y 4836.2 ±6.0 km **N**

E

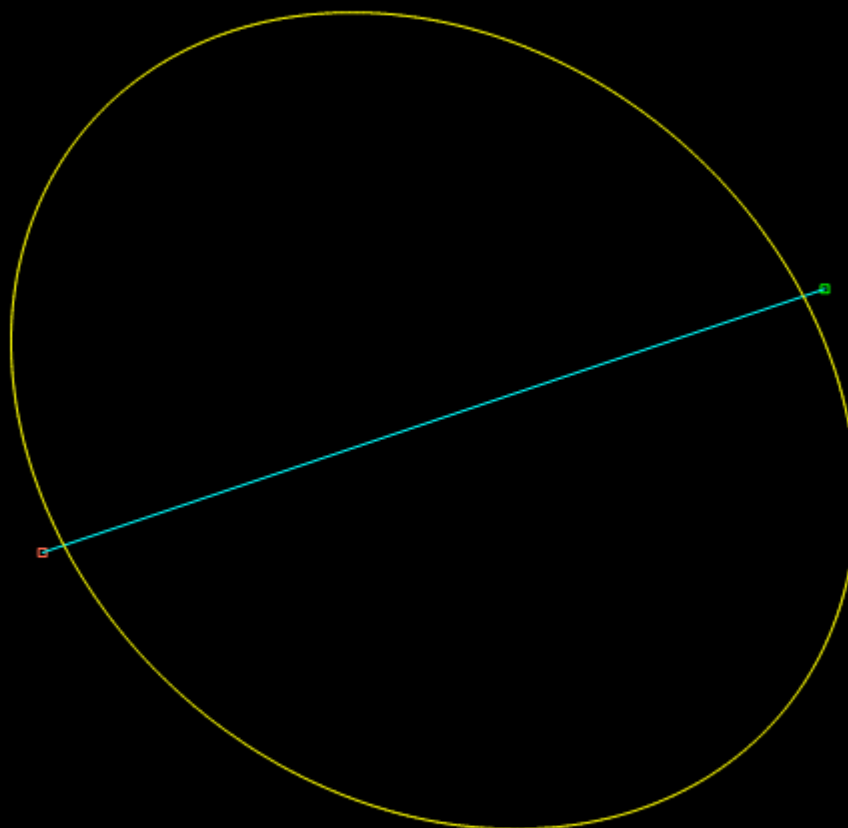


3juno2014oct10

(3) Juno 2014 Oct 10 343.0 x 281.0 km, PA 50.0° °
Geocentric X -4998.9 ±20.6 Y -3717.0 ±39.7 km **N**

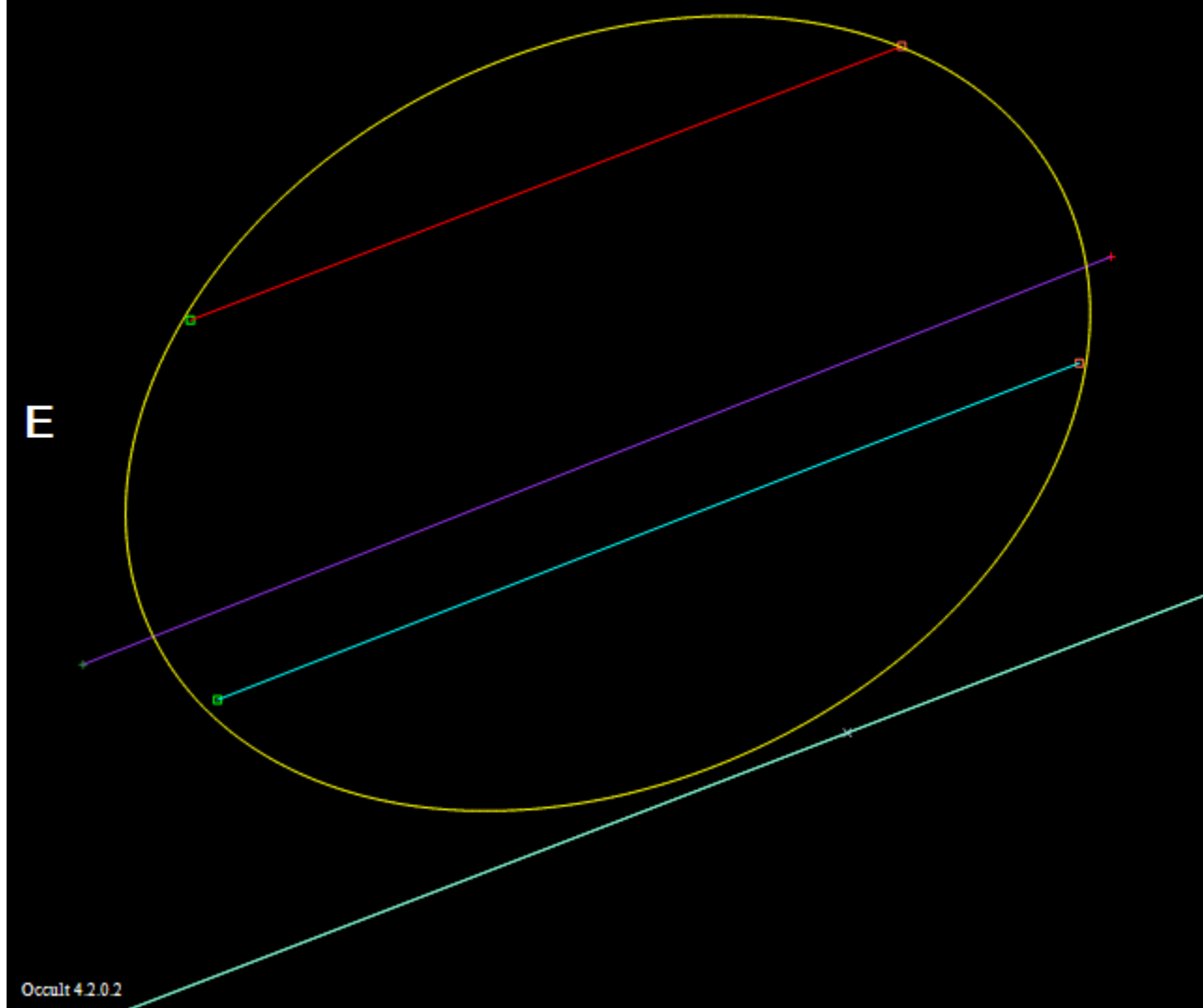
E

Occult 4.2.0.2



402chloe2004dec15

(402) Chloe 2004 Dec 15 $76.0 \pm 2.5 \times 55.0$ km, PA $-63.8^\circ \pm 6.3^\circ$
Geocentric X -3827.4 ± 1.2 Y 2426.2 ± 1.5 km **N**

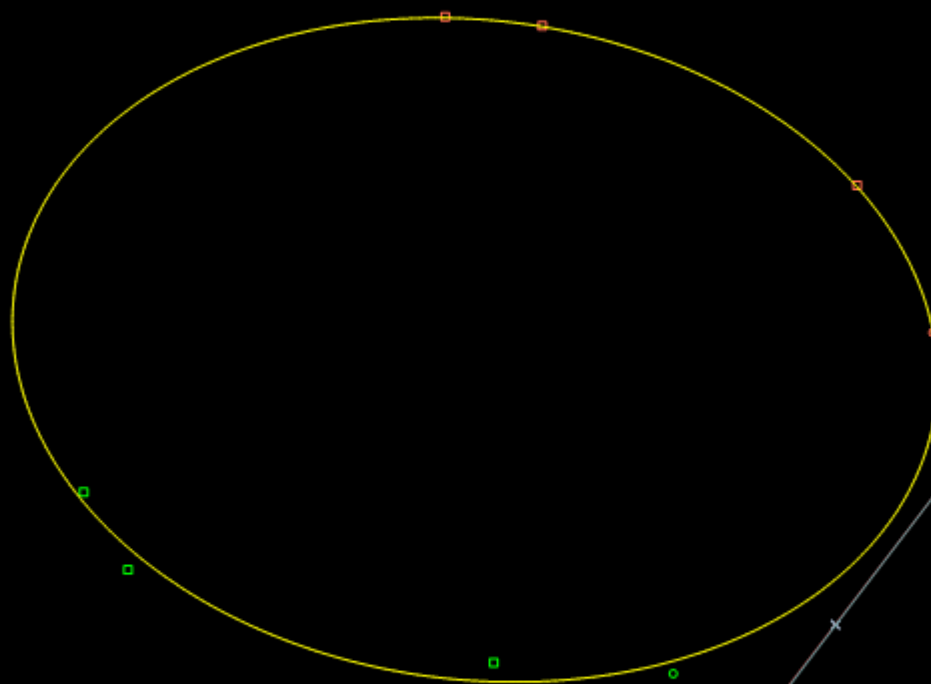


404arsinoe2003feb21

(404) Arsinoe 2003 Feb 21 $83.2 \pm 1.5 \times 117.2 \pm 4.4$ km, PA $-7.1^\circ \pm 4.2^\circ$
Geocentric X -2556.5 ± 1.3 Y 1465.8 ± 0.8 km **N**

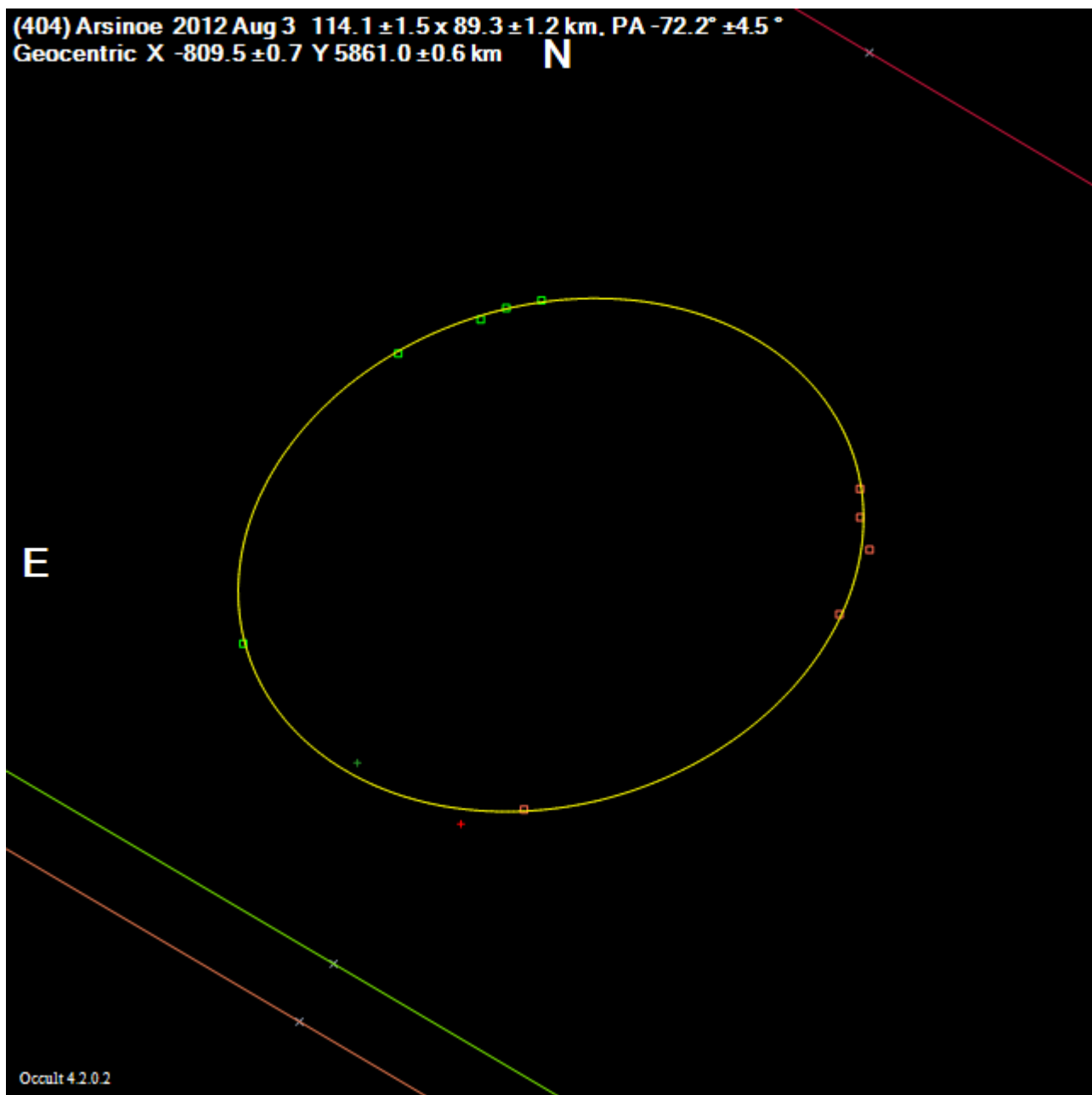
E

Occult 4.2.0.2



404arsinoe2012aug03

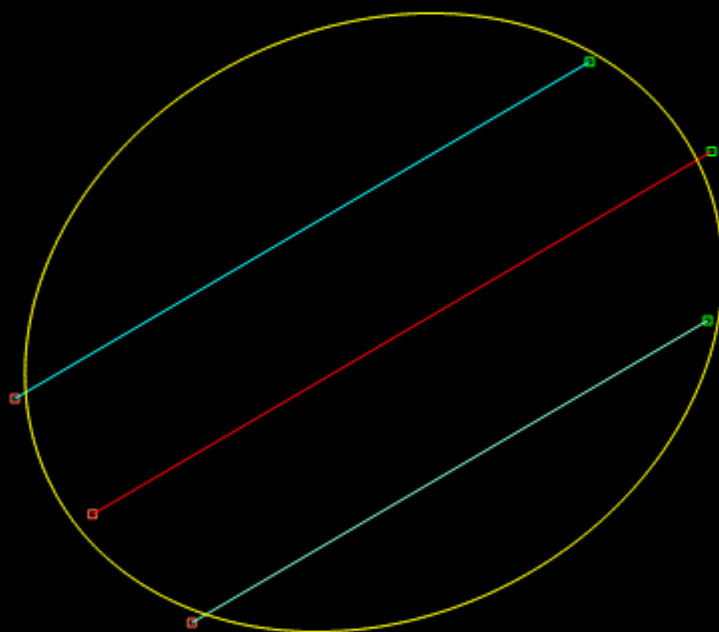
(404) Arsinoe 2012 Aug 3 $114.1 \pm 1.5 \times 89.3 \pm 1.2$ km, PA $-72.2^\circ \pm 4.5^\circ$
Geocentric X -809.5 ± 0.7 Y 5861.0 ± 0.6 km **N**



404arsinoe2012may04

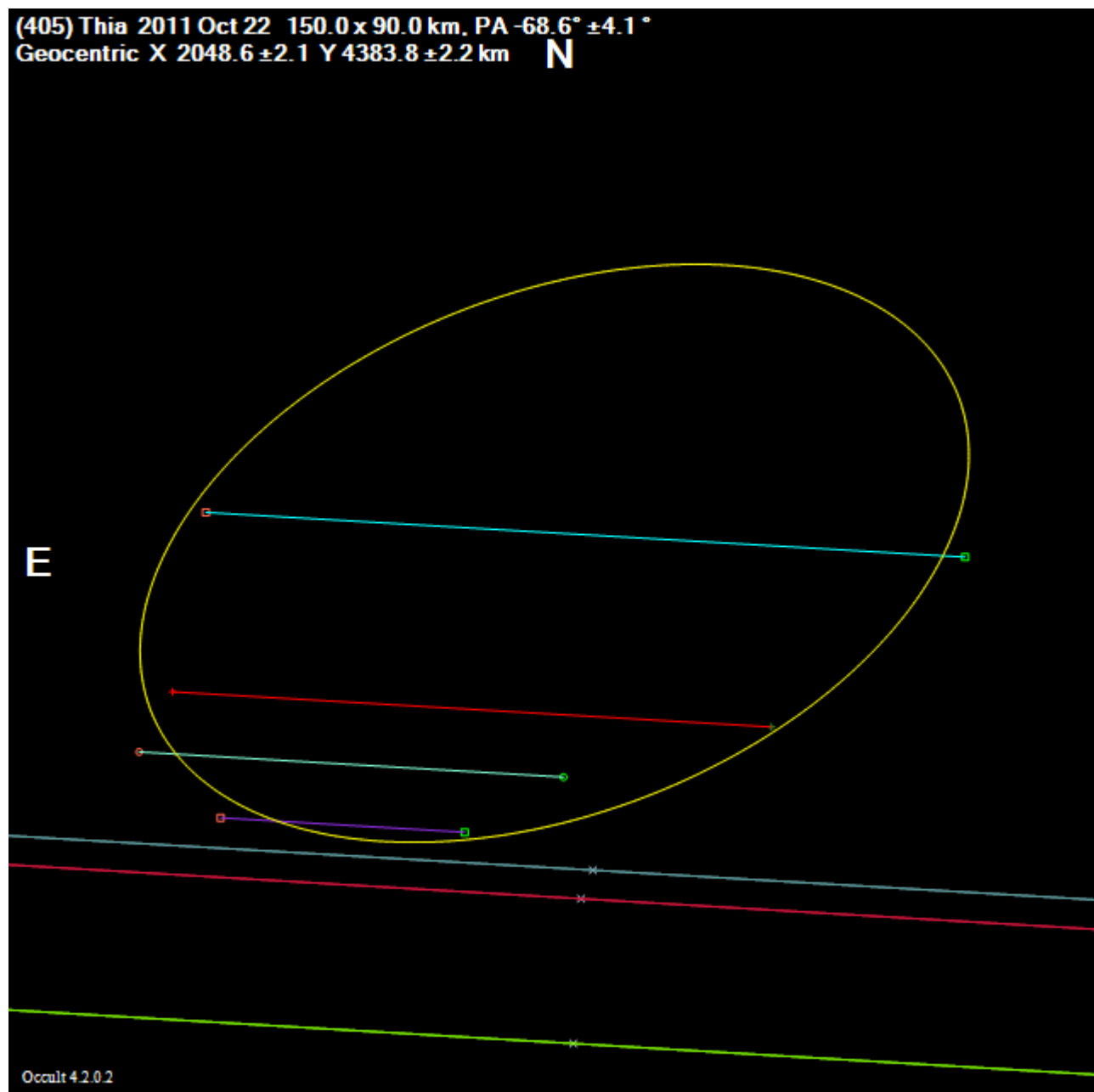
(404) Arsinoe 2012 May 4 $110.1 \pm 2.9 \times 89.6 \pm 12.0$ km, PA $-63.1^\circ \pm 7.0^\circ$
Geocentric X -4607.8 ± 1.5 Y -1605.3 ± 1.9 km **N**

E



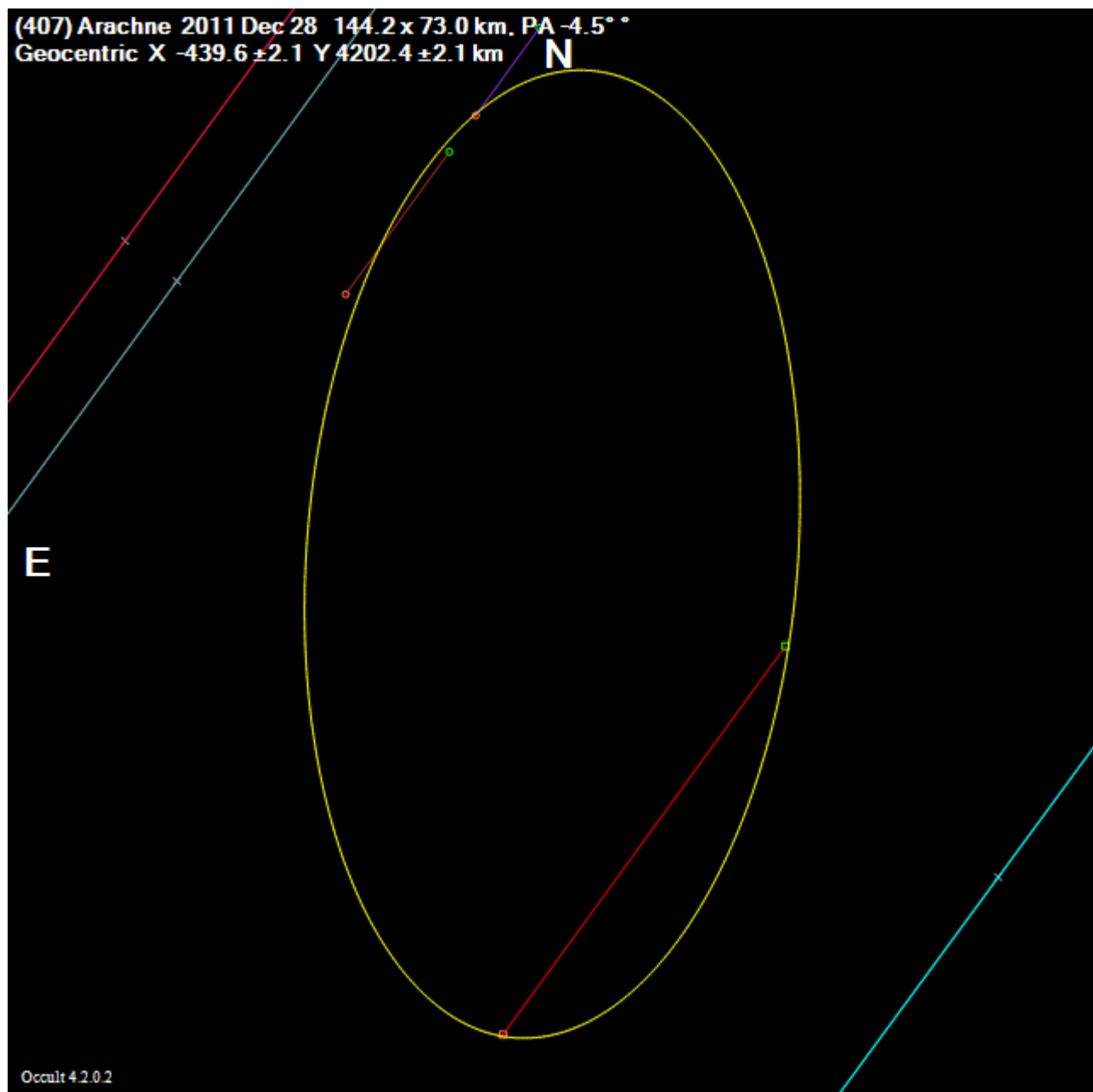
405thia2011oct22

(405) Thia 2011 Oct 22 150.0 x 90.0 km, PA $-68.6^{\circ} \pm 4.1^{\circ}$
Geocentric X 2048.6 ± 2.1 Y 4383.8 ± 2.2 km **N**



407arachne2011dec28

(407) Arachne 2011 Dec 28 144.2 x 73.0 km, PA -4.5°
Geocentric X -439.6 ±2.1 Y 4202.4 ±2.1 km



409aspasia2006dec20

(409) Aspasia 2006 Dec 20 $191.6 \pm 8.9 \times 155.3 \pm 6.5$ km, PA $-46.0^\circ \pm 9.5^\circ$
Geocentric X 764.3 ± 2.4 Y 3400.0 ± 5.1 km **N**



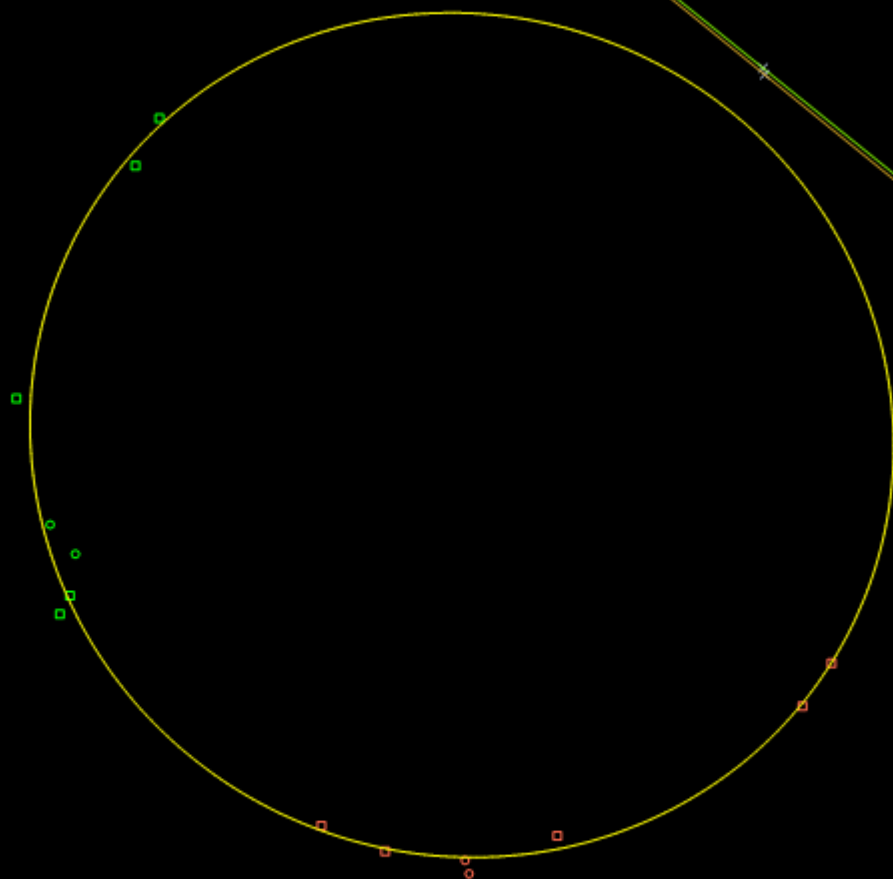
409aspasia2006oct08

(409) Aspasia 2006 Oct 8 $183.1 \pm 2.3 \times 176.9 \pm 13.3$ km, PA $65.3^\circ \pm 37.0^\circ$
Geocentric X -705.3 ± 3.9 Y 3234.3 ± 4.6 km

N

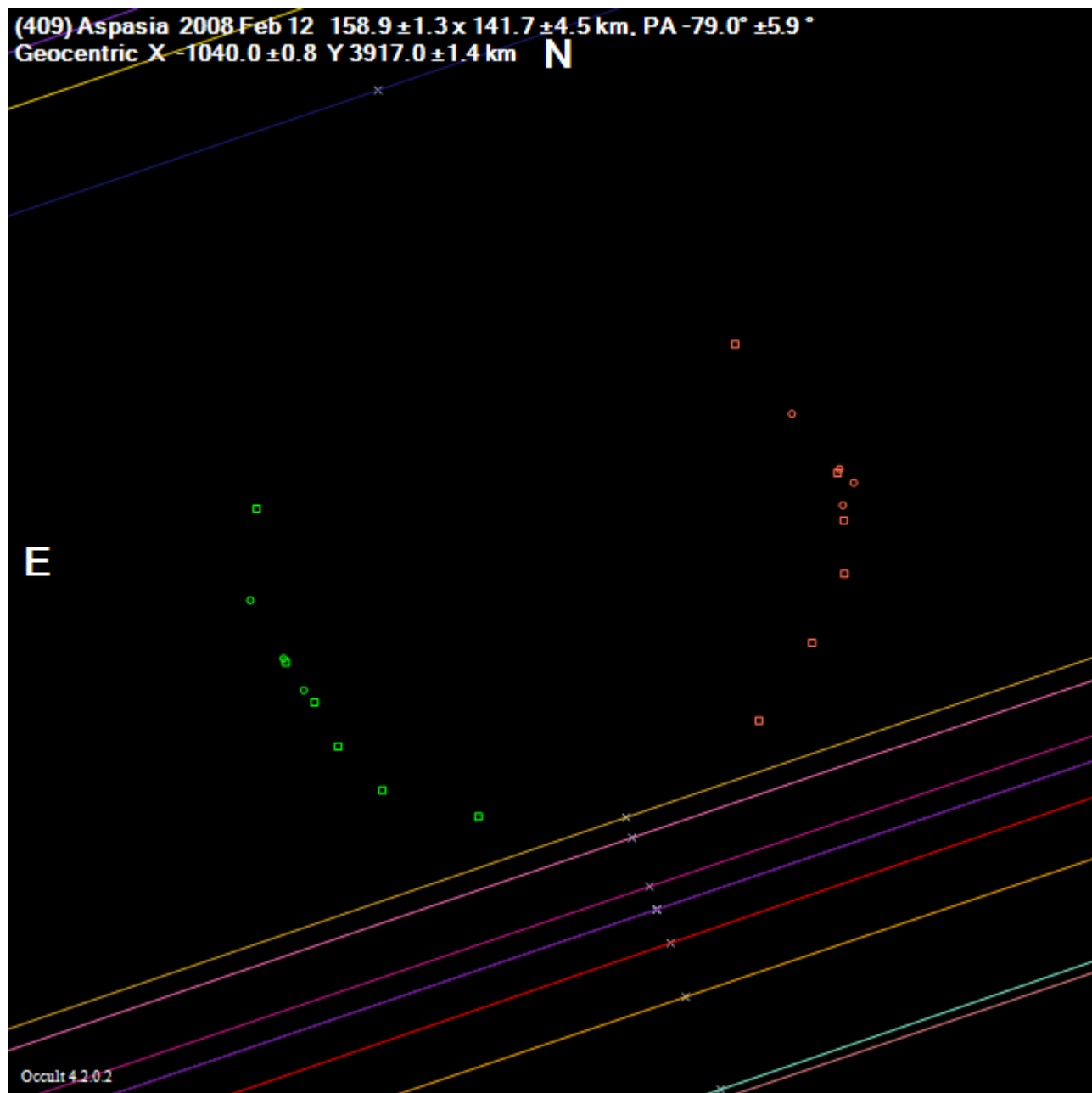
E

Occult 4.2.0.2



409aspasia2008feb12

(409) Aspasia 2008 Feb 12 $158.9 \pm 1.3 \times 141.7 \pm 4.5$ km, PA $-79.0^\circ \pm 5.9^\circ$
Geocentric X -1040.0 ± 0.8 Y 3917.0 ± 1.4 km **N**

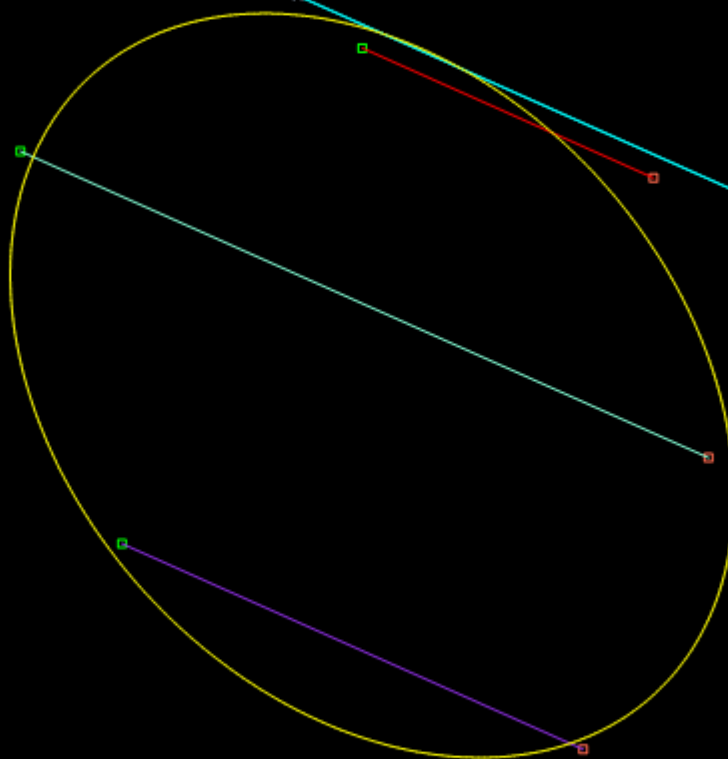


409aspasia2014aug30

(409) Aspasia 2014 Aug 30 $199.2 \pm 3.9 \times 146.3 \pm 3.3$ km, PA $42.3^\circ \pm 3.0^\circ$
Geocentric X 3272.0 ± 1.5 Y -4732.1 ± 1.5 km **N**

E

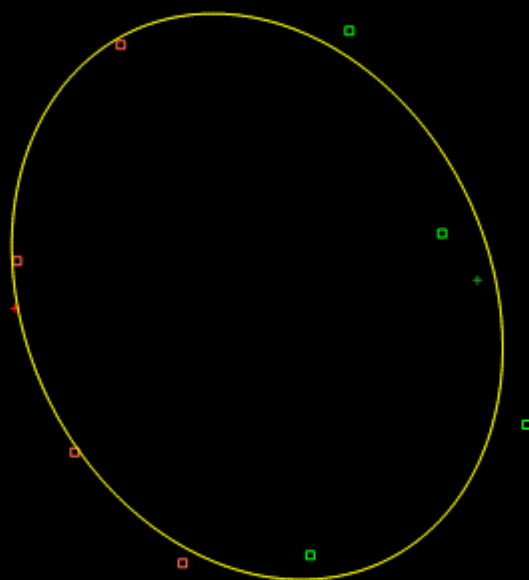
Occult 4.2.0.2



409aspasia2015sep04

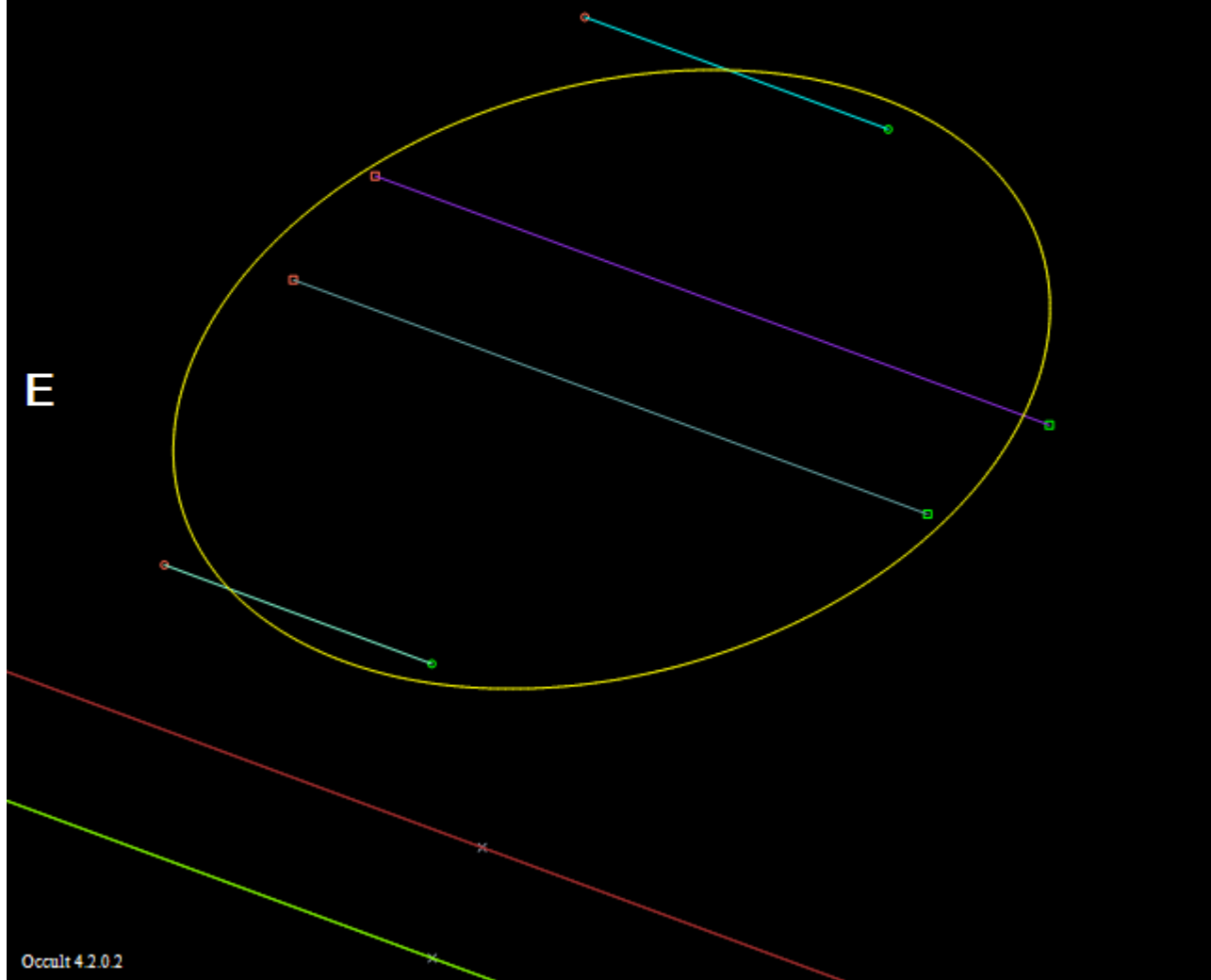
(409) Aspasia 2015 Sep 4 $184.0 \pm 8.5 \times 145.9 \pm 6.2$ km, PA $25.8^\circ \pm 8.9^\circ$
Geocentric X -4387.1 ± 2.8 Y 2646.7 ± 3.2 km **N**

E



40harmonia2007nov12

(40) Harmonia 2007 Nov 12 $132.6 \pm 8.6 \times 86.9 \pm 7.0$ km, PA $-73.5^\circ \pm 5.7^\circ$
Geocentric X 1543.3 ± 3.1 Y 5539.2 ± 2.5 km **N**



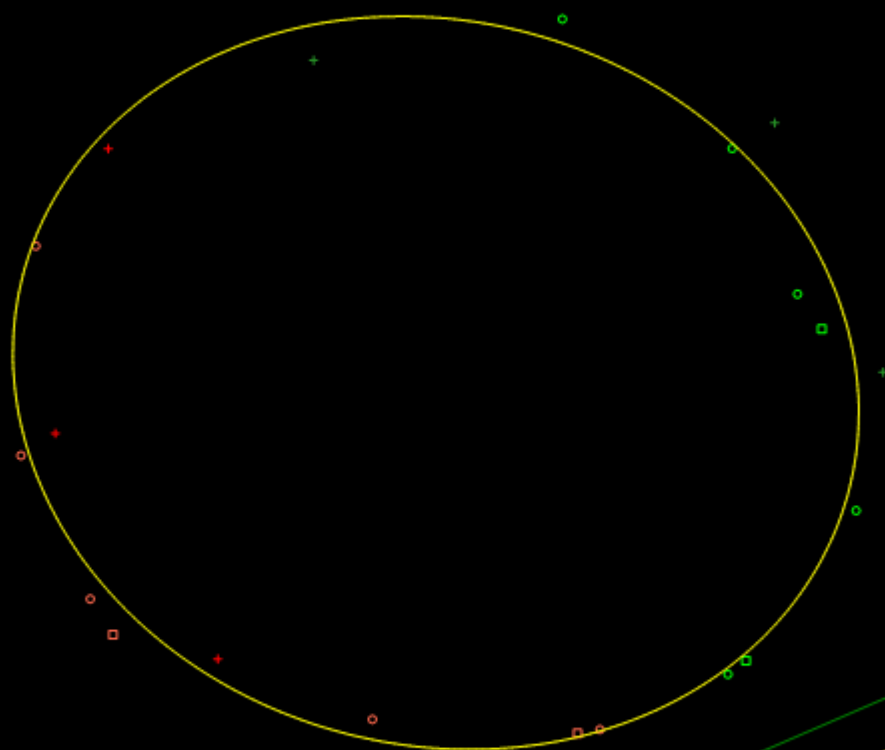
411xanthe2007apr18

(411) Xanthe 2007 Apr 18 $71.6 \pm 1.1 \times 84.4 \pm 1.1$ km, PA $-14.7^\circ \pm 3.7^\circ$
Geocentric X -16.5 ± 0.4 Y 384.3 ± 0.5 km

N

E

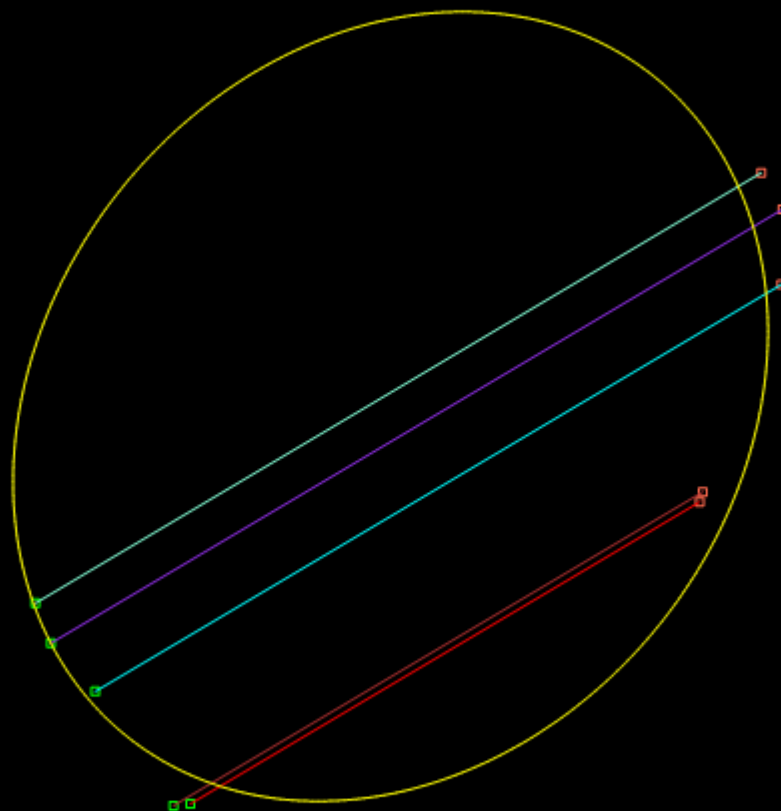
Occult 4.2.0.2



412elisabetha2011jan23

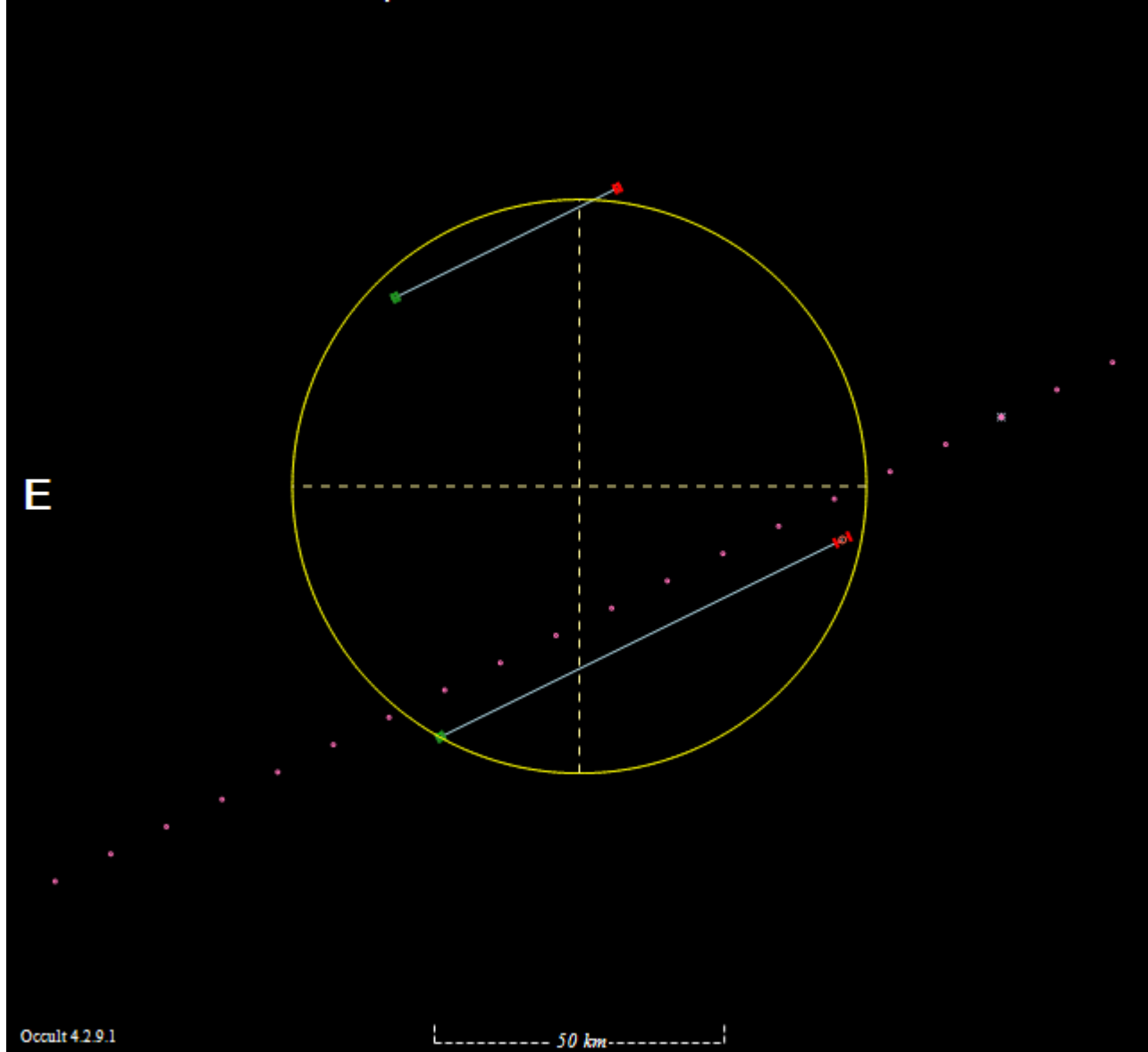
(412) Elisabetha 2011 Jan 23 100.0 x 82.0 km, PA $-38.4^{\circ} \pm 8.9^{\circ}$
Geocentric X -3177.5 ± 1.3 Y 1509.2 ± 1.8 km **N**

E



412Elisabetha2016Mar17

(412) Elisabetha 2016 Mar 17 $99.0 \pm 4.2 \times 99.0$ km, PA 0.0°
Geocentric X -3894.4 ± 2.1 Y 3694.4 ± 1.8 km **N**
Sat: 10.0×10.0 km, PA 0.0° ; Sep $0.2110''$ at PA -50.7°

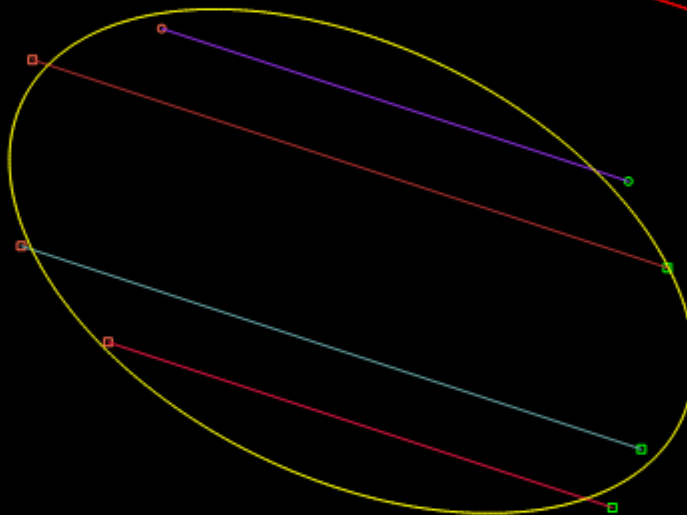


415palatia2009mar01

(415) Palatia 2009 Mar 1 $72.4 \pm 1.9 \times 42.7 \pm 2.6$ km, PA $63.9^\circ \pm 2.3^\circ$
Geocentric X -4594.0 ± 0.7 Y 4093.7 ± 0.6 km **N**

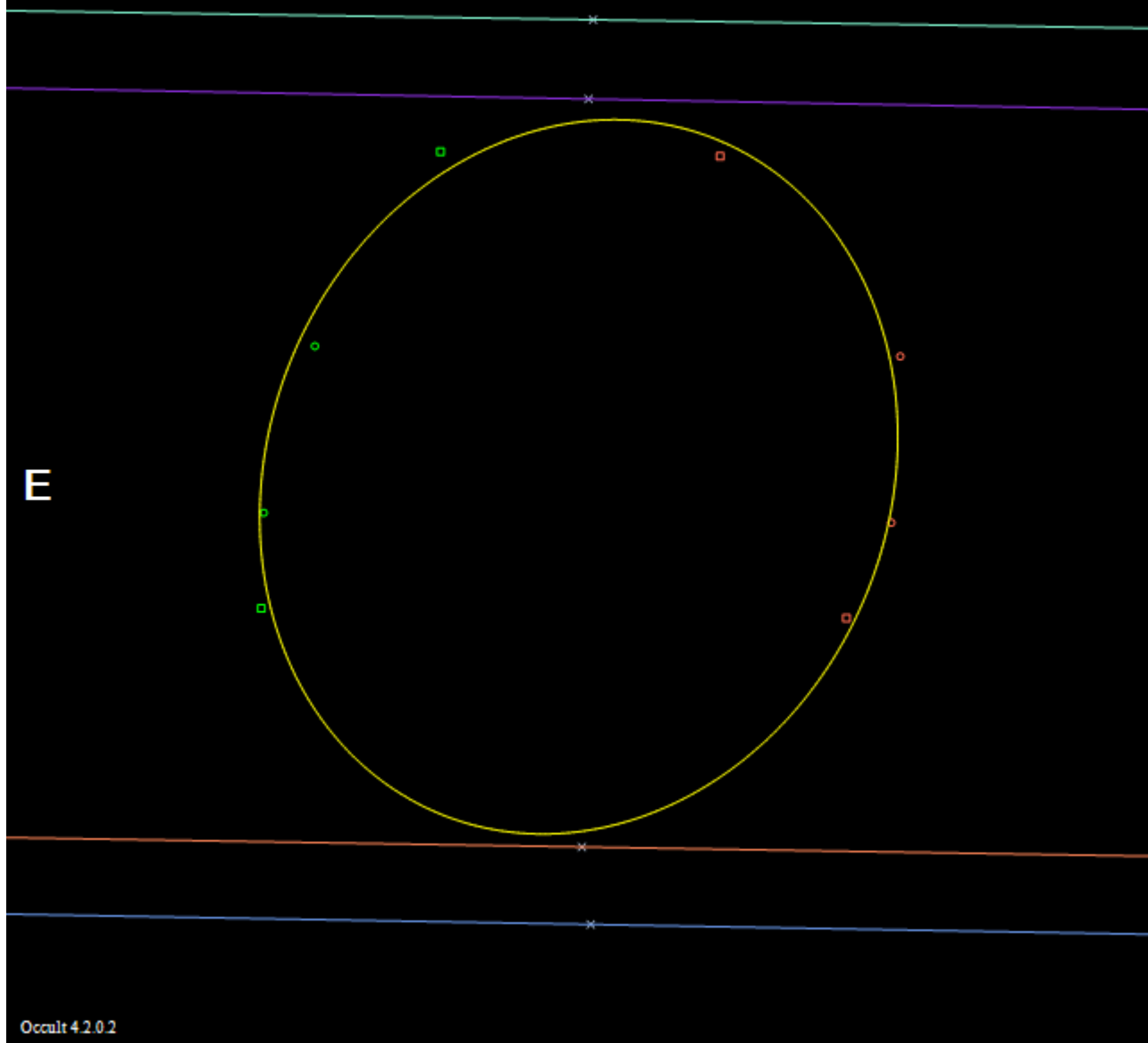
E

Occult 4.2.0.2



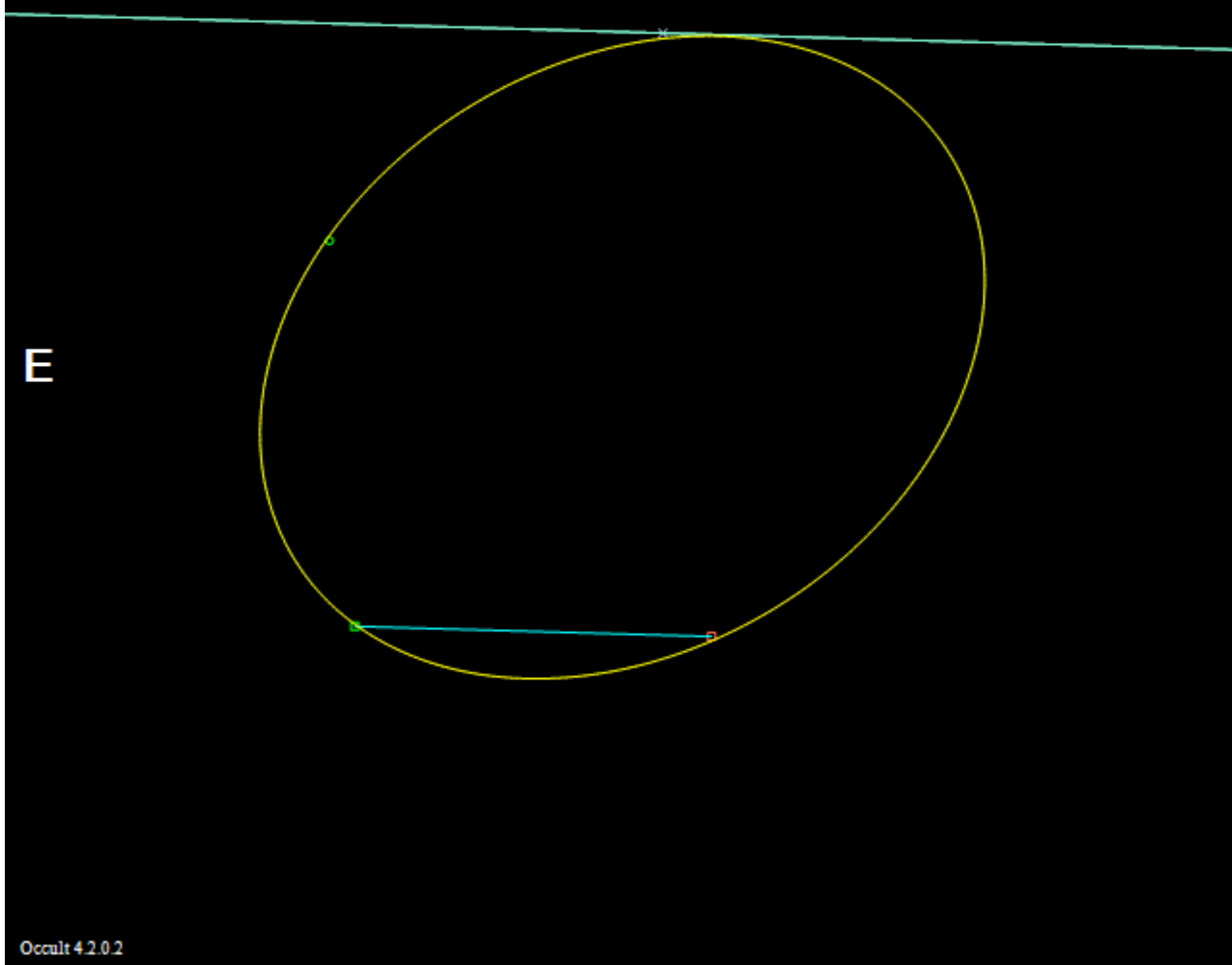
419aurelia2006dec05

(419) Aurelia 2006 Dec 5 $136.9 \pm 7.5 \times 116.7 \pm 2.3$ km, PA $-22.5^\circ \pm 10.0^\circ$
Geocentric X -4661.1 ± 1.0 Y 2384.5 ± 3.2 km **N**



419aurelia2011jan08

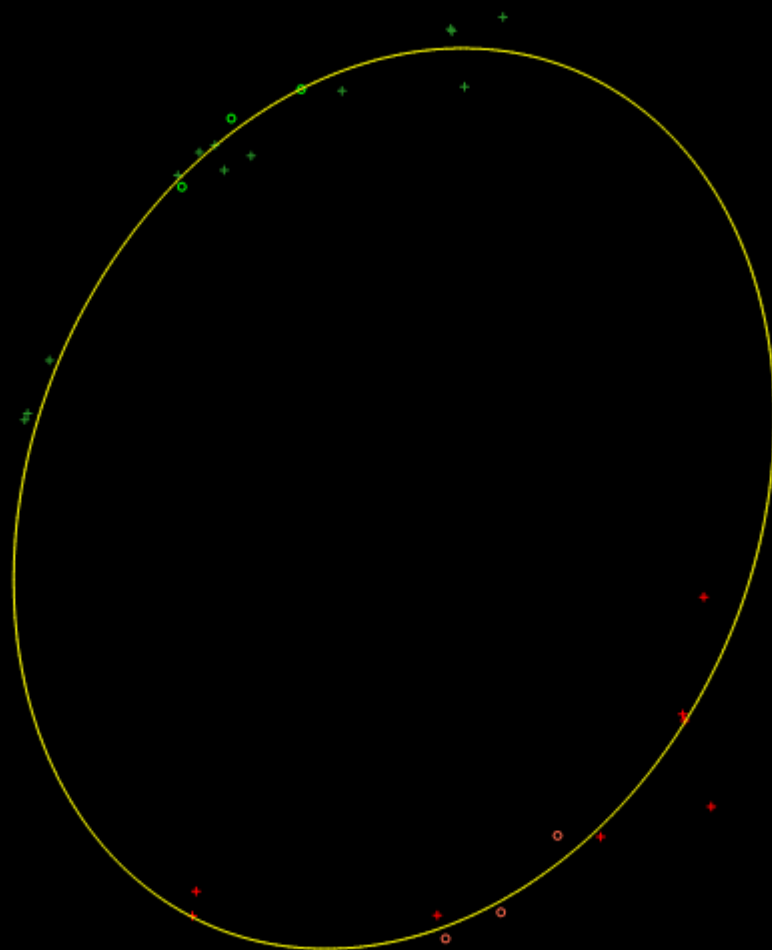
(419) Aurelia 2011 Jan 8 143.0 x 109.0 km. PA $-58.4^{\circ} \pm 2.5^{\circ}$
Geocentric X 287.1 ± 0.4 Y -5152.5 ± 0.5 km **N**



41daphne1999jul02

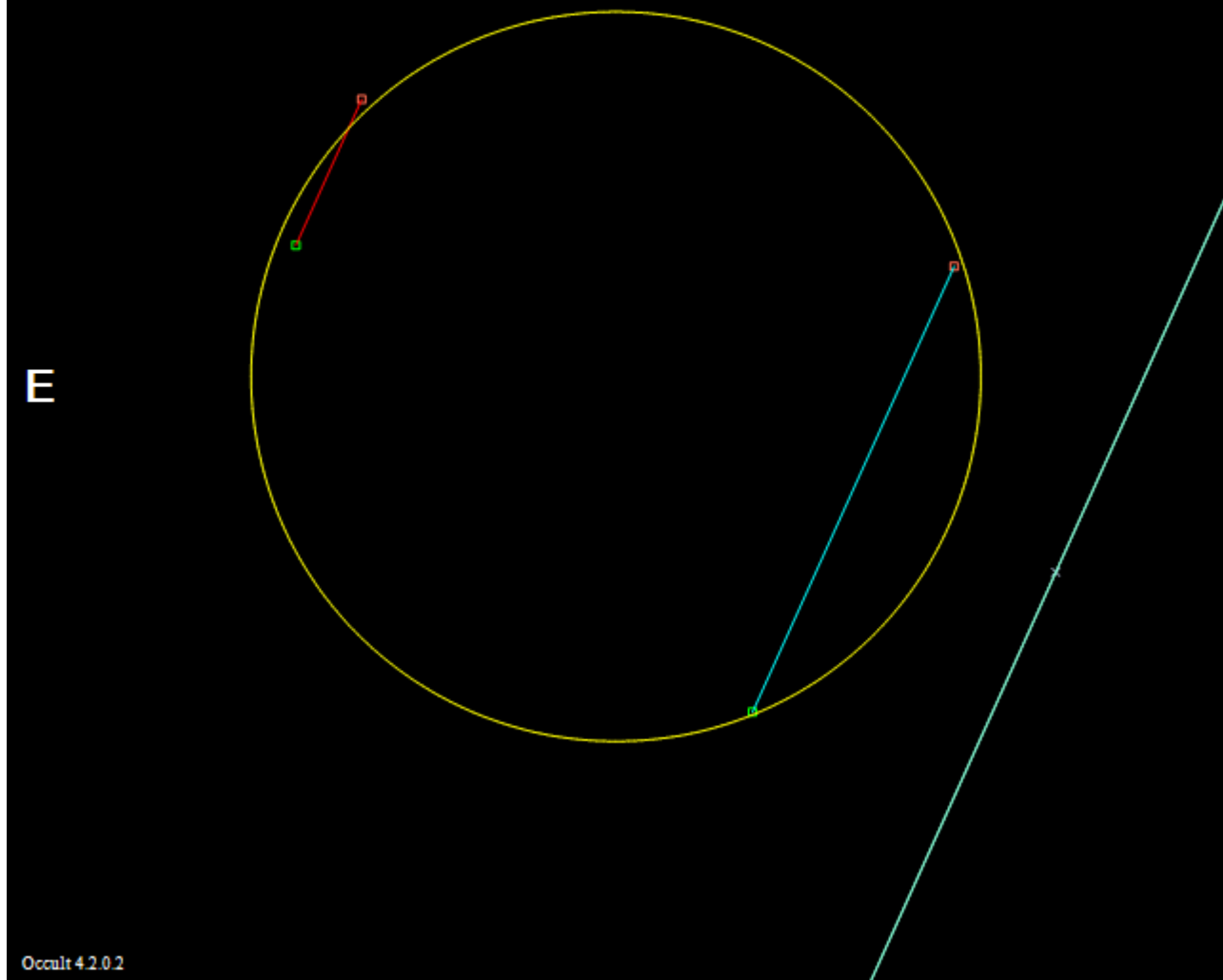
(41) Daphne 1999 Jul 2 $210.5 \pm 6.4 \times 164.1 \pm 4.8$ km, PA $-23.4^\circ \pm 6.3^\circ$
Geocentric X 1329.4 ± 2.5 Y 4238.9 ± 1.9 km **N**

E



41daphne2008apr01

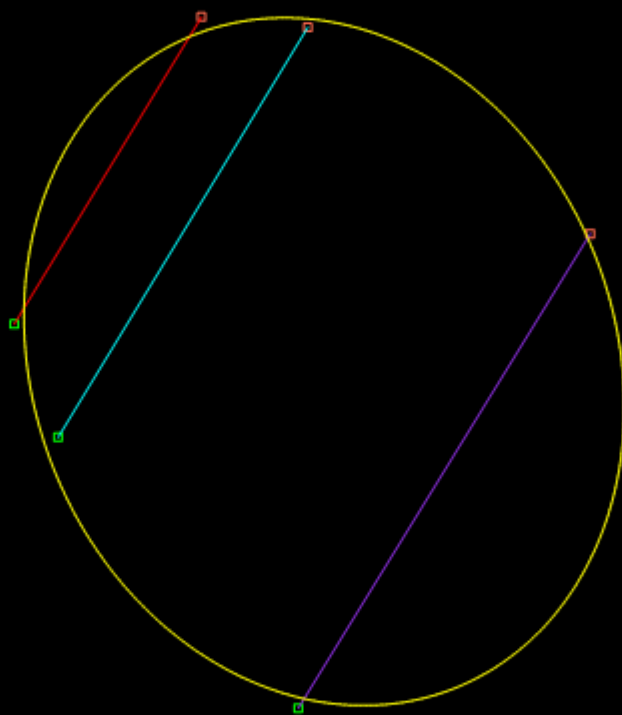
(41) Daphne 2008 Apr 1 $209.5 \pm 6.4 \times 209.5$ km, PA 0.0°
Geocentric X 2867.7 ± 2.4 Y 3526.8 ± 2.9 km **N**



41daphne2012feb23

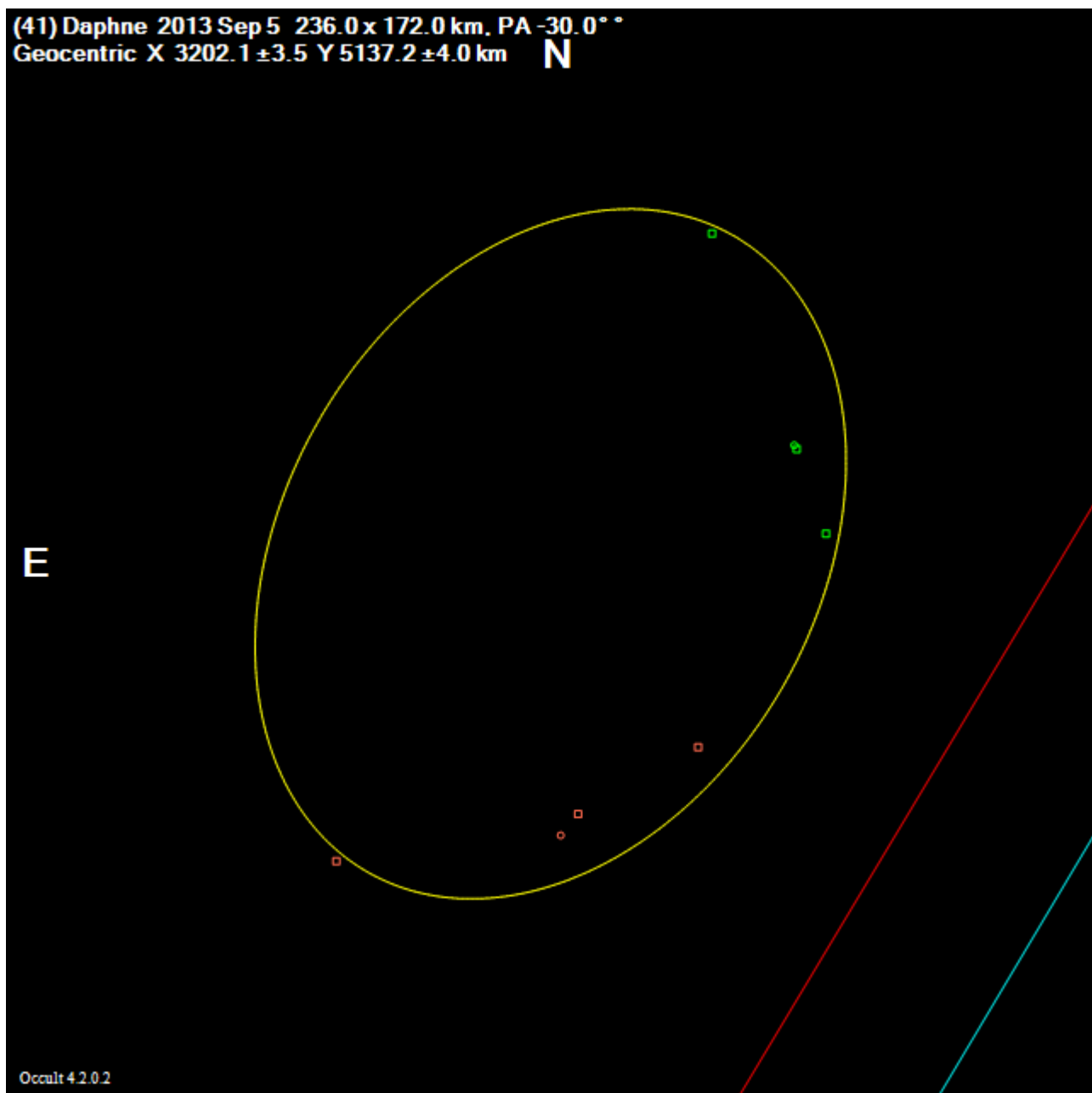
(41) Daphne 2012 Feb 23 192.2 x 159.0 \pm 3.7 km, PA 22.0° \pm 7.5°
Geocentric X -331.5 \pm 2.0 Y 4574.6 \pm 1.7 km **N**

E



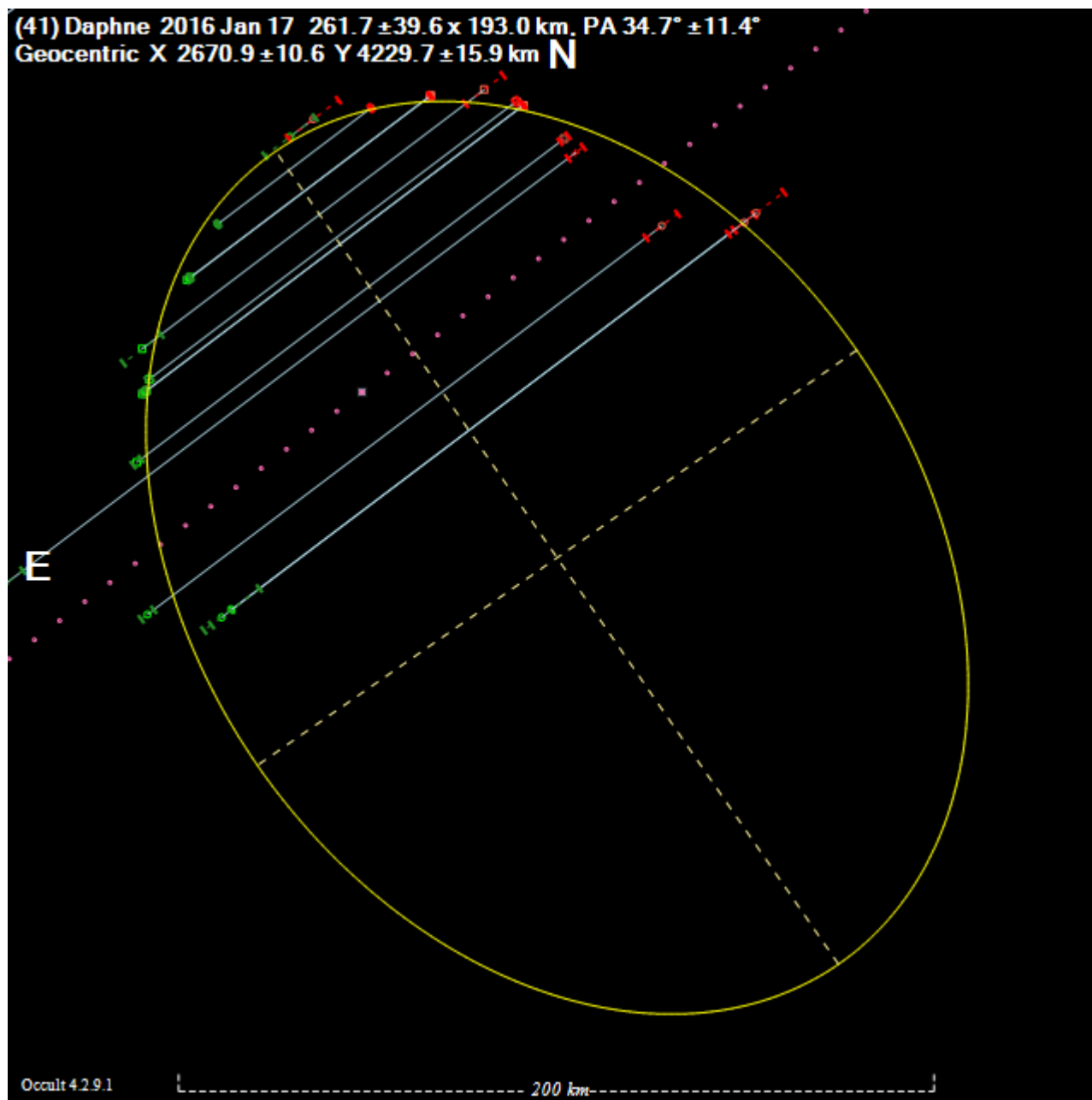
41daphne2013sep05

(41) Daphne 2013 Sep 5 236.0 x 172.0 km, PA -30.0° °
Geocentric X 3202.1 ± 3.5 Y 5137.2 ± 4.0 km **N**



41Daphne2016Jan17

(41) Daphne 2016 Jan 17 $261.7 \pm 39.6 \times 193.0$ km, PA $34.7^\circ \pm 11.4^\circ$
Geocentric X 2670.9 ± 10.6 Y 4229.7 ± 15.9 km **N**



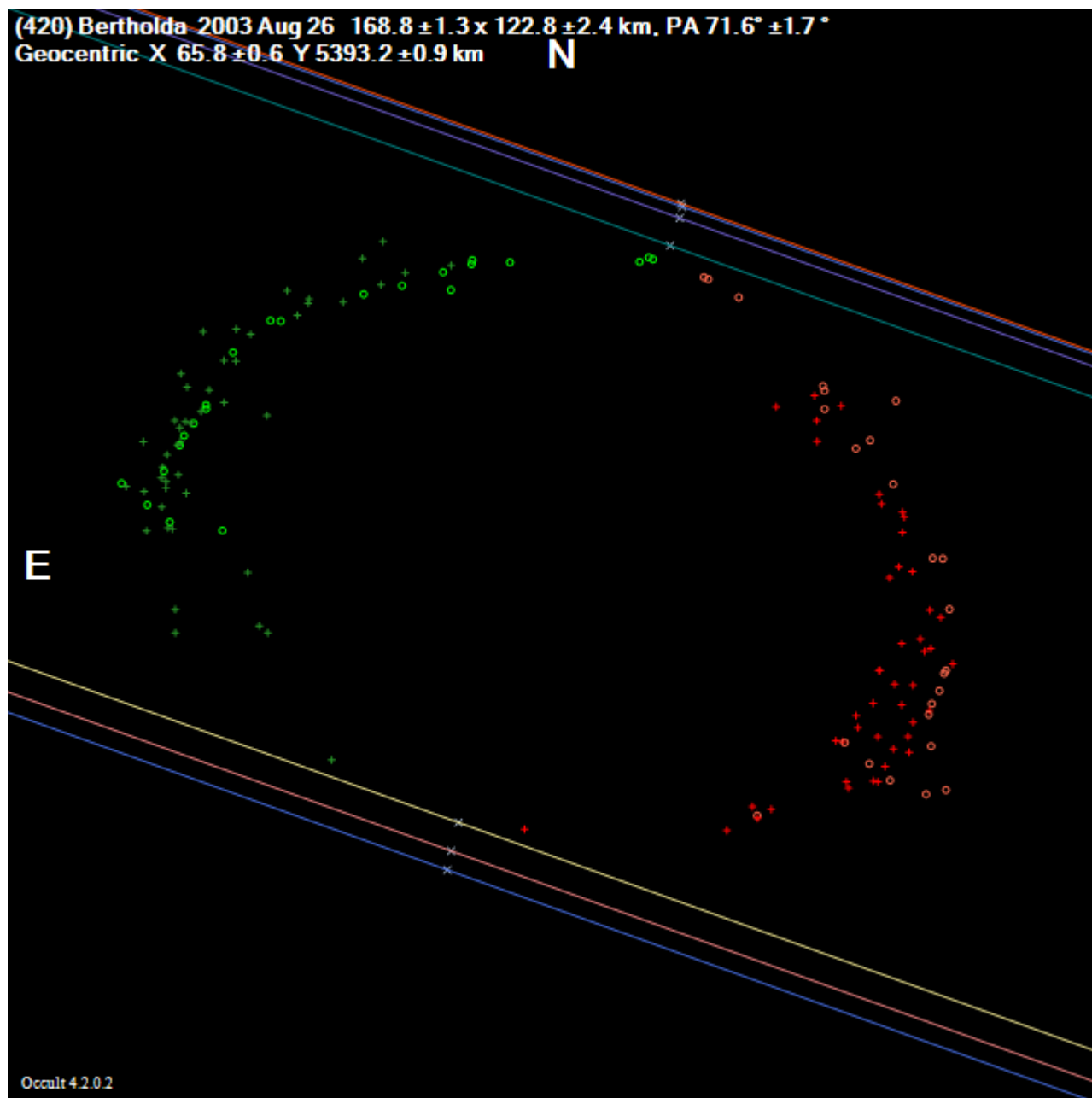
420bertholda2003aug26

(420) Bertholda 2003 Aug 26 $168.8 \pm 1.3 \times 122.8 \pm 2.4$ km, PA $71.6^\circ \pm 1.7^\circ$
Geocentric X 65.8 ± 0.6 Y 5393.2 ± 0.9 km

N

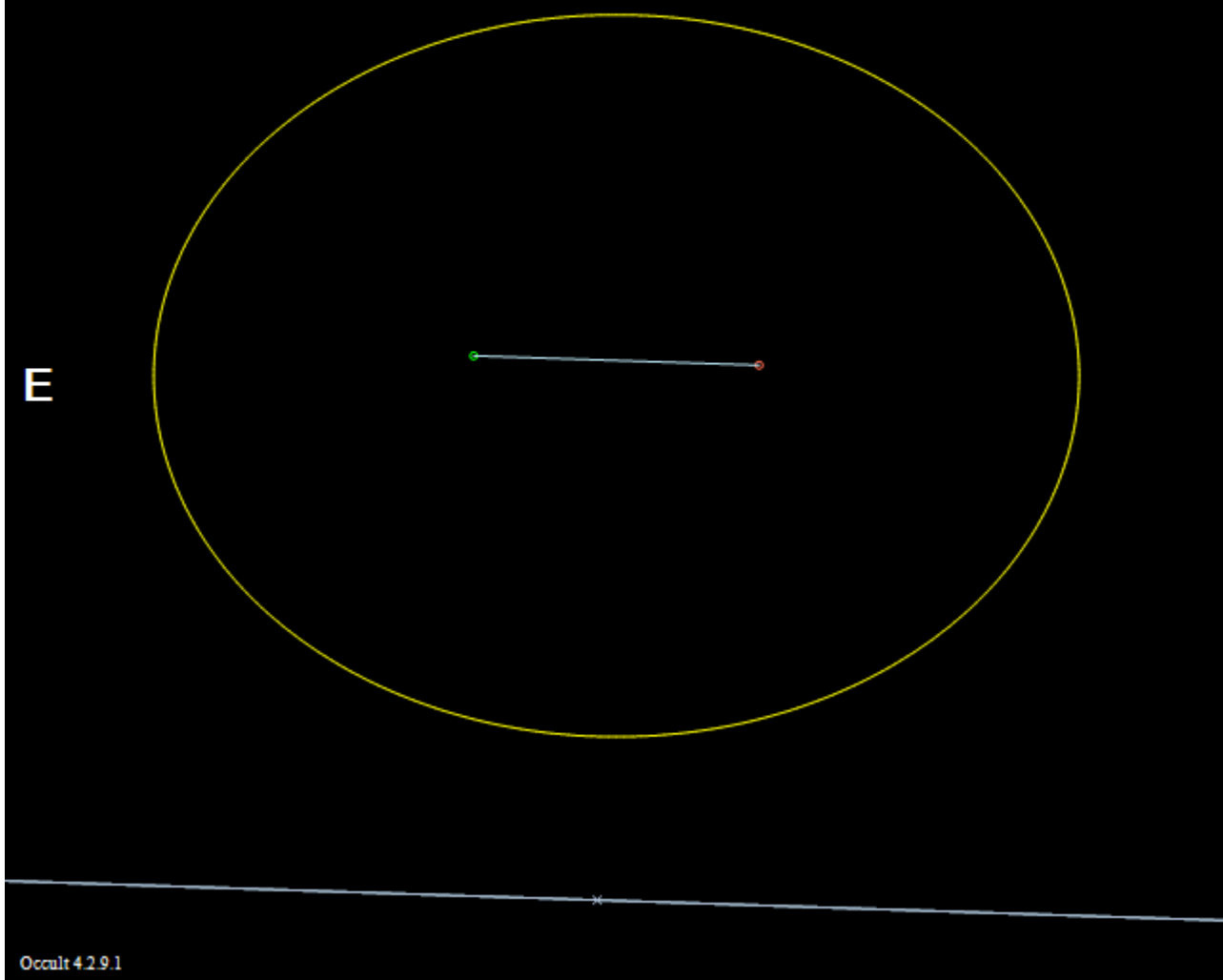
E

Occult 4.2.0.2



420bertholda2015jul31

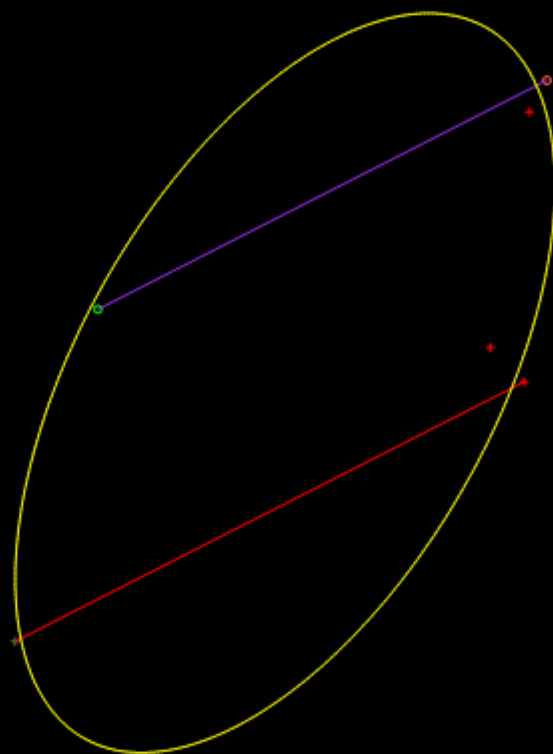
(420) Bertholda 2015 Jul 31 182.0 x 142.0 km, PA 90.0°
Geocentric X -1912.0 ± 0.2 Y -841.5 ± 0.5 km **N**



423diotima2000jan07

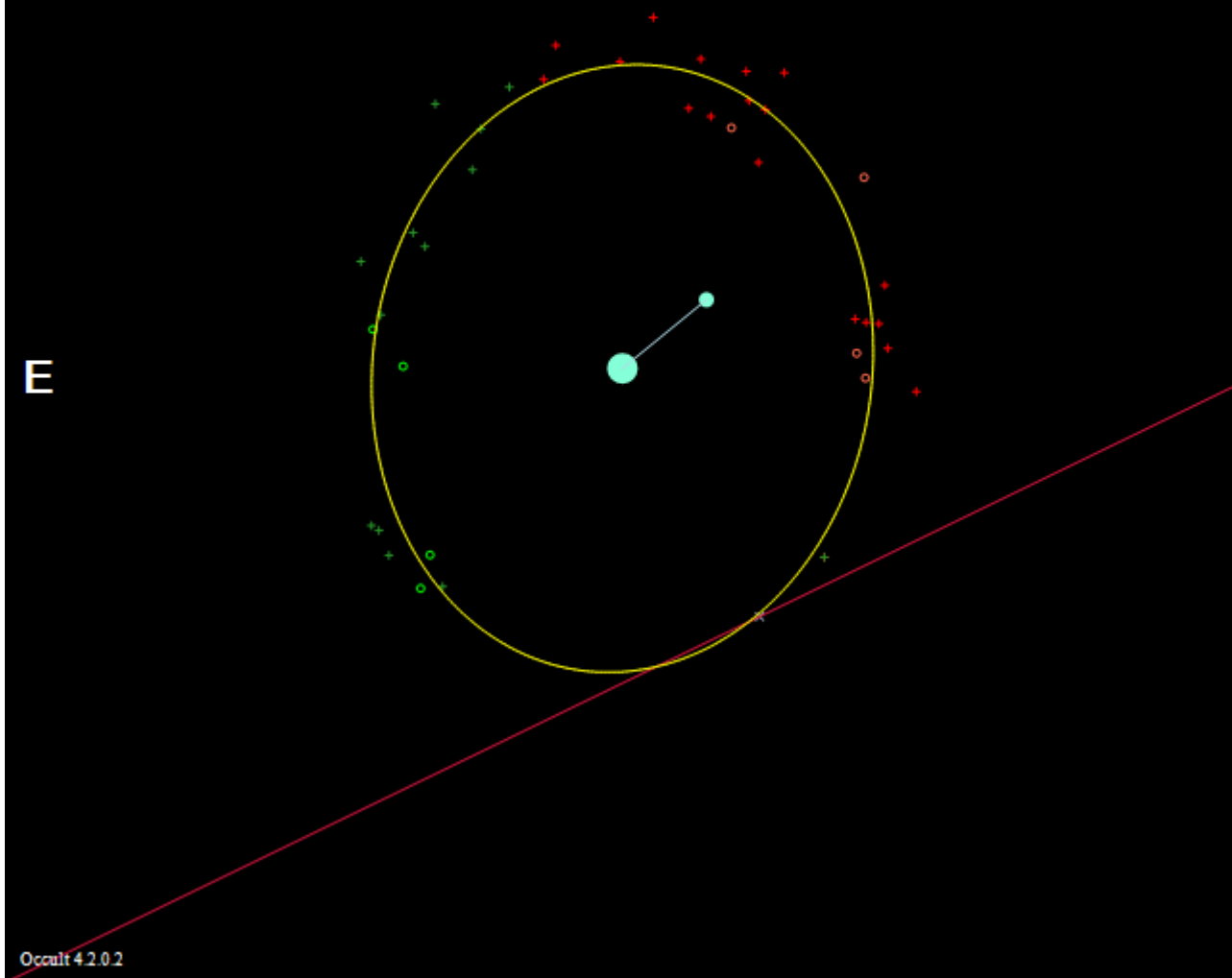
(423) Diotima 2000 Jan 7 221.0 x 112.0 km, PA -29.5°
Geocentric X -2936.4 ± 2.0 Y 2118.7 ± 4.2 km **N**

E



423diotima2001mar15

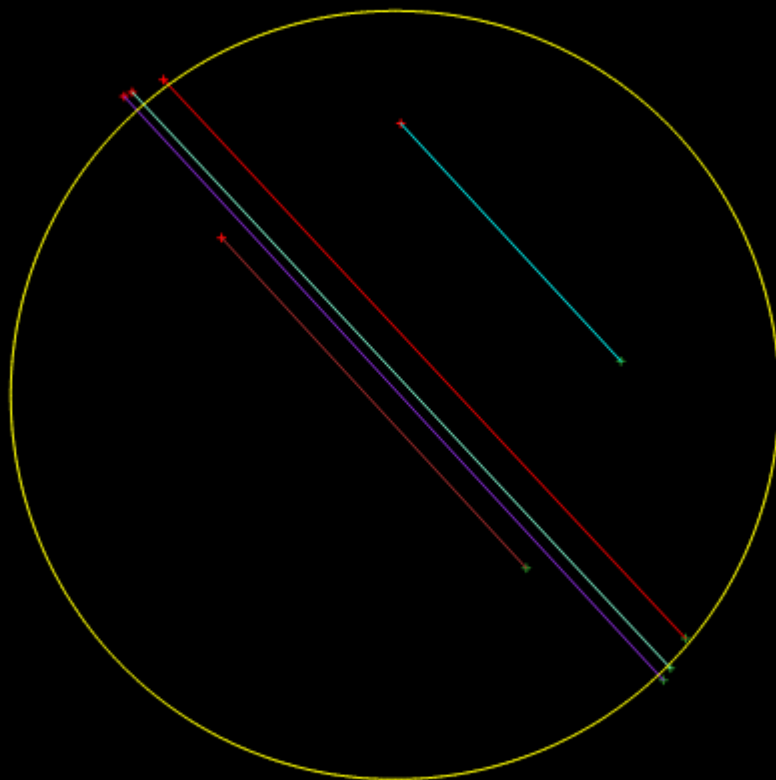
(423) Diotima 2001 Mar 15 $171.9 \pm 7.4 \times 140.7 \pm 3.3$ km, PA $-8.1^\circ \pm 7.9^\circ$
Geocentric X -3203.8 ± 2.2 Y 4069.1 ± 4.0 km **N**
Double : Sep $0.0197 \pm 0.0019''$, PA $-50.7^\circ \pm 7.4^\circ$



423diotima2010dec10

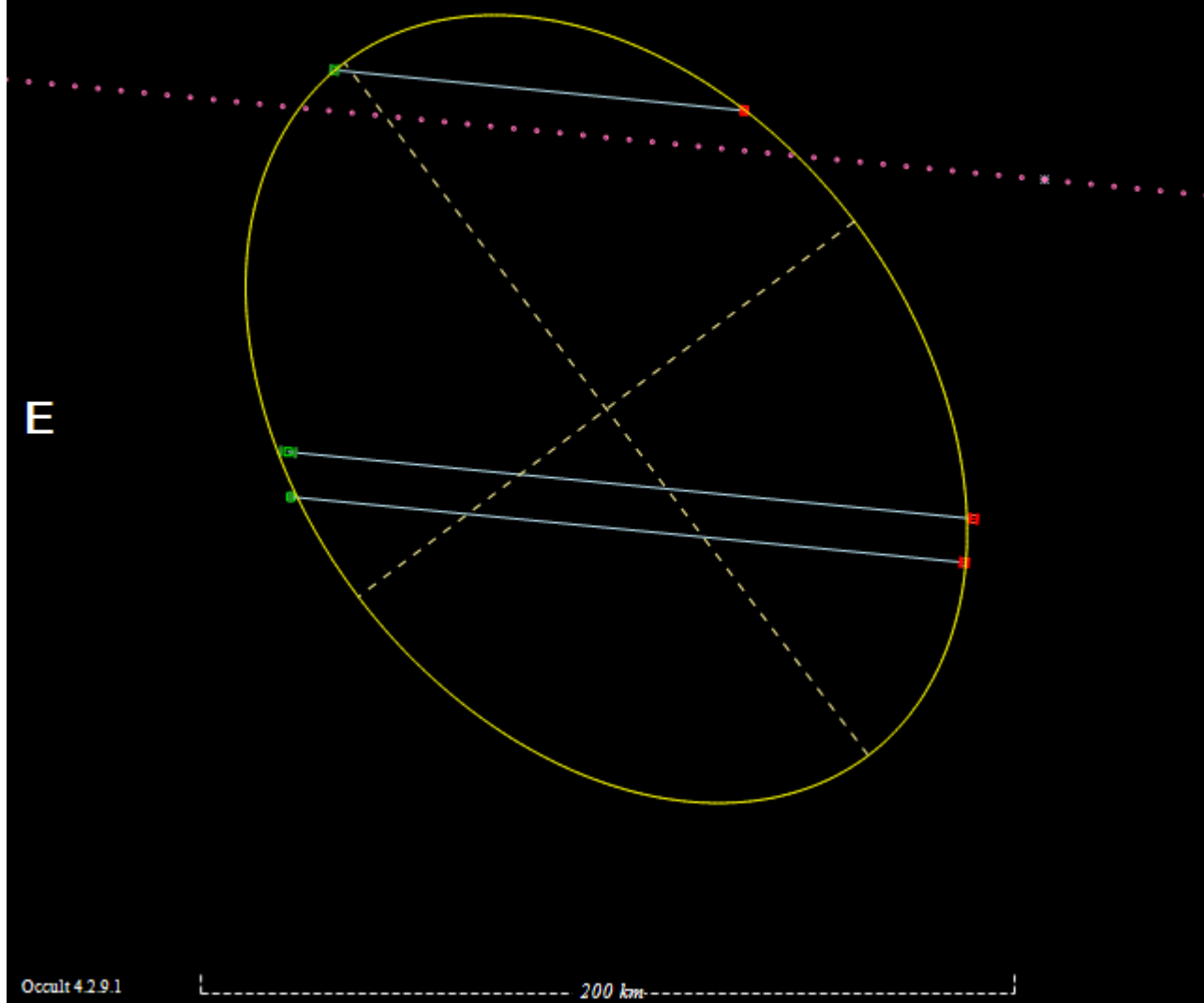
(423) Diotima 2010 Dec 10 172.0 x 172.0 km, PA 0.0° °
Geocentric X 127.5 ± 14.0 Y 713.7 ± 13.1 km **N**

E



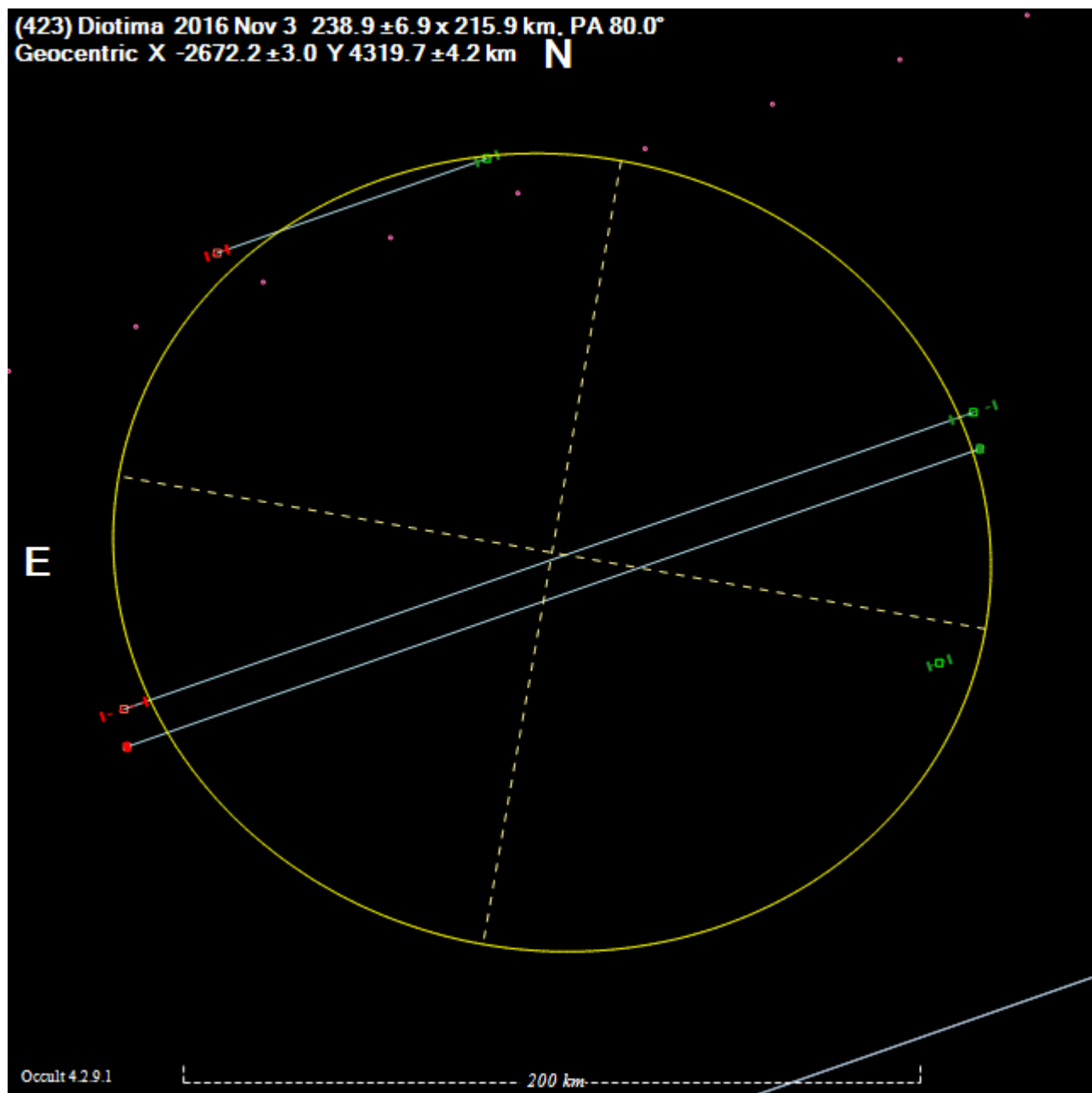
423Diotima2016Feb16

(423) Diotima 2016 Feb 16 $213.4 \pm 10.6 \times 152.9 \pm 2.4$ km, PA $37.1^\circ \pm 7.8^\circ$
Geocentric X 3870.3 ± 1.3 Y 4587.5 ± 5.5 km **N**



423Diotima2016Nov03

(423) Diotima 2016 Nov 3 $238.9 \pm 6.9 \times 215.9$ km, PA 80.0°
Geocentric X -2672.2 ± 3.0 Y 4319.7 ± 4.2 km **N**



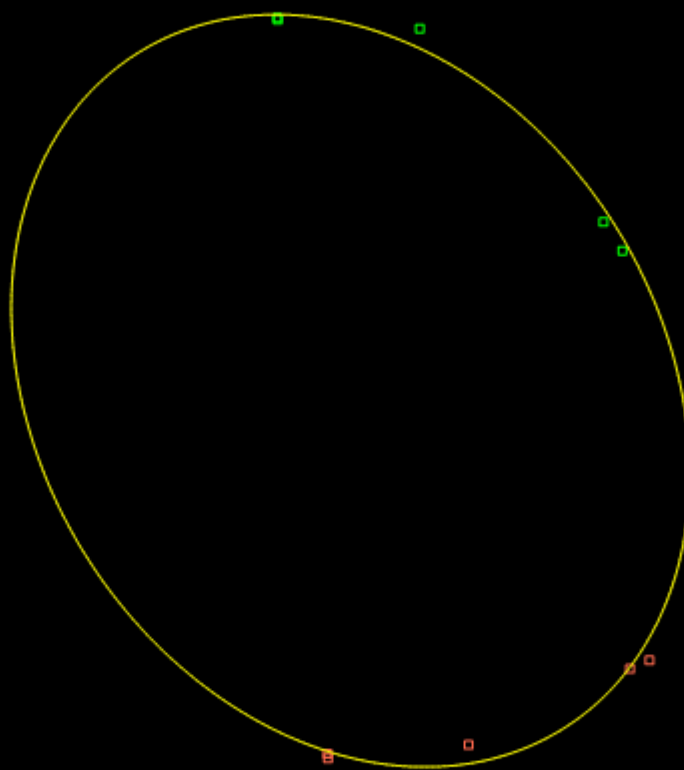
426hippo2012jan13

(426) Hippo 2012 Jan 13 $125.7 \pm 2.0 \times 98.2 \pm 3.1$ km, PA $32.4^\circ \pm 5.5^\circ$
Geocentric X 3296.5 ± 1.9 Y 834.6 ± 0.4 km

N

E

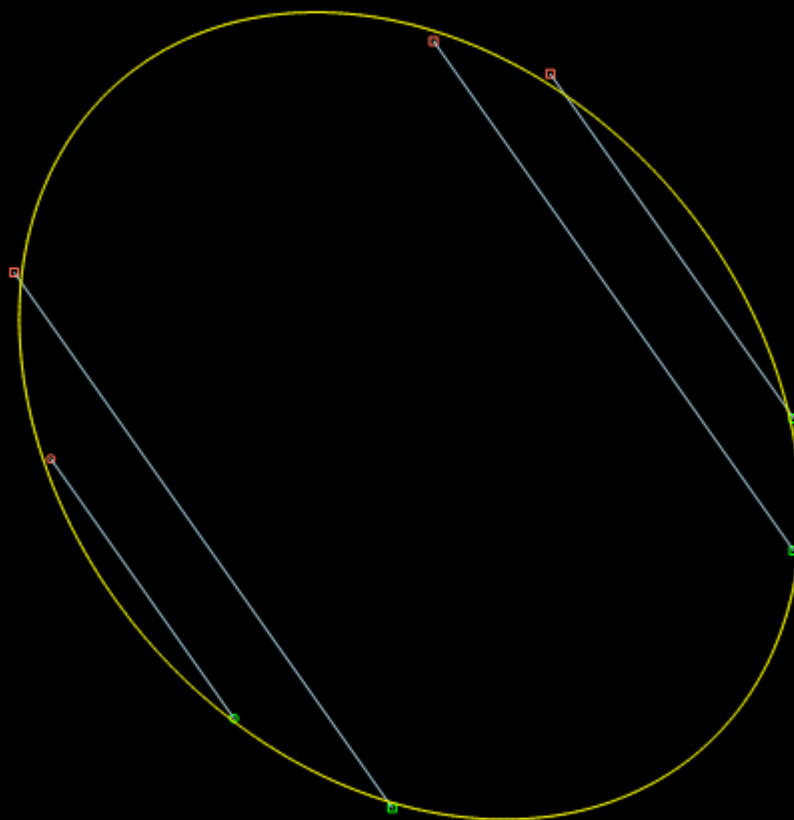
Occult 4.2.0.2



426hippo2015jun20

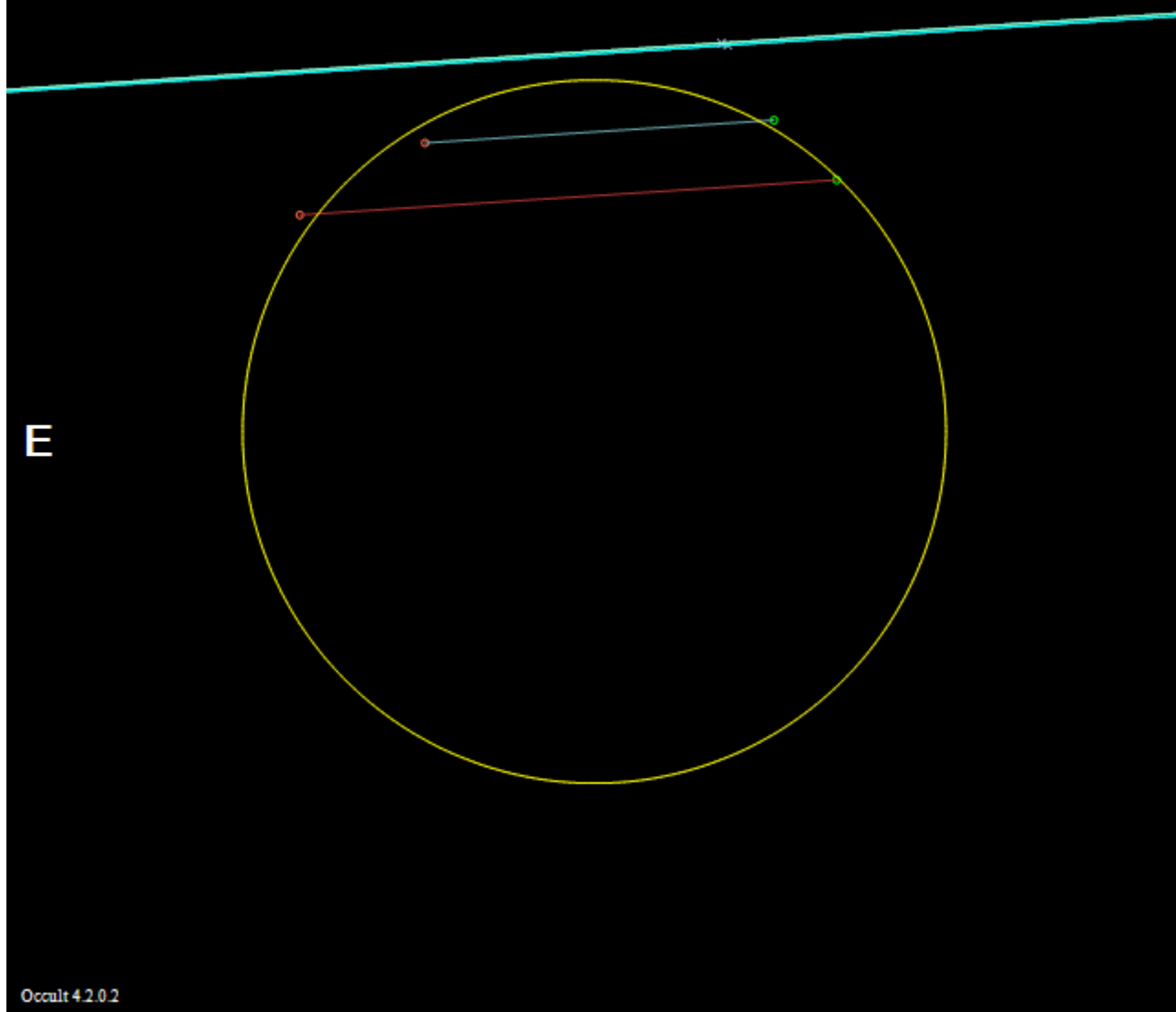
(426) Hippo 2015 Jun 20 $133.7 \pm 2.8 \times 104.3 \pm 1.4$ km, PA $41.2^\circ \pm 1.9^\circ$
Geocentric X -4966.3 ± 0.5 Y 3110.2 ± 0.6 km **N**

E



42isis2010sep20

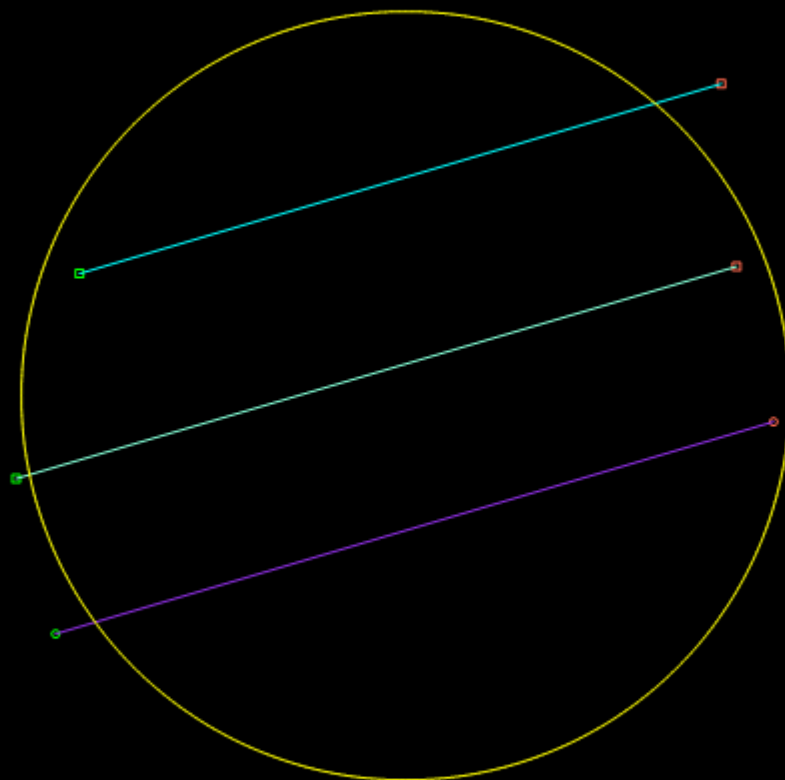
(42) Isis 2010 Sep 20 100.0 x 100.0 km, PA 0.0° °
Geocentric X -3437.7 ± 1.3 Y 3224.9 ± 1.1 km **N**



42isis2011jan22

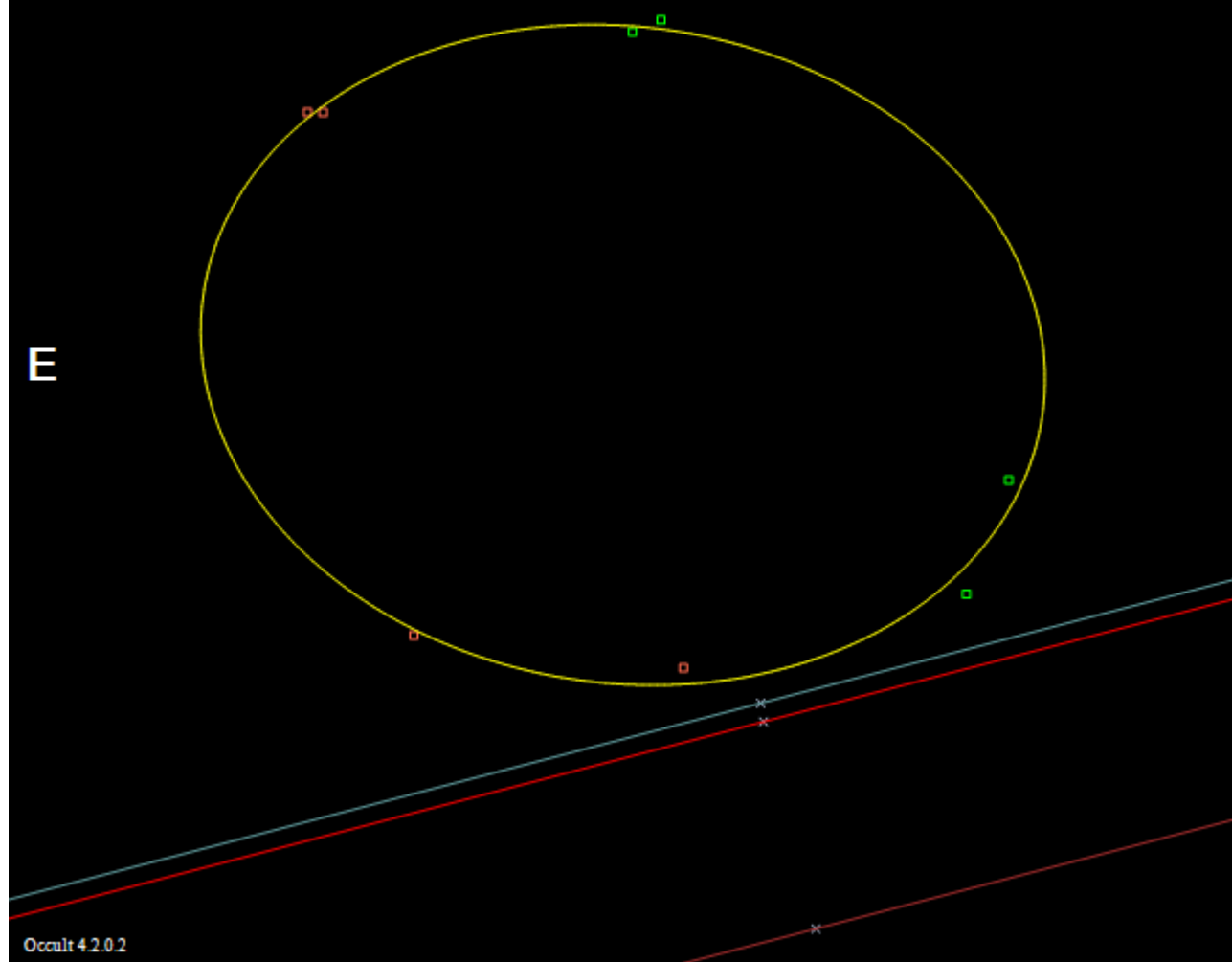
(42) Isis 2011 Jan 22 100.0 x 100.0 km, PA 0.0° °
Geocentric X 3972.2 ± 2.4 Y 3190.9 ± 4.9 km **N**

E



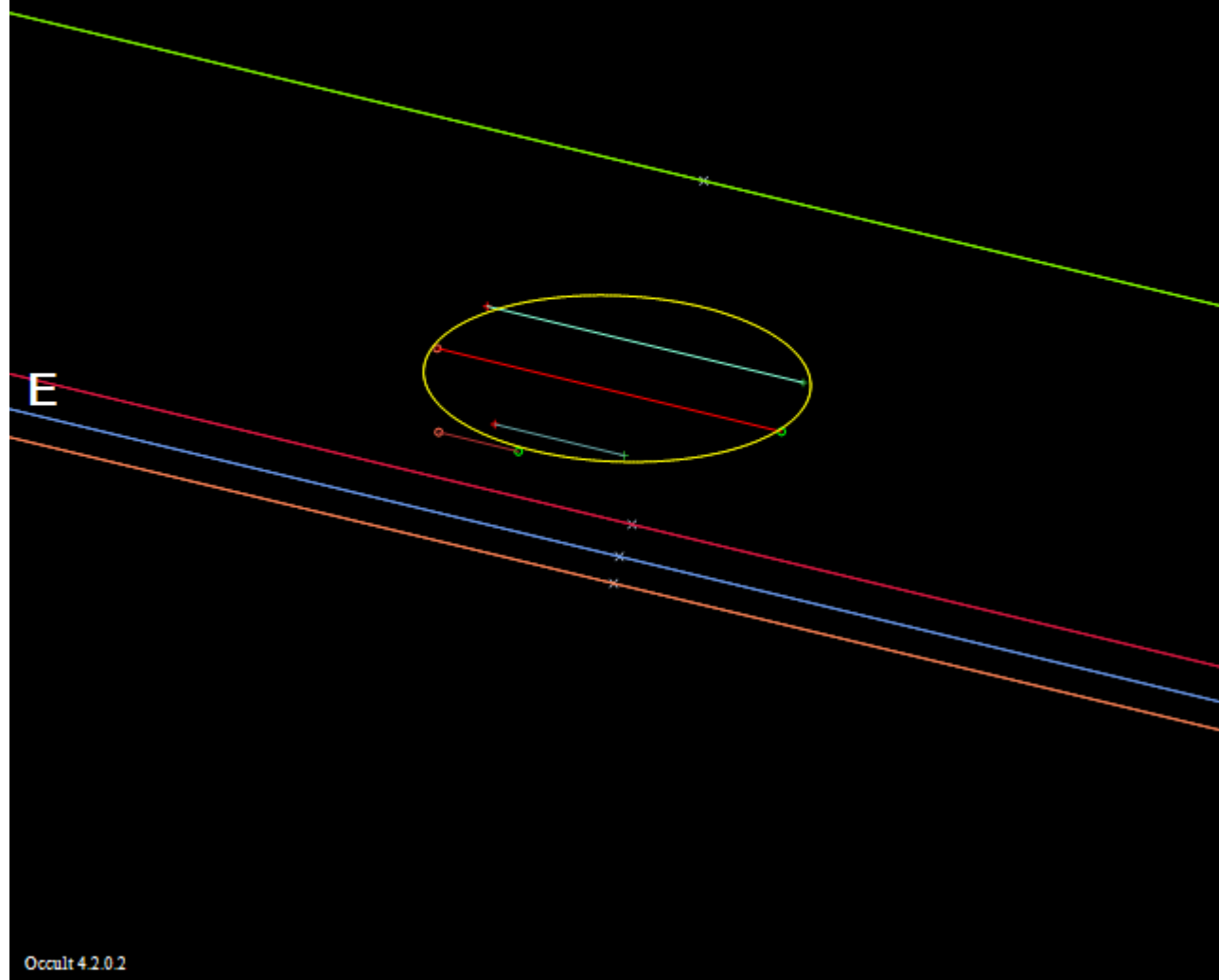
42isis2011may03

(42) Isis 2011 May 3 $115.2 \pm 4.2 \times 89.2 \pm 1.7$ km. PA $81.9^\circ \pm 6.5^\circ$
Geocentric X 3553.6 ± 1.2 Y 4011.1 ± 0.8 km **N**



430hybris2012aug14

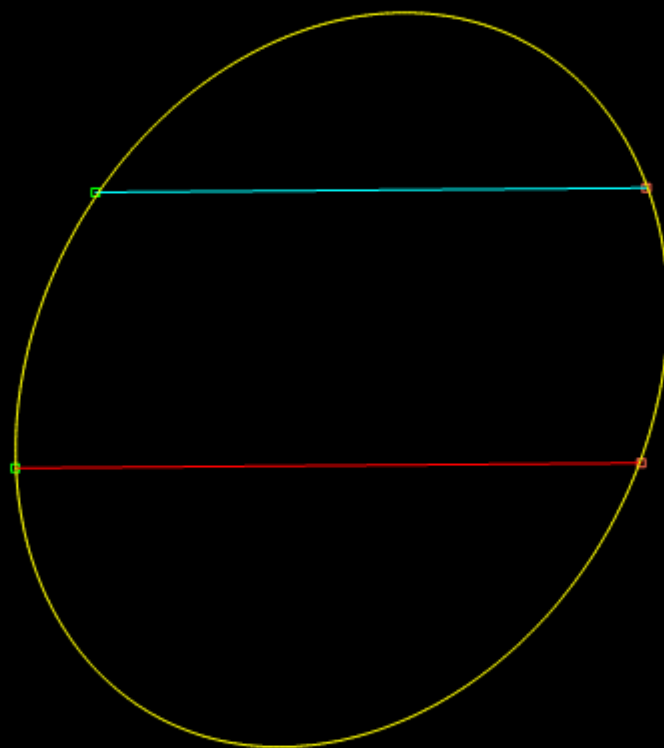
(430) Hybris 2012 Aug 14 $54.8 \pm 2.9 \times 23.5 \pm 3.9$ km, PA $87.5^\circ \pm 3.5^\circ$
Geocentric X -3930.5 ± 1.5 Y 2783.9 ± 1.3 km **N**



4317garibaldi2013may07

(4317) Garibaldi 2013 May 7 49.0 x 39.0 km, PA -29.2° ± 0.7°
Geocentric X -486.9 ± 0.0 Y 5494.6 ± 0.1 km **N**

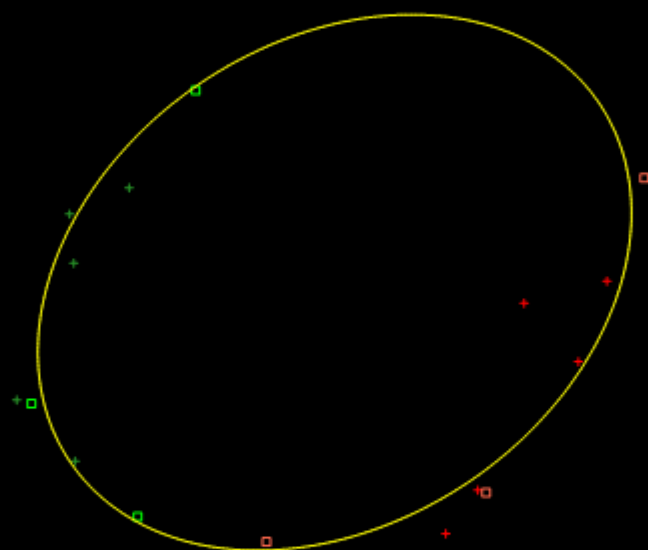
E



431nephele2002nov03

(431) Nephela 2002 Nov 3 $79.0 \pm 5.0 \times 59.4 \pm 3.1$ km, PA $-55.8^\circ \pm 11.1^\circ$
Geocentric X -4605.4 ± 1.5 Y 3327.7 ± 2.3 km **N**

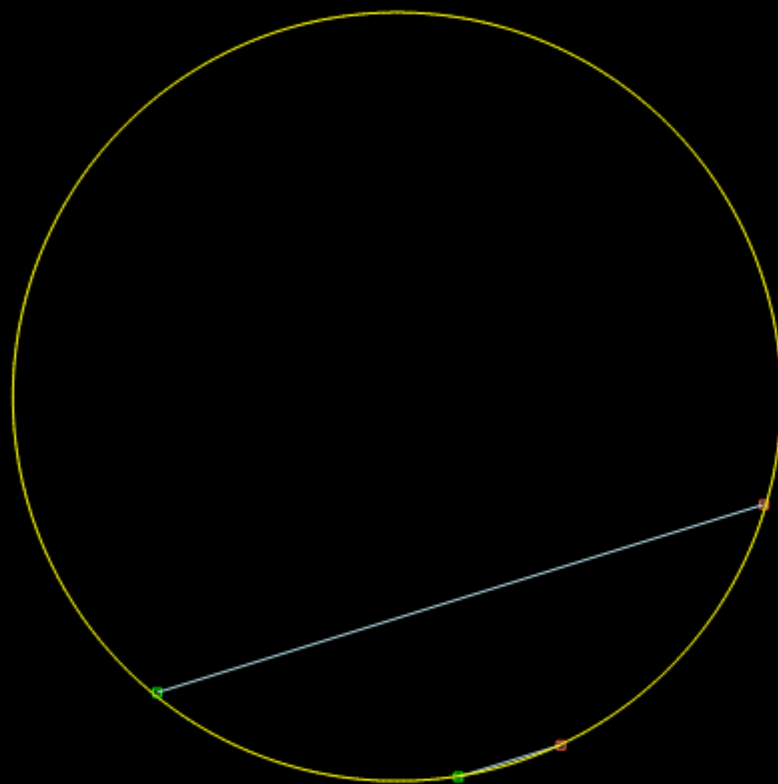
E



432pythia2015jan16

(432) Pythia 2015 Jan 16 46.0 x 46.0 km, PA 0.0°
Geocentric X 608.5 ± 0.1 Y -5689.0 ± 0.1 km **N**

E

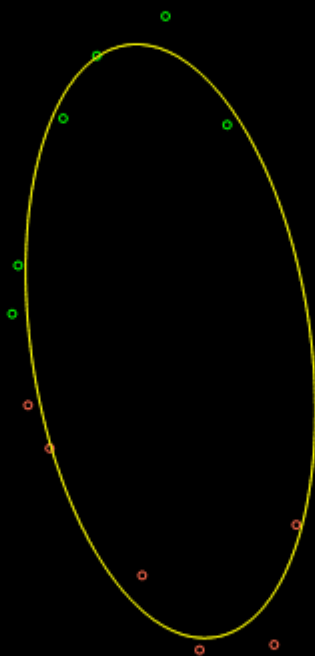


Occult 4.2.9.1

433eros1975jan24

(433) Eros 1975 Jan 24 $14.8 \pm 0.5 \times 6.9 \pm 0.6$ km, PA $8.4^\circ \pm 2.9^\circ$
Geocentric X -4160.3 ± 0.2 Y 2871.4 ± 0.2 km **N**

E



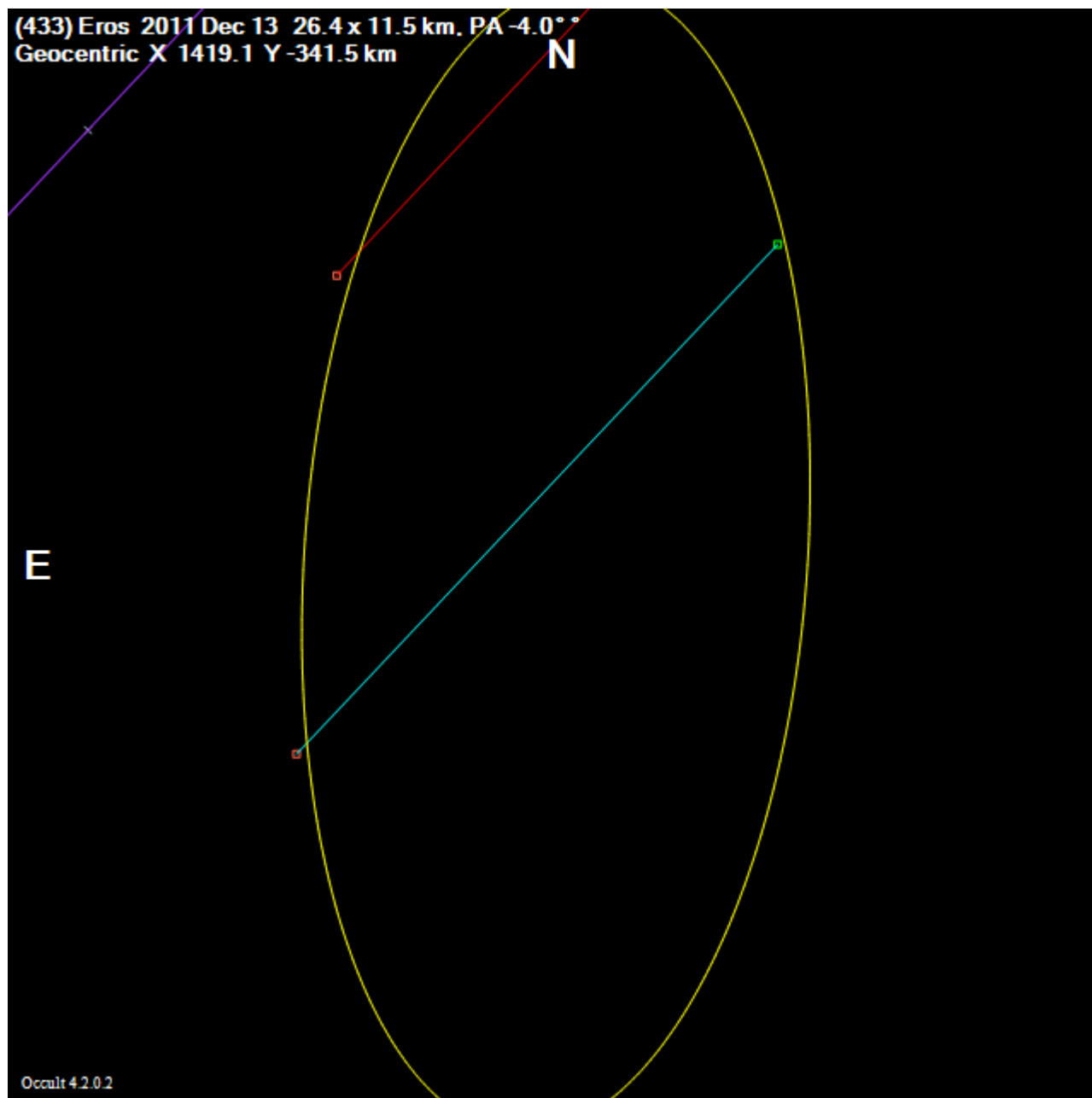
433eros2011dec13

(433) Eros 2011 Dec 13 26.4 x 11.5 km, PA -4.0°
Geocentric X 1419.1 Y -341.5 km

N

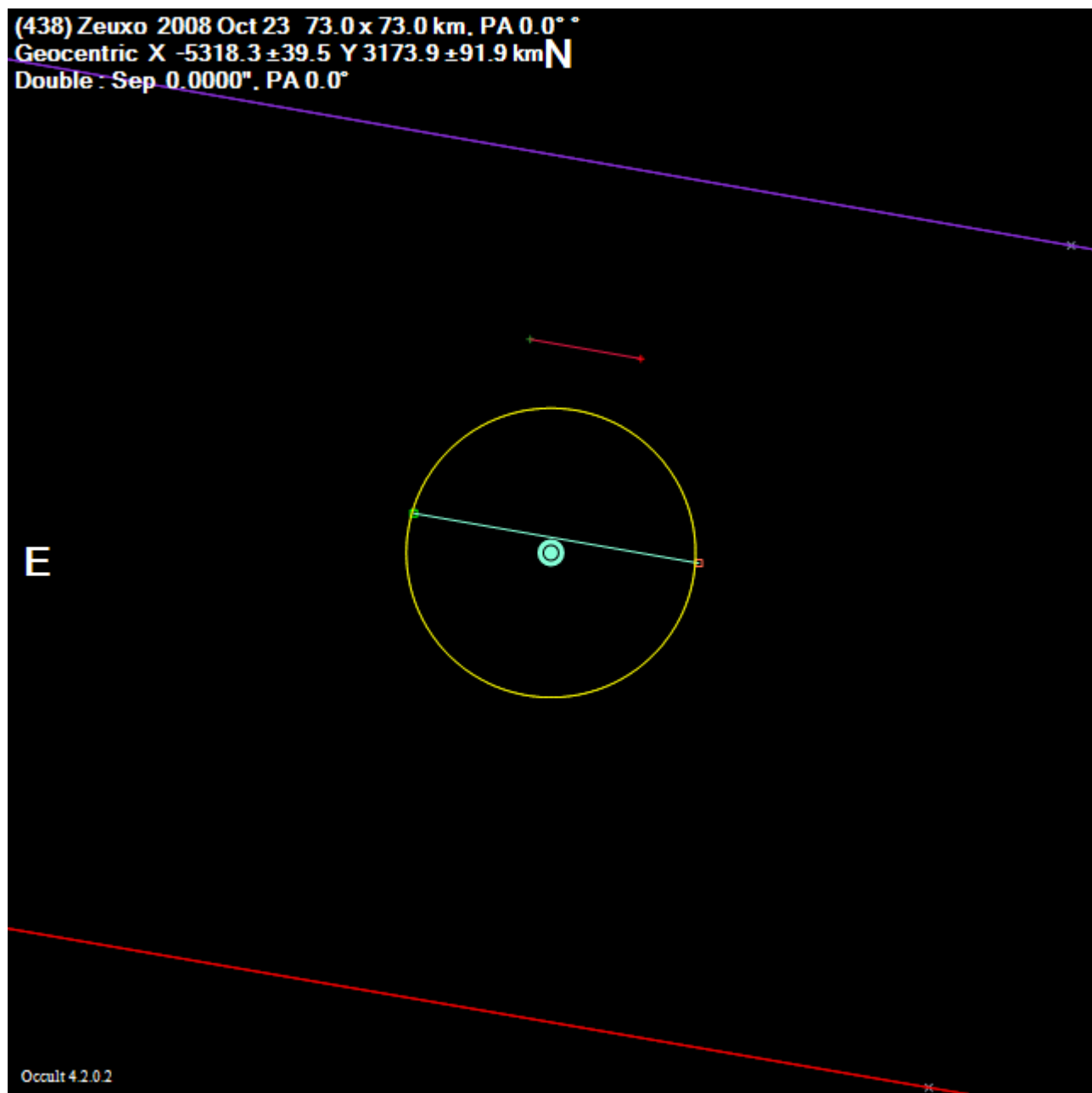
E

Occult 4.2.0.2



438zeuxo2008oct23

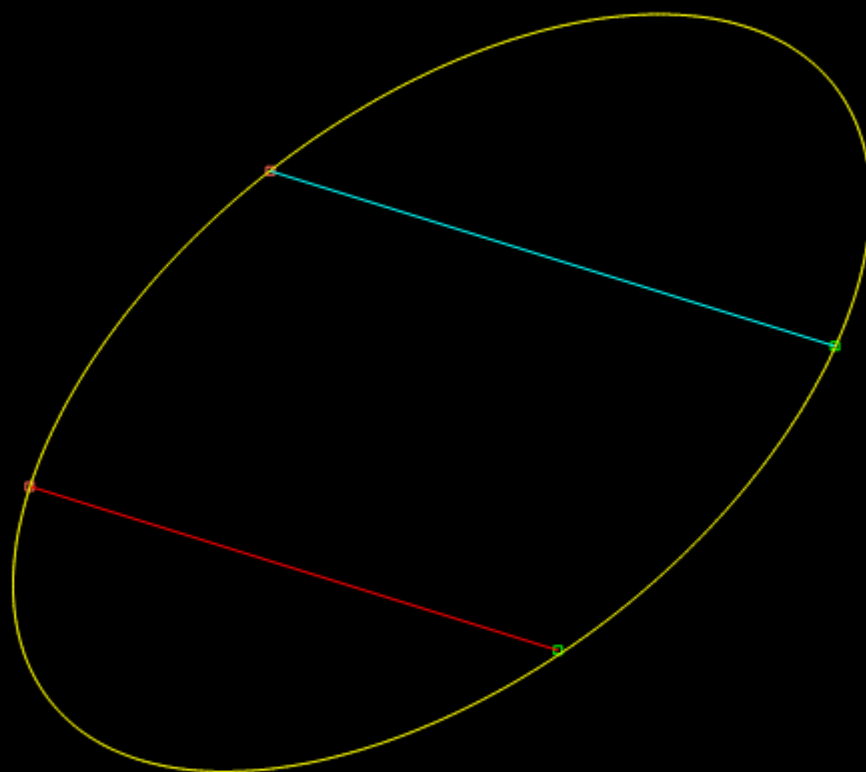
(438) Zeuxo 2008 Oct 23 73.0 x 73.0 km, PA 0.0° °
Geocentric X -5318.3 ± 39.5 Y 3173.9 ± 91.9 km **N**
Double : Sep 0.0000", PA 0.0°



43ariadne2008dec05

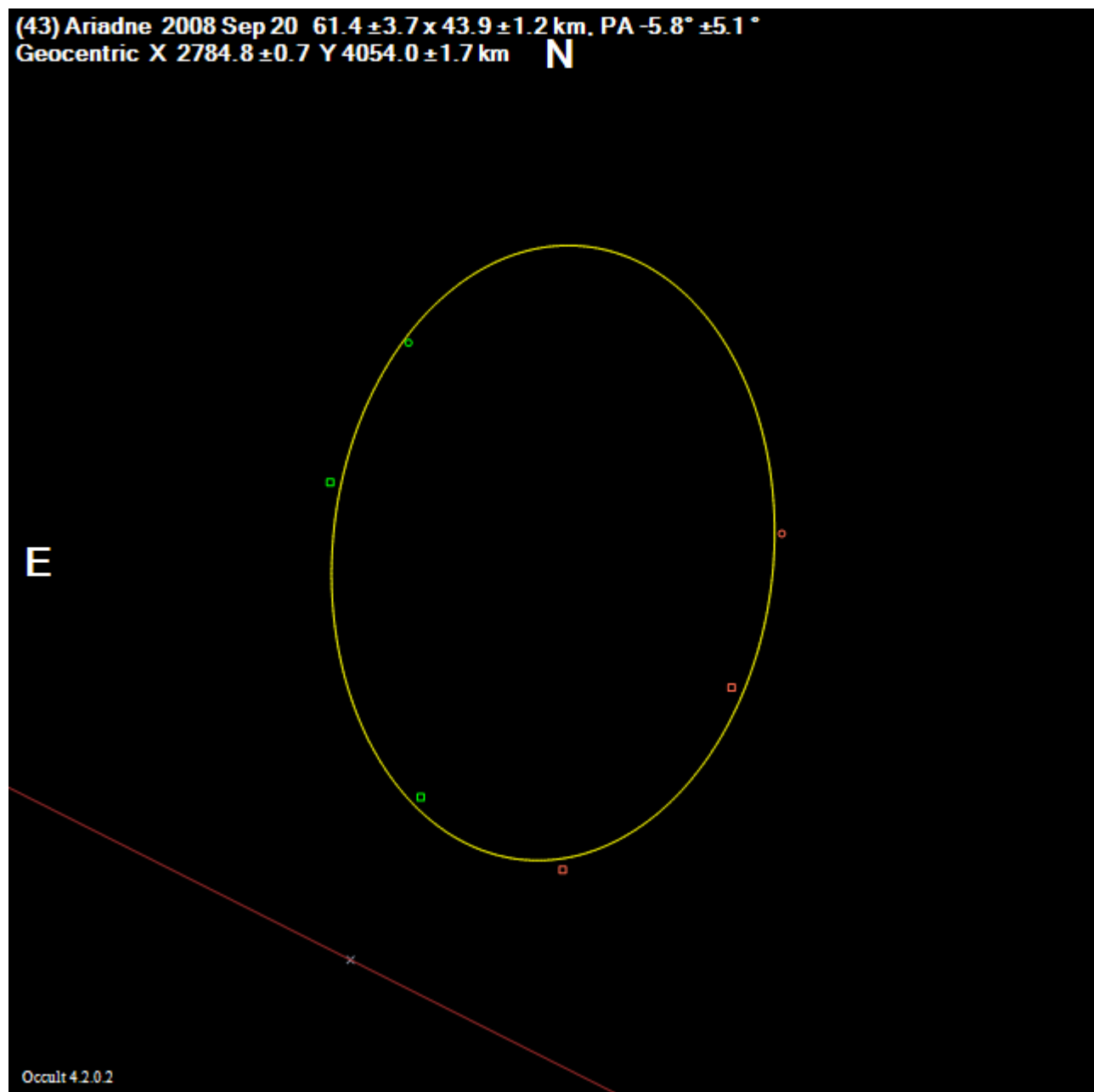
(43) Ariadne 2008 Dec 5 $84.3 \pm 0.1 \times 47.5 \pm 0.0$ km. PA -51.9° °
Geocentric X 288.9 ± 0.0 Y 3780.0 ± 0.0 km **N**

E



43ariadne2008sep20

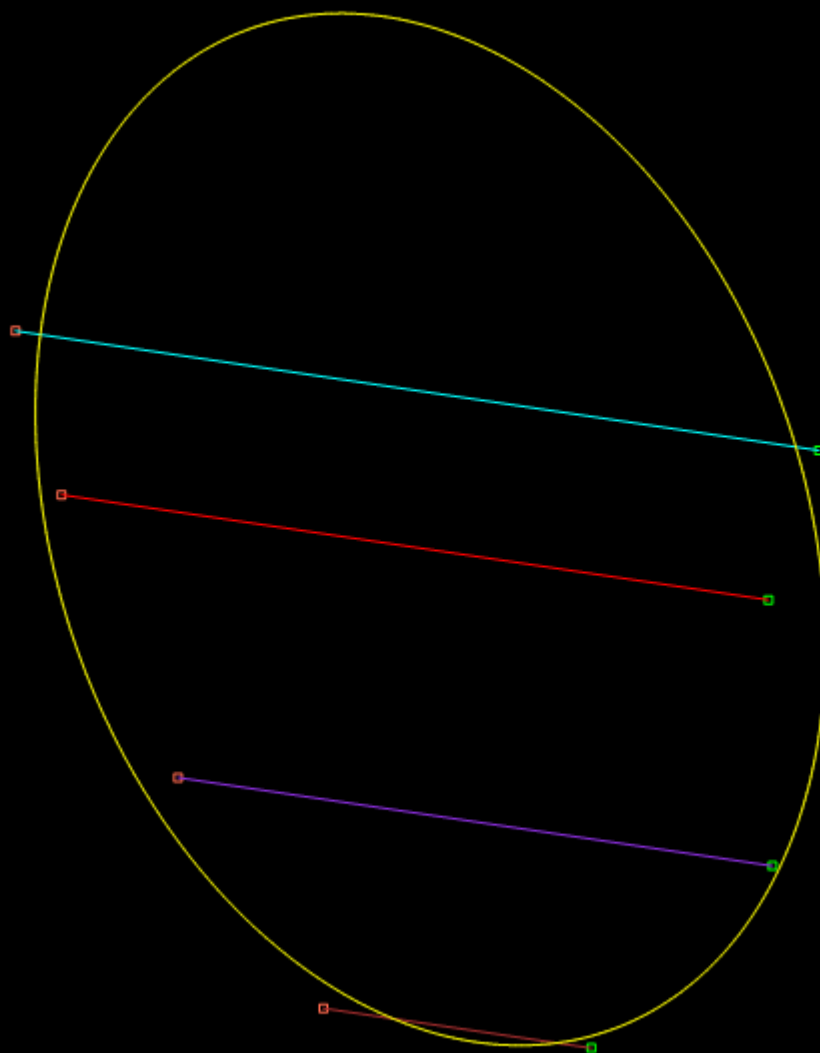
(43) Ariadne 2008 Sep 20 $61.4 \pm 3.7 \times 43.9 \pm 1.2$ km, PA $-5.8^\circ \pm 5.1^\circ$
Geocentric X 2784.8 ± 0.7 Y 4054.0 ± 1.7 km **N**



43ariadne2011oct19

(43) Ariadne 2011 Oct 19 90.0 x 63.1 ± 1.5 km, PA 20.0° ± 3.0°
Geocentric X 4505.9 ± 0.6 Y 4100.5 ± 0.9 km **N**

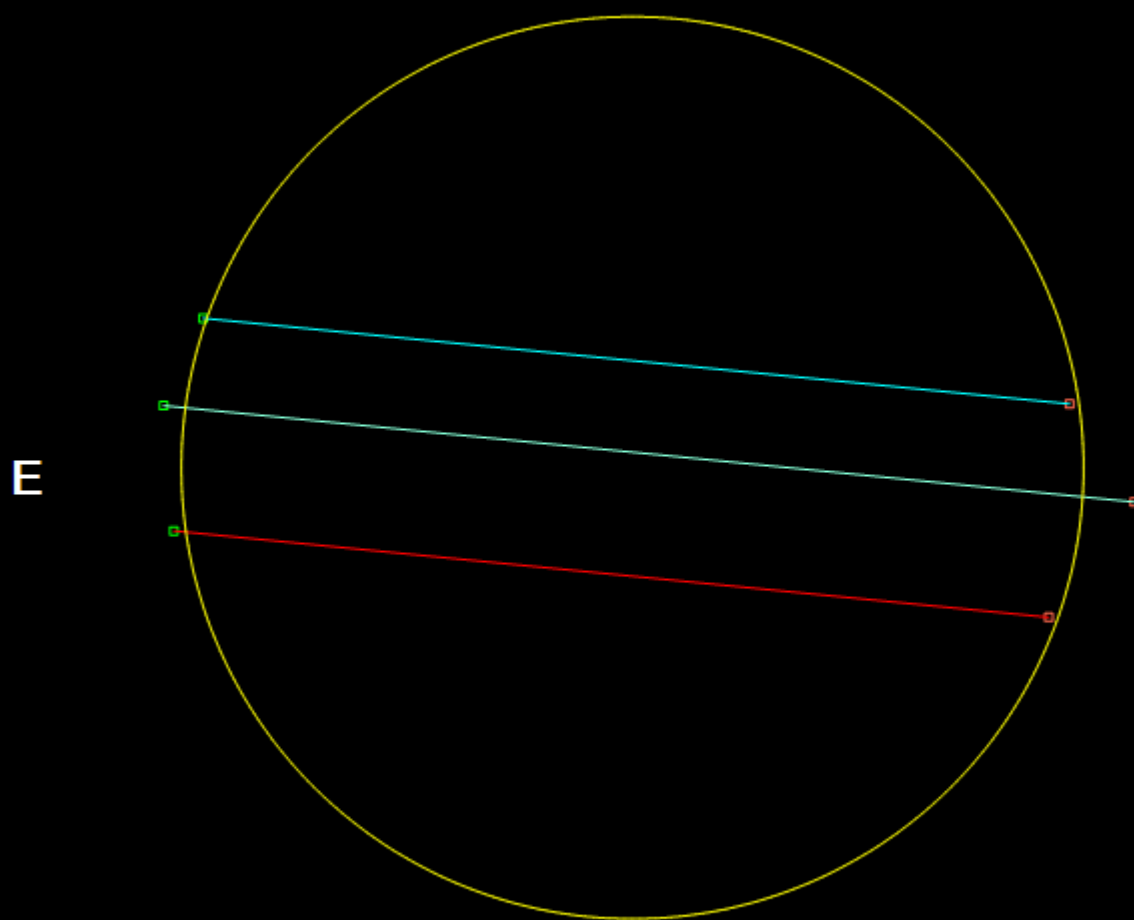
E



Occult 4.2.0.2

43ariadne2012nov28

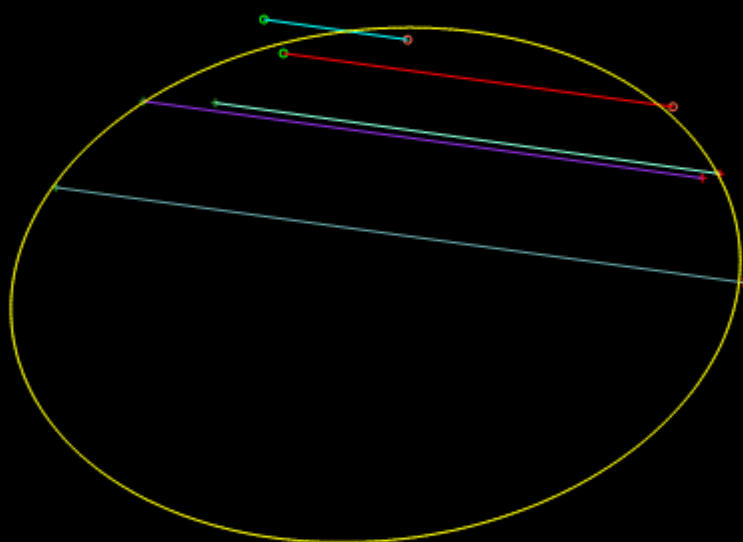
(43) Ariadne 2012 Nov 28 $76.3 \pm 22.1 \times 76.3$ km, PA 0.0° °
Geocentric X 4576.3 ± 0.8 Y 2291.1 ± 3.7 km **N**



441bathilde2003jan11

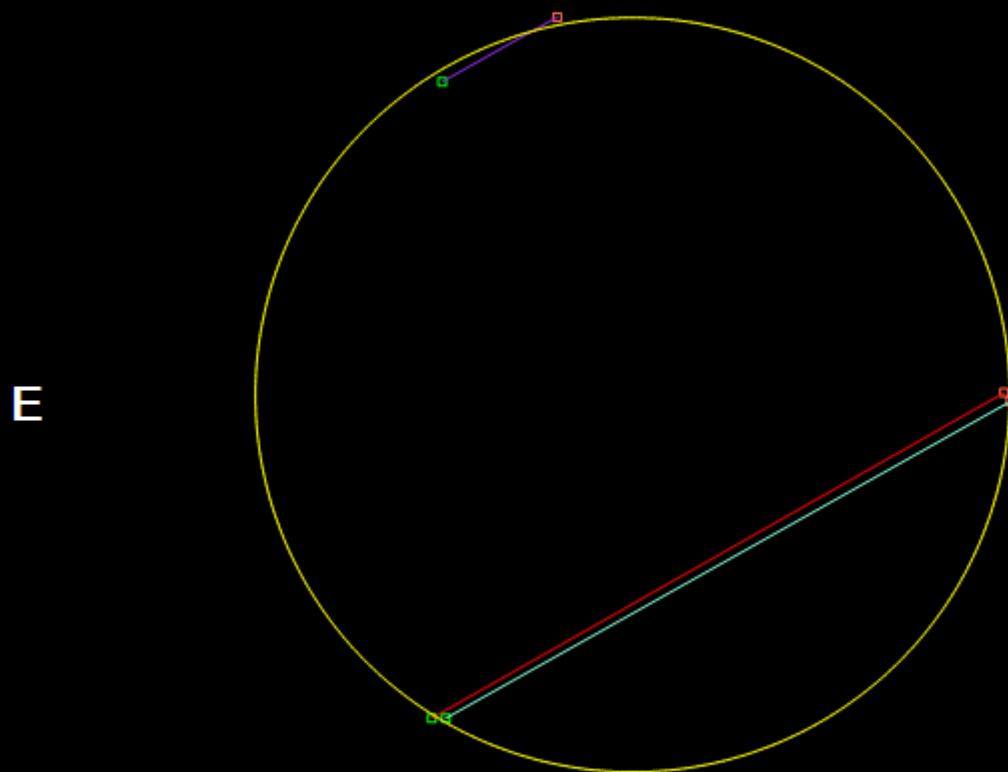
(441) Bathilde 2003 Jan 11 $66.7 \pm 6.4 \times 46.5 \pm 10.4$ km, PA $-82.7^\circ \pm 12.8^\circ$
Geocentric X 2145.4 ± 2.7 Y 3990.2 ± 5.3 km **N**

E



442eichsfeldia2014mar31

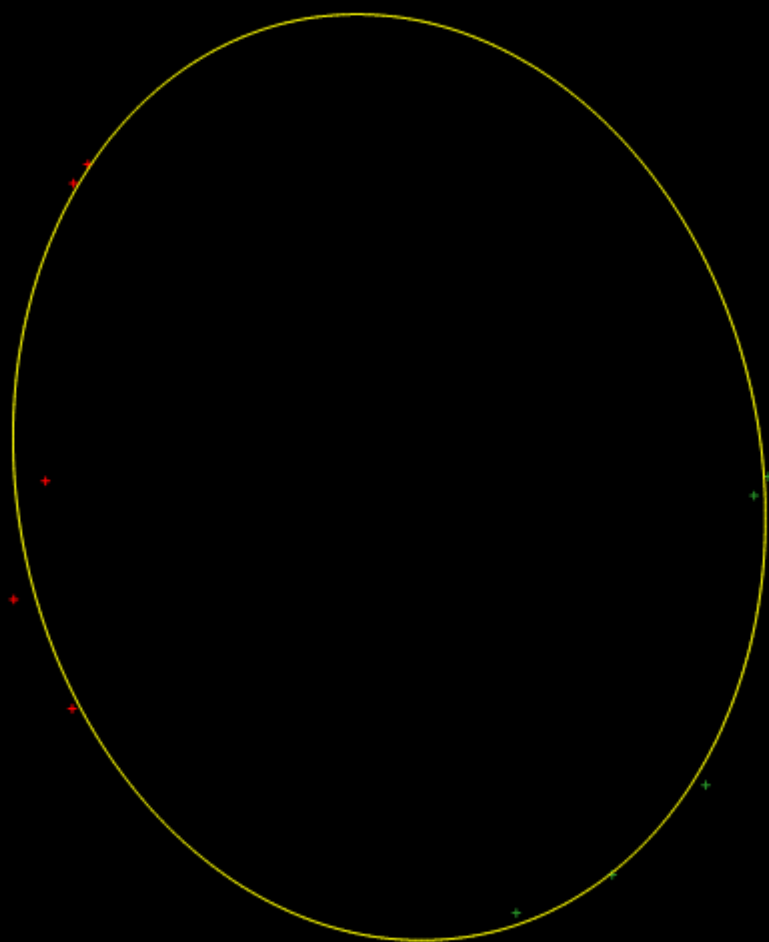
(442) Eichsfeldia 2014 Mar 31 $63.8 \pm 0.8 \times 63.8$ km, PA 0.0° °
Geocentric X 1477.4 ± 0.4 Y 3432.9 ± 0.3 km **N**



444gyptis1994jan08

(444) Gyptis 1994 Jan 8 $192.9 \pm 9.9 \times 154.0 \pm 2.9$ km, PA $11.2^\circ \pm 10.2^\circ$
Geocentric X 4481.0 ± 1.3 Y -3966.4 ± 3.6 km **N**

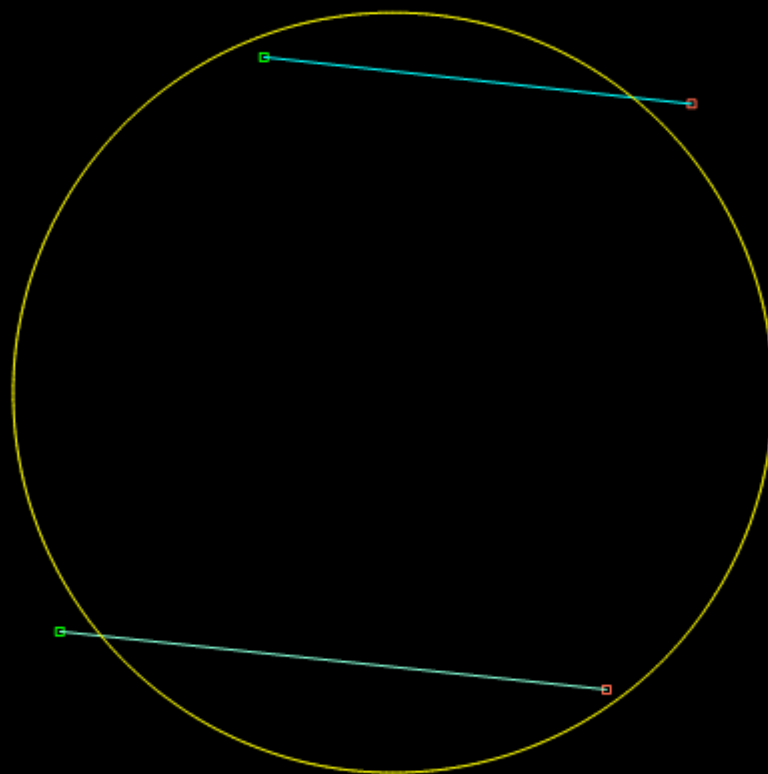
E



444gyptis2007dec20

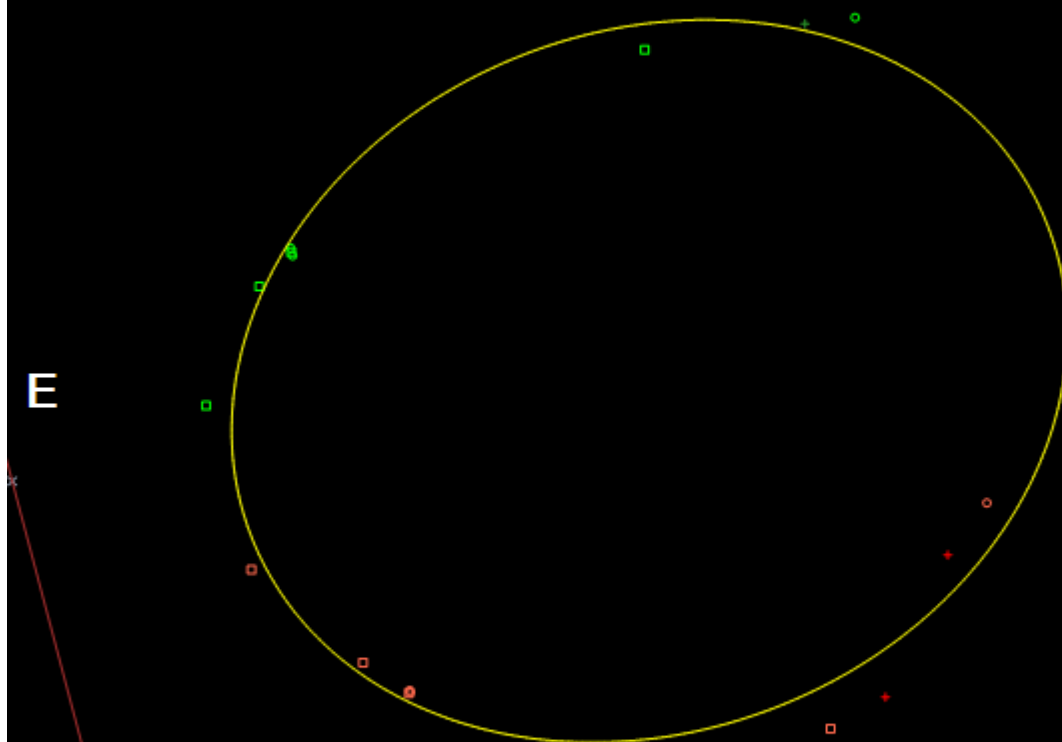
(444) Gyptis 2007 Dec 20 $161.2 \pm 8.8 \times 161.2$ km. PA 0.0° °
Geocentric X 1688.7 ± 4.2 Y 2189.4 ± 3.6 km **N**

E



444gyptis2007oct14

(444) Gyptis 2007 Oct 14 $181.3 \pm 7.8 \times 148.4 \pm 5.2$ km, PA $-68.5^\circ \pm 4.8^\circ$
Geocentric X -2265.9 ± 2.6 Y 4406.1 ± 1.8 km **N**



Occult 4.2.0.2

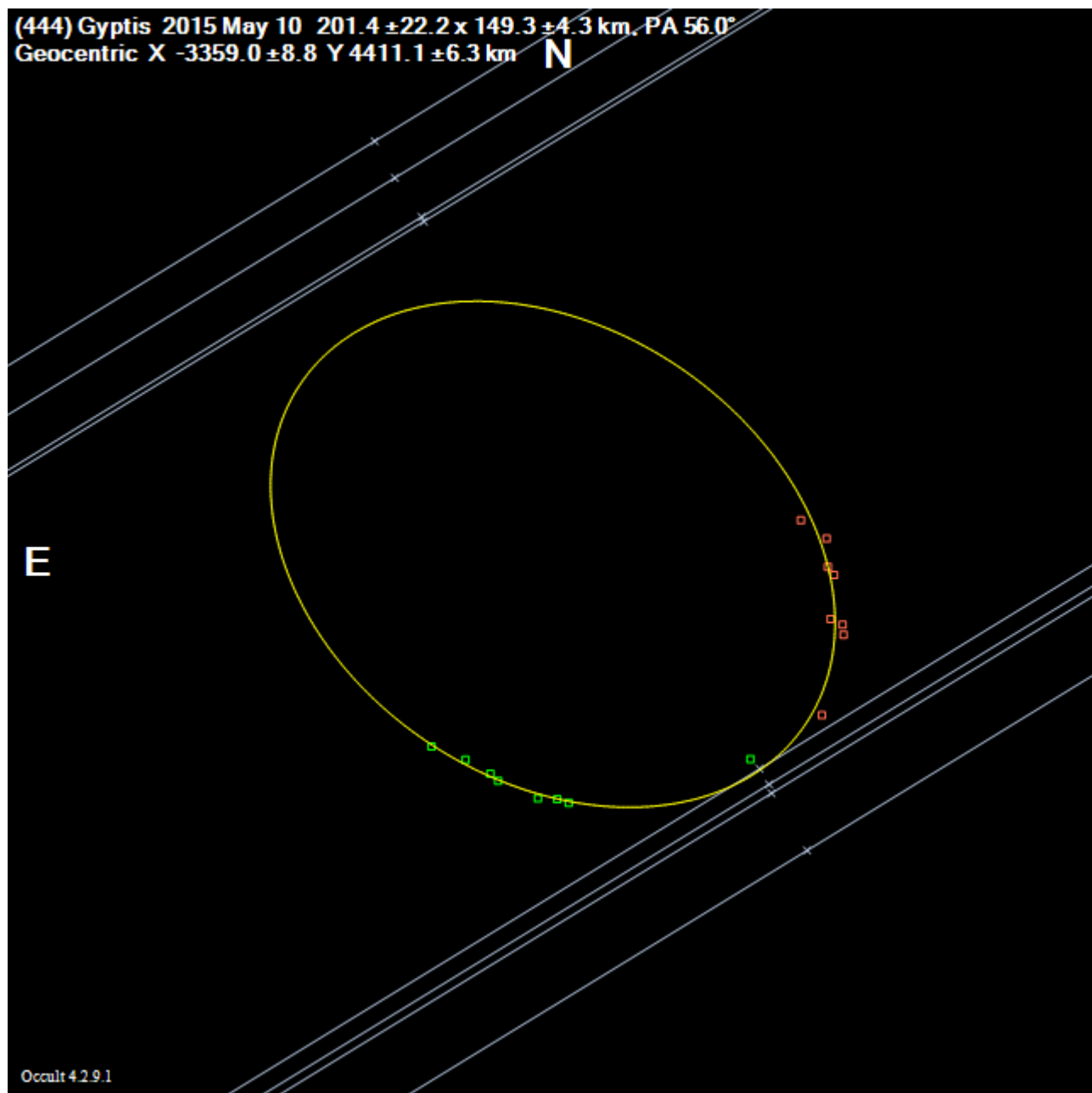
444gyptis2015may10

(444) Gyptis 2015 May 10 $201.4 \pm 22.2 \times 149.3 \pm 4.3$ km, PA 56.0°
Geocentric X -3359.0 ± 8.8 Y 4411.1 ± 6.3 km

N

E

Occult 4.2.9.1

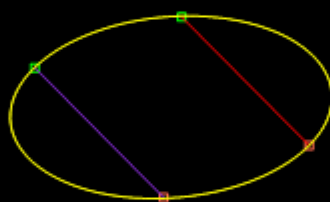


445edna2013nov09

(445) Edna 2013 Nov 9 122.8 x 68.9 km, PA 95.1 ° °
Geocentric X -2120.8 Y -1137.2 km

N

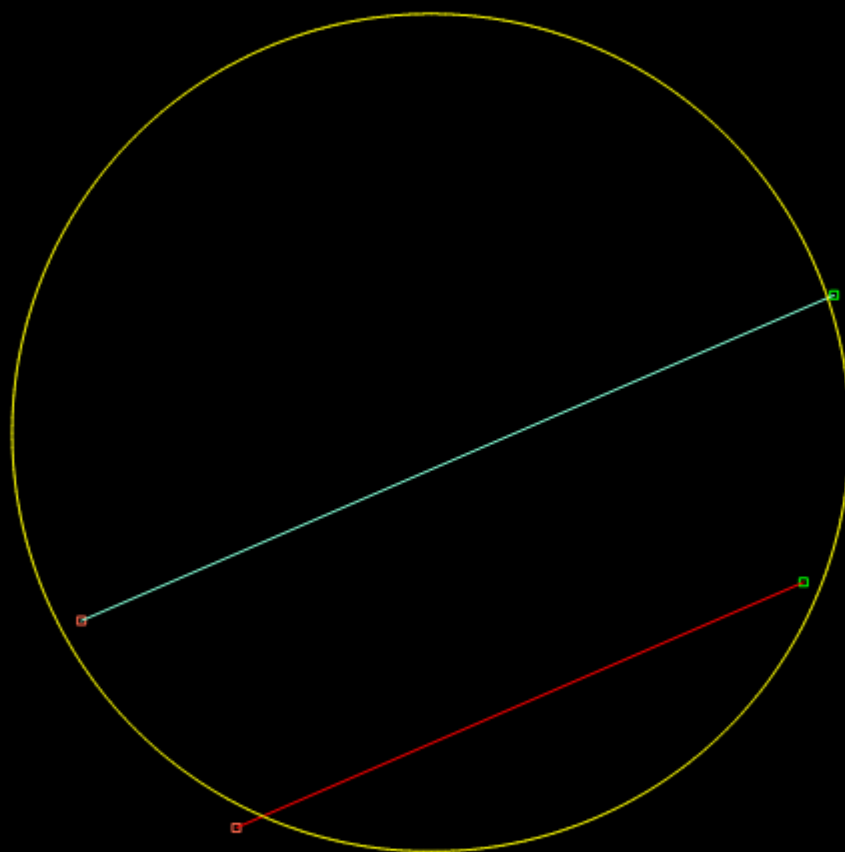
E



445edna2014sep18

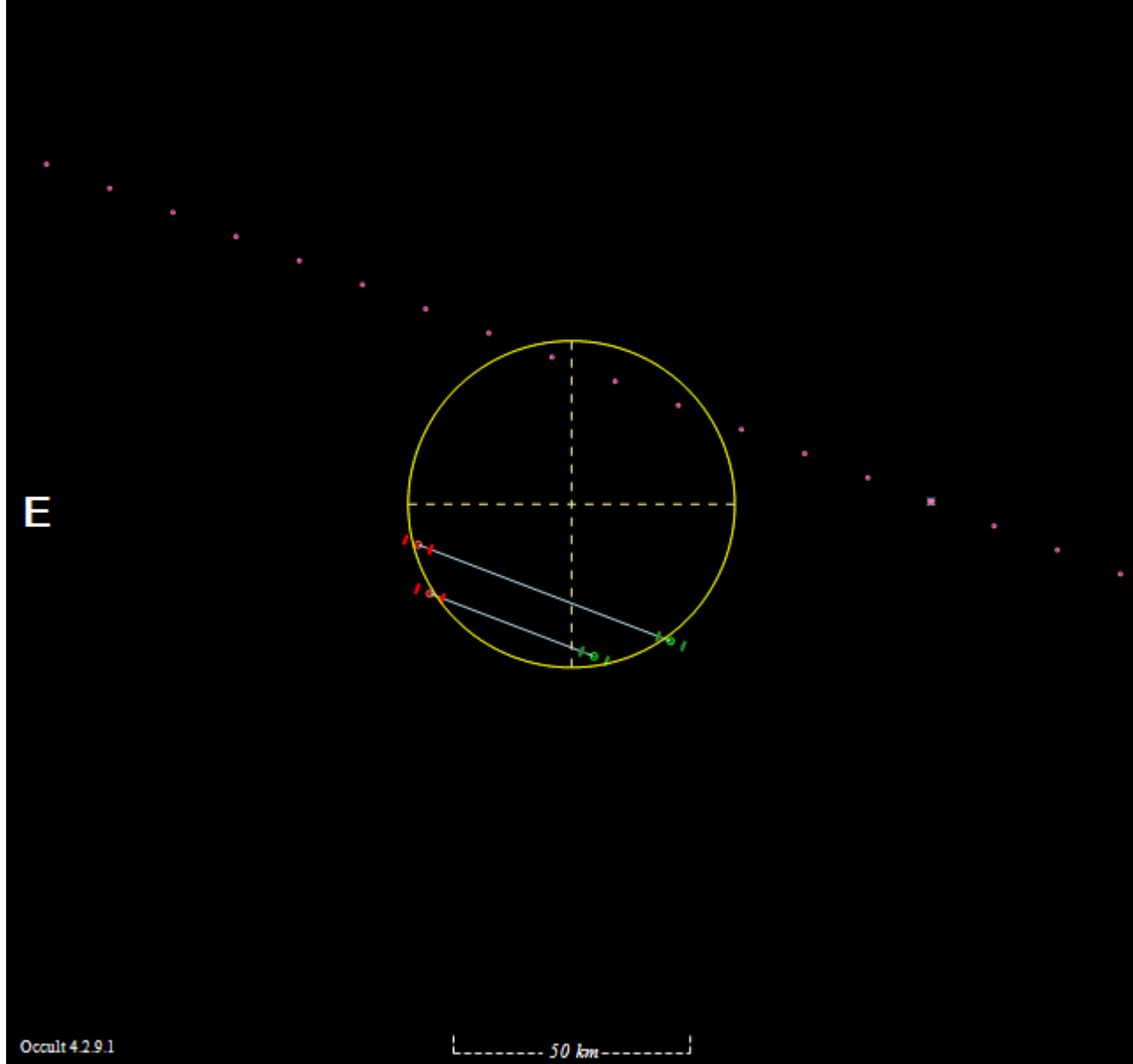
(445) Edna 2014 Sep 18 97.0 x 97.0 km, PA 0.0°°
Geocentric X -4185.3 ± 1.4 Y 3180.7 ± 2.0 km **N**

E



446Aeternitas2016Sep27

(446) Aeternitas 2016 Sep 27 $69.0 \pm 15.5 \times 69.0$ km, PA 0.0°
Geocentric X -4309.9 ± 1.5 Y 2782.0 ± 6.6 km **N**



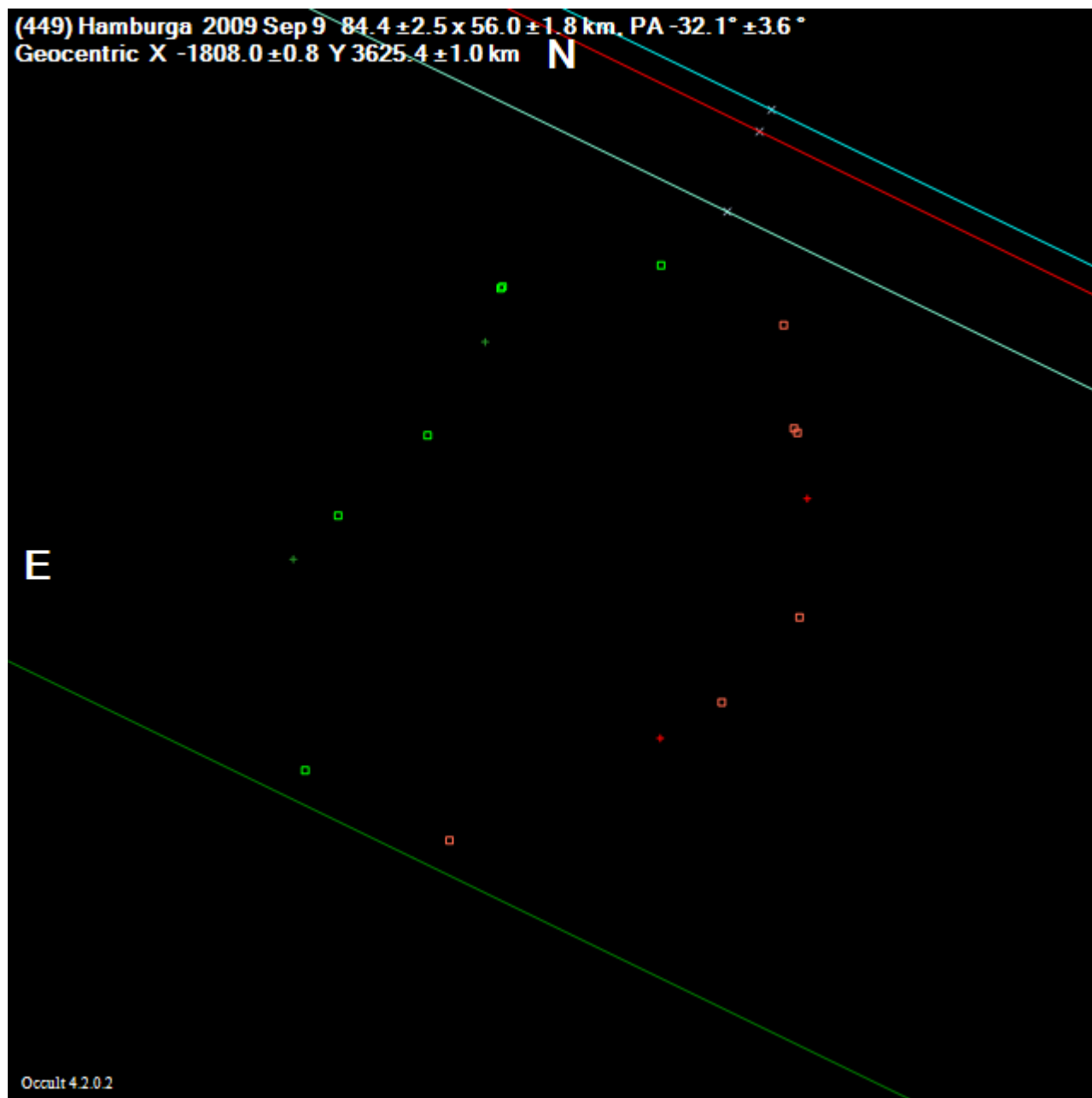
449hamburga2009sep09

(449) Hamburga 2009 Sep 9 $84.4 \pm 2.5 \times 56.0 \pm 1.8$ km, PA $-32.1^\circ \pm 3.6^\circ$
Geocentric X -1808.0 ± 0.8 Y 3625.4 ± 1.0 km

