

Graphics of Asteroid occultation observations.

2018 March

Introduction

The following graphics plot the 302 best observed Asteroid occultations (which is about 8% of all observed Asteroid occultation events).

The plots have a filename convention concatenating the asteroid number, asteroid name or provisional designation, and occultation date.

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 a '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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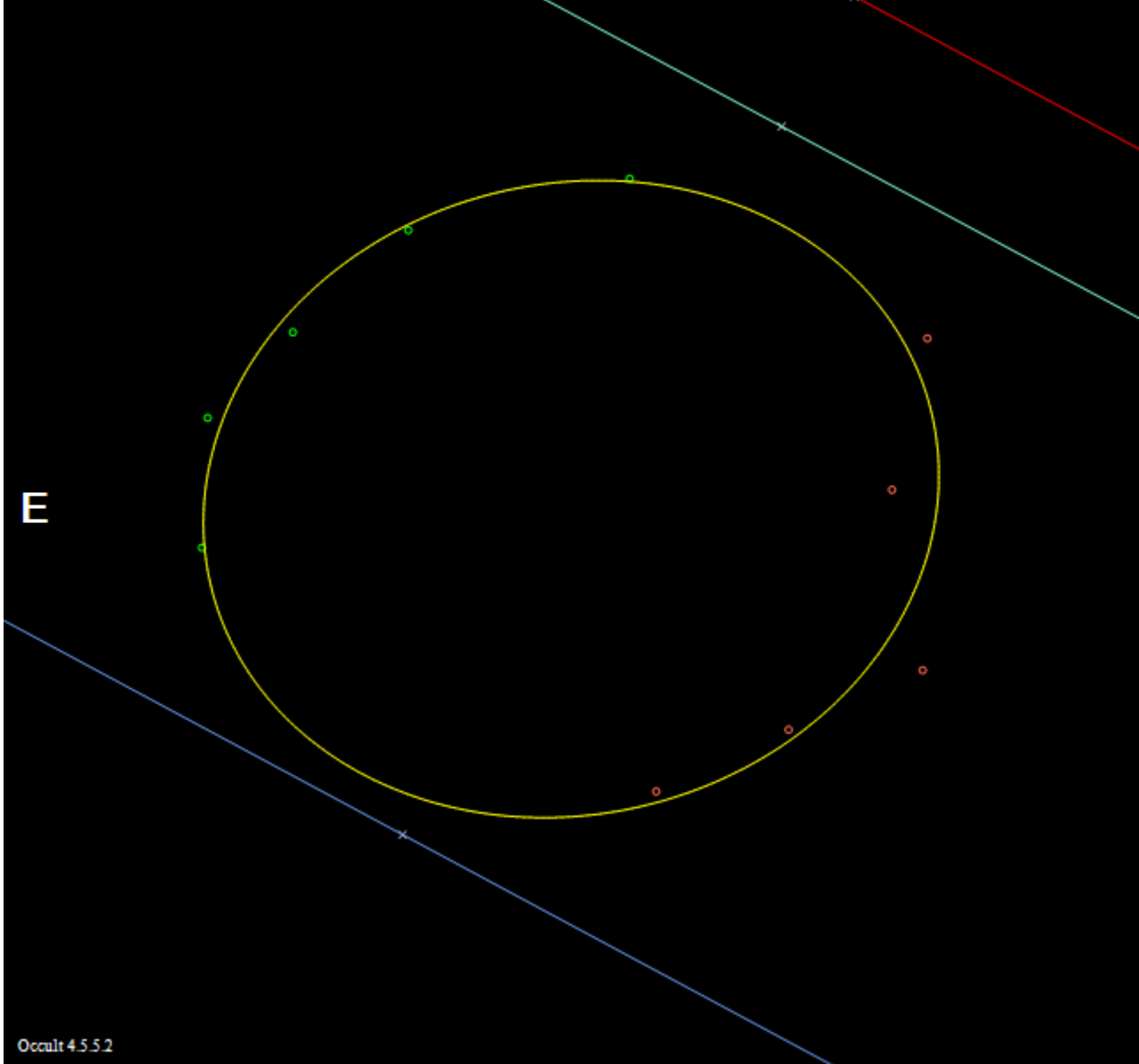
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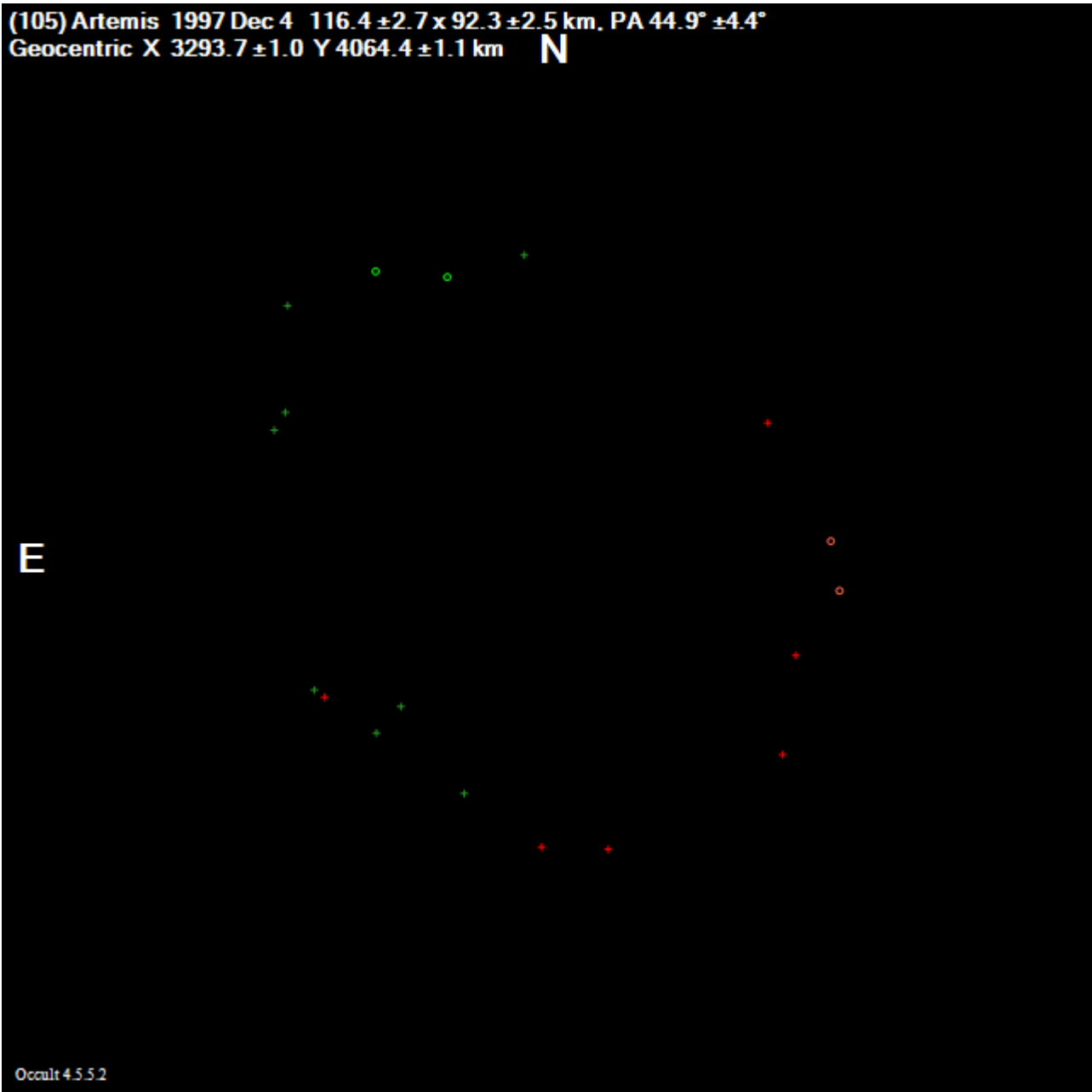
100Hekate2015Aug22

(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**



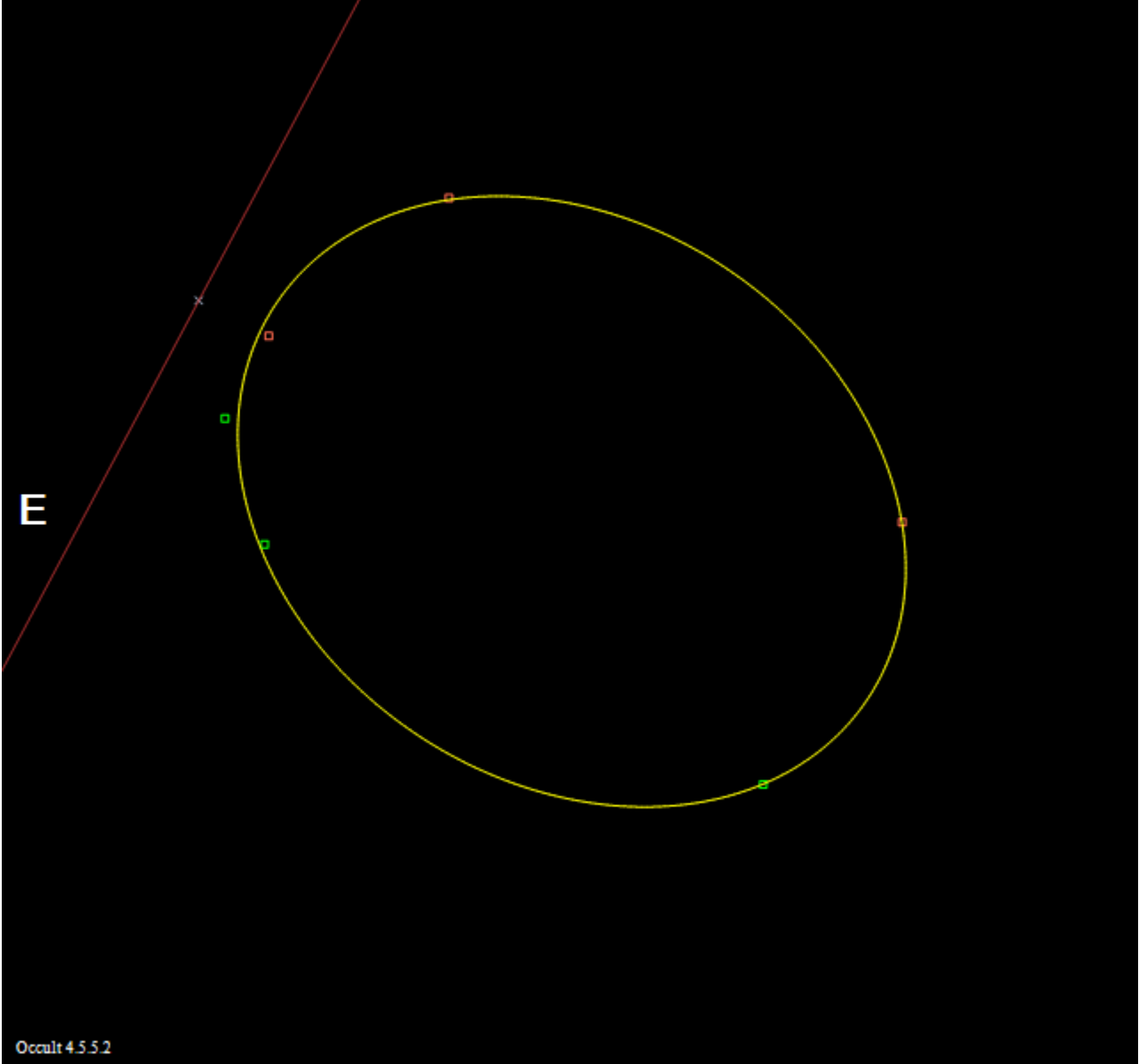
105Artemis1997Dec04

(105) Artemis 1997 Dec 4 $116.4 \pm 2.7 \times 92.3 \pm 2.5$ km, PA $44.9^\circ \pm 4.4^\circ$
Geocentric X 3293.7 ± 1.0 Y 4064.4 ± 1.1 km



105Artemis2017Apr11

(105) Artemis 2017 Apr 11 $124.2 \pm 2.0 \times 97.7 \pm 3.5$ km, PA $56.1^\circ \pm 2.6^\circ$
Geocentric X 3343.8 ± 0.7 Y 4239.1 ± 0.8 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**



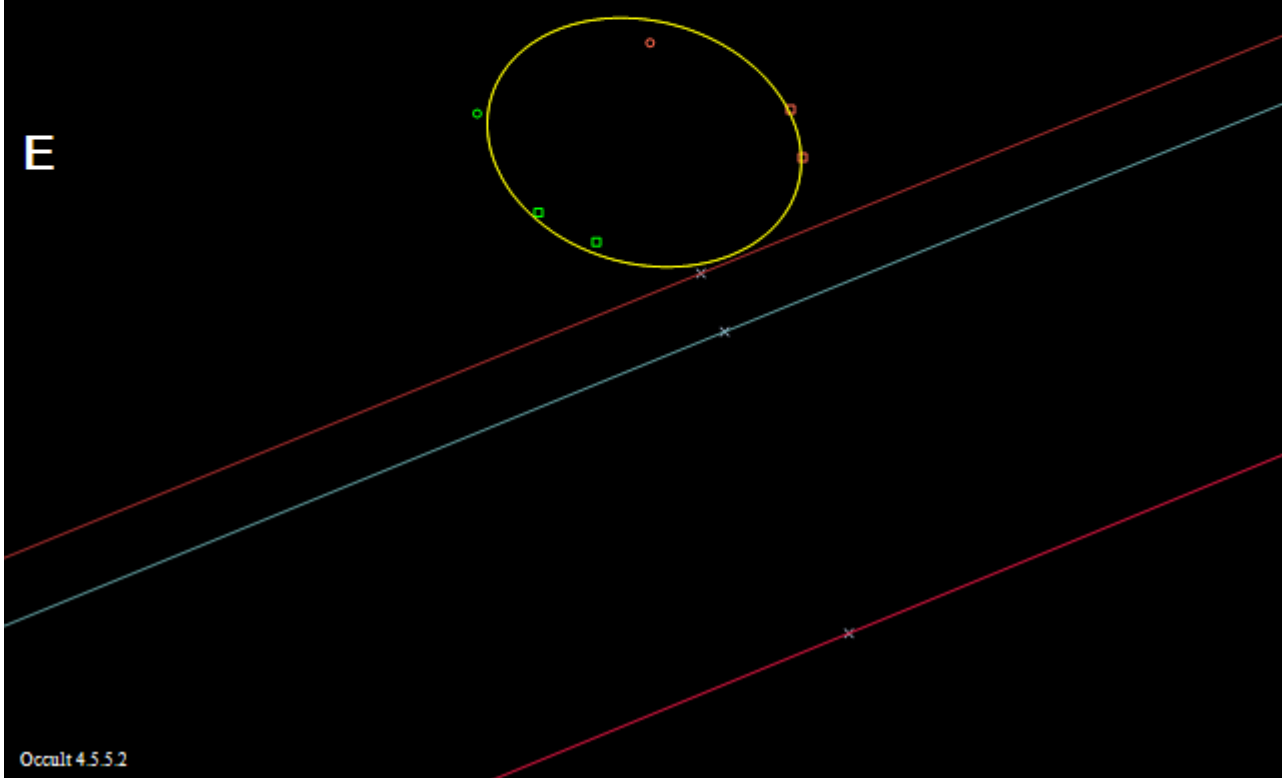
107Camilla2015Aug23

(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**



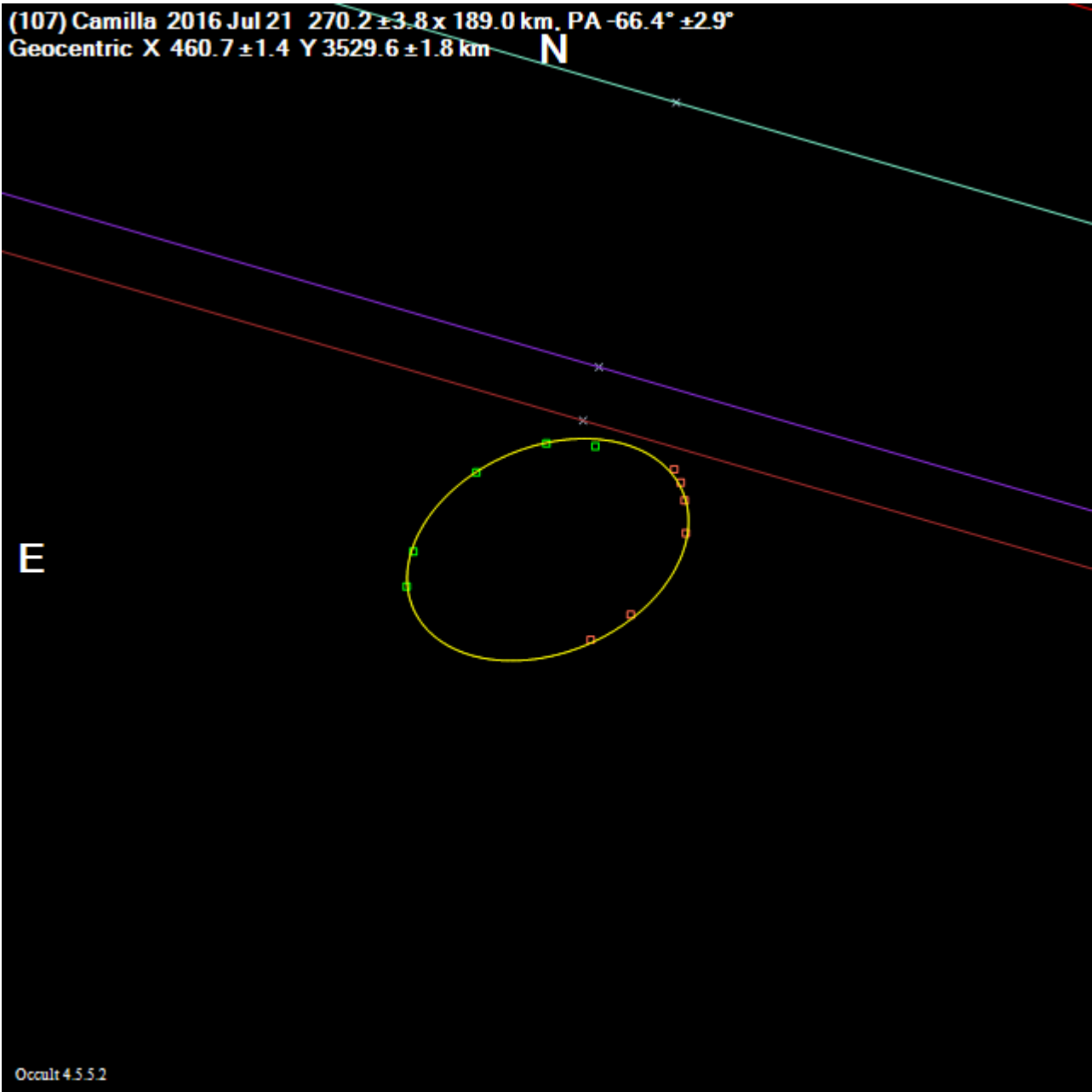
107Camilla2015May06

(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



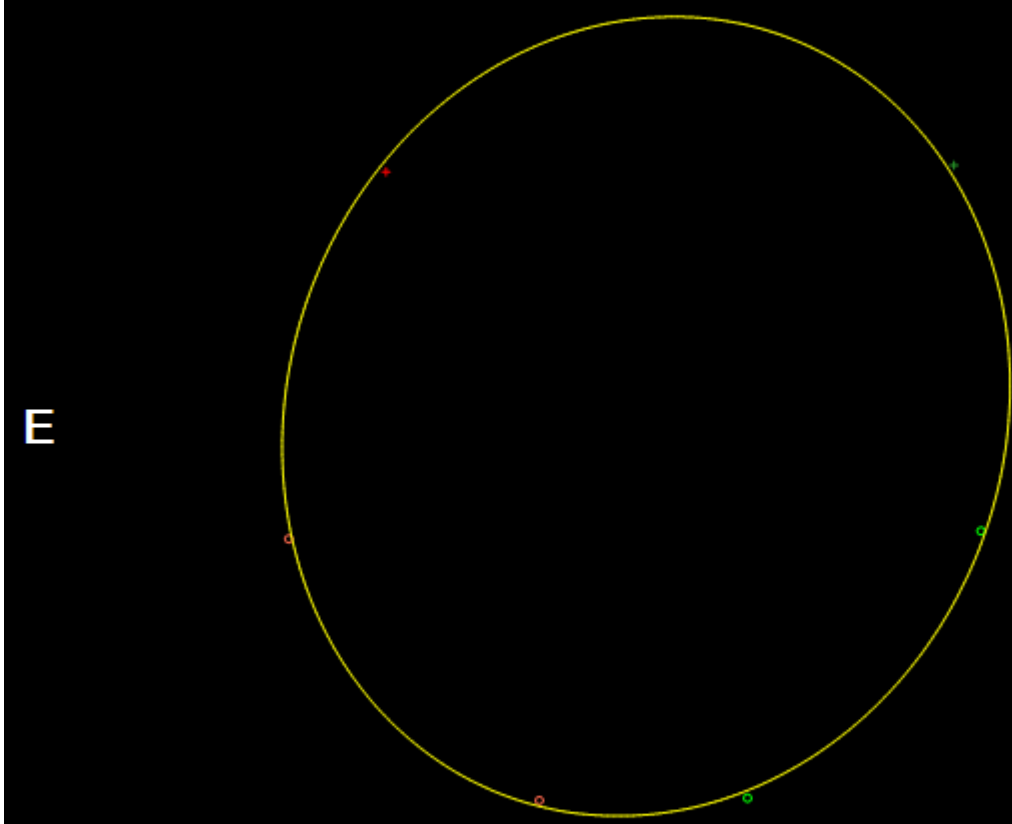
1093Freda2005Dec24

(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**



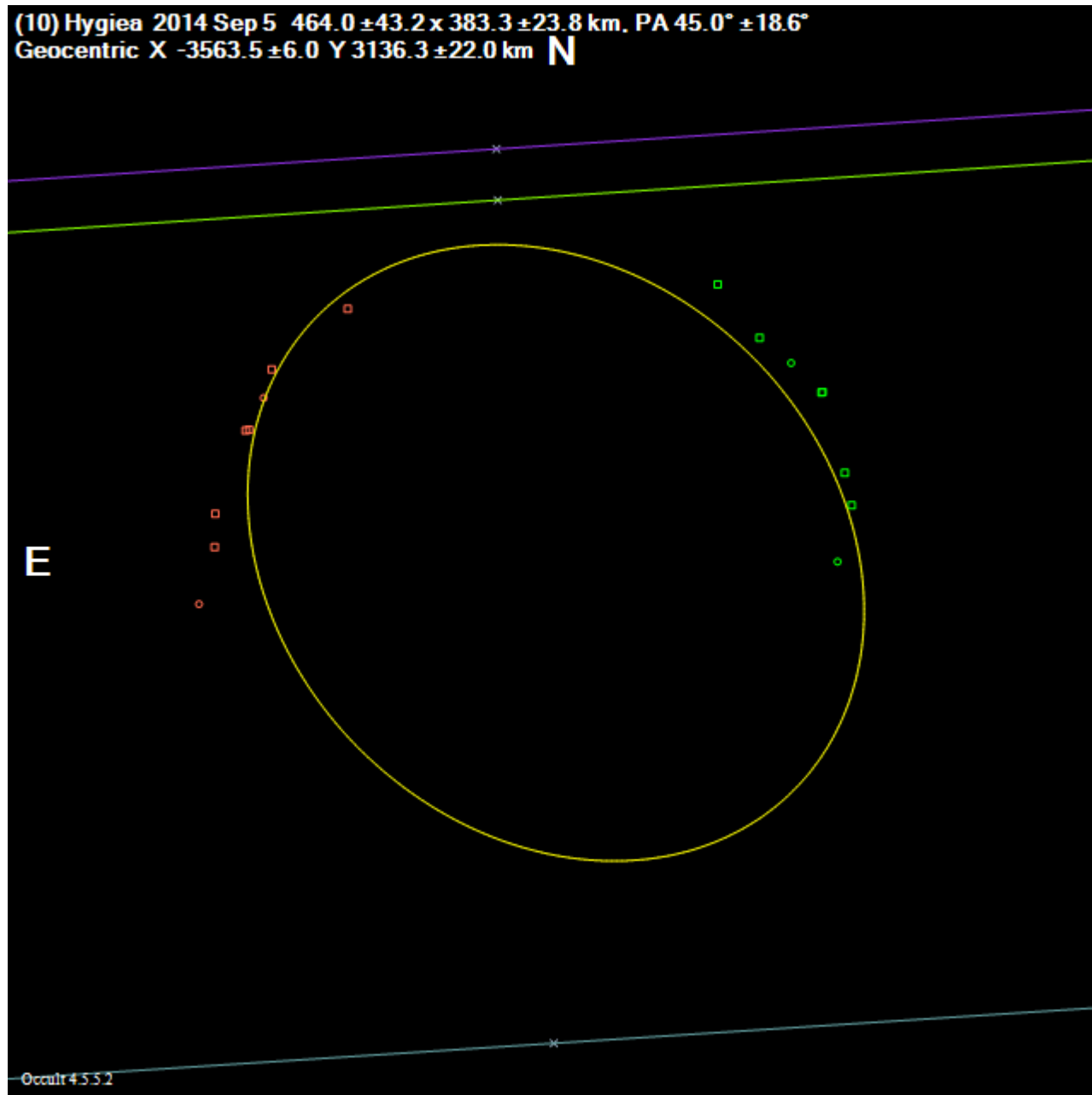
109Felicitas2003Mar29

(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**



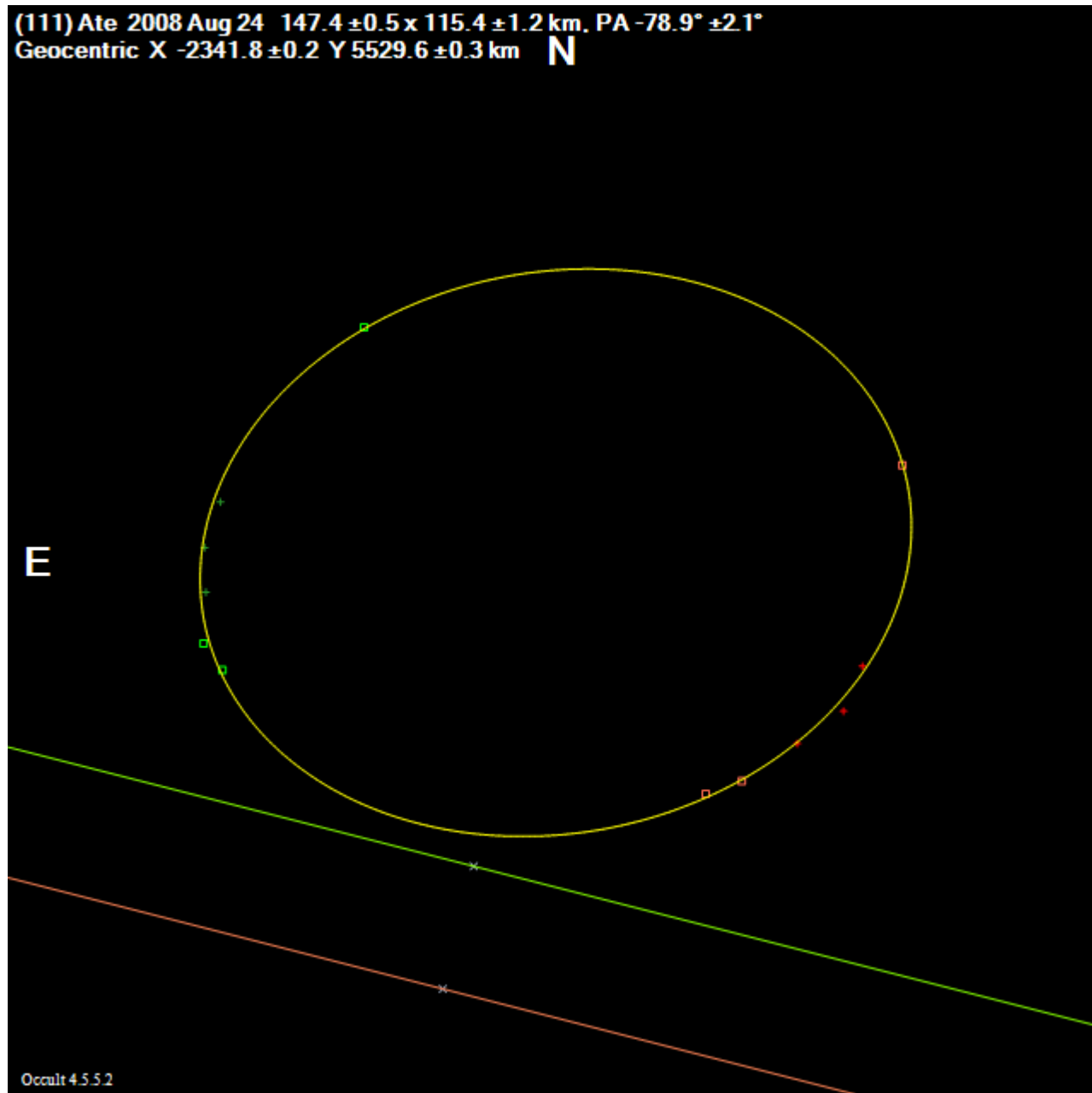
10Hygiea2014Sep05

(10) Hygiea 2014 Sep 5 $464.0 \pm 43.2 \times 383.3 \pm 23.8$ km. PA $45.0^\circ \pm 18.6^\circ$
Geocentric X -3563.5 ± 6.0 Y 3136.3 ± 22.0 km **N**



111Ate2008Aug24

(111) Ate 2008 Aug 24 $147.4 \pm 0.5 \times 115.4 \pm 1.2$ km, PA $-78.9^\circ \pm 2.1^\circ$
Geocentric X -2341.8 ± 0.2 Y 5529.6 ± 0.3 km **N**



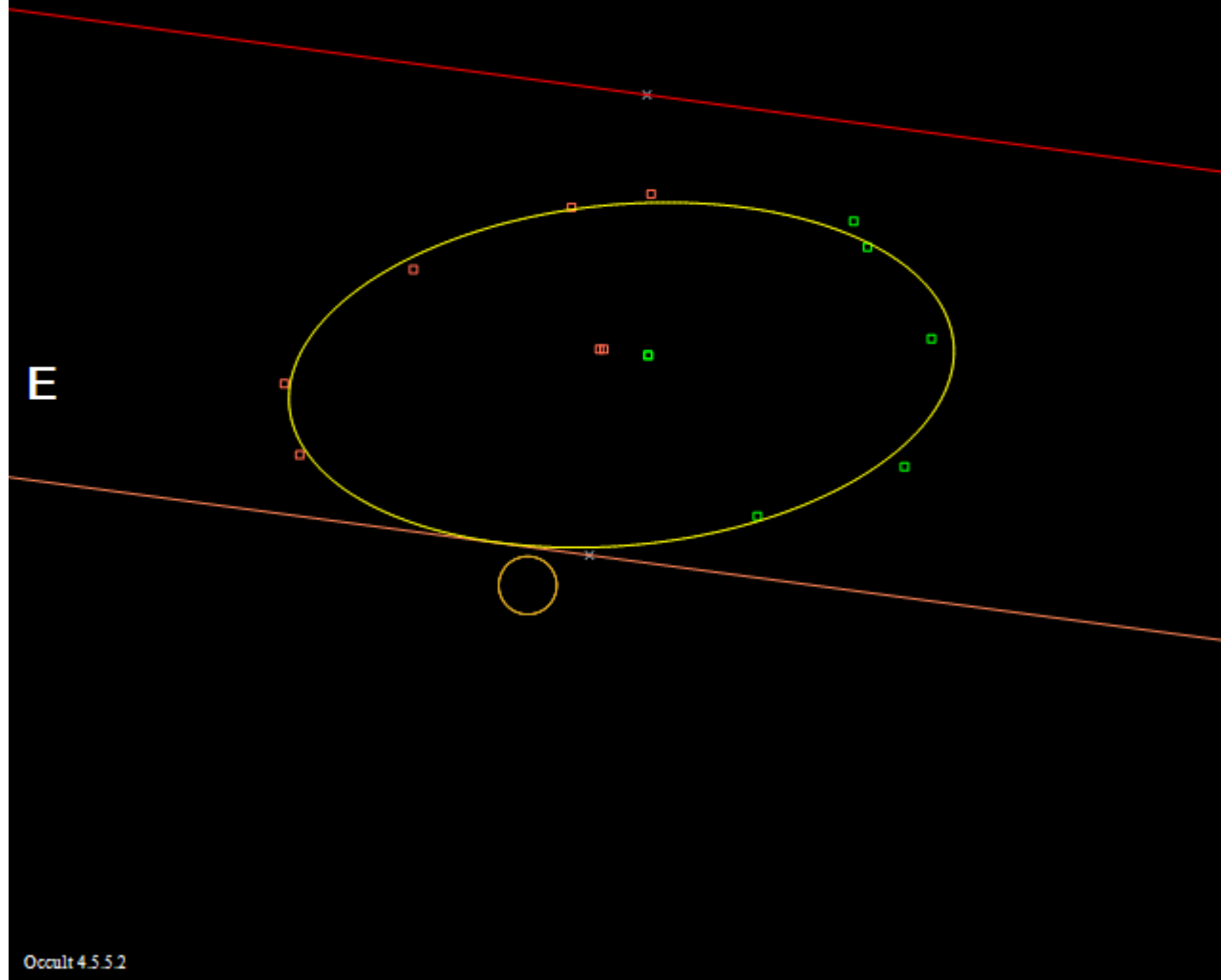
112Iphigenia2017Apr29

(112) Iphigenia 2017 Apr 29 70.0 x 70.0 km, PA 0.0°
Geocentric X -3079.8 ± 0.6 Y -2502.2 ± 0.9 km **N**



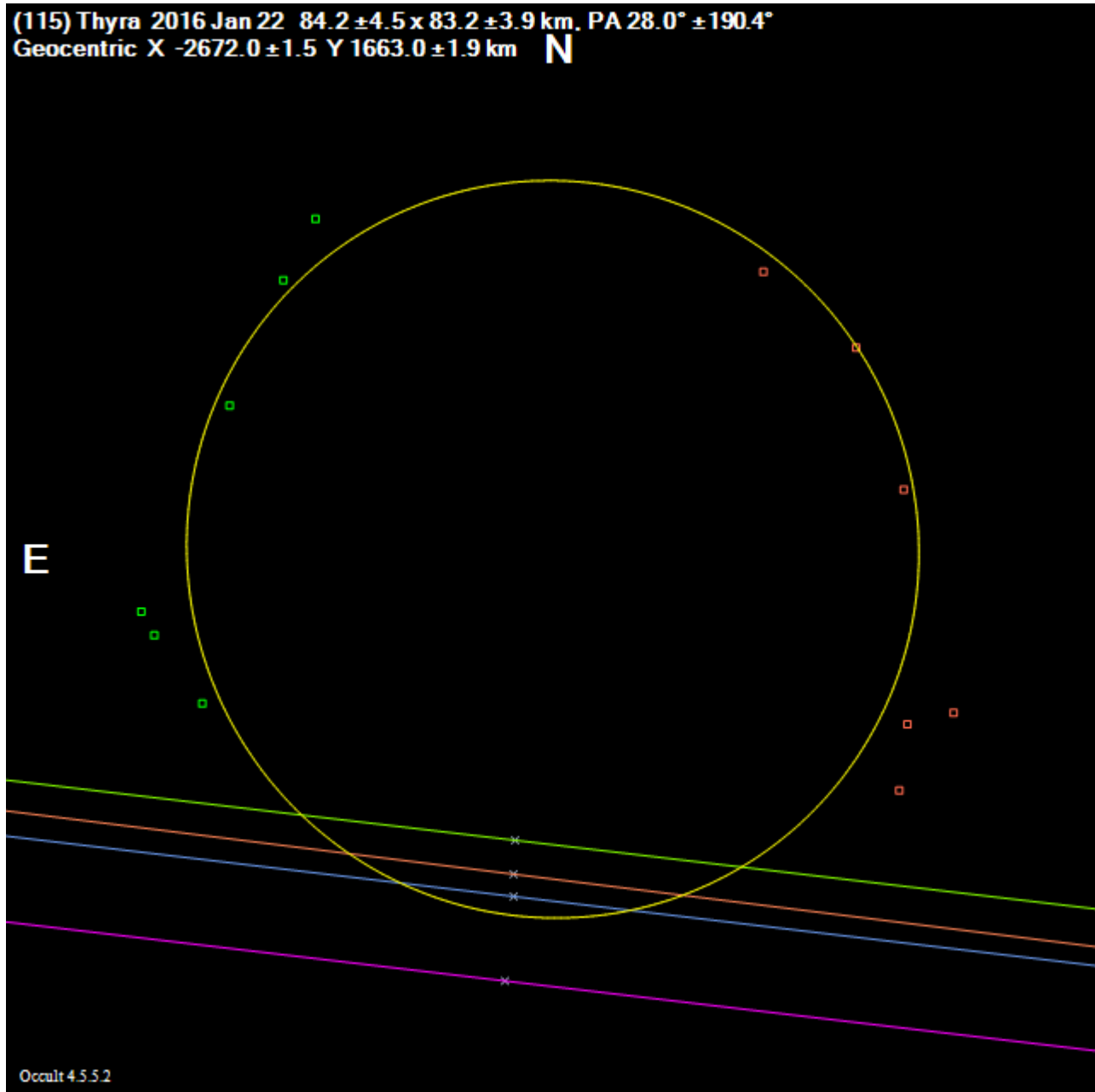
113Amalthea2017Mar14

(113) Amalthea 2017 Mar 14 $69.1 \pm 1.5 \times 35.3 \pm 1.9$ km, PA $-84.5^\circ \pm 2.4^\circ$
Geocentric X 1541.9 ± 0.7 Y 1181.7 ± 0.6 km **N**
Sat: 6.0×6.0 km, PA 0.0° ; Sep $0.0172''$ at PA 156.0°

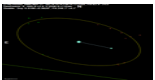


115Thyra2016Jan22

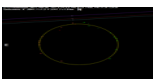
(115) Thyra 2016 Jan 22 $84.2 \pm 4.5 \times 83.2 \pm 3.9$ km, PA $28.0^\circ \pm 190.4^\circ$
Geocentric X -2672.0 ± 1.5 Y 1663.0 ± 1.9 km **N**



116Sirona2005Nov11



11Parthenope2011Jan26



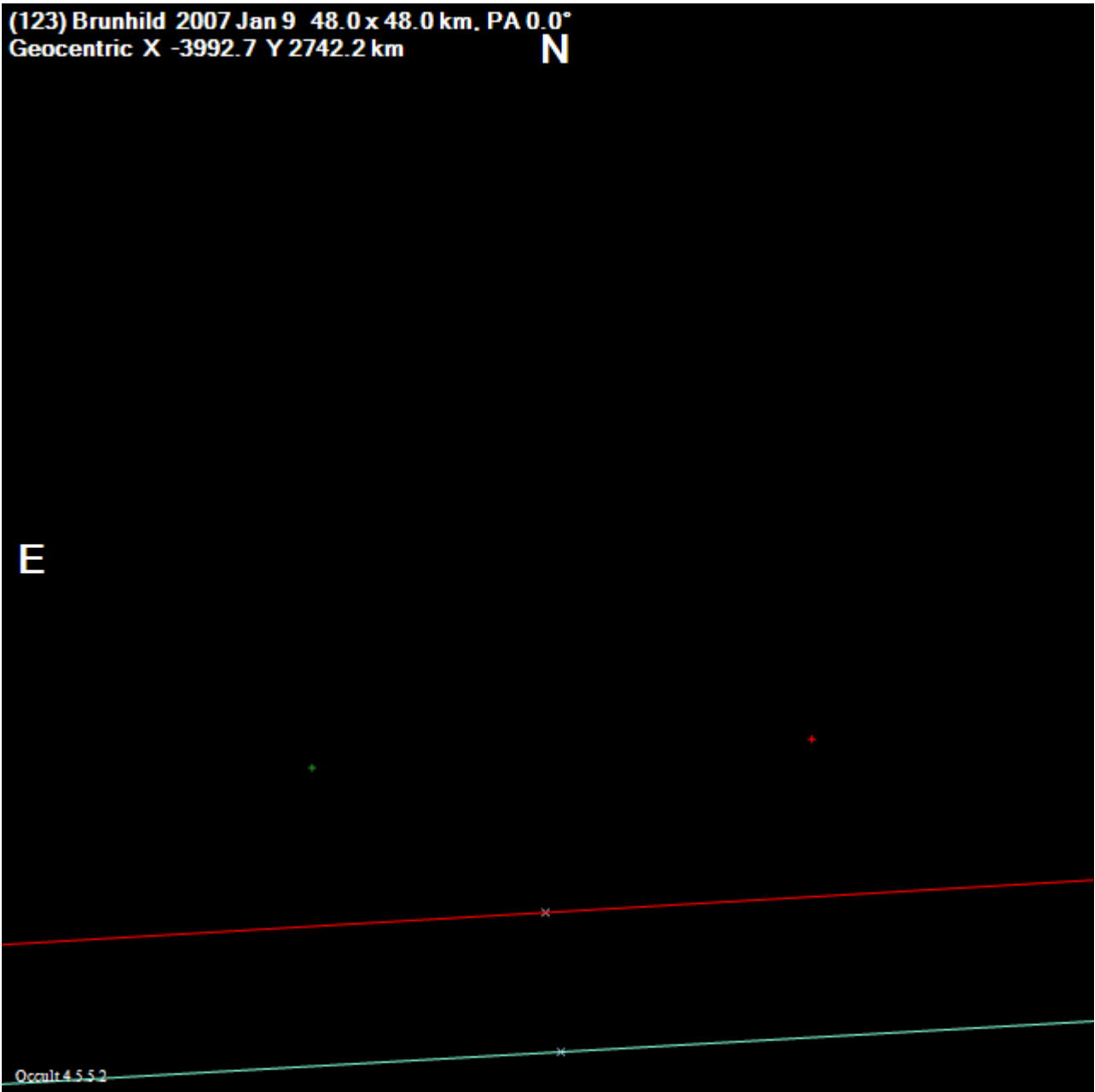
123Brunhild2007Jan09

(123) Brunhild 2007 Jan 9 48.0 x 48.0 km, PA 0.0°
Geocentric X -3992.7 Y 2742.2 km

N

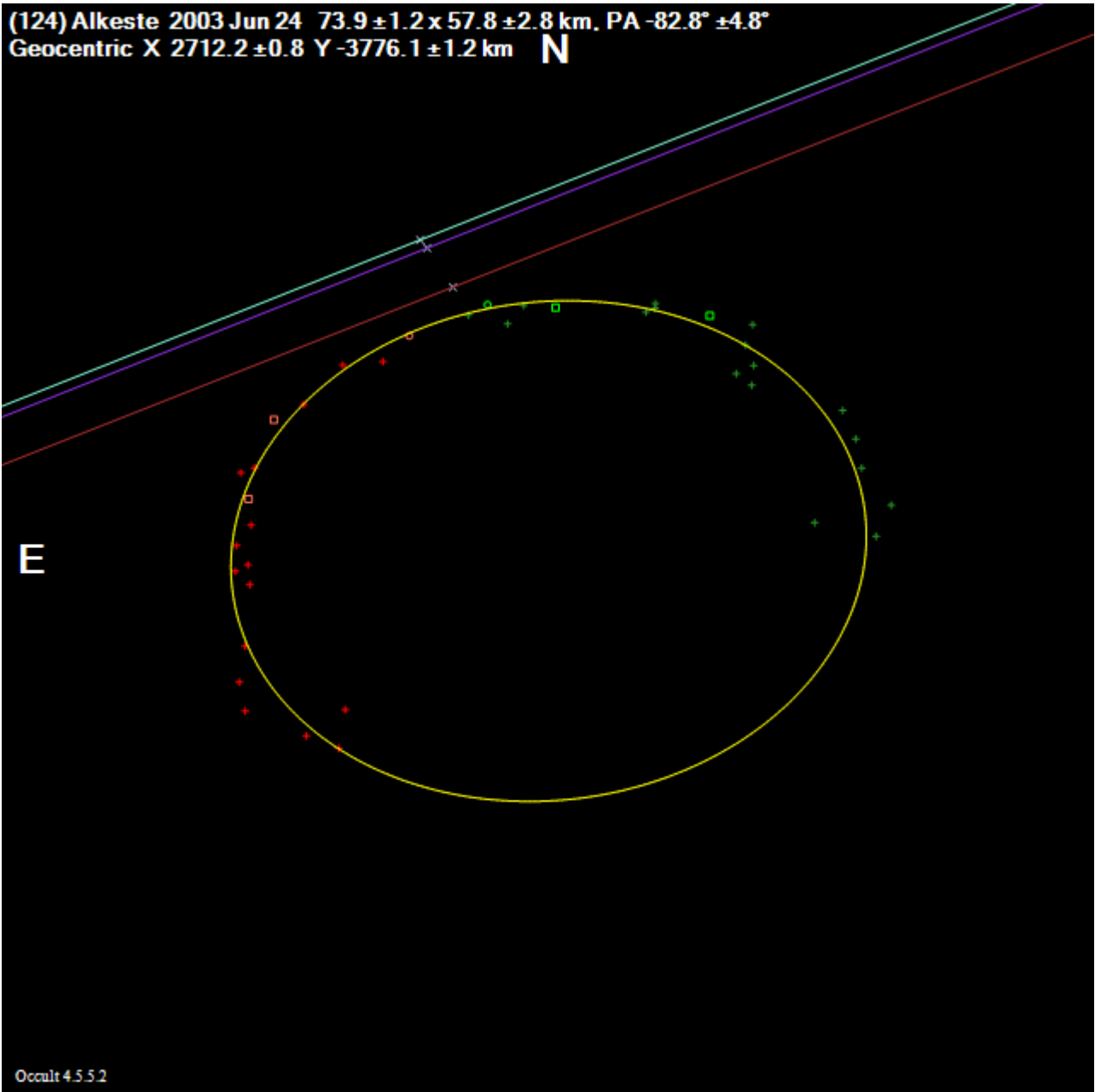
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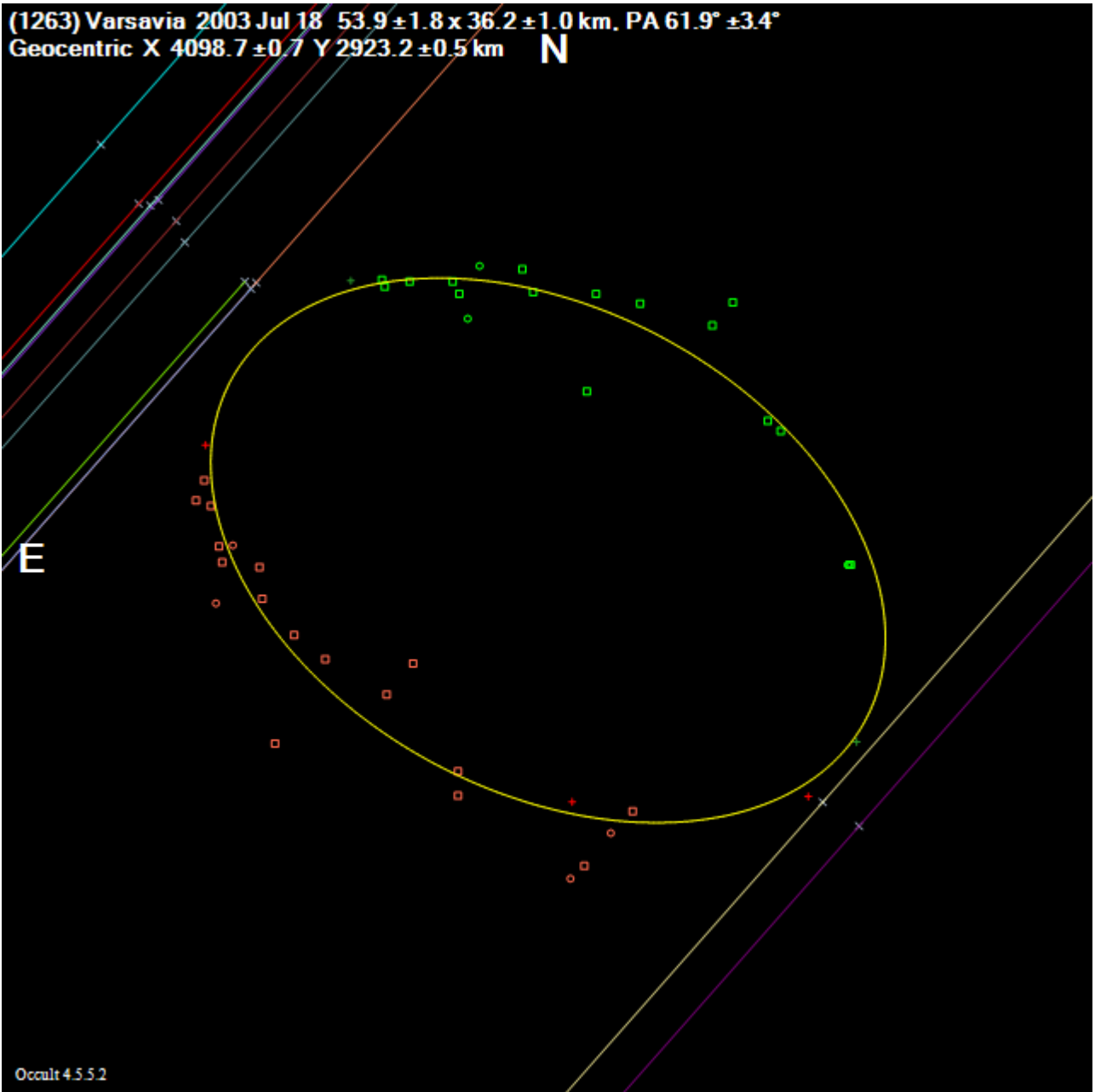
124Alkeste2003Jun24

(124) Alkeste 2003 Jun 24 $73.9 \pm 1.2 \times 57.8 \pm 2.8$ km, PA $-82.8^\circ \pm 4.8^\circ$
Geocentric X 2712.2 ± 0.8 Y -3776.1 ± 1.2 km **N**



1263Varsavia2003Jul18

(1263) Varsavia 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**

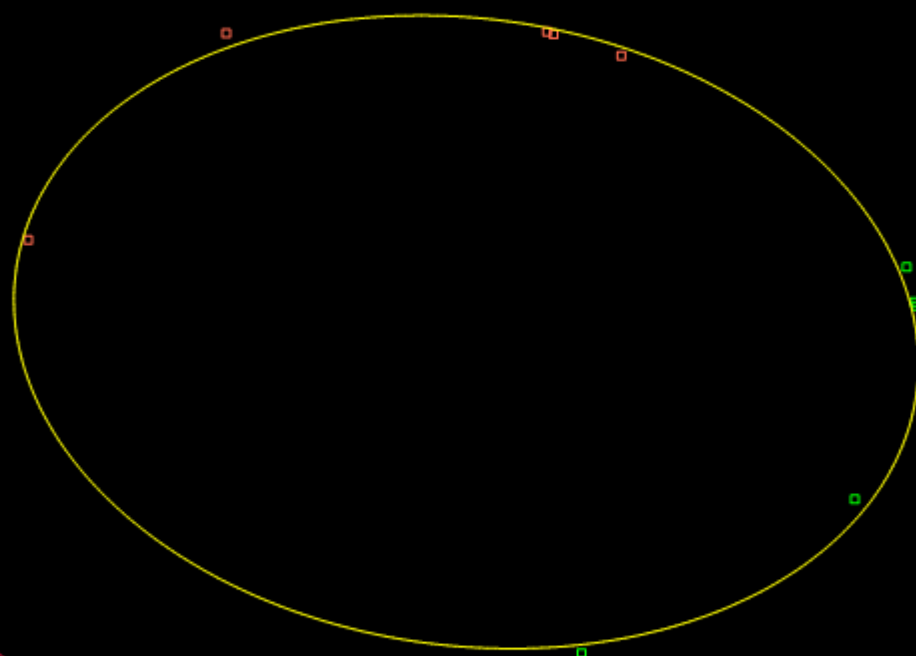


127Johanna2014Sep08

(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

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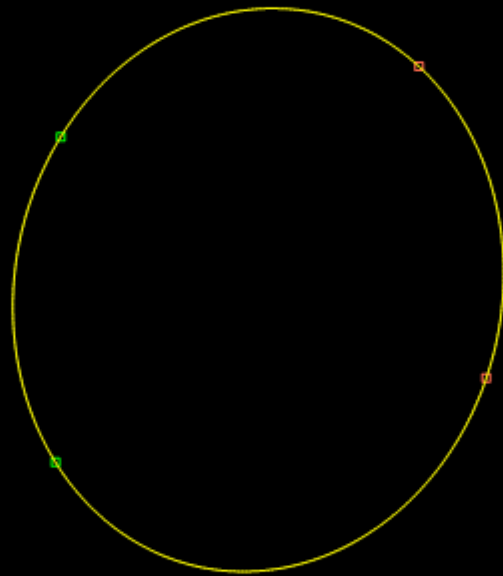


128Nemesis2009Dec04

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

N

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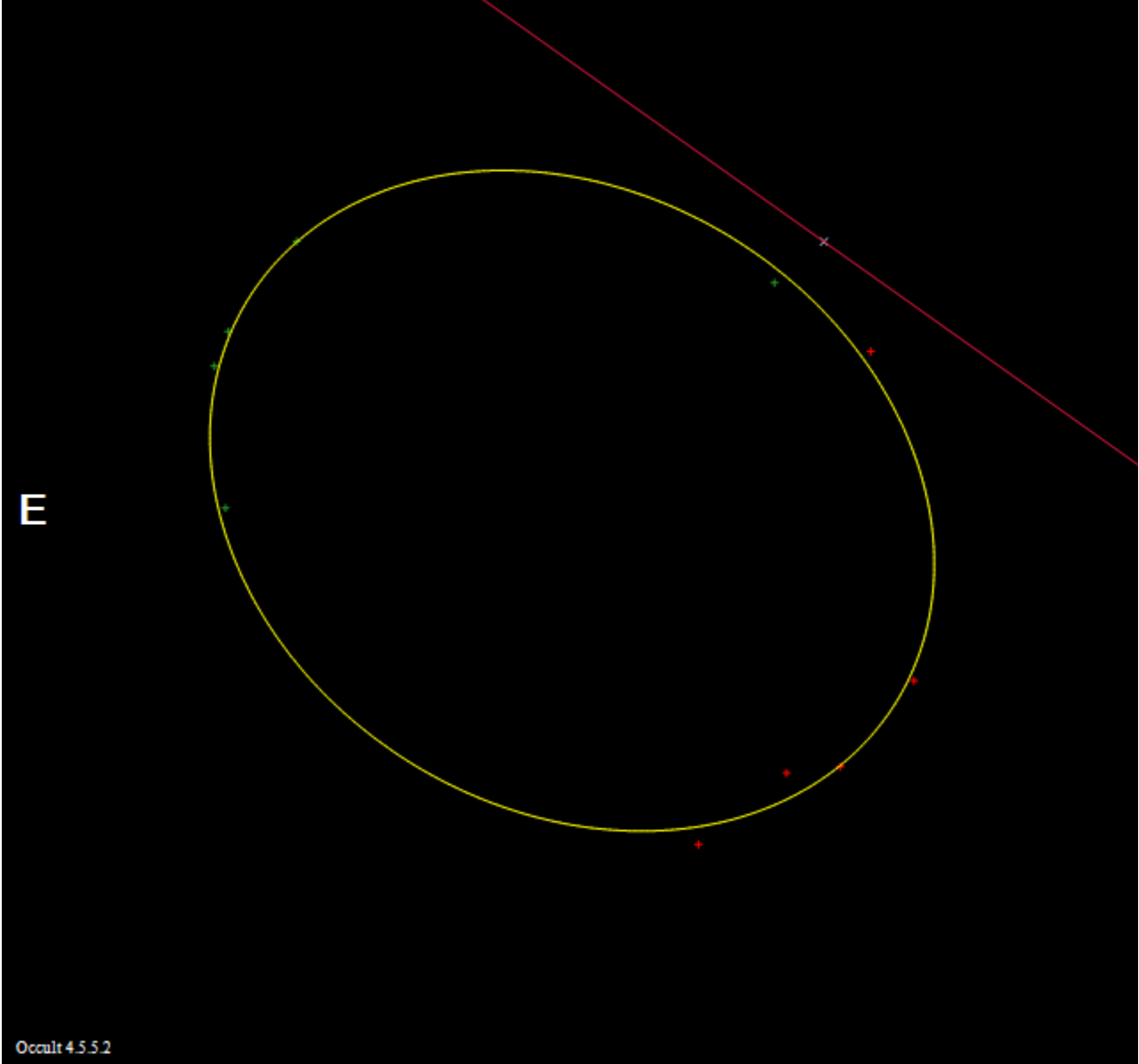
128Nemesis2012Mar30

(128) Nemesis 2012 Mar 30 $173.3 \pm 0.4 \times 152.6 \pm 1.1$ km, PA $84.5^\circ \pm 1.7^\circ$
Geocentric X -77.4 ± 0.2 Y -676.0 ± 0.3 km **N**



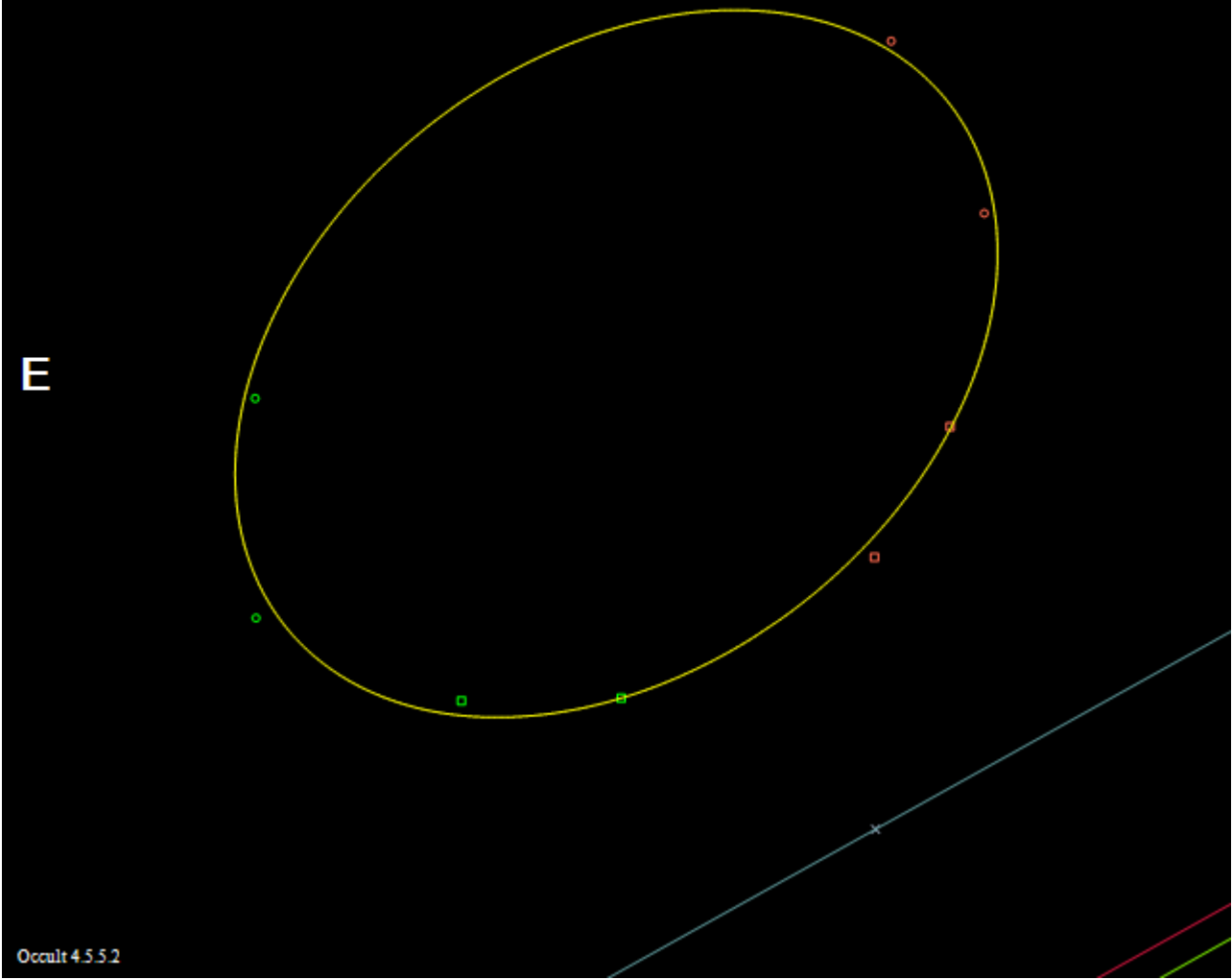
129Antigone2001Sep09

(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**



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**



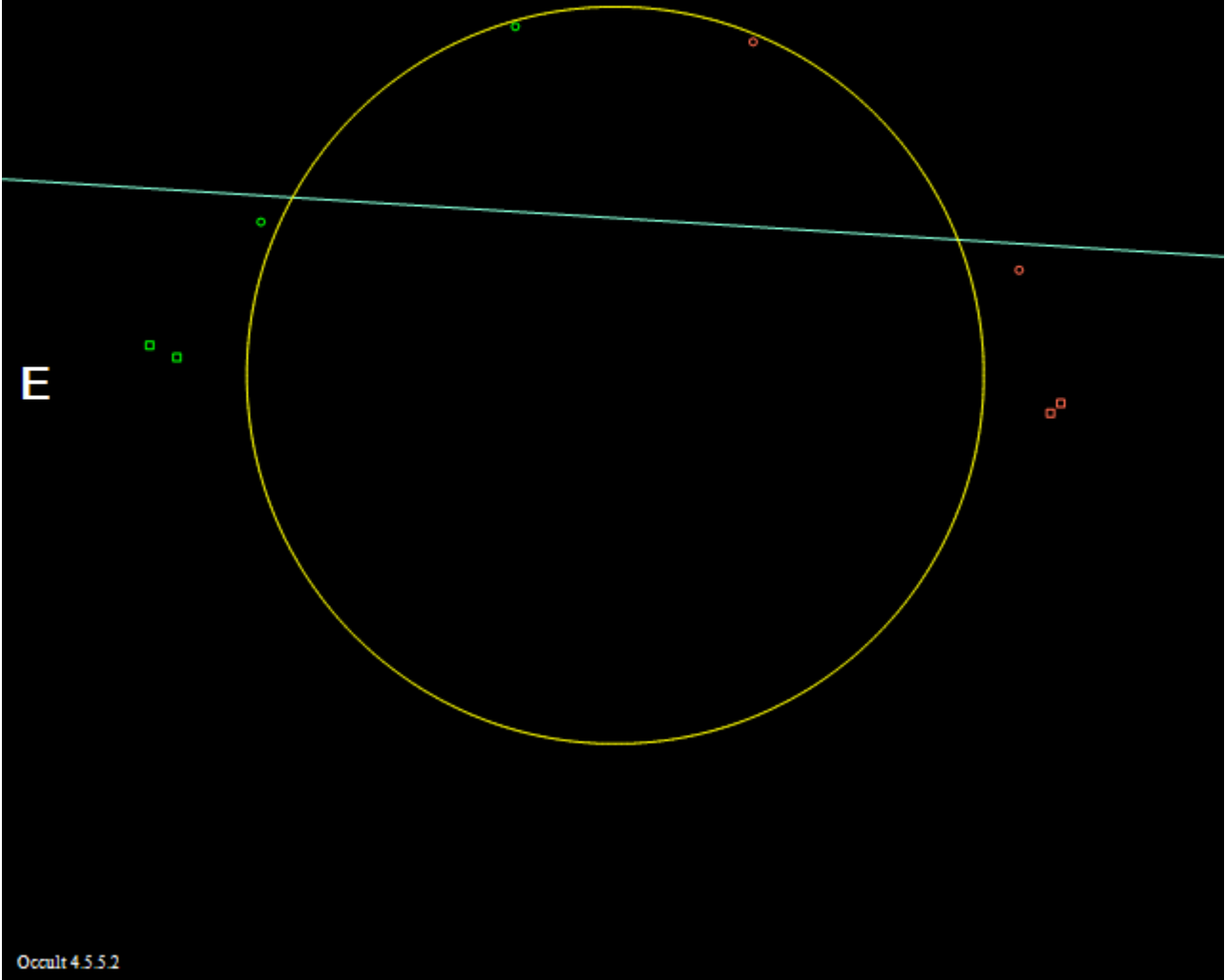
1309Hyperborea2012Nov24

(1309) Hyperborea 2012 Nov 24 $59.5 \pm 2.6 \times 52.9 \pm 3.3$ km, PA $71.0^\circ \pm 23.3^\circ$
Geocentric X 1481.8 ± 1.3 Y 3697.2 ± 1.4 km **N**



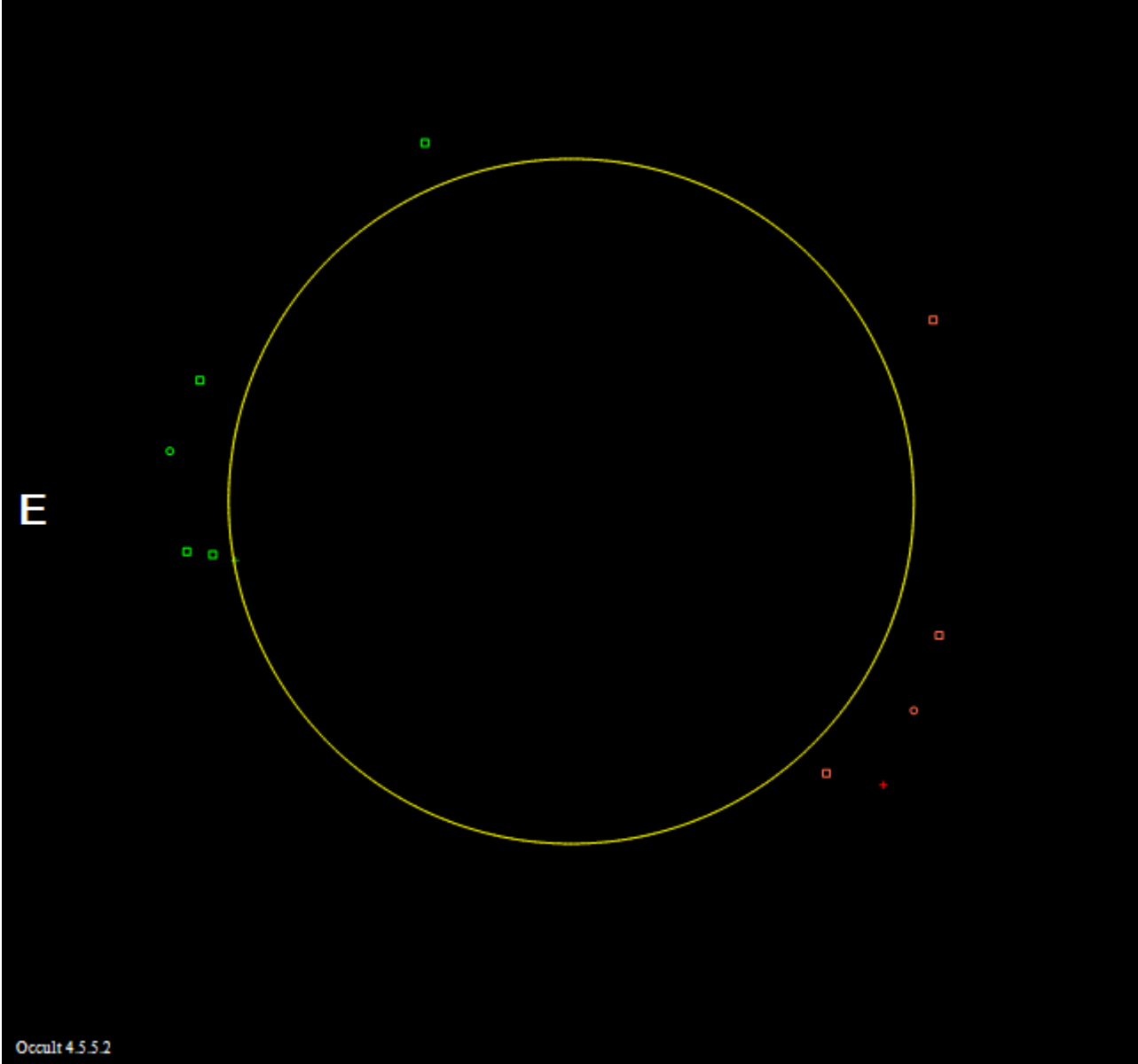
134340Plutobarycen2008Jun22

(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



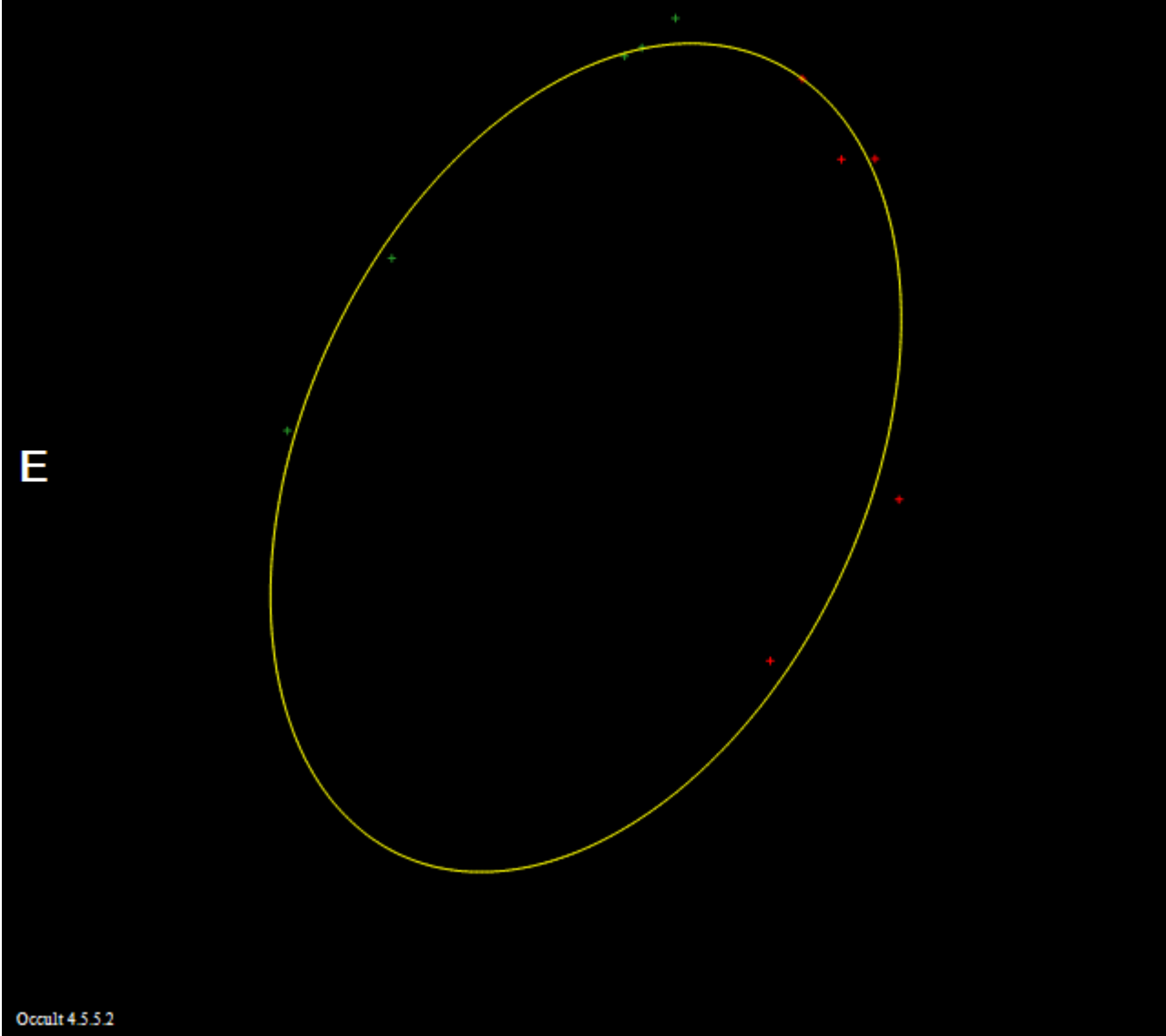
134340Plutobarycen2012Aug26

(134340) Pluto barycen 2012 Aug 26 2382.0 x 2382.0 km, PA 0.0°
Geocentric X 641.7 ± 27.3 Y -1088.6 ± 49.1 km **N**



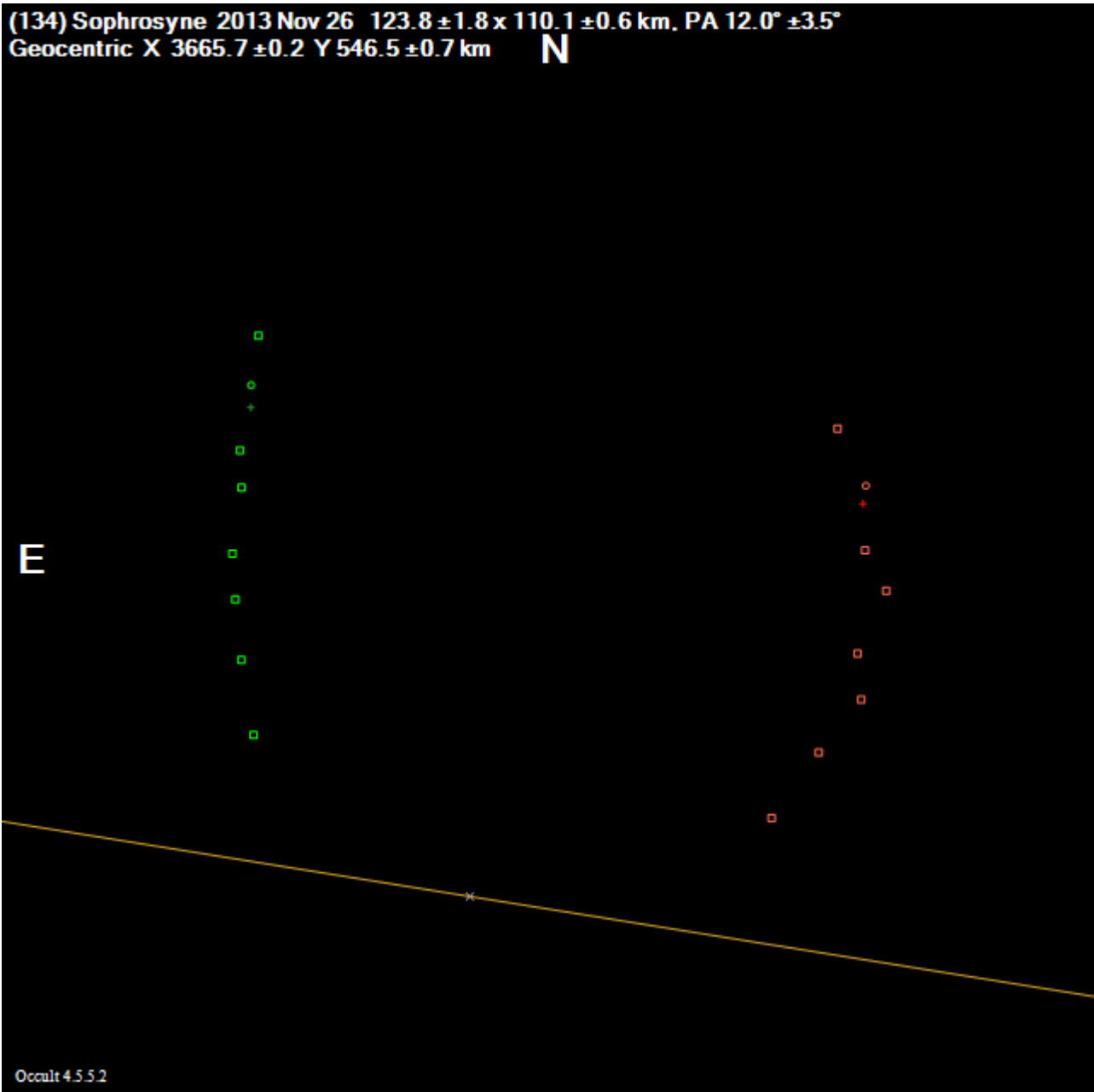
134Sophrosyne1980Nov24

(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**



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 **N**

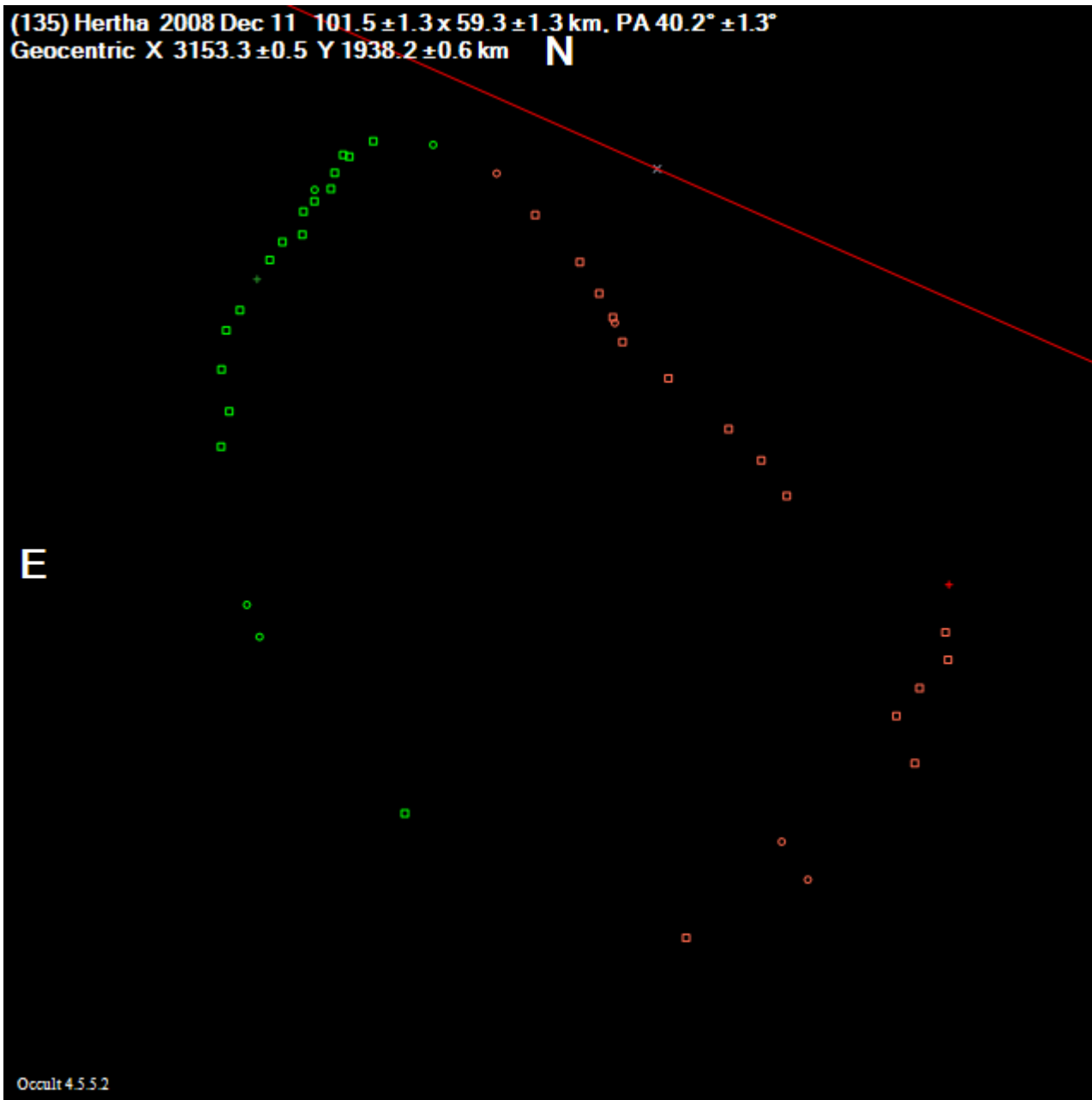


135Hertha2008Dec11

(135) Hertha 2008 Dec 11 $101.5 \pm 1.3 \times 59.3 \pm 1.3$ km, PA $40.2^\circ \pm 1.3^\circ$
Geocentric X 3153.3 ± 0.5 Y 1938.2 ± 0.6 km

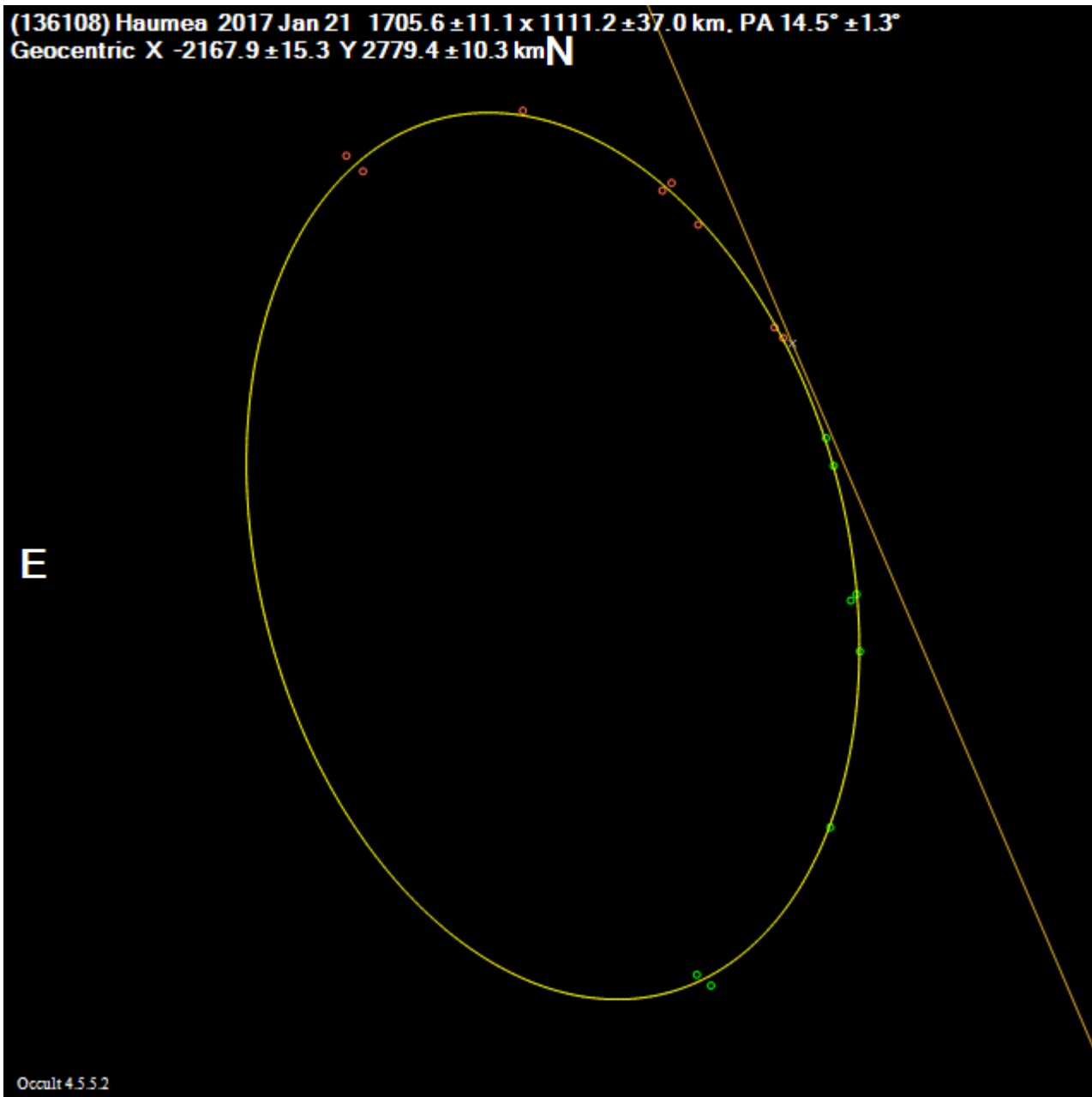
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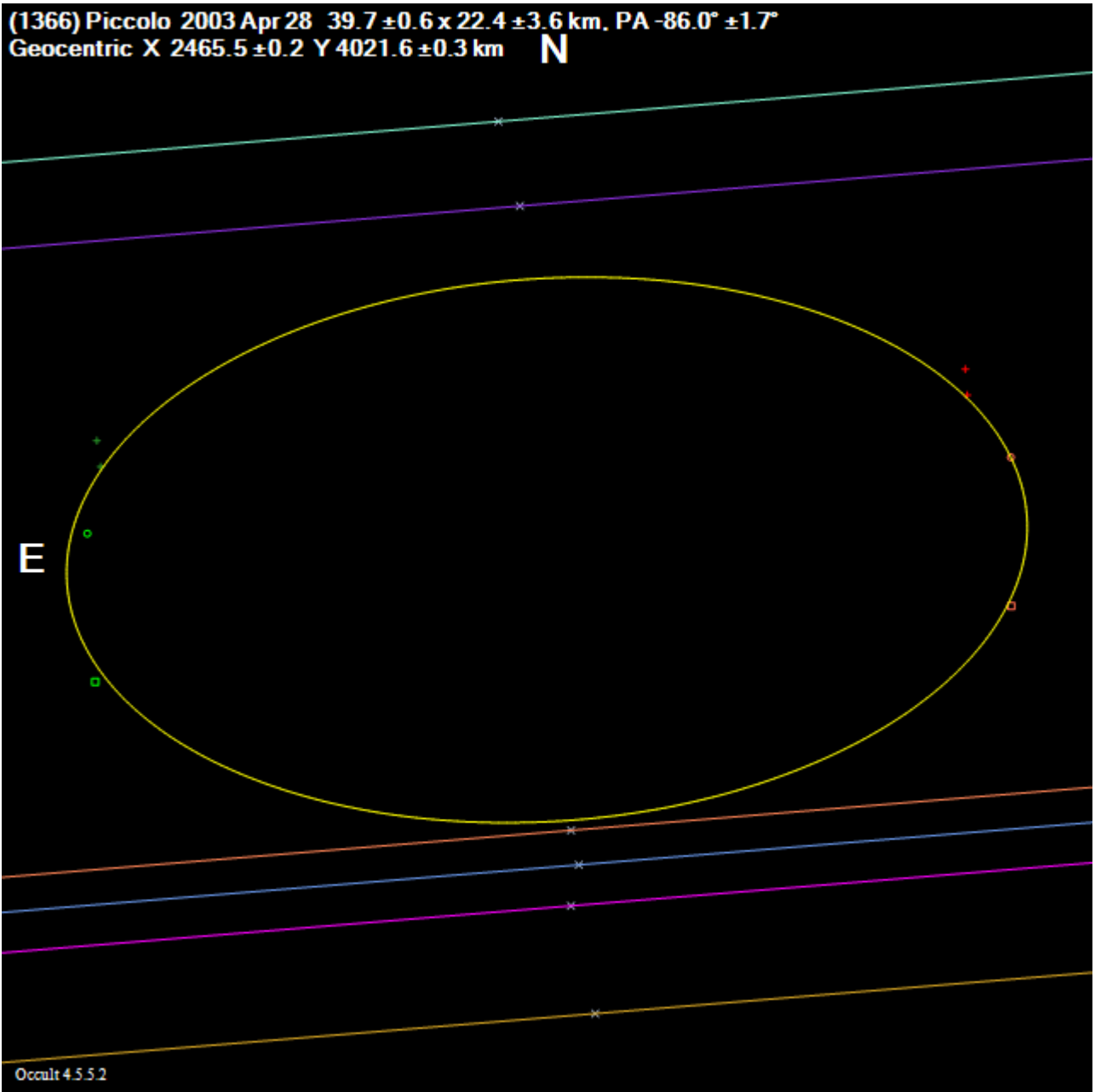
136108Haumea2017Jan21

(136108) Haumea 2017 Jan 21 $1705.6 \pm 11.1 \times 1111.2 \pm 37.0$ km, PA $14.5^\circ \pm 1.3^\circ$
Geocentric X -2167.9 ± 15.3 Y 2779.4 ± 10.3 km



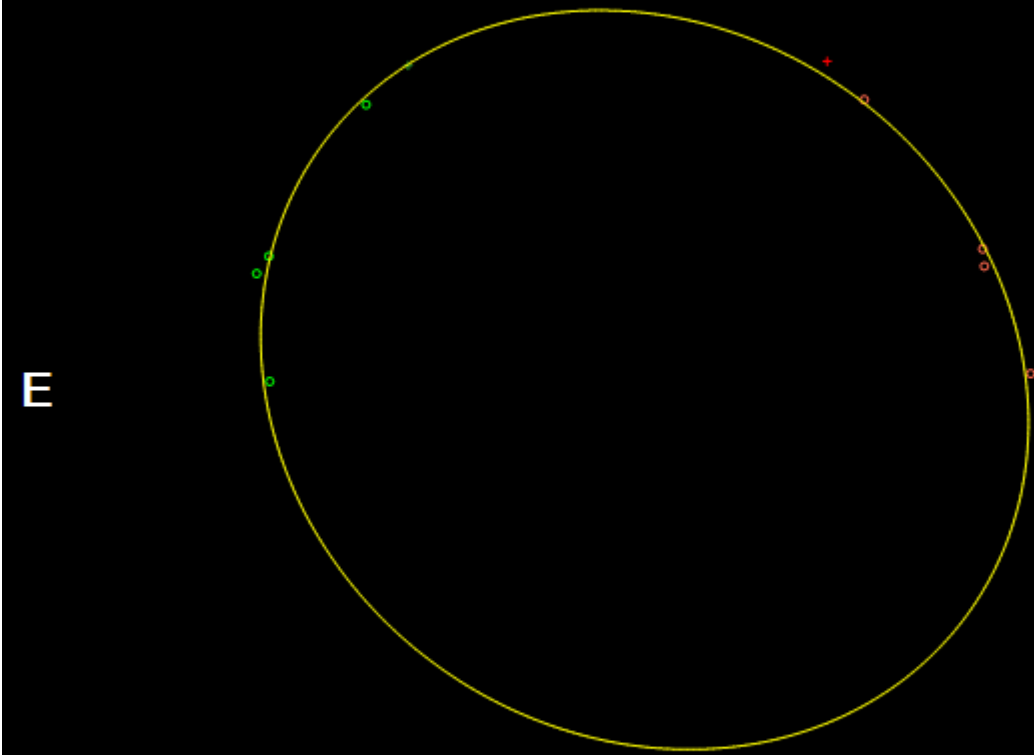
1366Piccolo2003Apr28

(1366) Piccolo 2003 Apr 28 $39.7 \pm 0.6 \times 22.4 \pm 3.6$ km, PA $-86.0^\circ \pm 1.7^\circ$
Geocentric X 2465.5 ± 0.2 Y 4021.6 ± 0.3 km **N**