N

E

Occult 4.2.0.2

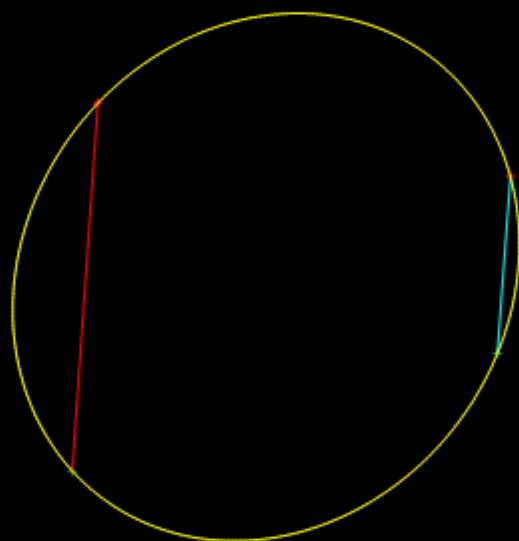


44nysa2003jan02

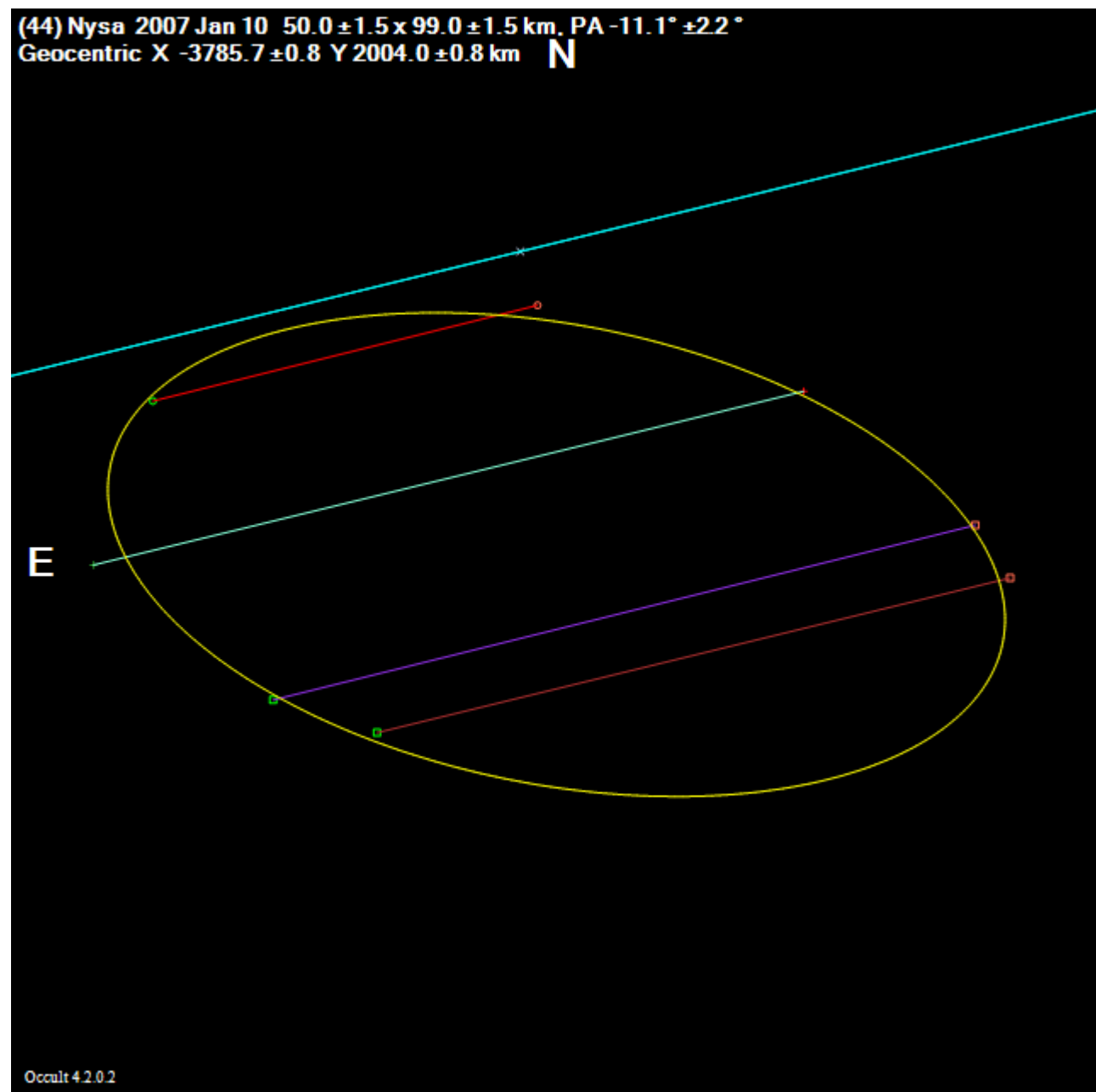
(44) Nysa 2003 Jan 2 50.1 x 43.9 km, PA -36.0° °
Geocentric X 2174.3 Y 2038.1 km

N

E



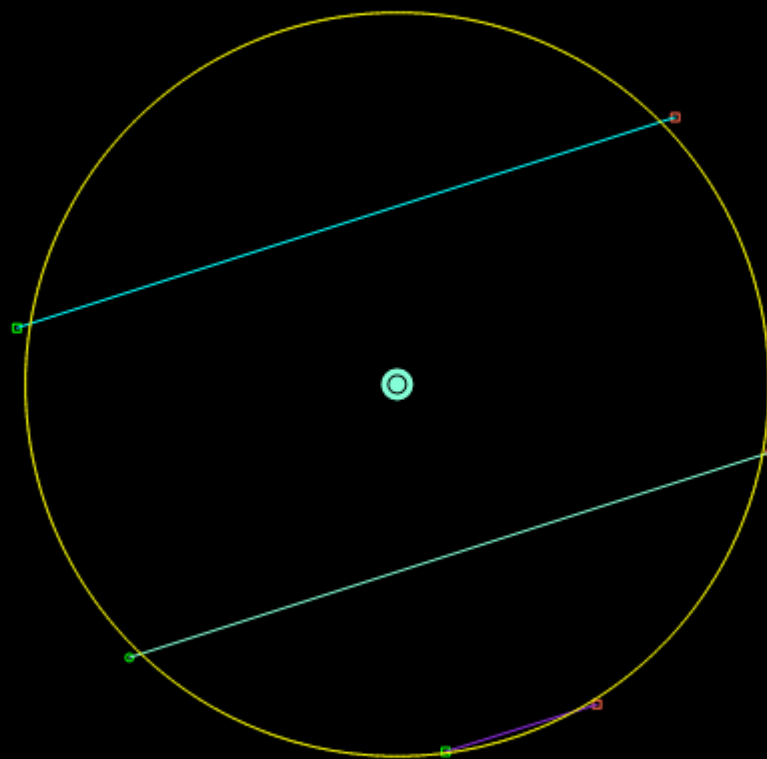
(44) Nysa 2007 Jan 10 50.0 \pm 1.5 x 99.0 \pm 1.5 km, PA -11.1 \pm 2.2 $^\circ$
Geocentric X -3785.7 \pm 0.8 Y 2004.0 \pm 0.8 km **N**



451patientia2013feb11

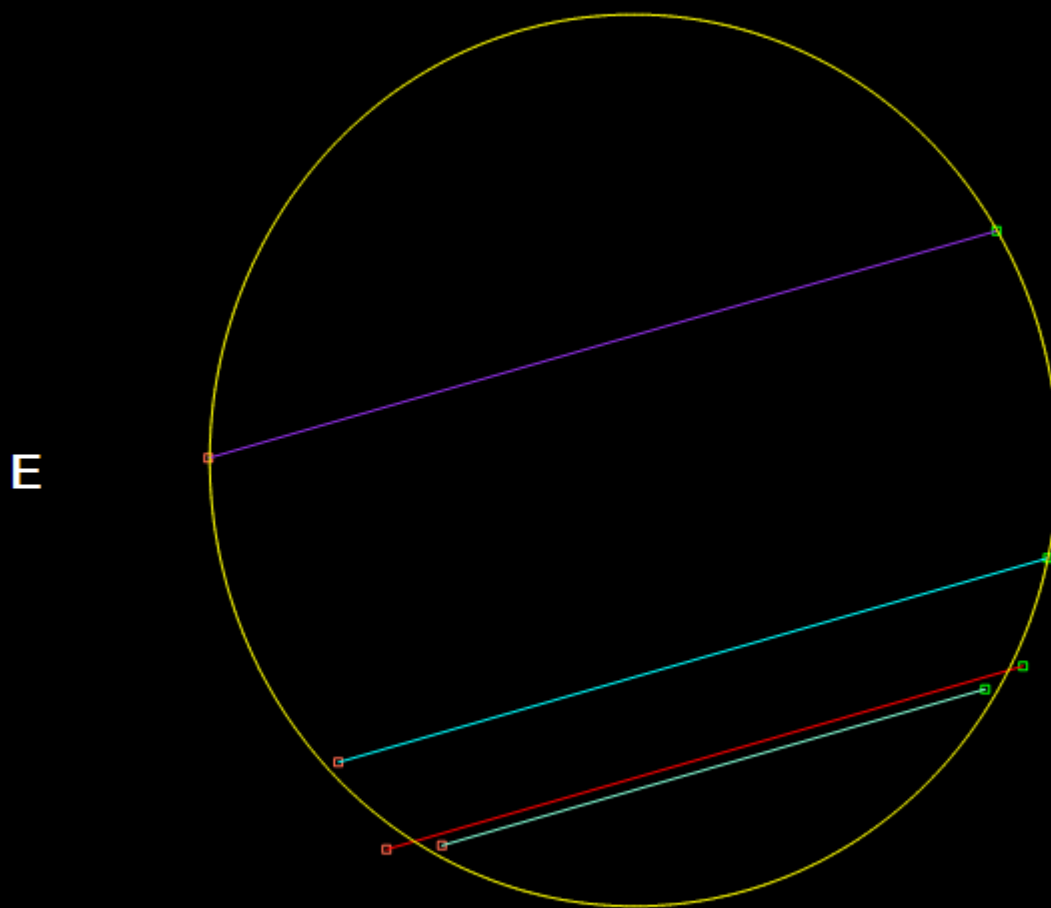
(451) Patientia 2013 Feb 11 234.0 x 234.0 km, PA 0.0° °
Geocentric X 1213.4 ± 0.9 Y 655.8 ± 1.0 km **N**
Double : Sep 0.0000", PA 0.0°

E

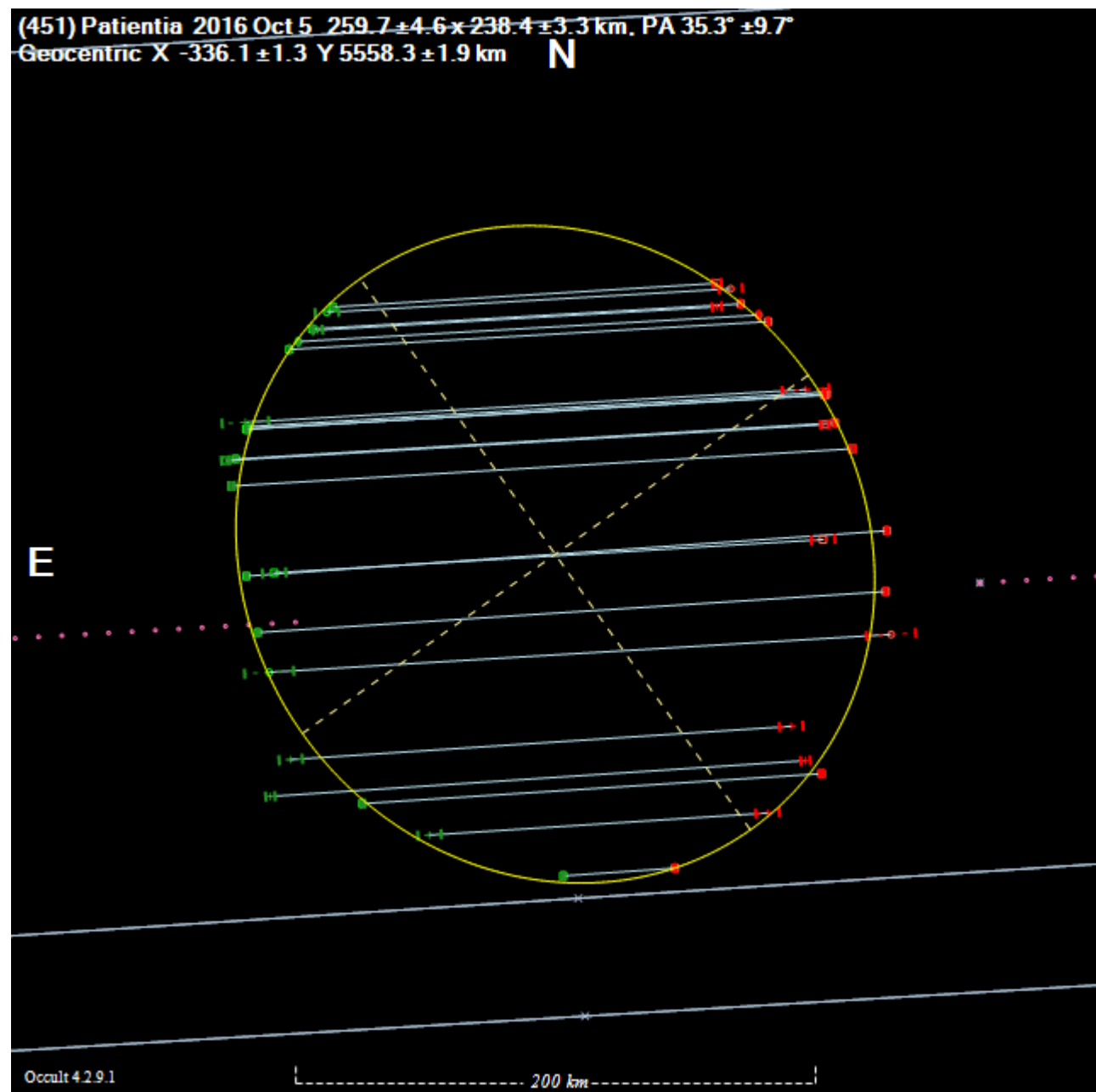


451patientia2013nov16

(451) Patientia 2013 Nov 16 $271.5 \pm 26.2 \times 258.3 \pm 4.8$ km, PA $0.9^\circ \pm 36.2^\circ$
Geocentric X -5186.5 ± 2.6 Y 3550.5 ± 7.3 km **N**

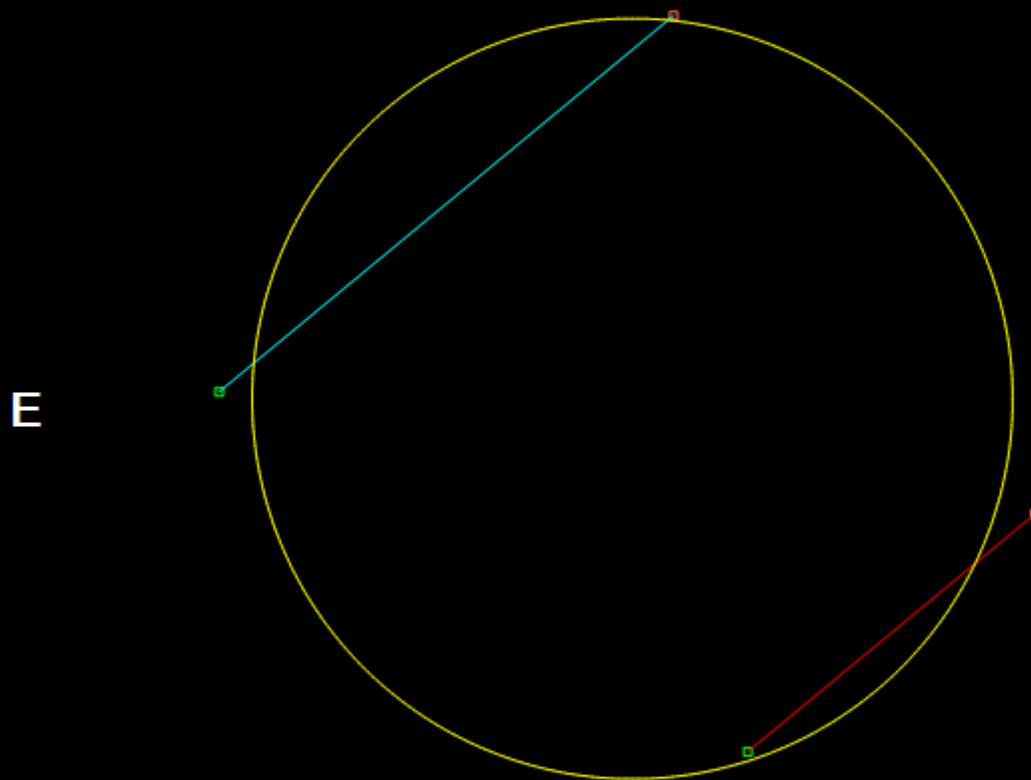


451Patientia2016Oct05



456abnoba2006feb26

(456) Abnoba 2006 Feb 26 $37.6 \pm 1.5 \times 37.6$ km, PA 0.0°
Geocentric X 1892.2 ± 0.7 Y 2534.0 ± 0.7 km **N**



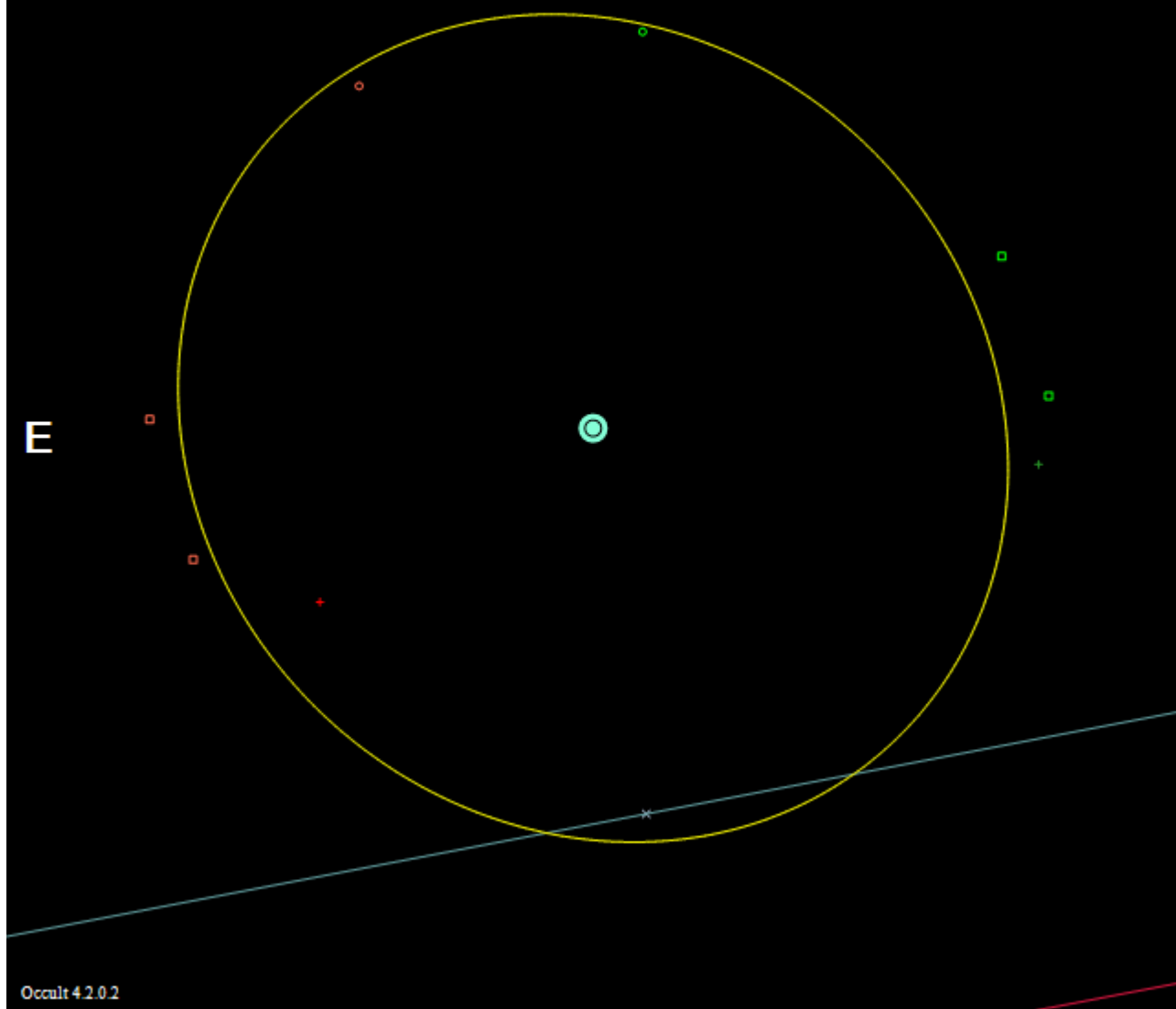
45eugenia2008mar09

(45) Eugenia 2008 Mar 9 252.0 x 183.4 km, PA -6.8° °
Geocentric X 5749.6 ± 0.3 Y 2036.3 ± 0.3 km **N**



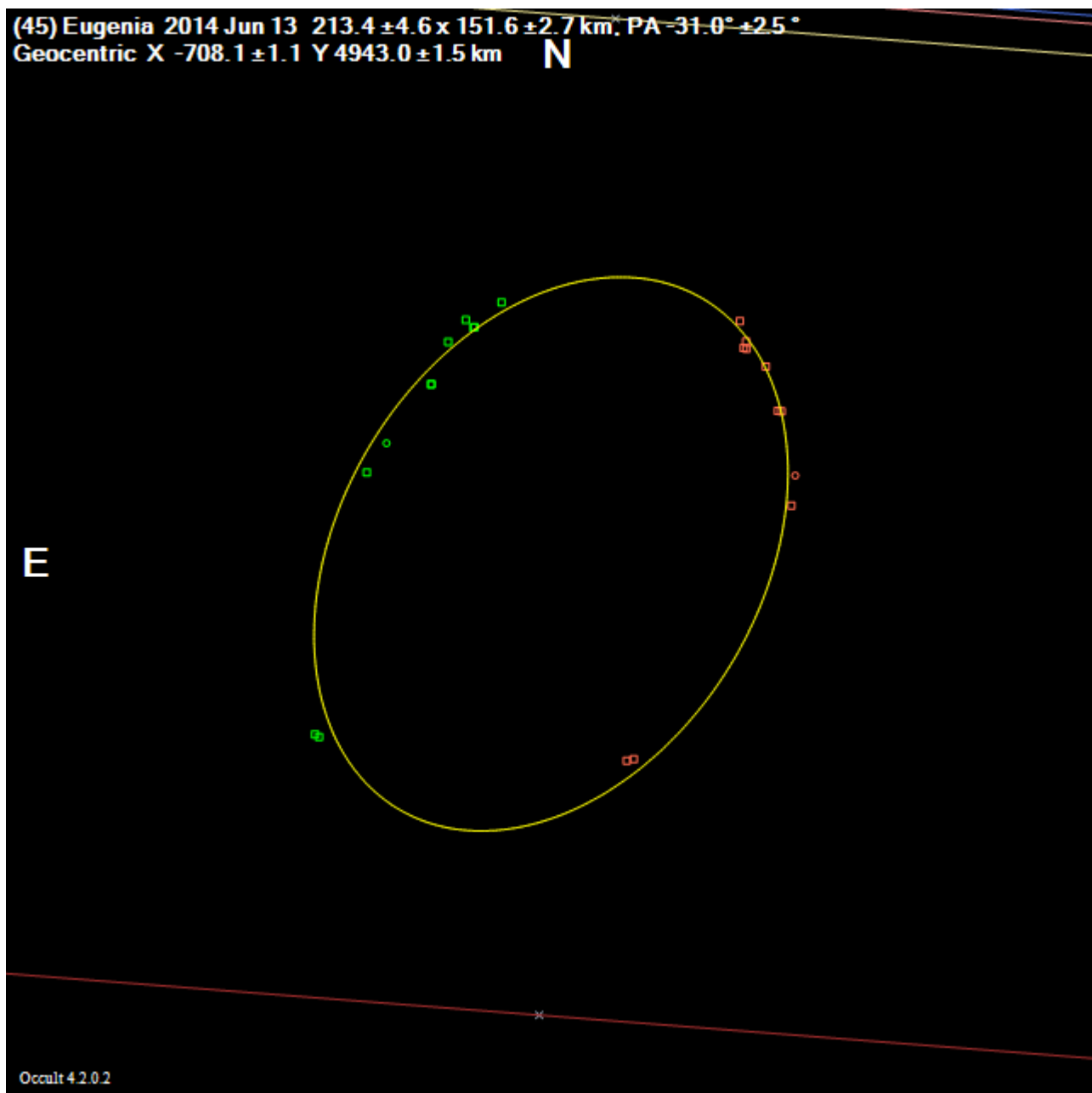
45eugenia2013may20

(45) Eugenia 2013 May 20 $225.9 \pm 39.4 \times 204.8 \pm 18.0$ km, PA $45.9^\circ \pm 64.6^\circ$
Geocentric X 4340.2 ± 7.4 Y 2923.2 ± 21.5 km **N**
Double : Sep $0.0000''$, PA 0.0°



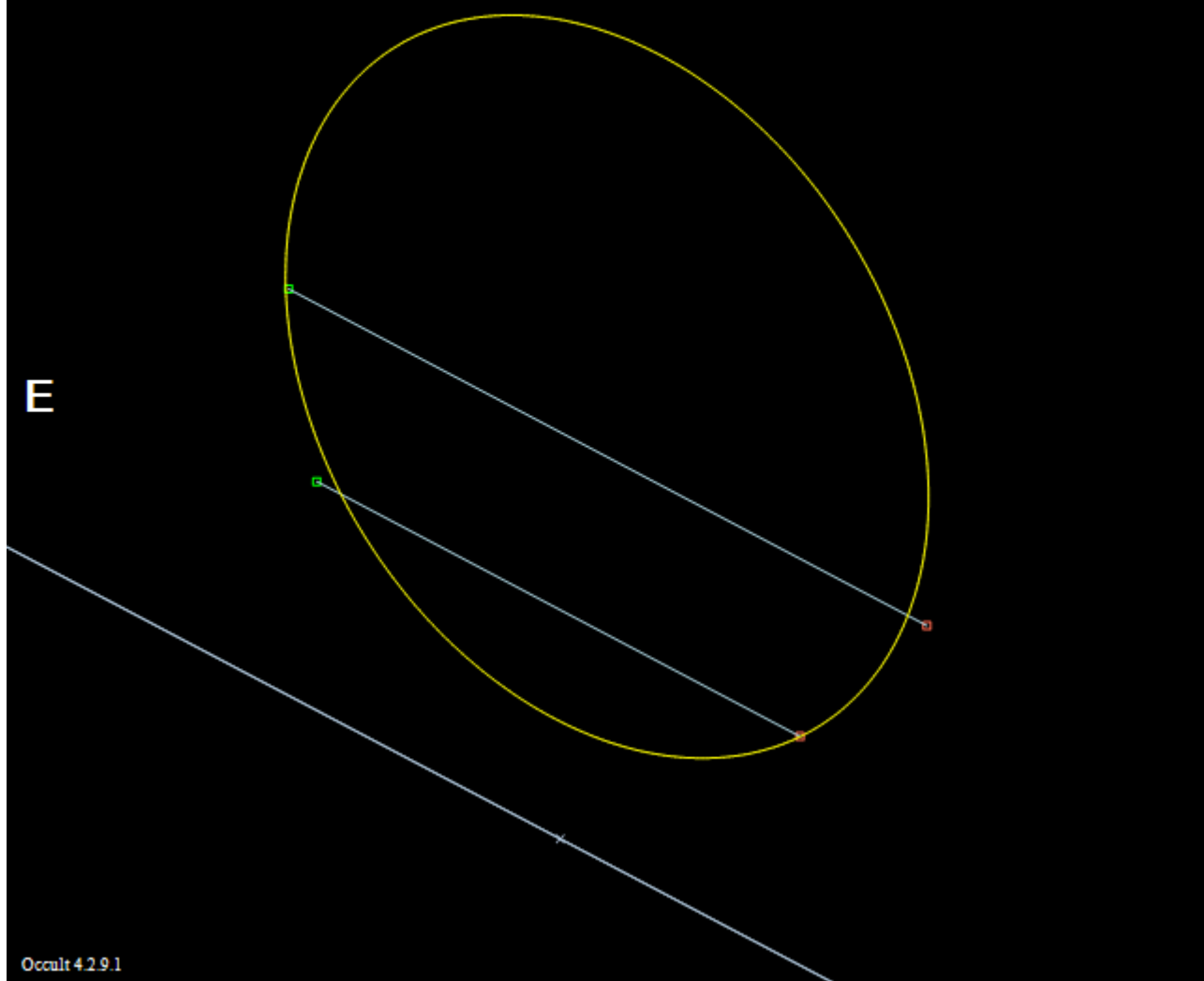
45eugenia2014jun13

(45) Eugenia 2014 Jun 13 $213.4 \pm 4.6 \times 151.6 \pm 2.7$ km, PA $-31.0^\circ \pm 2.5^\circ$
Geocentric X -708.1 ± 1.1 Y 4943.0 ± 1.5 km **N**



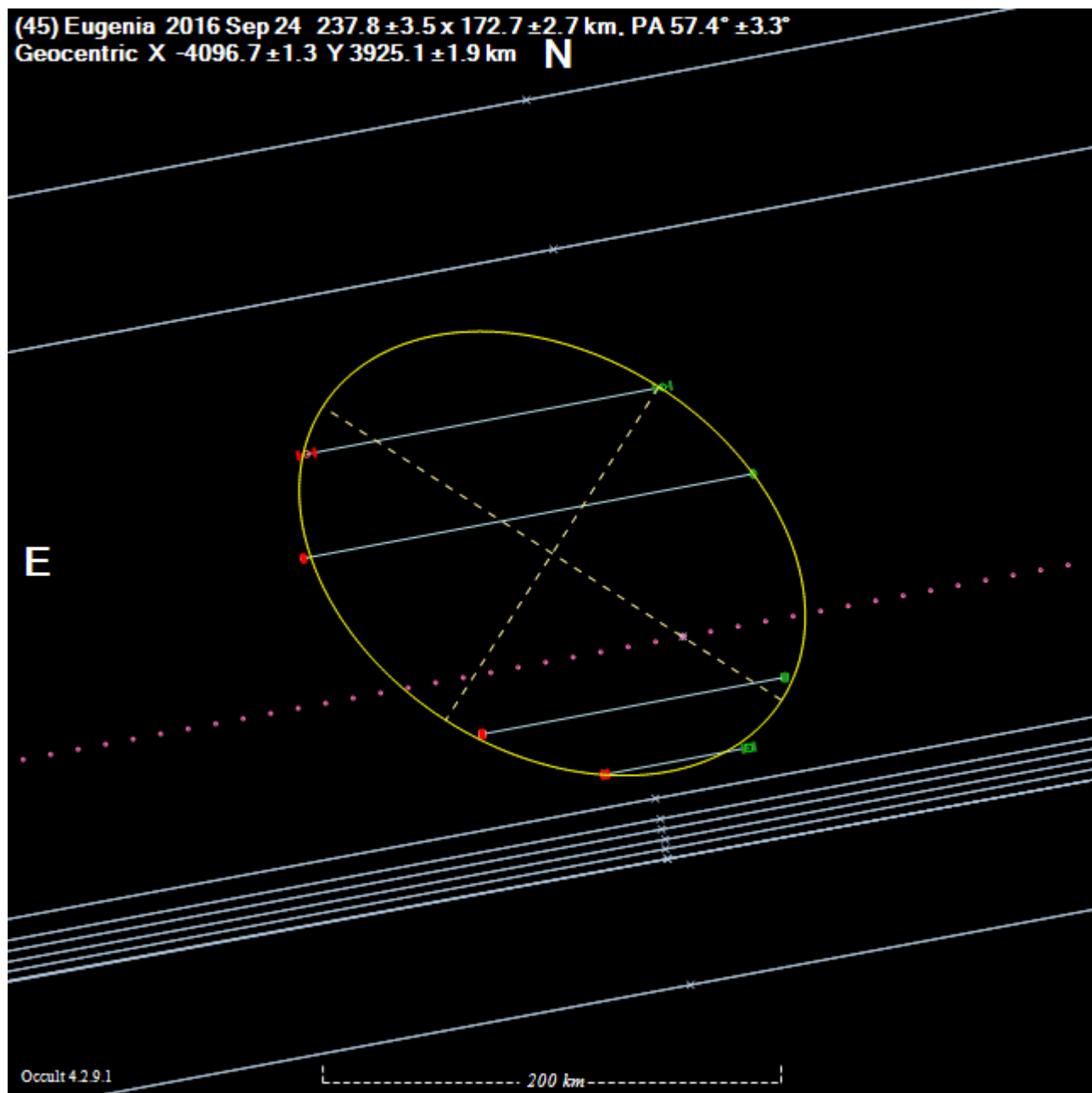
45eugenia2015oct02

(45) Eugenia 2015 Oct 2 229.0 x 163.0 km, PA 32.0°
Geocentric X -798.0 ± 1.7 Y -1879.2 ± 2.9 km **N**



45Eugenia2016Sep24

(45) Eugenia 2016 Sep 24 $237.8 \pm 3.5 \times 172.7 \pm 2.7$ km, PA $57.4^\circ \pm 3.3^\circ$
Geocentric X -4096.7 ± 1.3 Y 3925.1 ± 1.9 km **N**

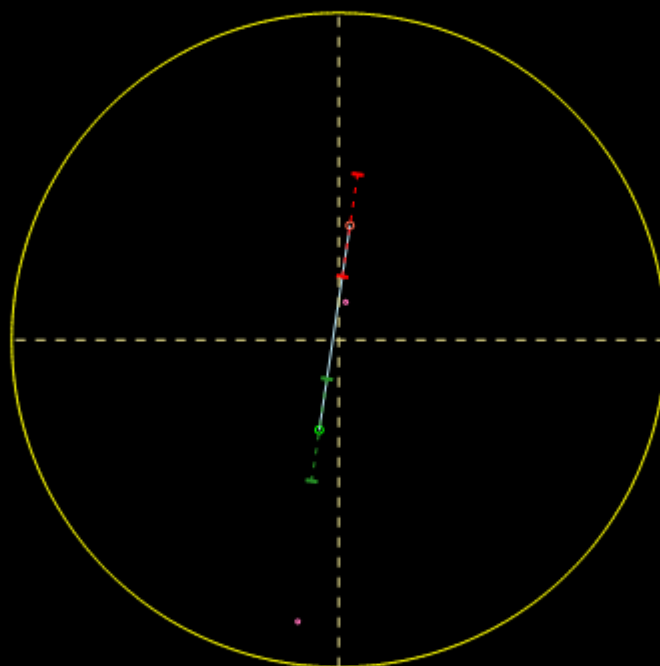


466701996NU2016Feb16

(46670) 1996 NU 2016 Feb 16 19.0 x 19.0 km, PA 0.0°
Geocentric X -1605.8 Y 4312.3 km

N

E

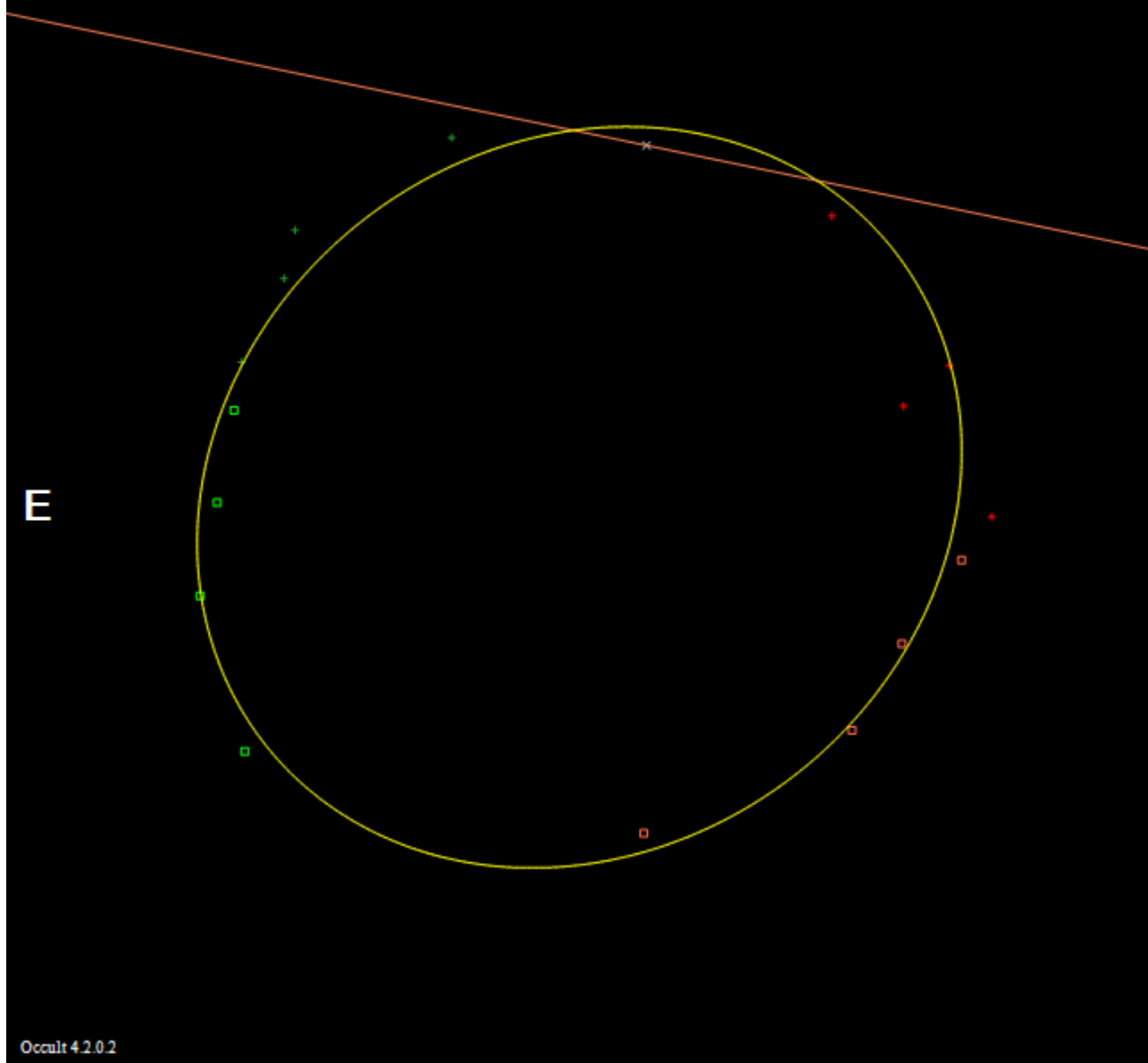


Occult 4.2.9.1

10 km

466tisiphone2006jan05

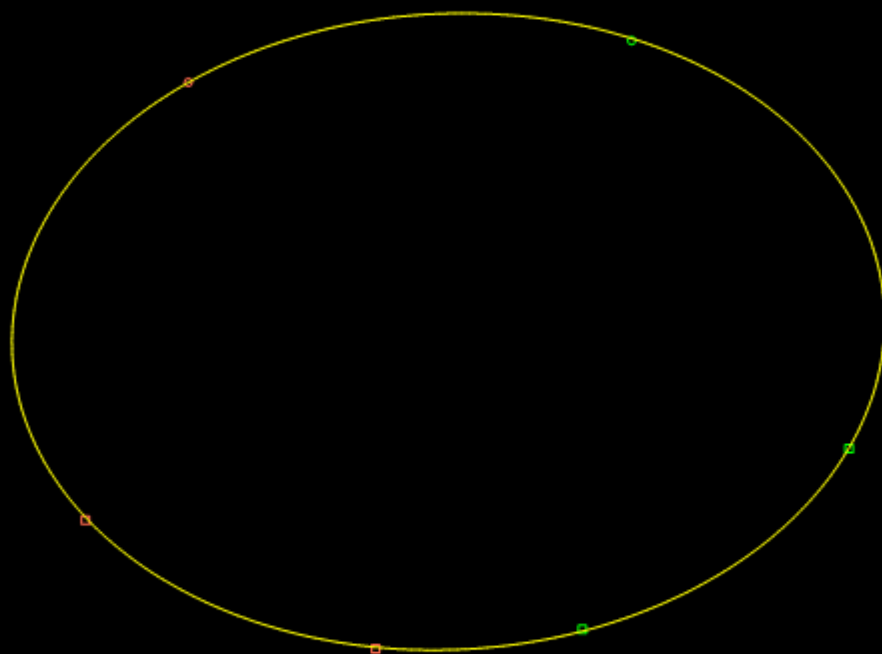
(466) Tisiphone 2006 Jan 5 $118.8 \pm 3.7 \times 135.1 \pm 5.0$ km, PA $38.0^\circ \pm 13.2^\circ$
Geocentric X 3937.8 ± 1.3 Y 1533.9 ± 2.2 km **N**



468lina2009sep21

(468) Lina 2009 Sep 21 $78.4 \pm 0.1 \times 57.1 \pm 0.1$ km, PA $93.0^\circ \pm 0.2^\circ$
Geocentric X 2421.4 ± 0.1 Y 5769.4 ± 0.0 km **N**

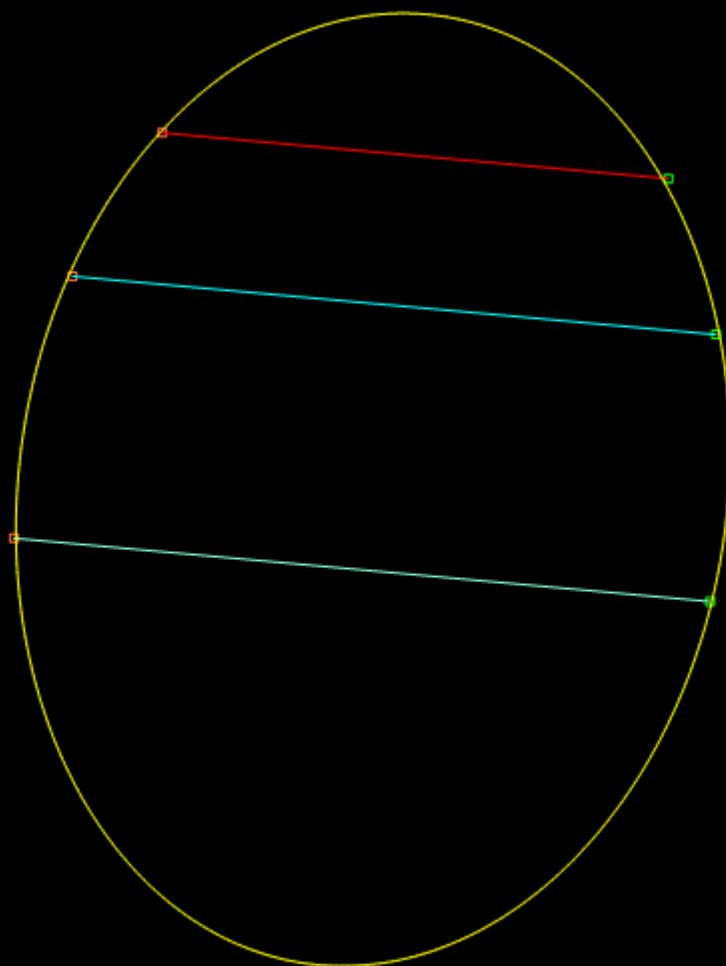
E



46hestia2006sep07

(46) Hestia 2006 Sep 7 $154.4 \pm 5.2 \times 114.3 \pm 0.5$ km. PA $-8.1^\circ \pm 1.1^\circ$
Geocentric X -4105.6 ± 0.3 Y 3850.2 ± 1.4 km **N**

E



(471) Papagena 1987 Jan 24 156.5 ± 1.4 x 105.3 ± 2.7 km, PA -56.7° ± 1.6°
Geocentric X -3172.0 ± 0.6 Y 1929.2 ± 0.9 km

E

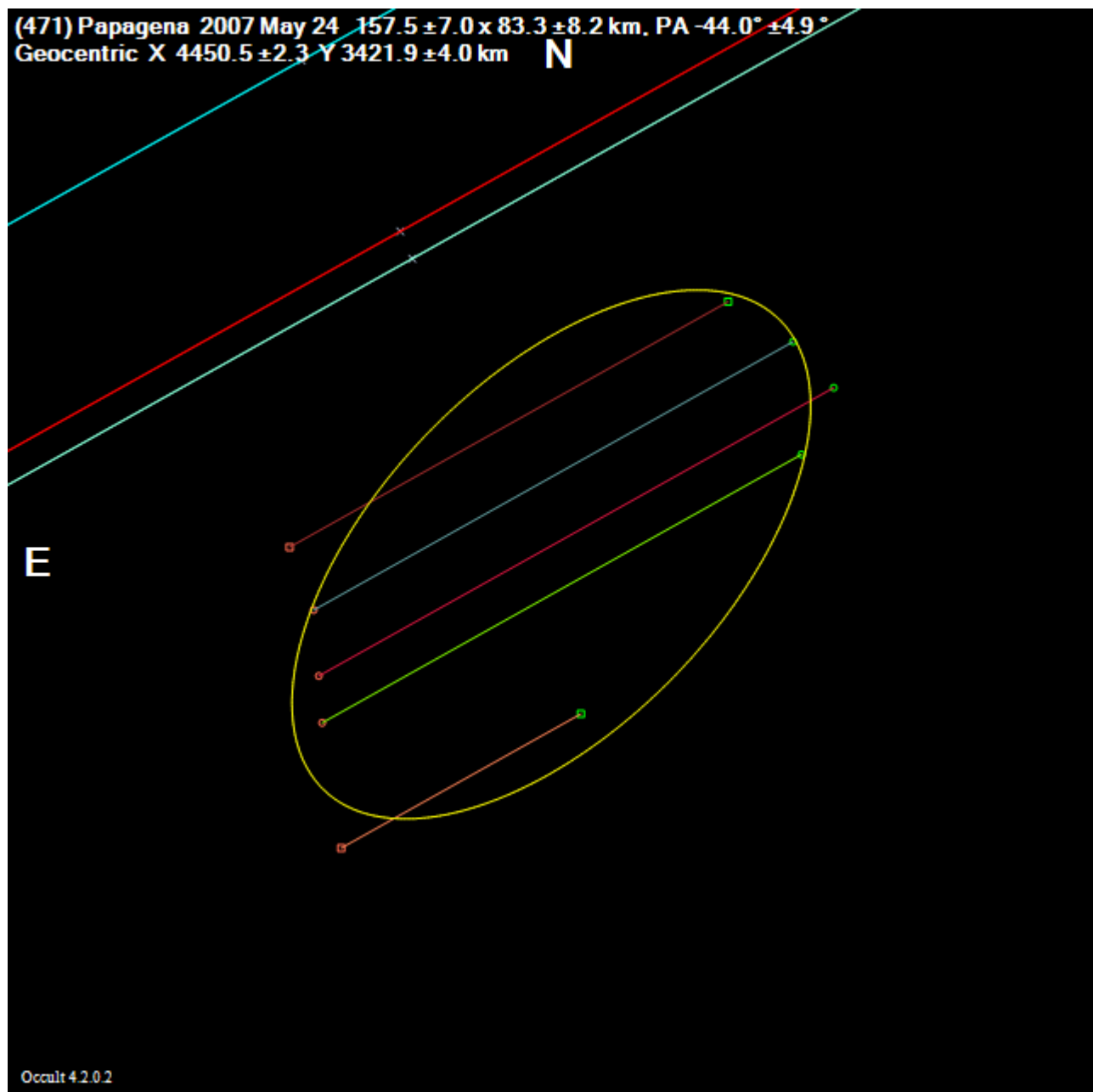
N

Occult 4.2.0.2

Occult 4.2.0.2

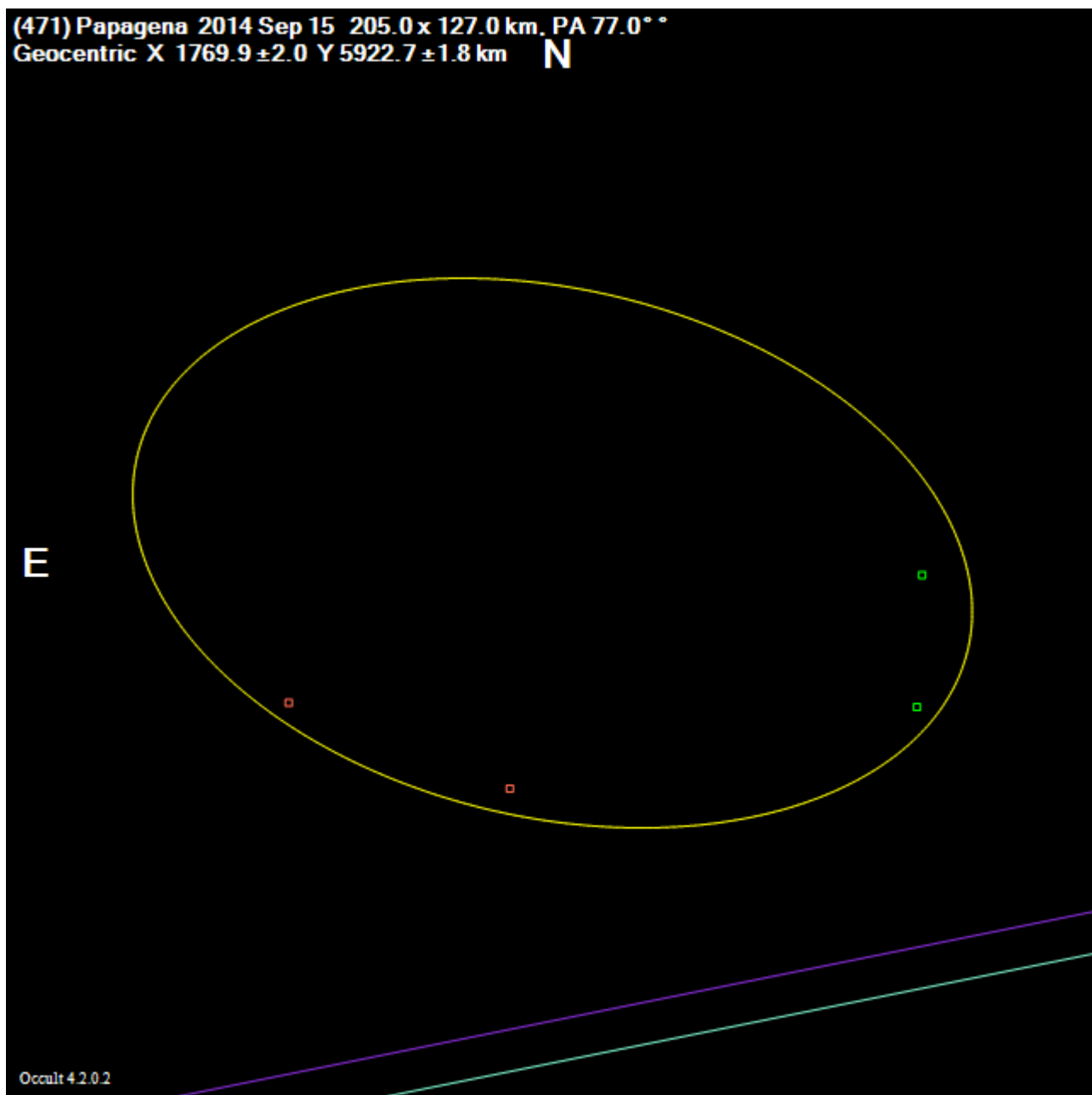
471papagena2007may24

(471) Papagena 2007 May 24 $157.5 \pm 7.0 \times 83.3 \pm 8.2$ km, PA $-44.0^\circ \pm 4.9^\circ$
Geocentric X 4450.5 ± 2.3 Y 3421.9 ± 4.0 km **N**



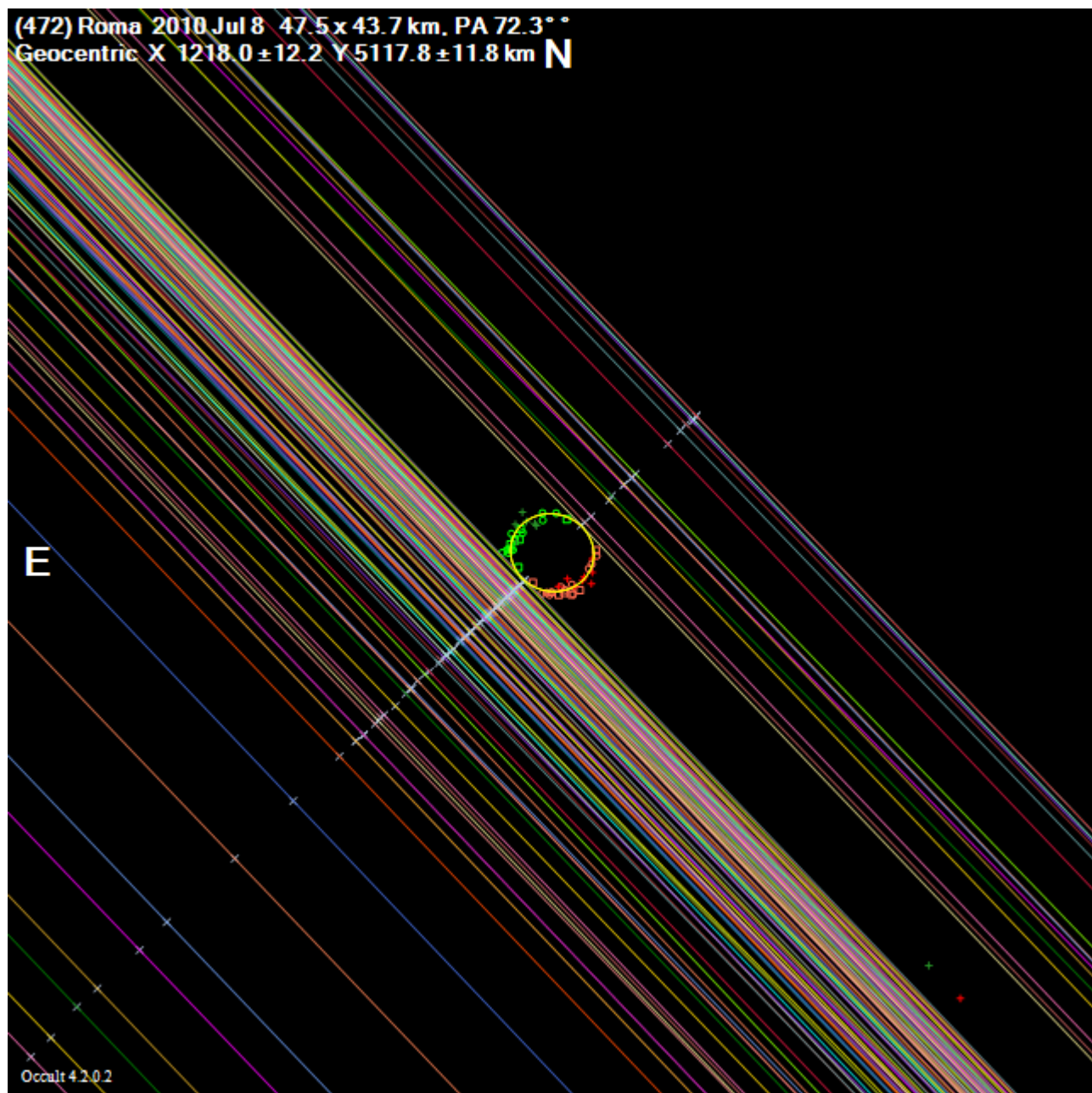
471papagena2014sep15

(471) Papagena 2014 Sep 15 205.0 x 127.0 km, PA 77.0° °
Geocentric X 1769.9 ± 2.0 Y 5922.7 ± 1.8 km **N**



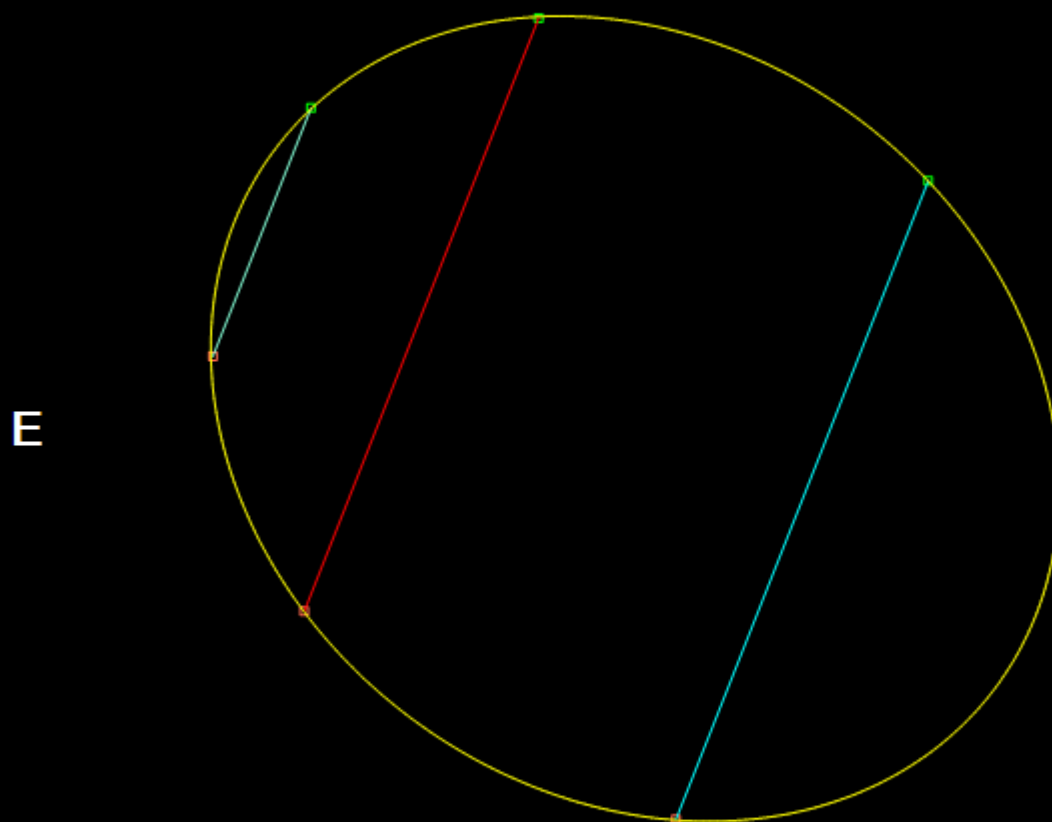
472roma2010jul08

(472) Roma 2010 Jul 8 47.5 x 43.7 km, PA 72.3° °
Geocentric X 1218.0 ± 12.2 Y 5117.8 ± 11.8 km N



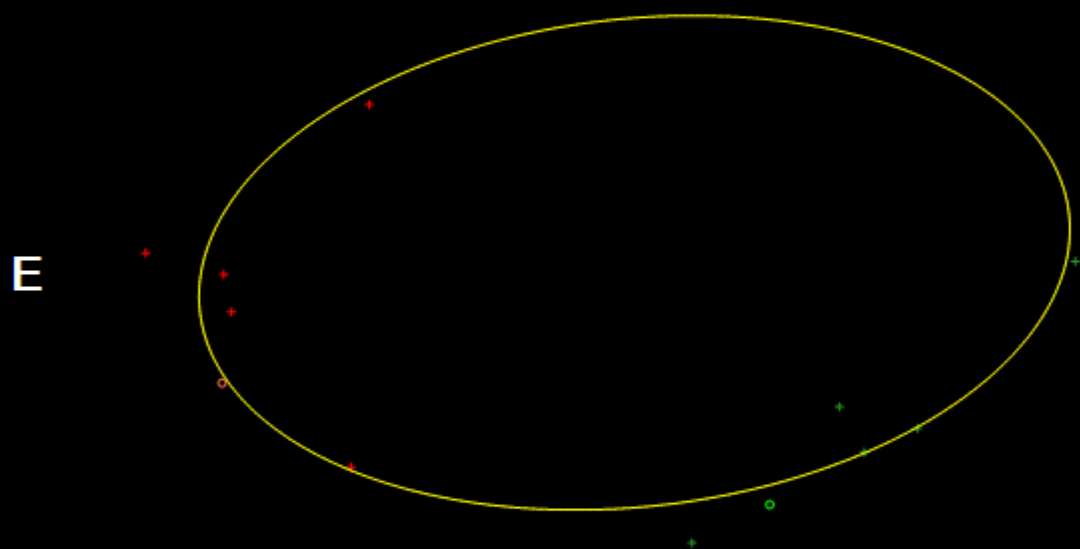
474prudentia2010aug13

(474) Prudentia 2010 Aug 13 $43.3 \pm 0.3 \times 36.0 \pm 0.1$ km, PA $53.3^\circ \pm 0.9^\circ$
Geocentric X -2813.4 ± 0.1 Y 3311.3 ± 0.1 km **N**

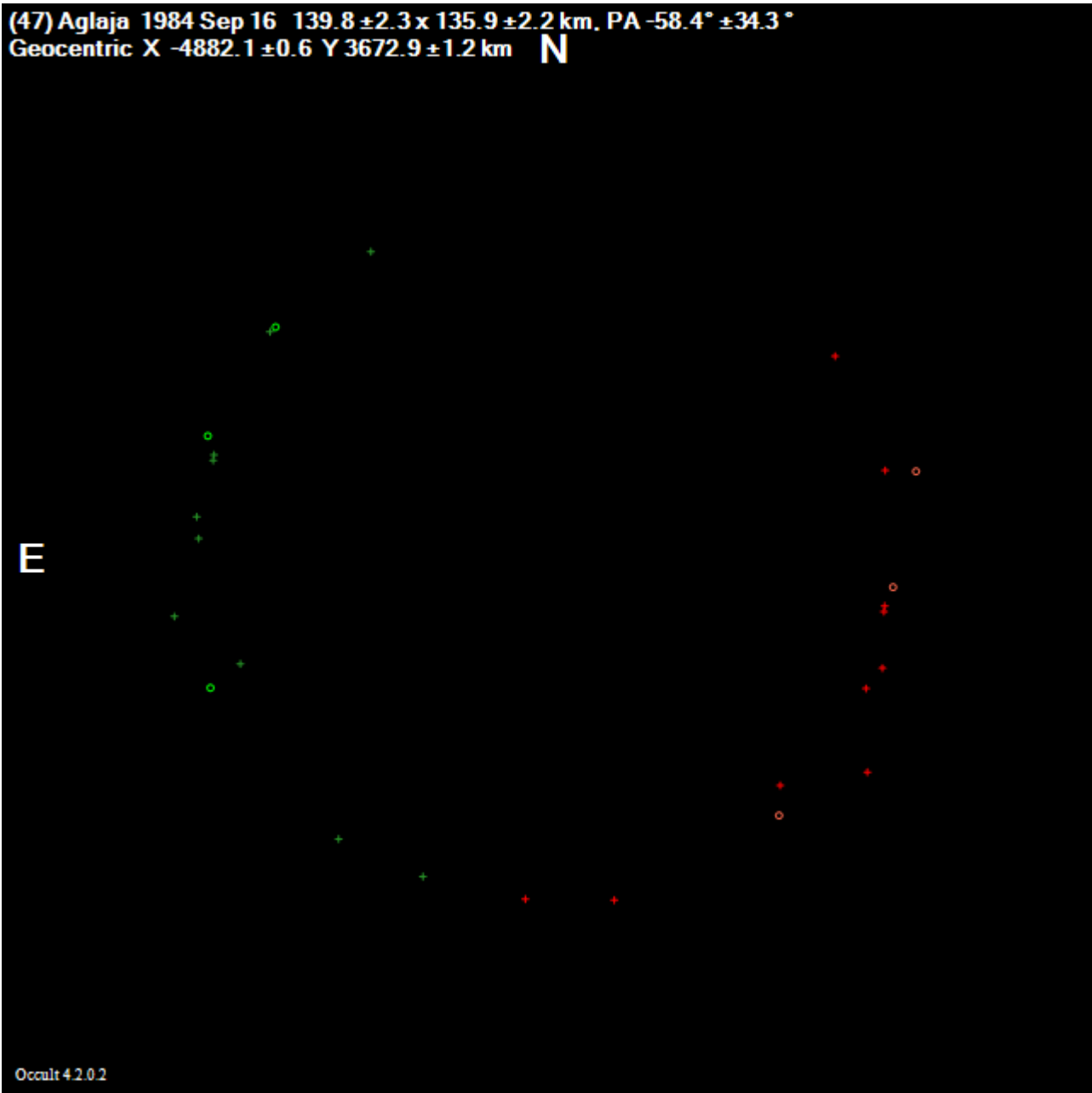


476hedwig2000nov07

(476) Hedwig 2000 Nov 7 $73.6 \pm 9.7 \times 132.0 \pm 6.8$ km, PA $6.4^\circ \pm 7.1^\circ$
Geocentric X 2634.5 ± 3.4 Y 5384.4 ± 3.6 km **N**



47aglaja1984sep16

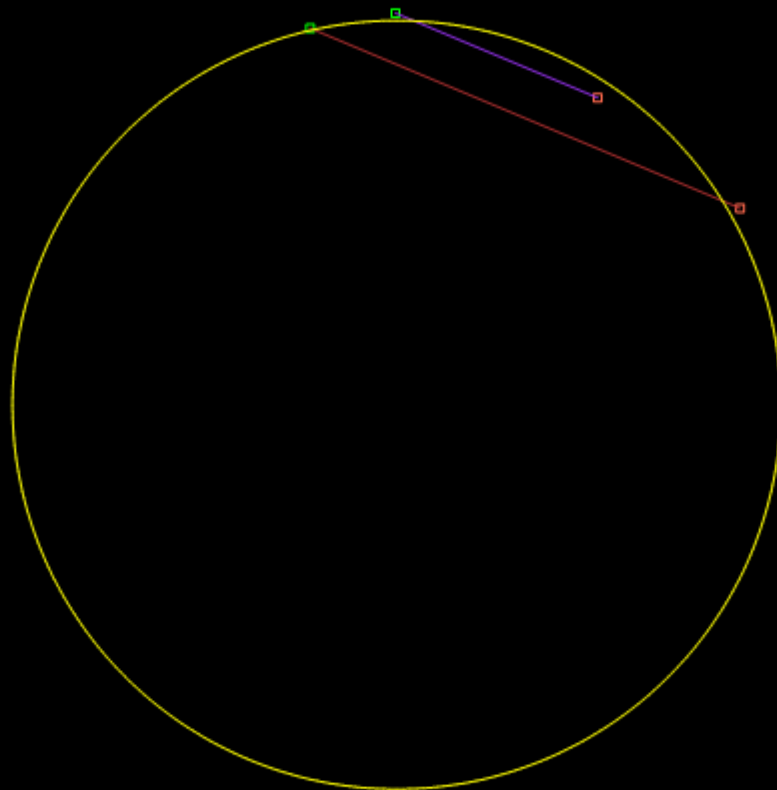


47aglaja2008jun12

(47) Aglaja 2008 Jun 12 140.0 x 140.0 km, PA 0.0° °
Geocentric X 1383.4 ± 2.1 Y 5852.8 ± 1.3 km

N

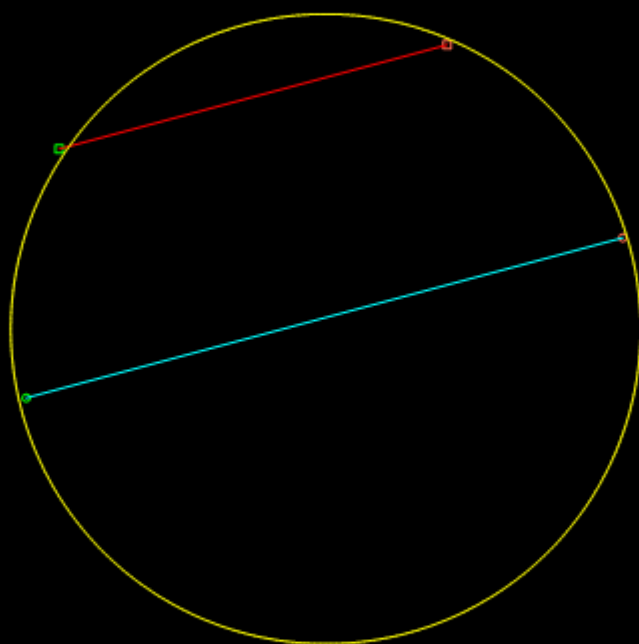
E



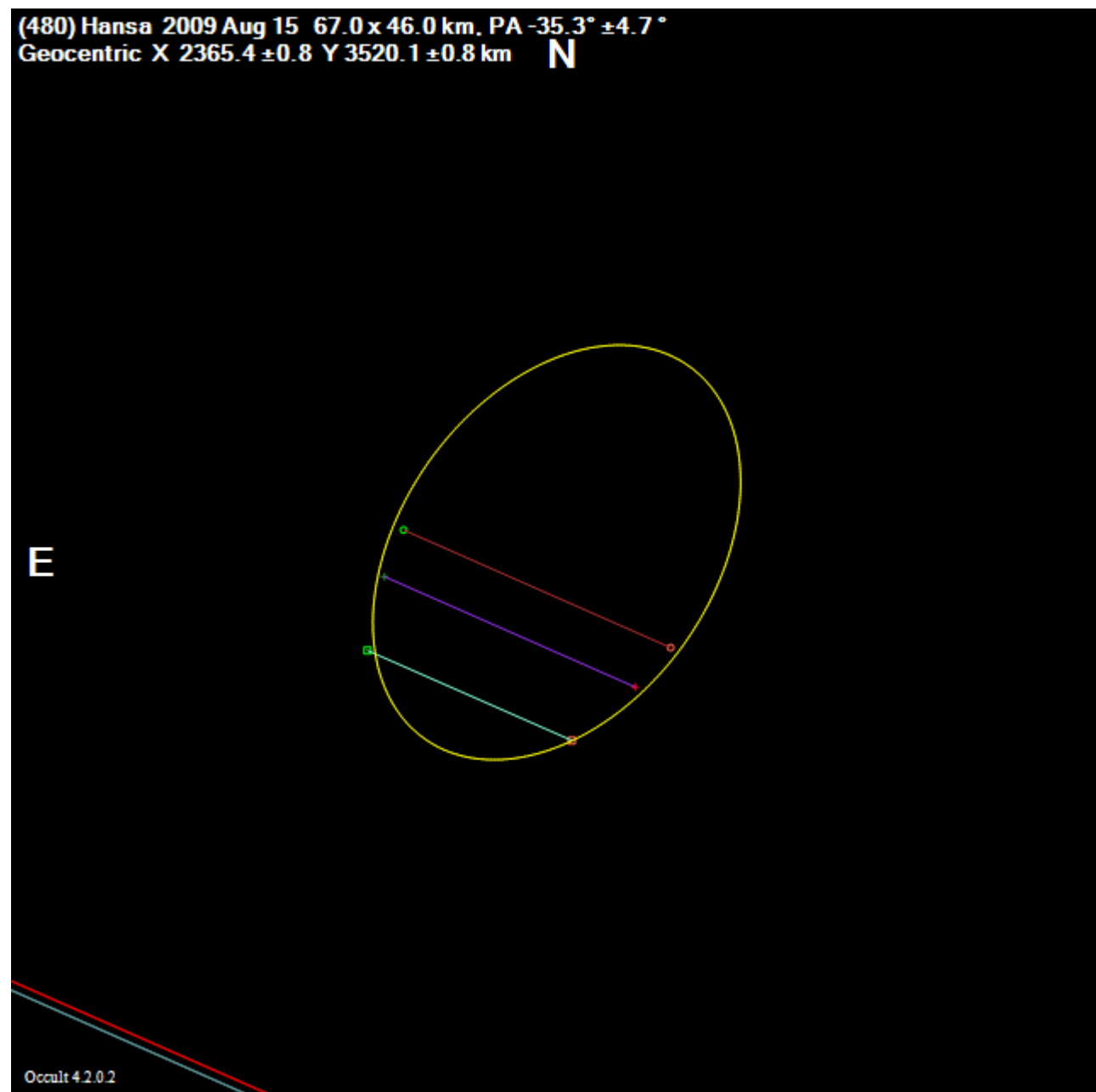
47aglaja2012mar28

(47) Aglaja 2012 Mar 28 140.0 x 140.0 km. PA 0.0°°
Geocentric X -2172.3 ± 0.8 Y 4920.0 ± 1.1 km **N**

E



(480) Hansa 2009 Aug 15 67.0 x 46.0 km. PA -35.3° ± 4.7°
Geocentric X 2365.4 ± 0.8 Y 3520.1 ± 0.8 km **N**



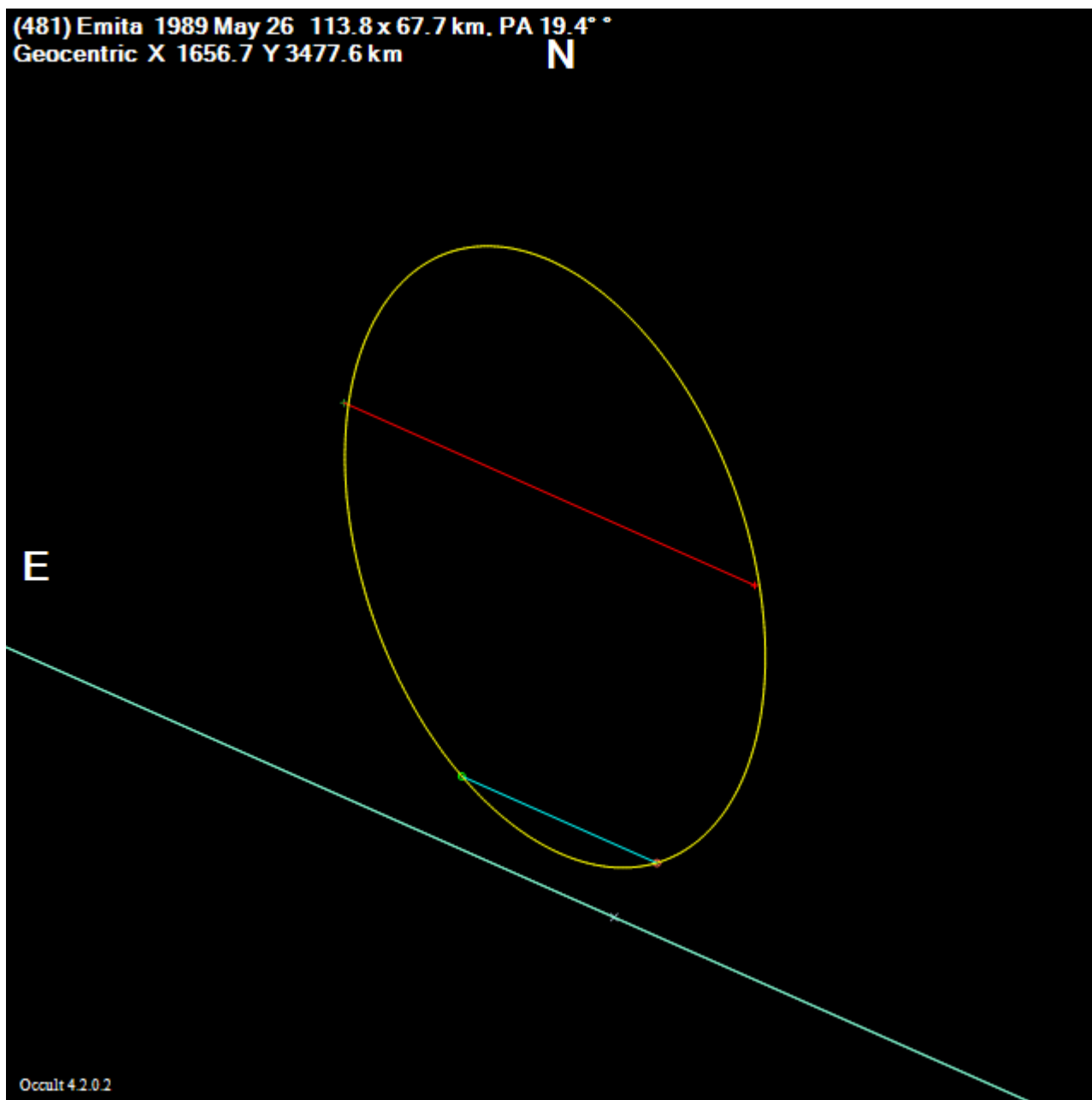
481emita1989may26

(481) Erita 1989 May 26 113.8 x 67.7 km, PA 19.4° °
Geocentric X 1656.7 Y 3477.6 km

N

E

Occult 4.2.0.2

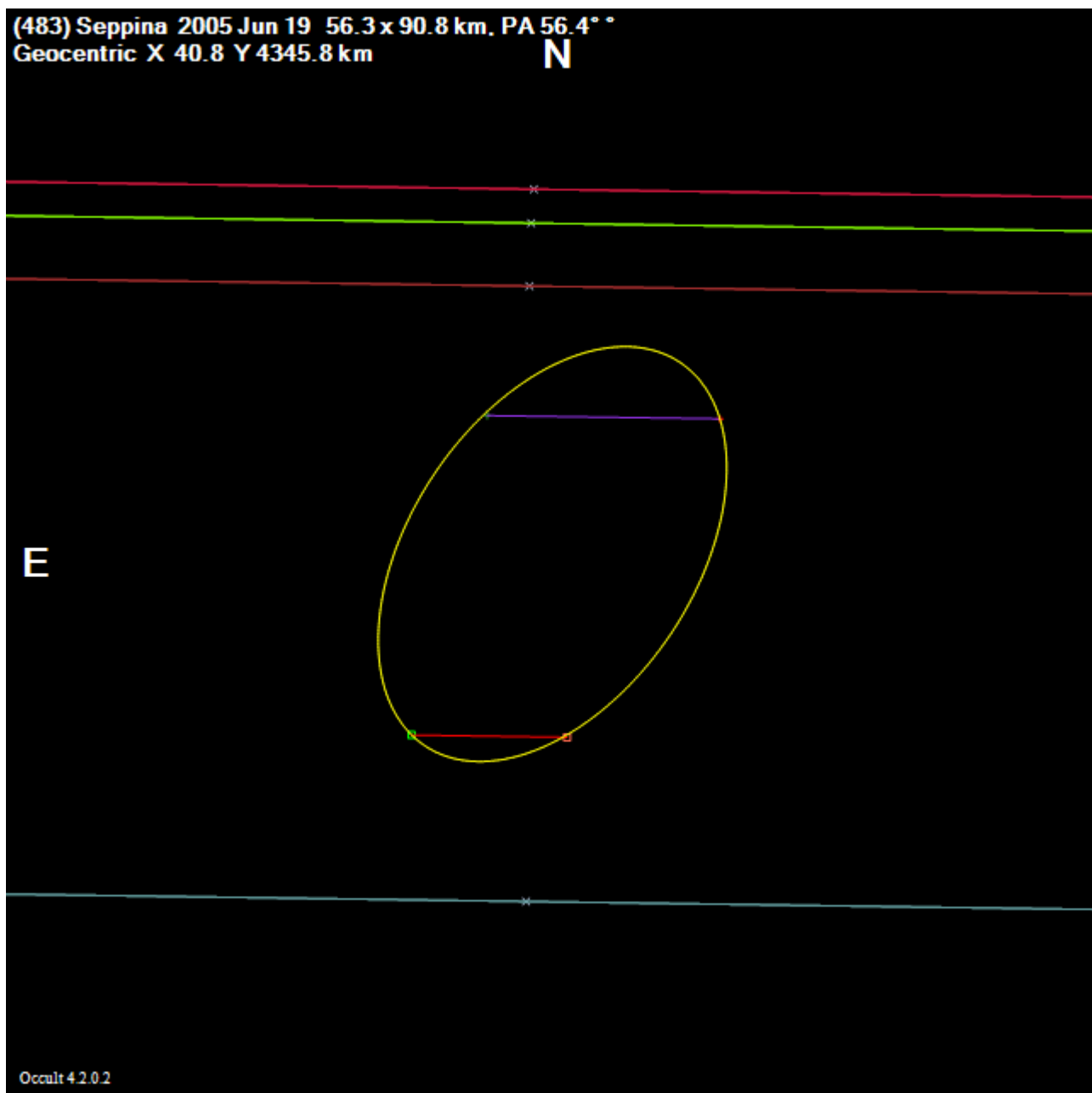


483seppina2005jun19

(483) Seppina 2005 Jun 19 56.3 x 90.8 km, PA 56.4° °
Geocentric X 40.8 Y 4345.8 km

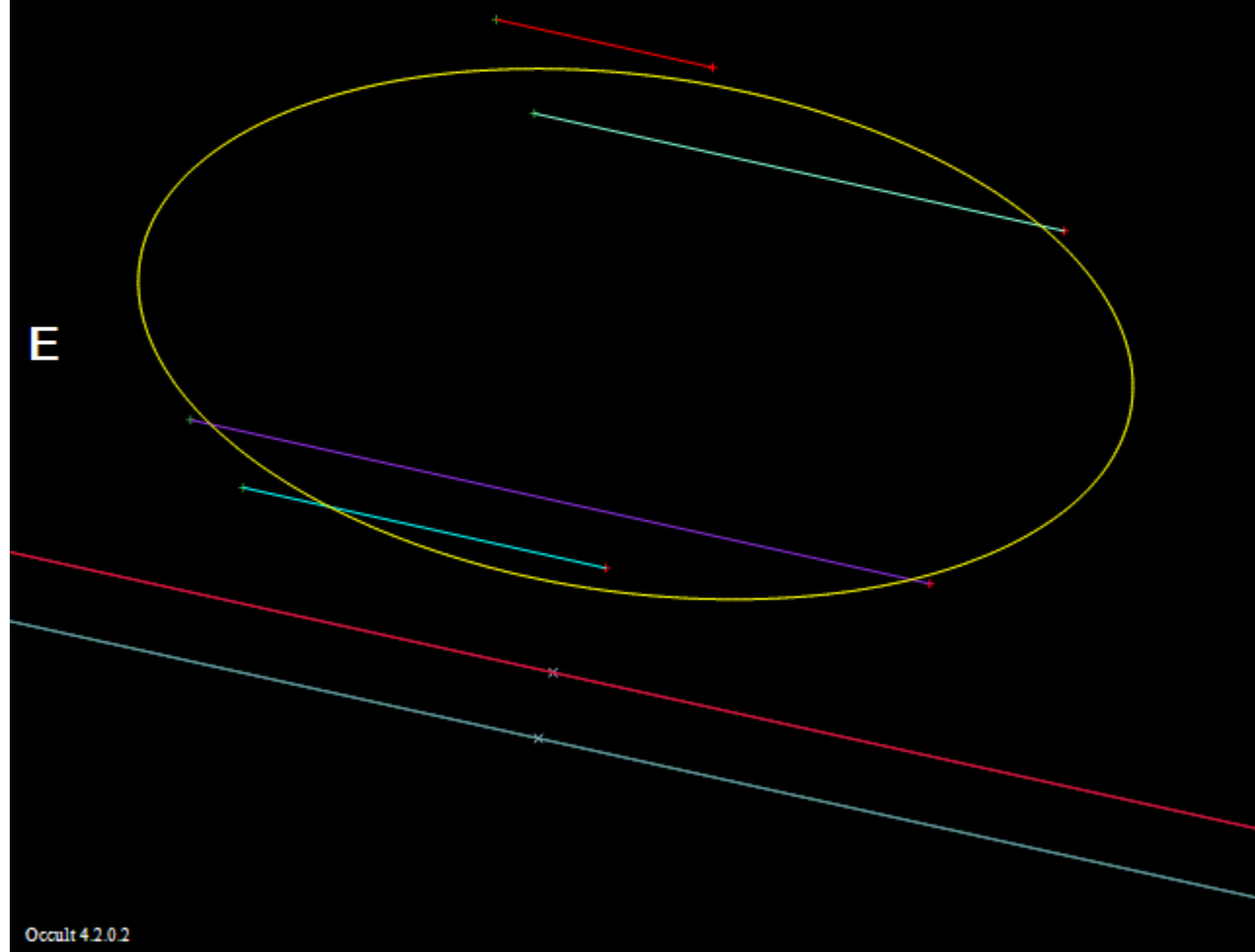
N

E



485genua2005dec27

(485) Genua 2005 Dec 27 $98.6 \pm 7.6 \times 50.8 \pm 3.5$ km, PA $81.8^\circ \pm 4.7^\circ$
Geocentric X -4331.1 ± 2.2 Y 3881.8 ± 1.2 km **N**



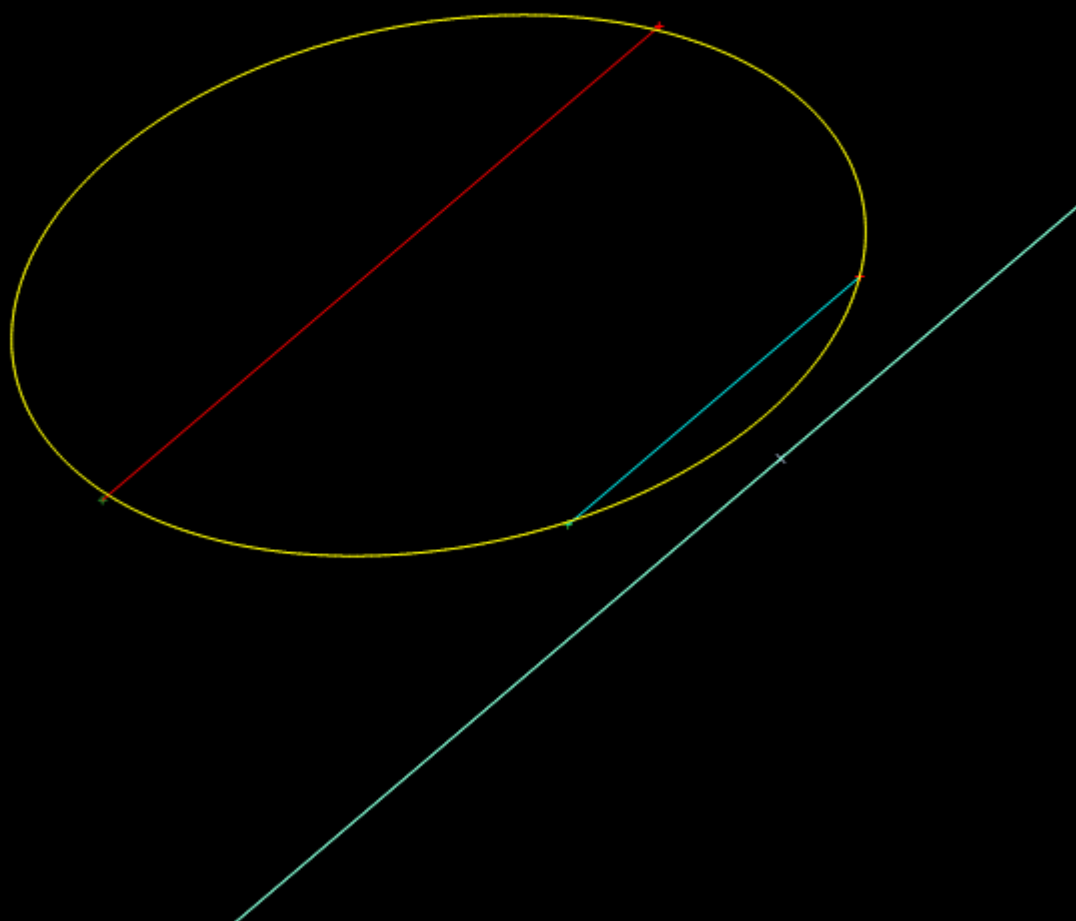
489comacina2000feb13

(489) Comacina 2000 Feb 13 156.4 x 94.7 km, PA -78.6° °
Geocentric X 1169.2 Y 4487.0 km

N

E

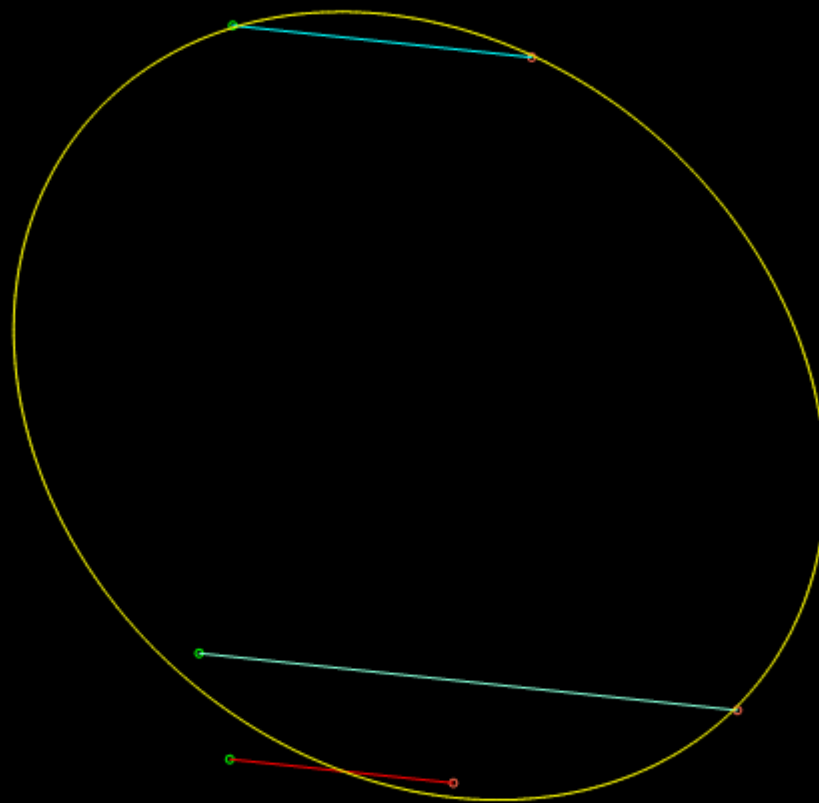
Occult 4.2.0.2



489comacina2004dec06

(489) Comacina 2004 Dec 6 $129.8 \pm 3.7 \times 158.2 \pm 5.2$ km, PA $-40.6^\circ \pm 10.8^\circ$
Geocentric X -619.6 ± 2.2 Y 4267.1 ± 1.2 km **N**

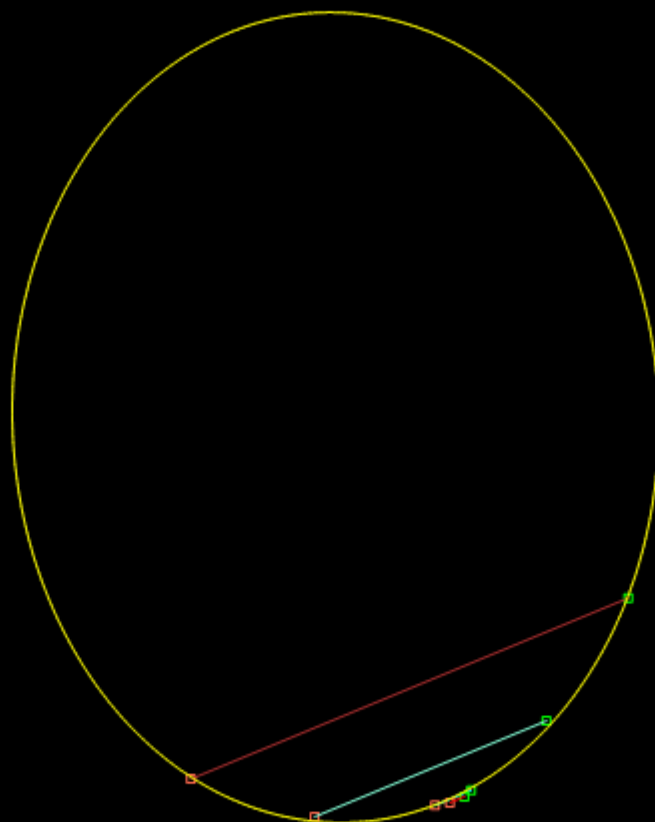
E



489comacina2012jun21

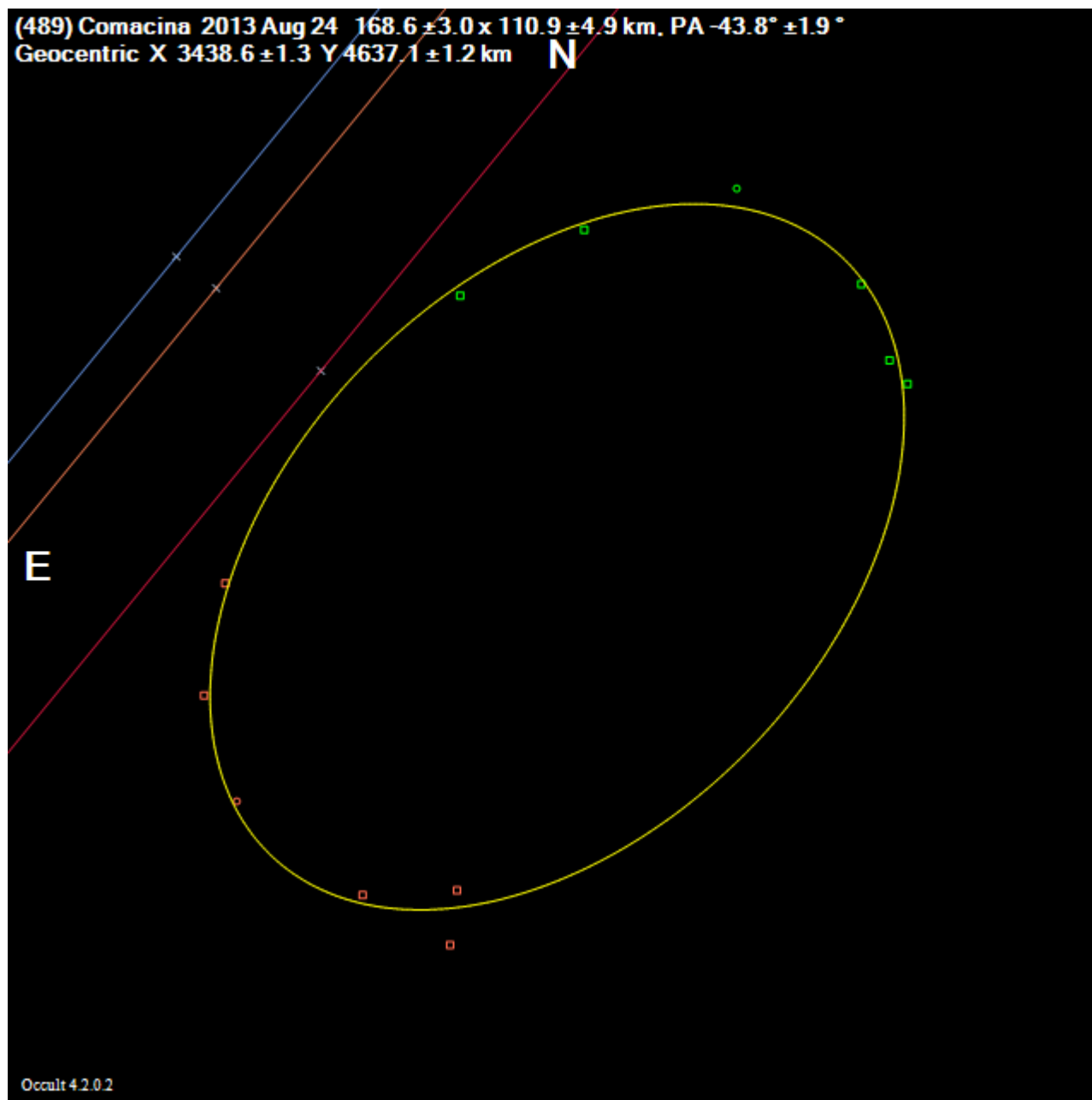
(489) Comacina 2012 Jun 21 141.3 x 112.7 \pm 4.0 km, PA 2.0° \pm 10.6°
Geocentric X 4615.2 \pm 4.1 Y 4081.1 \pm 0.3 km **N**

E



489comacina2013aug24

(489) Comacina 2013 Aug 24 $168.6 \pm 3.0 \times 110.9 \pm 4.9$ km, PA $-43.8^\circ \pm 1.9^\circ$
Geocentric X 3438.6 ± 1.3 Y 4637.1 ± 1.2 km

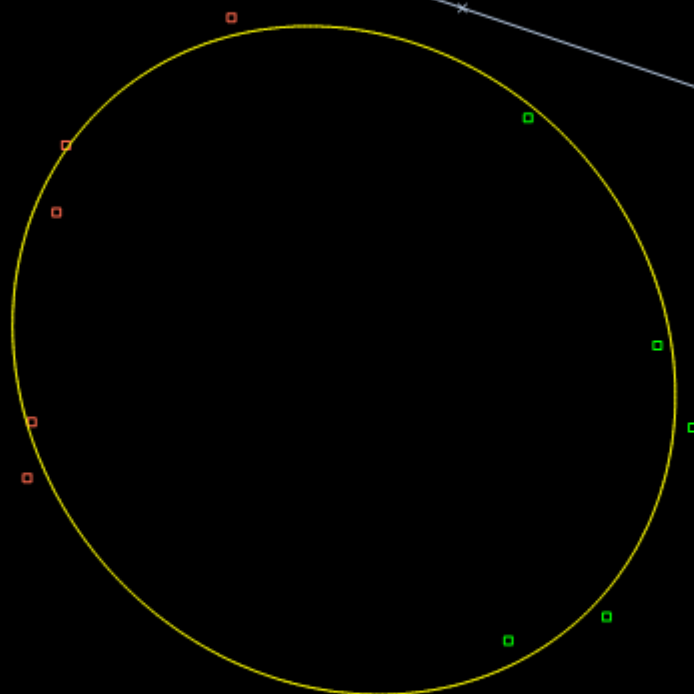


489comacina2015jan10

(489) Comacina 2015 Jan 10 $126.6 \pm 2.9 \times 113.8 \pm 4.1$ km, PA $42.7^\circ \pm 14.9^\circ$
Geocentric X 3915.6 ± 1.2 Y 4334.5 ± 1.7 km **N**

E

Occult 4.2.9.1



48doris1999oct14

(48) Doris 1999 Oct 14 $271.6 \pm 15.6 \times 141.9 \pm 14.7$ km, PA $-81.7^\circ \pm 4.2^\circ$
Geocentric X 5348.4 ± 5.9 Y -2155.2 ± 4.5 km **N**

E

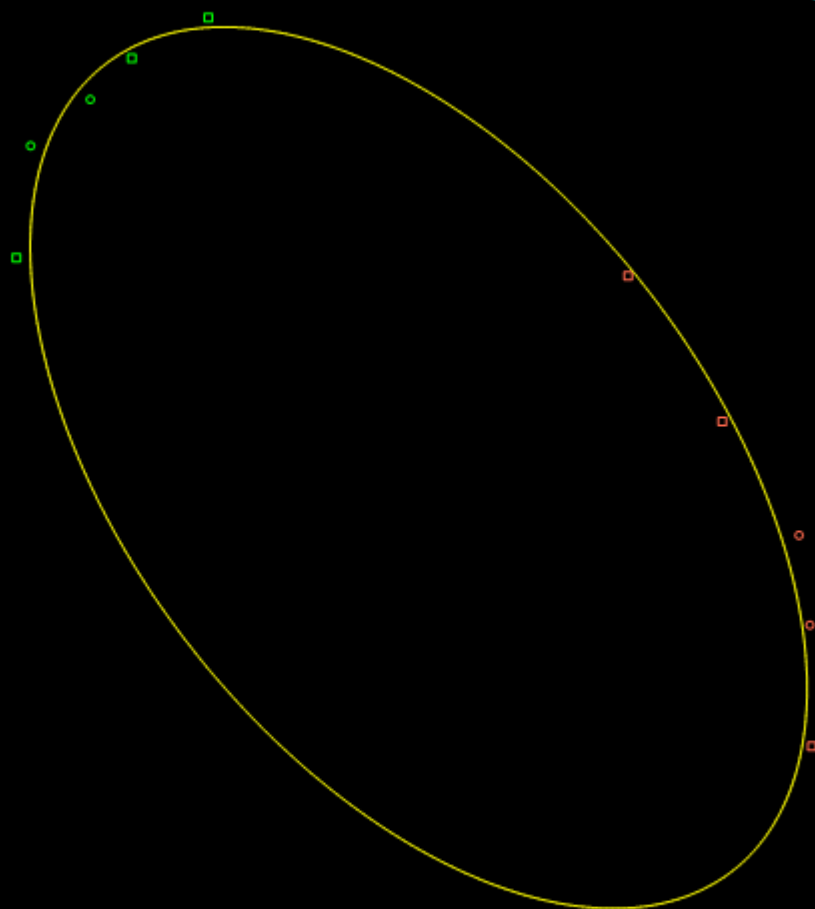


48doris2011sep14

(48) Doris 2011 Sep 14 $265.9 \pm 5.0 \times 150.9 \pm 7.3$ km, PA $37.9^\circ \pm 2.6^\circ$
Geocentric X -1919.8 ± 1.2 Y 4892.8 ± 4.2 km **N**

E

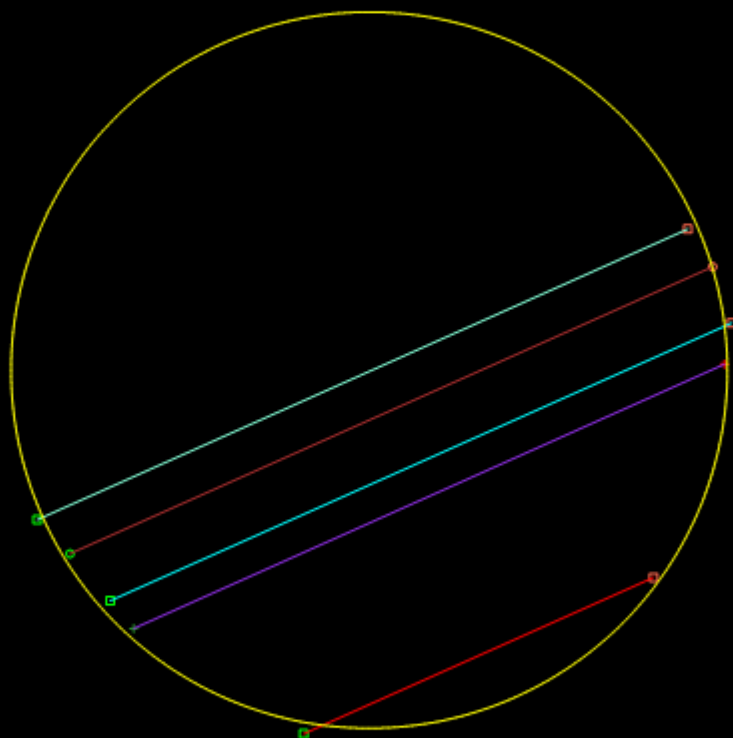
Occult 4.2.0.2



490veritas2006jan28

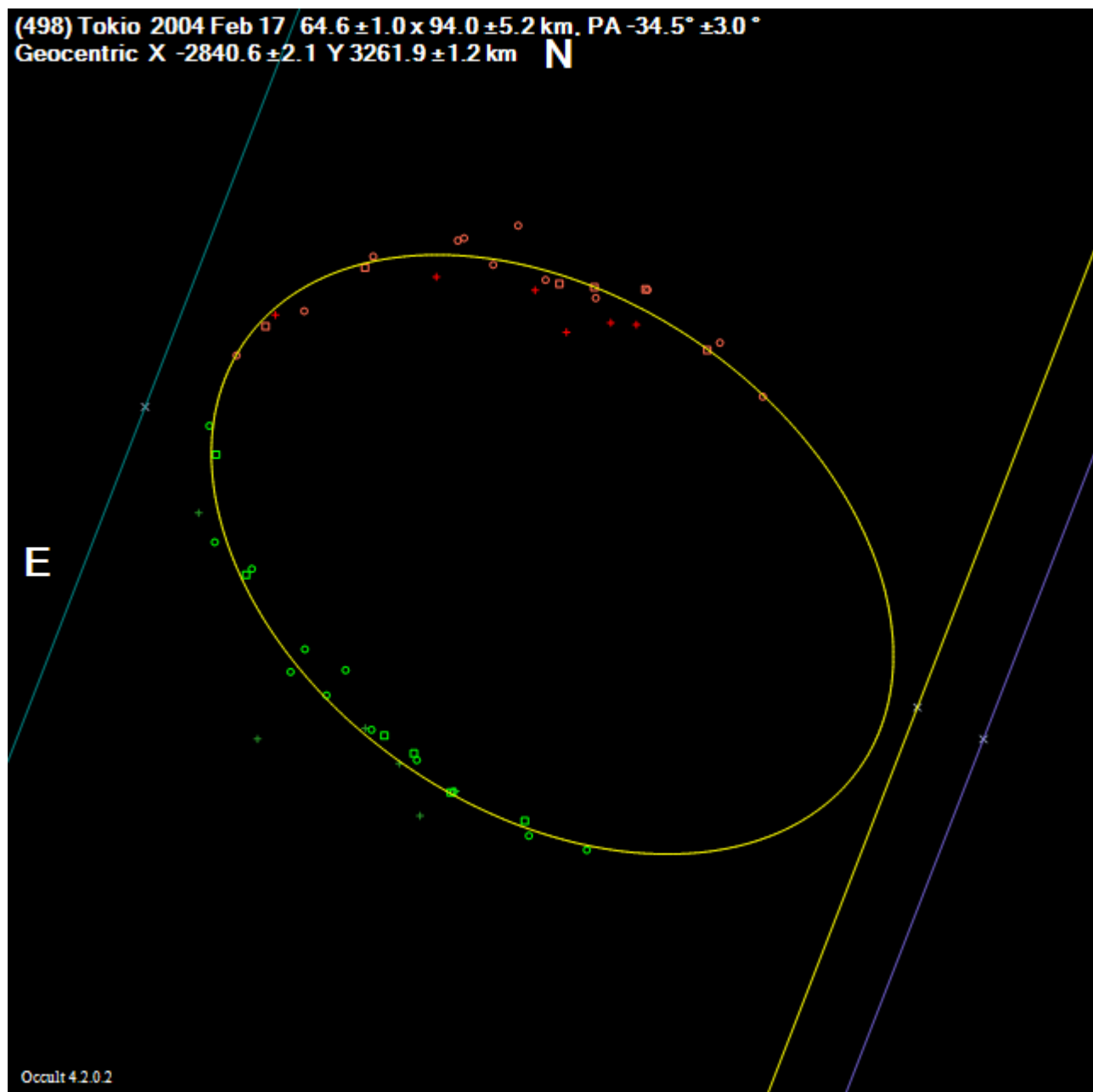
(490) Veritas 2006 Jan 28 $108.1 \pm 4.2 \times 108.1$ km, PA 0.0° °
Geocentric X -2968.8 ± 0.6 Y 2754.4 ± 1.8 km **N**

E



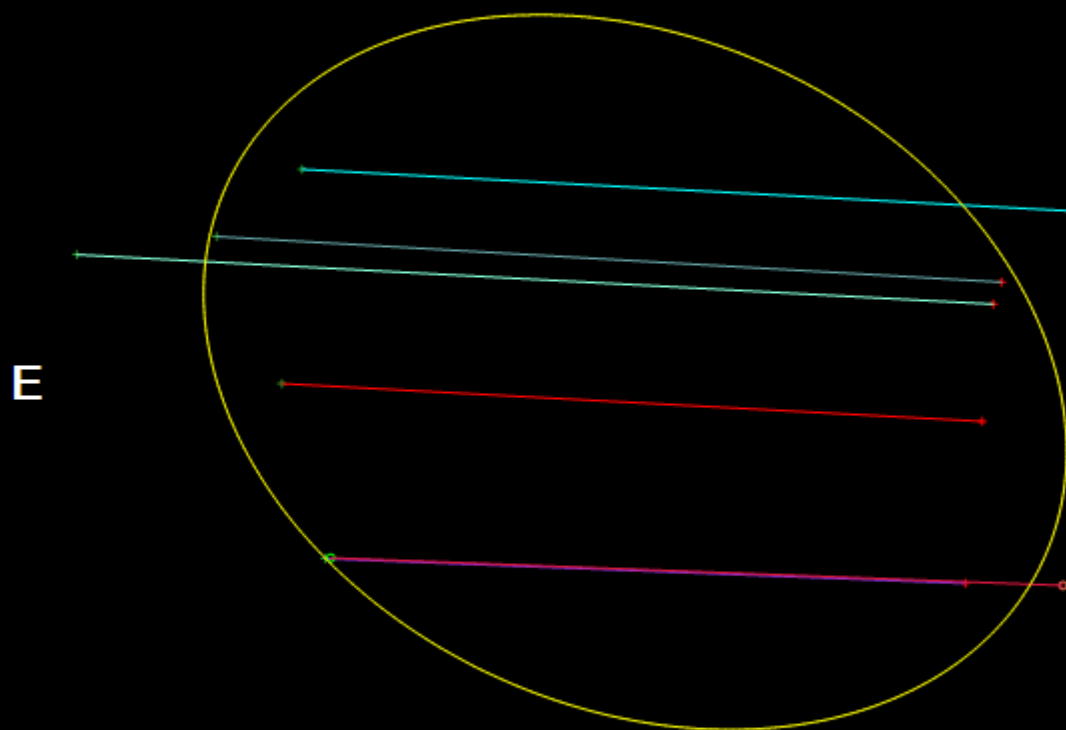
498tokio2004feb17

(498) Tokio 2004 Feb 17 $64.6 \pm 1.0 \times 94.0 \pm 5.2$ km, PA $-34.5^\circ \pm 3.0^\circ$
Geocentric X -2840.6 ± 2.1 Y 3261.9 ± 1.2 km **N**



49pales2000jan17

(49) Pales 2000 Jan 17 $174.2 \pm 8.6 \times 129.8 \pm 26.7$ km, PA $65.3^\circ \pm 24.8^\circ$
Geocentric X 2154.9 ± 3.5 Y 3124.6 ± 6.7 km **N**

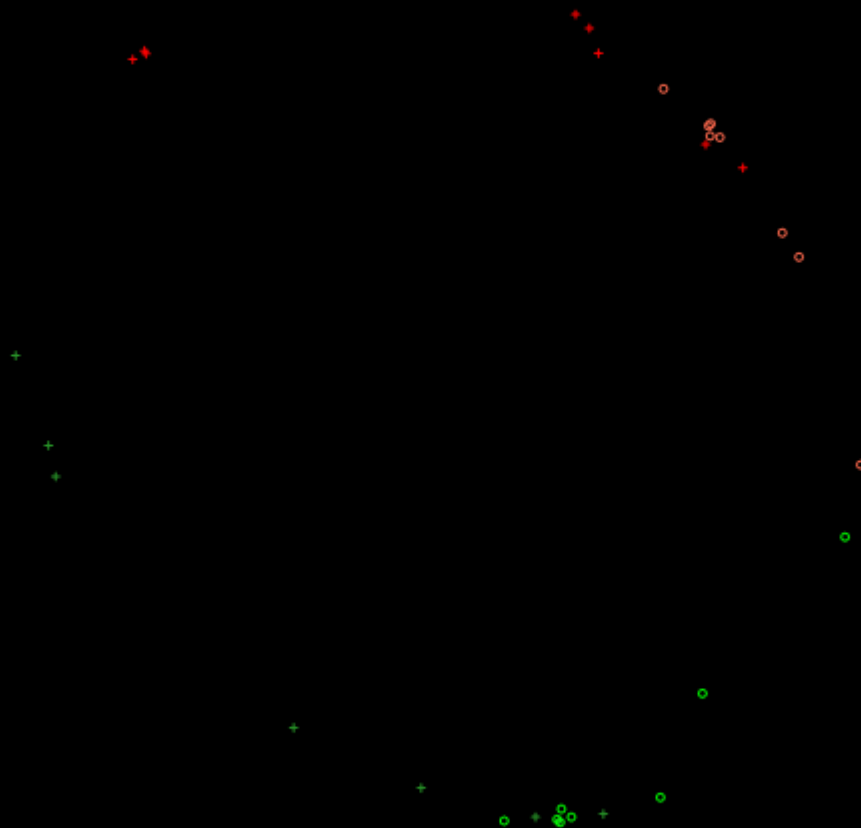


4vesta1991jan04

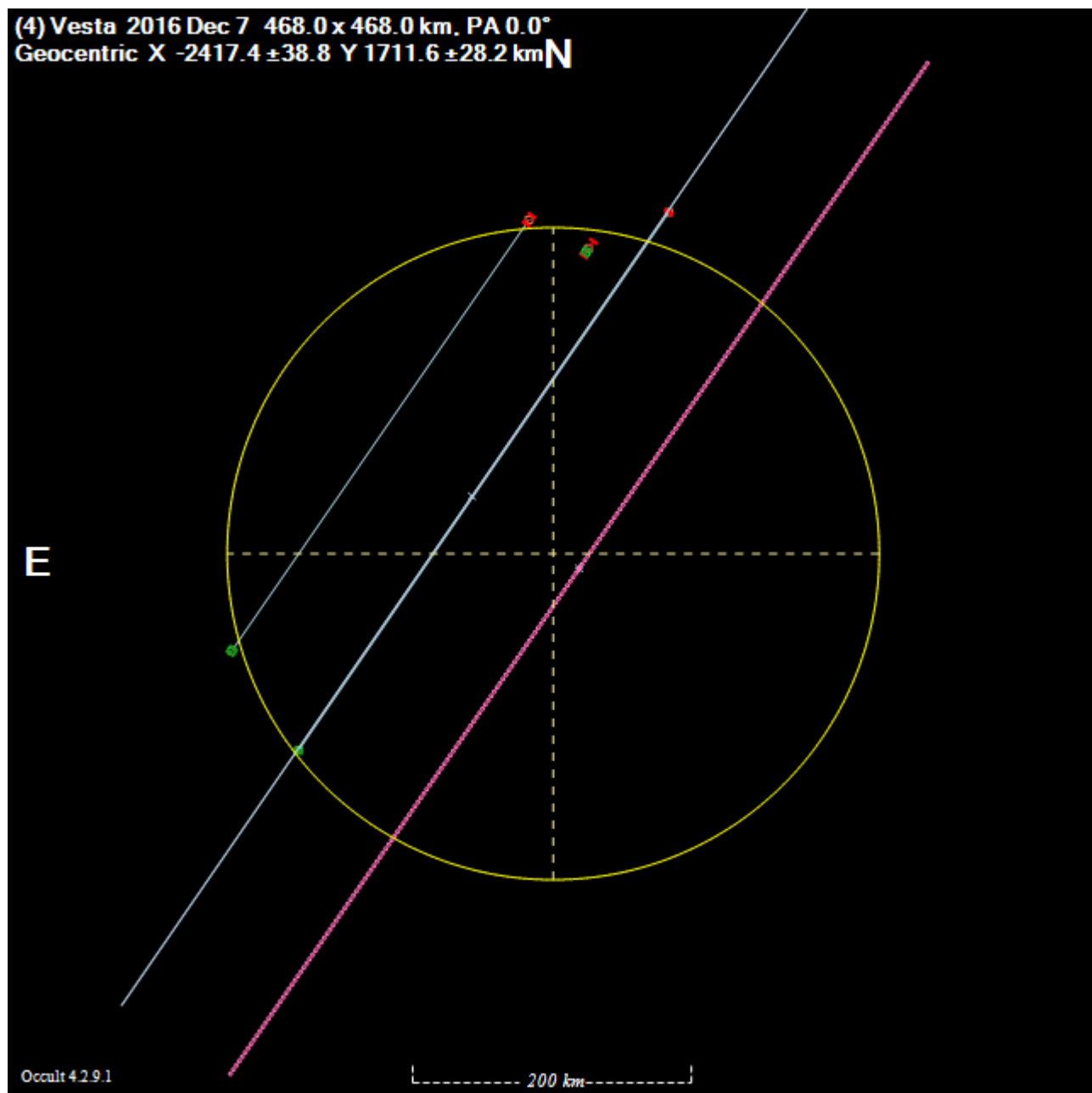
(4) Vesta 1991 Jan 4 $547.2 \pm 5.5 \times 462.8 \pm 4.9$ km, PA $38.5^\circ \pm 3.3^\circ$
Geocentric X -1314.4 ± 2.2 Y 3472.6 ± 2.3 km **N**

E

Occult 4.2.0.2



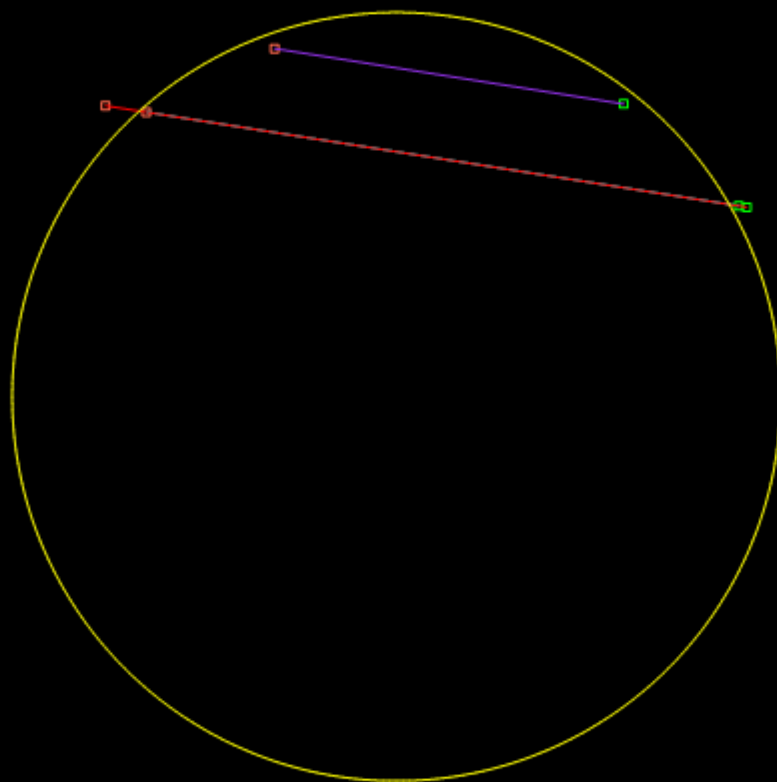
(4) Vesta 2016 Dec 7 468.0 x 468.0 km, PA 0.0°
Geocentric X -2417.4 ± 38.8 Y 1711.6 ± 28.2 km



50000quaoar2012feb17

(50000) Quaoar 2012 Feb 17 1260.0 x 1260.0 km, PA 0.0° °
Geocentric X -3618.3 ± 14.6 Y 4661.8 ± 14.4 km **N**

E

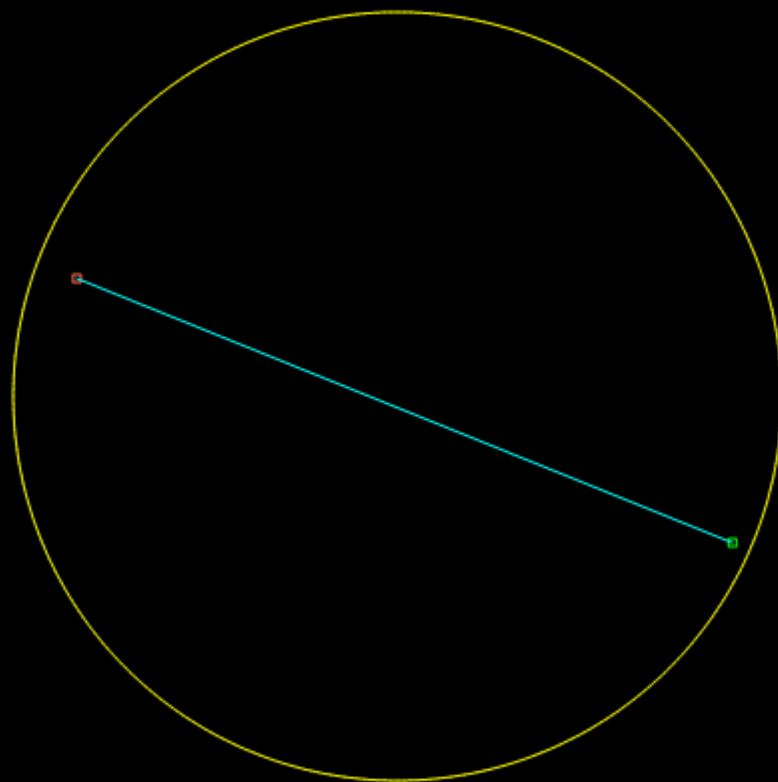


506marion2006nov28

(506) Marion 2006 Nov 28 106.0 x 106.0 km, PA 0.0°
Geocentric X 4732.5 Y 4078.4 km

N

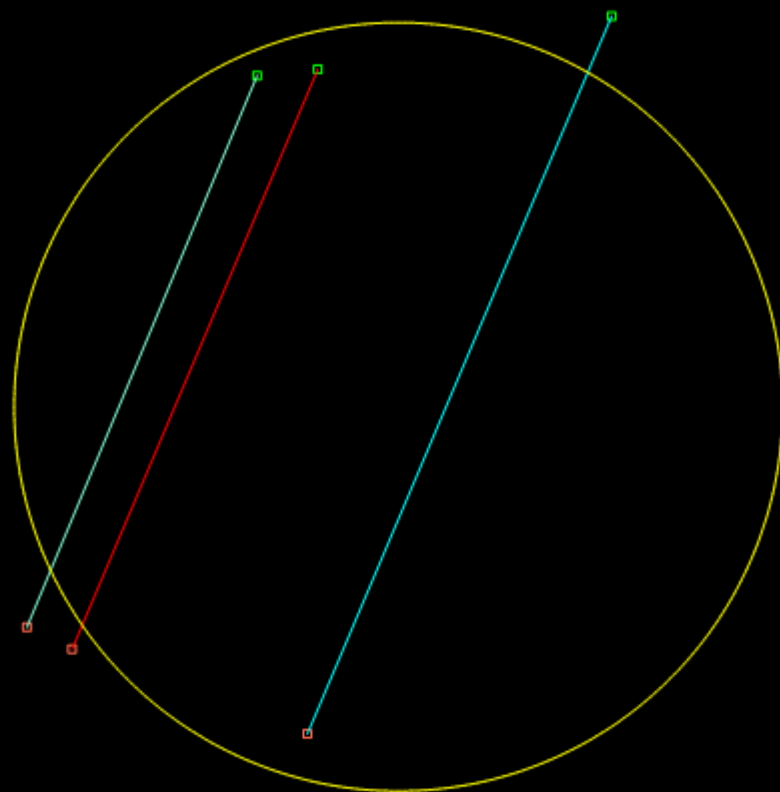
E



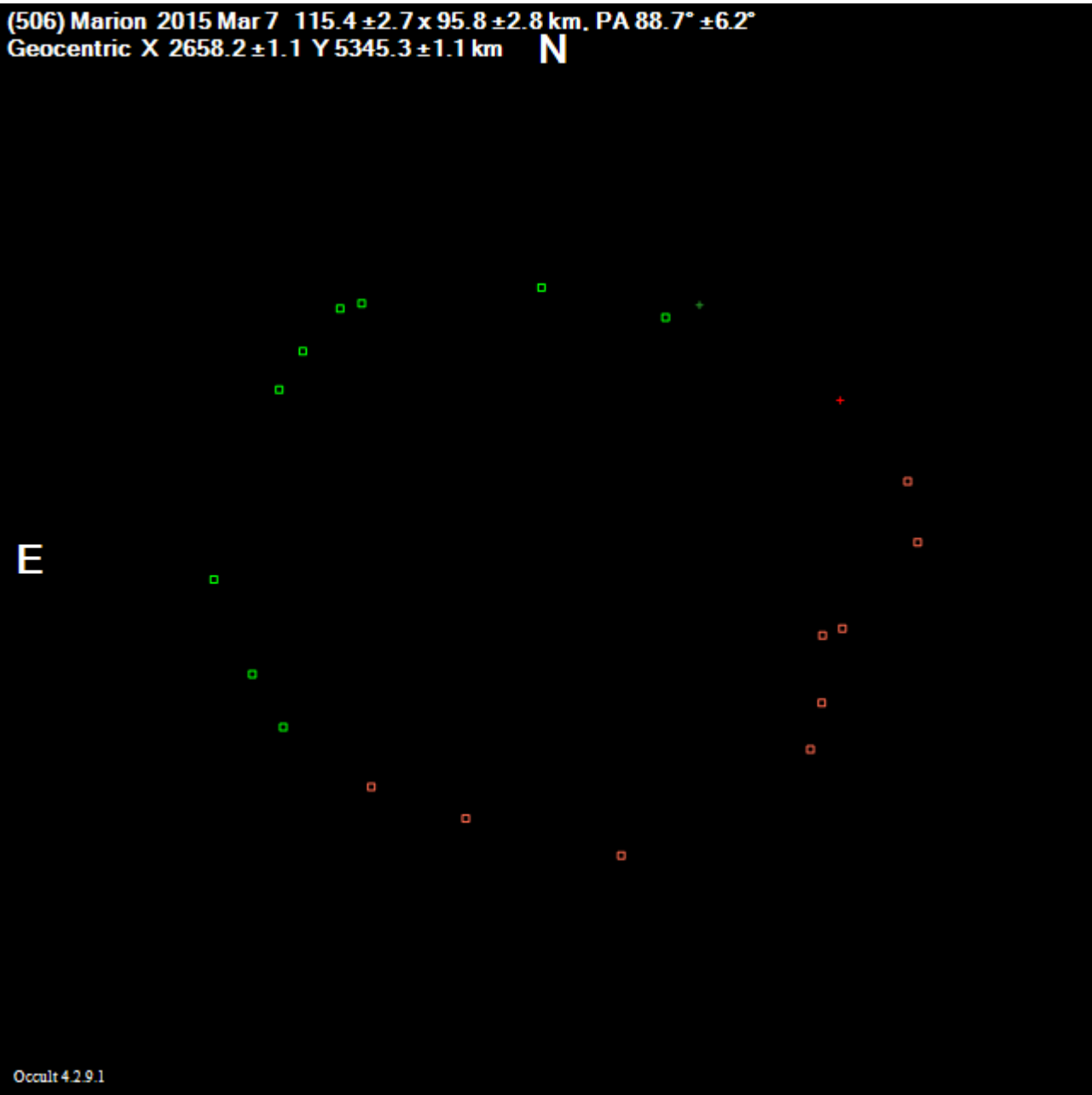
506marion2014mar02

(506) Marion 2014 Mar 2 99.0 x 99.0 km. PA 0.0° °
Geocentric X 181.3 ± 4.2 Y 2530.3 ± 2.8 km **N**

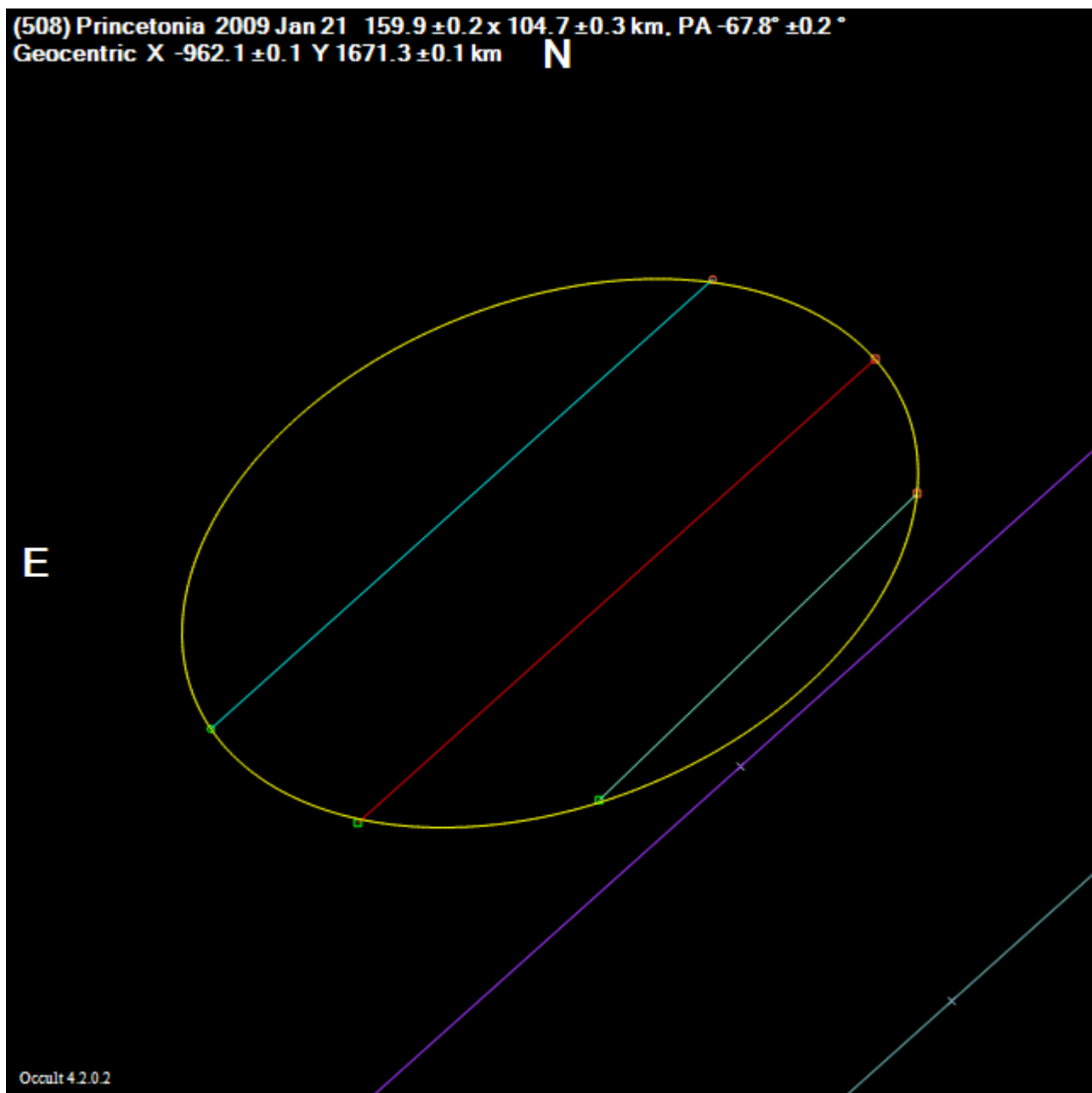
E



506marion2015mar07



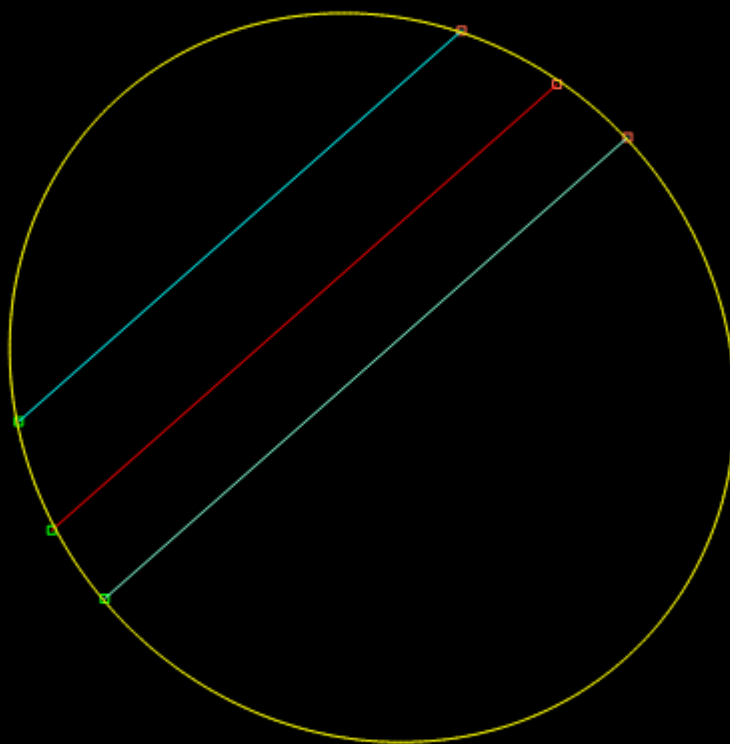
(508) Princetonia 2009 Jan 21 159.9 ± 0.2 x 104.7 ± 0.3 km, PA -67.8° ± 0.2°
Geocentric X -962.1 ± 0.1 Y 1671.3 ± 0.1 km **N**



511davida2009feb06

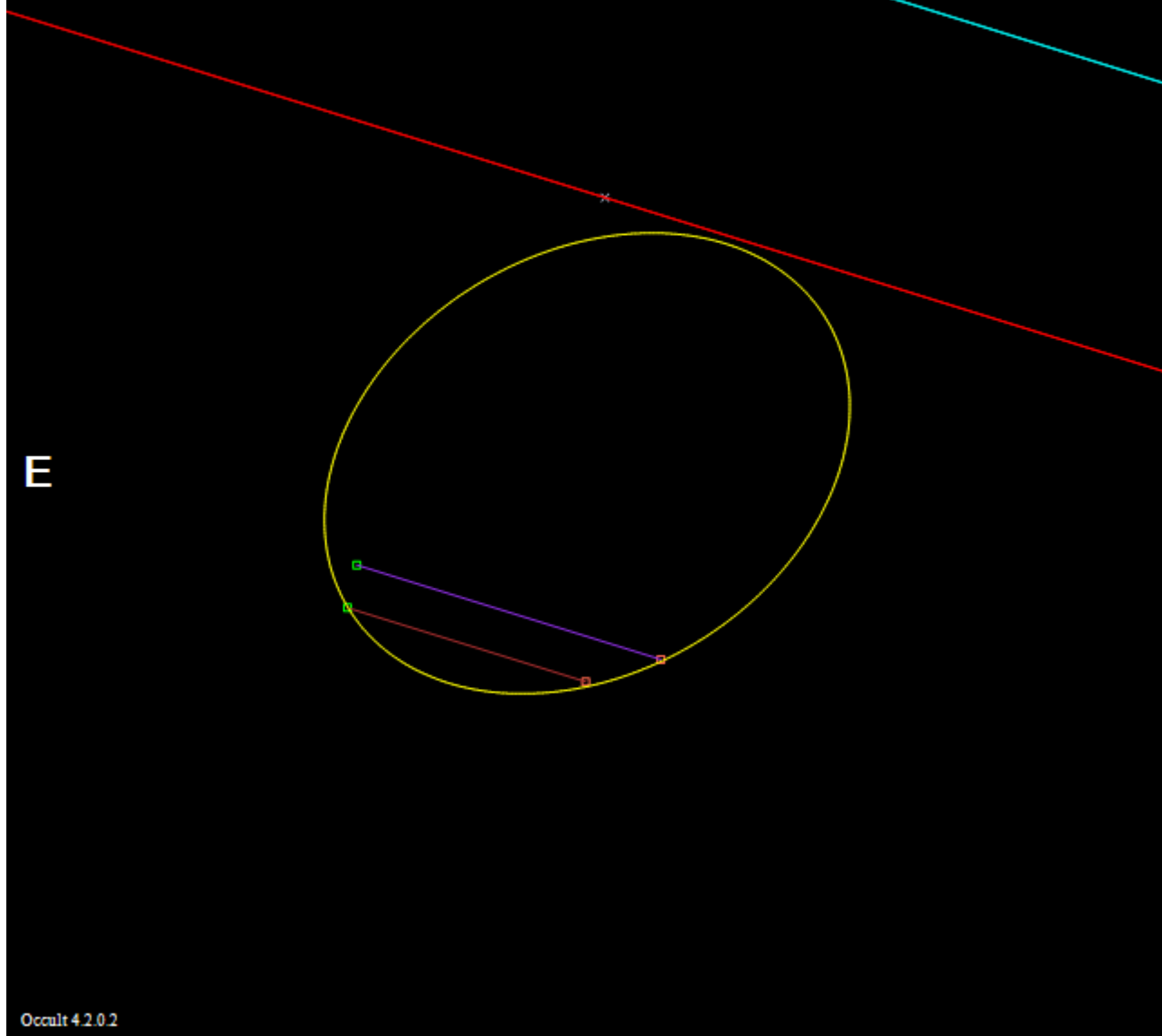
(511) Davida 2009 Feb 6 $320.6 \pm 35.6 \times 295.9 \pm 2.0$ km, PA $43.2^\circ \pm 6.4^\circ$
Geocentric X -165.2 ± 6.7 Y 1237.1 ± 7.5 km **N**

E



511davida2011jul14

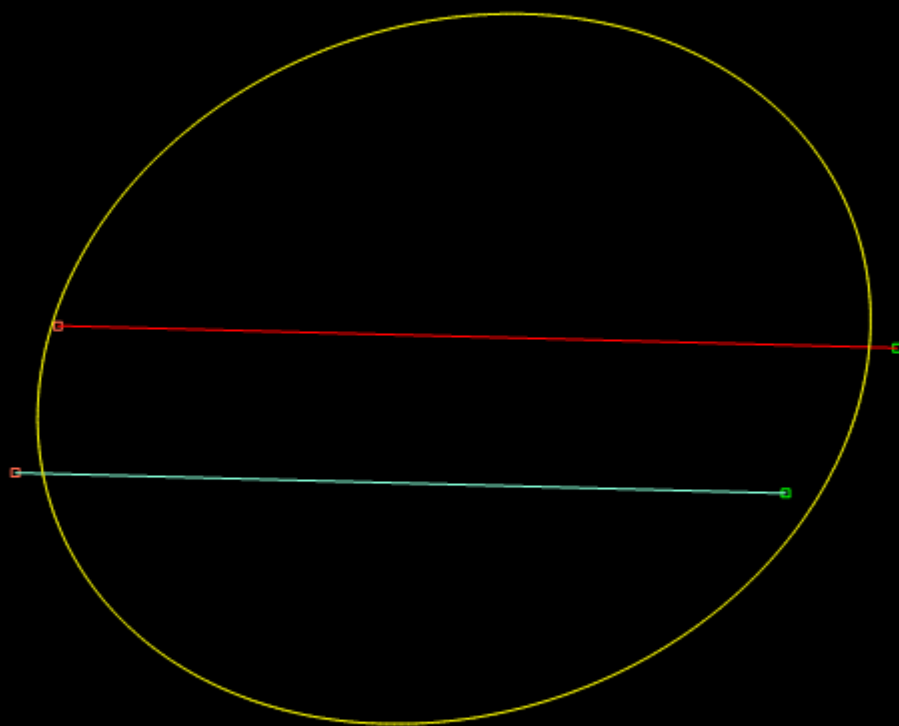
(511) Davida 2011 Jul 14 $262.0 \pm 121.8 \times 197.0 \pm 52.8$ km, PA -59.0° °
Geocentric X -281.6 ± 55.4 Y 5219.3 ± 33.8 km **N**



511davida2011mar12

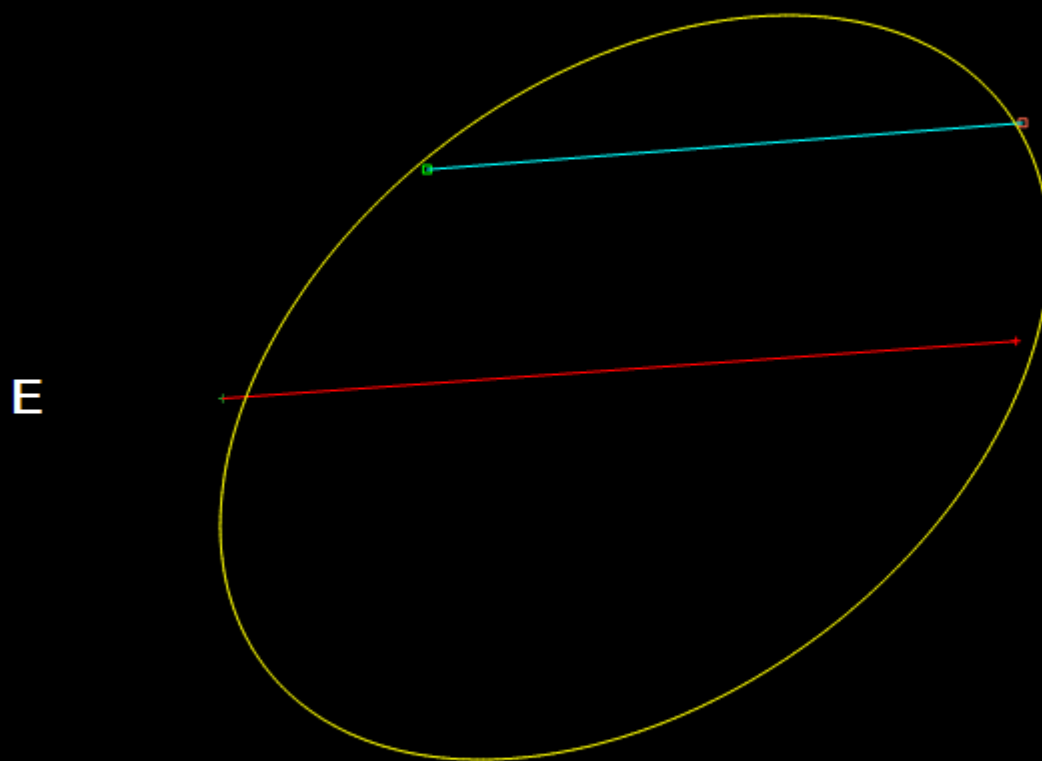
(511) Davida 2011 Mar 12 361.0 x 292.0 km, PA -69.6° ± 5.8 °
Geocentric X -2644.7 ± 3.2 Y 5024.1 ± 9.9 km **N**

E



514armida2014aug15

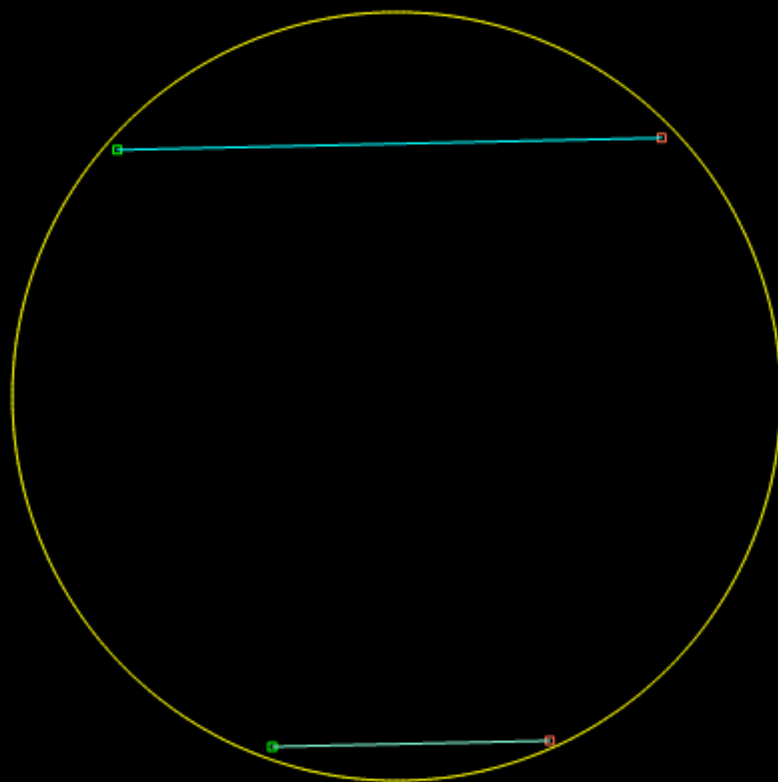
(514) Armida 2014 Aug 15 117.0 x 78.0 km, PA -53.1° ± 4.1 °
Geocentric X 3667.1 ± 0.8 Y 4708.1 ± 1.2 km **N**



514armida2014jun07

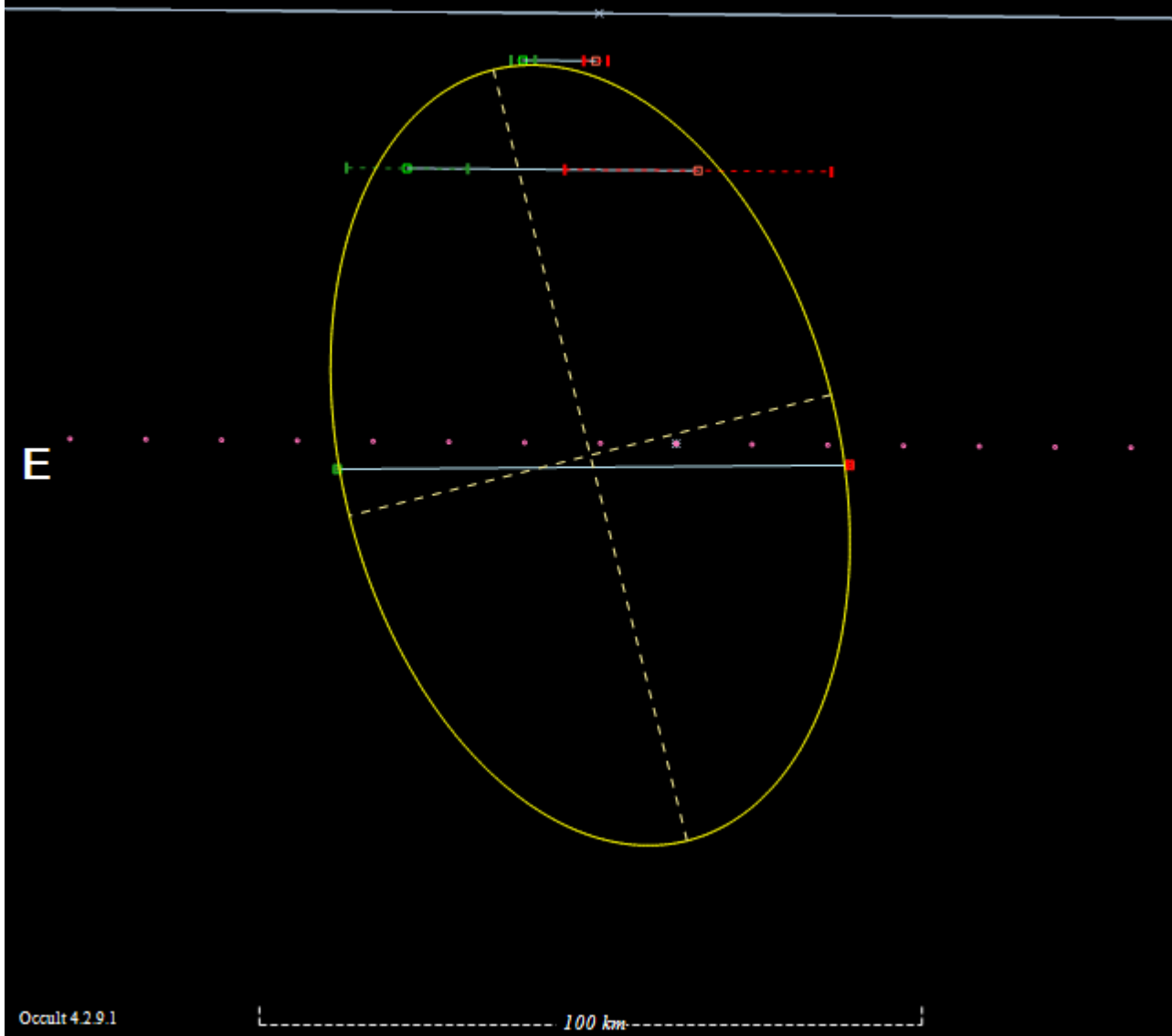
(514) Armida 2014 Jun 7 97.0 x 97.0 km. PA 0.0° °
Geocentric X -2919.6 ± 0.3 Y 5185.0 ± 0.2 km **N**

E



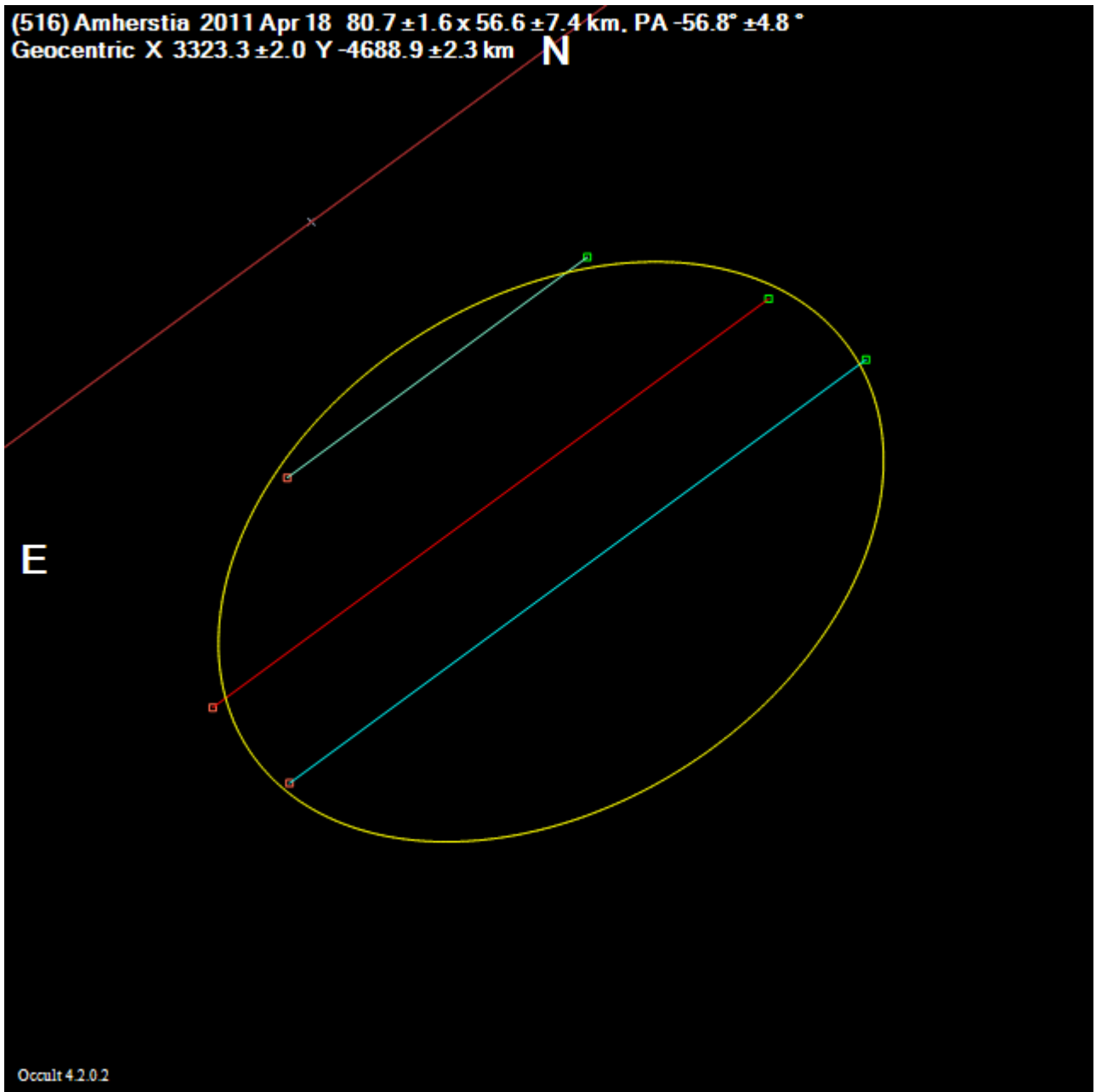
514Armida2016Dec15

(514) Armida 2016 Dec 15 120.0 x 75.0 \pm 3.2 km, PA 14.1° \pm 6.9°
Geocentric X 3328.8 \pm 1.7 Y 3107.0 \pm 2.3 km **N**



516amherstia2011apr18

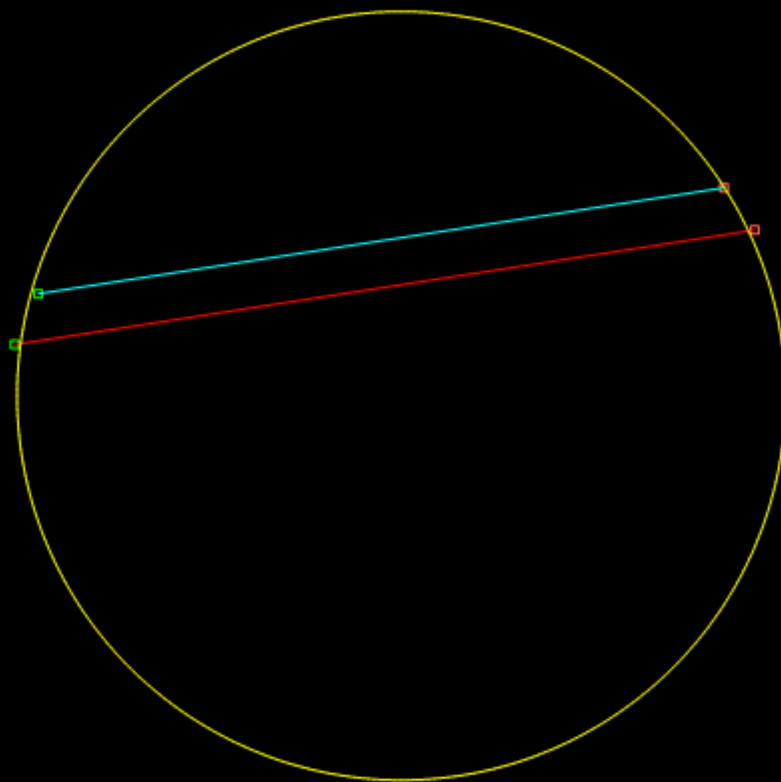
(516) Amherstia 2011 Apr 18 $80.7 \pm 1.6 \times 56.6 \pm 7.4$ km, PA $-56.8^\circ \pm 4.8^\circ$
Geocentric X 3323.3 ± 2.0 Y -4688.9 ± 2.3 km



517edith2011jan28

(517) Edith 2011 Jan 28 91.0 x 91.0 km, PA 0.0° °
Geocentric X 1816.8 ± 0.4 Y 1948.7 ± 0.9 km **N**

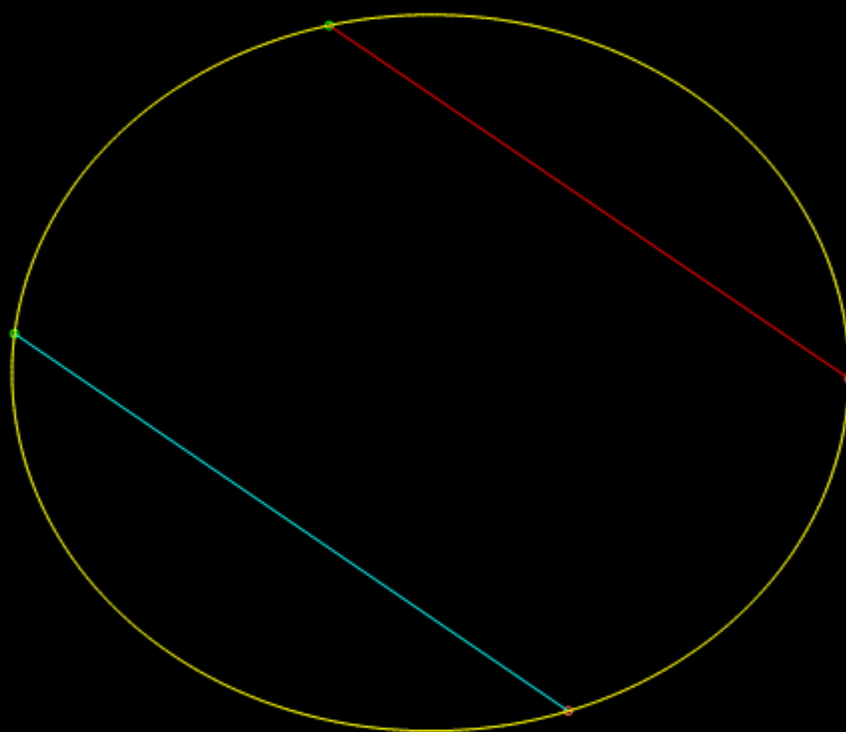
E



51nemausa1979aug17

(51) Nemausa 1979 Aug 17 $160.1 \pm 0.0 \times 137.0 \pm 0.0$ km, PA 90.0° °
Geocentric X 1138.7 ± 0.0 Y 4982.1 ± 0.0 km **N**

E



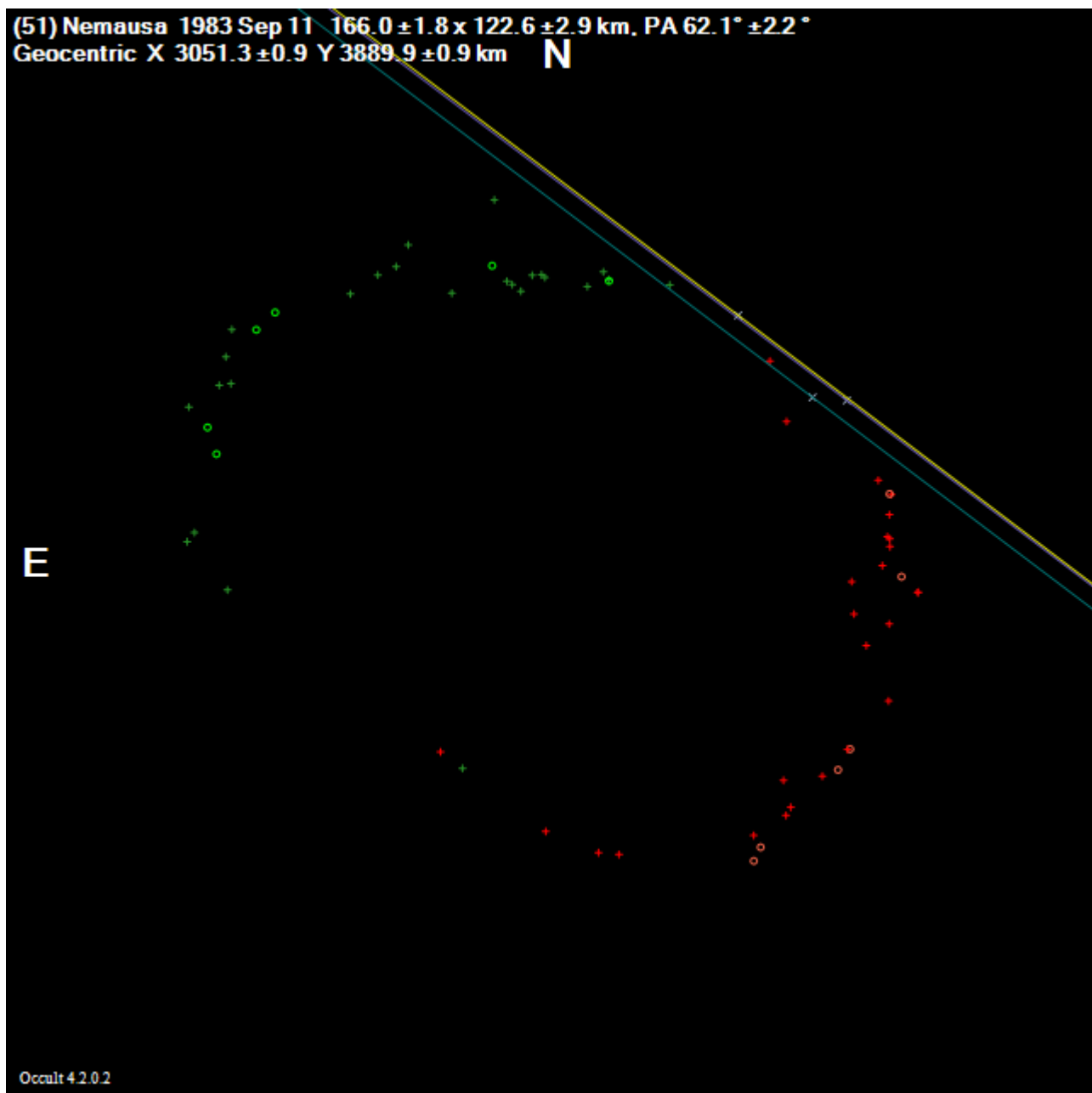
51nemausa1983sep11

(51) Nemausa 1983 Sep 11 $166.0 \pm 1.8 \times 122.6 \pm 2.9$ km, PA $62.1^\circ \pm 2.2^\circ$
Geocentric X 3051.3 ± 0.9 Y 3889.9 ± 0.9 km

N

E

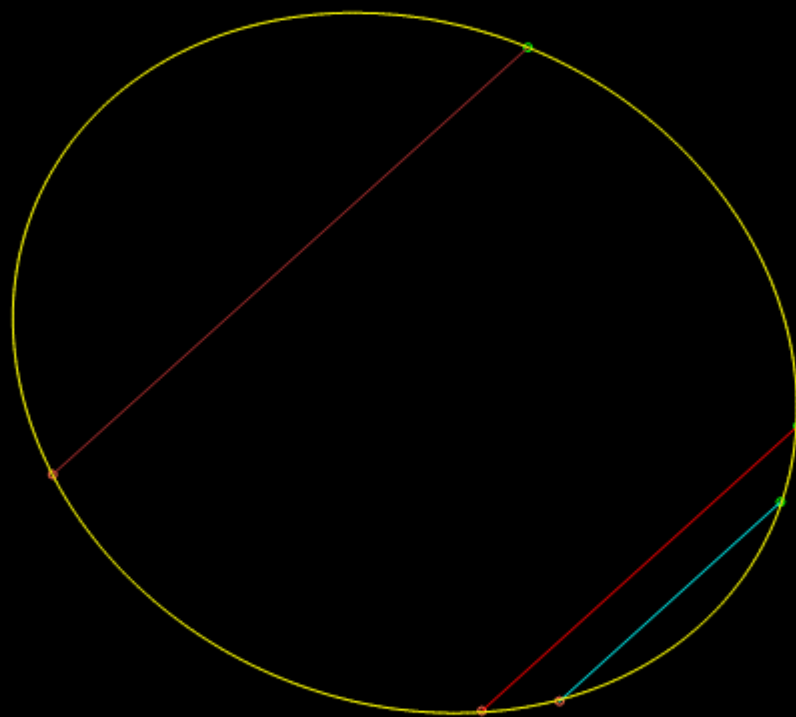
Occult 4.2.0.2



51nemausa2002oct21

(51) Nemausa 2002 Oct 21 $153.8 \pm 0.9 \times 129.5 \pm 0.3$ km, PA $65.7^\circ \pm 1.1^\circ$
Geocentric X -3805.2 ± 0.3 Y 3056.6 ± 0.3 km **N**

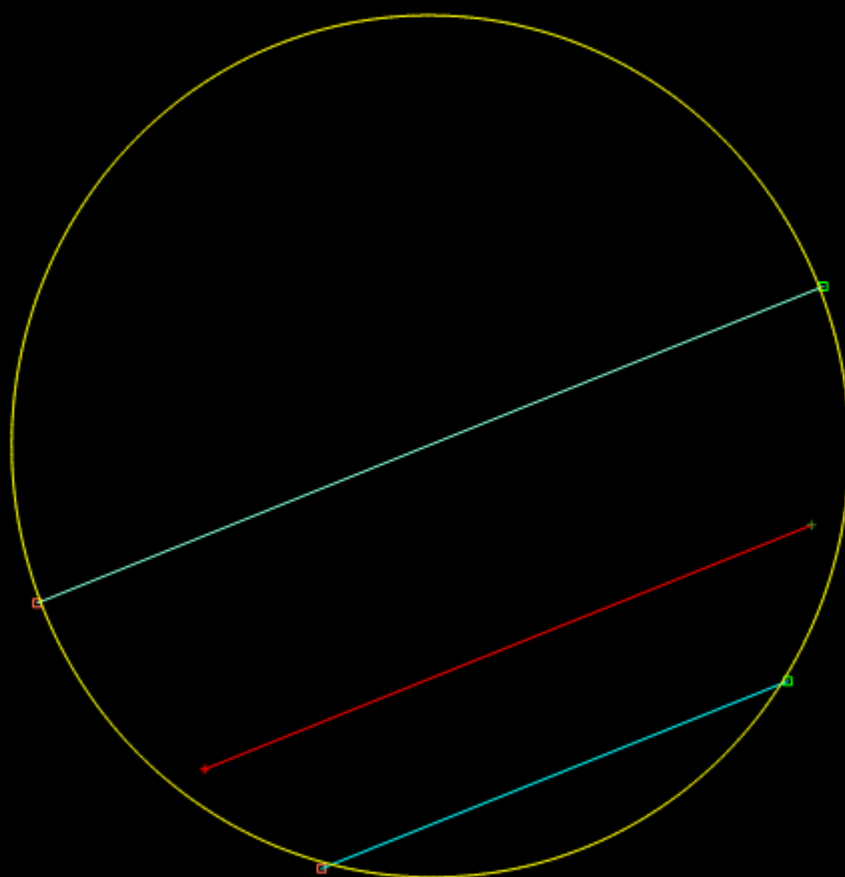
E



51nemausa2006oct31

(51) Nemausa 2006 Oct 31 166.0 x 161.3 \pm 4.5 km. PA 4.2° \pm 57.9°
Geocentric X -1977.1 \pm 2.3 Y 4097.6 \pm 2.5 km **N**

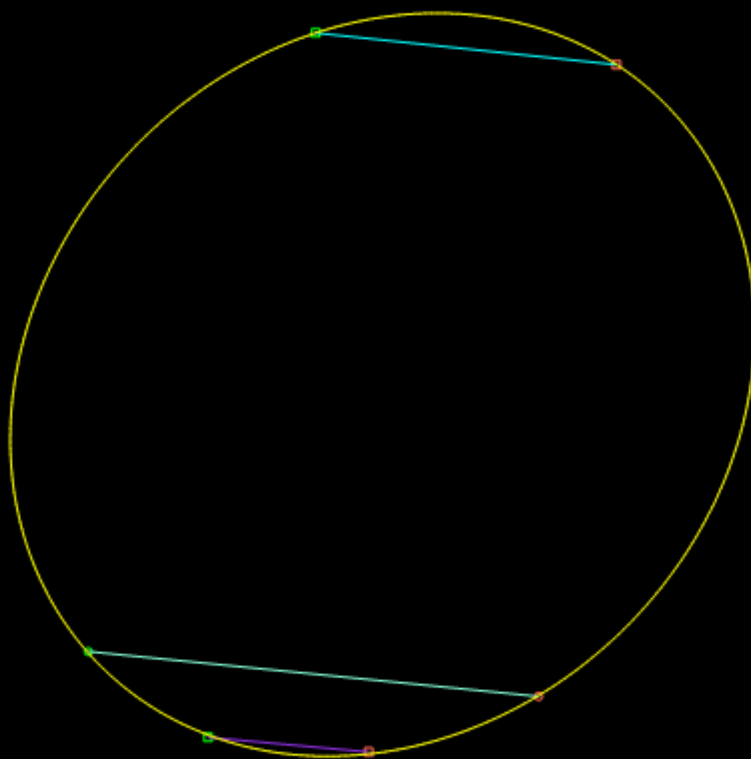
E



51nemausa2007jan03

(51) Nemausa 2007 Jan 3 $153.4 \pm 0.4 \times 132.3 \pm 0.7$ km, PA $-45.4^\circ \pm 1.9^\circ$
Geocentric X 4035.0 ± 0.2 Y 4078.7 ± 0.1 km **N**

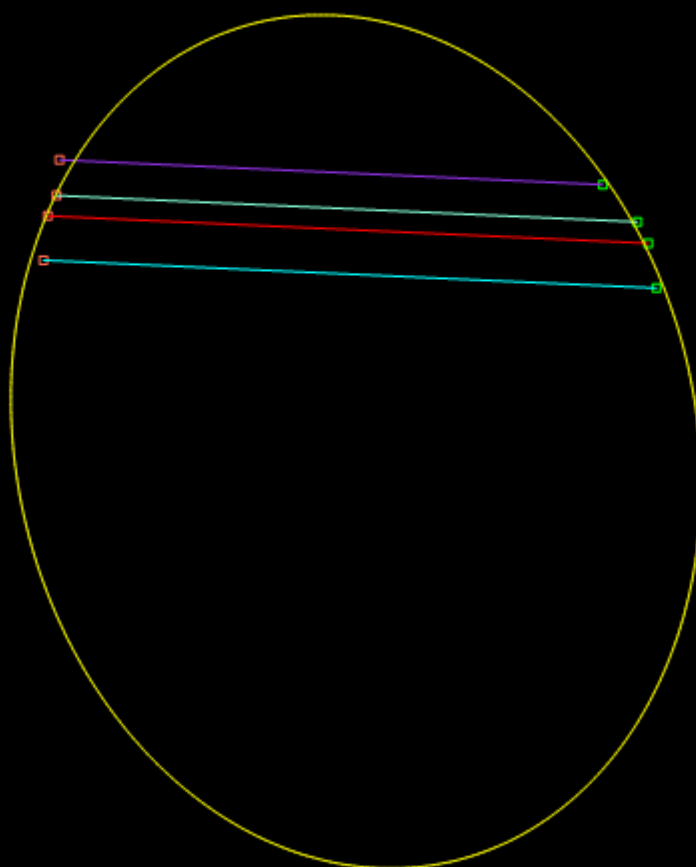
E



51nemausa2011feb04

(51) Nemausa 2011 Feb 4 186.0 x 147.0 km, PA $12.6^\circ \pm 10.6^\circ$
Geocentric X -5095.9 ± 3.3 Y -3269.2 ± 2.0 km **N**