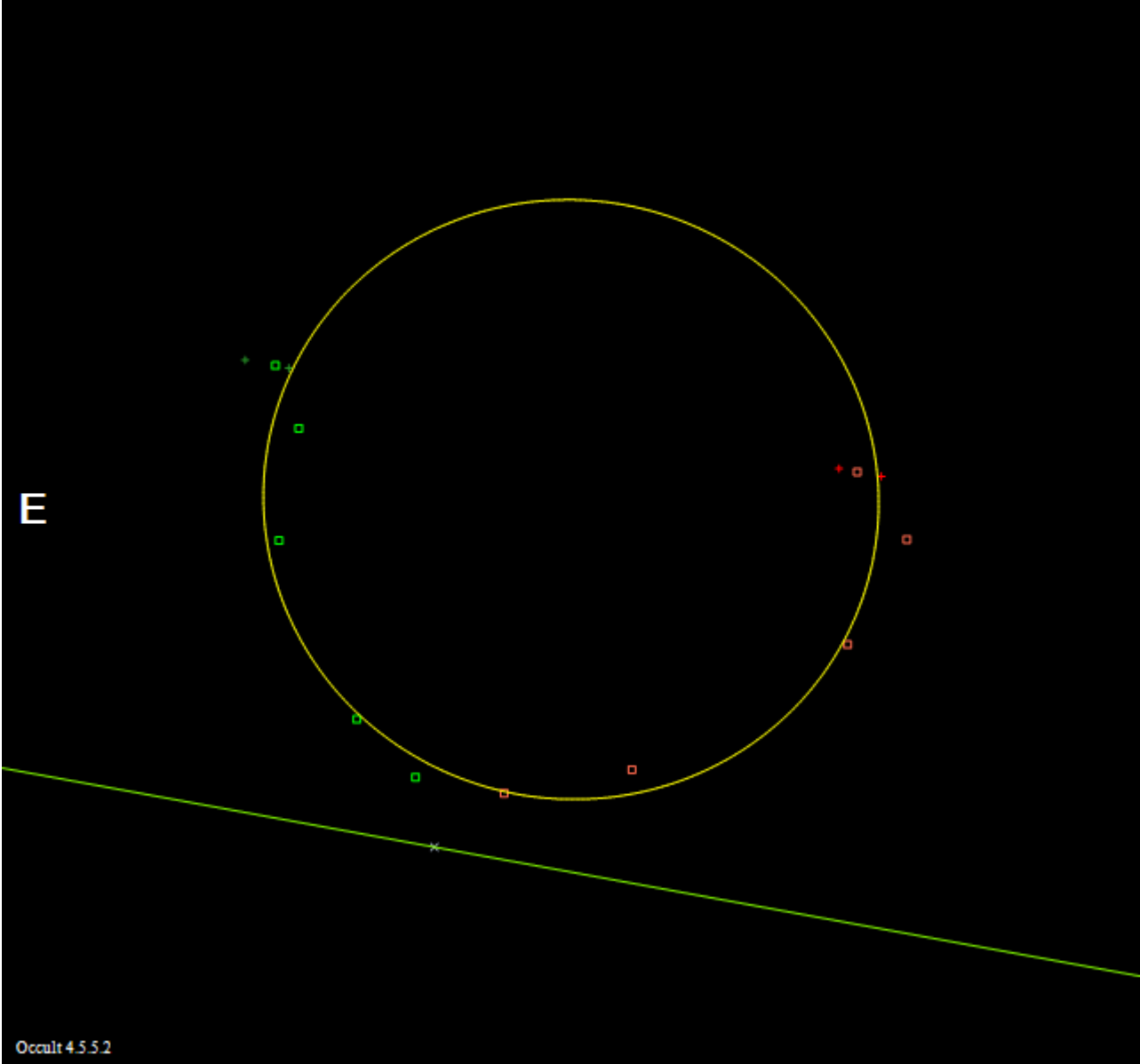
139Juewa2002Apr20

(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**



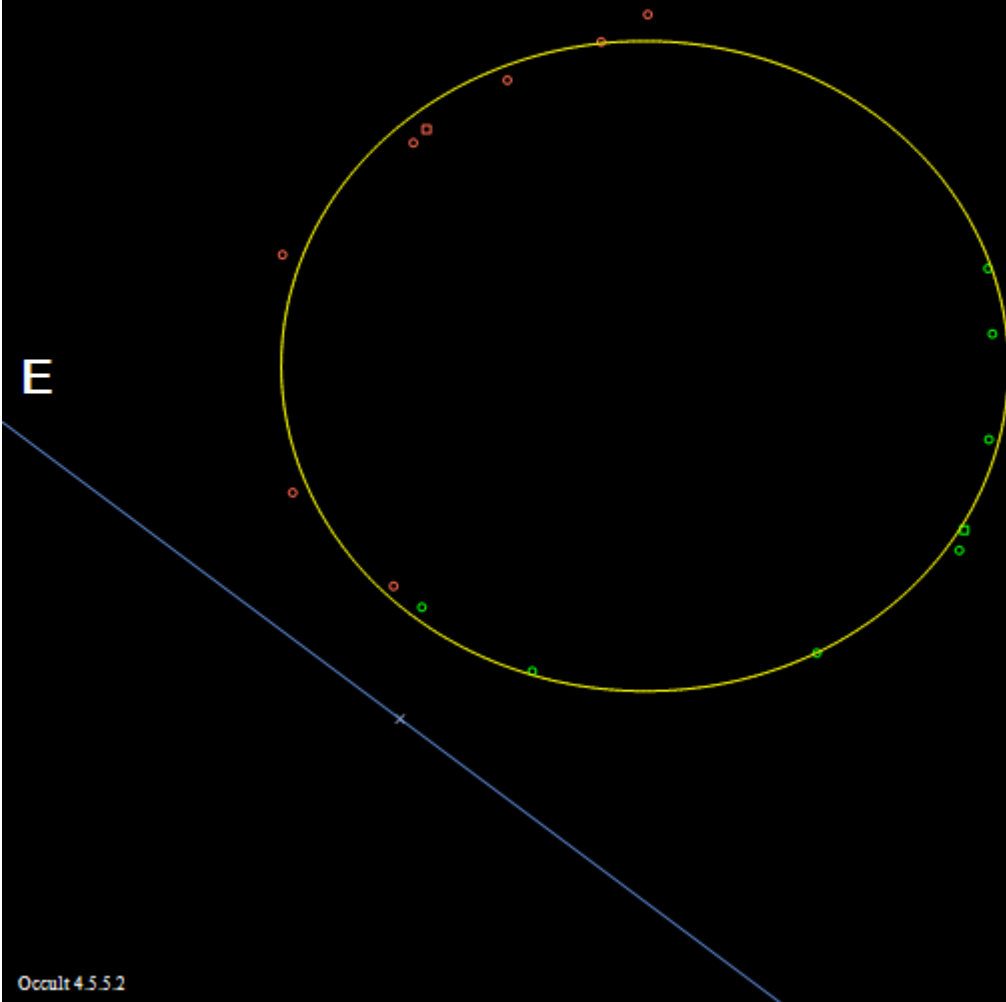
139Juewa2013Aug31

(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**



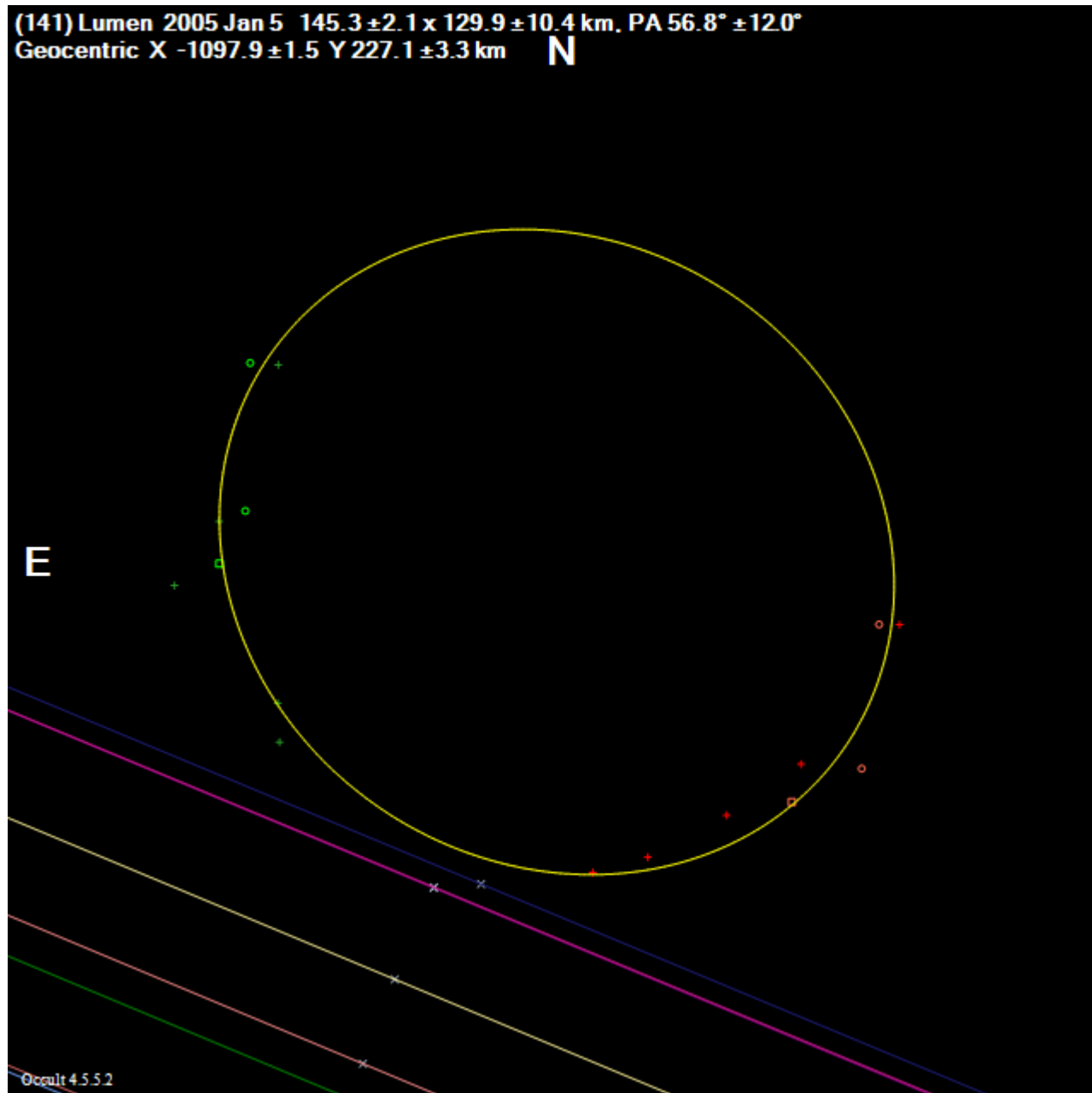
13Egeria2008Jan22

(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**



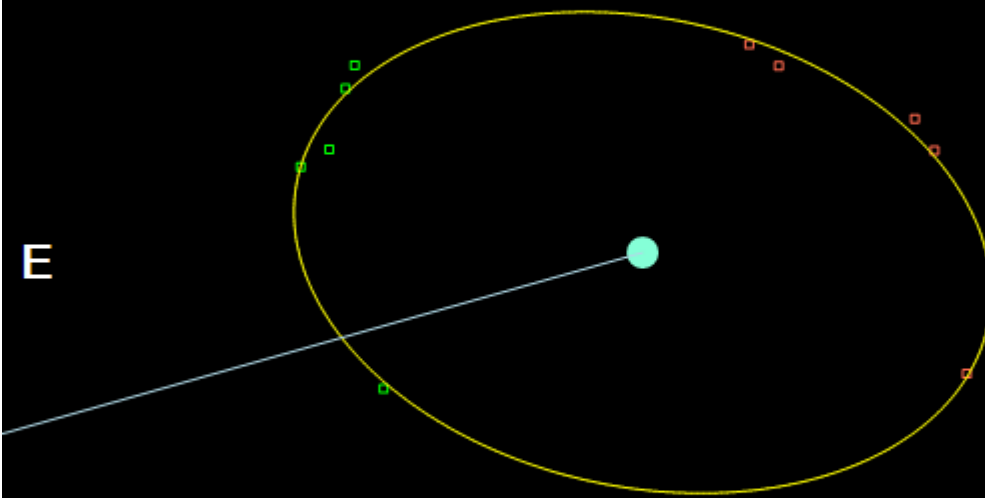
141Lumen2005Jan05

(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**



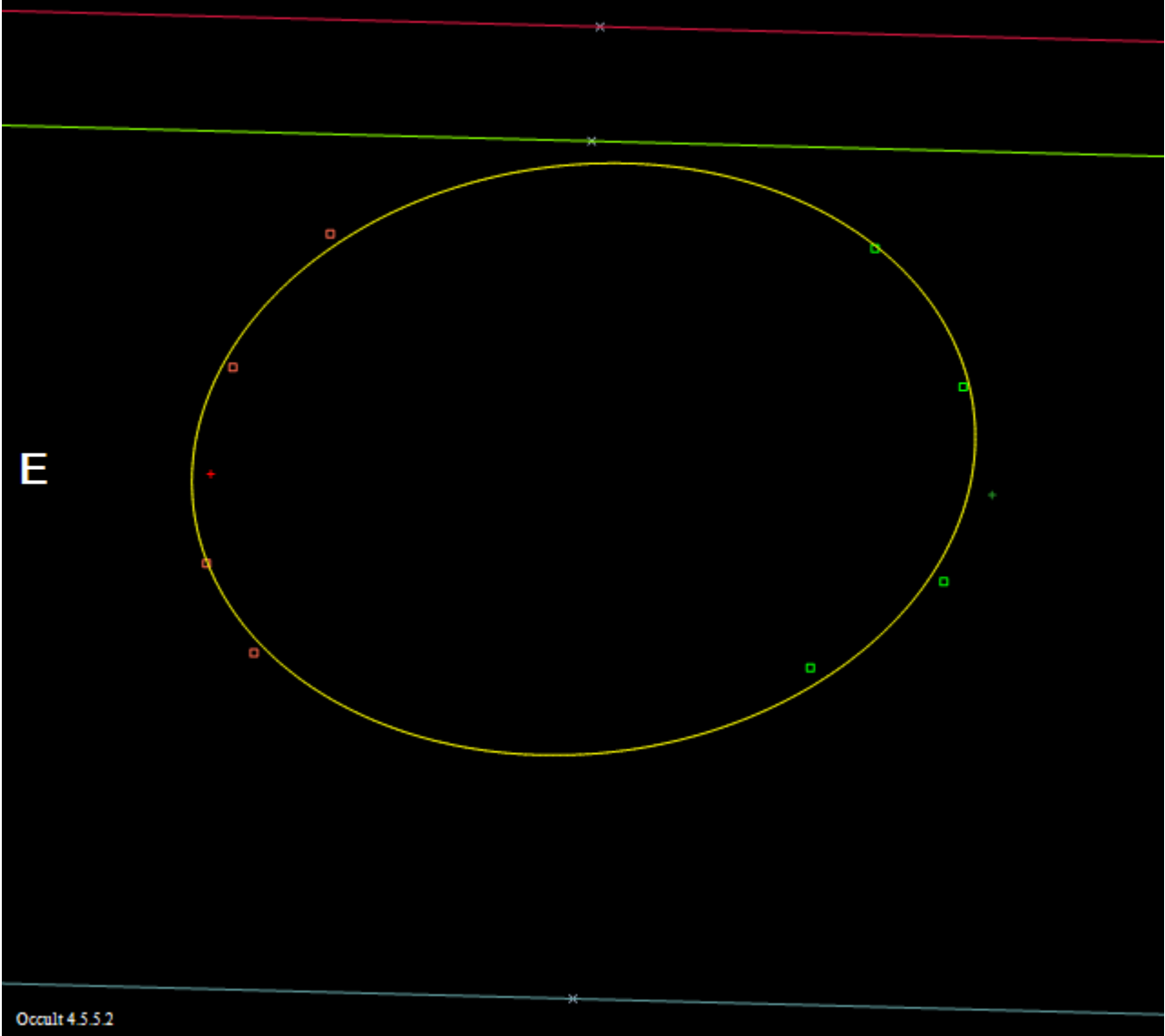
141Lumen2013Dec28

(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 **N**
Double : Sep $0.1529 \pm 0.0016''$, PA $105.8^\circ \pm 1.3^\circ$



144Vibilia2006Sep15

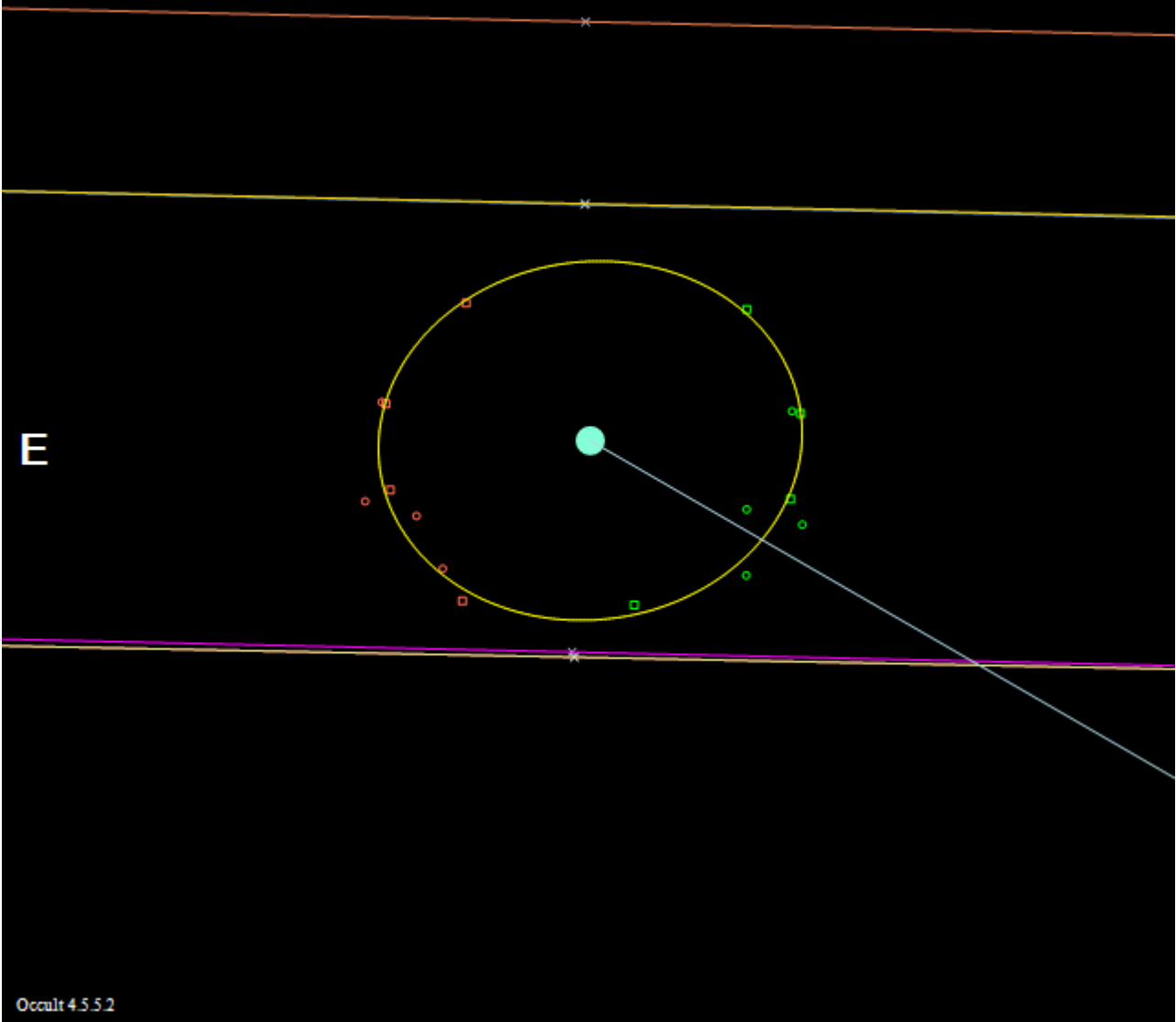
(144) Vibilia 2006 Sep 15 $119.8 \pm 2.9 \times 160.1 \pm 1.6$ km, PA $7.4^\circ \pm 1.9^\circ$
Geocentric X -4749.0 ± 0.6 Y 2700.3 ± 0.7 km **N**



Occult 4.5.5.2

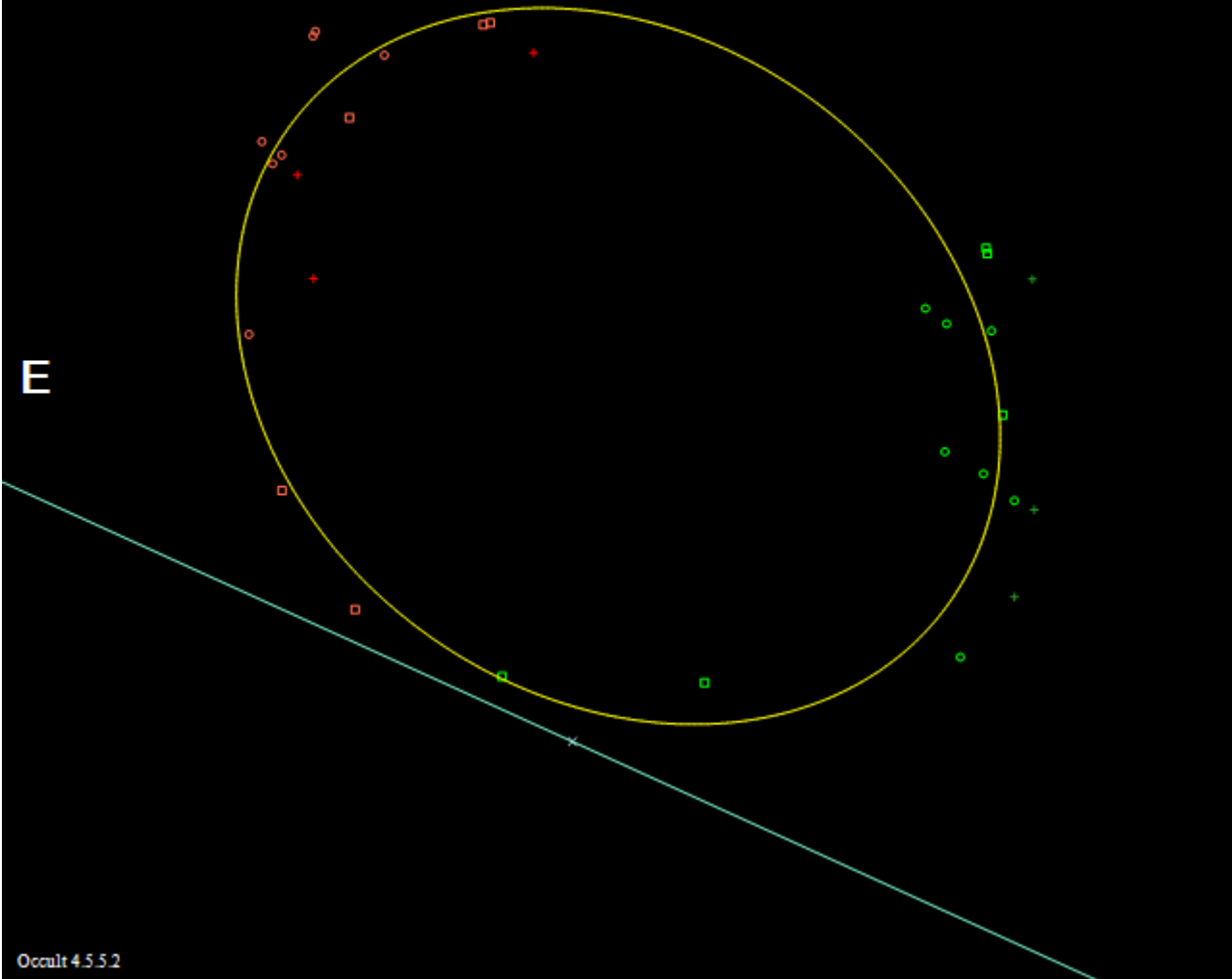
144Vibilia2006Sep19

(144) Vibilia 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 $240.0^\circ \pm 0.5^\circ$



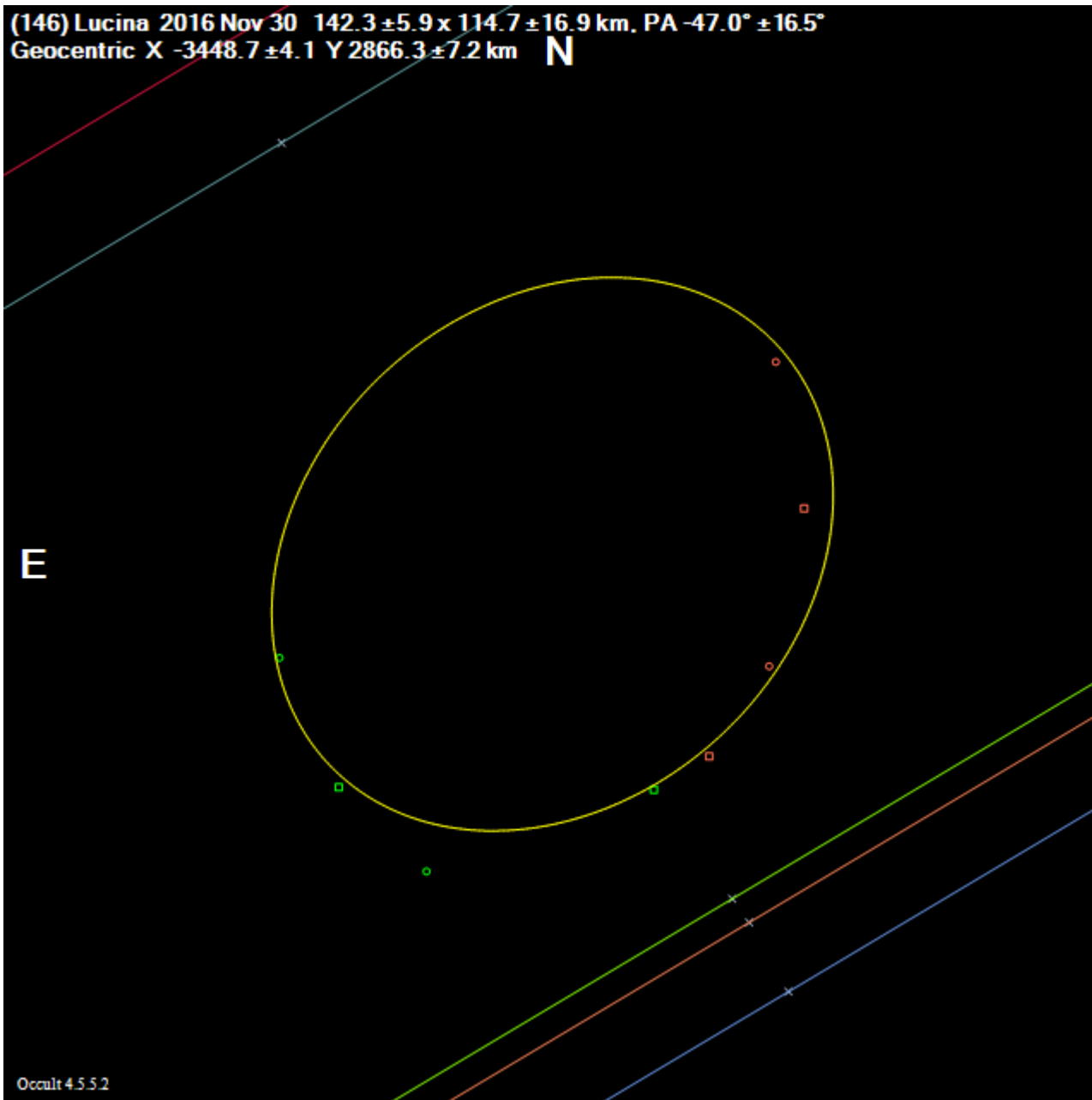
144Vibilia2011Jan25

(144) Vibilia 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**



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**



1512Oulu2002May07

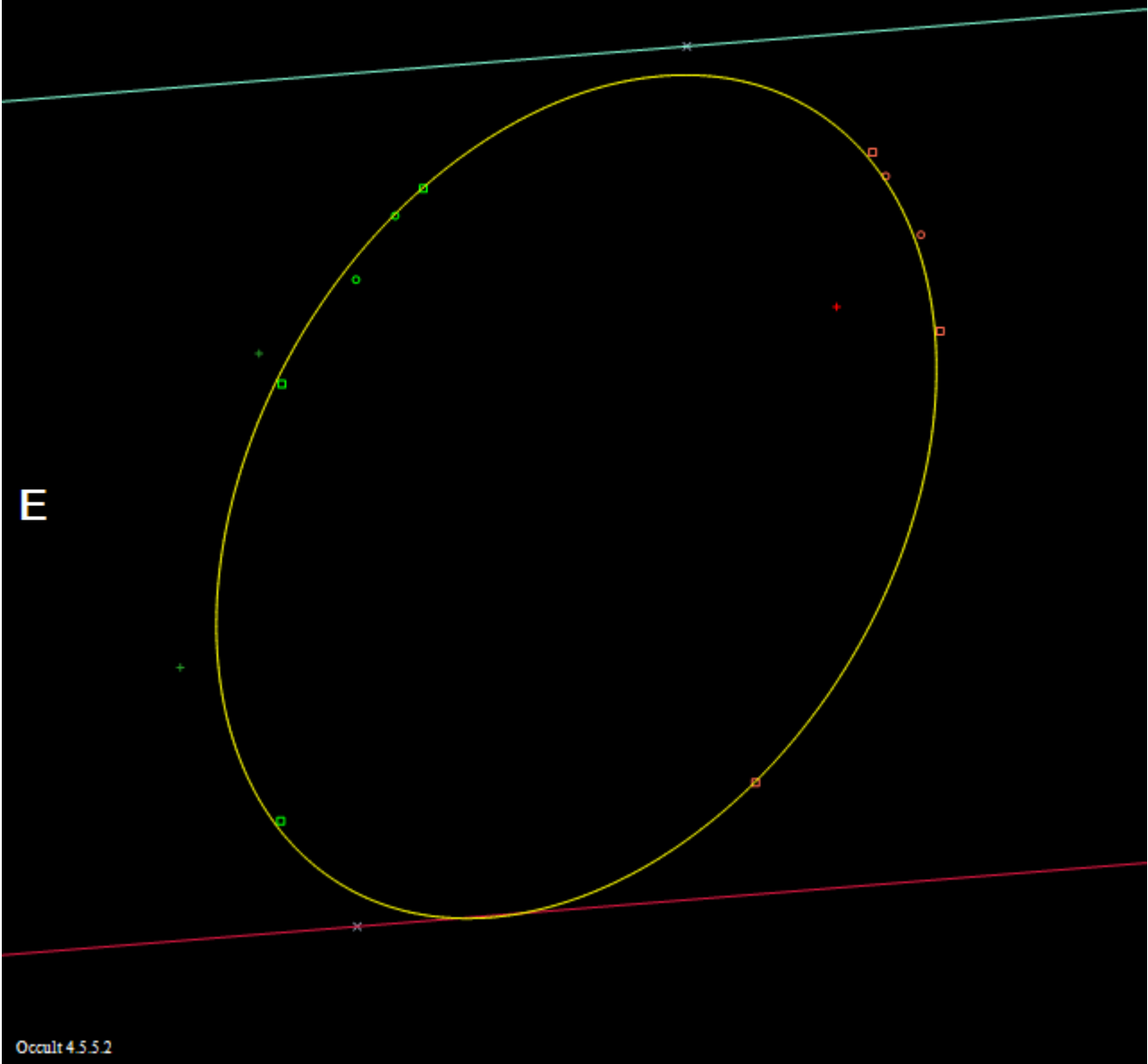
(1512) Oulu 2002 May 7 $85.9 \pm 0.9 \times 49.1 \pm 2.5$ km, PA $86.3^\circ \pm 1.4^\circ$
Geocentric X -1174.8 ± 0.5 Y -1031.3 ± 1.0 km **N**

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152Atala2006May07

(152) Atala 2006 May 7 $79.2 \pm 2.5 \times 55.7 \pm 1.4$ km, PA $-31.2^\circ \pm 5.0^\circ$
Geocentric X -760.9 ± 0.6 Y 4944.3 ± 0.8 km **N**



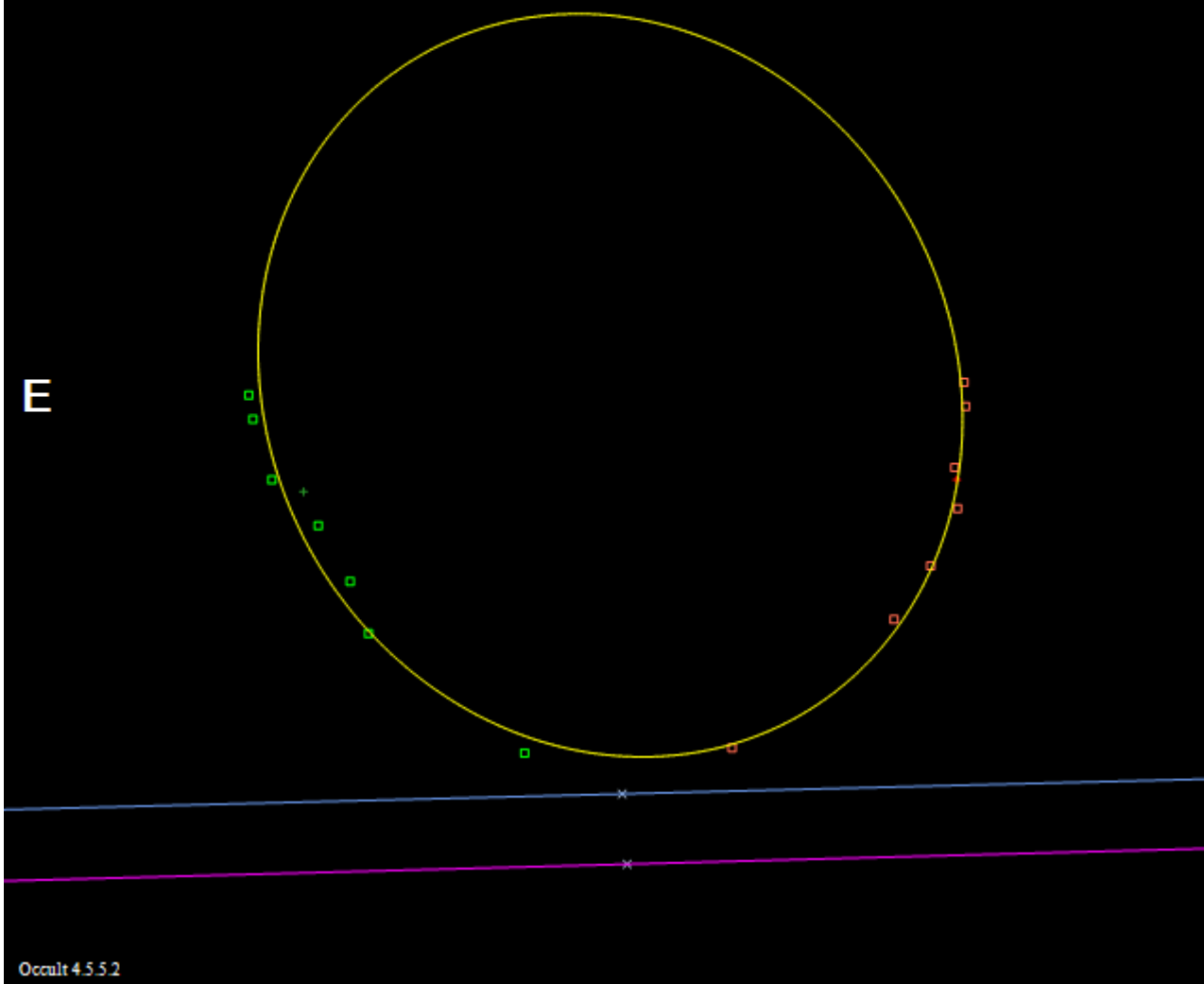
153Hilda2007Jul20

(153) Hilda 2007 Jul 20 $186.5 \pm 7.1 \times 146.2 \pm 1.7$ km, PA $11.3^\circ \pm 2.4^\circ$
Geocentric X 2194.6 ± 0.7 Y 5455.2 ± 2.1 km **N**



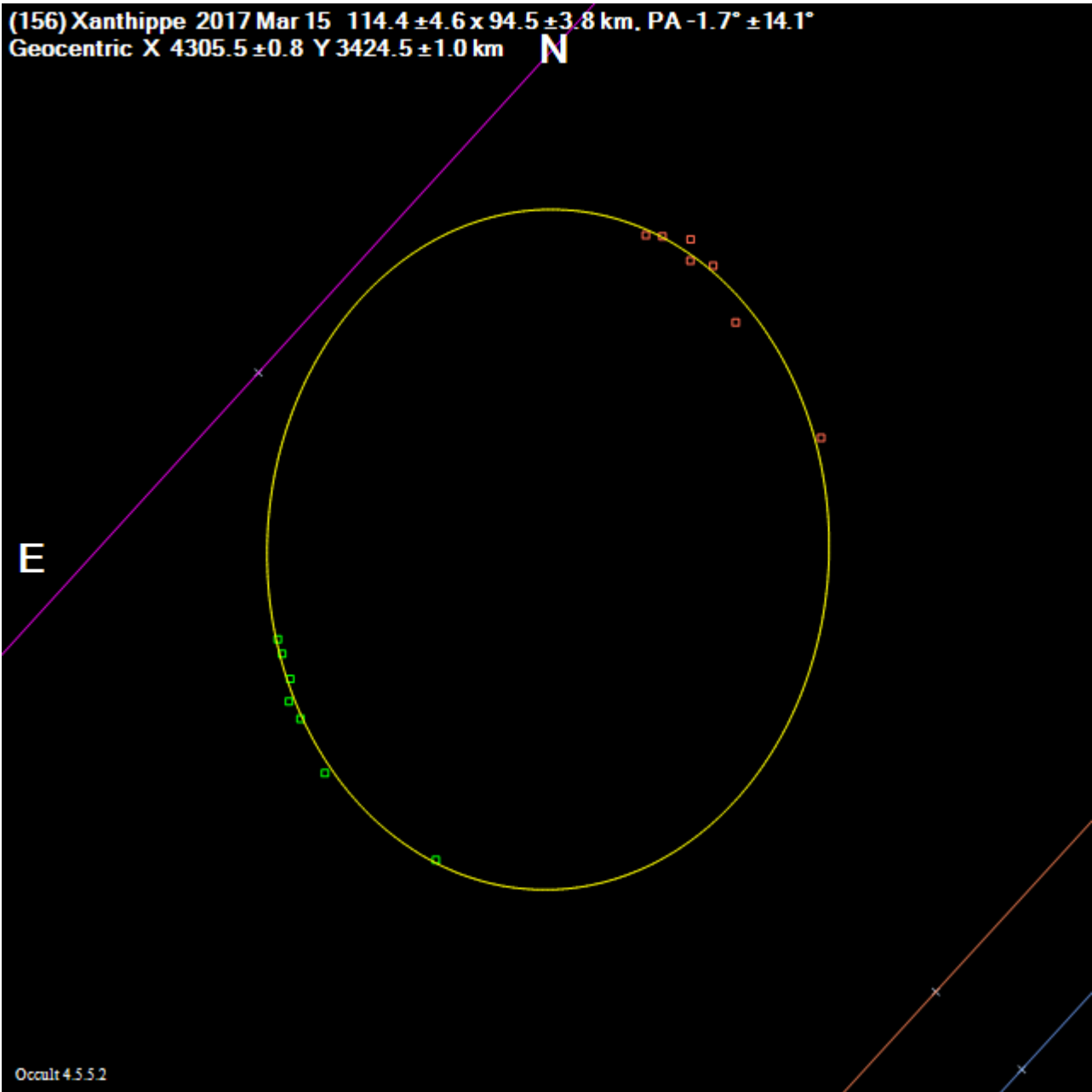
154Bertha2017Oct23

(154) Bertha 2017 Oct 23 197.0 x 177.2 ± 3.7 km, PA 29.9° ± 9.5°
Geocentric X 3033.0 ± 1.1 Y 3650.6 ± 2.1 km N



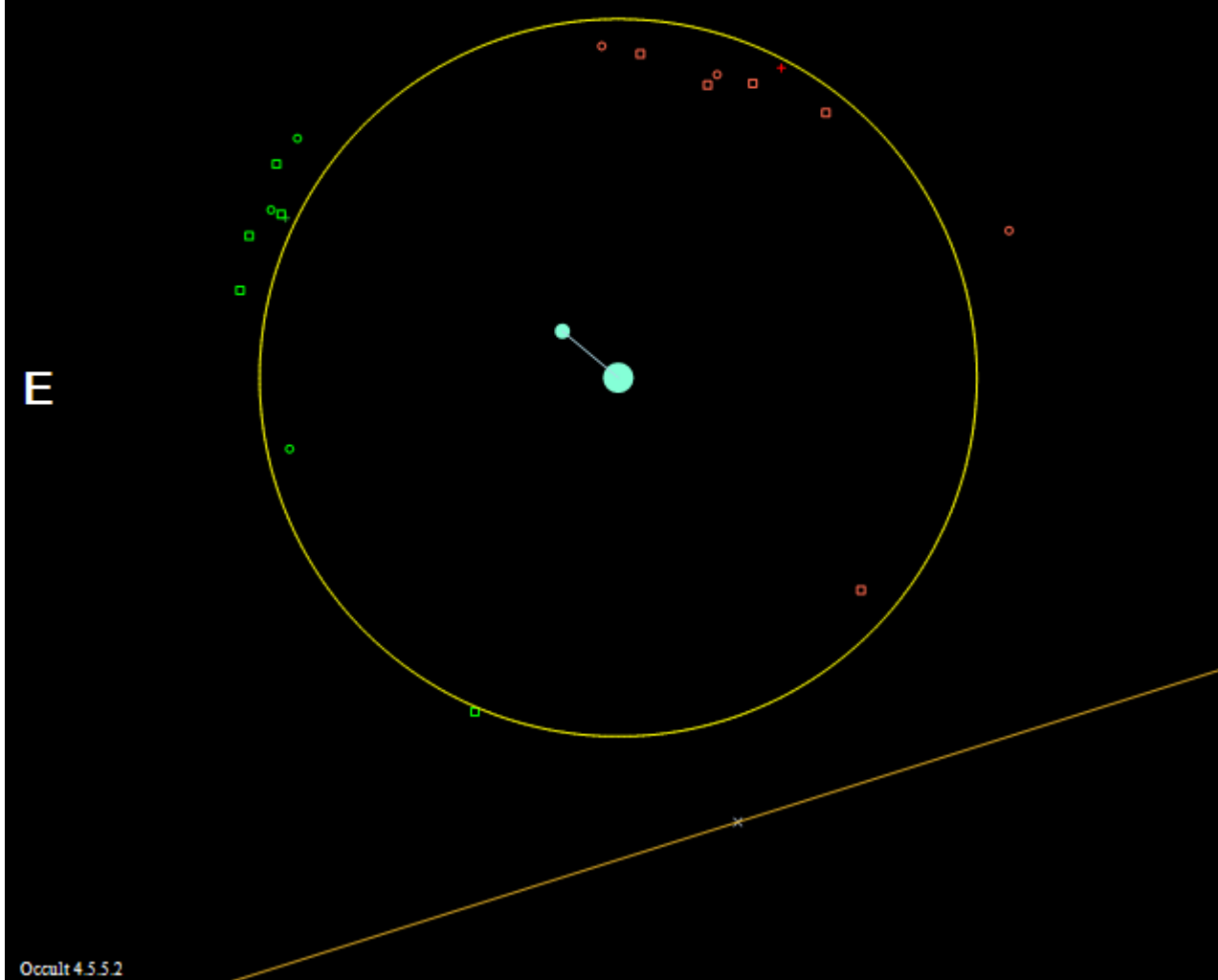
156Xanthippe2017Mar15

(156) Xanthippe 2017 Mar 15 $114.4 \pm 4.6 \times 94.5 \pm 3.8$ km, PA $-1.7^\circ \pm 14.1^\circ$
Geocentric X 4305.5 ± 0.8 Y 3424.5 ± 1.0 km



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 $50.2^\circ \pm 23.3^\circ$



1645Waterfield2002May20

(1645) Waterfield 2002 May 20 30.0 x 30.0 km, PA 0.0°
Geocentric X 1138.5 Y -524.0 km

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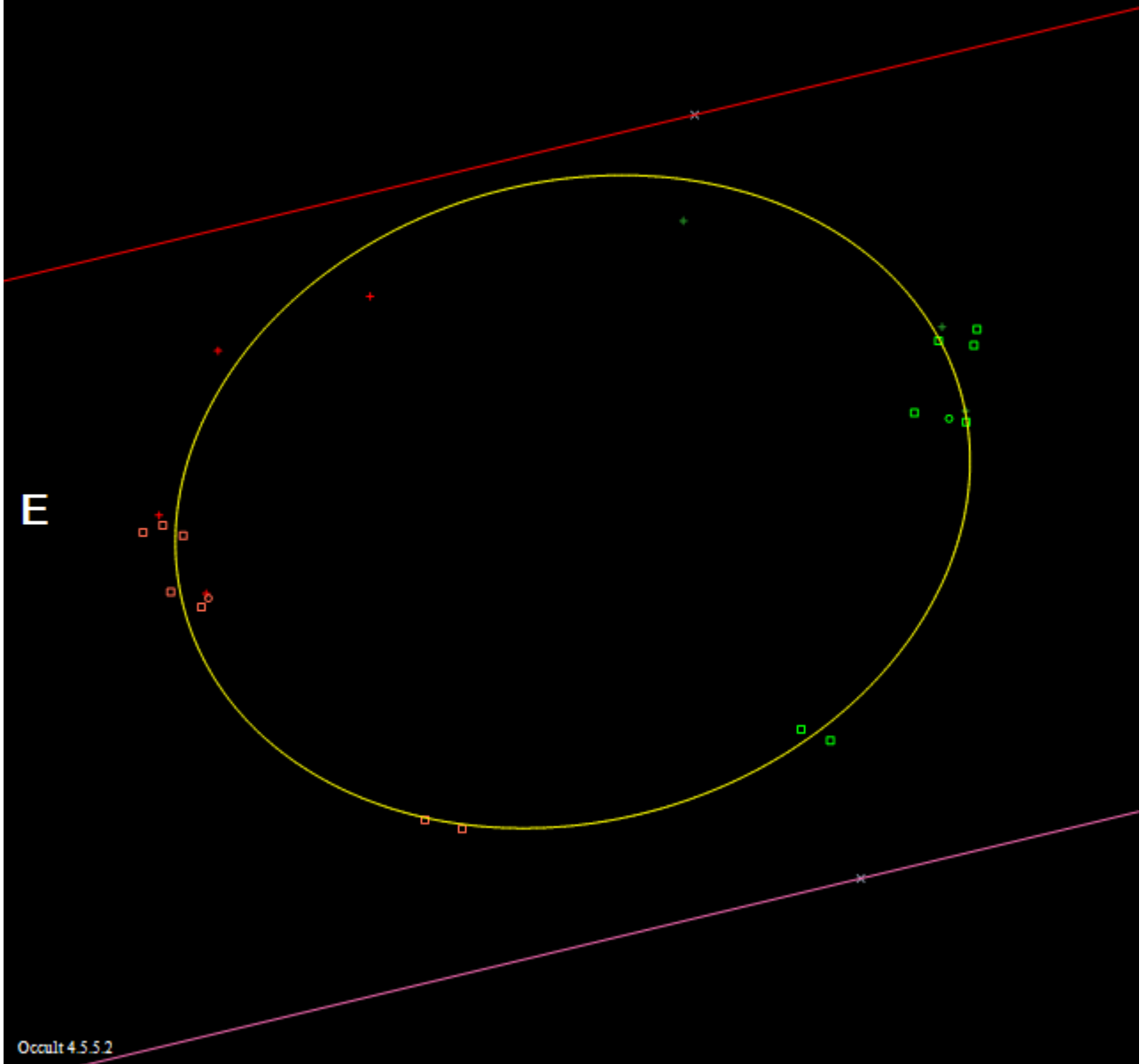
165Loreley2009Jun29

(165) Loreley 2009 Jun 29 $208.3 \pm 3.1 \times 167.2 \pm 1.1$ km, PA $45.1^\circ \pm 3.2^\circ$
Geocentric X -4674.6 ± 1.2 Y 3743.6 ± 0.6 km **N**



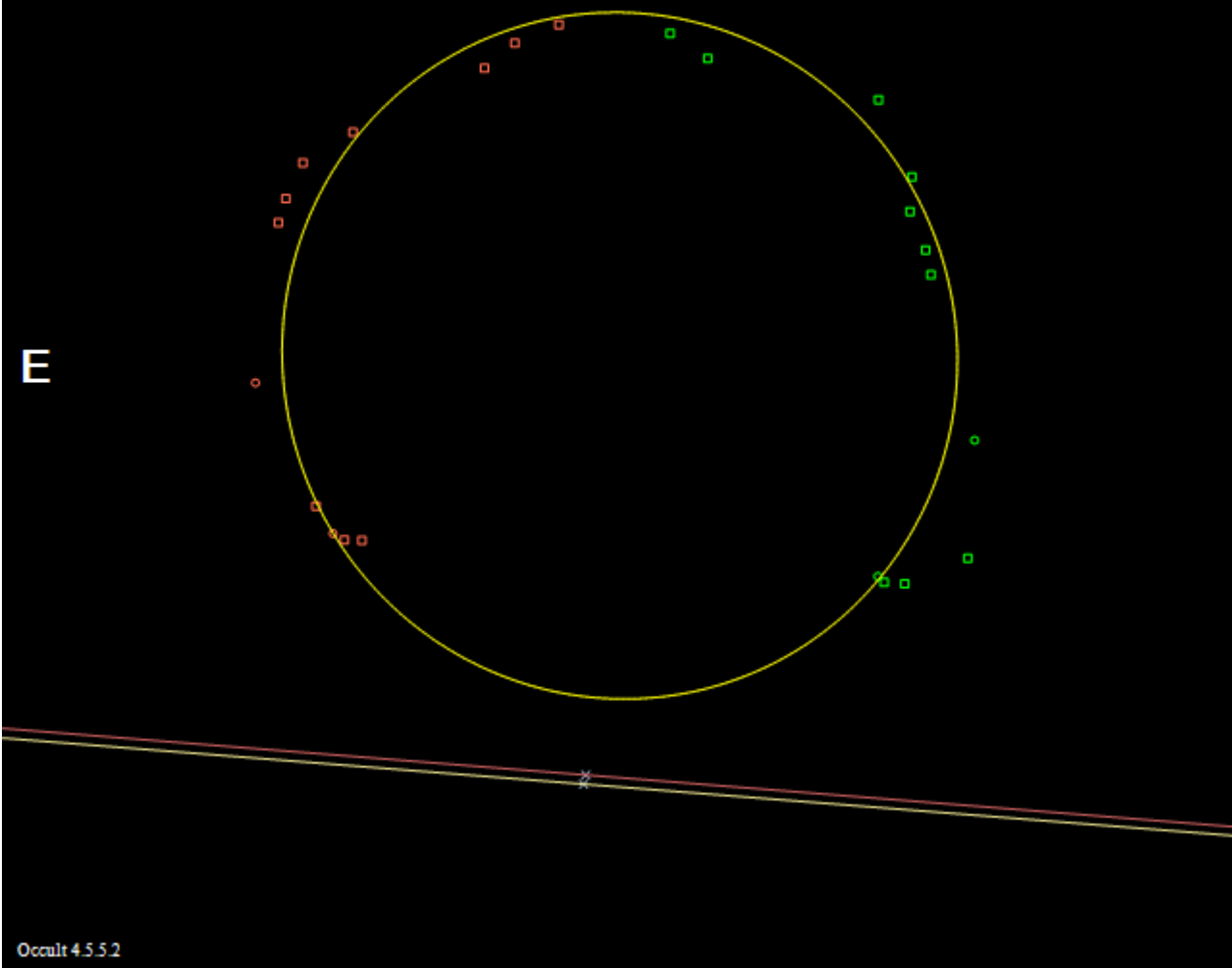
166Rhodope2005Oct19

(166) Rhodope 2005 Oct 19 $63.9 \pm 0.6 \times 50.6 \pm 1.5$ km, PA $-73.9^\circ \pm 4.0^\circ$
Geocentric X -4576.5 ± 0.3 Y 3412.4 ± 0.6 km **N**



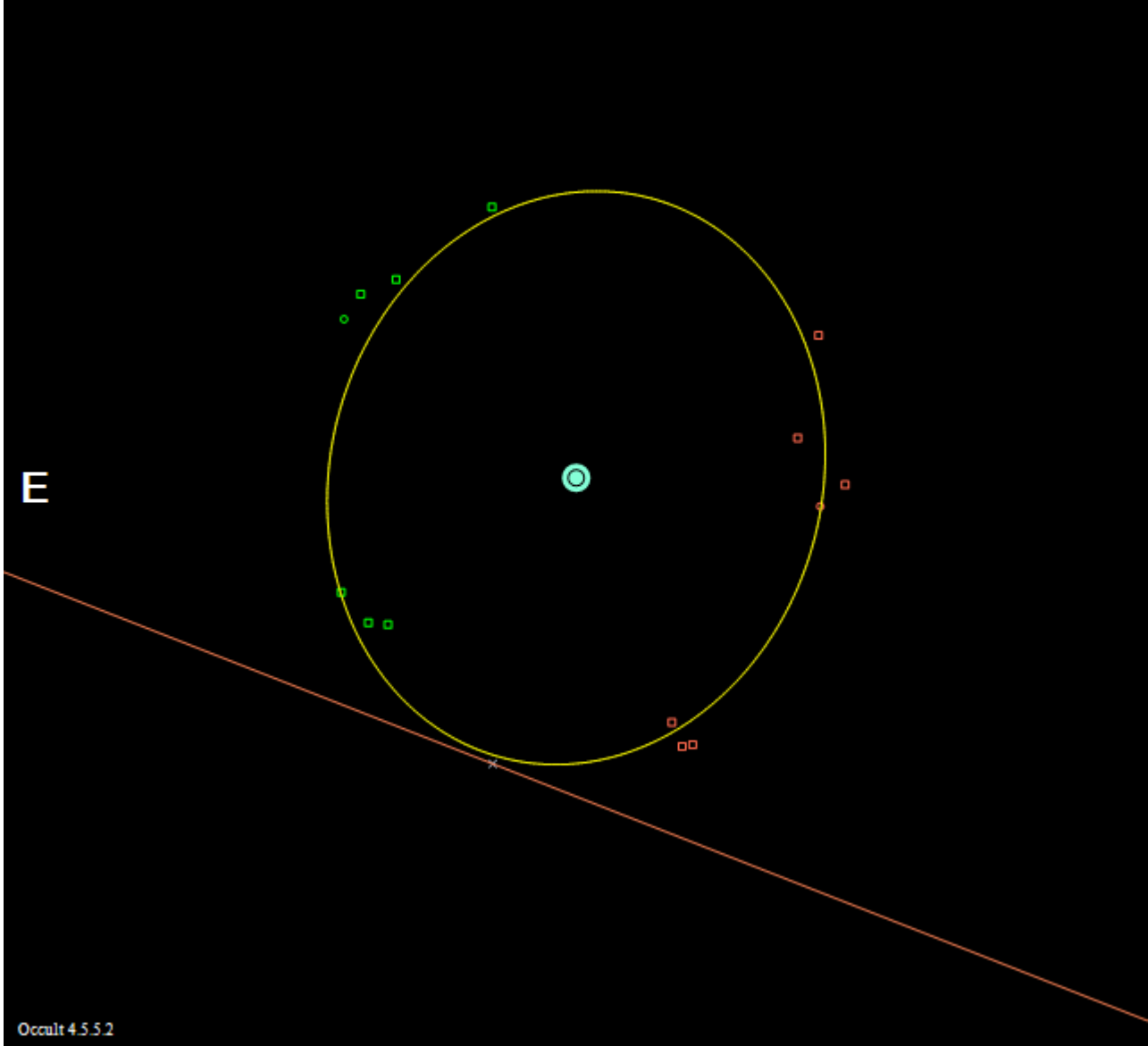
16Psyche2010Aug21

(16) Psyche 2010 Aug 21 $235.4 \pm 3.9 \times 230.4 \pm 2.4$ km, PA $19.1^\circ \pm 31.1^\circ$
Geocentric X -2646.1 ± 1.0 Y 2287.8 ± 1.6 km **N**



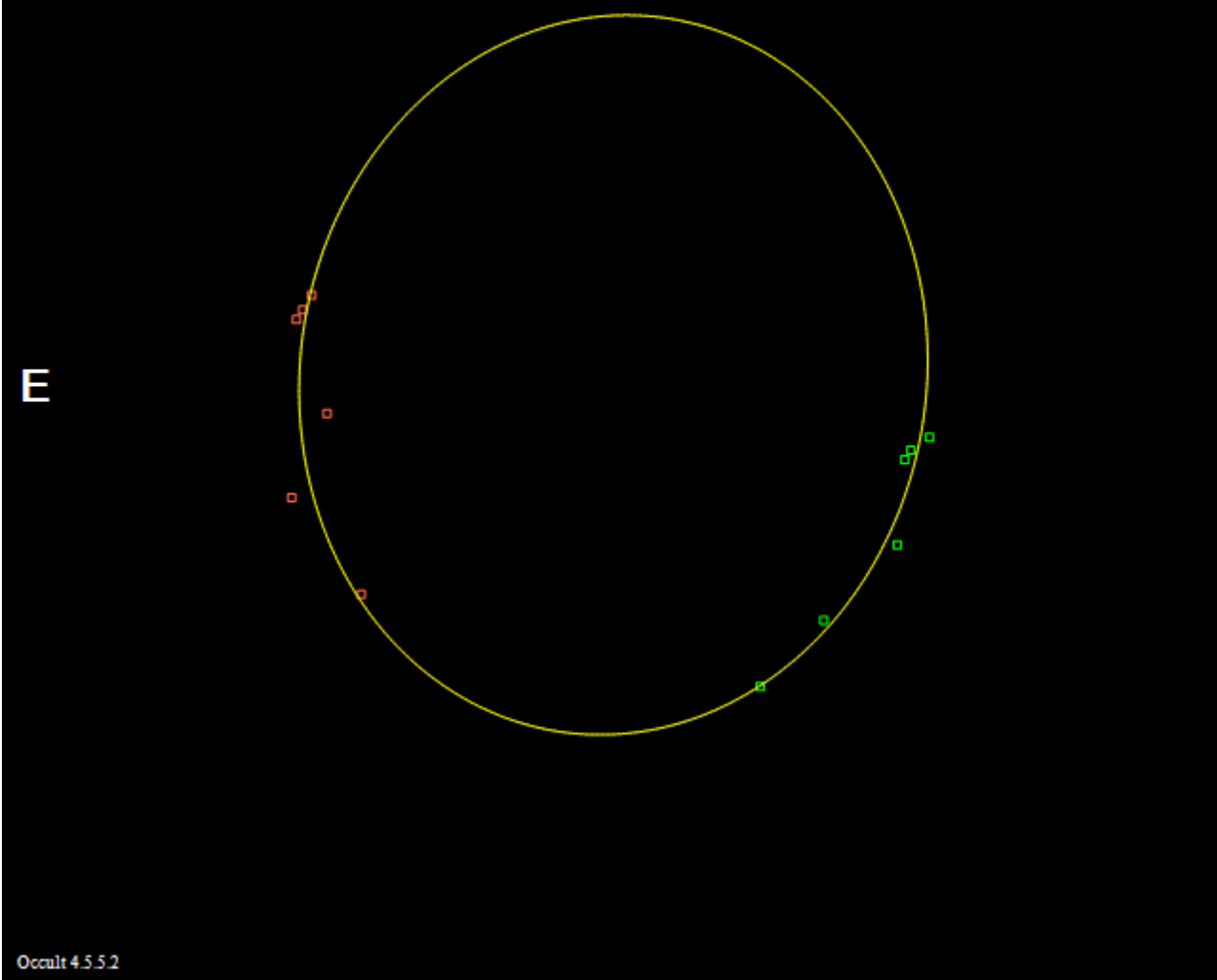
16Psyche2014Jul22

(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°



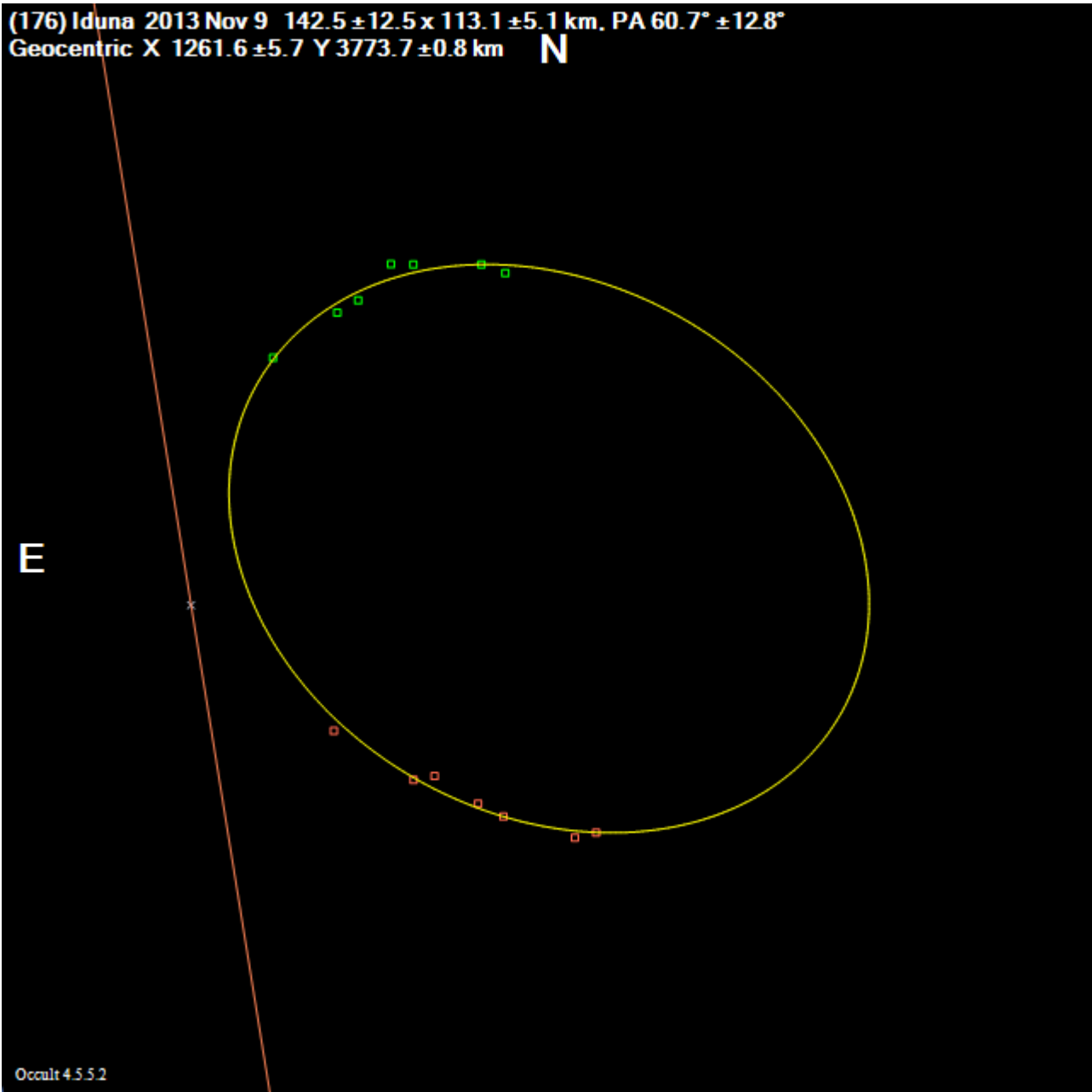
173Ino2015Apr09

(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**



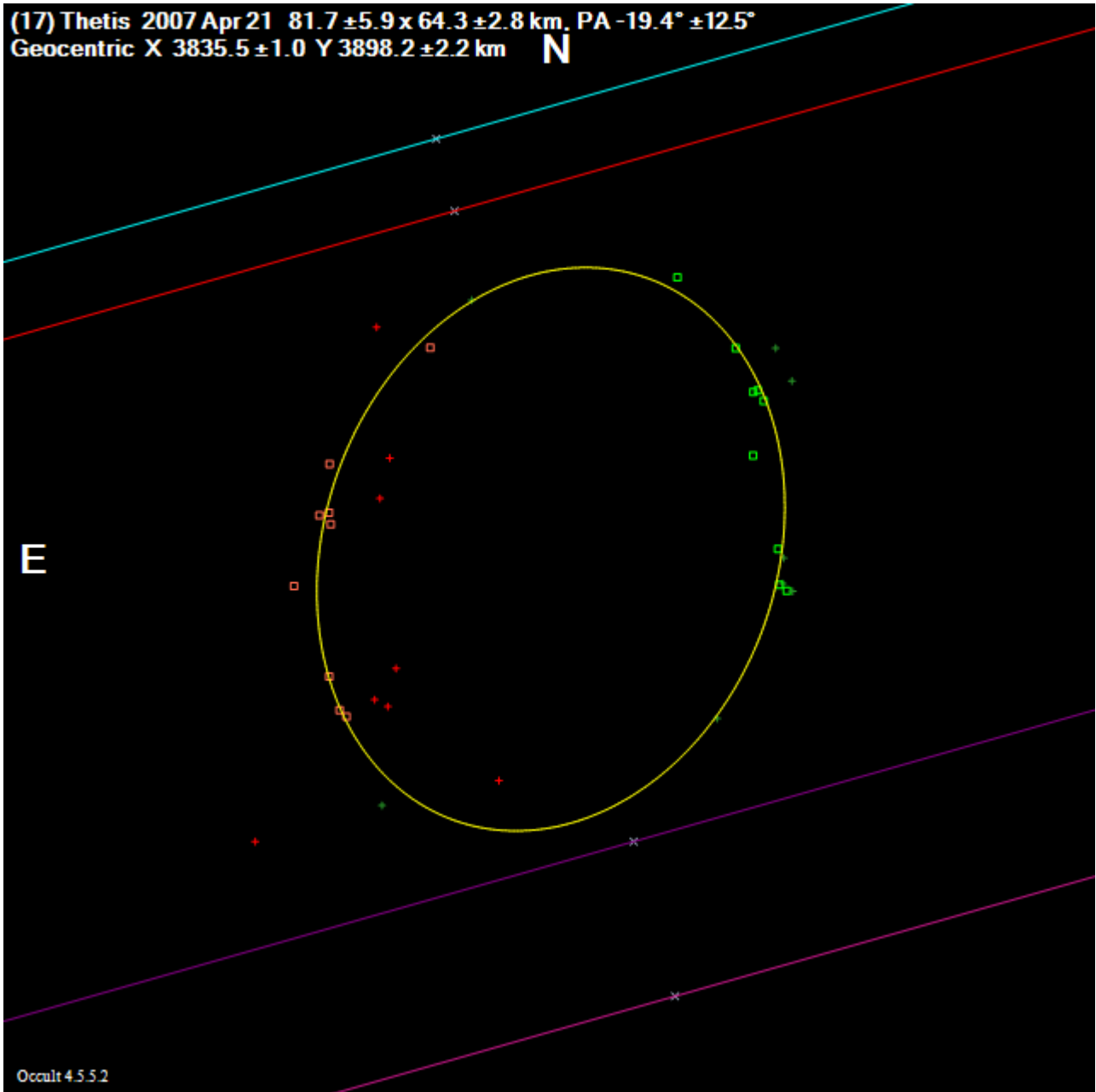
176Iduna2013Nov09

(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**



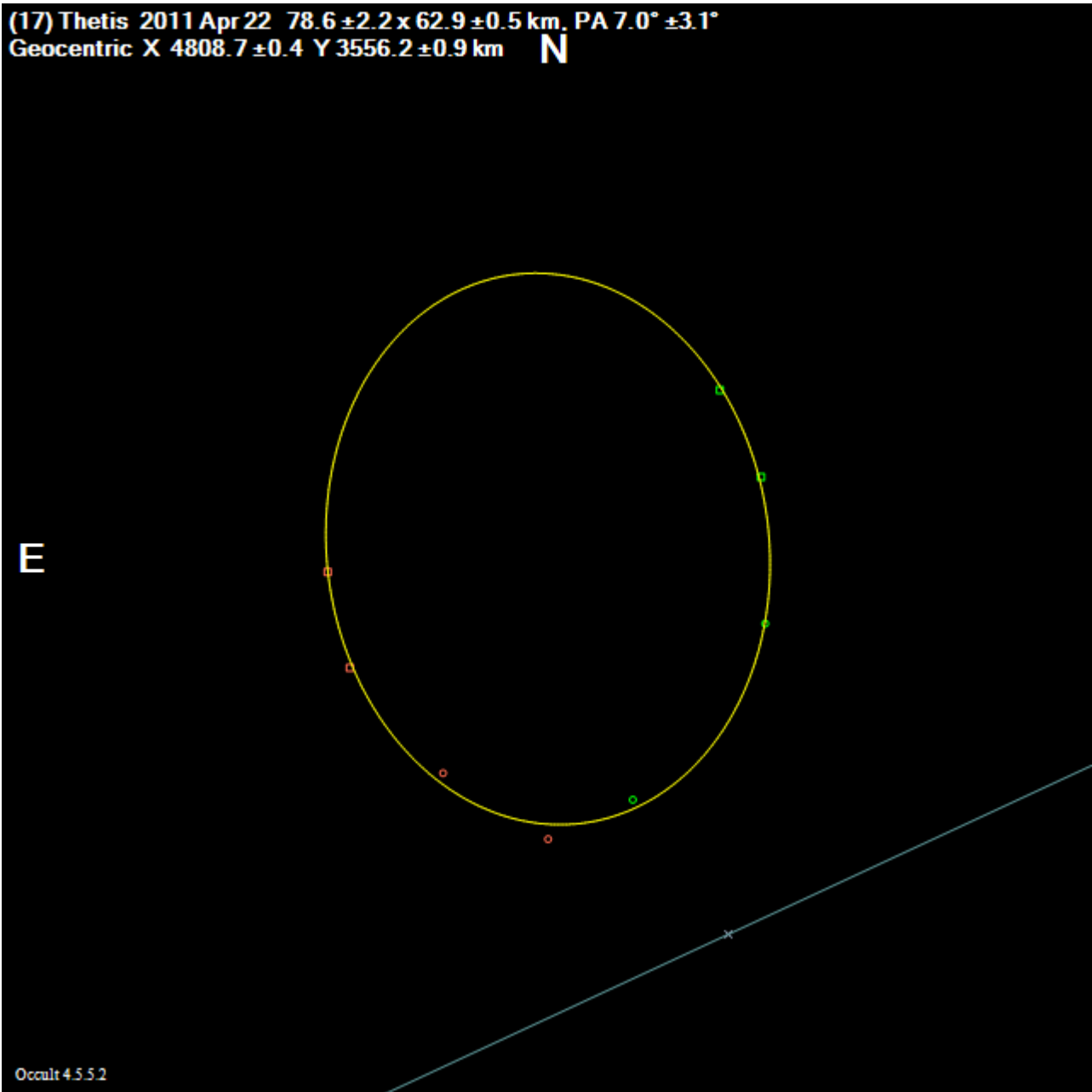
17Thetis2007Apr21

(17) Thetis 2007 Apr 21 $81.7 \pm 5.9 \times 64.3 \pm 2.8$ km, PA $-19.4^\circ \pm 12.5^\circ$
Geocentric X 3835.5 ± 1.0 Y 3898.2 ± 2.2 km **N**



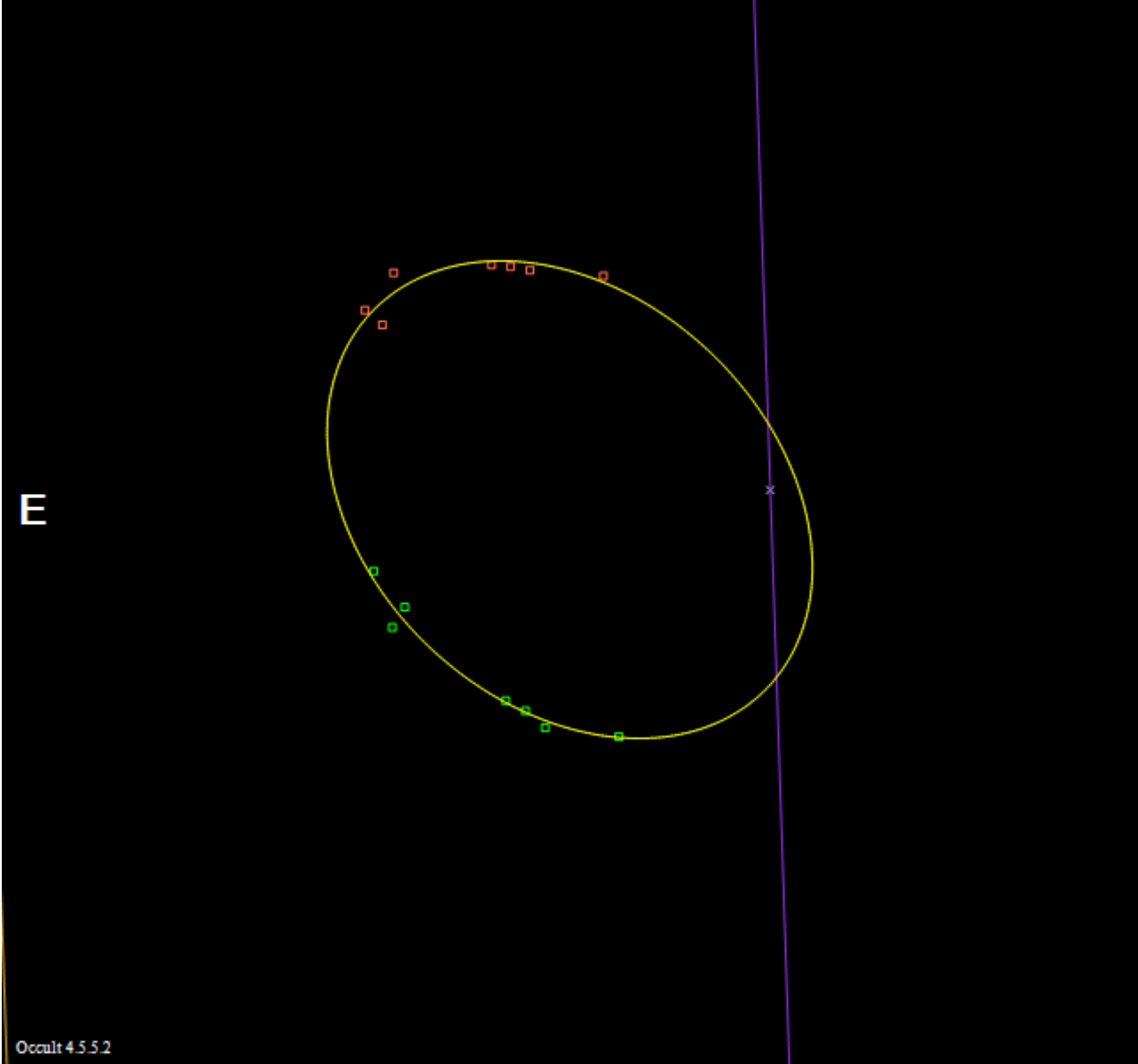
17Thetis2011Apr22

(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**



1867Deiphobus2007May13

(1867) Deiphobus 2007 May 13 $145.8 \pm 10.0 \times 108.8 \pm 5.2$ km, PA $46.6^\circ \pm 10.0^\circ$
Geocentric X 391.5 ± 5.2 Y 5446.8 ± 1.5 km N

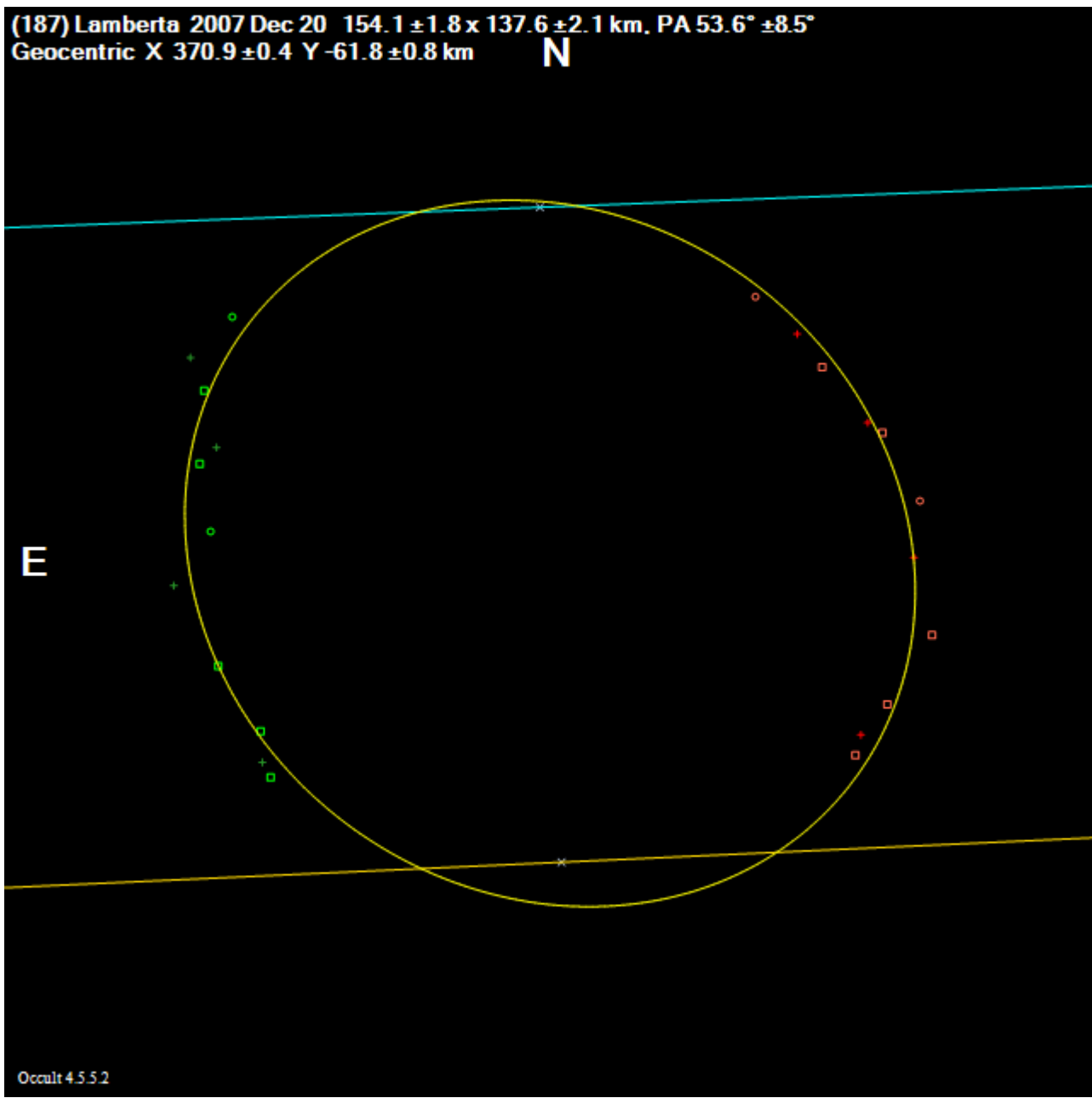


187Lamberta2007Dec20

(187) Lamberta 2007 Dec 20 $154.1 \pm 1.8 \times 137.6 \pm 2.1$ km, PA $53.6^\circ \pm 8.5^\circ$
Geocentric X 370.9 ± 0.4 Y -61.8 ± 0.8 km

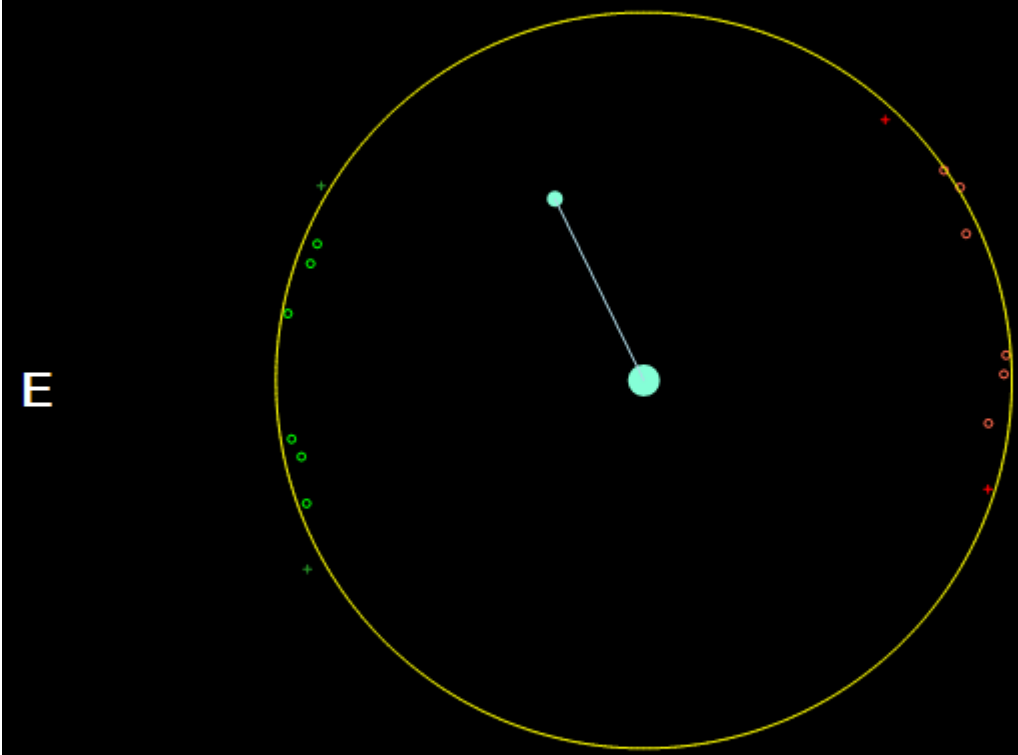
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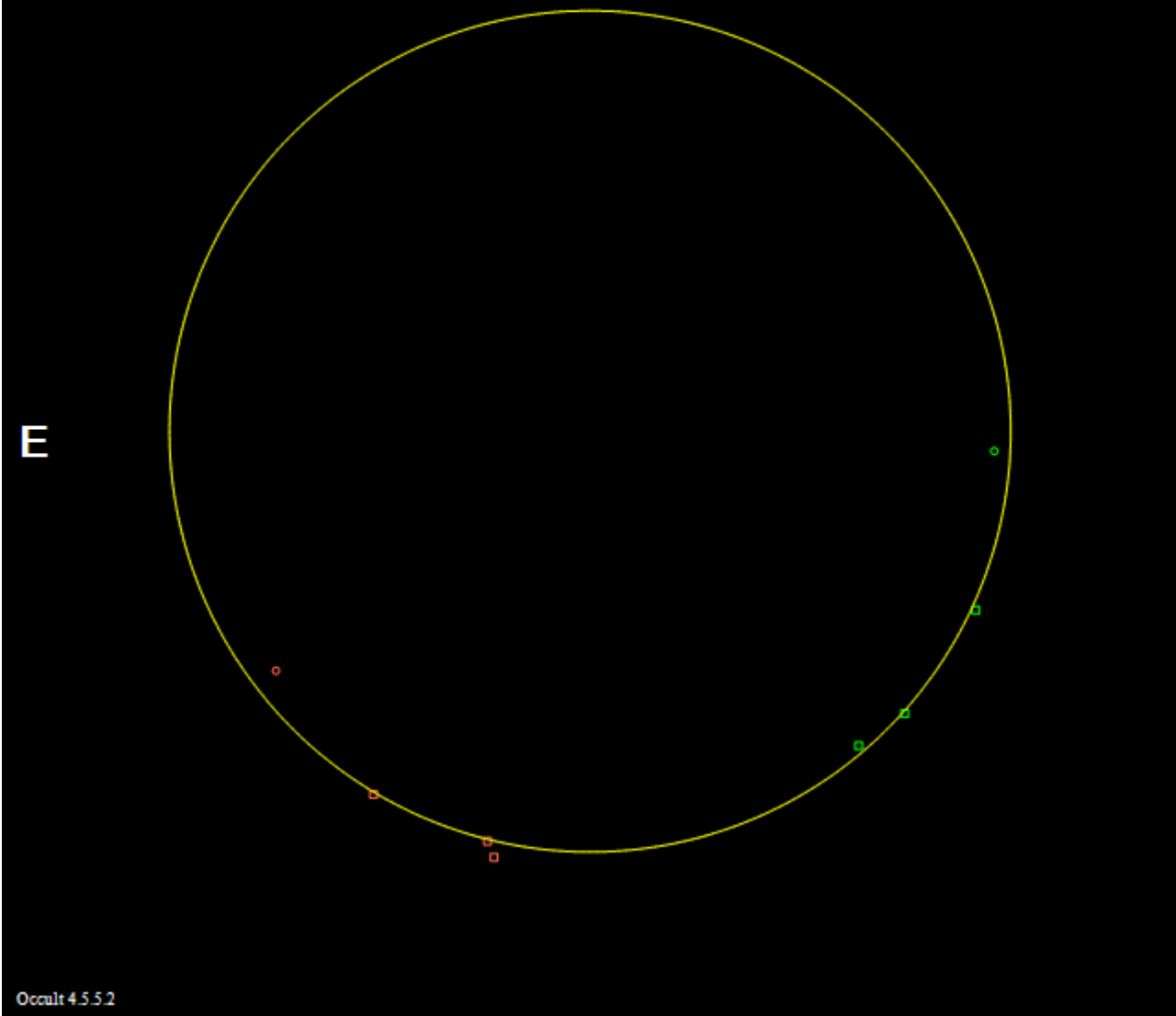
18Melpomene1978Dec11

(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 $26.1^\circ \pm 2.5^\circ$



18Melpomene2017Nov19

(18) Melpomene 2017 Nov 19 168.0 x 168.0 km, PA 0.0°
Geocentric X -2168.9 ± 1.3 Y 4871.1 ± 1.2 km **N**

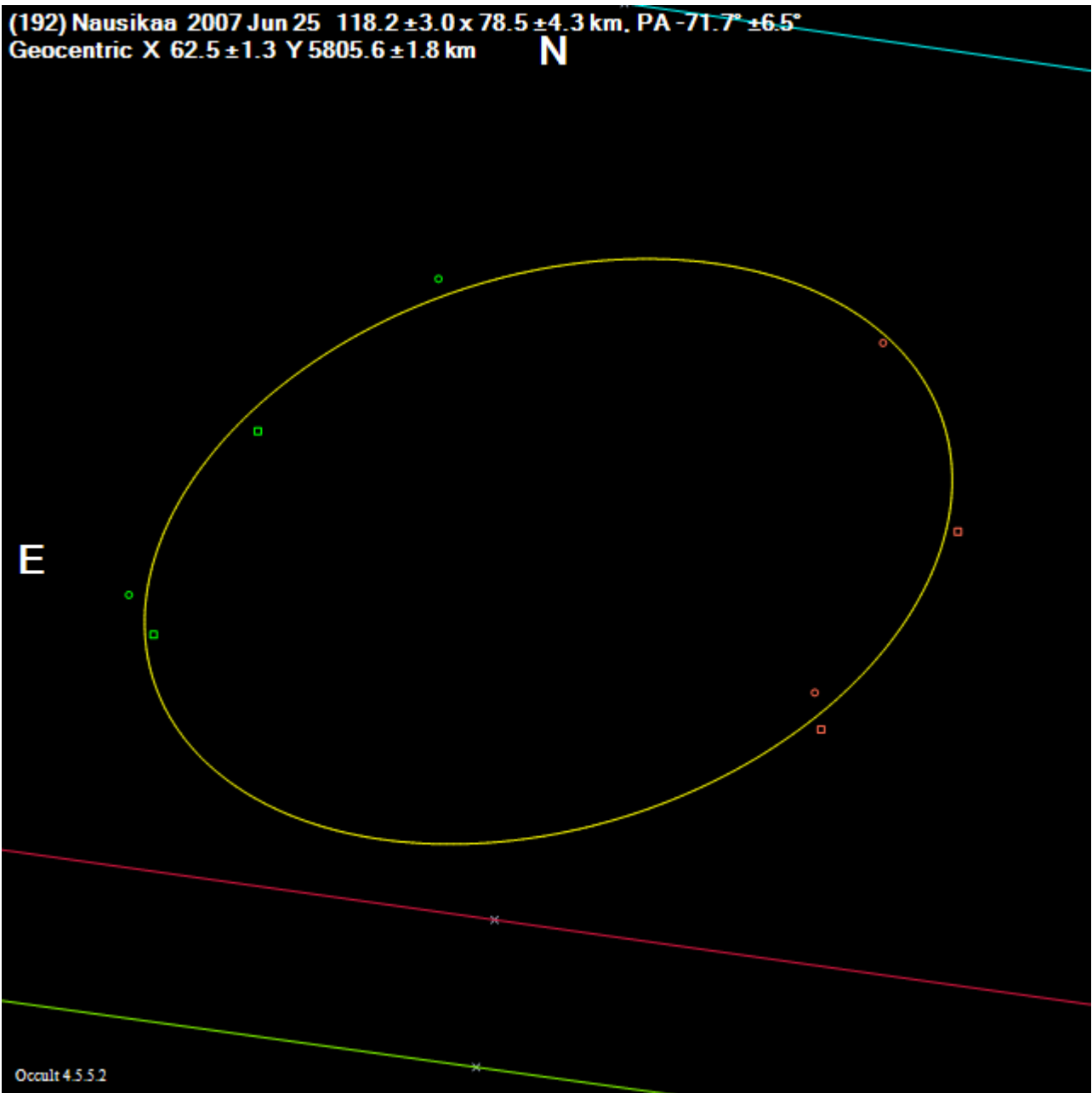


192Nausikaa2007Jun25

(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

N

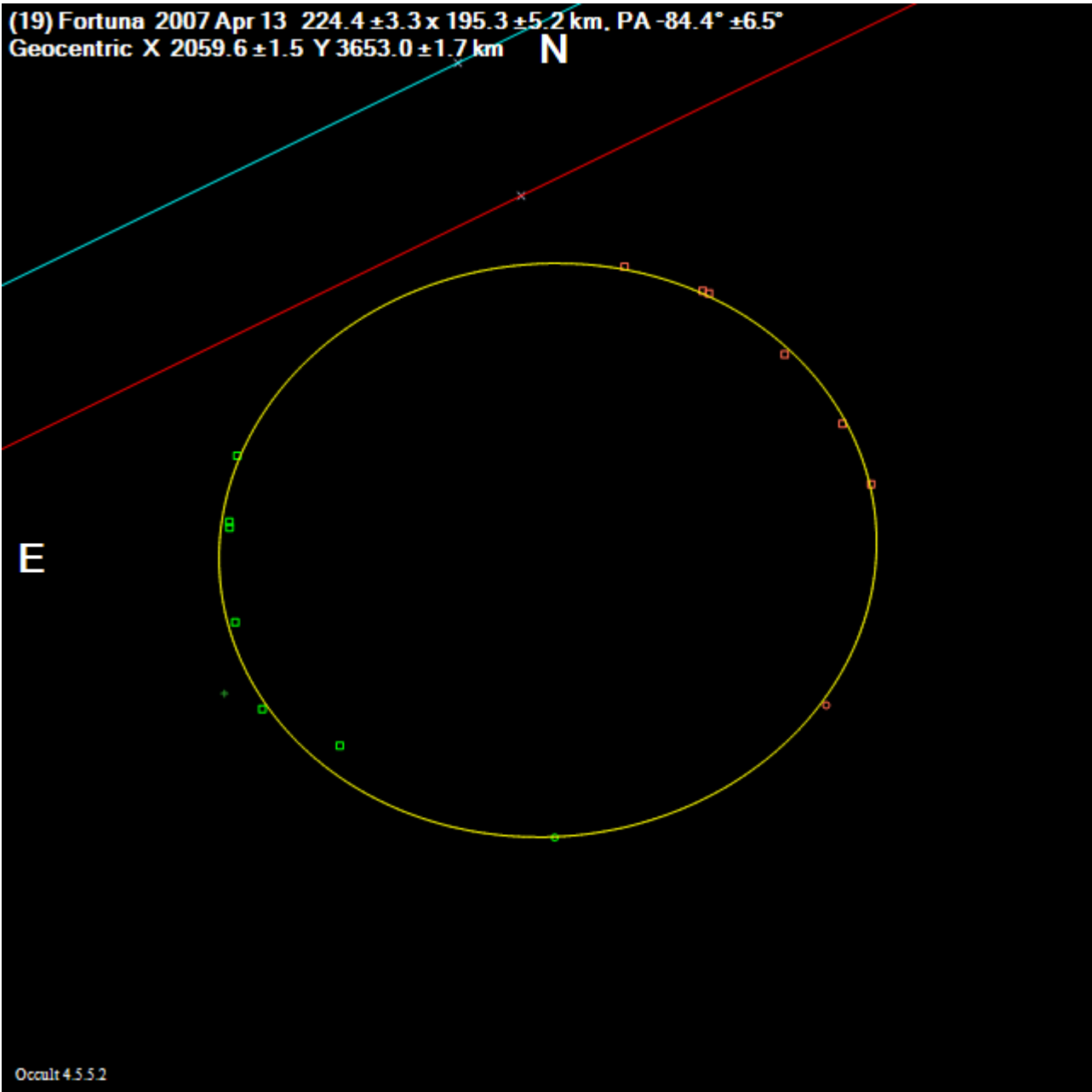
E



Occult 4.5.5.2

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

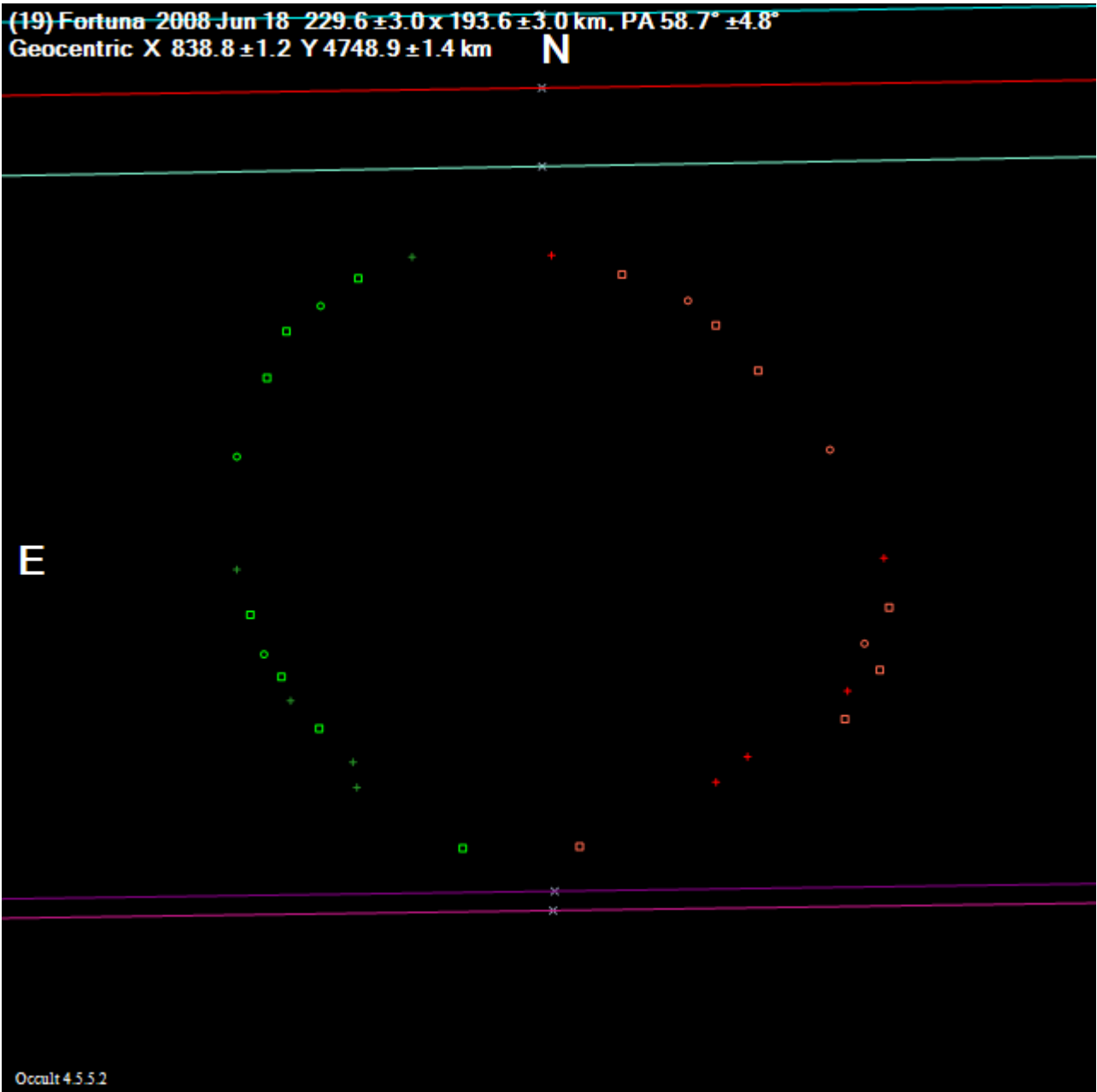


19Fortuna2008Jun18

(19) Fortuna 2008 Jun 18 $229.6 \pm 3.0 \times 193.6 \pm 3.0$ km, PA $58.7^\circ \pm 4.8^\circ$
Geocentric X 838.8 ± 1.2 Y 4748.9 ± 1.4 km

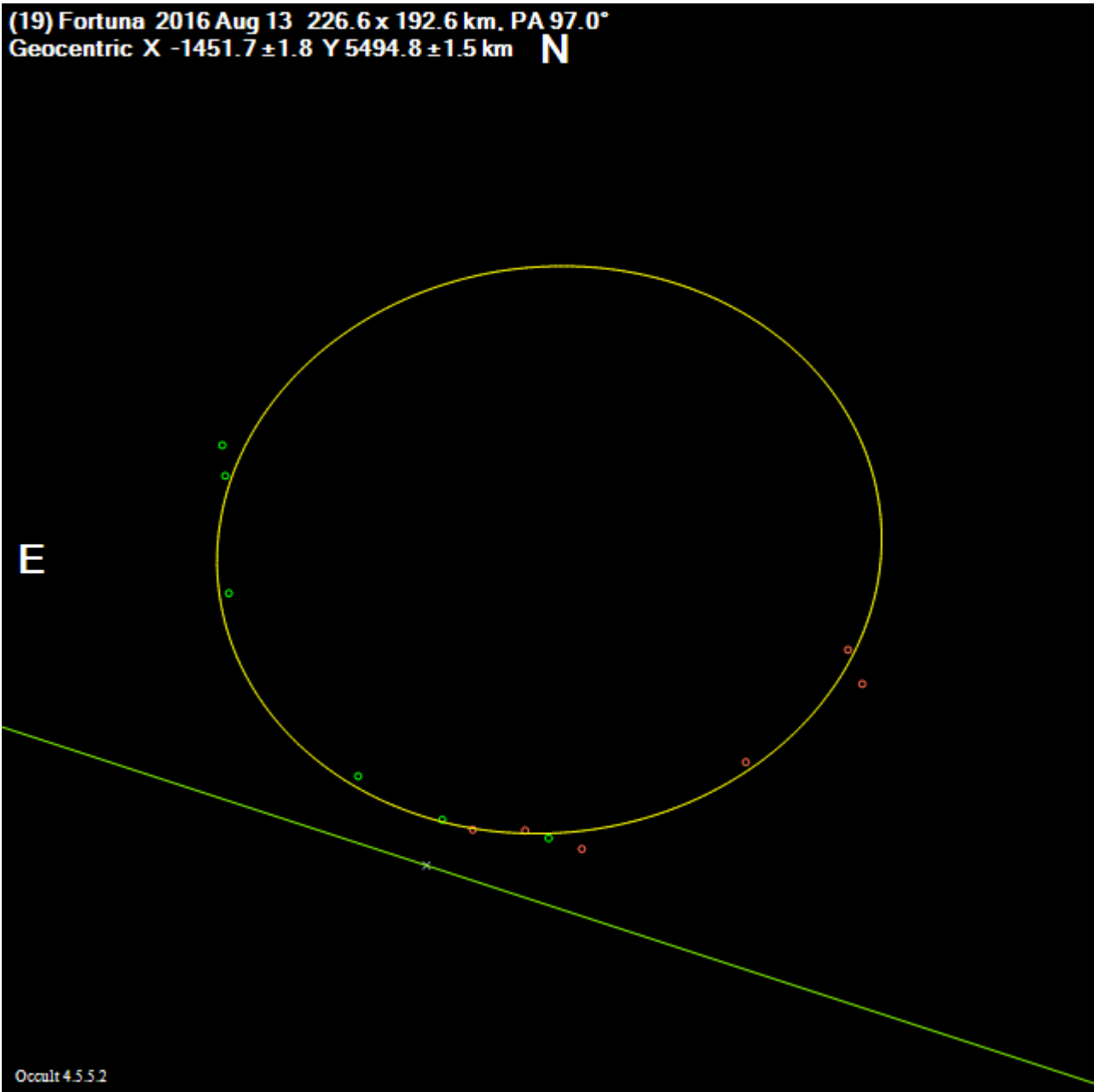
N

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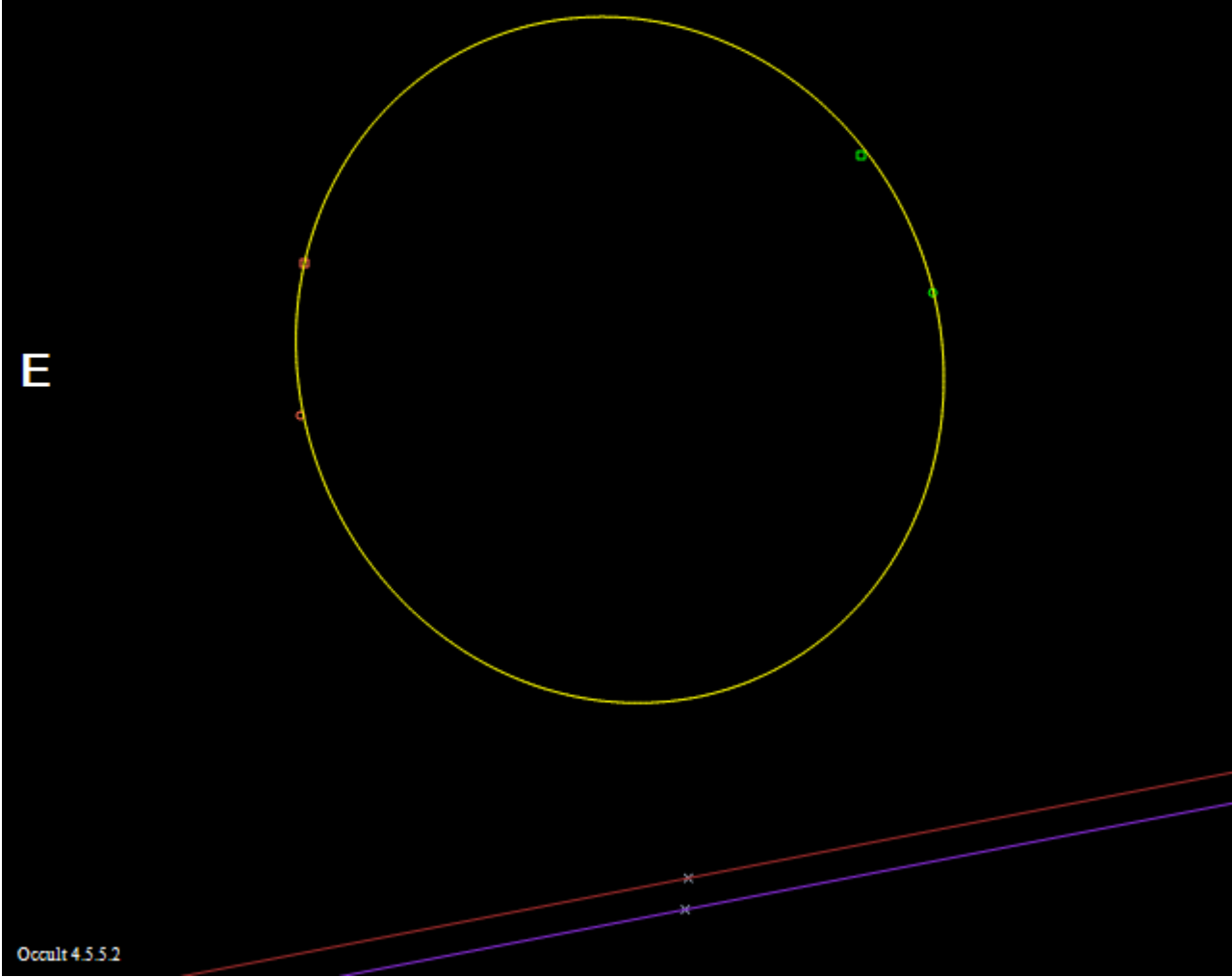
19Fortuna2016Aug13