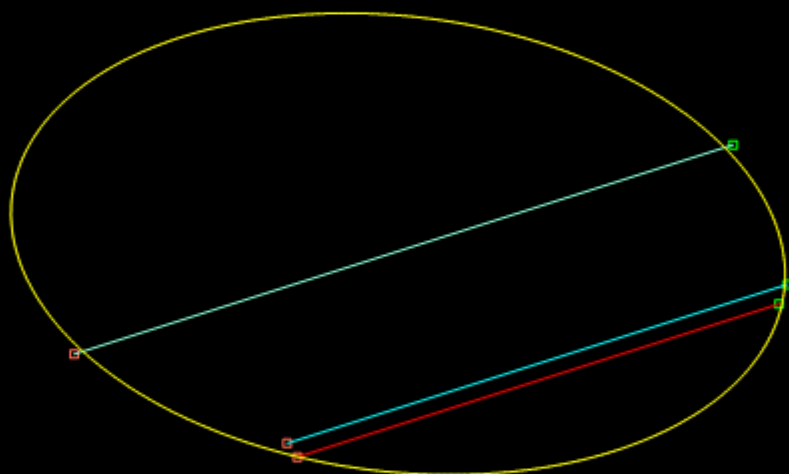
E



51nemausa2013sep30

(51) Nemausa 2013 Sep 30 $168.0 \pm 1.4 \times 98.3 \pm 1.4$ km, PA 83.0° °
Geocentric X -2787.7 ± 0.7 Y 3304.8 ± 0.8 km **N**

E



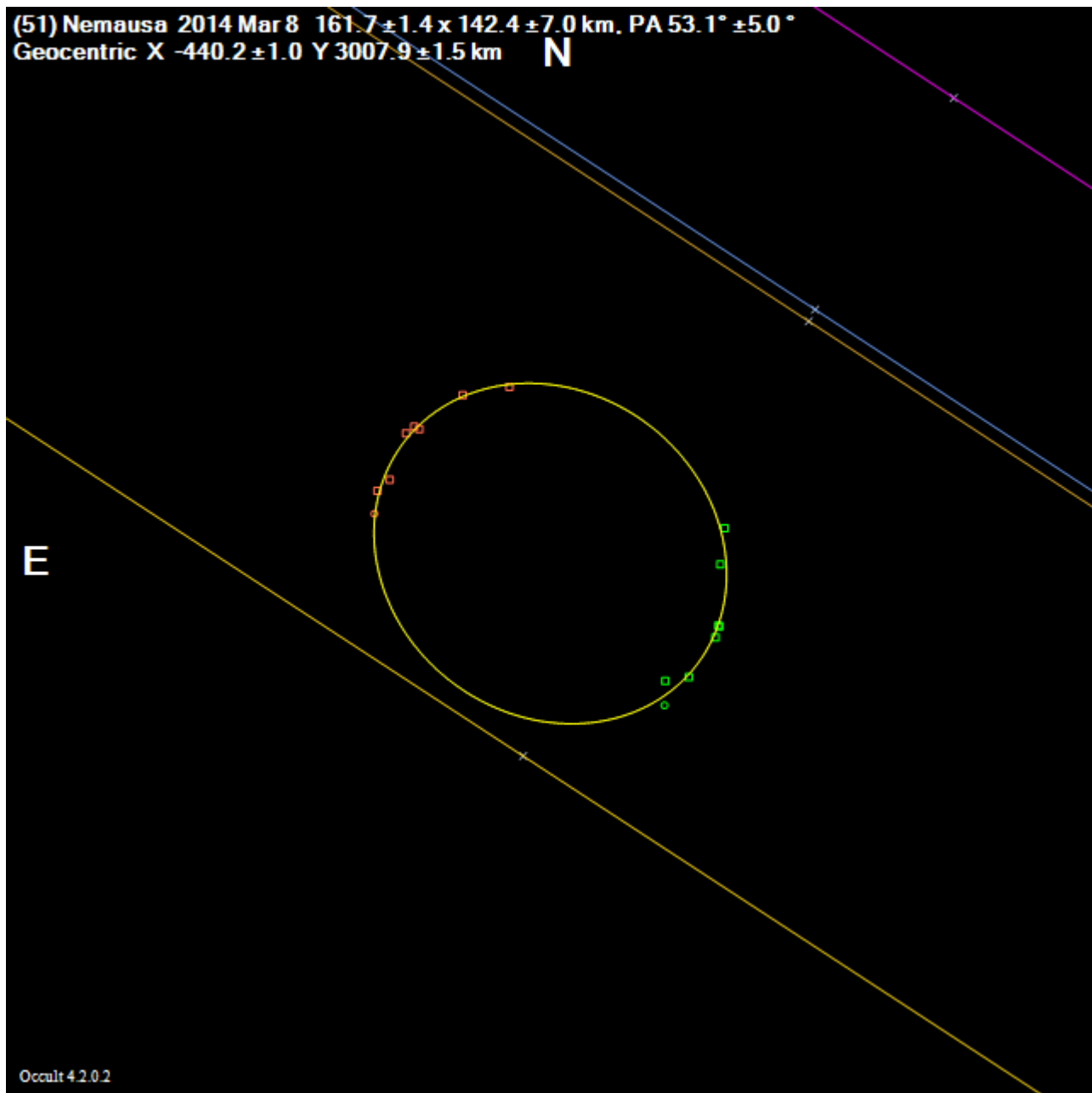
51nemausa2014mar08

(51) Nemausa 2014 Mar 8 $161.7 \pm 1.4 \times 142.4 \pm 7.0$ km, PA $53.1^\circ \pm 5.0^\circ$
Geocentric X -440.2 ± 1.0 Y 3007.9 ± 1.5 km

N

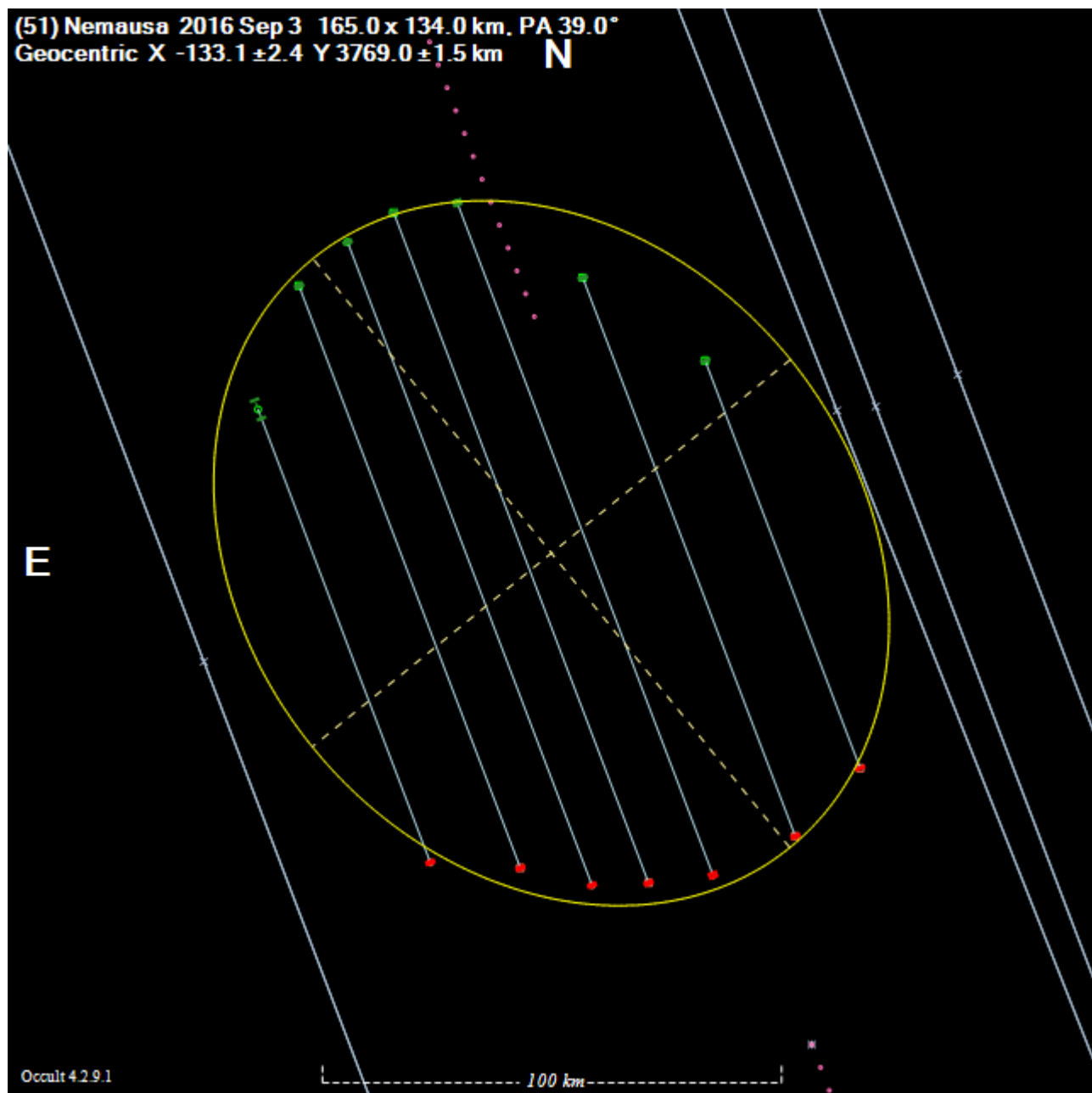
E

Occult 4.2.0.2



51Nemausa2016Sep03

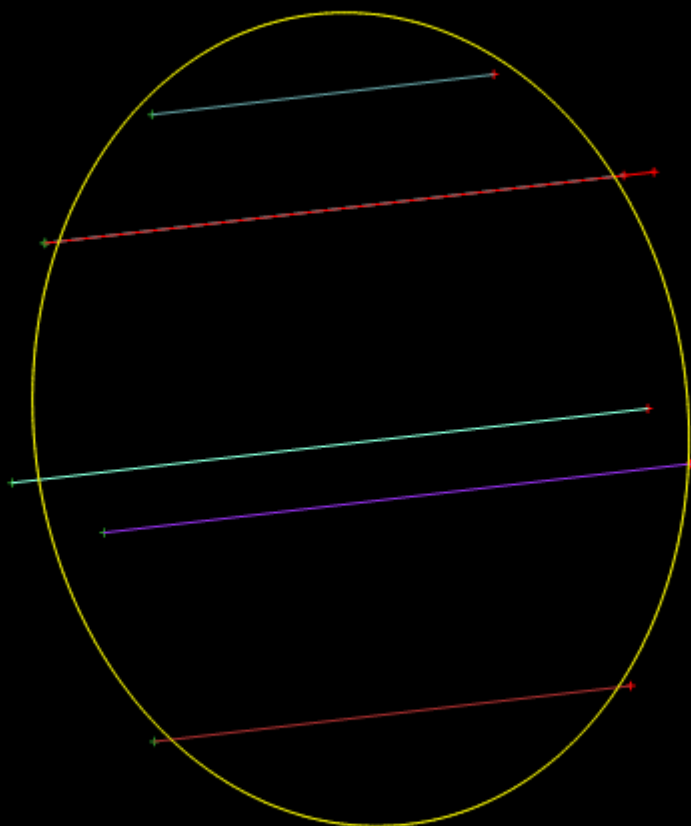
(51) Nemausa 2016 Sep 3 165.0 x 134.0 km, PA 39.0°
Geocentric X -133.1 ± 2.4 Y 3769.0 ± 1.5 km **N**



521brixia1989oct23

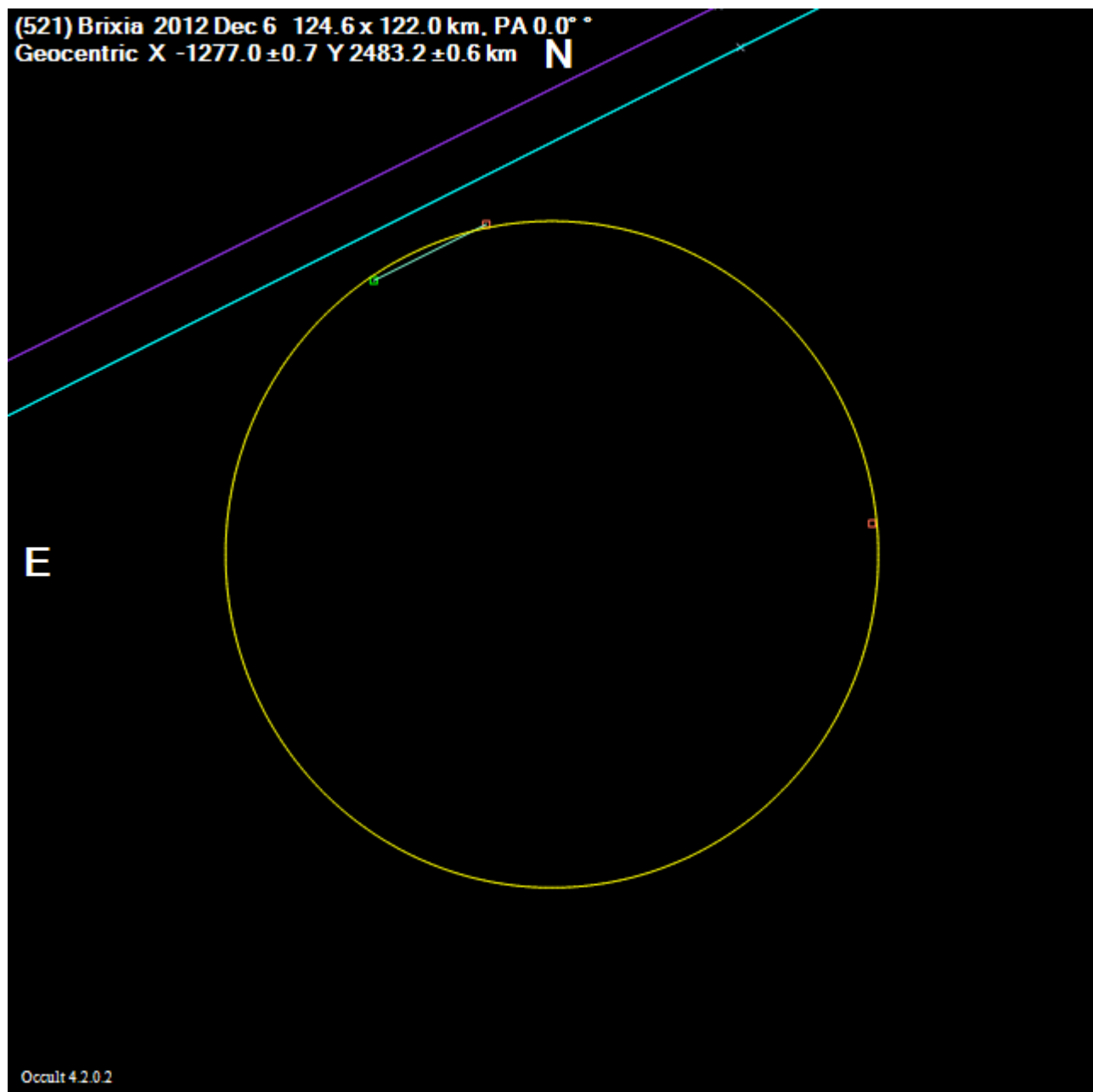
(521) Brixia 1989 Oct 23 $122.0 \pm 7.7 \times 97.9 \pm 3.2$ km, PA $6.4^\circ \pm 6.9^\circ$
Geocentric X 3587.2 ± 1.3 Y 5124.1 ± 2.4 km **N**

E



521brixia2012dec06

(521) Brixia 2012 Dec 6 124.6 x 122.0 km, PA 0.0° °
Geocentric X -1277.0 ± 0.7 Y 2483.2 ± 0.6 km **N**

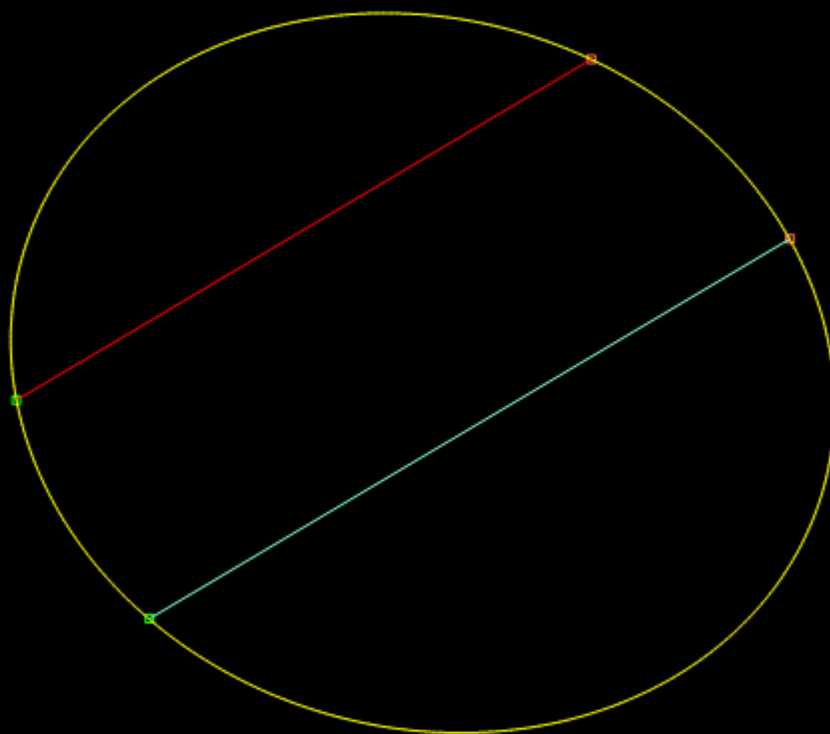


521brixia2012nov29

(521) Brixia 2012 Nov 29 132.4 x 112.4 km, PA 73.0° °
Geocentric X -5081.3 Y 3012.6 km

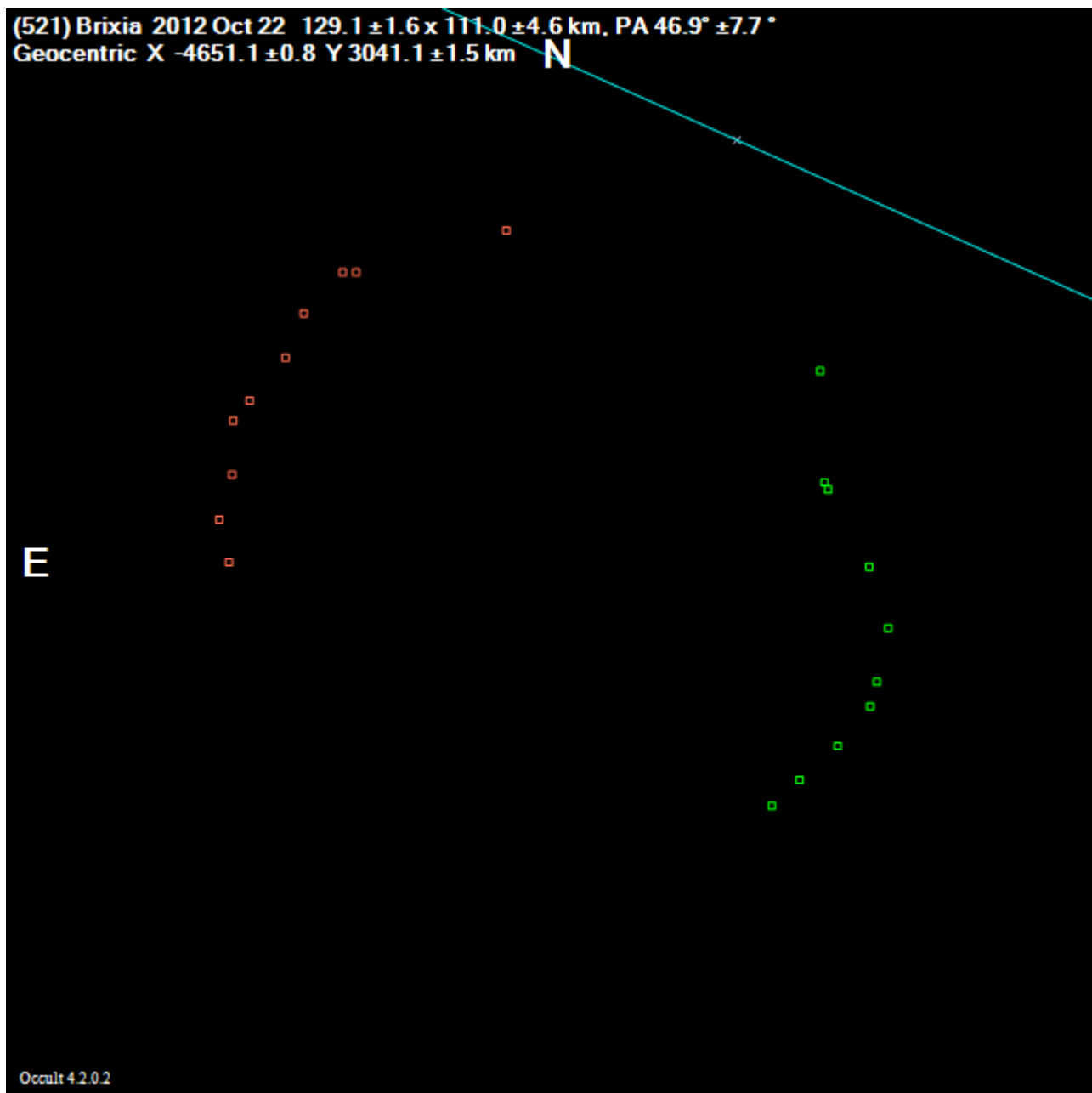
N

E



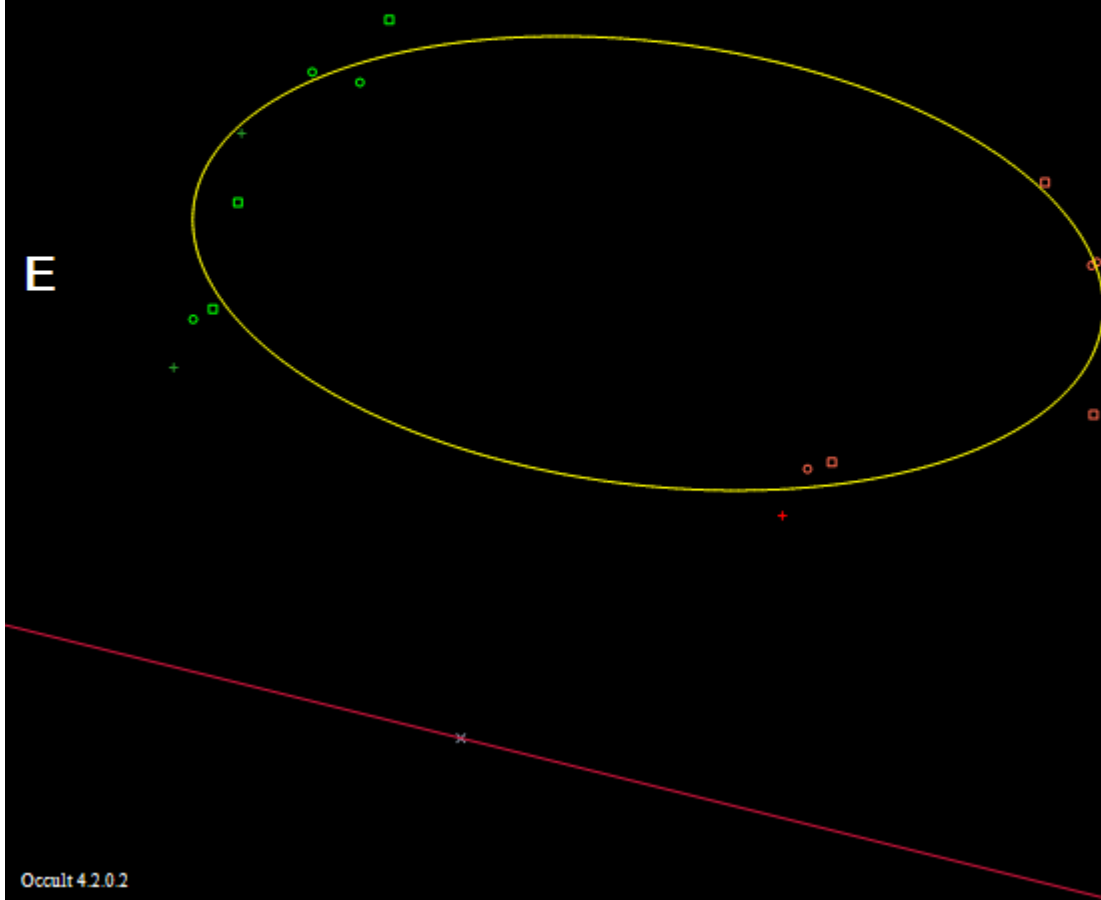
521brixia2012oct22

(521) Brixia 2012 Oct 22 $129.1 \pm 1.6 \times 111.0 \pm 4.6$ km, PA $46.9^\circ \pm 7.7^\circ$
Geocentric X -4651.1 ± 0.8 Y 3041.1 ± 1.5 km



522helga2004jun30

(522) Helga 2004 Jun 30 $120.4 \pm 1.9 \times 58.2 \pm 2.9$ km, PA $82.8^\circ \pm 1.8^\circ$
Geocentric X -2211.7 ± 0.7 Y 5126.2 ± 0.7 km **N**



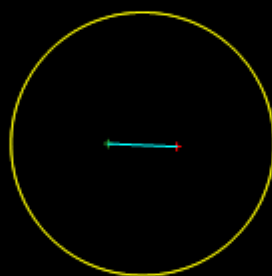
Occult 4.2.0.2

523ada2006jan29

(523) Ada 2006 Jan 29 32.0 x 32.0 km, PA 0.0° °
Geocentric X 944.6 ± 0.0 Y 1848.6 ± 0.0 km

N

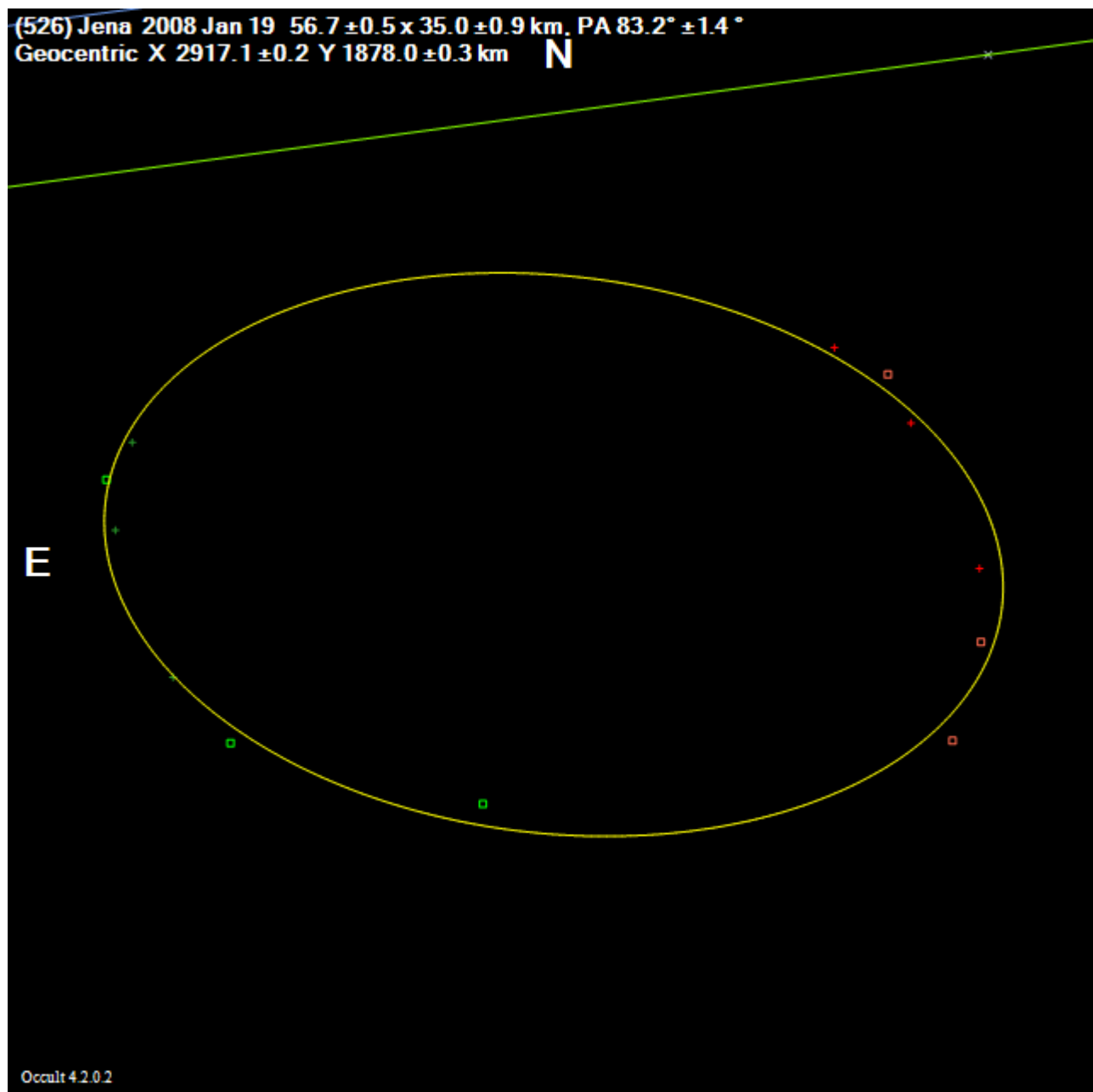
E



Occult 4.2.0.2

526jena2008jan19

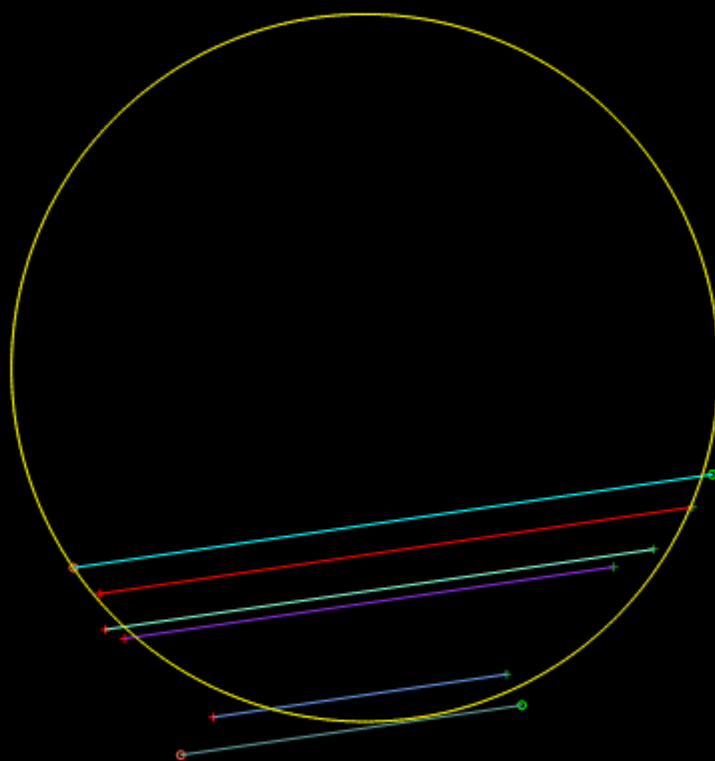
(526) Jena 2008 Jan 19 $56.7 \pm 0.5 \times 35.0 \pm 0.9$ km, PA $83.2^\circ \pm 1.4^\circ$
Geocentric X 2917.1 ± 0.2 Y 1878.0 ± 0.3 km **N**



52europa1983apr26

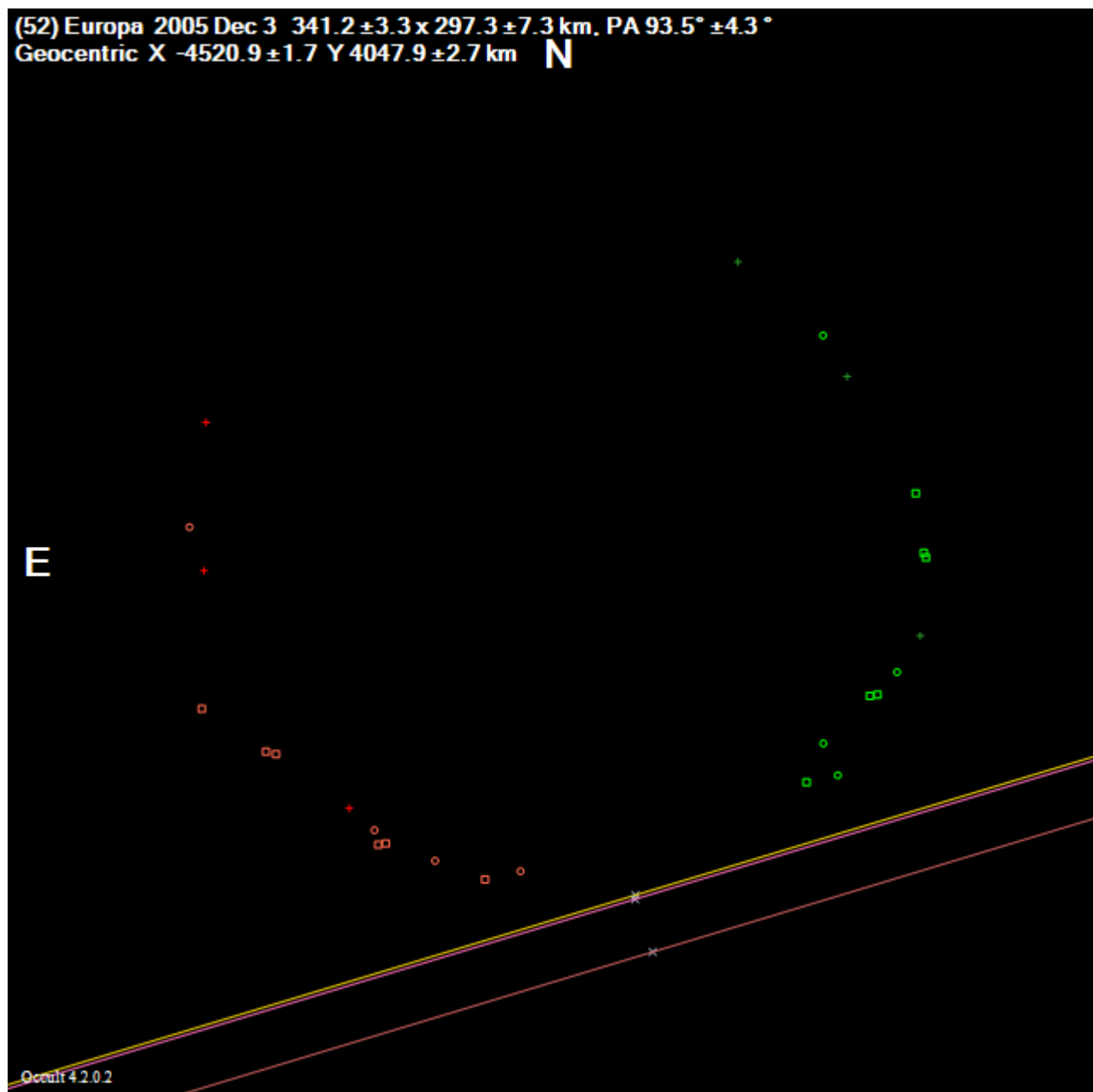
(52) Europa 1983 Apr 26 278.0 ± 51.8 x 278.0 km. PA 0.0° ±
Geocentric X 4913.0 ± 4.3 Y 2877.8 ± 21.2 km **N**

E



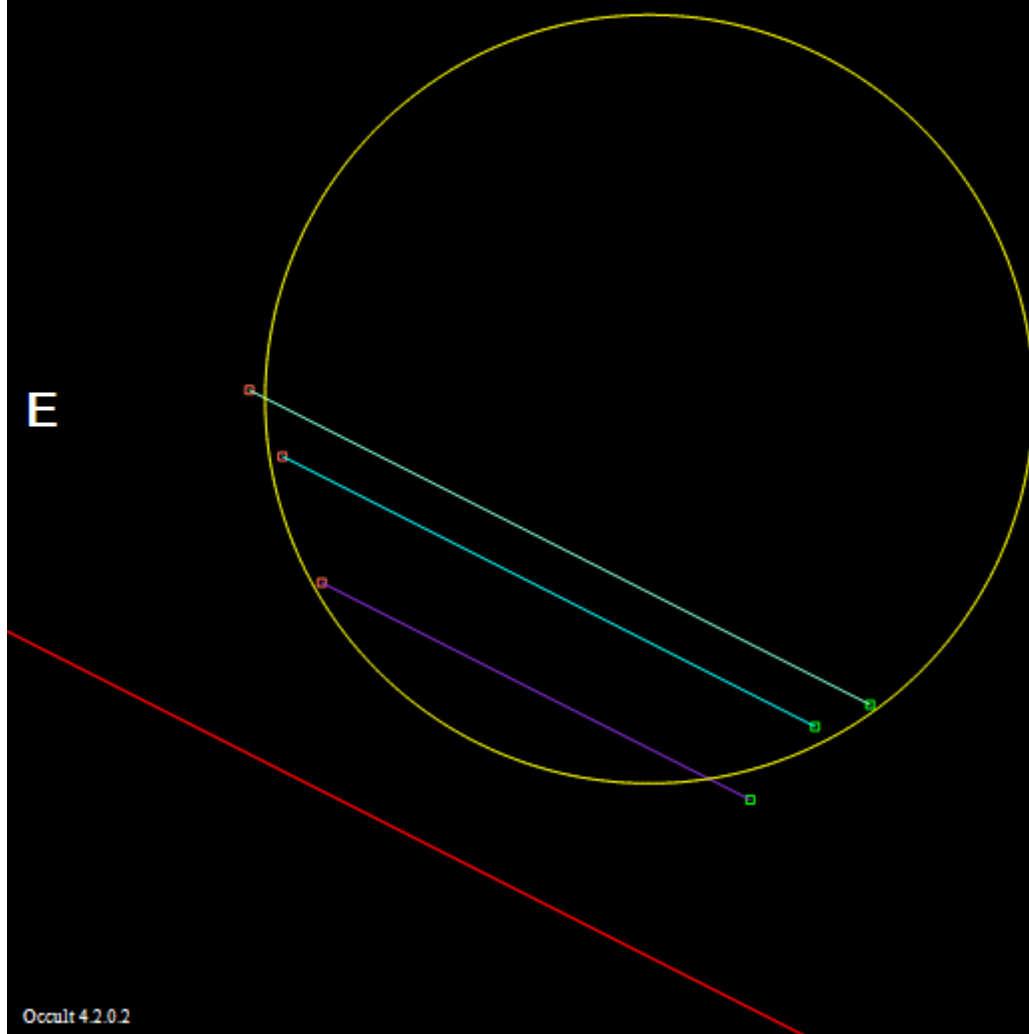
52europa2005dec03

(52) Europa 2005 Dec 3 $341.2 \pm 3.3 \times 297.3 \pm 7.3$ km, PA $93.5^\circ \pm 4.3^\circ$
Geocentric X -4520.9 ± 1.7 Y 4047.9 ± 2.7 km **N**



52europa2009jan21

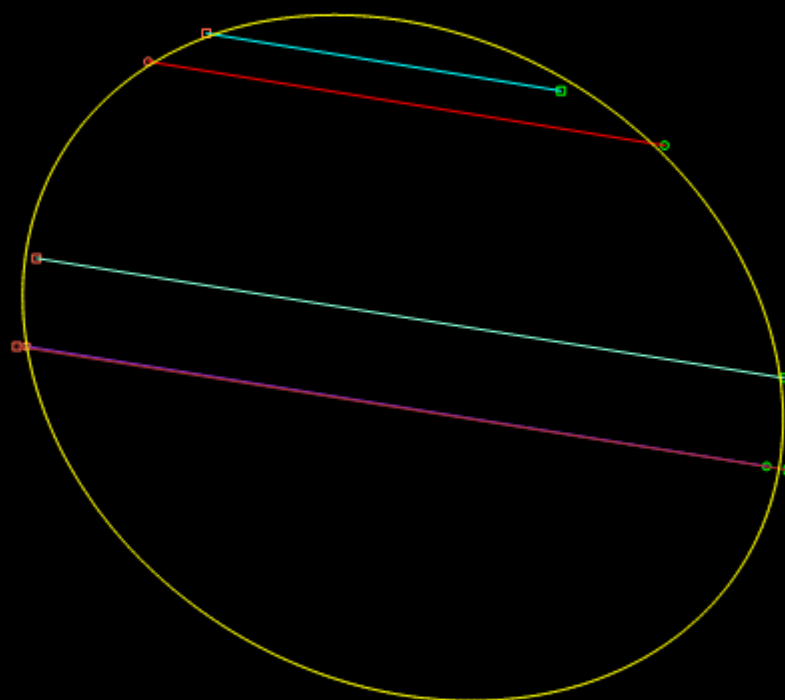
(52) Europa 2009 Jan 21 341.0 x 341.0 km, PA 0.0° °
Geocentric X 3734.3 ± 4.1 Y 4491.2 ± 4.6 km **N**



52europa2010mar29

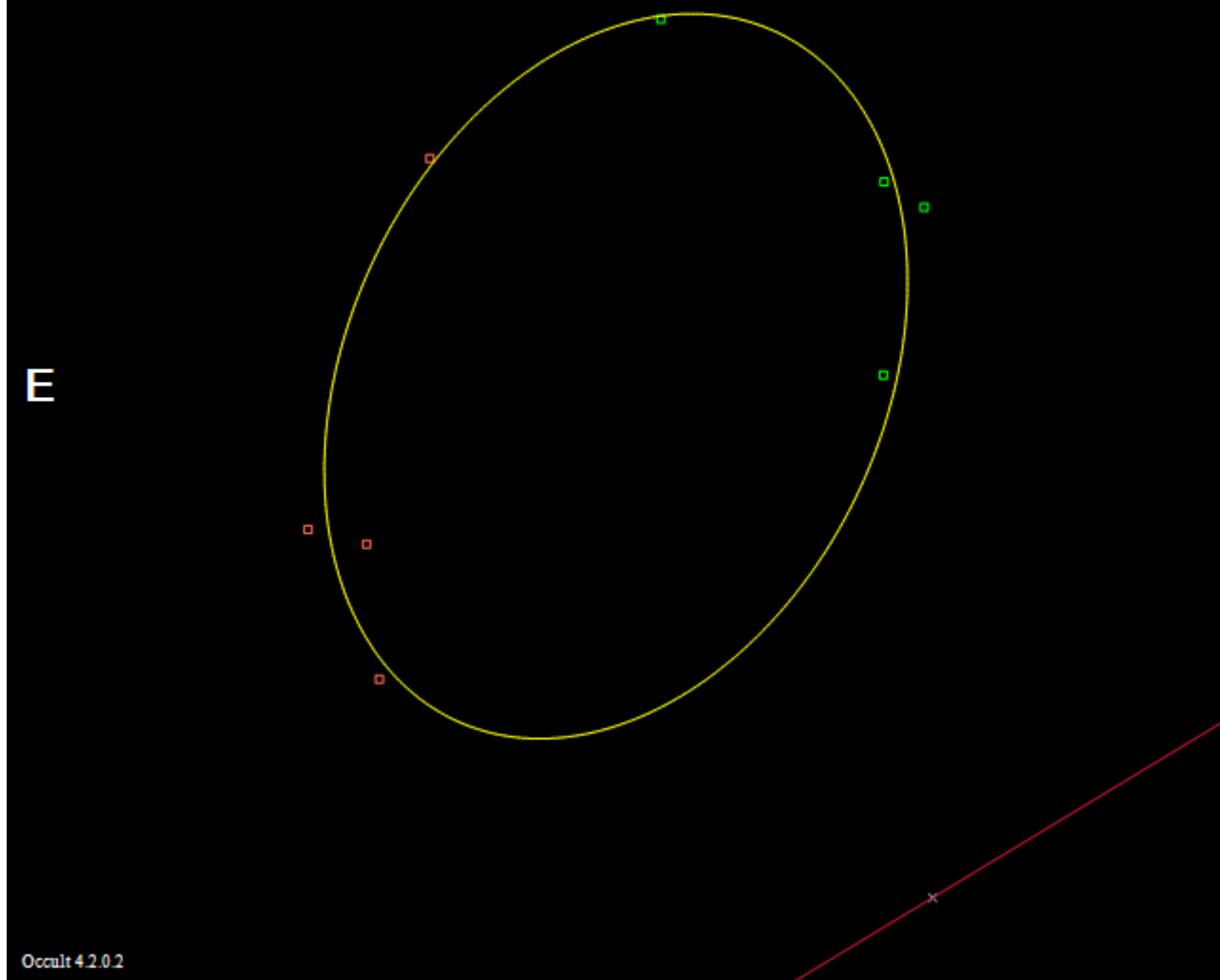
(52) Europa 2010 Mar 29 $352.9 \pm 5.6 \times 286.1 \pm 18.8$ km, PA $59.9^\circ \pm 9.2^\circ$
Geocentric X 3456.4 ± 1.5 Y 1707.2 ± 9.5 km **N**

E



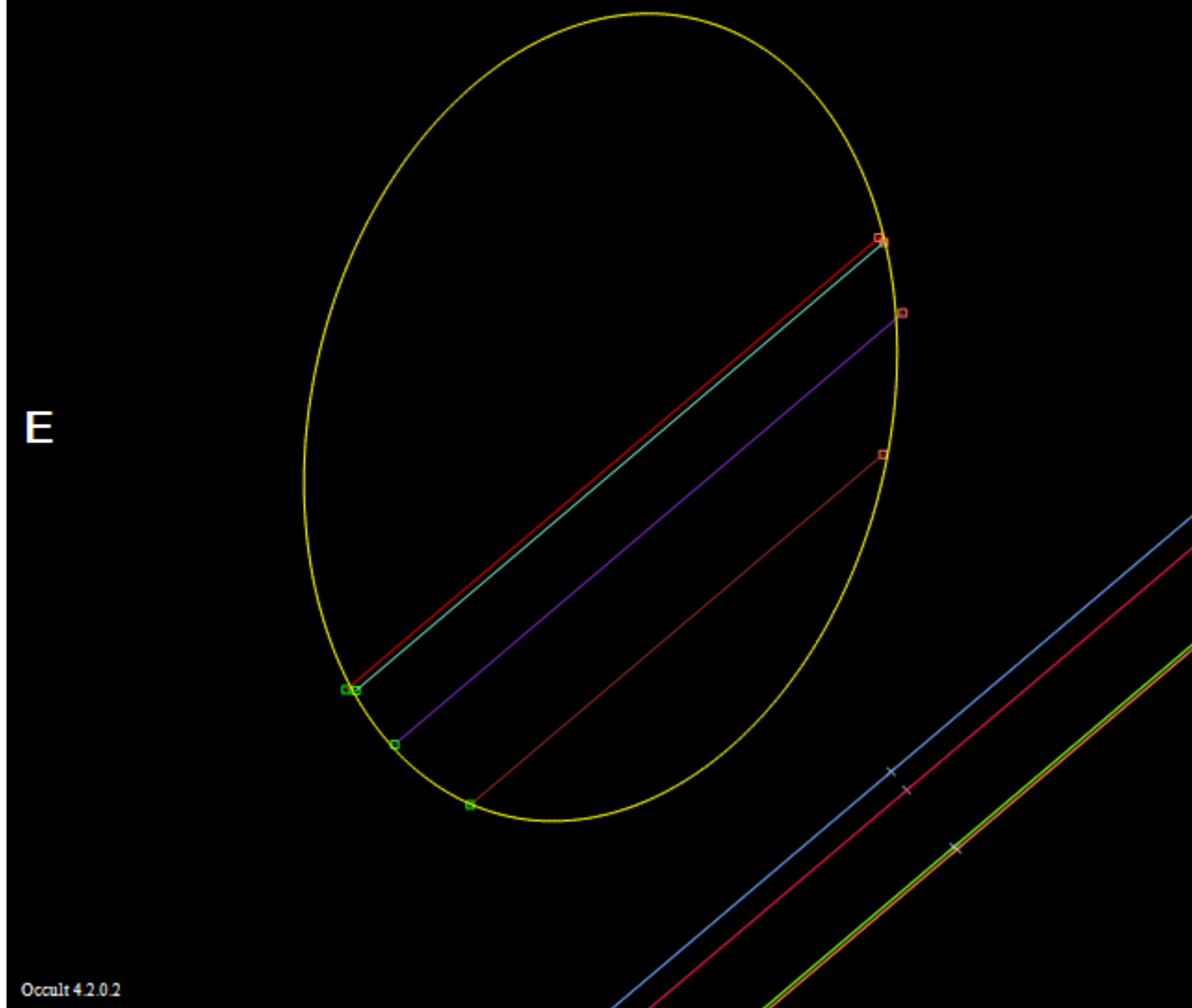
52europa2011jul04

(52) Europa 2011 Jul 4 $366.3 \pm 17.7 \times 259.2 \pm 15.9$ km, PA $-25.0^\circ \pm 8.4^\circ$
Geocentric X 3118.6 ± 4.3 Y 3894.4 ± 10.8 km **N**



52europa2011mar03

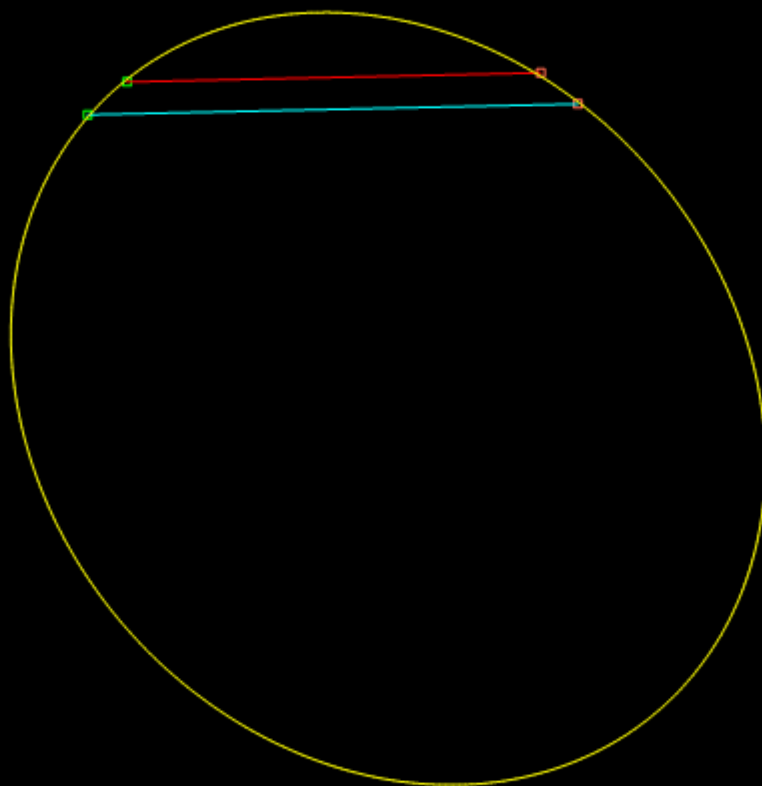
(52) Europa 2011 Mar 3 $404.5 \pm 26.2 \times 285.0 \pm 17.6$ km, PA $-13.6^\circ \pm 8.4^\circ$
Geocentric X -142.5 ± 5.0 Y 3302.2 ± 13.2 km **N**



52europa2012may25

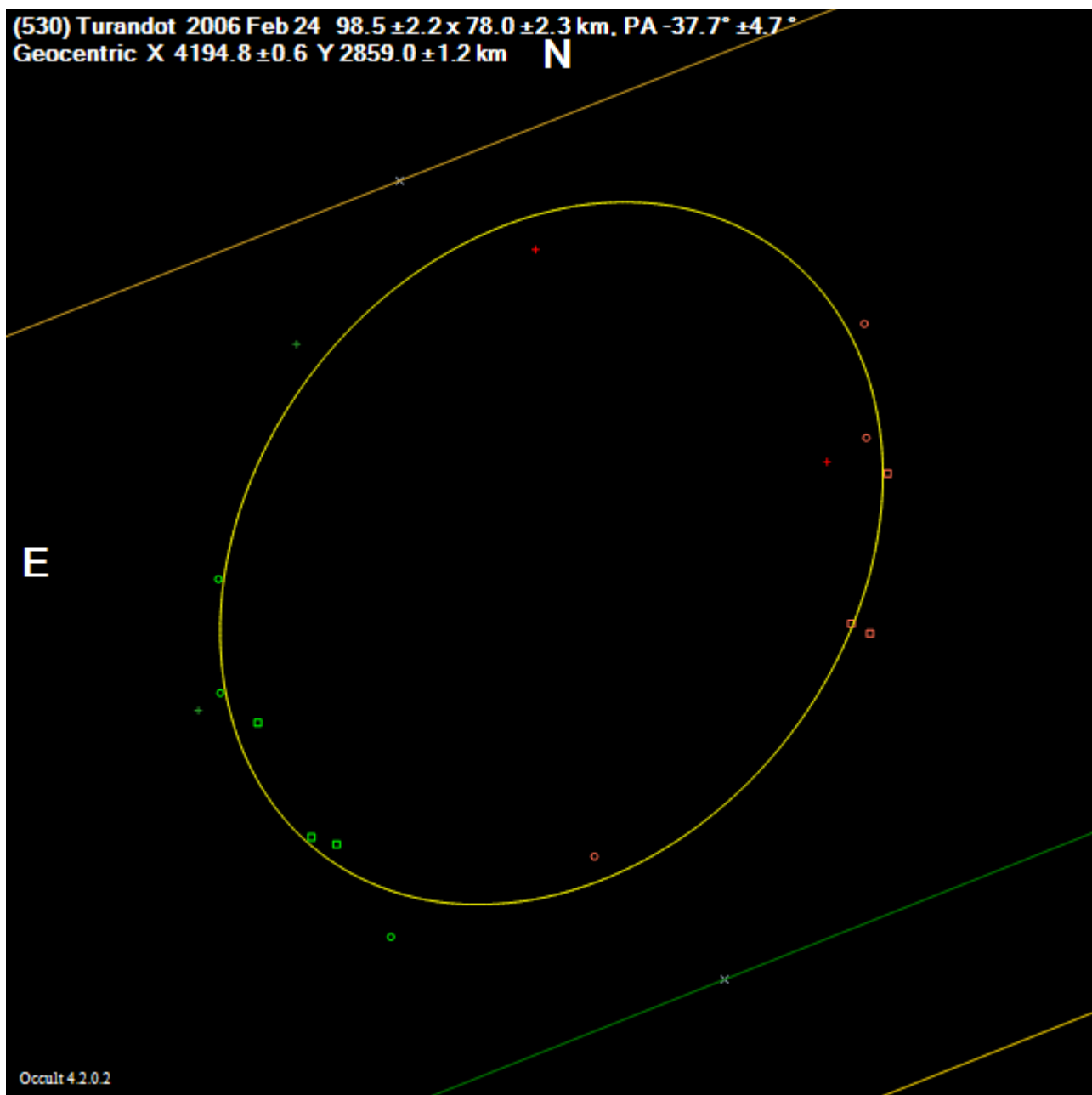
(52) Europa 2012 May 25 378.0 x 319.0 km. PA 41.0° °
Geocentric X -292.4 ± 0.8 Y -2129.2 ± 0.6 km **N**

E



530turandot2006feb24

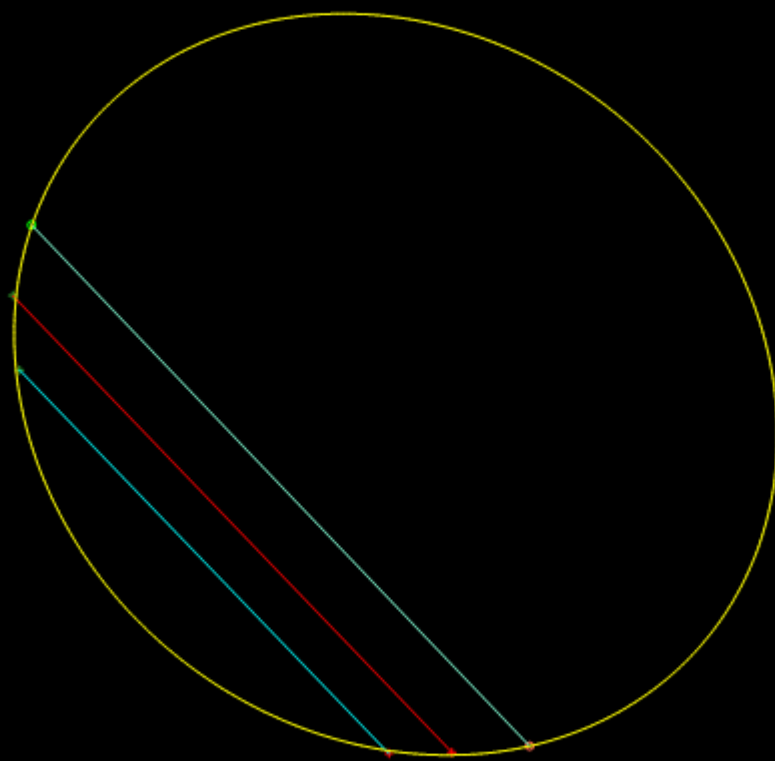
(530) Turandot 2006 Feb 24 $98.5 \pm 2.2 \times 78.0 \pm 2.3$ km, PA $-37.7^\circ \pm 4.7^\circ$
Geocentric X 4194.8 ± 0.6 Y 2859.0 ± 1.2 km **N**



532herculina1978jun07

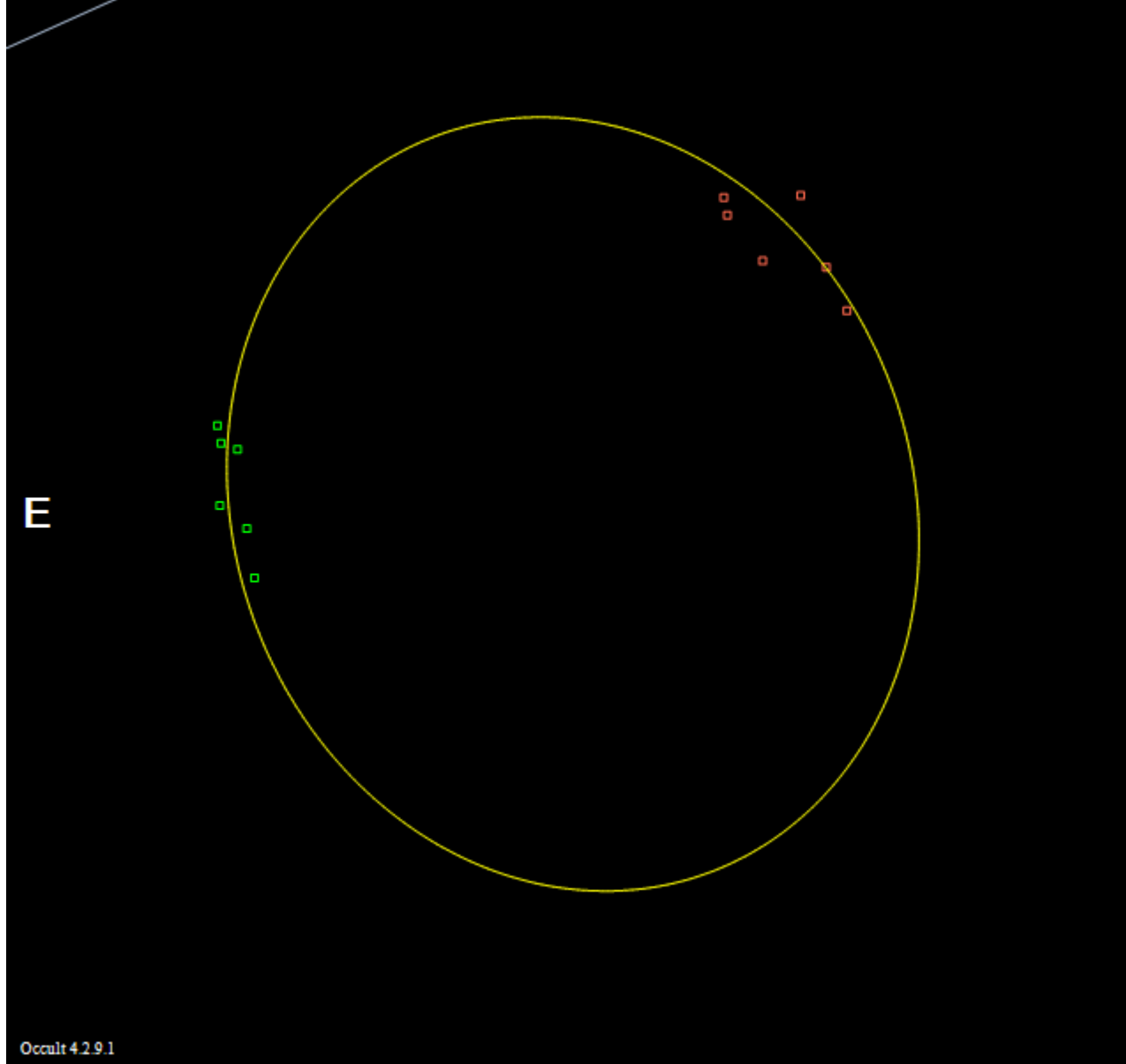
(532) Herculina 1978 Jun 7 232.0 x 201.6 km. PA 51.0° °
Geocentric X 5202.4 ± 0.5 Y 3677.6 ± 0.5 km **N**

E



532herculina2015apr18

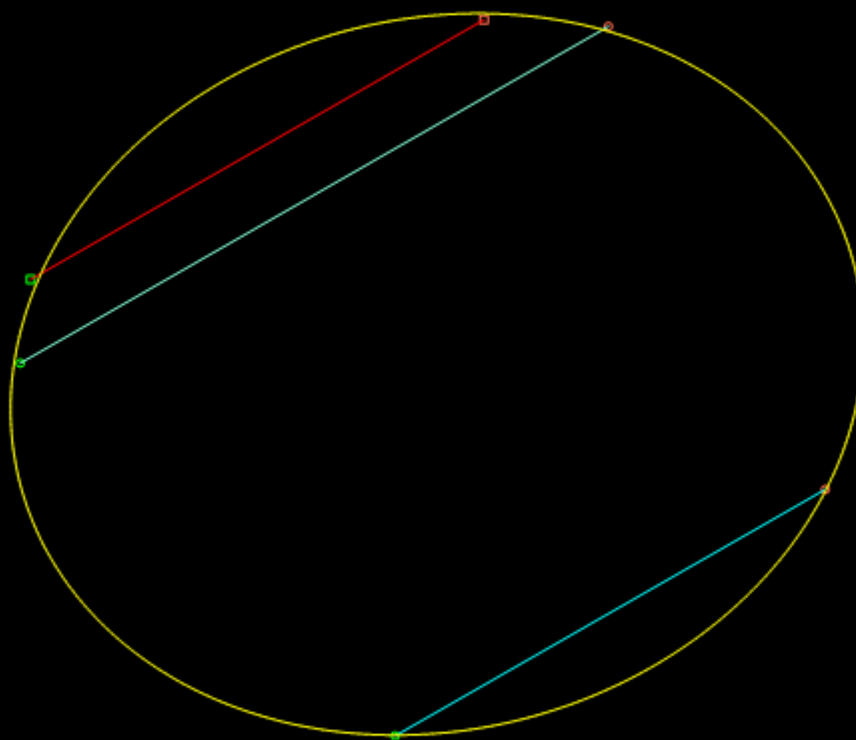
(532) Herculina 2015 Apr 18 235.0 x 203.0 km. PA 20.0°
Geocentric X -1514.7 ± 2.4 Y 3553.0 ± 4.1 km **N**



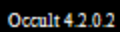
536merapi2005nov18

(536) Merapi 2005 Nov 18 $169.4 \pm 3.6 \times 139.6 \pm 2.3$ km, PA $-75.0^\circ \pm 4.1^\circ$
Geocentric X -2494.8 ± 0.7 Y 331.0 ± 0.6 km **N**

E



(536) Merapi 2013 Jan 27 175.0 x 142.0 km, PA -38.6° ±5.3°
 Geocentric X -3131.7 ±1.2 Y 1807.7 ±1.9 km **N**
 Double : Sep 0.0430 ±0.0012", PA 237.0° ±2.4°



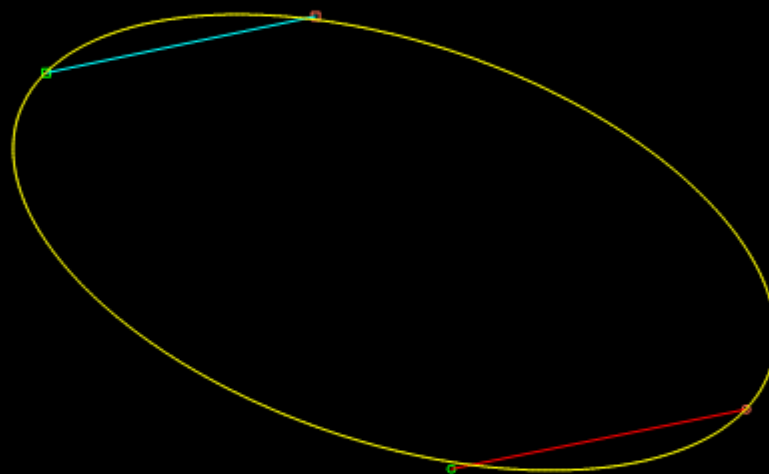
539pamina2008jun07

(539) Pamina 2008 Jun 7 86.6 x 43.6 km, PA 71.3° °
Geocentric X 912.6 Y 4916.6 km

N

E

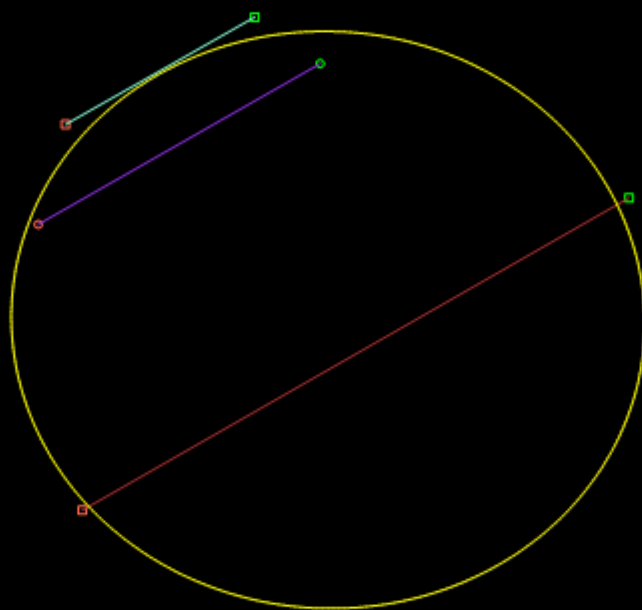
Occult 4.2.0.2



545messalina2014mar18

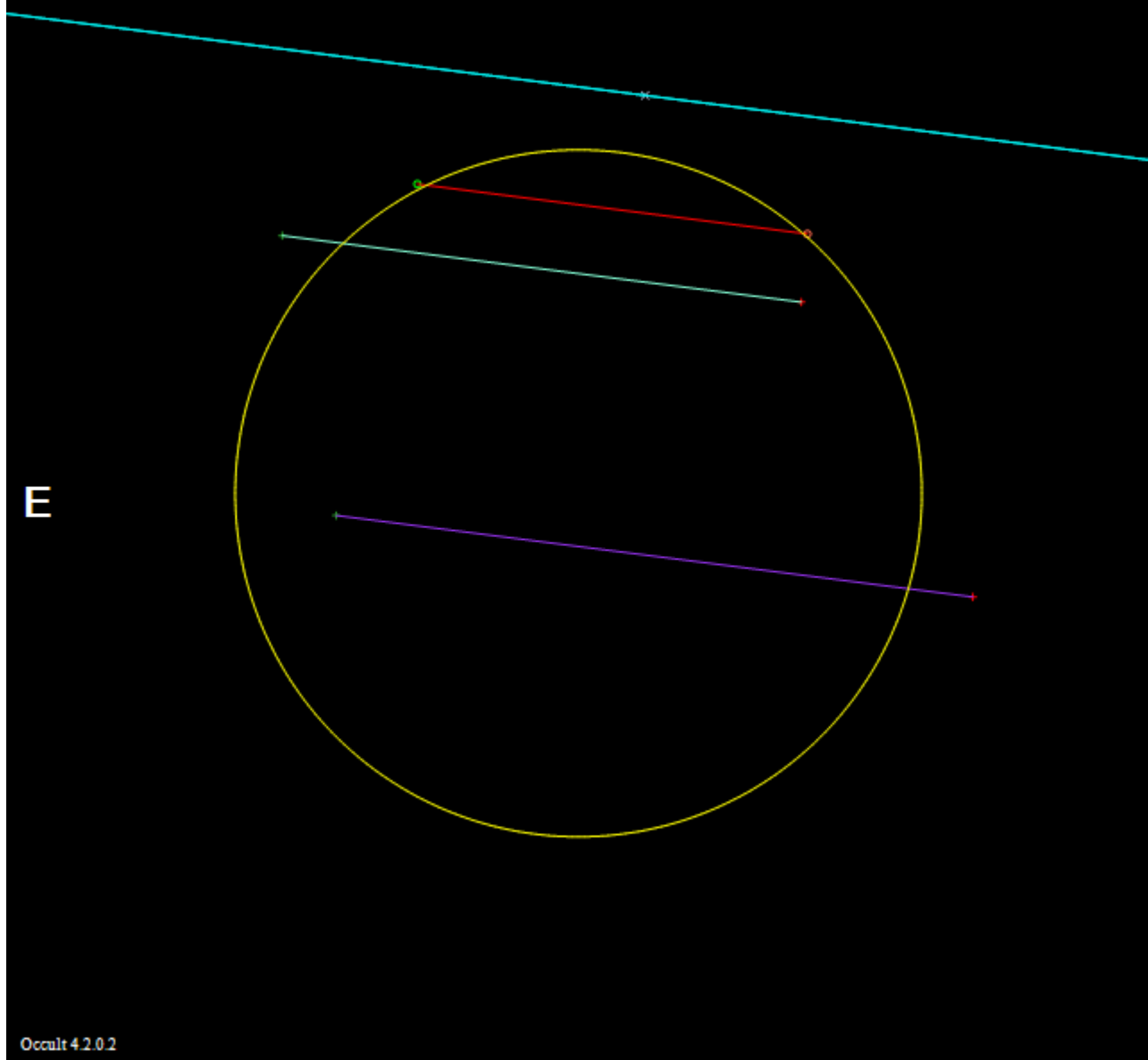
(545) Messalina 2014 Mar 18 111.8 x 101.8 km, PA 86.7° ± 29.7°
Geocentric X 1608.3 ± 2.3 Y 1696.1 ± 2.3 km **N**

E



547praxedis2006dec22

(547) Praxedis 2006 Dec 22 $70.0 \pm 45.8 \times 70.0$ km. PA 0.0° °
Geocentric X -2329.0 ± 3.4 Y 3650.0 ± 18.5 km **N**



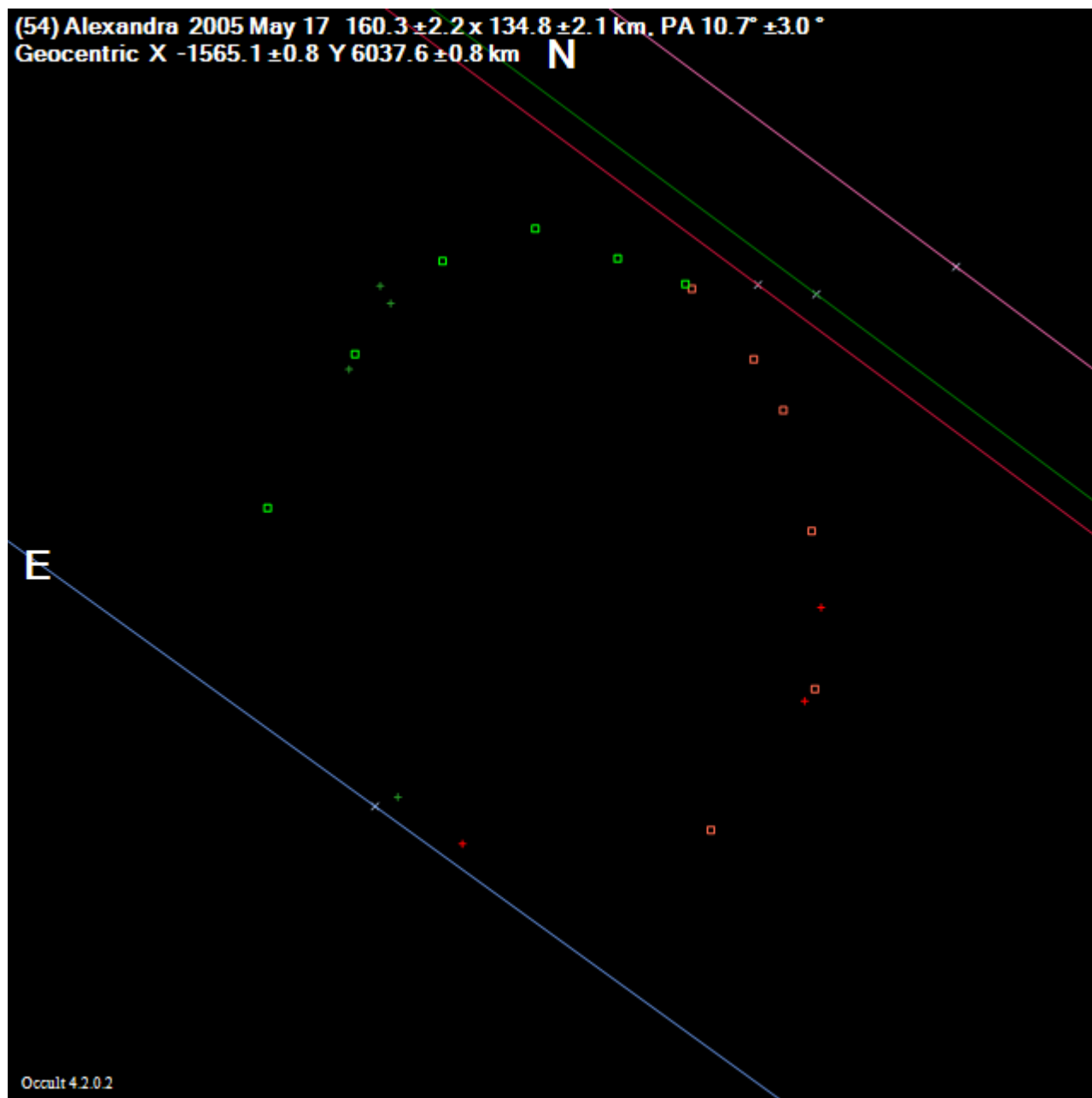
54alexandra2005may17

(54) Alexandra 2005 May 17 $160.3 \pm 2.2 \times 134.8 \pm 2.1$ km, PA $10.7^\circ \pm 3.0^\circ$
Geocentric X -1565.1 ± 0.8 Y 6037.6 ± 0.8 km

N

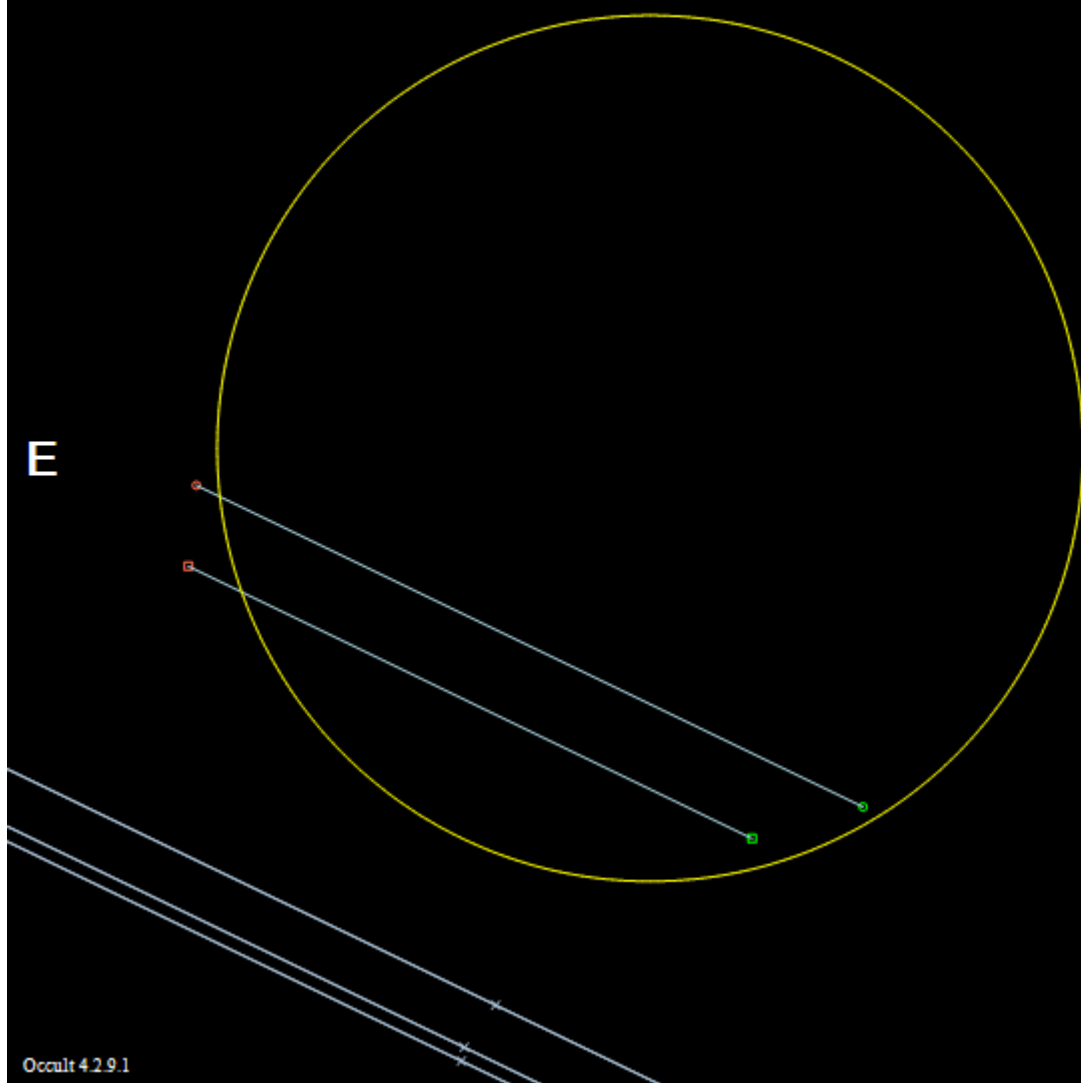
E

Occult 4.2.0.2



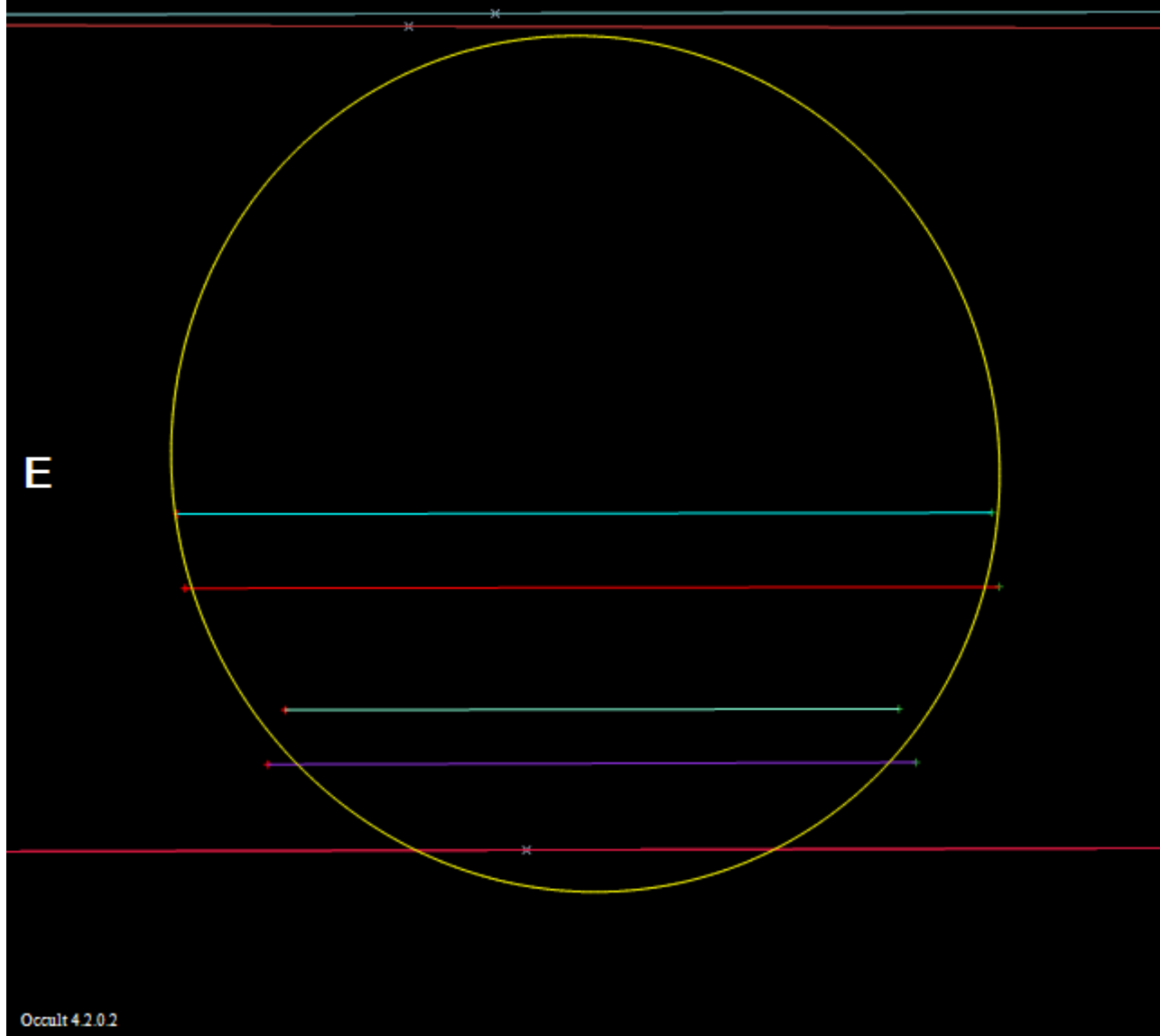
54alexandra2015aug14

(54) Alexandra 2015 Aug 14 160.0 x 160.0 km, PA 0.0°
Geocentric X -4228.2 ± 3.7 Y 4676.4 ± 4.2 km **N**



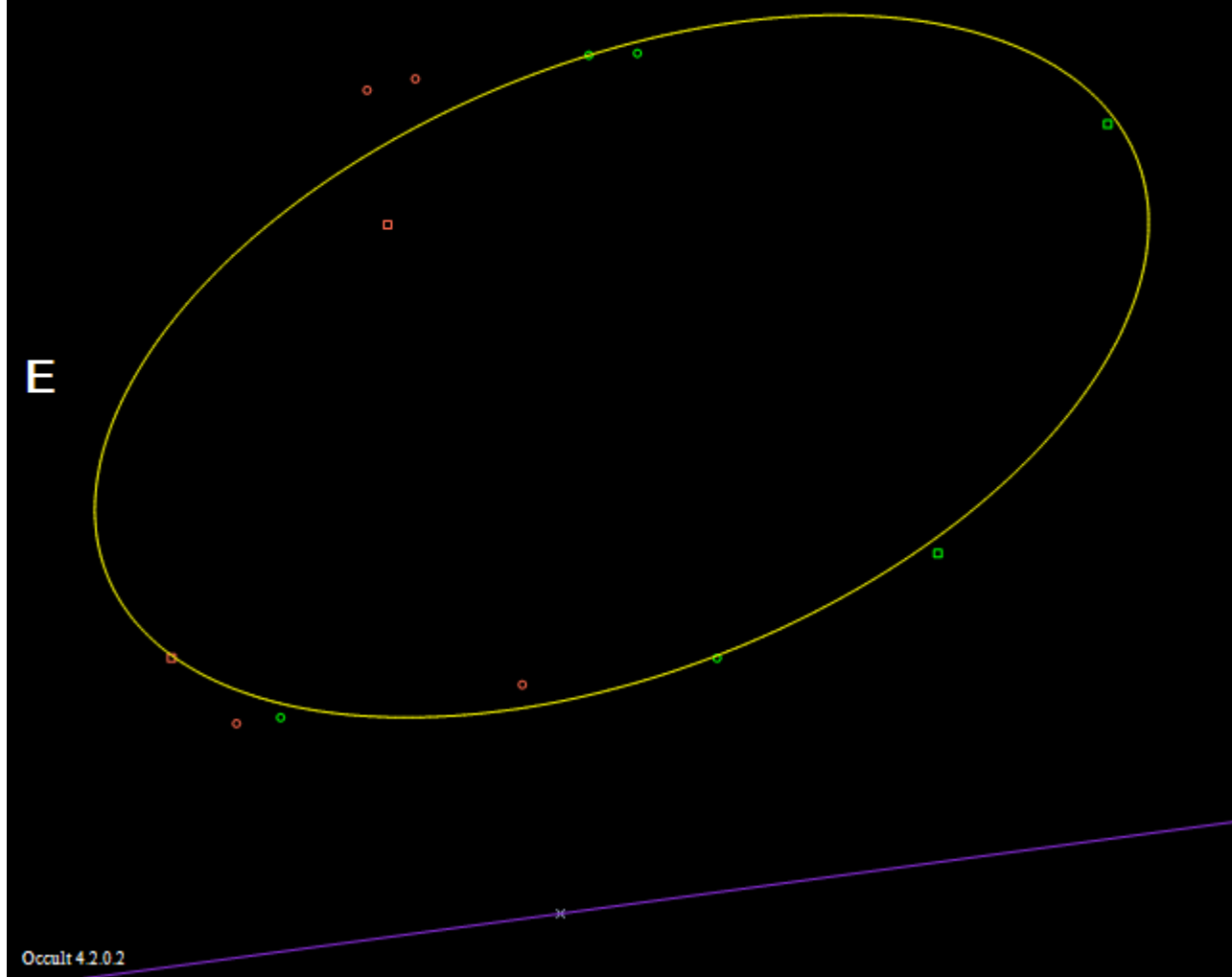
554peraga1999oct01

(554) Peraga 1999 Oct 1 $117.7 \pm 16.1 \times 113.0 \pm 3.6$ km, PA 18.0° °
Geocentric X -2935.0 ± 2.0 Y 2032.7 ± 6.5 km **N**



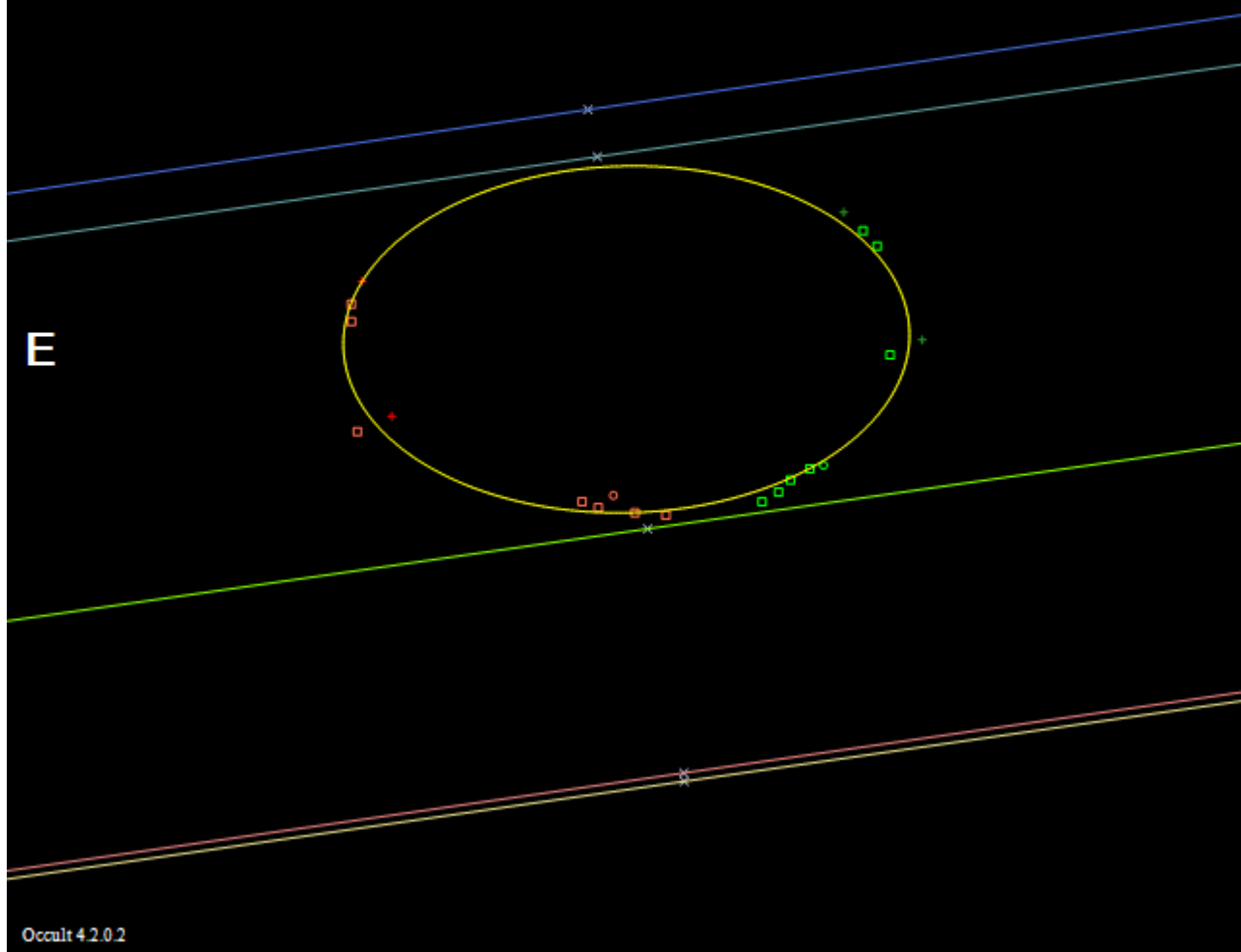
554peraga2011apr01

(554) Peraga 2011 Apr 1 $143.2 \pm 5.8 \times 78.4 \pm 3.0$ km, PA $-67.8^\circ \pm 5.1^\circ$
Geocentric X 1302.9 ± 2.5 Y 2708.3 ± 1.6 km **N**



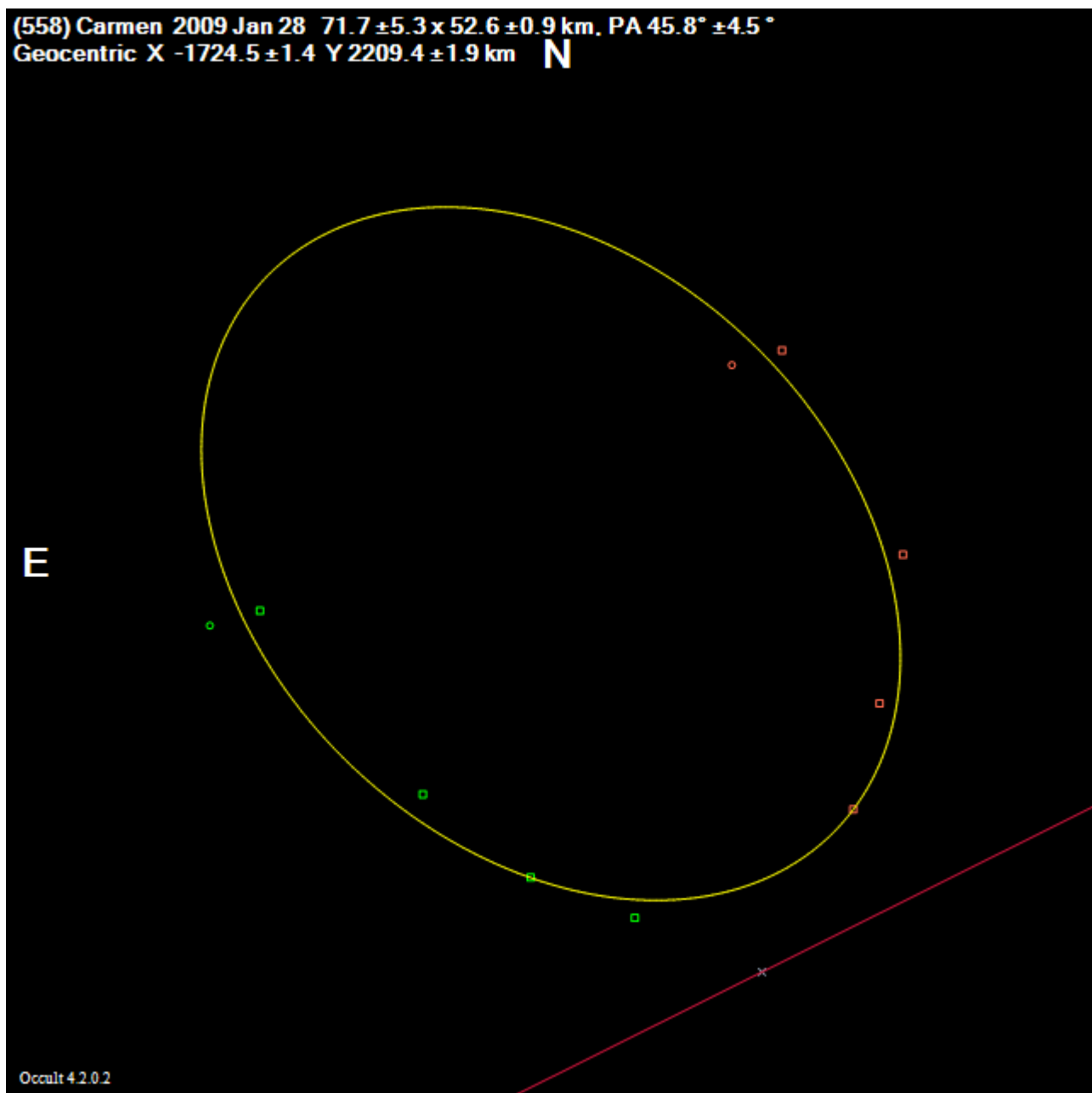
554peraga2011mar08

(554) Peraga 2011 Mar 8 $130.2 \pm 1.1 \times 79.7 \pm 1.7$ km, PA $91.5^\circ \pm 1.1^\circ$
Geocentric X 2127.3 ± 0.5 Y 3547.3 ± 0.8 km **N**



558carmen2009jan28

(558) Carmen 2009 Jan 28 $71.7 \pm 5.3 \times 52.6 \pm 0.9$ km, PA $45.8^\circ \pm 4.5^\circ$
Geocentric X -1724.5 ± 1.4 Y 2209.4 ± 1.9 km **N**

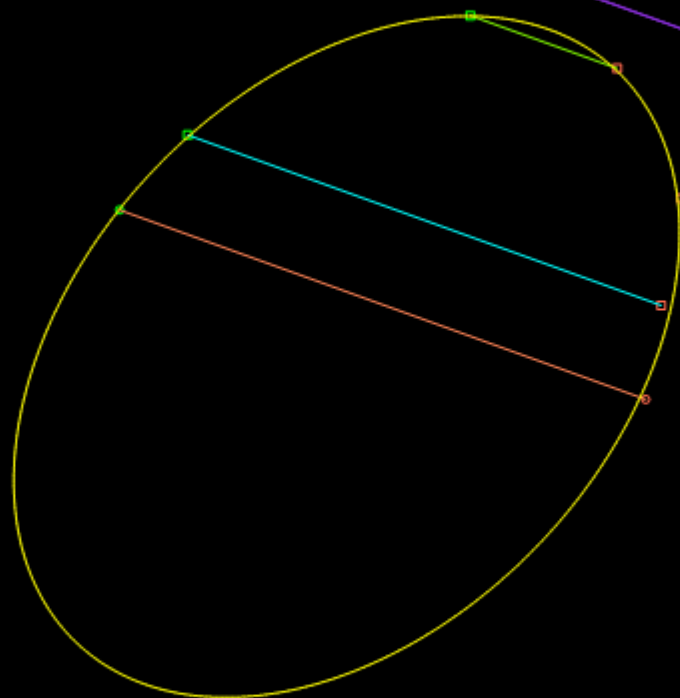


559nanon2004jul01

(559) Nanon 2004 Jul 1 $81.9 \pm 7.8 \times 55.9 \pm 1.5$ km, PA $-43.2^\circ \pm 3.0^\circ$
Geocentric X 2595.1 ± 2.2 Y 4911.6 ± 3.2 km **N**

E

Occult 4.2.0.2



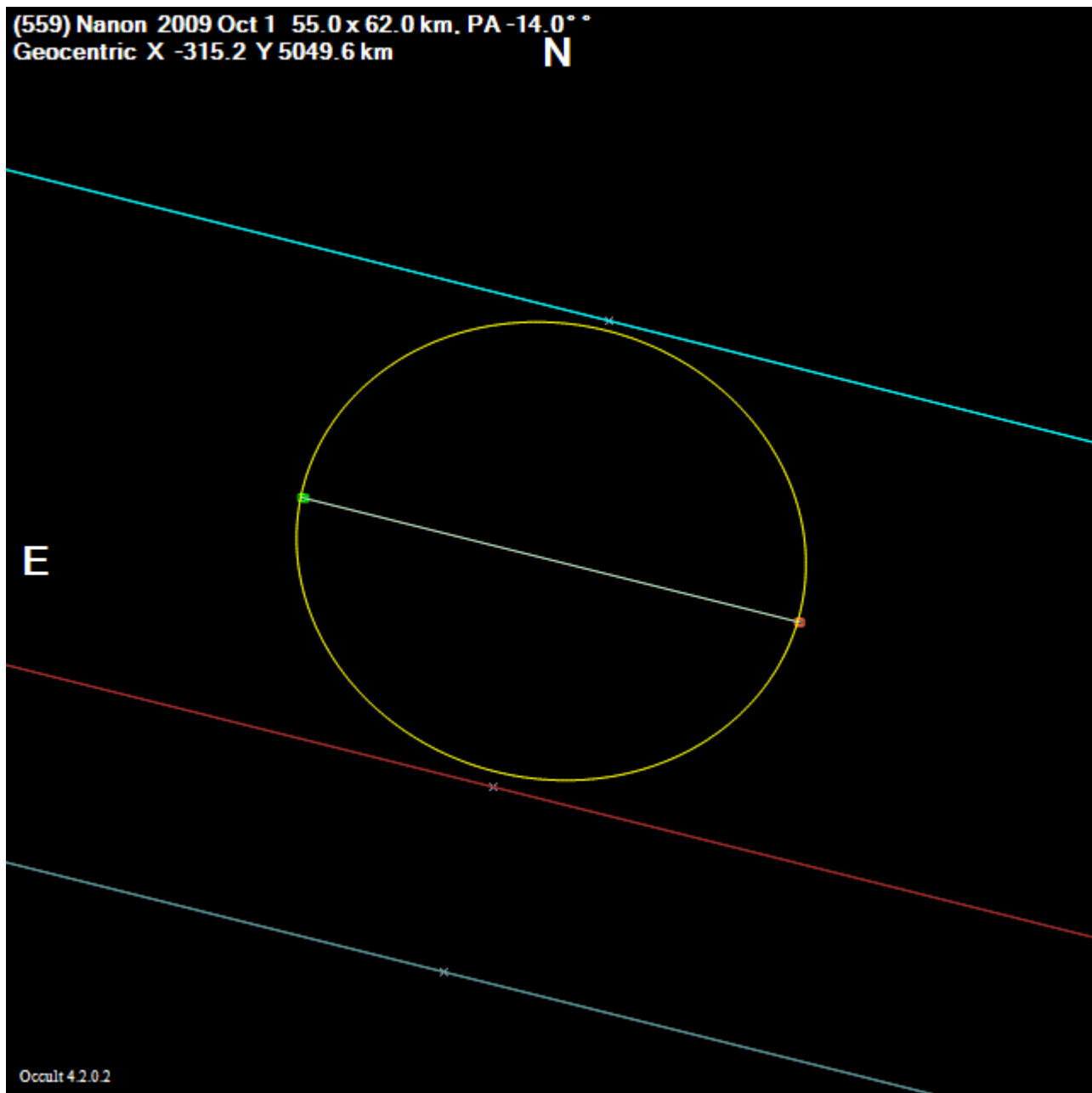
559nanon2009oct01

(559) Nanon 2009 Oct 1 55.0 x 62.0 km, PA -14.0° °
Geocentric X -315.2 Y 5049.6 km

N

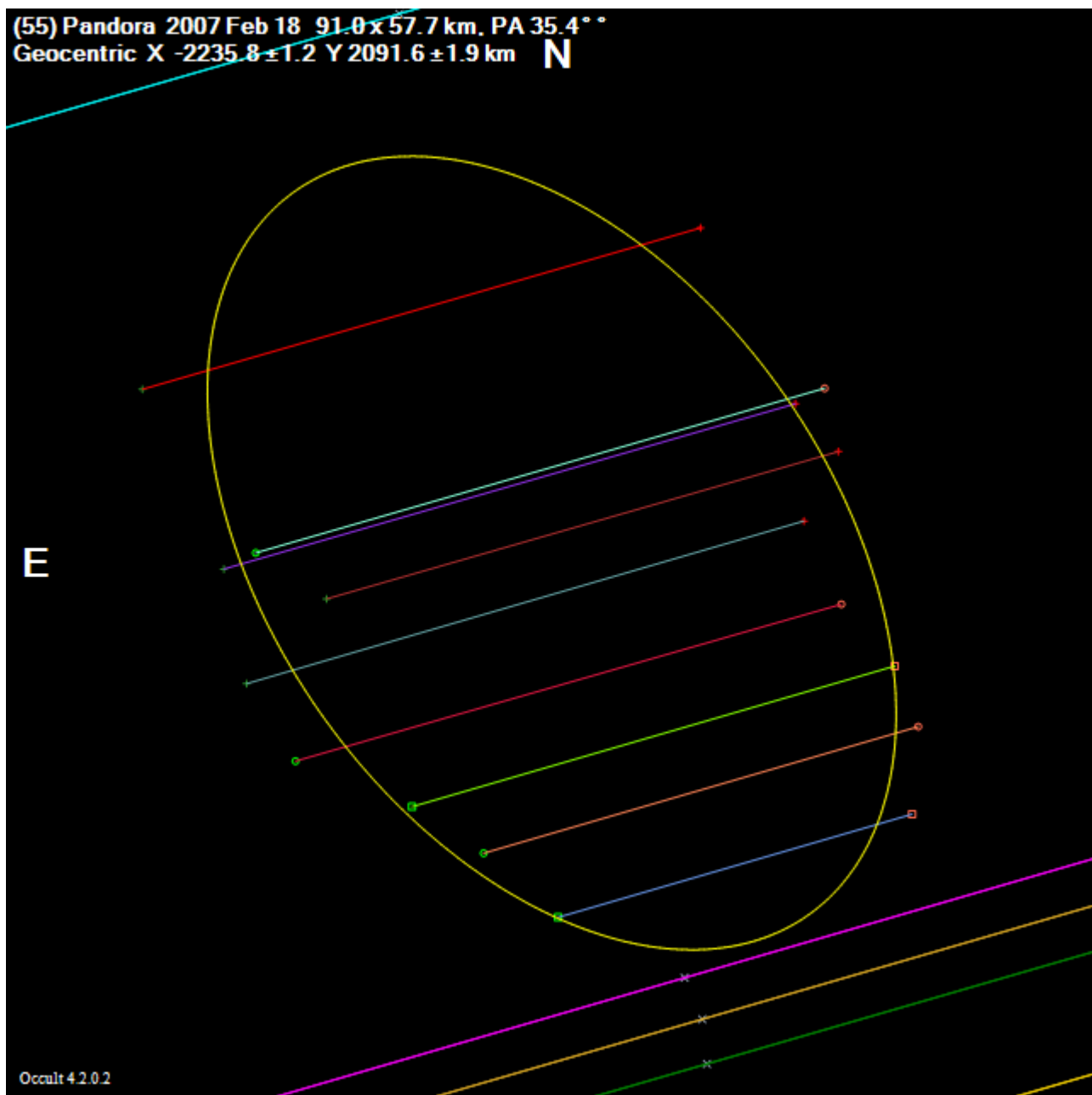
E

Occult 4.2.0.2



55pandora2007feb18

(55) Pandora 2007 Feb 18 91.0 x 57.7 km, PA 35.4° °
Geocentric X -2235.8 ± 1.2 Y 2091.6 ± 1.9 km **N**

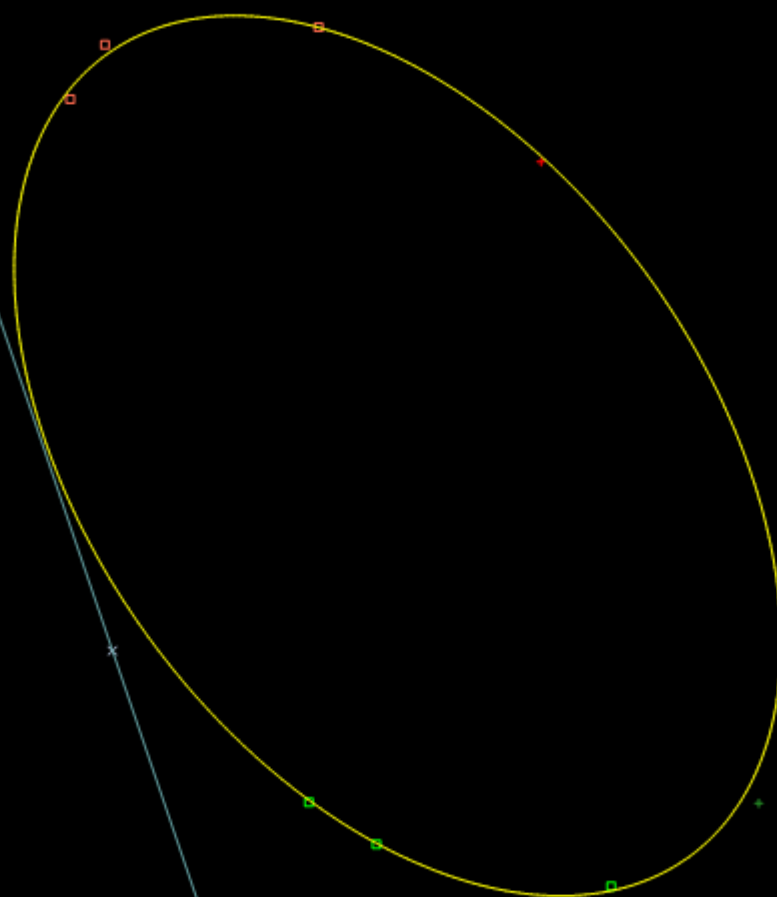


564dudu2012jan14

(564) Dudu 2012 Jan 14 $64.5 \pm 0.5 \times 40.1 \pm 1.3$ km, PA $36.0^\circ \pm 2.3^\circ$
Geocentric X 3829.2 ± 0.4 Y 2908.8 ± 0.2 km **N**

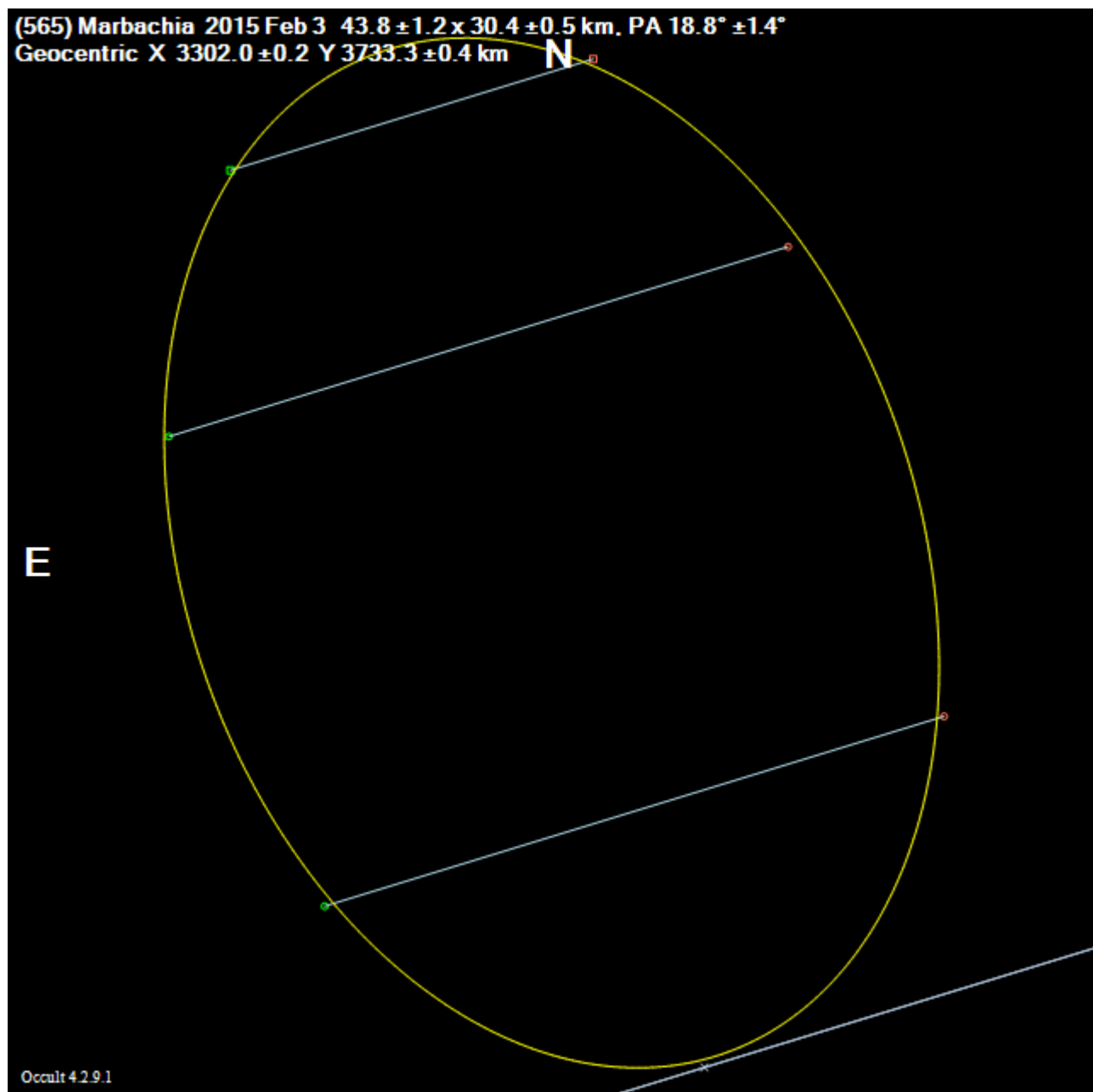
E

Occult 4.2.0.2



565marbachia2015feb03

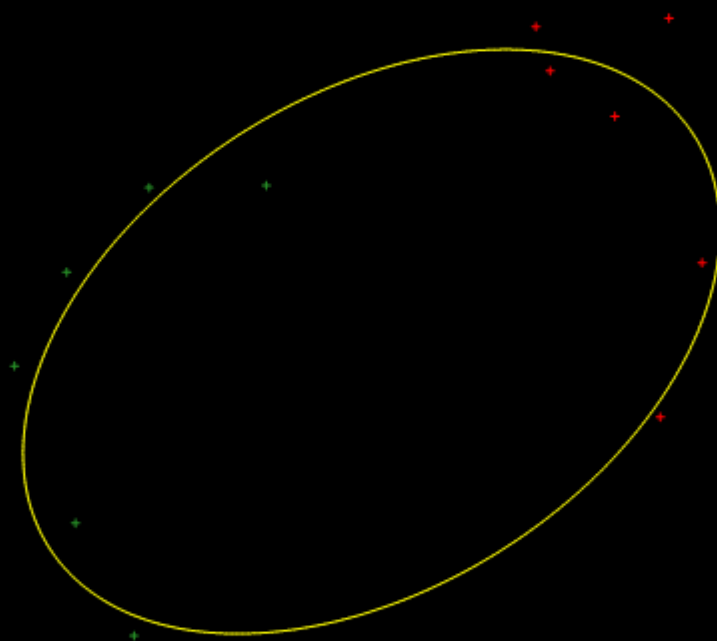
(565) Marbachia 2015 Feb 3 $43.8 \pm 1.2 \times 30.4 \pm 0.5$ km, PA $18.8^\circ \pm 1.4^\circ$
Geocentric X 3302.0 ± 0.2 Y 3733.3 ± 0.4 km



566stereoskopia2004mar23

(566) Stereoskopia 2004 Mar 23 $167.3 \pm 8.1 \times 107.4 \pm 11.1$ km, PA $-57.4^\circ \pm 6.7^\circ$
Geocentric X 1360.5 ± 3.2 Y 5101.4 ± 3.6 km **N**

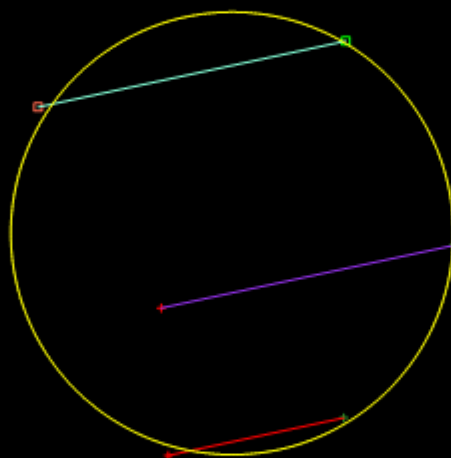
E



567eleutheria2014nov04

(567) Eleutheria 2014 Nov 4 $96.0 \pm 14.1 \times 96.0$ km. PA 0.0° °
Geocentric X -3448.5 ± 5.9 Y 2468.9 ± 5.8 km **N**

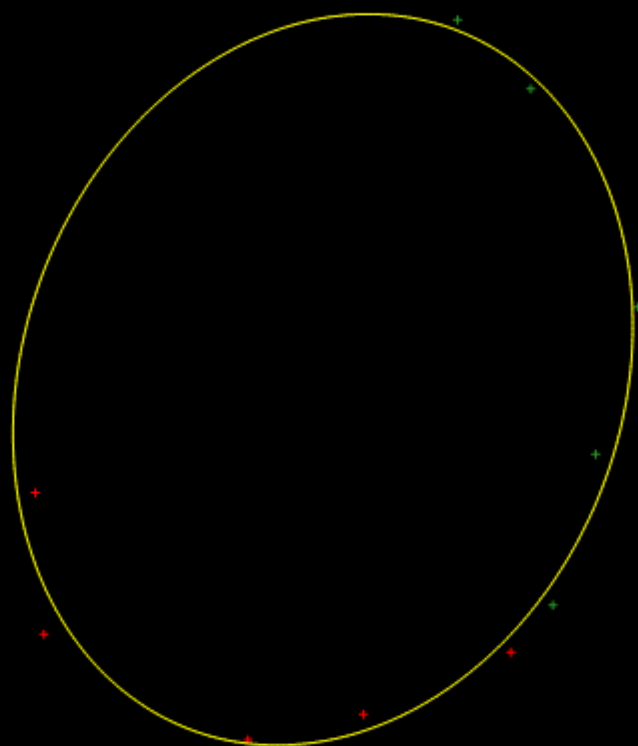
E



568cheruskia1999oct24

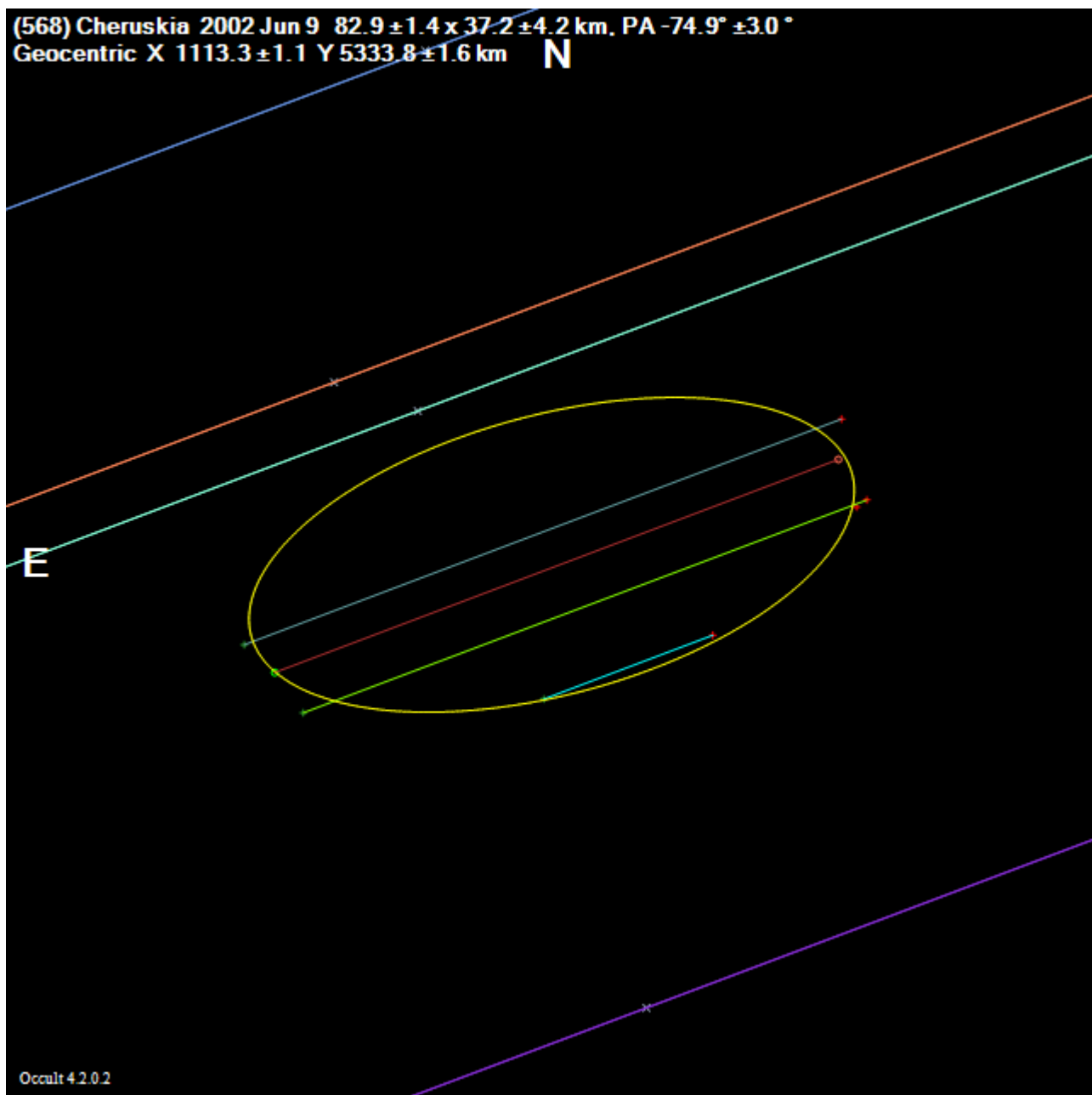
(568) Cheruskia 1999 Oct 24 $84.7 \pm 1.8 \times 67.8 \pm 3.1$ km, PA $-20.8^\circ \pm 8.2^\circ$
Geocentric X -2783.4 ± 1.2 Y 2223.2 ± 1.3 km **N**

E



568cheruskia2002jun09

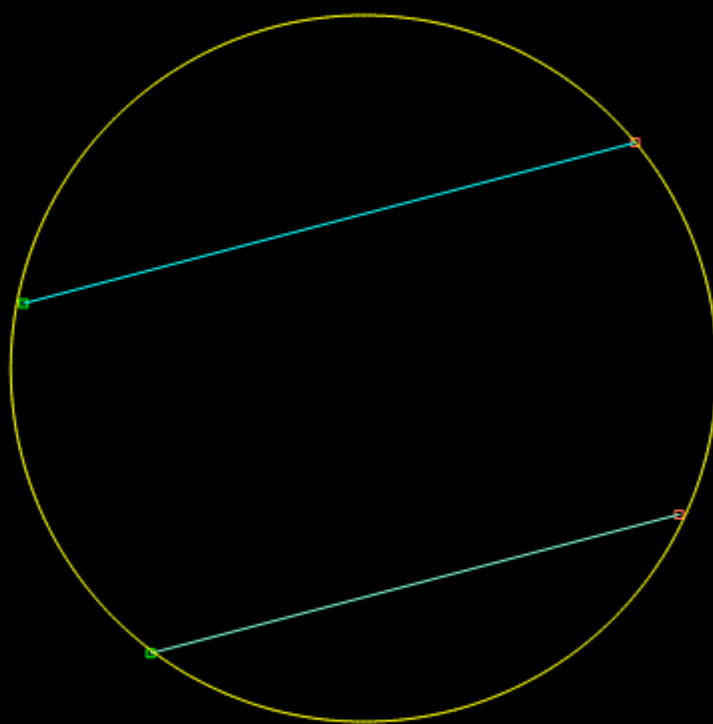
(568) Cheruskia 2002 Jun 9 $82.9 \pm 1.4 \times 37.2 \pm 4.2$ km, PA $-74.9^\circ \pm 3.0^\circ$
Geocentric X 1113.3 ± 1.1 Y 5333.8 ± 1.6 km **N**



569misa2011jan29

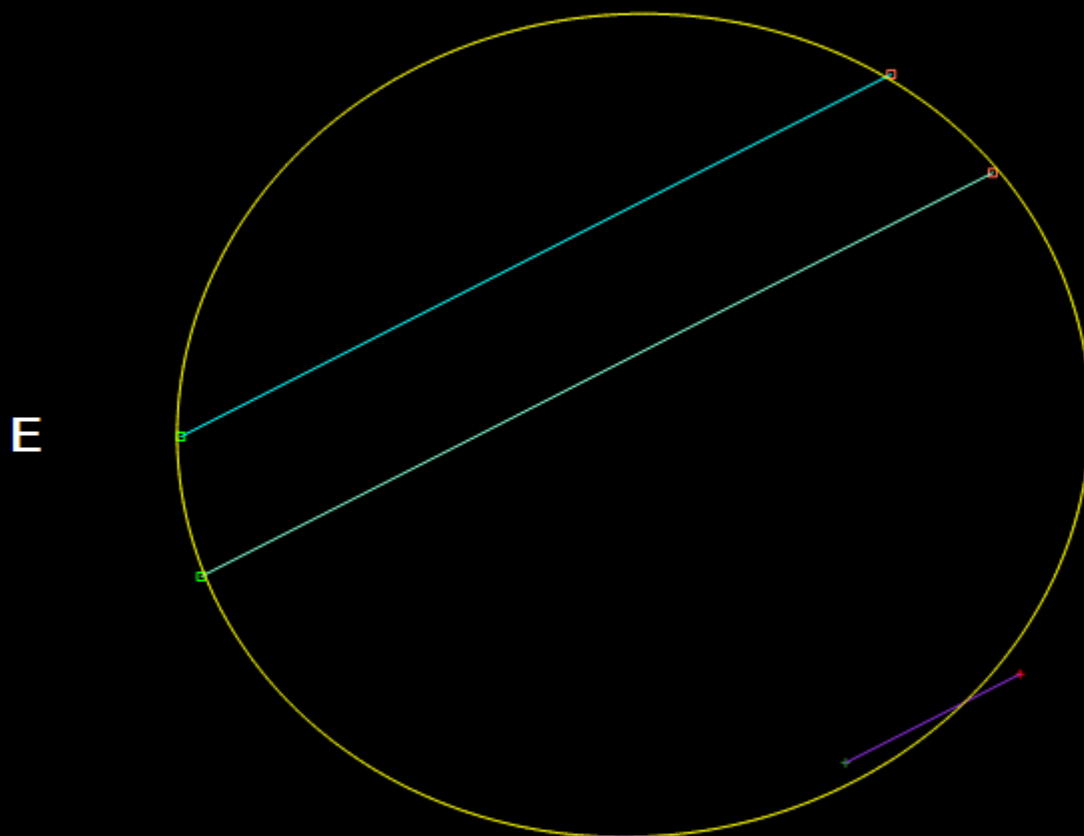
(569) Misa 2011 Jan 29 $67.1 \pm 1.0 \times 67.1$ km, PA 0.0° °
Geocentric X -4370.0 ± 0.2 Y 1893.9 ± 0.4 km **N**

E



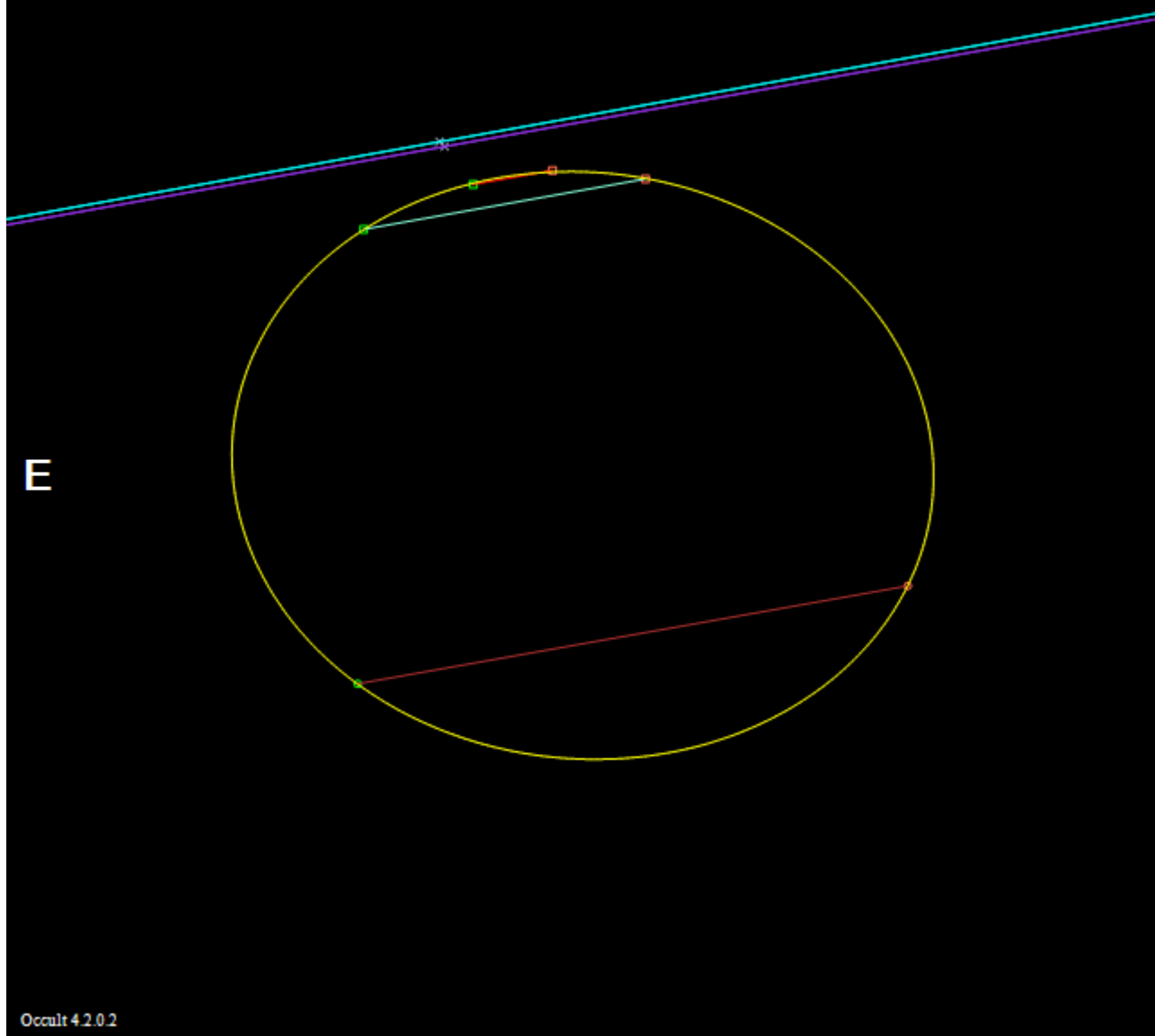
56melete2010feb14

(56) Melete 2010 Feb 14 $134.4 \pm 2.1 \times 120.9 \pm 3.8$ km, PA $-83.9^\circ \pm 10.0^\circ$
Geocentric X 4018.2 ± 1.0 Y 2224.0 ± 1.4 km **N**



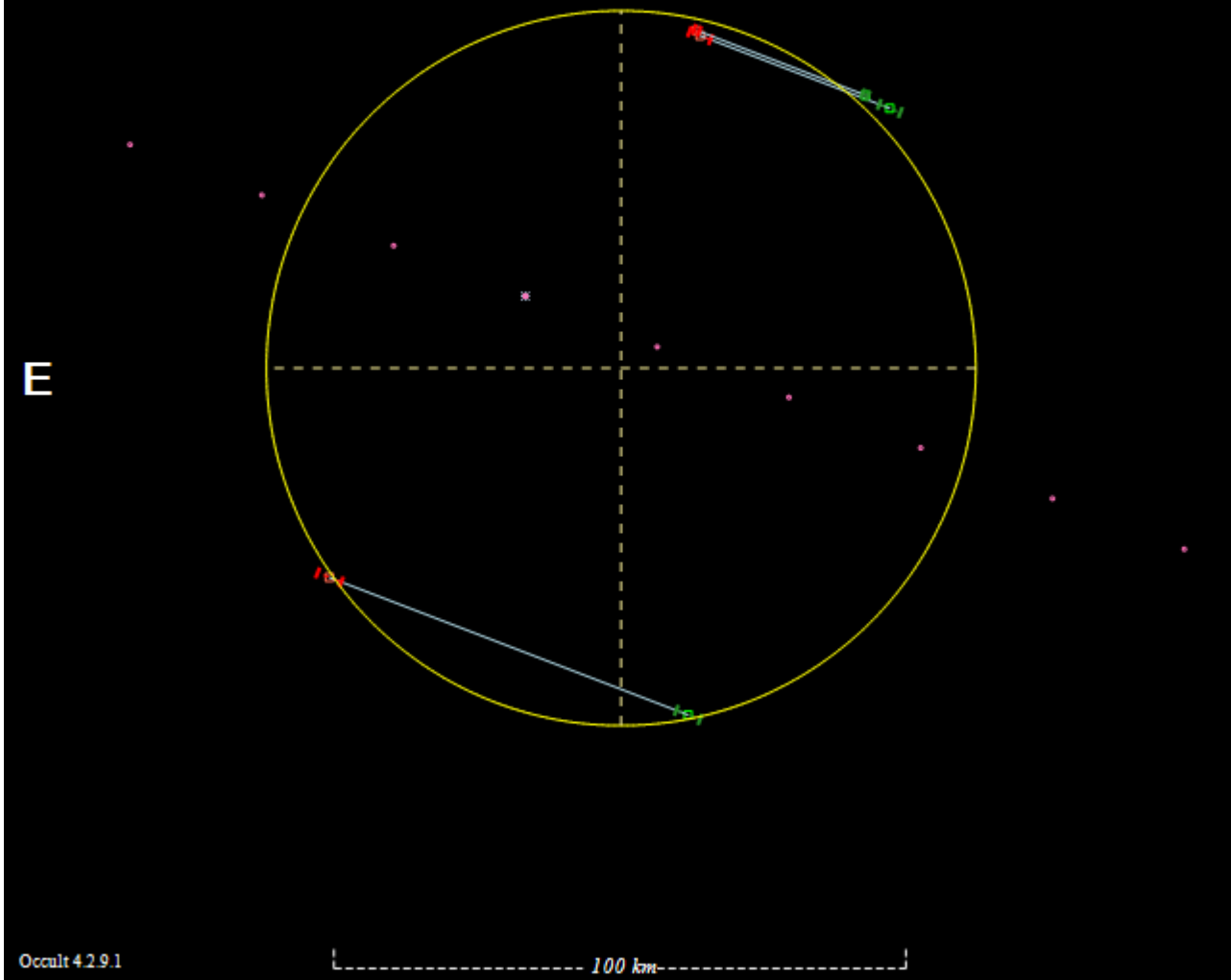
56melete2014jan17

(56) Melete 2014 Jan 17 $136.3 \pm 1.5 \times 113.8 \pm 0.9$ km, PA $84.4^\circ \pm 2.4^\circ$
Geocentric X -1934.0 ± 0.2 Y 4078.1 ± 0.5 km **N**



56Melete2016Apr20

(56) Melete 2016 Apr 20 125.0 x 124.0 km, PA 0.0°
Geocentric X -3573.4 ± 2.0 Y 5053.9 ± 1.3 km **N**

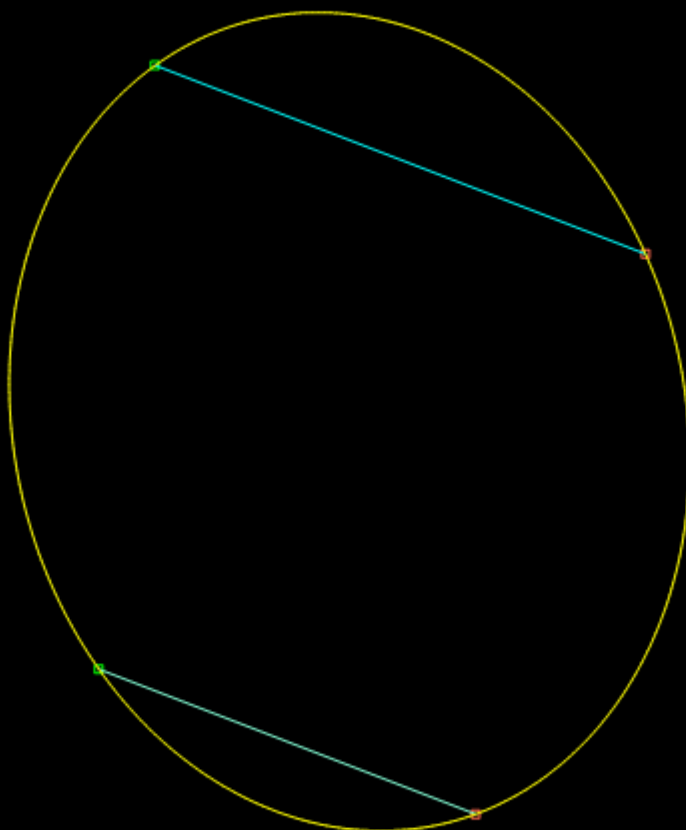


570kythera2013sep06

(570) Kythera 2013 Sep 6 105.3 x 85.6 km, PA 13.3° °
Geocentric X 1542.9 Y 4400.5 km

N

E



573recha2005sep27

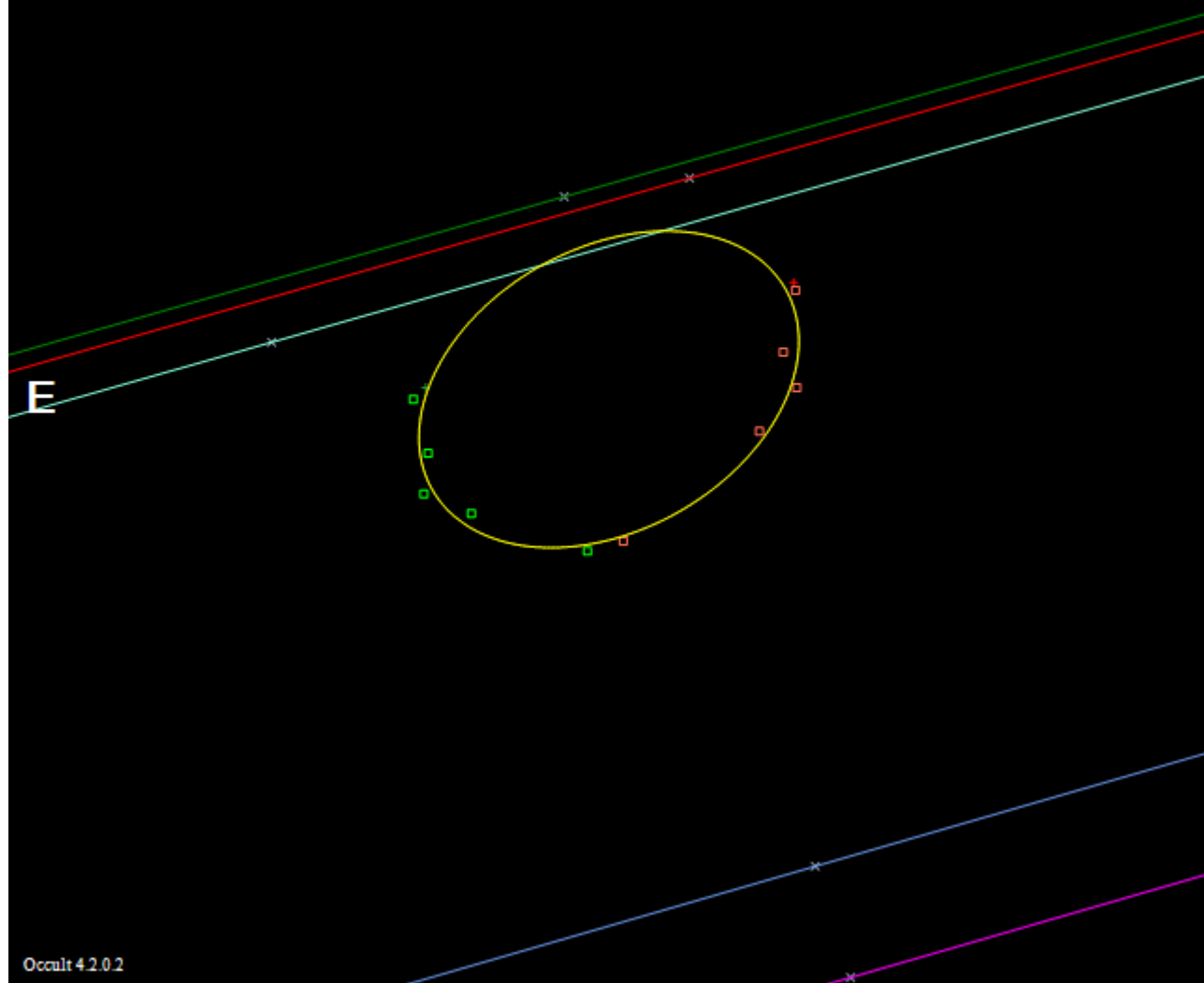
(573) Recha 2005 Sep 27 $51.5 \pm 5.9 \times 51.5$ km, PA 0.0° °
Geocentric X 573.3 ± 2.5 Y 2344.5 ± 2.6 km **N**

E



576emanela2013jul26

(576) Emanuela 2013 Jul 26 $97.2 \pm 2.1 \times 67.5 \pm 4.2$ km, PA $-60.5^\circ \pm 4.7^\circ$
Geocentric X -2925.2 ± 0.8 Y -2077.3 ± 1.9 km **N**

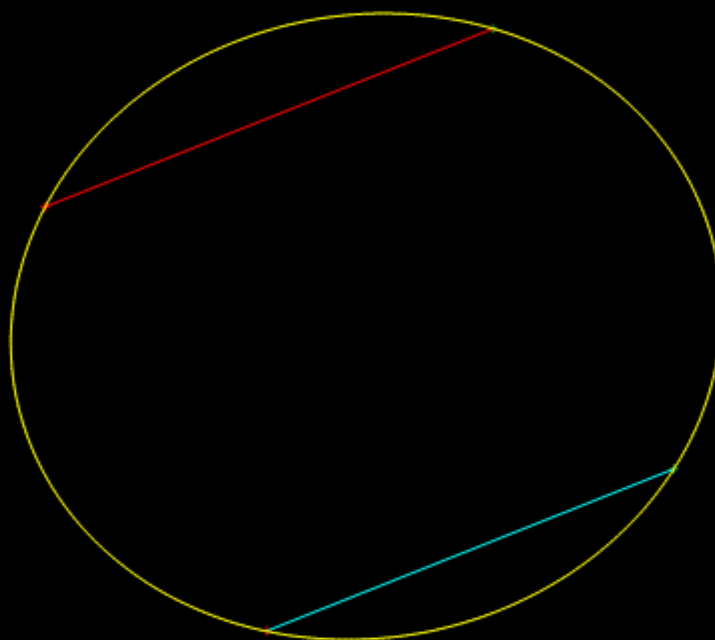


578happelia1998mar26

(578) Hapelia 1998 Mar 26 64.1 x 55.9 km, PA -78.9° °
Geocentric X 3649.5 Y 3343.7 km

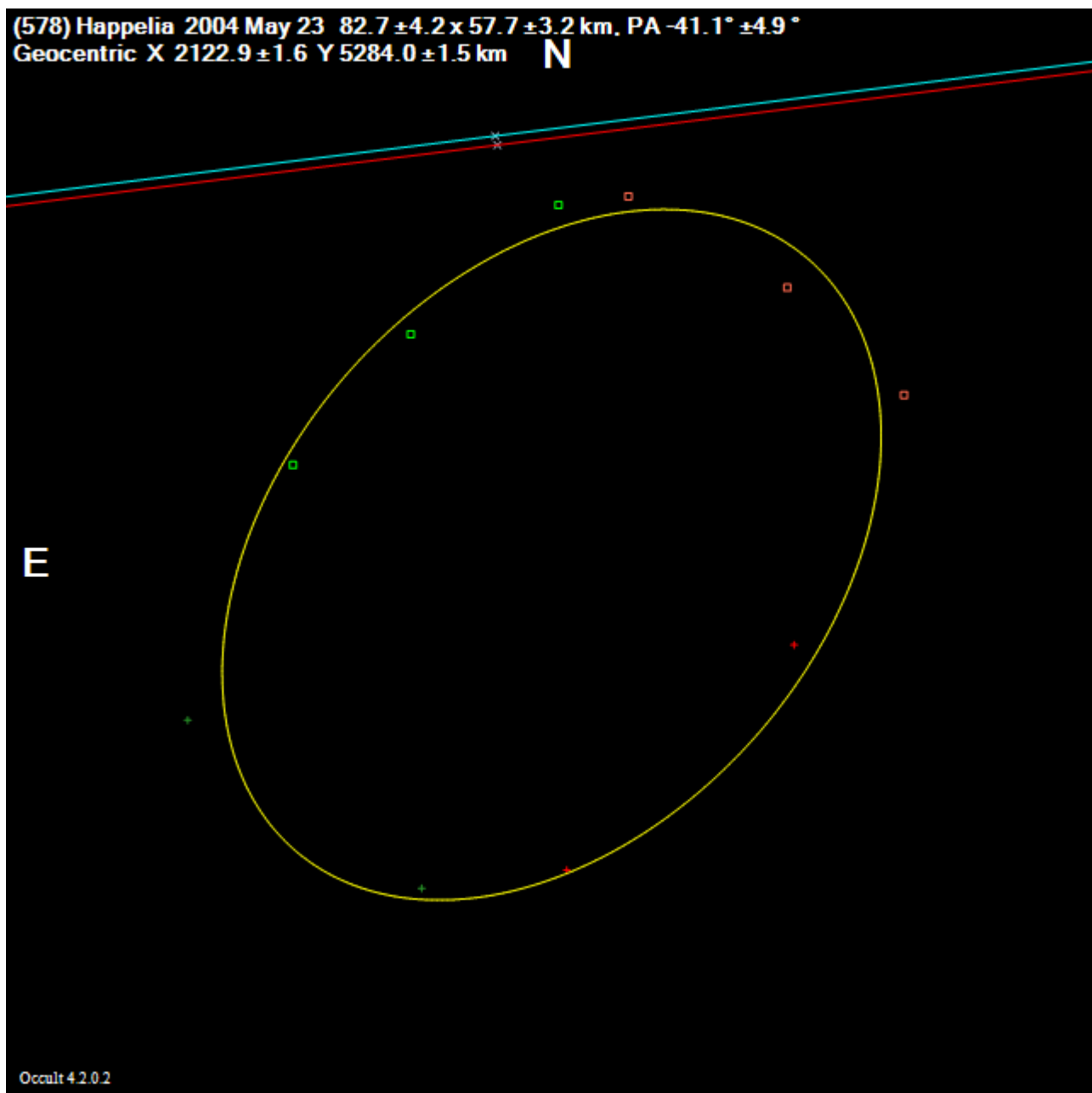
N

E



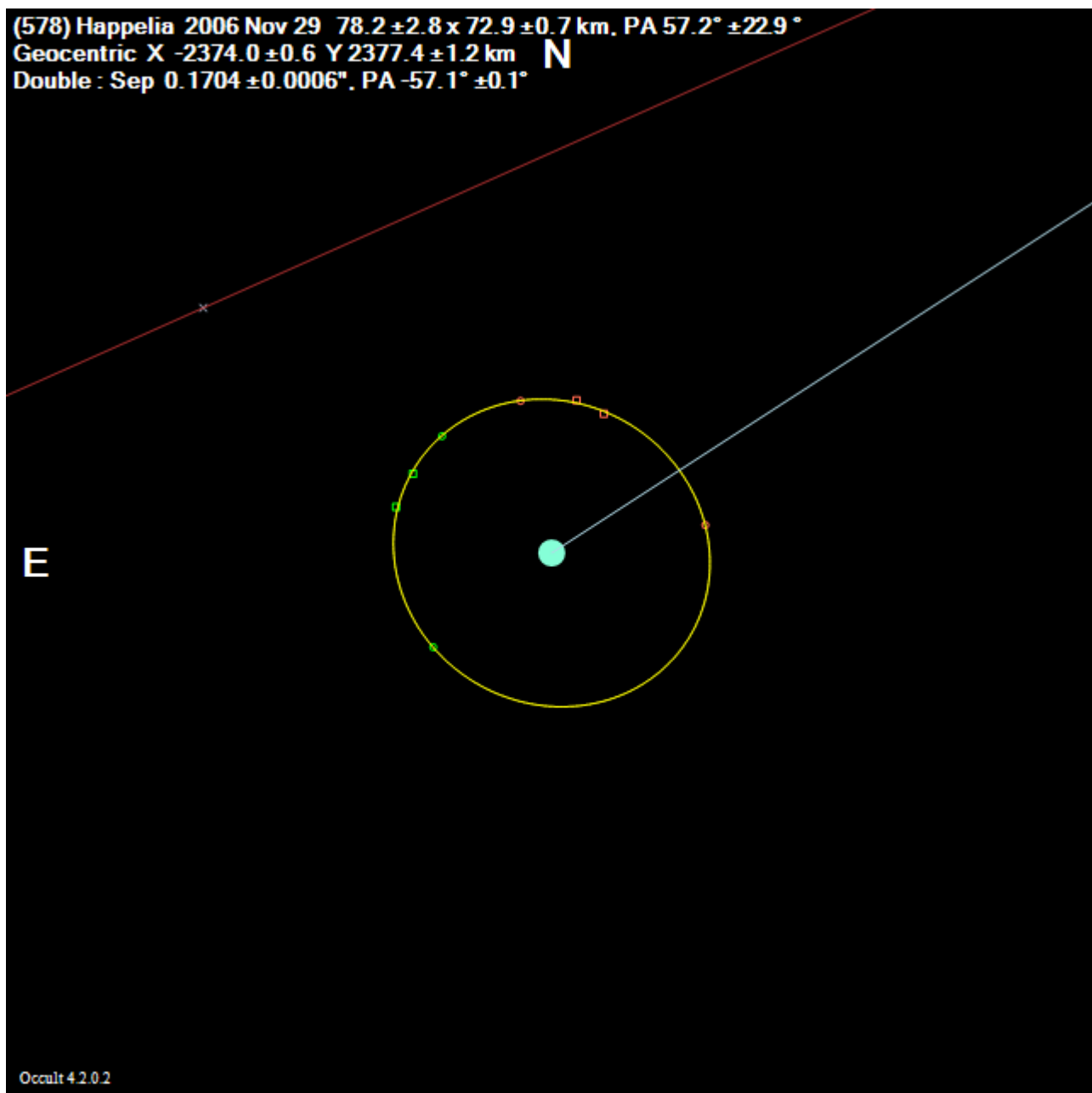
578happelia2004may23

(578) Hapelia 2004 May 23 $82.7 \pm 4.2 \times 57.7 \pm 3.2$ km, PA $-41.1^\circ \pm 4.9^\circ$
Geocentric X 2122.9 ± 1.6 Y 5284.0 ± 1.5 km **N**



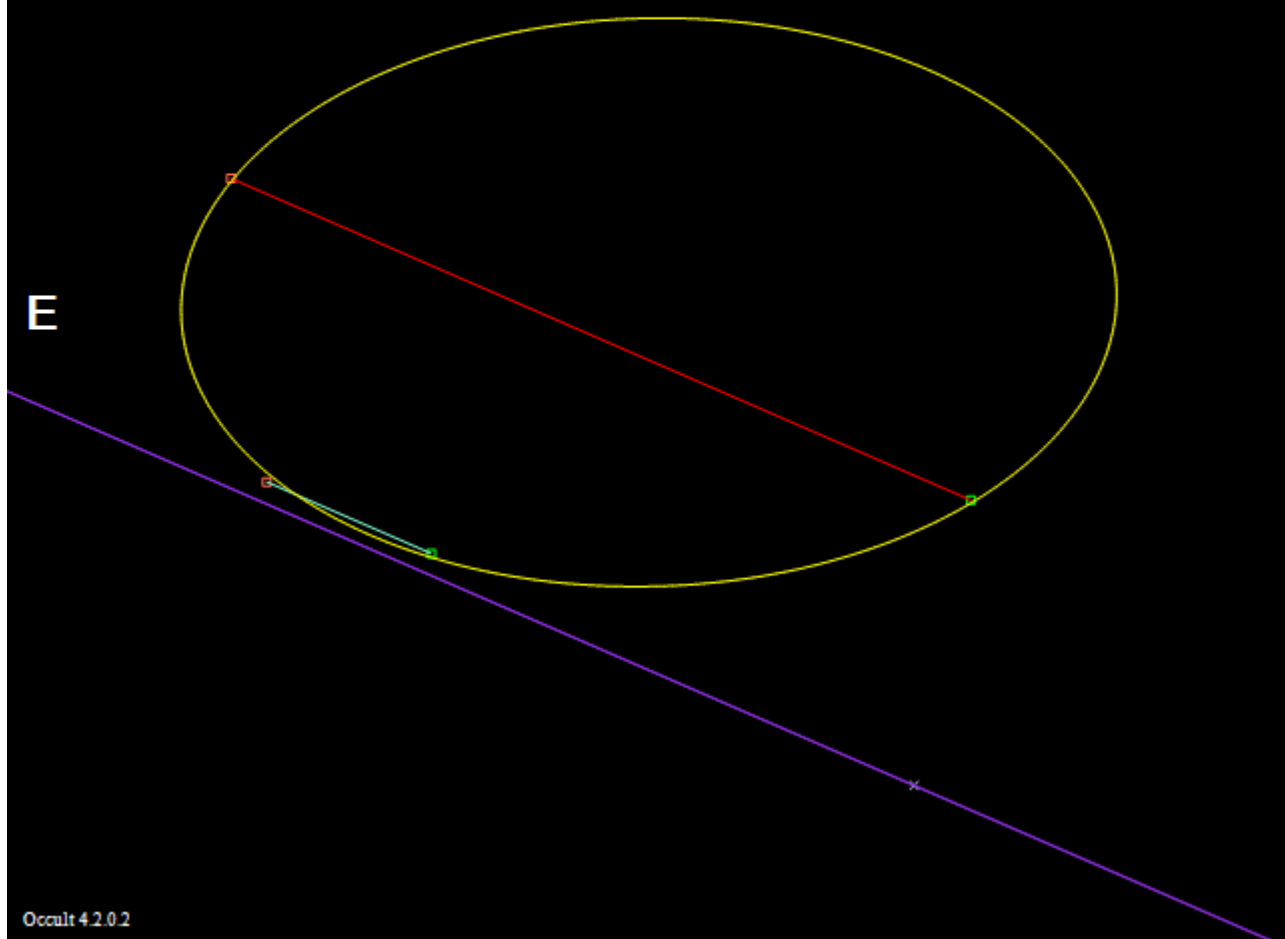
578happelia2006nov29

(578) Hapelia 2006 Nov 29 $78.2 \pm 2.8 \times 72.9 \pm 0.7$ km, PA $57.2^\circ \pm 22.9^\circ$
Geocentric X -2374.0 ± 0.6 Y 2377.4 ± 1.2 km **N**
Double : Sep $0.1704 \pm 0.0006''$, PA $-57.1^\circ \pm 0.1^\circ$



578happelia2009nov06

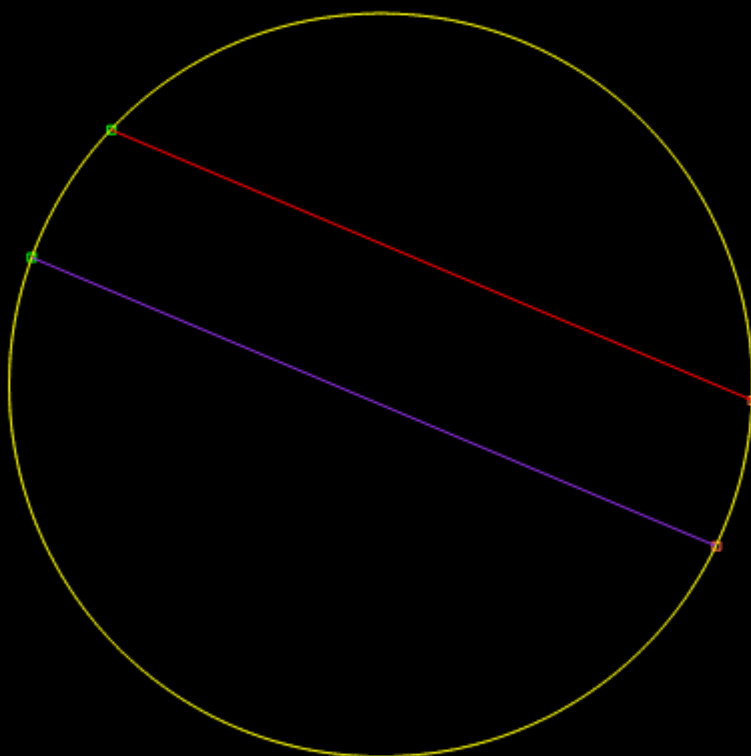
(578) Hapelia 2009 Nov 6 84.0 x 51.0 km, PA -88.5° ± 0.0°
Geocentric X 1152.1 ± 0.0 Y 5810.9 ± 0.0 km **N**



579sidonia2009sep24

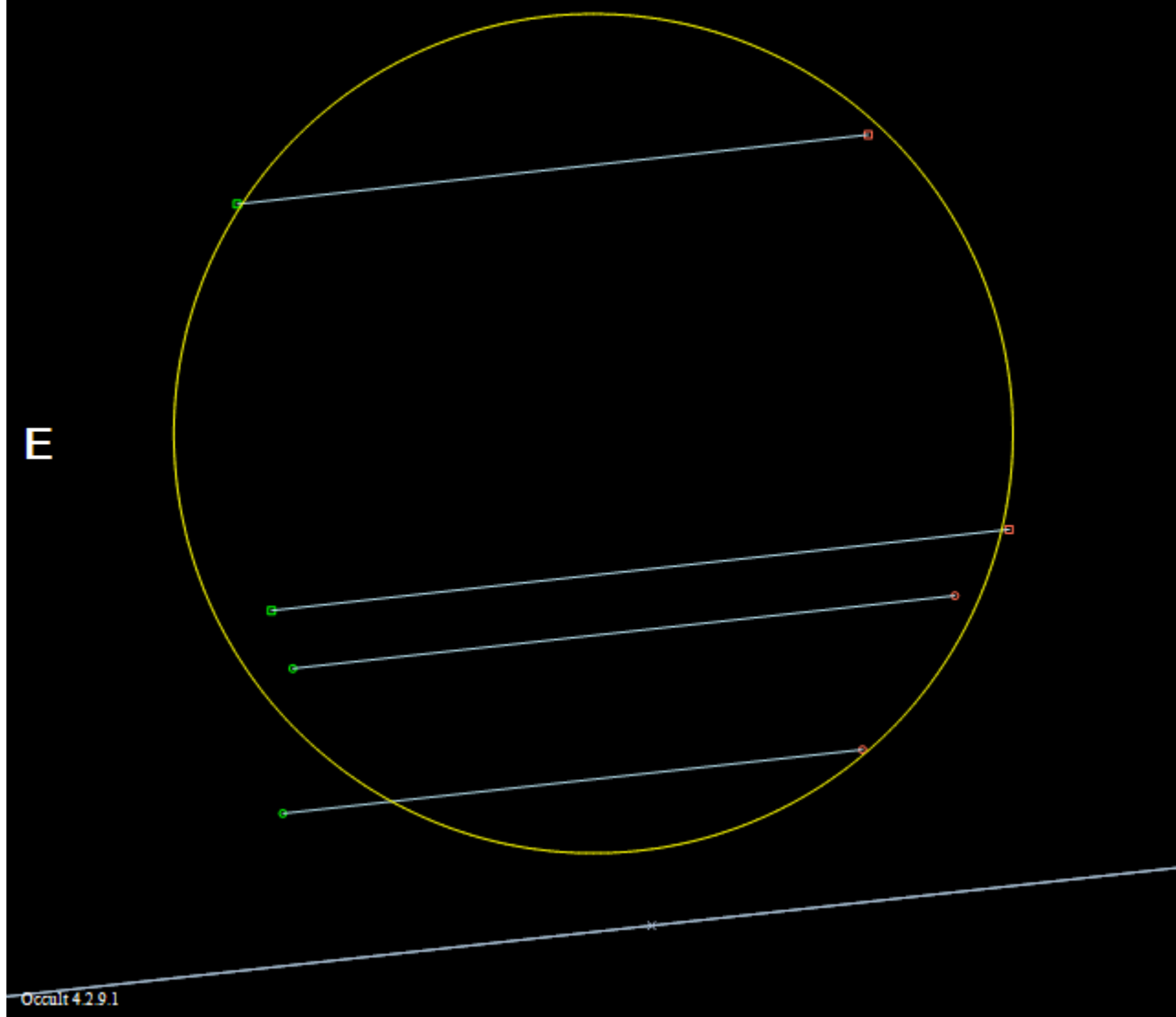
(579) Sidonia 2009 Sep 24 82.2 x 82.2 km, PA 0.0°
Geocentric X 2665.6 ± 0.1 Y 5197.9 ± 0.1 km **N**

E



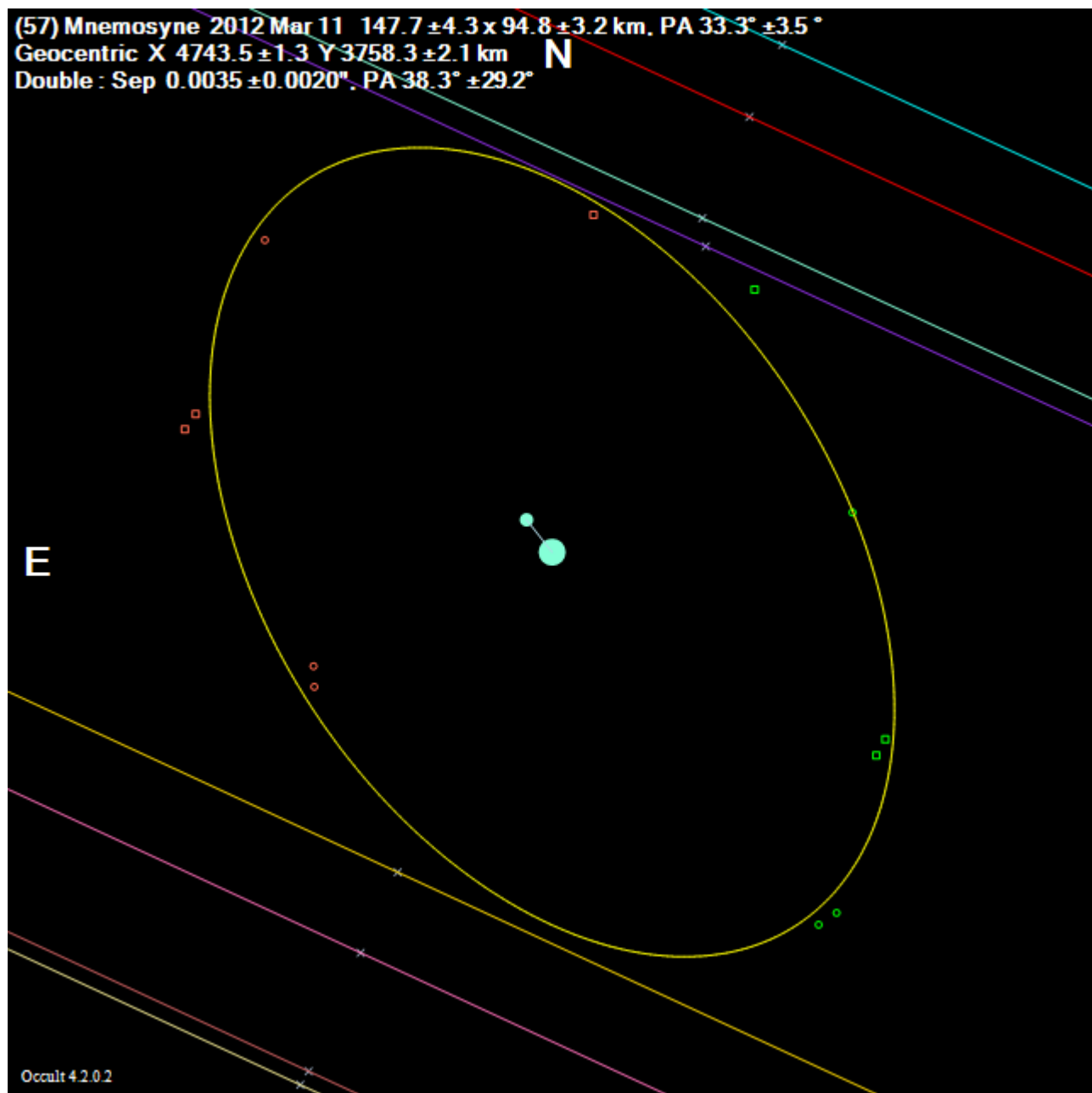
579sidonia2015dec17

(579) Sidonia 2015 Dec 17 $101.4 \pm 8.1 \times 101.4$ km, PA 0.0°
Geocentric X 4953.4 ± 1.9 Y -3882.4 ± 2.7 km **N**



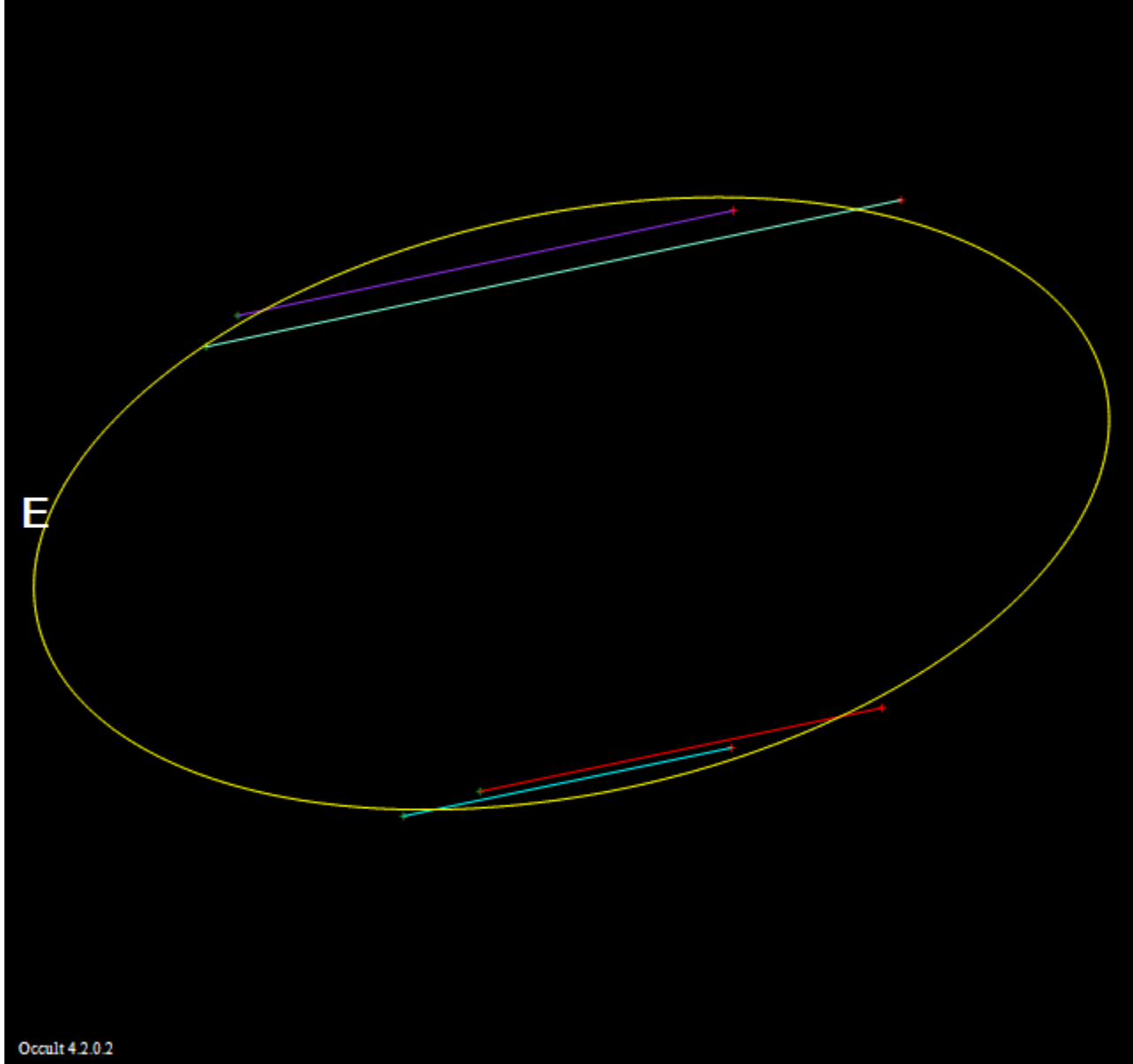
57mnemosyne2012mar11

(57) Mnemosyne 2012 Mar 11 $147.7 \pm 4.3 \times 94.8 \pm 3.2$ km, PA $33.3^\circ \pm 3.5^\circ$
Geocentric X 4743.5 ± 1.3 Y 3758.3 ± 2.1 km
Double : Sep $0.0035 \pm 0.0020''$, PA $38.3^\circ \pm 29.2^\circ$



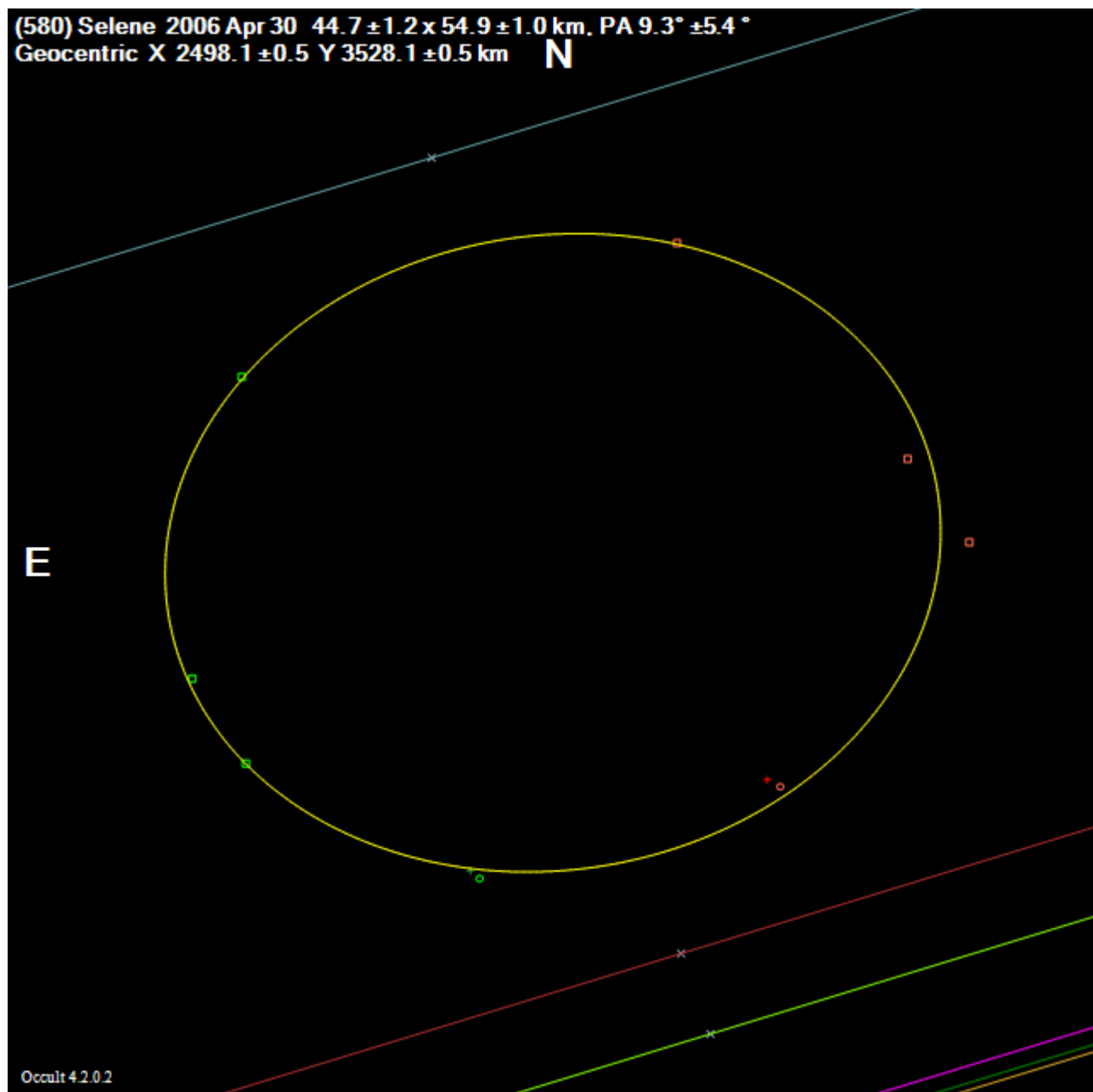
580selene1999mar03

(580) Selene 1999 Mar 3 38.4 x 72.5 km. PA 12.4° °
Geocentric X 2564.9 ± 0.9 Y 1369.3 ± 0.3 km **N**