(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**



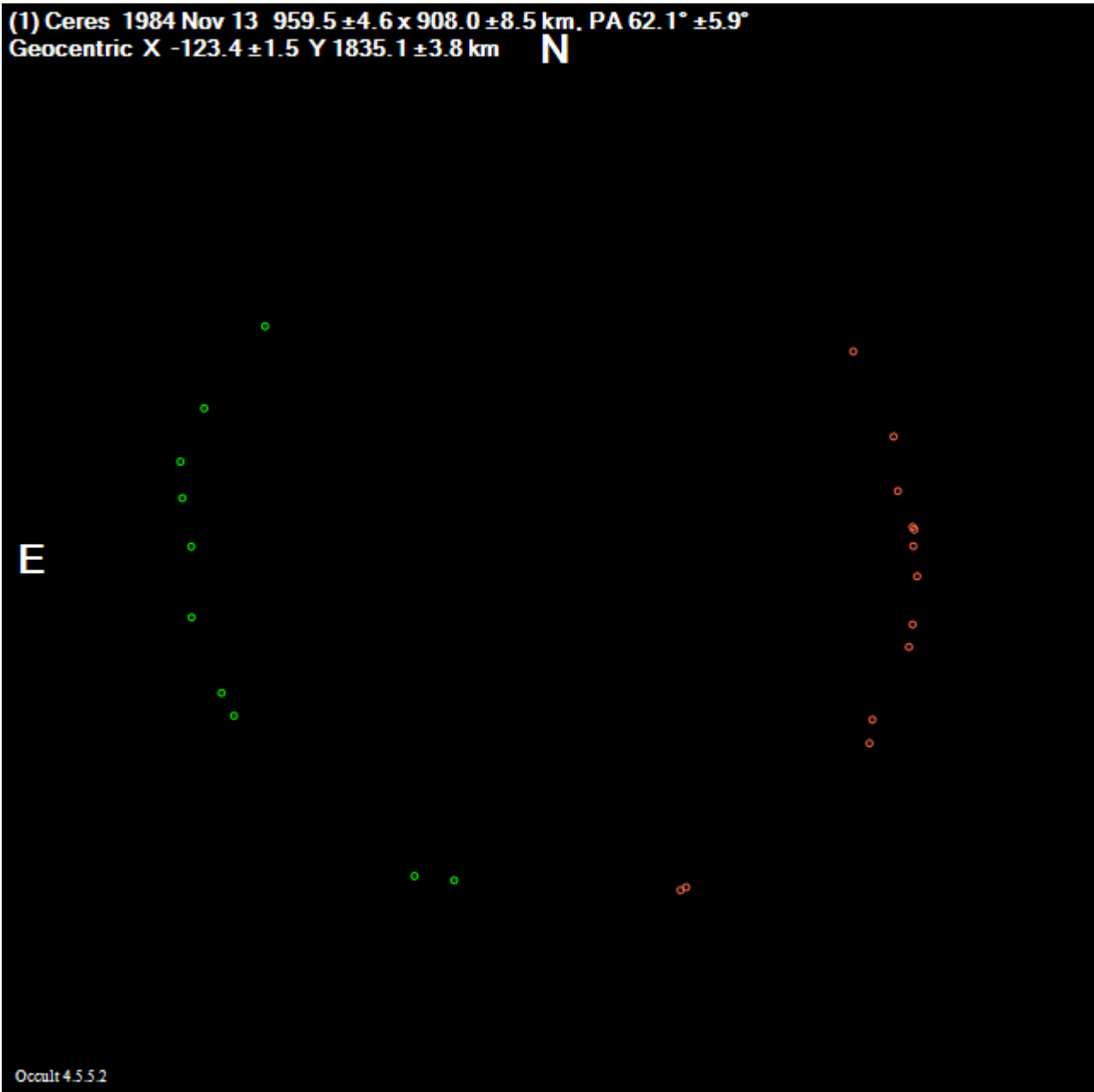
19Fortuna2017Sep12

(19) Fortuna 2017 Sep 12 209.0 x 193.0 km, PA 22.0°
Geocentric X -3546.0 ± 0.6 Y 4016.4 ± 1.6 km **N**



1Ceres1984Nov13

(1) Ceres 1984 Nov 13 $959.5 \pm 4.6 \times 908.0 \pm 8.5$ km, PA $62.1^\circ \pm 5.9^\circ$
Geocentric X -123.4 ± 1.5 Y 1835.1 ± 3.8 km **N**



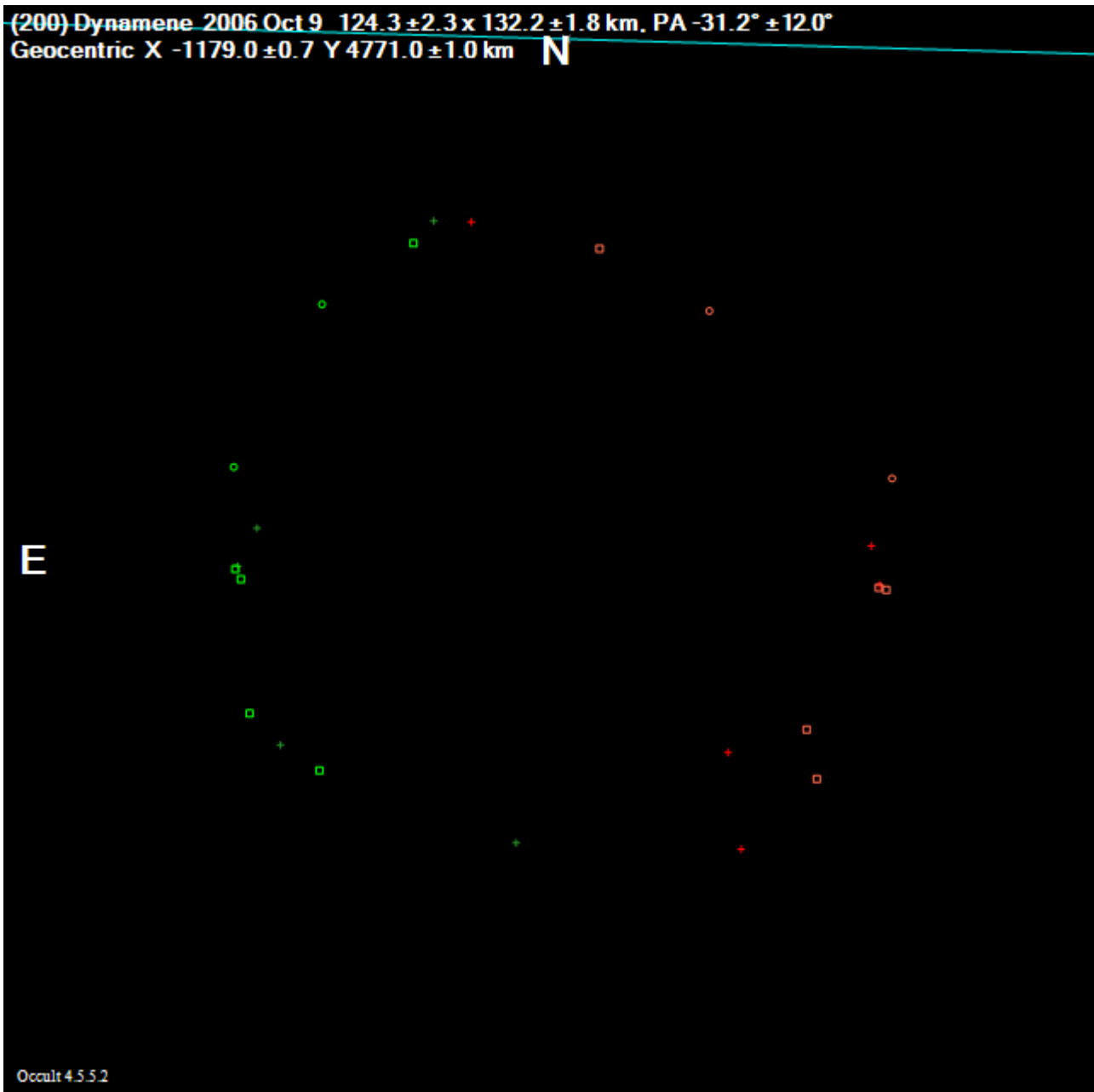
1Ceres2013Oct25

(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**



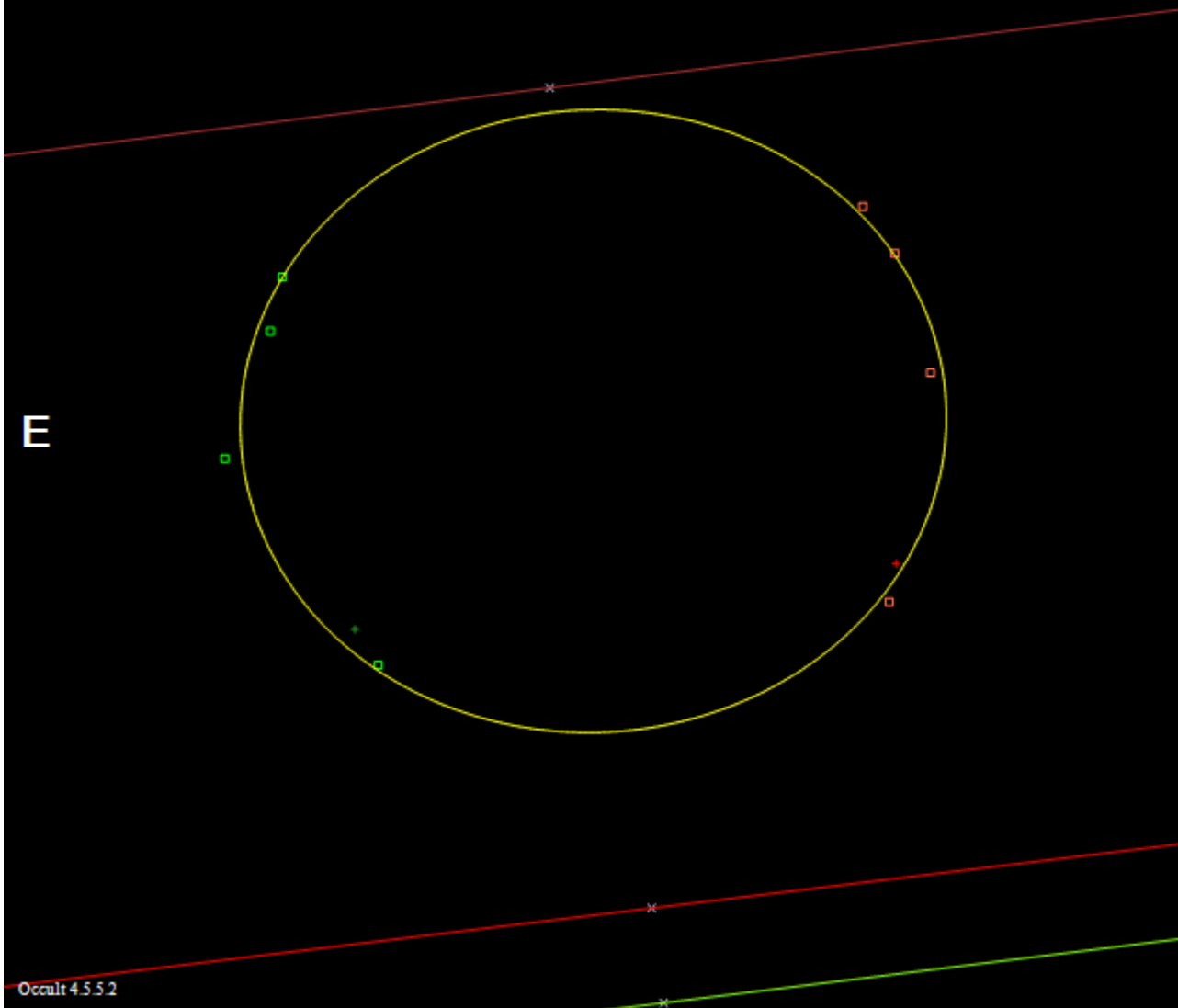
200Dynamene2006Oct09

(200) Dynamene 2006 Oct 9 $124.3 \pm 2.3 \times 132.2 \pm 1.8$ km, PA $-31.2^\circ \pm 12.0^\circ$
Geocentric X -1179.0 ± 0.7 Y 4771.0 ± 1.0 km



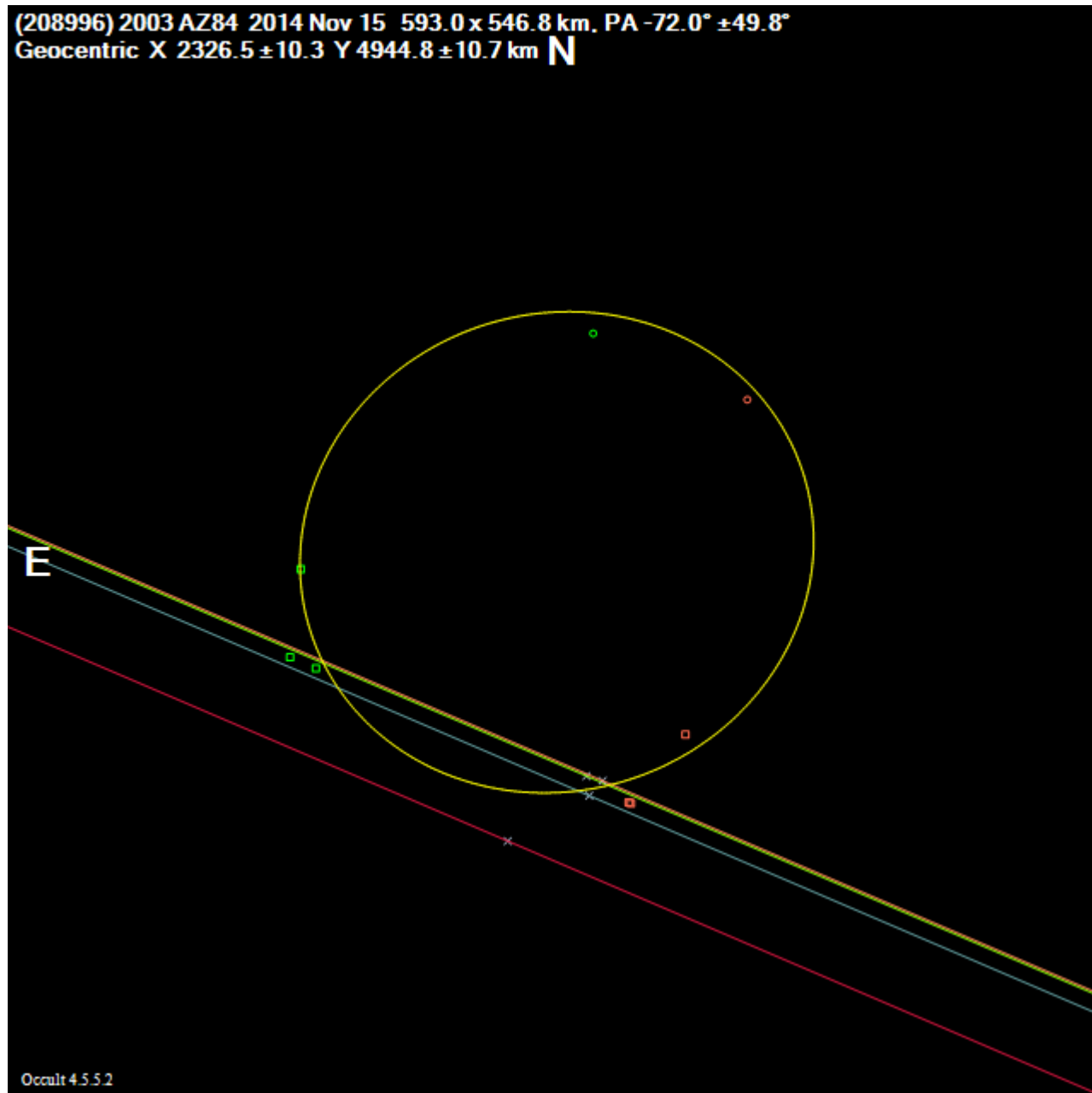
204Kallisto2005Jul12

(204) Kallisto 2005 Jul 12 $47.6 \pm 1.2 \times 54.0 \pm 0.5$ km, PA $3.2^\circ \pm 3.3^\circ$
Geocentric X 1022.3 ± 0.2 Y 4135.5 ± 0.3 km **N**



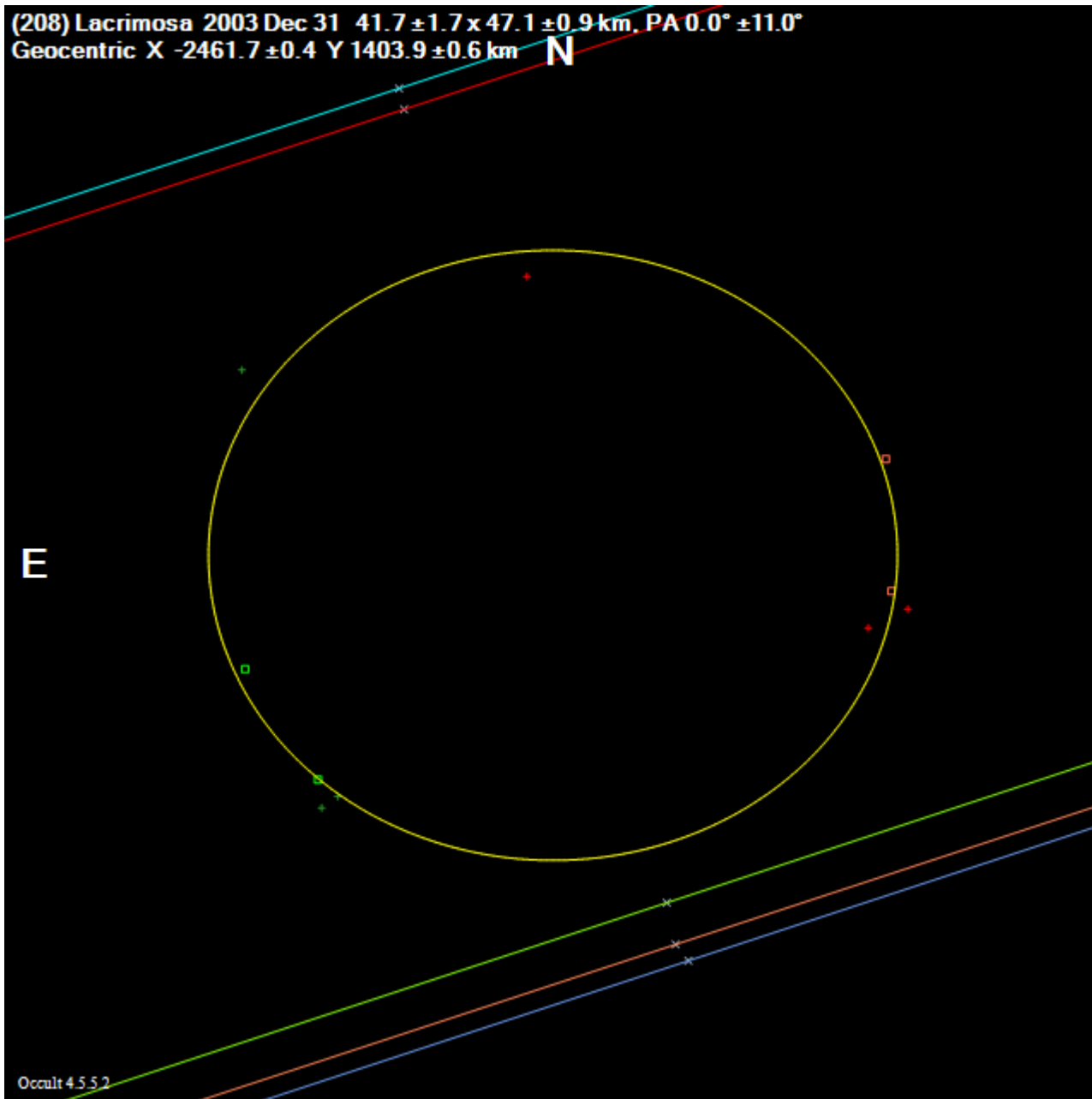
2089962003AZ842014Nov15

(208996) 2003 AZ84 2014 Nov 15 593.0 x 546.8 km, PA $-72.0^\circ \pm 49.8^\circ$
Geocentric X 2326.5 ± 10.3 Y 4944.8 ± 10.7 km **N**



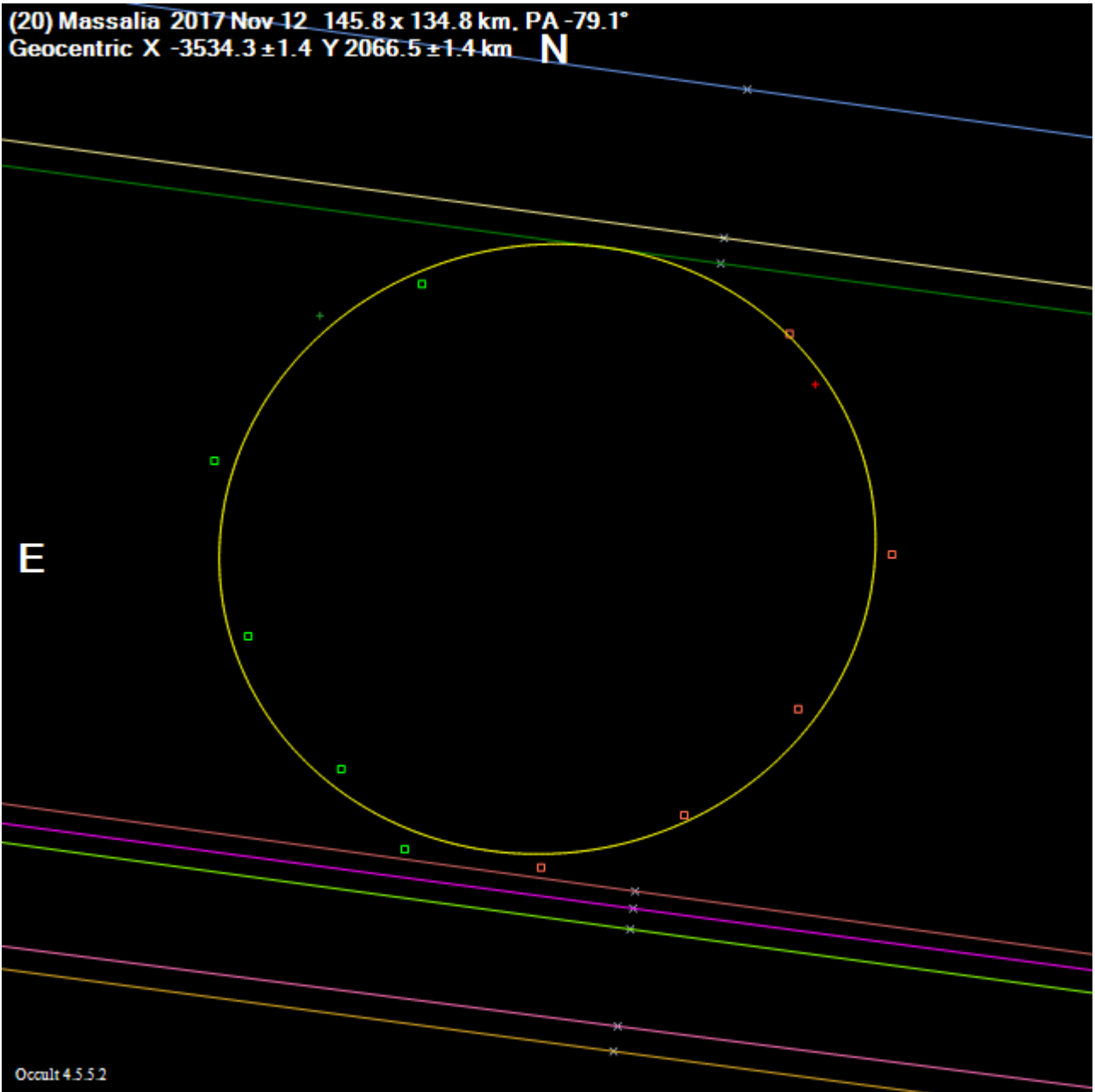
208Lacrimosa2003Dec31

(208) Lacrimosa 2003 Dec 31 $41.7 \pm 1.7 \times 47.1 \pm 0.9$ km. PA $0.0^\circ \pm 11.0^\circ$
Geocentric X -2461.7 ± 0.4 Y 1403.9 ± 0.6 km



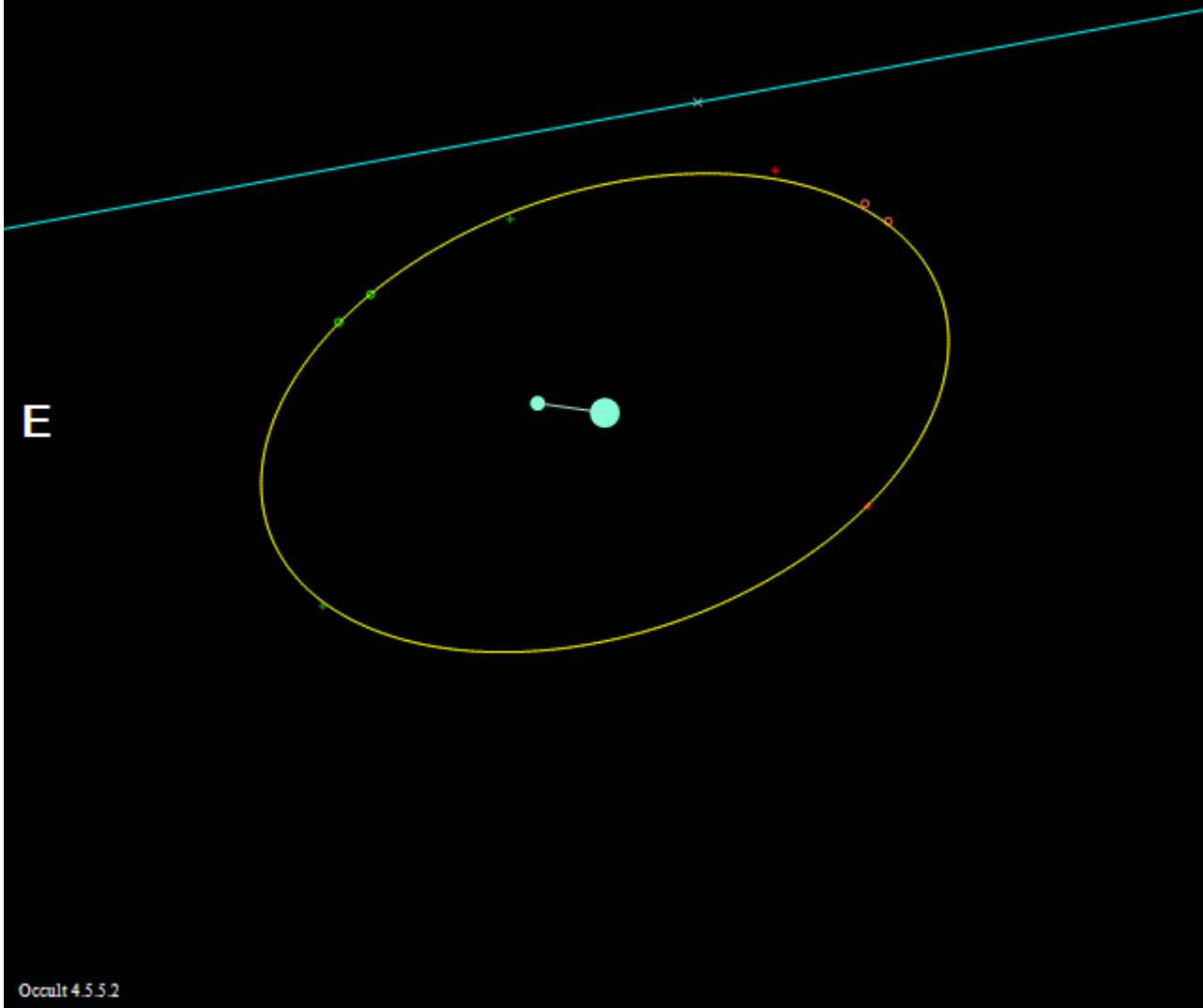
20Massalia2017Nov12

(20) Massalia 2017 Nov-12 145.8 x 134.8 km, PA -79.1°
Geocentric X -3534.3 ± 1.4 Y 2066.5 ± 1.4 km **N**



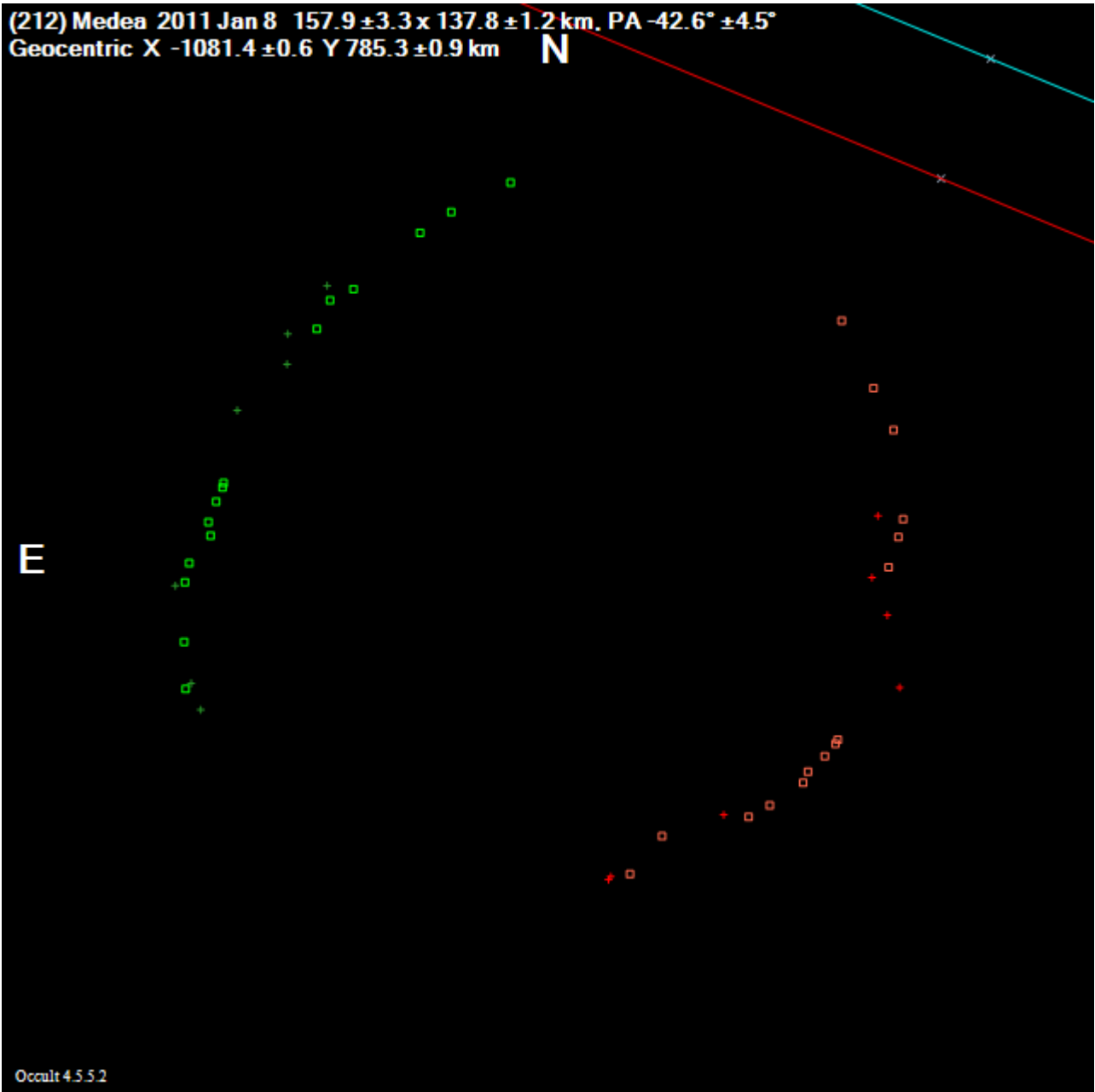
210Isabella2003Apr21

(210) Isabella 2003 Apr 21 $84.9 \pm 0.5 \times 52.6 \pm 0.6$ km, PA $-70.6^\circ \pm 0.7^\circ$
Geocentric X -4756.8 ± 0.2 Y -3073.6 ± 0.2 km **N**
Double : Sep $0.0054 \pm 0.0002''$, PA $81.9^\circ \pm 1.4^\circ$



212Medea2011Jan08

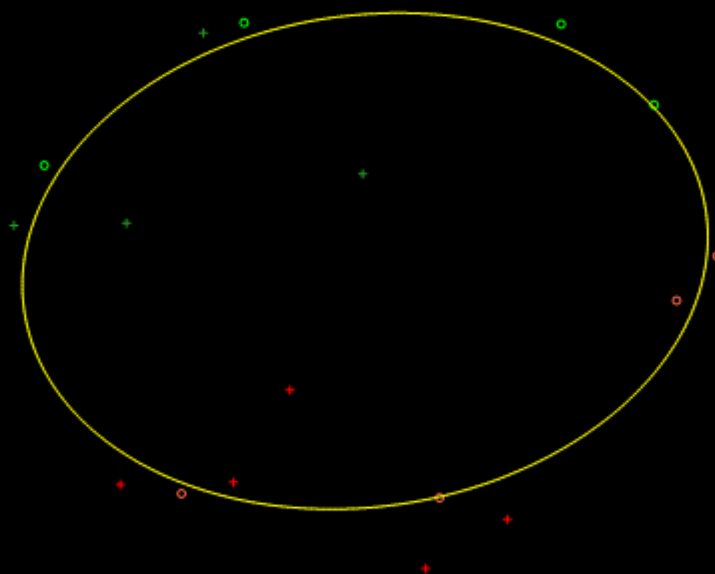
(212) Medea 2011 Jan 8 $157.9 \pm 3.3 \times 137.8 \pm 1.2$ km, PA $-42.6^\circ \pm 4.5^\circ$
Geocentric X -1081.4 ± 0.6 Y 785.3 ± 0.9 km



216Kleopatra1980Oct10

(216) Kleopatra 1980 Oct 10 $123.7 \pm 7.0 \times 88.2 \pm 5.6$ km, PA $-81.7^\circ \pm 7.0^\circ$
Geocentric X 1423.1 ± 2.8 Y 4547.8 ± 2.1 km **N**

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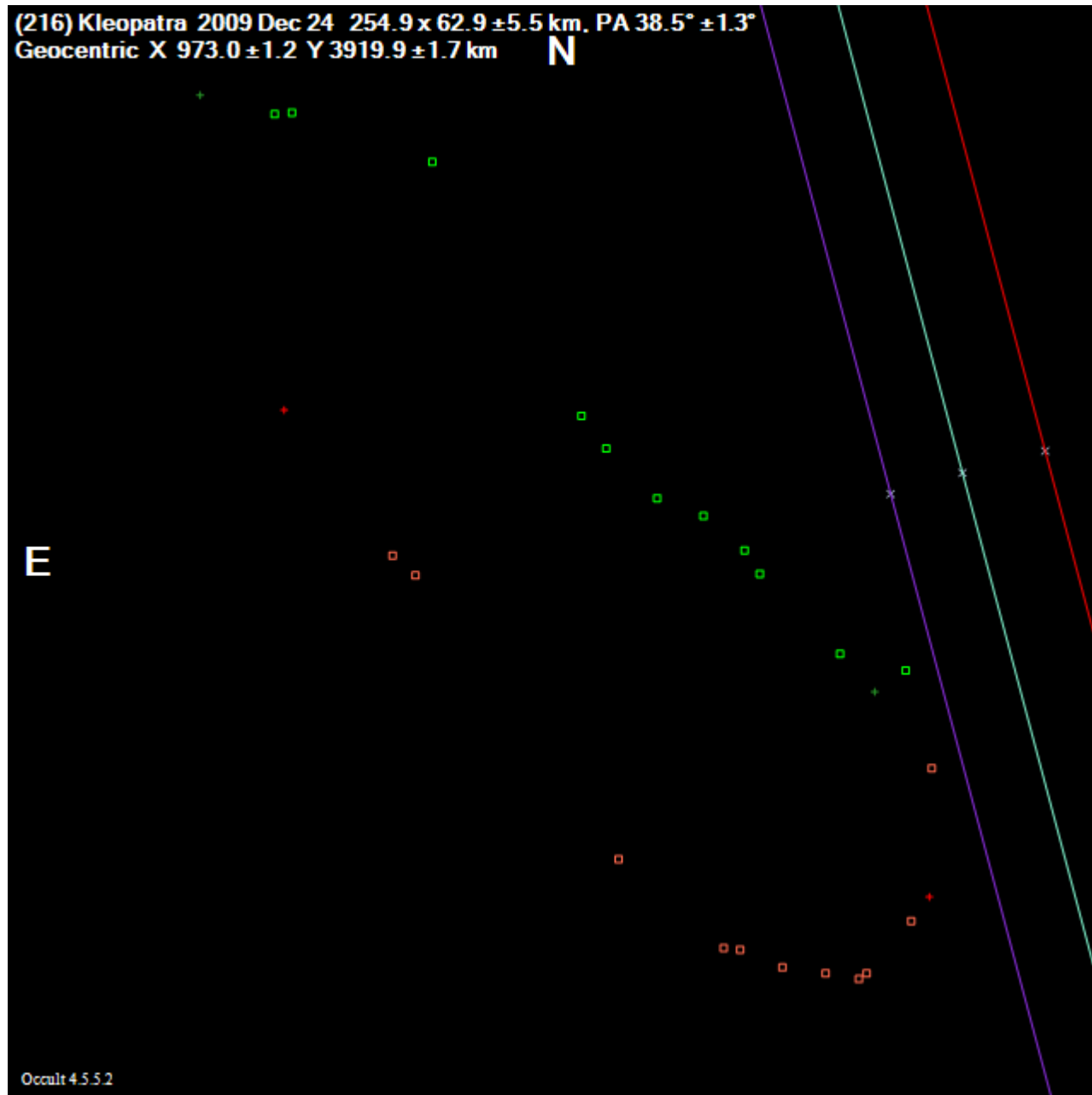
216Kleopatra2009Dec24

(216) Kleopatra 2009 Dec 24 254.9 x 62.9 ±5.5 km, PA 38.5° ±1.3°
Geocentric X 973.0 ±1.2 Y 3919.9 ±1.7 km

N

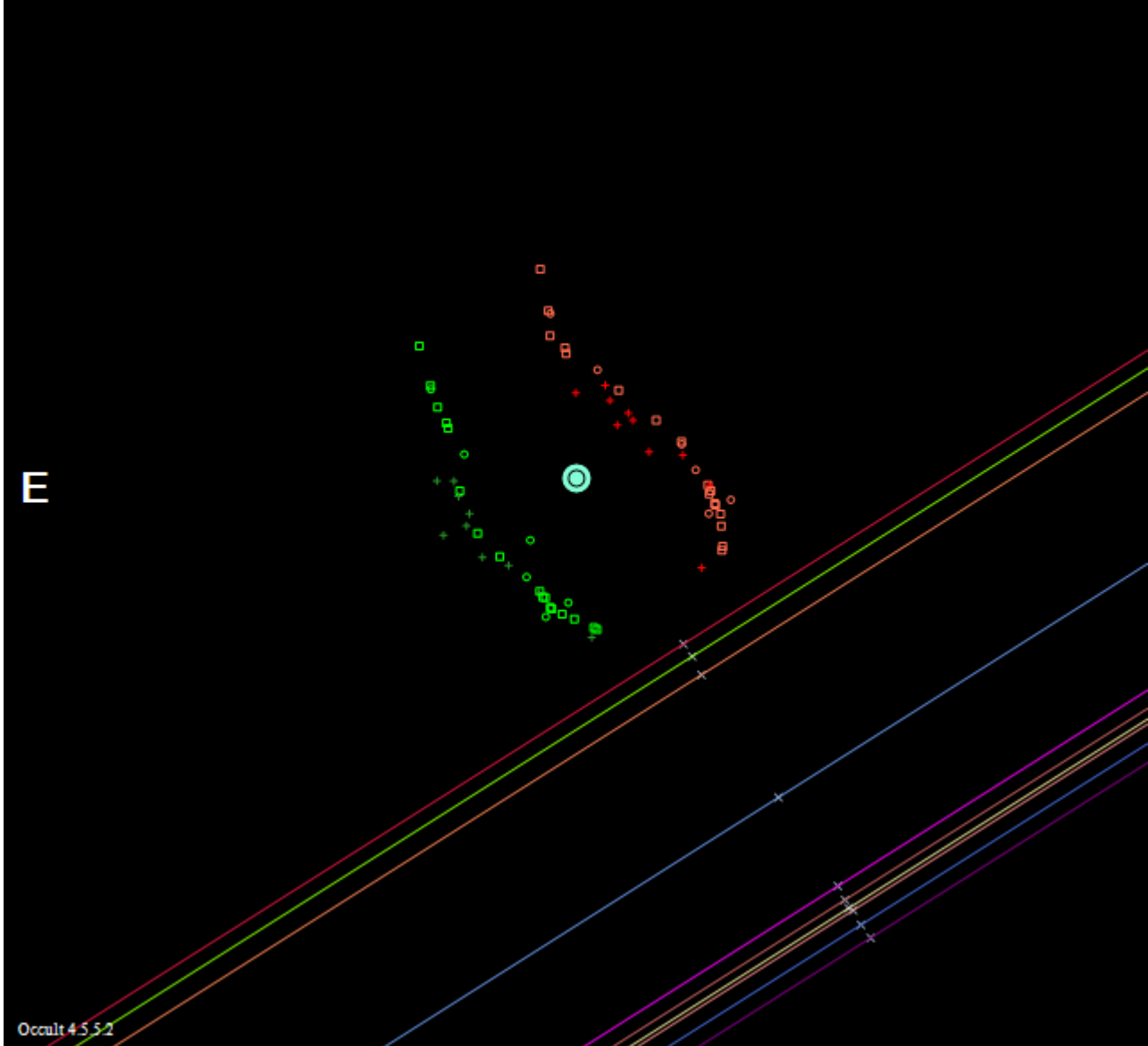
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216Kleopatra2015Mar12

(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°



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

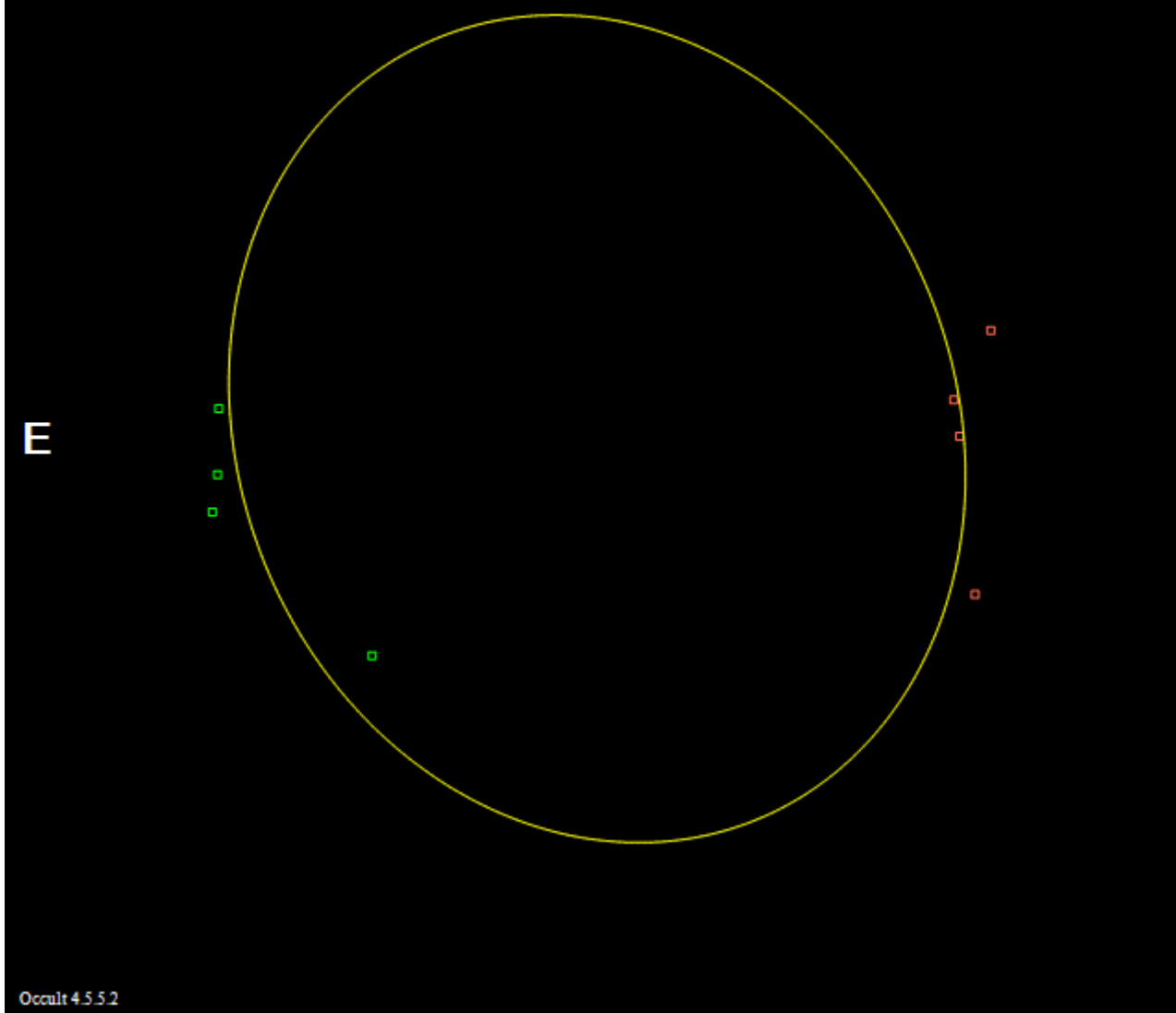
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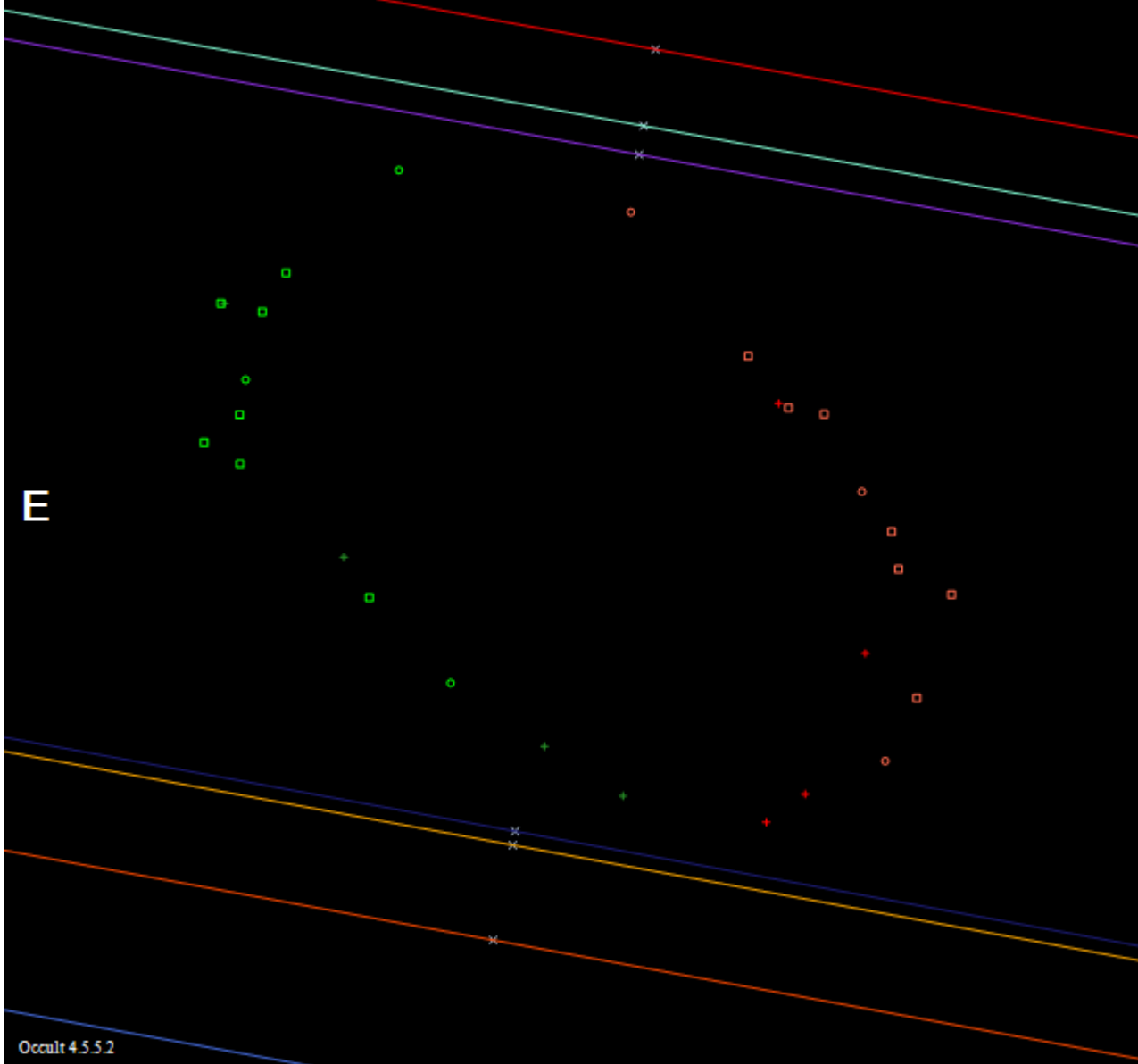
21Lutetia2017Feb10

(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**



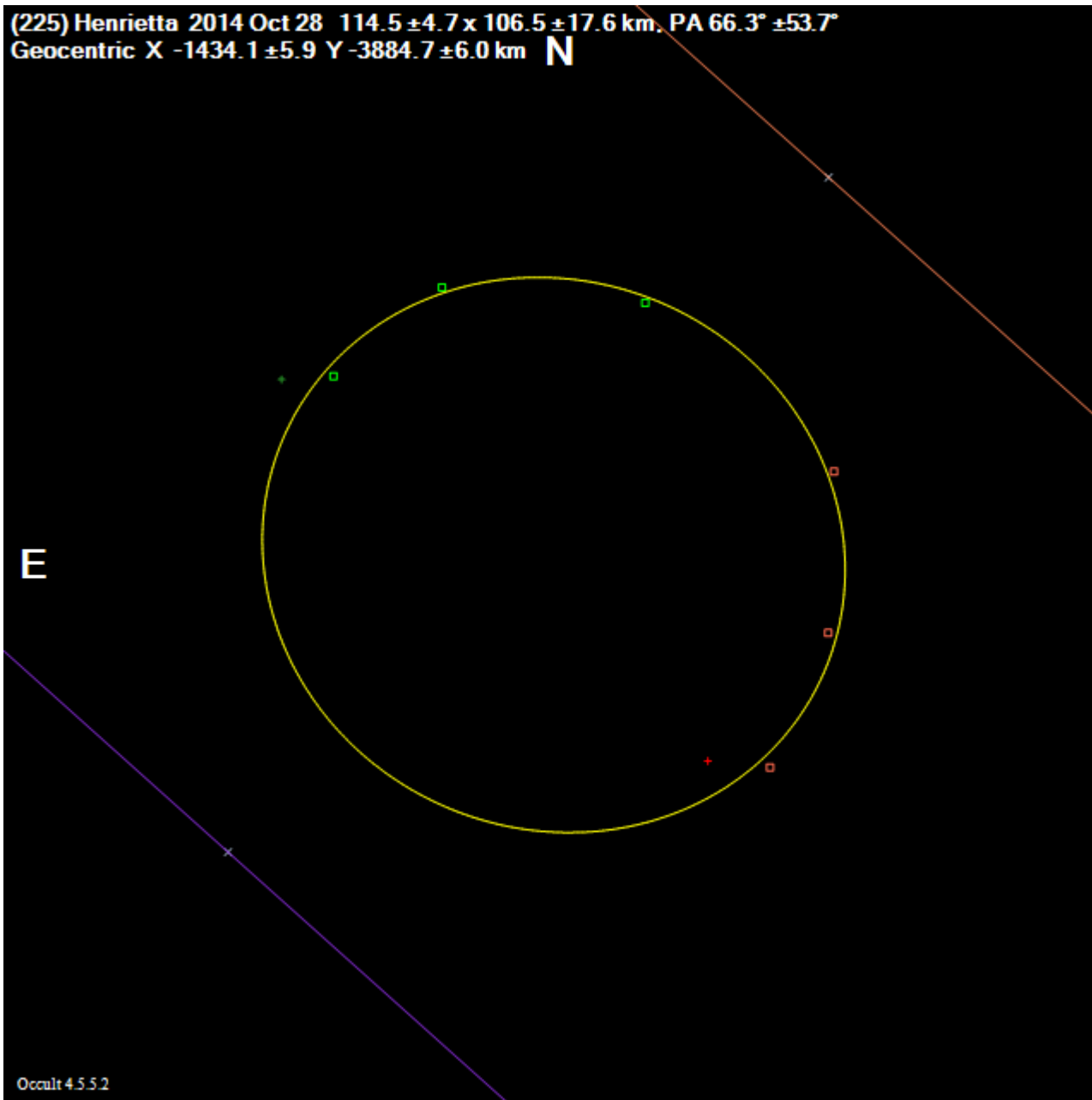
225Henrietta2007Jul16

(225) Henrietta 2007 Jul 16 $148.7 \pm 3.0 \times 87.6 \pm 2.6$ km, PA $49.8^\circ \pm 2.2^\circ$
Geocentric X -3796.3 ± 0.9 Y 2755.6 ± 1.4 km **N**



225Henrietta2014Oct28

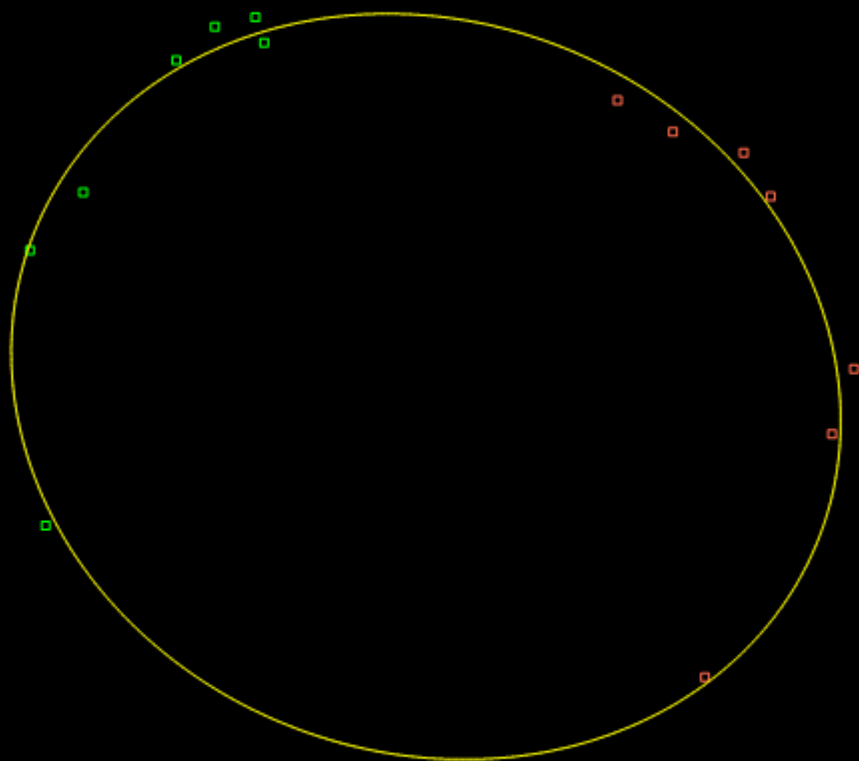
(225) Henrietta 2014 Oct 28 $114.5 \pm 4.7 \times 106.5 \pm 17.6$ km, PA $66.3^\circ \pm 53.7^\circ$
Geocentric X -1434.1 ± 5.9 Y -3884.7 ± 6.0 km **N**



2297622007UK1262014Nov15

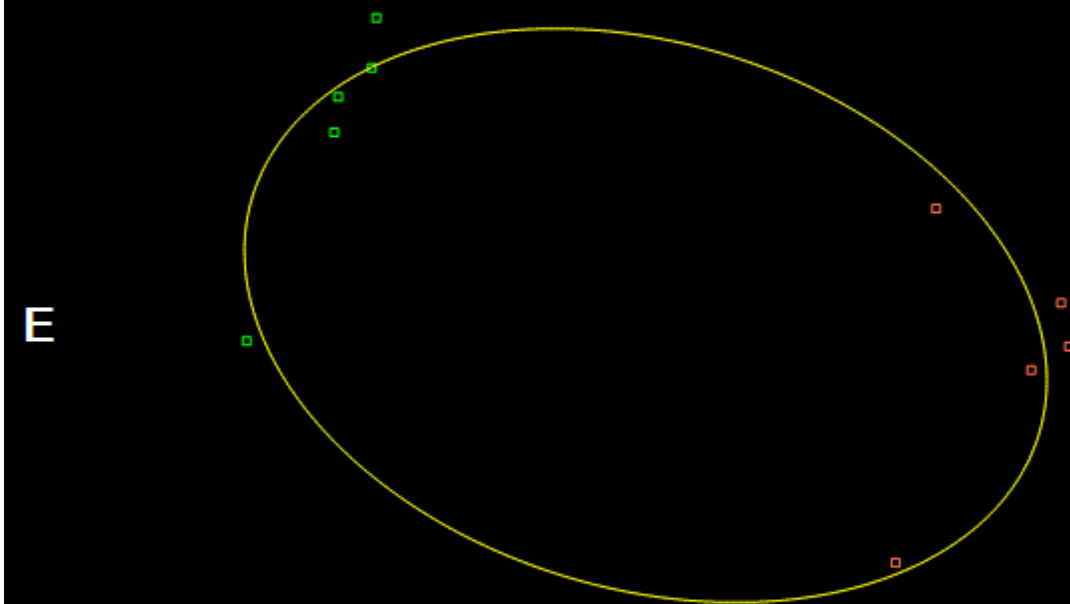
(229762) 2007 UK126 2014 Nov 15 $656.3 \pm 11.7 \times 570.0 \pm 19.7$ km, PA $69.6^\circ \pm 6.2^\circ$
Geocentric X 696.3 ± 5.1 Y 3536.5 ± 7.3 km **N**

E



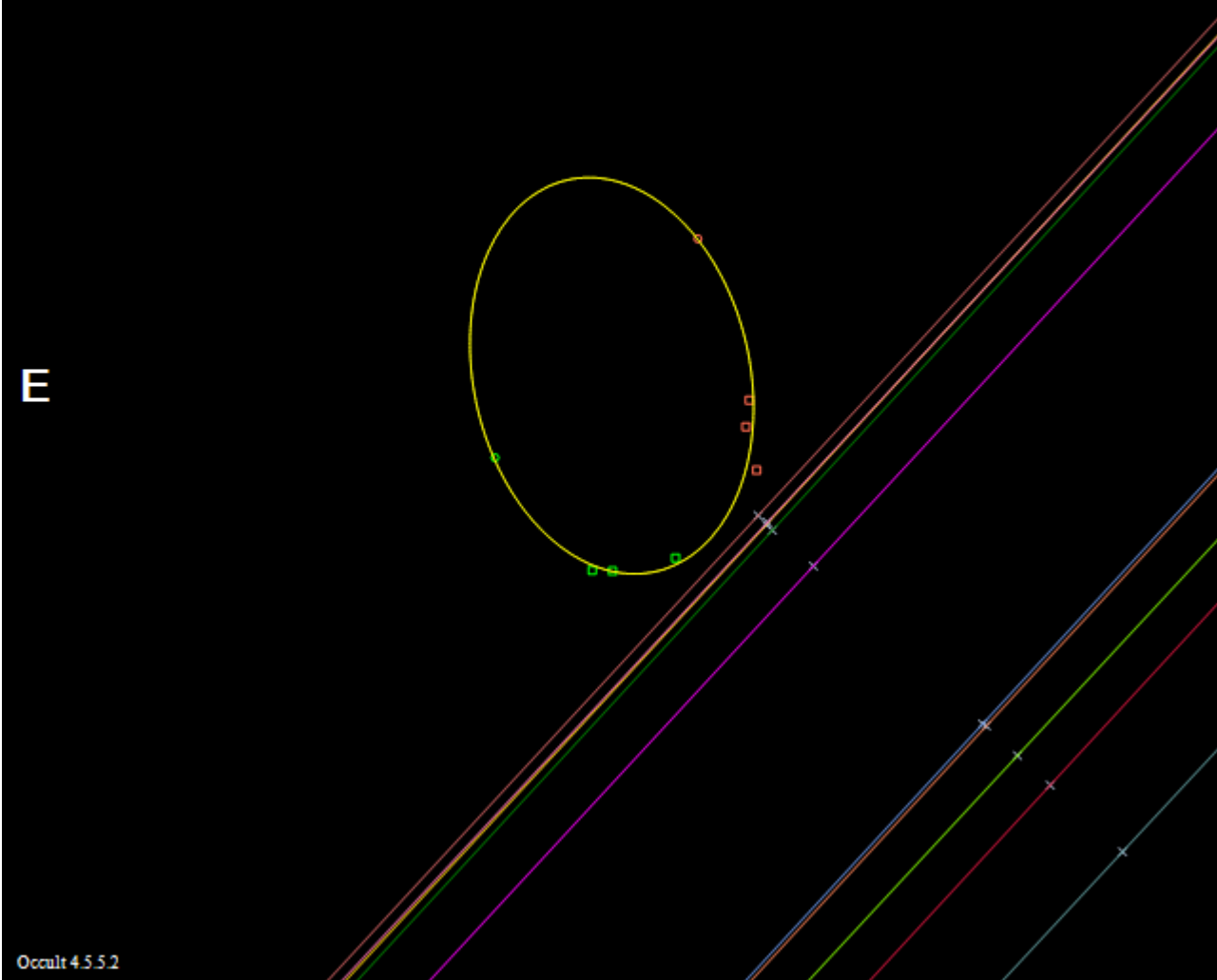
229Adelinda2015Oct21

(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**



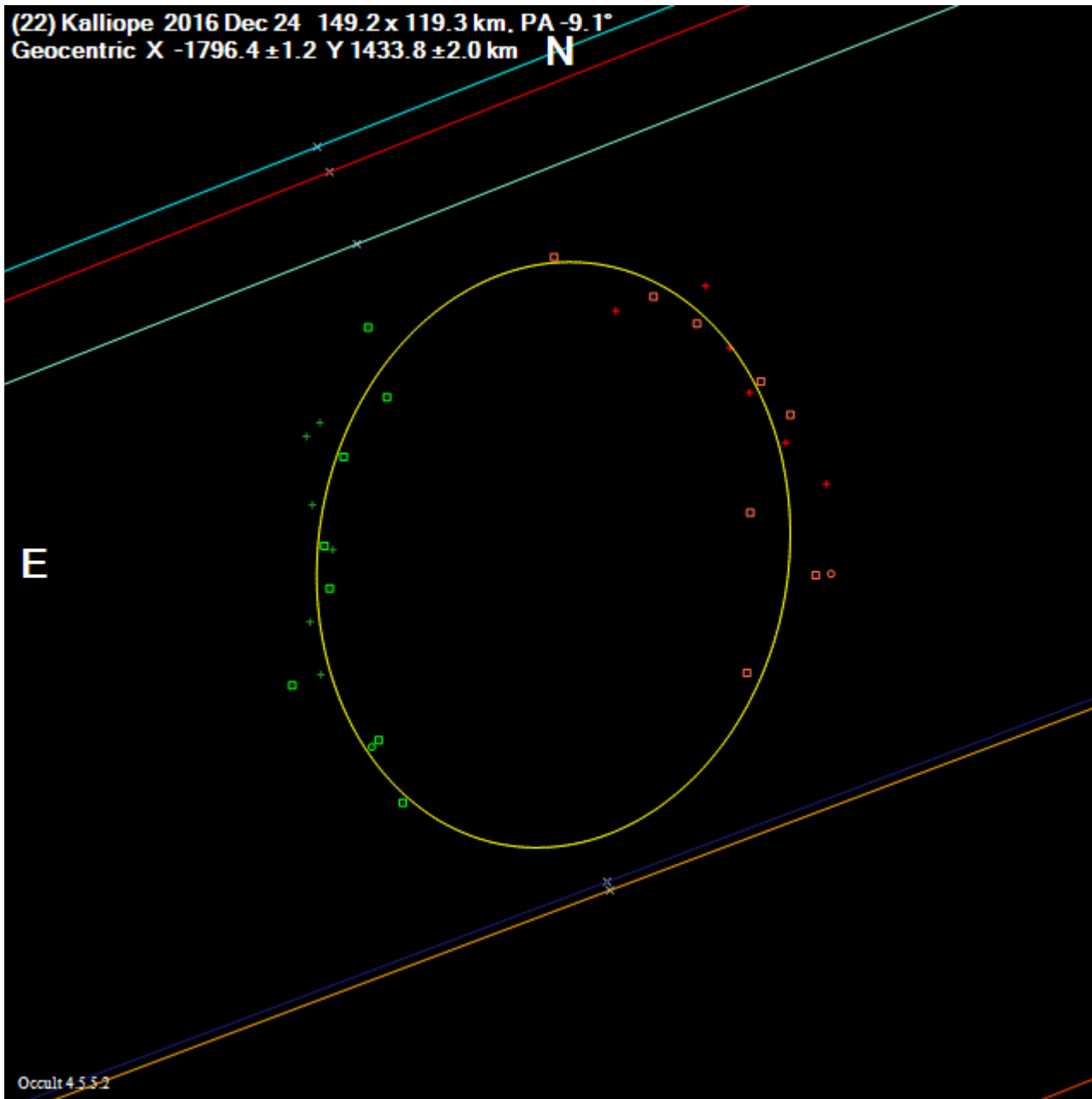
22Kalliope2011Nov22

(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**



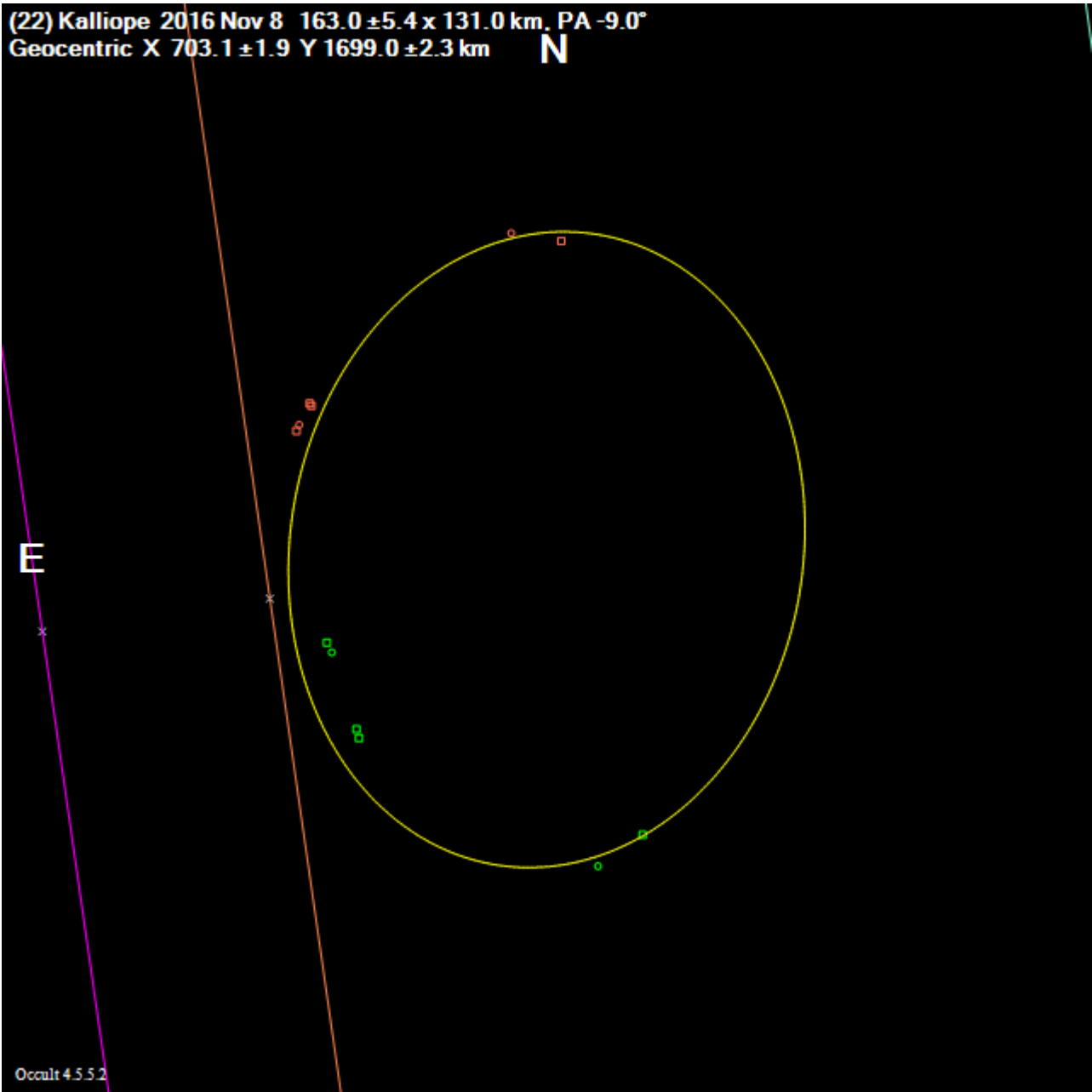
22Kalliope2016Dec24

(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



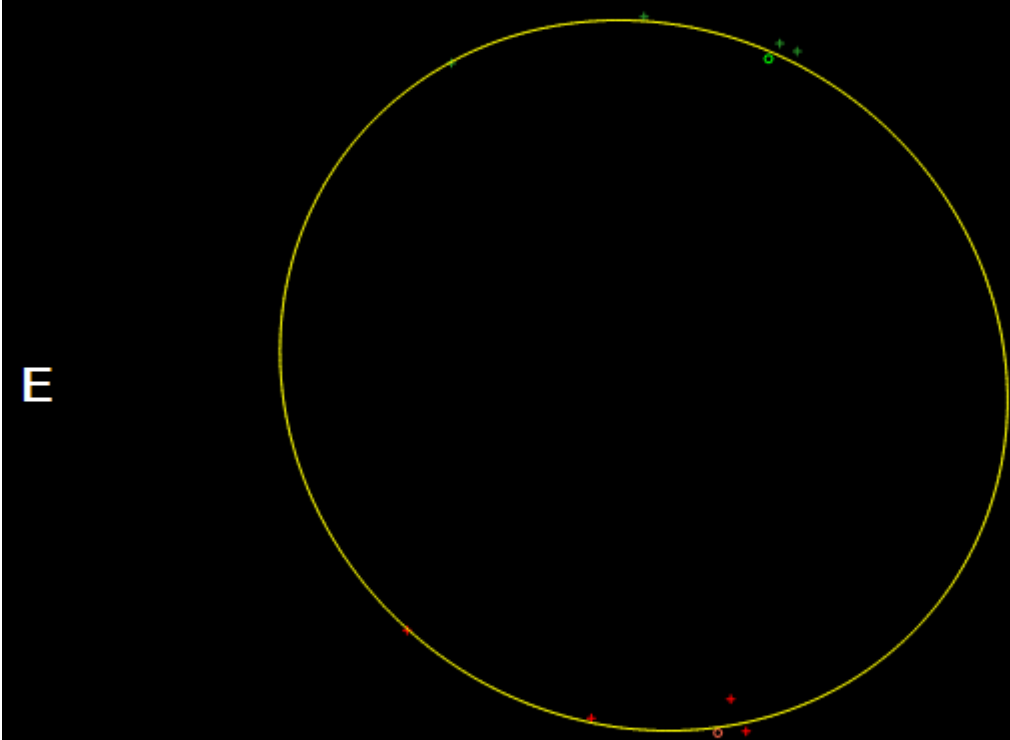
22Kalliope2016Nov08

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



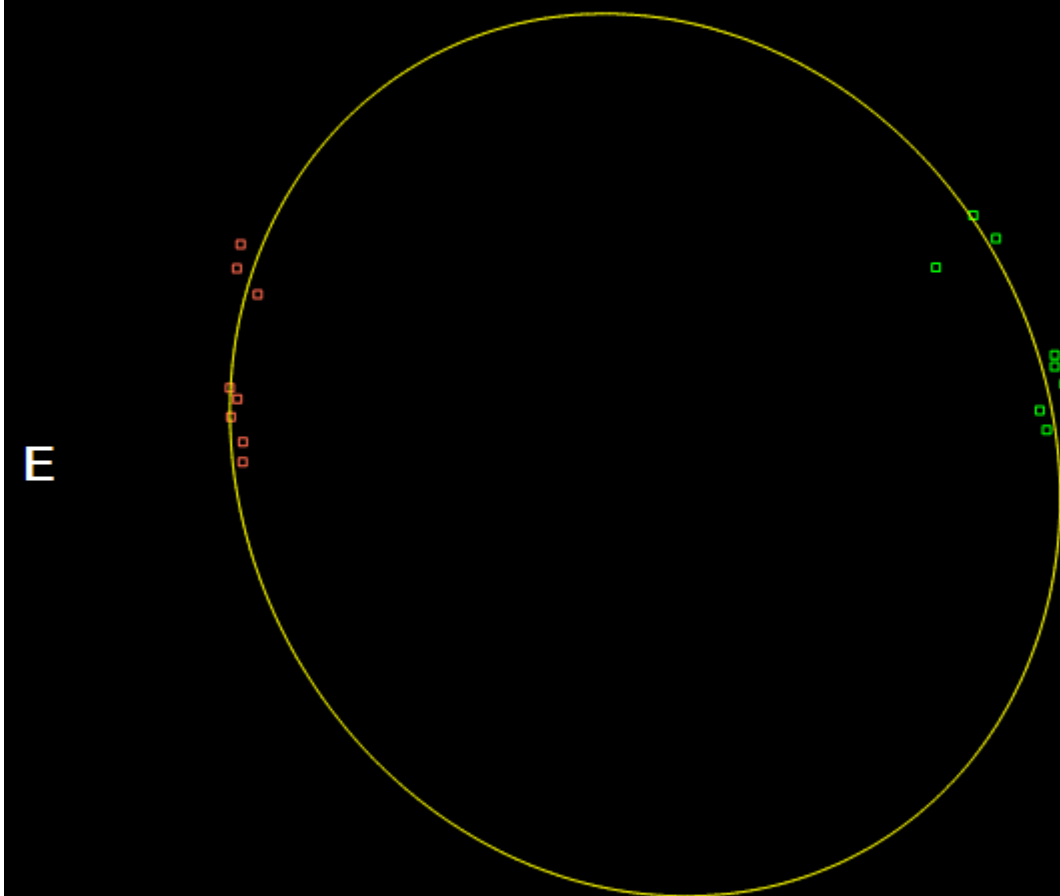
230Athamantis1991Jan21

(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**



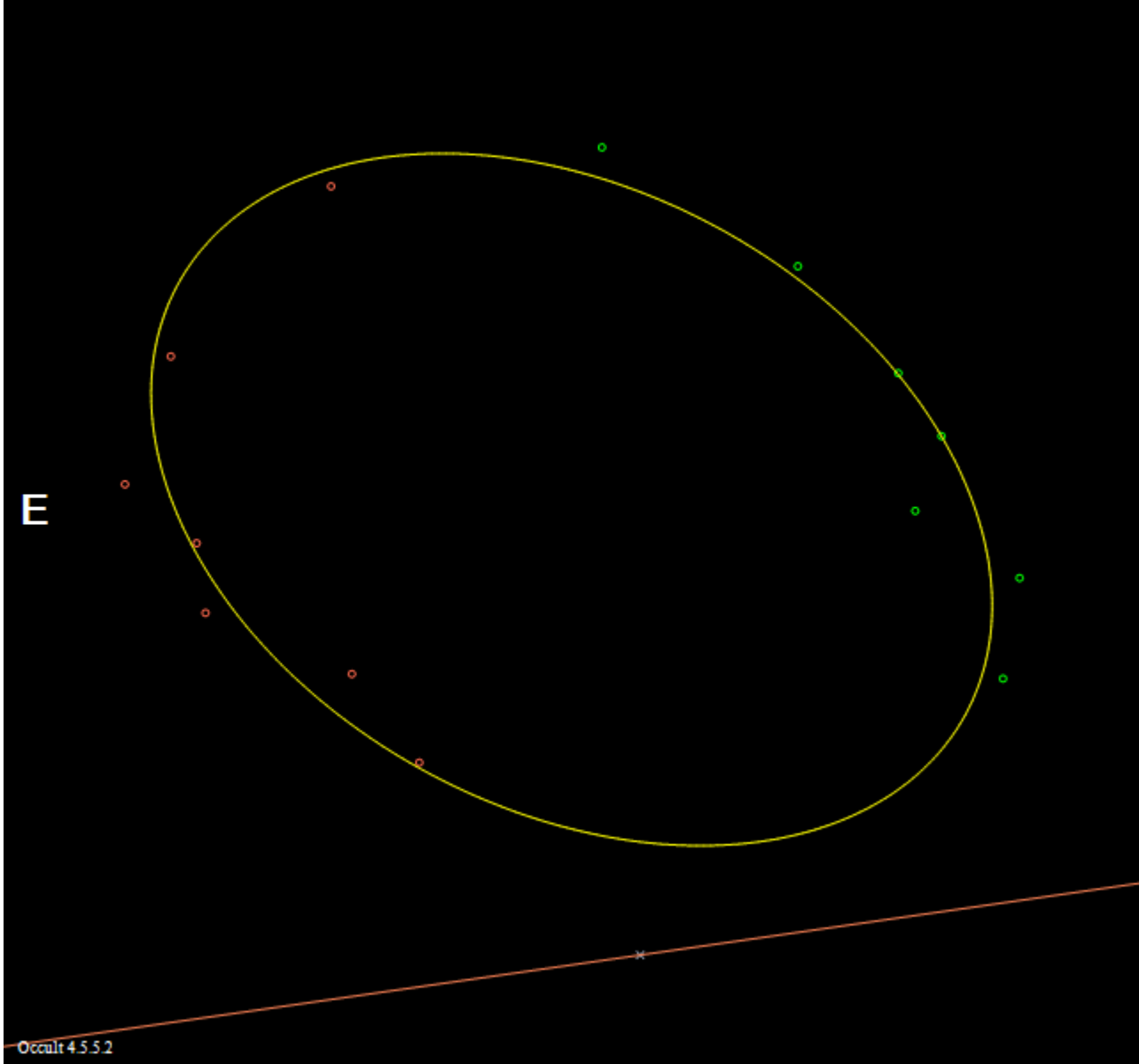
230Athamantis2014Oct08

(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**



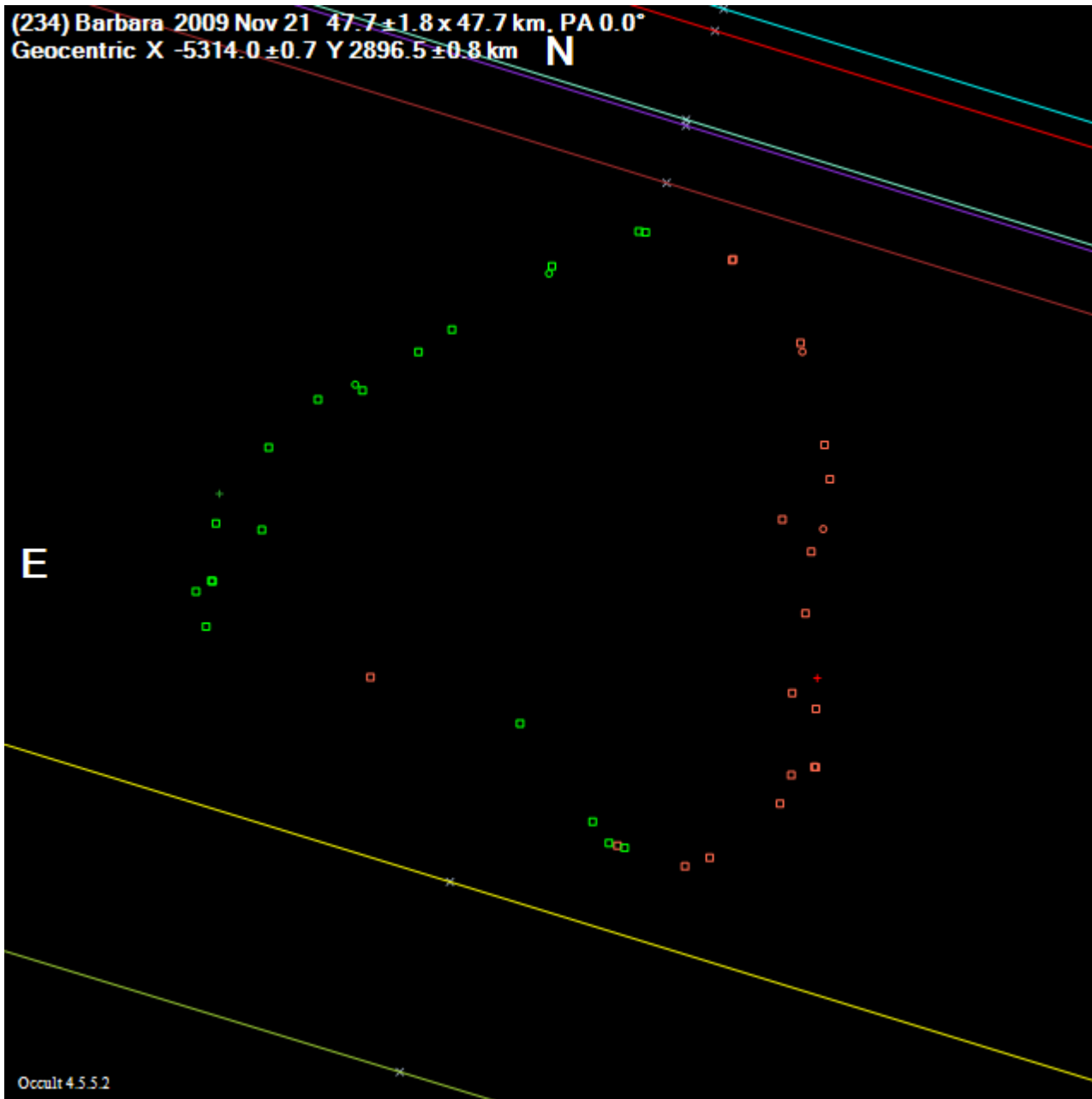
233Asterope2015Sep11

(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**



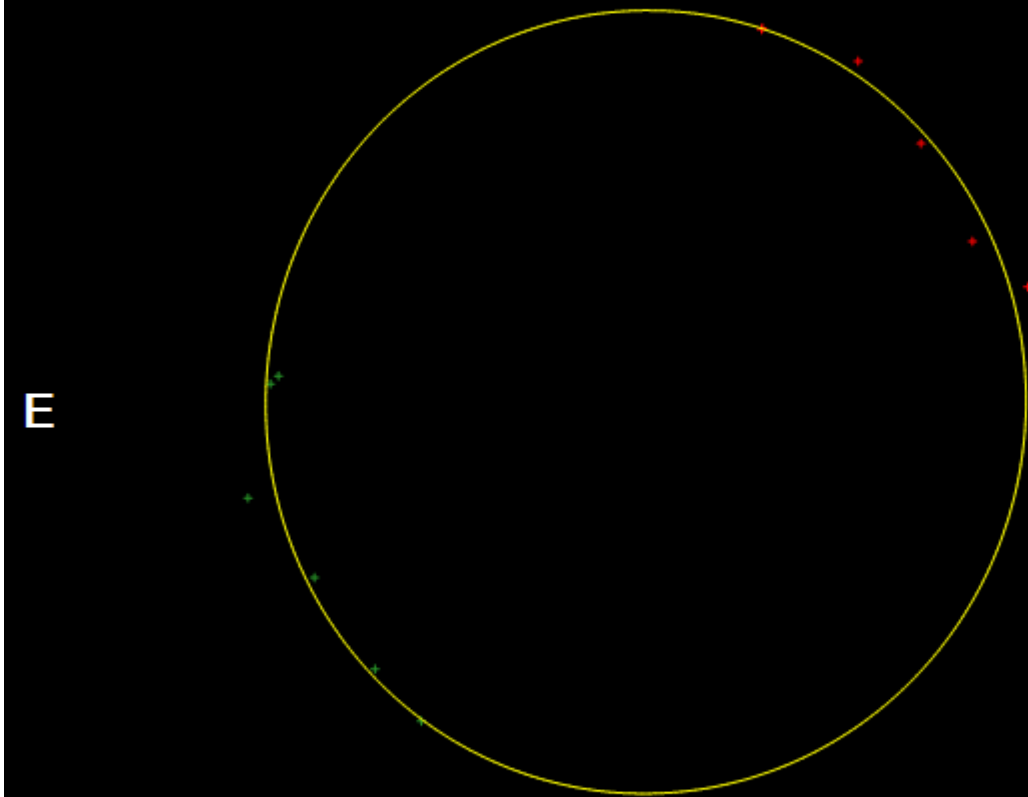
234Barbara2009Nov21

(234) Barbara 2009 Nov 21 $47.7 \pm 1.8 \times 47.7$ km, PA 0.0°
Geocentric X -5314.0 ± 0.7 Y 2896.5 ± 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**