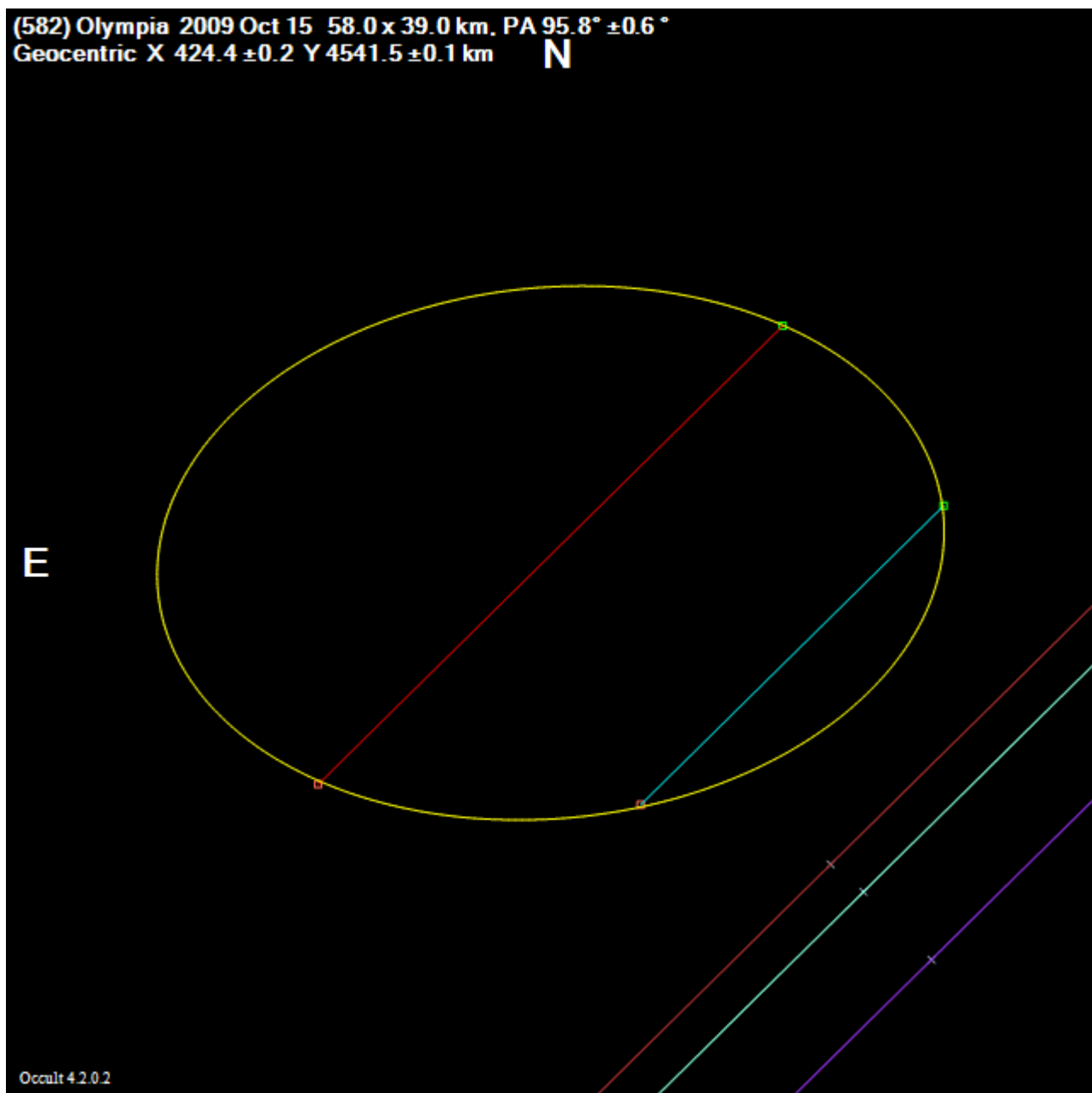
580selene2006apr30

(580) Selene 2006 Apr 30 $44.7 \pm 1.2 \times 54.9 \pm 1.0$ km, PA $9.3^\circ \pm 5.4^\circ$
Geocentric X 2498.1 ± 0.5 Y 3528.1 ± 0.5 km **N**



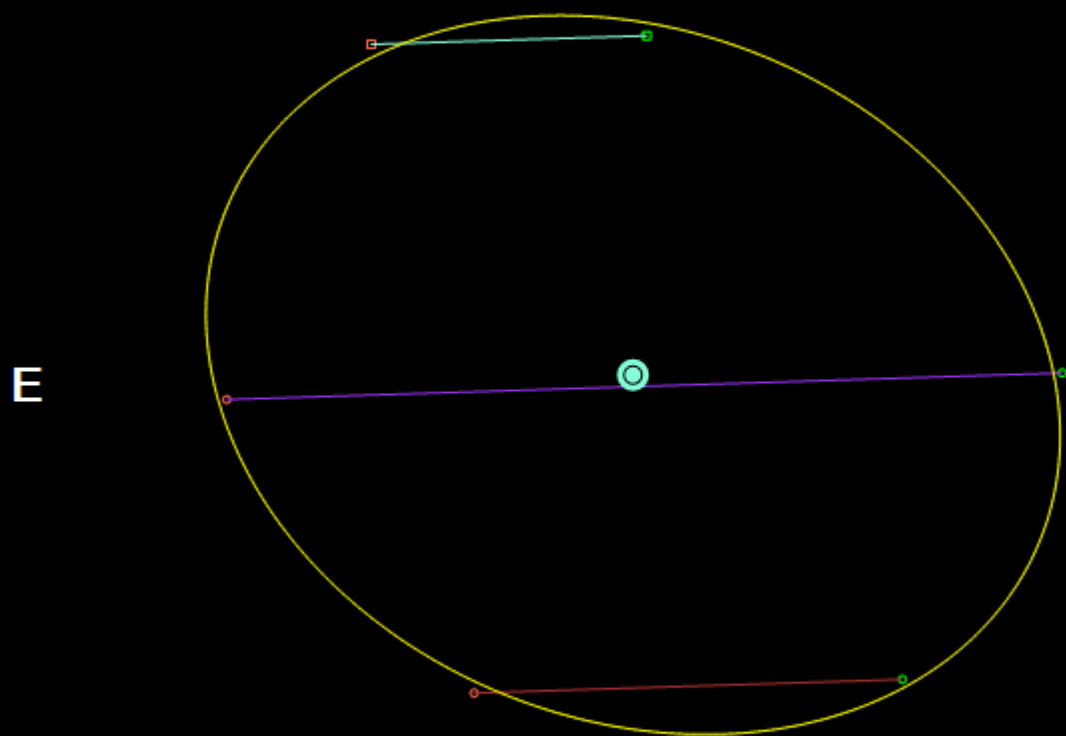
582olympia2009oct15

(582) Olympia 2009 Oct 15 58.0 x 39.0 km. PA $95.8^\circ \pm 0.6^\circ$
Geocentric X 424.4 ± 0.2 Y 4541.5 ± 0.1 km **N**



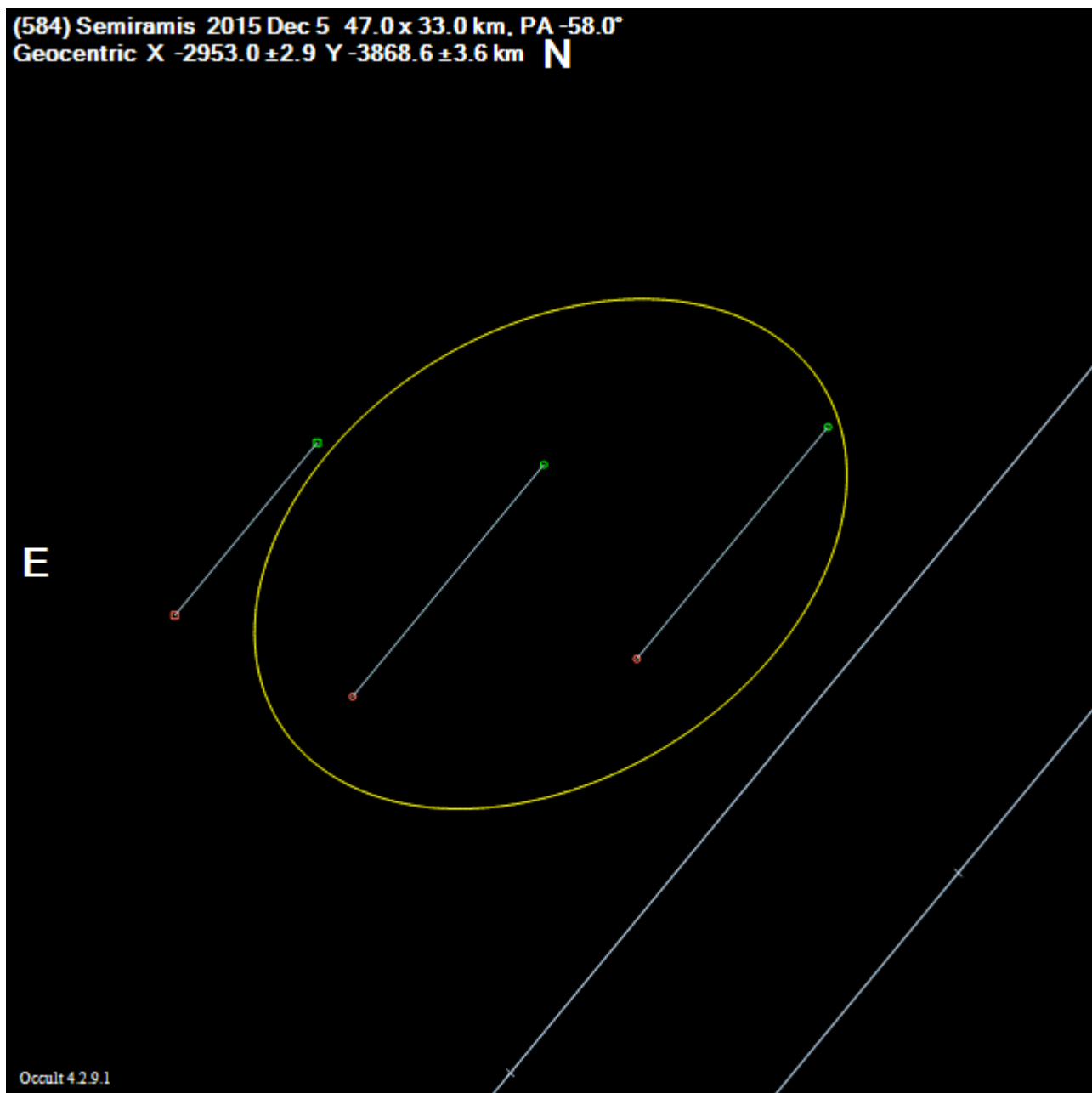
583klotilde2009mar17

(583) Klotilde 2009 Mar 17 $92.6 \pm 1.8 \times 72.6 \pm 1.7$ km, PA $67.8^\circ \pm 3.4^\circ$
Geocentric X 4525.3 ± 0.7 Y 2455.5 ± 0.6 km **N**
Double : Sep $0.0000''$, PA 0.0°



584semiramis2015dec05

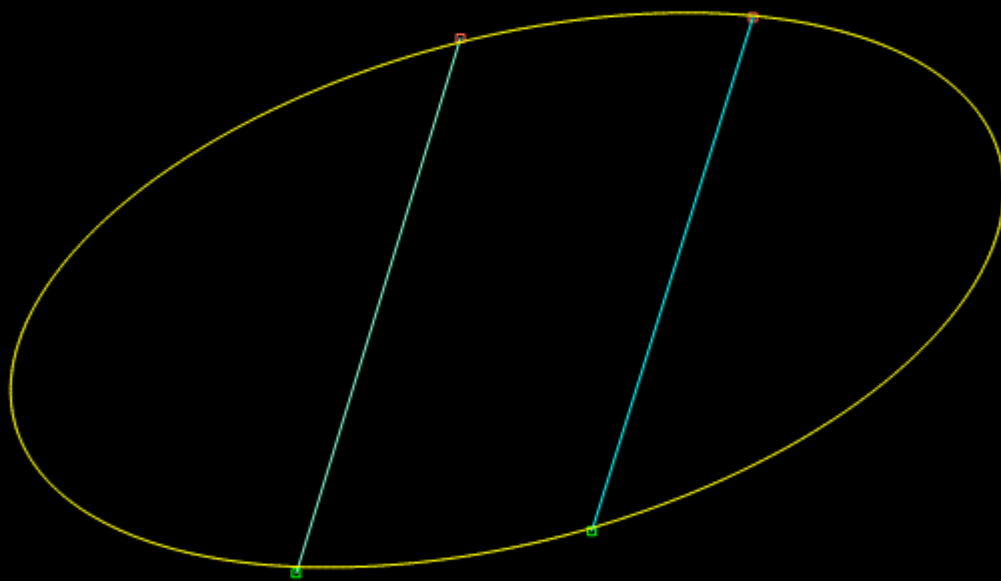
(584) Semiramis 2015 Dec 5 47.0 x 33.0 km, PA -58.0°
Geocentric X -2953.0 ± 2.9 Y -3868.6 ± 3.6 km **N**



585bilkis2008feb17

(585) Bilkis 2008 Feb 17 77.0 x 38.0 km. PA -74.8° °
Geocentric X 3556.1 ± 5.4 Y 1503.3 ± 0.6 km **N**

E



Occult 4.2.0.2

586thekla2009aug31

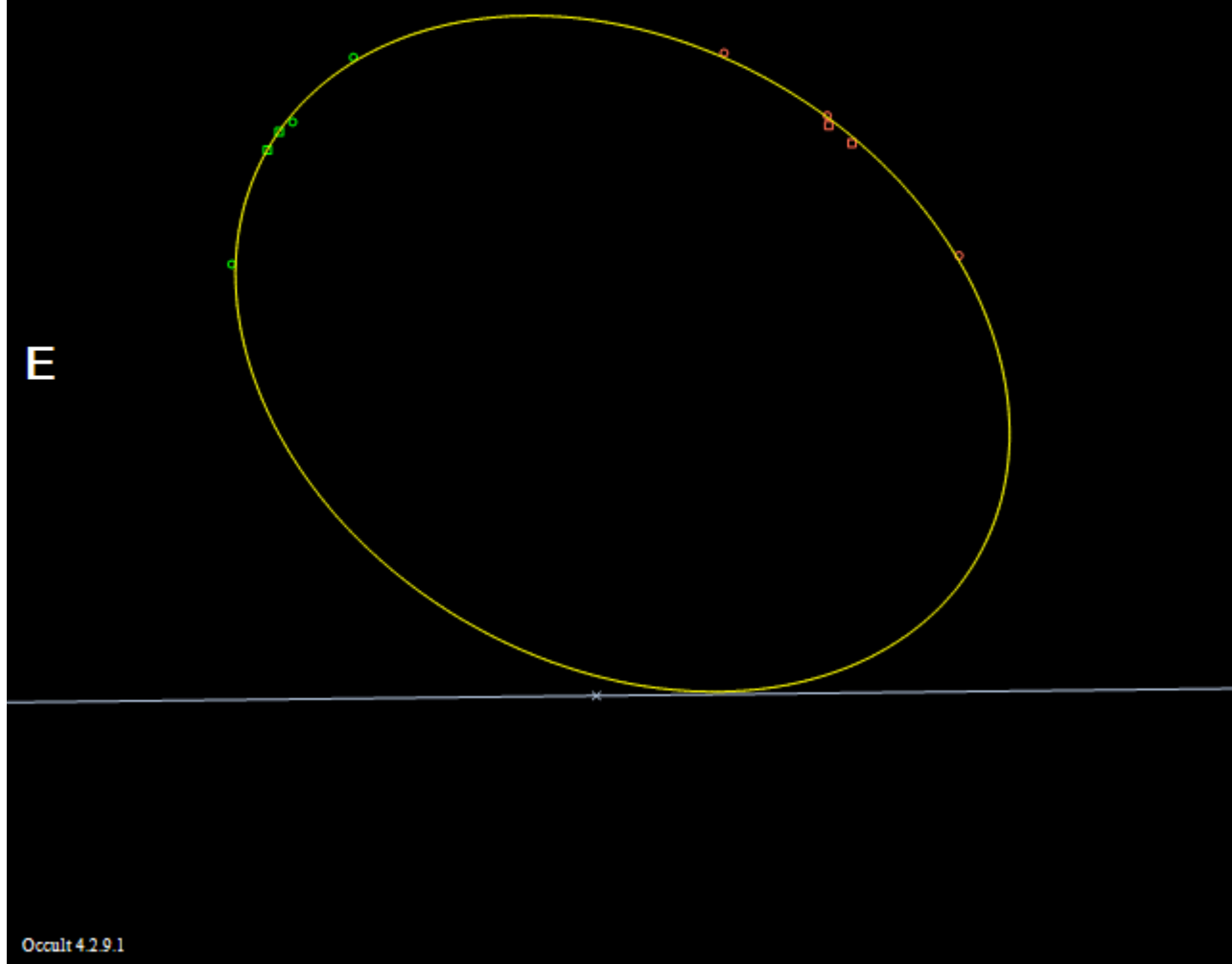
(586) Thekla 2009 Aug 31 100.0 x 64.7 ± 0.1 km, PA -67.7° ± 0.1 °
Geocentric X -208.8 ± 0.0 Y 5980.7 ± 0.0 km **N**



Occult 4.2.0.2

589croatia2015dec20

(589) Croatia 2015 Dec 20 $117.7 \pm 1.4 \times 89.2 \pm 0.9$ km, PA $60.0^\circ \pm 1.2^\circ$
Geocentric X -2827.7 ± 0.7 Y 4537.3 ± 0.3 km **N**

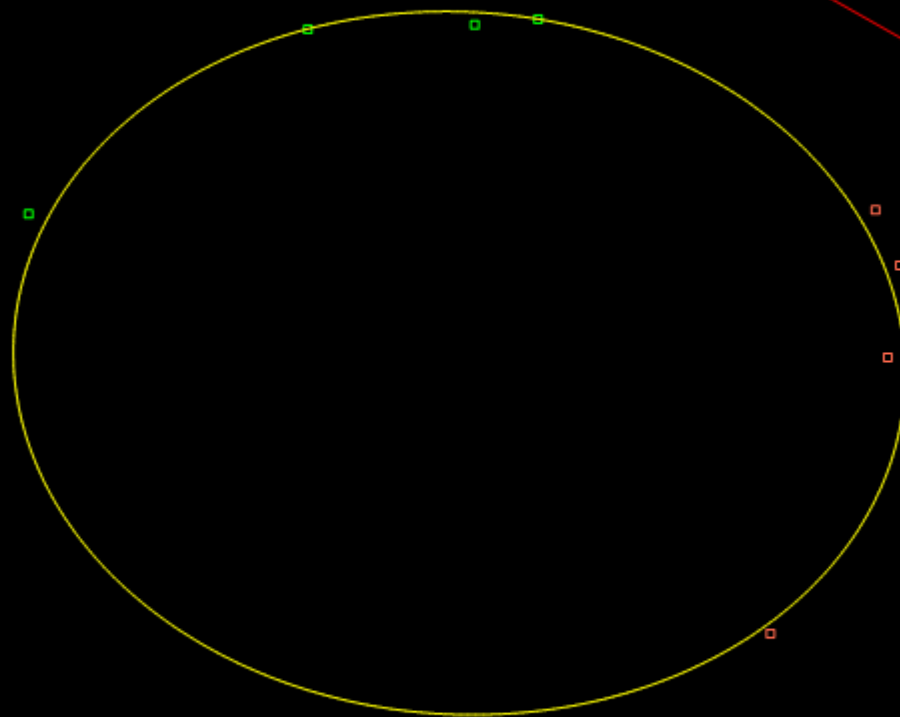


58concordia2008sep13

(58) Concordia 2008 Sep 13 $108.0 \times 85.0 \pm 2.5$ km, PA -93.6°
Geocentric X 3654.0 ± 0.8 Y 3864.4 ± 1.1 km

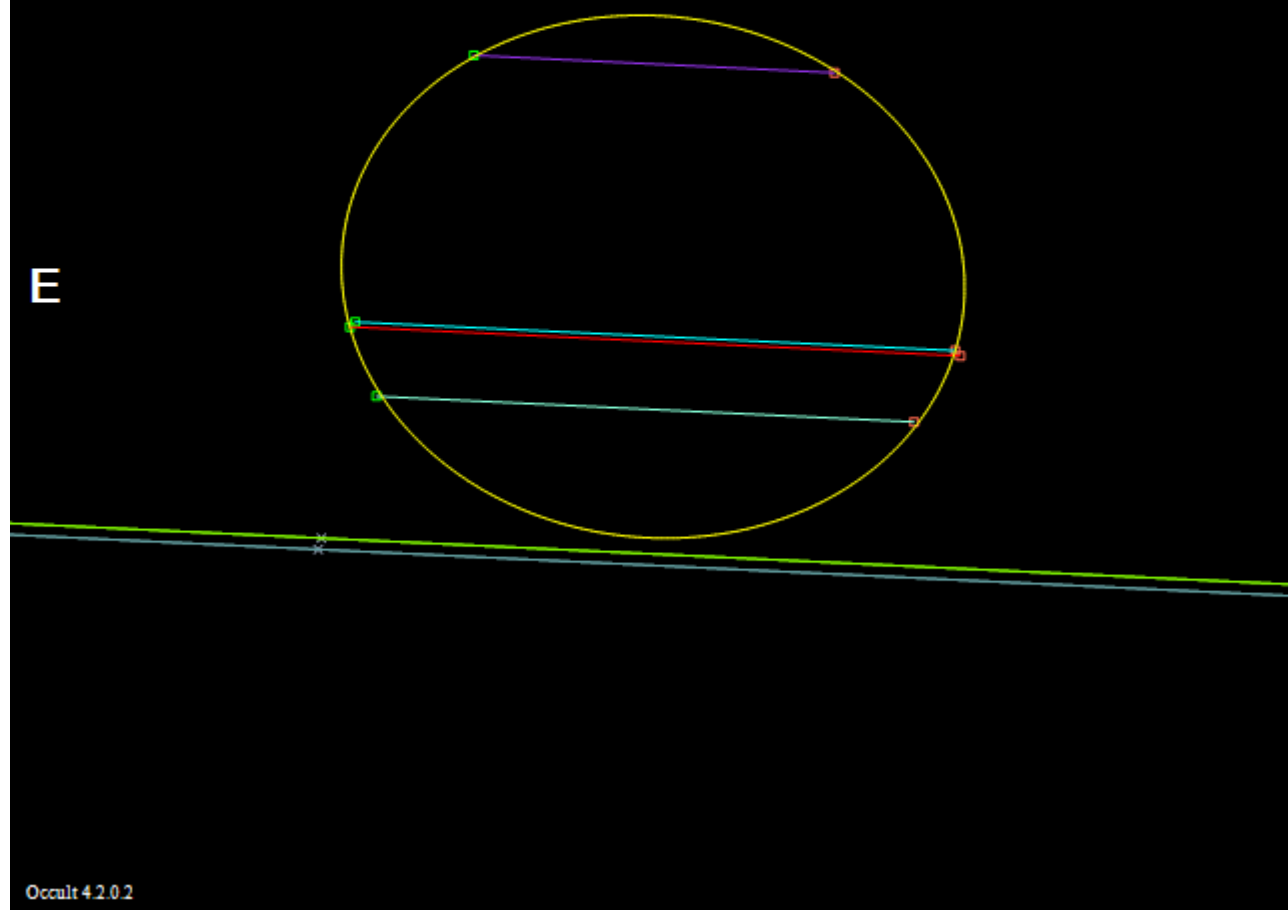
N

E



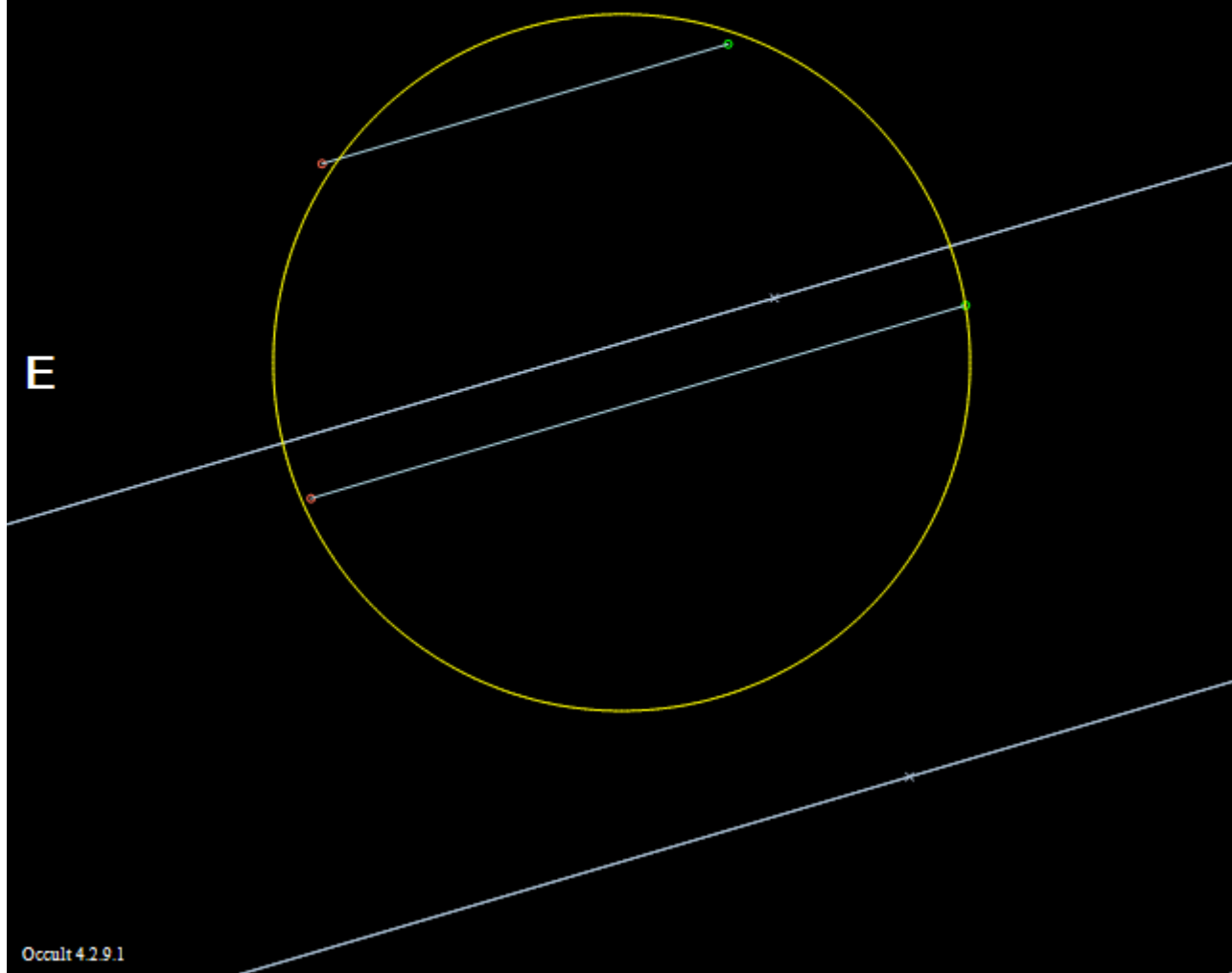
58concordia2009dec04

(58) Concordia 2009 Dec 4 $105.0 \pm 1.1 \times 87.7 \pm 2.3$ km, PA $83.6^\circ \pm 2.5^\circ$
Geocentric X -4010.7 ± 0.3 Y 2623.8 ± 0.8 km **N**



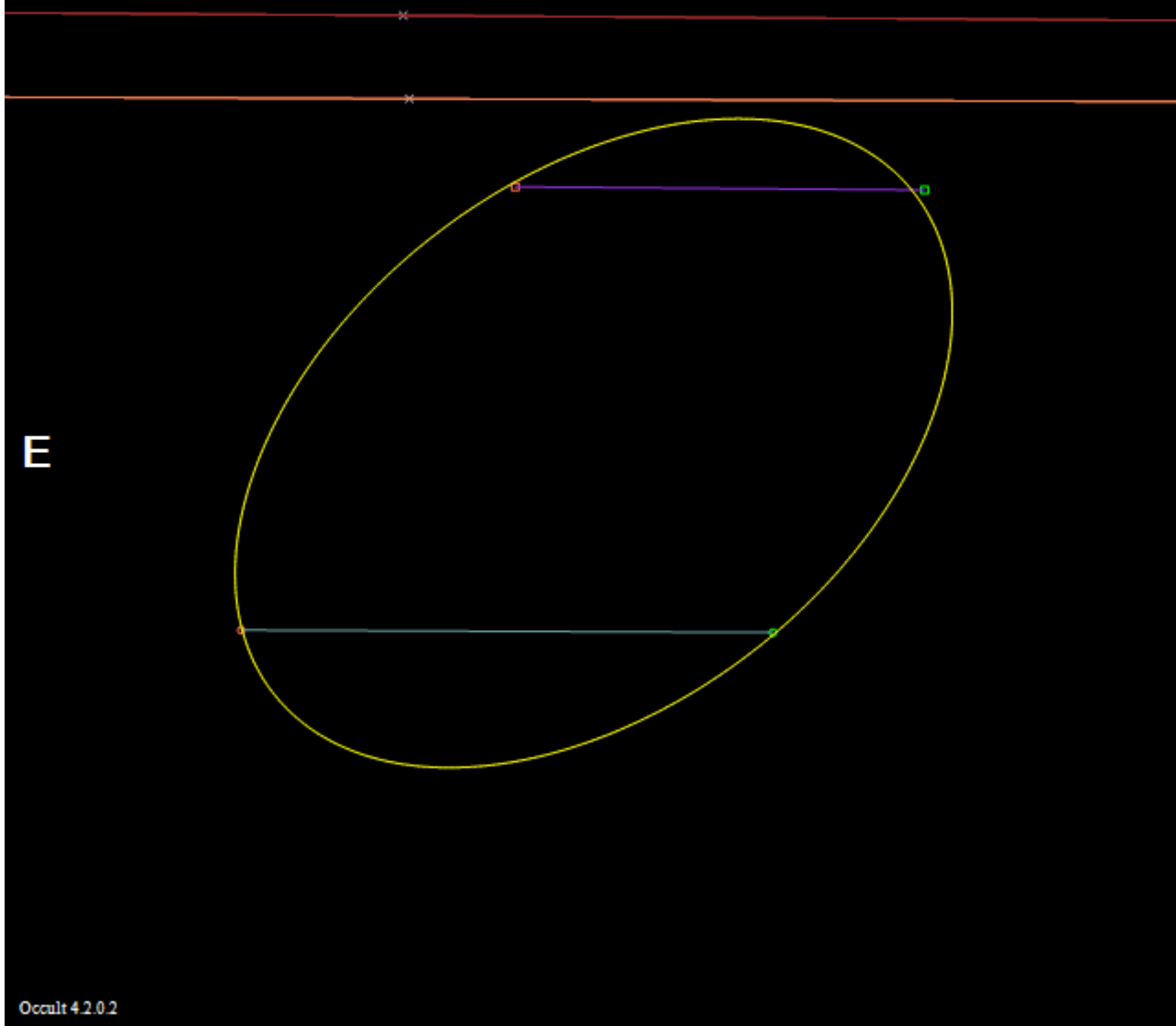
58concordia2015may23

(58) Concordia 2015 May 23 87.0 x 87.0 km, PA 0.0°
Geocentric X 3395.3 ± 0.7 Y 4485.1 ± 1.0 km **N**



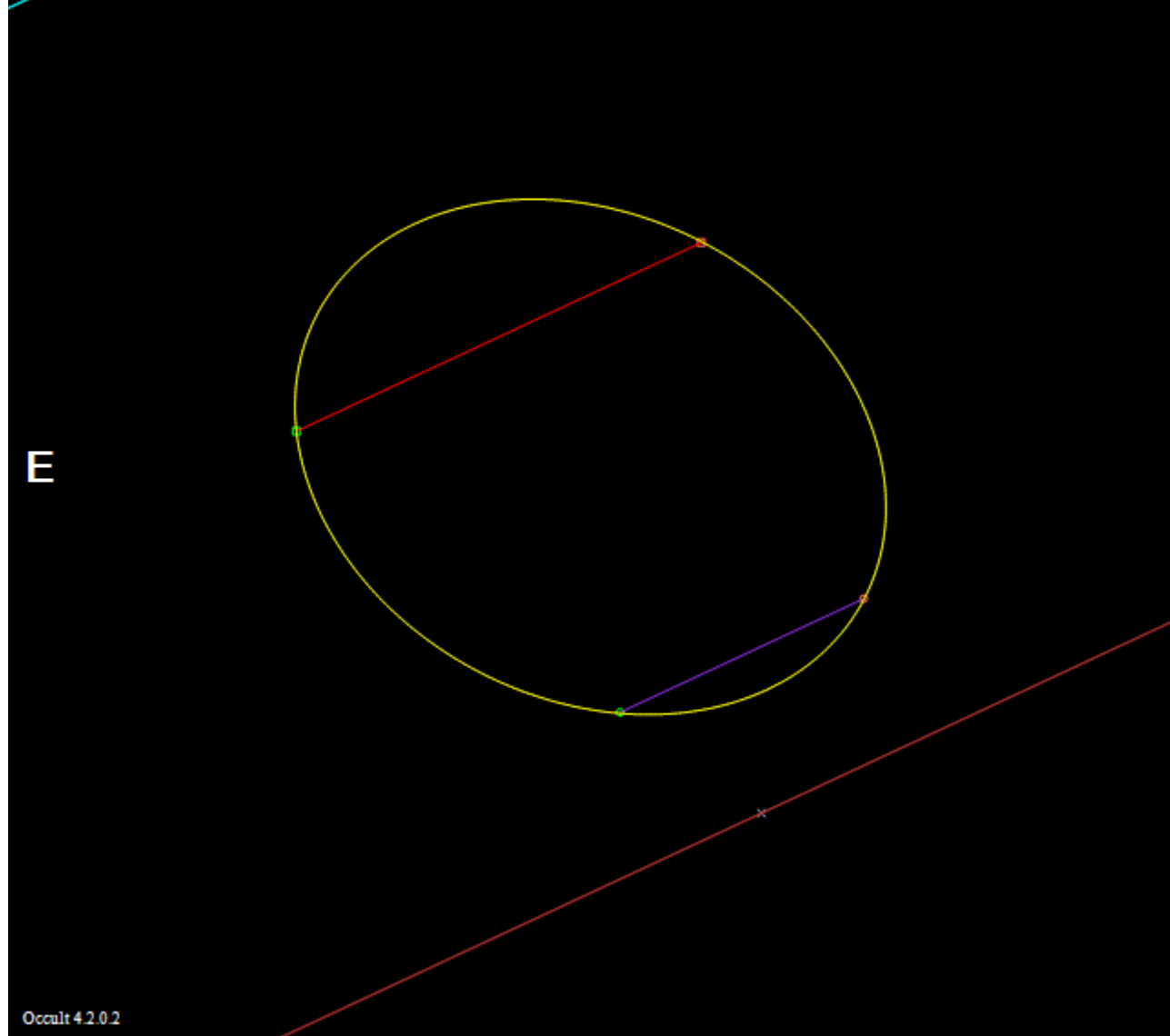
590tomyris2008oct20

(590) Tomyris 2008 Oct 20 45.0 x 29.0 km. PA -52.0° °
Geocentric X -484.1 ±0.2 Y 3588.3 ±0.2 km N



591irmgard2014nov11

(591) Irmgard 2014 Nov 11 56.0 x 44.0 km, PA 62.5° ± 0.3°
Geocentric X -4764.2 ± 0.0 Y 3903.3 ± 0.0 km **N**

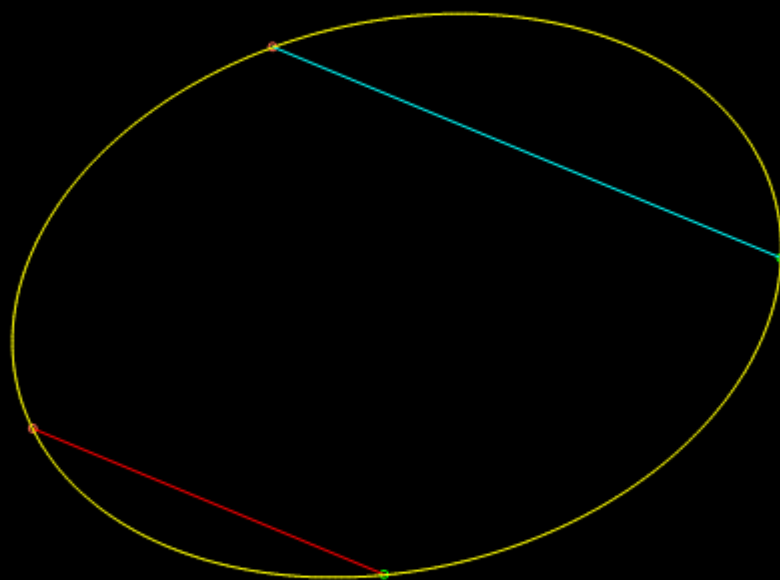


592bathseba2005mar12

(592) Bathseba 2005 Mar 12 46.7 x 32.8 km, PA -76.2° °
Geocentric X 3830.4 Y 2229.5 km

N

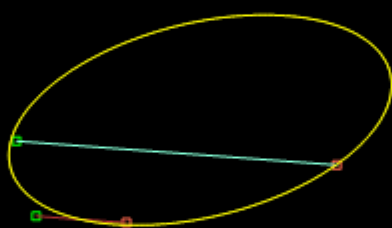
E



593titania2013may15

(593) Titania 2013 May 15 109.0 x 54.0 km, PA -76.1° °
Geocentric X -1307.2 ± 1.1 Y 4050.6 ± 0.8 km **N**

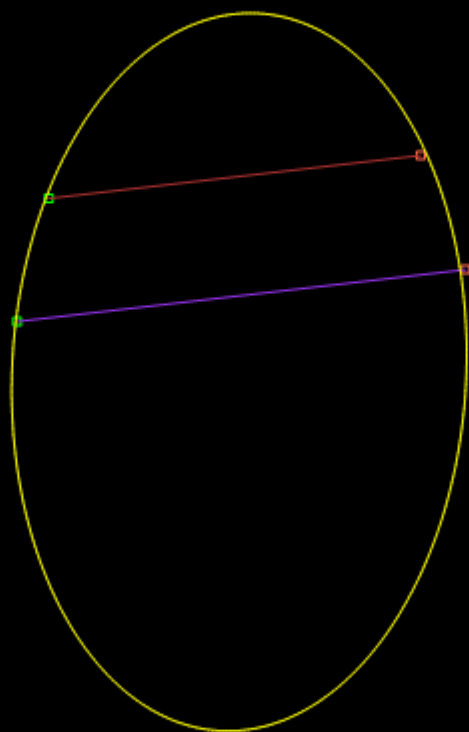
E



595polyxena2008feb03

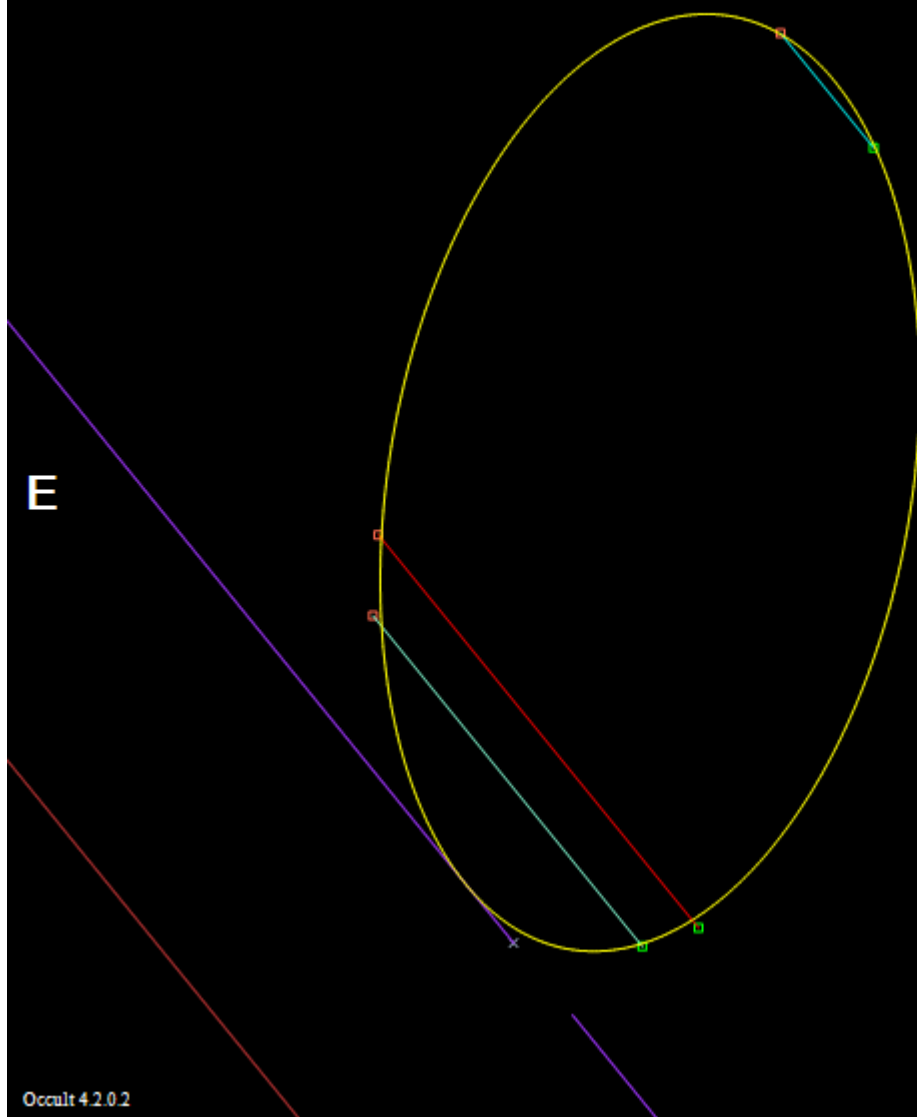
(595) Polyxena 2008 Feb 3 125.0 x 79.0 km. PA -3.0° ± 336.5°
Geocentric X -3877.9 ± 94.7 Y 2075.4 ± 134.1 km

E



595polyxena2010aug28

(595) Polyxena 2010 Aug 28 $134.3 \pm 0.4 \times 74.1 \pm 0.9$ km, PA $-9.9^\circ \pm 0.8^\circ$
Geocentric X 5031.6 ± 0.2 Y -1682.4 ± 0.3 km **N**

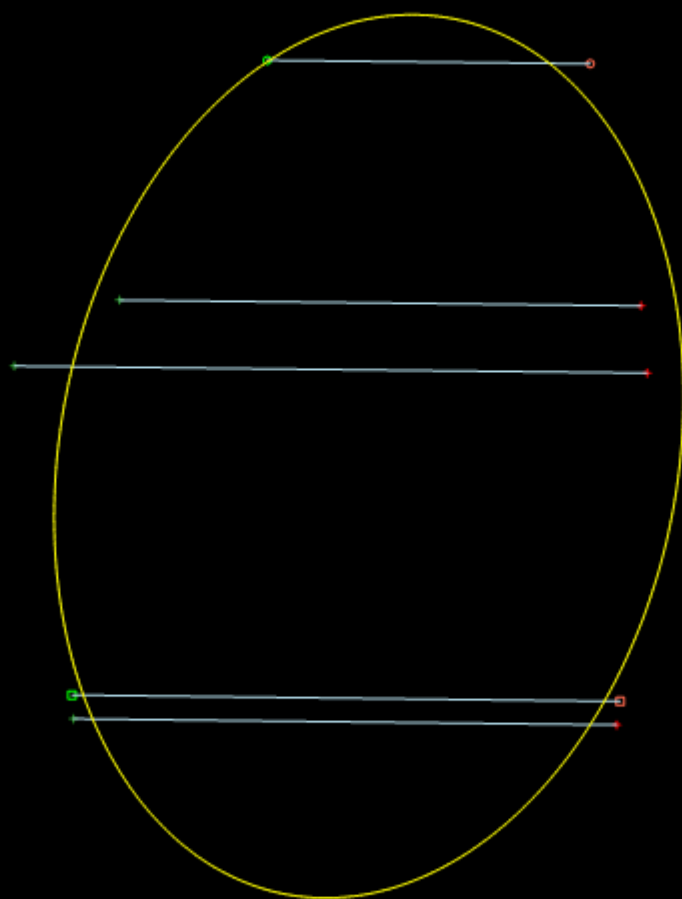


595polyxena2015apr15

(595) Polyxena 2015 Apr 15 124.1 x 86.0 km, PA -10.8°
Geocentric X 1013.1 ± 1.5 Y 5270.6 ± 2.2 km

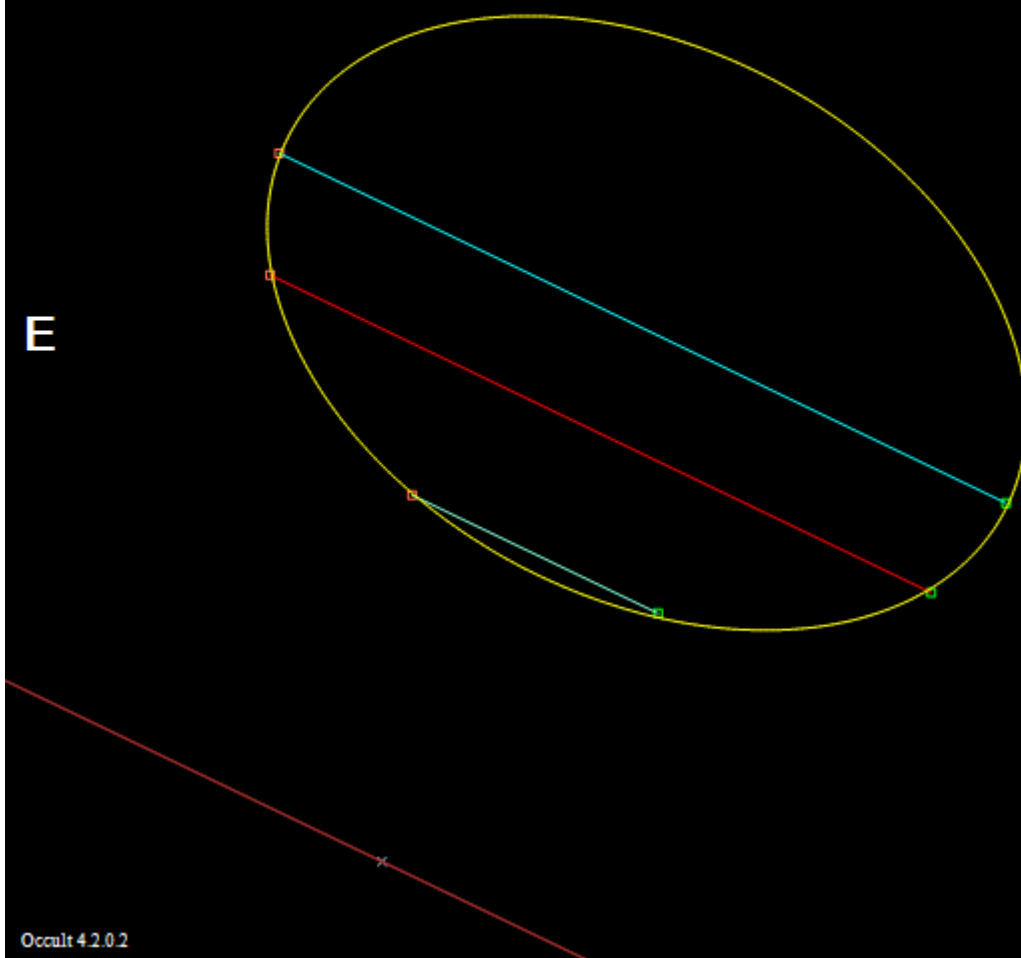
N

E

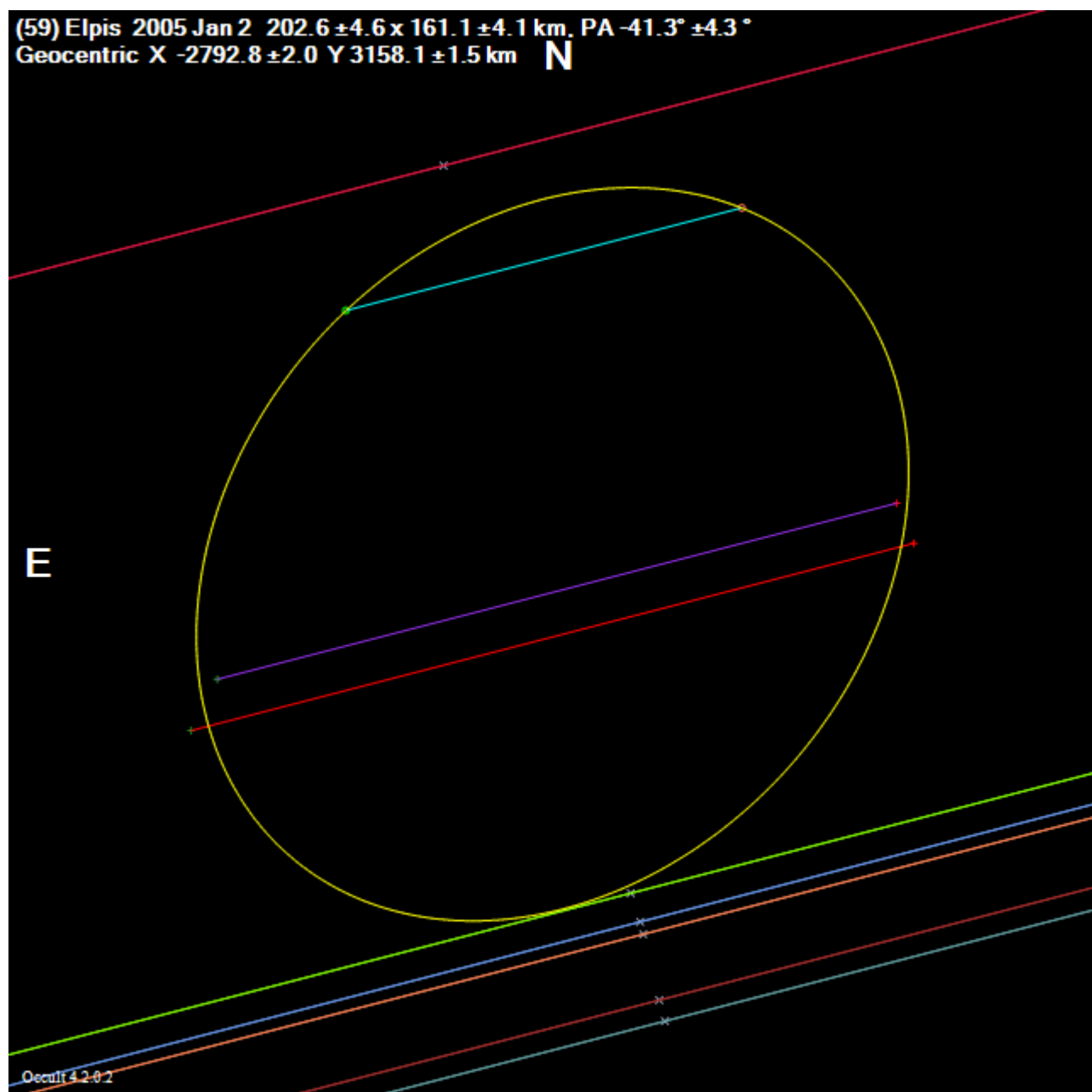


598octavia2010mar09

(598) Octavia 2010 Mar 9 $89.8 \pm 0.3 \times 60.9 \pm 1.1$ km, PA $62.2^\circ \pm 0.7^\circ$
Geocentric X 3970.1 ± 0.2 Y 3496.0 ± 0.5 km **N**



(59) Elpis 2005 Jan 2 202.6 ± 4.6 x 161.1 ± 4.1 km, PA -41.3° ± 4.3°
Geocentric X -2792.8 ± 2.0 Y 3158.1 ± 1.5 km **N**



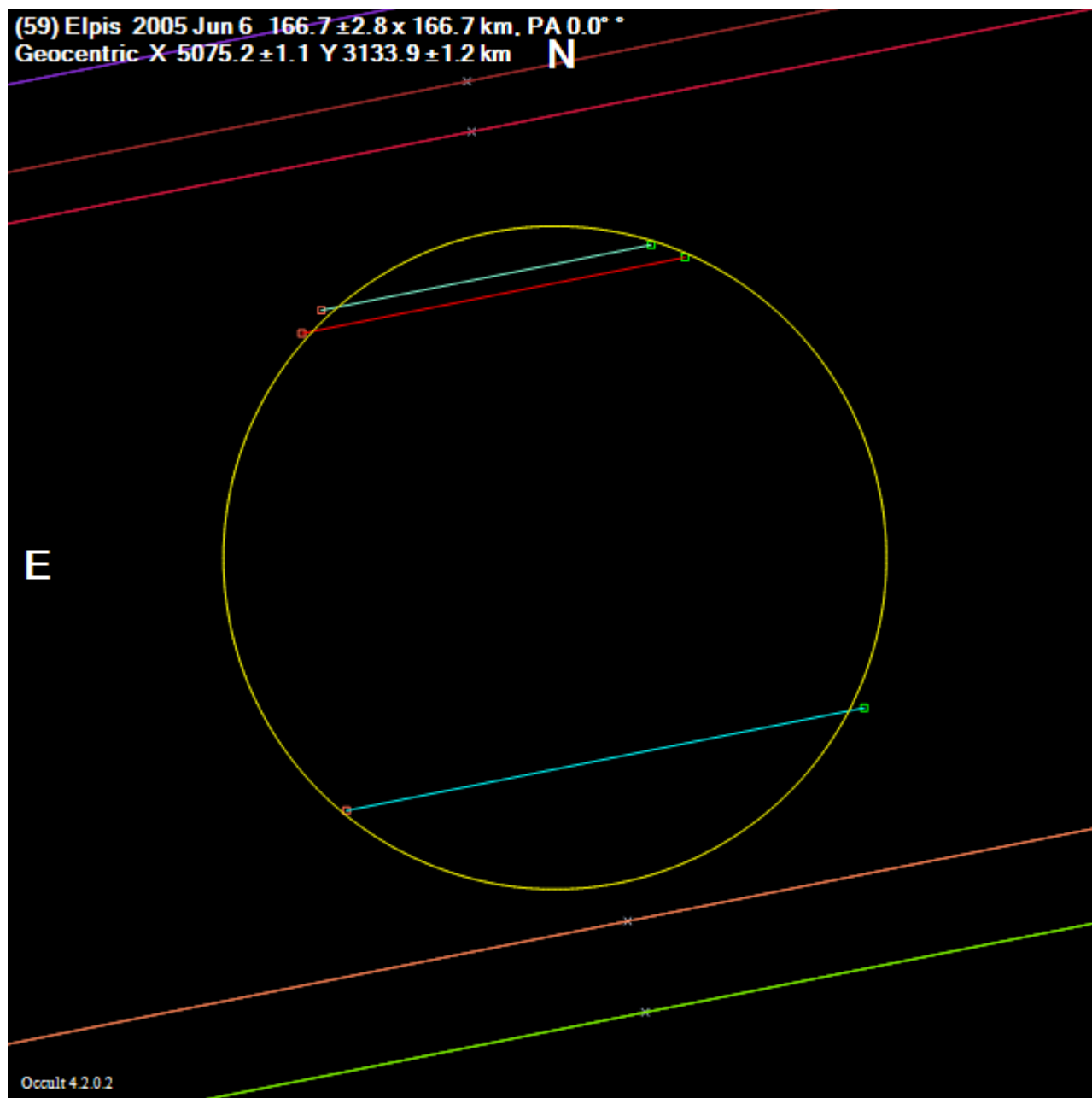
59elpis2005jun06

(59) Elpis 2005 Jun 6 $166.7 \pm 2.8 \times 166.7$ km, PA 0.0°
Geocentric X 5075.2 ± 1.1 Y 3133.9 ± 1.2 km

N

E

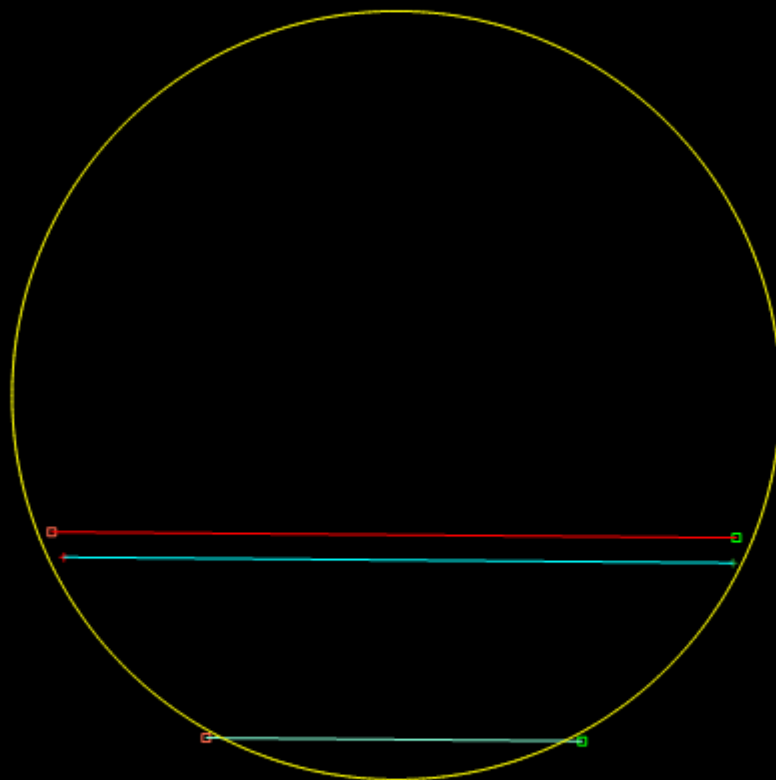
Occult 4.2.0.2



59elpis2014apr24

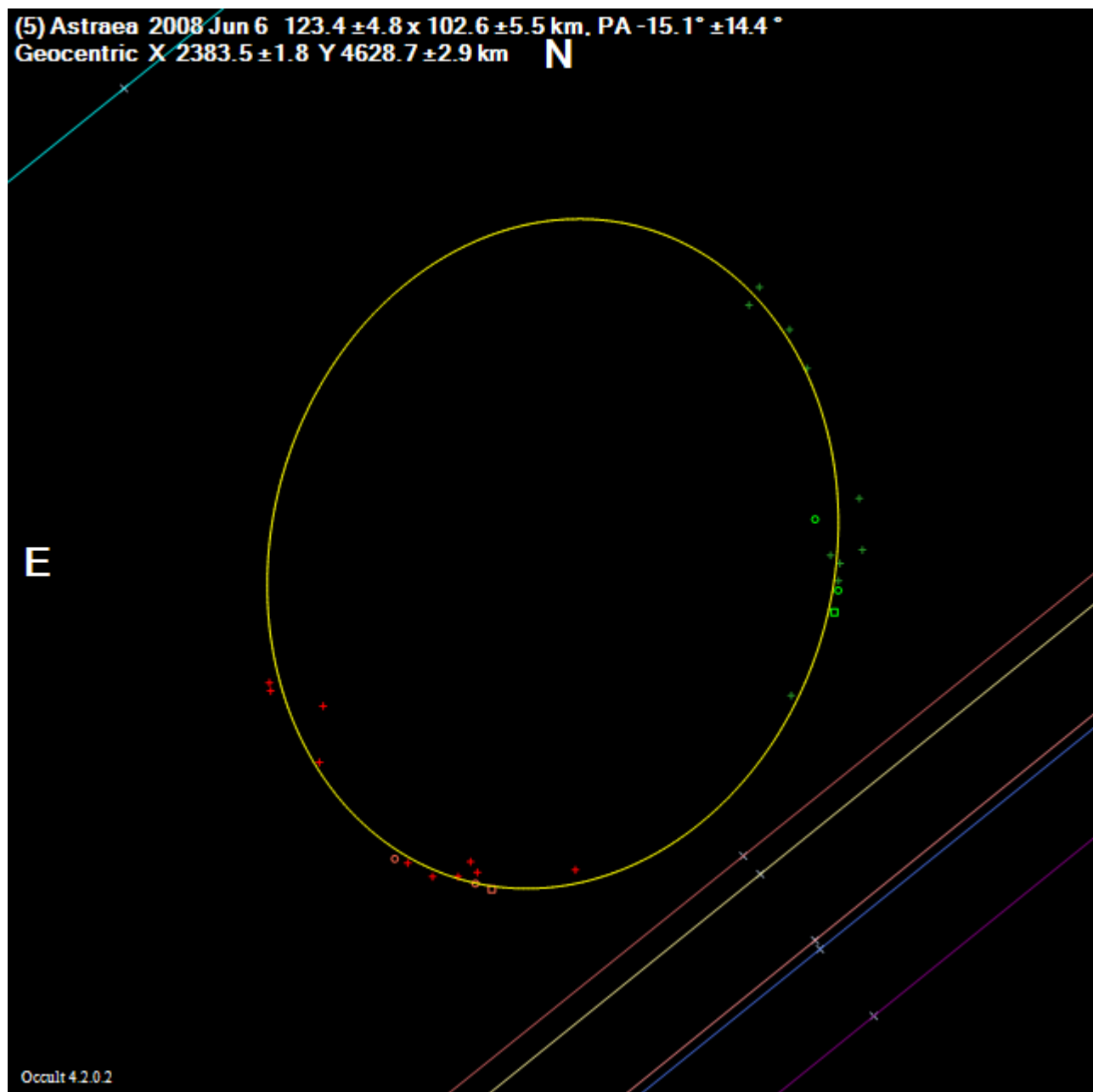
(59) Elpis 2014 Apr 24 202.0 x 202.0 km, PA 0.0° °
Geocentric X 3667.7 ± 1.4 Y -3867.6 ± 1.7 km **N**

E



5astraea2008jun06

(5) Astraea 2008 Jun 6 $123.4 \pm 4.8 \times 102.6 \pm 5.5$ km. PA $-15.1^\circ \pm 14.4^\circ$
Geocentric X 2383.5 ± 1.8 Y 4628.7 ± 2.9 km **N**

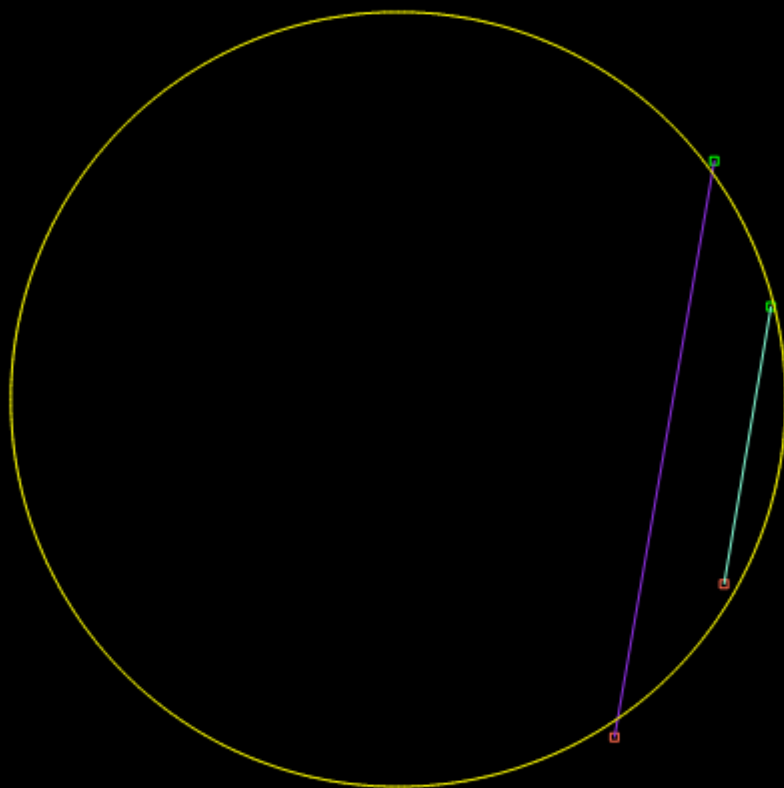


602marianna2007dec18

(602) Marianna 2007 Dec 18 125.0 x 125.0 km, PA 0.0° °
Geocentric X 2014.8 ± 1.0 Y -194.5 ± 1.4 km N

E

Occult 4.2.0.2

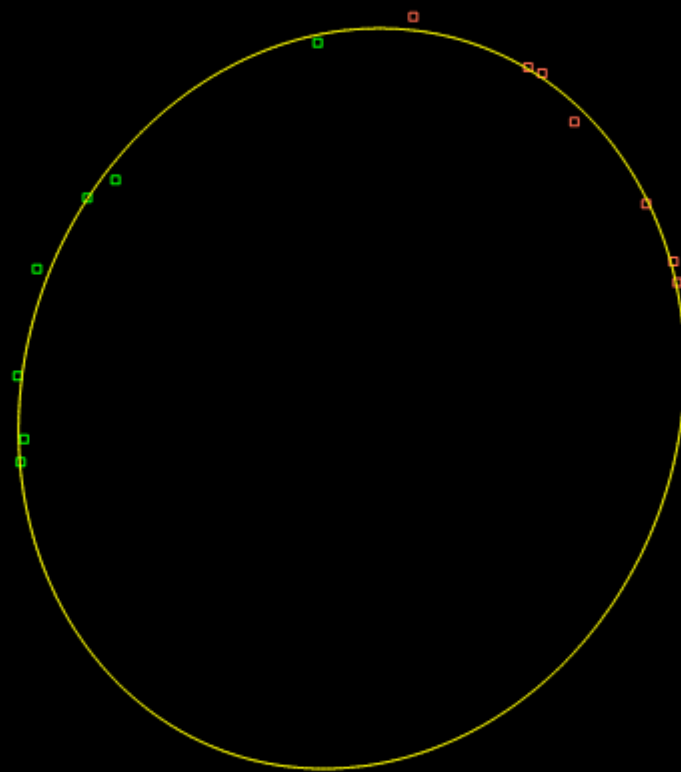


602marianna2013dec12

(602) Marianna 2013 Dec 12 $125.9 \pm 8.6 \times 110.0 \pm 4.0$ km, PA $-19.3^\circ \pm 14.7^\circ$
Geocentric X 2069.1 ± 1.0 Y 251.6 ± 4.7 km

N

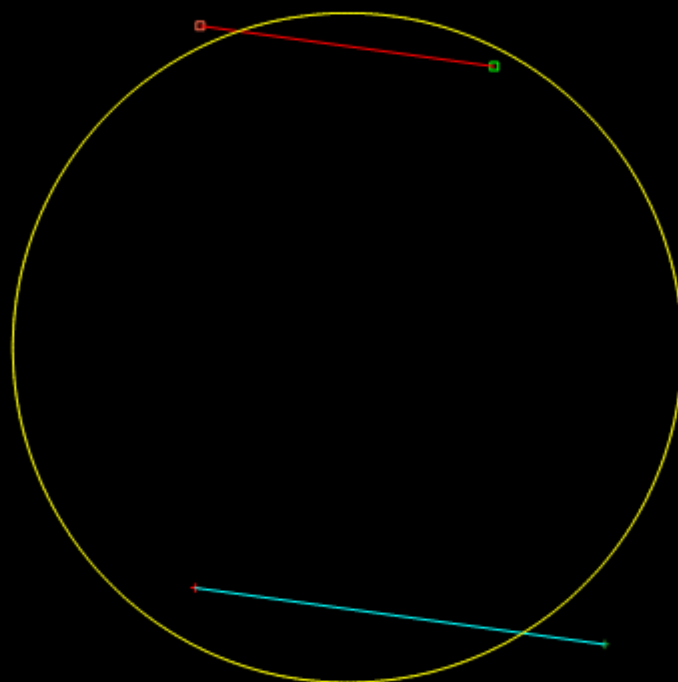
E



607jenny2007dec14

(607) Jenny 2007 Dec 14 $57.6 \pm 6.2 \times 57.6$ km, PA 0.0° °
Geocentric X 724.1 ± 3.7 Y 3117.4 ± 2.8 km **N**

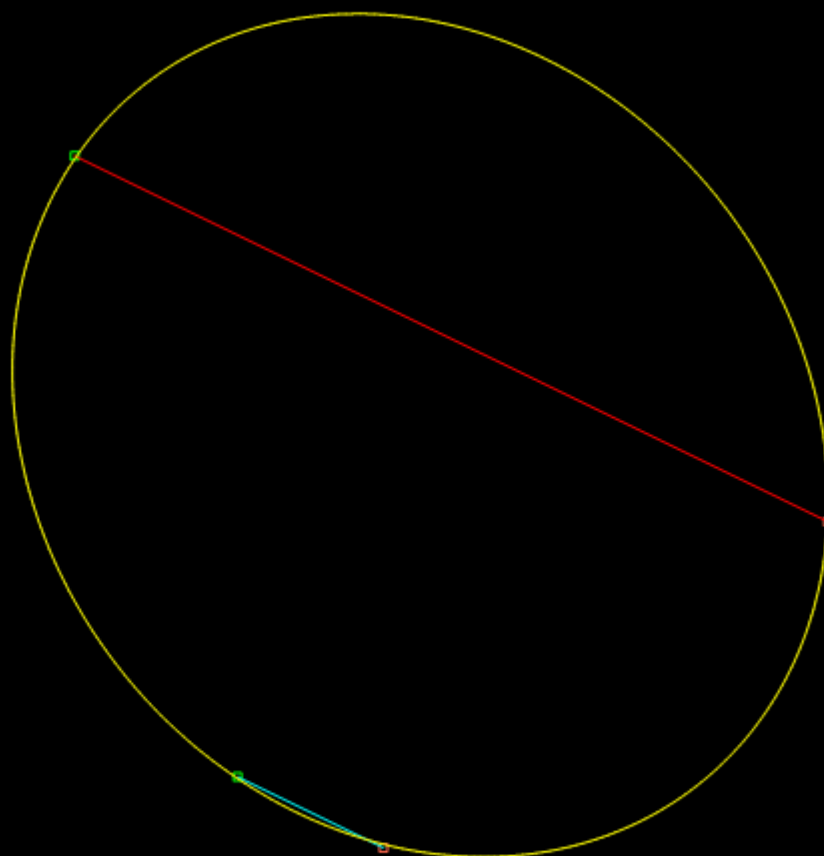
E



609fulvia2014sep03

(609) Fulvia 2014 Sep 3 60.4 x 51.5 km, PA $39.0^\circ \pm 1.9^\circ$
Geocentric X 275.9 ± 0.1 Y -1771.5 ± 0.1 km **N**

E

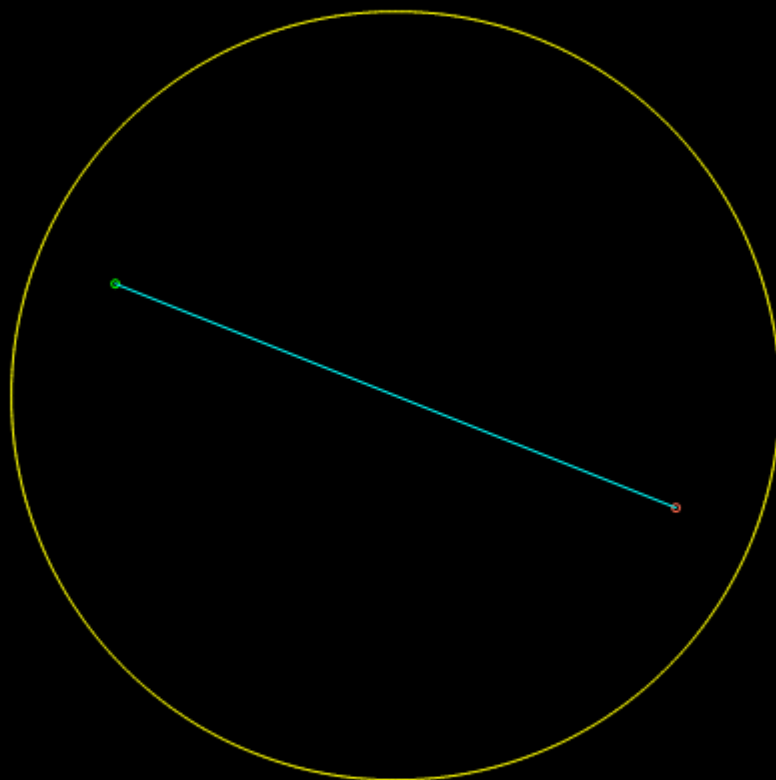


60echo2004aug28

(60) Echo 2004 Aug 28 60.0 x 60.0 km, PA 0.0° °
Geocentric X 1225.4 Y -1423.5 km

N

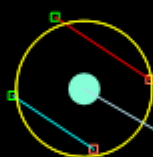
E



611valeria2013aug15

(611) Valeria 2013 Aug 15 58.0 x 58.0 km, PA 0.0° °
Geocentric X -127.6 ± 1.8 Y -2824.5 ± 1.9 km **N**
Double : Sep 0.3800", PA 240.0°

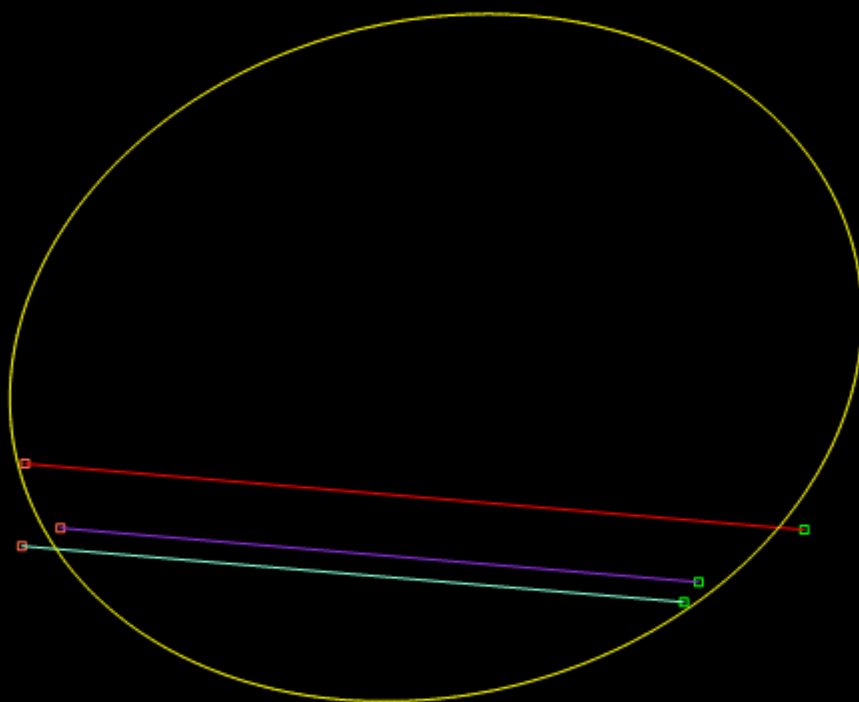
E



611valeria2014jul27

(611) Valeria 2014 Jul 27 64.0 x 50.0 km, PA -75.5° ± 9.4°
Geocentric X -628.0 ± 0.8 Y 2607.4 ± 0.7 km **N**

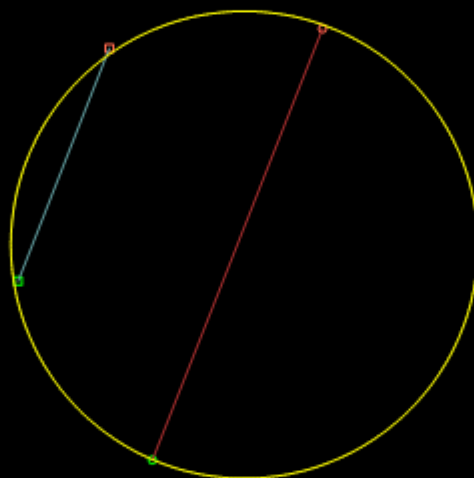
E



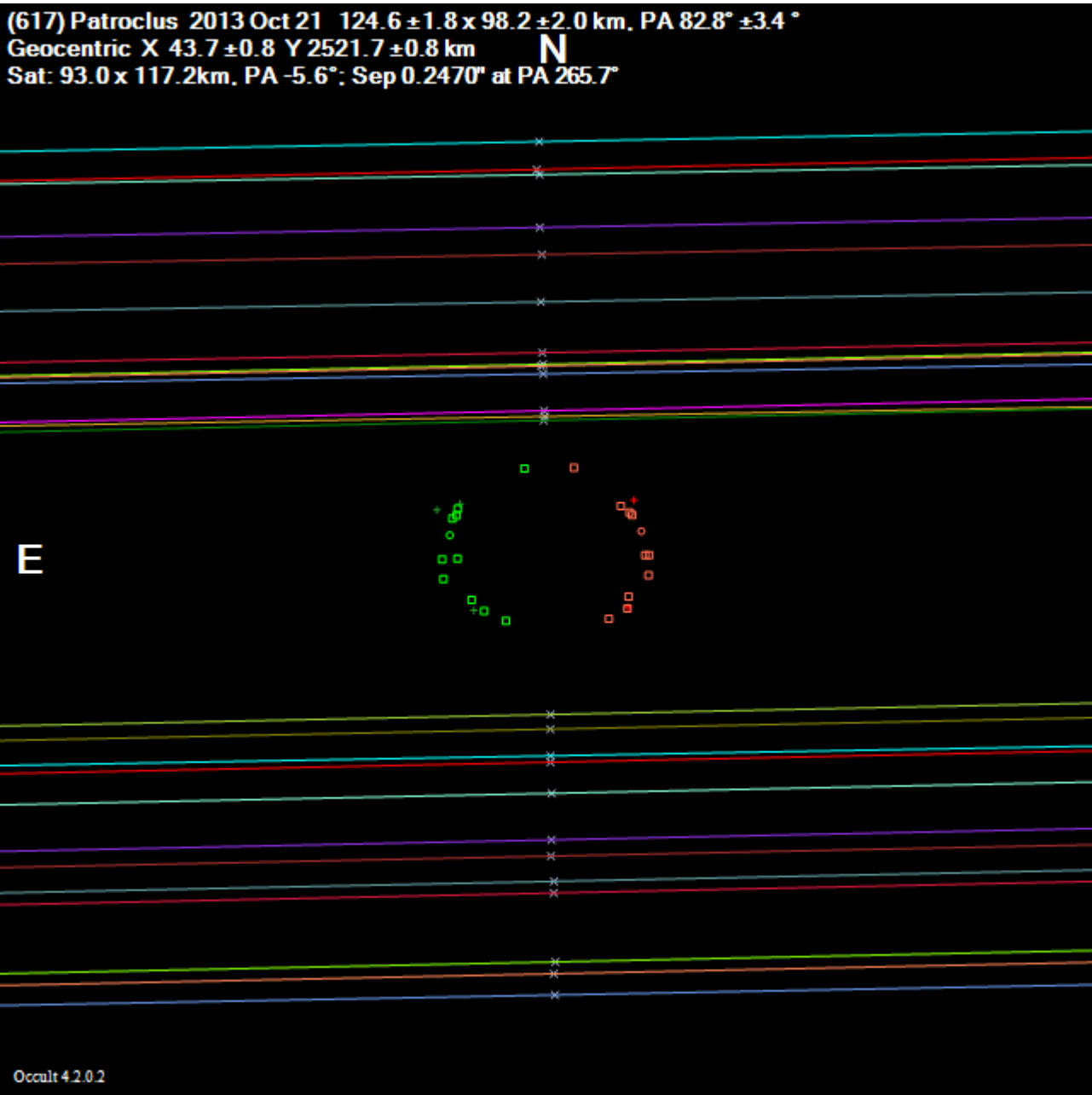
613ginevra2011sep27

(613) Ginevra 2011 Sep 27 $73.4 \pm 0.9 \times 73.4$ km. PA 0.0° °
Geocentric X -1749.5 ± 0.5 Y 569.4 ± 0.4 km **N**

E

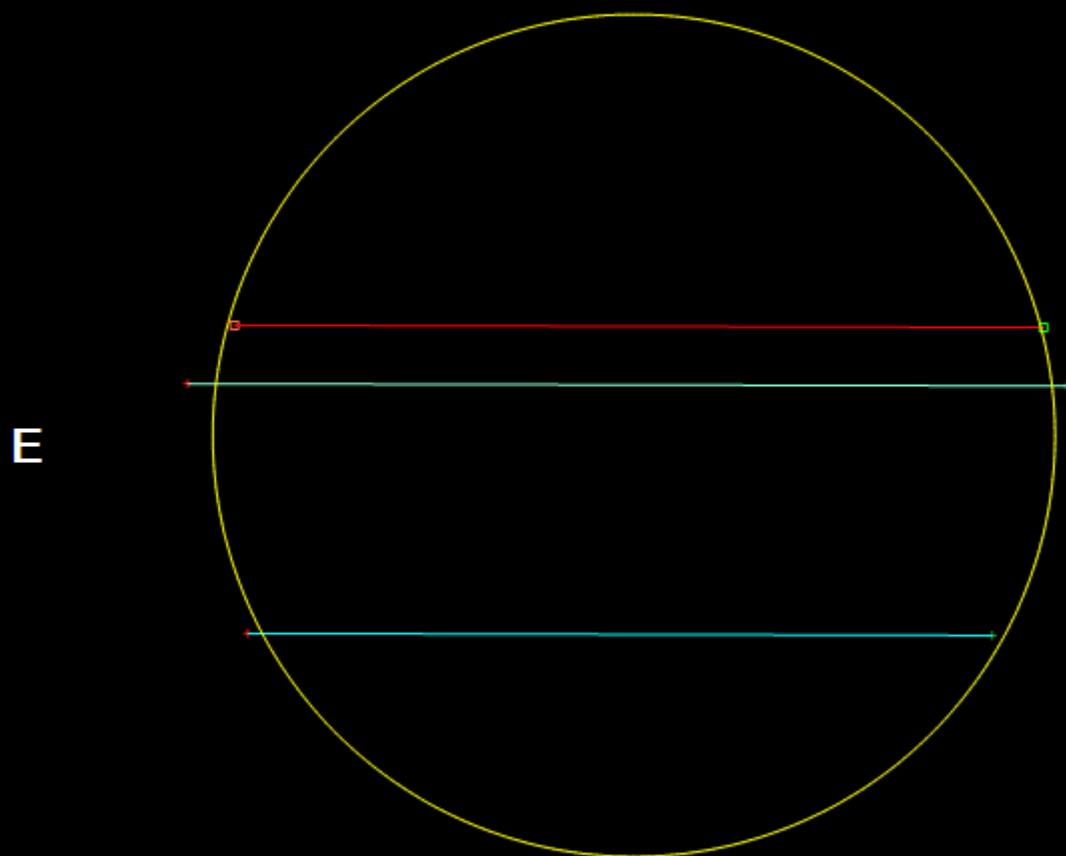


617patroclus2013oct21



618elfriede2008may26

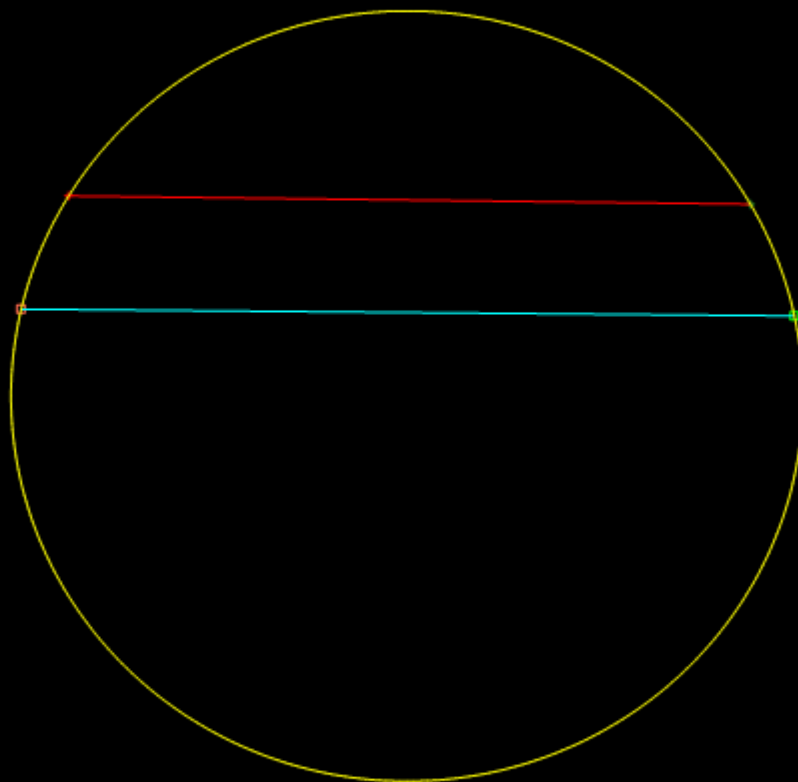
(618) Elfriede 2008 May 26 $131.5 \pm 16.1 \times 131.5$ km, PA 0.0° °
Geocentric X -5424.2 ± 0.9 Y -2314.0 ± 3.0 km **N**



618elfriede2013apr13

(618) Elfriede 2013 Apr 13 $135.0 \pm 1.1 \times 131.3 \pm 10.3$ km, PA 90.0° °
Geocentric X -4321.3 ± 0.0 Y -2781.1 ± 3.4 km **N**

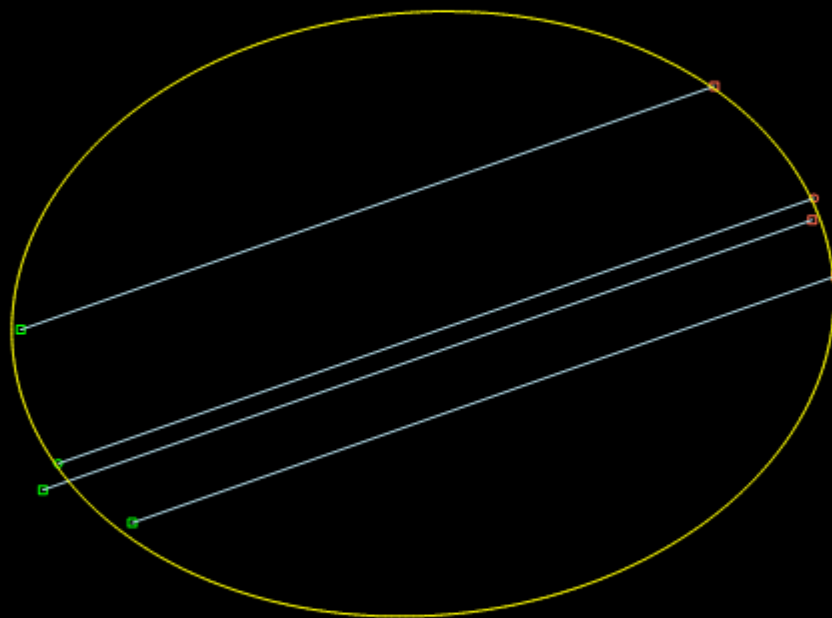
E



618elfriede2015dec30

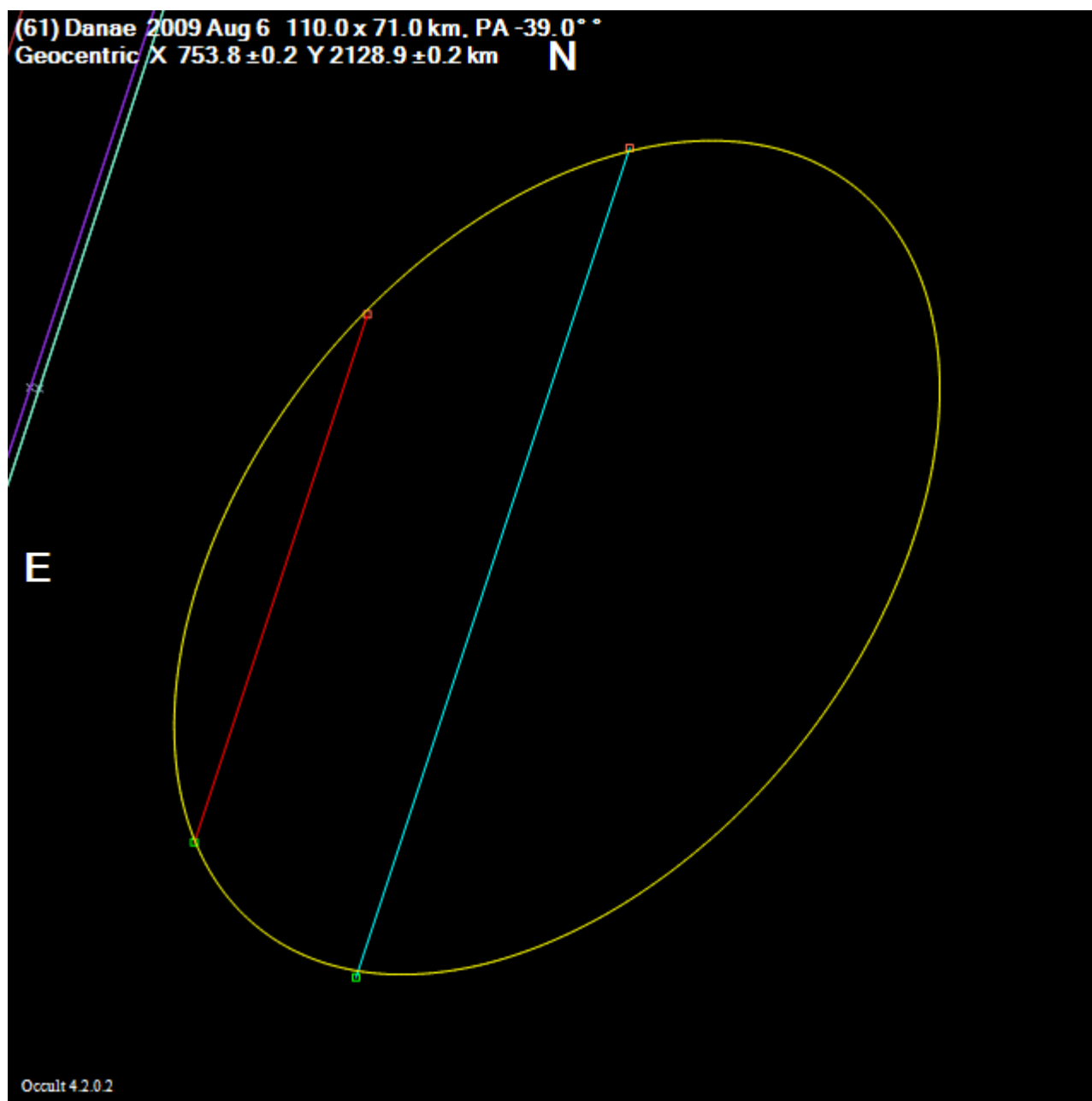
(618) Elfriede 2015 Dec 30 140.4 x 102.8 km, PA 95.0°
Geocentric X -1235.6 ± 1.2 Y 2835.5 ± 1.8 km **N**

E



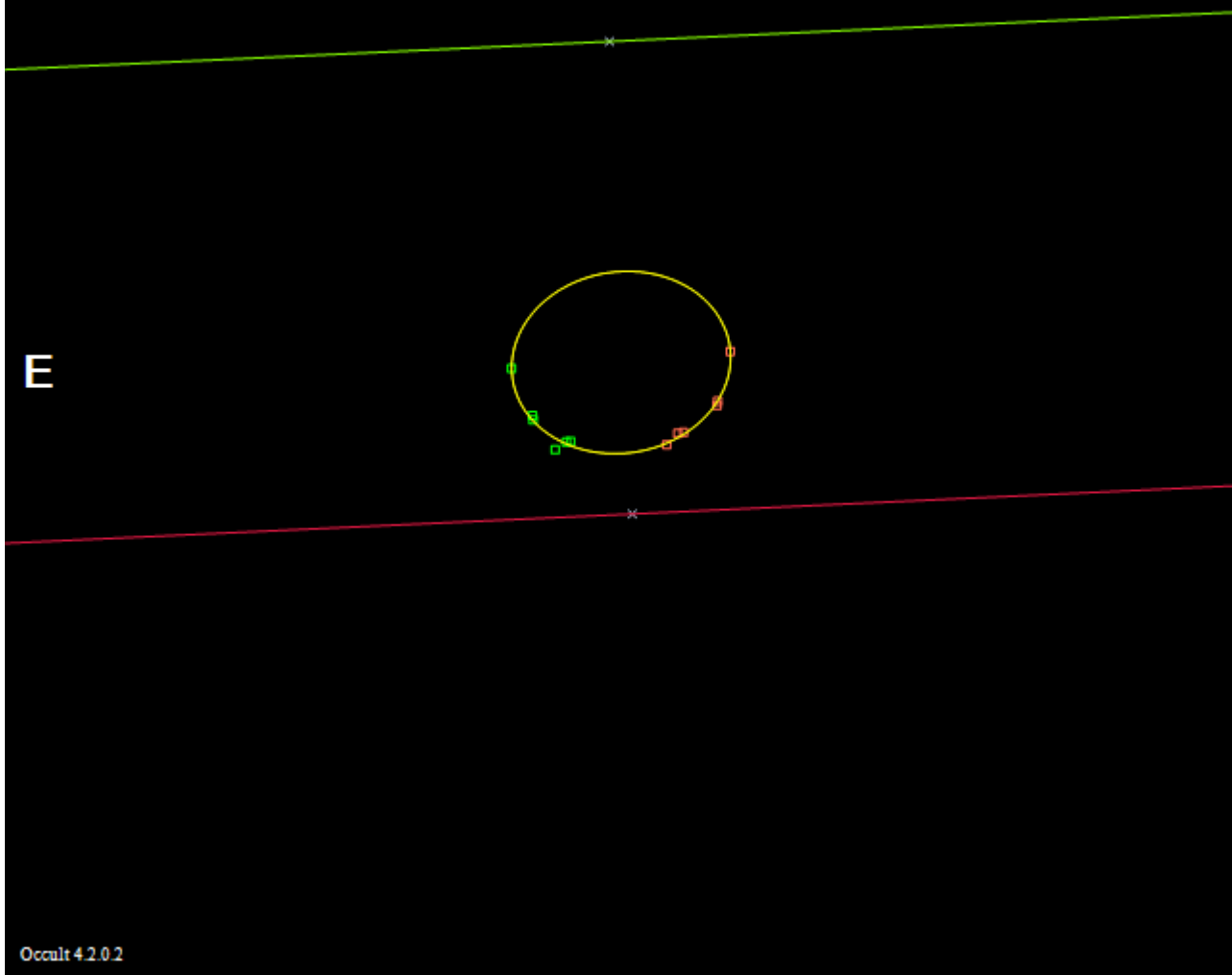
61danae2009aug06

(61) Danae 2009 Aug 6 110.0 x 71.0 km, PA -39.0° °
Geocentric X 753.8 ± 0.2 Y 2128.9 ± 0.2 km N



61danae2010oct18

(61) Danae 2010 Oct 18 $94.0 \pm 2.0 \times 77.6 \pm 8.3$ km, PA -81.4°
Geocentric X 4971.8 ± 0.8 Y 1744.2 ± 3.5 km **N**

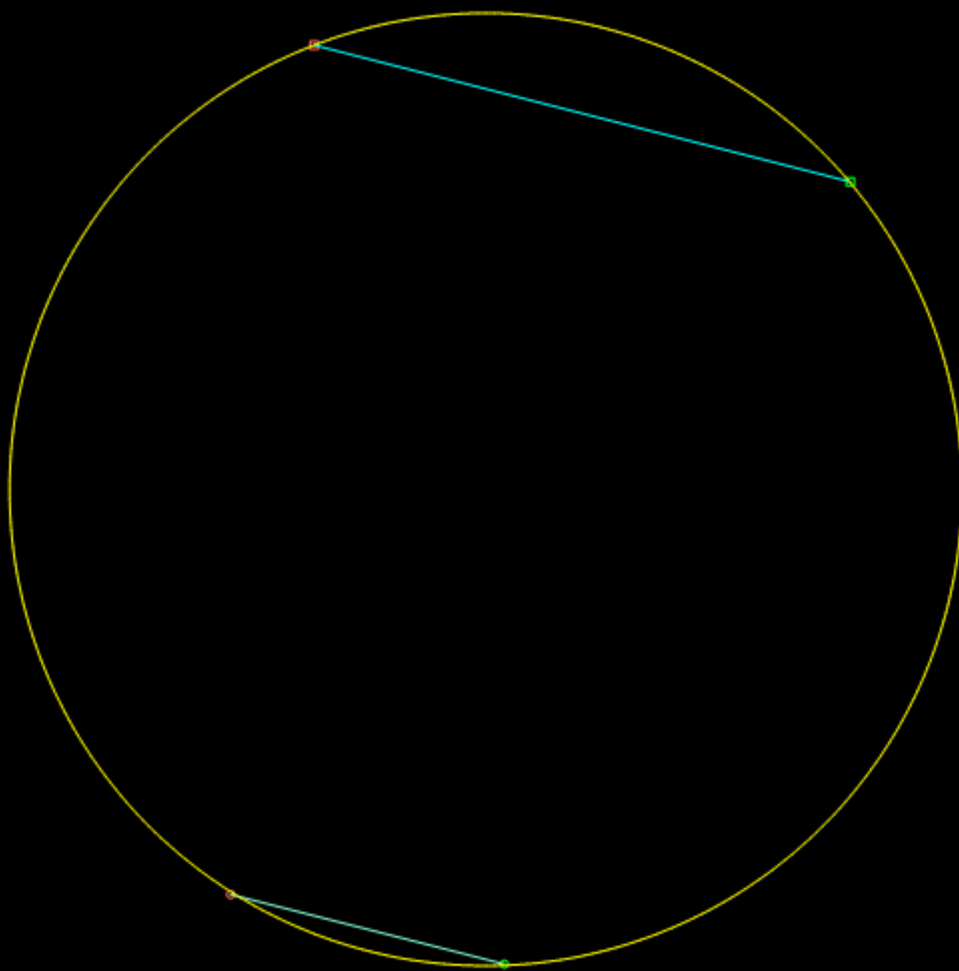


626notburga2013oct17

(626) Notburga 2013 Oct 17 $94.2 \pm 0.2 \times 94.2$ km, PA 0.0° °
Geocentric X -1379.8 ± 0.1 Y -396.4 ± 0.1 km **N**

E

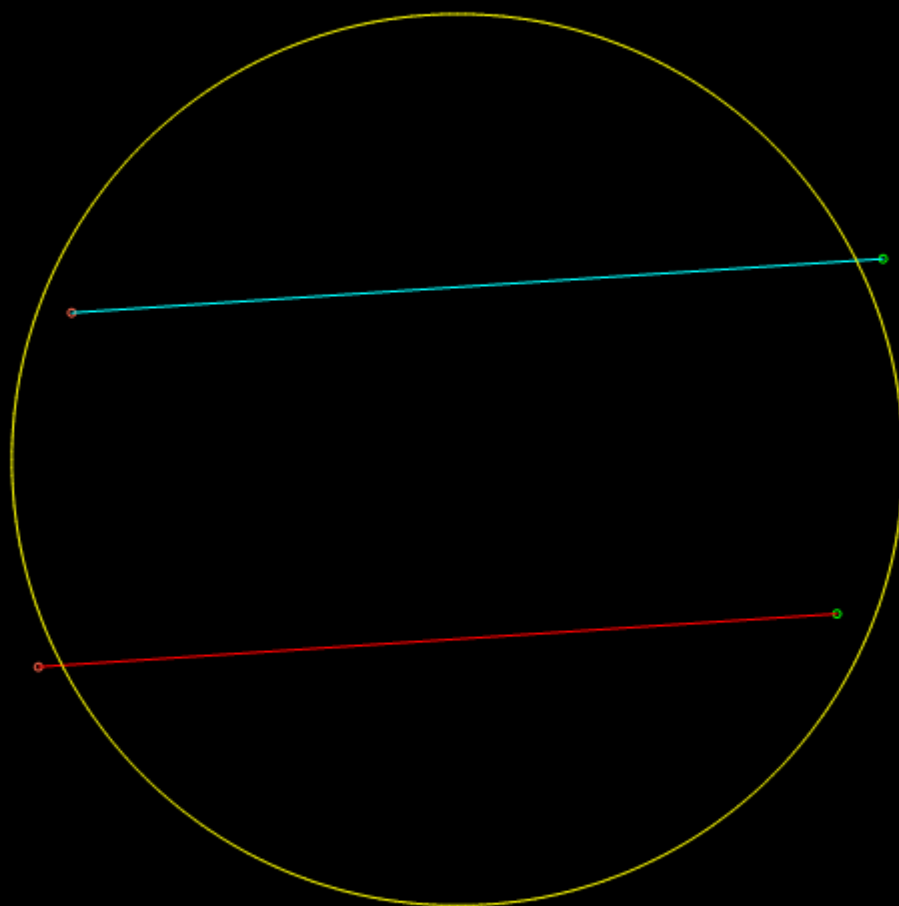
Occult 4.2.0.2



628christine2005sep29

(628) Christine 2005 Sep 29 $58.0 \pm 5.8 \times 58.0$ km. PA 0.0° °
Geocentric X -4130.8 ± 0.5 Y 3967.5 ± 1.2 km **N**

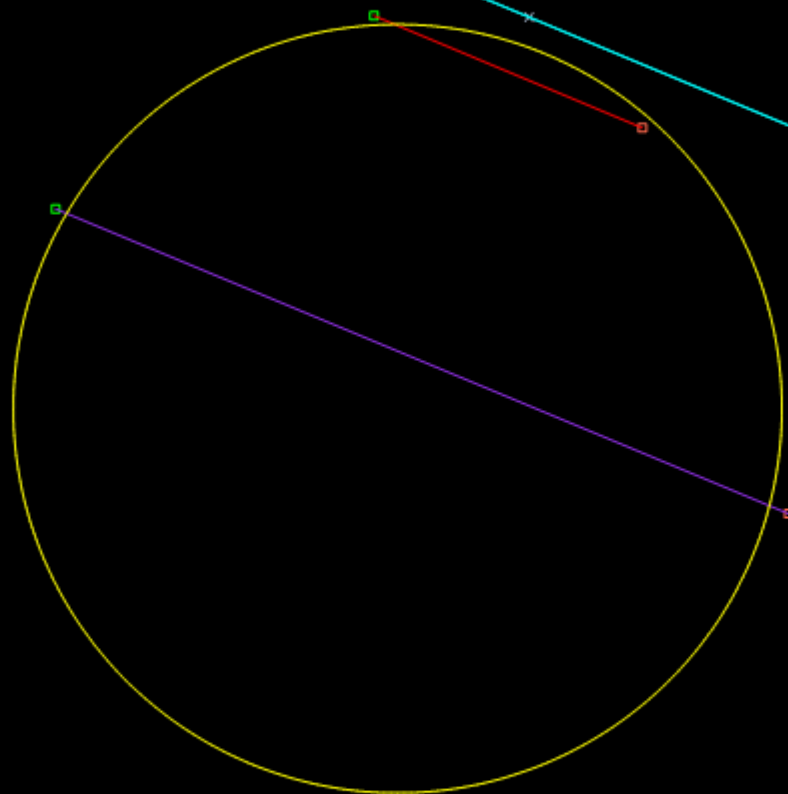
E



62erato2014jul15

(62) Erato 2014 Jul 15 78.0 x 78.0 km, PA 0.0° °
Geocentric X -514.6 ± 0.8 Y 4512.5 ± 0.9 km N

E

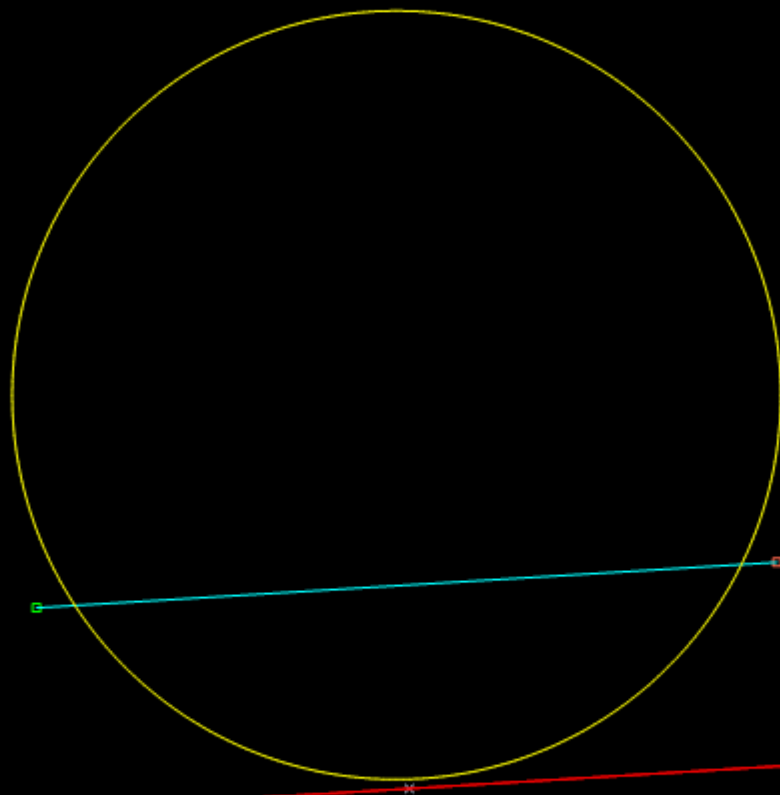


636erika2009oct13

(636) Erika 2009 Oct 13 74.0 x 74.0 km, PA 0.0° °
Geocentric X 1816.3 Y 2614.1 km

N

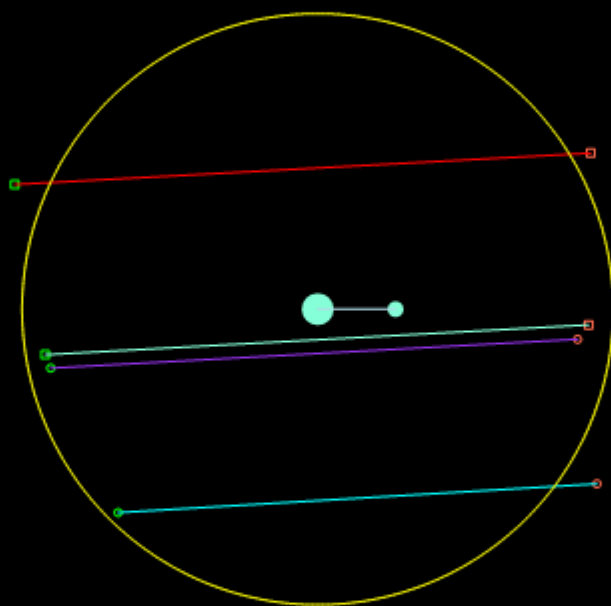
E



638moira2002may10

(638) Moira 2002 May 10 $50.0 \pm 7.5 \times 50.0$ km, PA 0.0° °
Geocentric X 2363.2 ± 0.8 Y 4386.5 ± 2.2 km **N**
Double : Sep $0.0070''$, PA 270.0°

E

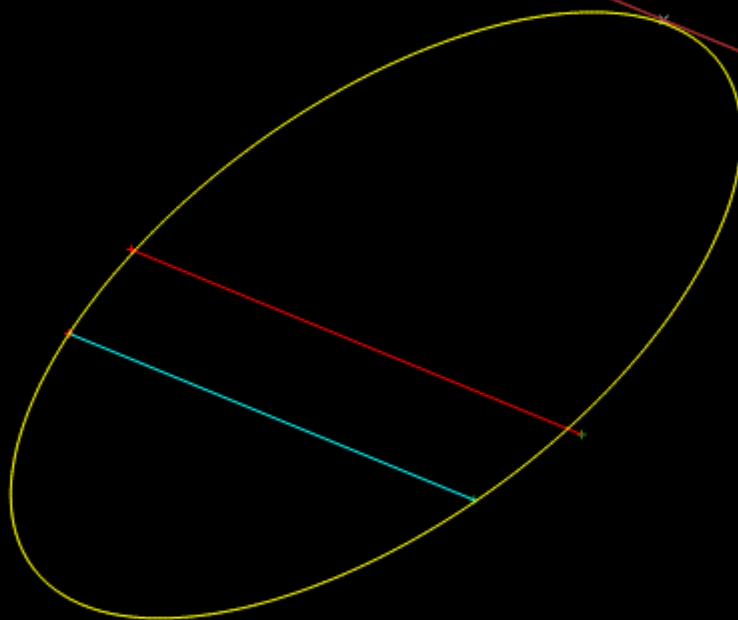


63ausonia1999dec10

(63) Ausonia 1999 Dec 10 114.2 x 56.1 km, PA -53.8° °
Geocentric X 2330.5 Y 4392.3 km

N

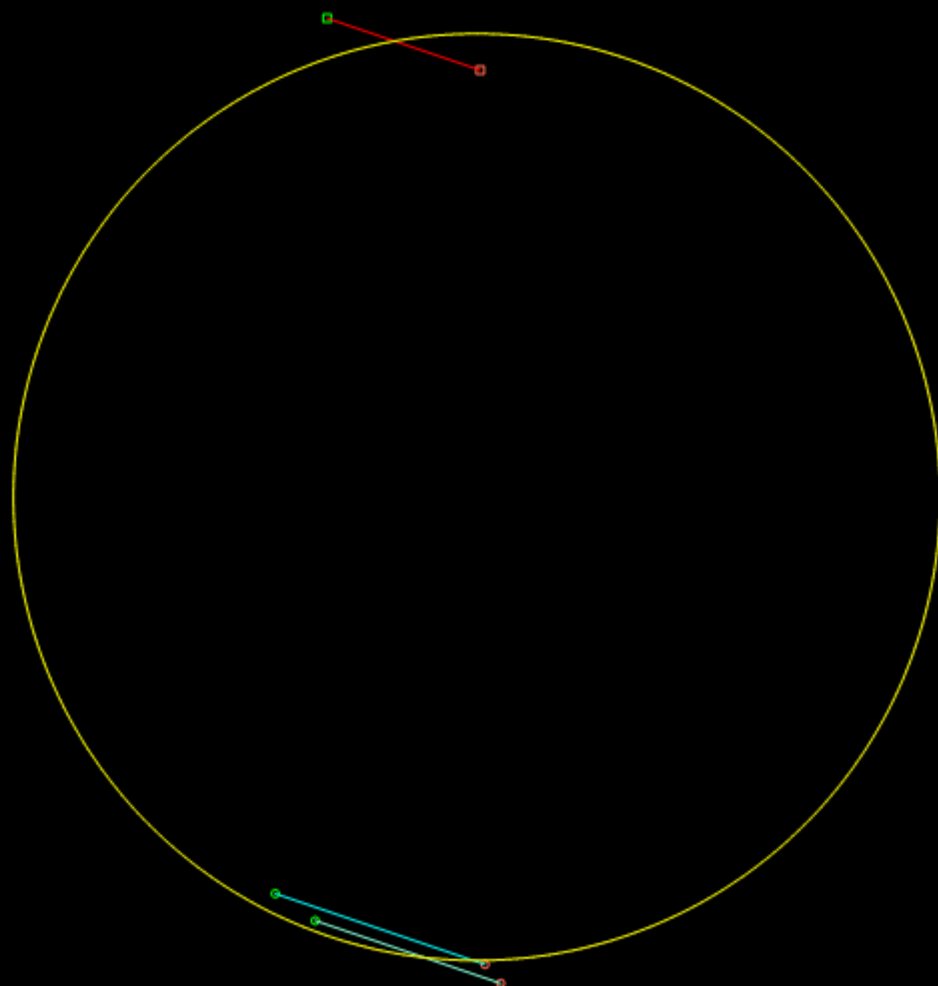
E



63ausonia2000dec22

(63) Ausonia 2000 Dec 22 $124.2 \pm 3.7 \times 124.2$ km, PA 0.0° °
Geocentric X 4053.9 ± 6.4 Y 1543.9 ± 1.5 km **N**

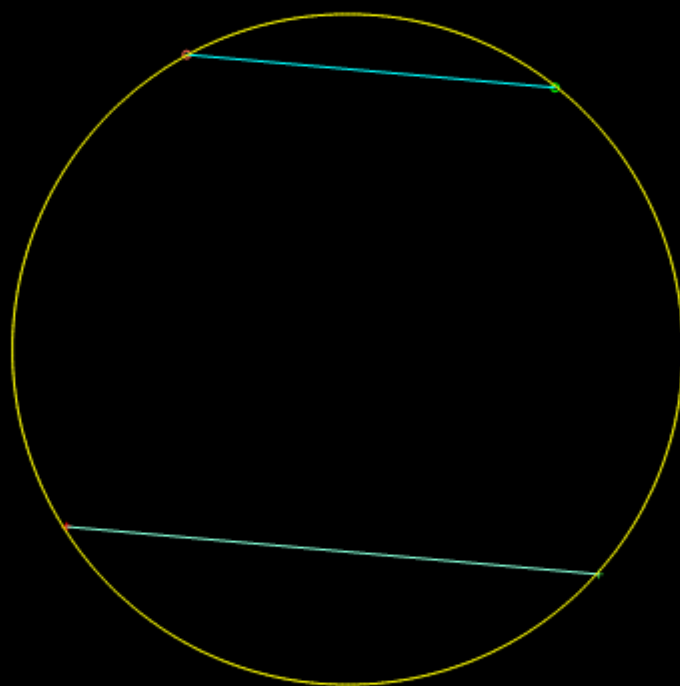
E



63ausonia2012mar21

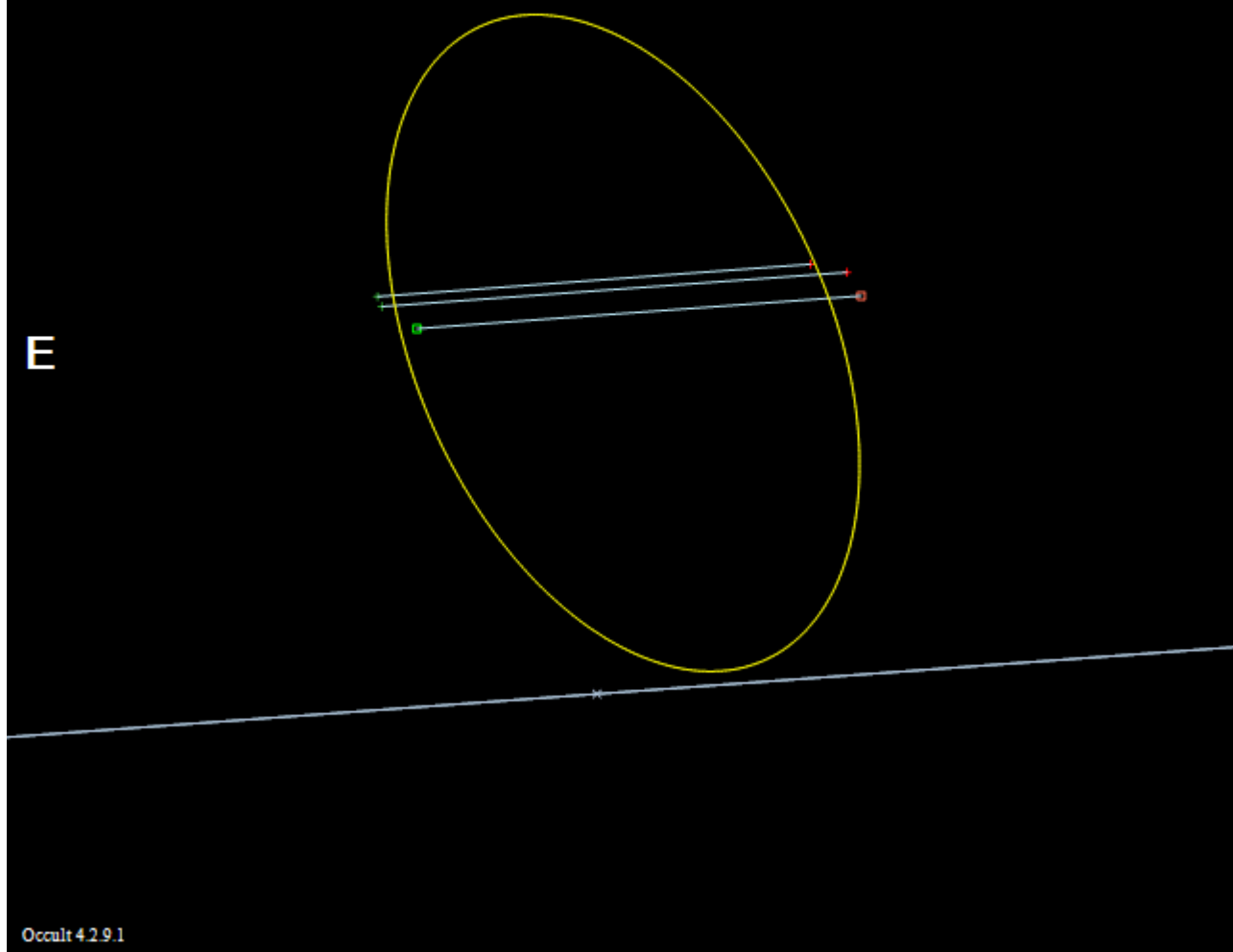
(63) Ausonia 2012 Mar 21 $94.4 \pm 0.7 \times 94.4$ km, PA 0.0° °
Geocentric X 3664.5 ± 0.2 Y 1751.2 ± 0.3 km **N**

E



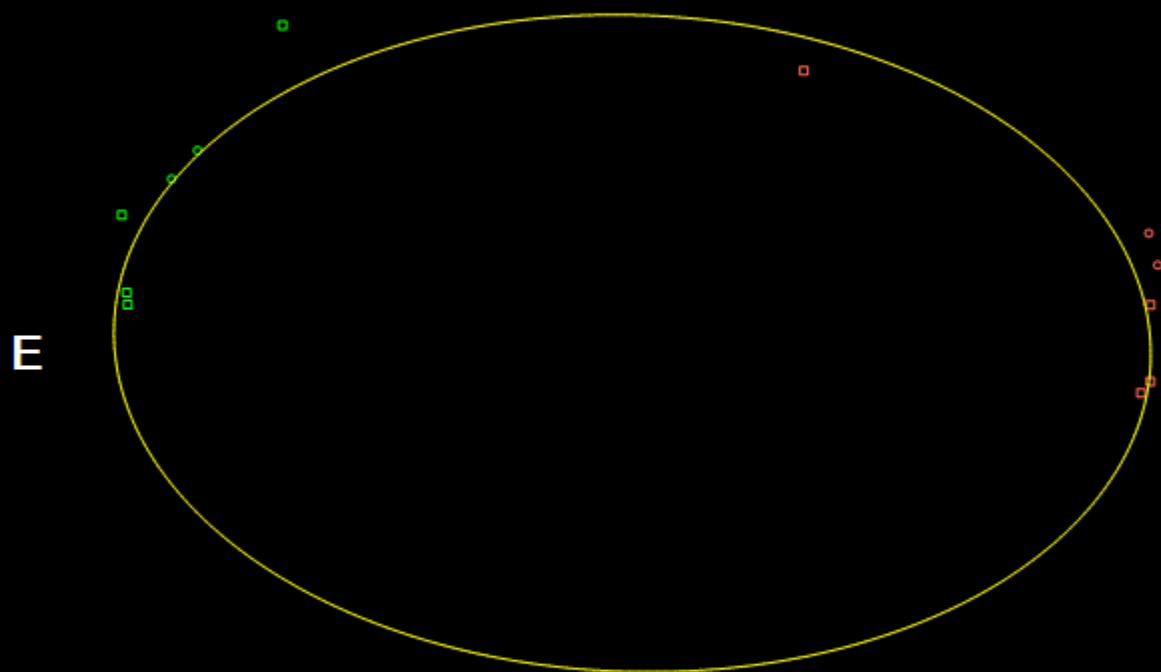
63ausonia2015dec06

(63) Ausonia 2015 Dec 6 97.0 x 58.0 km, PA 24.0°
Geocentric X -76.7 ± 4.9 Y 2961.5 ± 18.0 km **N**



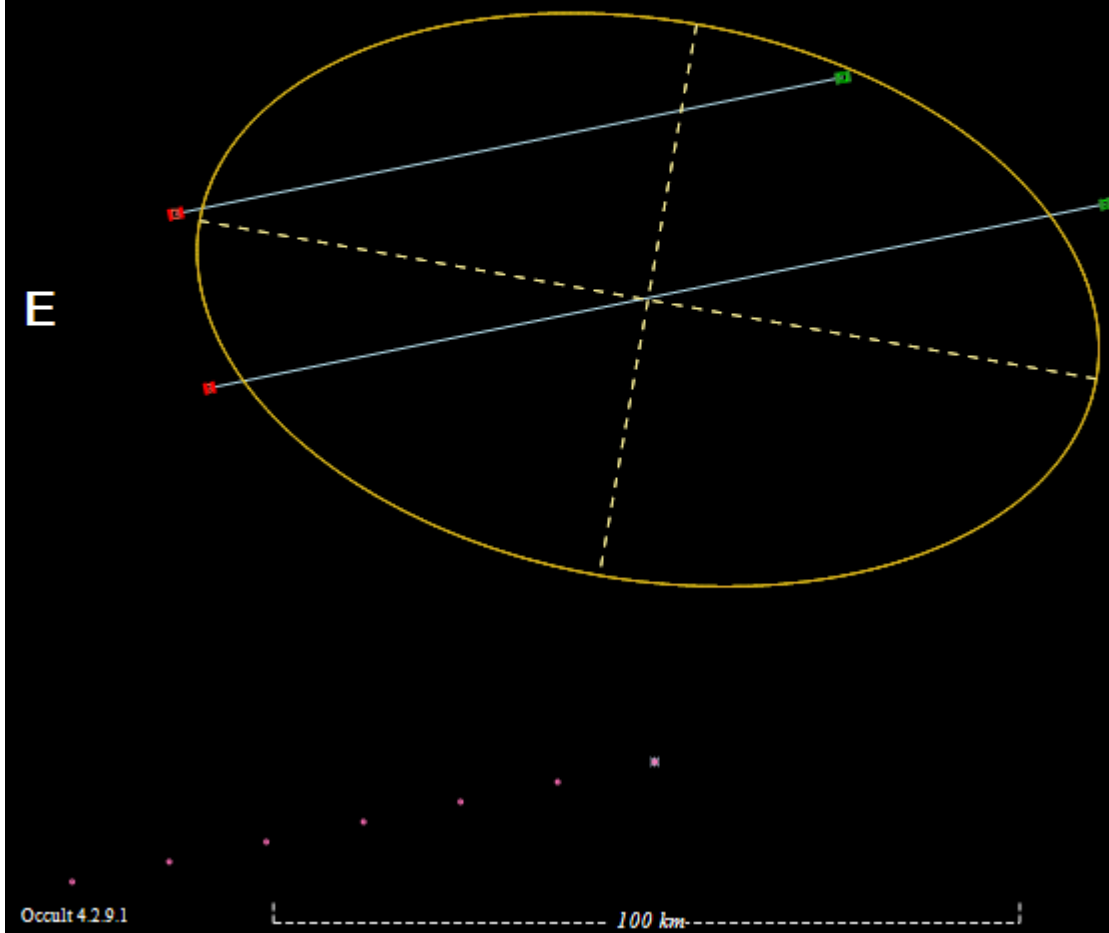
63ausonia2015dec25

(63) Ausonia 2015 Dec 25 139.0 x 88.0 km, PA -92.0°
Geocentric X 3669.2 ± 1.1 Y 1927.8 ± 1.6 km **N**



63Ausonia2016Mar11

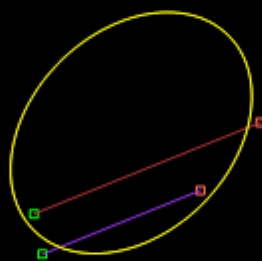
(63) Ausonia 2016 Mar 11 $122.0 \pm 4.5 \times 75.0$ km, PA 80.0°
Geocentric X 2578.0 ± 2.3 Y 2502.8 ± 2.6 km **N**
Double : Sep $0.0000''$, PA 0.0°



640brambilla2013jun10

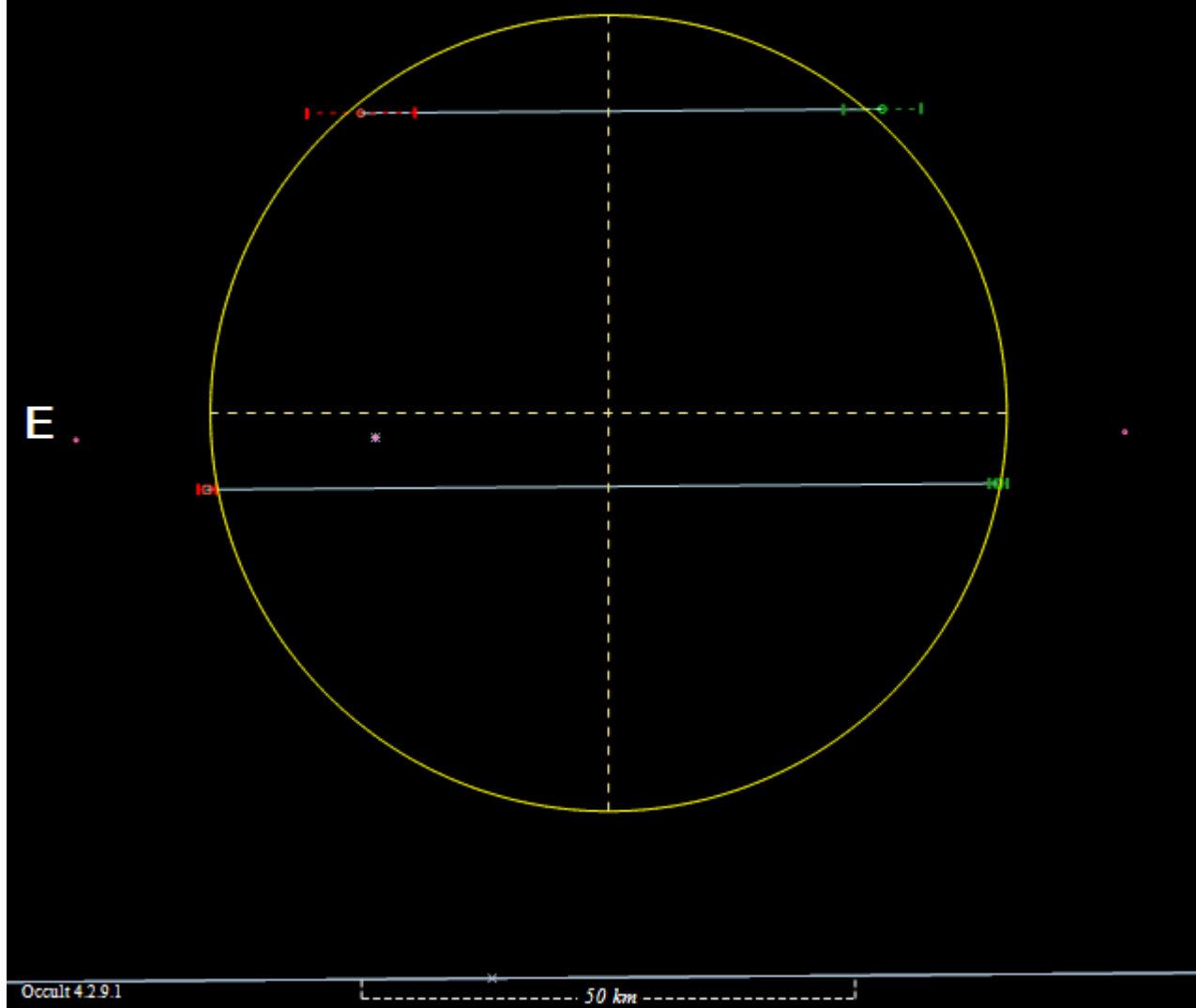
(640) Brambilla 2013 Jun 10 82.0 x 60.0 km, PA -45.0° °
Geocentric X -2252.1 ±2.2 Y 5448.6 ±2.8 km **N**

E

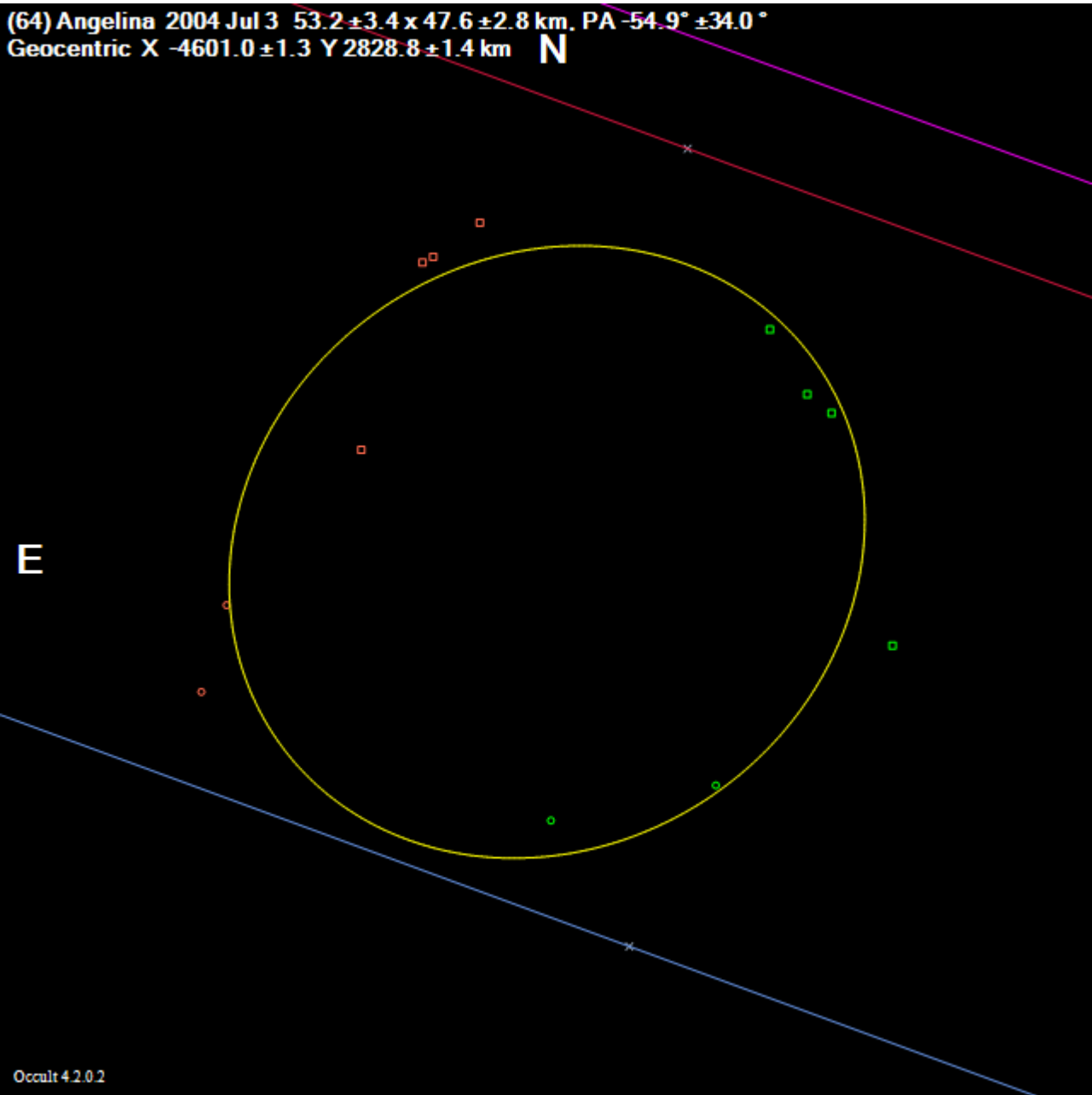


648Pippa2016Aug29

(648) Pippa 2016 Aug 29 80.7 x 80.7 km, PA 0.0°
Geocentric X -4302.9 ±0.5 Y 4324.6 ±0.8 km N



64angelina2004jul03



654zelinda2001sep28

(654) Zelinda 2001 Sep 28 133.0 x 133.0 km, PA 0.0° °
Geocentric X -4217.1 ±4.0 Y 2619.9 ±20.6 km **N**

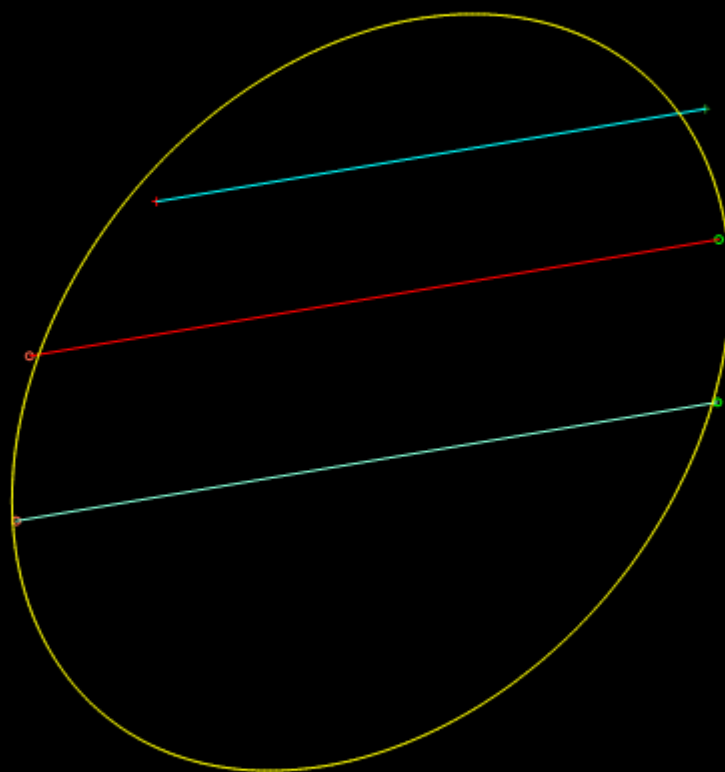
E



654zelinda2002mar27

(654) Zelinda 2002 Mar 27 $138.4 \pm 10.8 \times 102.8 \pm 5.8$ km, PA $-39.8^\circ \pm 13.6^\circ$
Geocentric X 514.2 ± 0.7 Y 3677.9 ± 3.5 km **N**

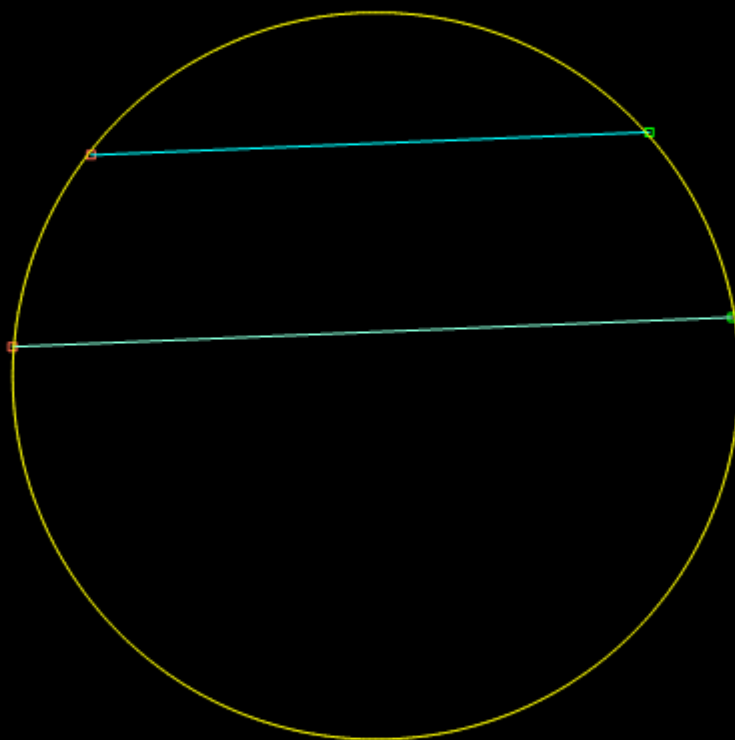
E



654zelinda2007nov16

(654) Zelinda 2007 Nov 16 122.0 x 122.0 km, PA 0.0° °
Geocentric X 5093.5 ± 0.2 Y 2490.0 ± 0.4 km **N**

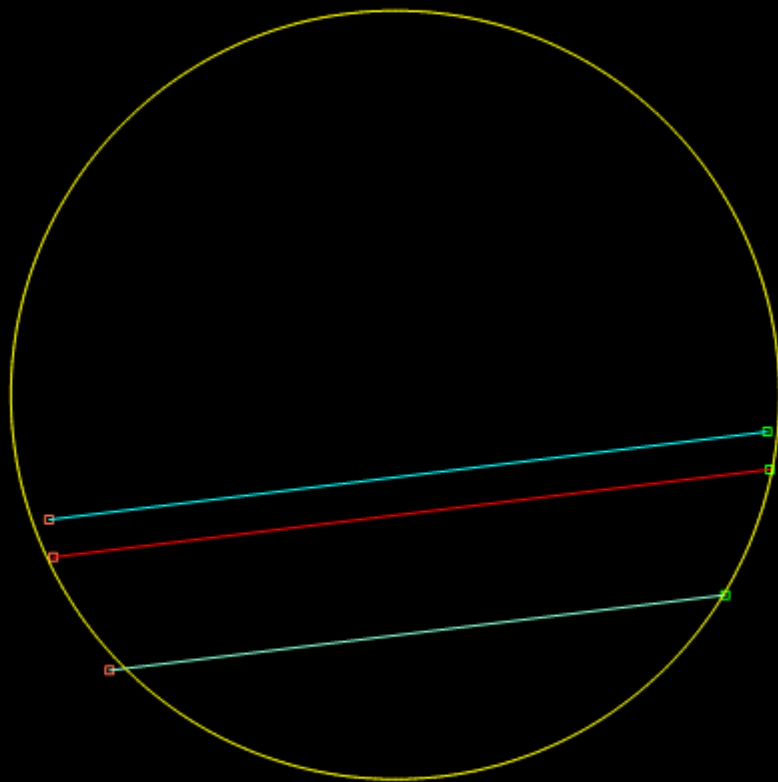
E



654zelinda2009mar16

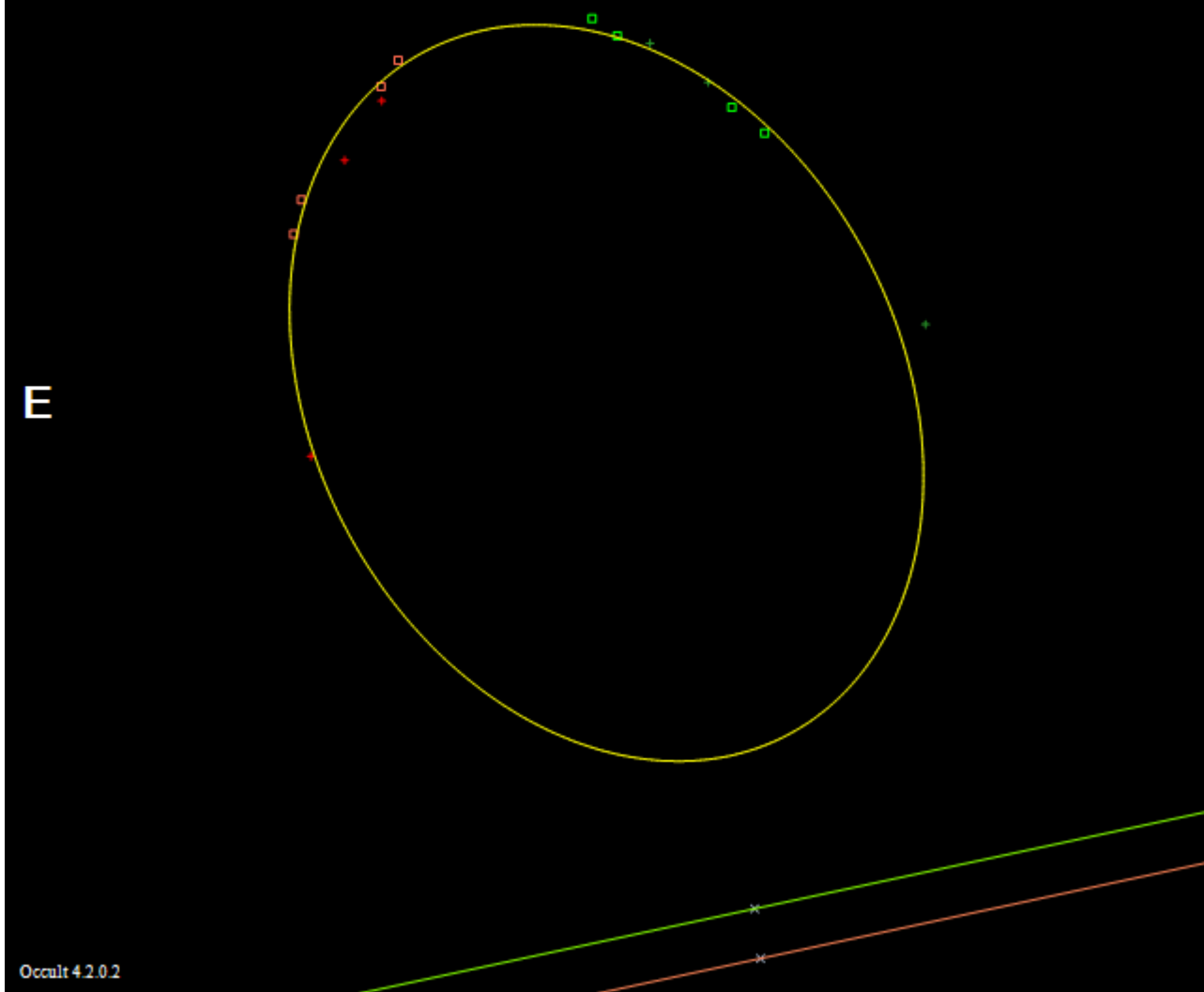
(654) Zelinda 2009 Mar 16 129.0 x 129.0 km. PA 0.0° °
Geocentric X 2616.5 ± 0.7 Y -3358.8 ± 1.5 km **N**

E



654zelinda2012jan06

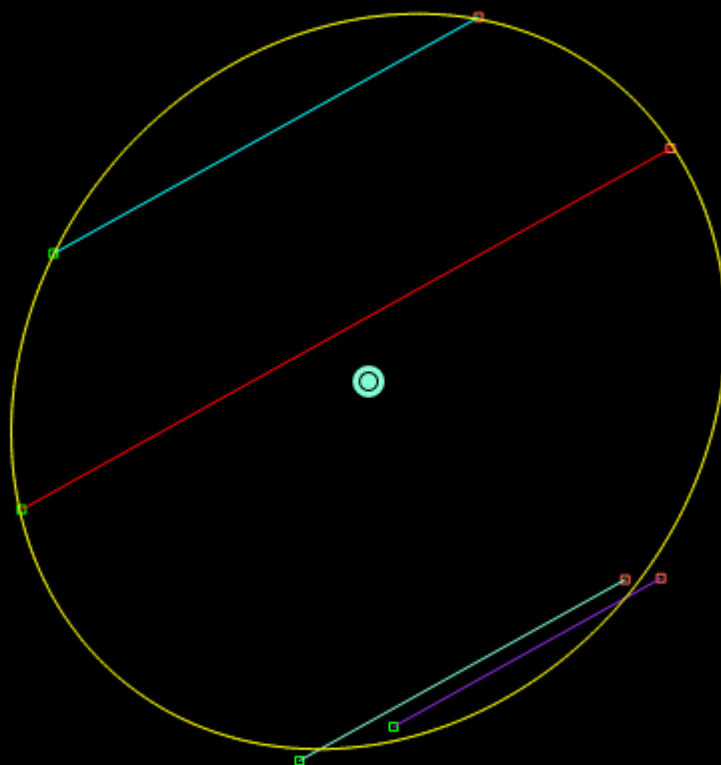
(654) Zelinda 2012 Jan 6 $145.0 \times 110.1 \pm 3.2$ km, PA $28.2^\circ \pm 6.2^\circ$
Geocentric X 1423.8 ± 2.0 Y 1409.4 ± 1.6 km **N**



654zelinda2013may12

(654) Zelinda 2013 May 12 $124.0 \pm 2.1 \times 107.5 \pm 2.0$ km, PA $-39.2^\circ \pm 6.1^\circ$
Geocentric X 2000.6 ± 0.8 Y -302.3 ± 0.9 km **N**
Double : Sep $0.0000''$, PA 0.0°

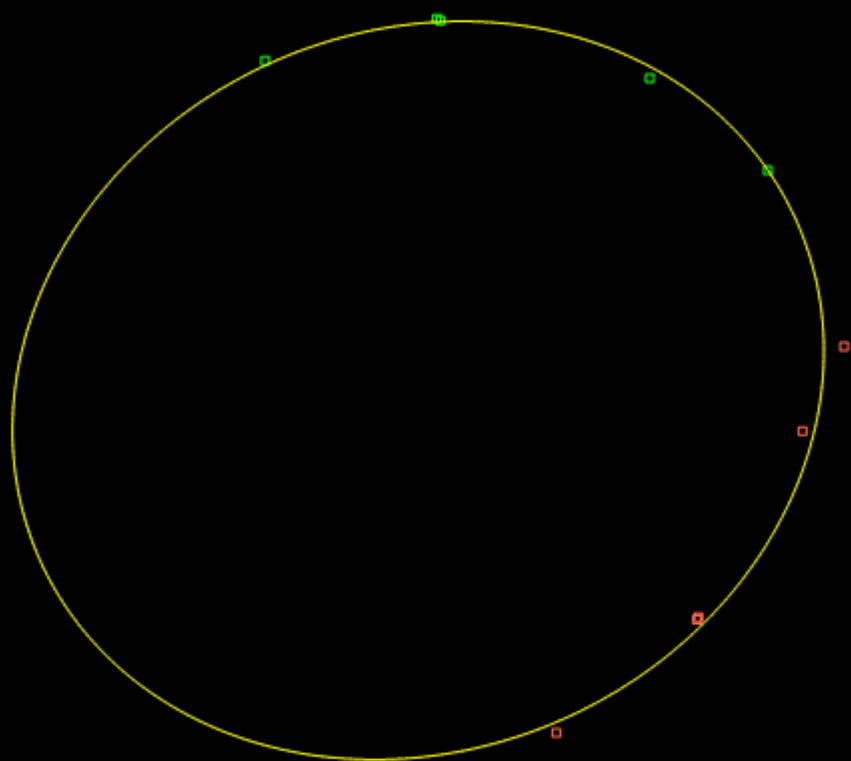
E



654zelinda2015dec31

(654) Zelinda 2015 Dec 31 $137.0 \pm 11.7 \times 118.7 \pm 2.1$ km, PA $-65.7^\circ \pm 7.3^\circ$
Geocentric X -486.1 ± 4.9 Y 3360.1 ± 2.3 km **N**

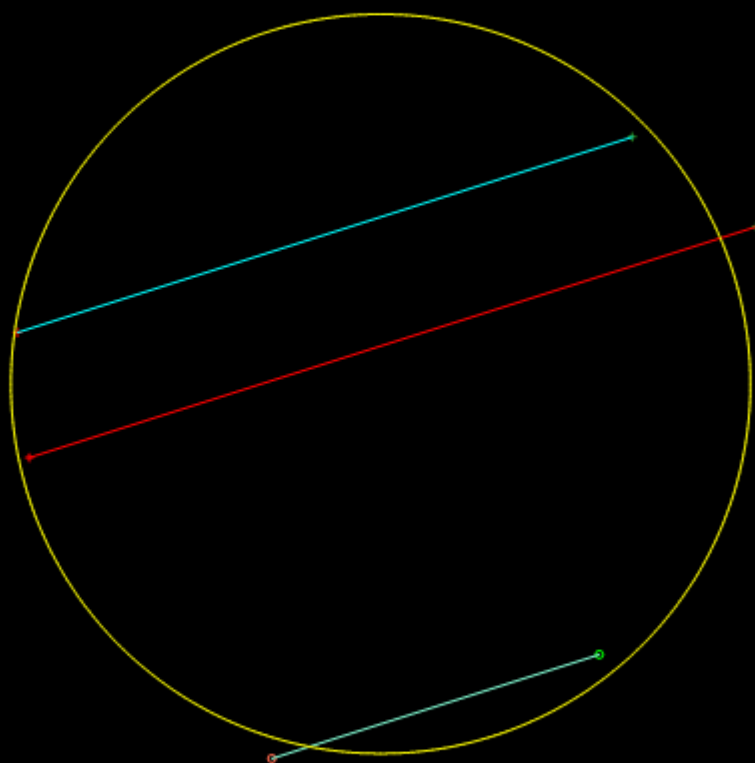
E



65cybele1979oct17

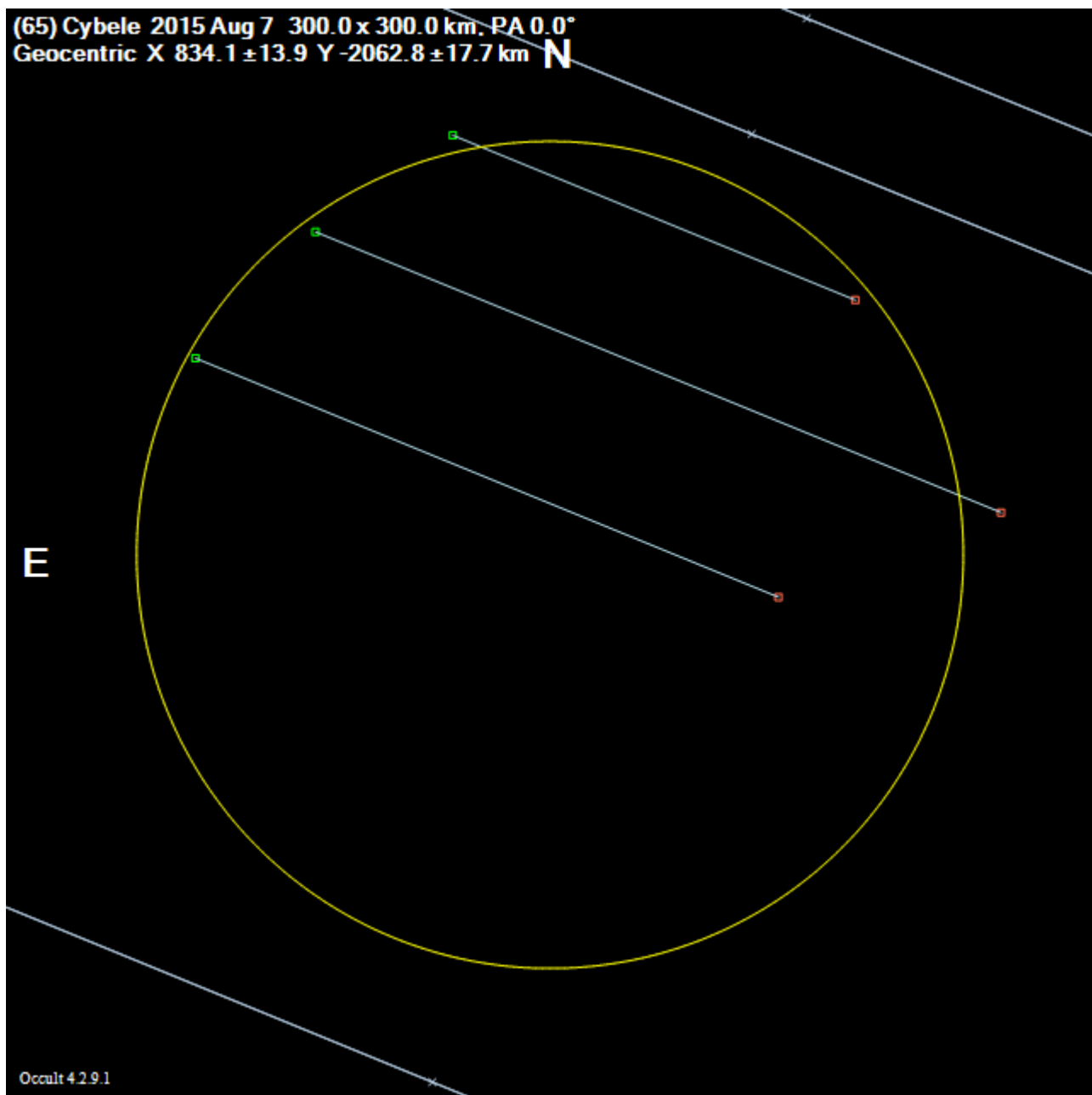
(65) Cybele 1979 Oct 17 $228.0 \pm 14.8 \times 228.0$ km. PA 0.0° °
Geocentric X -4019.3 ± 4.1 Y 2841.3 ± 6.2 km **N**

E



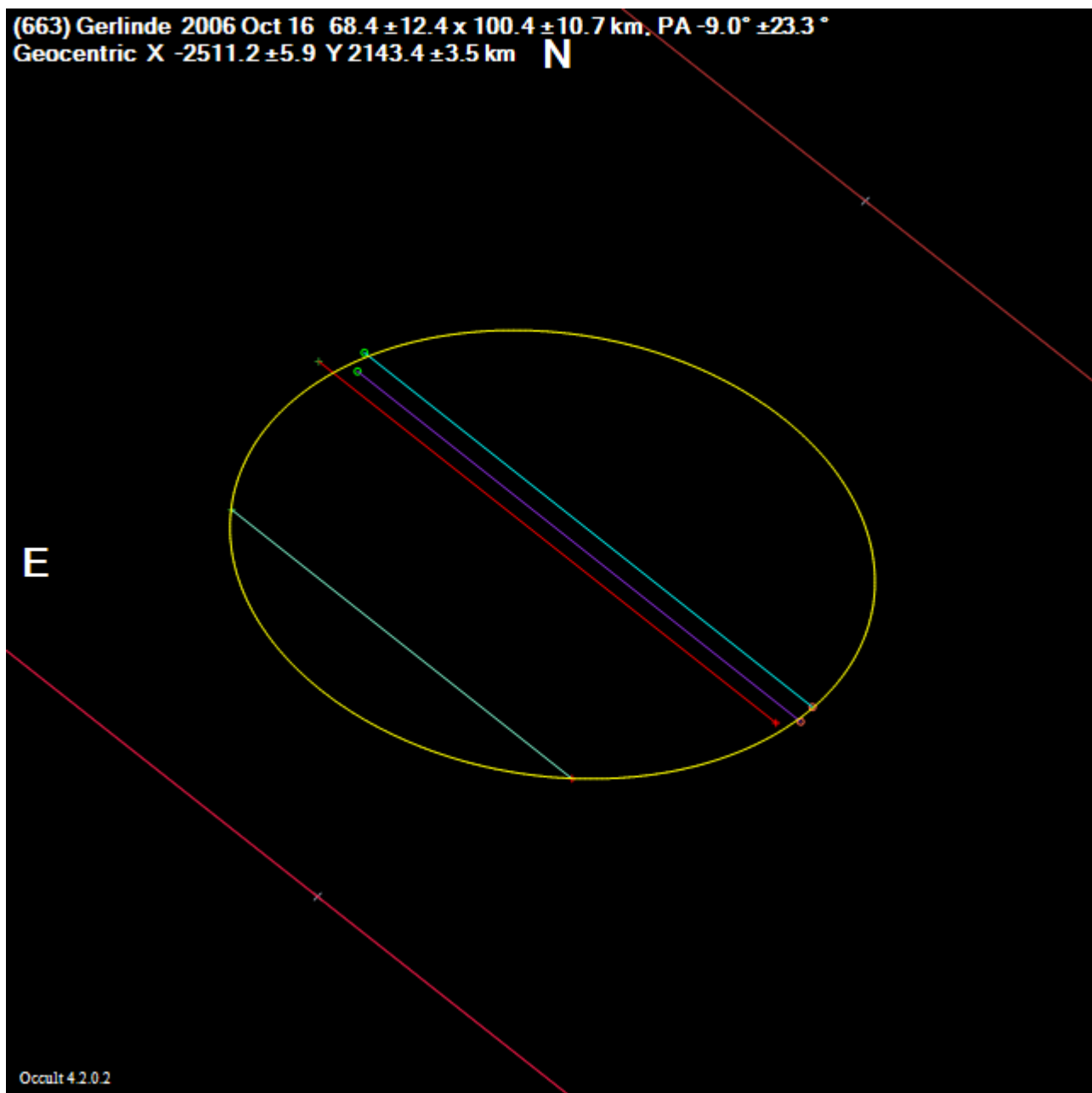
65Cybele2015Aug07

(65) Cybele 2015 Aug 7 300.0 x 300.0 km. PA 0.0°
Geocentric X 834.1 ± 13.9 Y -2062.8 ± 17.7 km **N**



663gerlinde2006oct16

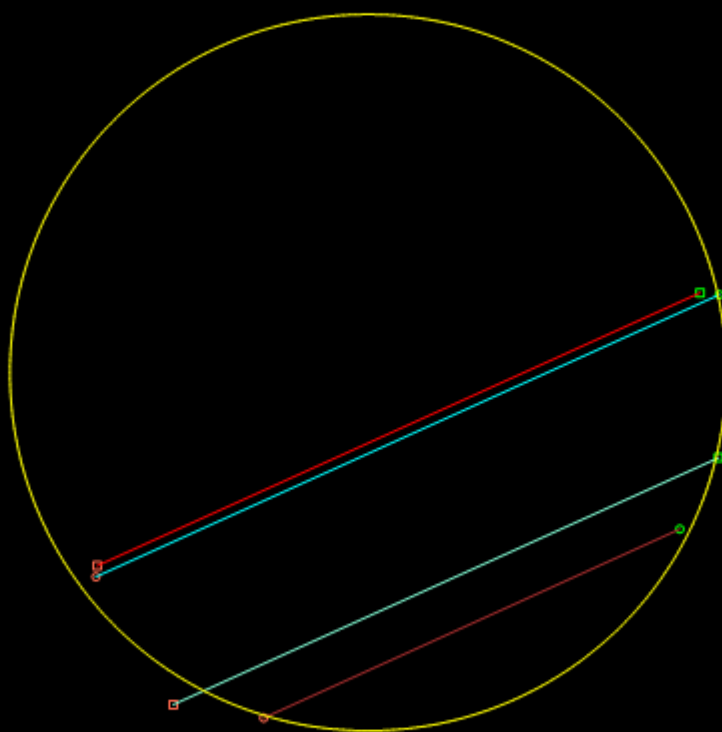
(663) Gerlinde 2006 Oct 16 $68.4 \pm 12.4 \times 100.4 \pm 10.7$ km, PA $-9.0^\circ \pm 23.3^\circ$
Geocentric X -2511.2 ± 5.9 Y 2143.4 ± 3.5 km **N**



663gerlinde2007sep21

(663) Gerlinde 2007 Sep 21 106.6 x 106.6 km, PA 0.0° °
Geocentric X -2902.8 ± 1.1 Y 3982.7 ± 1.5 km **N**

E

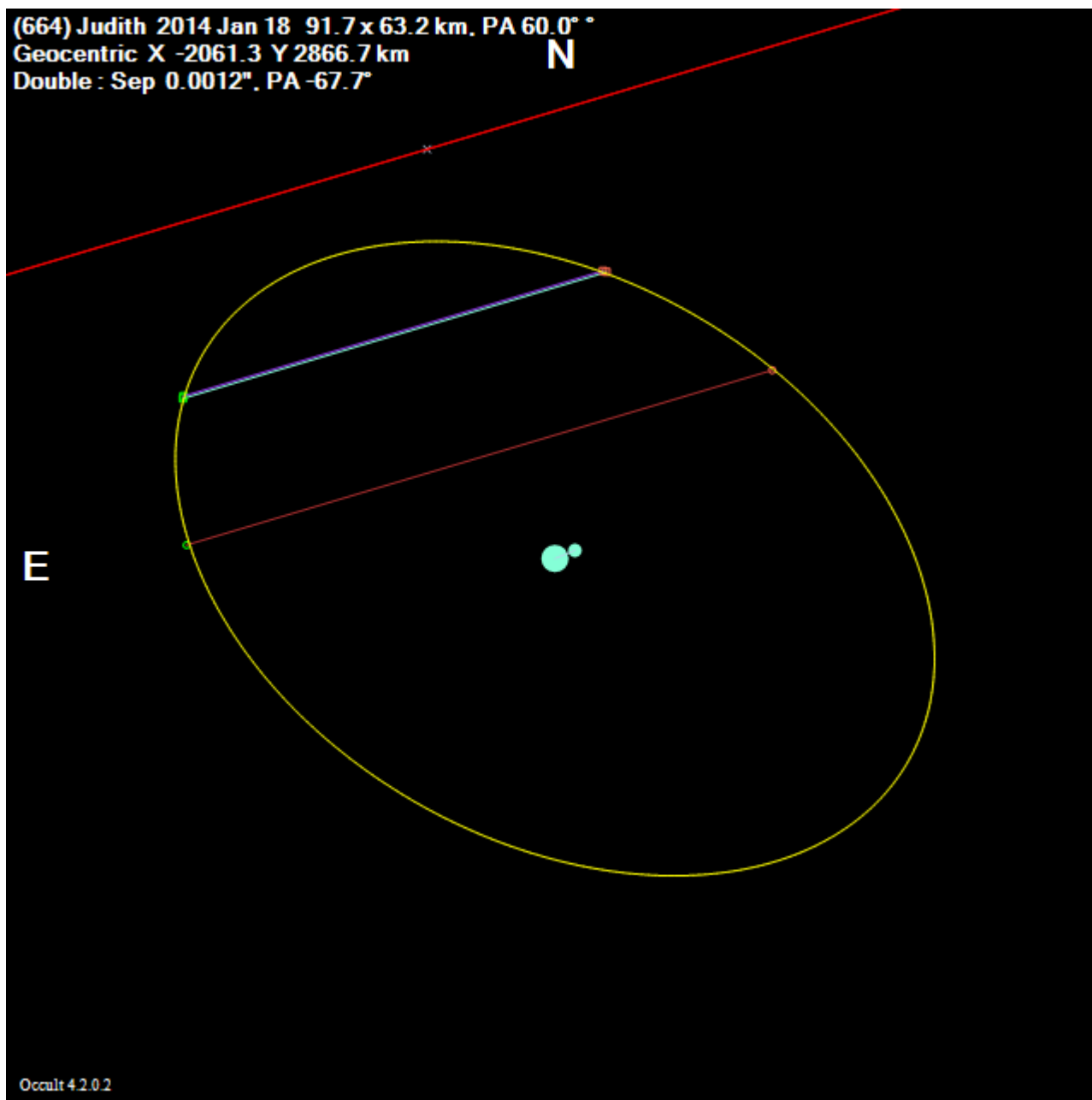


664judith2014jan18

(664) Judith 2014 Jan 18 91.7 x 63.2 km, PA 60.0°
Geocentric X -2061.3 Y 2866.7 km
Double : Sep 0.0012", PA -67.7°

N

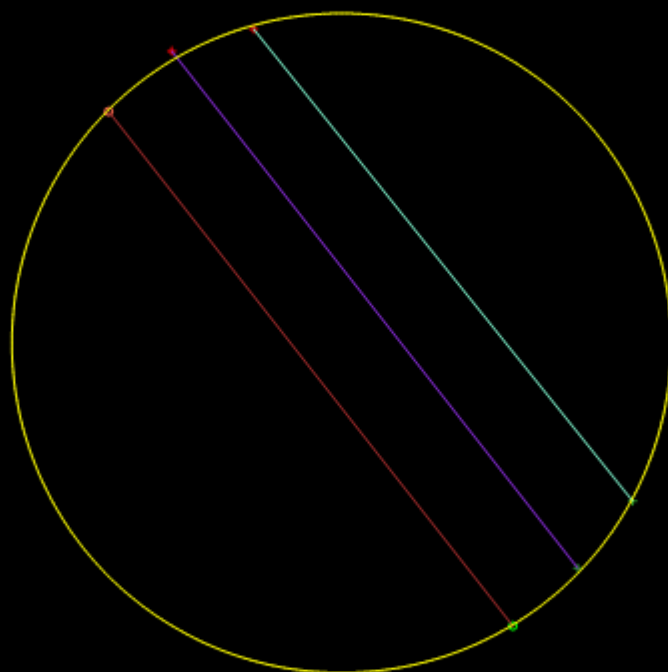
E



667denise2008apr08

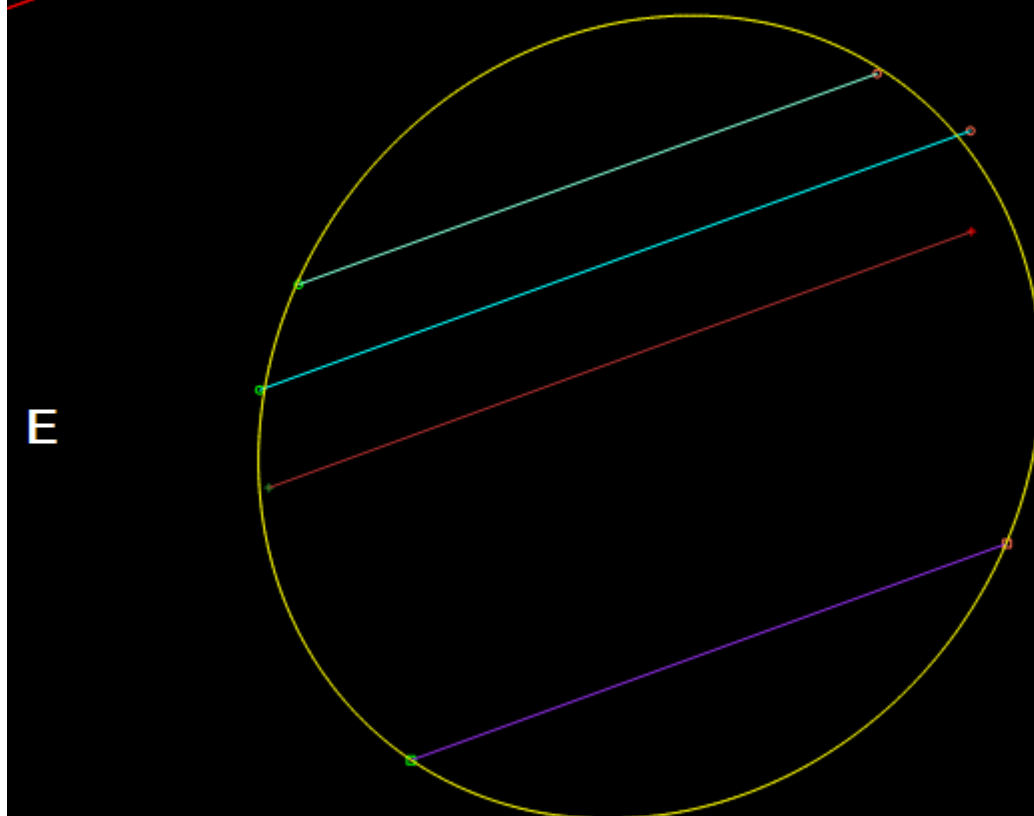
(667) Denise 2008 Apr 8 $69.5 \pm 0.5 \times 69.5$ km, PA 0.0° °
Geocentric X 240.6 ± 0.7 Y 1512.2 ± 0.6 km **N**

E

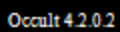


674rachele2010mar02

(674) Rachele 2010 Mar 2 $105.5 \pm 1.1 \times 94.4 \pm 2.3$ km, PA $-38.3^\circ \pm 13.5^\circ$
Geocentric X -2518.1 ± 0.5 Y 2598.3 ± 0.7 km **N**



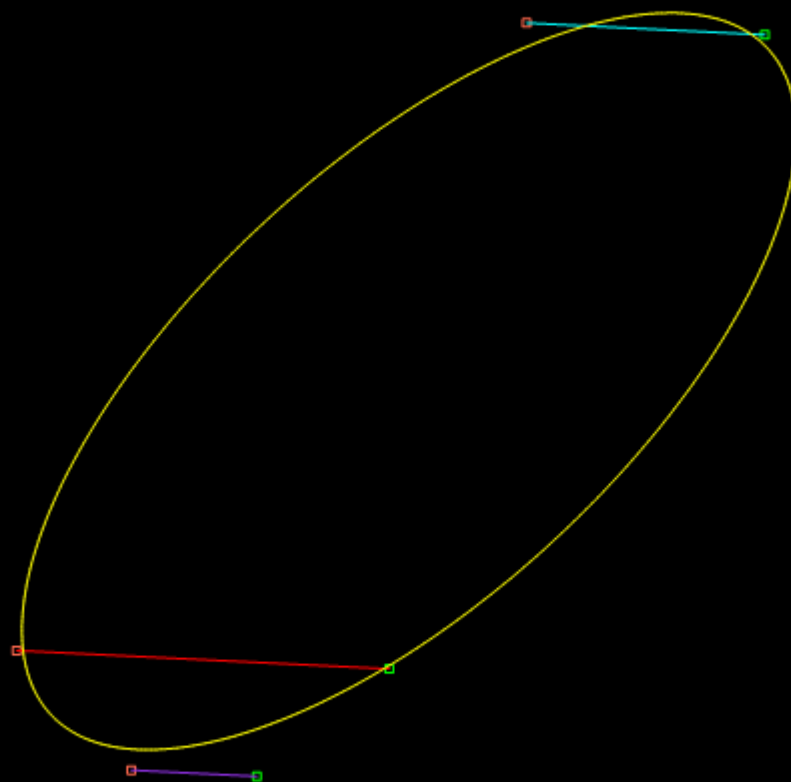
(675) Ludmilla 2010 Oct 20 86.0 ± 2.6 x 86.0 km, PA 0.0° °
 Geocentric X -5177.7 ± 0.7 Y 1089.0 ± 1.3 km **N**
 Double : Sep 0.0283 ± 0.0005", PA 205.1° ± 1.5°



675ludmilla2013nov08

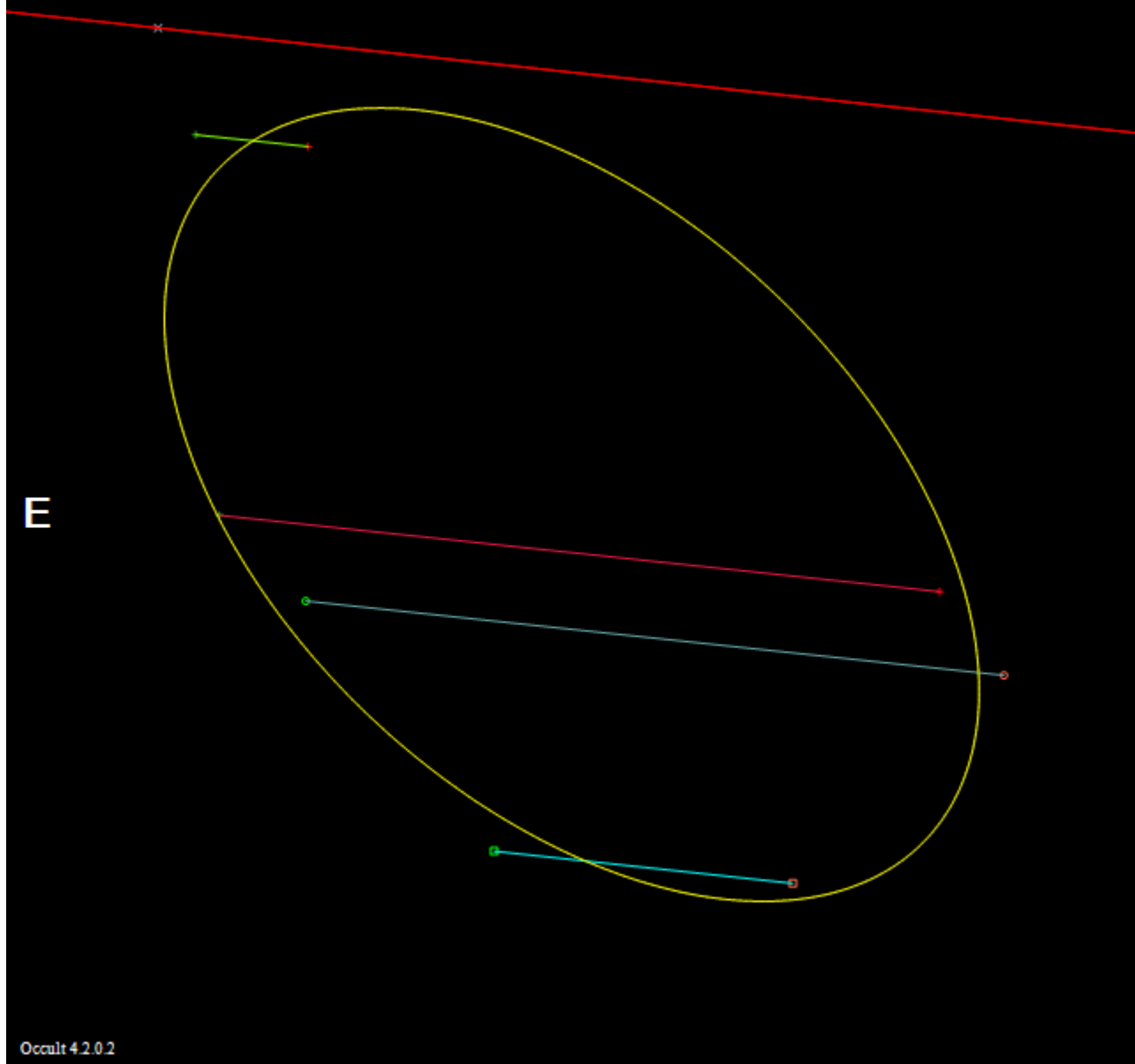
(675) Ludmilla 2013 Nov 8 $85.3 \pm 1.0 \times 37.5 \pm 2.0$ km, PA $-47.1^\circ \pm 1.2^\circ$
Geocentric X 3987.6 ± 0.5 Y 4566.4 ± 0.4 km **N**

E



676melitta2007jun14

(676) Melitta 2007 Jun 14 $114.9 \pm 4.8 \times 69.0 \pm 5.5$ km, PA 46.6°
Geocentric X -1444.8 ± 2.0 Y 5068.1 ± 2.0 km **N**



678fredegundis2012mar13

(678) Fredegundis 2012 Mar 13 52.0 x 32.0 km, PA 81.1° ± 8.2°
Geocentric X 1415.2 ± 1.4 Y 1711.0 ± 2.2 km **N**

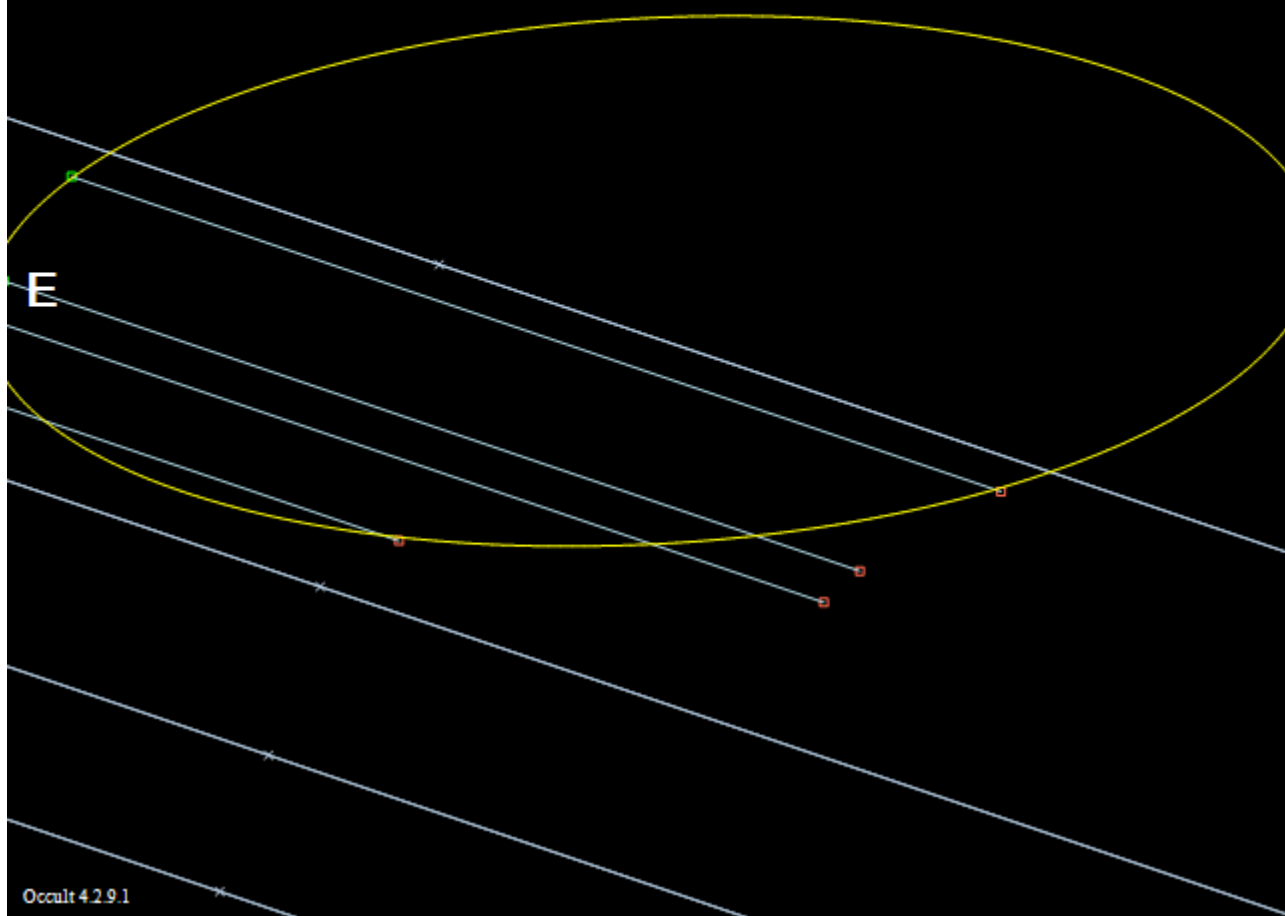
E



The diagram shows an elliptical shape representing the asteroid (678) Fredegundis. A red line segment passes through the center of the ellipse, with a red dot at the left end and a green dot at the right end. A cyan line segment is positioned below the red line, with a red dot at the left end and a green dot at the right end. The red line is oriented horizontally, while the cyan line is oriented diagonally. The red line is labeled 'E' on the left and 'N' on the right. The cyan line is labeled 'E' on the left and 'N' on the right.