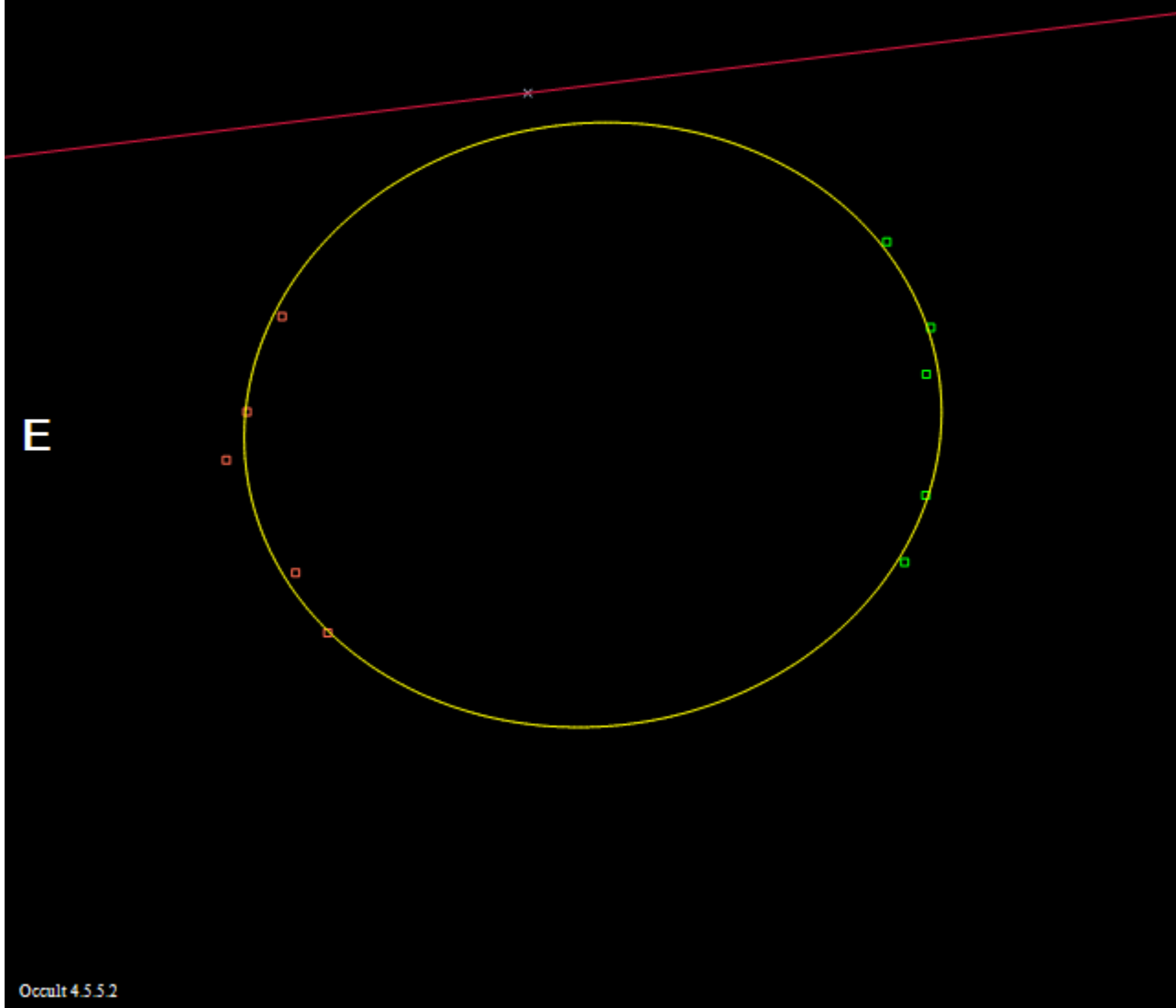
238Hypatia2005Feb23

(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**



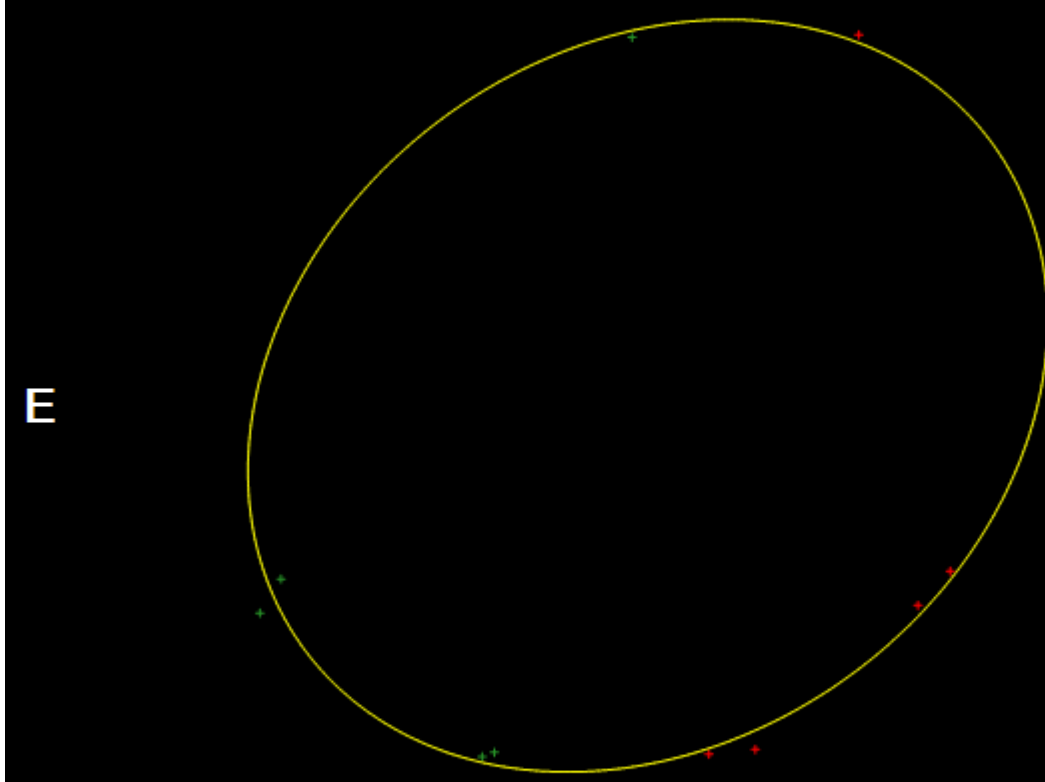
241Germania2014Apr18

(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**



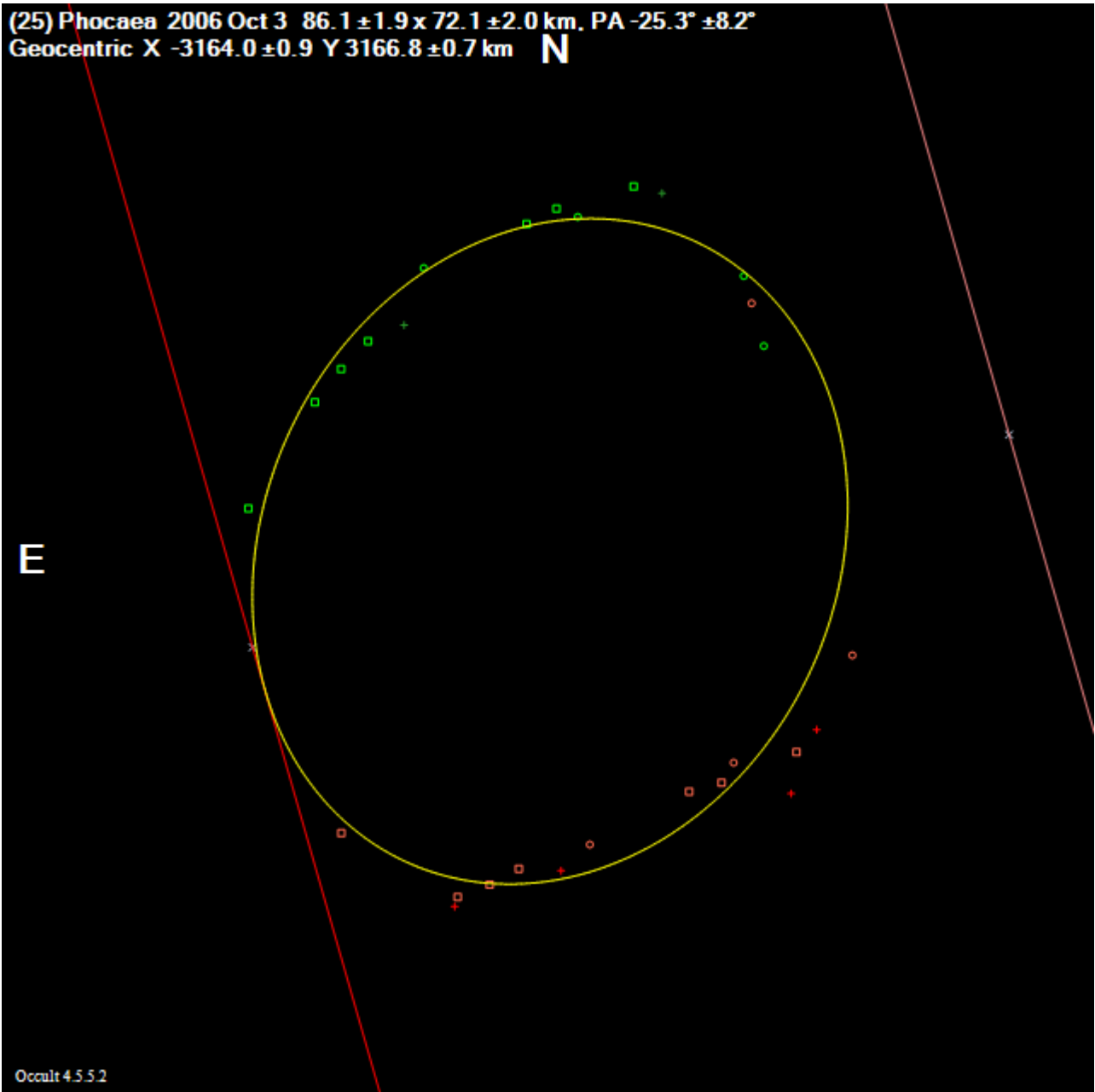
248Lameia1998Jun27

(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**



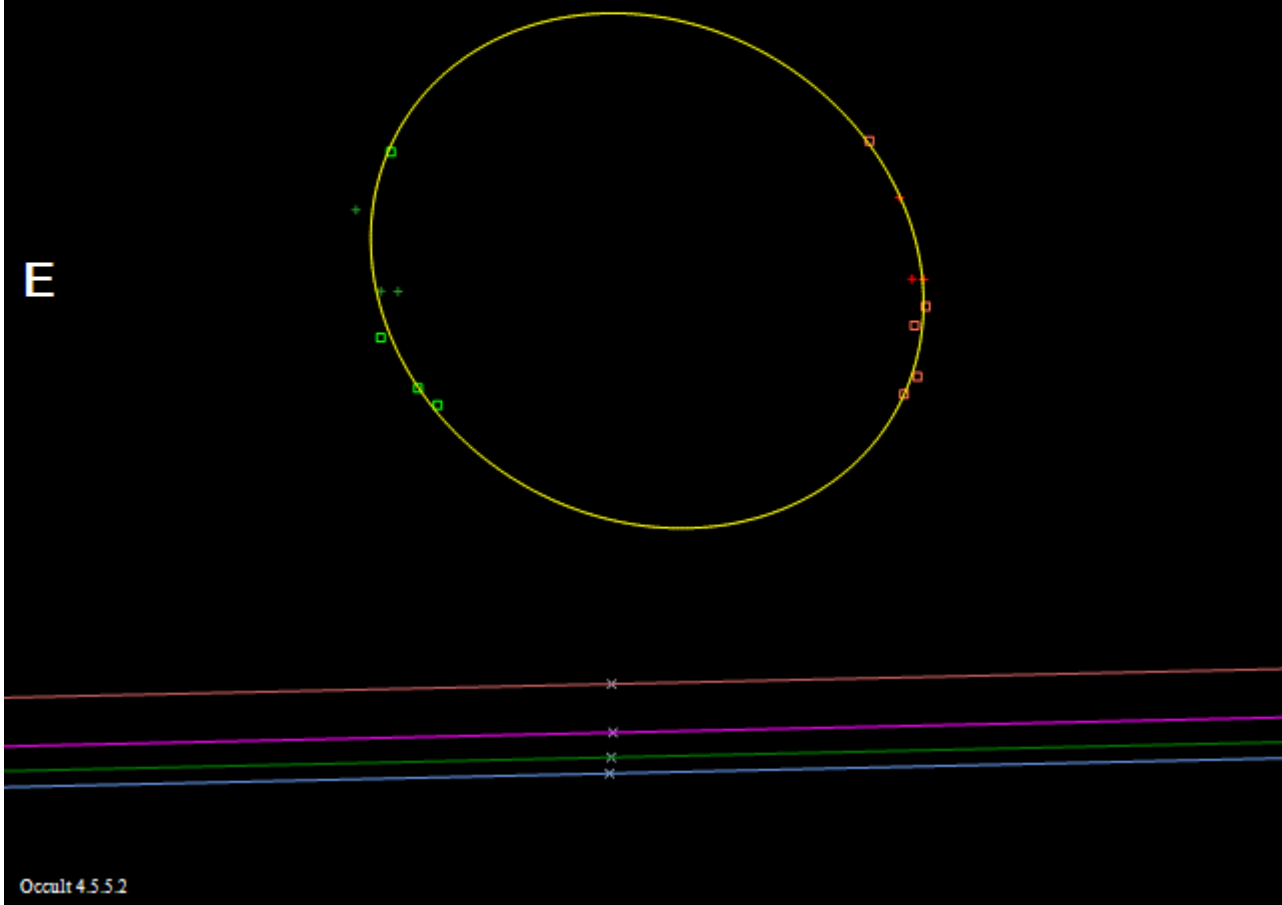
25Phocaea2006Oct03

(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**



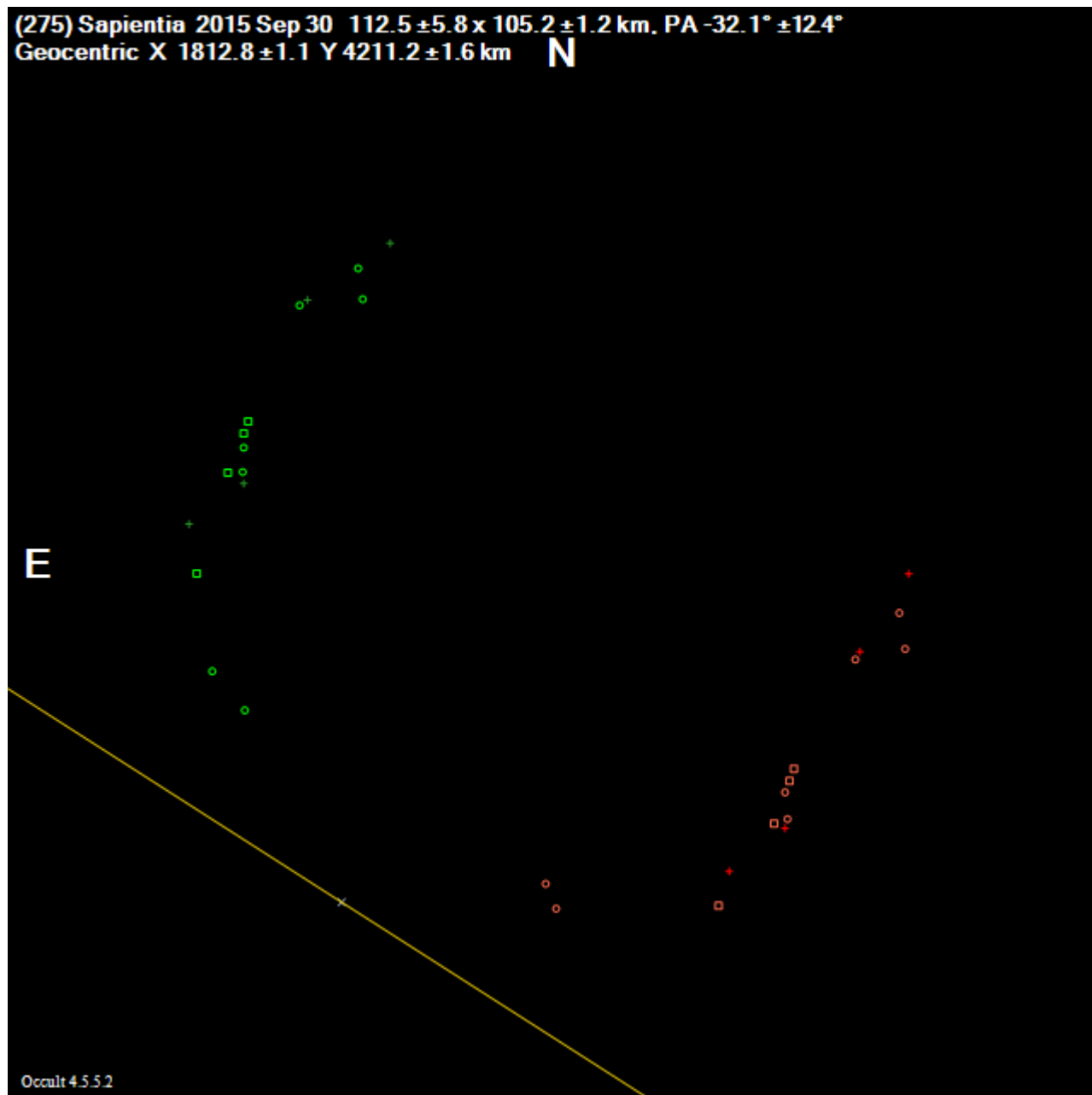
266Aline2012Jan17

(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**



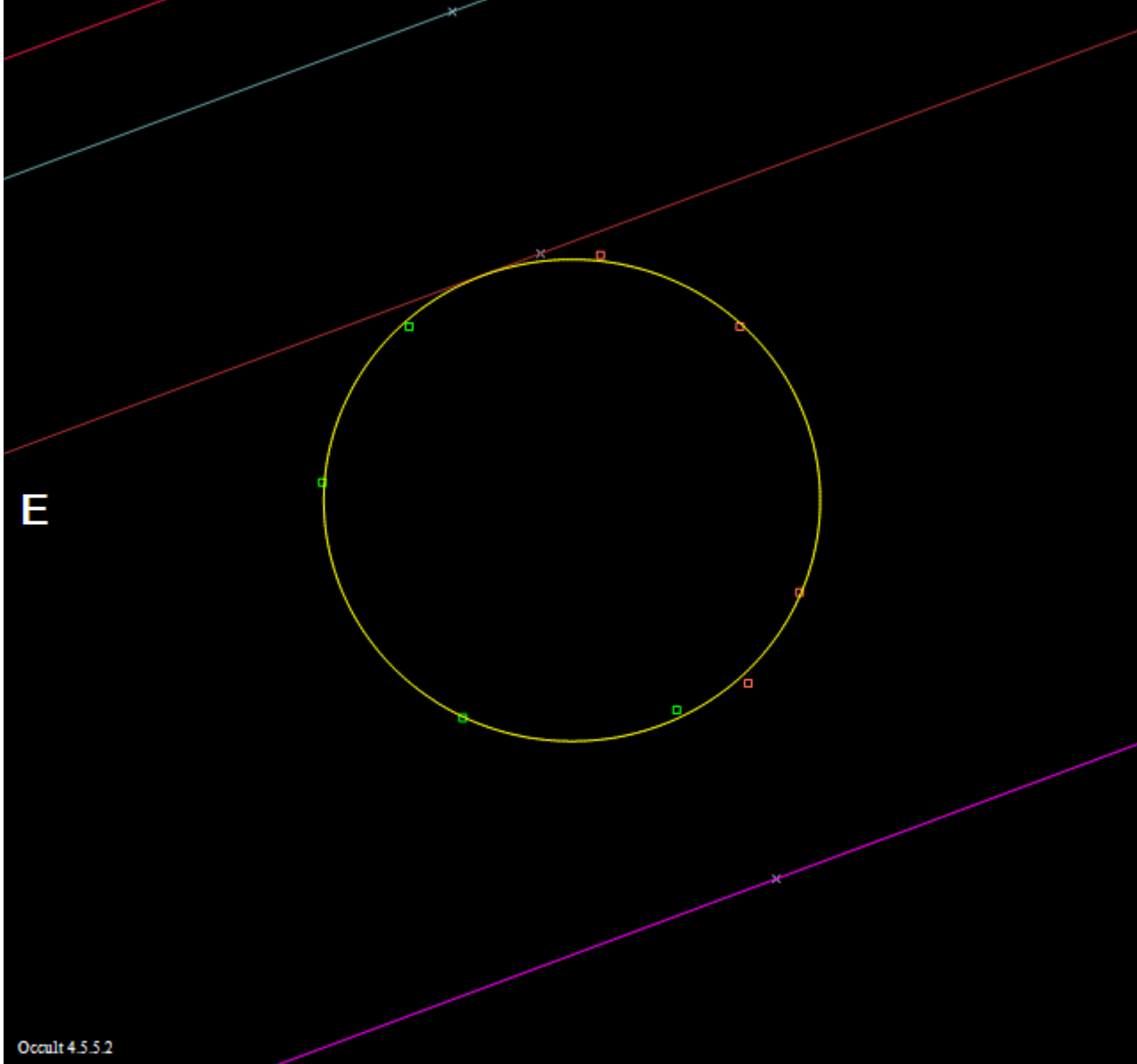
275Sapientia2015Sep30

(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 **N**



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**



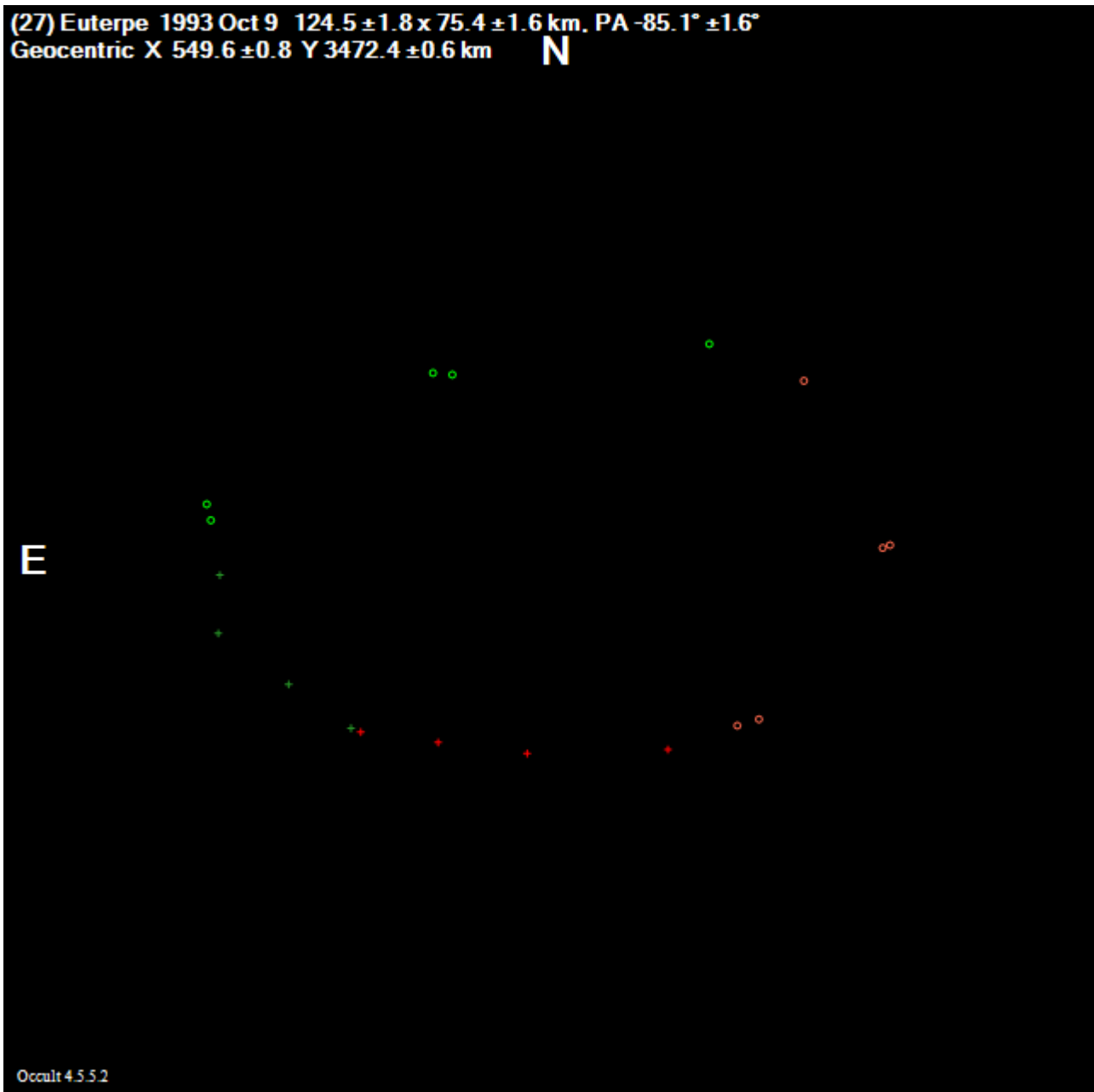
27Euterpe1993Oct09

(27) Euterpe 1993 Oct 9 $124.5 \pm 1.8 \times 75.4 \pm 1.6$ km, PA $-85.1^\circ \pm 1.6^\circ$
Geocentric X 549.6 ± 0.8 Y 3472.4 ± 0.6 km

N

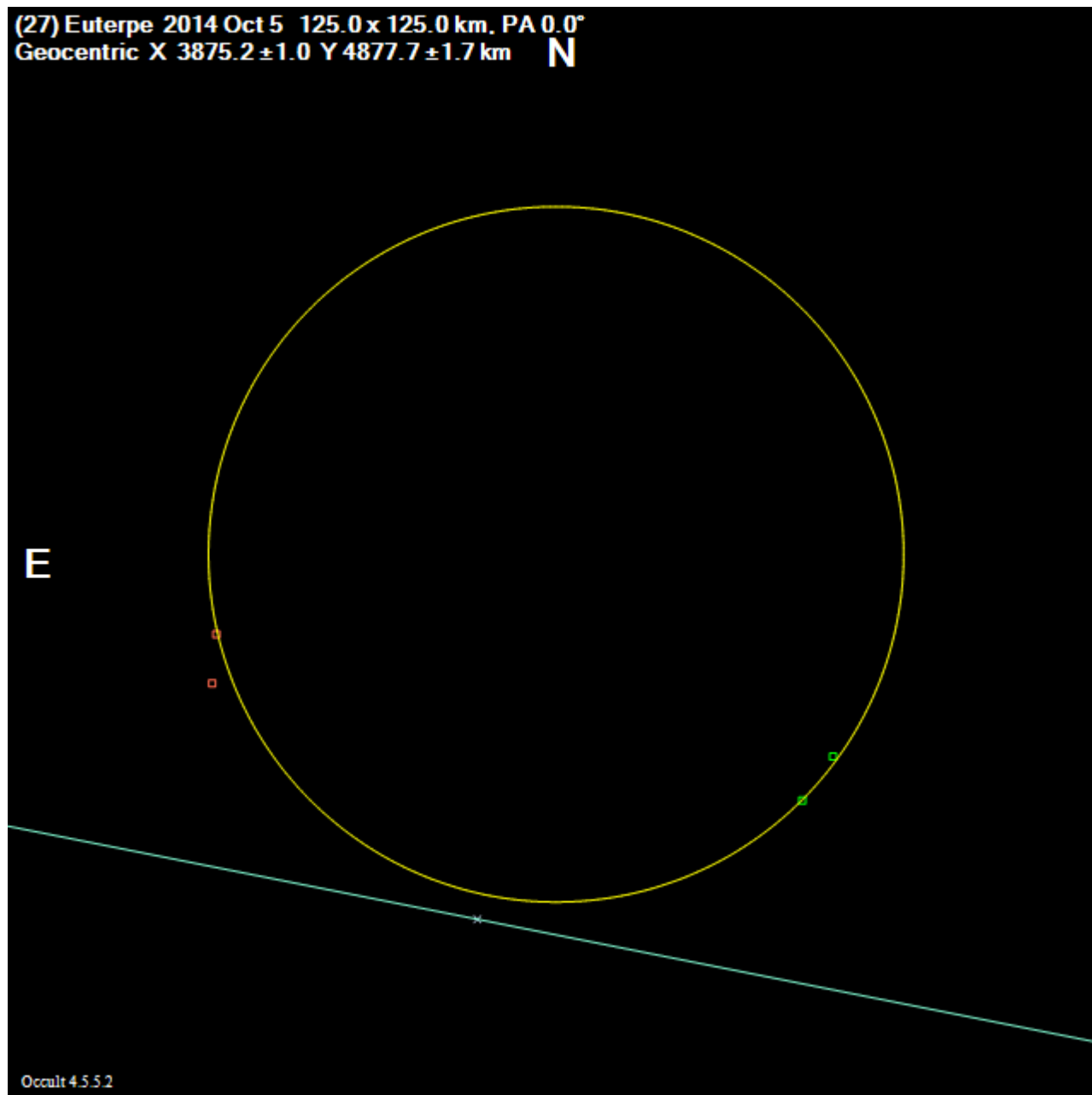
E

Occult 4.5.5.2



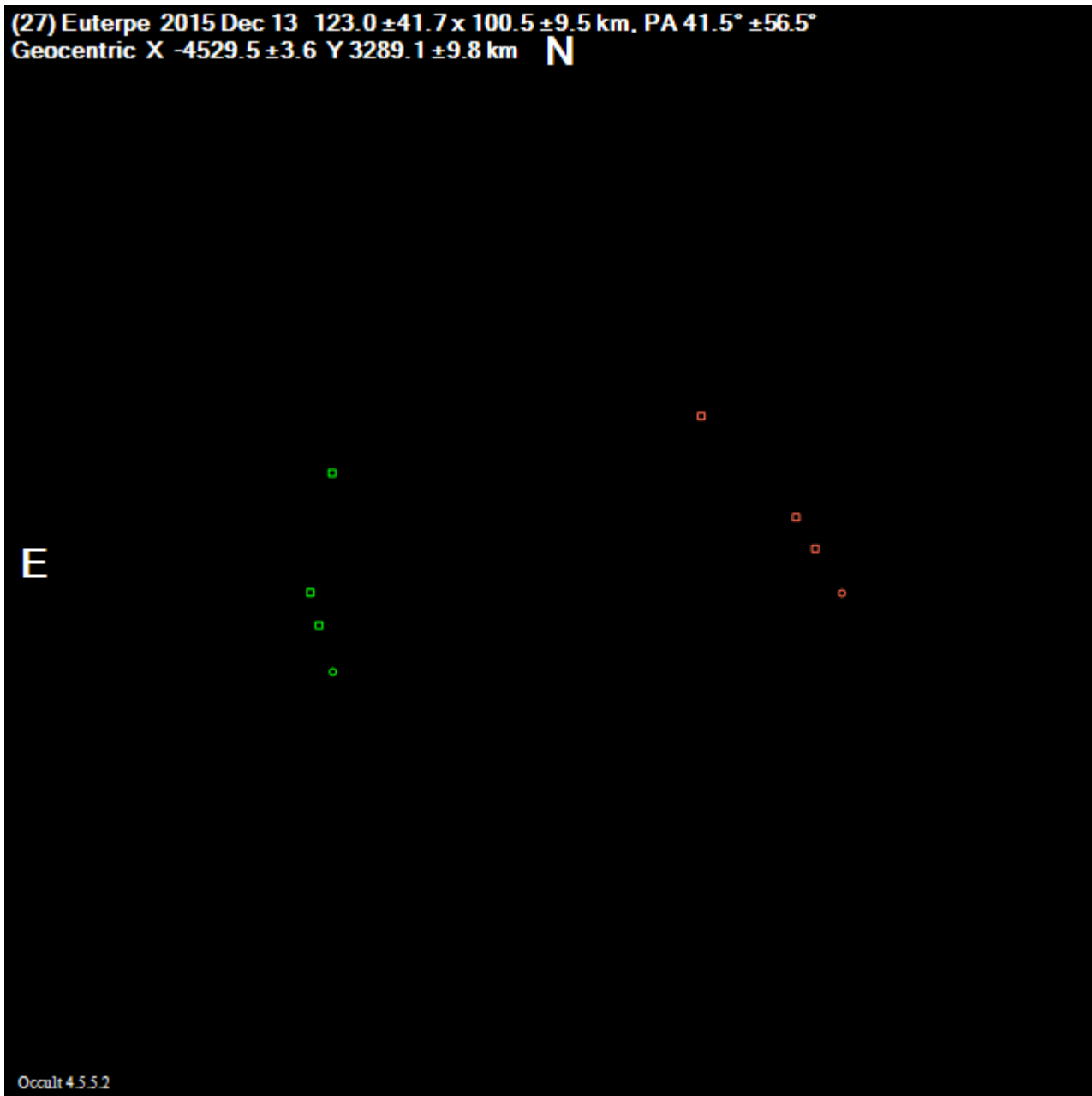
27Euterpe2014Oct05

(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



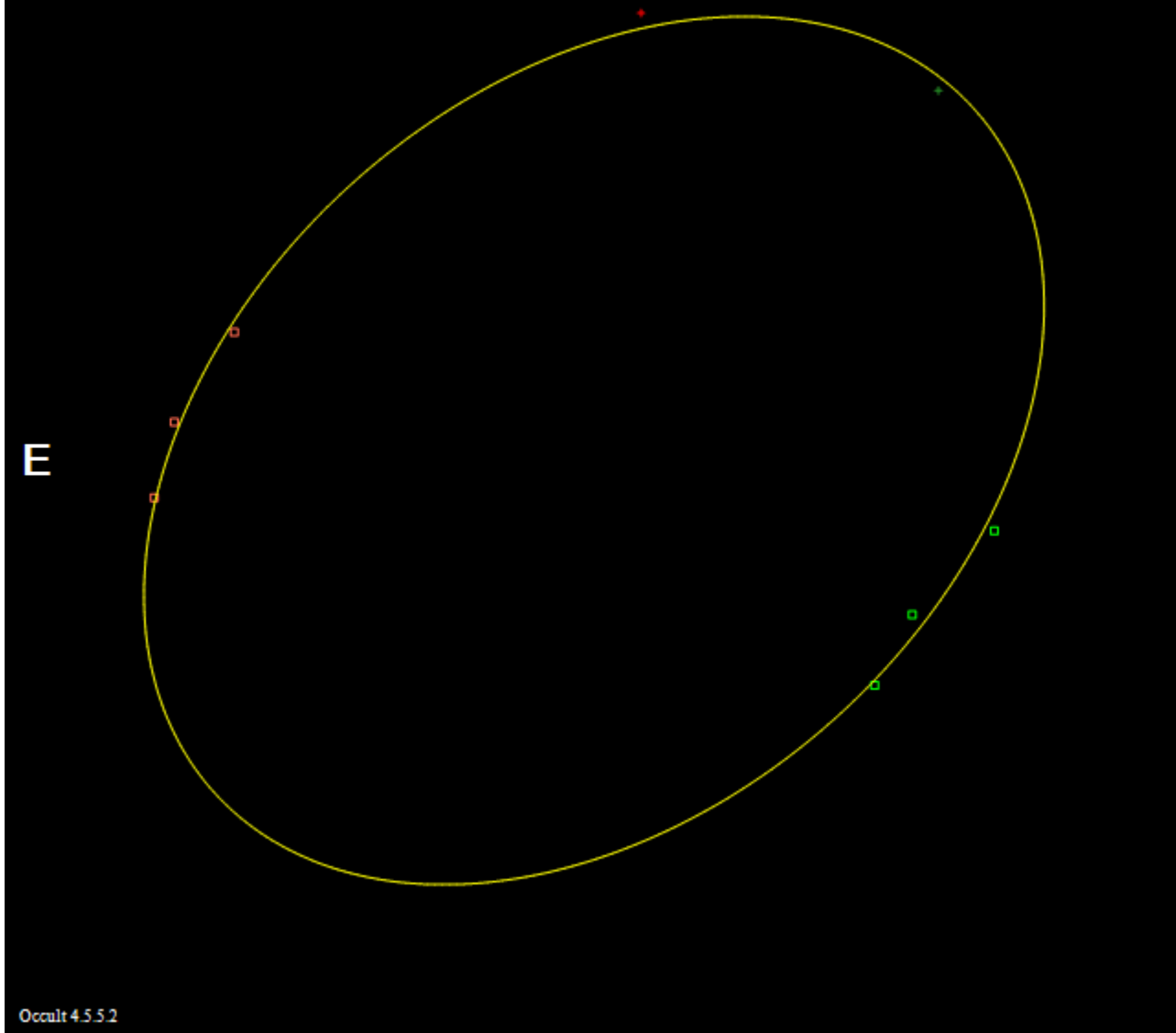
27Euterpe2015Dec13

(27) Euterpe 2015 Dec 13 $123.0 \pm 41.7 \times 100.5 \pm 9.5$ km, PA $41.5^\circ \pm 56.5^\circ$
Geocentric X -4529.5 ± 3.6 Y 3289.1 ± 9.8 km **N**



287Nepthys2008May11

(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**



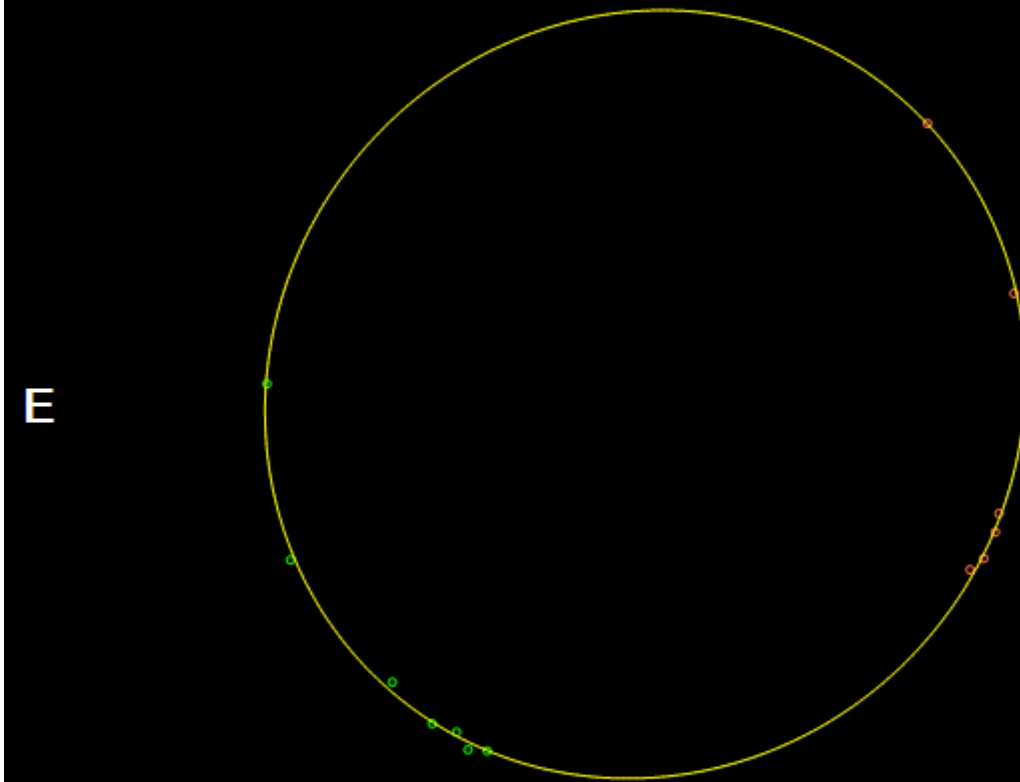
29Amphitrite2015Nov11

(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**



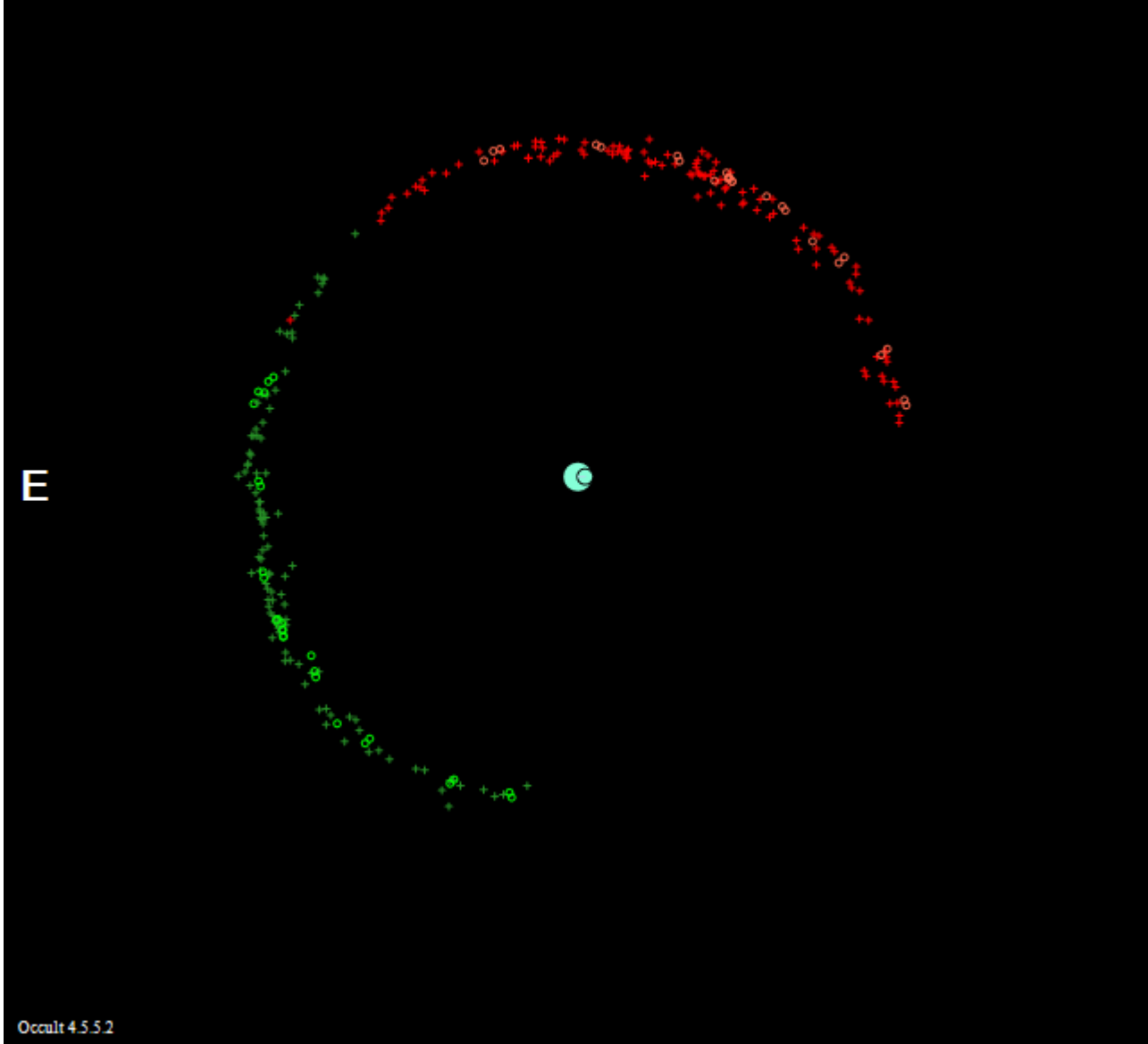
2Pallas1978May29

(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**



2Pallas1983May29

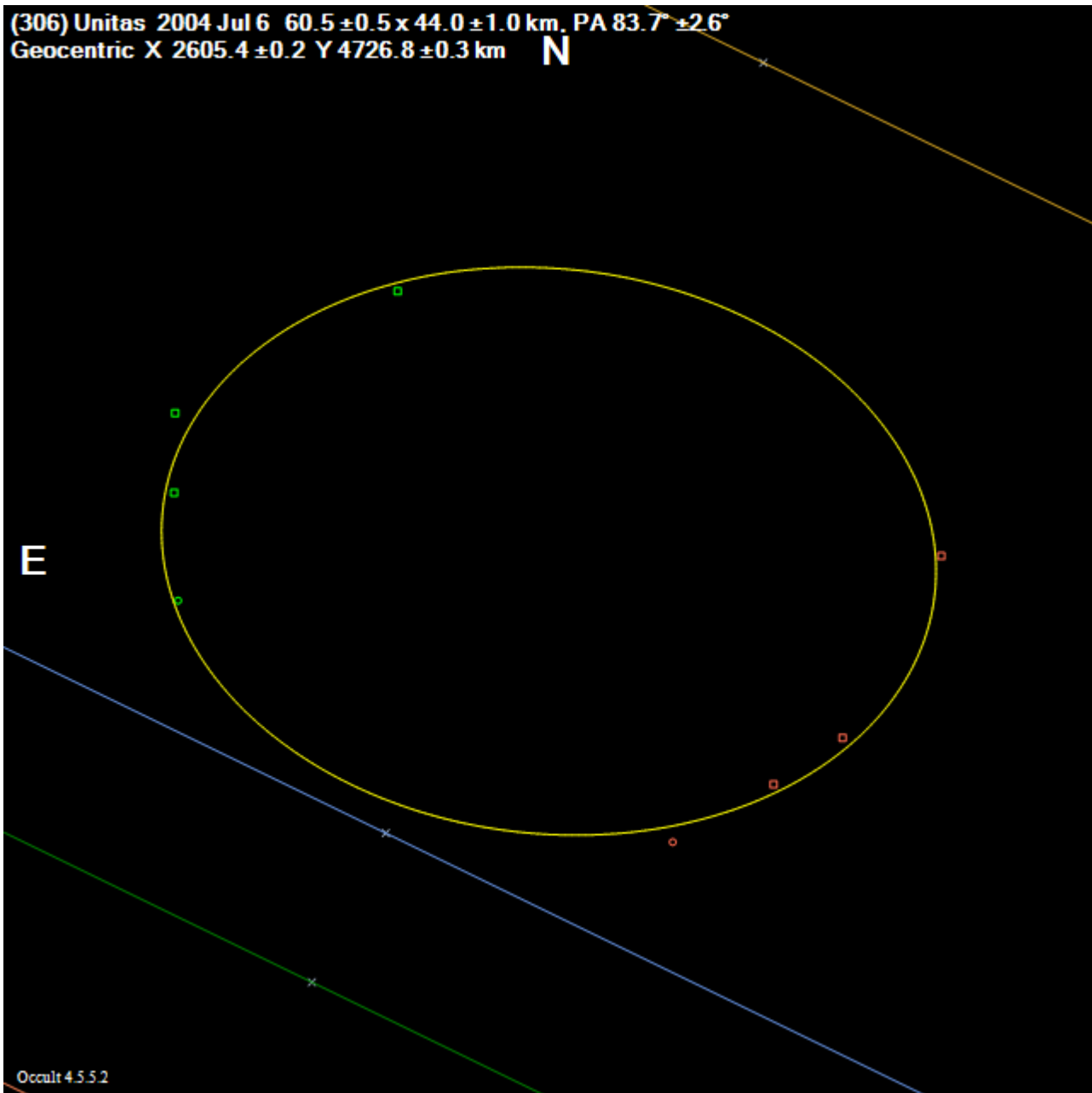
(2) Pallas 1983 May 29 $528.6 \pm 1.3 \times 512.3 \pm 3.4$ km, PA $-31.7^\circ \pm 5.4^\circ$
Geocentric X -5331.0 ± 1.1 Y 2389.5 ± 1.1 km **N**
Double : Sep $0.0030 \pm 0.0008''$, PA $-88.0^\circ \pm 17.1^\circ$



Occult 4.5.5.2

306Unitas2004Jul06

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



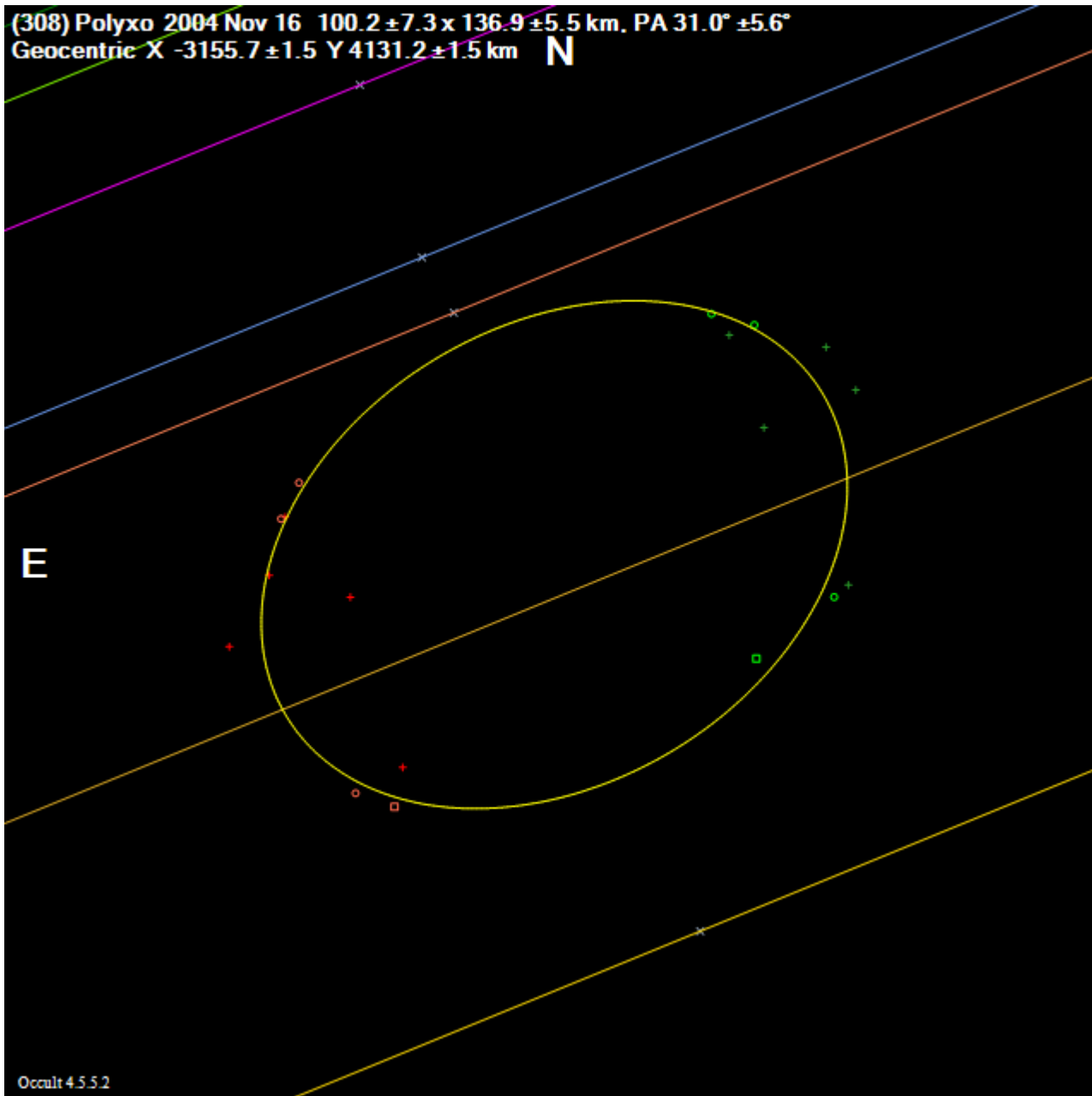
308Polyxo2000Jan10

(308) Polyxo 2000 Jan 10 $165.5 \pm 16.2 \times 126.1 \pm 1.7$ km, PA $38.7^\circ \pm 6.8^\circ$
Geocentric X -4497.8 ± 3.4 Y 3351.4 ± 6.7 km **N**



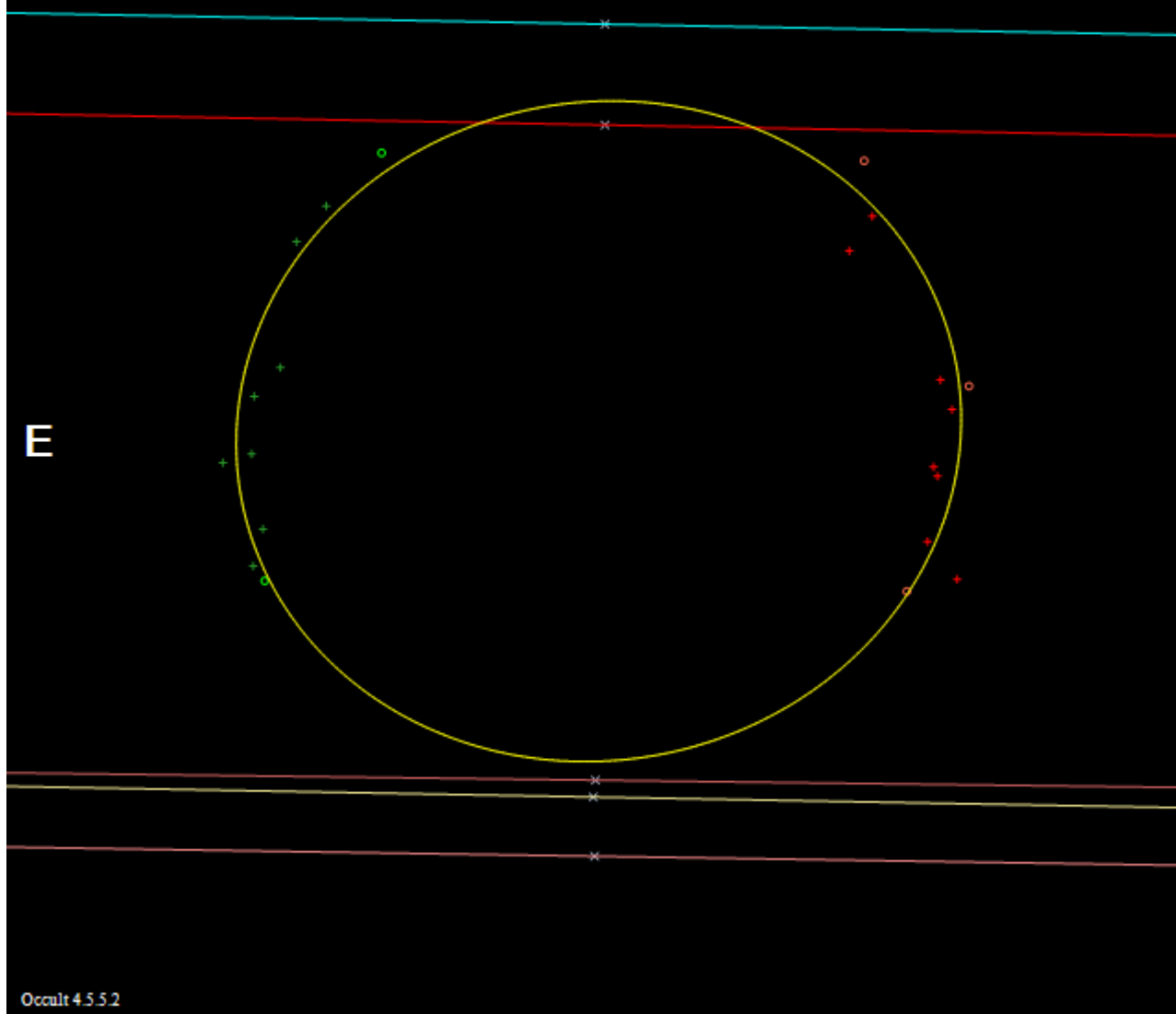
308Polyxo2004Nov16

(308) Polyxo 2004 Nov 16 $100.2 \pm 7.3 \times 136.9 \pm 5.5$ km, PA $31.0^\circ \pm 5.6^\circ$
Geocentric X -3155.7 ± 1.5 Y 4131.2 ± 1.5 km **N**



324Bamberg1987Dec08

(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**

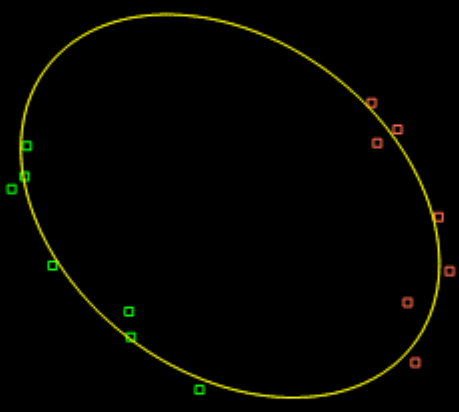


329Svea2011Dec28

(329) Svea 2011 Dec 28 $83.3 \pm 2.3 \times 60.3 \pm 1.2$ km, PA $53.2^\circ \pm 4.9^\circ$
Geocentric X 565.4 ± 0.5 Y 3809.1 ± 1.0 km

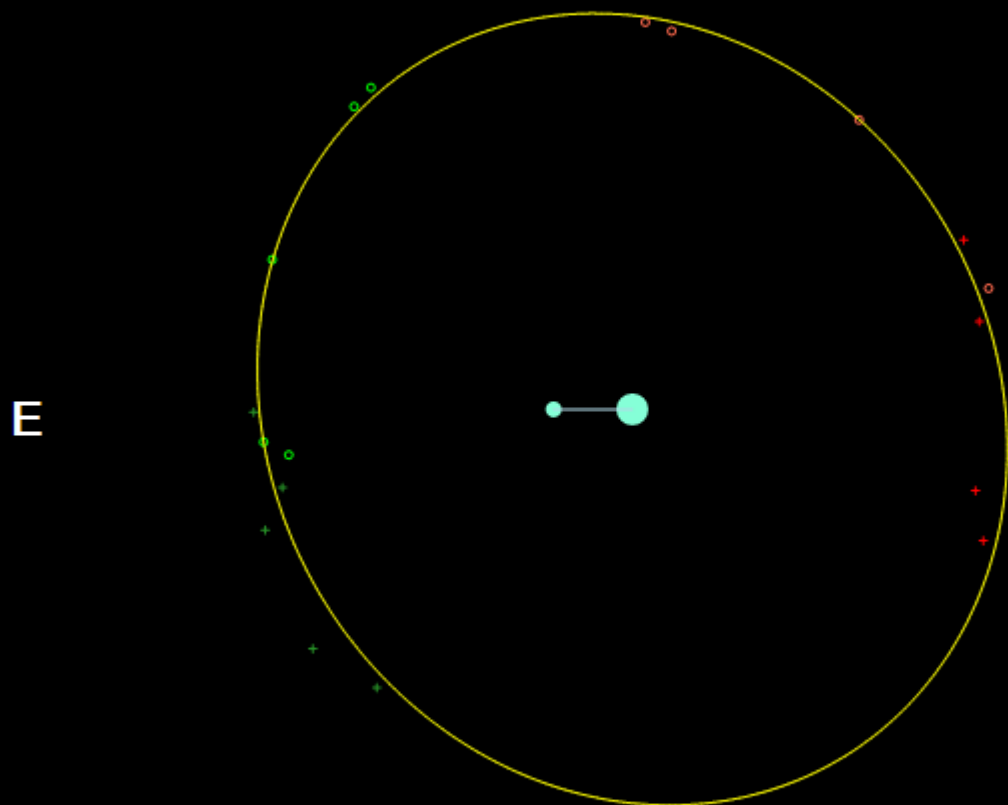
N

E



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°

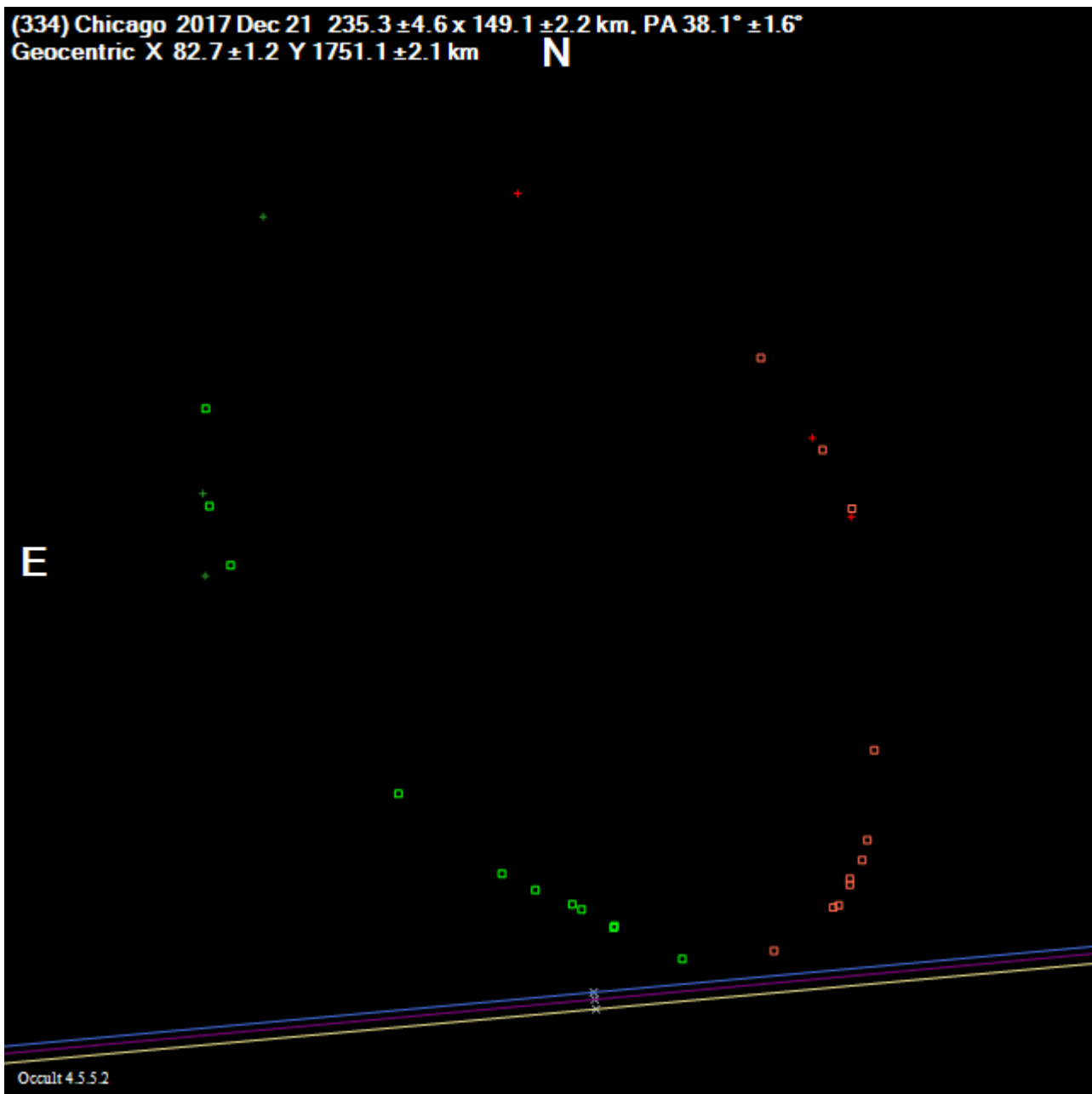


334Chicago2017Dec21

(334) Chicago 2017 Dec 21 $235.3 \pm 4.6 \times 149.1 \pm 2.2$ km, PA $38.1^\circ \pm 1.6^\circ$
Geocentric X 82.7 ± 1.2 Y 1751.1 ± 2.1 km