678fredegundis2015nov15

(678) Fredegundis 2015 Nov 15 $91.2 \pm 1.1 \times 35.9 \pm 1.2$ km, PA $93.3^\circ \pm 1.0^\circ$
Geocentric X -4653.9 ± 0.6 Y 1924.6 ± 0.6 km **N**



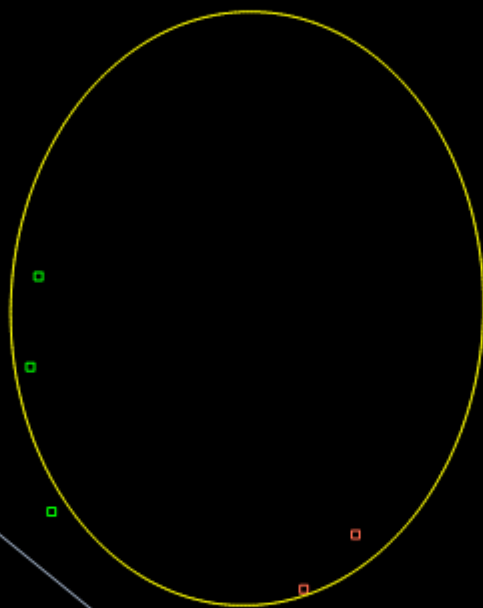
679pax2015jul17

(679) Pax 2015 Jul 17 51.0 x 40.6 km. PA -1.8°
Geocentric X -1560.1 ± 0.9 Y 5689.8 ± 1.0 km

N

E

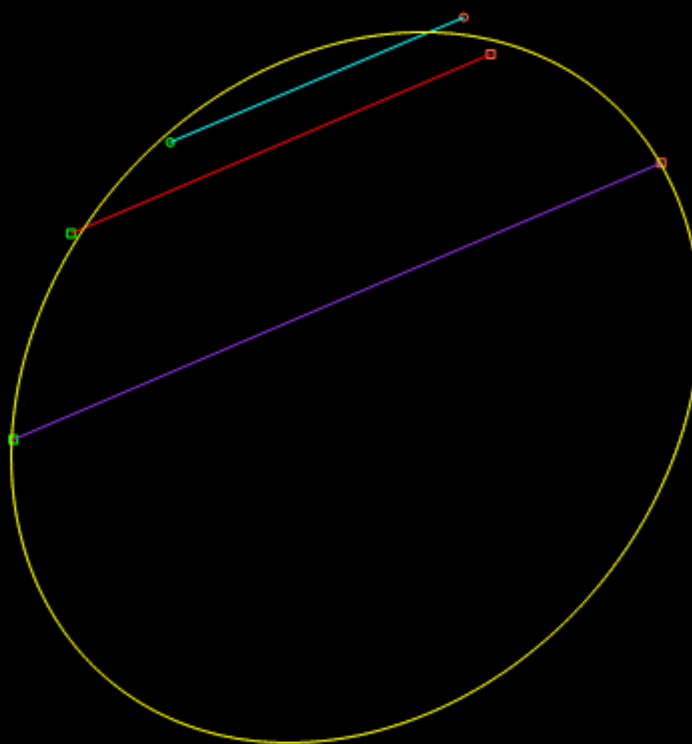
Occult 4.2.9.1



67asia2008may22

(67) Asia 2008 May 22 $57.8 \pm 12.5 \times 47.3 \pm 18.5$ km, PA $-40.5^\circ \pm 52.7^\circ$
Geocentric X -2299.1 ± 2.6 Y 4465.5 ± 11.3 km **N**

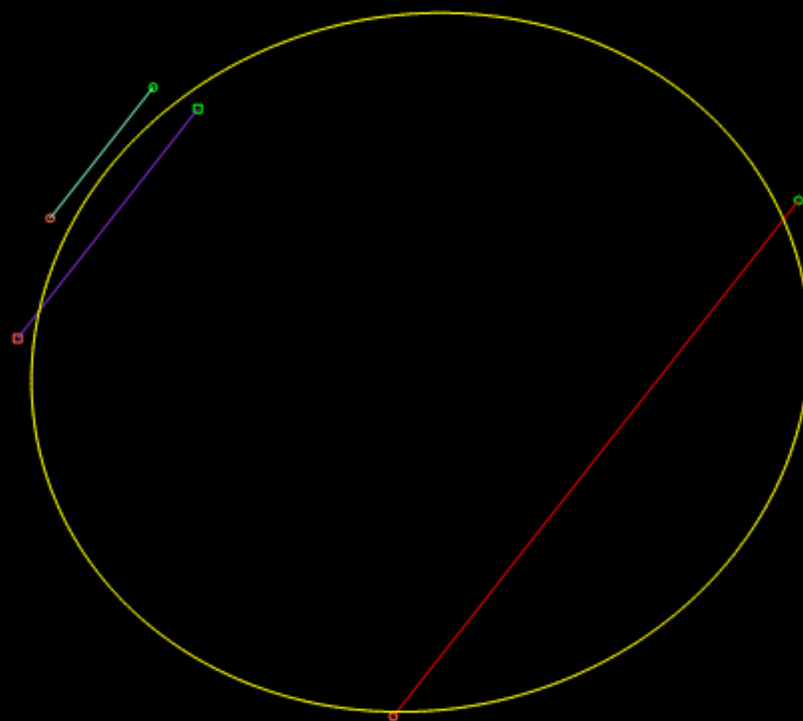
E



67asia2012sep03

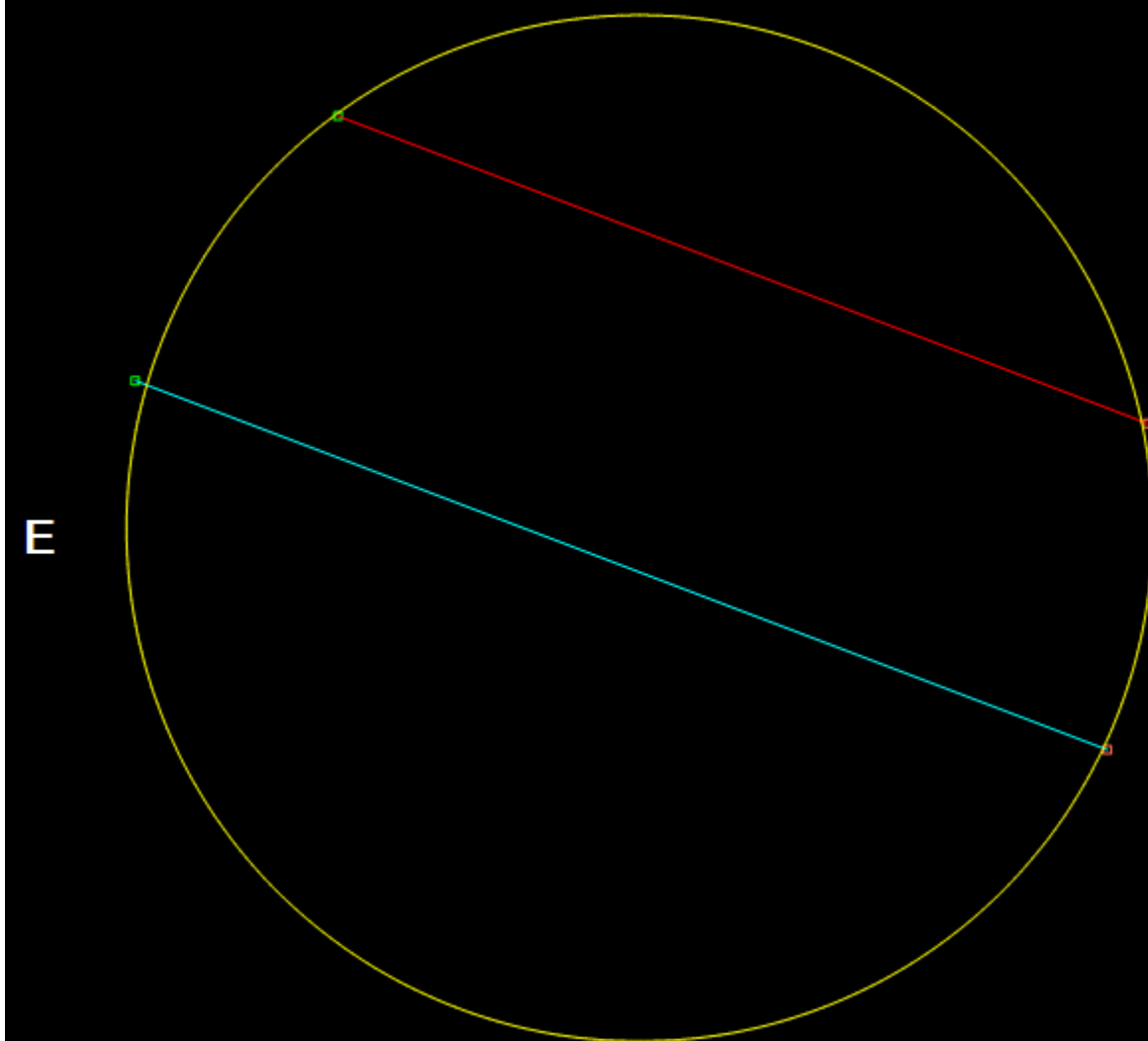
(67) Asia 2012 Sep 3 $62.1 \times 55.1 \pm 1.7$ km, PA $-77.0^\circ \pm 135.6^\circ$
Geocentric X 920.8 ± 5.4 Y 5708.5 ± 4.1 km **N**

E



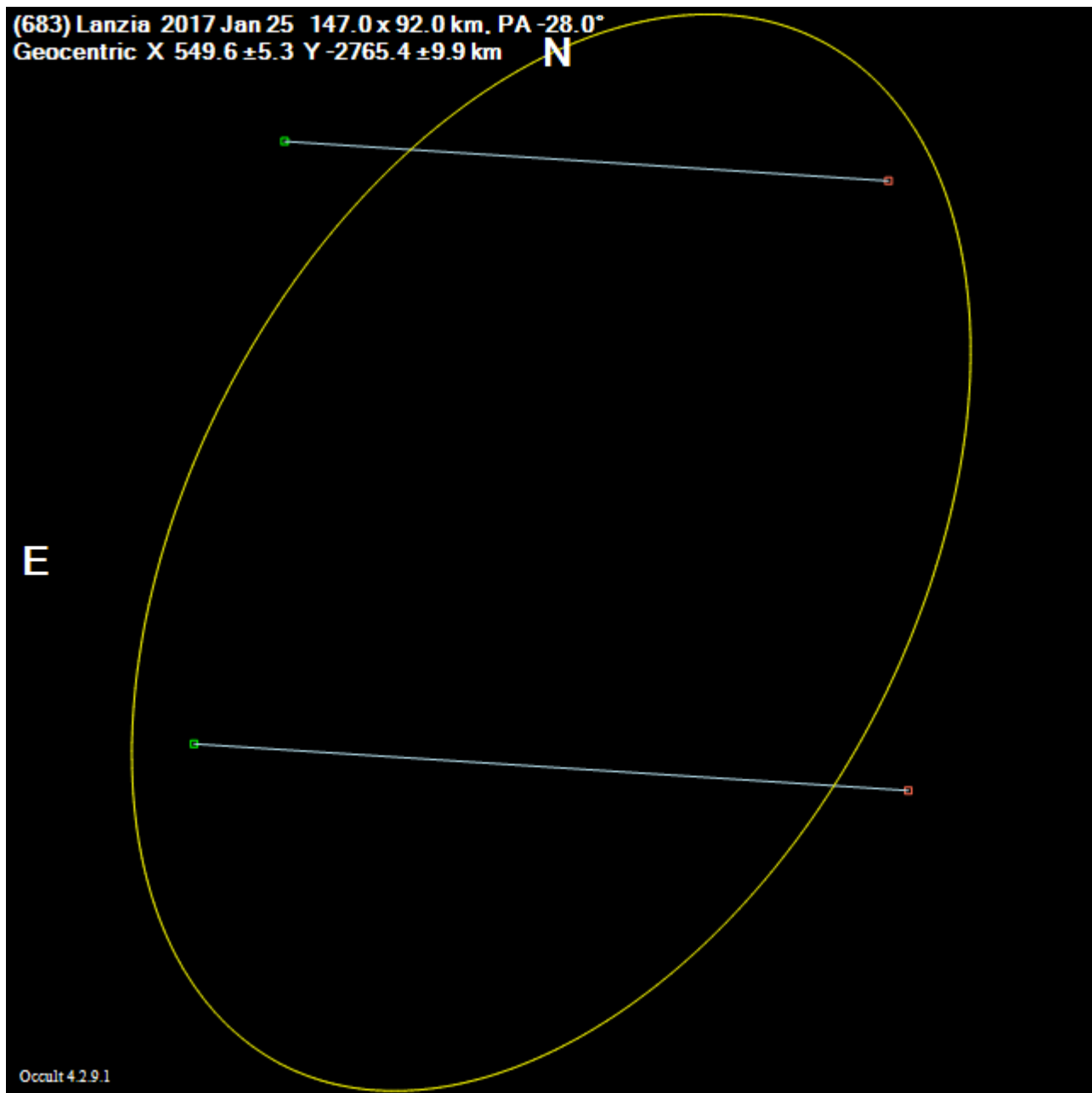
683lanzia2010dec27

(683) Lanzia 2010 Dec 27 112.0 x 112.0 km. PA 0.0° °
Geocentric X 3655.9 ± 0.4 Y 3002.1 ± 0.7 km N



683Lanzia2017Jan25

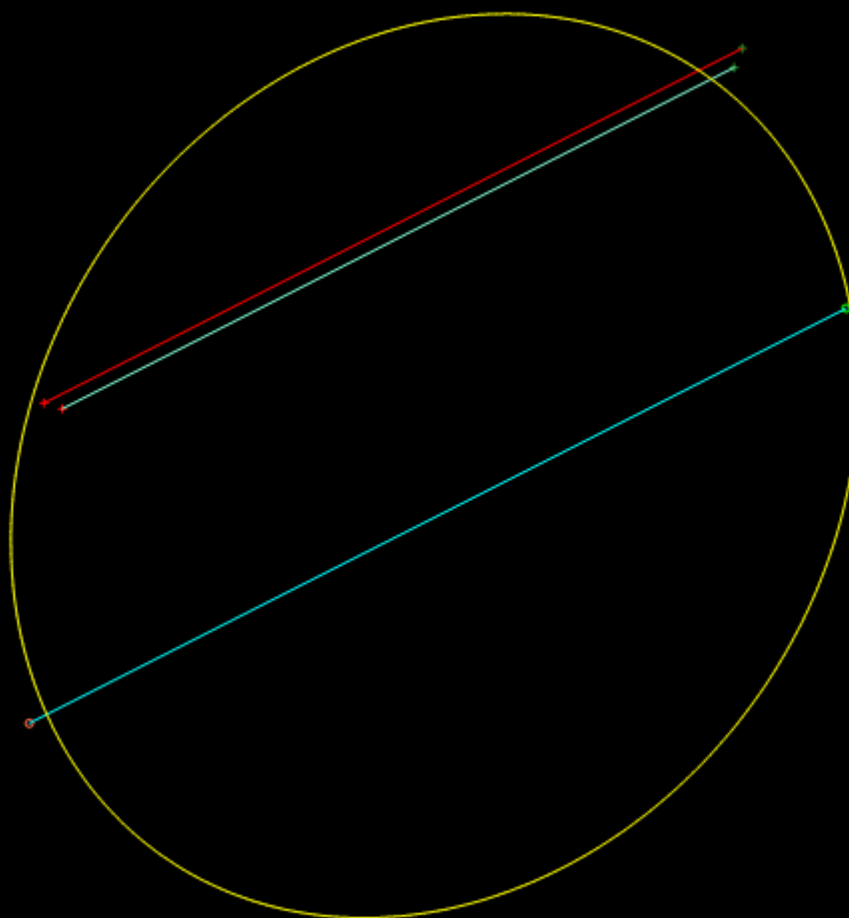
(683) Lanzia 2017 Jan 25 147.0 x 92.0 km, PA -28.0°
Geocentric X 549.6 ± 5.3 Y -2765.4 ± 9.9 km



68leto1999may23

(68) Leto 1999 May 23 151.0 x 126.0 km, PA $-34.4^{\circ} \pm 9.2^{\circ}$
Geocentric X 4805.2 ± 2.2 Y 2977.2 ± 4.6 km **N**

E

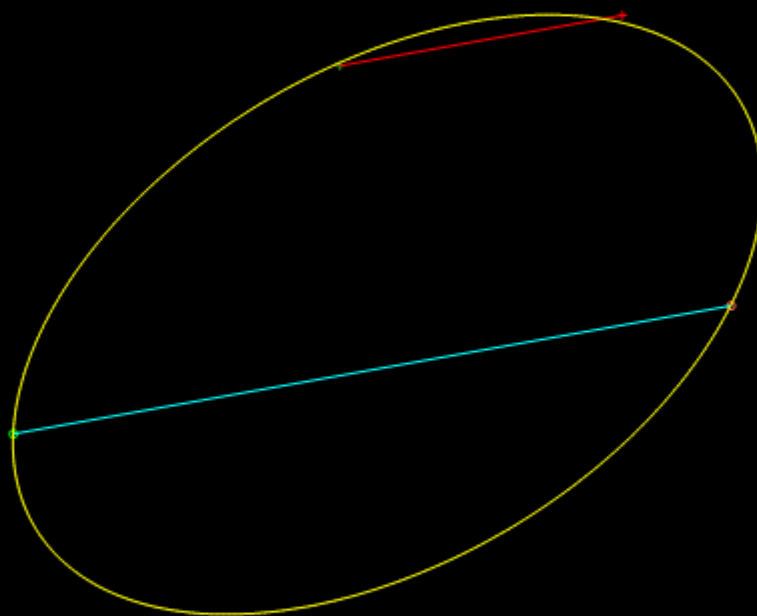


690wratislavia2003jul24

(690) Wratislavia 2003 Jul 24 144.7 x 86.5 km, PA -58.8° °
Geocentric X -2212.2 Y -1409.1 km

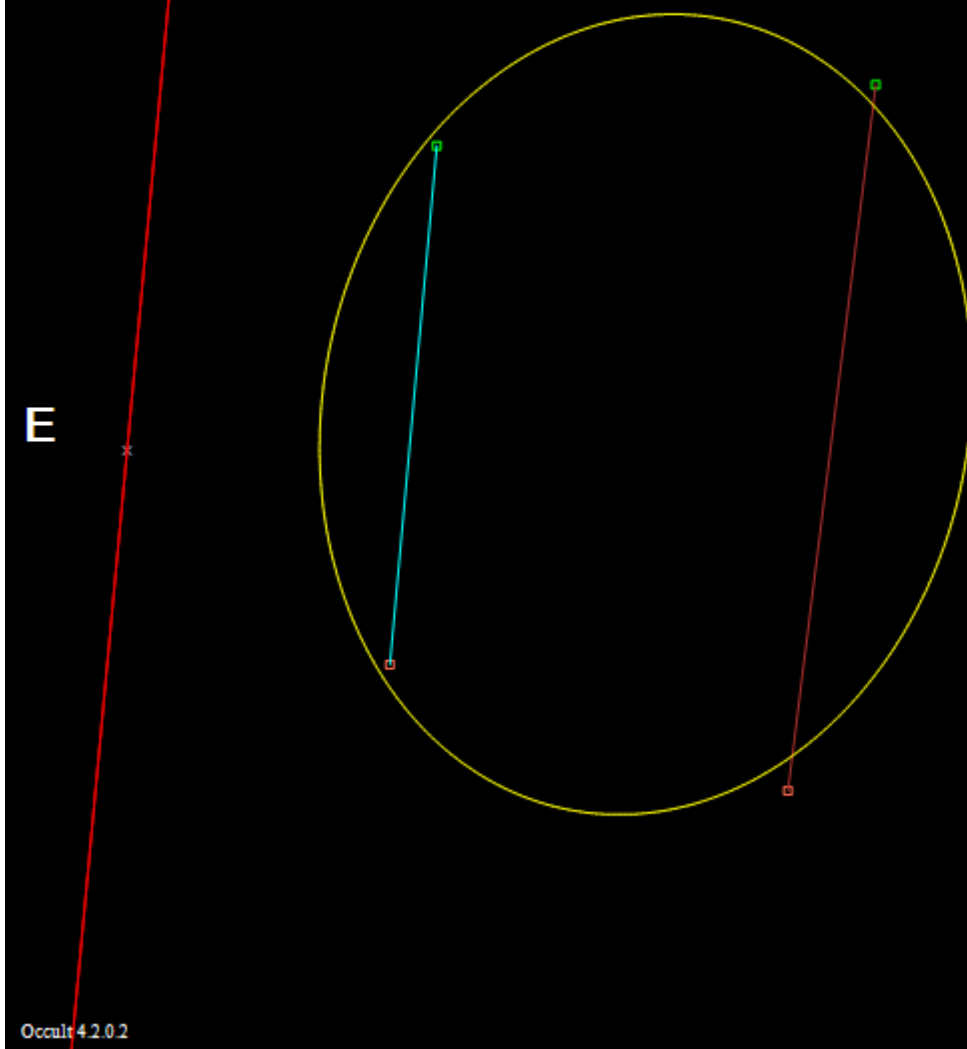
N

E



690wratislavia2013feb11

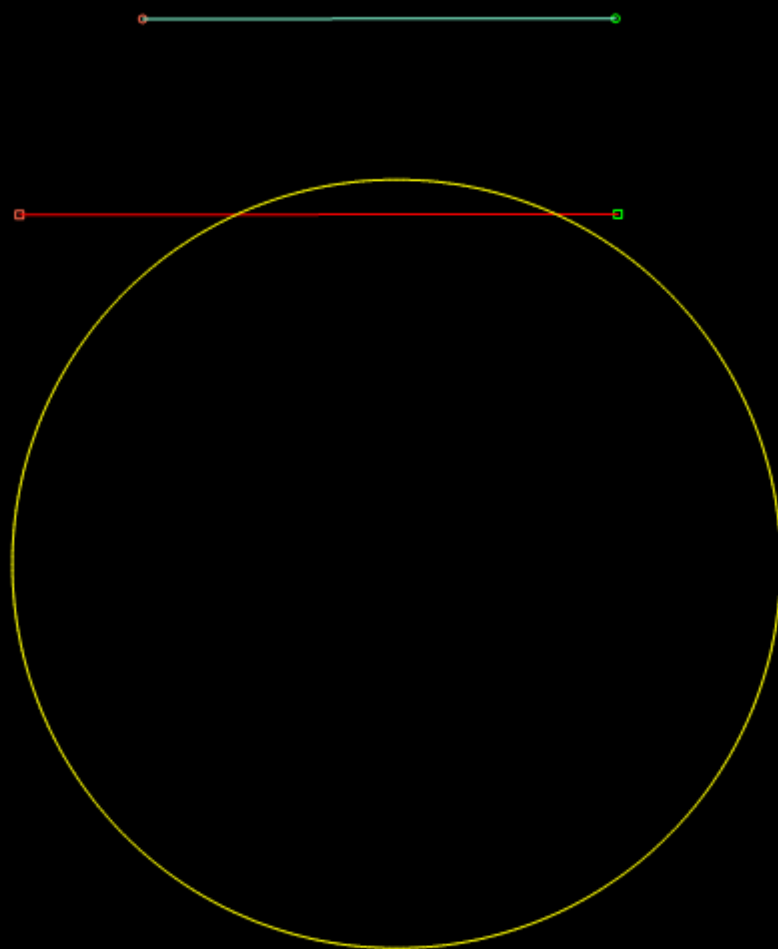
(690) Wratislavia 2013 Feb 11 $171.9 \pm 6.5 \times 137.9$ km, PA -11.0°
Geocentric X -3372.2 ± 2.5 Y -950.2 ± 2.6 km **N**



690wratislavia2014oct09

(690) Wratislavia 2014 Oct 9 $158.0 \pm 258.4 \times 158.0$ km, PA 0.0° °
Geocentric X 1848.4 ± 17.5 Y 5566.3 ± 111.9 km **N**

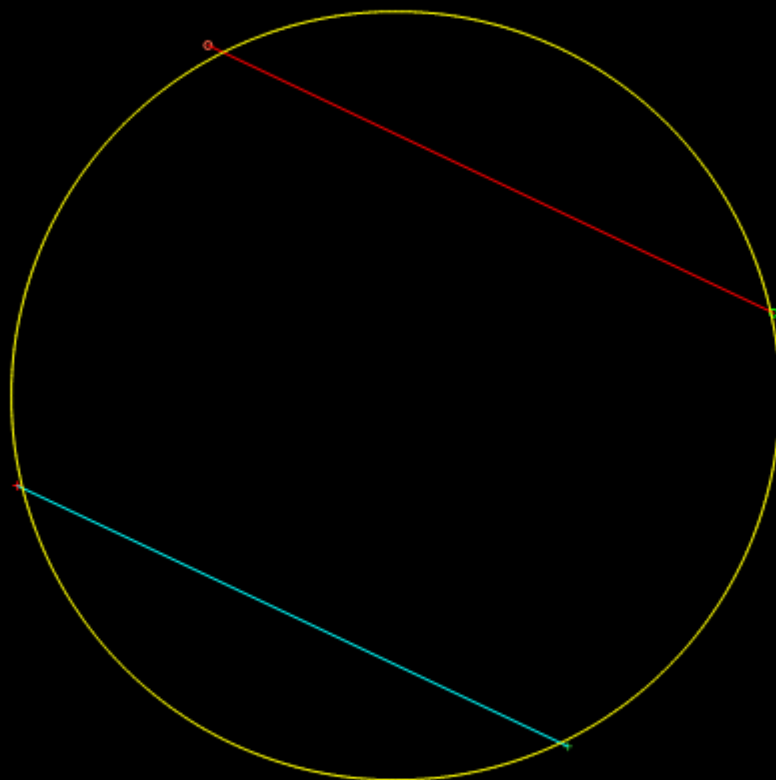
E



693zerbinetta2004oct13

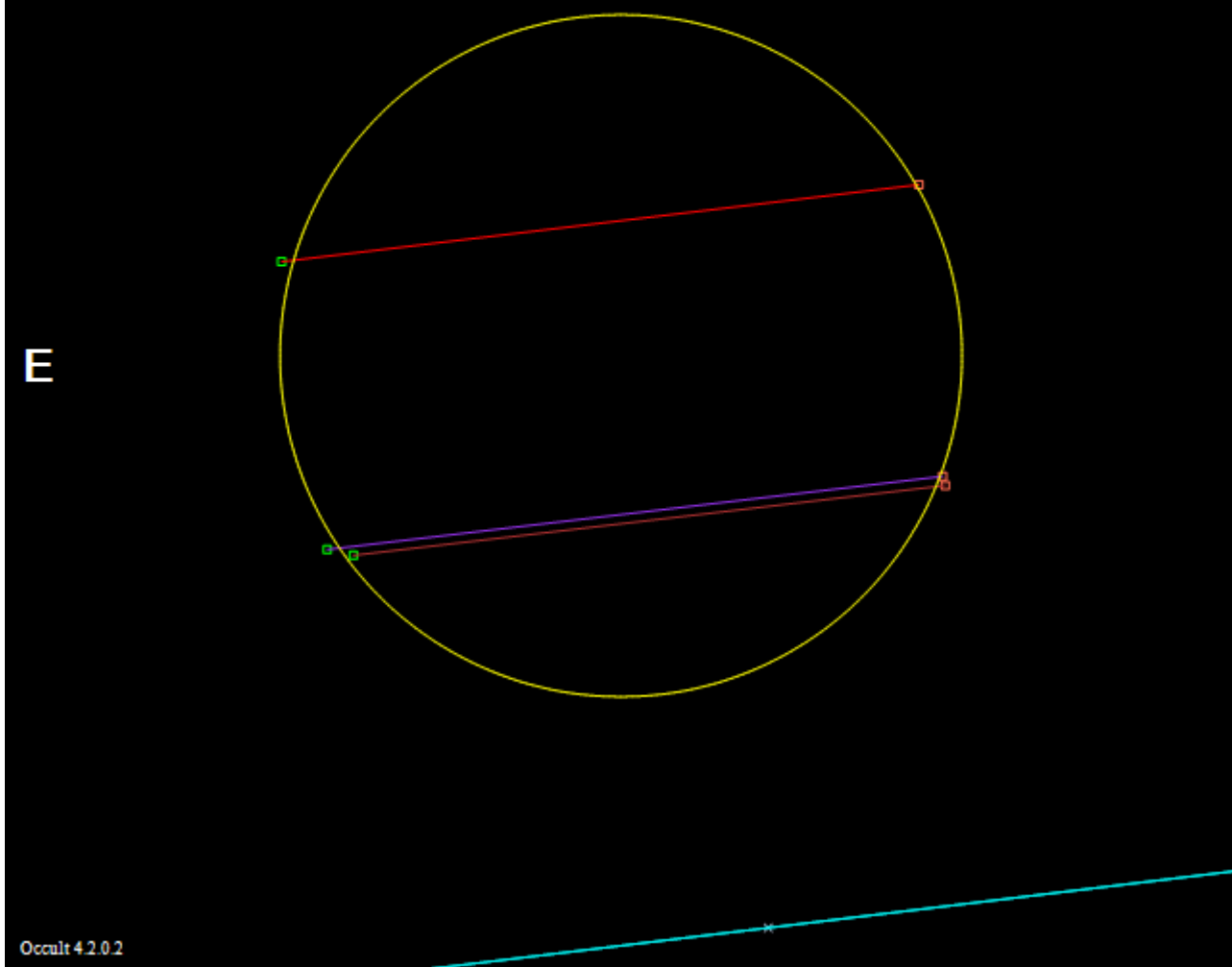
(693) Zerbinetta 2004 Oct 13 $68.0 \pm 0.5 \times 68.0$ km, PA 0.0° °
Geocentric X 1380.7 ± 0.2 Y 5979.6 ± 0.2 km **N**

E



693zerbinetta2011dec18

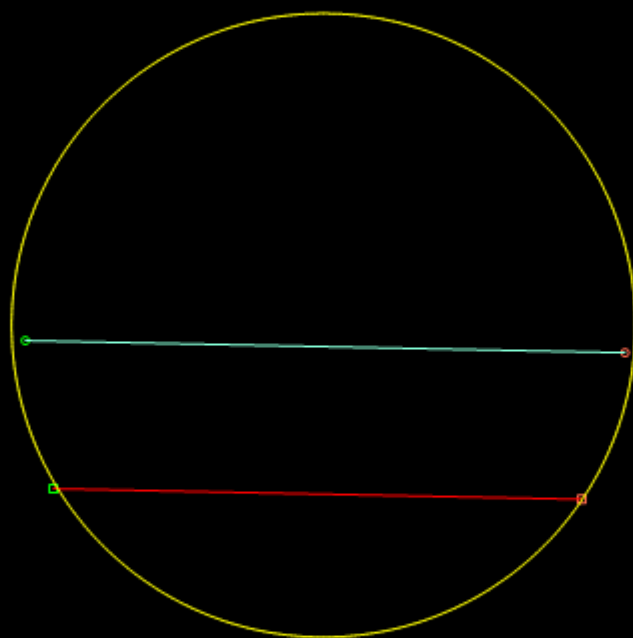
(693) Zerbinetta 2011 Dec 18 $73.0 \pm 2.8 \times 73.0$ km. PA 0.0° °
Geocentric X -2296.7 ± 0.3 Y 305.5 ± 0.7 km **N**



693zerbinetta2011dec26

(693) Zerbinetta 2011 Dec 26 74.0 x 74.0 km. PA 0.0° °
Geocentric X 3704.4 ± 0.4 Y 1451.0 ± 1.0 km **N**

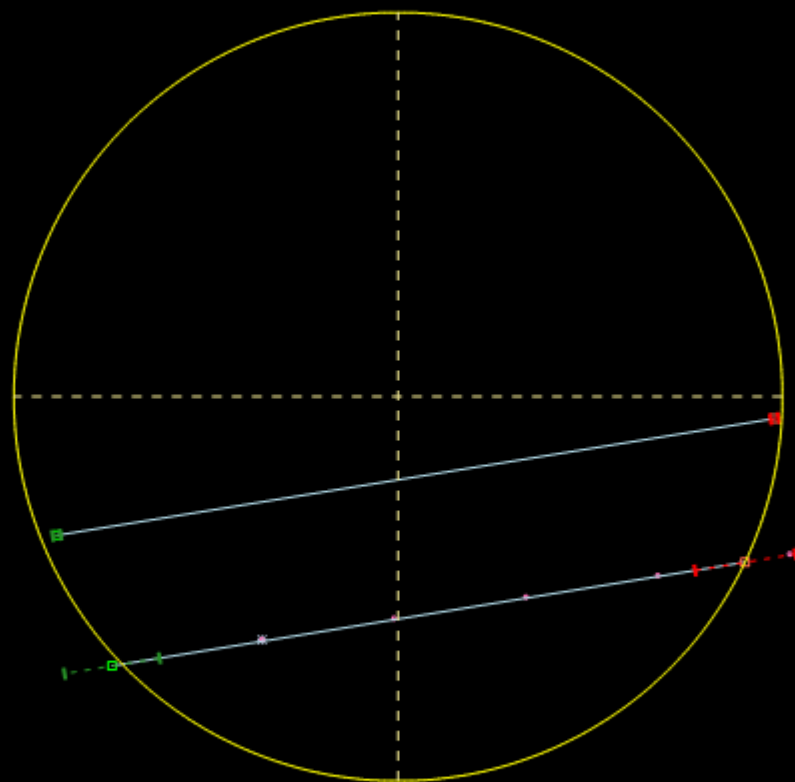
E



693Zerbinetta2016Dec10

(693) Zerbinetta 2016 Dec 10 75.0 x 75.0 km. PA 0.0°
Geocentric X -1361.1 ± 0.5 Y -1088.7 ± 1.0 km **N**

E

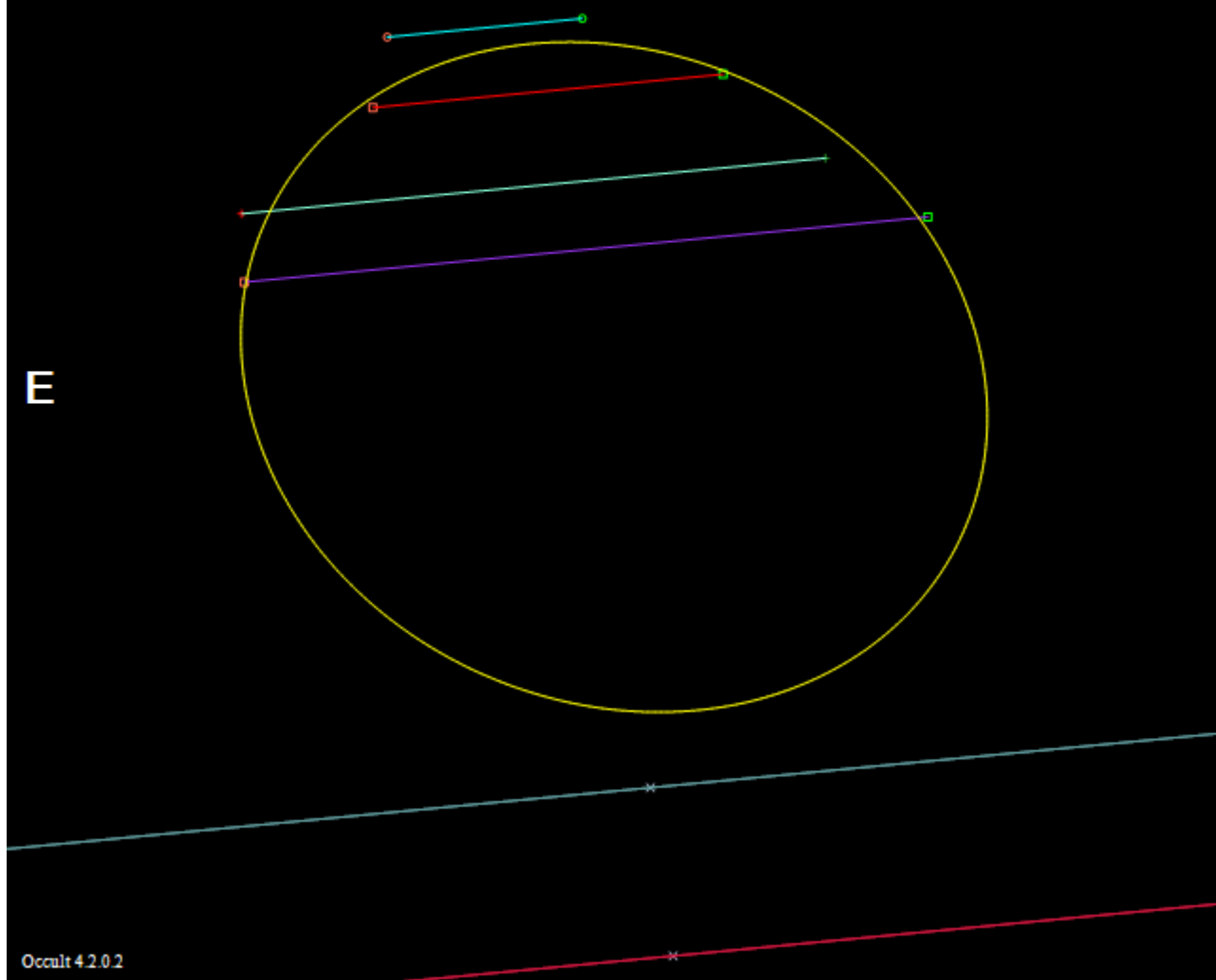


Occult 4.2.9.1

┌----- 50 km -----┐

694ekard2009nov08

(694) Ekard 2009 Nov 8 $88.5 \pm 74.9 \times 104.0 \pm 57.0$ km, PA $156.0^\circ \pm 129.5^\circ$
Geocentric X -94.9 ± 12.9 Y 4112.7 ± 47.7 km **N**



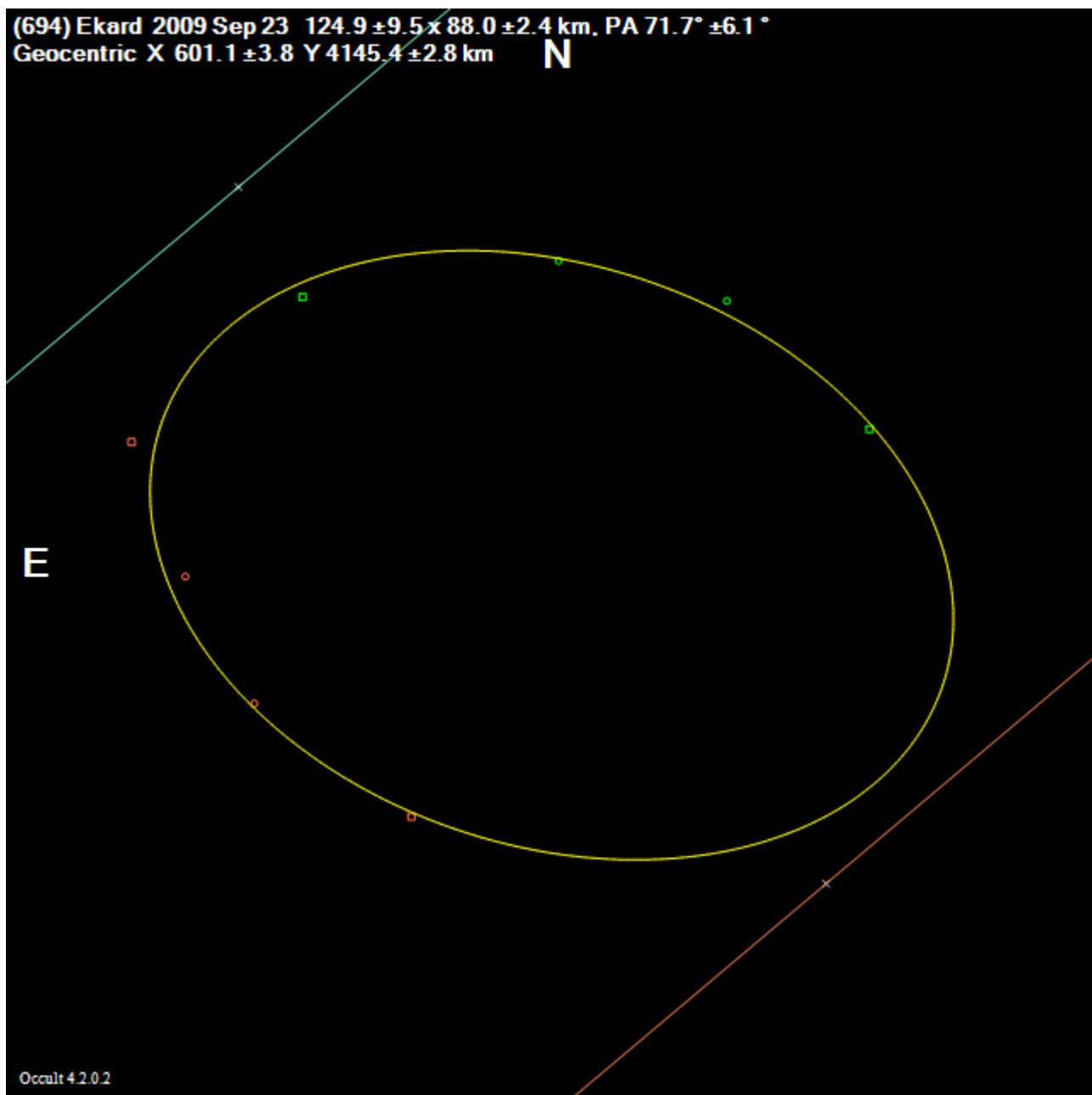
694ekard2009sep23

(694) Ekard 2009 Sep 23 $124.9 \pm 9.5 \times 88.0 \pm 2.4$ km, PA $71.7^\circ \pm 6.1^\circ$
Geocentric X 601.1 ± 3.8 Y 4145.4 ± 2.8 km

N

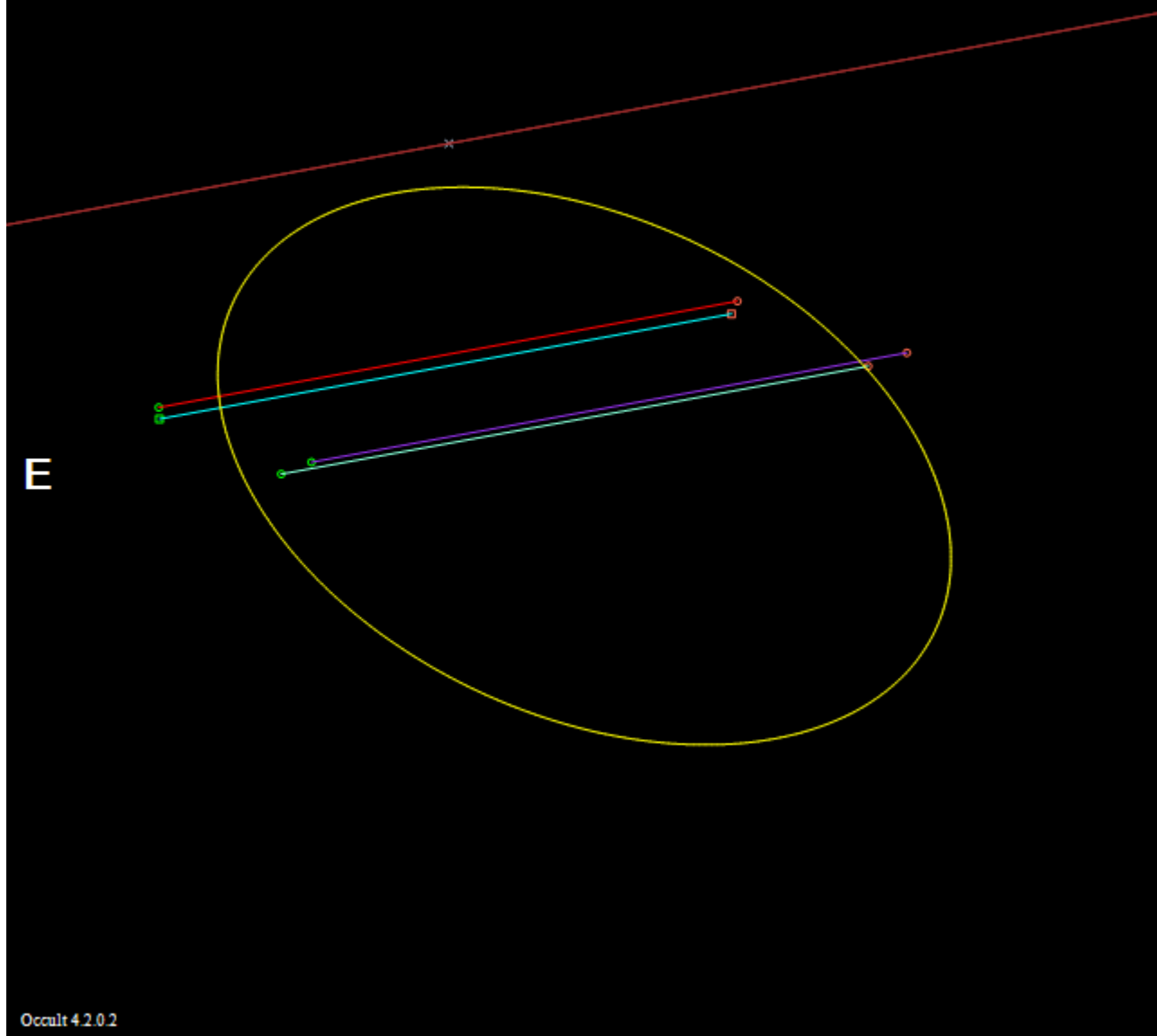
E

Occult 4.2.0.2



694ekard2011jan24

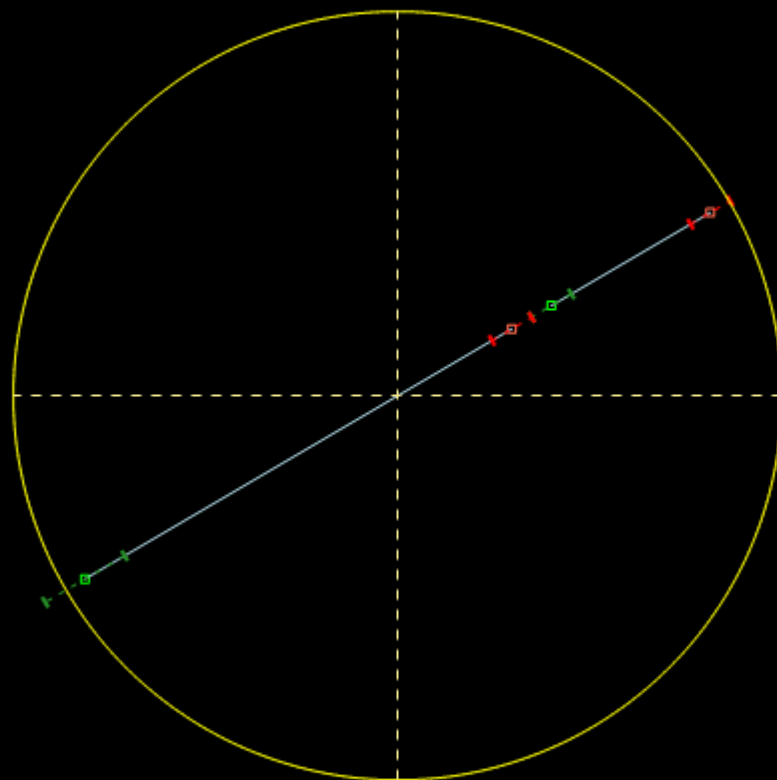
(694) Ekard 2011 Jan 24 140.0 x 90.0 km. PA $65.0^\circ \pm 12.8^\circ$
Geocentric X 2632.0 ± 9.5 Y 4357.6 ± 12.5 km **N**



694Ekard2016Mar04

(694) Ekard 2016 Mar 4 90.0 x 90.0 km, PA 0.0°
Geocentric X 3095.8 ± 665.9 Y -3797.2 ± 1146.4 km

E

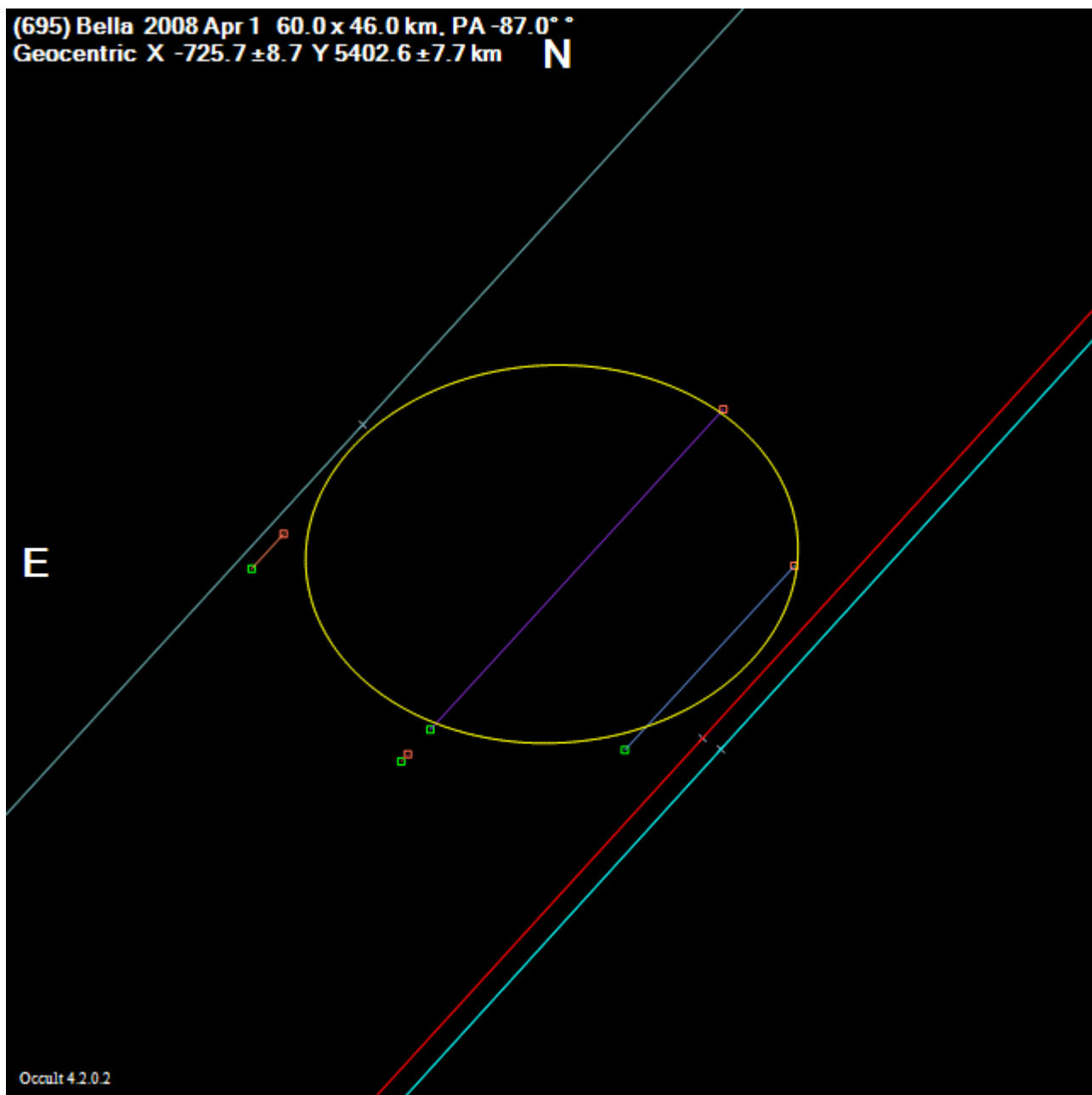


Occult 4.2.9.1

----- 50 km -----

695bella2008apr01

(695) Bella 2008 Apr 1 60.0 x 46.0 km, PA -87.0° °
Geocentric X -725.7 ± 8.7 Y 5402.6 ± 7.7 km **N**

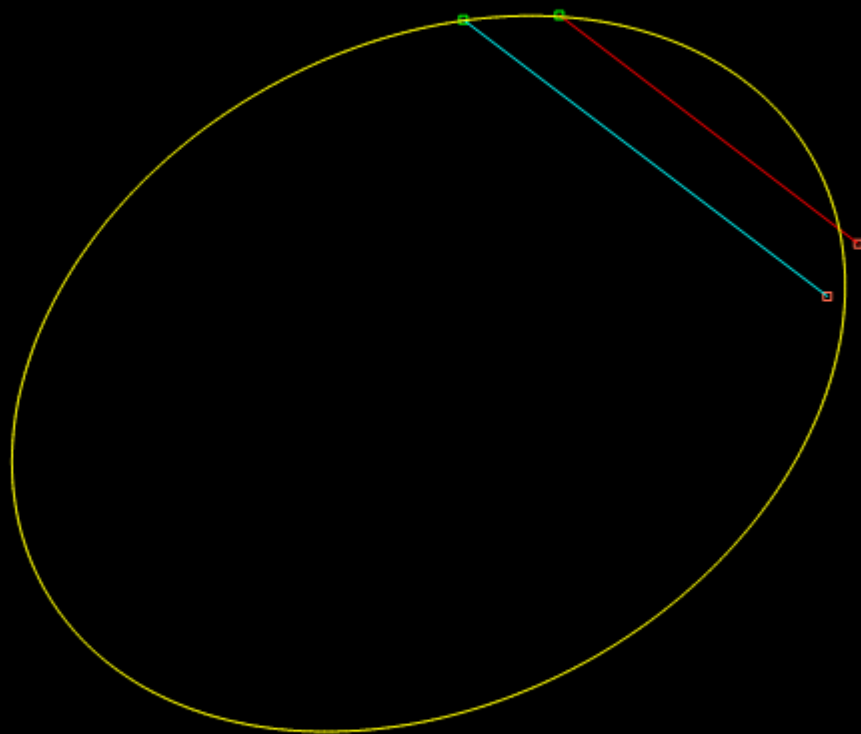


695bella2010nov01

(695) Bella 2010 Nov 1 55.0 x 41.0 km, PA -60.9° ± 22.2°
Geocentric X -2994.0 ± 2.1 Y 1377.1 ± 2.4 km **N**

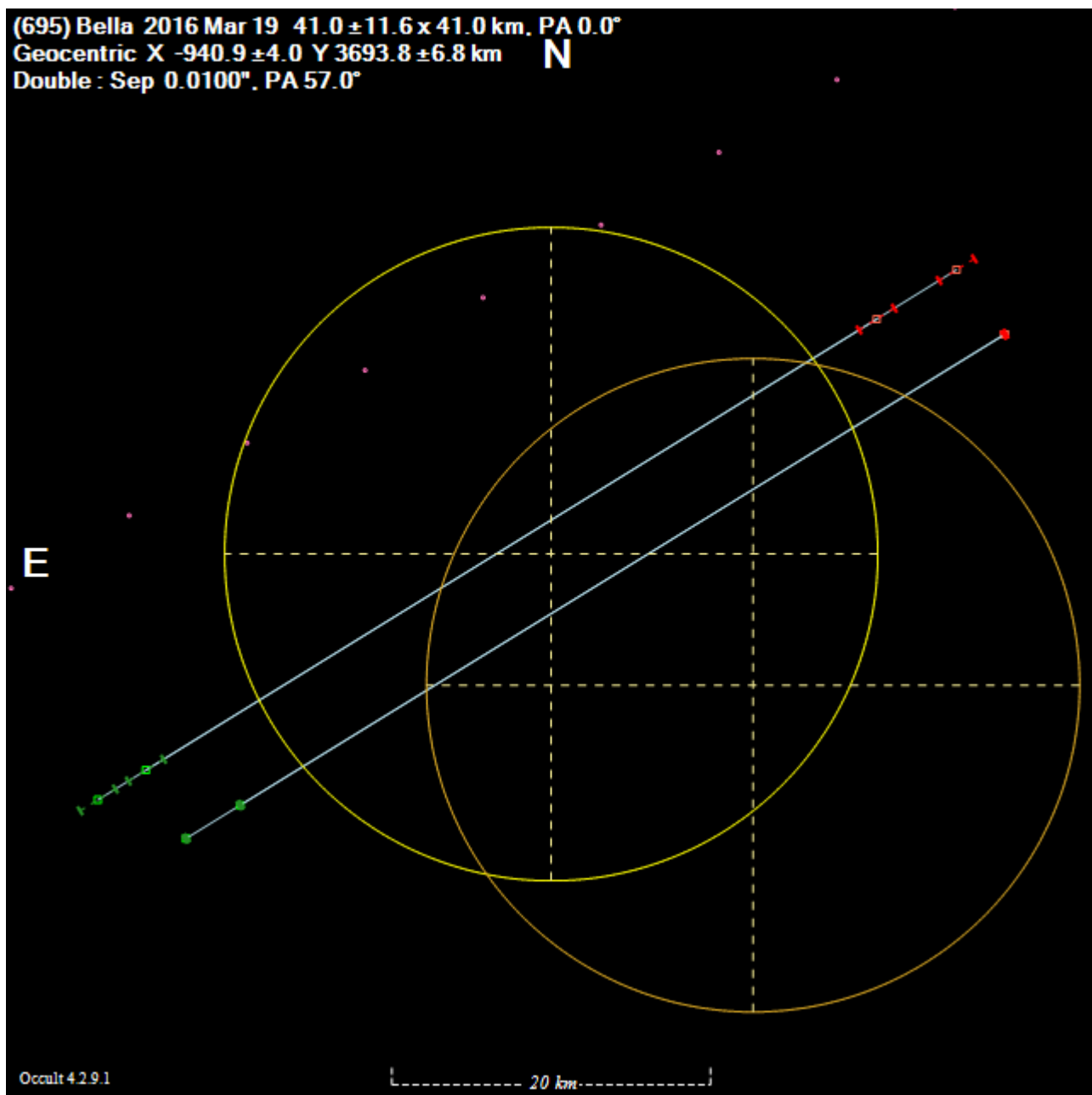
E

Occult 4.2.0.2



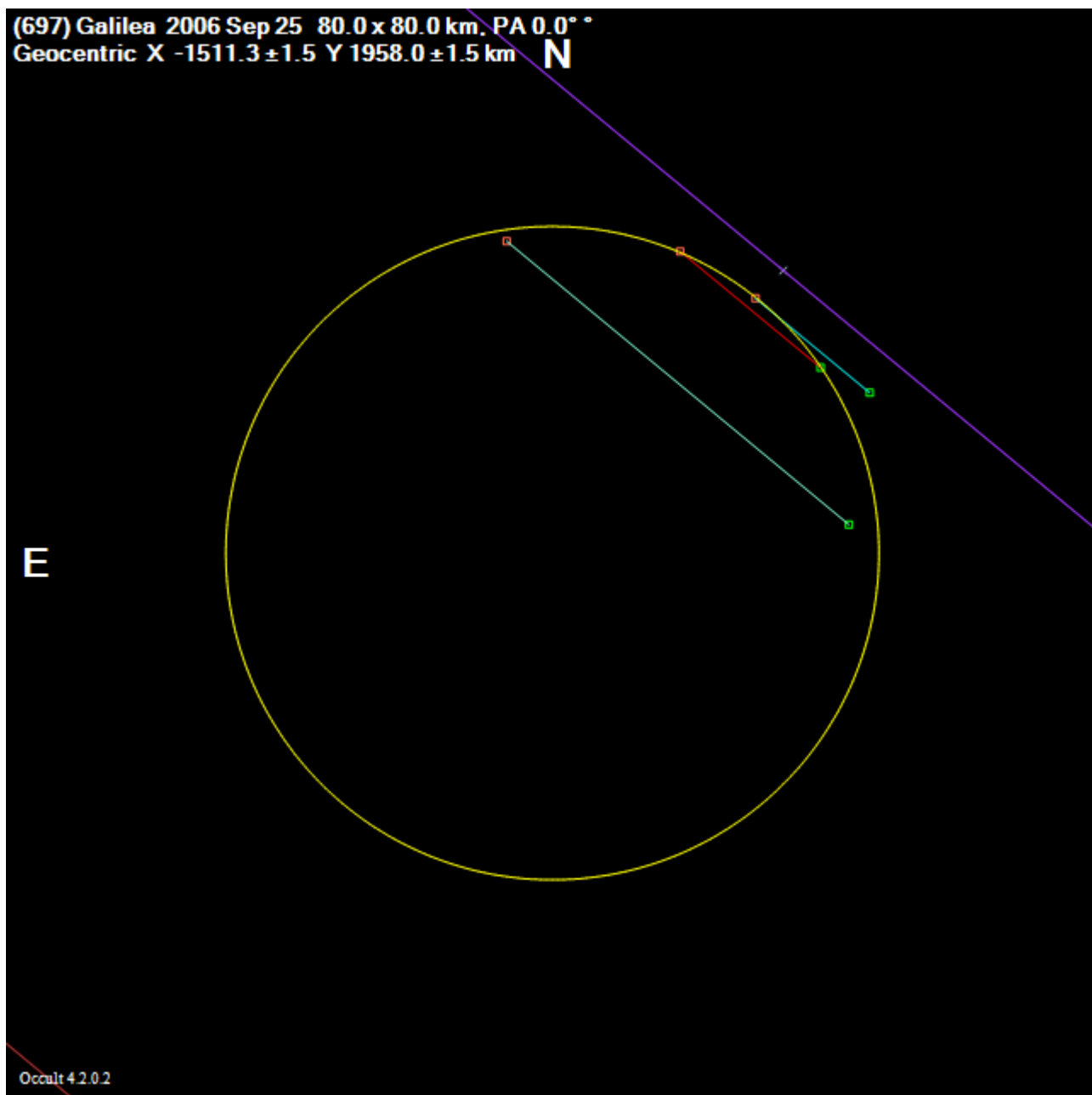
695Bella2016Mar19

(695) Bella 2016 Mar 19 $41.0 \pm 11.6 \times 41.0$ km, PA 0.0°
Geocentric X -940.9 ± 4.0 Y 3693.8 ± 6.8 km **N**
Double : Sep $0.0100''$, PA 57.0°



697galilea2006sep25

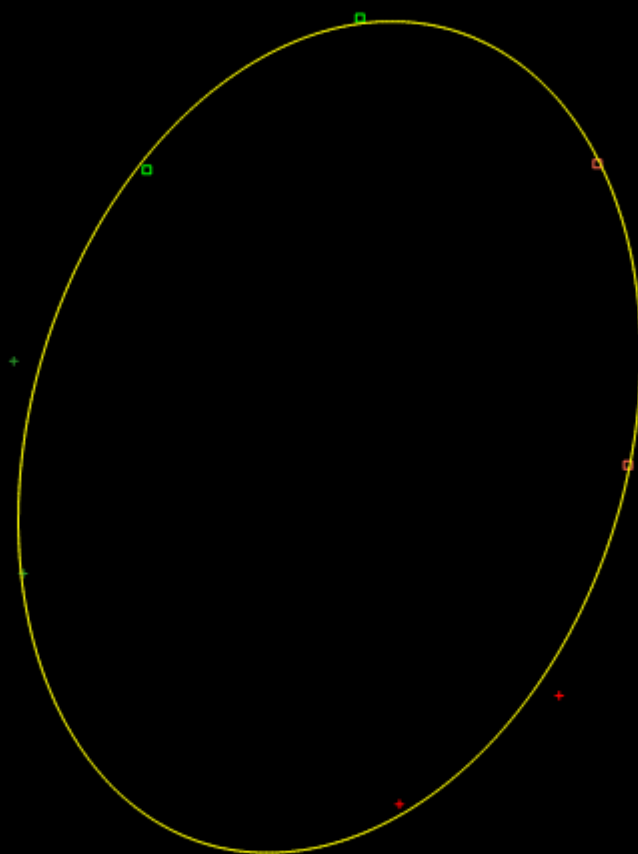
(697) Galilea 2006 Sep 25 80.0 x 80.0 km, PA 0.0° °
Geocentric X -1511.3 ± 1.5 Y 1958.0 ± 1.5 km **N**



697galilea2007jan08

(697) Galilea 2007 Jan 8 $88.5 \pm 2.2 \times 62.1 \pm 0.9$ km, PA $-17.1^\circ \pm 2.2^\circ$
Geocentric X -1280.0 ± 0.6 Y -421.2 ± 0.9 km **N**

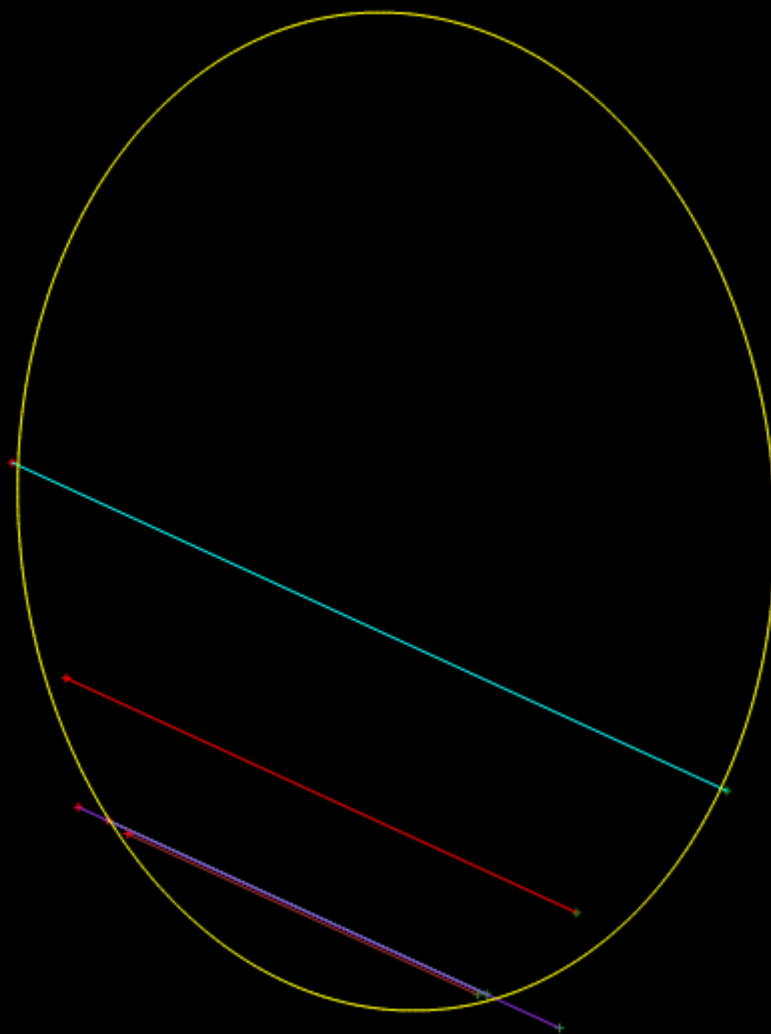
E



6hebe1977mar05

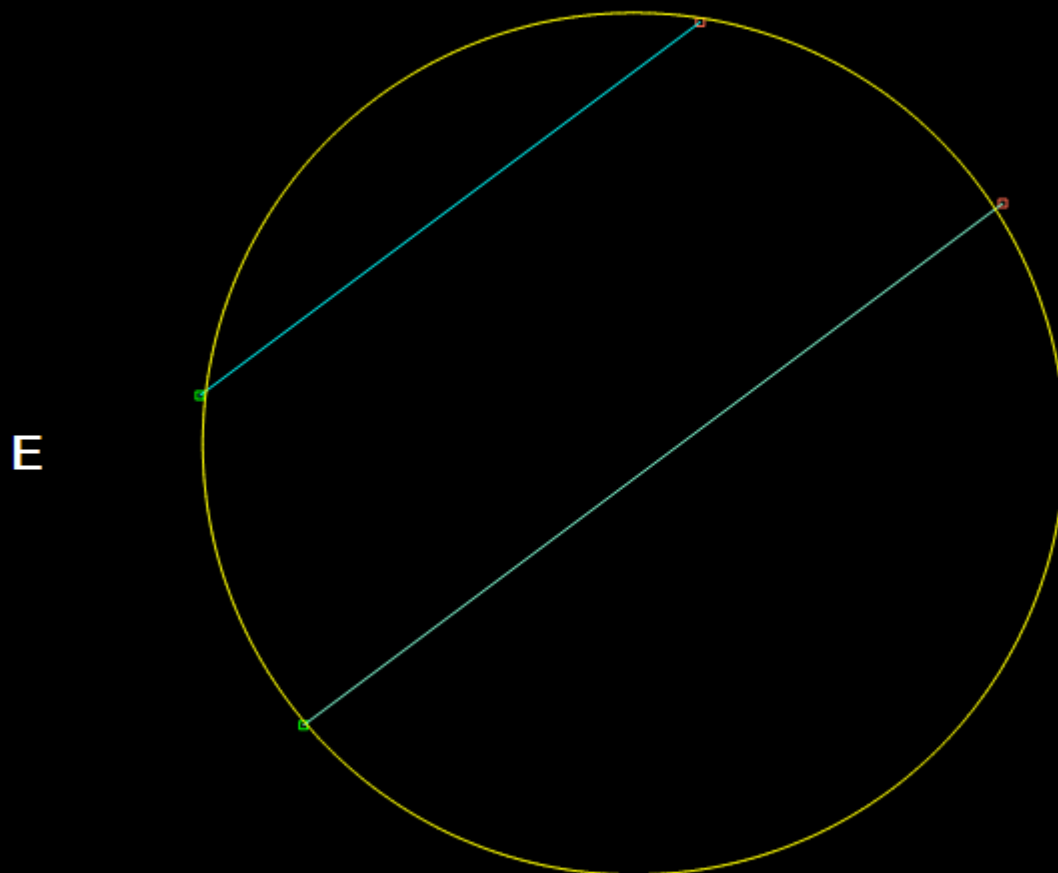
(6) Hebe 1977 Mar 5 $240.6 \times 182.0 \pm 10.4$ km, PA $4.5^\circ \pm 10.6^\circ$
Geocentric X 5173.1 ± 6.5 Y 1984.4 ± 3.4 km **N**

E



6hebe2008feb20

(6) Hebe 2008 Feb 20 $207.5 \pm 2.9 \times 207.5$ km, PA 0.0°
Geocentric X -4610.4 ± 1.0 Y 1871.6 ± 1.4 km **N**



701oriola2002apr21

(701) Oriola 2002 Apr 21 $51.0 \pm 0.0 \times 41.3 \pm 0.0$ km, PA $-69.6^\circ \pm 0.0^\circ$
Geocentric X 3438.8 ± 0.0 Y 3512.9 ± 0.0 km **N**

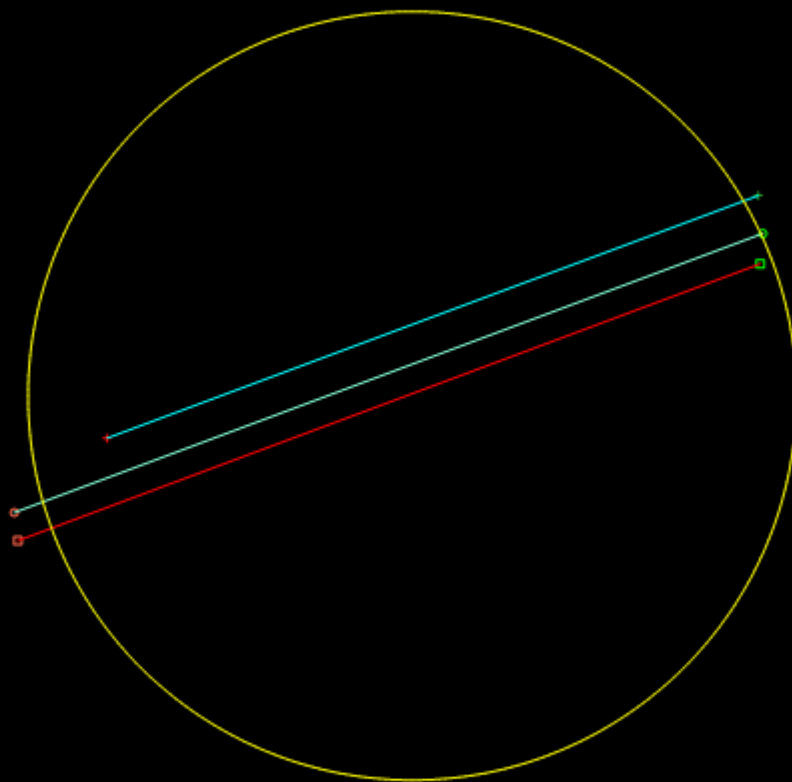
E



702alauda2004mar21

(702) Alauda 2004 Mar 21 194.0 x 194.0 km, PA 0.0°
Geocentric X 4162.9 ± 9.7 Y 2198.6 ± 25.6 km **N**

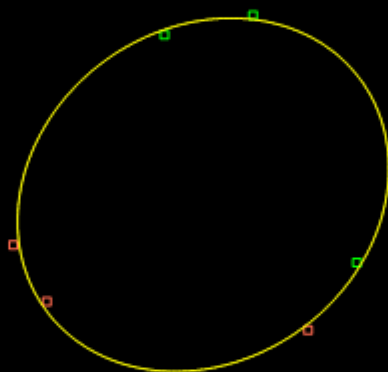
E



702alauda2008dec24

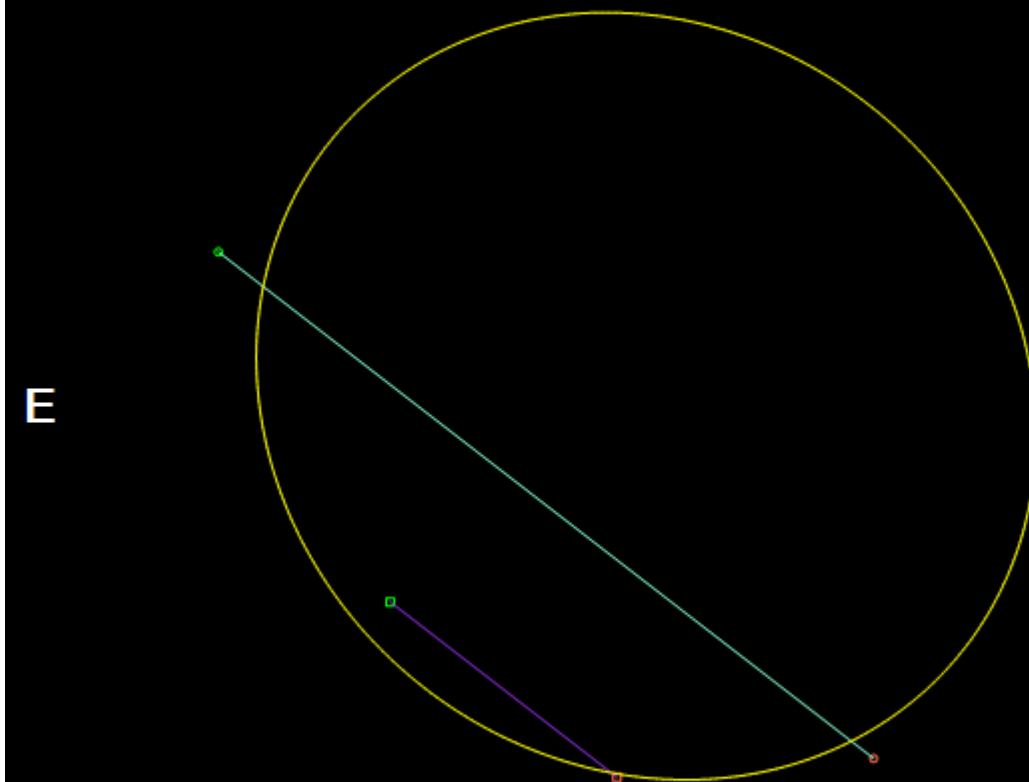
(702) Alauda 2008 Dec 24 $219.5 \pm 6.9 \times 187.1 \pm 4.7$ km, PA $-54.1^\circ \pm 9.8^\circ$
Geocentric X -713.7 ± 3.0 Y 1227.9 ± 2.7 km **N**

E



702alauda2008nov03

(702) Alauda 2008 Nov 3 205.0 x 185.0 km, PA 49.6° ± 95.7°
Geocentric X 644.1 ± 12.4 Y -1332.2 ± 12.1 km **N**



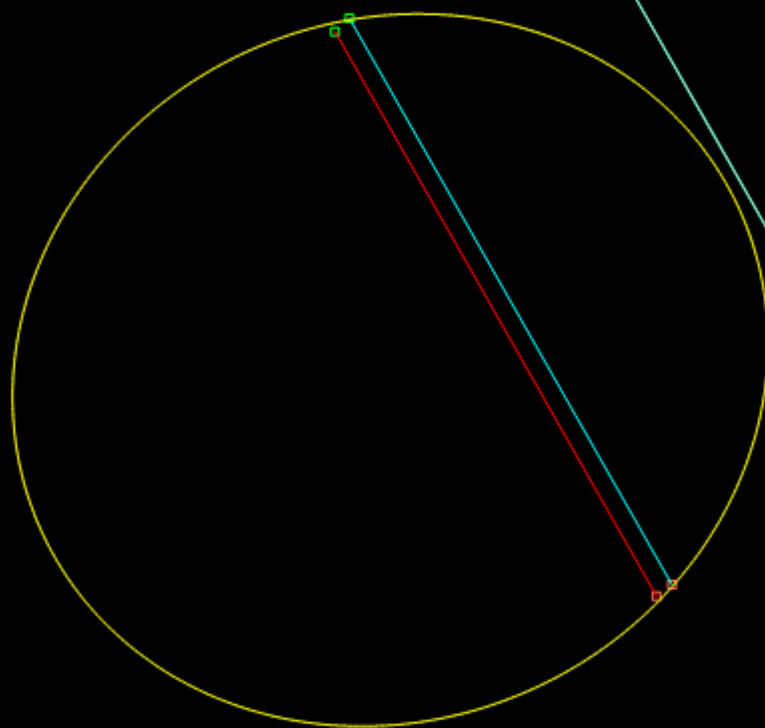
Occult 4.2.0.2

702alauda2014dec18

(702) Alauda 2014 Dec 18 219.0 x 199.0 km, PA 116.0°
Geocentric X 3952.7 ± 1.5 Y -4958.9 ± 1.0 km **N**

E

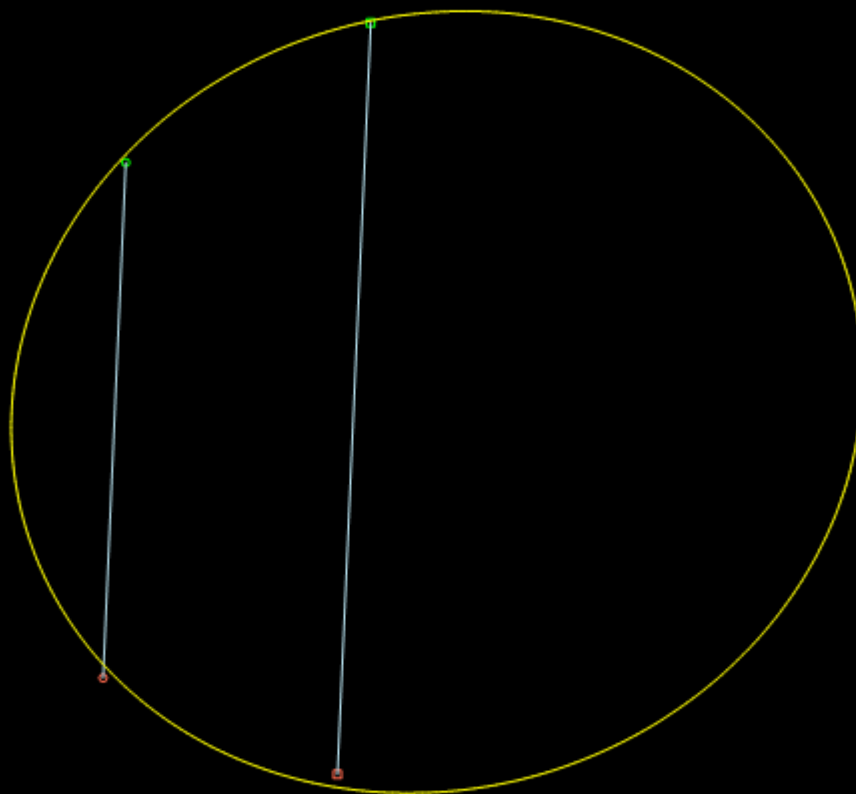
Occult 4.2.0.2



702alauda2015jan05

(702) Alauda 2015 Jan 5 226.0 x 203.0 km, PA $-71.2^\circ \pm 10.0^\circ$
Geocentric X -1917.0 ± 2.0 Y 1171.4 ± 1.7 km **N**

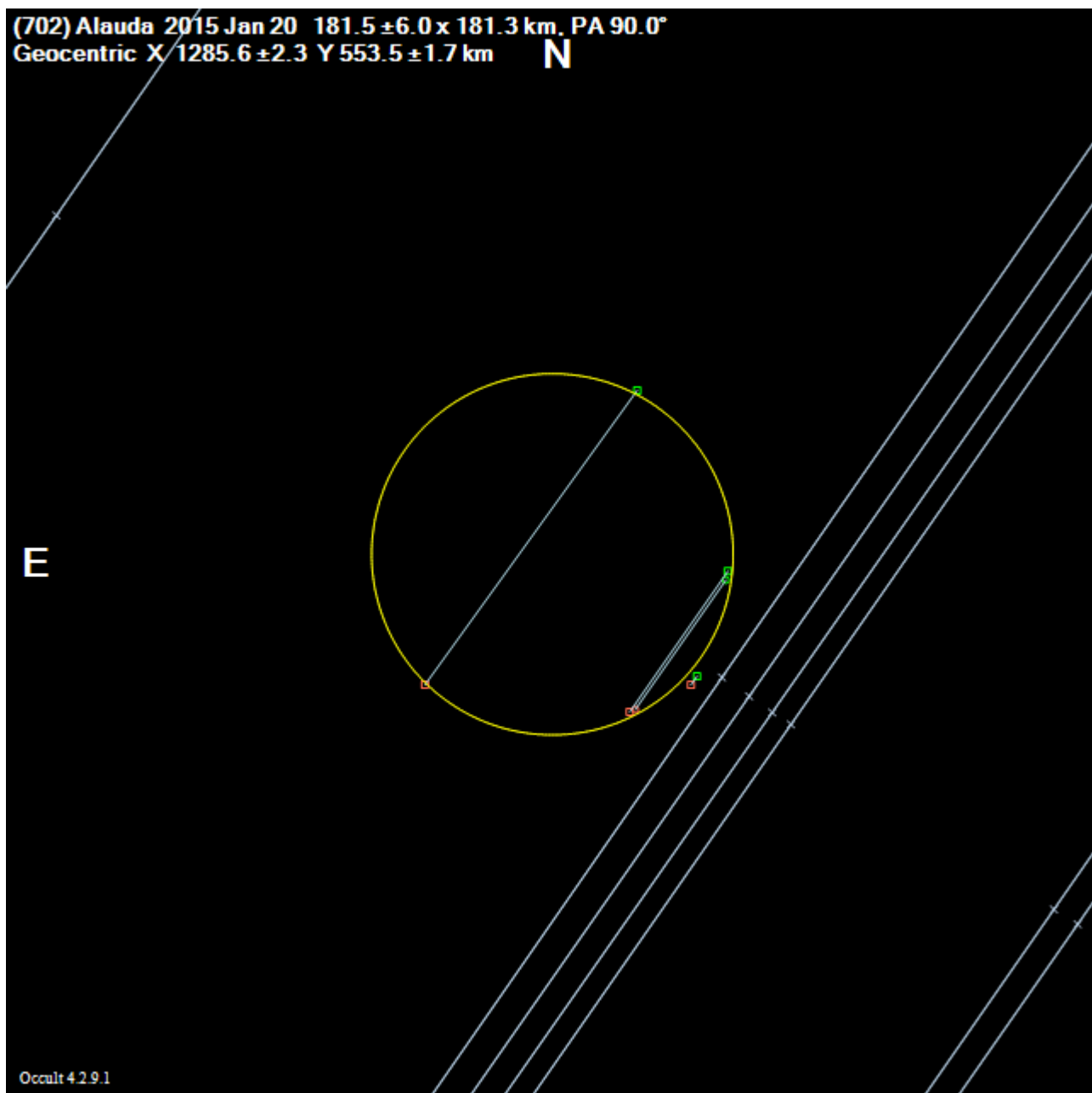
E



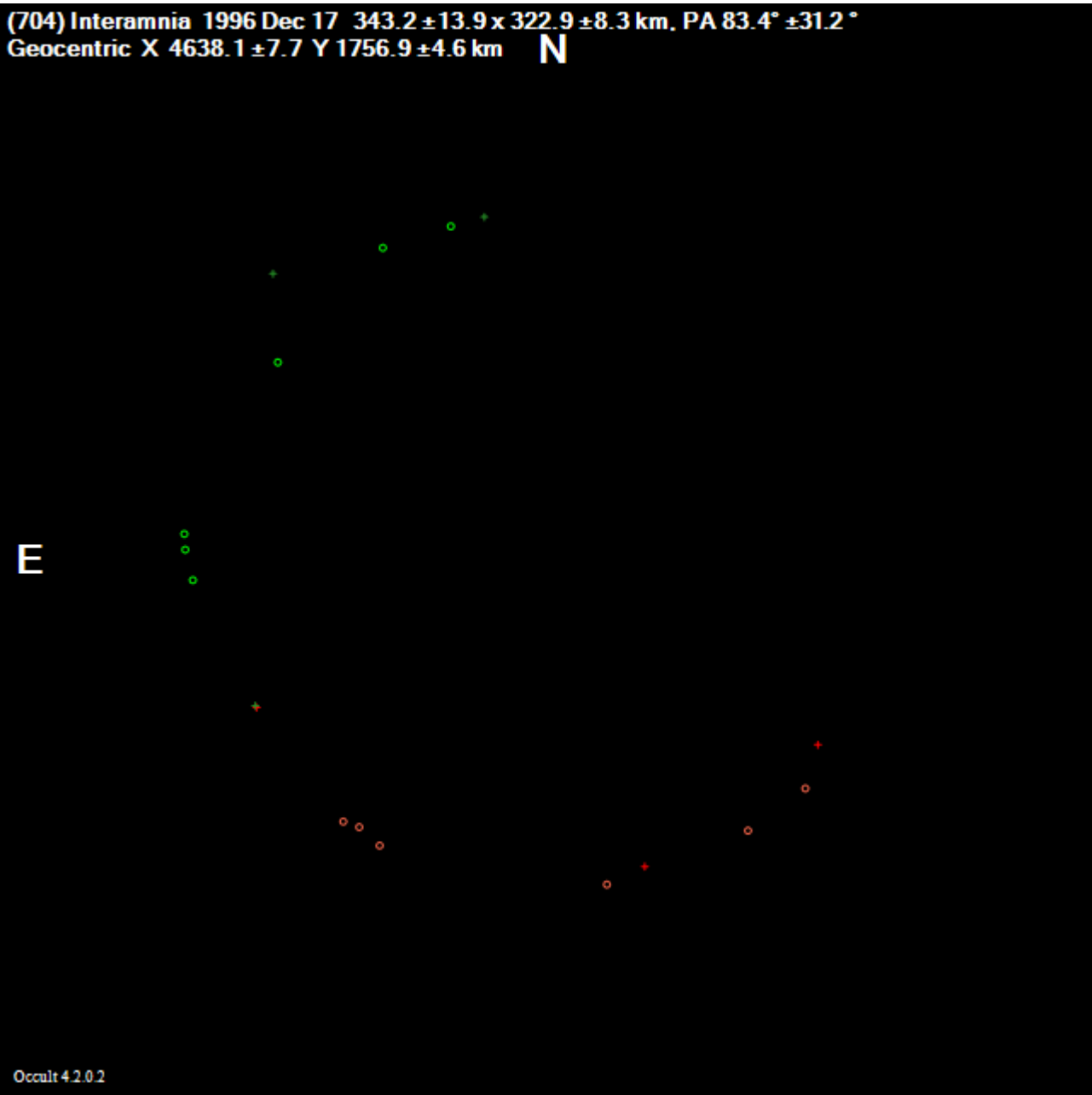
Occult 4.2.9.1

702alauda2015jan20

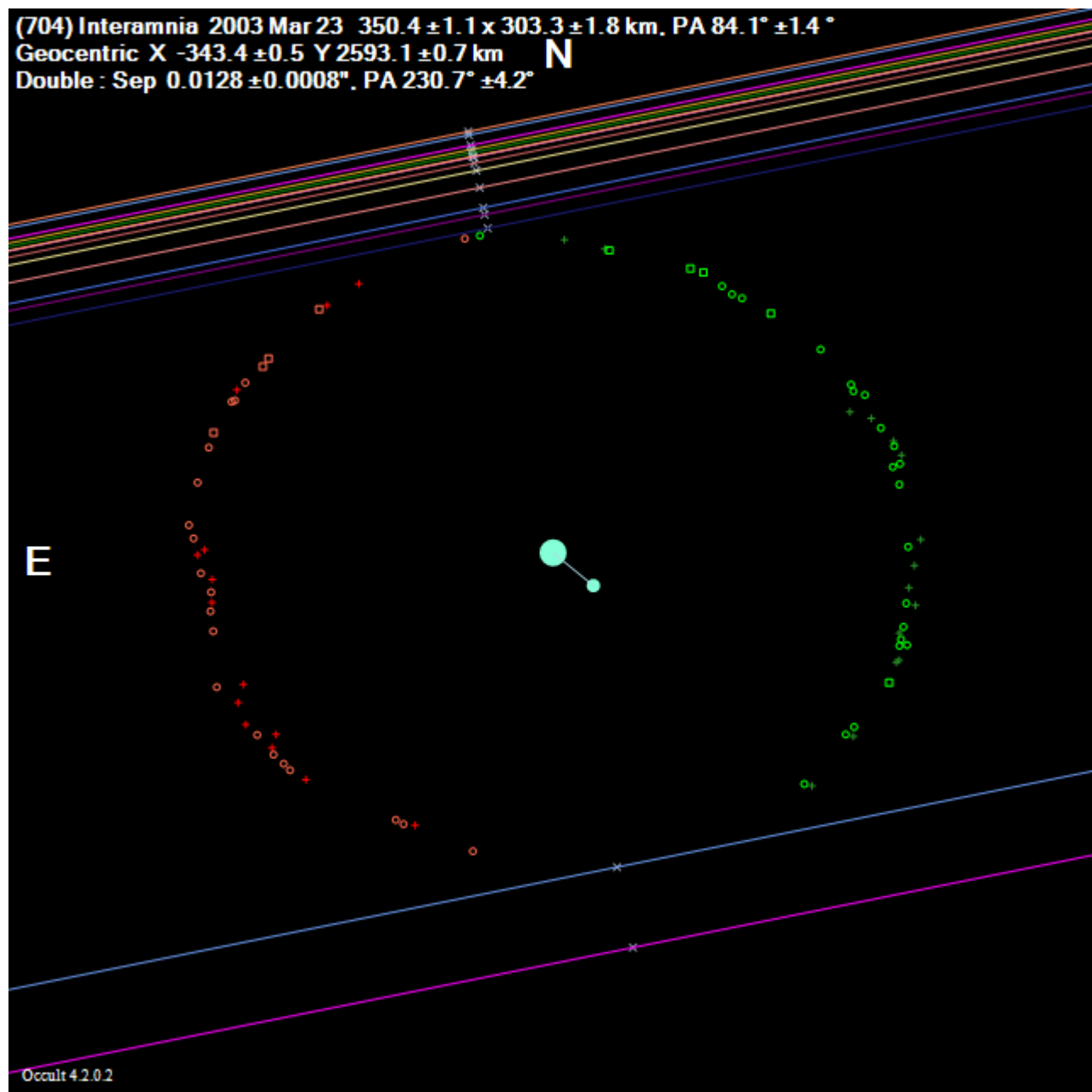
(702) Alauda 2015 Jan 20 $181.5 \pm 6.0 \times 181.3$ km. PA 90.0°
Geocentric X 1285.6 ± 2.3 Y 553.5 ± 1.7 km N



704interamnia1996dec17



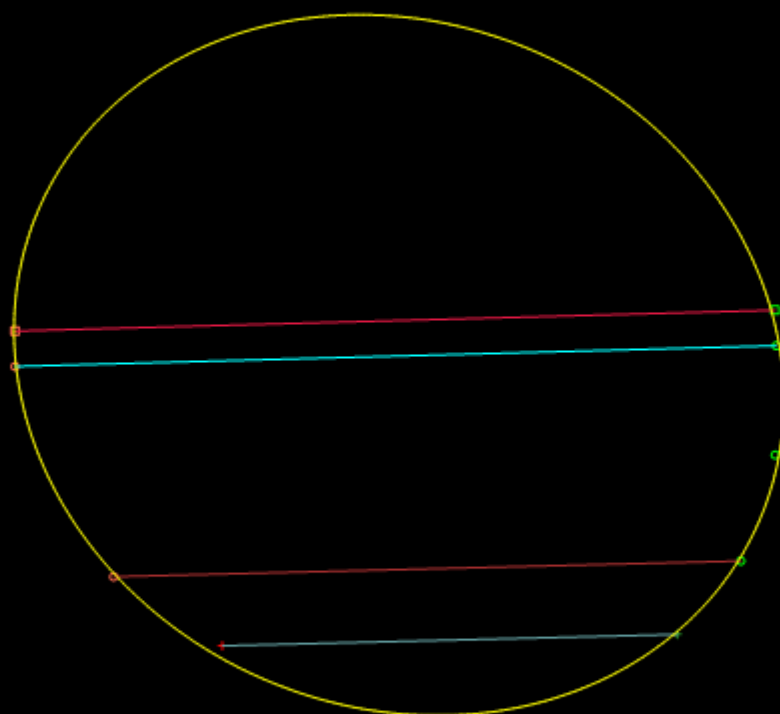
704interamnia2003mar23



704interamnia2007sep09

(704) Interamnia 2007 Sep 9 $357.5 \pm 2.9 \times 311.4 \pm 8.4$ km, PA $66.6^\circ \pm 6.4^\circ$
Geocentric X -3708.7 ± 0.6 Y 1805.0 ± 3.4 km **N**

E

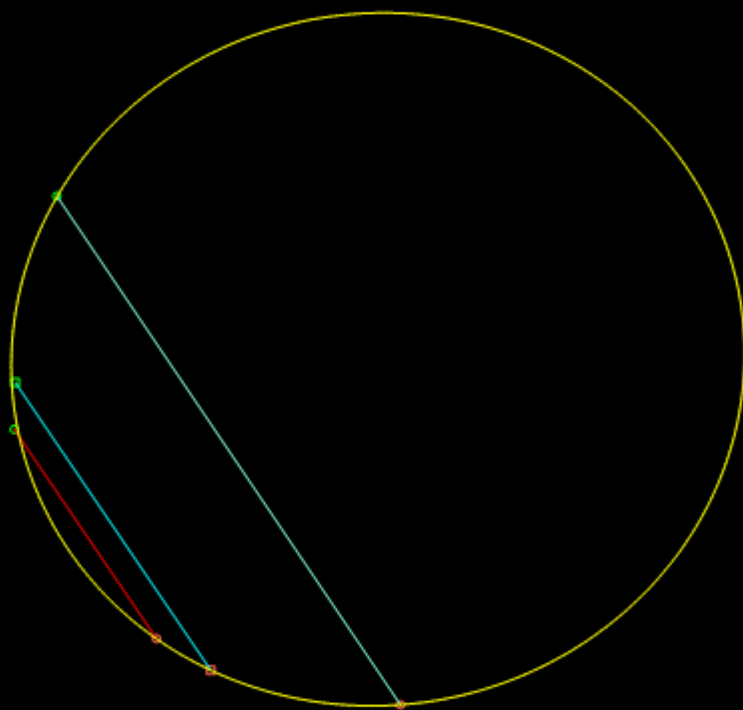


704interamnia2009jan11

(704) Interamnia 2009 Jan 11 $334.3 \pm 9.9 \times 315.2 \pm 3.0$ km, PA 98.0° °
Geocentric X 27.6 ± 4.6 Y 5346.2 ± 1.2 km

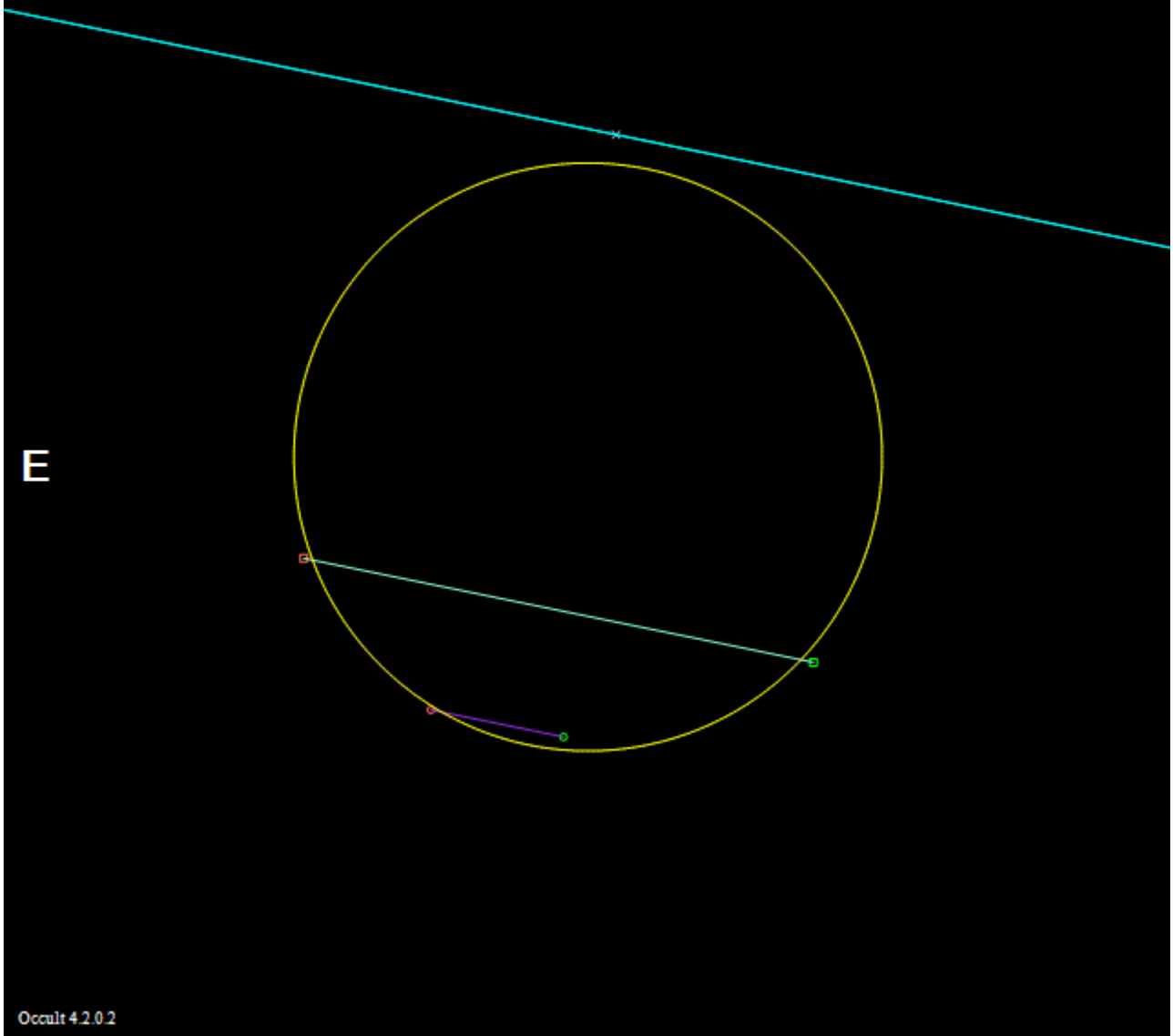
N

E



704interamnia2011nov05

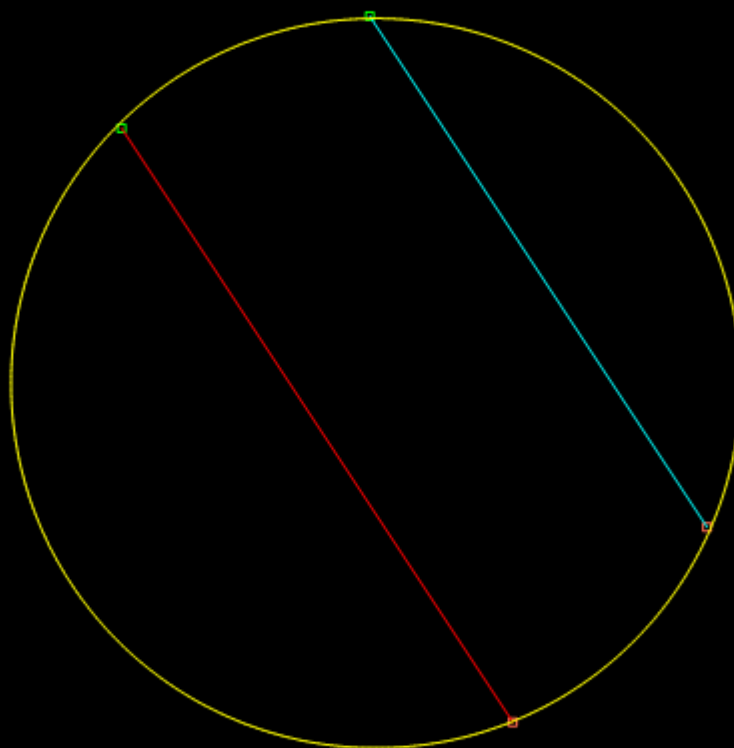
(704) Interamnia 2011 Nov 5 300.0 x 300.0 km, PA 0.0°
Geocentric X 4071.4 ± 3.6 Y 3902.5 ± 3.2 km **N**



704interamnia2012dec02

(704) Interamnia 2012 Dec 2 $338.9 \pm 2.0 \times 338.9$ km, PA 0.0° °
Geocentric X 4548.5 ± 1.5 Y 3163.5 ± 1.2 km **N**

E



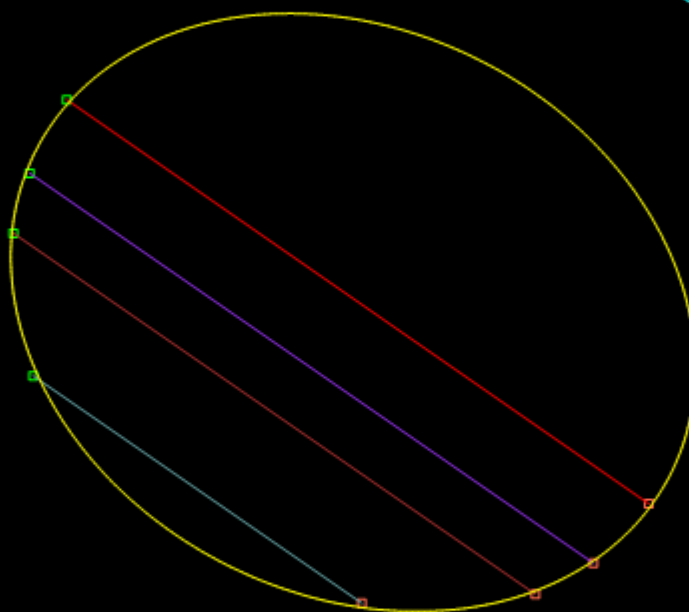
704interamnia2012nov12

(704) Interamnia 2012 Nov 12 $330.9 \pm 2.2 \times 262.2 \pm 10.7$ km, PA $63.0^\circ \pm 2.4^\circ$
Geocentric X -2631.4 ± 2.8 Y -108.1 ± 3.4 km

N

E

Occult 4.2.0.2

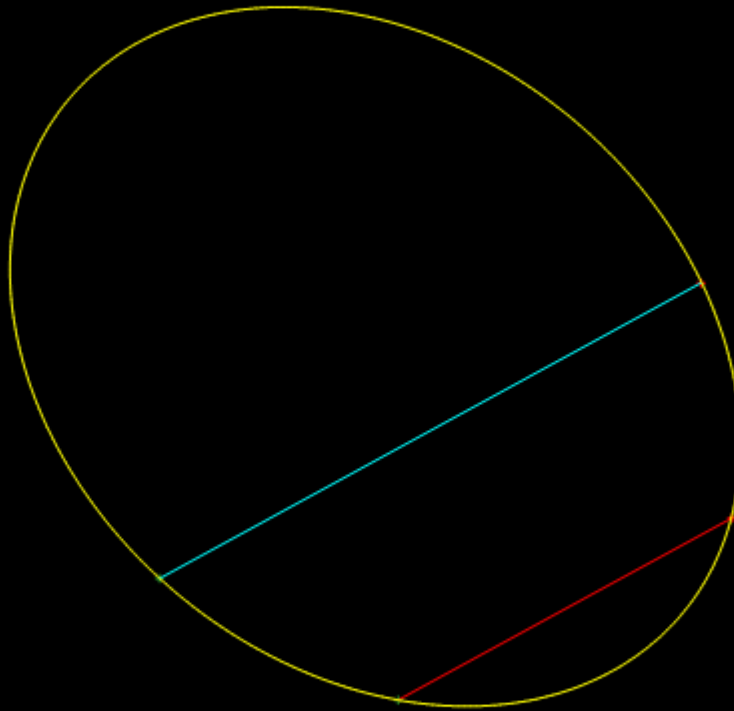


705erminia1998may31

(705) Erminia 1998 May 31 139.6 x 107.7 km, PA 50.0°
Geocentric X 4670.7 Y -2246.7 km

N

E



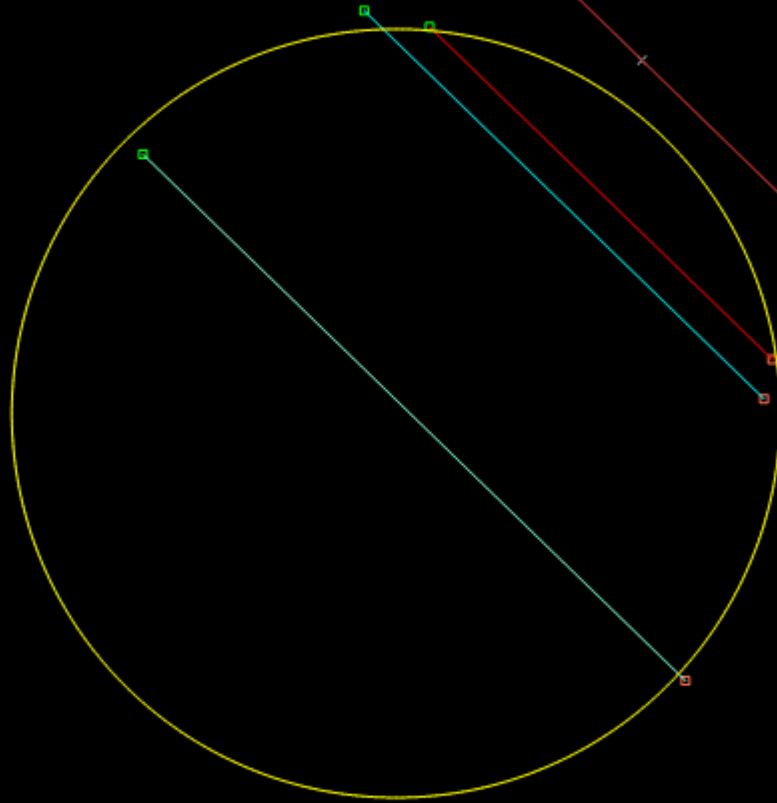
705erminia2008mar24

(705) Erminia 2008 Mar 24 134.0 x 134.0 km, PA 0.0°
Geocentric X 2579.4 ± 0.8 Y 5615.1 ± 0.8 km

N

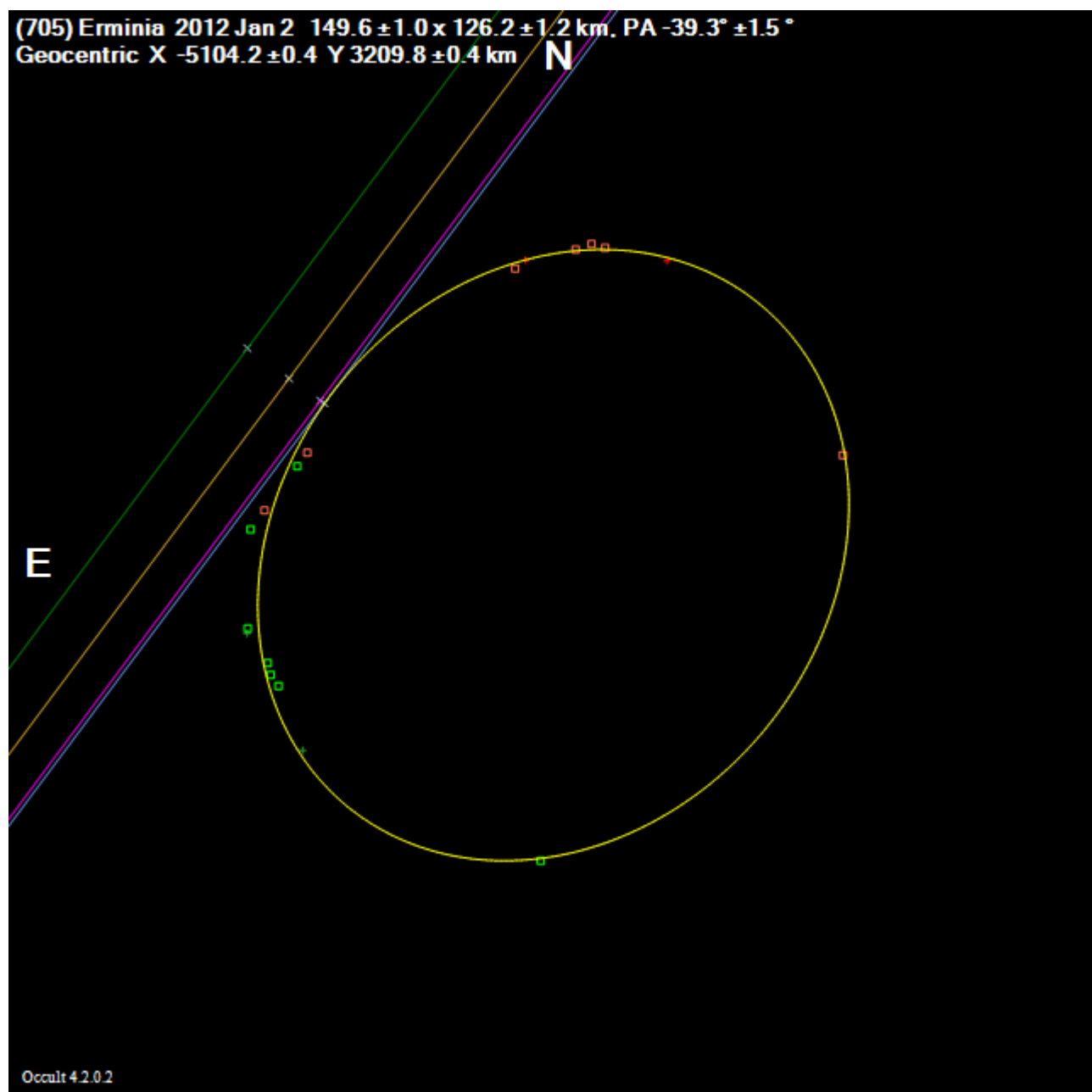
E

Occult 4.2.0.2



705erminia2012jan02

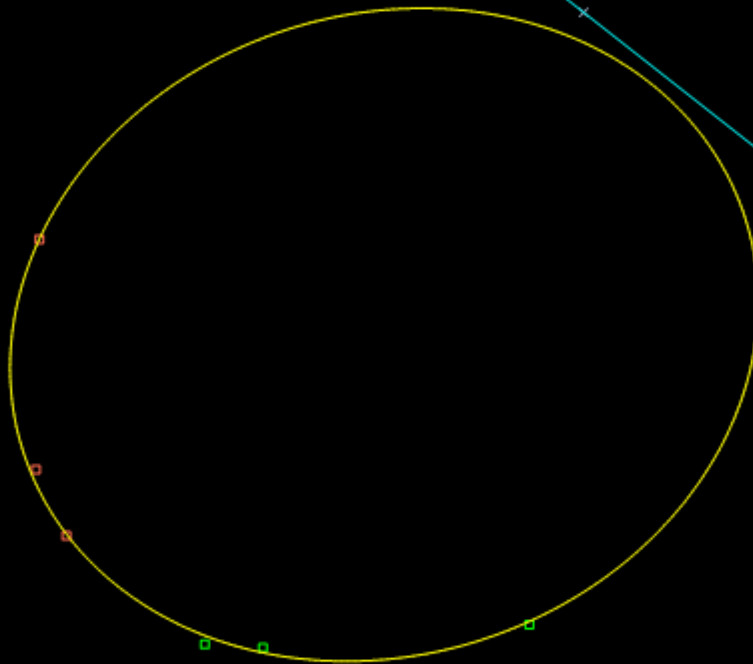
(705) Erminia 2012 Jan 2 $149.6 \pm 1.0 \times 126.2 \pm 1.2$ km, PA $-39.3^\circ \pm 1.5^\circ$
Geocentric X -5104.2 ± 0.4 Y 3209.8 ± 0.4 km



705erminia2014dec08

(705) Erminia 2014 Dec 8 148.1 x 125.0 km, PA -71.8° ± 3.8°
Geocentric X 5519.4 ± 0.6 Y -1997.2 ± 0.8 km **N**

E



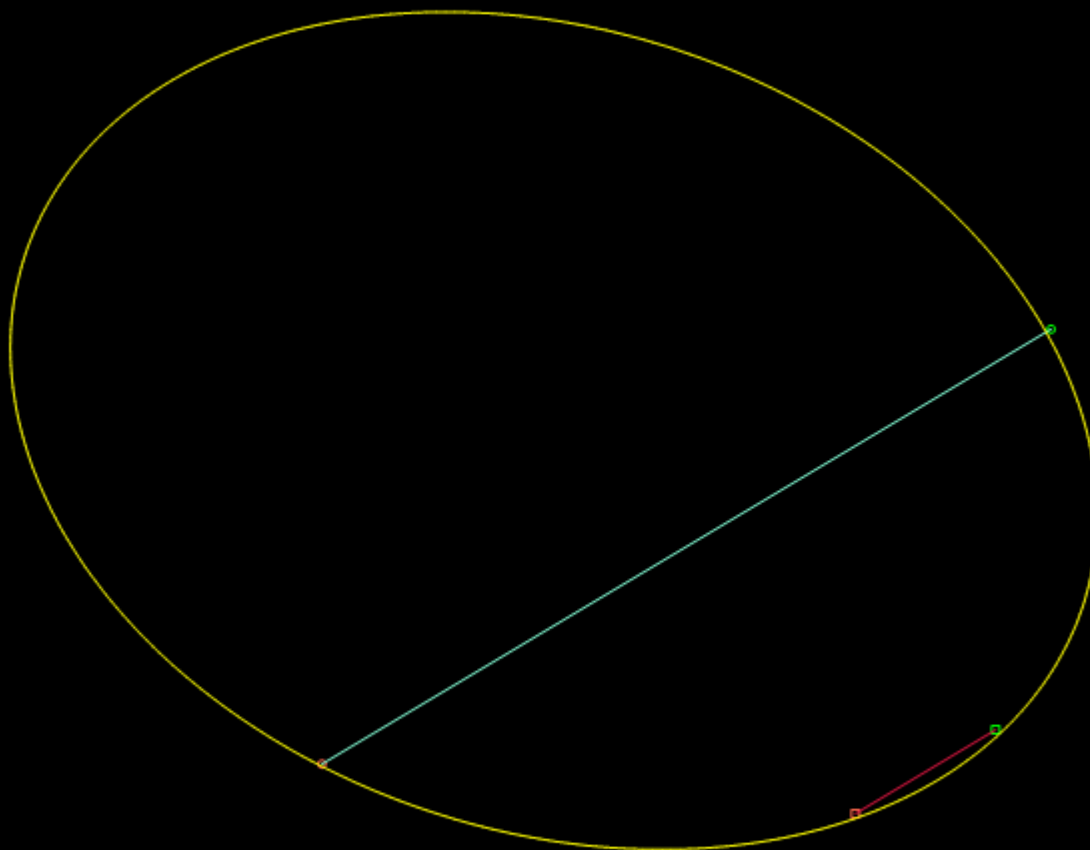
707steina2003nov24

(707) Steina 2003 Nov 24 17.4 x 12.5 km, PA 71.5° °
Geocentric X 1518.1 Y 2999.8 km

N

E

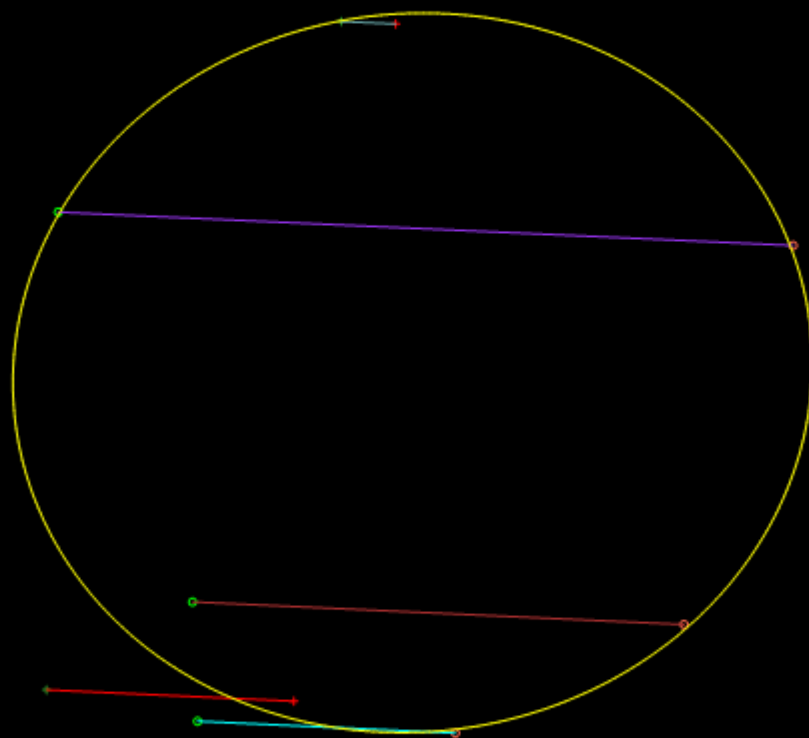
Occult 4.2.0.2



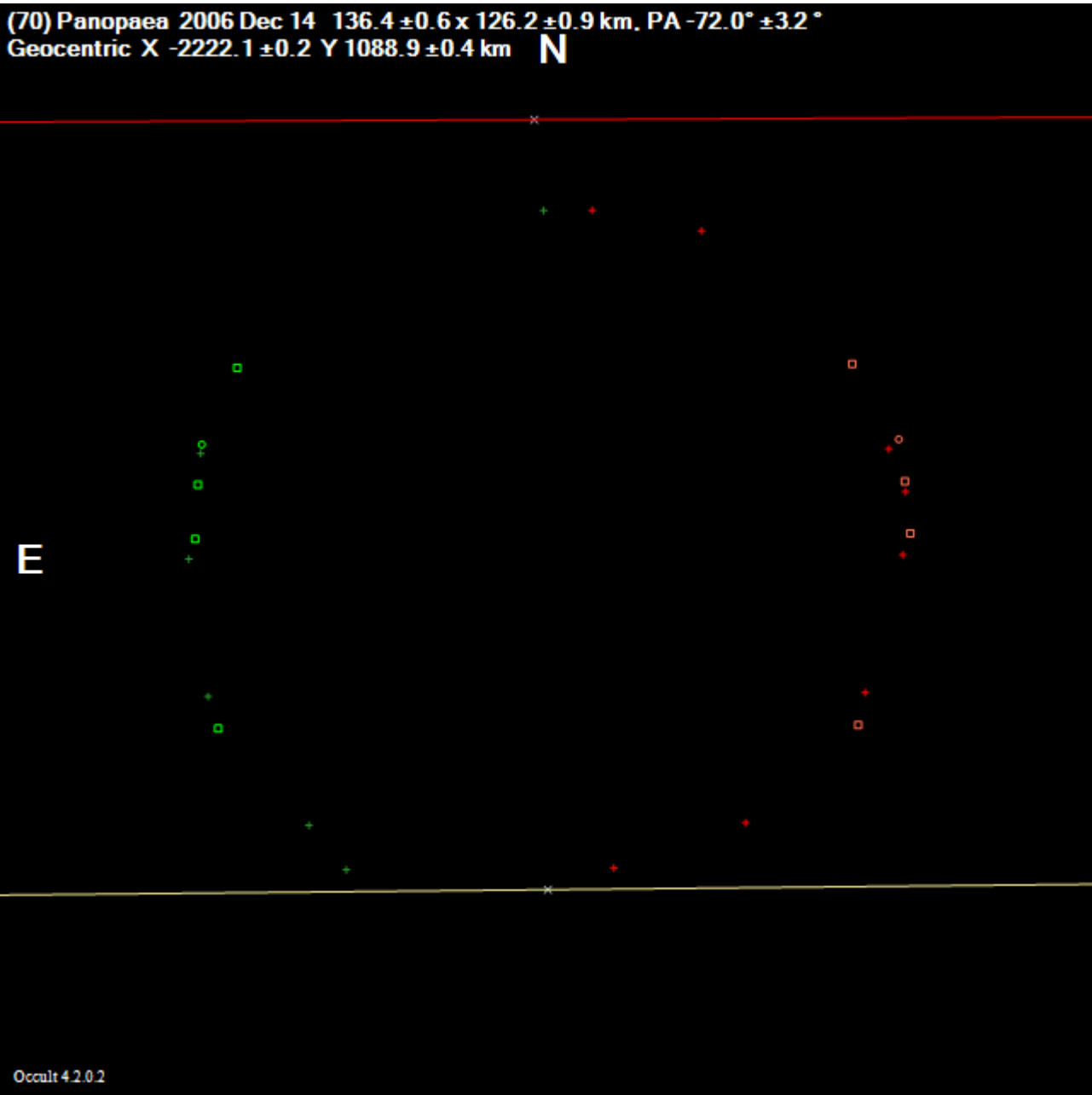
709fringilla2003sep26

(709) Fringilla 2003 Sep 26 $100.0 \pm 6.5 \times 89.7 \pm 6.5$ km, PA $-82.8^\circ \pm 24.8^\circ$
Geocentric X 2117.3 ± 2.4 Y 4500.9 ± 2.6 km **N**

E



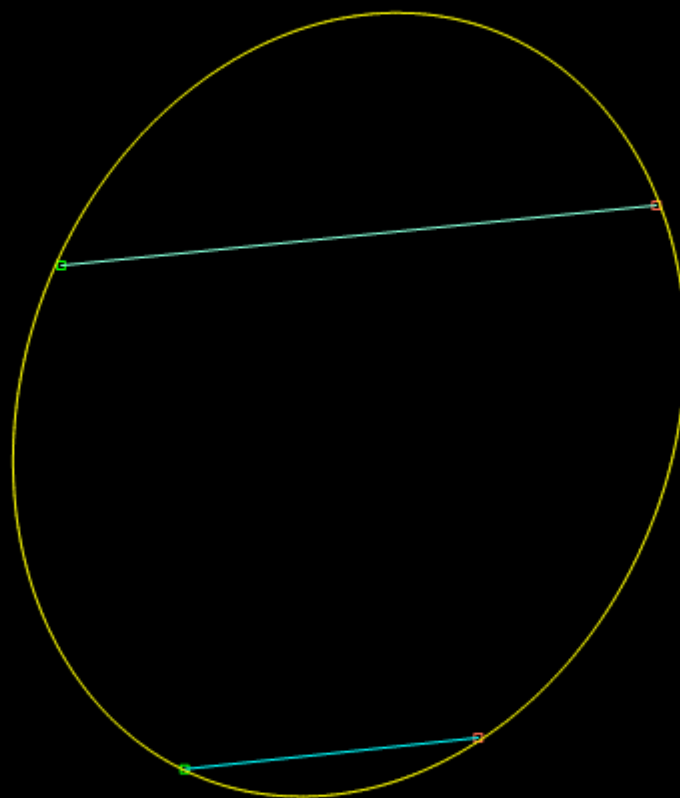
70panopaea2006dec14



70panopaea2014oct04

(70) Panopaea 2014 Oct 4 142.0 x 115.0 km, PA -21.5° ±0.9°
Geocentric X 5443.0 ±0.2 Y -2399.6 ±0.2 km **N**

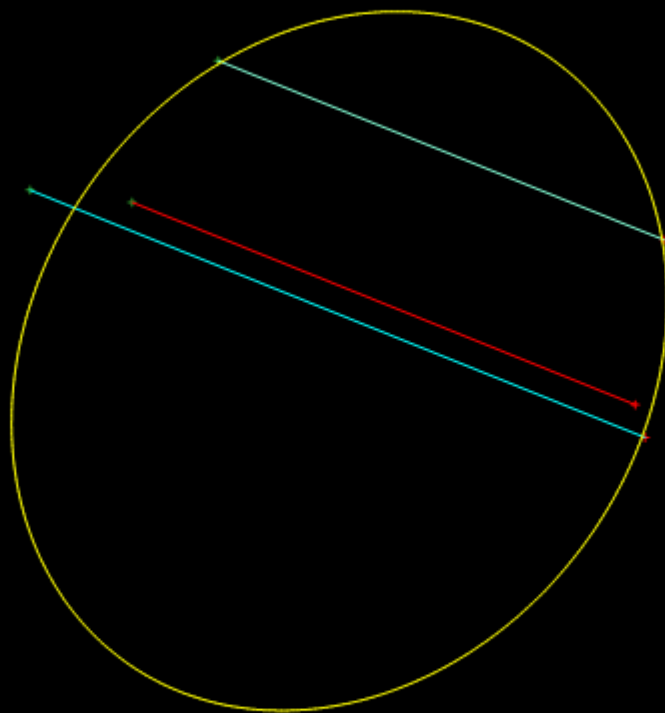
E



712boliviana2001dec19

(712) Boliviana 2001 Dec 19 122.0 x 101.0 km, PA -35.0° °
Geocentric X -2283.2 ±2.9 Y 3262.8 ±4.8 km **N**

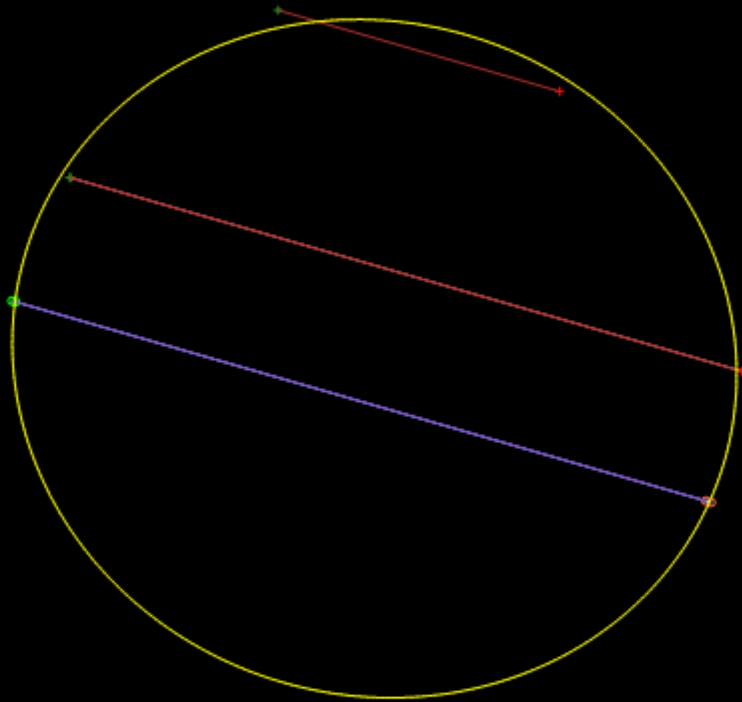
E



712boliviana2001dec28

(712) Boliviana 2001 Dec 28 $120.5 \pm 1.2 \times 111.2 \pm 8.4$ km, PA $72.5^\circ \pm 15.2^\circ$
Geocentric X 739.0 ± 1.0 Y 3121.0 ± 3.2 km **N**

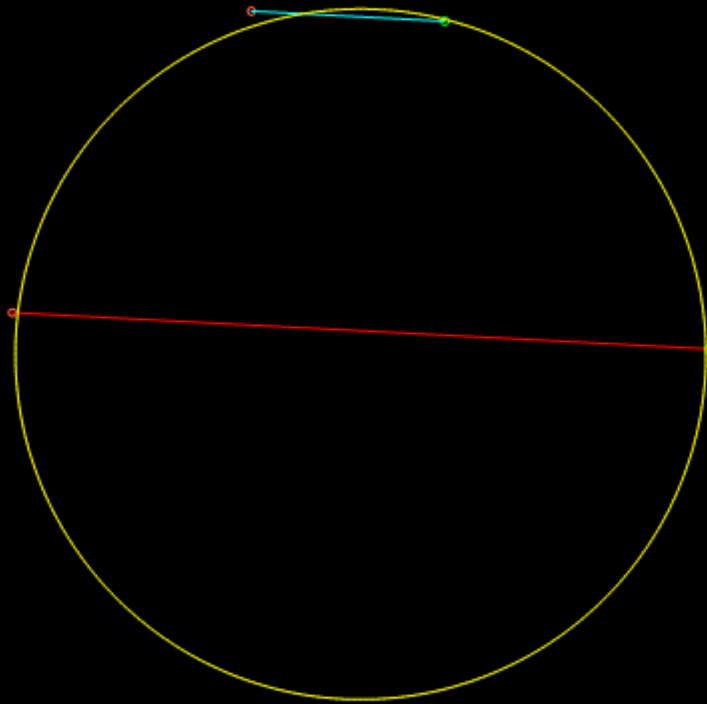
E



712boliviana2004nov14

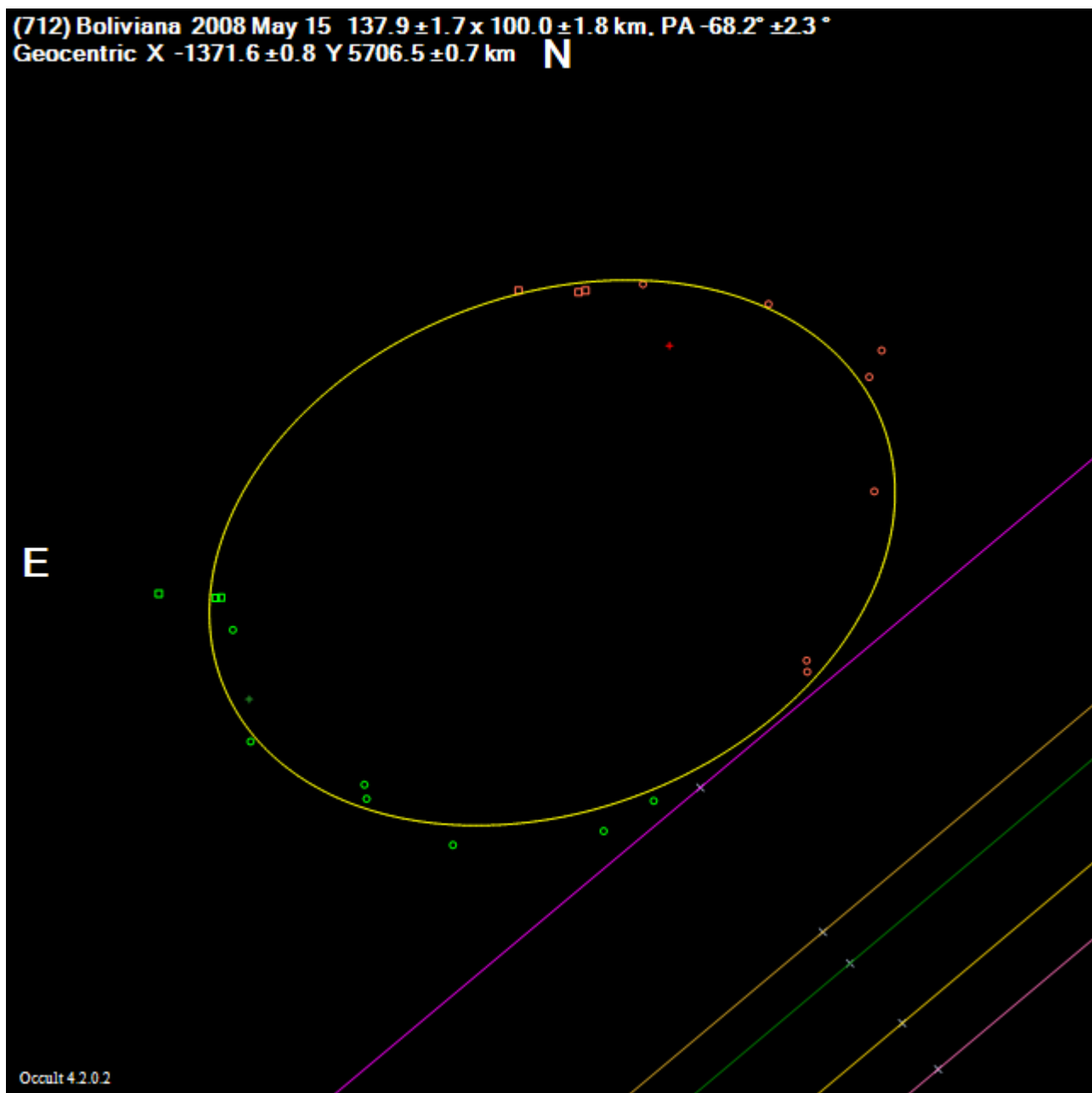
(712) Boliviana 2004 Nov 14 $115.0 \pm 269.9 \times 115.0 \pm 15.7$ km, PA 0.0° °
Geocentric X 3444.6 ± 5.8 Y 4544.2 ± 130.5 km **N**

E



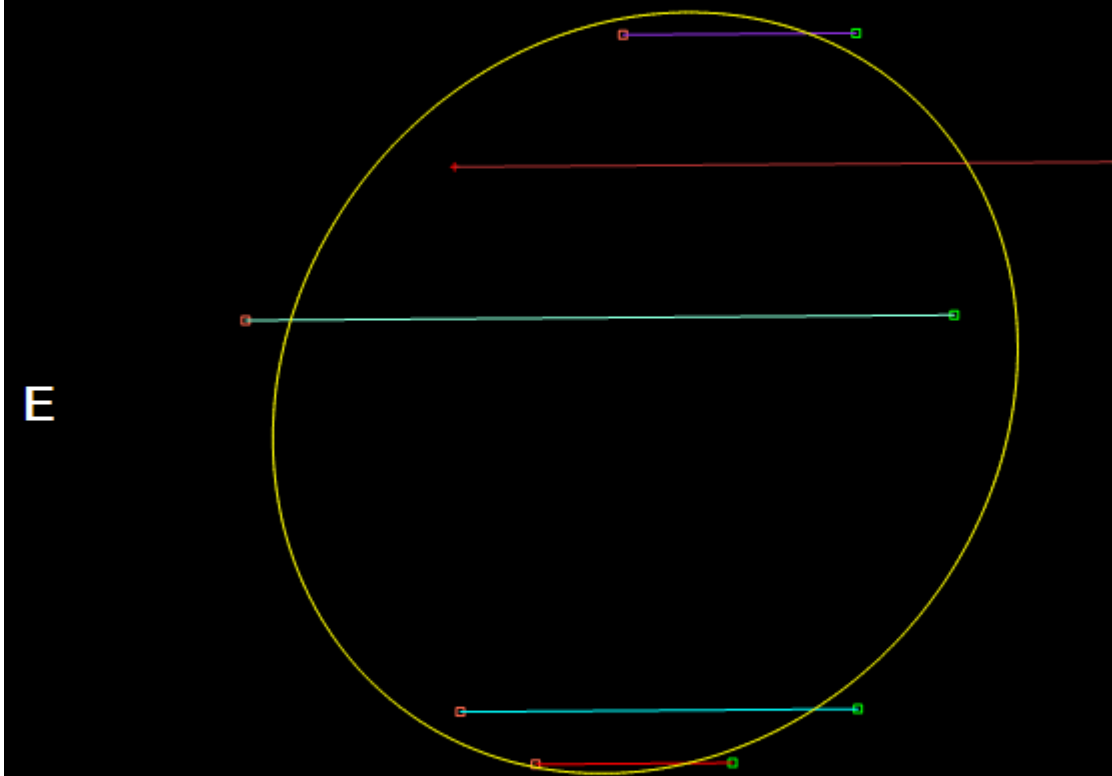
712boliviana2008may15

(712) Boliviana 2008 May 15 $137.9 \pm 1.7 \times 100.0 \pm 1.8$ km, PA $-68.2^\circ \pm 2.3^\circ$
Geocentric X -1371.6 ± 0.8 Y 5706.5 ± 0.7 km **N**



712boliviana2008nov01

(712) Boliviana 2008 Nov 1 131.7 ± 10.3 x 116.7 ± 10.6 km, PA -39.8° ± 31.5°
Geocentric X 4097.2 ± 4.6 Y 4329.2 ± 3.7 km **N**

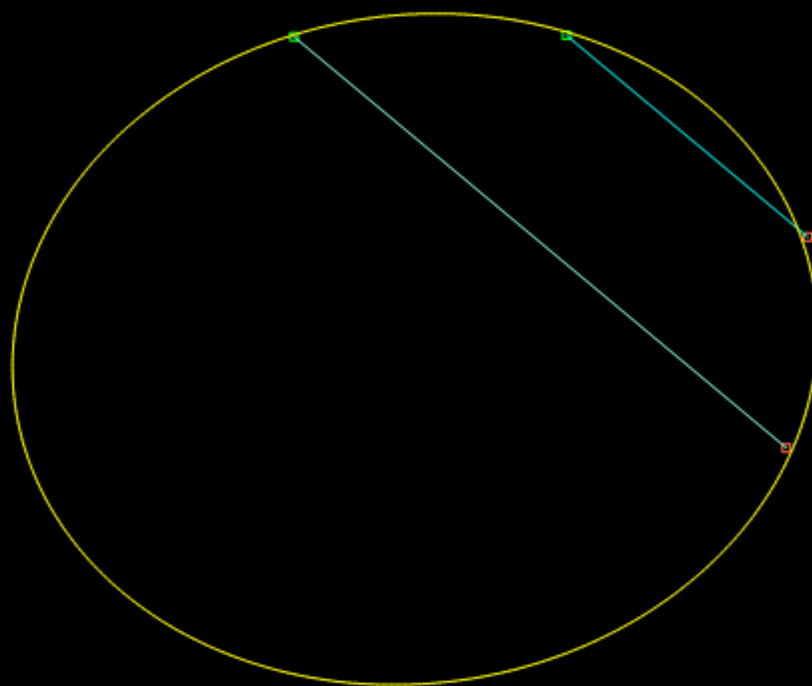


Occult 4.2.0.2

712boliviana2013sep28

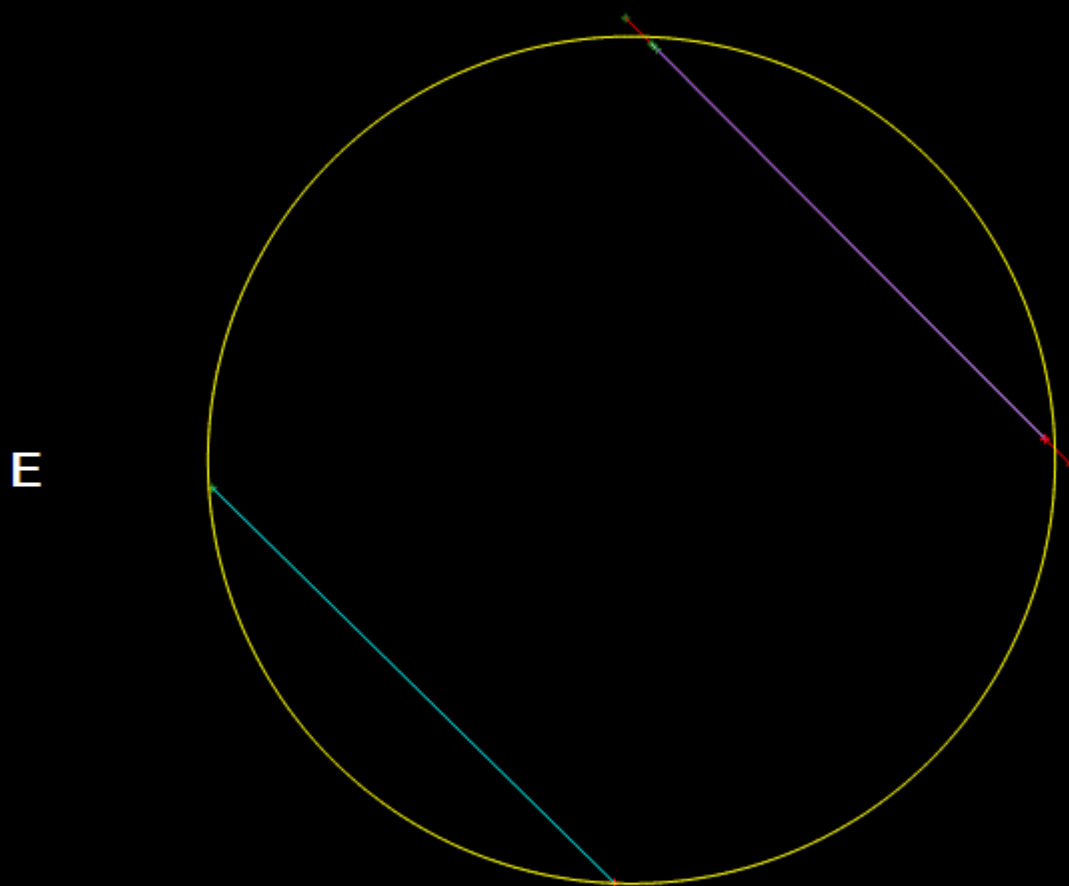
(712) Boliviana 2013 Sep 28 145.0 x 120.0 km, PA -82.0° °
Geocentric X -4651.9 ±0.6 Y 3564.4 ±0.6 km **N**

E



713luscinia2007sep11

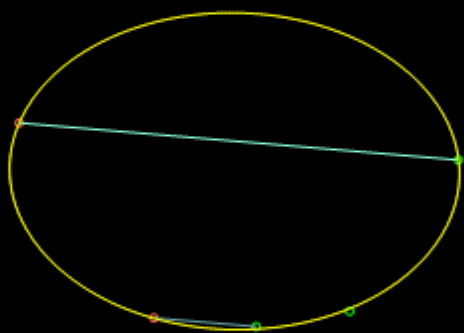
(713) Luscinia 2007 Sep 11 $98.1 \pm 1.5 \times 98.1$ km, PA 0.0° °
Geocentric X 2279.6 ± 0.6 Y 4017.4 ± 0.7 km **N**



71niobe2009aug24

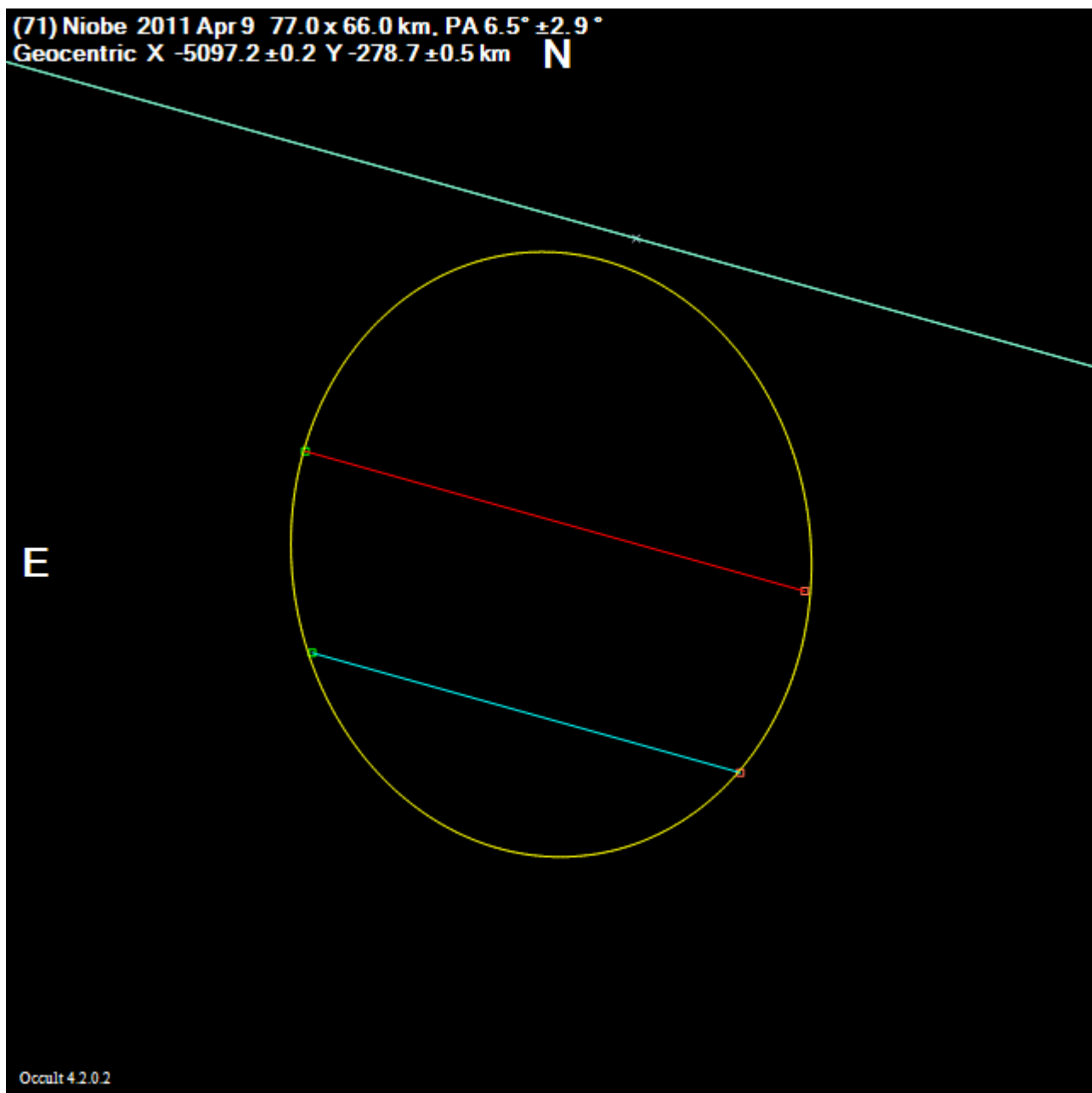
(71) Niobe 2009 Aug 24 $63.9 \pm 0.4 \times 45.0$ km, PA $88.8^\circ \pm 1.5^\circ$
Geocentric X -3878.6 ± 0.2 Y 4280.6 ± 0.2 km **N**

E



71niobe2011apr09

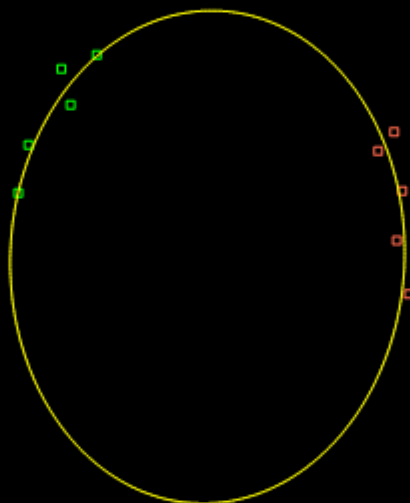
(71) Niobe 2011 Apr 9 77.0 x 66.0 km, PA 6.5° ± 2.9°
Geocentric X -5097.2 ± 0.2 Y -278.7 ± 0.5 km **N**



71niobe2015feb18

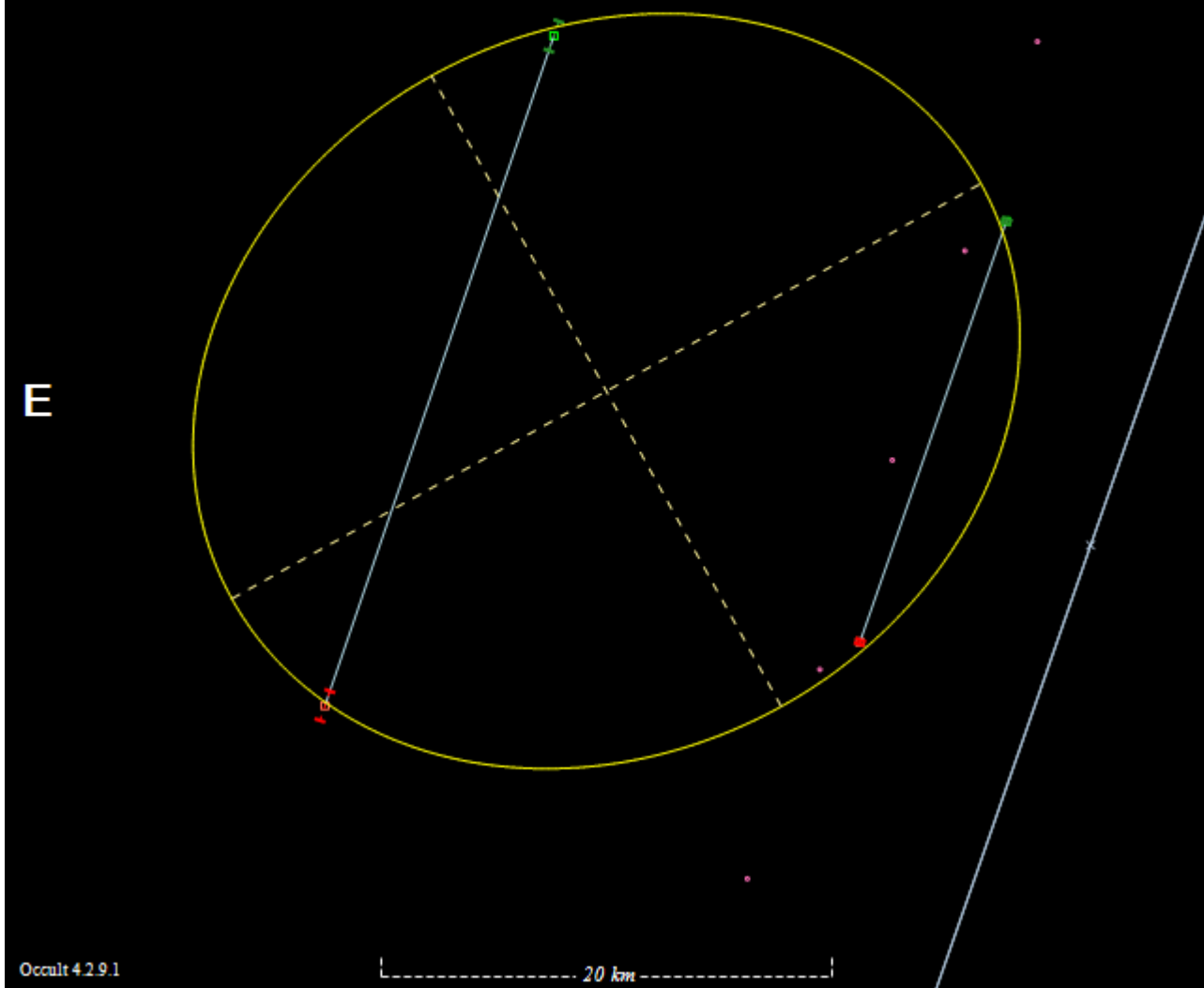
(71) Niobe 2015 Feb 18 $106.3 \pm 38.2 \times 85.0 \pm 4.6$ km, PA $-2.8^\circ \pm 17.7^\circ$
Geocentric X 4129.7 ± 3.1 Y 2215.3 ± 13.8 km **N**

E



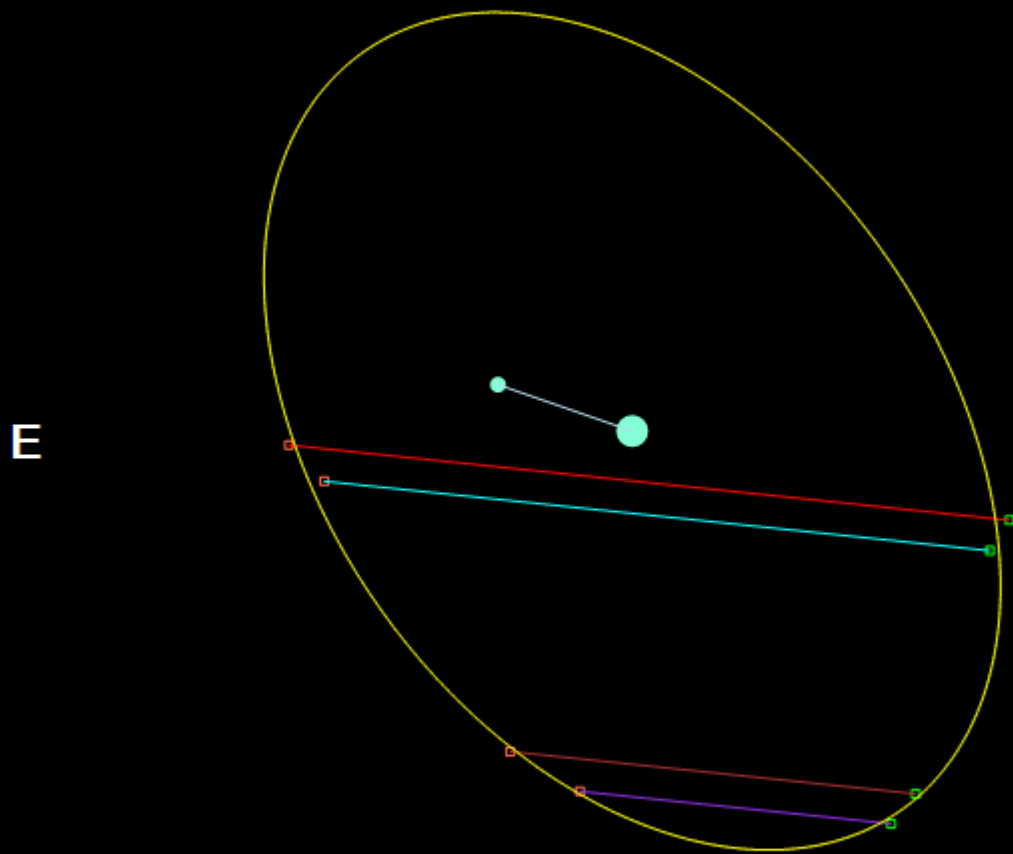
727Nipponia2016Jul25

(727) Nipponia 2016 Jul 25 38.0 x 32.0 km, PA -61.0° ± 9.3°
Geocentric X 2445.7 ± 0.4 Y 4629.7 ± 0.2 km **N**



72feronia2007mar28

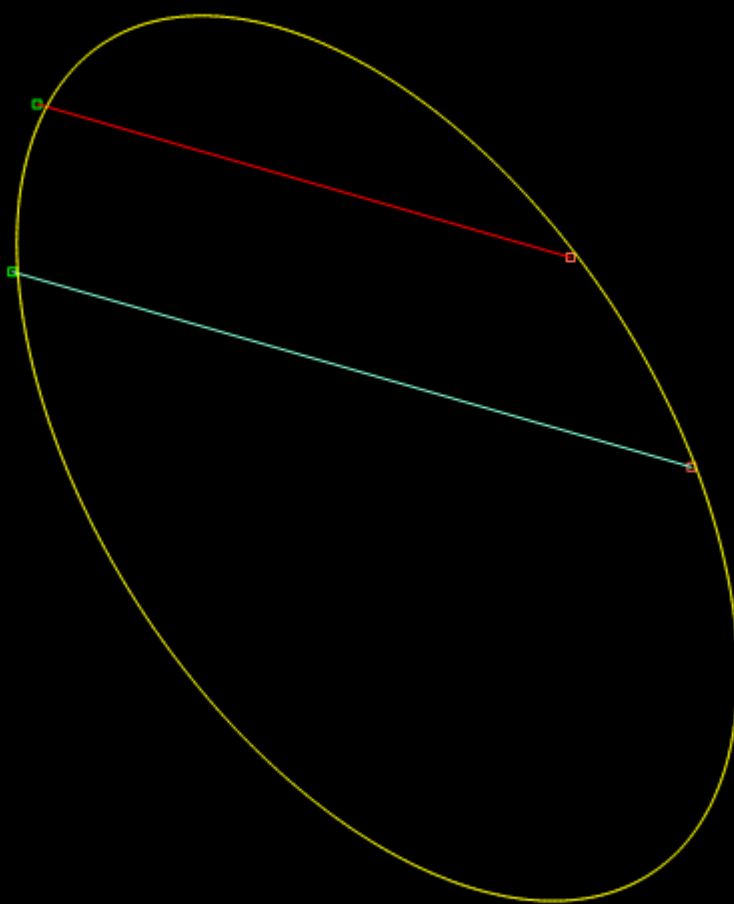
(72) Feronia 2007 Mar 28 104.0 x 69.0 ± 1.8 km, PA 35.4° ± 2.8°
Geocentric X 3786.7 ± 0.8 Y 1269.5 ± 1.1 km **N**
Double : Sep 0.0097 ± 0.0006", PA 70.9° ± 3.8°



72feronia2009dec19

(72) Feronia 2009 Dec 19 110.0 x 62.0 km, PA $33.5^\circ \pm 1.5^\circ$
Geocentric X -3379.7 ± 0.5 Y 2603.6 ± 1.0 km **N**

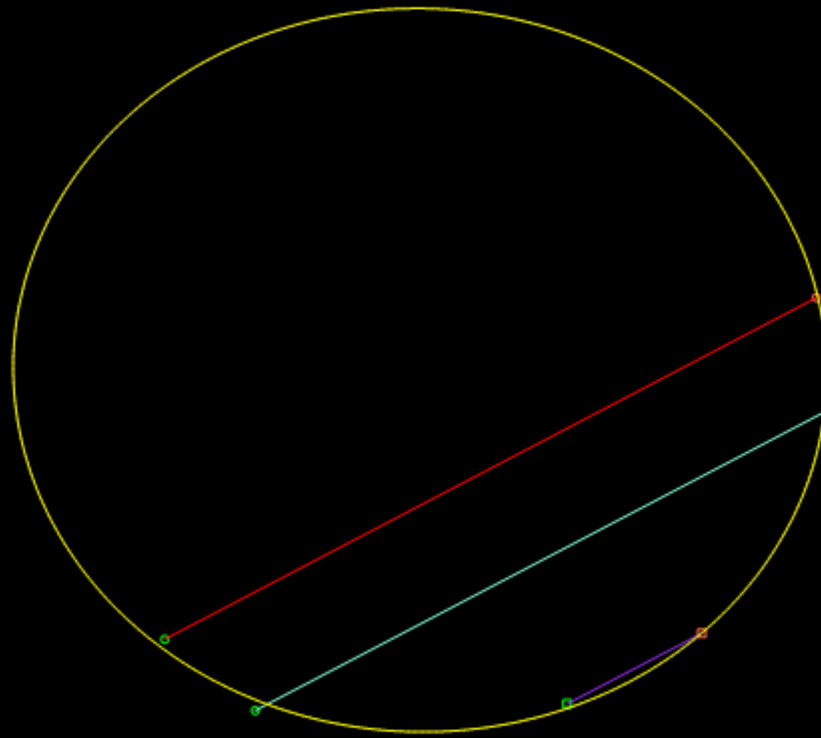
E



72feronia2011mar09

(72) Feronia 2011 Mar 9 90.0 x 80.0 km, PA 88.1° ± 4.7°
Geocentric X -765.8 ± 0.4 Y 3609.2 ± 0.4 km **N**

E

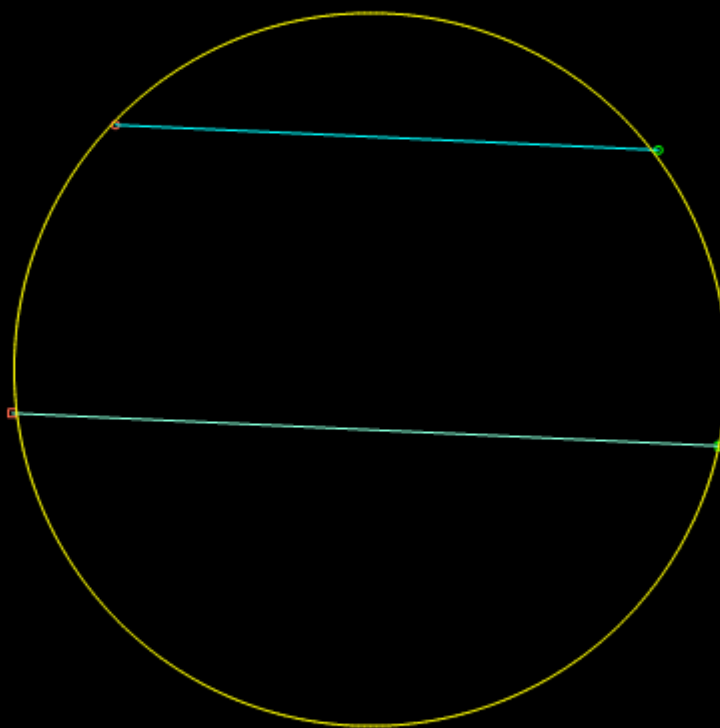


Occult 4.2.0.2

72feronia2014apr11

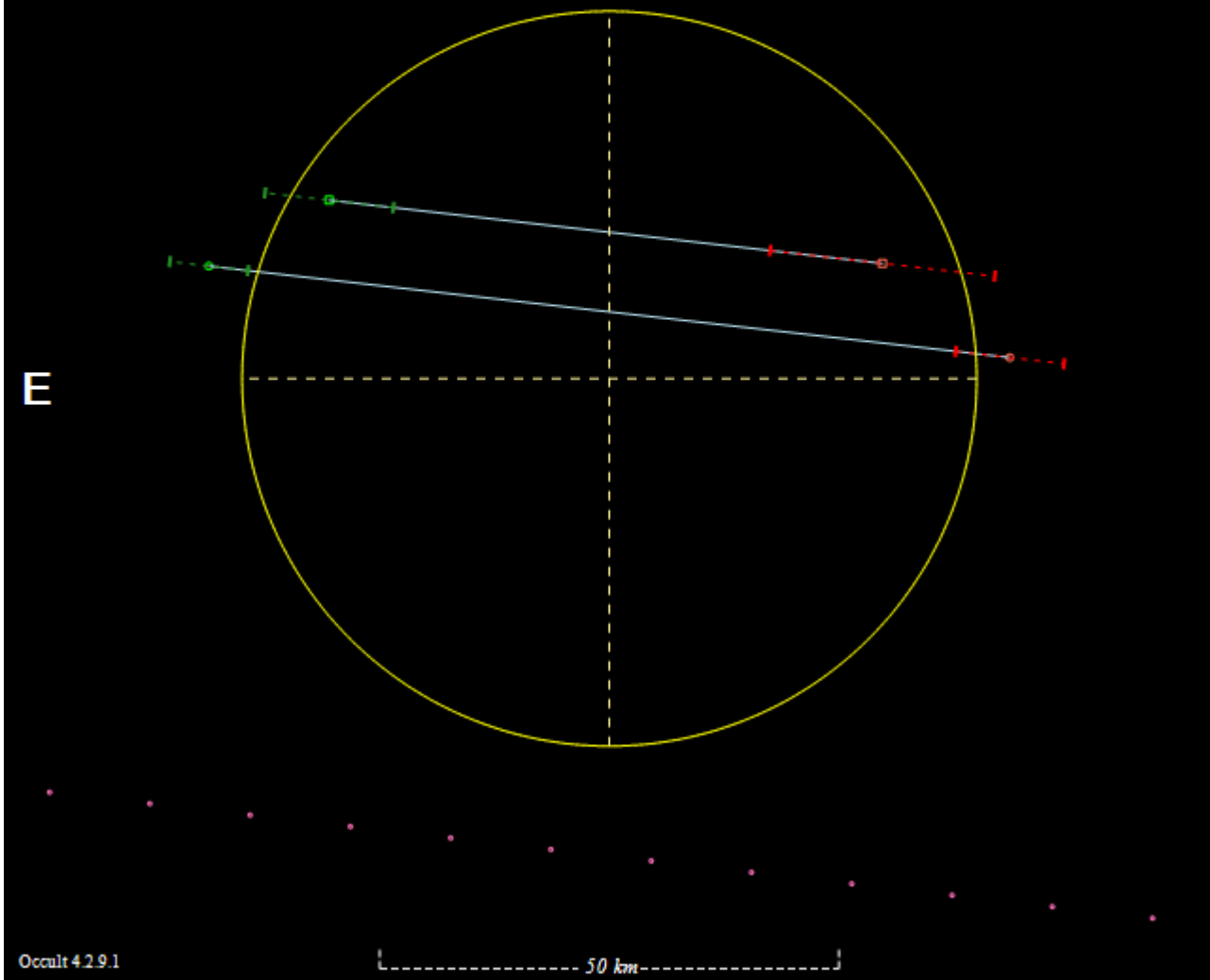
(72) Feronia 2014 Apr 11 77.0 x 77.0 km, PA 0.0° °
Geocentric X 4698.1 ± 0.2 Y 2148.7 ± 0.4 km **N**

E



72Feronia2016Dec22

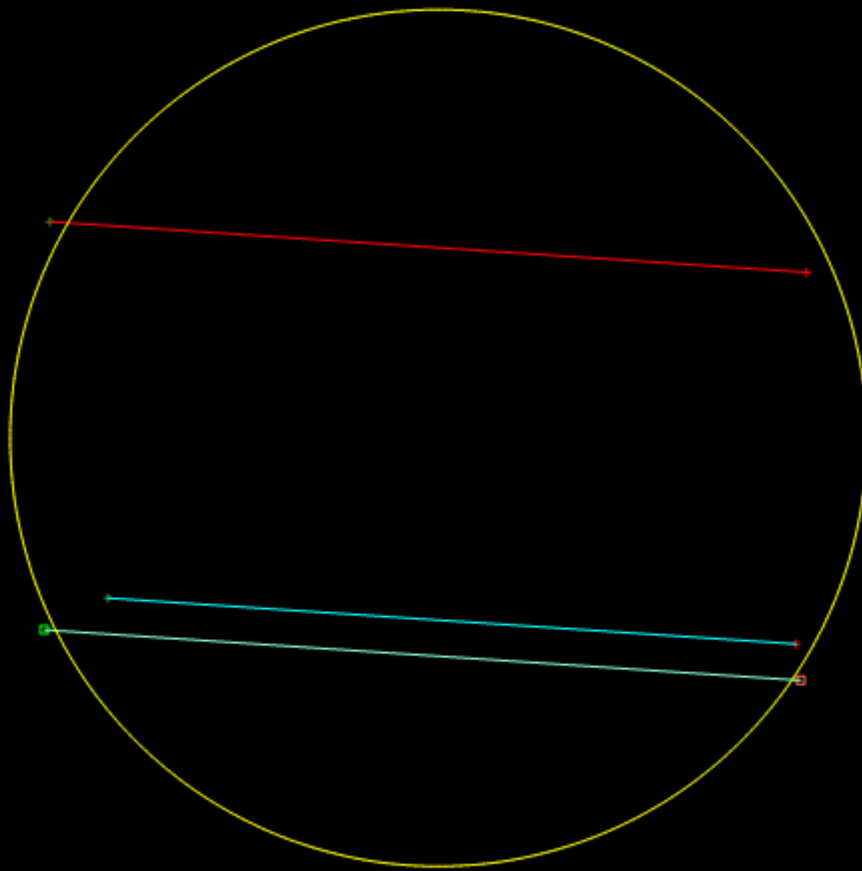
(72) Feronia 2016 Dec 22 80.0 x 80.0 km, PA 0.0°
Geocentric X -433.8 ± 2.9 Y 3026.5 ± 7.6 km **N**



731sorga2007oct24

(731) Sörga 2007 Oct 24 45.7 x 45.7 km. PA 0.0°
Geocentric X 3527.0 ± 0.7 Y 4535.5 ± 1.2 km **N**

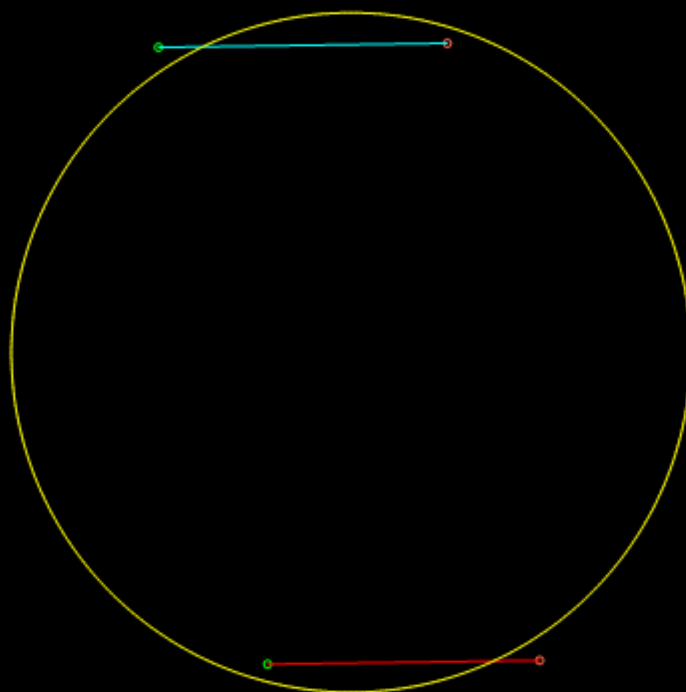
E



732tjilaki2005jun20

(732) Tjilaki 2005 Jun 20 $33.6 \pm 1.1 \times 33.6$ km, PA 0.0° °
Geocentric X -3517.9 ± 1.1 Y 3670.0 ± 0.5 km **N**

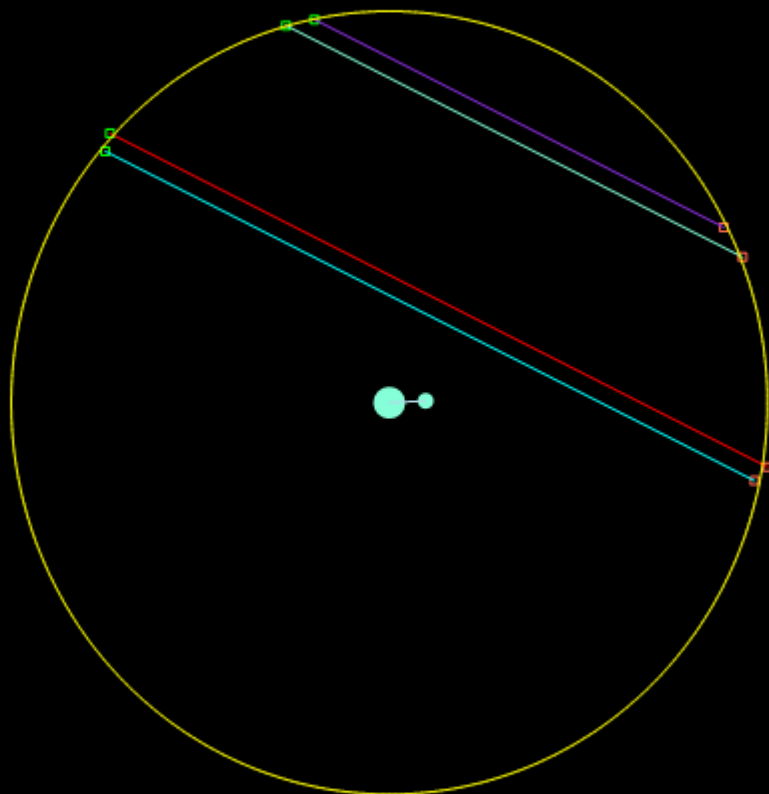
E



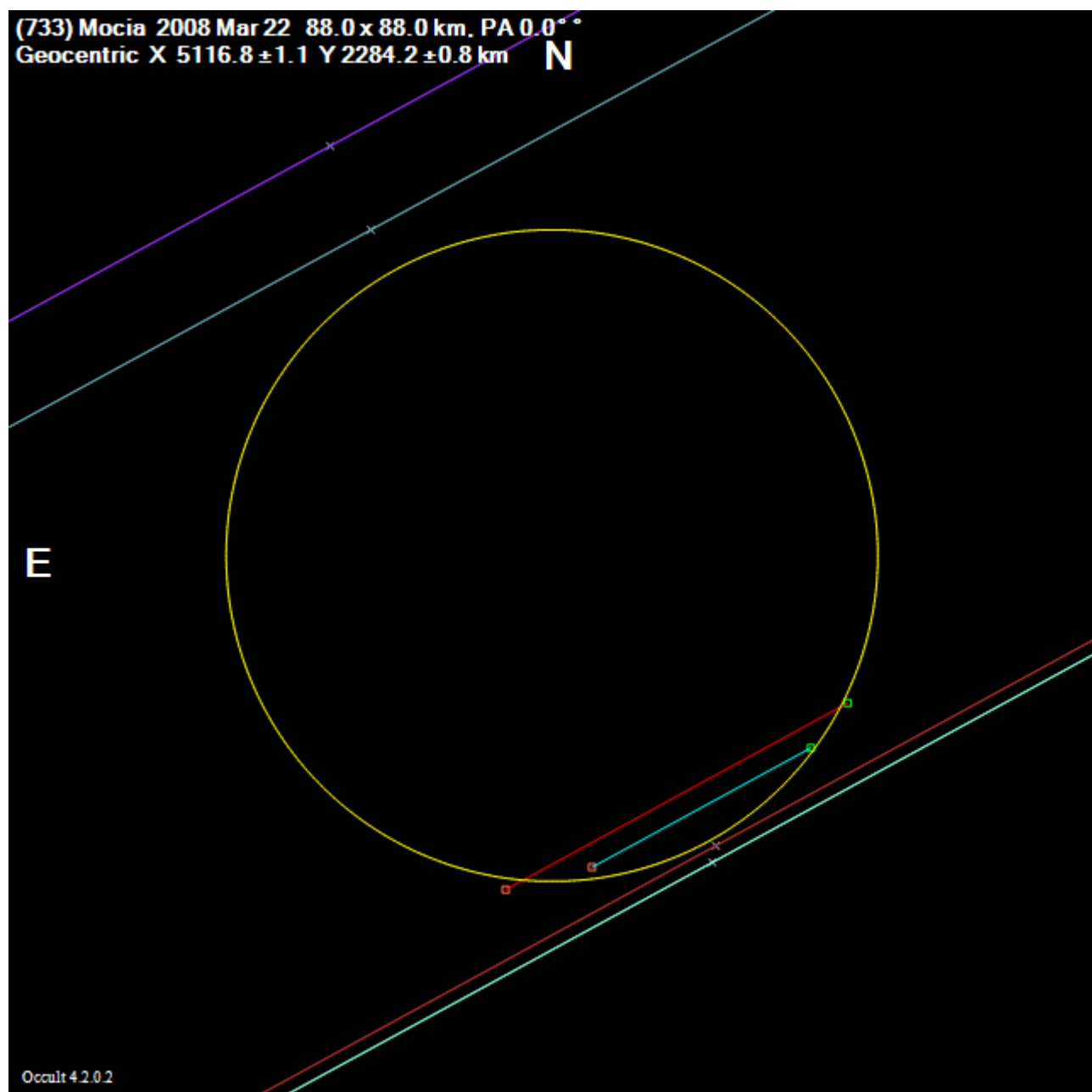
732tjilaki2009jul28

(732) Tjilaki 2009 Jul 28 $37.7 \pm 0.8 \times 36.4 \pm 0.3$ km. PA $0.0^\circ \pm$
Geocentric X -179.9 ± 0.1 Y -3994.5 ± 0.4 km **N**
Double : Sep $0.0017 \pm 0.0002''$, PA $-87.0^\circ \pm 6.5^\circ$

E



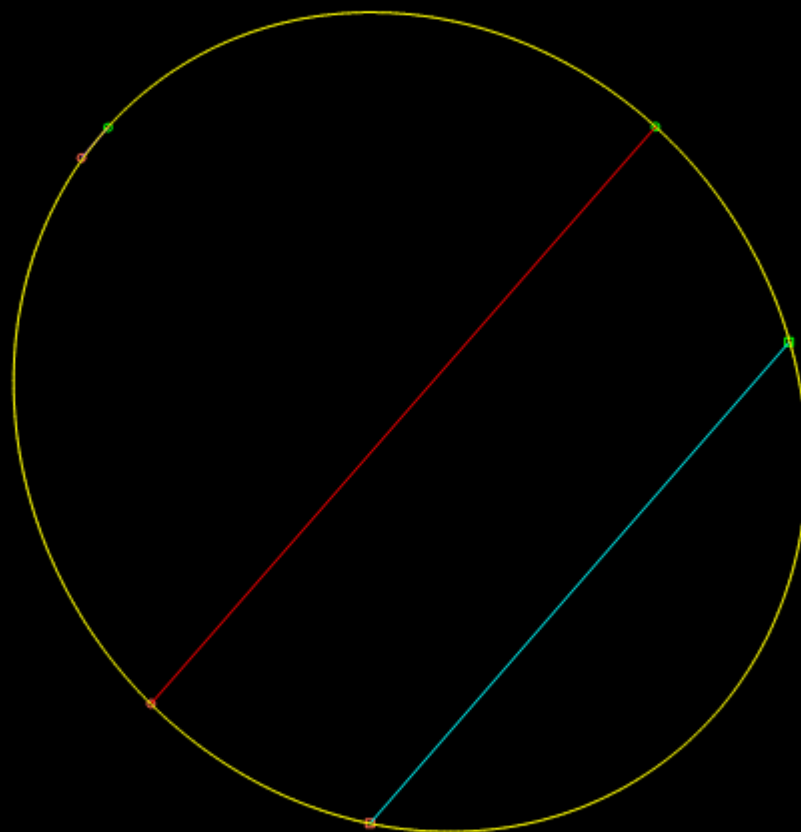
733mocia2008mar22



735marghanna2008mar11

(735) Marghanna 2008 Mar 11 $81.6 \pm 0.2 \times 73.5 \pm 0.1$ km, PA $36.0^\circ \pm 0.9^\circ$
Geocentric X 5220.3 ± 0.1 Y 1284.9 ± 0.1 km **N**

E

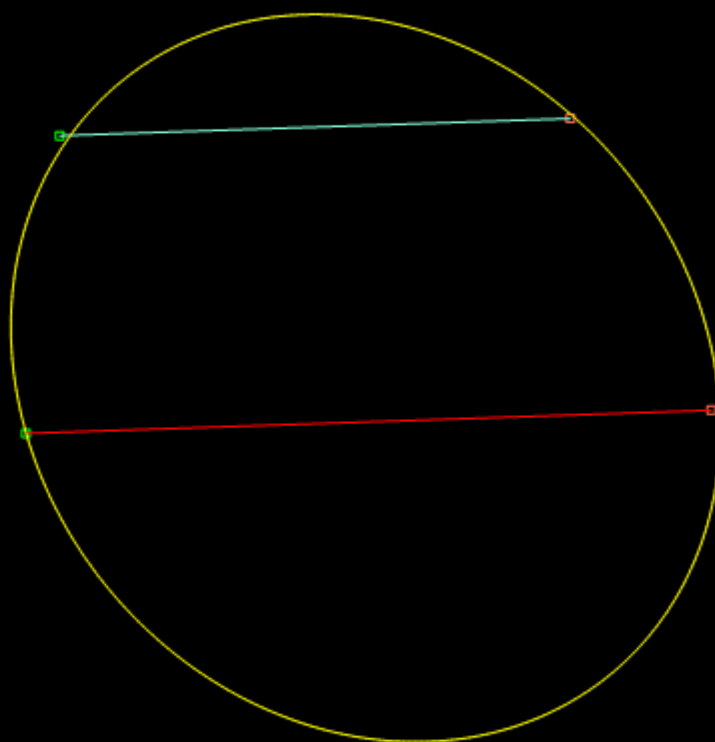


735marghanna2010may04

(735) Marghanna 2010 May 4 74.0 x 64.0 km, PA 40.0° °
Geocentric X -500.0 ± 0.3 Y -2372.5 ± 0.6 km N

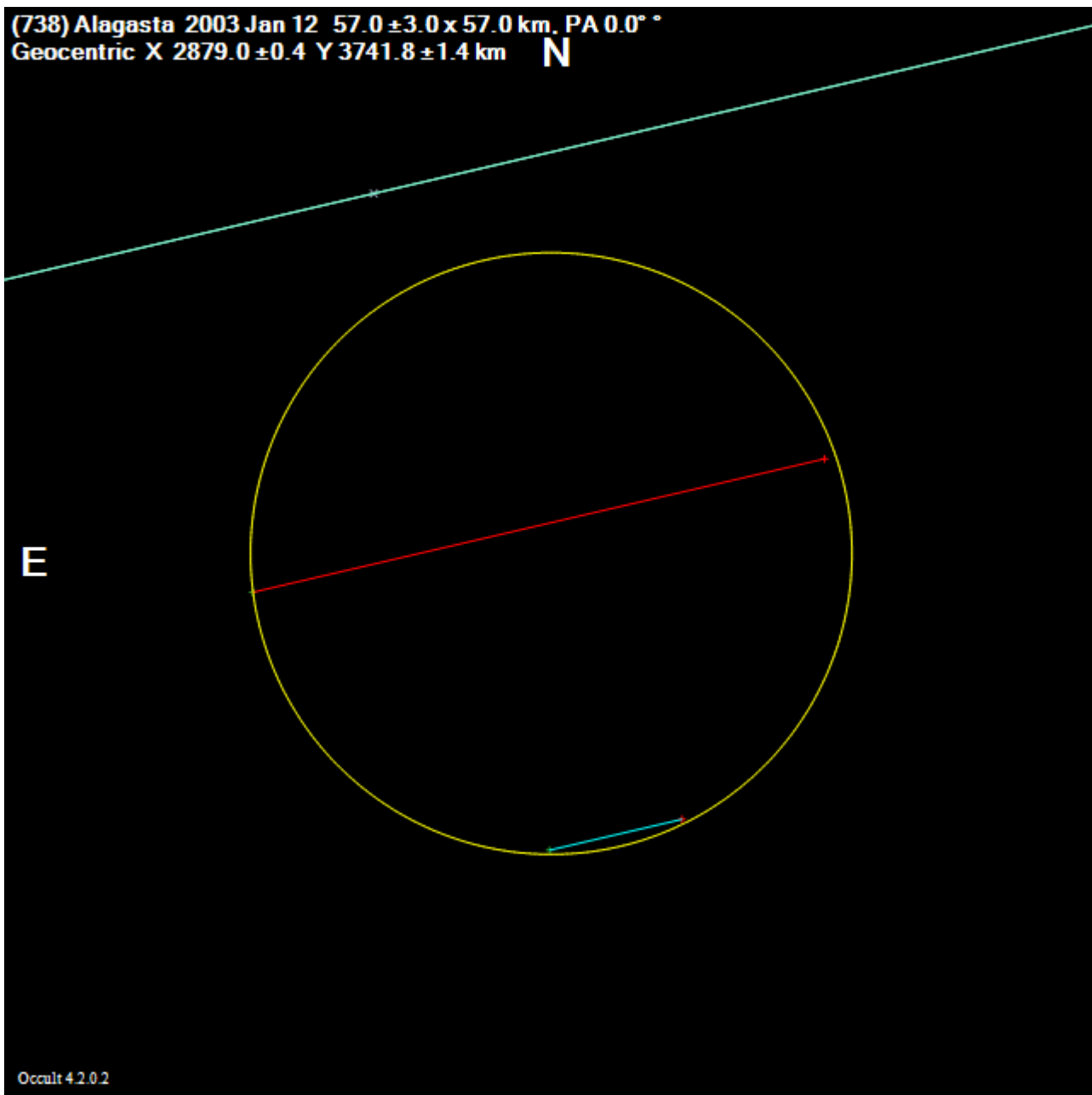
E

Occult 4.2.0.2



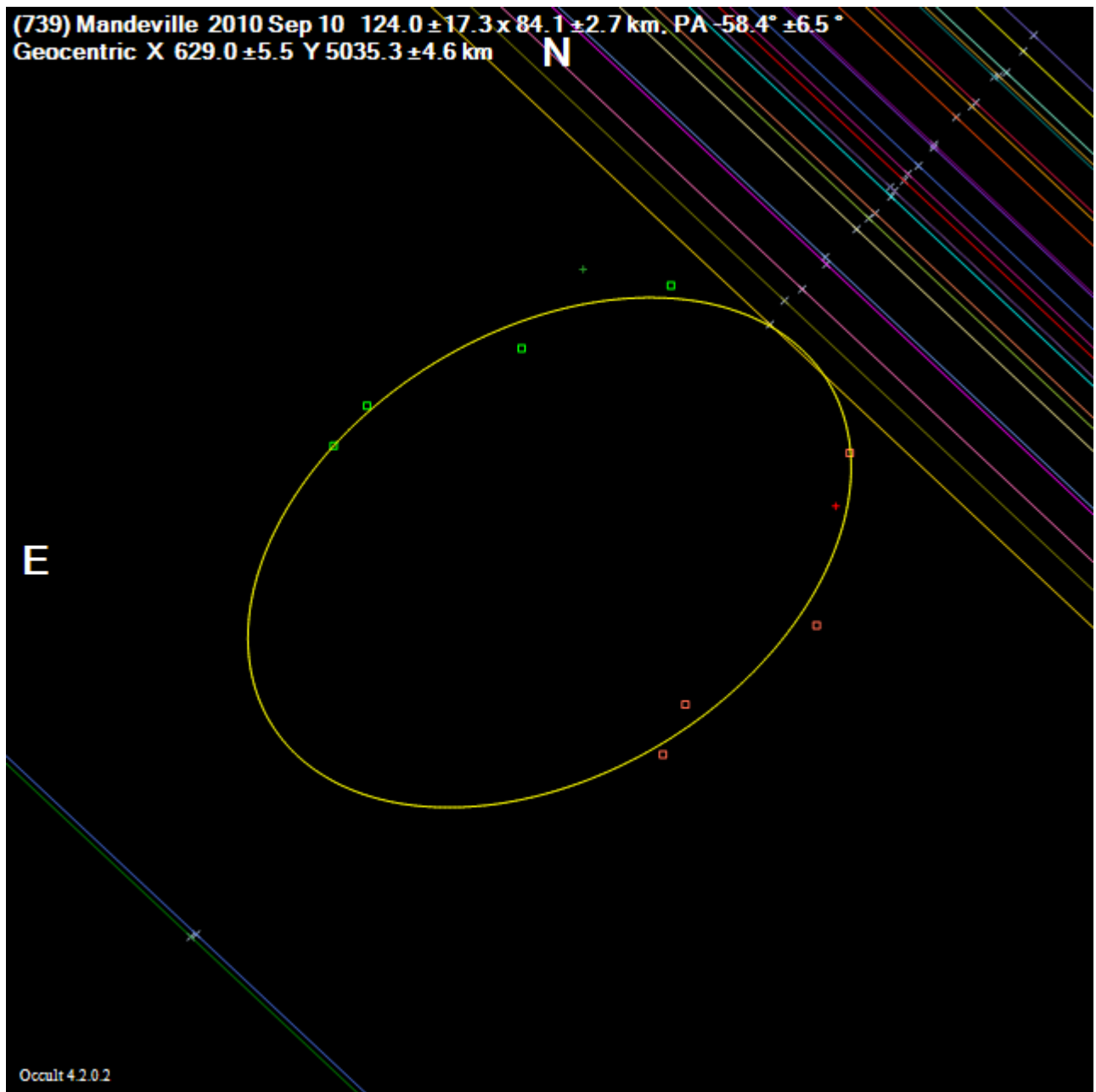
738alagasta2003jan12

(738) Alagasta 2003 Jan 12 $57.0 \pm 3.0 \times 57.0$ km, PA 0.0° °
Geocentric X 2879.0 ± 0.4 Y 3741.8 ± 1.4 km N



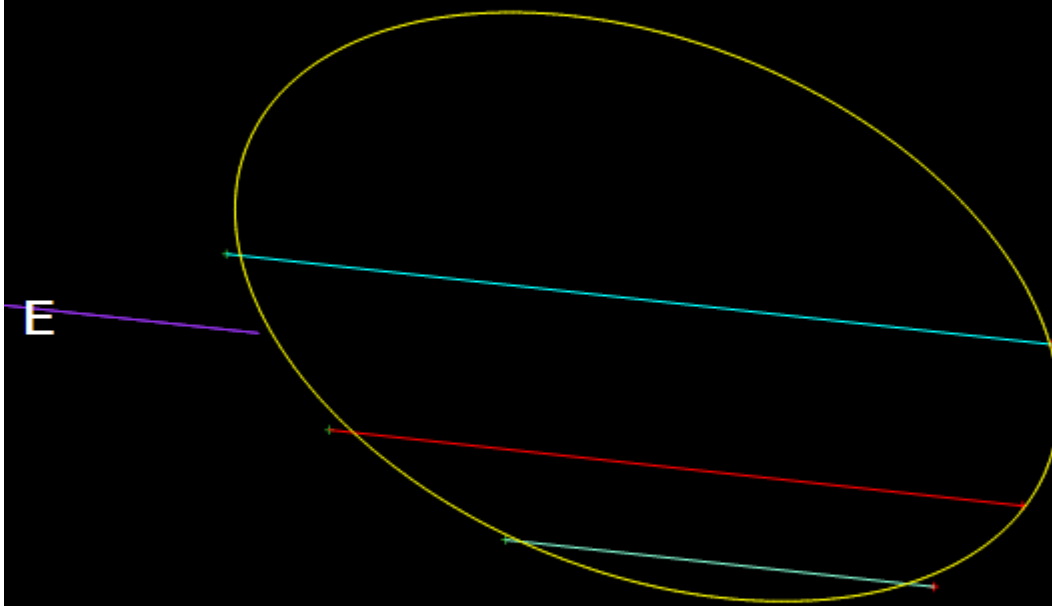
739mandeville2010sep10

(739) Mandeville 2010 Sep 10 $124.0 \pm 17.3 \times 84.1 \pm 2.7$ km, PA $-58.4^\circ \pm 6.5^\circ$
Geocentric X 629.0 ± 5.5 Y 5035.3 ± 4.6 km



739mandeville2011nov26

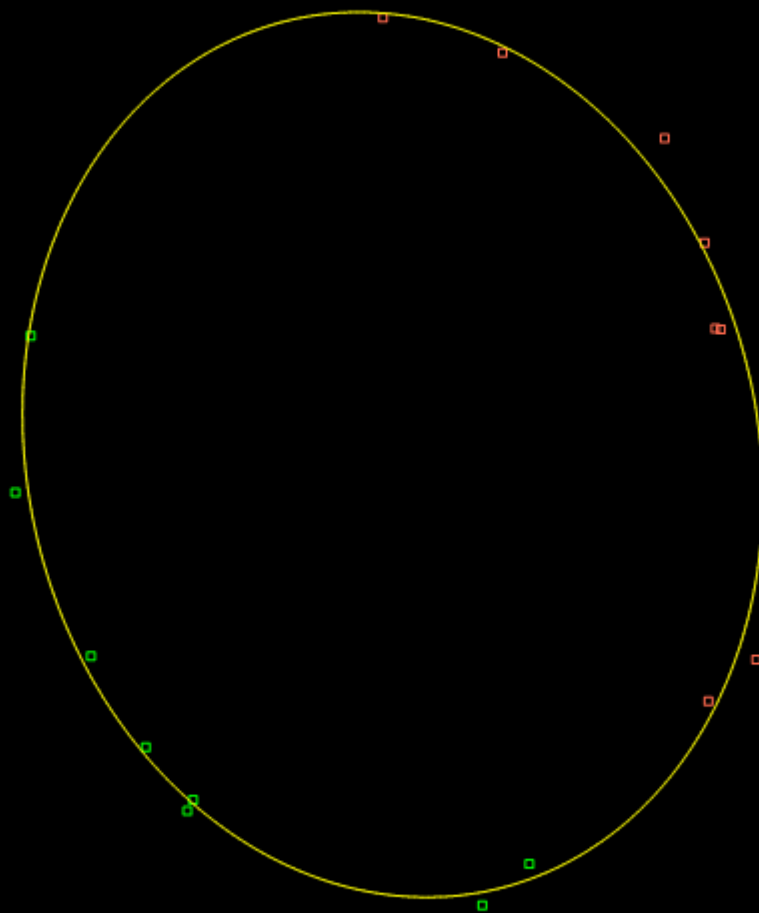
(739) Mandeville 2011 Nov 26 138.0 x 85.0 km, PA 68.0° ± 22.7°
Geocentric X -2285.4 ± 11.2 Y 4326.9 ± 7.4 km **N**



739Mandeville2017Jan01

(739) Mandeville 2017 Jan 1 $119.7 \pm 2.1 \times 97.9 \pm 1.3$ km, PA $13.6^\circ \pm 3.7^\circ$
Geocentric X 2790.7 ± 0.7 Y 2969.2 ± 0.8 km **N**

E



Occult 4.2.9.1

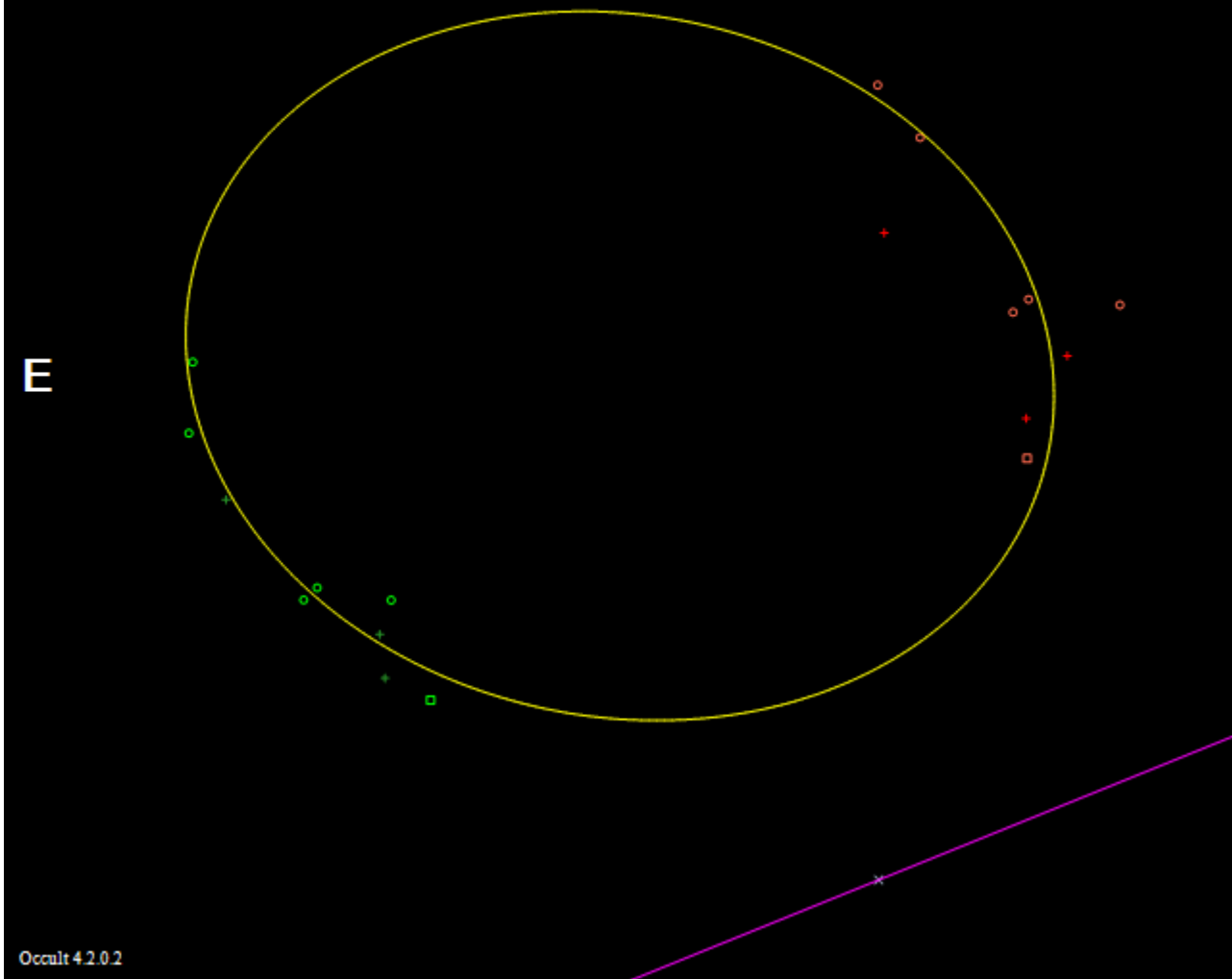
73klytia2008oct11

(73) Klytia 2008 Oct 11 48.0 x 42.0 km. PA $55.6^{\circ} \pm 7.7^{\circ}$
Geocentric X -2125.1 ± 0.4 Y 931.0 ± 0.4 km **N**



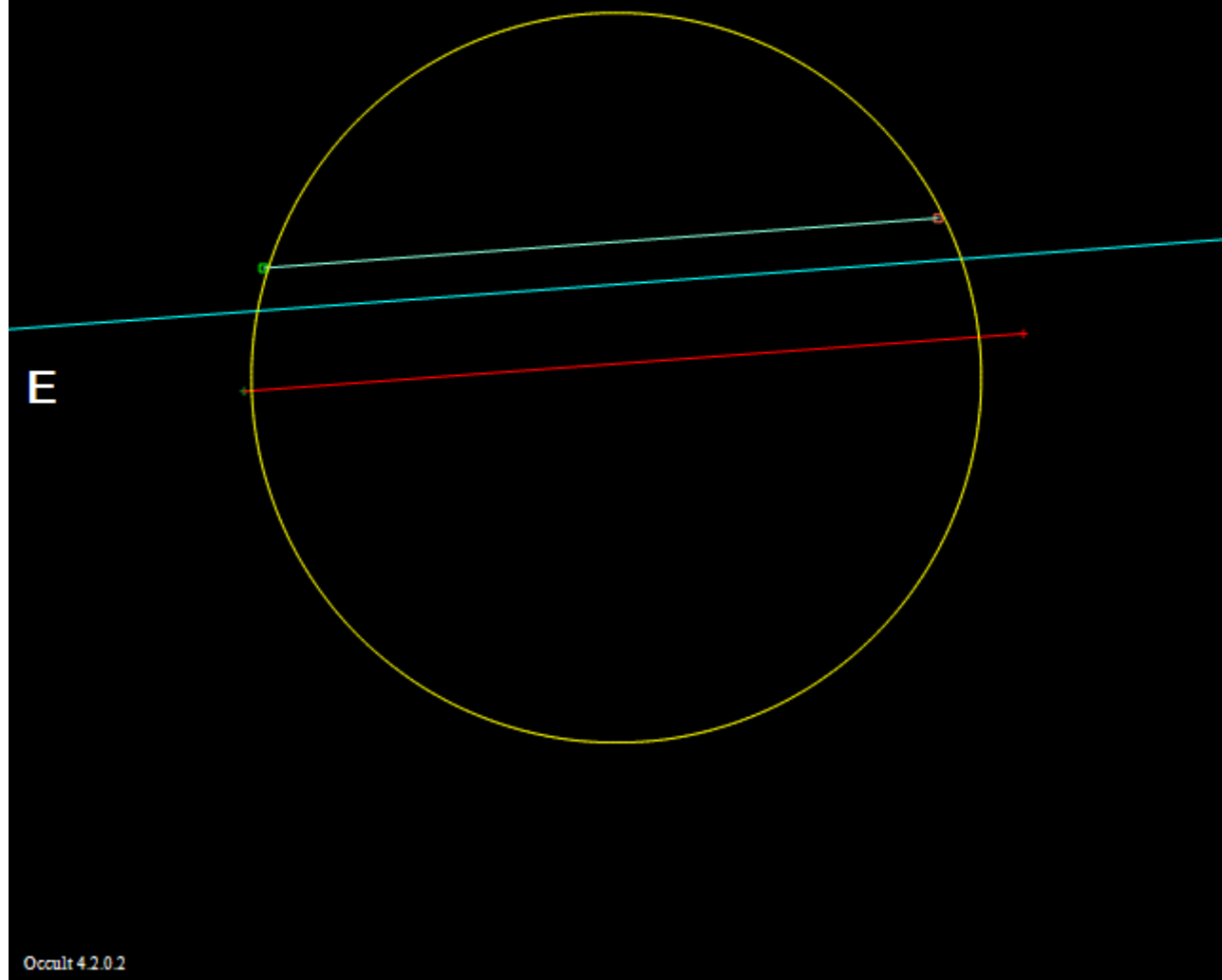
747winchester2008may01

(747) Winchester 2008 May 1 $202.4 \pm 11.9 \times 162.5 \pm 16.9$ km, PA $78.7^\circ \pm 23.6^\circ$
Geocentric X -507.3 ± 3.7 Y 4820.4 ± 5.0 km **N**



747winchester2008may27

(747) Winchester 2008 May 27 171.0 x 171.0 km. PA 0.0° °
Geocentric X -2840.1 ±2.4 Y -3044.1 ±6.7 km **N**



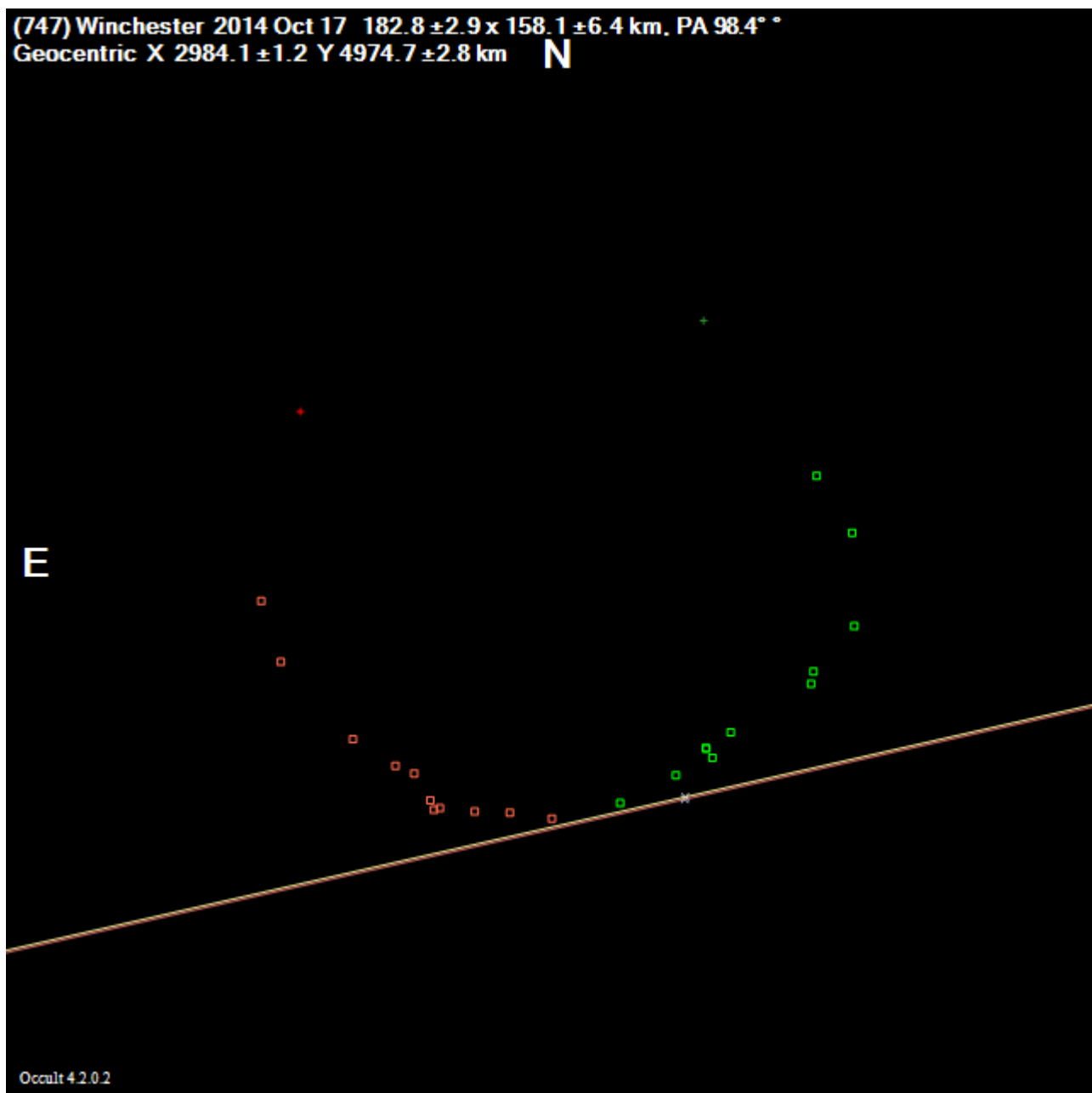
747winchester2009sep05

(747) Winchester 2009 Sep 5 $171.1 \pm 4.0 \times 159.7 \pm 4.9$ km, PA $65.3^\circ \pm 23.4^\circ$
Geocentric X 979.5 ± 2.8 Y -1019.0 ± 1.7 km **N**



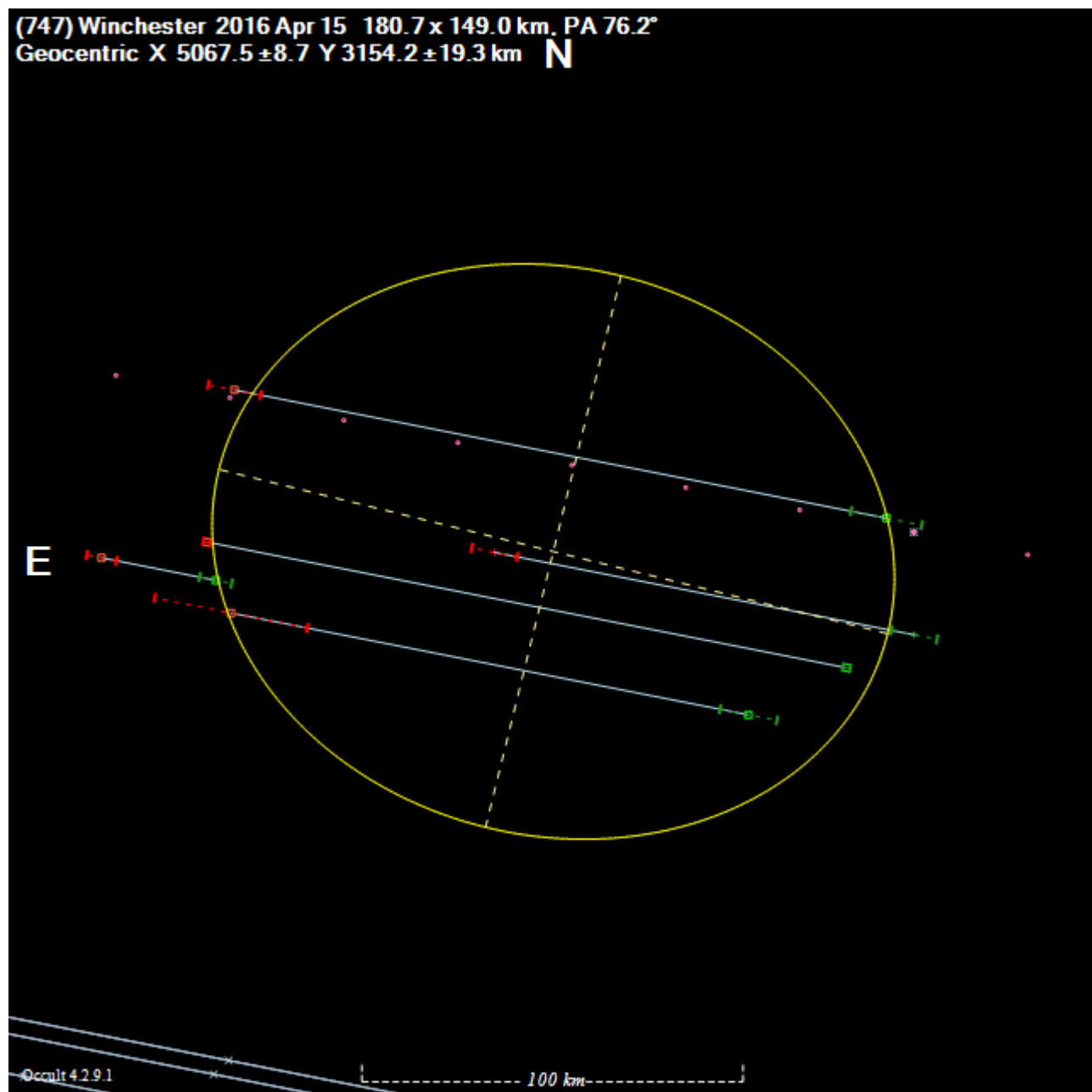
747winchester2014oct17

(747) Winchester 2014 Oct 17 $182.8 \pm 2.9 \times 158.1 \pm 6.4$ km, PA 98.4° °
Geocentric X 2984.1 ± 1.2 Y 4974.7 ± 2.8 km N



747Winchester2016Apr15

(747) Winchester 2016 Apr 15 180.7 x 149.0 km, PA 76.2°
Geocentric X 5067.5 ± 8.7 Y 3154.2 ± 19.3 km **N**



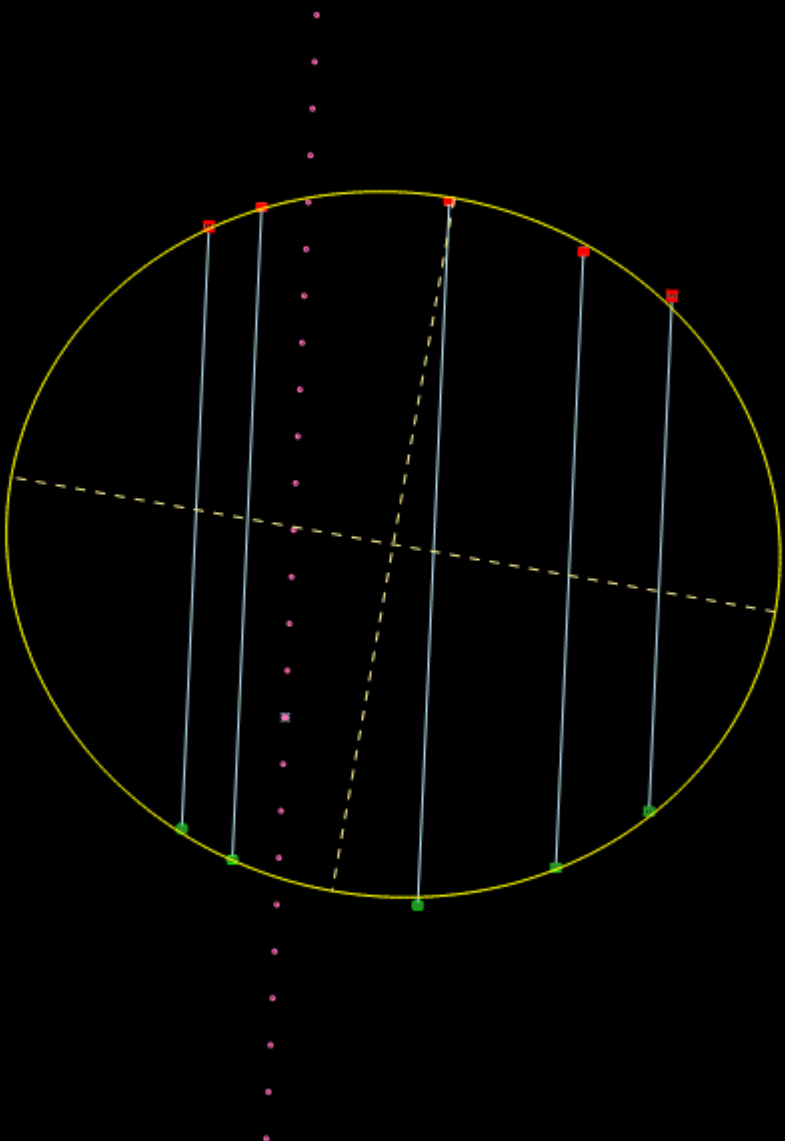
747Winchester2016Jan19

(747) Winchester 2016 Jan 19 $172.6 \pm 4.6 \times 156.5 \pm 1.3$ km, PA $80.0^\circ \pm 4.1^\circ$
Geocentric X -1663.1 ± 0.9 Y 3268.5 ± 0.4 km **N**

E

Occult 4.2.9.1

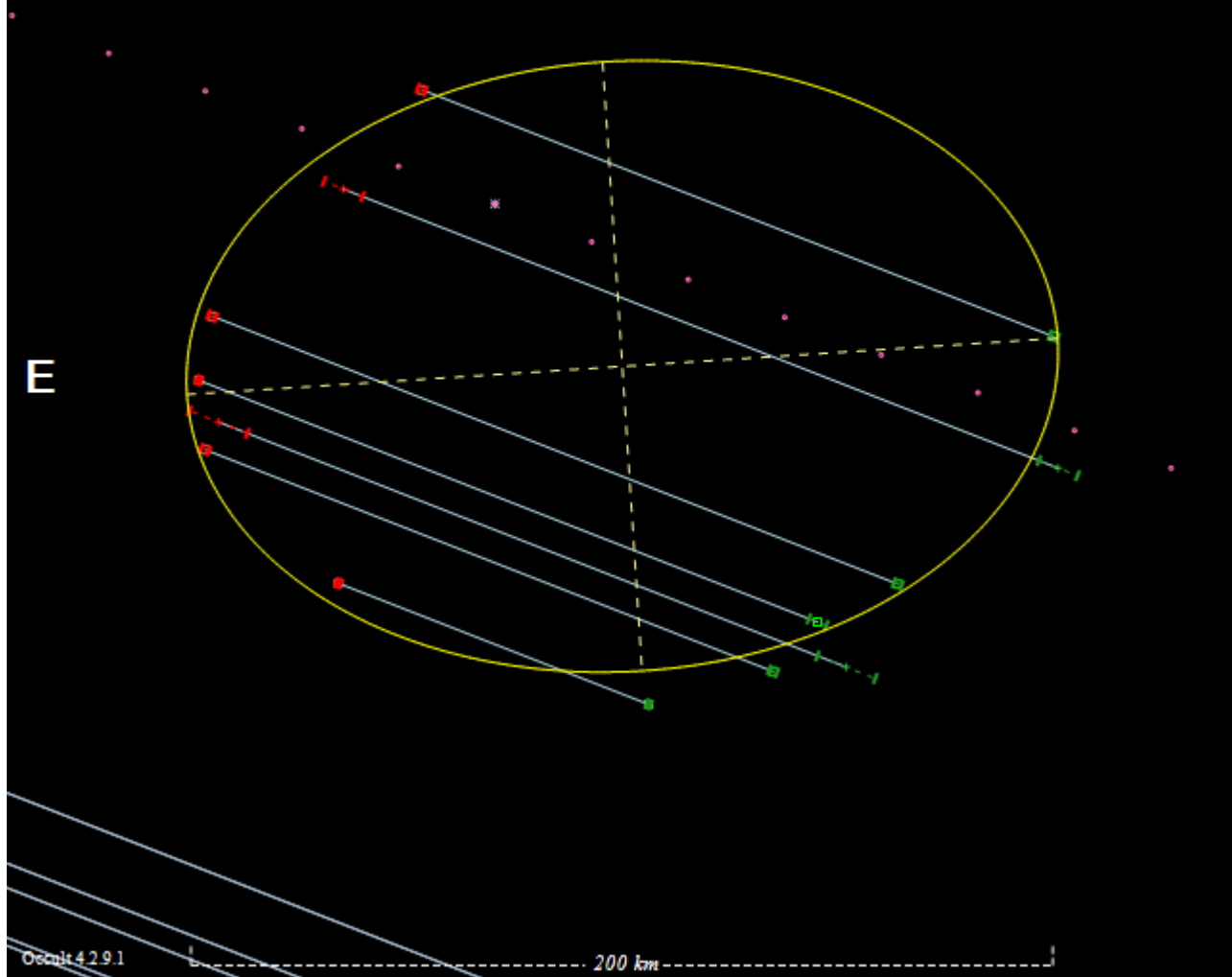
100 km



The diagram illustrates an occultation event. A large yellow circle represents the occulted body. A dashed line represents the path of the occulting body. A series of red and green dots represent observation points. Vertical lines connect the dots to the circle's edge. A scale bar at the bottom indicates 100 km.

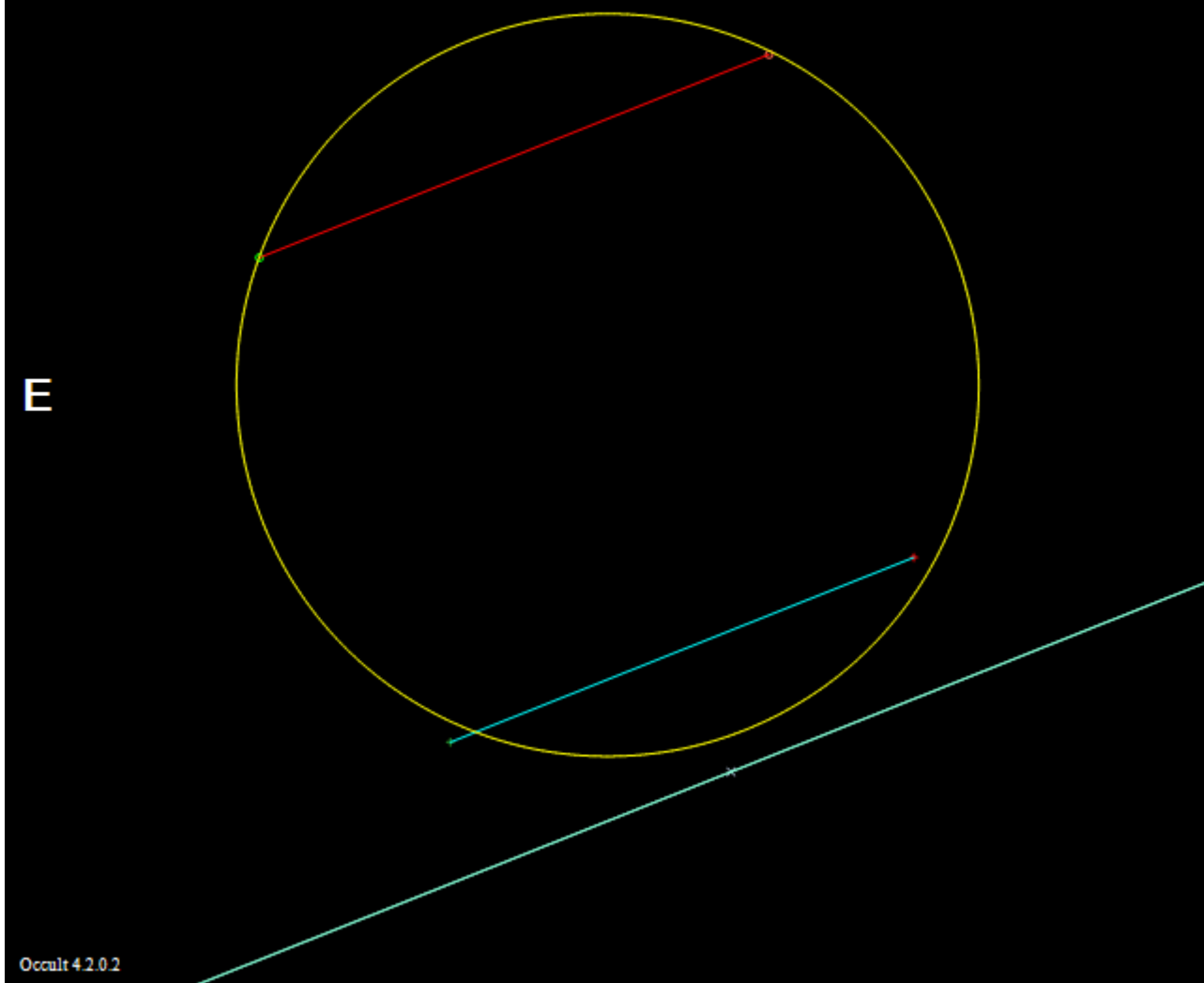
747Winchester2016Mar22

(747) Winchester 2016 Mar 22 $202.5 \pm 5.5 \times 141.6 \pm 7.6$ km, PA $93.7^\circ \pm 6.0^\circ$
Geocentric X 4691.9 ± 2.7 Y 2979.8 ± 3.0 km **N**



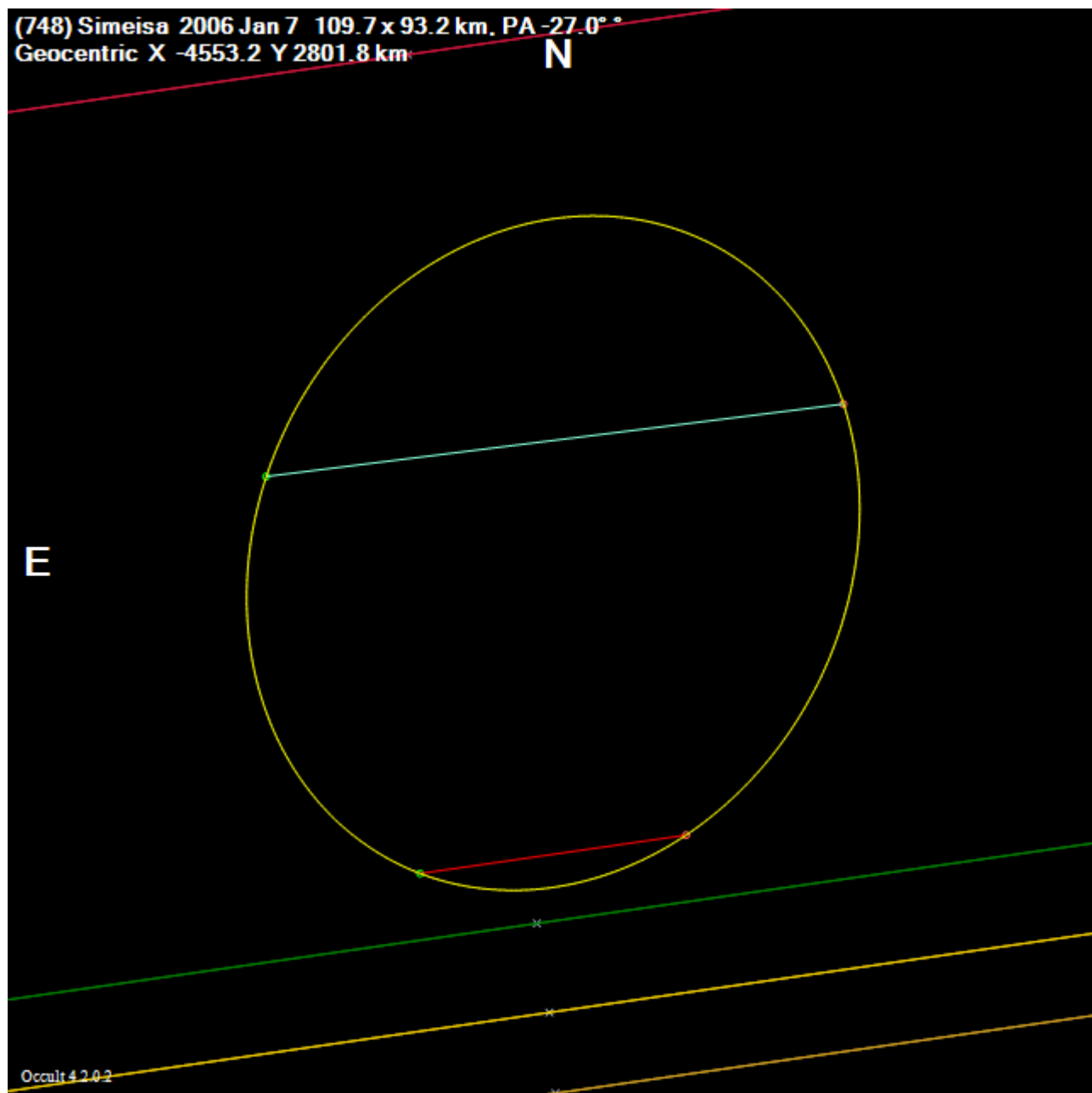
748simeisa1999mar04

(748) Simeisa 1999 Mar 4 $106.0 \pm 4.1 \times 106.0$ km, PA 0.0° °
Geocentric X -3528.4 ± 1.4 Y 4017.6 ± 1.7 km **N**



748simeisa2006jan07

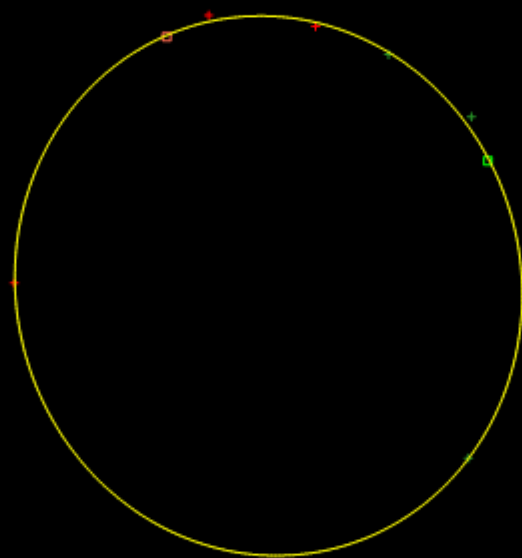
(748) Simeisa 2006 Jan 7 109.7 x 93.2 km. PA -27.0°
Geocentric X -4553.2 Y 2801.8 km



74galatea2002jan12

(74) Galatea 2002 Jan 12 $101.3 \pm 2.0 \times 94.5 \pm 0.9$ km, PA $13.7^\circ \pm 14.4^\circ$
Geocentric X 2739.7 ± 0.5 Y 3372.6 ± 1.1 km **N**

E



751faina2007mar28

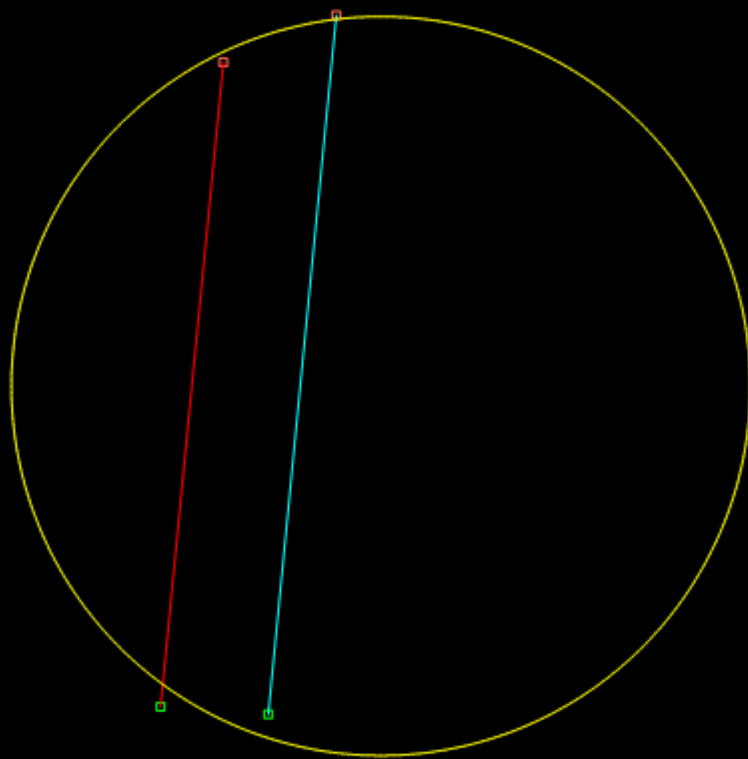
(751) Faina 2007 Mar 28 132.0 x 88.2 \pm 1.9 km, PA 11.1 $^{\circ}$ \pm 3.0 $^{\circ}$
Geocentric X -3621.7 \pm 1.3 Y 5096.7 \pm 0.6 km



751faina2012oct21

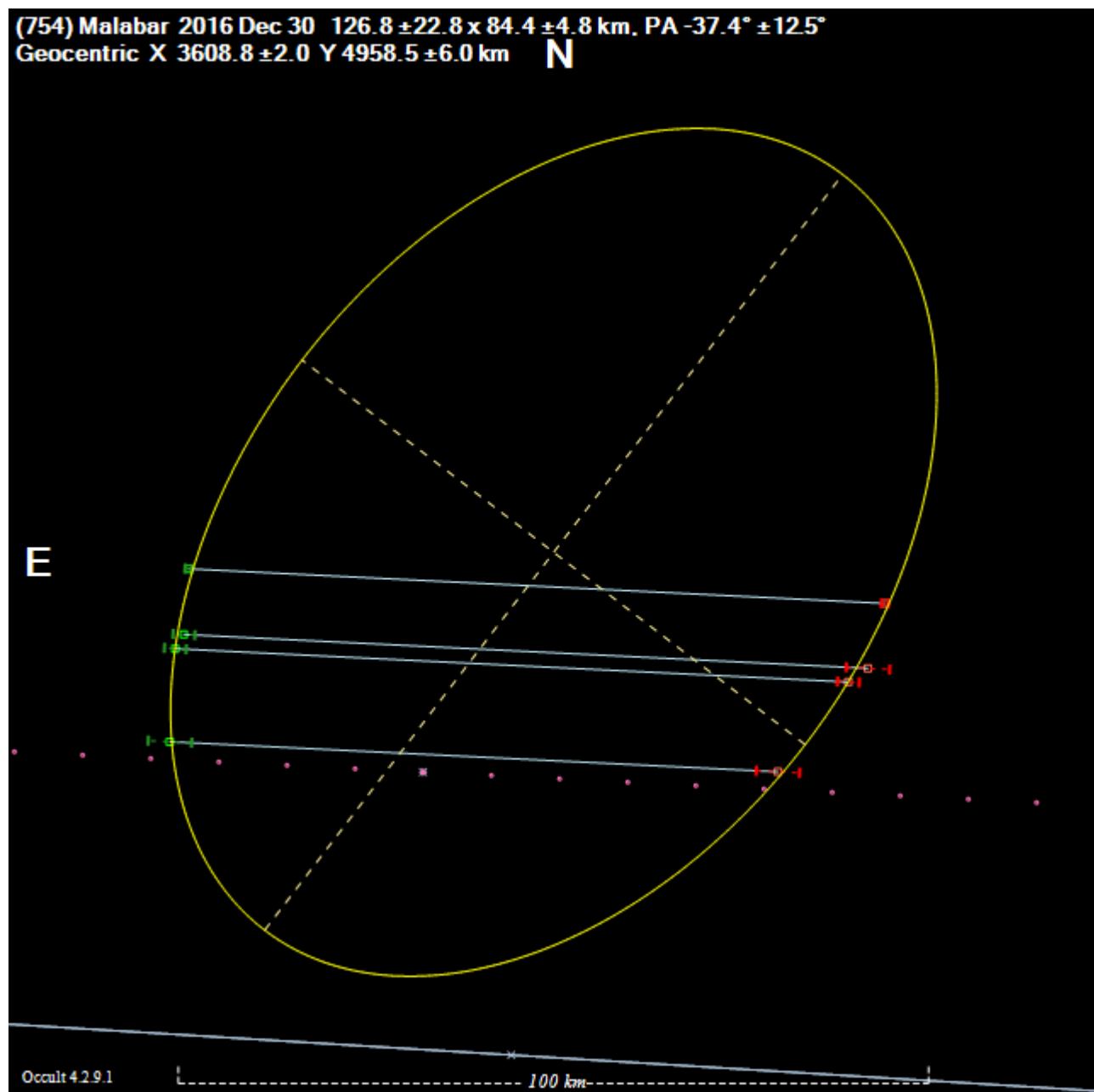
(751) Faina 2012 Oct 21 125.0 x 125.0 km, PA 0.0°
Geocentric X -1939.6 ± 3.4 Y 173.4 ± 1.5 km **N**

E



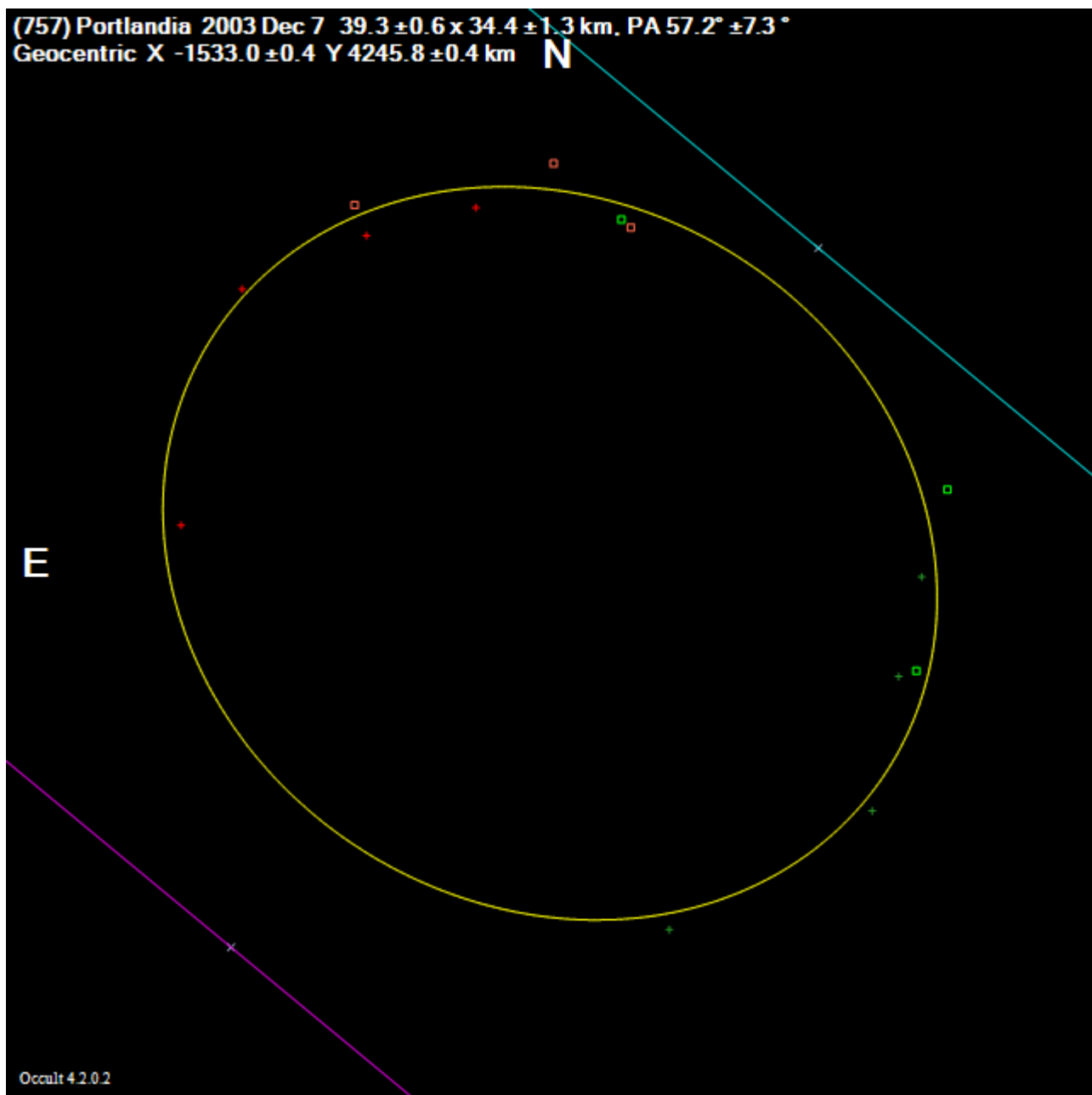
754Malabar2016Dec30

(754) Malabar 2016 Dec 30 $126.8 \pm 22.8 \times 84.4 \pm 4.8$ km, PA $-37.4^\circ \pm 12.5^\circ$
Geocentric X 3608.8 ± 2.0 Y 4958.5 ± 6.0 km **N**



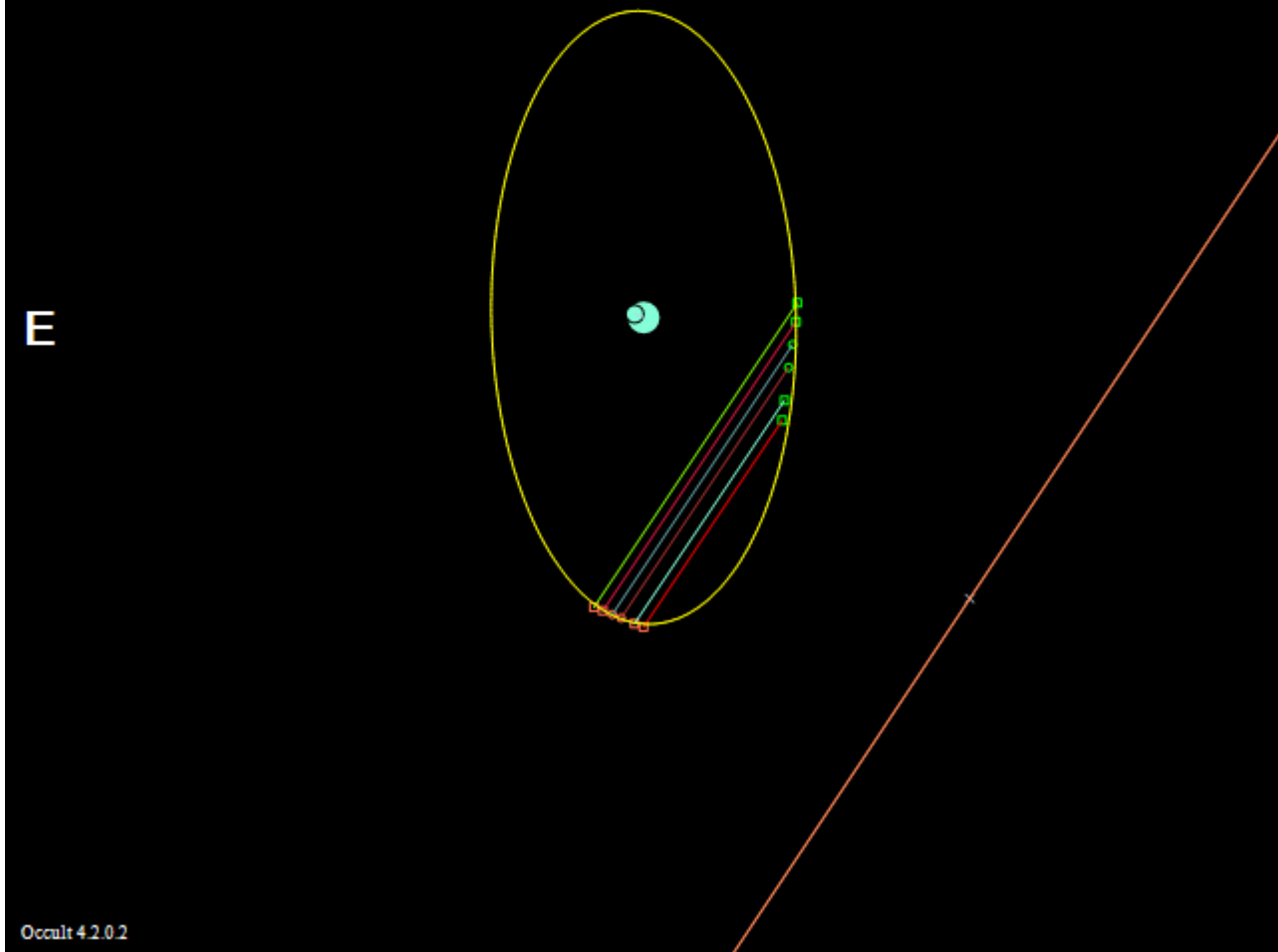
757portlandia2003dec07

(757) Portlandia 2003 Dec 7 $39.3 \pm 0.6 \times 34.4 \pm 1.3$ km, PA $57.2^\circ \pm 7.3^\circ$
Geocentric X -1533.0 ± 0.4 Y 4245.8 ± 0.4 km



759vinifera2012jan13

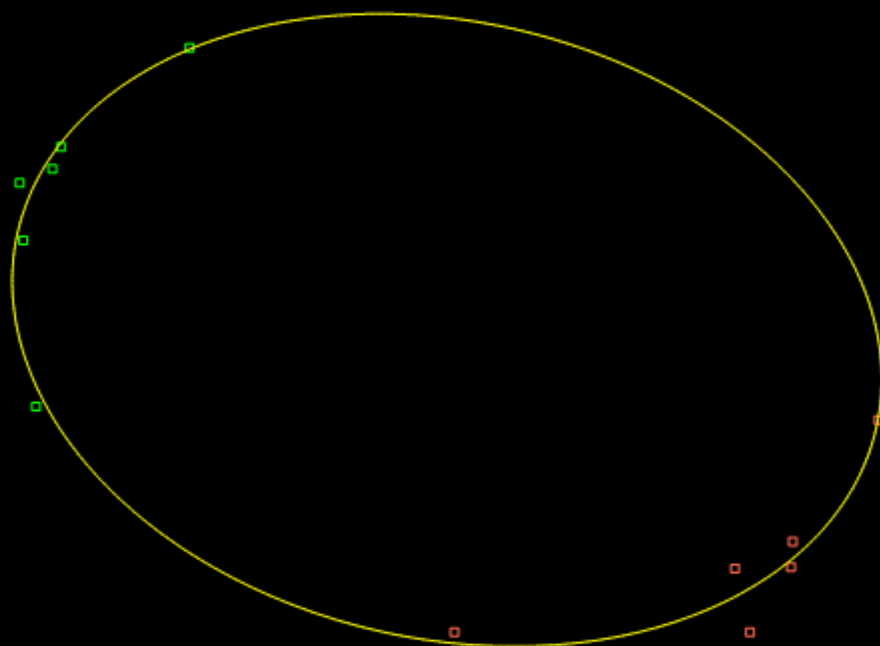
(759) Vinifera 2012 Jan 13 $59.0 \pm 1.4 \times 29.3 \pm 0.5$ km, PA $1.3^\circ \pm 0.7^\circ$
Geocentric X -144.8 ± 0.3 Y 1507.8 ± 0.7 km **N**
Double : Sep $0.0006 \pm 0.0001''$, PA $68.4^\circ \pm 7.0^\circ$



760massinga2012feb29

(760) Massinga 2012 Feb 29 $80.2 \pm 1.5 \times 56.2 \pm 3.5$ km, PA $77.2^\circ \pm 4.5^\circ$
Geocentric X -3710.9 ± 0.9 Y 4464.4 ± 1.0 km **N**

E

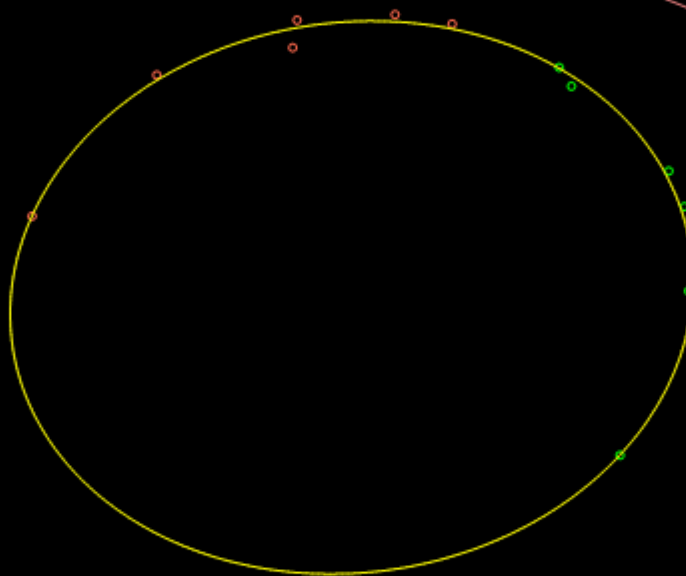


76freia2007jan14

(76) Freia 2007 Jan 14 $131.7 \pm 5.0 \times 164.0 \pm 3.9$ km, PA $7.9^\circ \pm 6.8^\circ$
Geocentric X 2697.6 ± 2.0 Y 3379.8 ± 2.9 km

N

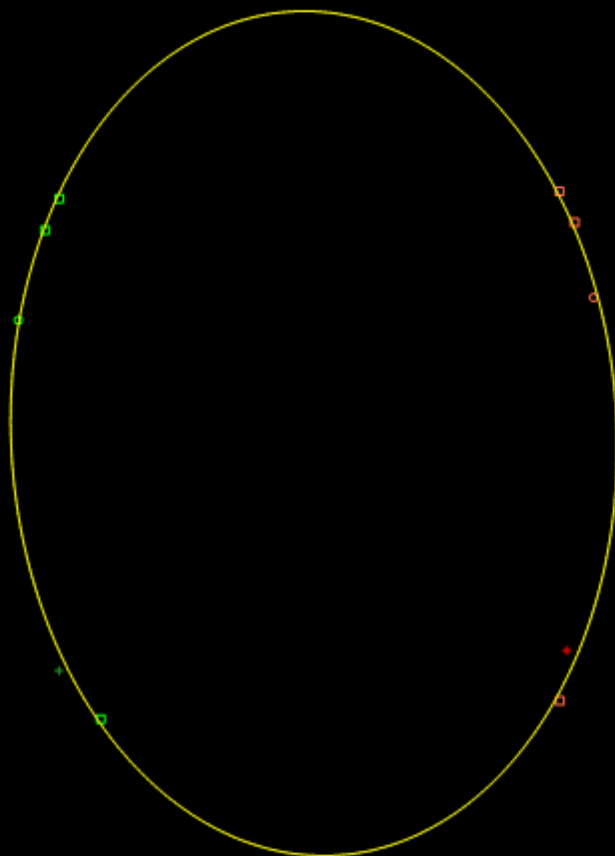
E



76freia2008jan17

(76) Freia 2008 Jan 17 $201.2 \pm 6.9 \times 144.3 \pm 2.2$ km, PA $2.7^\circ \pm 1.0^\circ$
Geocentric X -3791.9 ± 0.4 Y 3309.0 ± 1.2 km **N**

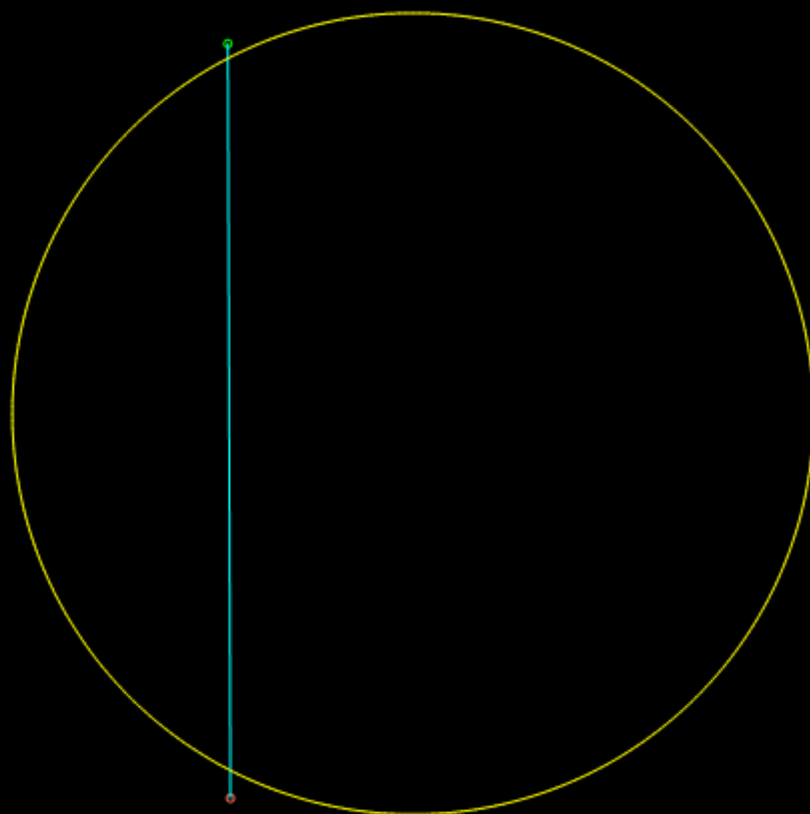
E



772tanete2004apr18

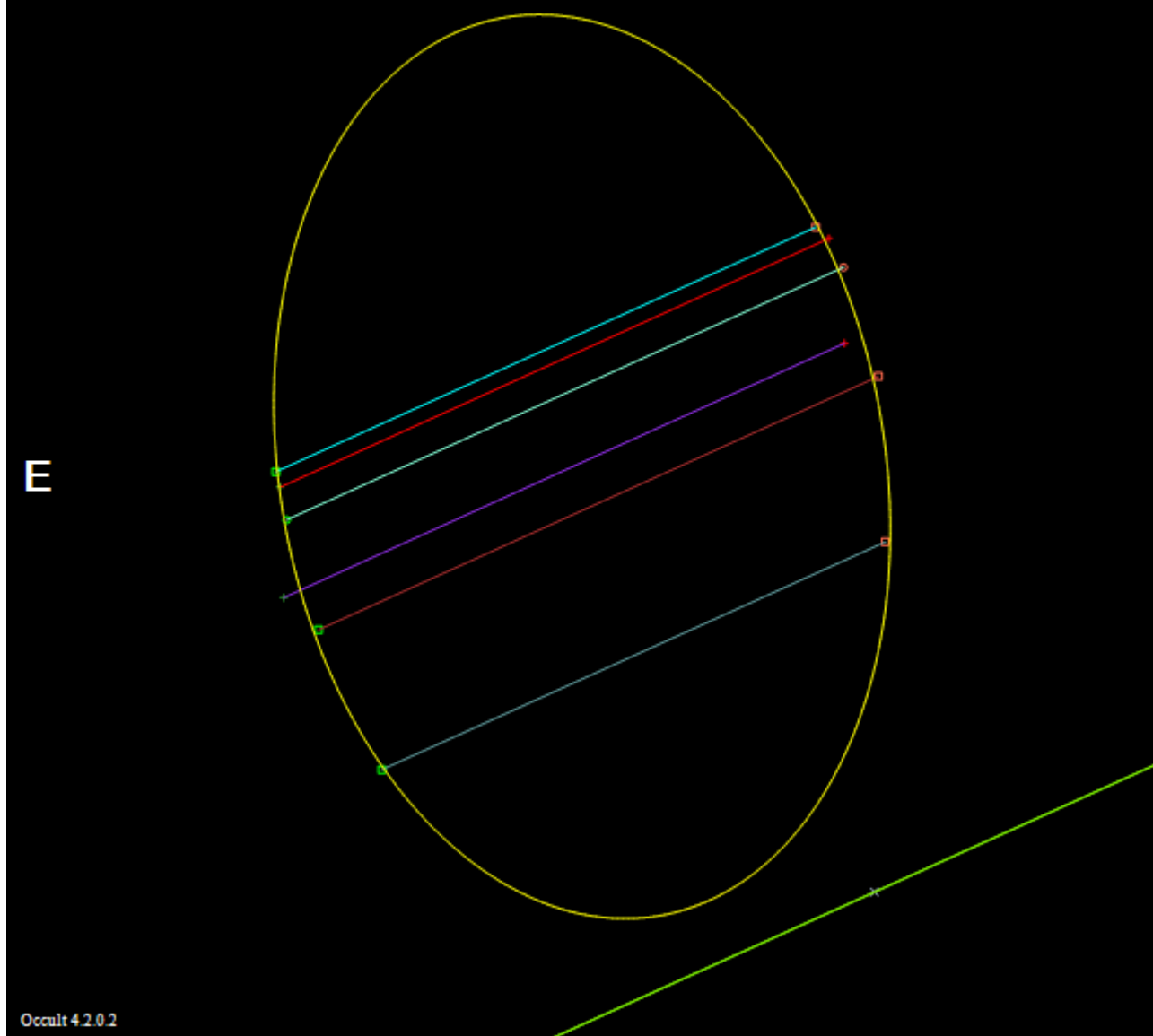
(772) Tanete 2004 Apr 18 122.0 x 122.0 km, PA 0.0° °
Geocentric X 125.3 ± 5.4 Y 5837.8 ± 3.8 km N

E



773irmintraud2008jun24

(773) Irmintraud 2008 Jun 24 $125.6 \pm 24.3 \times 83.4 \pm 0.9$ km, PA $9.8^\circ \pm 7.0^\circ$
Geocentric X -4853.1 ± 0.7 Y -41.9 ± 2.0 km **N**

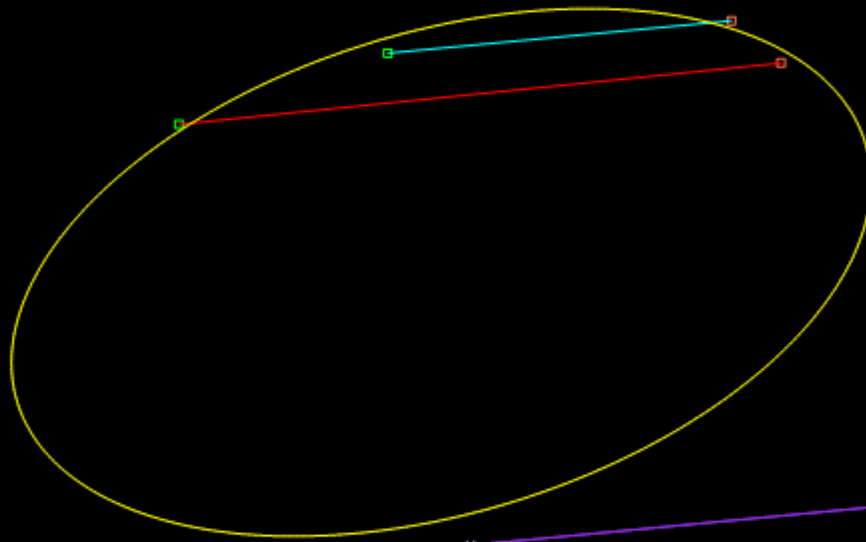


773irmintraud2009sep20

(773) Irimintraud 2009 Sep 20 109.6 x 59.4 km. PA 107.0° °
Geocentric X -2808.1 Y 2537.2 km

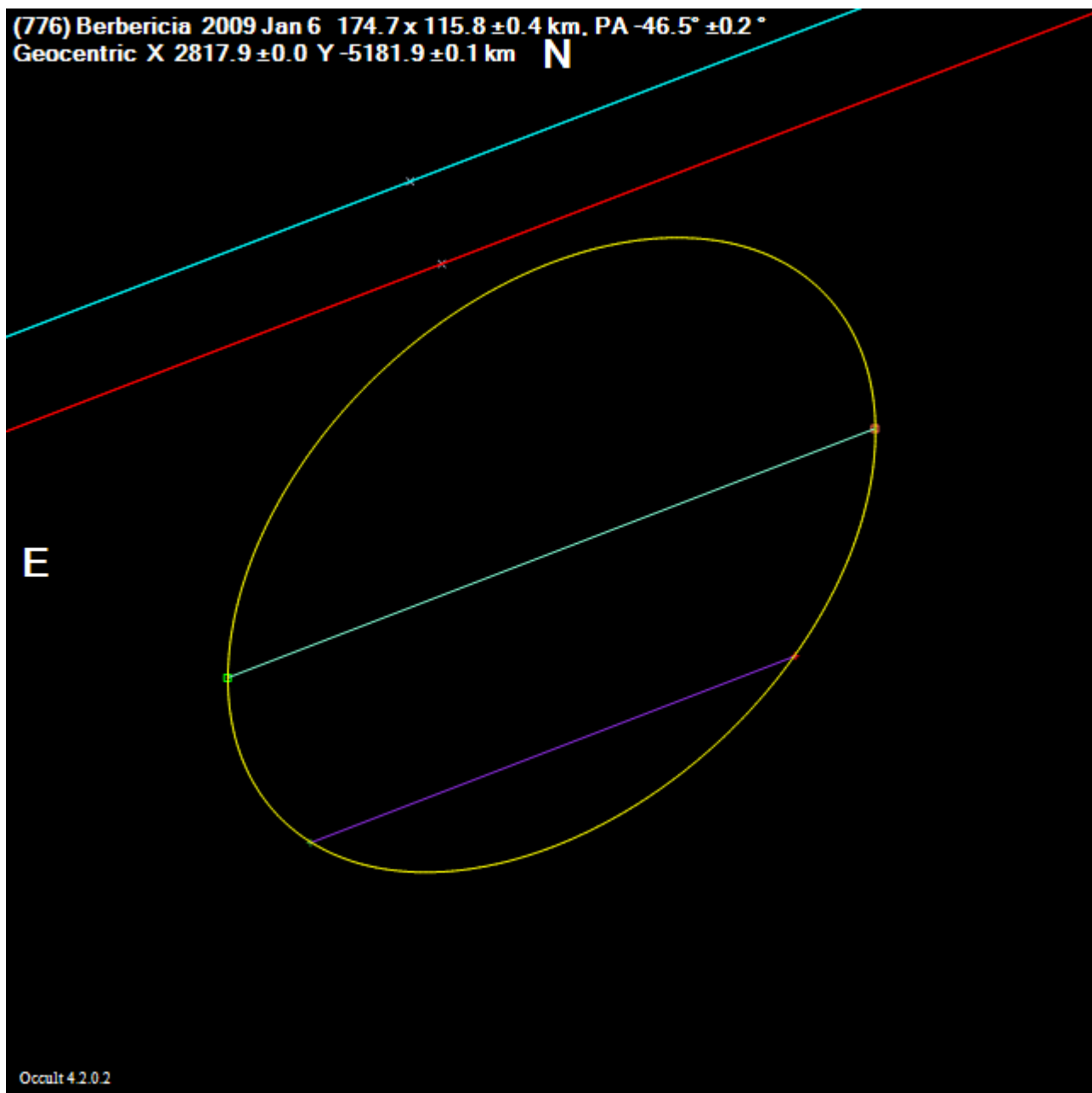
N

E



776berbericia2009jan06

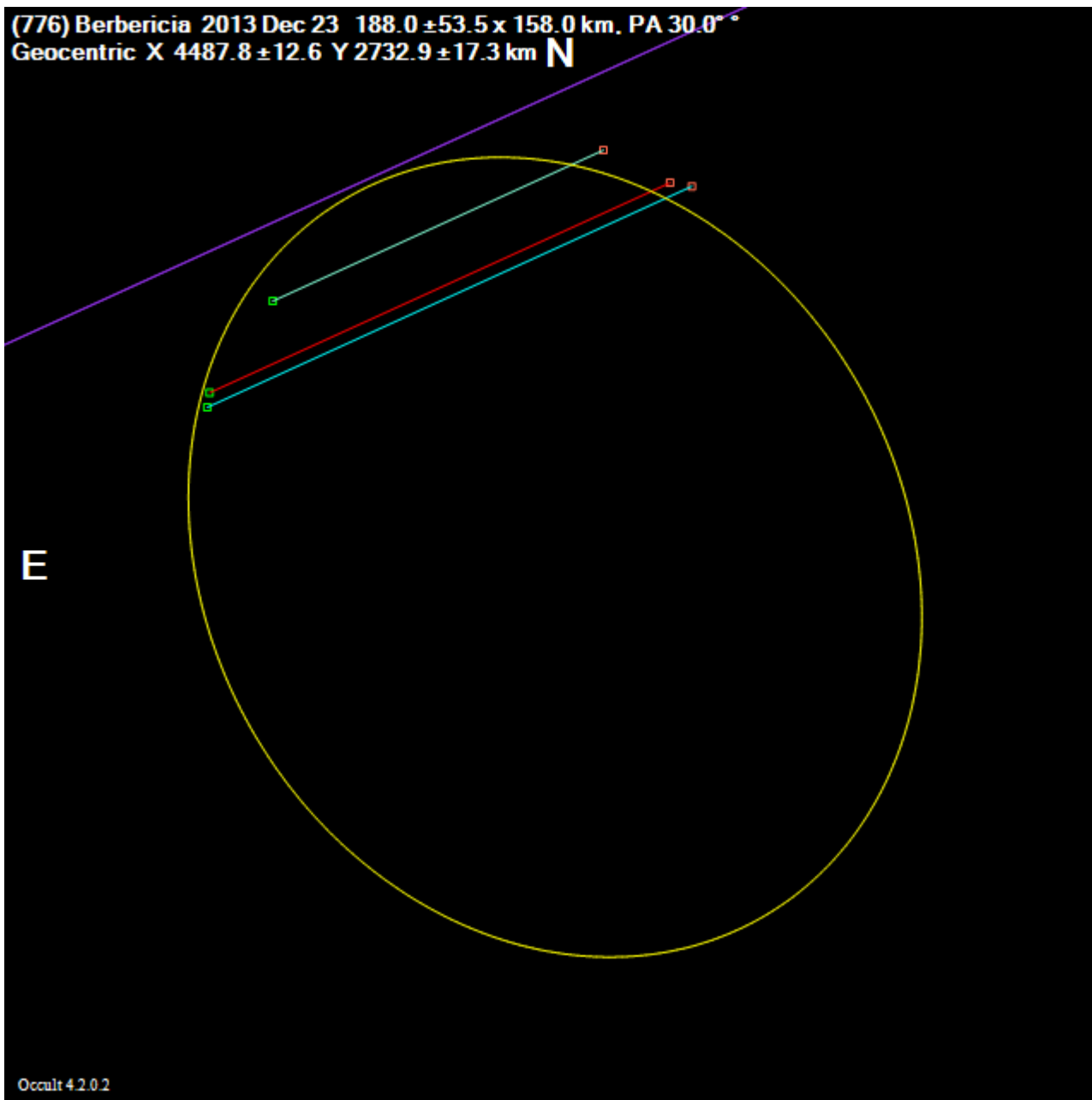
(776) Berbericia 2009 Jan 6 $174.7 \times 115.8 \pm 0.4$ km, PA $-46.5^\circ \pm 0.2^\circ$
Geocentric X 2817.9 ± 0.0 Y -5181.9 ± 0.1 km **N**



776berbericia2013dec23

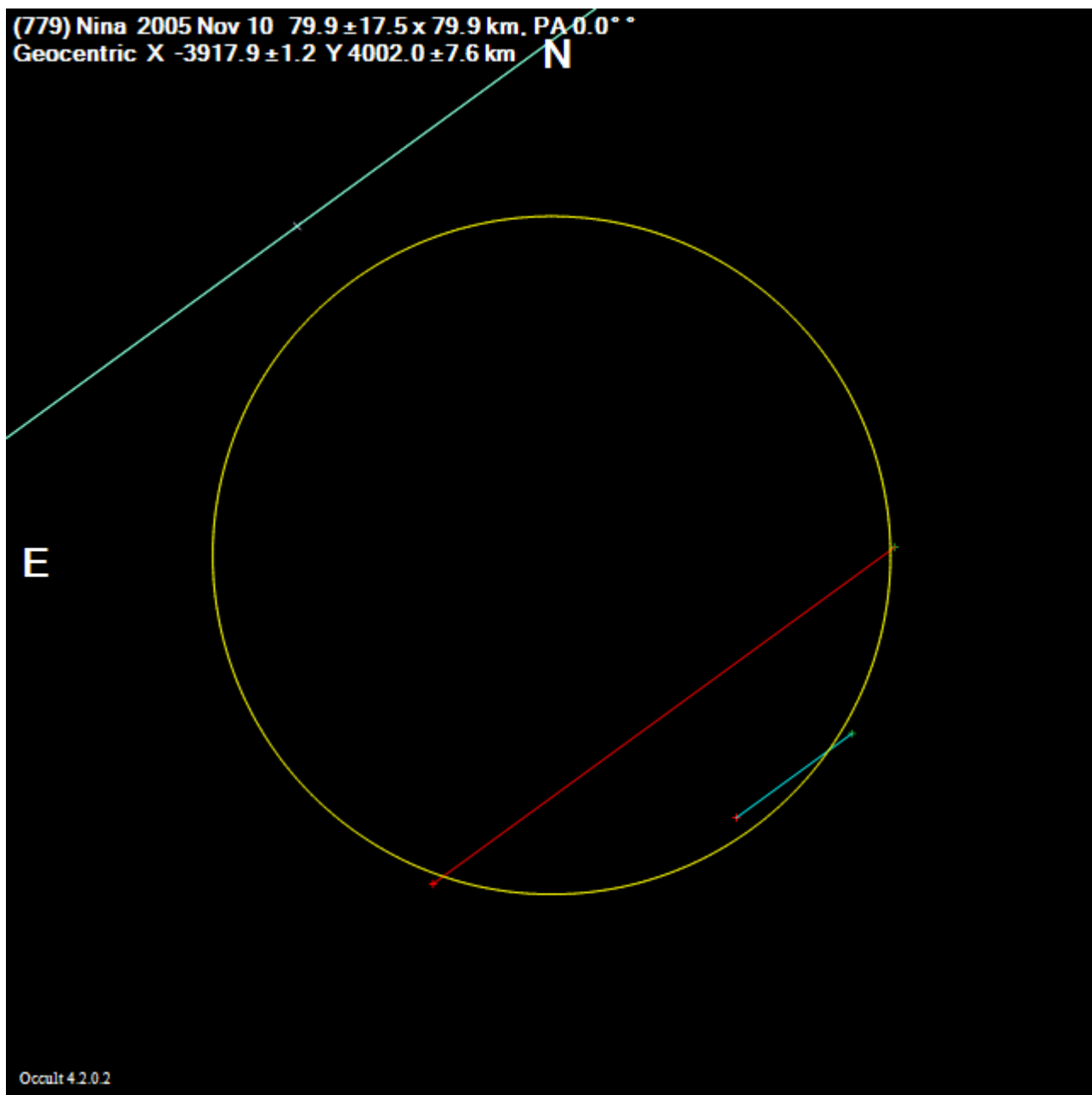
(776) Berbericia 2013 Dec 23 $188.0 \pm 53.5 \times 158.0$ km, PA 30.0°
Geocentric X 4487.8 ± 12.6 Y 2732.9 ± 17.3 km **N**

E



779nina2005nov10

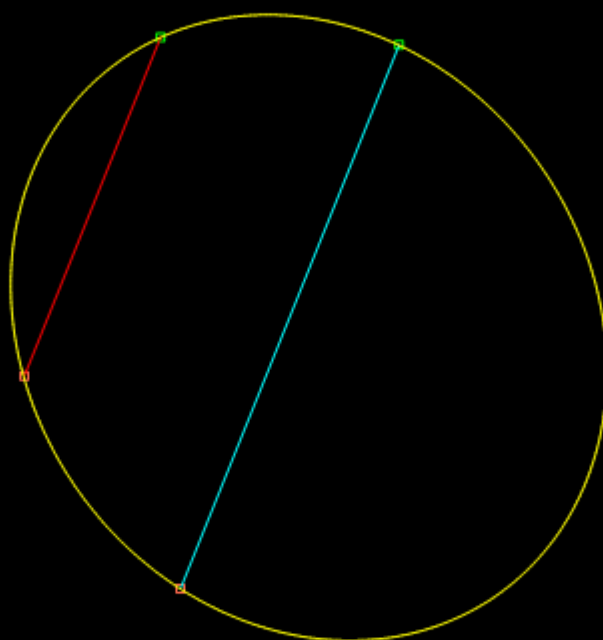
(779) Nina 2005 Nov 10 $79.9 \pm 17.5 \times 79.9$ km, PA 0.0° °
Geocentric X -3917.9 ± 1.2 Y 4002.0 ± 7.6 km



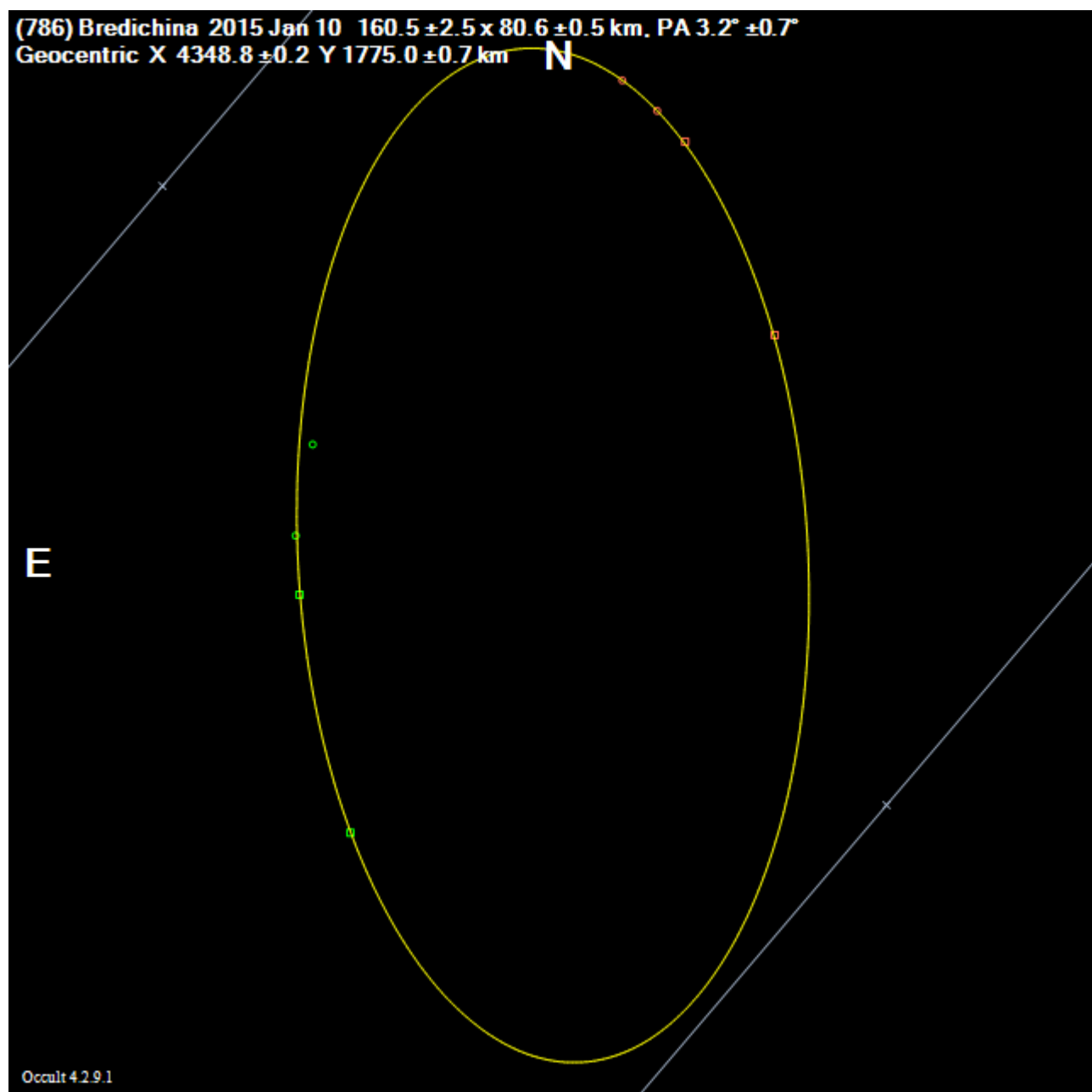
780armenia2005jul24

(780) Armenia 2005 Jul 24 80.0 x 69.1 \pm 0.1 km, PA 35.3° \pm 0.4°
Geocentric X -59.2 \pm 0.0 Y 4392.1 \pm 0.0 km **N**

E

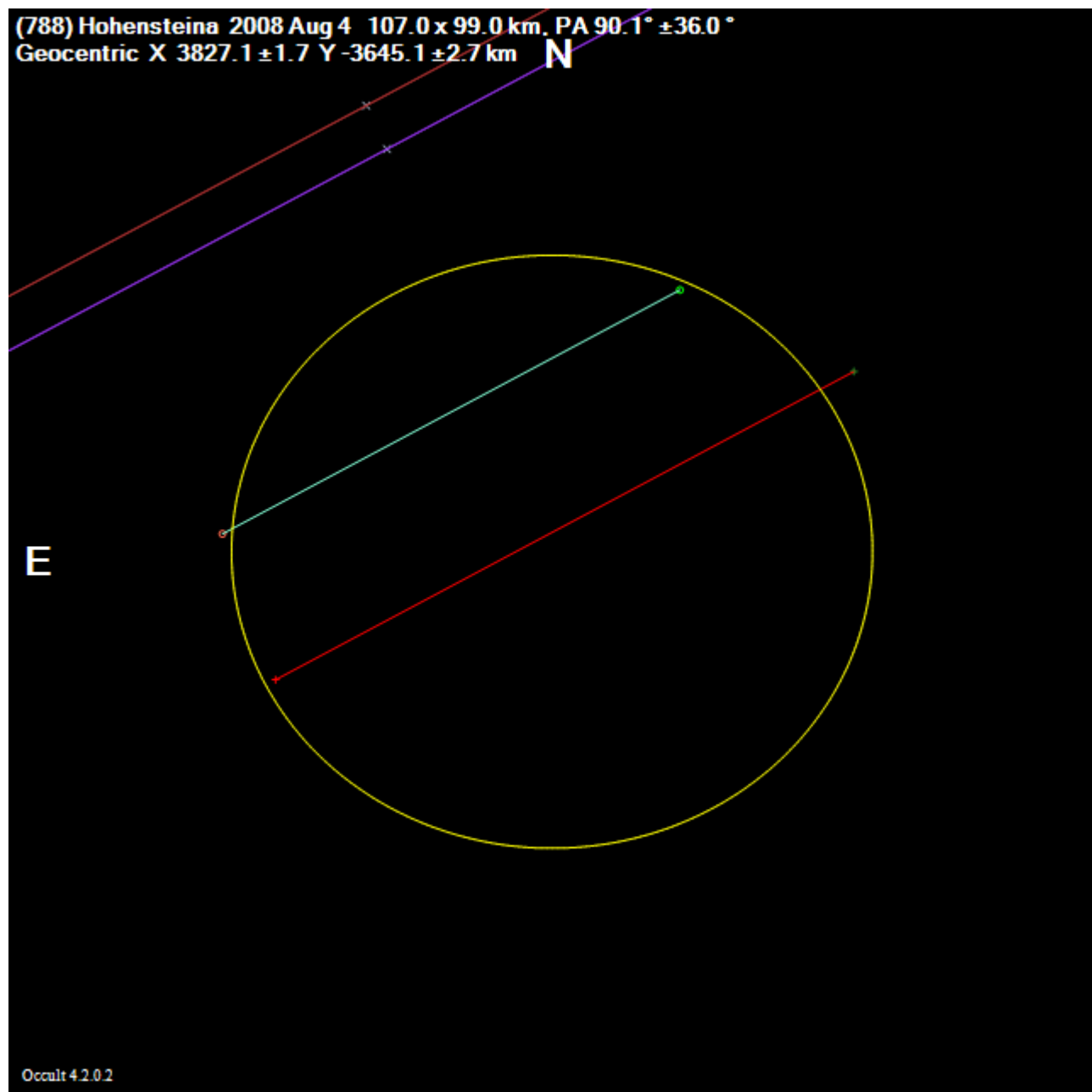


786bredichina2015jan10



788hohensteina2008aug04

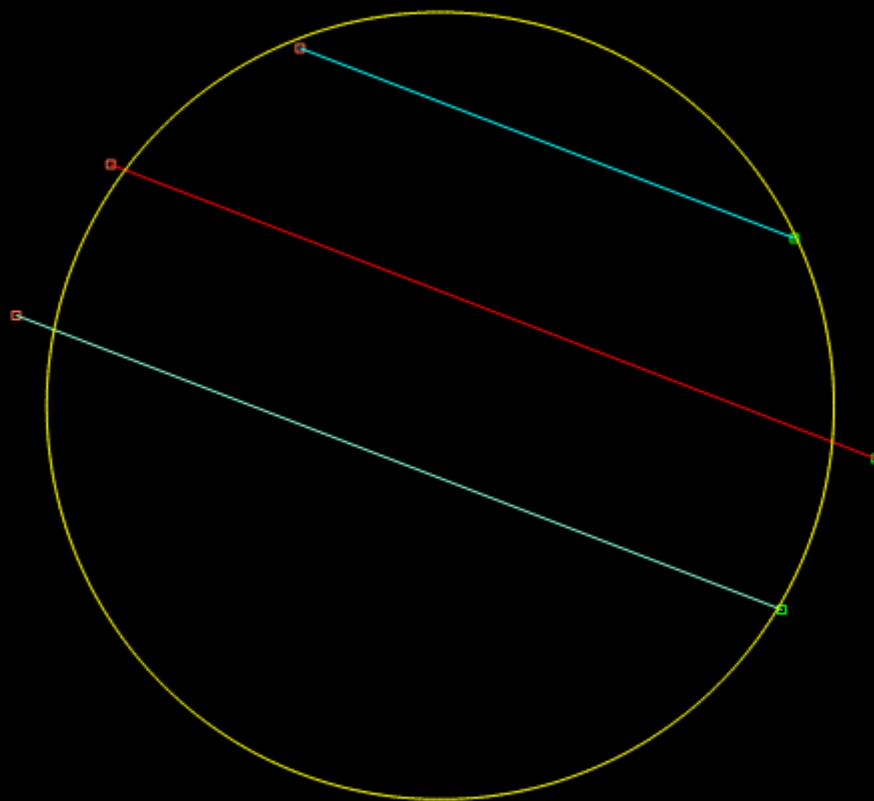
(788) Hohensteina 2008 Aug 4 107.0 x 99.0 km, PA 90.1° ± 36.0°
Geocentric X 3827.1 ± 1.7 Y -3645.1 ± 2.7 km



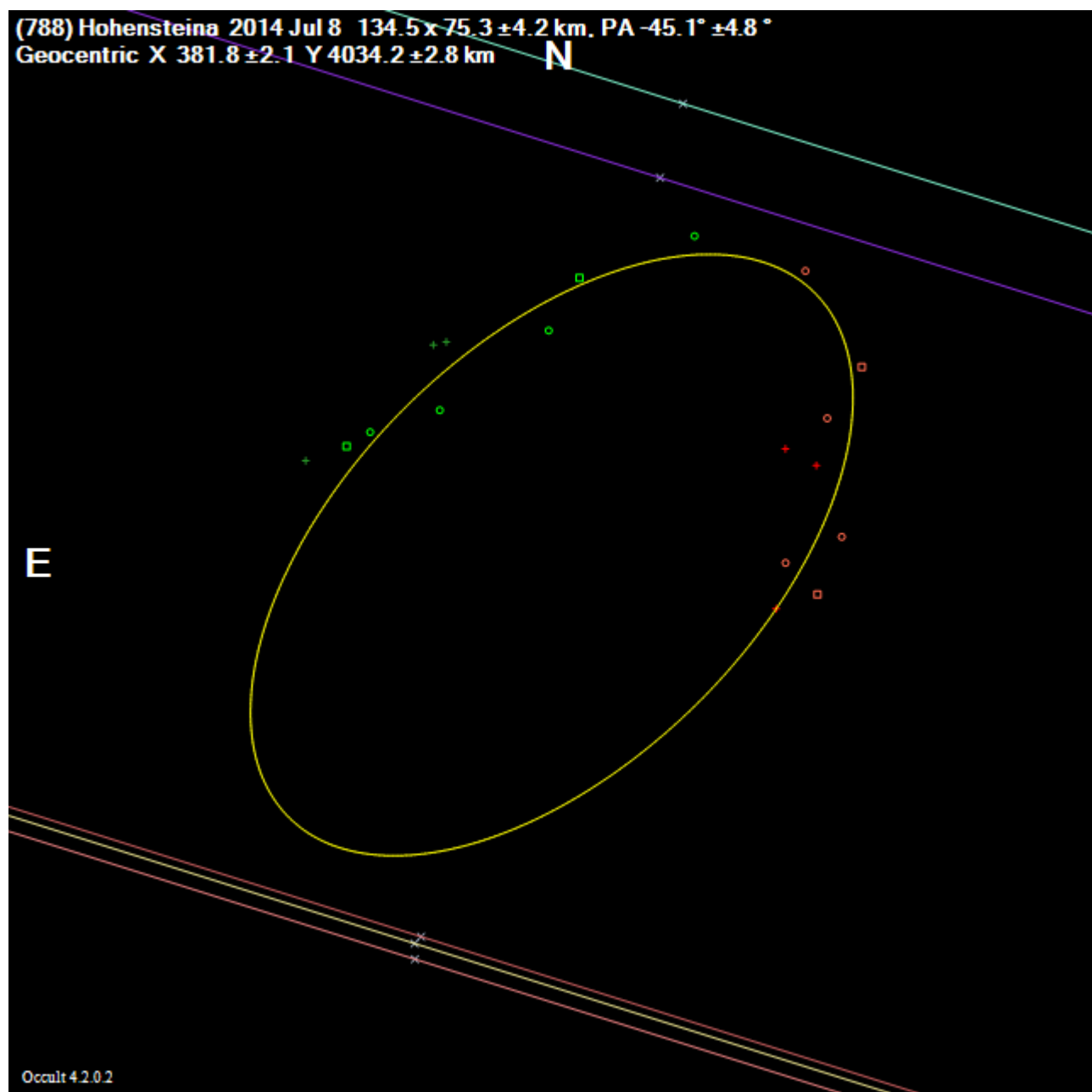
788hohensteina2009apr10

(788) Hohensteina 2009 Apr 10 $105.5 \pm 8.9 \times 105.5$ km, PA 0.0° °
Geocentric X -3028.6 ± 1.6 Y -3328.9 ± 3.7 km **N**

E



788hohensteina2014jul08

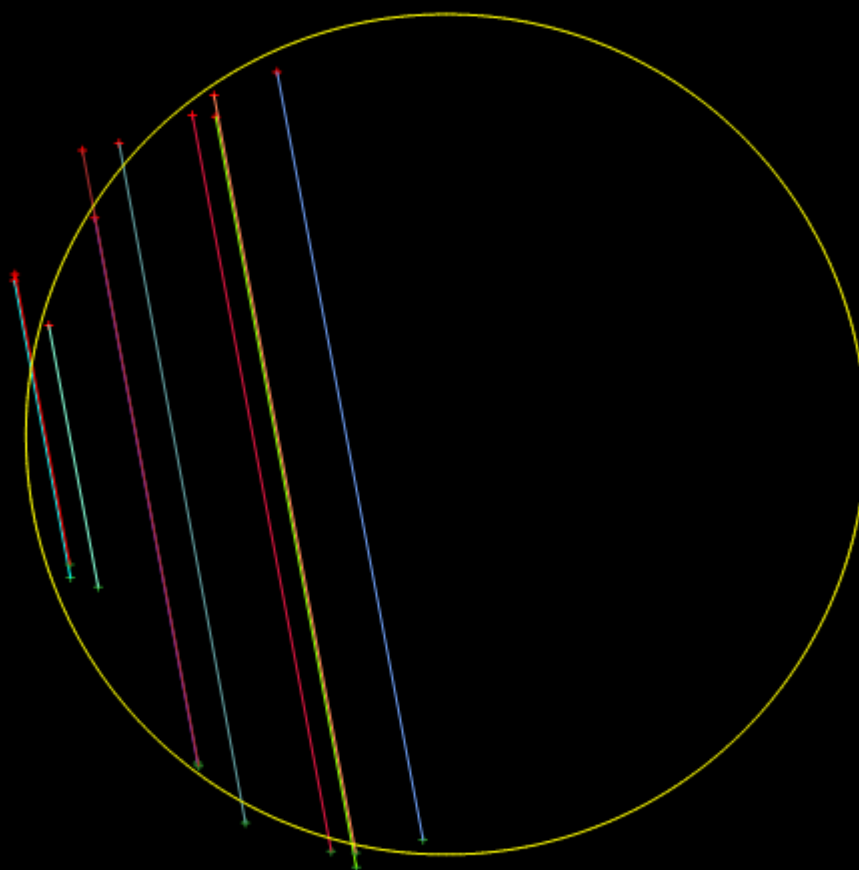


78diana1980sep04

(78) Diana 1980 Sep 4 $131.2 \pm 3.5 \times 131.2$ km, PA 0.0° °
Geocentric X 1581.1 ± 1.5 Y 1054.1 ± 1.2 km **N**

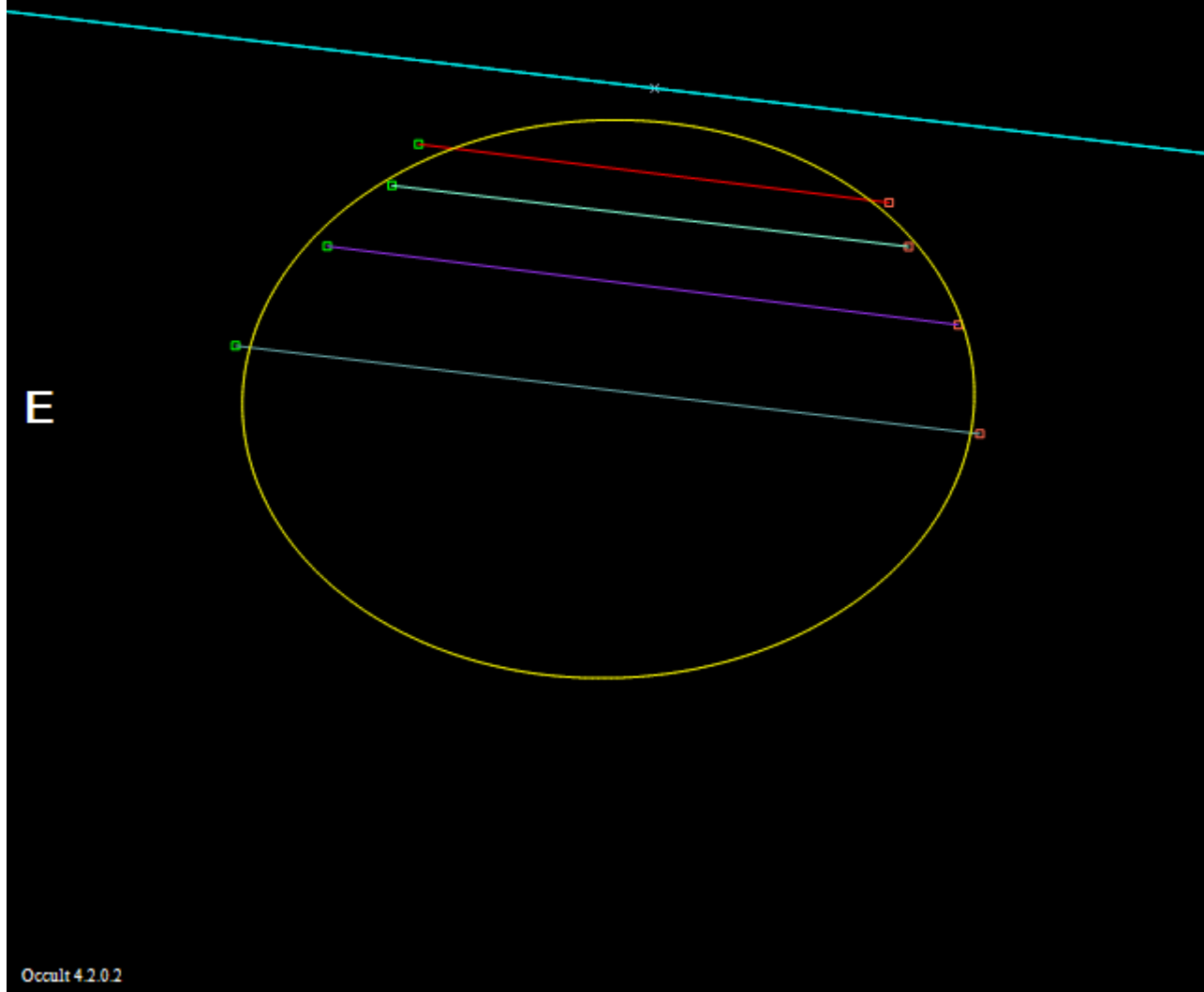
E

Occult 4.2.0.2



78diana2010dec05

(78) Diana 2010 Dec 5 122.0 x 93.0 km, PA 91.9° ± 4.9°
Geocentric X 2791.7 ± 1.3 Y 218.9 ± 1.1 km **N**

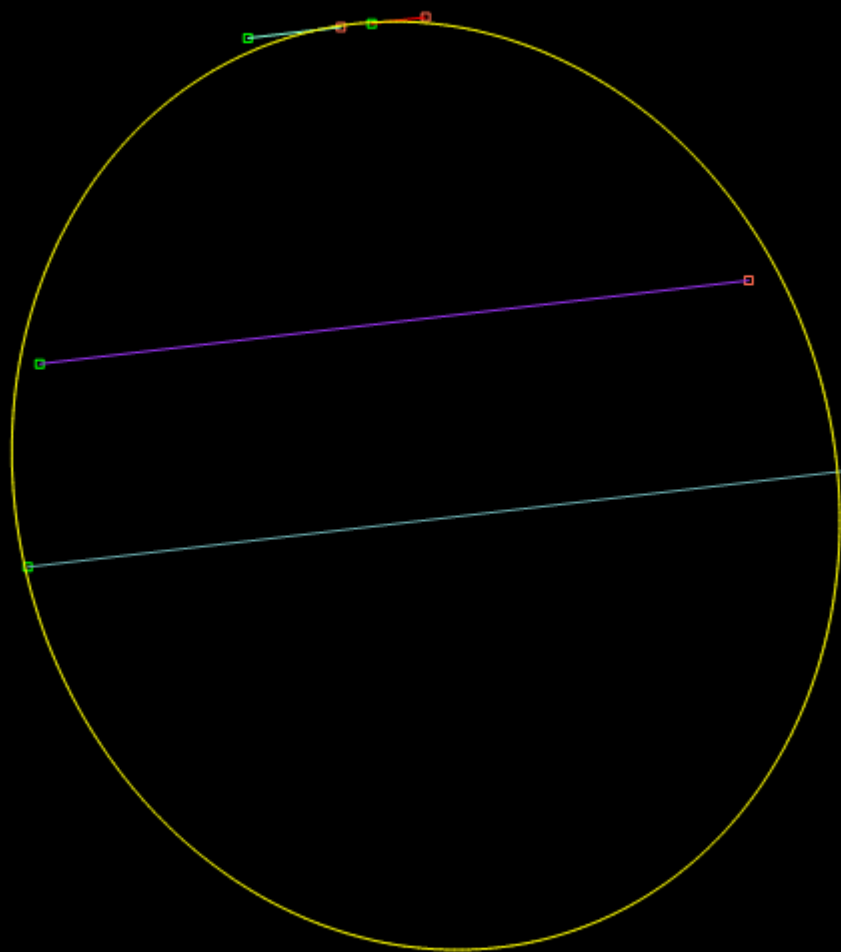


78diana2014oct13

(78) Diana 2014 Oct 13 153.7 x 134.0 km. PA $16.7^\circ \pm 12.0^\circ$
Geocentric X 1015.2 ± 1.3 Y 1446.4 ± 1.3 km N

E

Occult 4.2.0.2



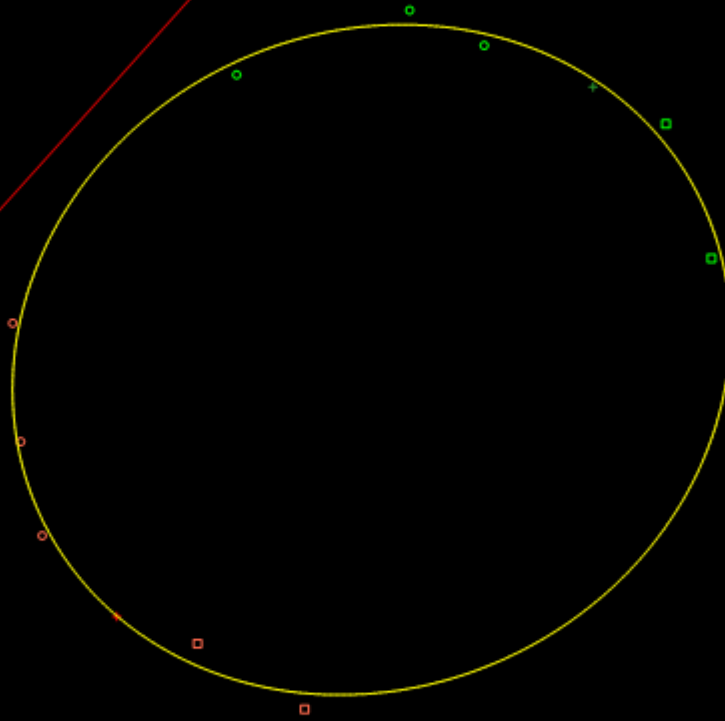
790pretoria2005oct29

(790) Pretoria 2005 Oct 29 $144.8 \pm 4.7 \times 161.9 \pm 2.3$ km, PA $26.0^\circ \pm 9.8^\circ$
Geocentric X -2184.9 ± 1.5 Y 3599.5 ± 1.3 km

N

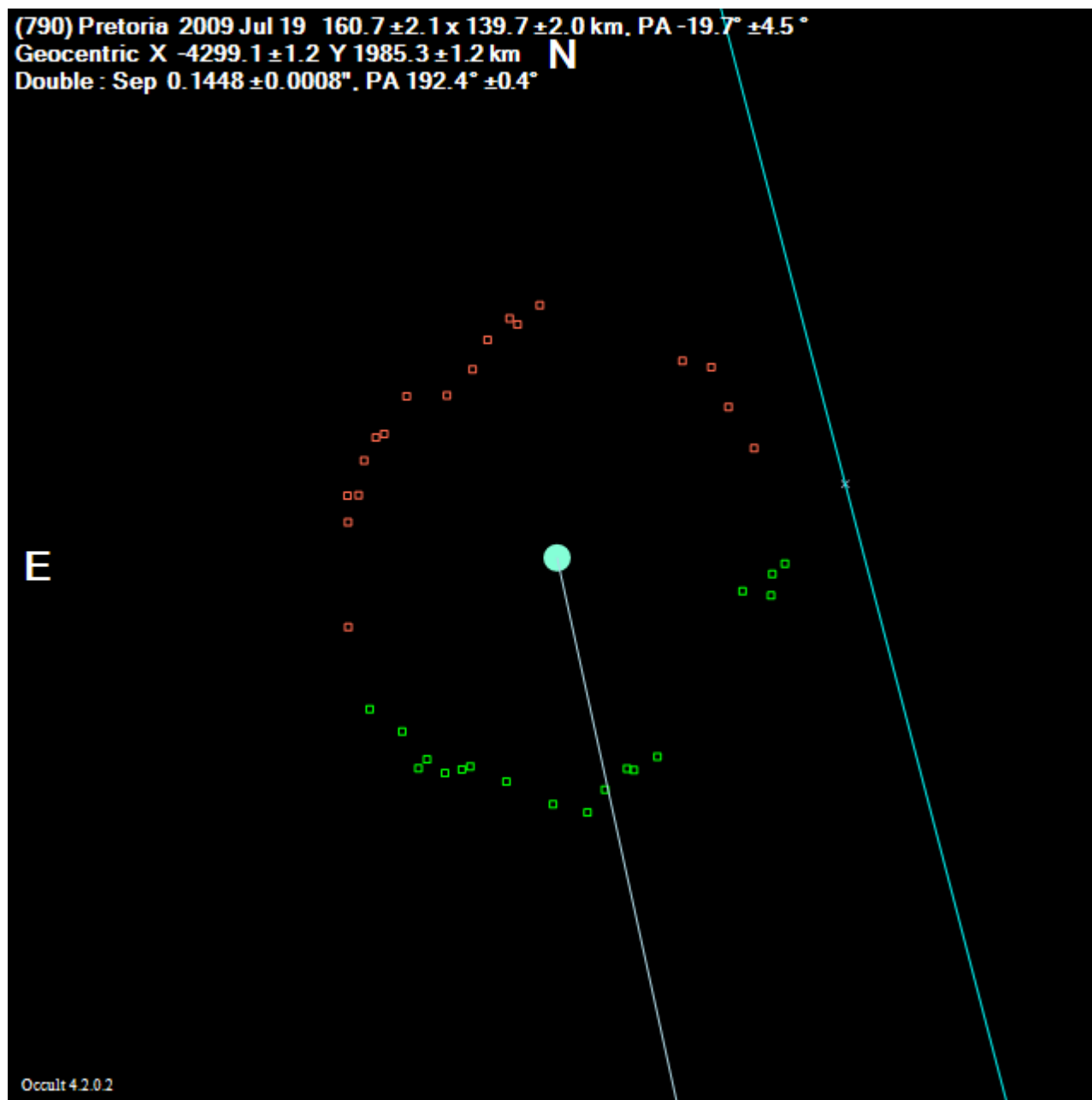
E

Occult 4.2.0.2



790pretoria2009jul19

(790) Pretoria 2009 Jul 19 $160.7 \pm 2.1 \times 139.7 \pm 2.0$ km, PA $-19.7^\circ \pm 4.5^\circ$
Geocentric X -4299.1 ± 1.2 Y 1985.3 ± 1.2 km **N**
Double : Sep $0.1448 \pm 0.0008''$, PA $192.4^\circ \pm 0.4^\circ$



790Pretoria2016Dec18

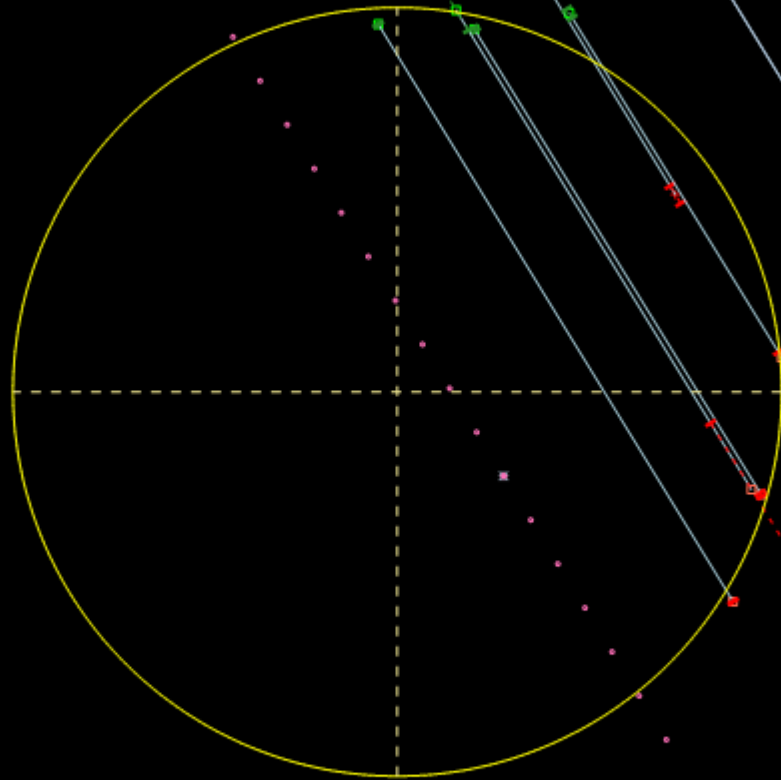
(790) Pretoria 2016 Dec 18 170.0 x 170.0 km, PA 0.0°
Geocentric X 4490.1 ± 1.8 Y 2224.0 ± 1.7 km

N

E

Occult 4.2.9.1

100 km

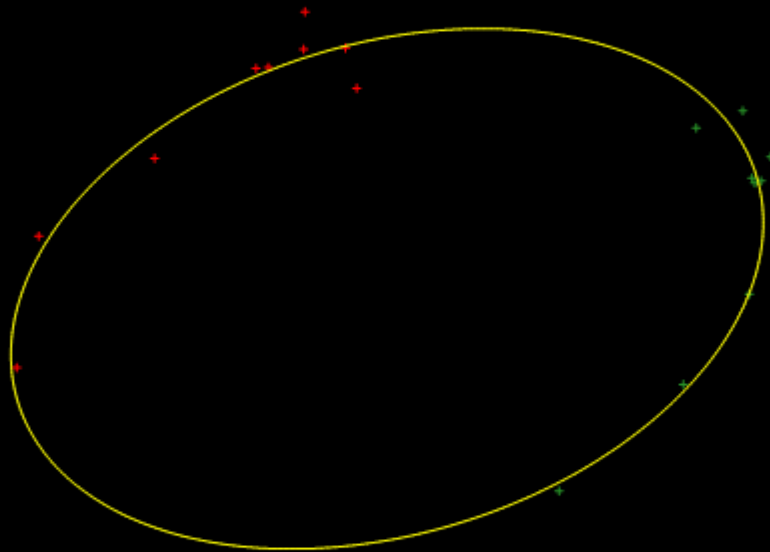


791ani2000apr07

(791) Ani 2000 Apr 7 $65.7 \pm 3.2 \times 103.5 \pm 3.0$ km. PA $17.0^\circ \pm 5.7^\circ$
Geocentric X 2816.2 ± 1.3 Y 3438.2 ± 1.6 km N

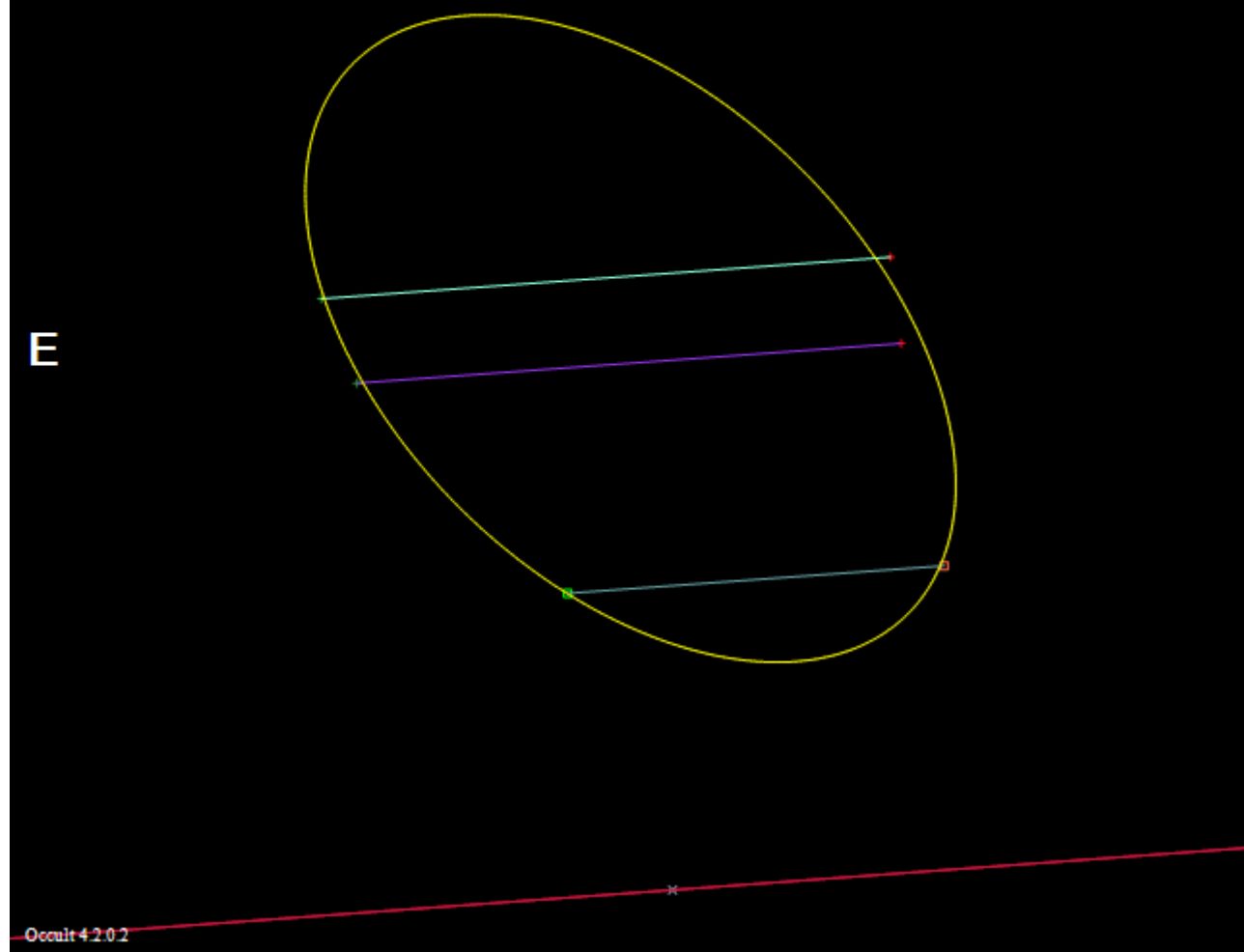
E

Occult 4.2.0.2



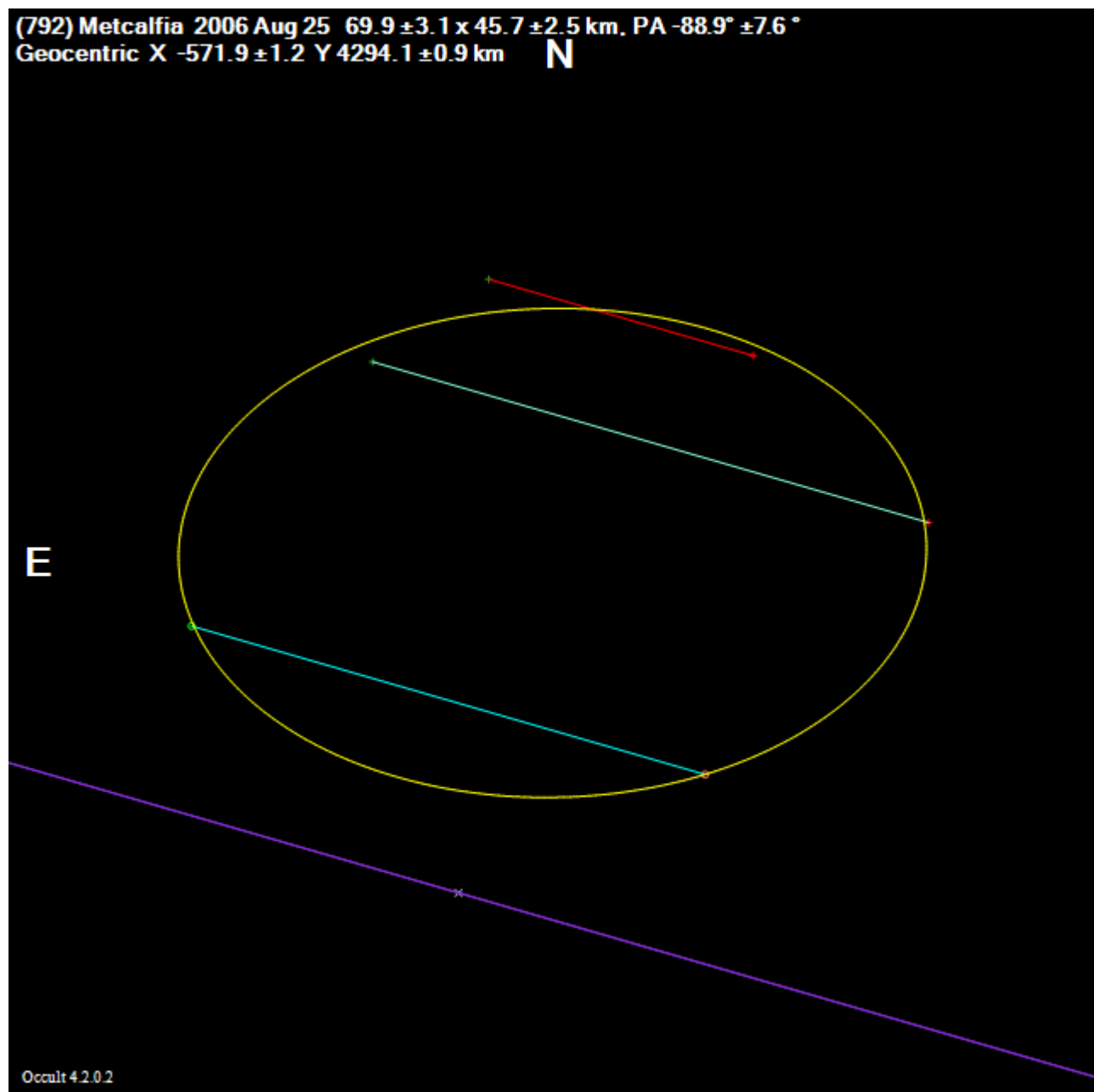
791ani2004nov24

(791) Ani 2004 Nov 24 109.5 ± 17.1 \times 67.4 ± 3.7 km, PA $45.3^\circ \pm 10.0^\circ$
Geocentric X 1328.8 ± 3.9 Y 2912.9 ± 7.1 km **N**



792metcalfia2006aug25

(792) Metcalfia 2006 Aug 25 $69.9 \pm 3.1 \times 45.7 \pm 2.5$ km, PA $-88.9^\circ \pm 7.6^\circ$
Geocentric X -571.9 ± 1.2 Y 4294.1 ± 0.9 km **N**




799gudula2004feb25

(799) Gudula 2004 Feb 25 49.8 x 28.8 km, PA -33.7° °
Geocentric X -2615.8 Y -4507.3 km

N

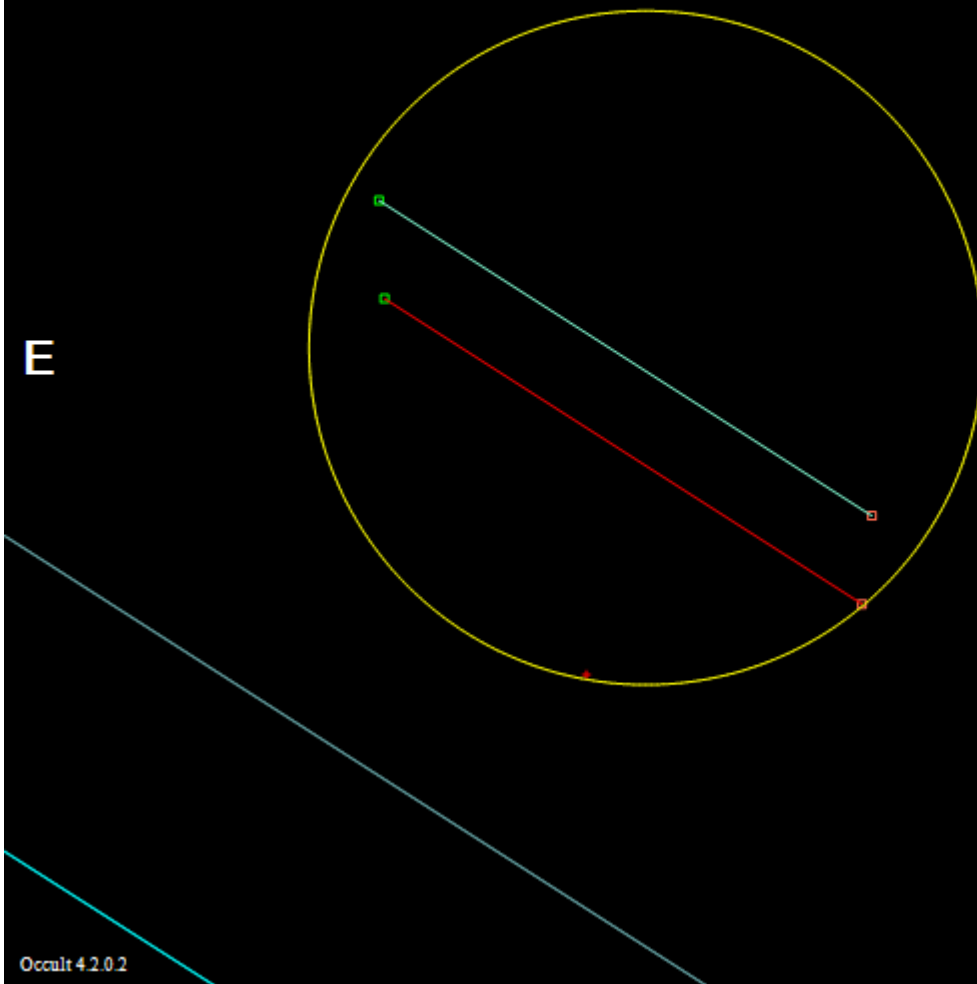
E

Occult 4.2.0.2



79eurynome2008sep12

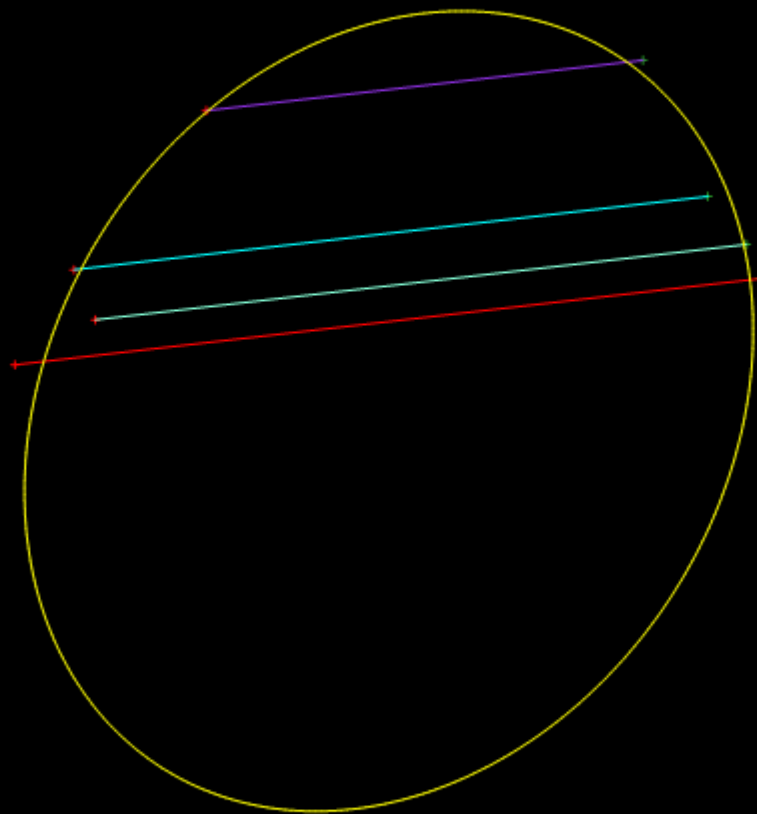
(79) Eurynome 2008 Sep 12 69.0 x 69.0 km, PA 0.0° °
Geocentric X -2688.4 ±2.4 Y 4557.2 ±3.3 km **N**



7iris2005feb17

(7) Iris 2005 Feb 17 $220.0 \pm 95.7 \times 175.8 \pm 45.0$ km, PA $-32.5^\circ \pm 55.6^\circ$
Geocentric X -5003.1 ± 6.0 Y -3097.7 ± 51.3 km **N**

E

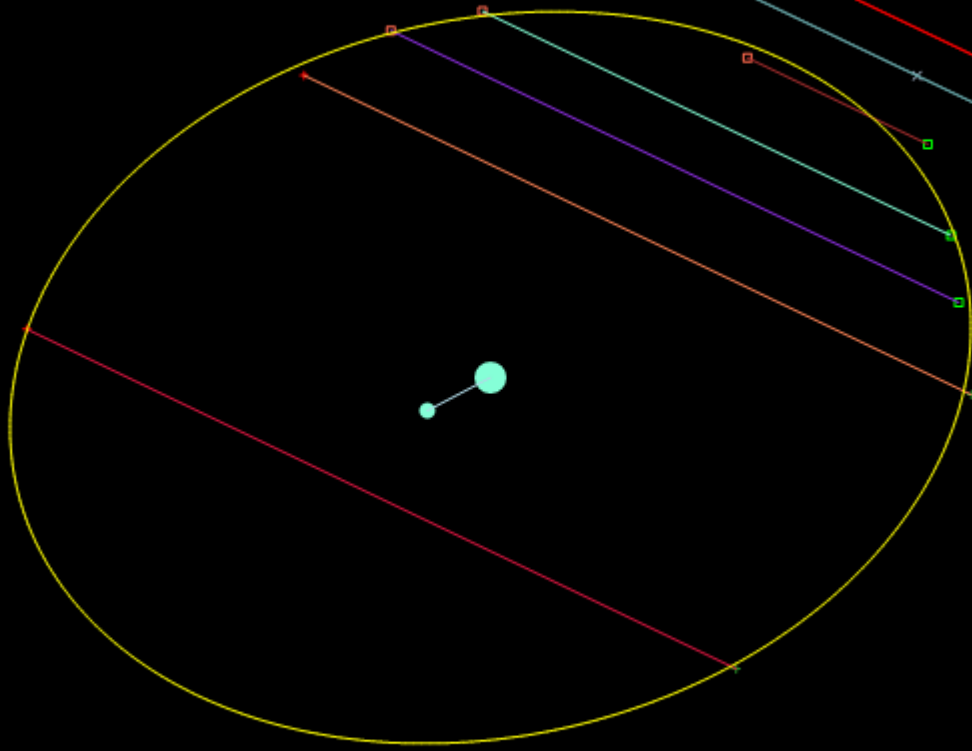


7iris2006may05

(7) Iris 2006 May 5 $186.4 \pm 3.8 \times 253.1 \pm 4.5$ km, PA $13.2^\circ \pm 3.1^\circ$
Geocentric X -4662.3 ± 2.0 Y 4044.7 ± 2.2 km **N**
Double : Sep $0.0098 \pm 0.0008''$, PA $117.6^\circ \pm 5.1^\circ$

E

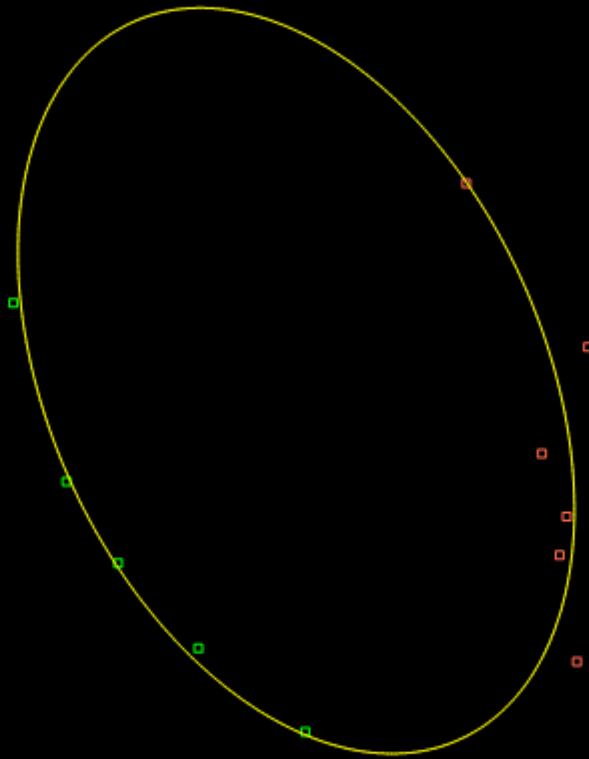
Occult 4.2.0.2



7iris2011feb19

(7) Iris 2011 Feb 19 $259.5 \pm 29.1 \times 162.7 \pm 5.6$ km, PA $24.6^\circ \pm 3.7^\circ$
Geocentric X 1528.3 ± 4.8 Y 4093.7 ± 11.0 km **N**

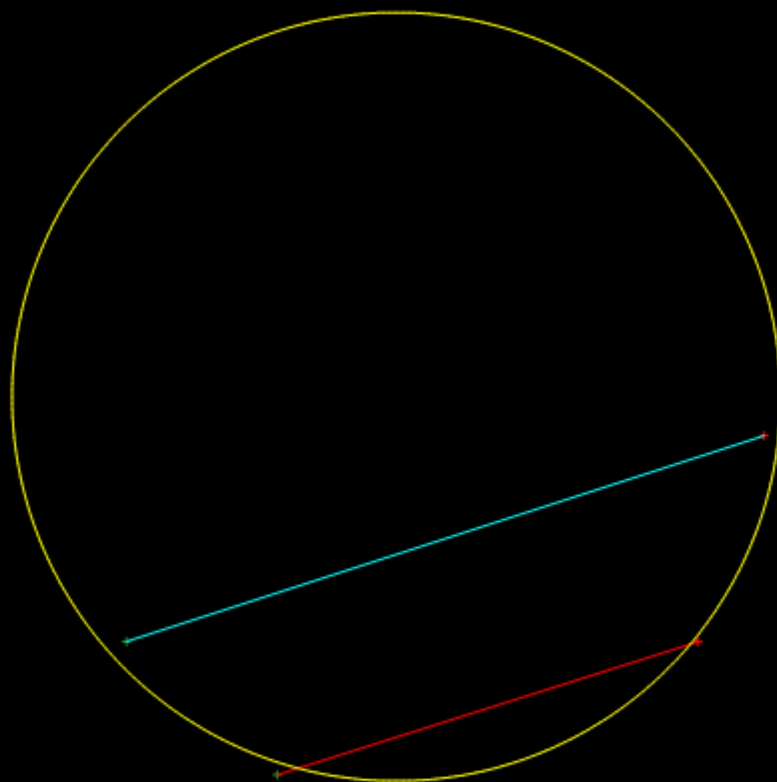
E



804hispania1992may05

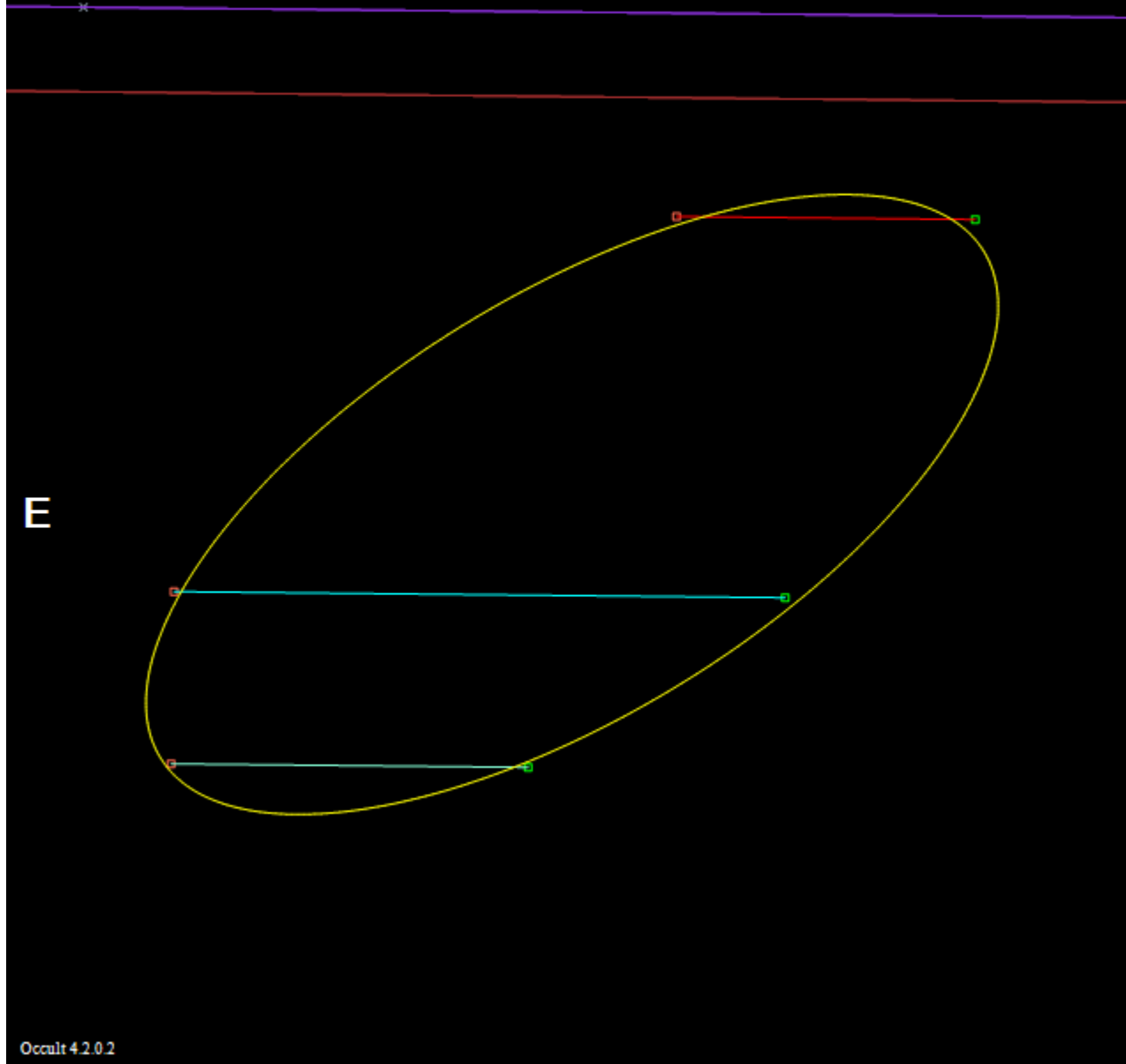
(804) Hispania 1992 May 5 157.0 x 157.0 km. PA 0.0° °
Geocentric X 1424.9 ± 1.8 Y -1891.5 ± 2.0 km **N**

E



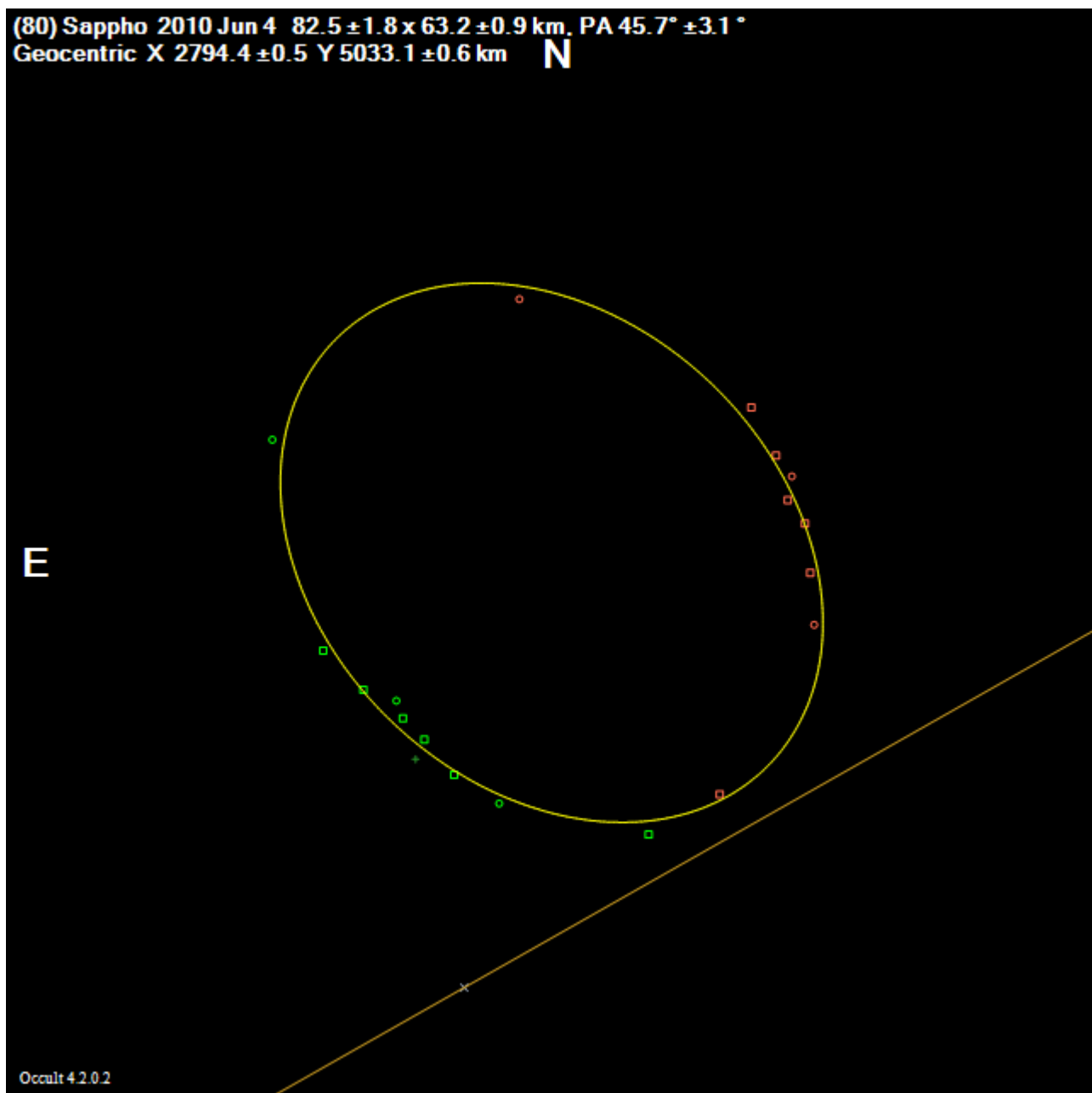
808merxia2012apr06

(808) Merxia 2012 Apr 6 $47.0 \pm 0.5 \times 20.4 \pm 0.5$ km. PA $-58.4^\circ \pm 0.8^\circ$
Geocentric X 987.2 ± 0.2 Y 1848.6 ± 0.2 km **N**



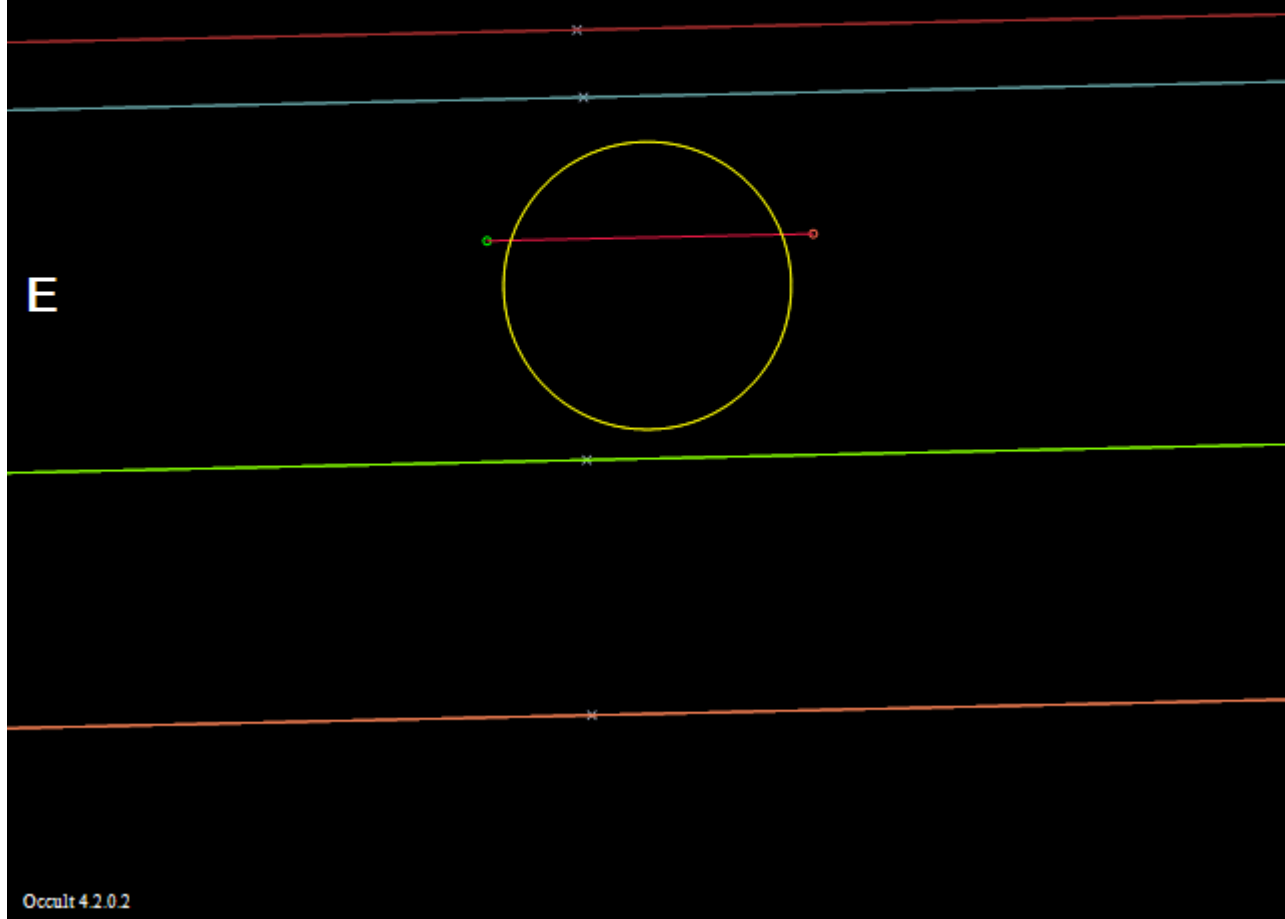
80sappho2010jun04

(80) Sappho 2010 Jun 4 $82.5 \pm 1.8 \times 63.2 \pm 0.9$ km, PA $45.7^\circ \pm 3.1^\circ$
Geocentric X 2794.4 ± 0.5 Y 5033.1 ± 0.6 km **N**



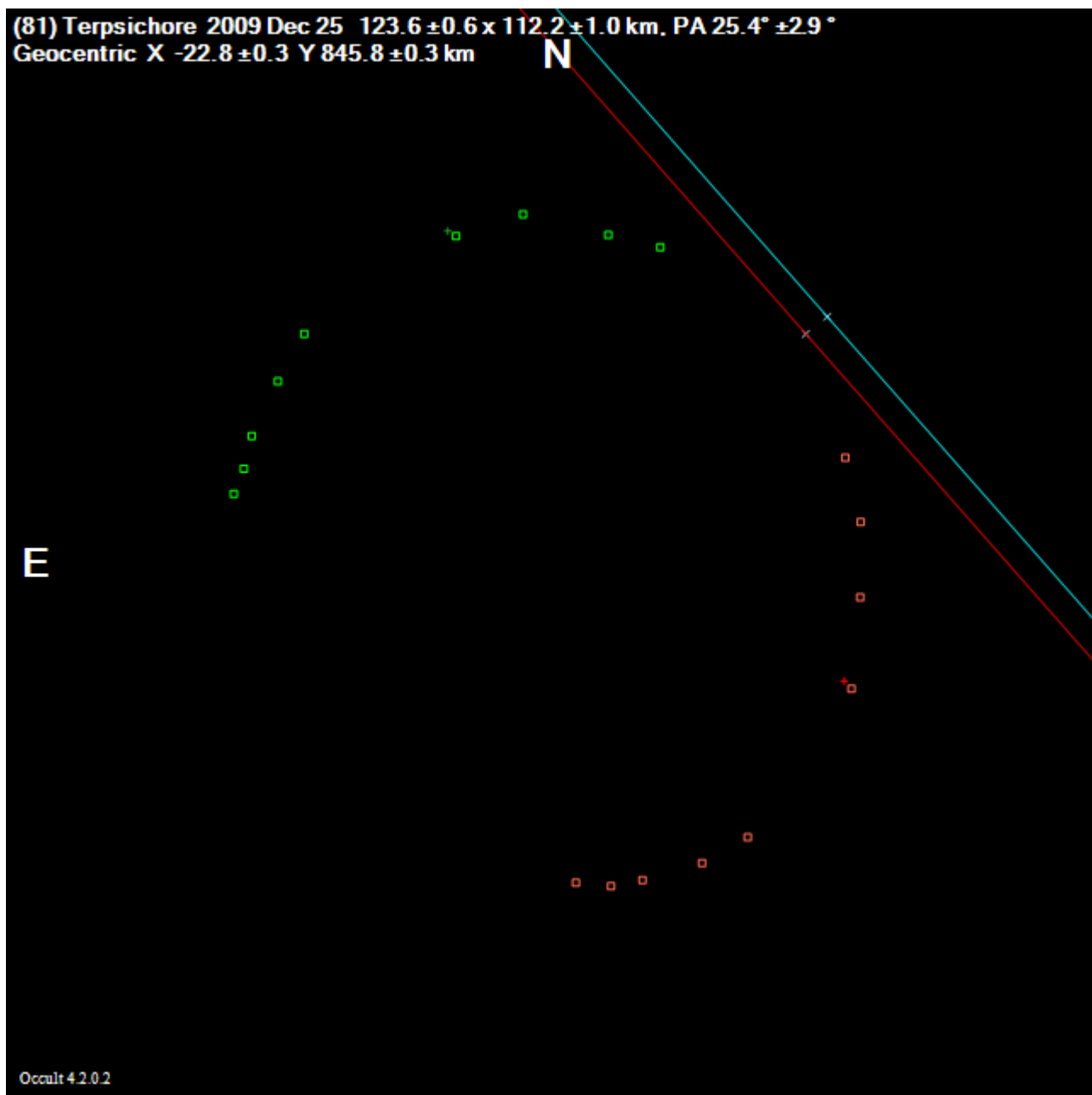
818kapteynia2008may03

(818) Kapteynia 2008 May 3 52.0 x 52.0 km. PA 0.0°
Geocentric X -1037.3 ± 0.5 Y 5504.4 ± 1.7 km **N**



81terpsichore2009dec25

(81) Terpsichore 2009 Dec 25 $123.6 \pm 0.6 \times 112.2 \pm 1.0$ km, PA $25.4^\circ \pm 2.9^\circ$
Geocentric X -22.8 ± 0.3 Y 845.8 ± 0.3 km



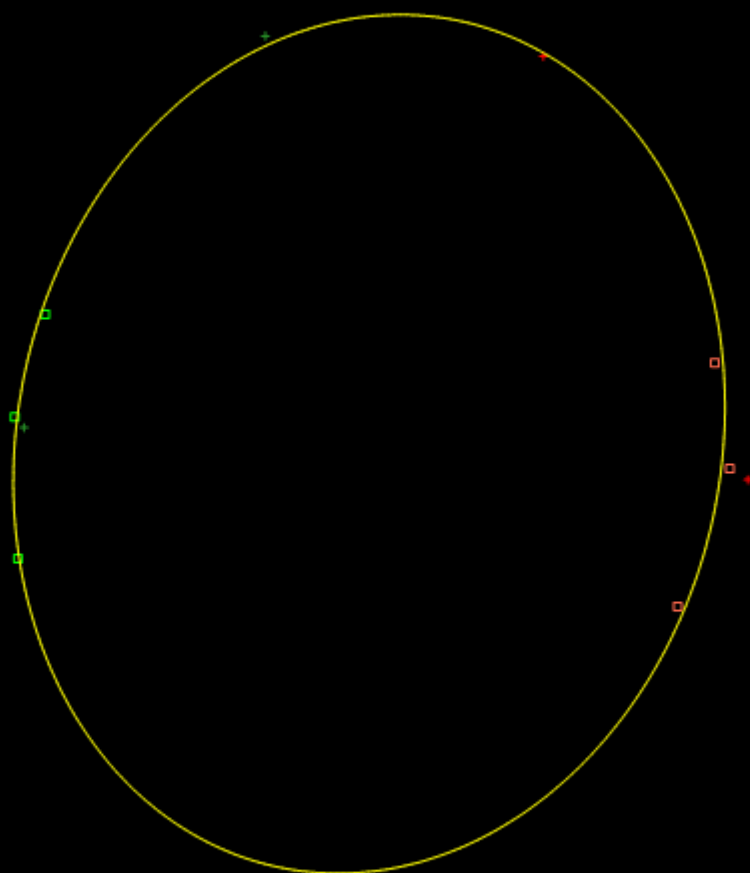
81terpsichore2009nov19

(81) Terpsichore 2009 Nov 19 $134.0 \pm 4.1 \times 108.9 \pm 0.7$ km, PA $-12.4^\circ \pm 3.4^\circ$
Geocentric X 4492.3 ± 0.4 Y 3785.0 ± 1.5 km

N

E

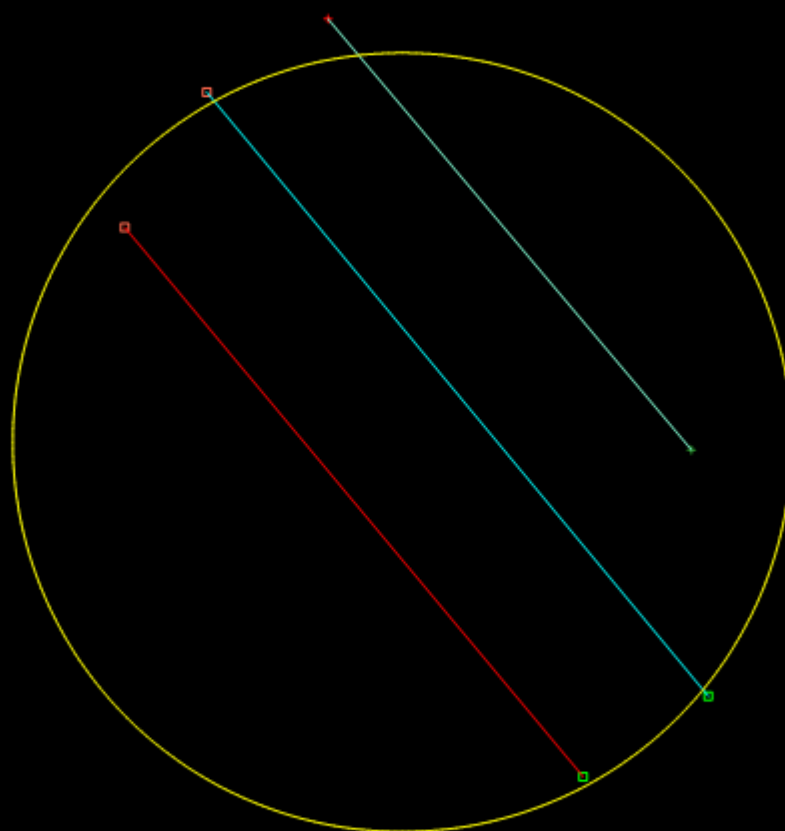
Occult 4.2.0.2



81terpsichore2009sep24

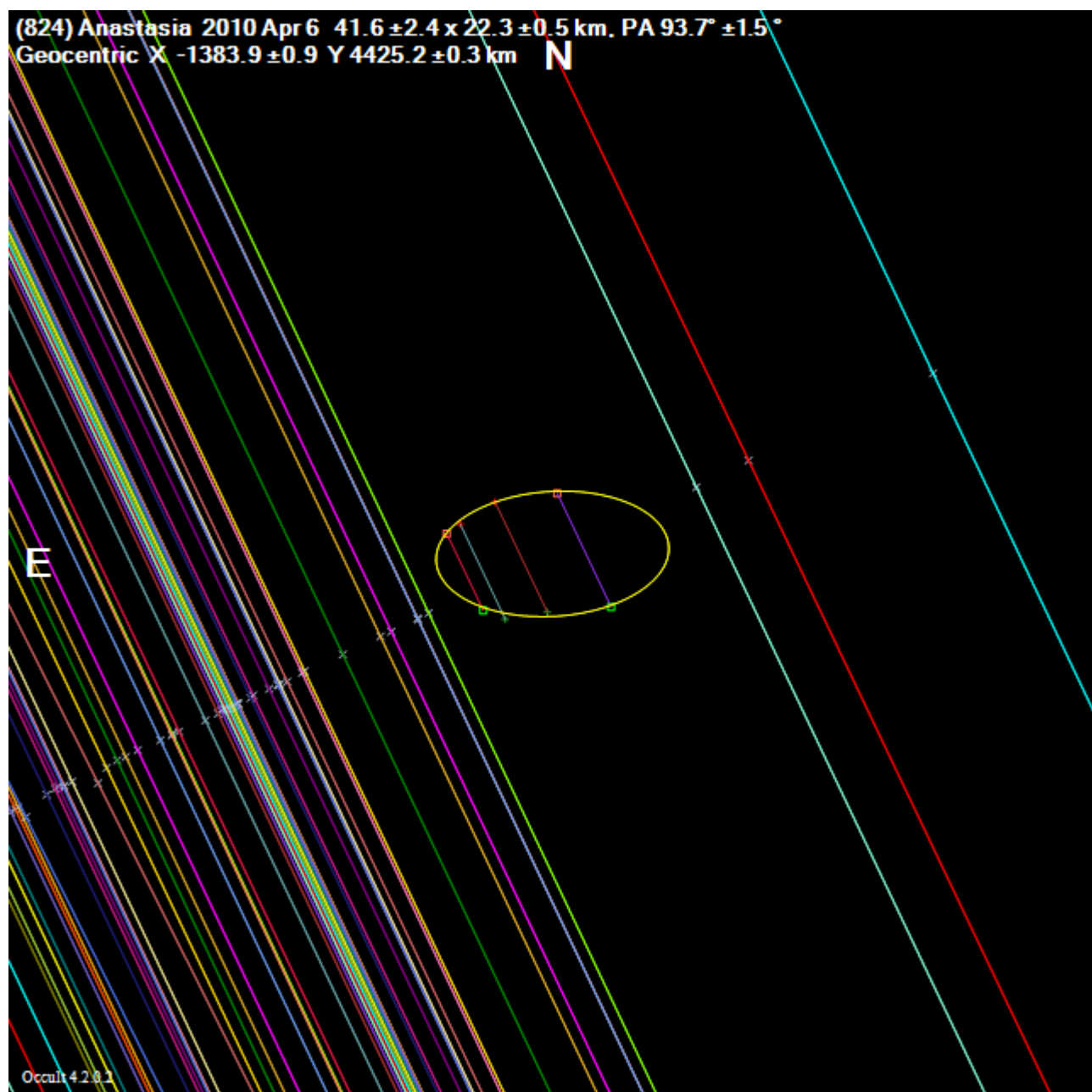
(81) Terpsichore 2009 Sep 24 $120.6 \pm 9.3 \times 120.6$ km, PA 0.0° °
Geocentric X -1936.0 ± 8.0 Y 1646.8 ± 7.0 km **N**

E



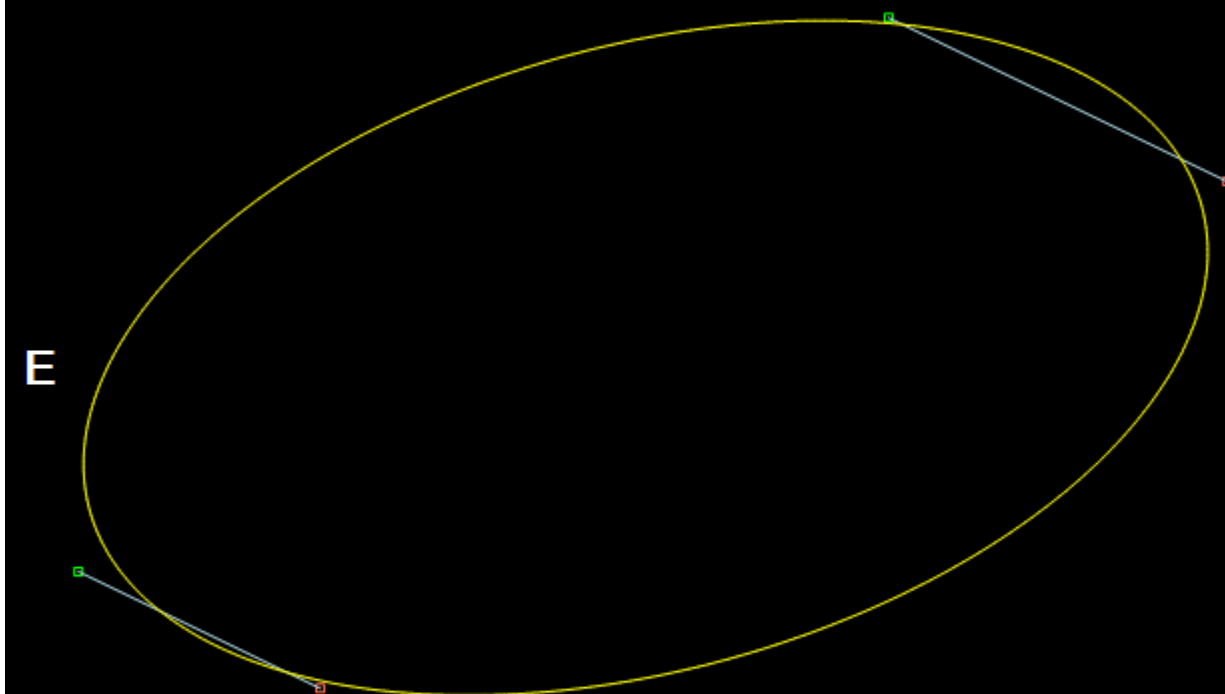
824anastasia2010apr06

(824) Anastasia 2010 Apr 6 $41.6 \pm 2.4 \times 22.3 \pm 0.5$ km, PA $93.7^\circ \pm 1.5^\circ$
Geocentric X -1383.9 ± 0.9 Y 4425.2 ± 0.3 km



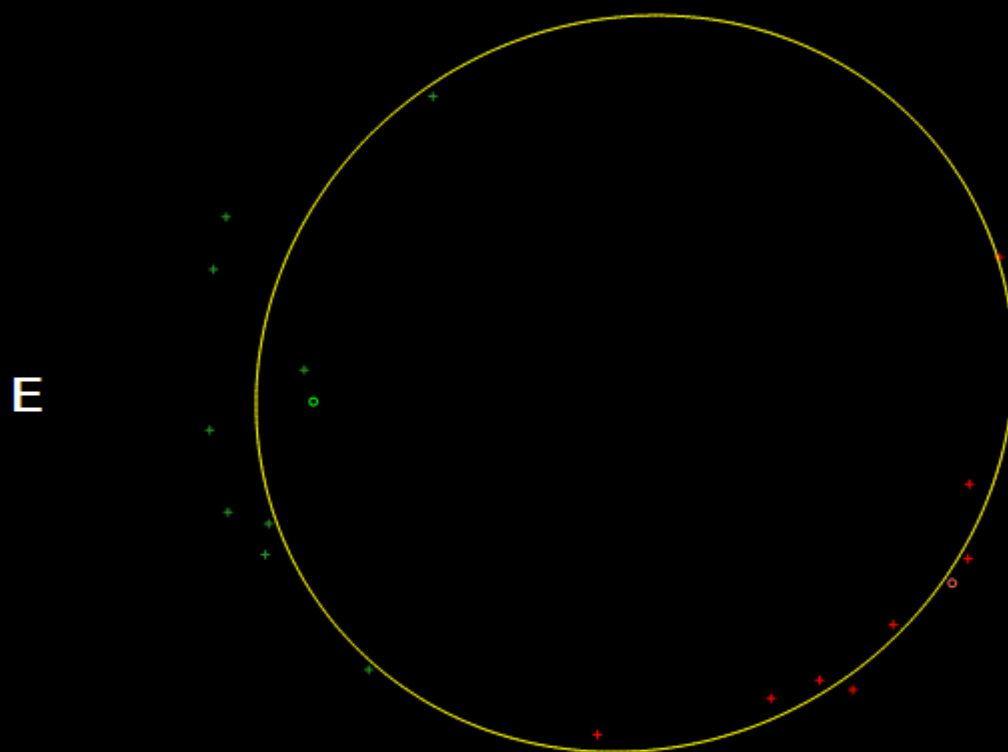
824anastasia2015jul20

(824) Anastasia 2015 Jul 20 48.0 x 26.0 km, PA -74.7° ±2.4°
Geocentric X -3685.5 ±0.7 Y -2823.2 ±0.5 km **N**



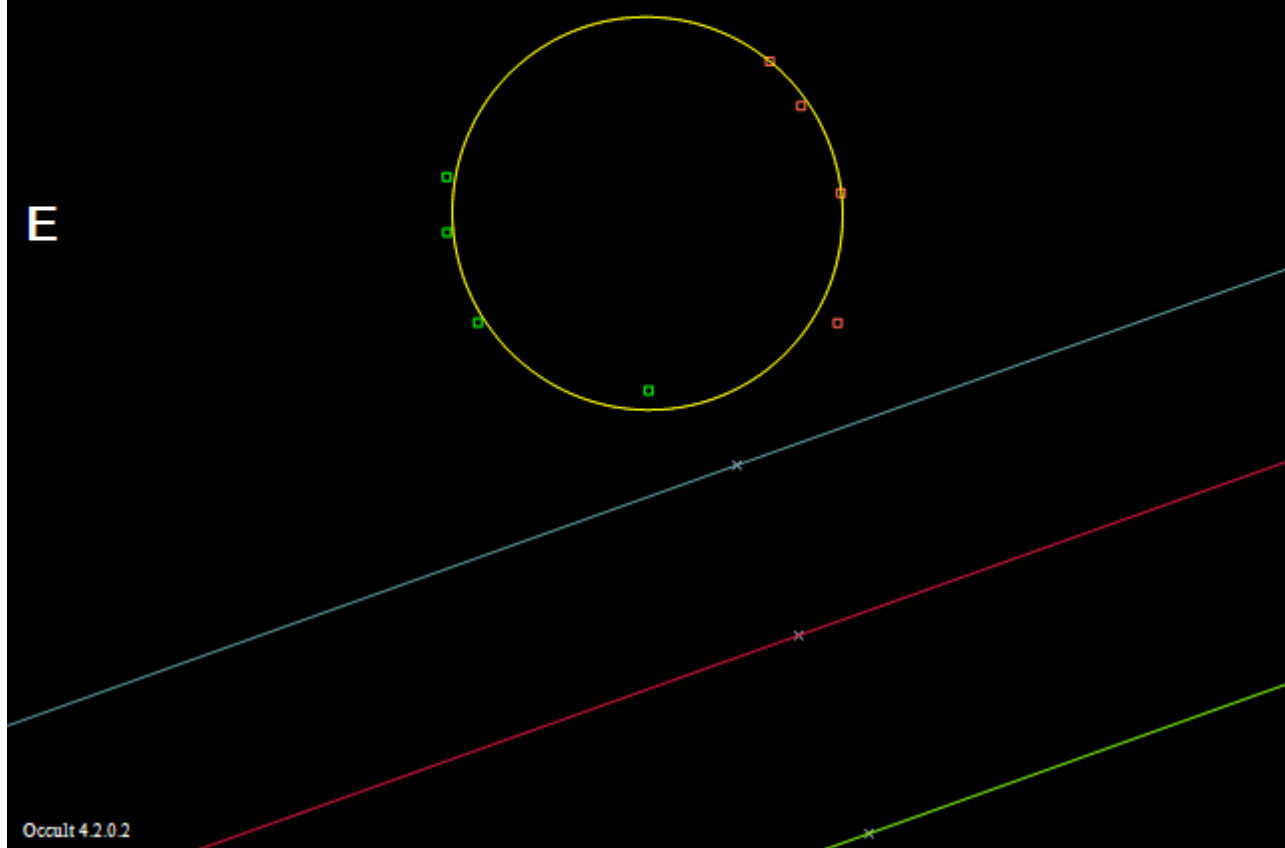
828lindemannia2002nov10

(828) Lindemania 2002 Nov 10 $53.1 \pm 2.8 \times 49.9 \pm 2.3$ km, PA $-58.5^\circ \pm 43.7^\circ$
Geocentric X 772.6 ± 0.8 Y 1401.0 ± 1.3 km **N**



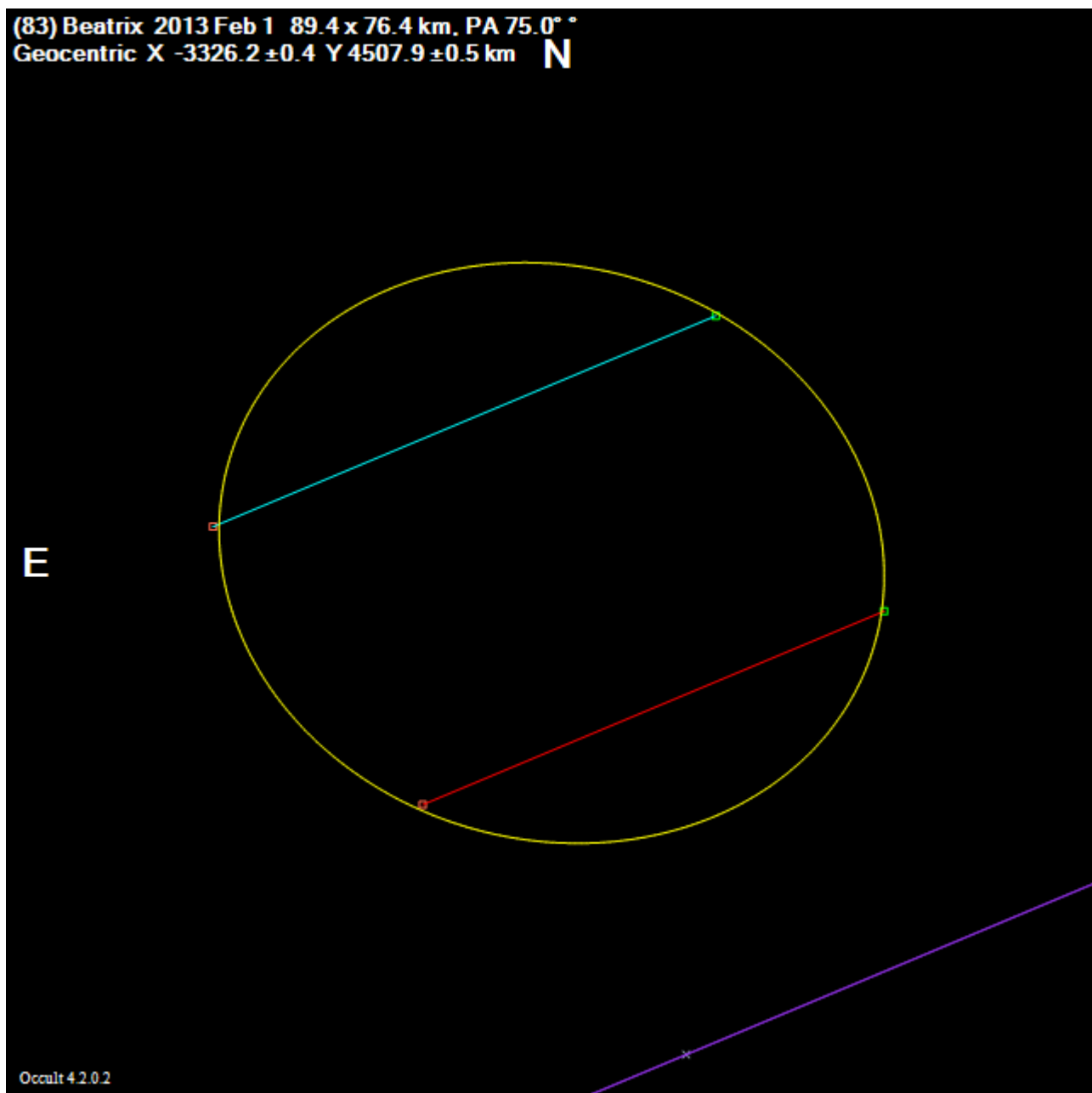
82alkmene2014sep18

(82) Alkmene 2014 Sep 18 $59.1 \pm 4.8 \times 58.5 \pm 2.0$ km, PA $24.0^\circ \pm 174.8^\circ$
Geocentric X 2686.0 ± 0.9 Y 5361.2 ± 1.6 km **N**



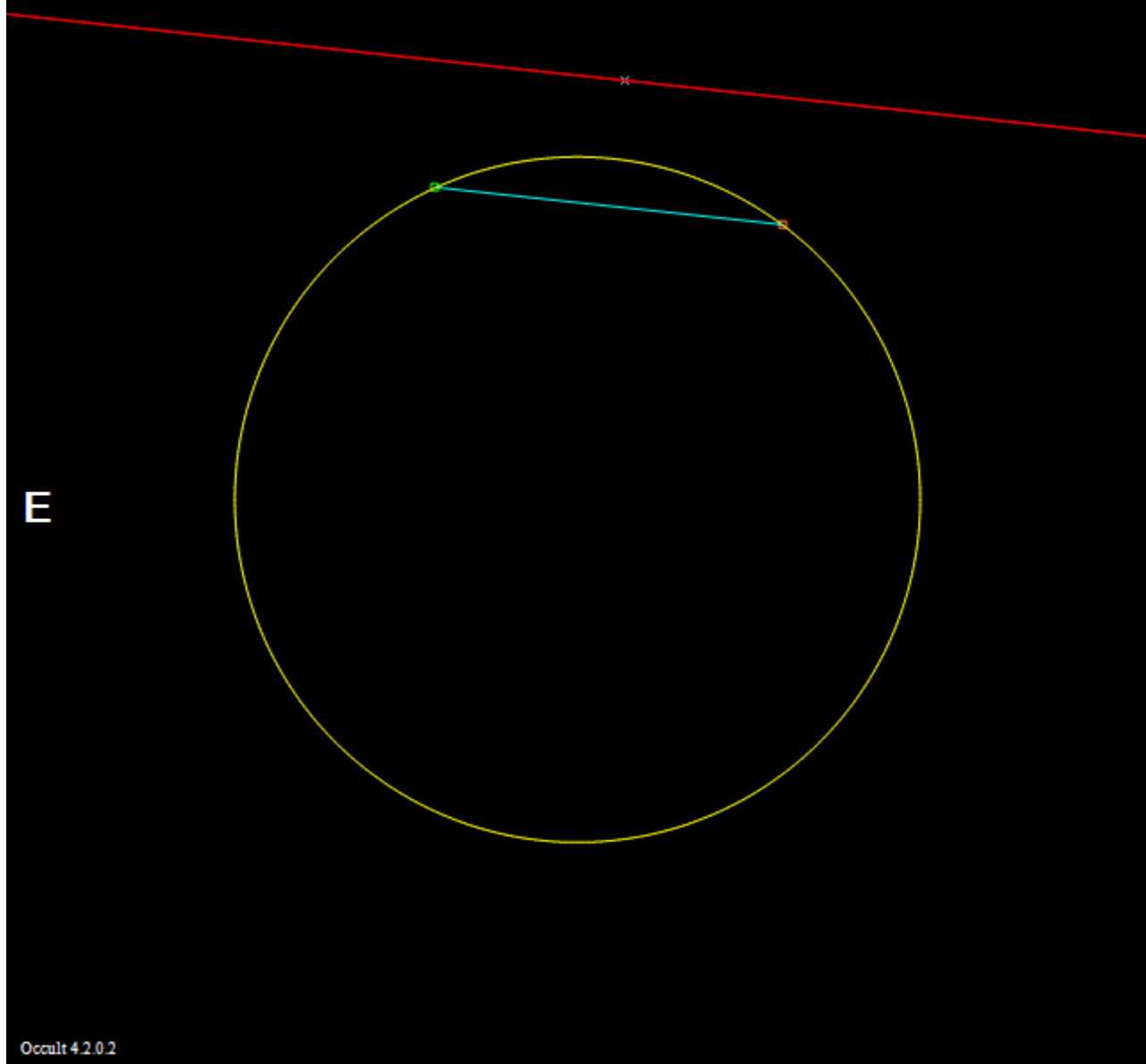
83beatrix2013feb01

(83) Beatrix 2013 Feb 1 89.4 x 76.4 km, PA 75.0° °
Geocentric X -3326.2 ± 0.4 Y 4507.9 ± 0.5 km **N**



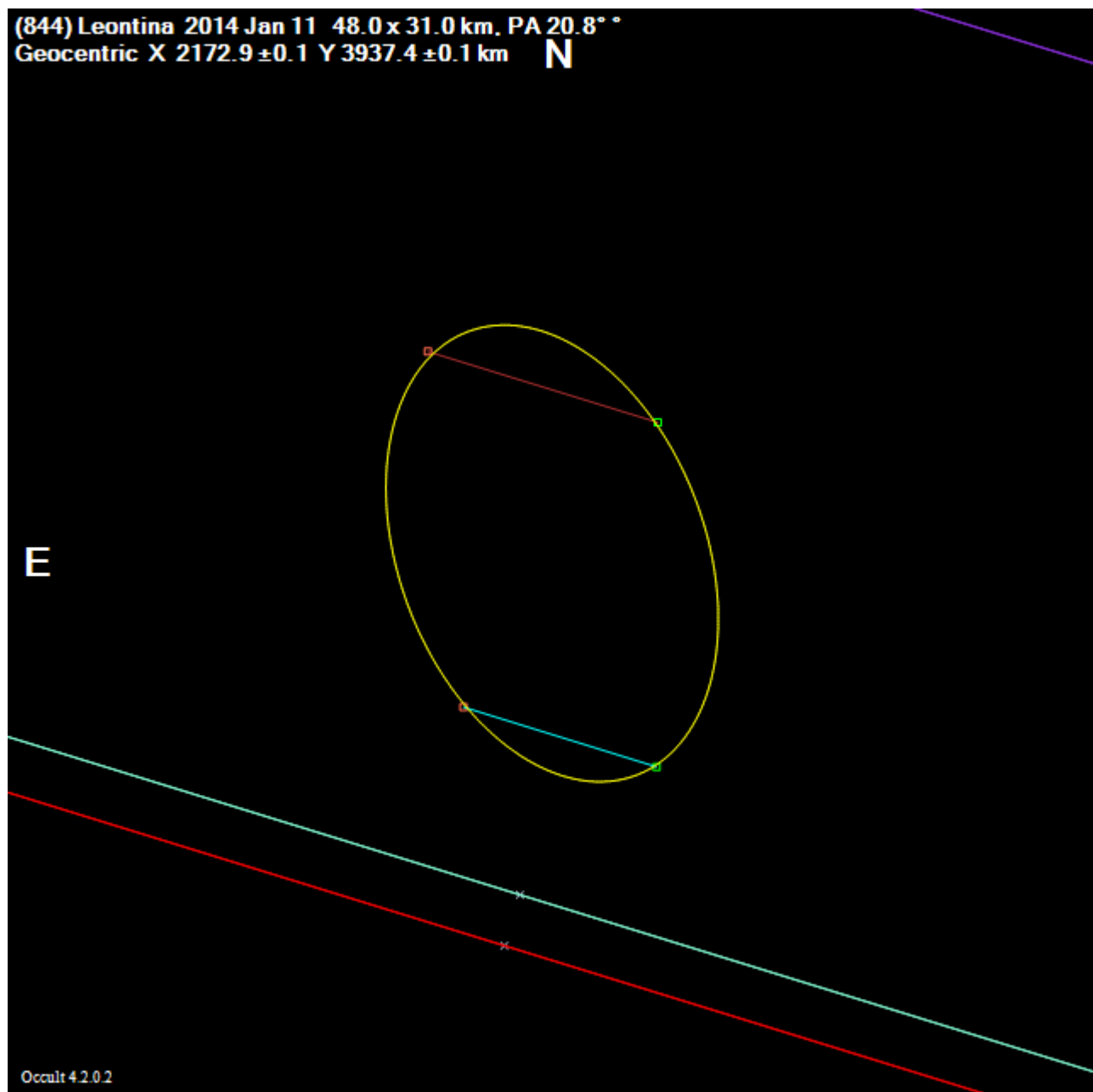
844leontina2008dec15

(844) Leontina 2008 Dec 15 66.0 x 66.0 km. PA 0.0° °
Geocentric X 5001.7 ± 0.0 Y 2016.3 ± 0.0 km **N**



844leontina2014jan11

(844) Leontina 2014 Jan 11 48.0 x 31.0 km, PA 20.8° °
Geocentric X 2172.9 ± 0.1 Y 3937.4 ± 0.1 km **N**

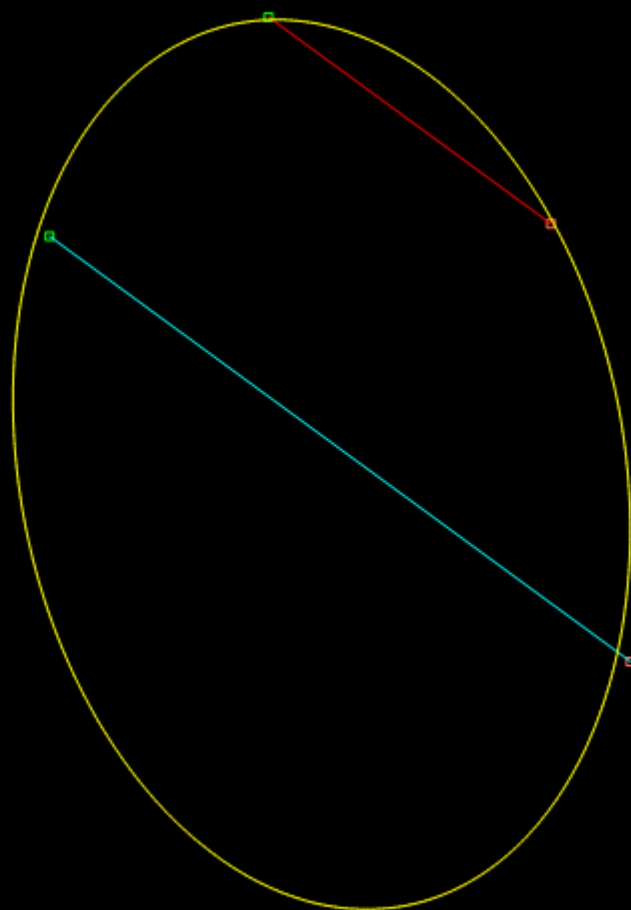


845naema2010apr10

(845) Naema 2010 Apr 10 $63.1 \pm 0.8 \times 42.5 \pm 0.7$ km, PA $10.7^\circ \pm 1.5^\circ$
Geocentric X -3428.5 Y -1582.3 km

N

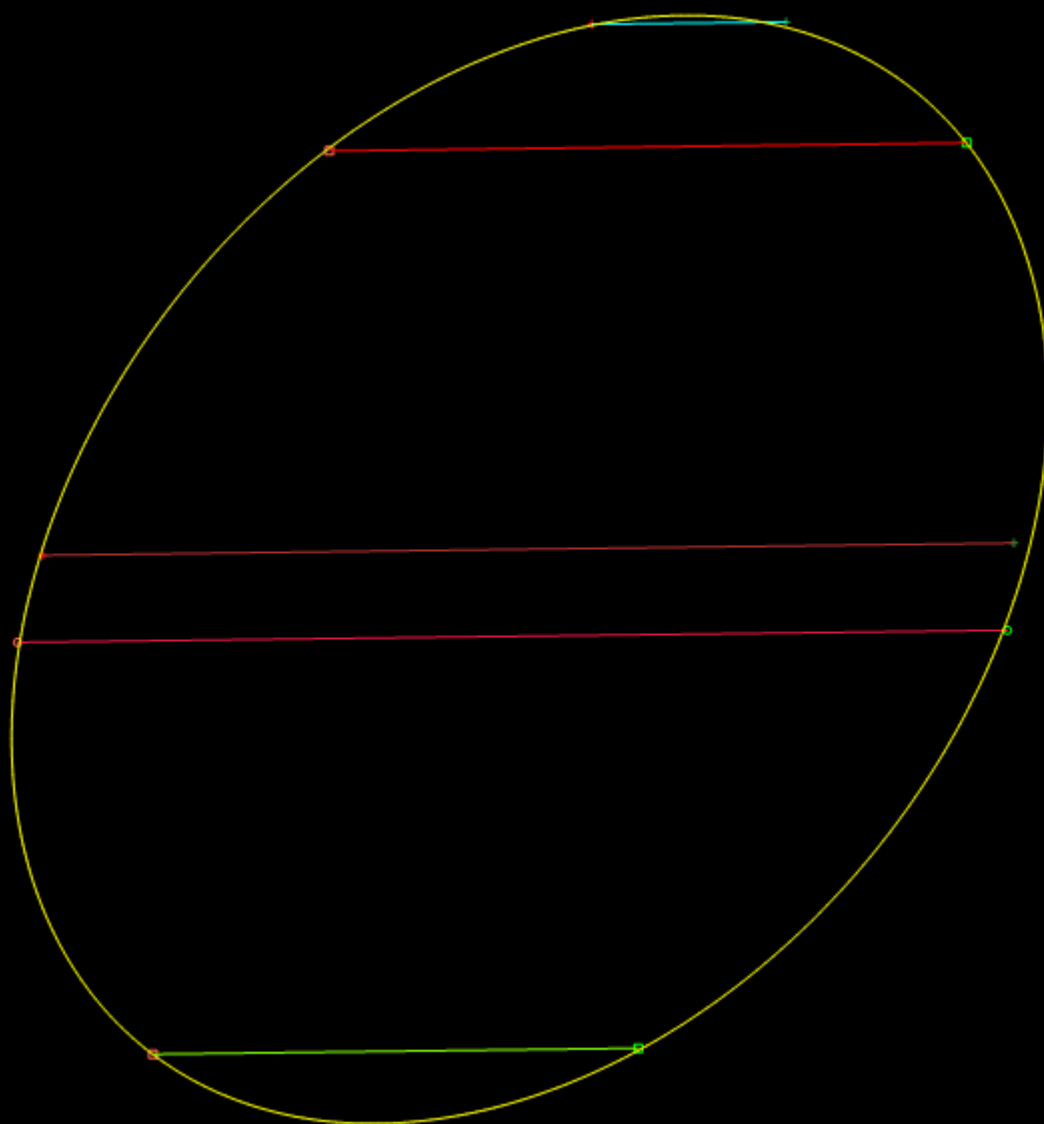
E



849ara2009jan27

(849) Ara 2009 Jan 27 $97.5 \pm 0.3 \times 70.7 \pm 0.3$ km, PA $-38.8^\circ \pm 0.5^\circ$
Geocentric X -2453.4 ± 0.1 Y 5139.1 ± 0.1 km **N**

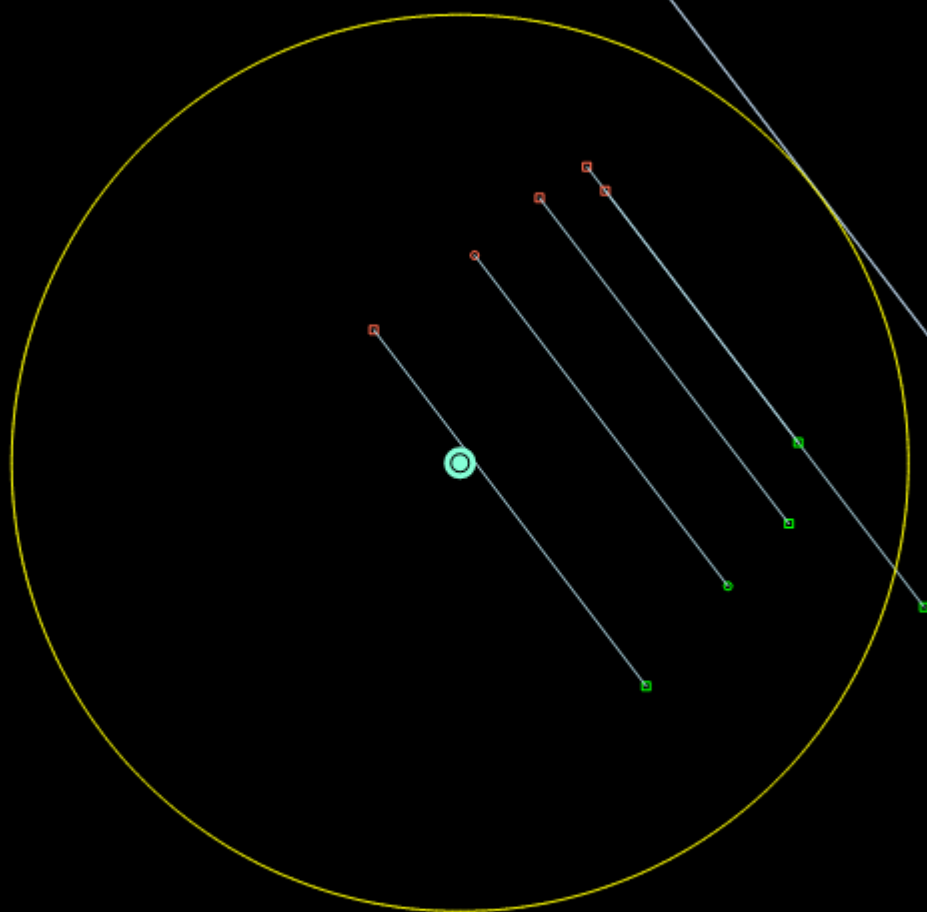
E



849ara2015may12

(849) Ara 2015 May 12 98.0 x 98.0 km, PA 0.0°
Geocentric X -4296.3 ± 4.1 Y 3521.8 ± 4.0 km **N**
Double : Sep 0.0000", PA 0.0°

E



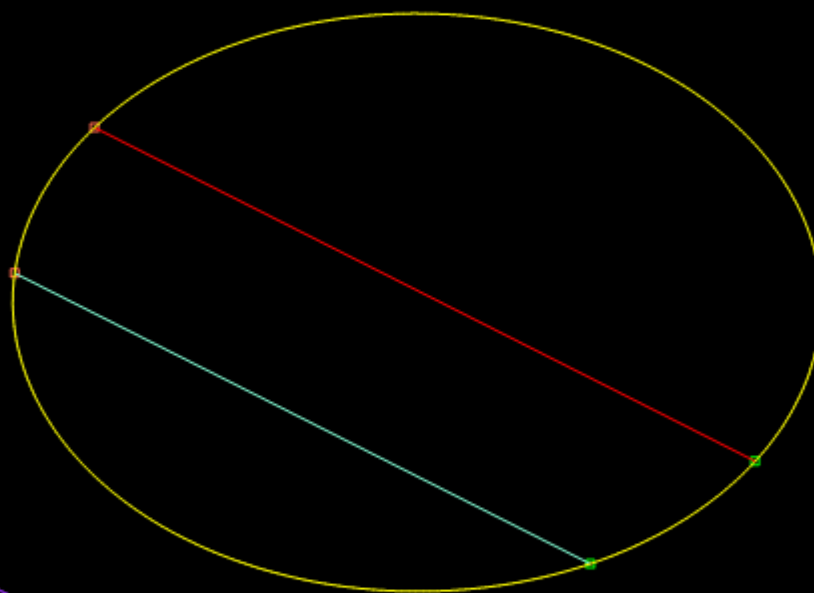
84klio2007aug21

(84) Klio 2007 Aug 21 83.1 x 59.4 km, PA 89.8° °
Geocentric X -2251.4 Y 2294.6 km

N

E

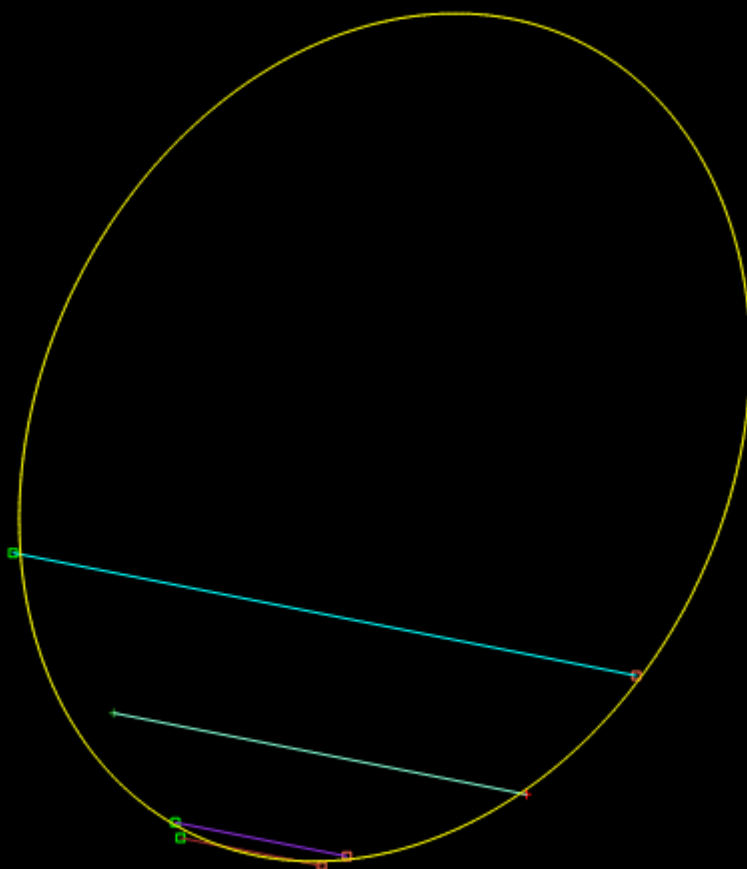
Occult 4.2.0.2



84klio2012feb01

(84) Klio 2012 Feb 1 $89.5 \pm 119.7 \times 70.0 \pm 31.7$ km, PA $-26.2^\circ \pm 33.5^\circ$
Geocentric X -3289.0 ± 20.0 Y 3529.3 ± 56.8 km **N**

E

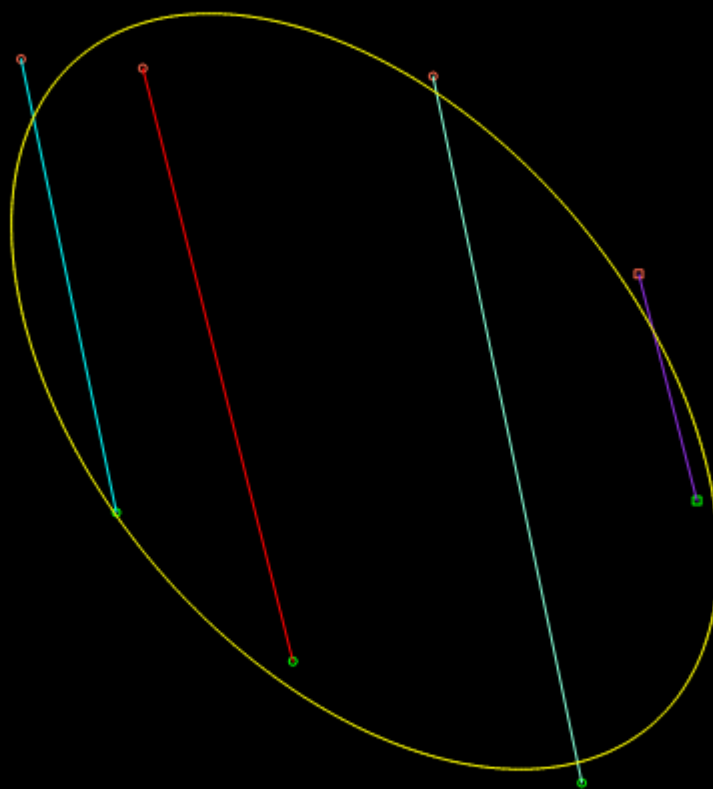


Occult 4.2.0.2

856backlunda2003mar08

(856) Backlunda 2003 Mar 8 $59.5 \pm 2.3 \times 36.9 \pm 1.9$ km, PA $40.7^\circ \pm 5.8^\circ$
Geocentric X 4728.7 ± 1.0 Y 1740.7 ± 0.9 km **N**

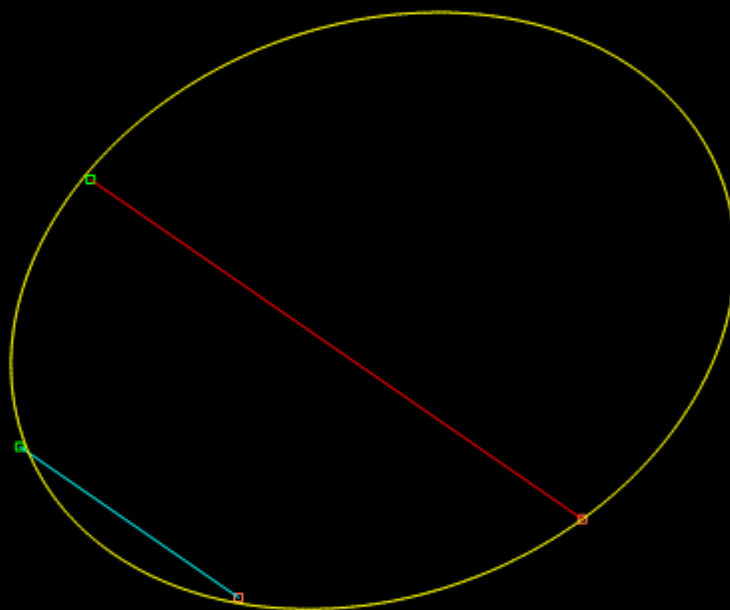
E



856backlunda2005oct08

(856) Backlunda 2005 Oct 8 57.2 x 43.8 km. PA -68.6° ±2.6°
Geocentric X -899.0 ±0.3 Y 5150.6 ±0.3 km **N**

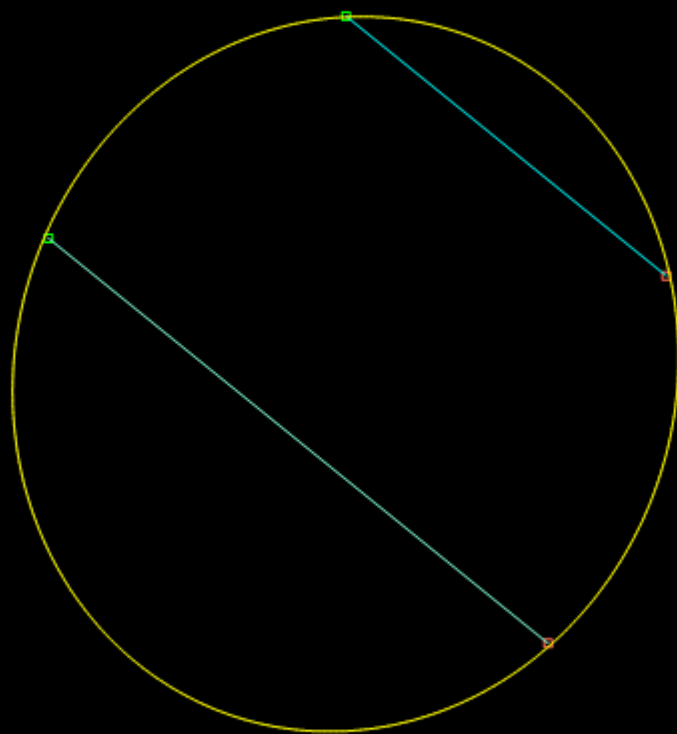
E



856backlunda2008aug29

(856) Backlunda 2008 Aug 29 48.7 x 44.7 km, PA -17.1° ± 2.8°
Geocentric X 3510.9 ± 0.1 Y 4769.5 ± 0.1 km **N**

E



85io1995dec10

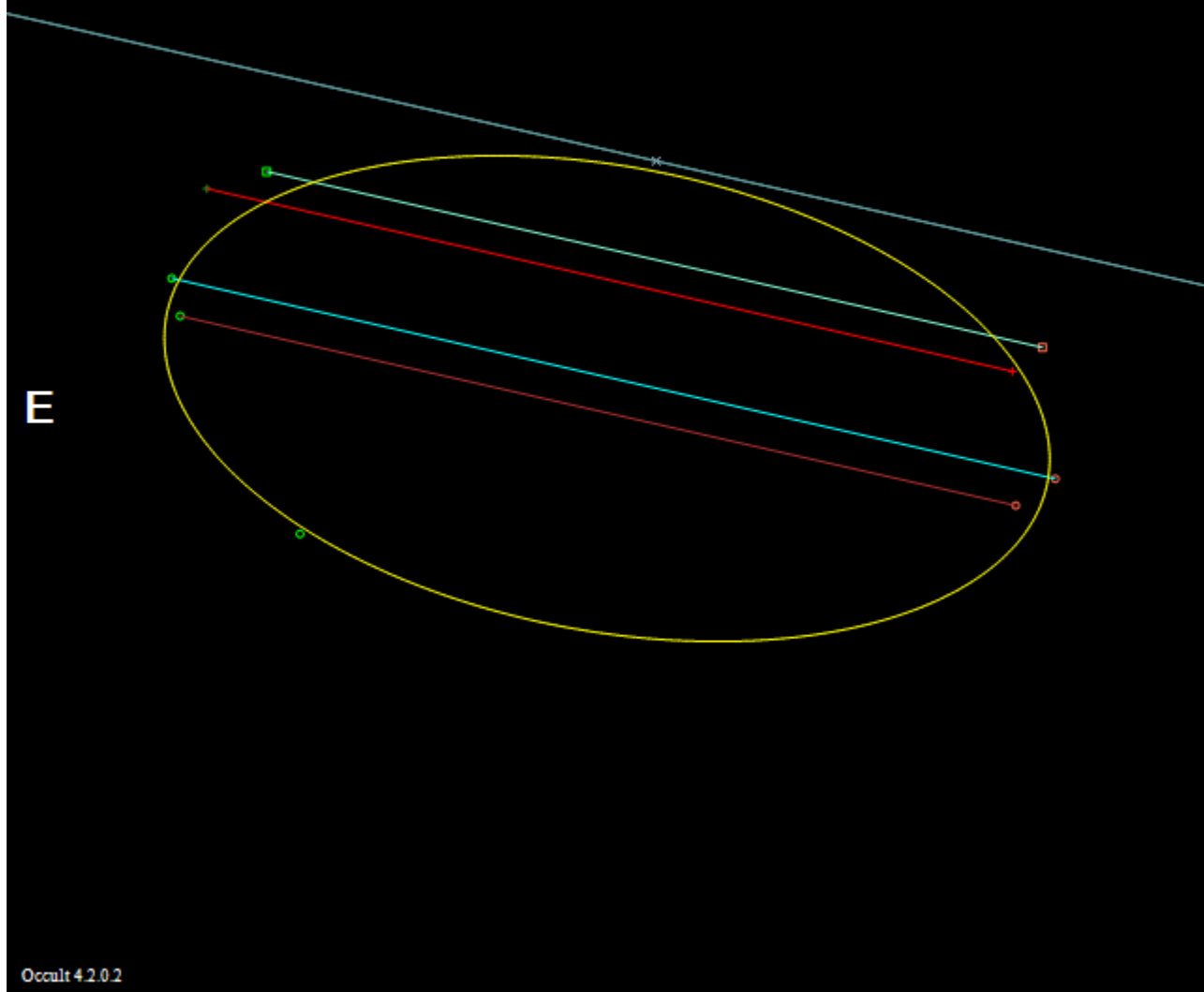
(85) Io 1995 Dec 10 $193.7 \pm 5.7 \times 138.4 \pm 10.7$ km, PA $61.6^\circ \pm 4.7^\circ$
Geocentric X -5158.0 ± 1.9 Y 3261.7 ± 3.7 km **N**

E



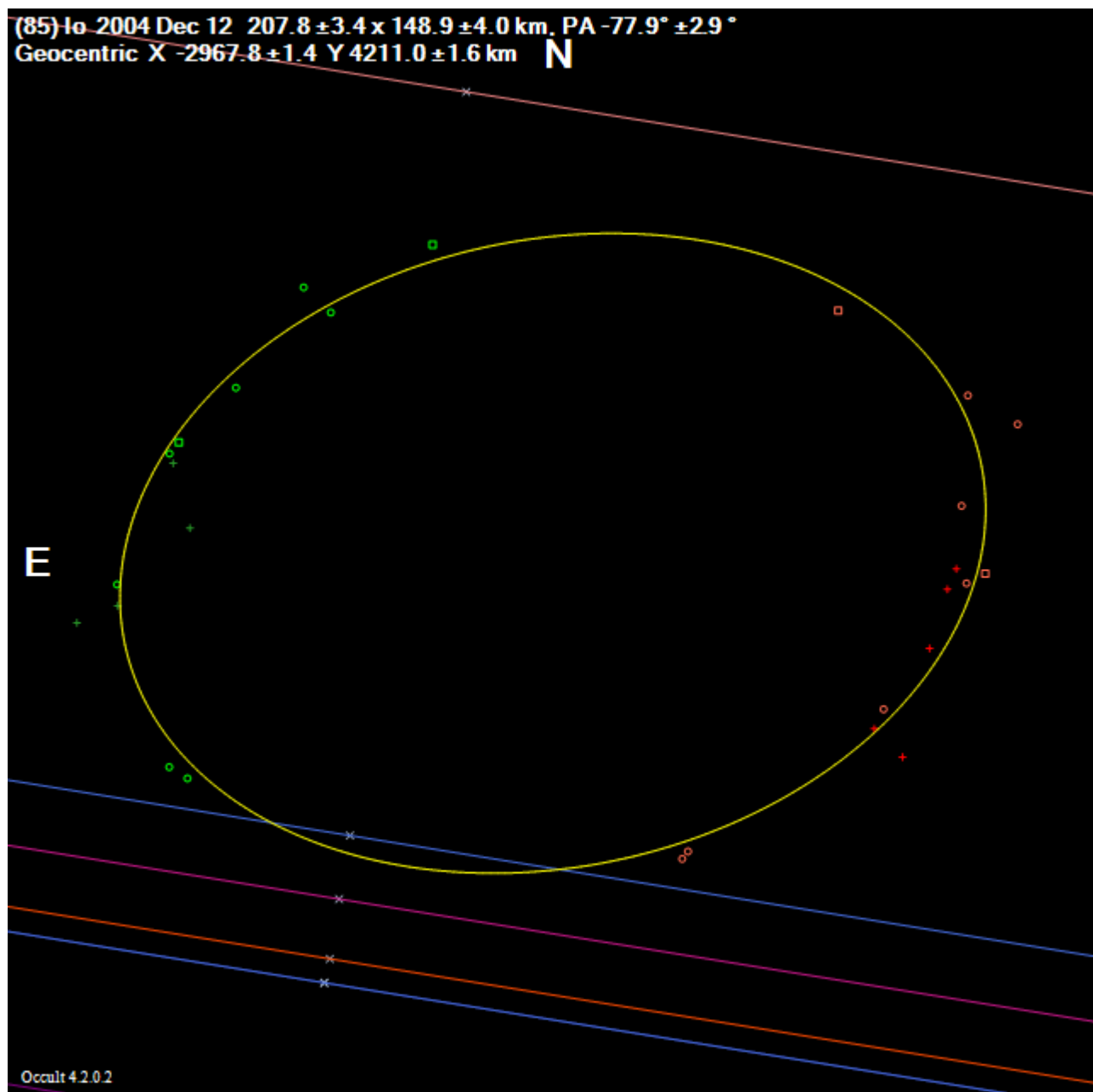
85io2004dec07

(85) Io 2004 Dec 7 $193.0 \pm 2.5 \times 100.0 \pm 6.1$ km, PA $79.3^\circ \pm 1.8^\circ$
Geocentric X -1707.3 ± 1.2 Y 3098.7 ± 1.7 km **N**



85io2004dec12

(85)Io 2004 Dec 12 $207.8 \pm 3.4 \times 148.9 \pm 4.0$ km, PA $-77.9^\circ \pm 2.9^\circ$
Geocentric X -2967.8 ± 1.4 Y 4211.0 ± 1.6 km **N**



85io2005may15

(85)Io 2005 May 15 165.0 x 165.0 km PA 0.0°
Geocentric X 4766.4 ± 0.9 Y 3071.4 ± 1.9 km

N

E

(85) Io 2007 Sep 26 200.0 ± 55.5 x 200.0 km, PA 0.0° °
Geocentric X 4226.8 ± 3.2 Y 4034.5 ± 18.8 km **N**

Occult 4.2.0.2

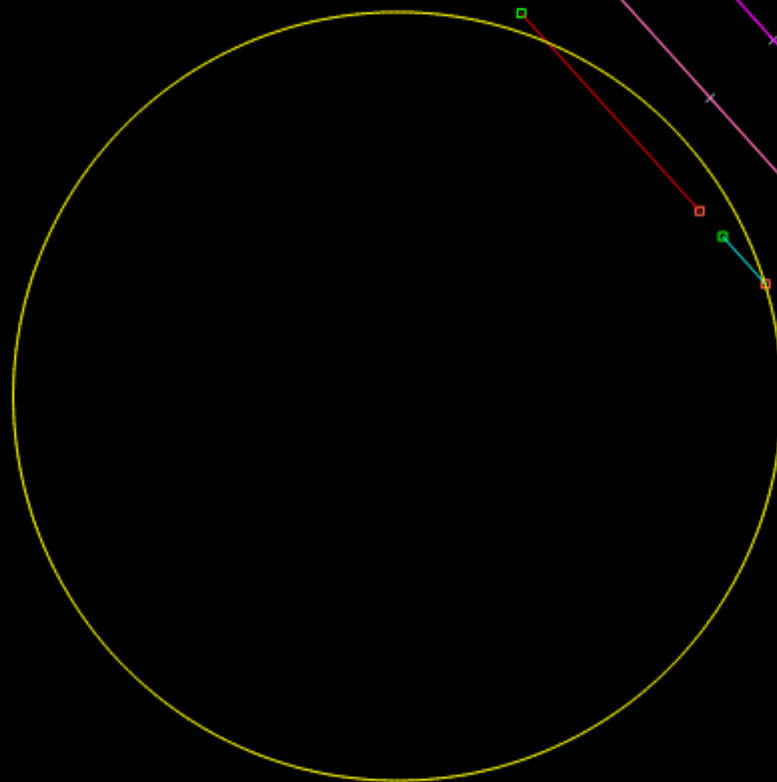
85io2012oct19

(85) Io 2012 Oct 19 208.0 x 208.0 km, PA 0.0°
Geocentric X 4373.2 ± 4.7 Y 3108.0 ± 6.2 km

N

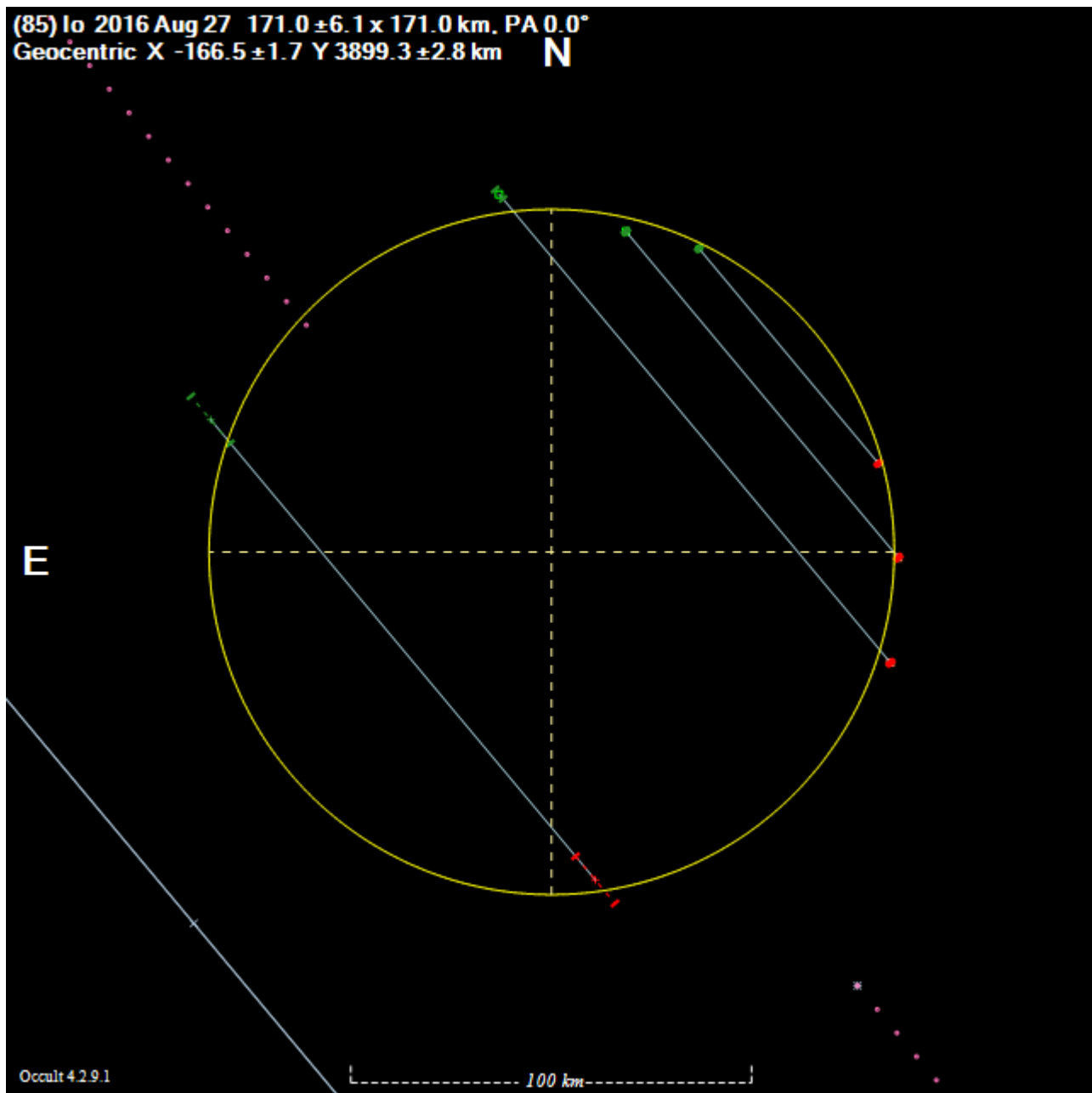
E

Occult 4.2.0.2



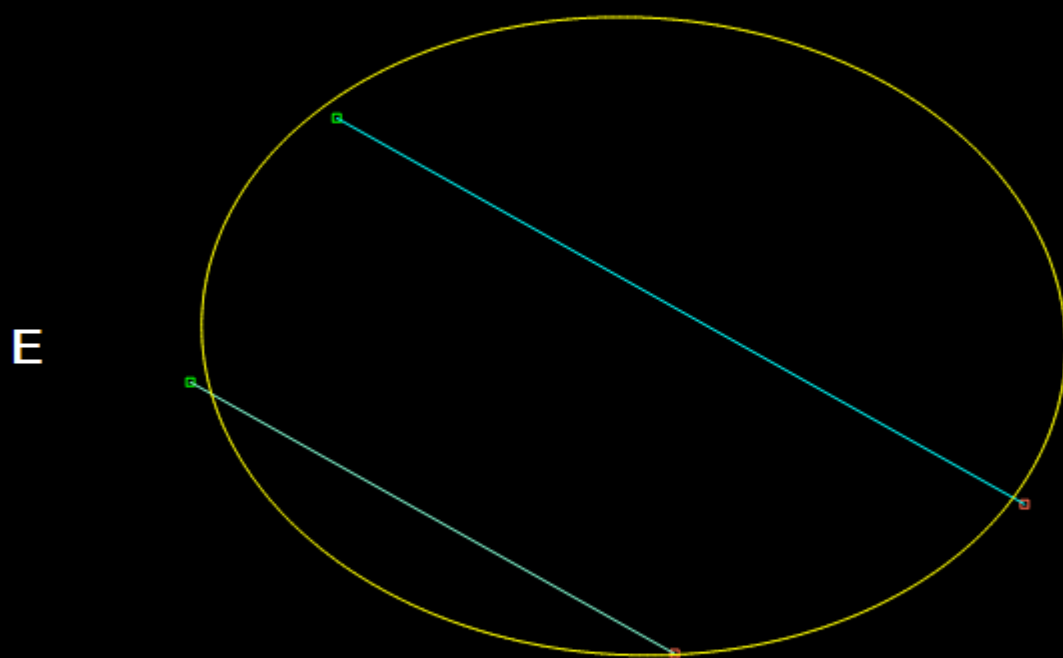
85Io2016Aug27

(85) Io 2016 Aug 27 $171.0 \pm 6.1 \times 171.0$ km, PA 0.0°
Geocentric X -166.5 ± 1.7 Y 3899.3 ± 2.8 km **N**



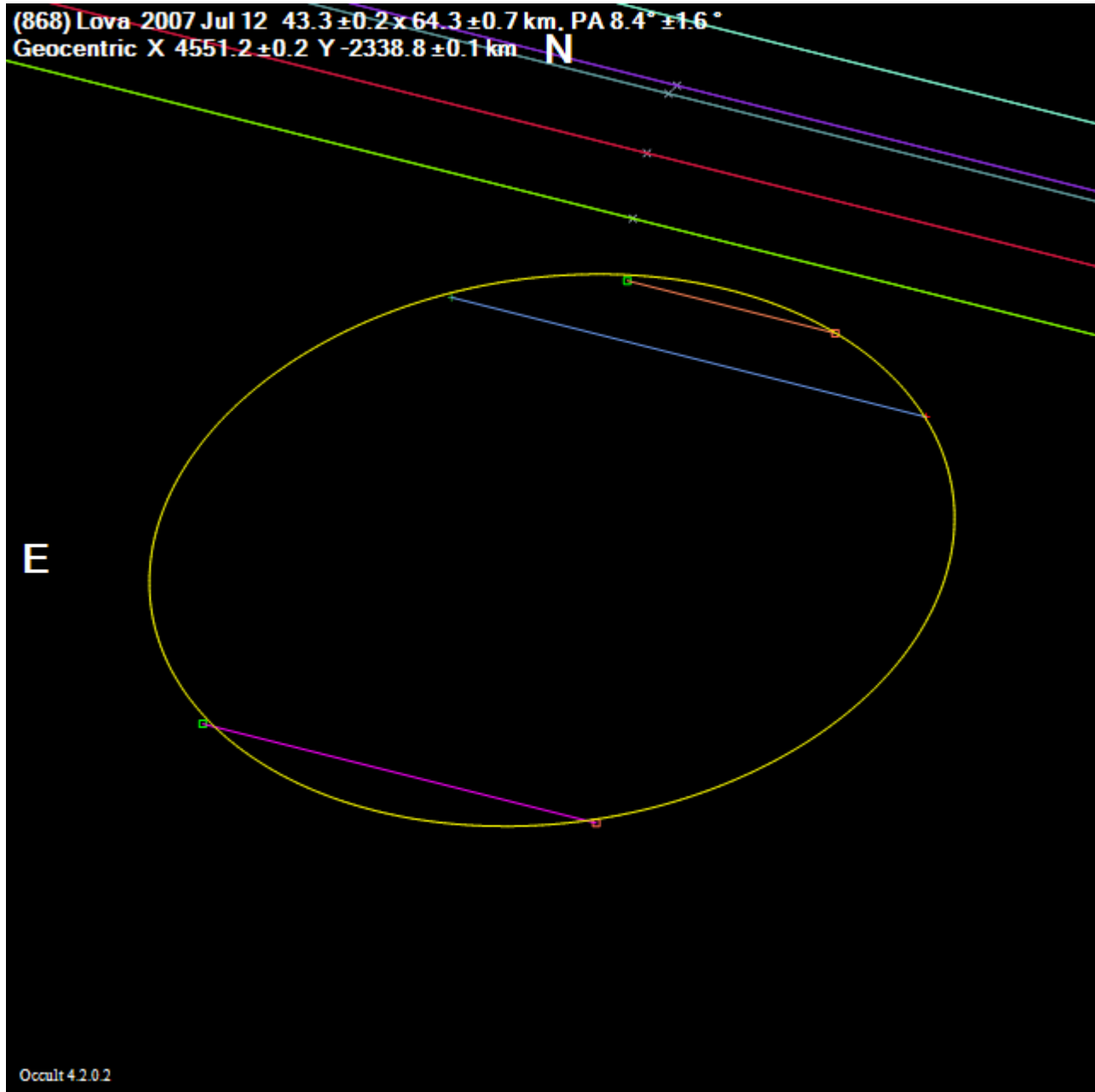
866fatme2008sep01

(866) Fatme 2008 Sep 1 $99.0 \pm 2.7 \times 73.0$ km, PA -93.0° °
Geocentric X -2832.8 ± 1.3 Y 4775.7 ± 1.2 km **N**



Occult 4.2.0.2

(868) Lova 2007 Jul 12 43.3 \pm 0.2 \times 64.3 \pm 0.7 km, PA 8.4 $^{\circ}$ \pm 1.6 $^{\circ}$
Geocentric X 4551.2 \pm 0.2 Y -2338.8 \pm 0.1 km **N**

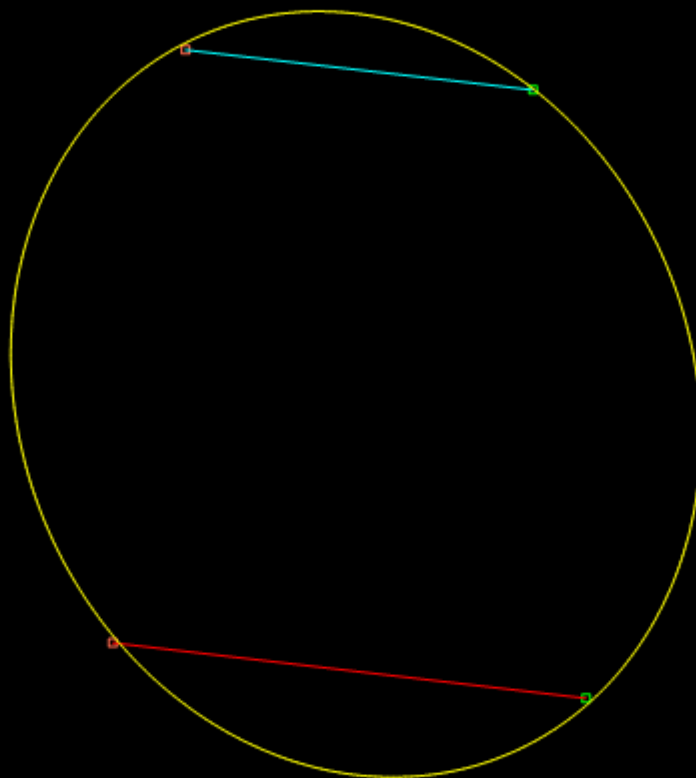


86semele2008oct08

(86) Semele 2008 Oct 8 122.0 x 105.0 km PA 23.0° °
Geocentric X -678.5 ±0.5 Y 1391.3 ±0.4 km

N

E

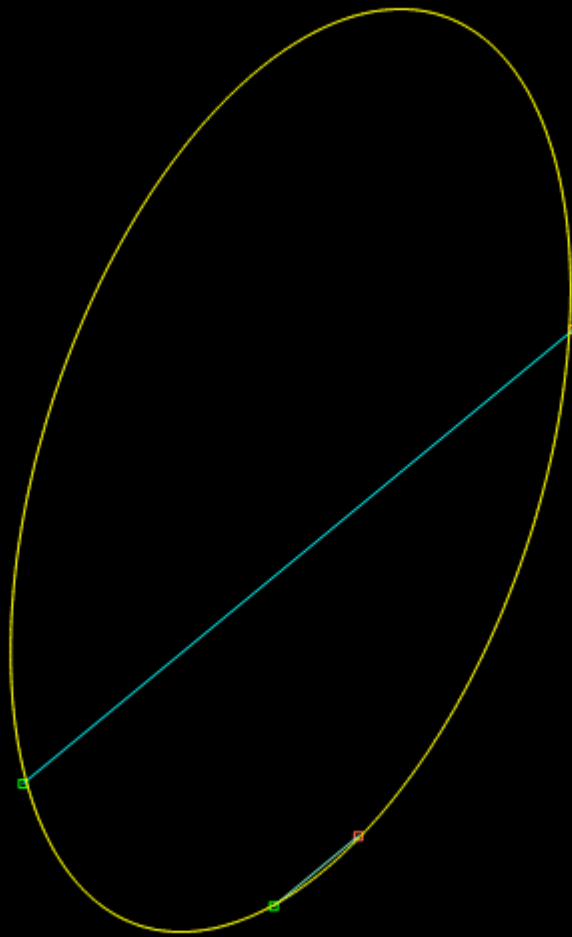


86semele2010jan28

(86) Semele 2010 Jan 28 149.7 x 77.4 km, PA -18.5° °
Geocentric X 2511.8 Y 3440.0 km

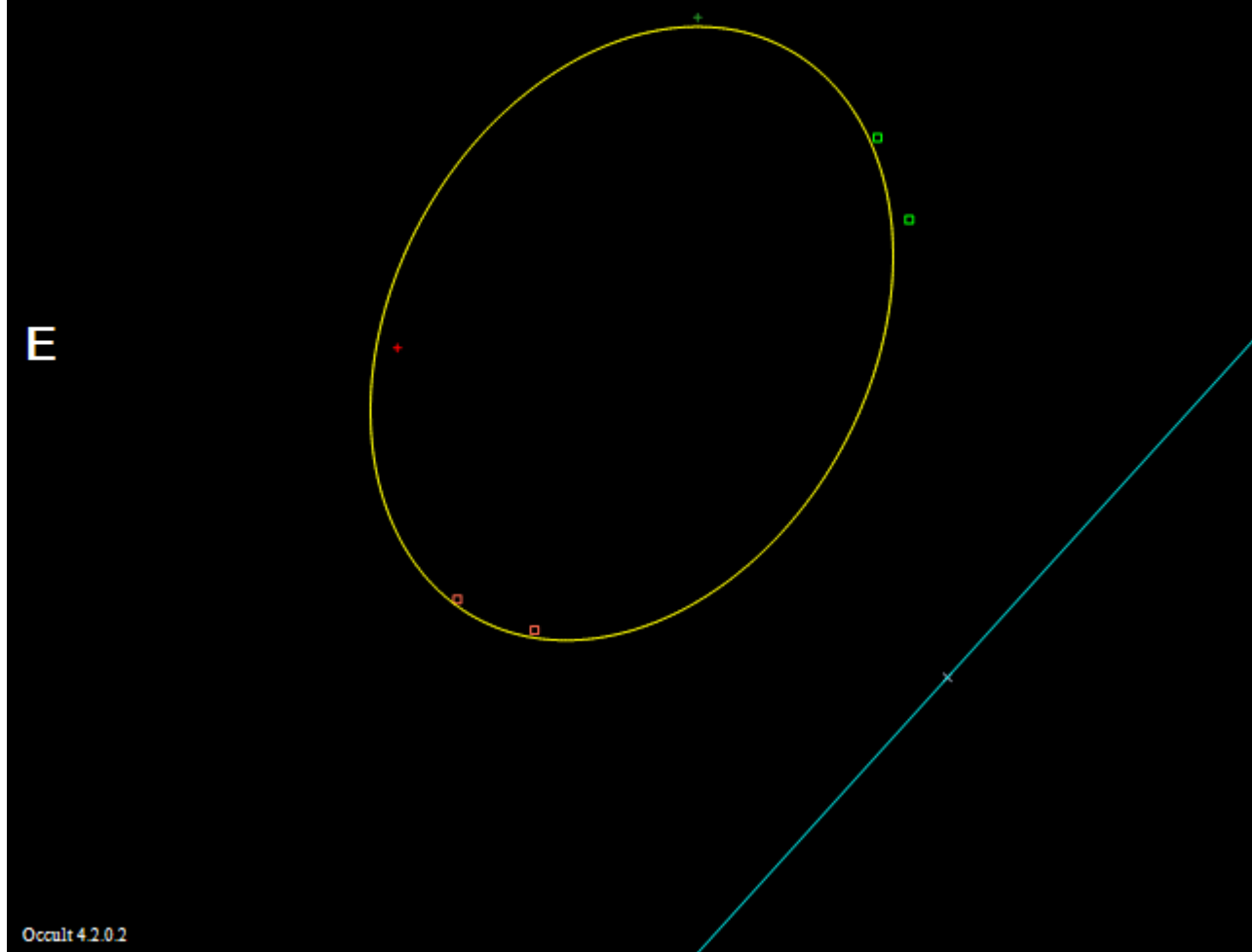
N

E



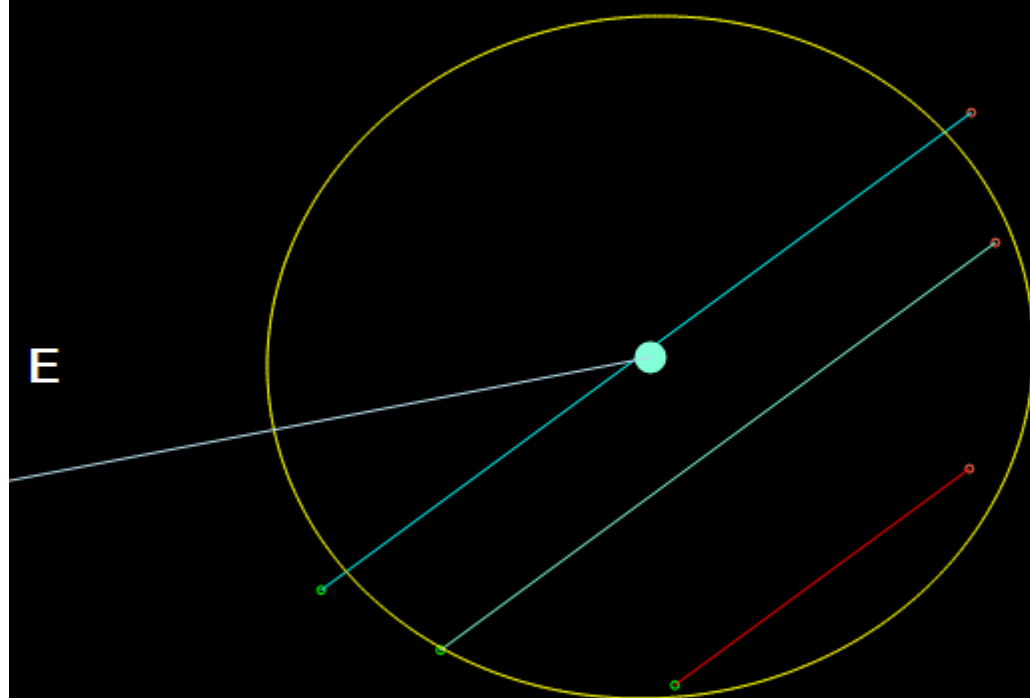
874rotraut2013sep22

(874) Rotraut 2013 Sep 22 $51.1 \pm 0.8 \times 37.7 \pm 2.0$ km, PA $-28.7^\circ \pm 4.7^\circ$
Geocentric X 3147.0 ± 0.4 Y 4889.8 ± 0.5 km **N**



87sylvia2006dec18

(87) Sylvia 2006 Dec 18 260.6 ±14.2 x 231.4 ±23.7 km, PA -83.9° °
 Geocentric X 992.8 ±7.2 Y -616.7 ±9.4 km **N**
 Double : Sep 0.1103", PA 100.9°



Occult 4.2.0.2

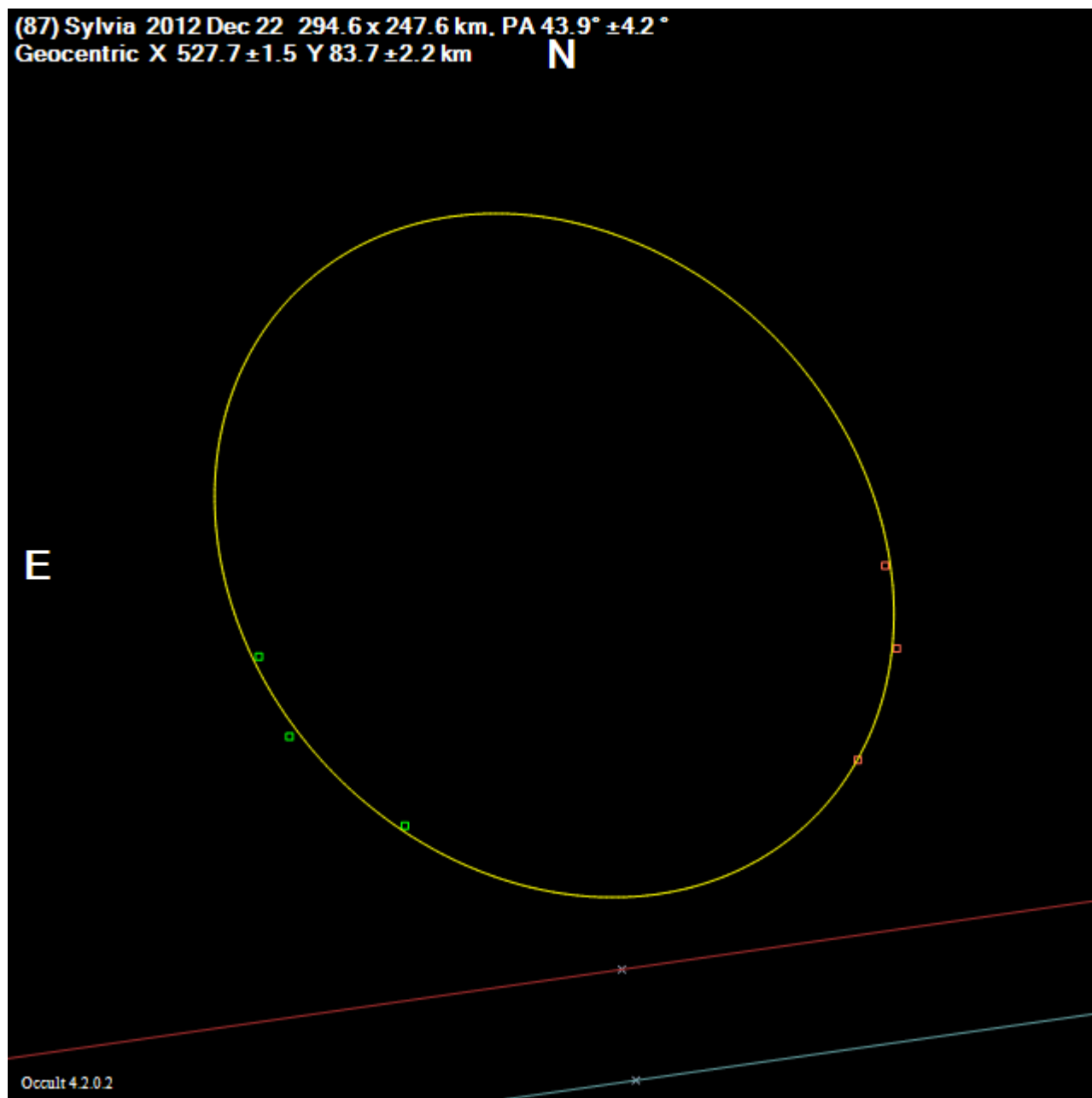
87sylvia2012dec22

(87) Sylvia 2012 Dec 22 294.6 x 247.6 km, PA 43.9° ± 4.2°
Geocentric X 527.7 ± 1.5 Y 83.7 ± 2.2 km

N

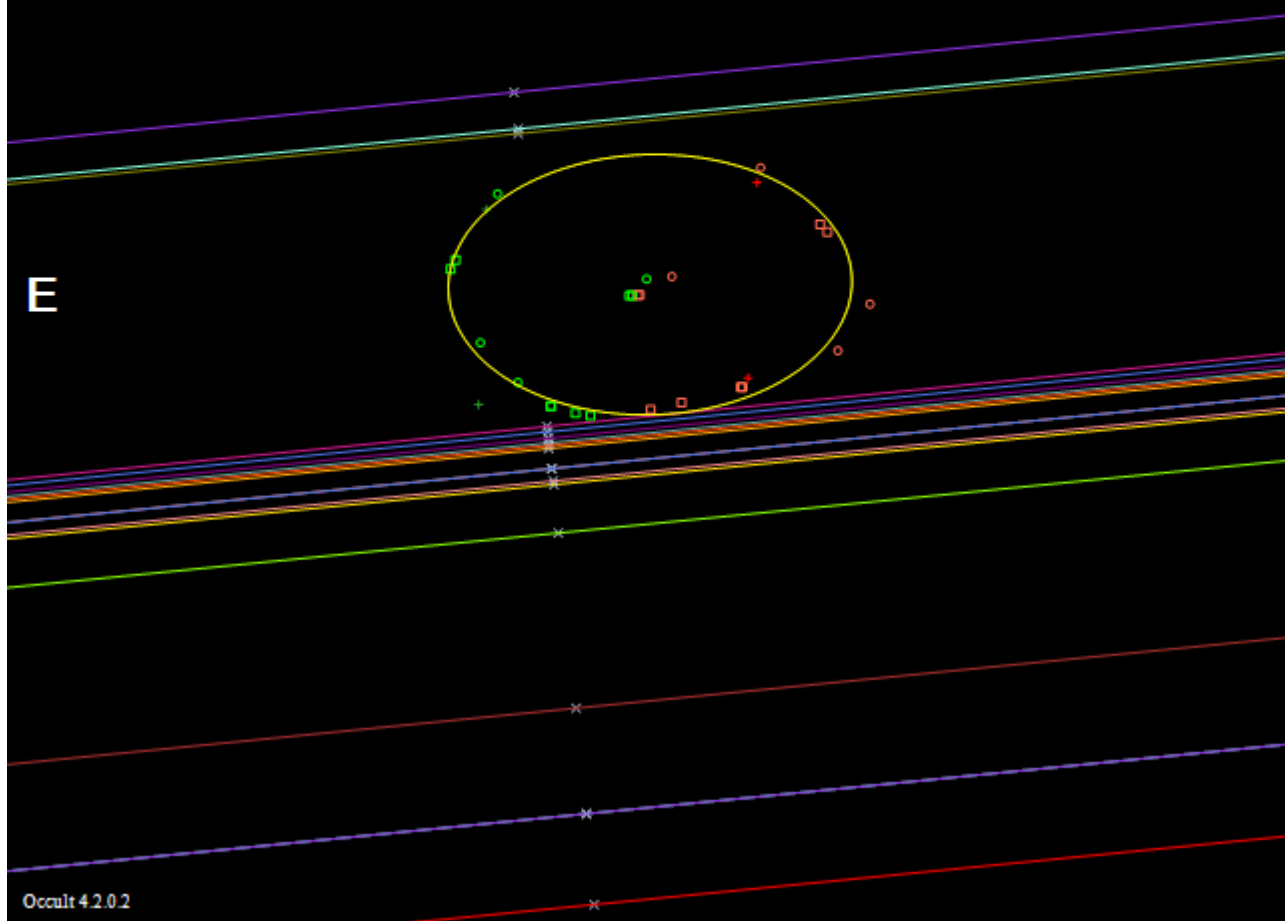
E

Occult 4.2.0.2



87sylvia2013jan06

(87) Sylvia 2013 Jan 6 355.9 x 229.5 km, PA 91.7° °
Geocentric X 4666.8 ± 4.0 Y 2637.8 ± 2.9 km **N**
Sat: 41.0 x 15.0 km, PA 114.0°; Sep 0.6030" at PA 100.1°

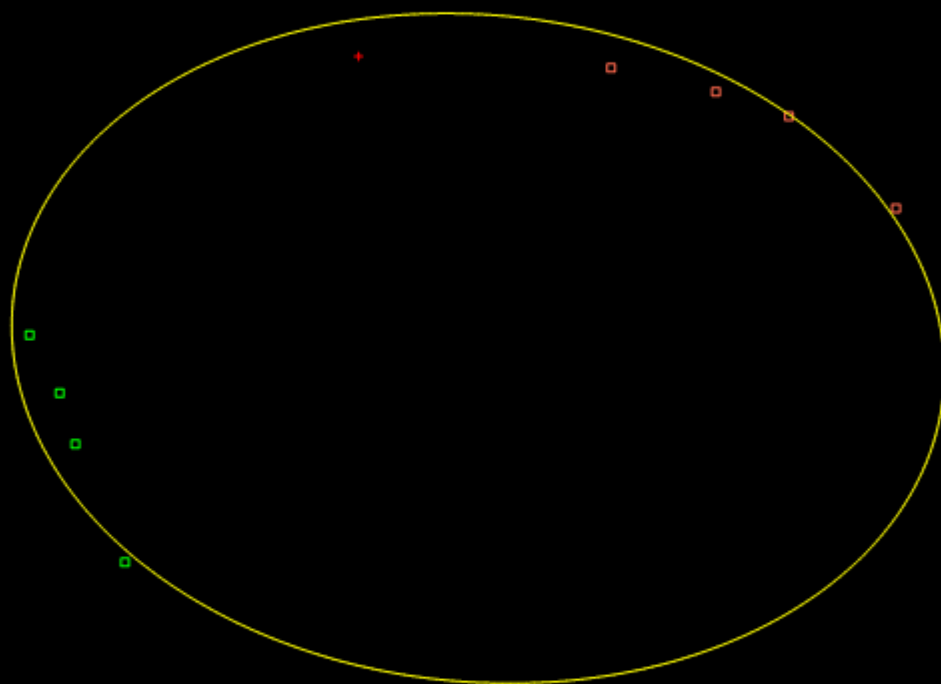


87sylvia2014feb10

(87) Sylvia 2014 Feb 10 $318.7 \pm 21.0 \times 227.3 \pm 22.2$ km, PA $84.3^\circ \pm 12.0^\circ$
Geocentric X 1465.1 ± 8.8 Y 925.6 ± 9.3 km

N

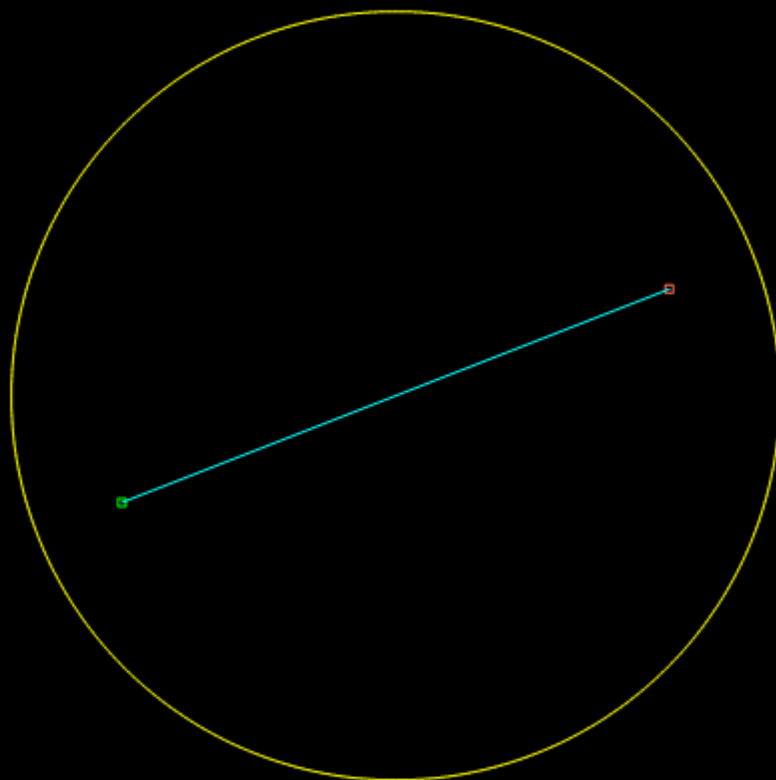
E



884priamus2008may04

(884) Priamus 2008 May 4 98.0 x 98.0 km, PA 0.0° °
Geocentric X -1892.8 ± 2.1 Y 5938.9 ± 5.3 km **N**

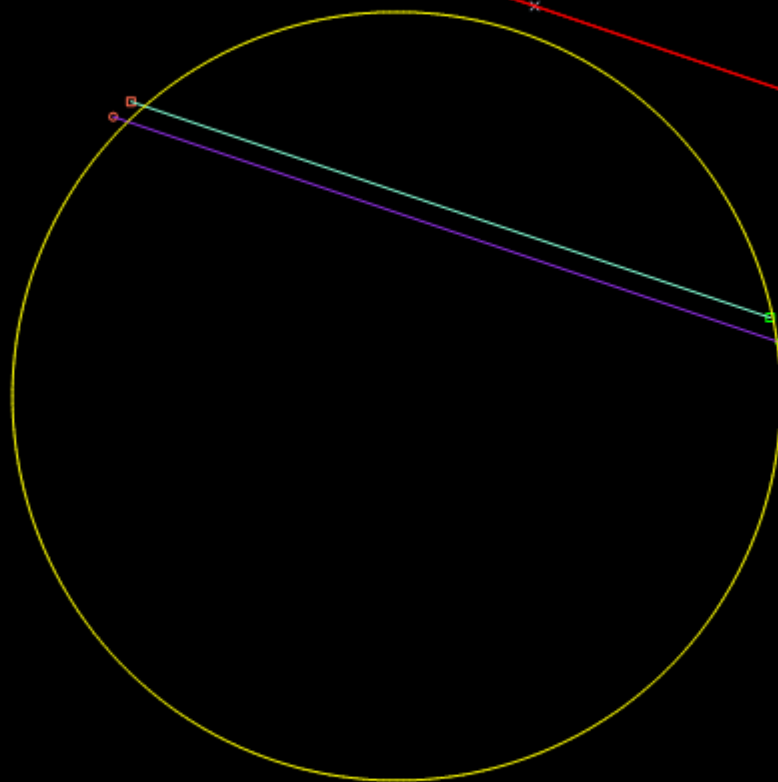
E



886washingtonia2008mar28

(886) Washingtonia 2008 Mar 28 $92.0 \pm 54.6 \times 92.0$ km, PA 0.0° °
Geocentric X 4583.3 ± 2.3 Y 1832.3 ± 17.6 km **N**

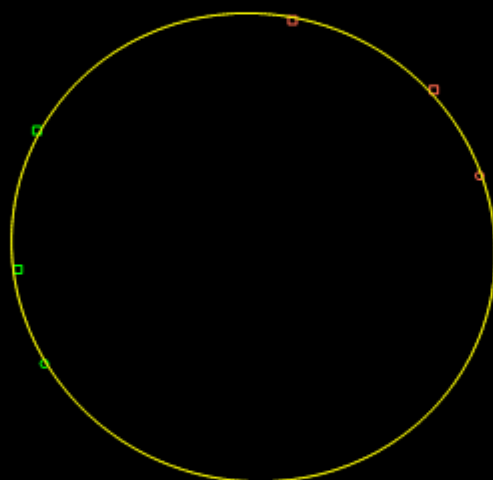
E



886washingtonia2013nov25

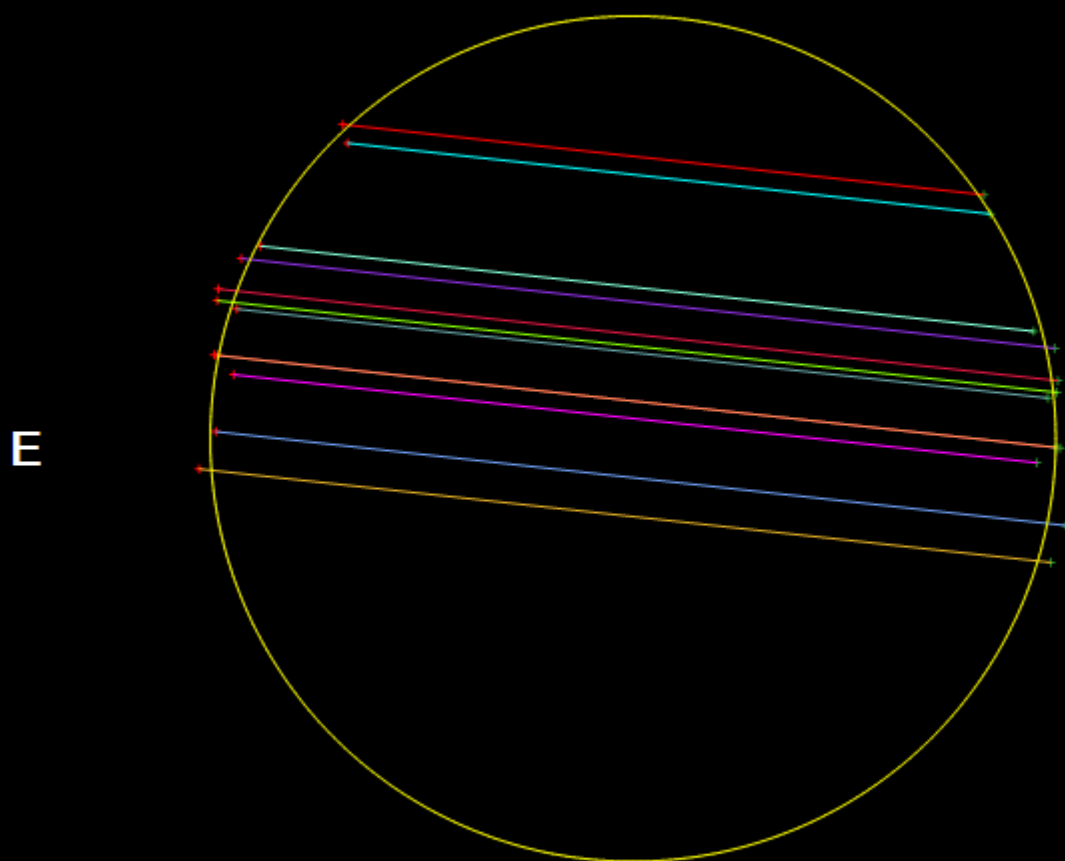
(886) Washingtonia 2013 Nov 25 $83.4 \pm 2.6 \times 80.0 \pm 2.6$ km, PA $70.4^\circ \pm 40.3^\circ$
Geocentric X -1970.8 ± 0.9 Y 897.2 ± 1.7 km **N**

E



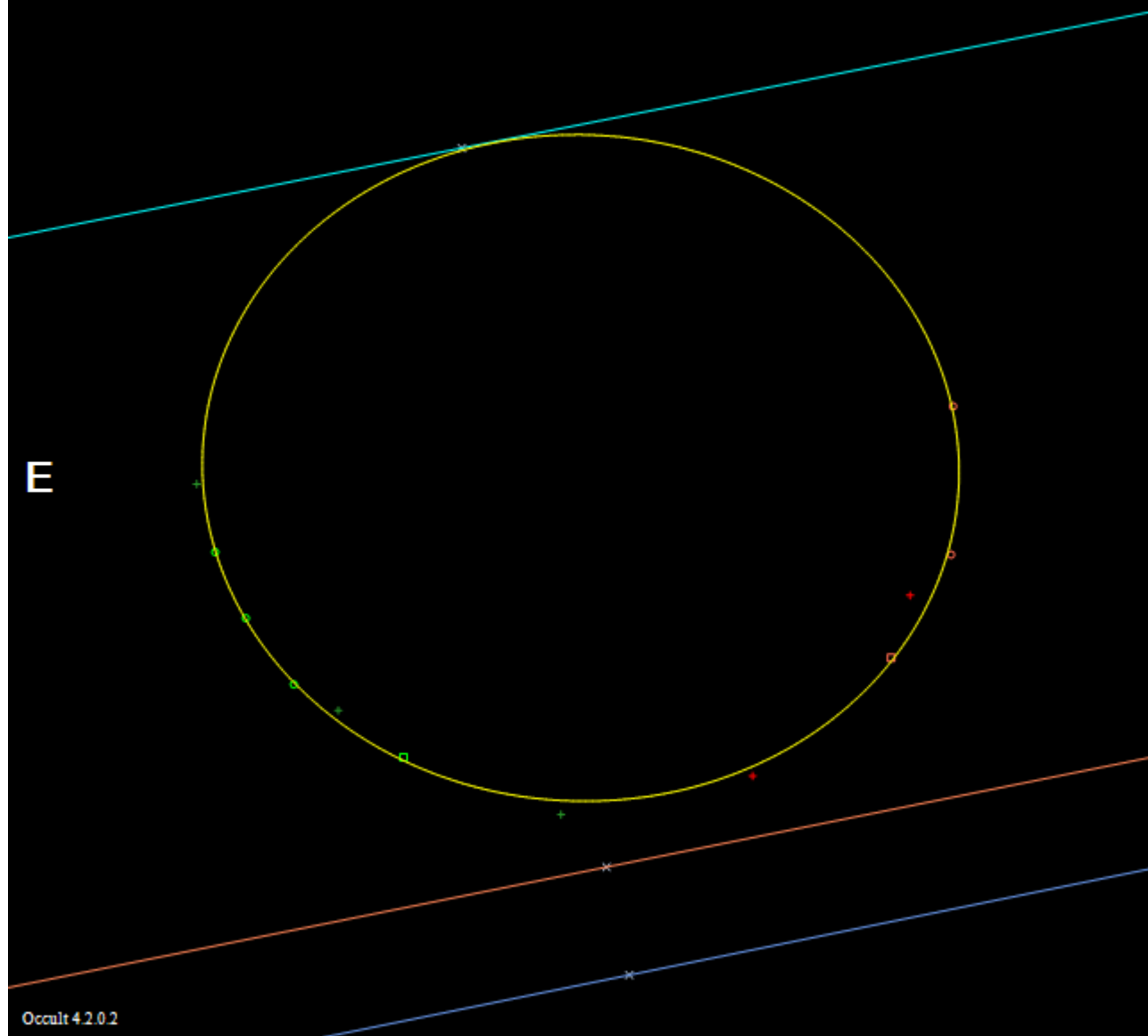
88thisbe1981oct07

(88) Thisbe 1981 Oct 7 $220.0 \pm 13.2 \times 220.0$ km, PA 0.0° °
Geocentric X 2370.6 ± 0.6 Y 5479.5 ± 3.8 km **N**



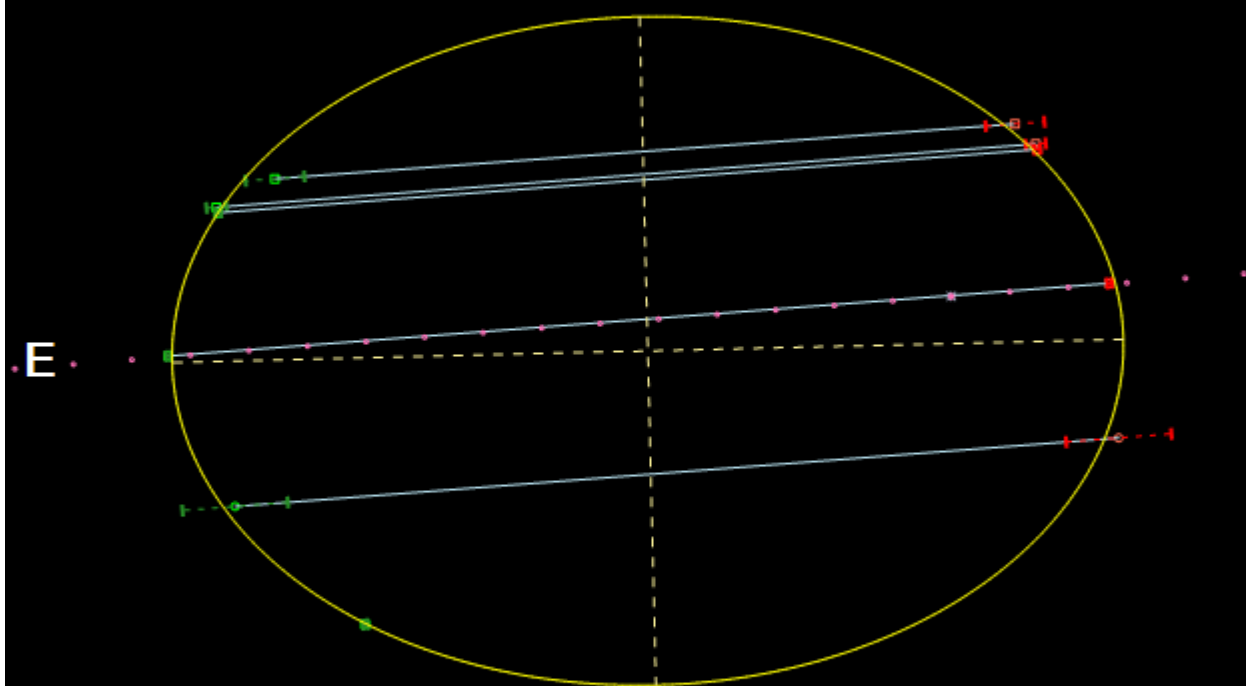
88thisbe2007feb21

(88) Thisbe 2007 Feb 21 $220.8 \pm 2.3 \times 194.3 \pm 2.7$ km, PA $87.5^\circ \pm 5.8^\circ$
Geocentric X -2488.9 ± 1.2 Y 1330.6 ± 1.2 km **N**



88Thisbe2016Jan13

(88) Thisbe 2016 Jan 13 $247.6 \pm 2.9 \times 174.0 \pm 6.5$ km, PA $91.4^\circ \pm 2.2^\circ$
Geocentric X 5183.0 ± 1.4 Y 3110.7 ± 1.5 km **N**

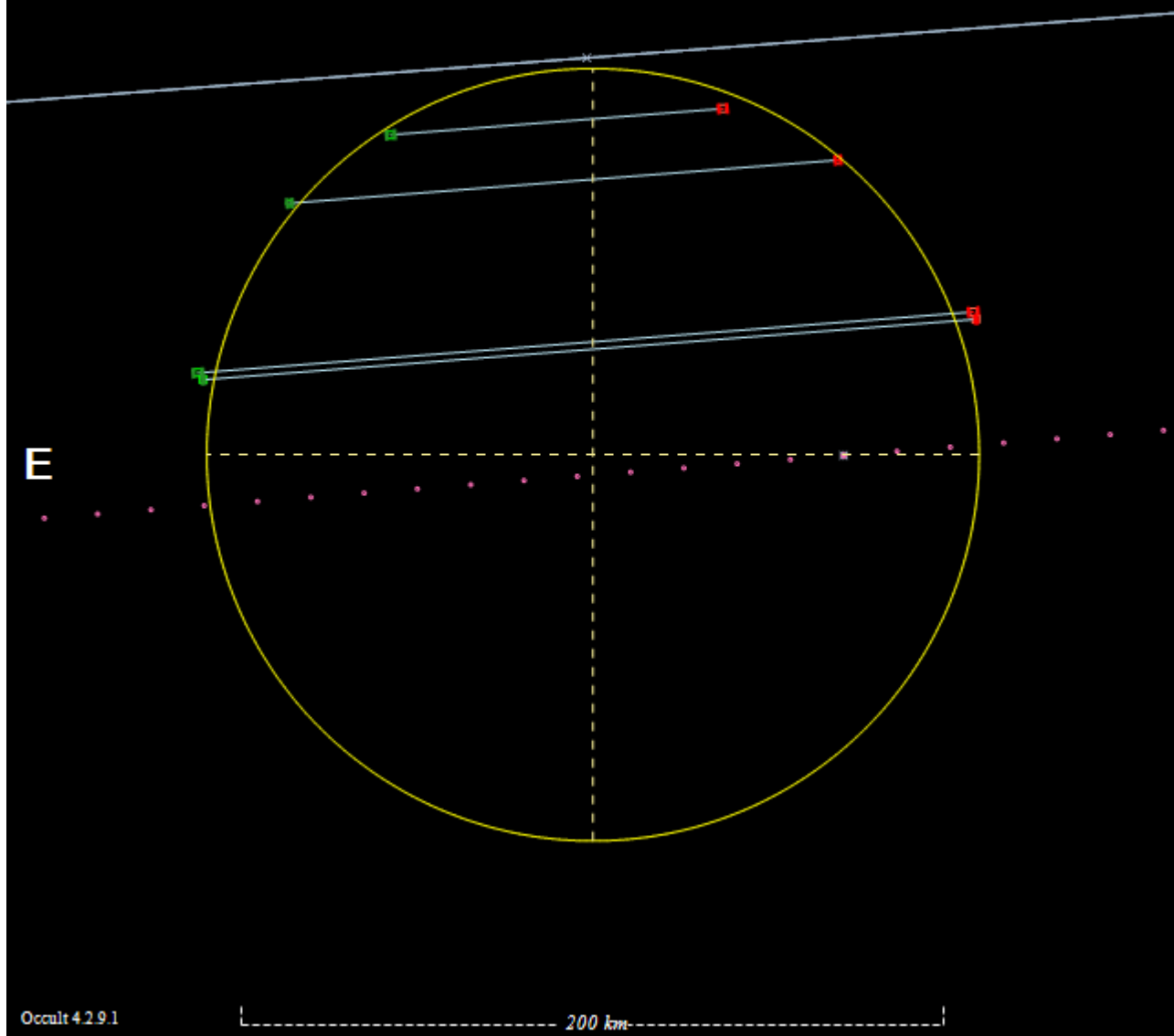


Occult 4.2.9.1

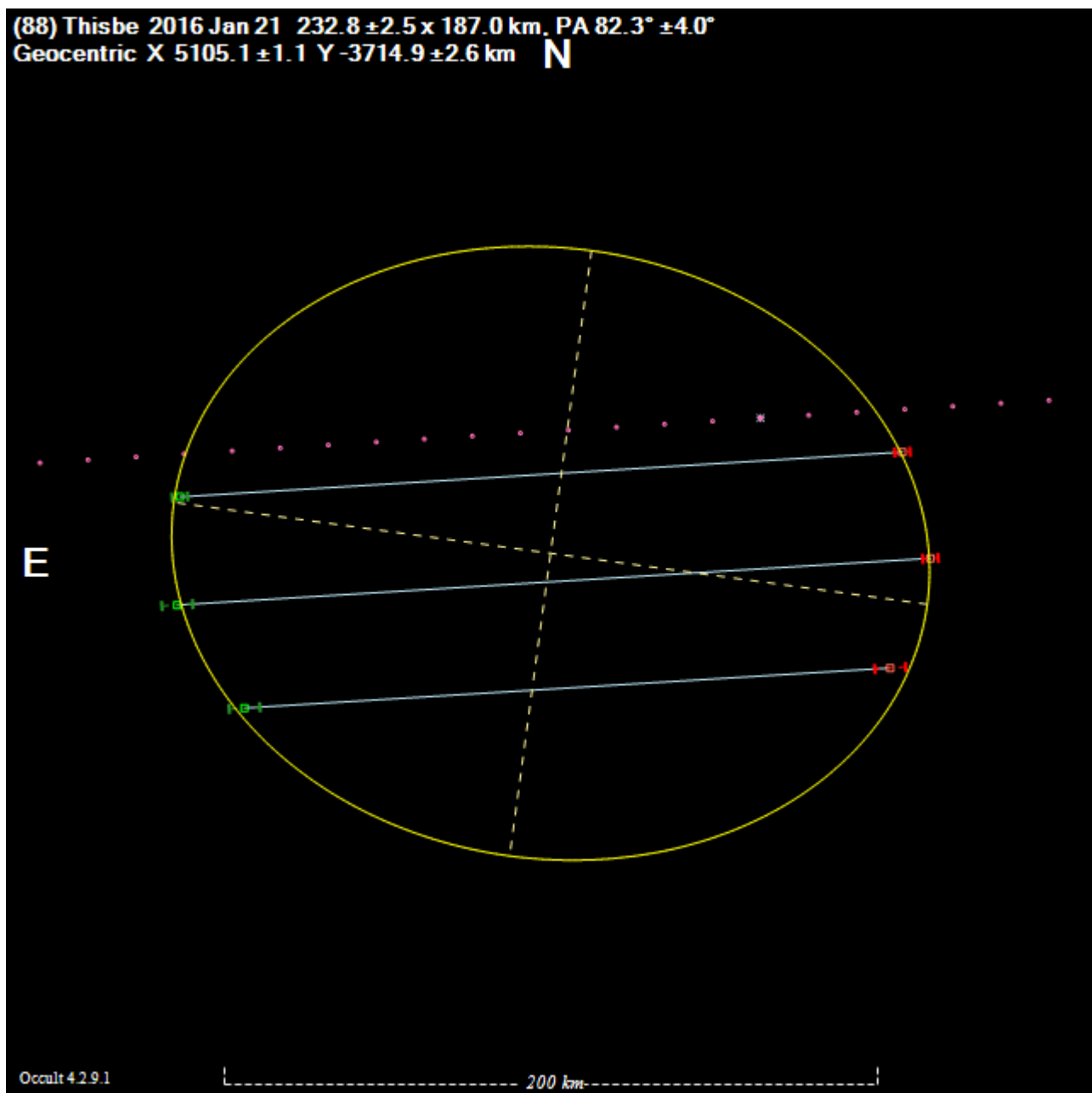
200 km

88Thisbe2016Jan14

(88) Thisbe 2016 Jan 14 220.0 x 220.0 km, PA 0.0°
Geocentric X -3328.4 ± 1.6 Y 3685.1 ± 2.2 km **N**

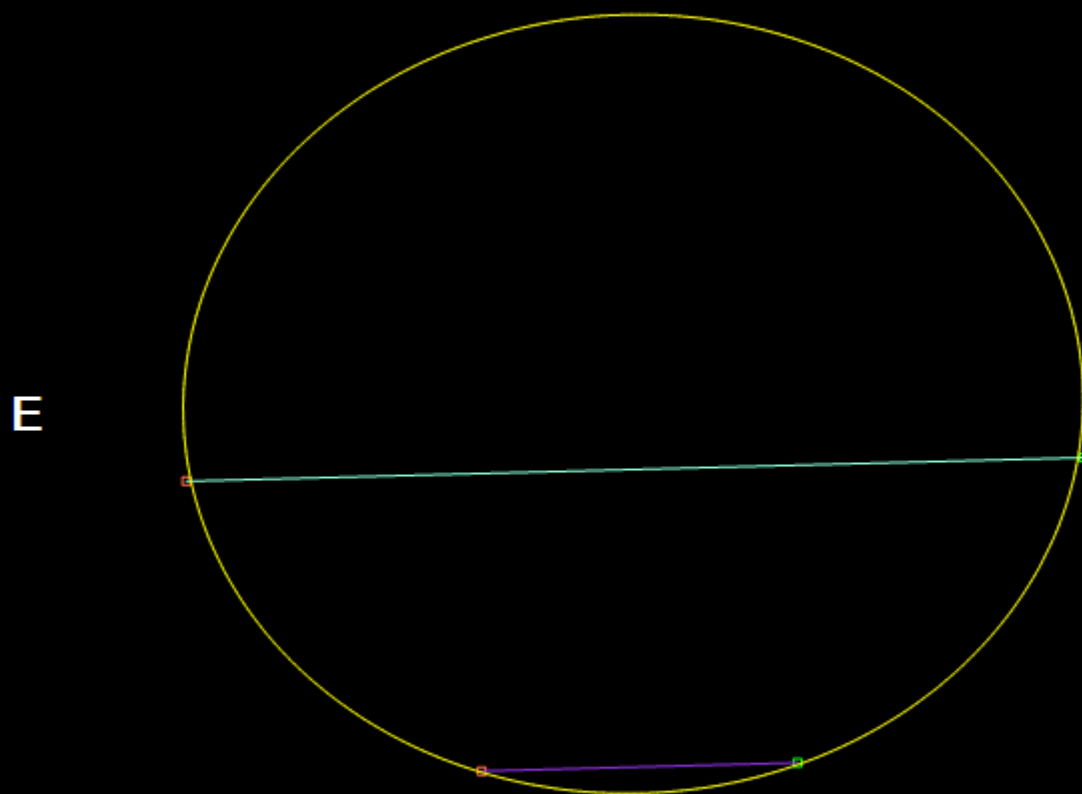


(88) Thisbe 2016 Jan 21 232.8 \pm 2.5 x 187.0 km. PA 82.3° \pm 4.0°
Geocentric X 5105.1 \pm 1.1 Y -3714.9 \pm 2.6 km **N**



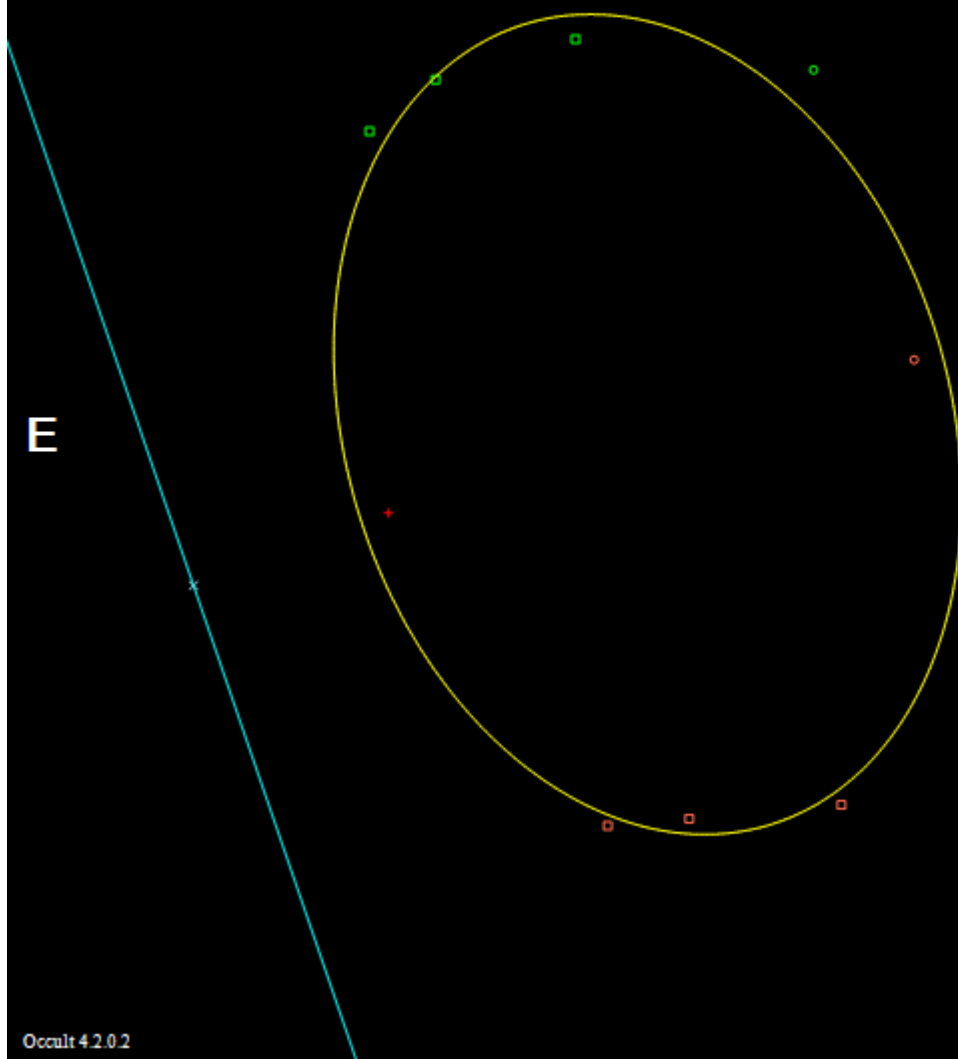
892seeligeria2008jul12

(892) Seeligeria 2008 Jul 12 89.0 x 77.0 km, PA 92.5° ±4.5°
Geocentric X -4427.4 ±0.3 Y 3492.9 ±0.2 km **N**



893leopoldina2010aug30

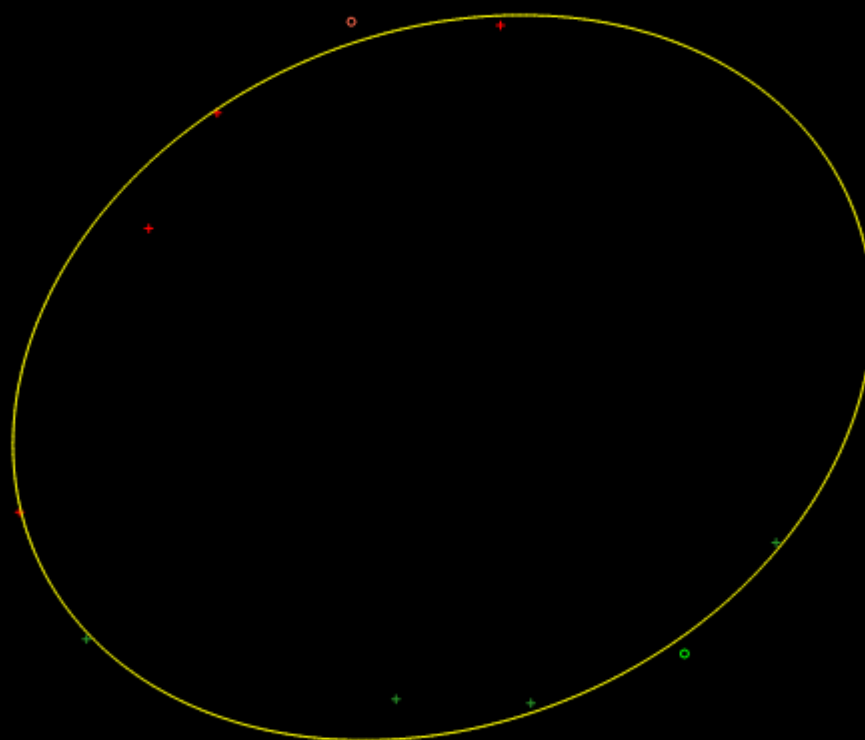
(893) Leopoldina 2010 Aug 30 $82.8 \pm 1.2 \times 59.8 \pm 2.0$ km, PA $17.0^\circ \pm 3.1^\circ$
Geocentric X -2450.5 ± 0.7 Y -2837.5 ± 0.5 km **N**



89julia2005aug13

(89) Julia 2005 Aug 13 $174.4 \pm 10.7 \times 135.6 \pm 4.7$ km, PA $-66.5^\circ \pm 7.2^\circ$
Geocentric X -2838.8 ± 4.4 Y 1468.1 ± 2.7 km **N**

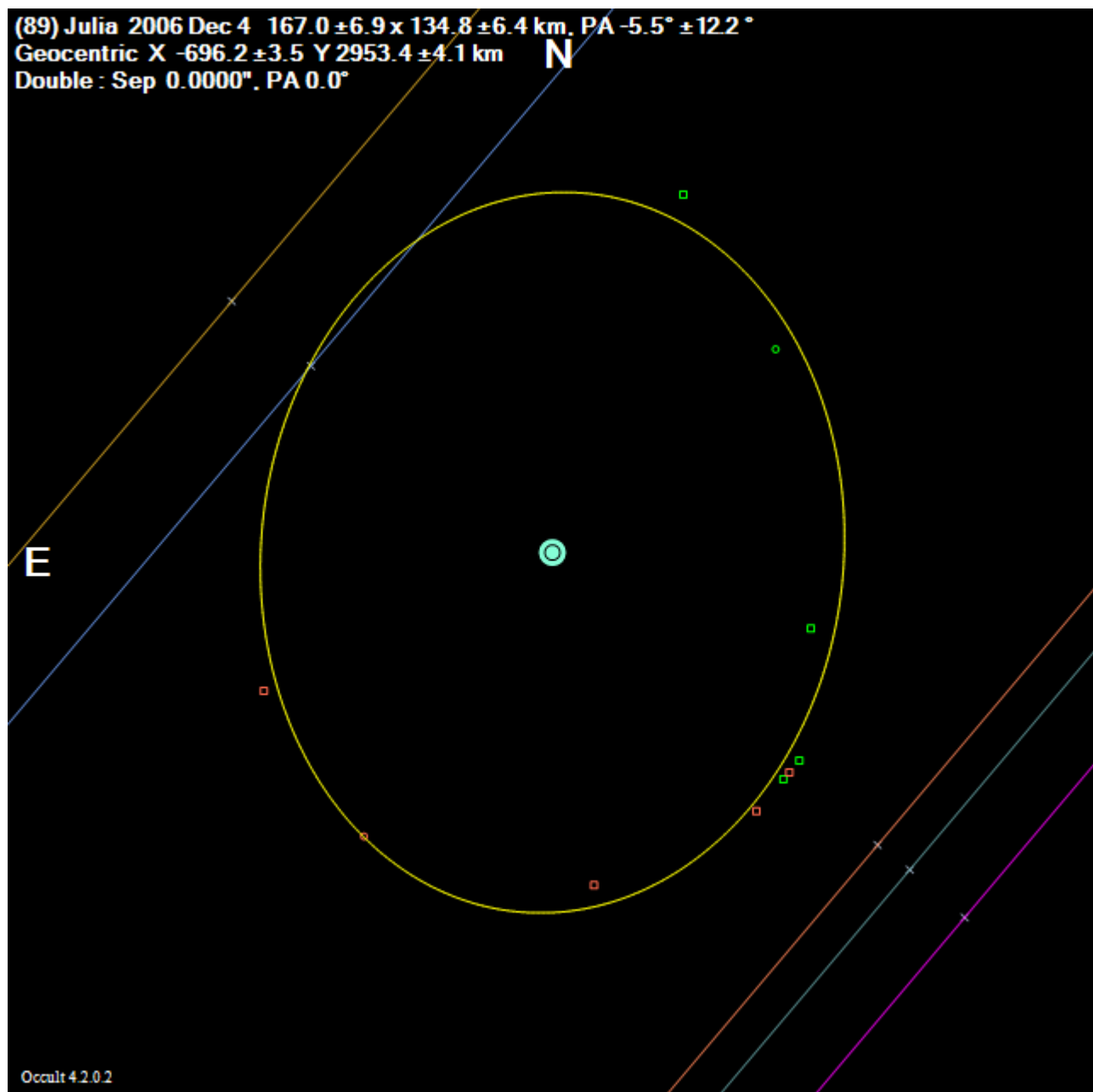
E



Occult 4.2.0.2

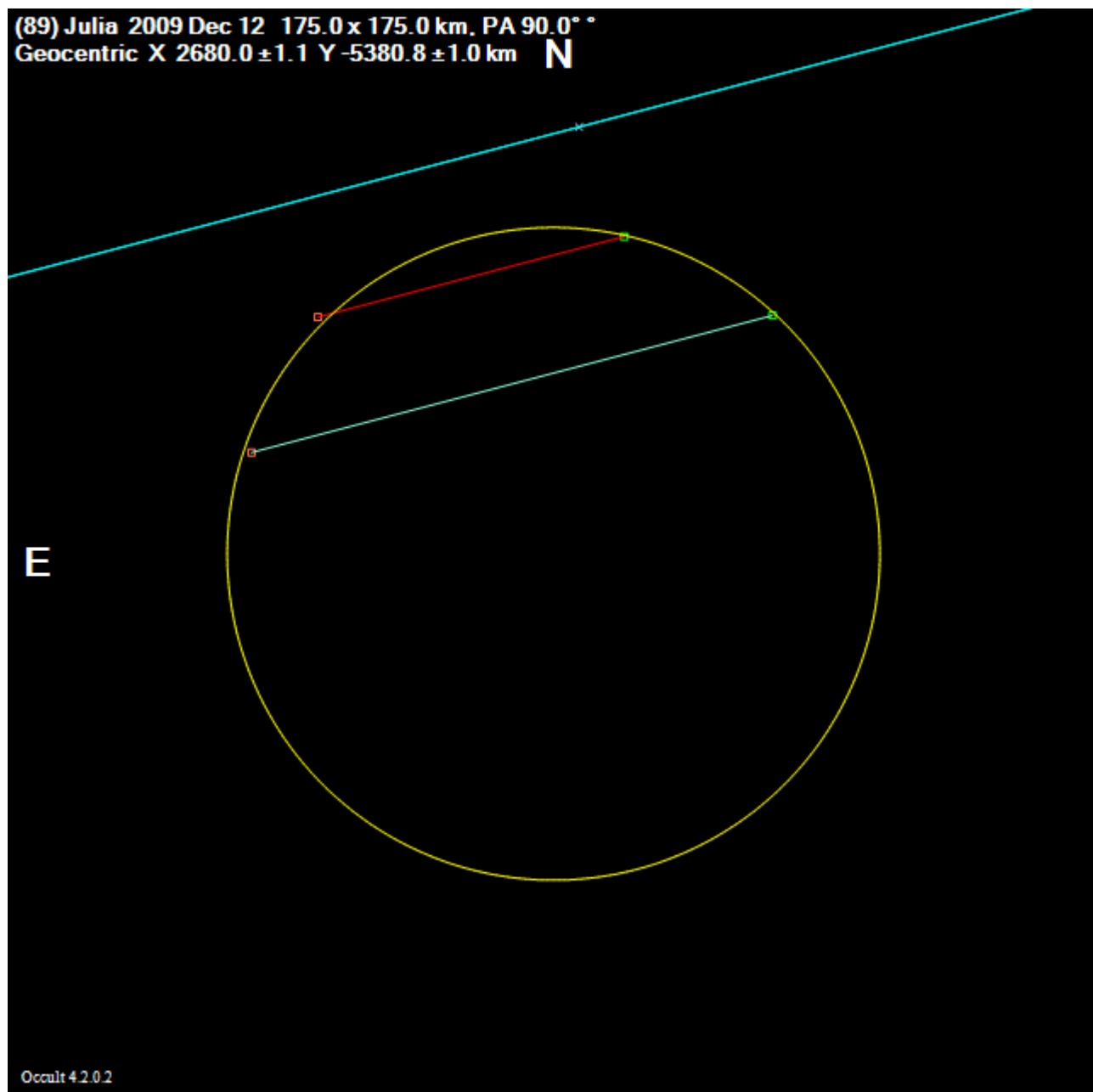
89julia2006dec04

(89) Julia 2006 Dec 4 $167.0 \pm 6.9 \times 134.8 \pm 6.4$ km, PA $-5.5^\circ \pm 12.2^\circ$
Geocentric X -696.2 ± 3.5 Y 2953.4 ± 4.1 km
Double : Sep $0.0000''$, PA 0.0°



89julia2009dec12

(89) Julia 2009 Dec 12 175.0 x 175.0 km, PA 90.0° °
Geocentric X 2680.0 ± 1.1 Y -5380.8 ± 1.0 km **N**



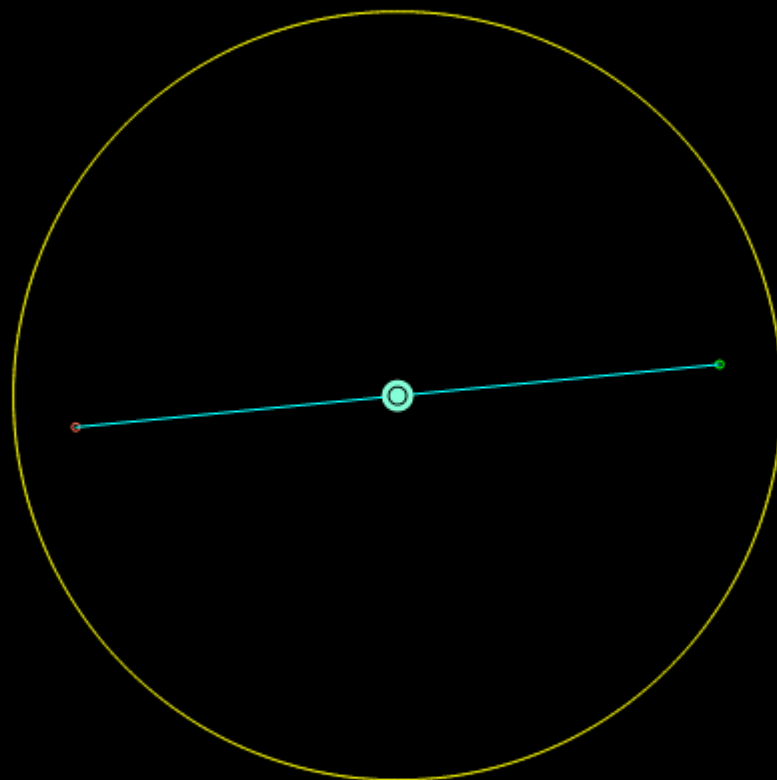
Occult 4.2.0.2

8flora2004oct07

(8) Flora 2004 Oct 7 136.0 x 136.0 km, PA 0.0° °
Geocentric X -3901.9 Y 4332.8 km
Double : Sep 0.0000", PA 0.0°

N

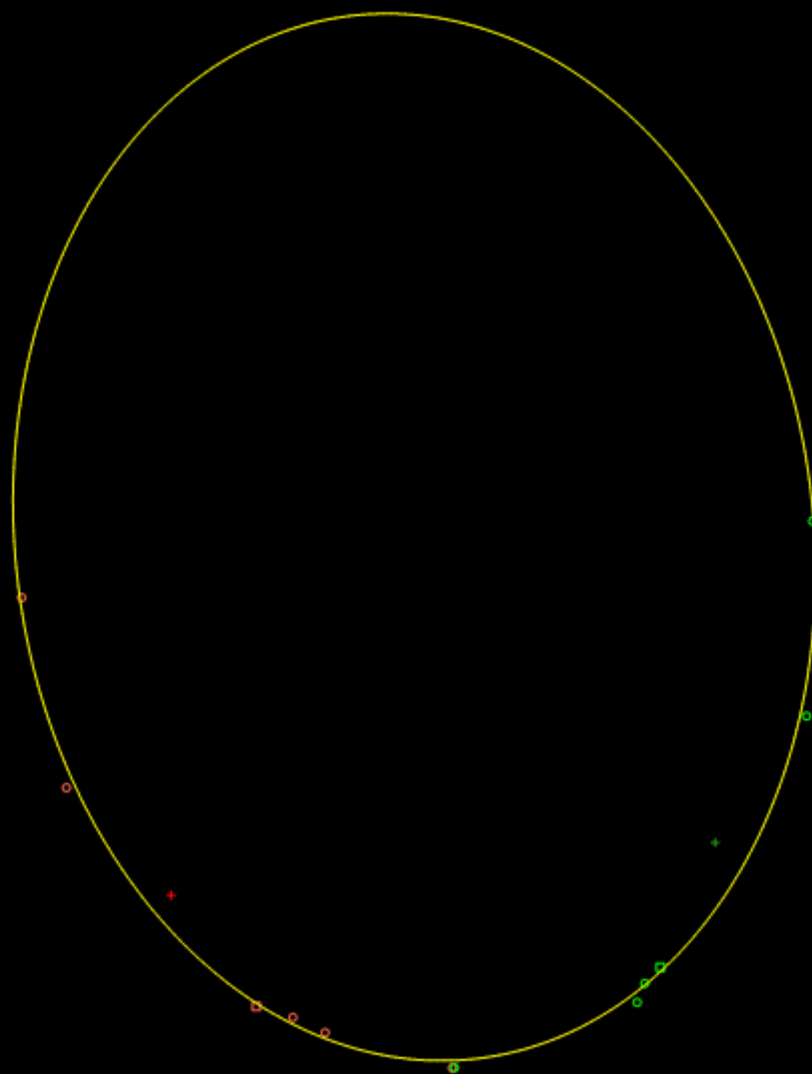
E



8flora2004oct29

(8) Flora 2004 Oct 29 $184.5 \pm 22.2 \times 140.2 \pm 3.6$ km, PA $7.1^\circ \pm 3.8^\circ$
Geocentric X -5323.3 ± 1.8 Y 2978.3 ± 10.6 km **N**

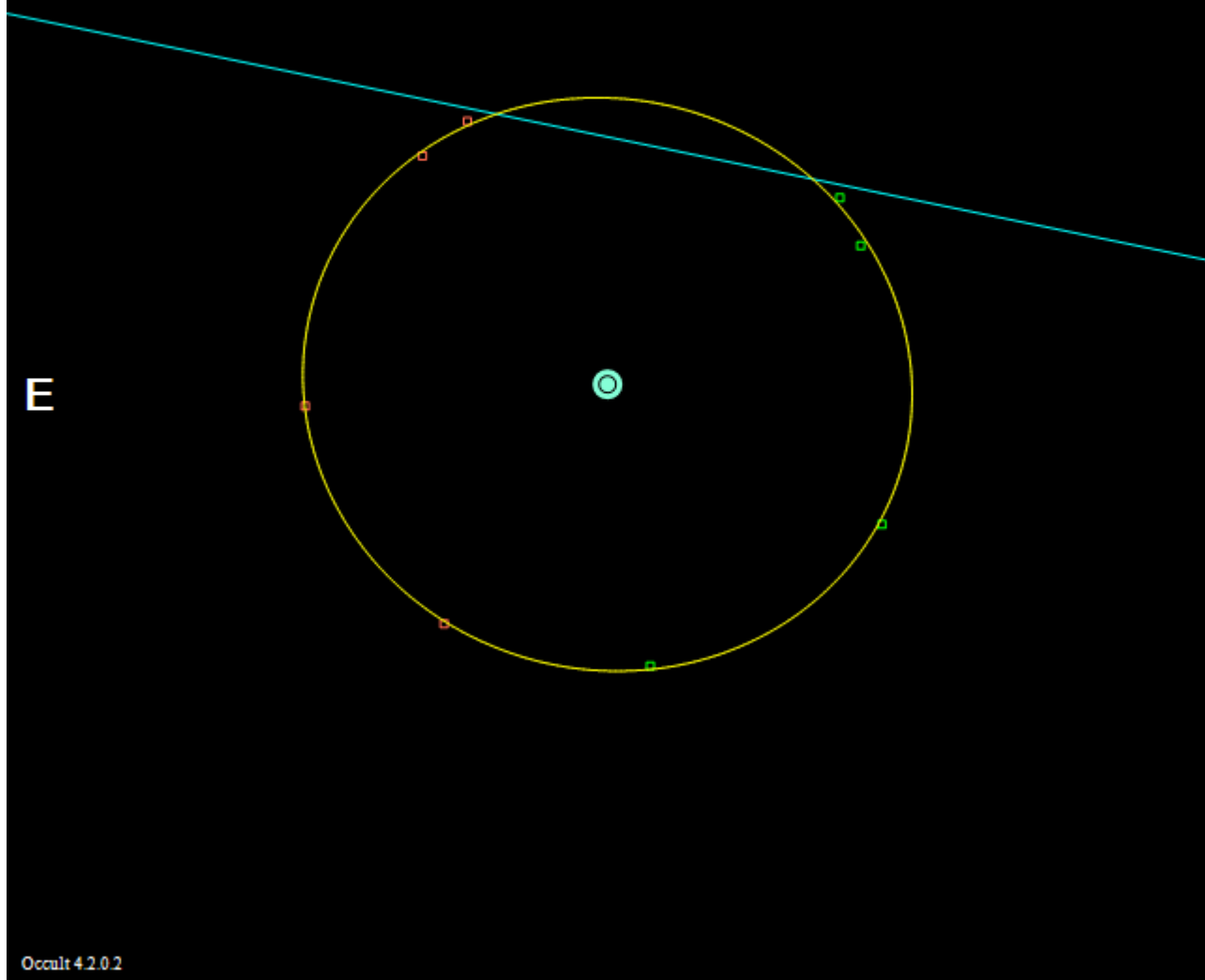
E



Occult 4.2.0.2

8flora2013oct25

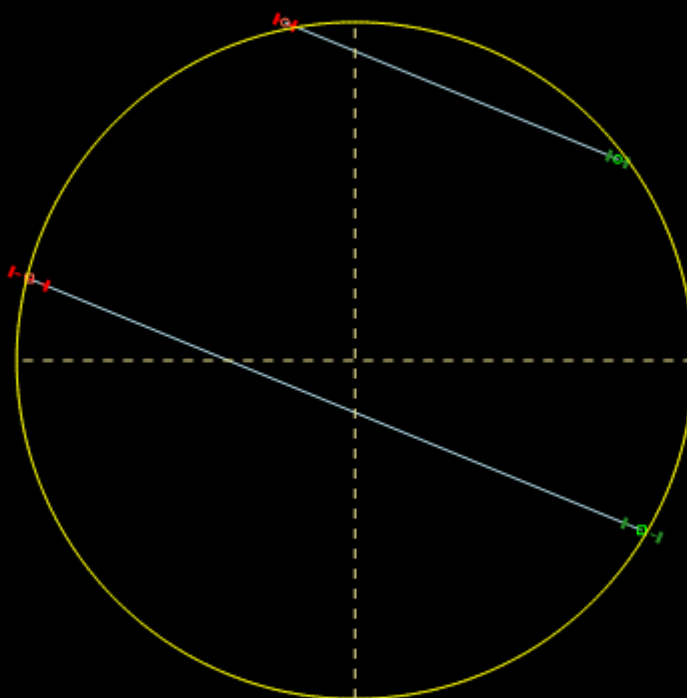
(8) Flora 2013 Oct 25 $157.0 \pm 1.6 \times 146.5 \pm 1.5$ km, PA $75.6^\circ \pm 5.3^\circ$
Geocentric X 2693.3 ± 0.6 Y -2198.5 ± 0.5 km **N**
Double : Sep $0.0000''$, PA 0.0°



904Rockefellia2016Apr25

(904) Rockefeller 2016 Apr 25 52.0 x 52.0 km, PA 0.0°
Geocentric X -4311.8 ± 0.3 Y -3812.3 ± 0.3 km **N**

E

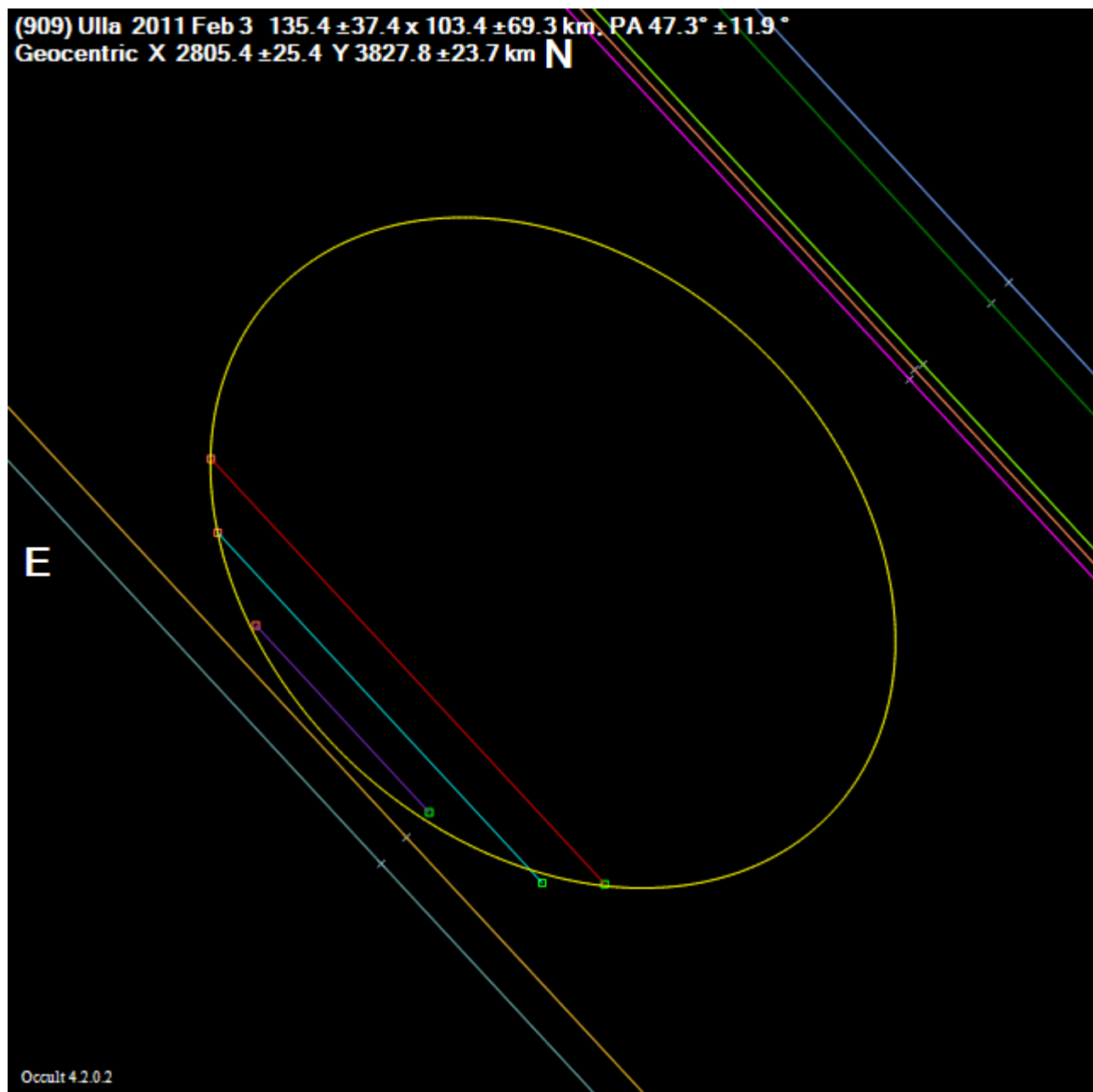


Occult 4.2.9.1

----- 50 km -----

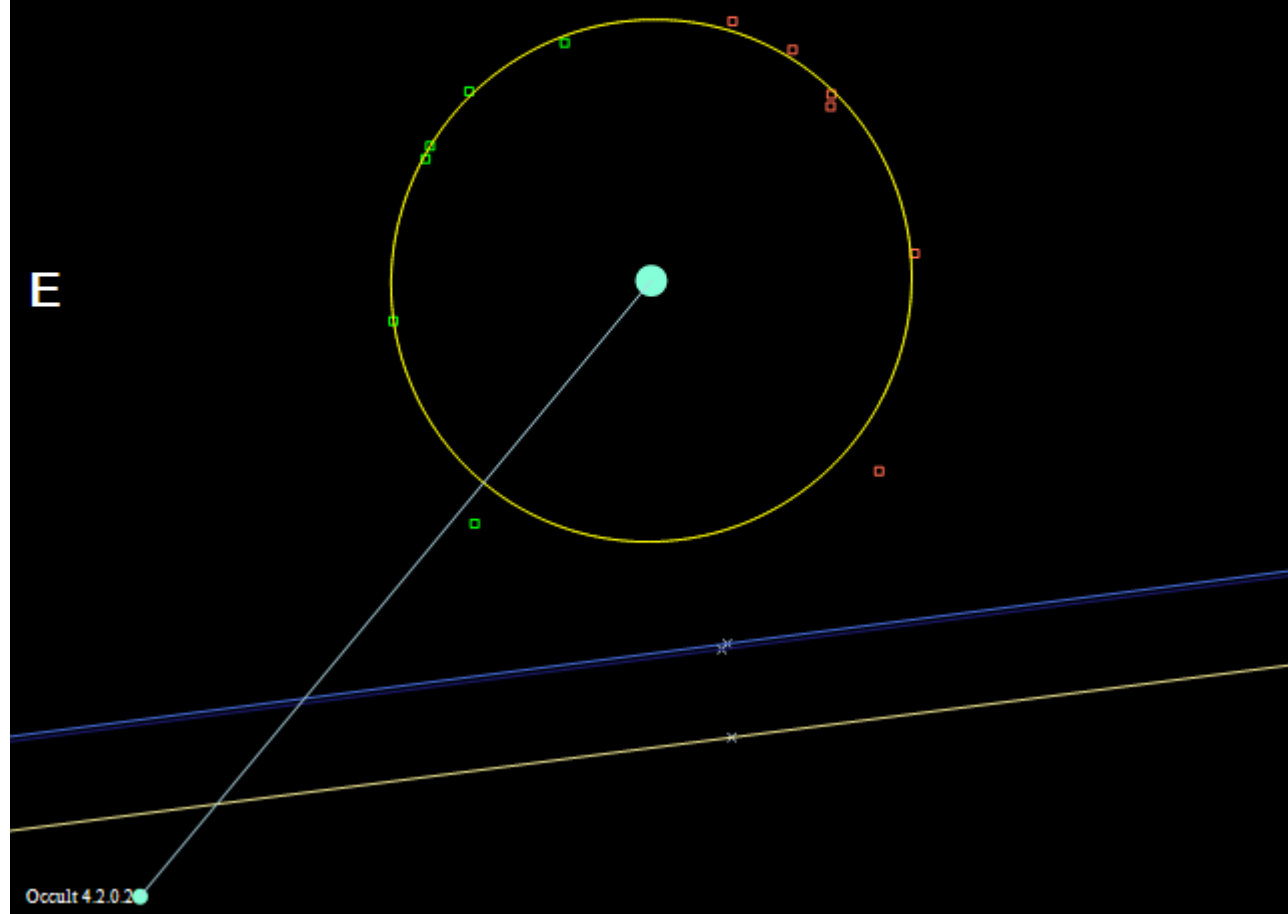
909ulla2011feb03

(909) Ulla 2011 Feb 3 $135.4 \pm 37.4 \times 103.4 \pm 69.3$ km, PA $47.3^\circ \pm 11.9^\circ$
Geocentric X 2805.4 ± 25.4 Y 3827.8 ± 23.7 km **N**



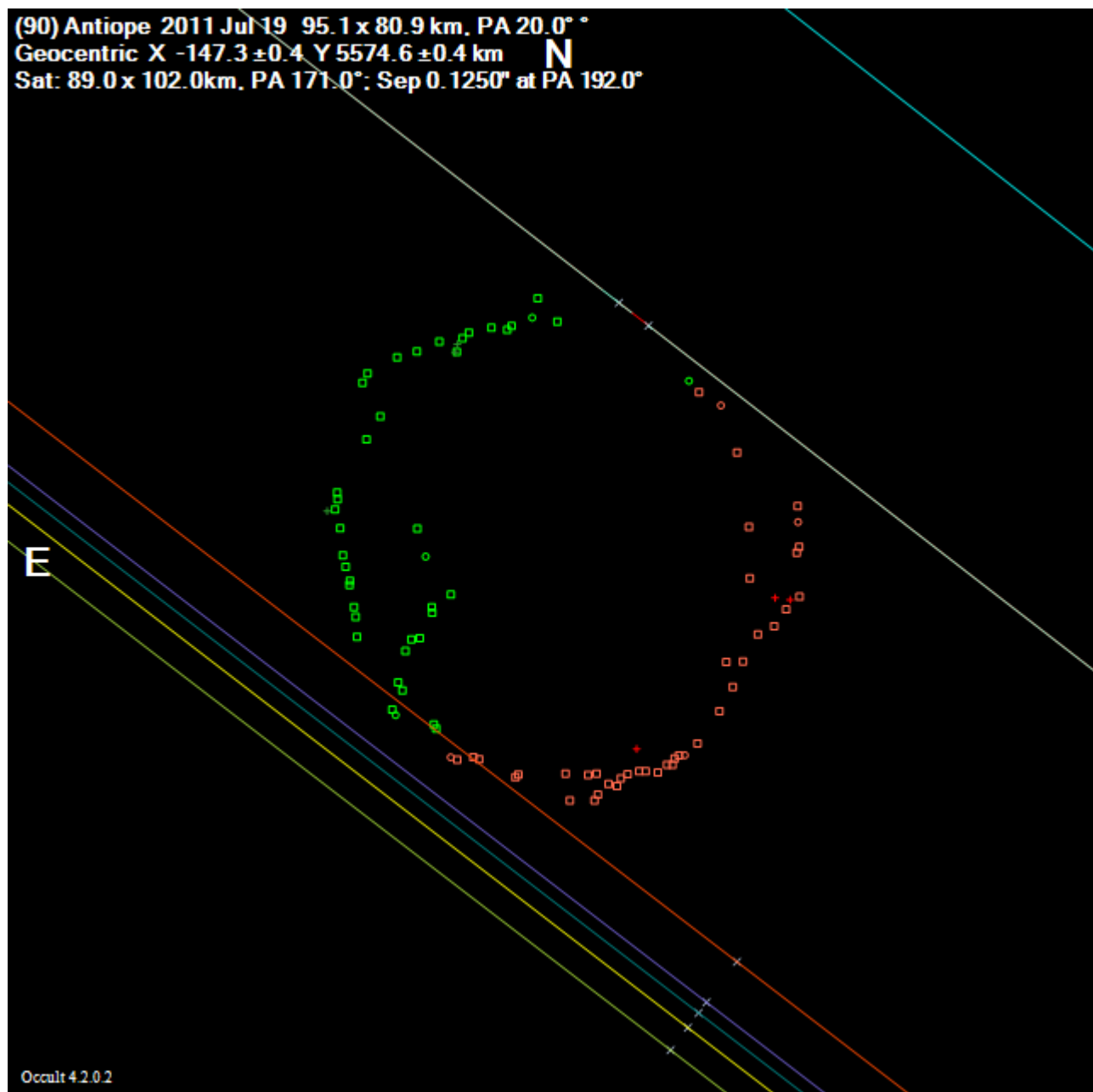
90antiope2008jan02

(90) Antiope 2008 Jan 2 $82.0 \pm 2.4 \times 80.8 \pm 2.5$ km, PA -39.0°
Geocentric X 3372.2 ± 1.0 Y 1647.5 ± 1.2 km **N**
Double : Sep $0.0667''$, PA 140.3°

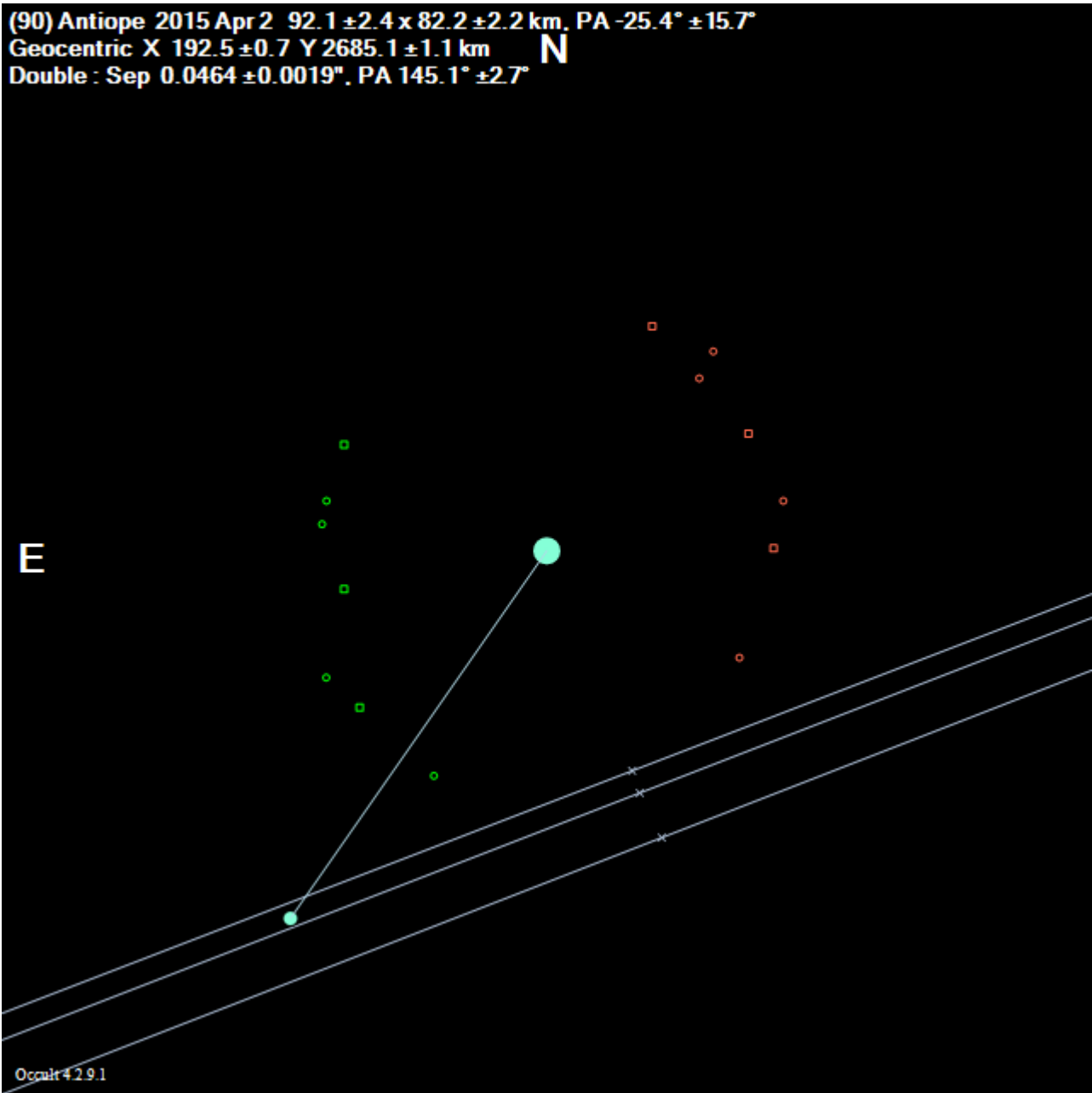


90antiope2011jul19

(90) Antiope 2011 Jul 19 95.1 x 80.9 km, PA 20.0°
Geocentric X -147.3 ± 0.4 Y 5574.6 ± 0.4 km
Sat: 89.0 x 102.0 km, PA 171.0°; Sep 0.1250" at PA 192.0°



90antiope2015apr02

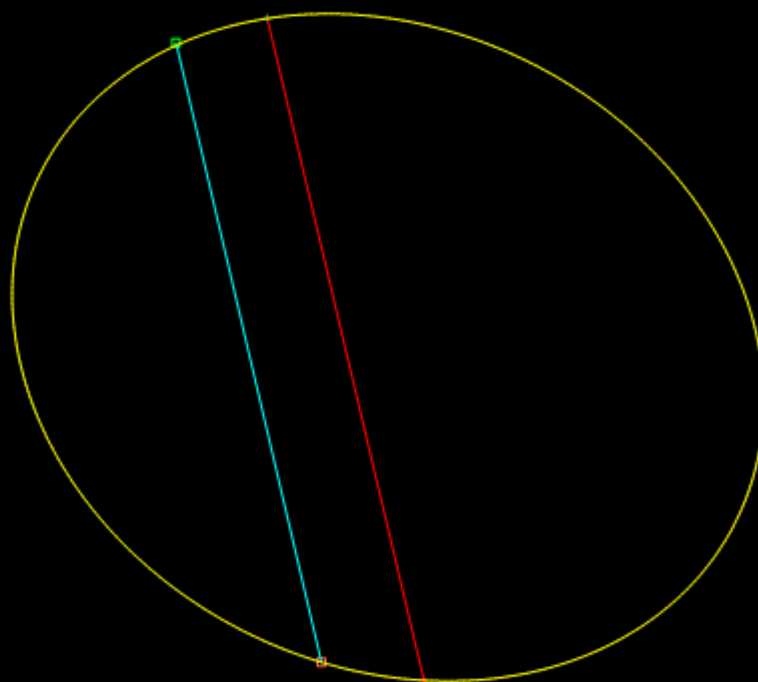


911agamemnon2000mar21

(911) Agamemnon 2000 Mar 21 168.0 x 137.5 km, PA 63.4° °
Geocentric X 1372.6 Y 592.4 km

N

E



911agamemnon2004may06

(911) Agamemnon 2004 May 6 203.2 x 126.6 km. PA -37.0° °
Geocentric X -1609.7 Y 688.4 km

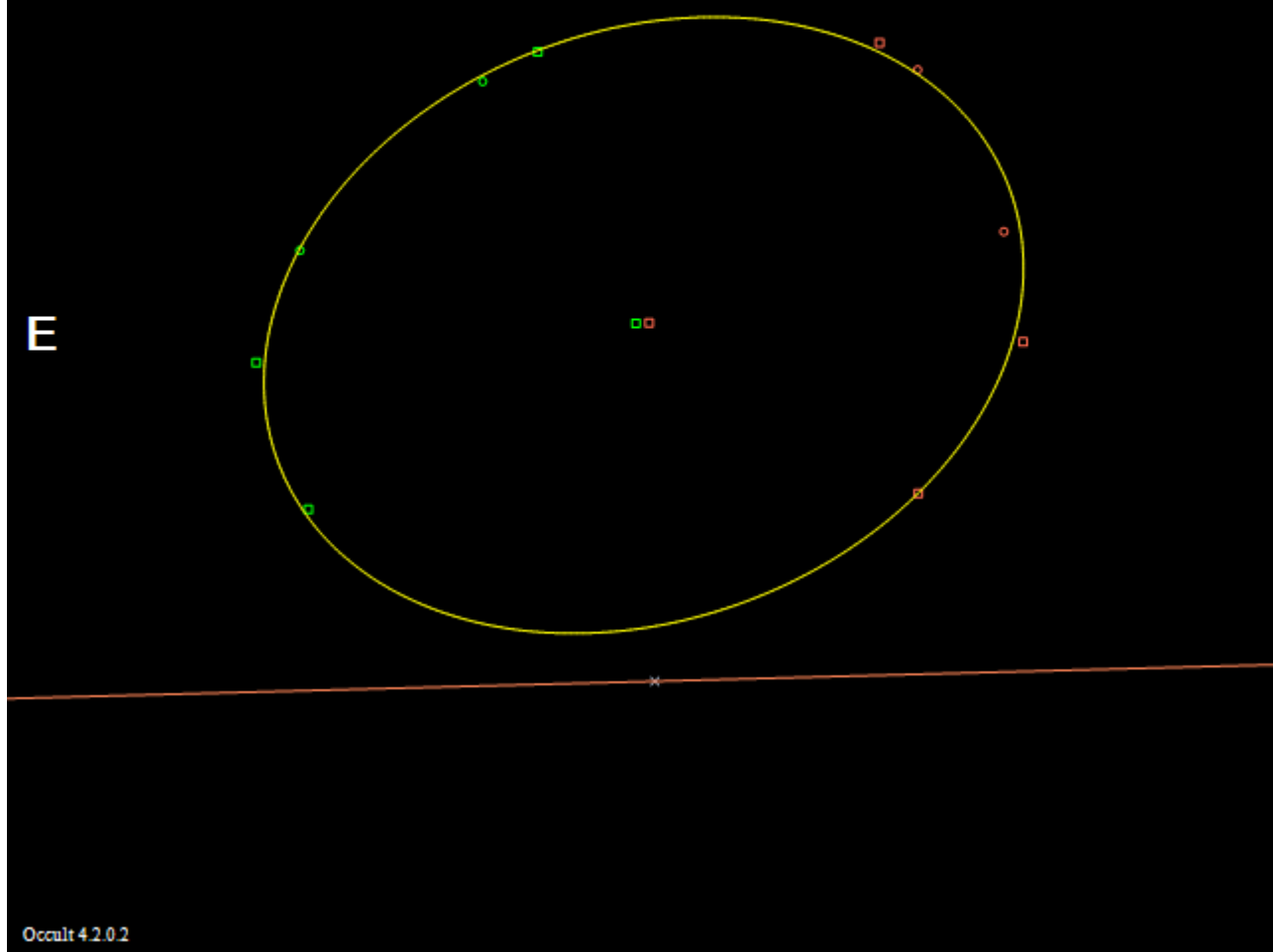
N

E



911agamemnon2012jan19

(911) Agamemnon 2012 Jan 19 $190.6 \pm 1.9 \times 143.8 \pm 3.0$ km, PA $-69.3^\circ \pm 2.6^\circ$
Geocentric X 4661.5 ± 0.8 Y 3113.7 ± 1.3 km **N**
Sat: 9.0×9.0 km, PA -71.0° ; Sep $0.0930''$ at PA 93.0°

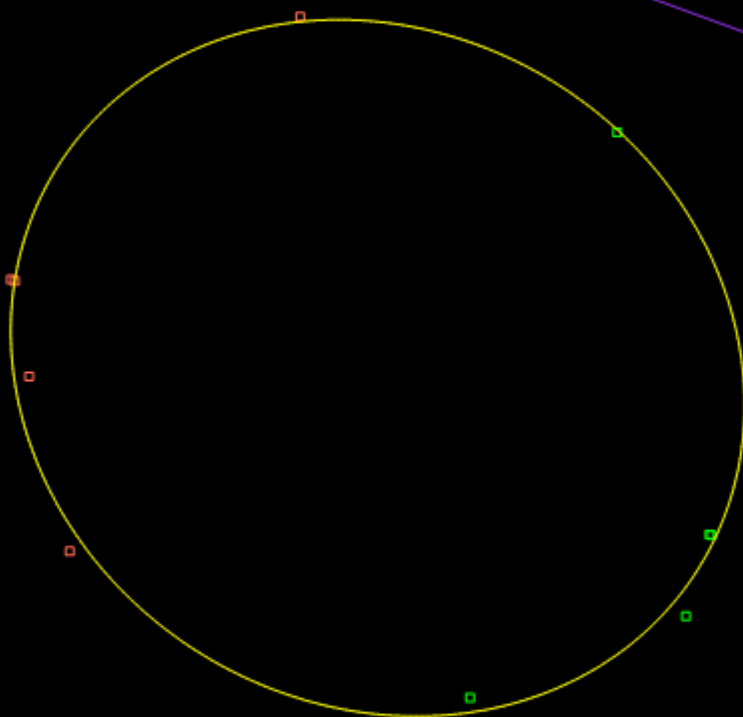


912maritima2011sep25

(912) Maritima 2011 Sep 25. $87.6 \pm 0.6 \times 77.8 \pm 0.8$ km. PA $58.1^\circ \pm 3.9^\circ$
Geocentric X -2892.6 ± 0.3 Y 1506.2 ± 0.3 km **N**

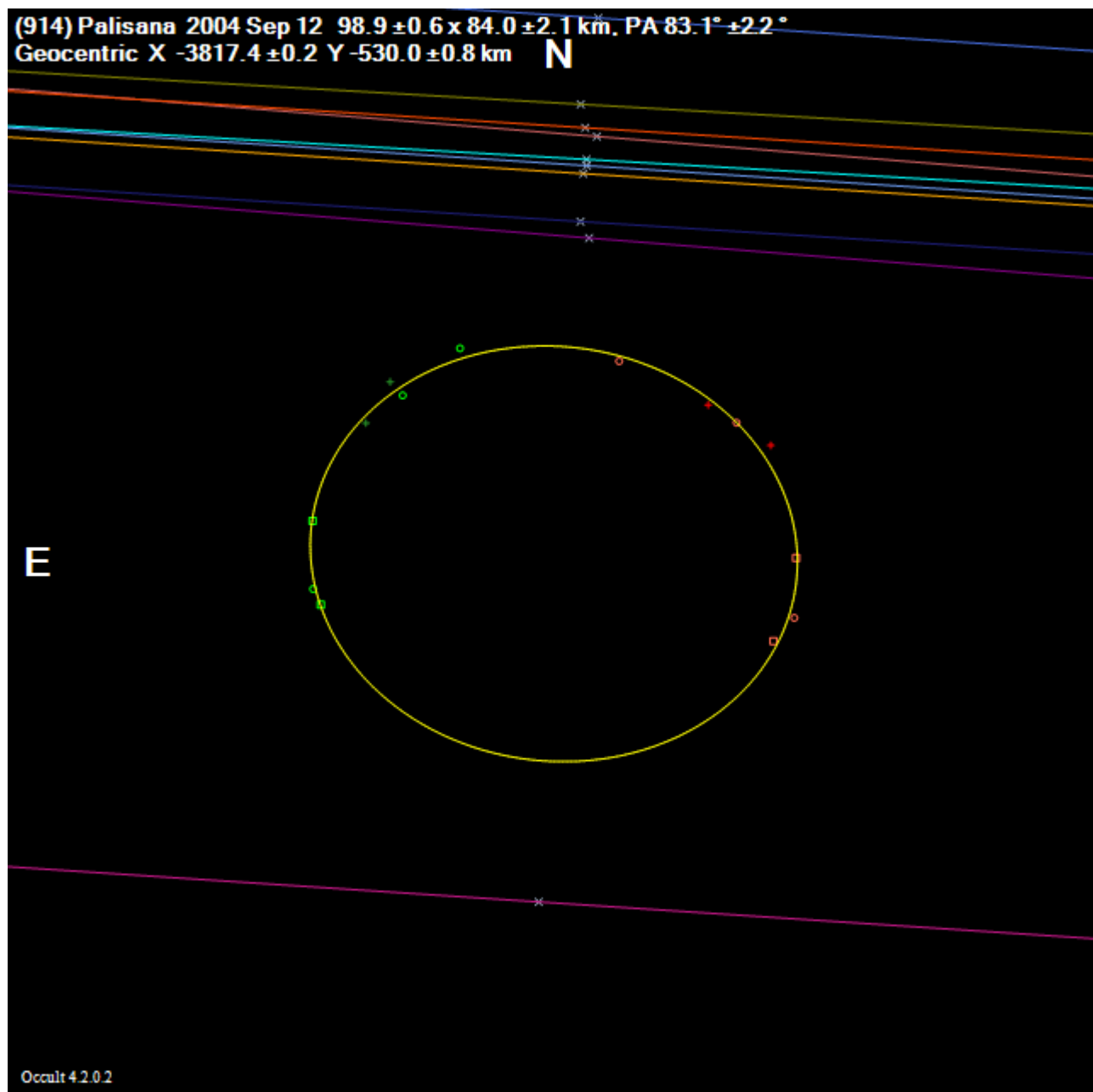
E

Occult 4.2.0.2



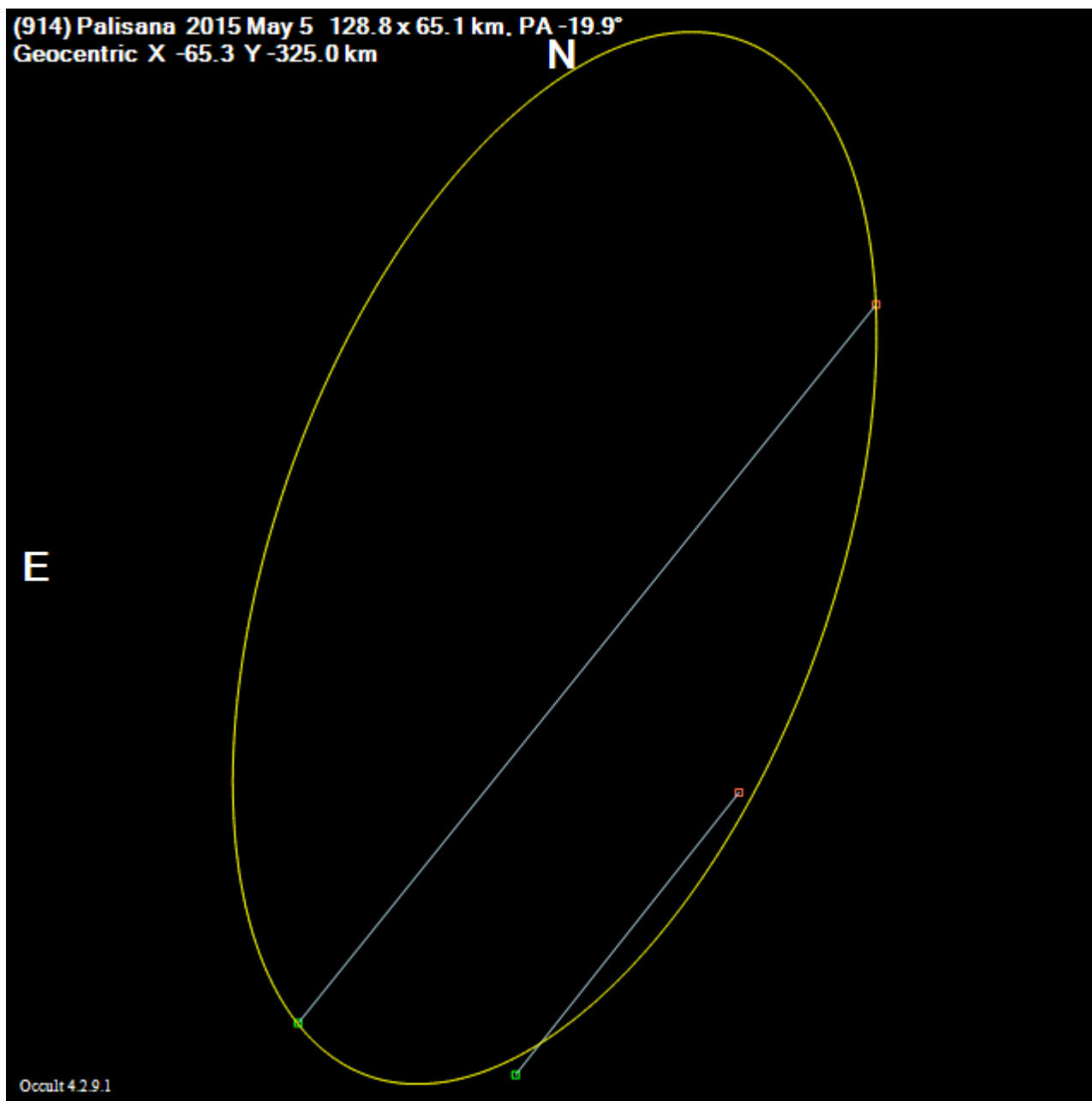
914palisana2004sep12

(914) Palisana 2004 Sep 12 $98.9 \pm 0.6 \times 84.0 \pm 2.1$ km, PA $83.1^\circ \pm 2.2^\circ$
Geocentric X -3817.4 ± 0.2 Y -530.0 ± 0.8 km **N**



914palisana2015may05

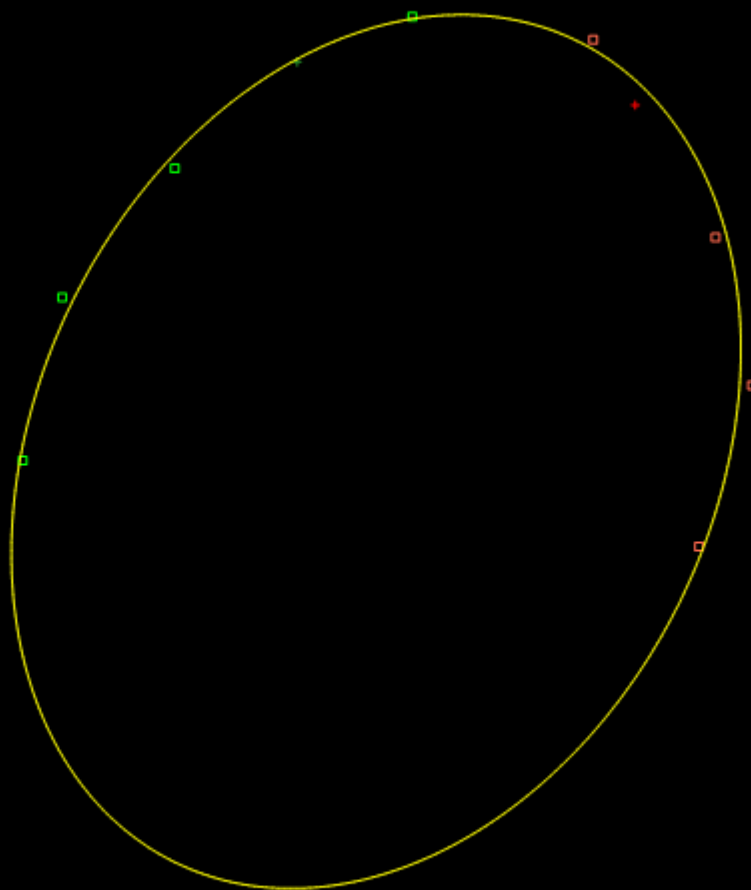
(914) Palisana 2015 May 5 128.8 x 65.1 km, PA -19.9°
Geocentric X -65.3 Y -325.0 km



91aegina2011jul27

(91) Aegina 2011 Jul 27 $129.7 \pm 7.2 \times 96.1 \pm 1.5$ km, PA $-26.1^\circ \pm 3.7^\circ$
Geocentric X -3908.0 ± 1.1 Y -984.7 ± 3.3 km **N**

E



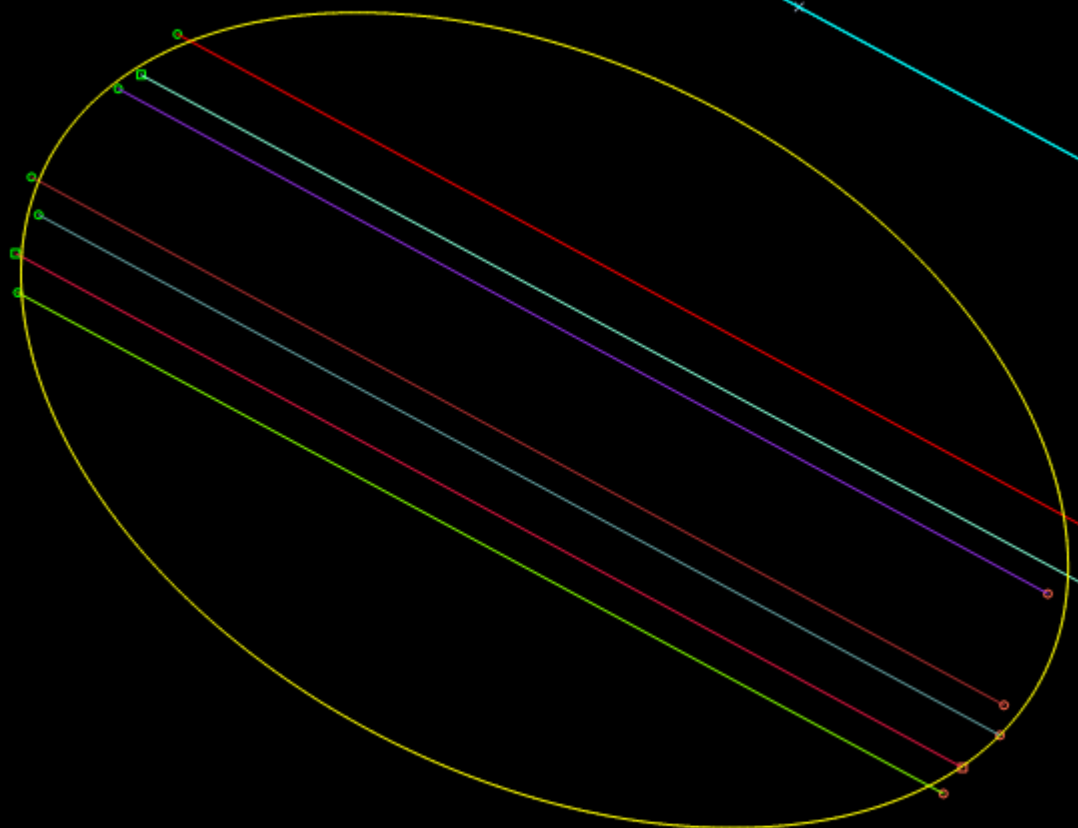
925alphonsina2003dec15

(925) Alphonsina 2003 Dec 15 $78.7 \pm 0.5 \times 50.0$ km, PA $62.6^\circ \pm 1.3^\circ$
Geocentric X 2084.9 ± 0.3 Y -664.0 ± 0.4 km

N

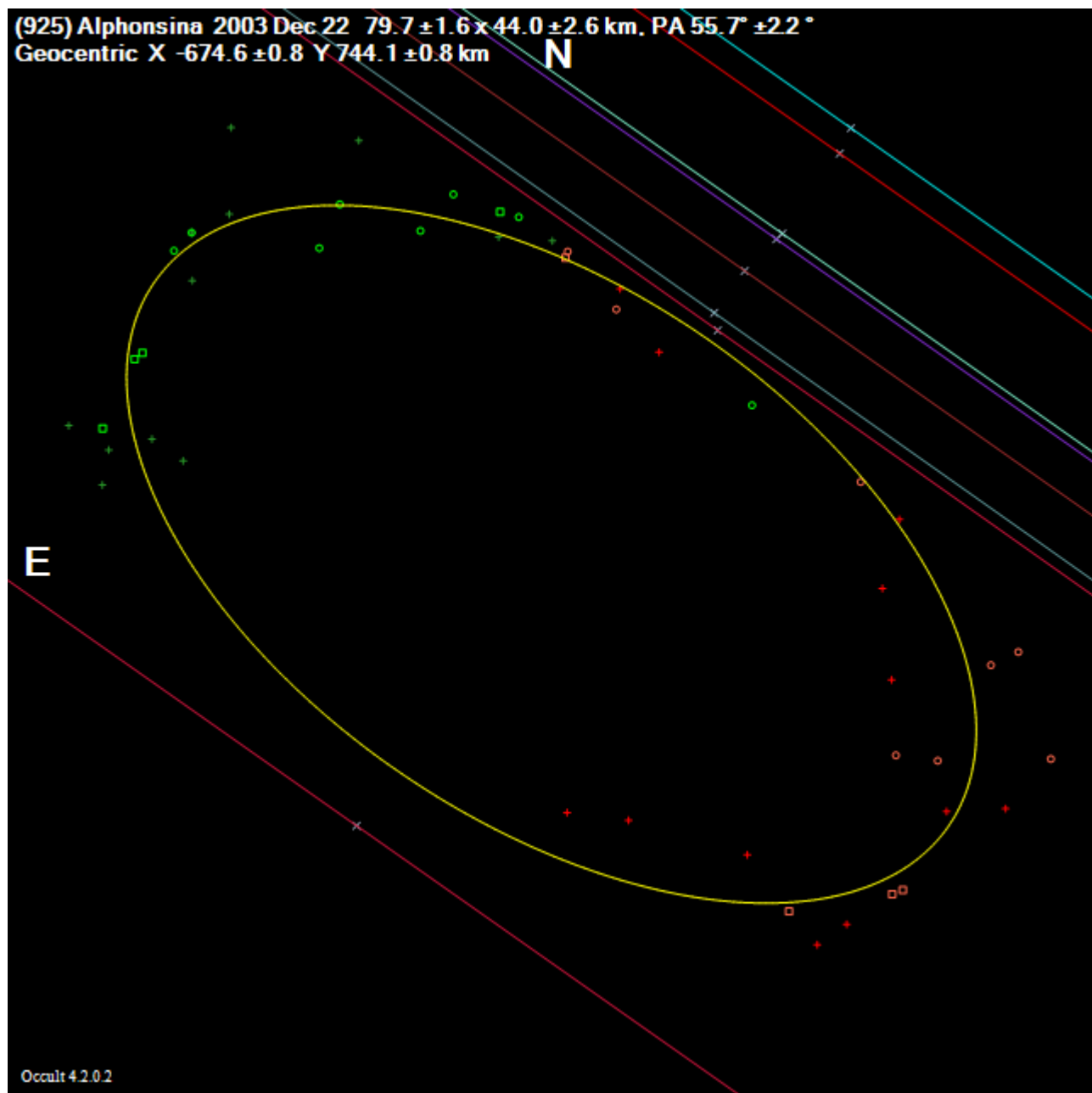
E

Occult 4.2.0.2



925alphonsina2003dec22

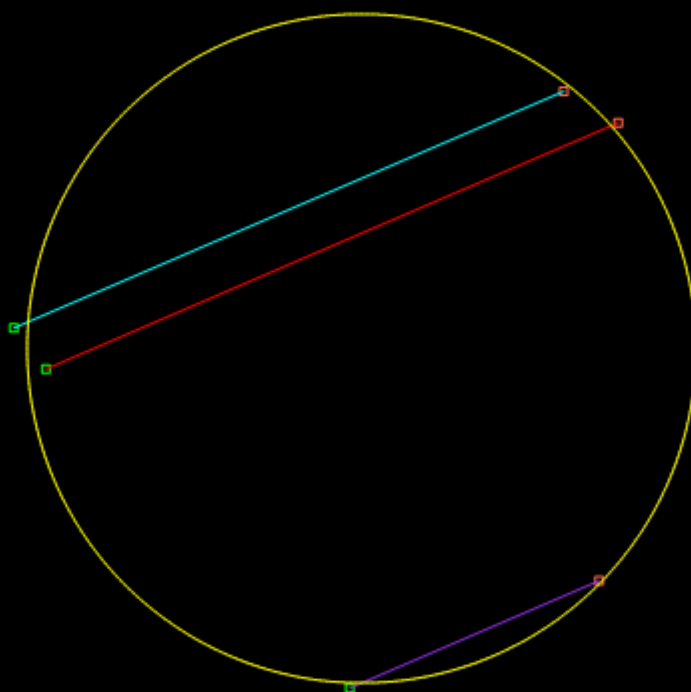
(925) Alphonsina 2003 Dec 22 $79.7 \pm 1.6^\circ \times 44.0 \pm 2.6^\circ$ km, PA $55.7^\circ \pm 2.2^\circ$
Geocentric X -674.6 ± 0.8 Y 744.1 ± 0.8 km



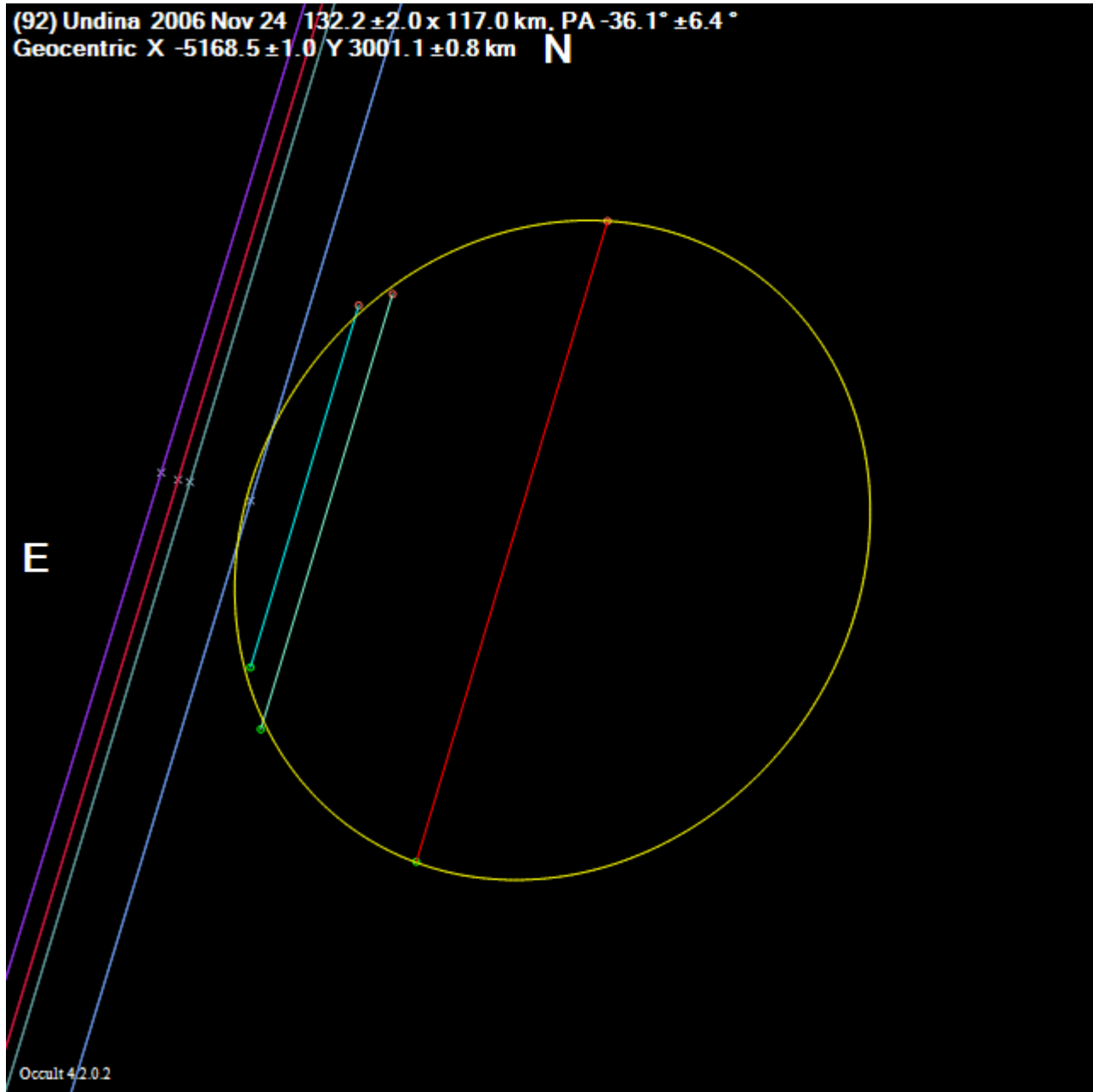
925alphonsina2007sep26

(925) Alphonsina 2007 Sep 26 $47.0 \pm 1.3 \times 47.0$ km, PA 0.0° °
Geocentric X -3927.6 ± 0.5 Y 1991.6 ± 0.5 km **N**

E

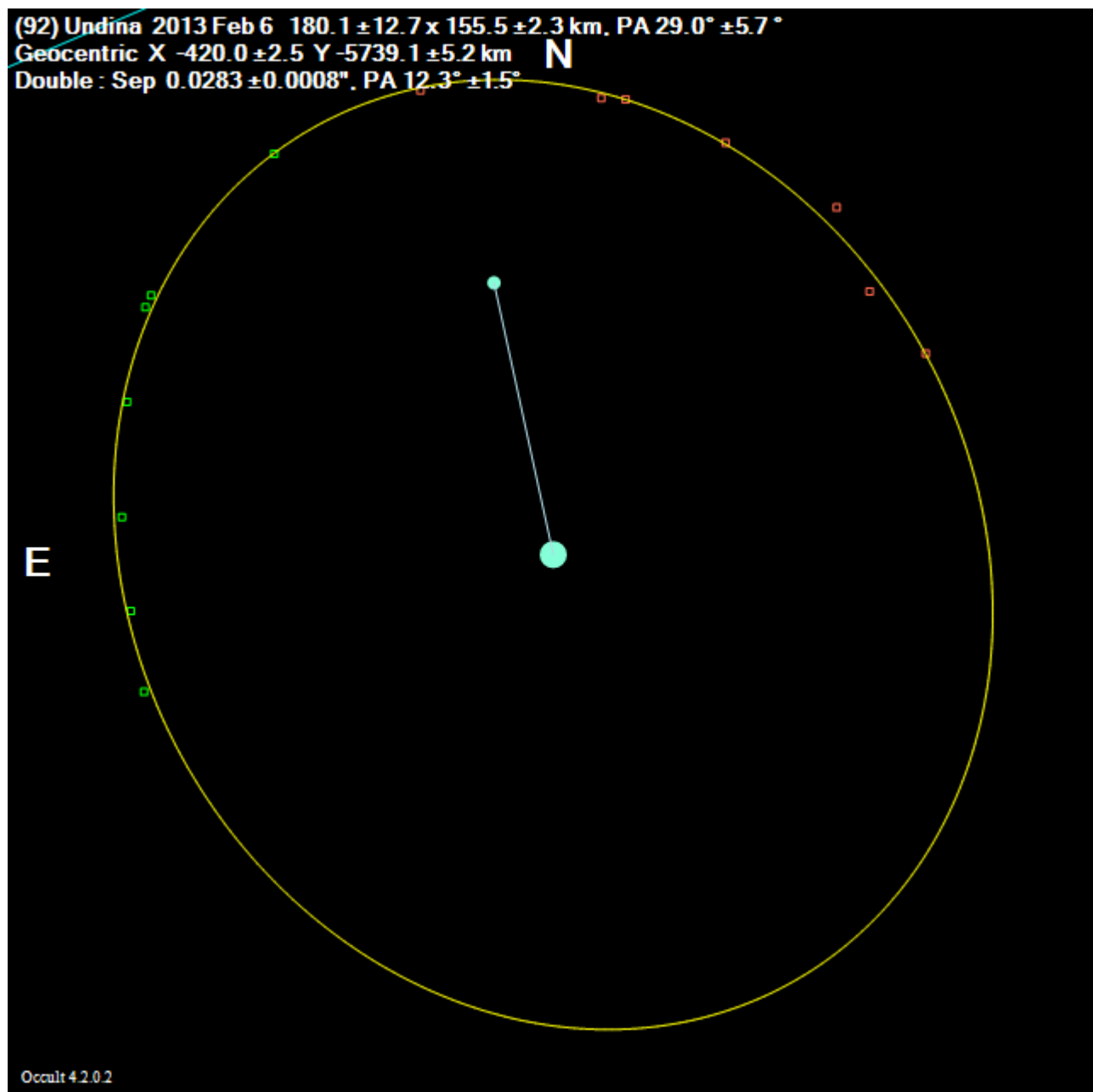


(92) Undina 2006 Nov 24 132.2 ± 2.0 x 117.0 km, PA -36.1° ± 6.4°
Geocentric X -5168.5 ± 1.0 Y 3001.1 ± 0.8 km **N**



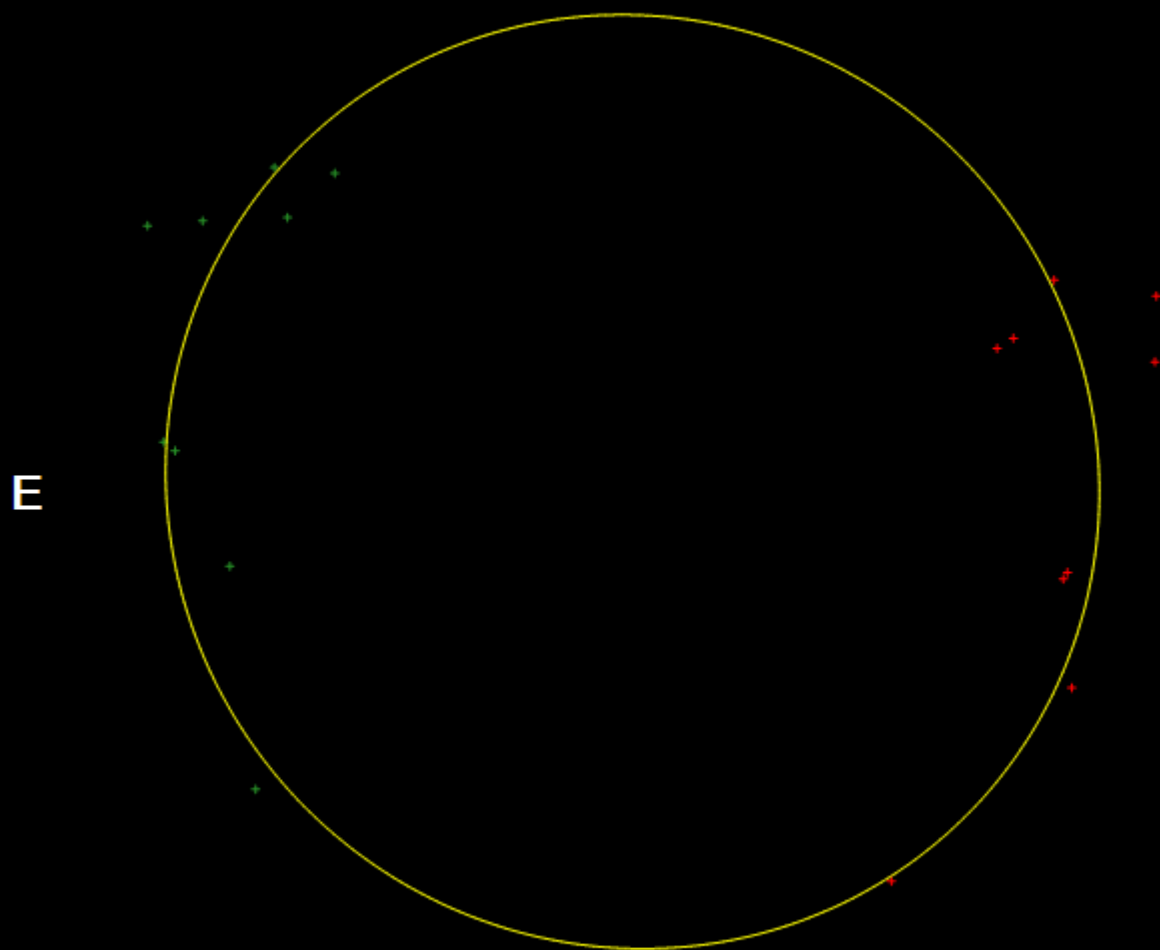
92undina2013feb06

(92) Undina 2013 Feb 6 $180.1 \pm 12.7 \times 155.5 \pm 2.3$ km, PA $29.0^\circ \pm 5.7^\circ$
Geocentric X -420.0 ± 2.5 Y -5739.1 ± 5.2 km
Double : Sep $0.0283 \pm 0.0008''$, PA $12.3^\circ \pm 1.5^\circ$



93minerva1982nov22

(93) Minerva 1982 Nov 22 $173.2 \pm 7.9 \times 169.4 \pm 12.4$ km, PA $44.6^\circ \pm 175.1^\circ$
Geocentric X -1720.6 ± 2.4 Y 1634.5 ± 4.6 km **N**

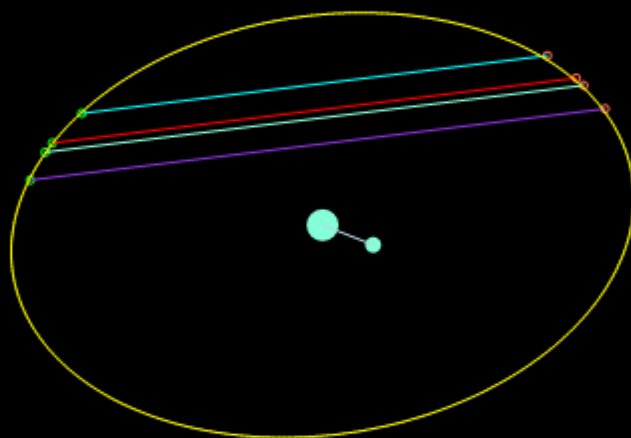


93minerva1996nov25

(93) Minerva 1996 Nov 25 $115.0 \pm 2.6 \times 76.8 \pm 8.2$ km, PA $-81.1^\circ \pm 1.7^\circ$
Geocentric X 852.8 ± 0.4 Y -61.3 ± 3.2 km
Double : Sep $0.0063 \pm 0.0001''$, PA $248.7^\circ \pm 1.0^\circ$

E

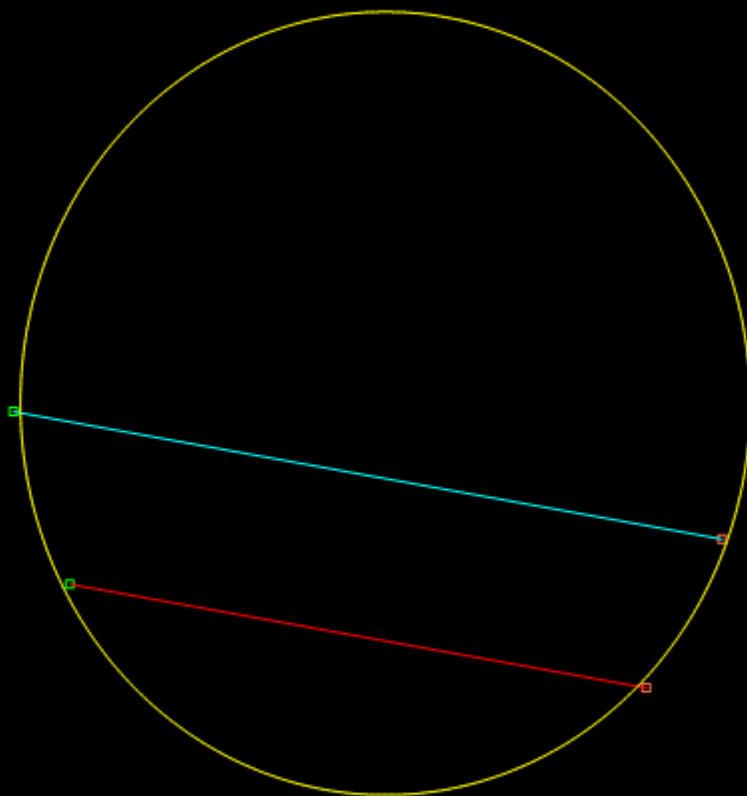
N



93minerva2008may17

(93) Minerva 2008 May 17 160.0 x 149.1 \pm 2.7 km, PA 0.0° °
Geocentric X 3271.6 \pm 0.9 Y 5312.3 \pm 2.6 km **N**

E



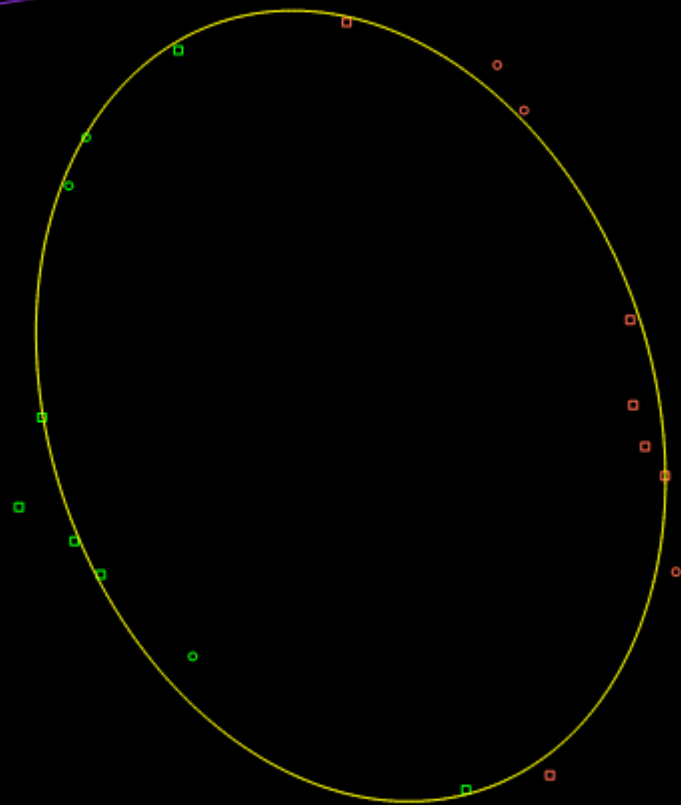
93minerva2010dec24

(93) Minerva 2010 Dec 24 $179.4 \pm 3.9 \times 133.4 \pm 2.6$ km, PA $19.4^\circ \pm 3.6^\circ$
Geocentric X -4322.7 ± 1.2 Y 964.9 ± 1.7 km

N

E

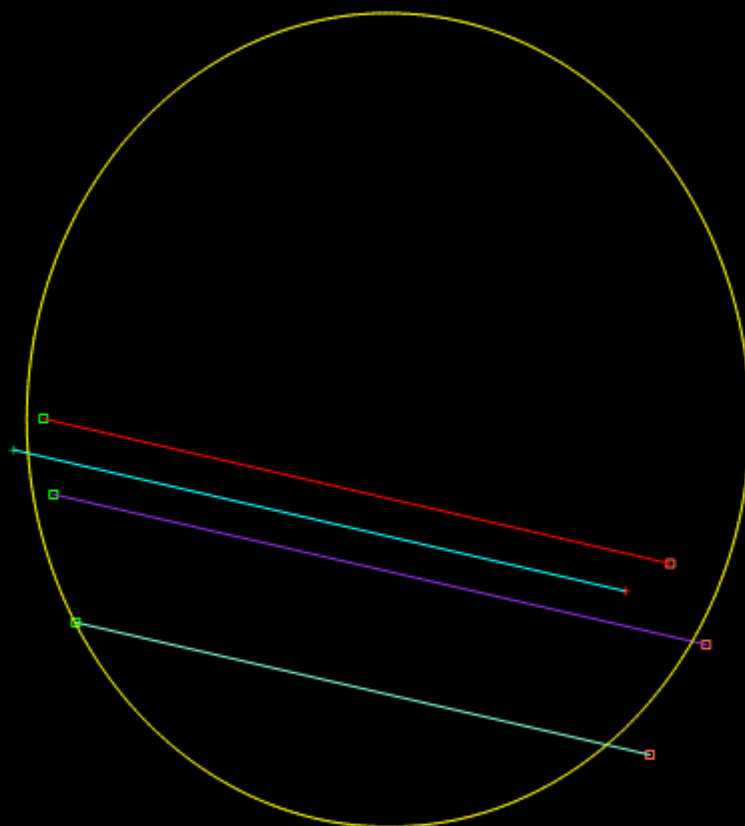
Occult 4.2.0.2



93minerva2011jan28

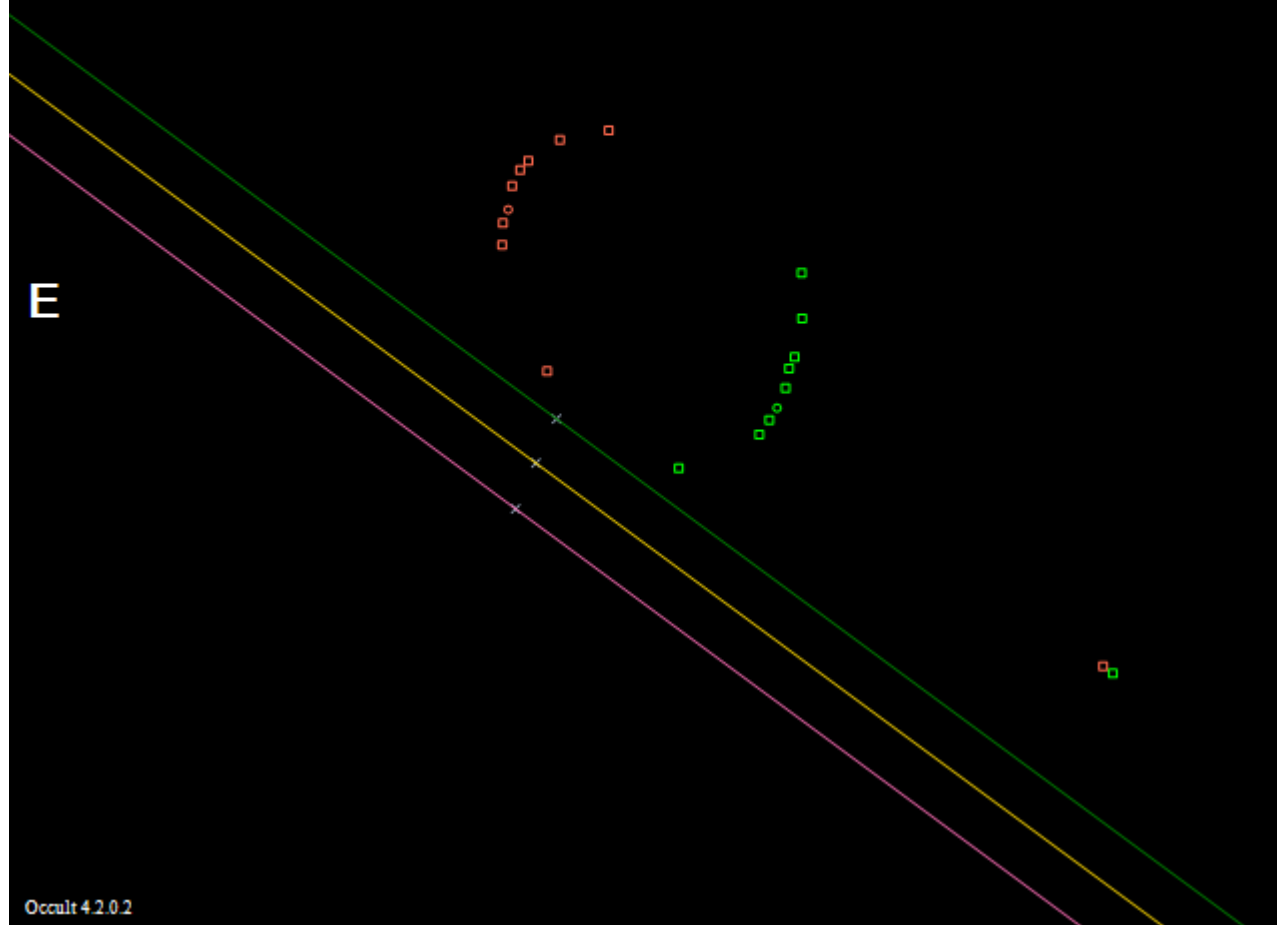
(93) Minerva 2011 Jan 28 180.0 x 160.0 km, PA 0.4° ± 46.7°
Geocentric X -2971.9 ± 5.7 Y 691.0 ± 8.3 km **N**

E

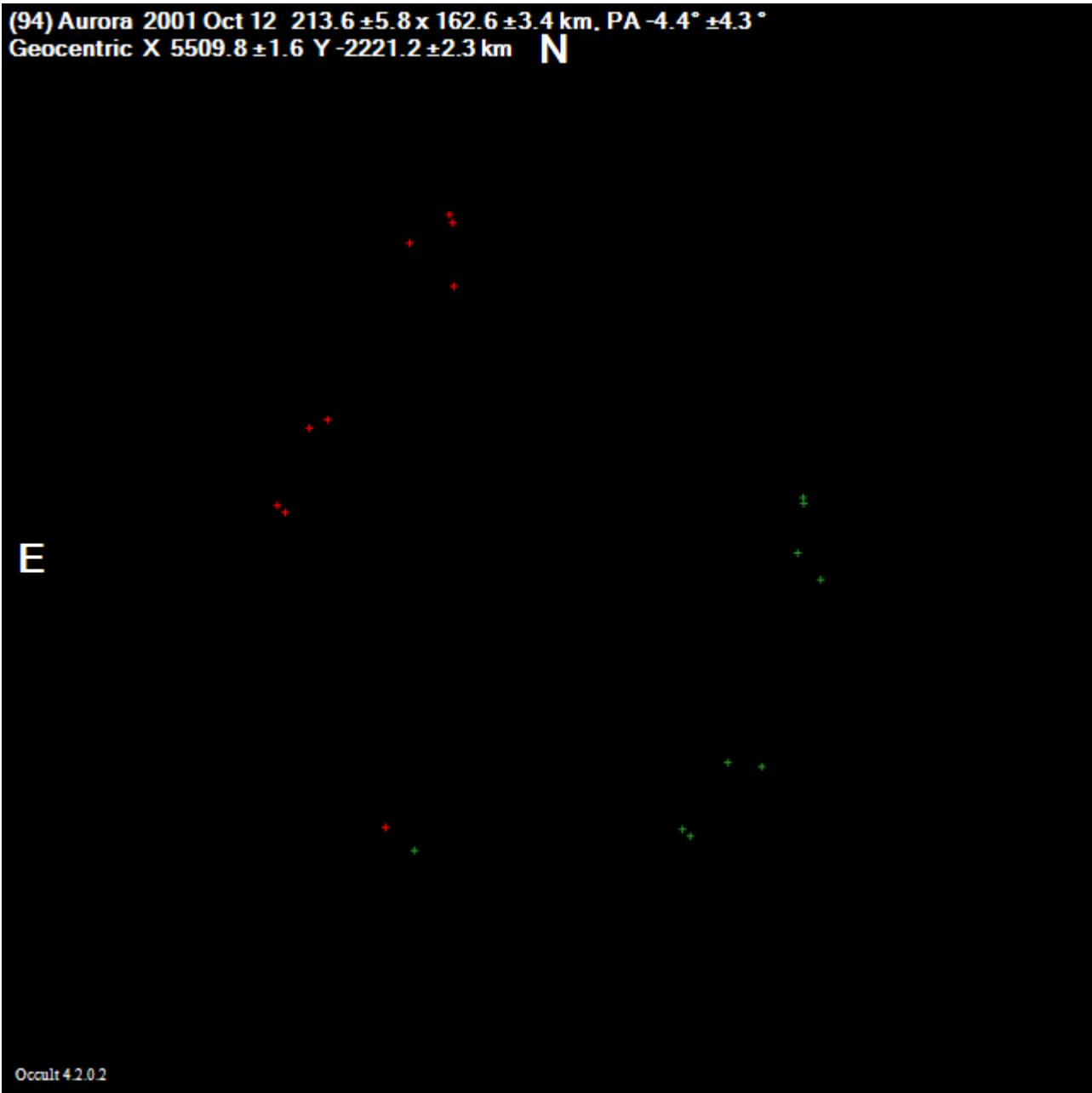


93minerva2014sep06

(93) Minerva 2014 Sep 6 $189.1 \pm 2.1 \times 146.7 \pm 3.3$ km, PA $30.2^\circ \pm 2.9^\circ$
Geocentric X -4634.7 ± 0.8 Y 1952.0 ± 1.2 km **N**
Sat: 0.0×0.0 km, PA 0.0° ; Sep $0.0000''$ at PA 0.0°

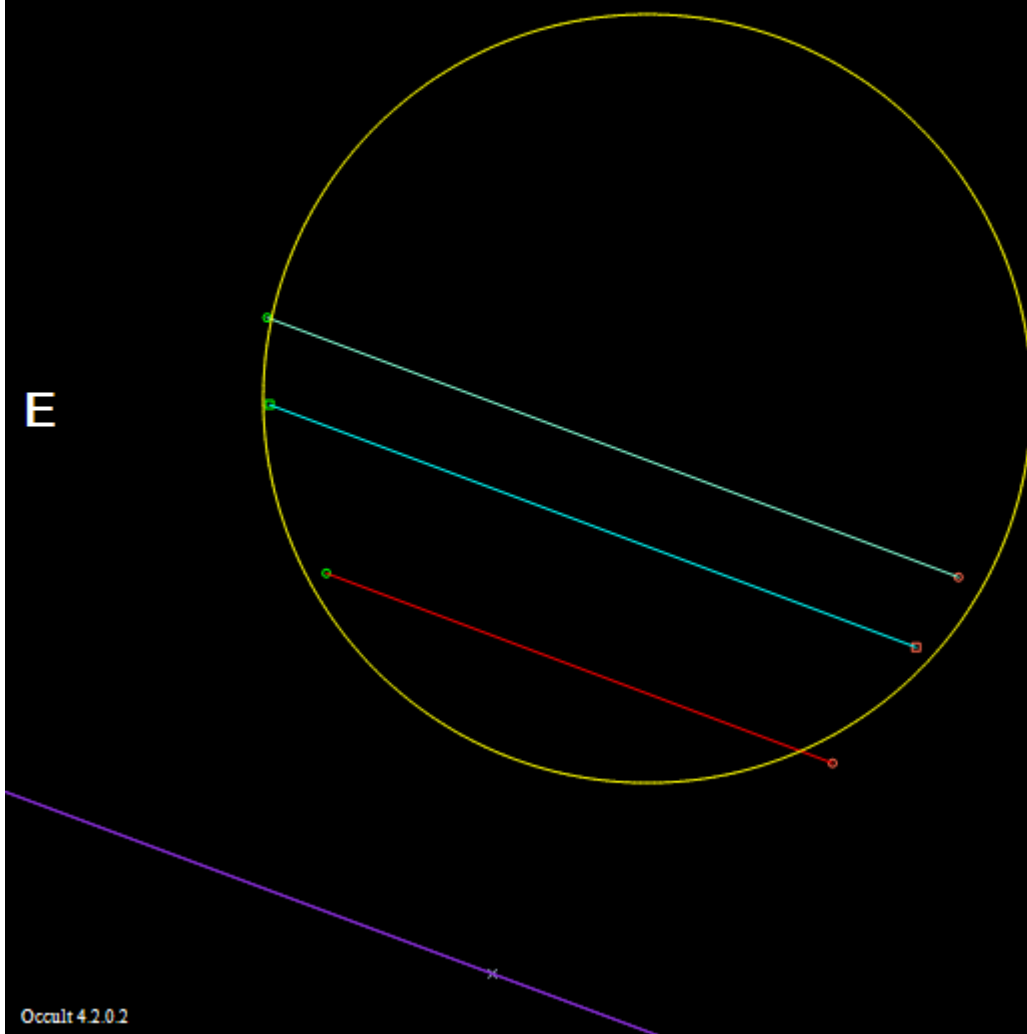


94aurora2001oct12



94aurora2004feb26

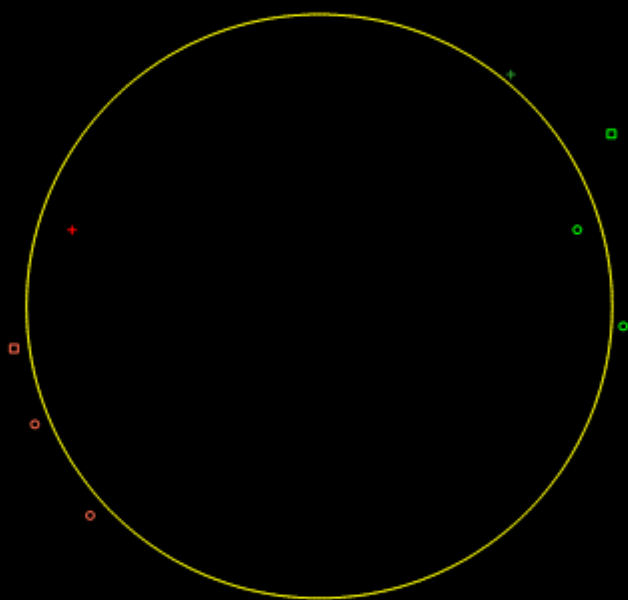
(94) Aurora 2004 Feb 26 204.0 x 204.0 km, PA 0.0°
Geocentric X 4362.2 ± 2.4 Y 1871.0 ± 3.7 km **N**



94aurora2009nov25

(94) Aurora 2009 Nov 25 $166.1 \pm 7.7 \times 165.6 \pm 42.7$ km, PA $89.0^\circ \pm 2043.4^\circ$
Geocentric X -4818.7 ± 3.6 Y 3217.8 ± 7.8 km **N**

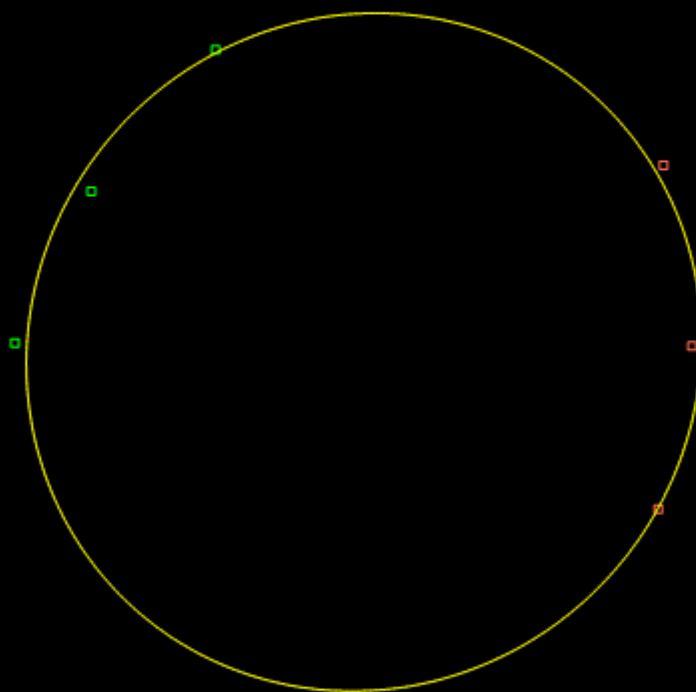
E



94aurora2012jun23

(94) Aurora 2012 Jun 23 195.3 x 188.5 km, PA $-41.8^{\circ} \pm 28.6^{\circ}$
Geocentric X 3769.3 ± 1.5 Y -549.3 ± 2.4 km **N**

E

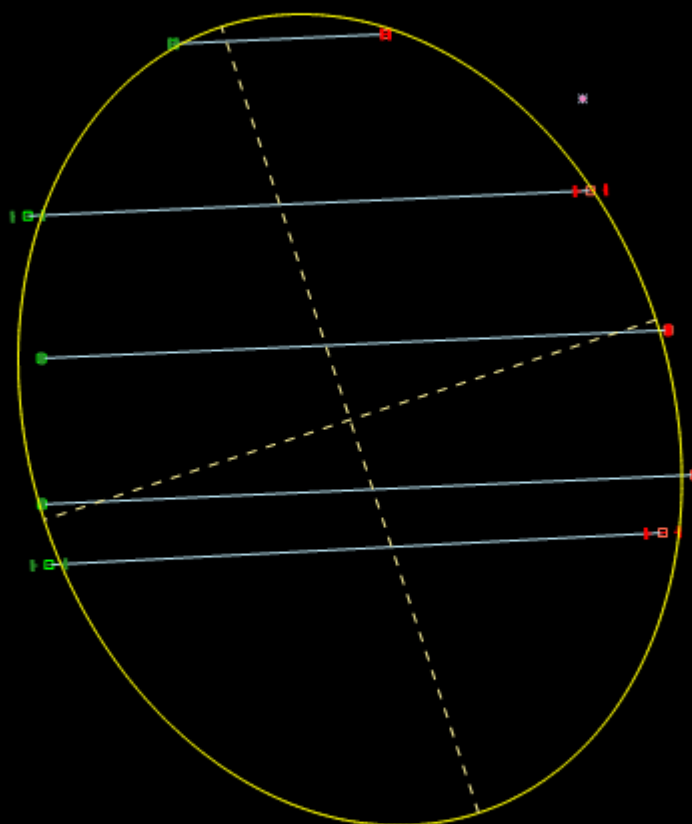


952Caia2016Feb14

(952) Caia 2016 Feb 14 $94.7 \pm 5.4 \times 73.7 \pm 1.2$ km, PA $18.1^\circ \pm 4.7^\circ$
Geocentric X -1747.7 ± 0.6 Y 394.7 ± 2.3 km

N

E



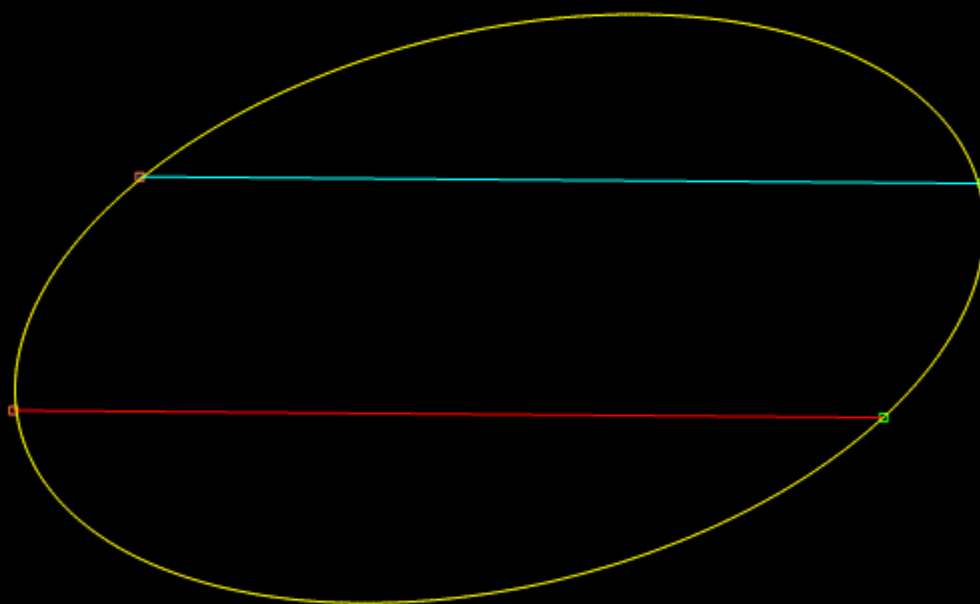
Occult 4.2.9.1

50 km

95arethusa2008apr16

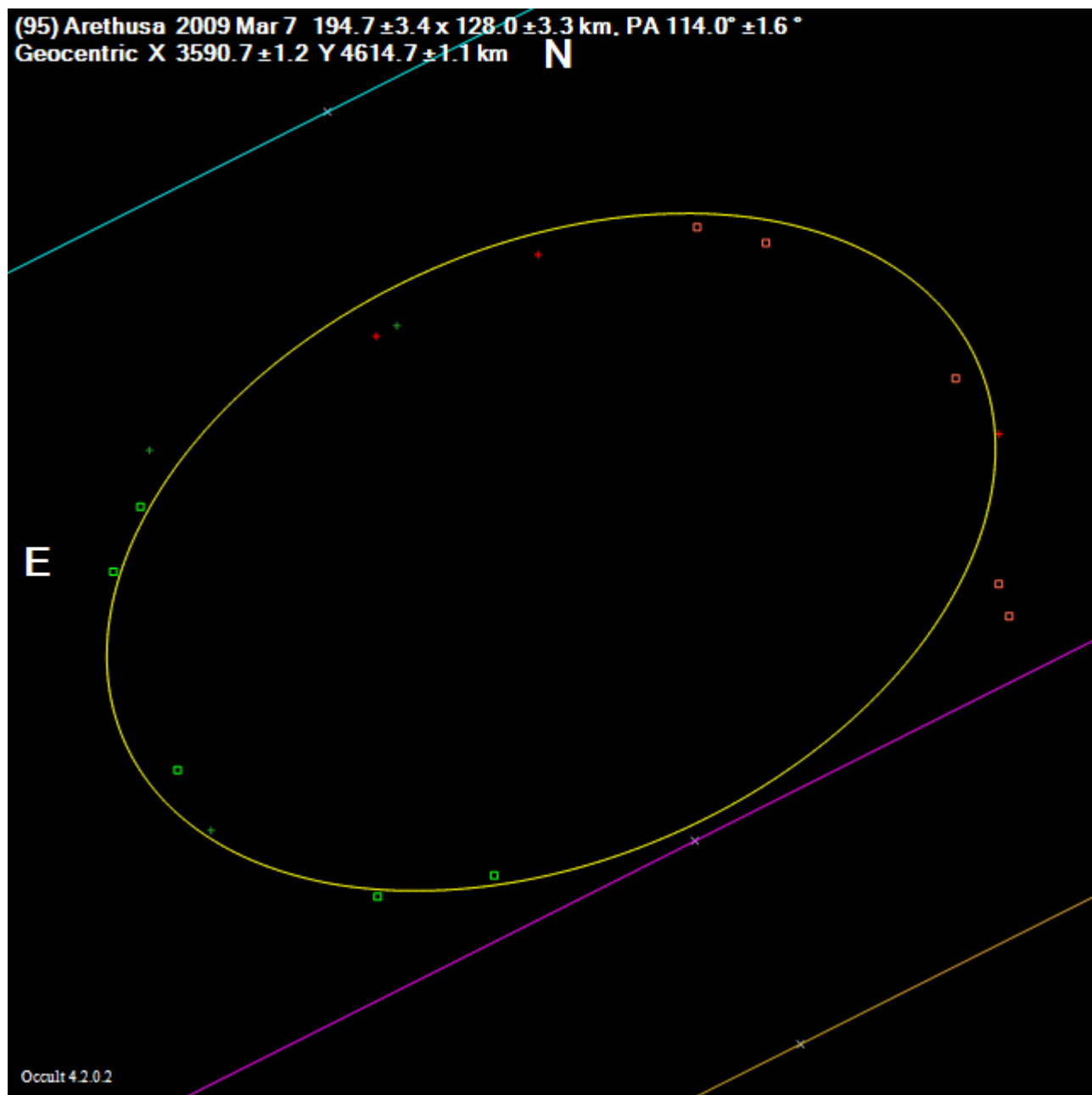
(95) Arethusa 2008 Apr 16 175.1 x 98.1 \pm 5.8 km, PA -76.0° \pm 3.1 °
Geocentric X 3959.4 \pm 0.2 Y 3436.2 \pm 0.4 km N

E



95arethusa2009mar07

(95) Arethusa 2009 Mar 7 $194.7 \pm 3.4 \times 128.0 \pm 3.3$ km, PA $114.0^\circ \pm 1.6^\circ$
Geocentric X 3590.7 ± 1.2 Y 4614.7 ± 1.1 km **N**

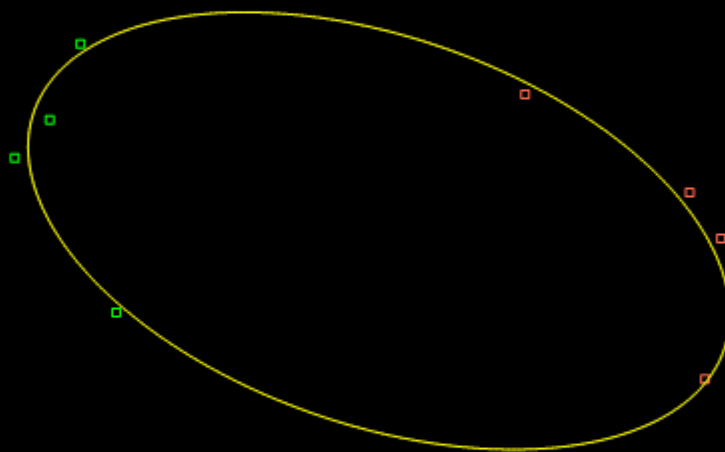


95arethusa2011aug03

(95) Arethusa 2011 Aug 3 $185.2 \pm 1.0 \times 98.5 \pm 1.8$ km, PA $71.0^\circ \pm 0.7^\circ$
Geocentric X 215.1 ± 0.5 Y 4335.1 ± 0.6 km

N

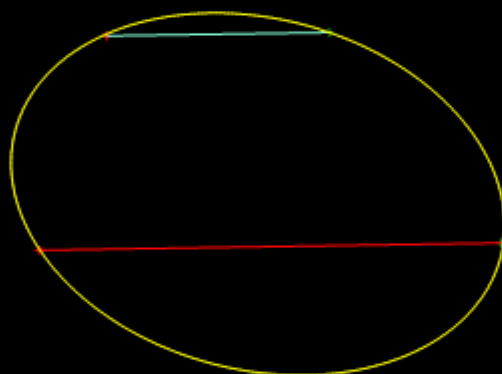
E



96aegle2002aug10

(96) Aegle 2002 Aug 10 200.0 x 140.0 km. PA $75.6^\circ \pm 0.8^\circ$
Geocentric X 1349.3 ± 0.3 Y -1328.3 ± 0.4 km **N**

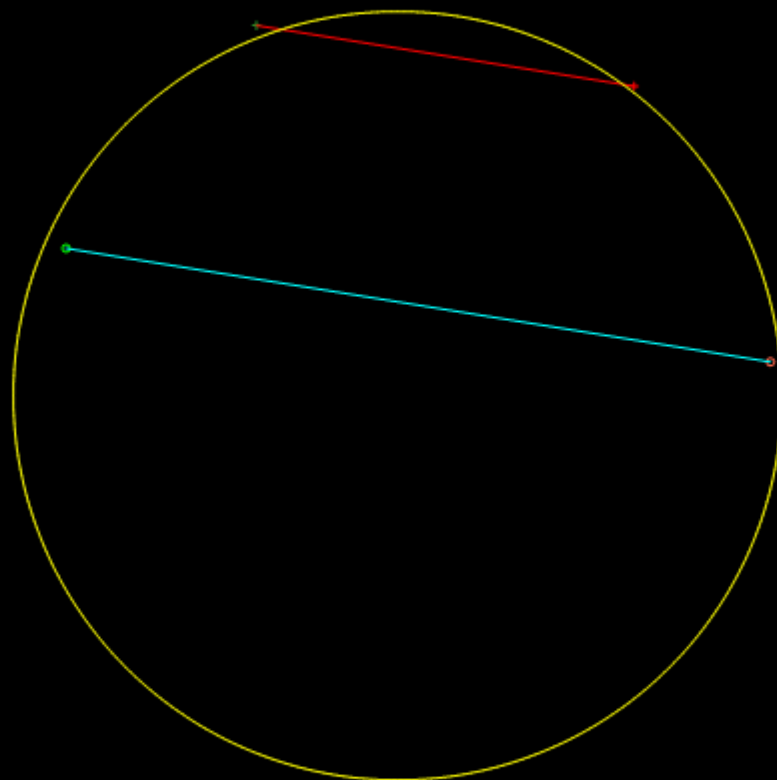
E



96aegle2009sep08

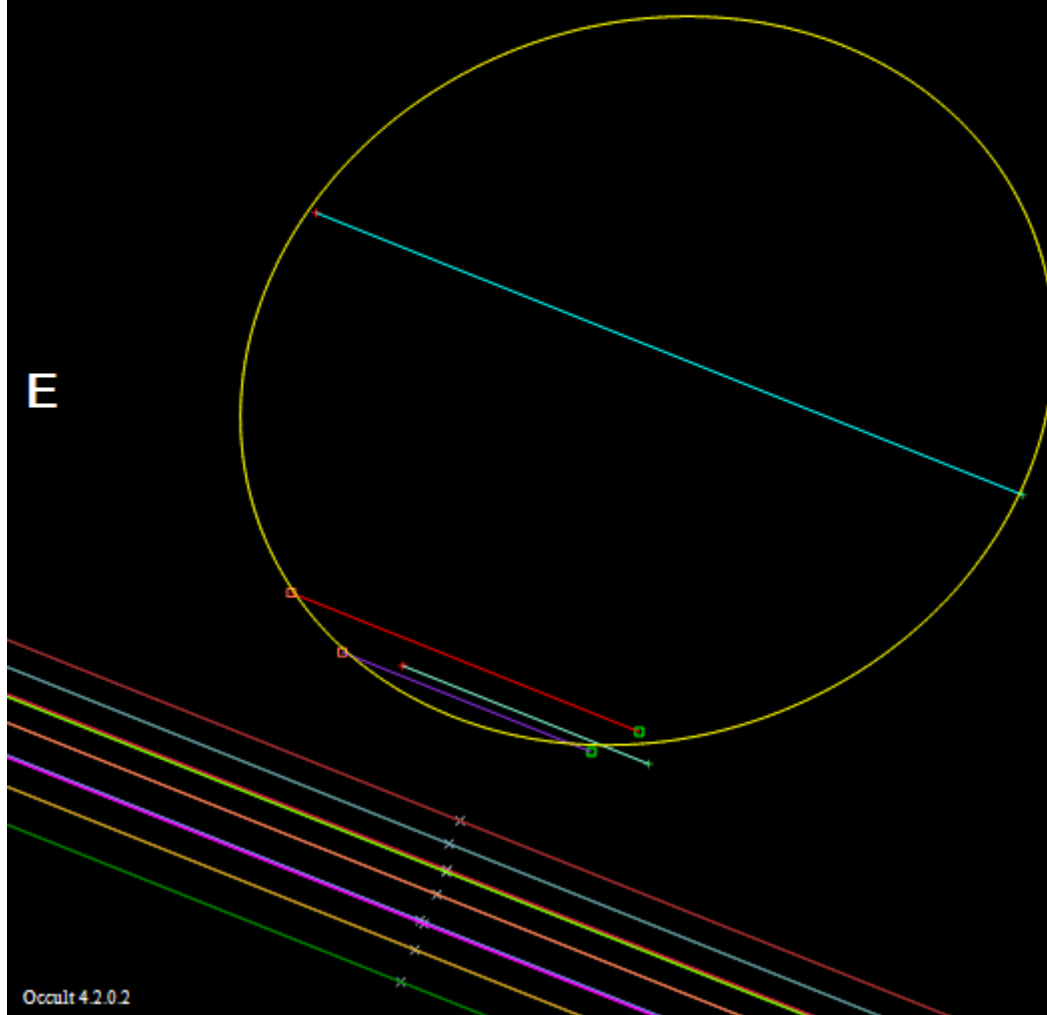
(96) Aegle 2009 Sep 8 $170.0 \pm 28.4 \times 170.0$ km, PA 0.0° °
Geocentric X -3874.0 ± 2.8 Y 3707.2 ± 12.2 km **N**

E



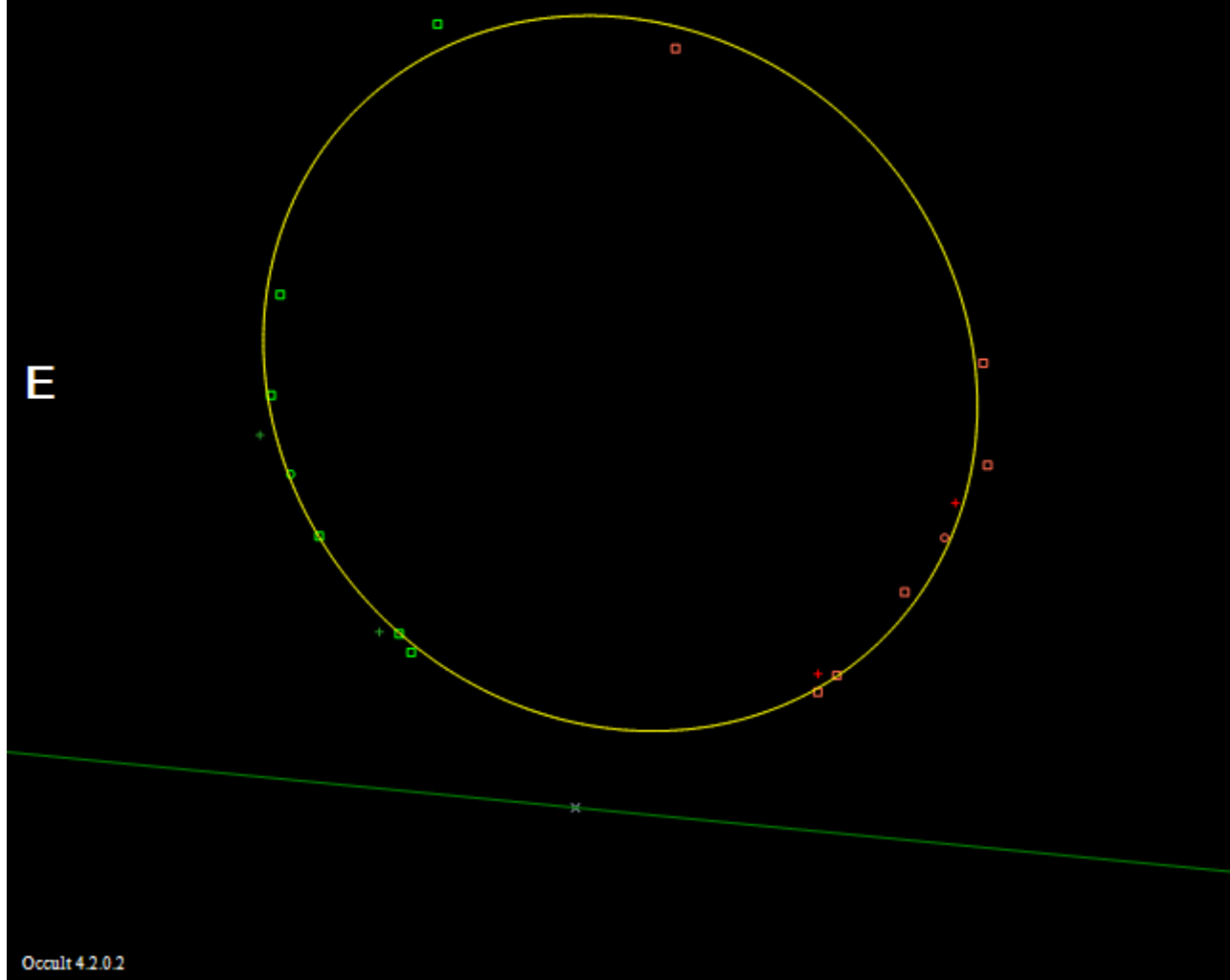
96aegle2010jan05

(96) Aegle 2010 Jan 5 183.0 x 157.7 km. PA $-69.0^\circ \pm 14.0^\circ$
Geocentric X 3382.5 ± 2.0 Y 3600.3 ± 2.4 km **N**



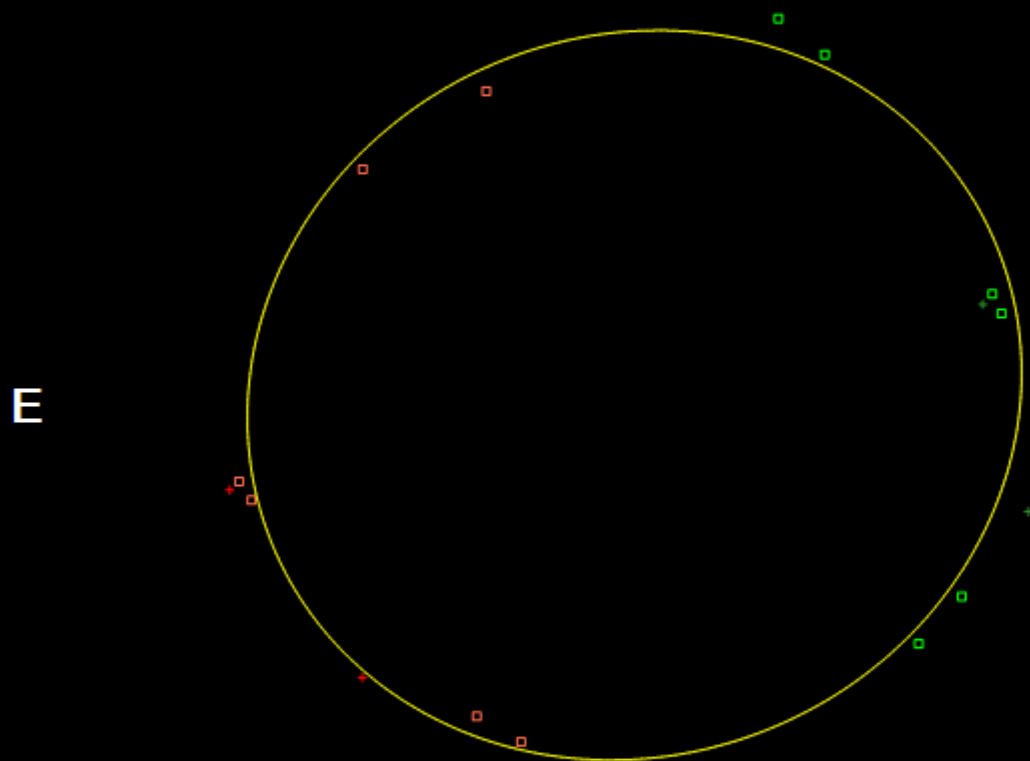
96aegle2010oct29

(96) Aegle 2010 Oct 29 $172.5 \pm 2.5 \times 157.5 \pm 2.8$ km, PA $44.3^\circ \pm 7.5^\circ$
Geocentric X 2224.9 ± 1.0 Y -243.6 ± 1.1 km **N**



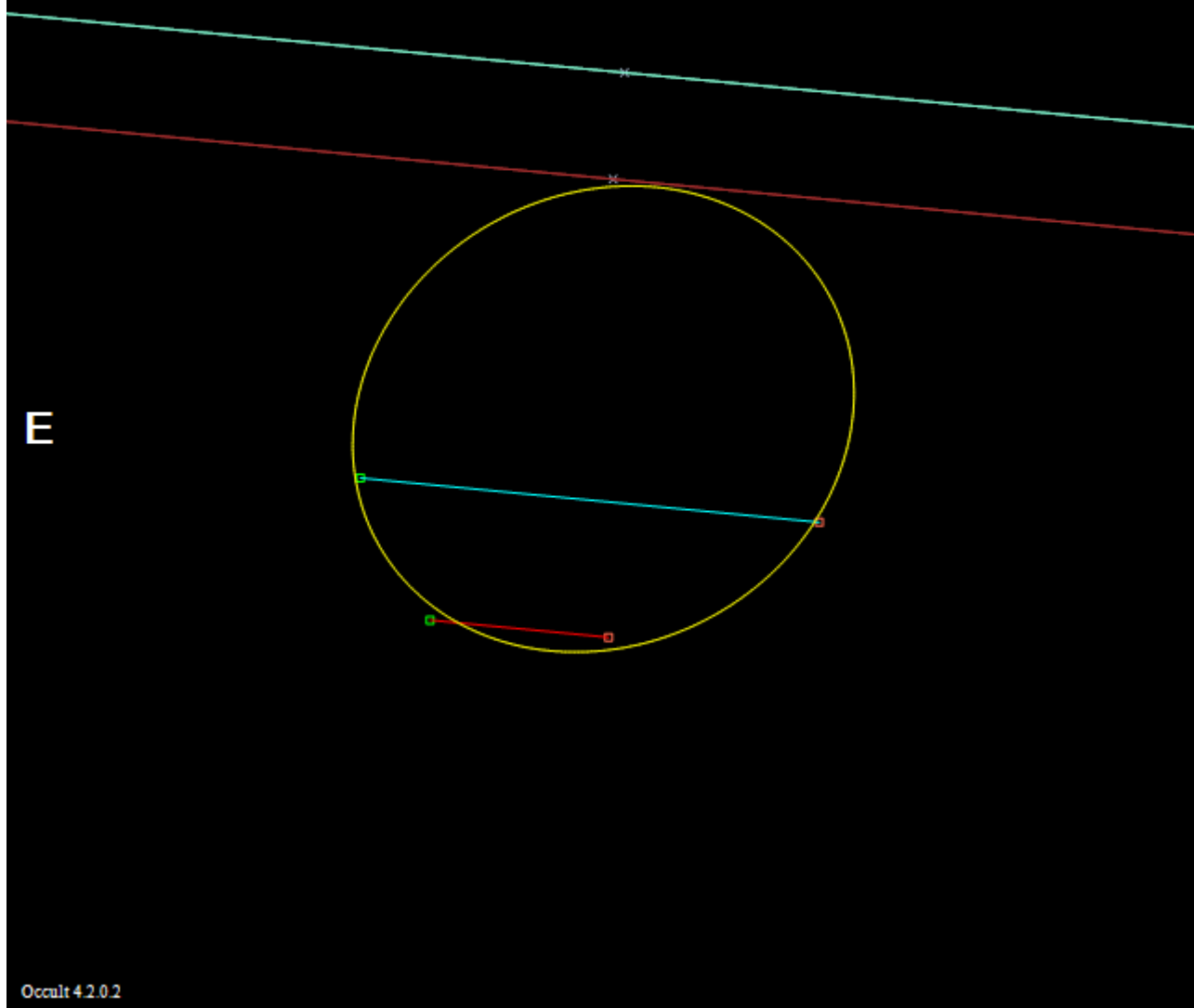
96aegle2015dec30

(96) Aegle 2015 Dec 30 $173.3 \pm 3.5 \times 159.2 \pm 4.0$ km, PA $-67.2^\circ \pm 12.0^\circ$
Geocentric X 3111.3 ± 1.5 Y 1650.3 ± 1.6 km **N**



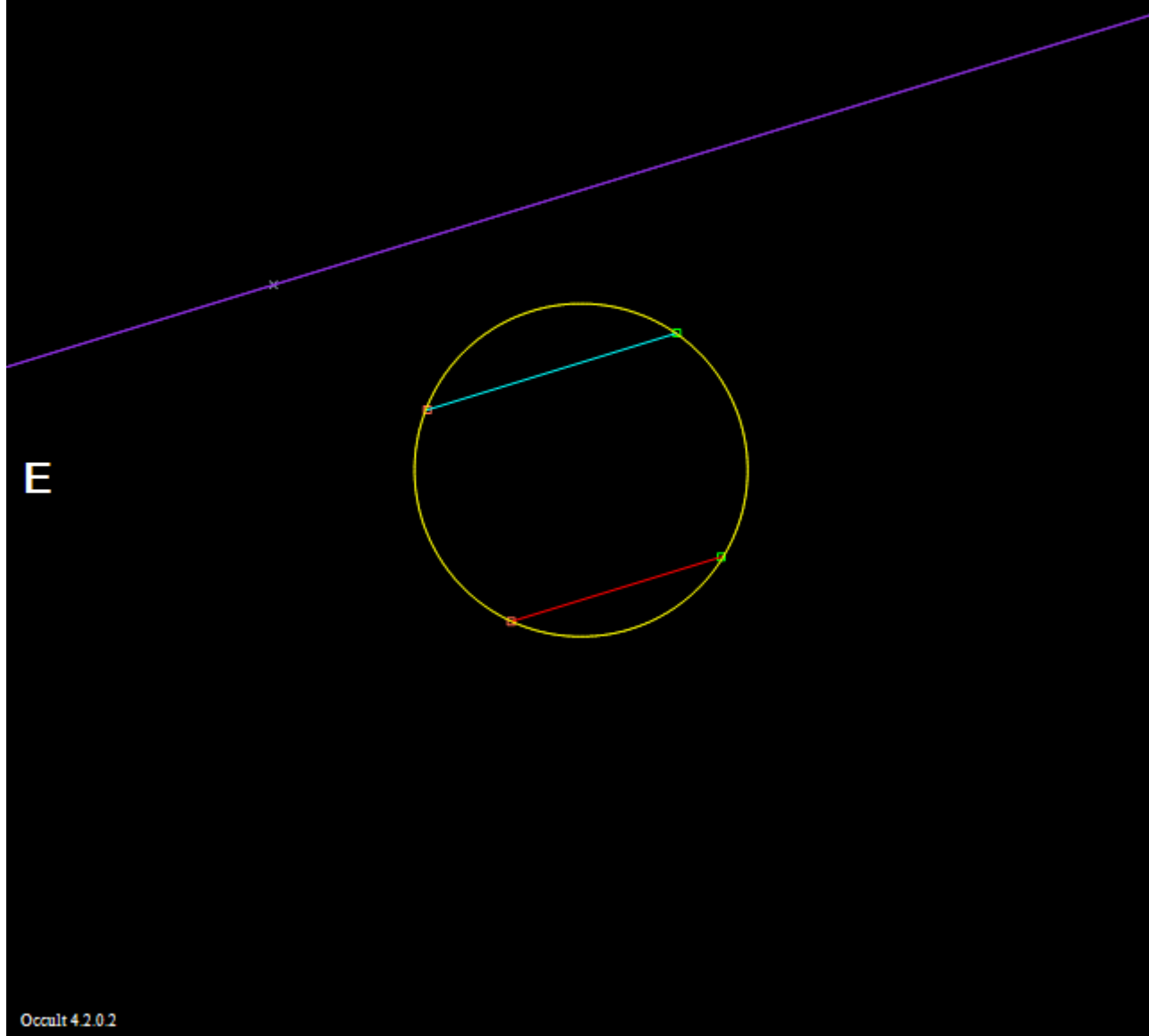
972cohnia2011aug29

(972) Cohnia 2011 Aug 29 80.0 x 70.0 km, PA $-61.6^\circ \pm 12.6^\circ$
Geocentric X -345.0 ± 1.1 Y 5098.9 ± 1.1 km **N**



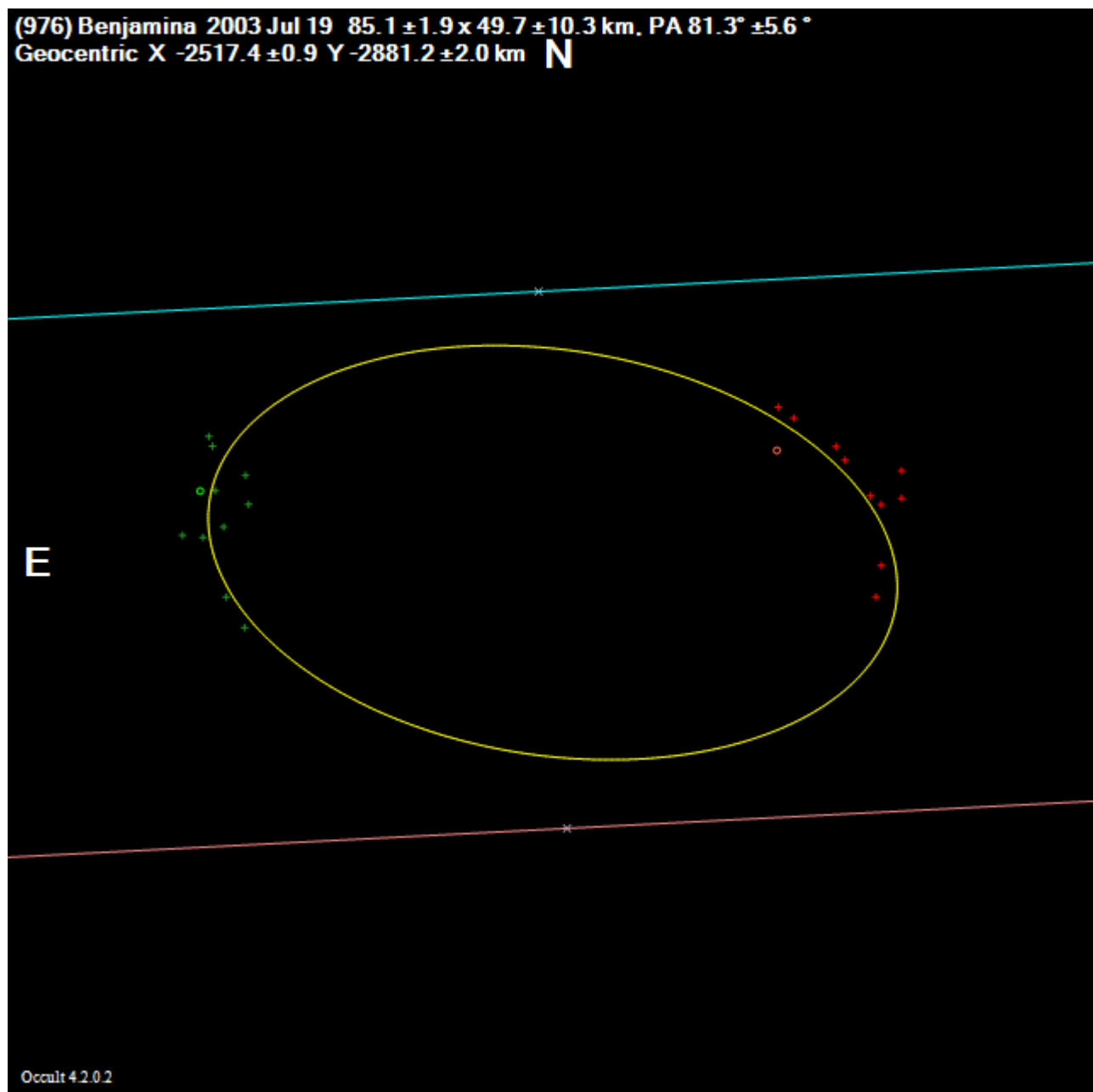
973aralia2008mar20

(973) Aralia 2008 Mar 20 $54.9 \pm 0.2 \times 54.9$ km, PA 0.0° °
Geocentric X 5093.1 ± 0.1 Y 2116.0 ± 0.1 km **N**



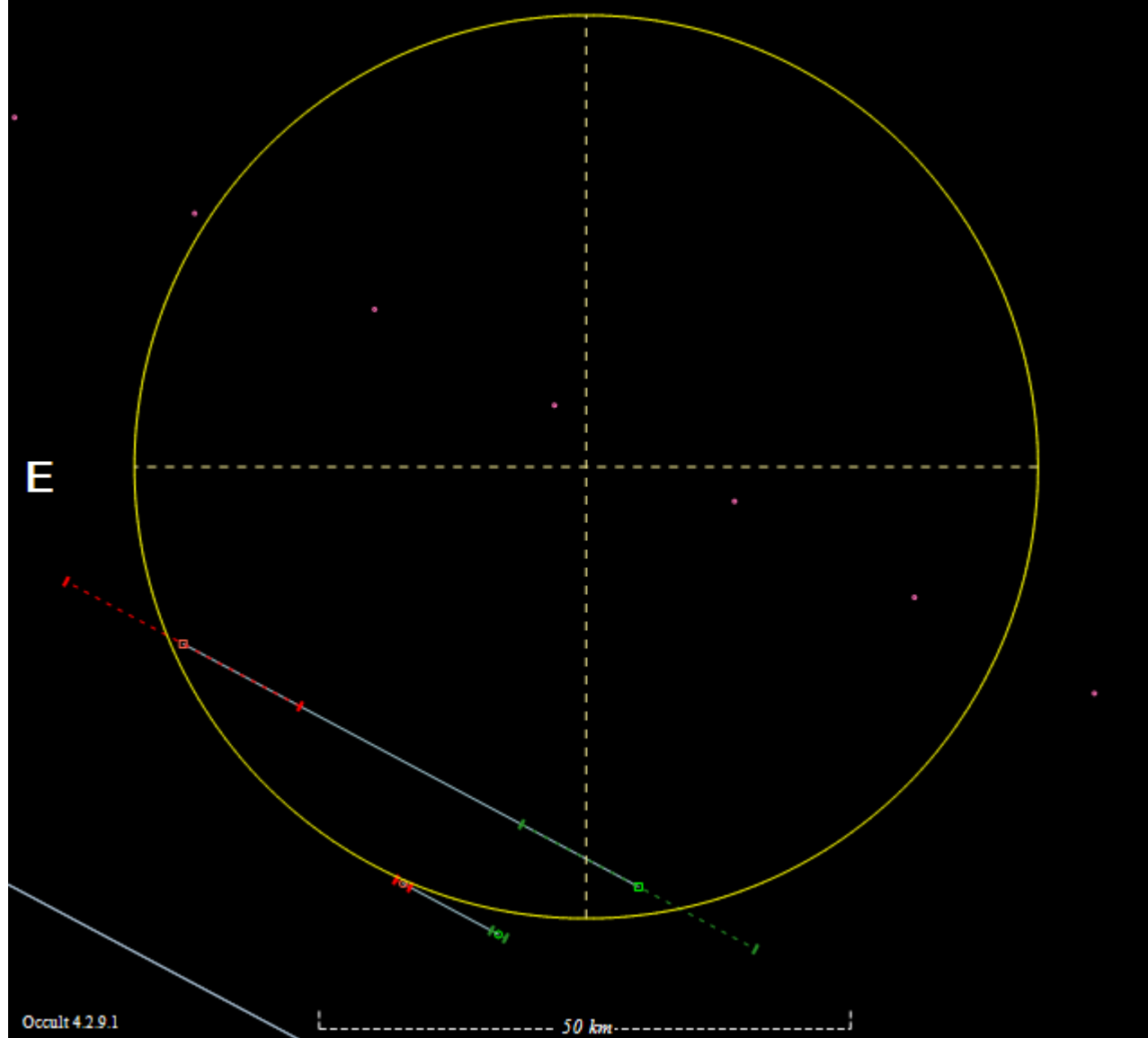
976benjamina2003jul19

(976) Benjamina 2003 Jul 19 $85.1 \pm 1.9 \times 49.7 \pm 10.3$ km, PA $81.3^\circ \pm 5.6^\circ$
Geocentric X -2517.4 ± 0.9 Y -2881.2 ± 2.0 km **N**



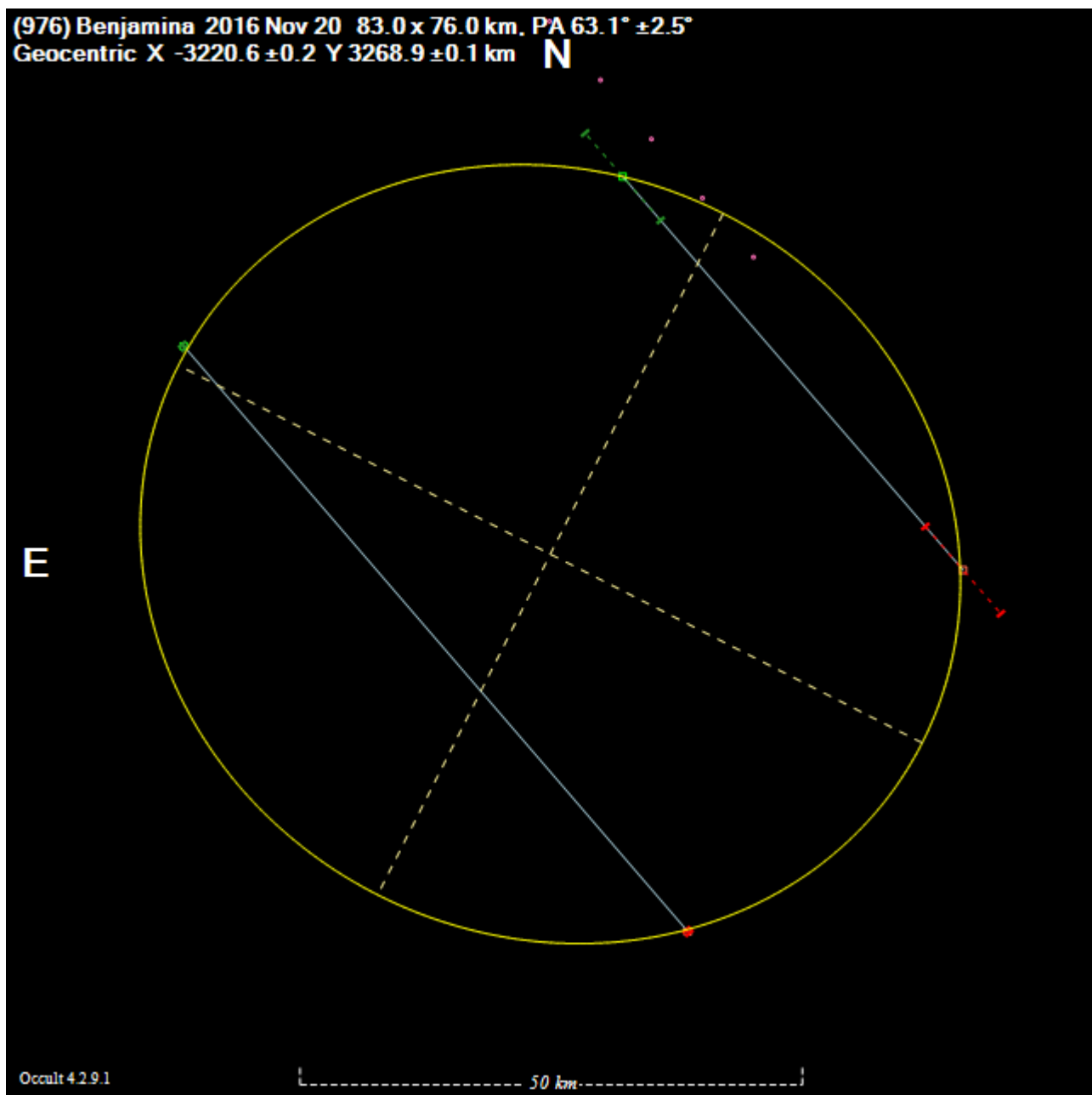
976Benjamina2016Jul03

(976) Benjamina 2016 Jul 3 85.0 x 85.0 km. PA 0.0°
Geocentric X -2748.5 ± 2.0 Y -4524.7 ± 1.2 km N



976Benjamina2016Nov20

(976) Benjamina 2016 Nov 20 83.0 x 76.0 km, PA 63.1° ± 2.5°
Geocentric X -3220.6 ± 0.2 Y 3268.9 ± 0.1 km **N**

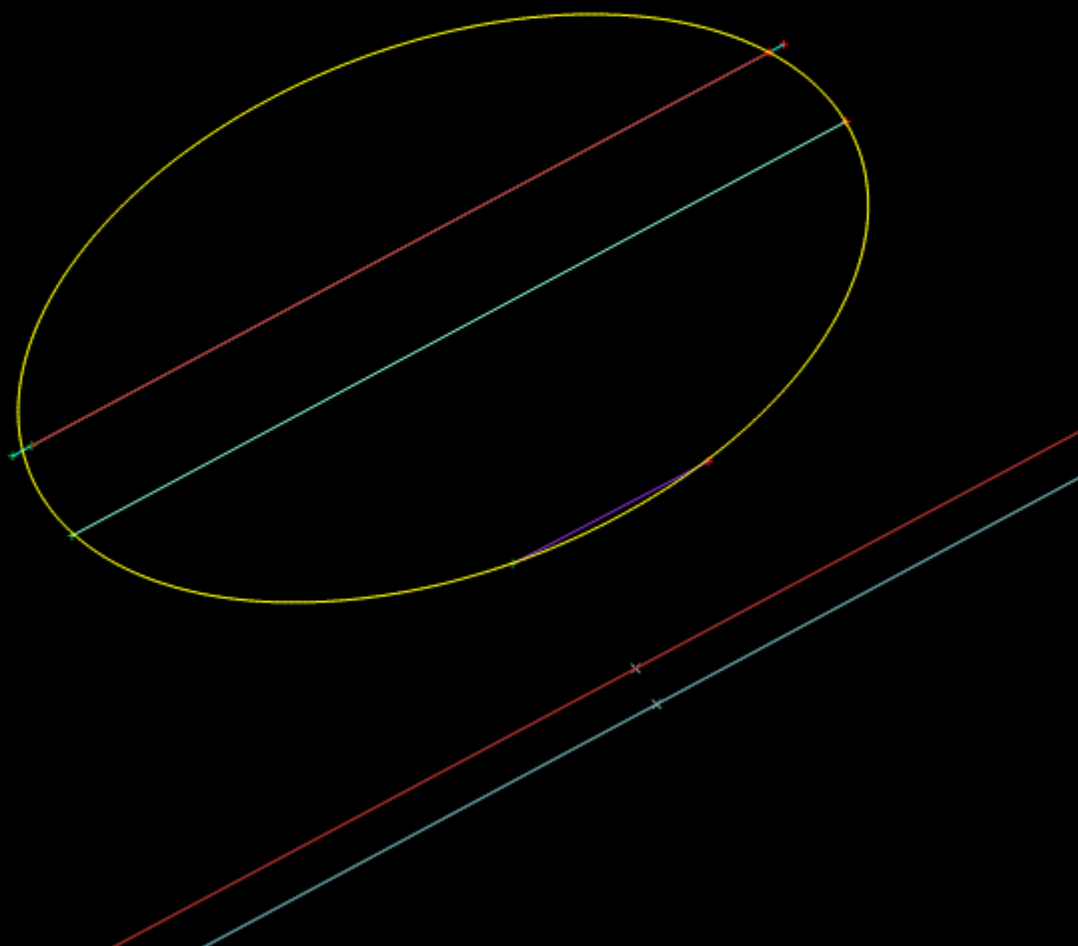


978aidamina2003jul26

(978) Aidamina 2003 Jul 26 $90.3 \pm 0.8 \times 53.4 \pm 2.2$ km, PA $-68.5^\circ \pm 2.0^\circ$
Geocentric X -3795.7 ± 0.6 Y 2903.1 ± 0.8 km **N**

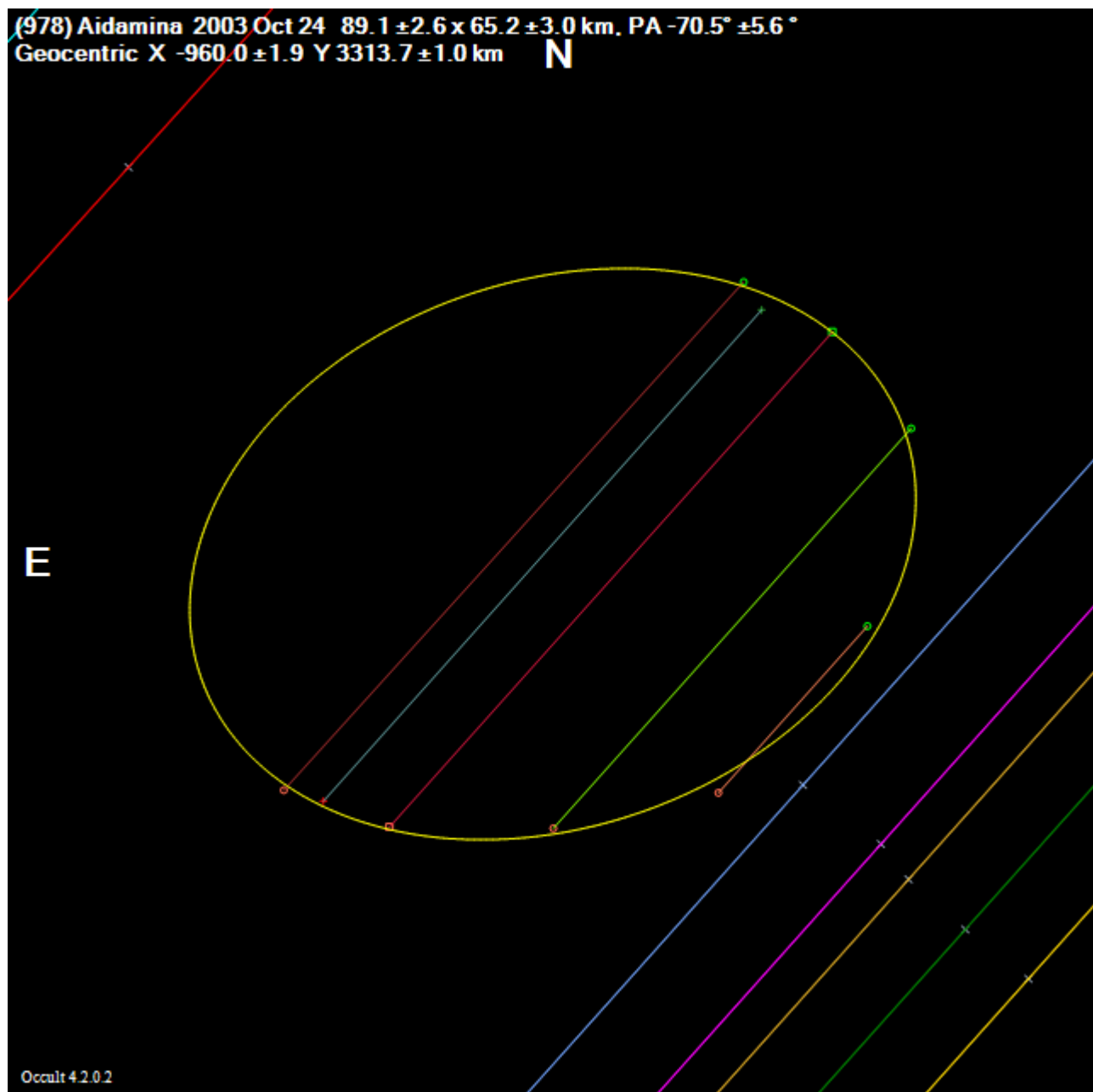
E

Occult 4.2.0.2



978aidamina2003oct24

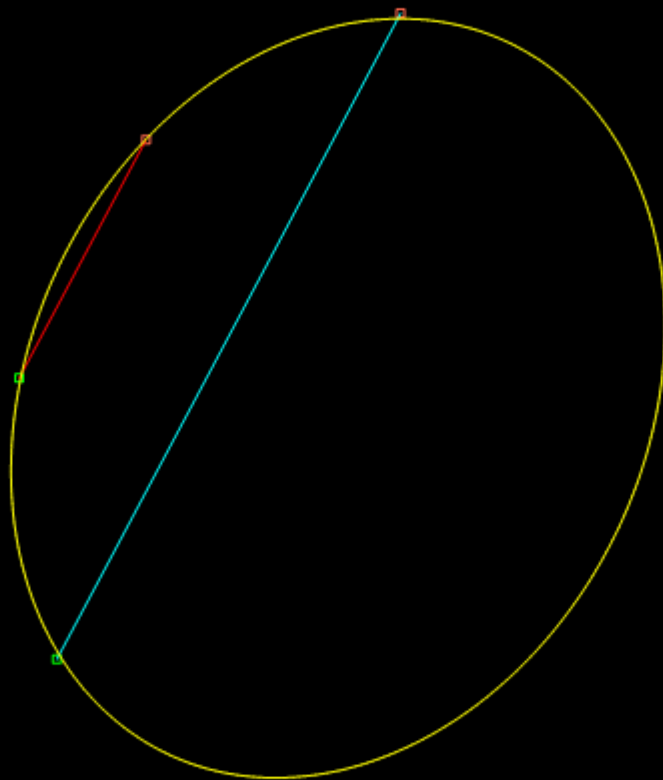
(978) Aidamina 2003 Oct 24 $89.1 \pm 2.6 \times 65.2 \pm 3.0$ km, PA $-70.5^\circ \pm 5.6^\circ$
Geocentric X -960.0 ± 1.9 Y 3313.7 ± 1.0 km N



97klotho2008mar10

(97) Klotho 2008 Mar 10 $90.4 \pm 0.4 \times 70.8$ km, PA -26.0° °
Geocentric X -4741.1 ± 0.2 Y -3391.5 ± 0.2 km **N**

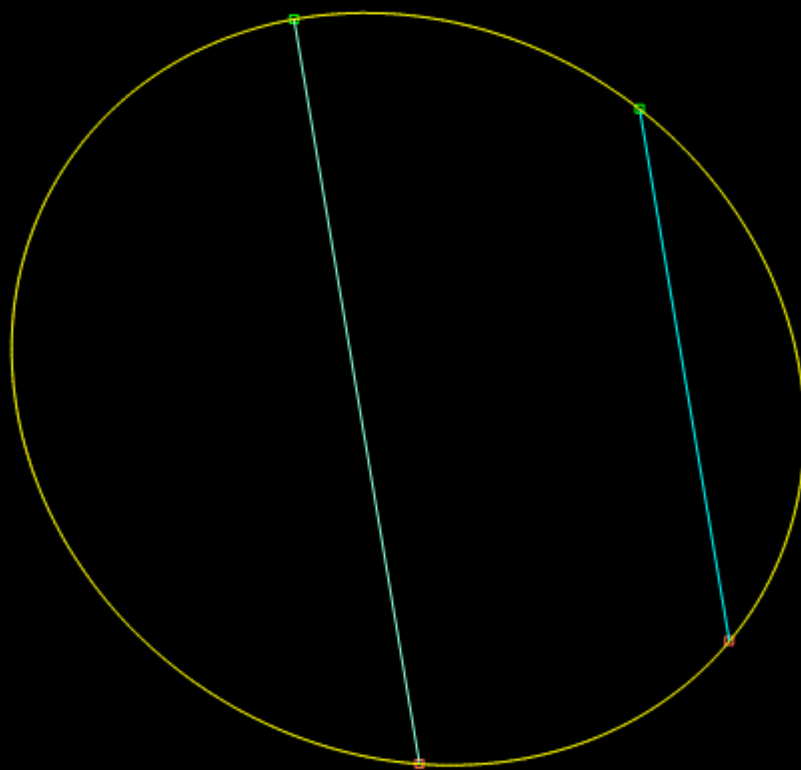
E



98ianthe2013feb27

(98) Ianthé 2013 Feb 27 $110.7 \pm 0.1 \times 98.1$ km, PA 58.0° °
Geocentric X -1671.2 ± 0.1 Y -570.3 ± 0.0 km **N**

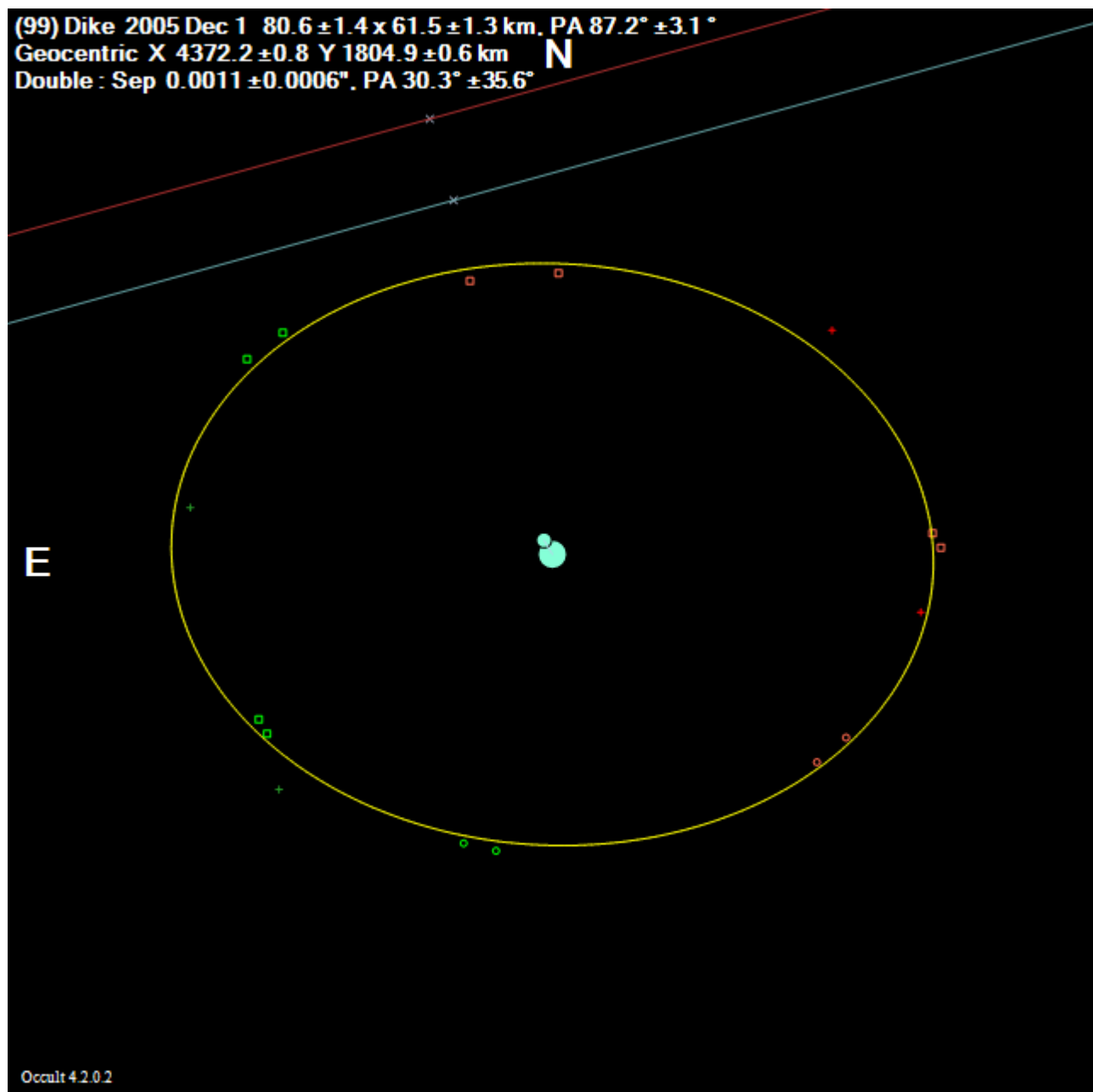
E



Occult 4.2.0.2

99dike2005dec01

(99) Dike 2005 Dec 1 $80.6 \pm 1.4 \times 61.5 \pm 1.3$ km, PA $87.2^\circ \pm 3.1^\circ$
Geocentric X 4372.2 ± 0.8 Y 1804.9 ± 0.6 km **N**
Double : Sep $0.0011 \pm 0.0006''$, PA $30.3^\circ \pm 35.6^\circ$



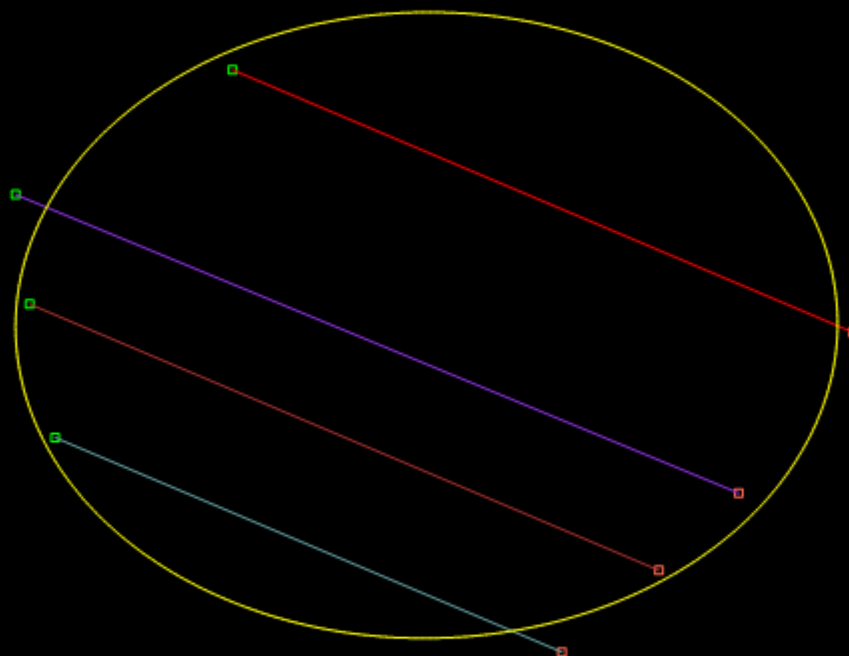
99dike2007apr22

(99) Dike 2007 Apr 22 $56.2 \pm 4.6 \times 73.8 \pm 2.3$ km. PA $0.6^\circ \pm 11.3^\circ$
Geocentric X 4531.0 ± 1.2 Y 2509.4 ± 1.4 km

N

E

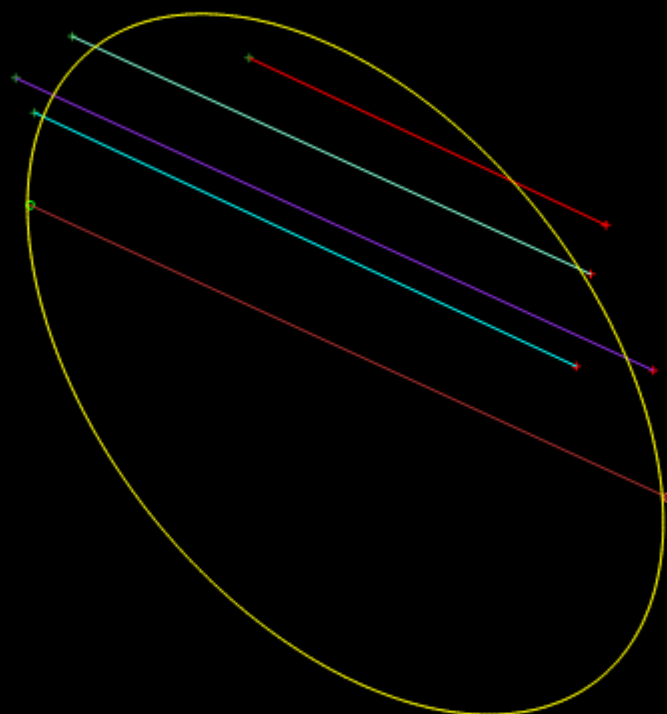
Occult 4.2.0.2



9metis1989aug06

(9) Metis 1989 Aug 6 $193.5 \pm 20.7 \times 117.8 \pm 20.0$ km, PA $38.9^\circ \pm 11.1^\circ$
Geocentric X -4172.3 ± 2.6 Y -2972.8 ± 14.2 km **N**

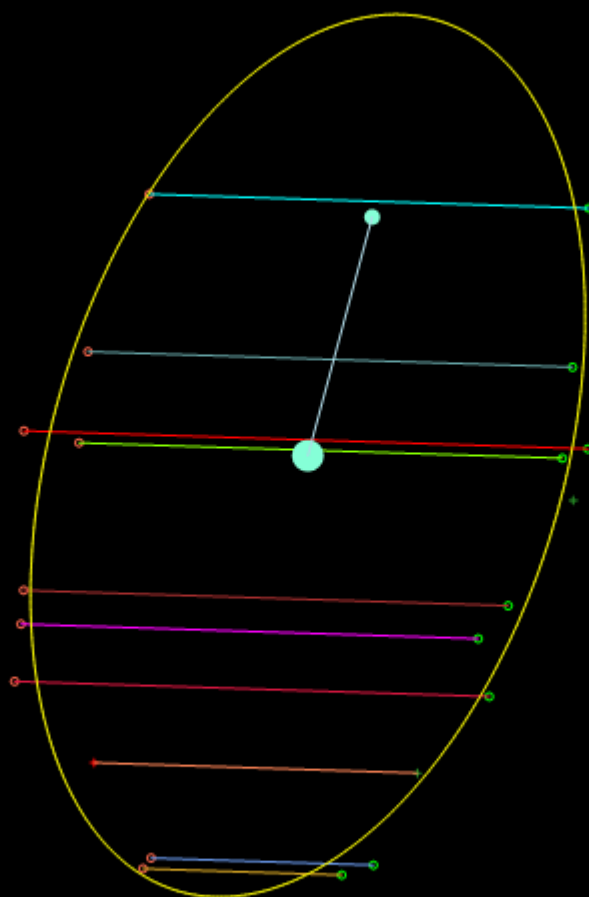
E



9metis2001sep07

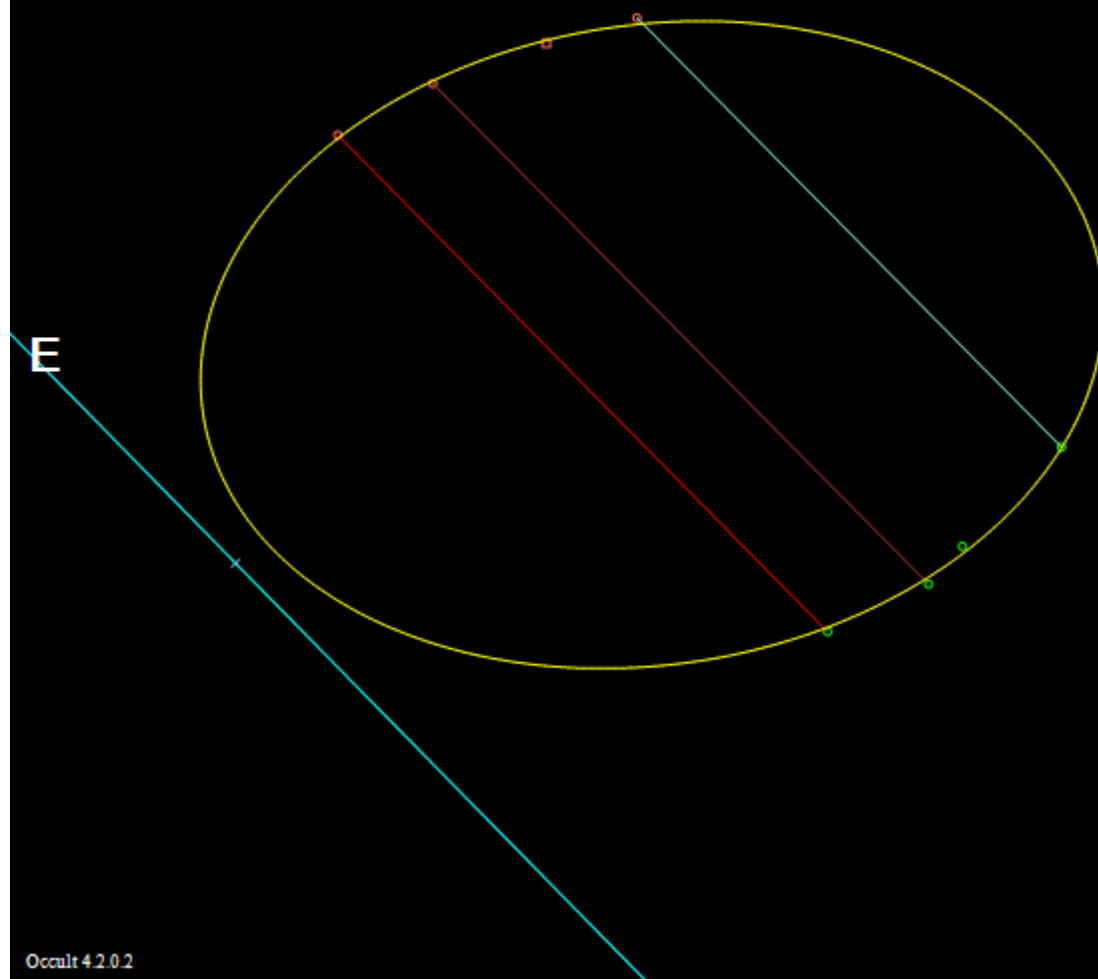
(9) Metis 2001 Sep 7 $217.5 \pm 15.2 \times 122.3 \pm 2.5$ km, PA $-16.7^\circ \pm 2.2^\circ$
Geocentric X -4922.5 ± 2.3 Y 3688.3 ± 7.2 km **N**
Double : Sep $0.0365 \pm 0.0069''$, PA $344.9^\circ \pm 2.4^\circ$

E



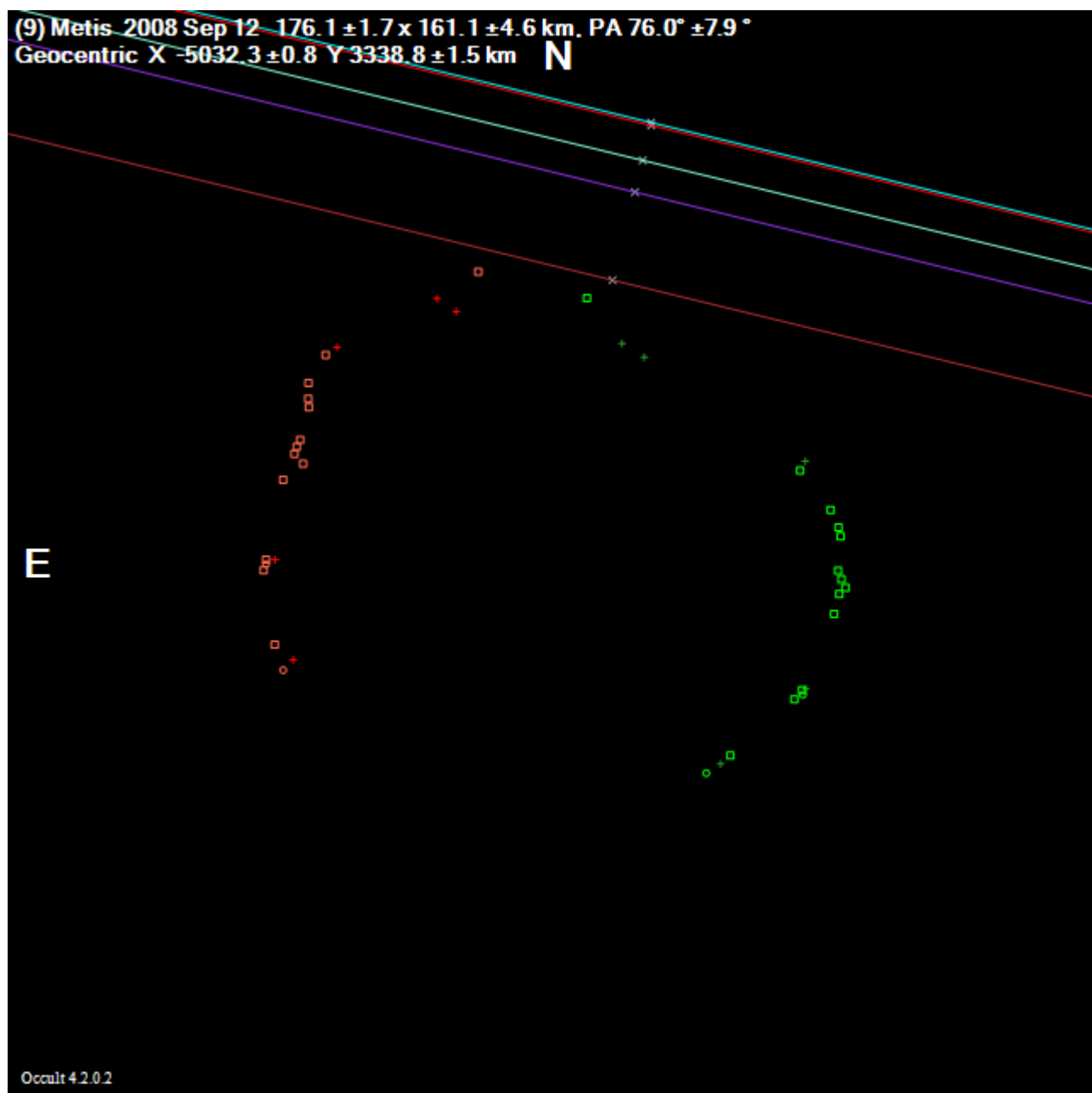
9metis2008dec29

(9) Metis 2008 Dec 29 236.4 x 166.4 km. PA -81.0° °
Geocentric X 3046.2 ± 1.4 Y 4150.9 ± 0.8 km **N**



9metis2008sep12

(9) Metis 2008 Sep 12 $176.1 \pm 1.7 \times 161.1 \pm 4.6$ km, PA $76.0^\circ \pm 7.9^\circ$
Geocentric X -5032.3 ± 0.8 Y 3338.8 ± 1.5 km **N**

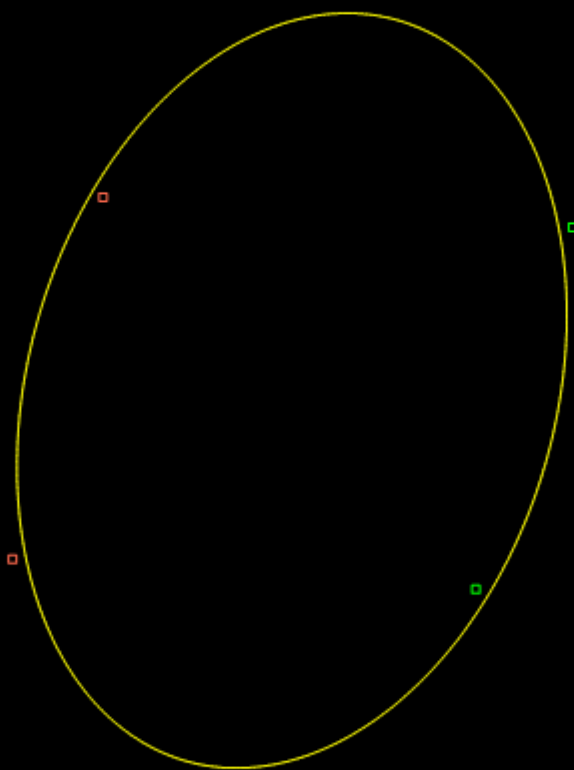


9metis2012oct08

(9) Metis 2012 Oct 8 200.5 x 137.3 km, PA -16.0° °
Geocentric X -2667.5 Y 1572.4 km

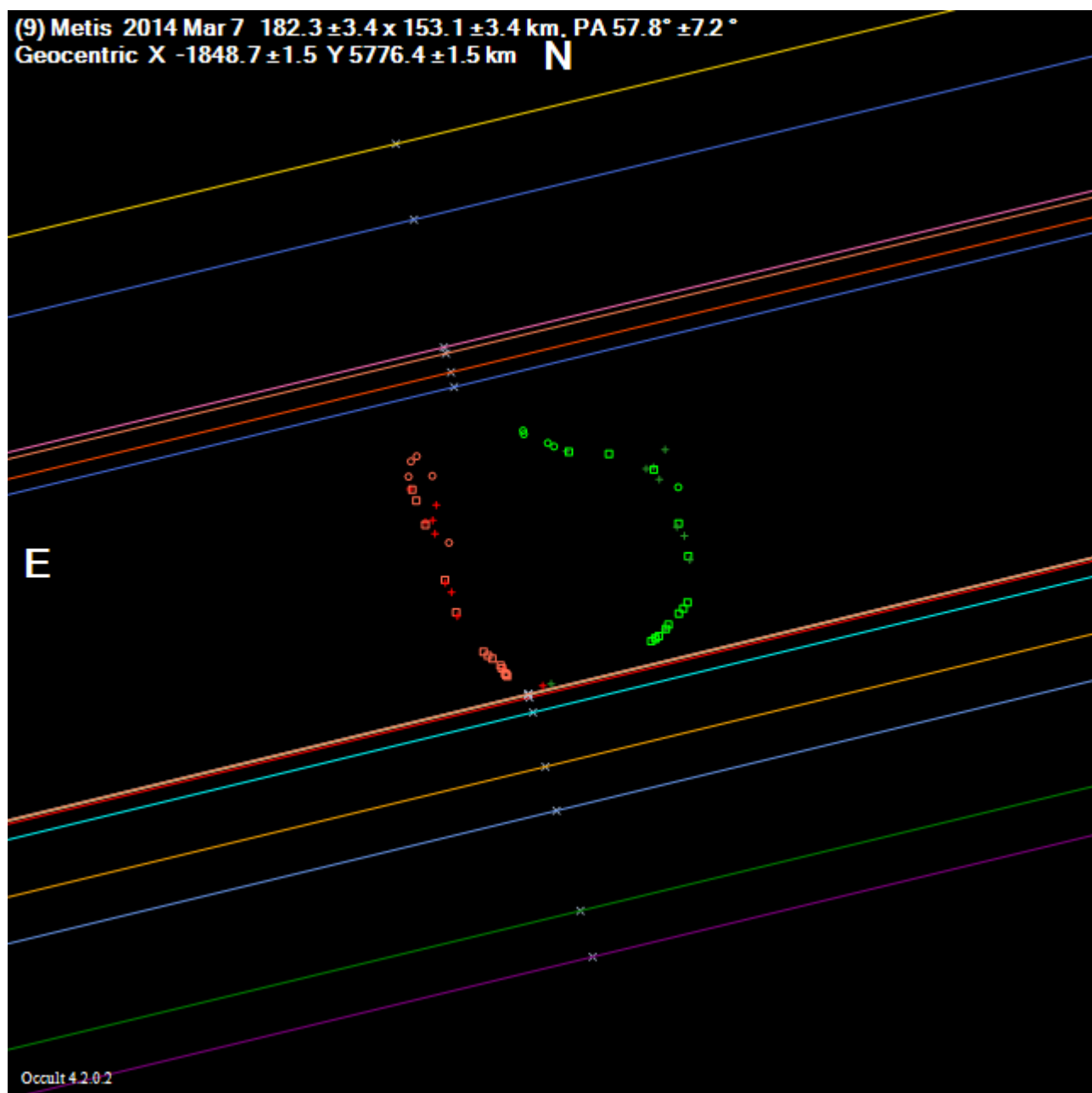
N

E



9metis2014mar07

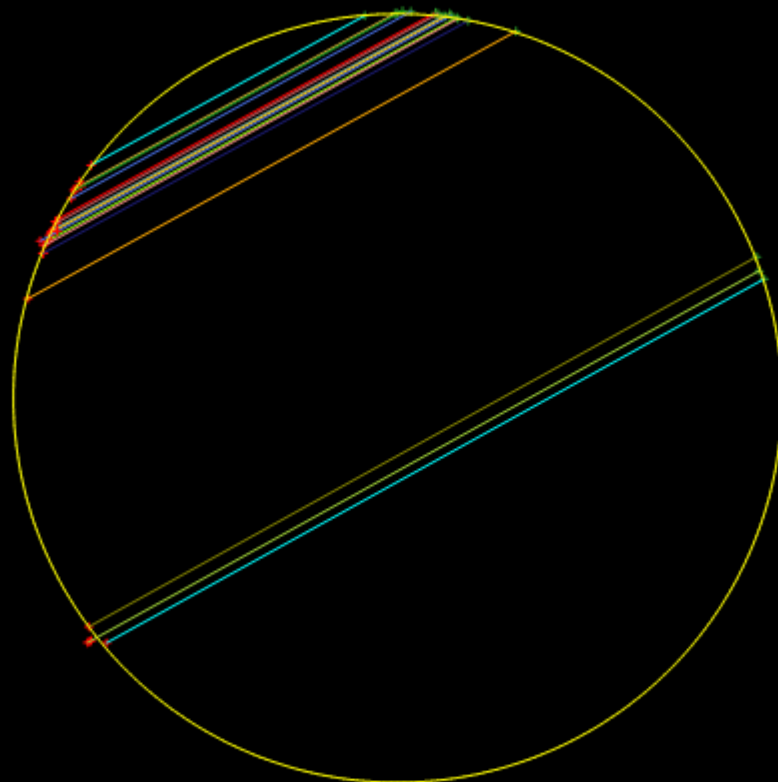
(9) Metis 2014 Mar 7 $182.3 \pm 3.4 \times 153.1 \pm 3.4$ km, PA $57.8^\circ \pm 7.2^\circ$
Geocentric X -1848.7 ± 1.5 Y 5776.4 ± 1.5 km **N**



p2m00venus1959jul07

Venus 1959 Jul 7 12244.0 x 12244.0 km, PA 0.0° °
Geocentric X -4789.0 ±9.2 Y 657.6 ±9.7 km N

E

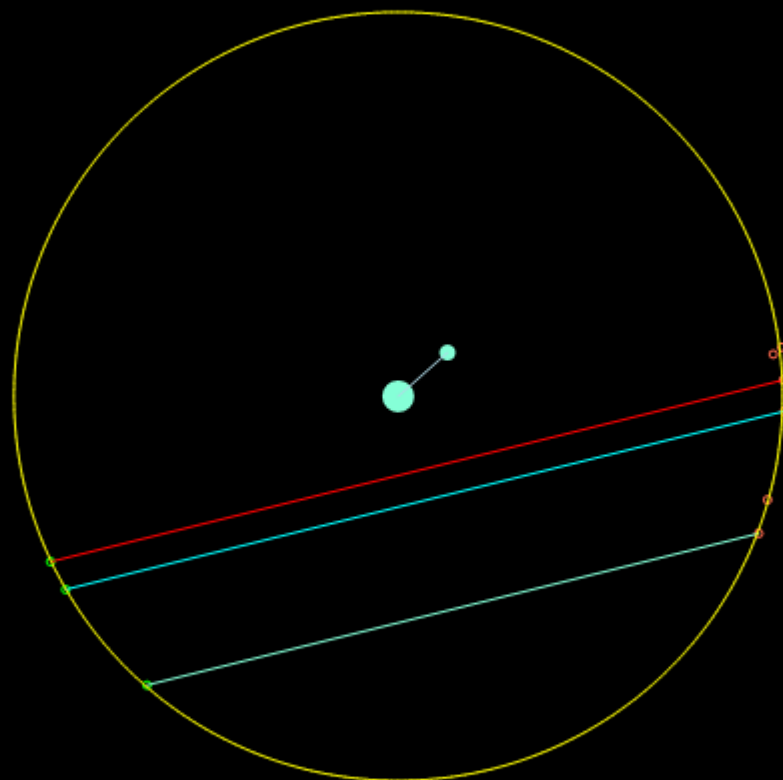


Occult 4.2.0.2

p5m01io1971may14

Io 1971 May 14 3643.0 x 3643.0 km, PA 0.0° °
Geocentric X -2419.3 ± 6.2 Y 3386.8 ± 14.1 km **N**
Double : Sep 0.0986 ± 0.0061", PA -48.4° ± 4.5°

E

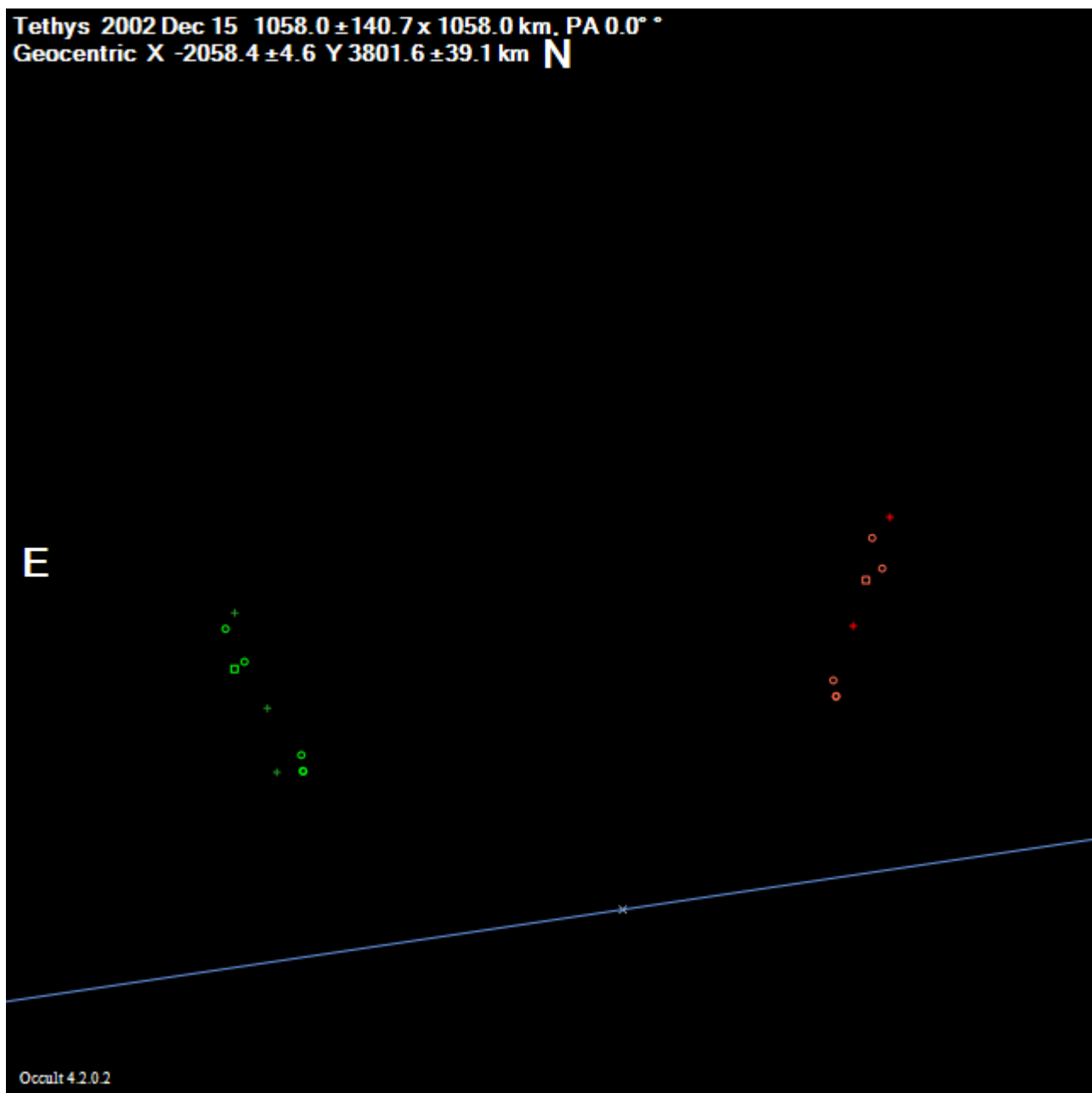


p6m03tethys2002dec15

Tethys 2002 Dec 15 $1058.0 \pm 140.7 \times 1058.0$ km, PA 0.0° °
Geocentric X -2058.4 ± 4.6 Y 3801.6 ± 39.1 km **N**

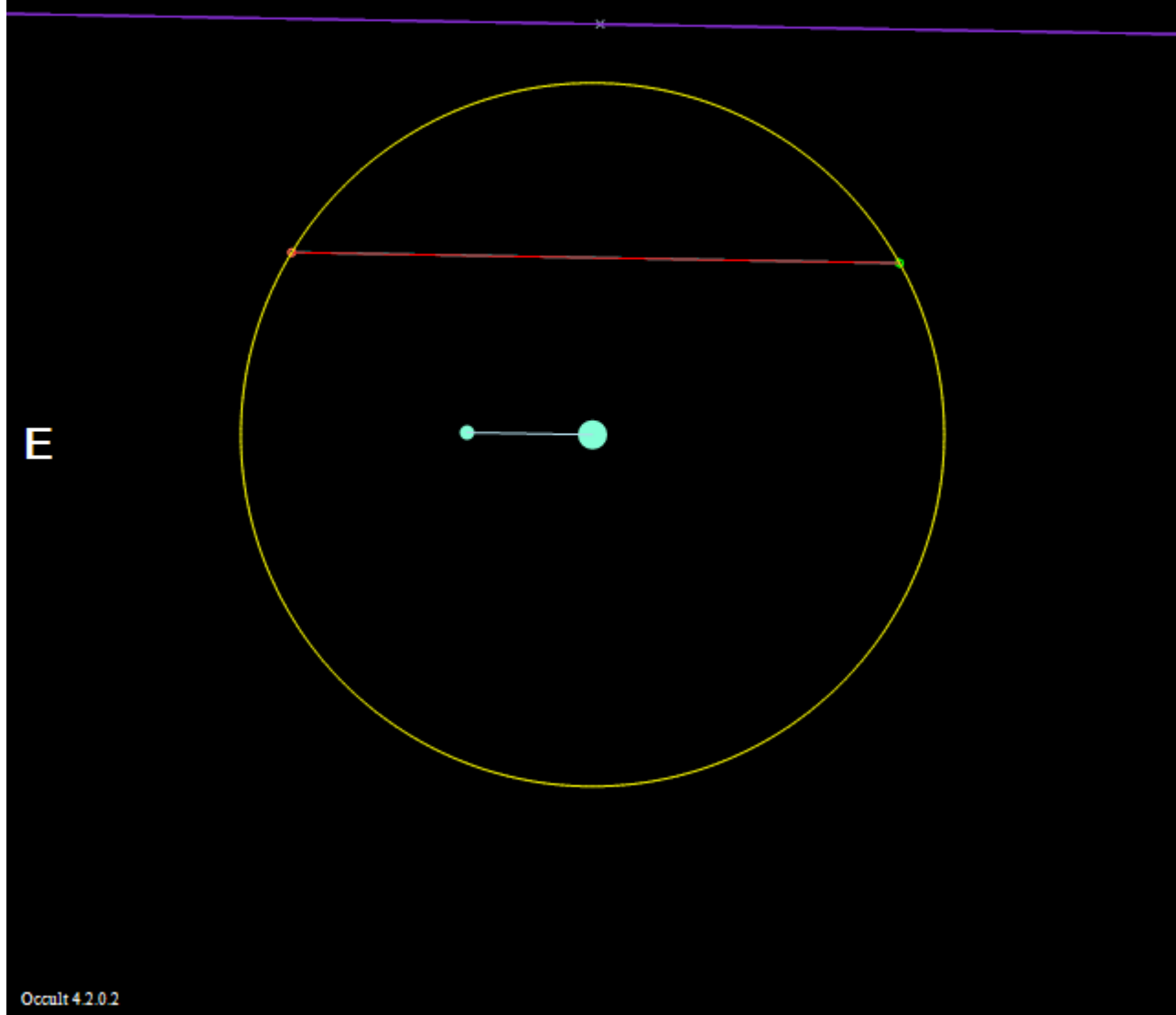
E

Occult 4.2.0.2



p6m05rhea1974aug29

Rhea 1974 Aug 29 1528.0 x 1528.0 km. PA 0.0° °
Geocentric X -5607.2 ±0.1 Y 2695.2 ±0.1 km **N**
Double : Sep 0.0390", PA 89.0°

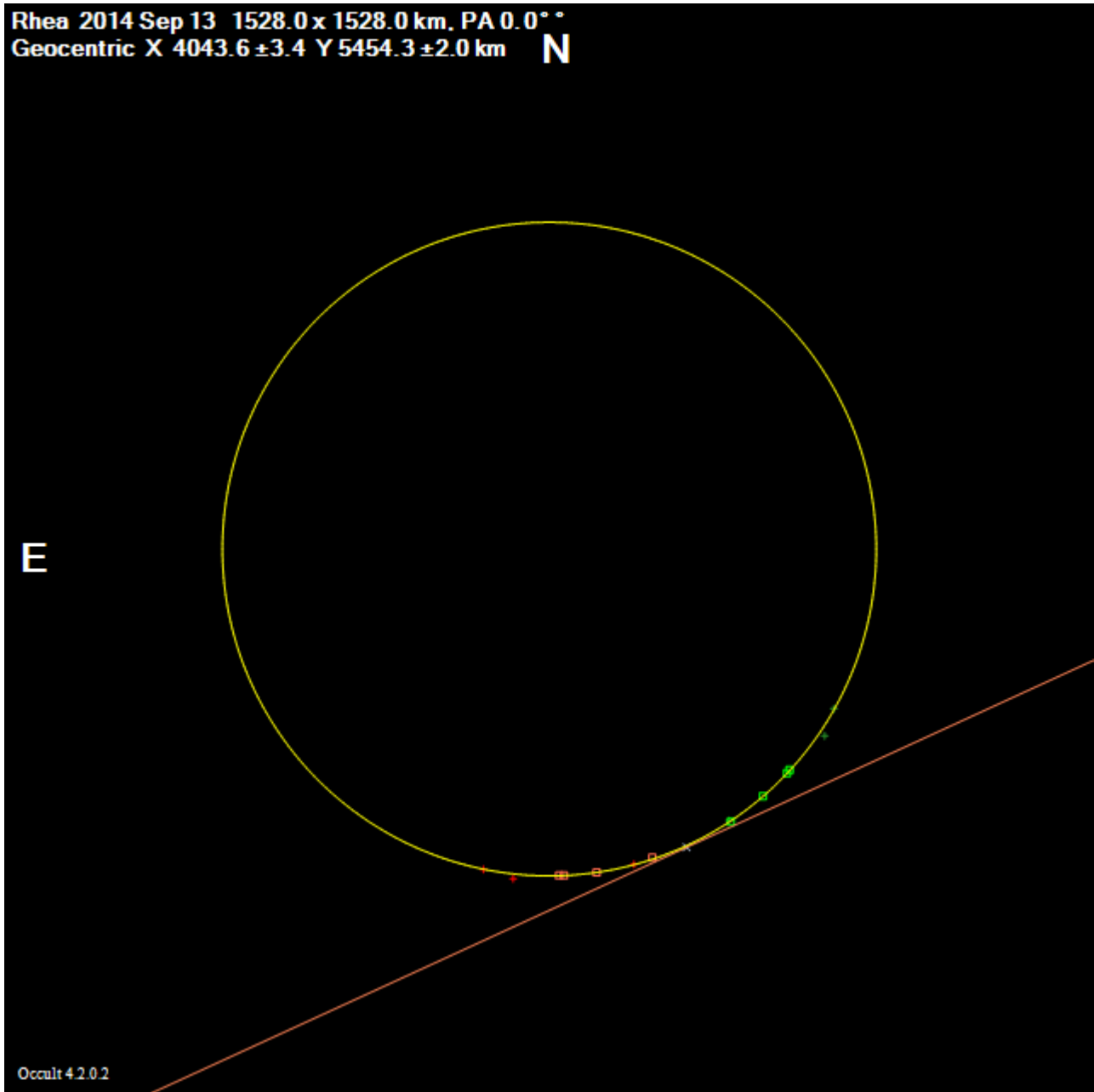


p6m05rhea2014sep13

Rhea 2014 Sep 13 1528.0 x 1528.0 km. PA 0.0° °
Geocentric X 4043.6 ± 3.4 Y 5454.3 ± 2.0 km **N**

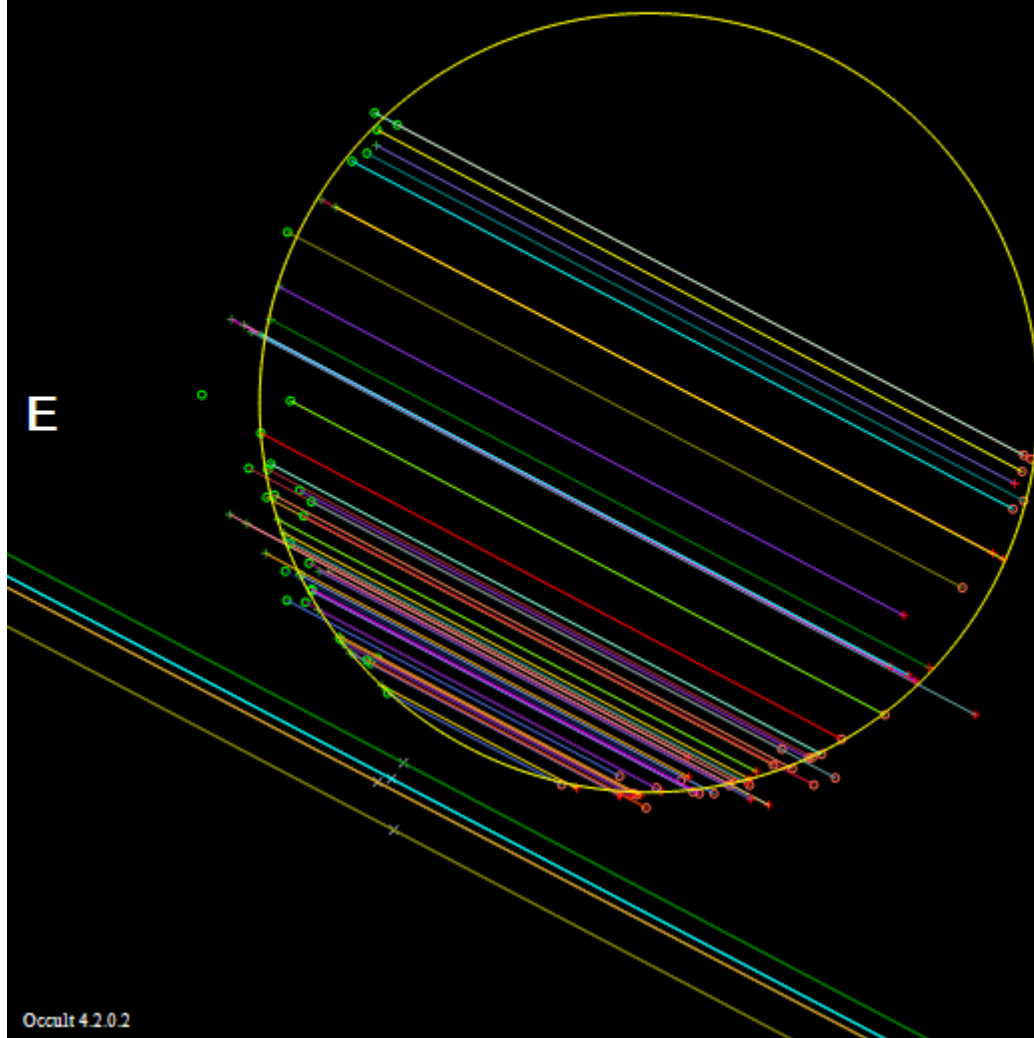
E

Occult 4.2.0.2



p7m03titania2001sep08

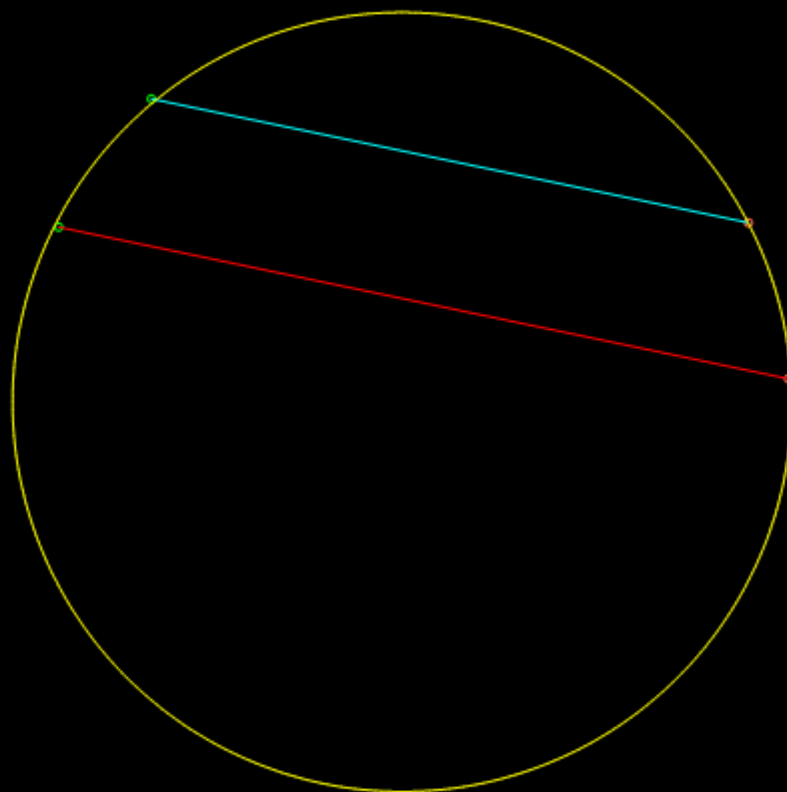
Titania 2001 Sep 8 1599.2 \pm 21.2 x 1599.2 km, PA 0.0° °
Geocentric X 3276.4 \pm 4.7 Y 5320.1 \pm 9.3 km **N**



p7m03titania2003aug01

Titania 2003 Aug 1 1600.0 \pm 84.9 x 1600.0 km, PA 0.0° °
Geocentric X -3749.2 \pm 4.0 Y 3343.1 \pm 27.3 km **N**

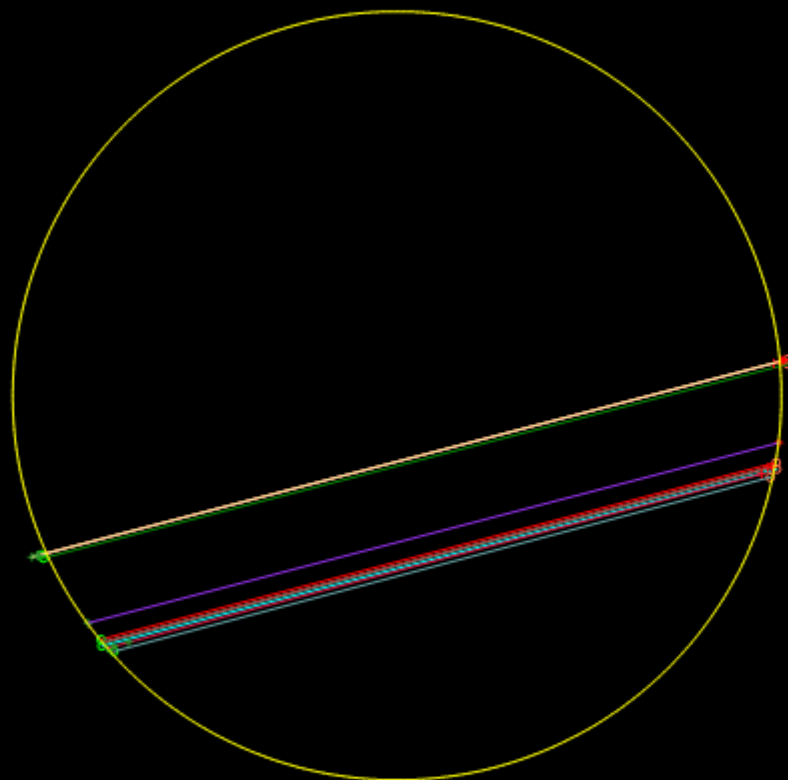
E



p8m00neptune1968apr07

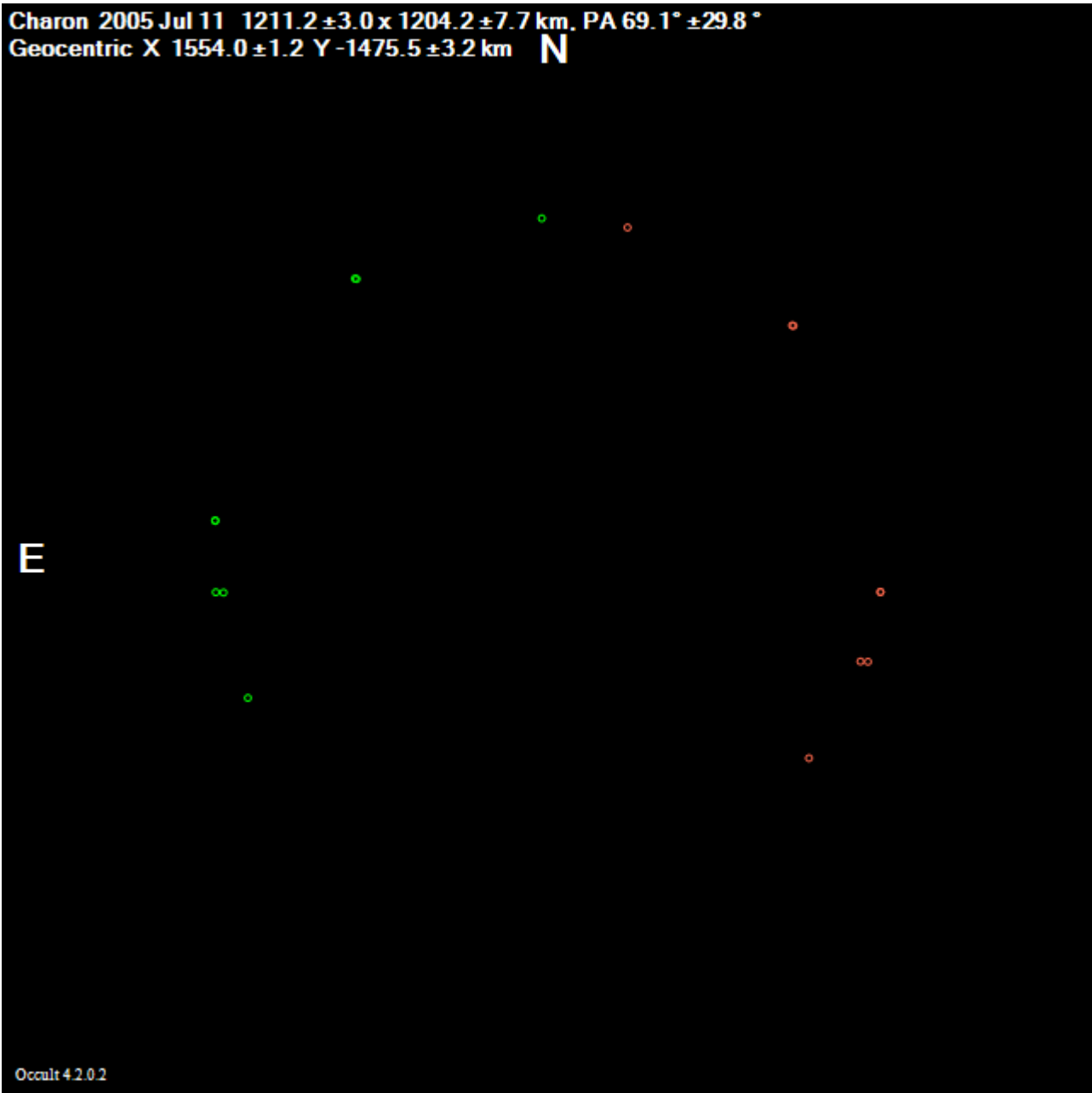
Neptune 1968 Apr 7 48600.0 x 48600.0 km. PA 0.0° °
Geocentric X 23088.7 ± 73.5 Y 2690.6 ± 158.2 km

E



Occult 4.2.0.2

p9m01charon2005jul11



p9m01charon2012jul27

Charon 2012 Jul 27 1186.0 x 1186.0 km. PA 0.0° °
Geocentric X 2730.4 ± 16.9 Y -413.3 ± 17.9 km **N**