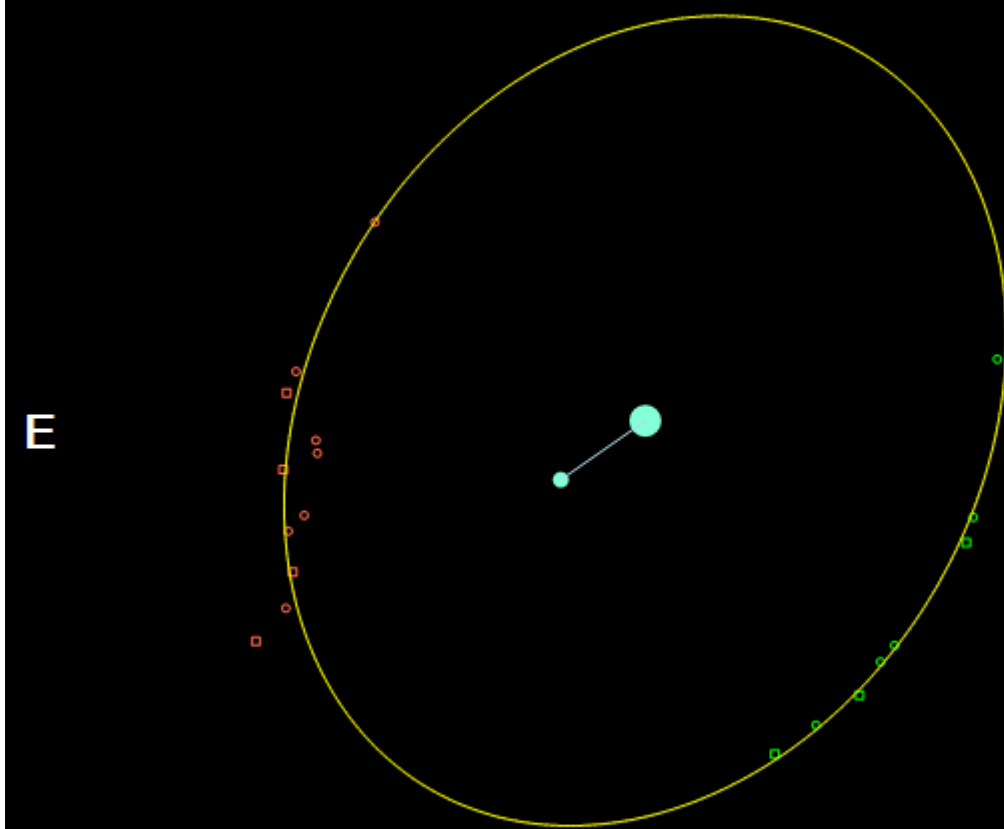
N

E



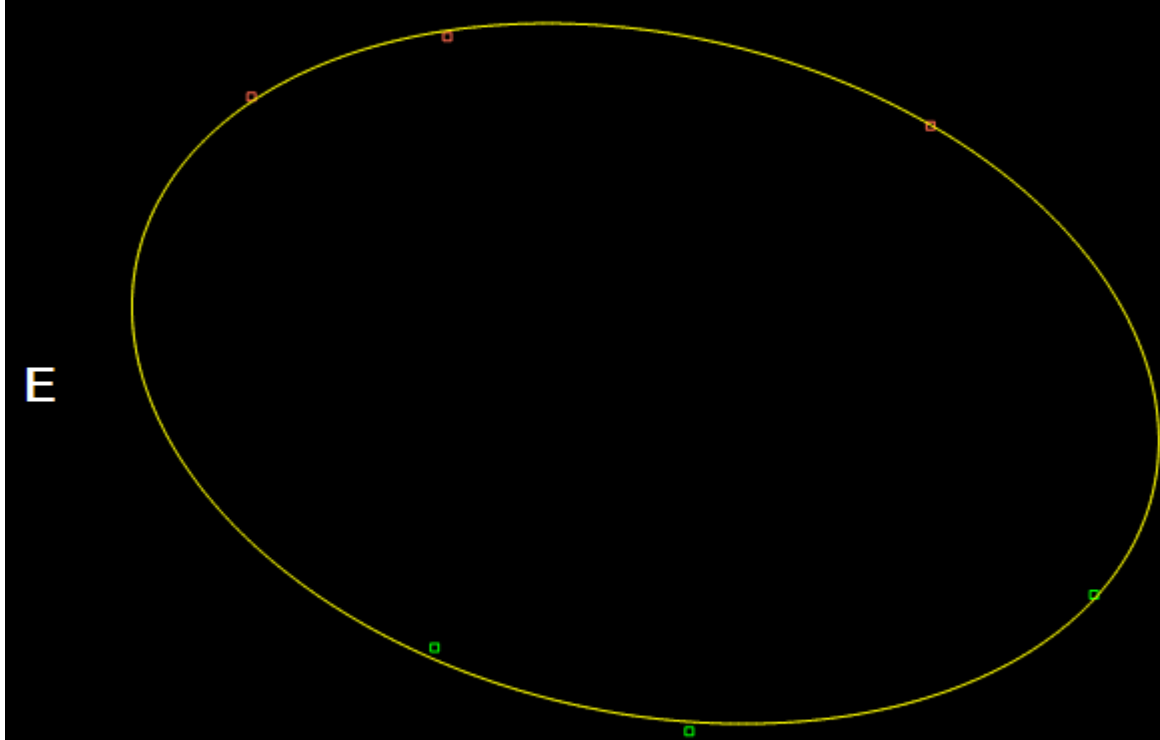
336Lacadiera2009Apr16

(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 $124.9^\circ \pm 9.8^\circ$



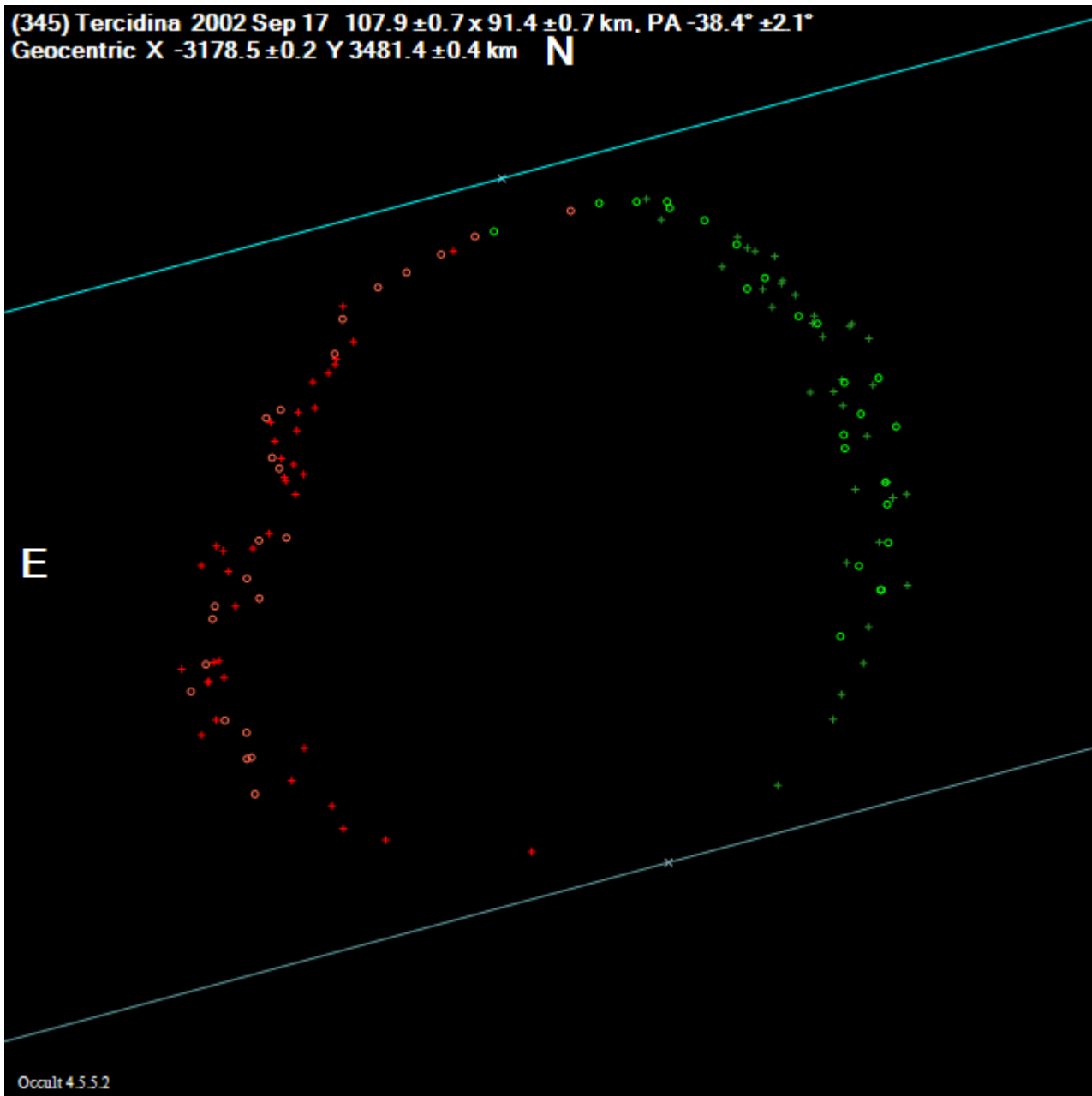
337Devosa2014Dec11

(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**



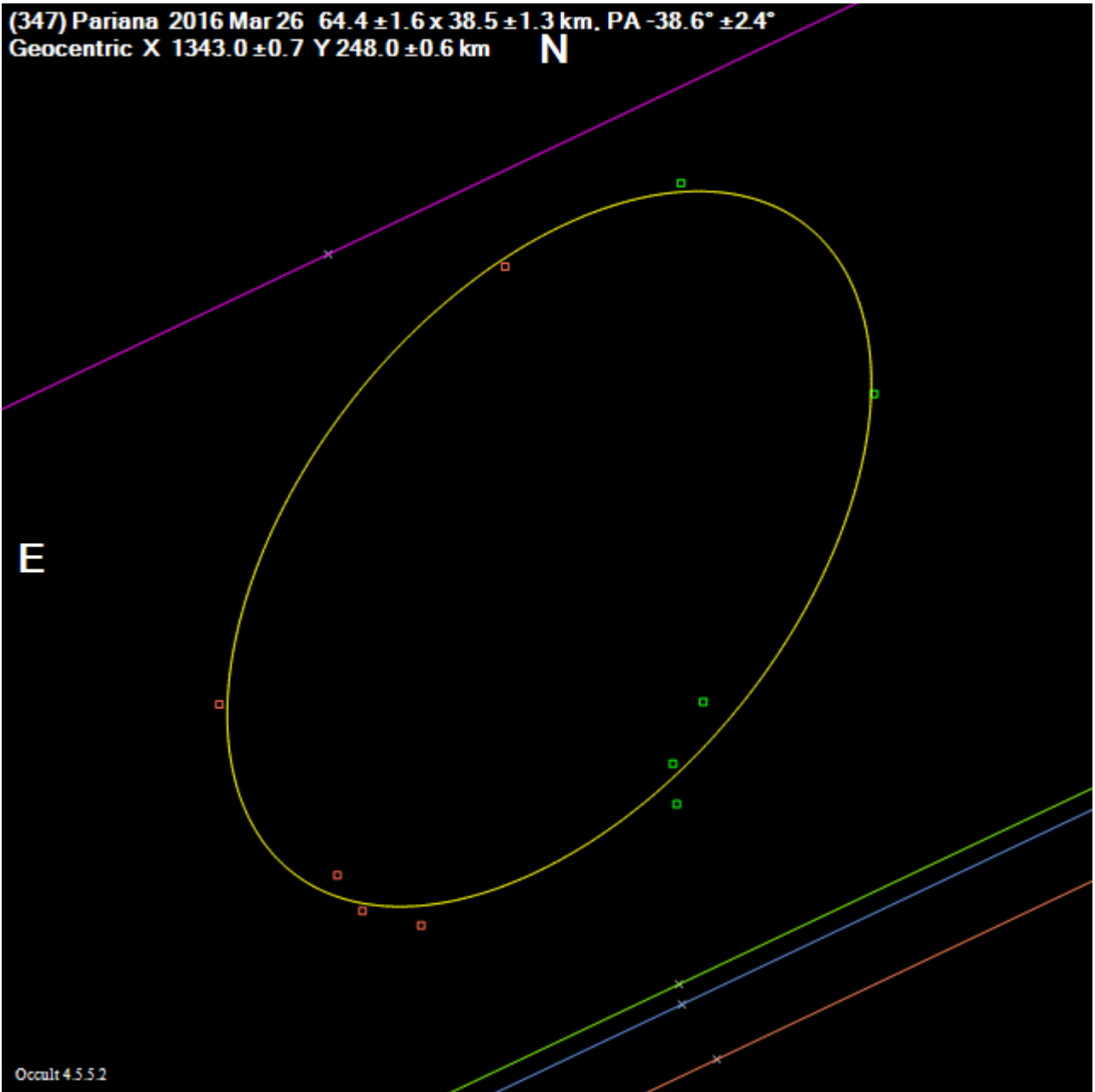
345Tercidina2002Sep17

(345) Tercidina 2002 Sep 17 $107.9 \pm 0.7 \times 91.4 \pm 0.7$ km, PA $-38.4^\circ \pm 2.1^\circ$
Geocentric X -3178.5 ± 0.2 Y 3481.4 ± 0.4 km **N**



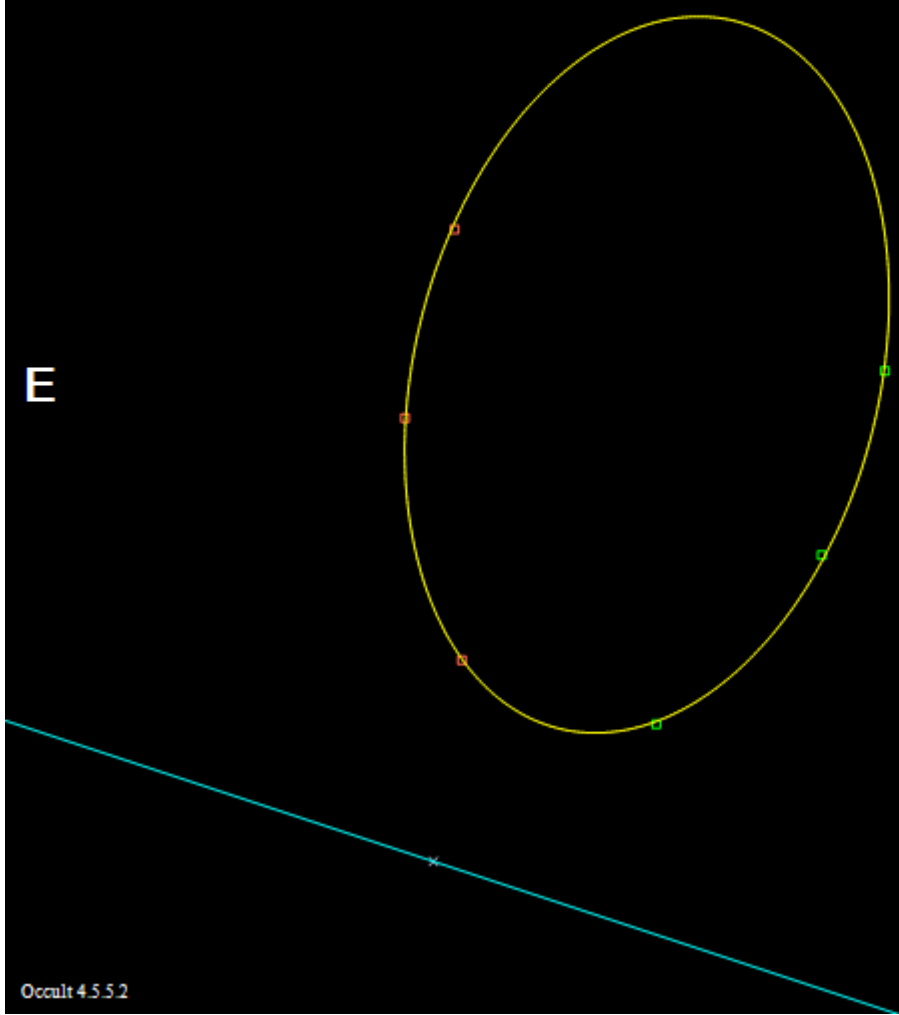
347Pariana2016Mar26

(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**



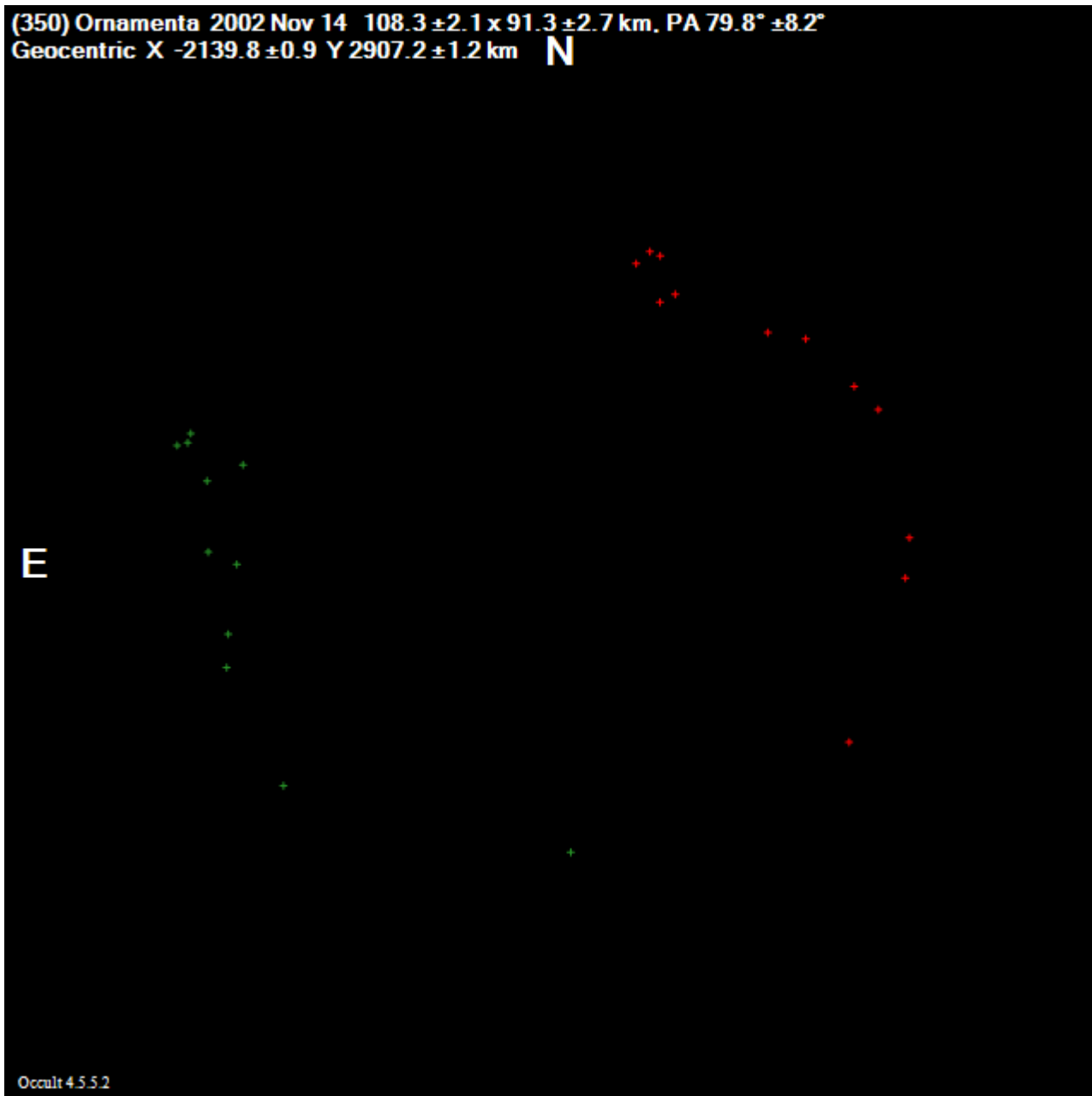
349Dembowska2017Aug07

(349) Dembowska 2017 Aug 7 $210.6 \pm 1.7 \times 134.3 \pm 0.2$ km, PA $-14.0^\circ \pm 0.3^\circ$
Geocentric X -3452.8 ± 0.2 Y -4333.9 ± 0.7 km **N**



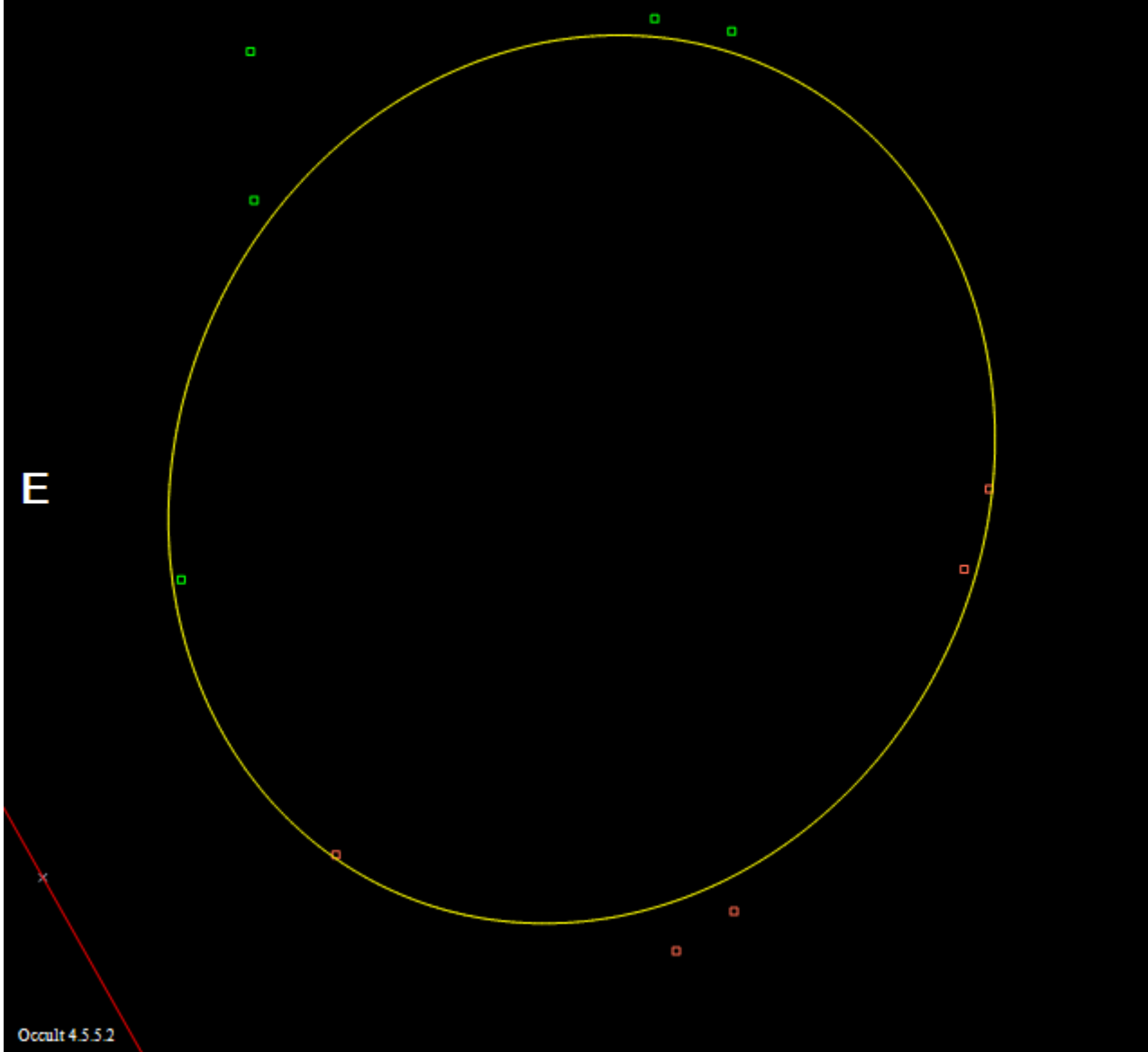
350Ornamenta2002Nov14

(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**



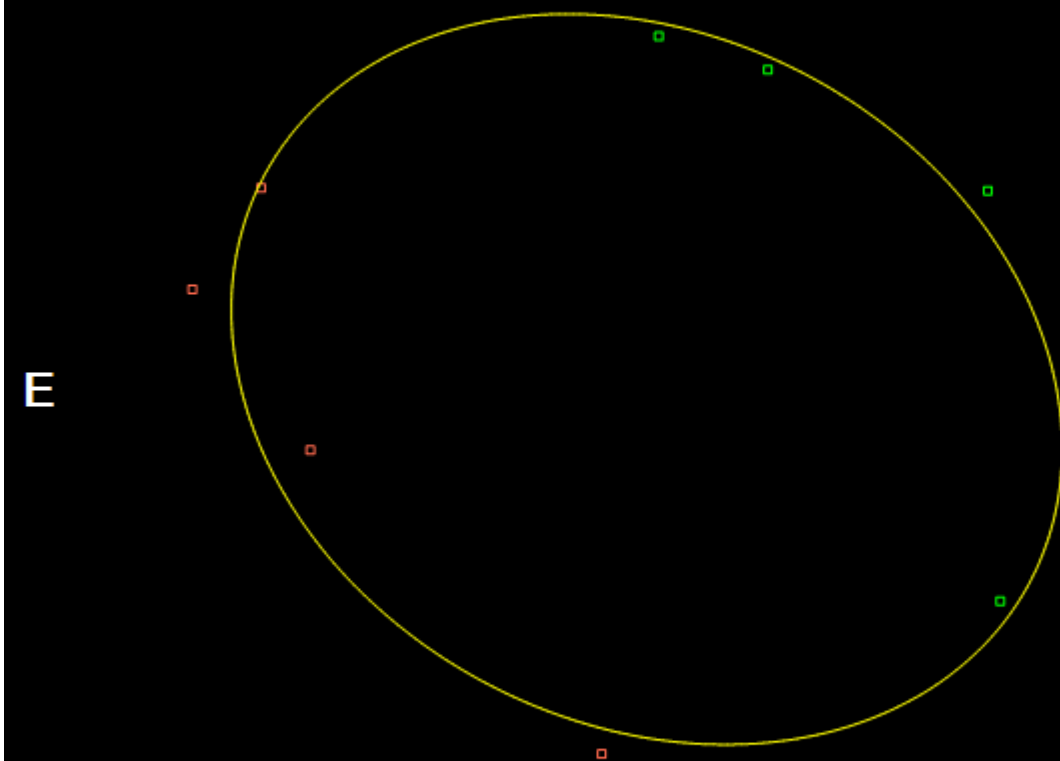
350Ornamenta2016Jul11

(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**



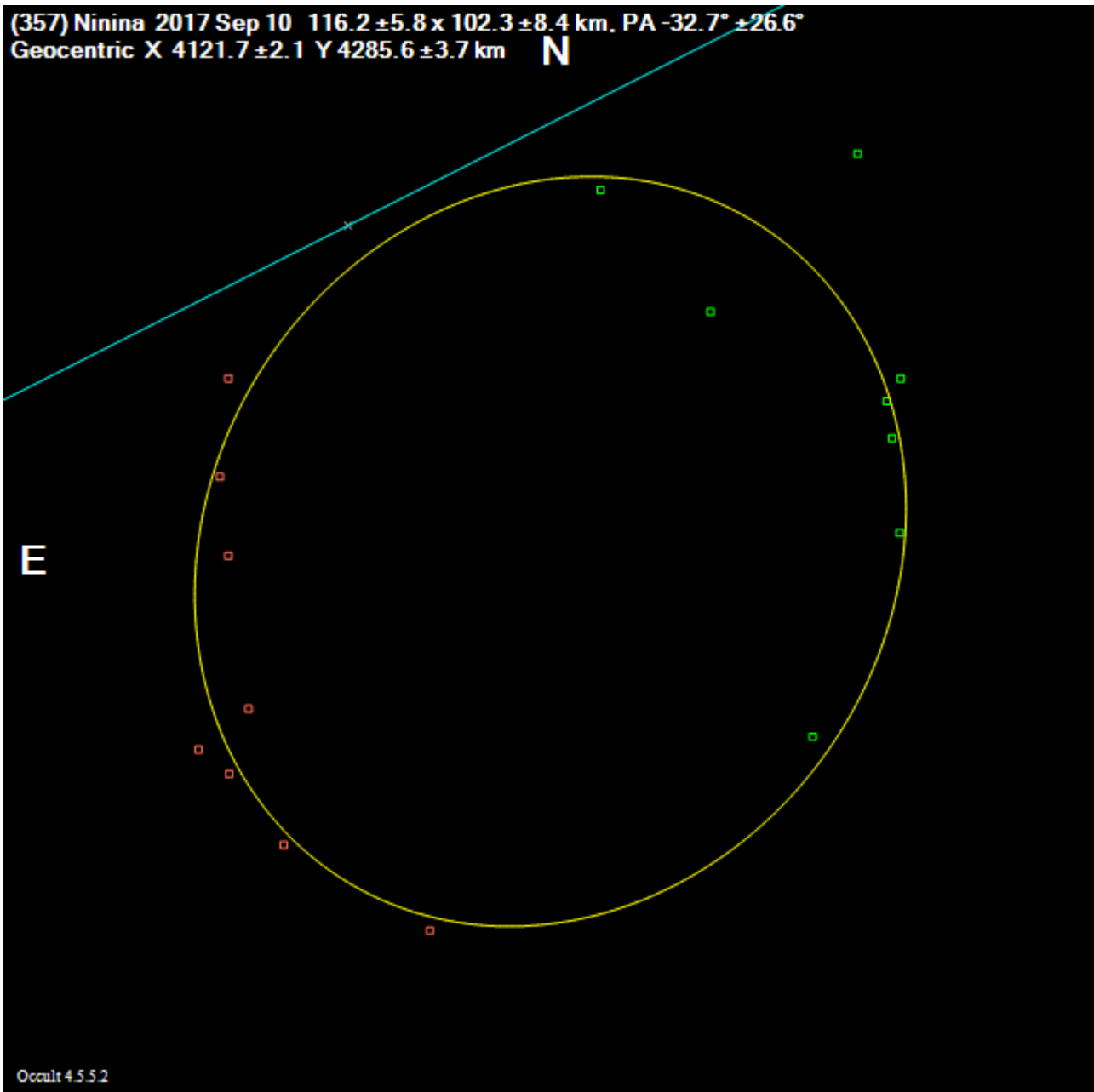
354Eleonora2016Oct05

(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**



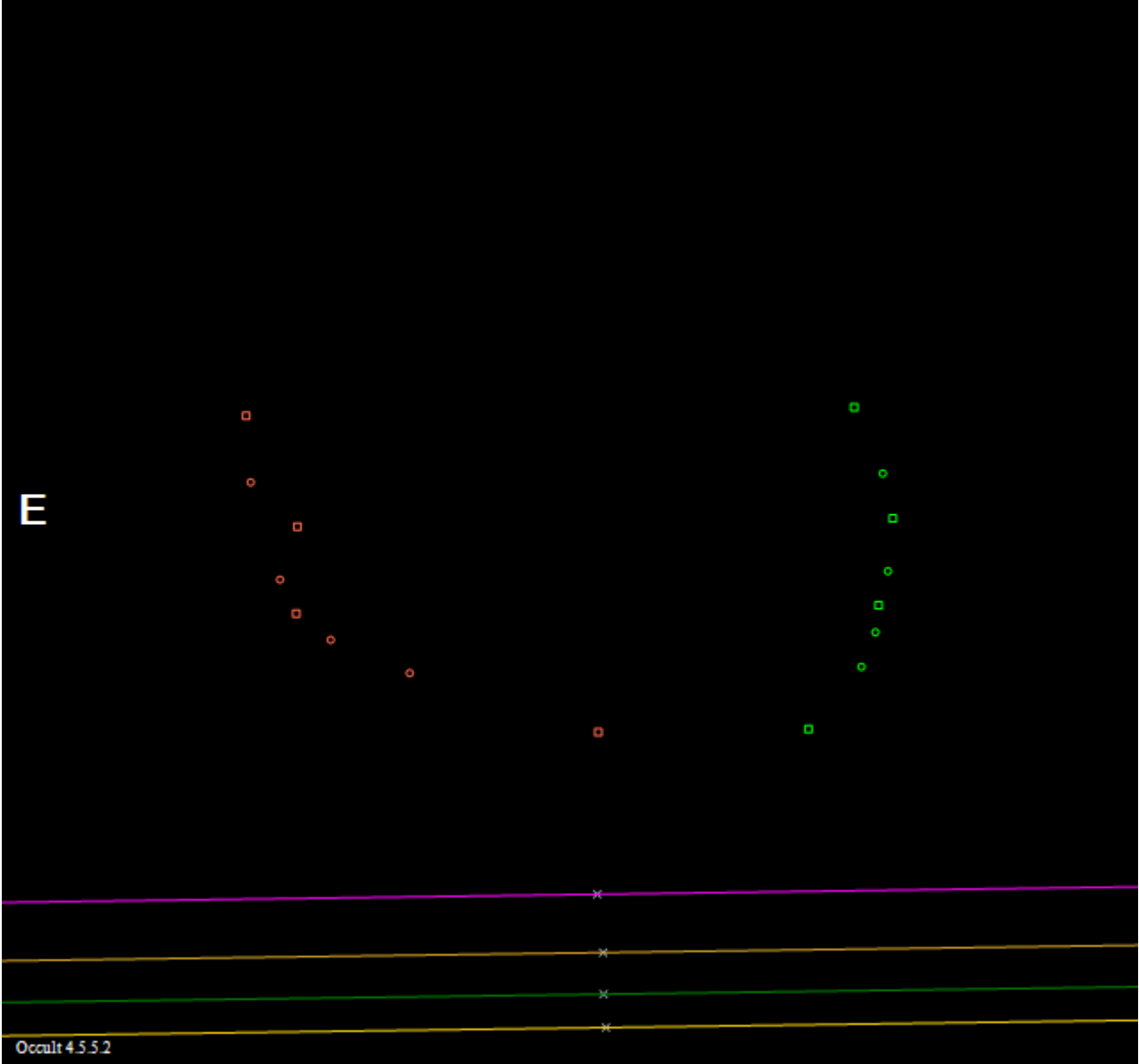
357Ninina2017Sep10

(357) Ninina 2017 Sep 10 $116.2 \pm 5.8 \times 102.3 \pm 8.4$ km, PA $-32.7^\circ \pm 26.6^\circ$
Geocentric X 4121.7 ± 2.1 Y 4285.6 ± 3.7 km **N**



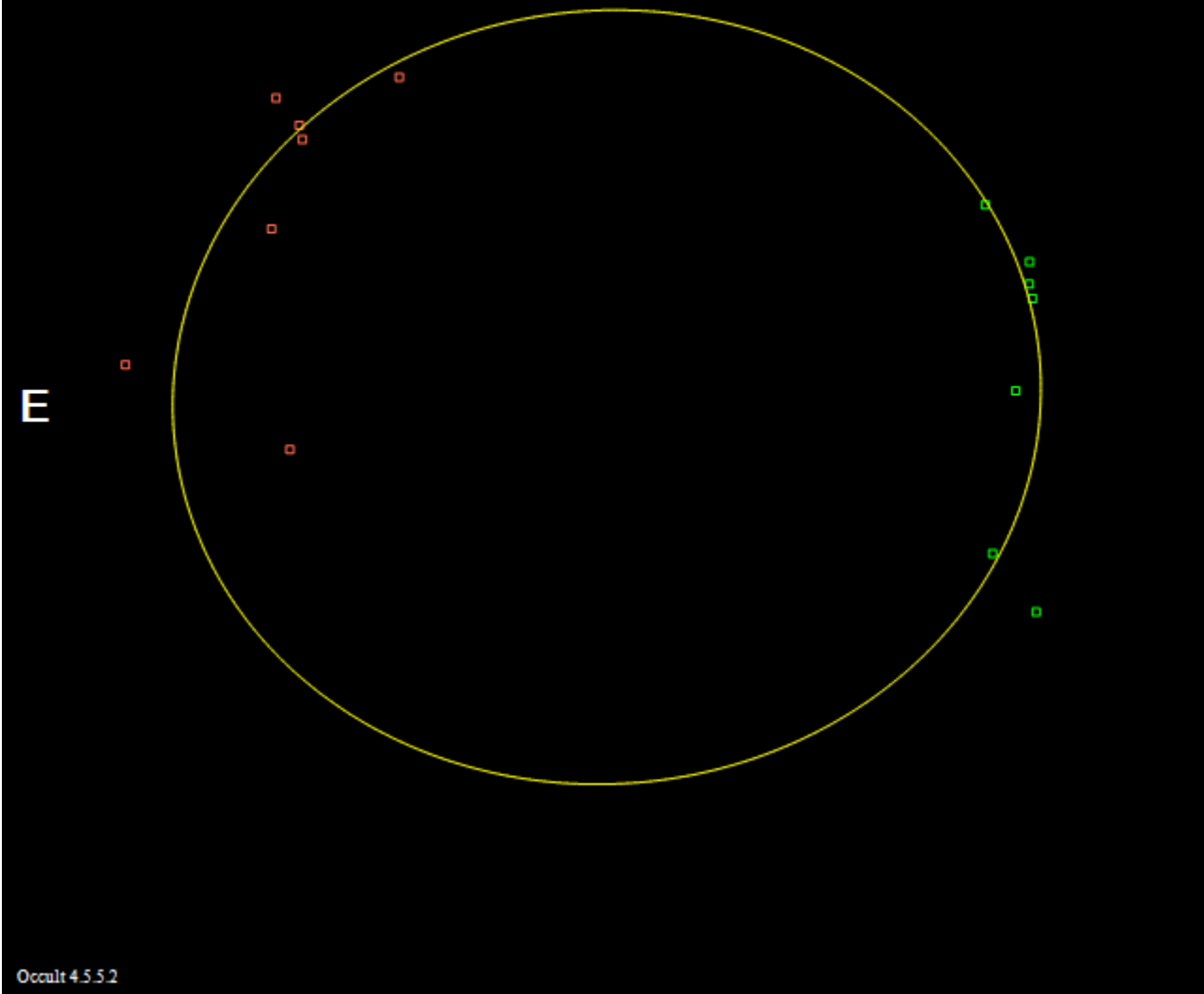
360Carlova2011Aug15

(360) Carlova 2011 Aug 15 $133.2 \pm 1.3 \times 95.4 \pm 2.9$ km, PA $71.6^\circ \pm 2.5^\circ$
Geocentric X -5156.2 ± 0.6 Y 3175.5 ± 1.2 km **N**



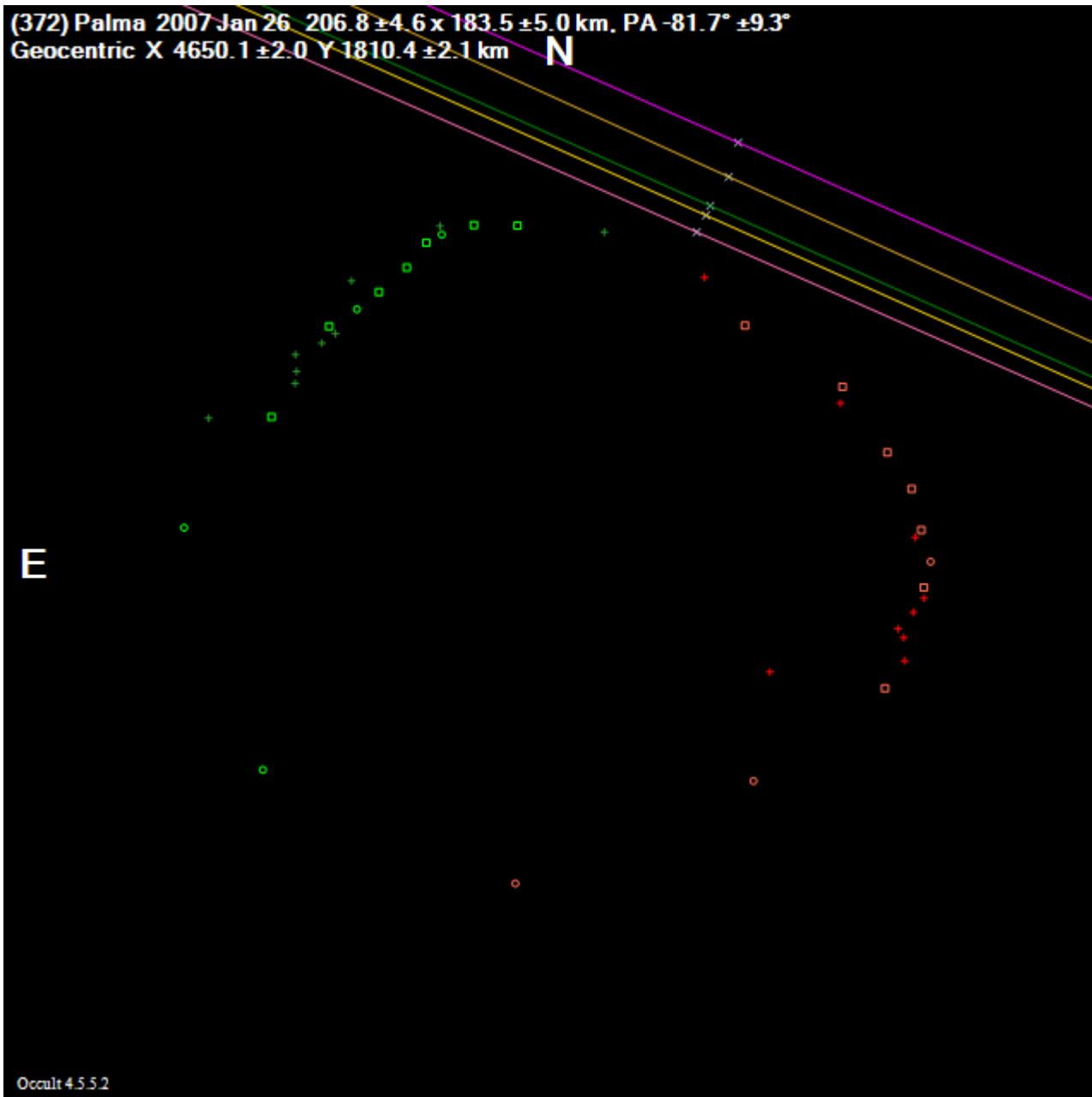
36Atalante2011Mar05

(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**



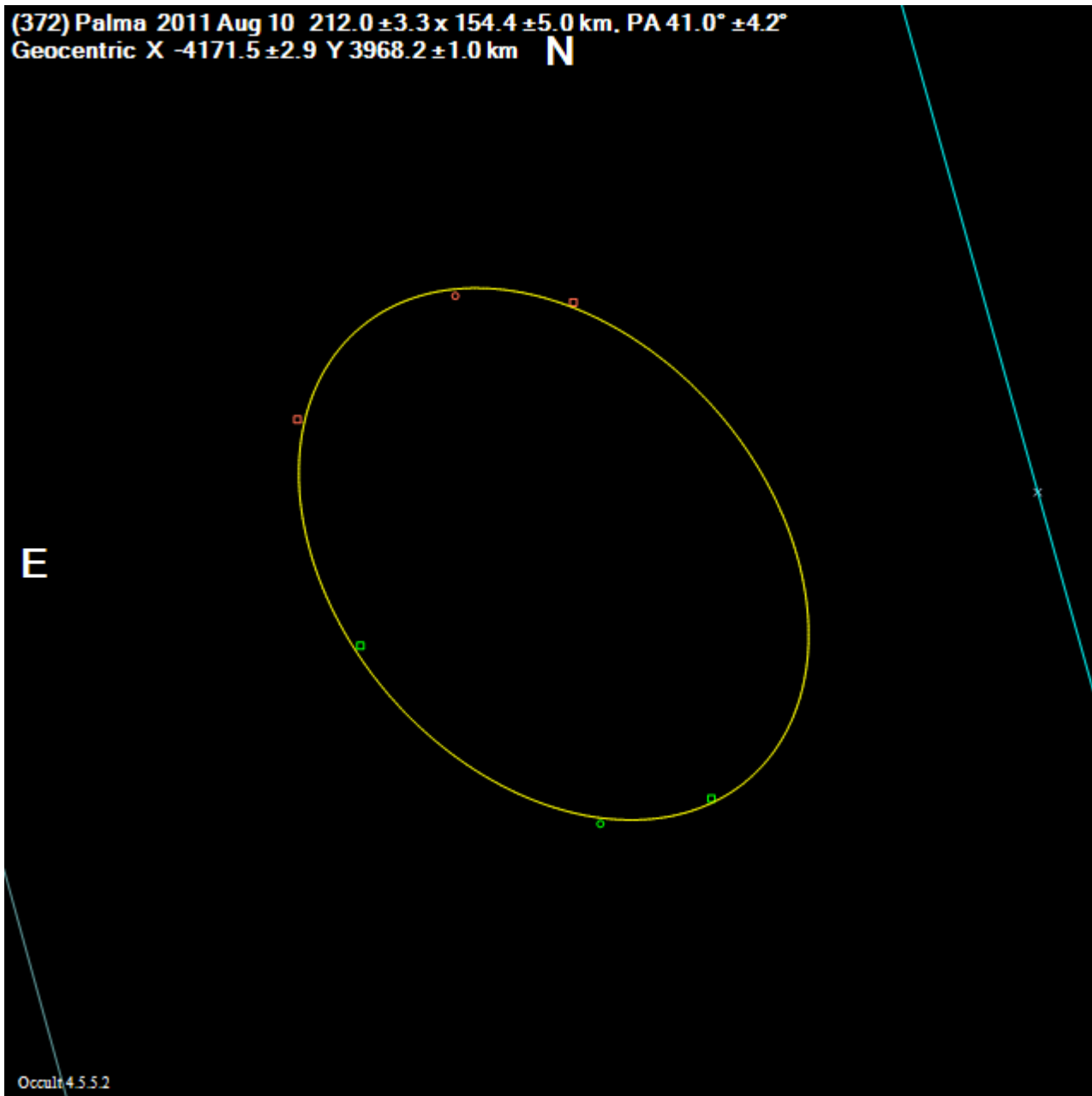
372Palma2007Jan26

(372) Palma 2007 Jan 26 $206.8 \pm 4.6 \times 183.5 \pm 5.0$ km, PA $-81.7^\circ \pm 9.3^\circ$
Geocentric X 4650.1 ± 2.0 Y -1810.4 ± 2.1 km



372Palma2011Aug10

(372) Palma 2011 Aug 10 $212.0 \pm 3.3 \times 154.4 \pm 5.0$ km, PA $41.0^\circ \pm 4.2^\circ$
Geocentric X -4171.5 ± 2.9 Y 3968.2 ± 1.0 km **N**



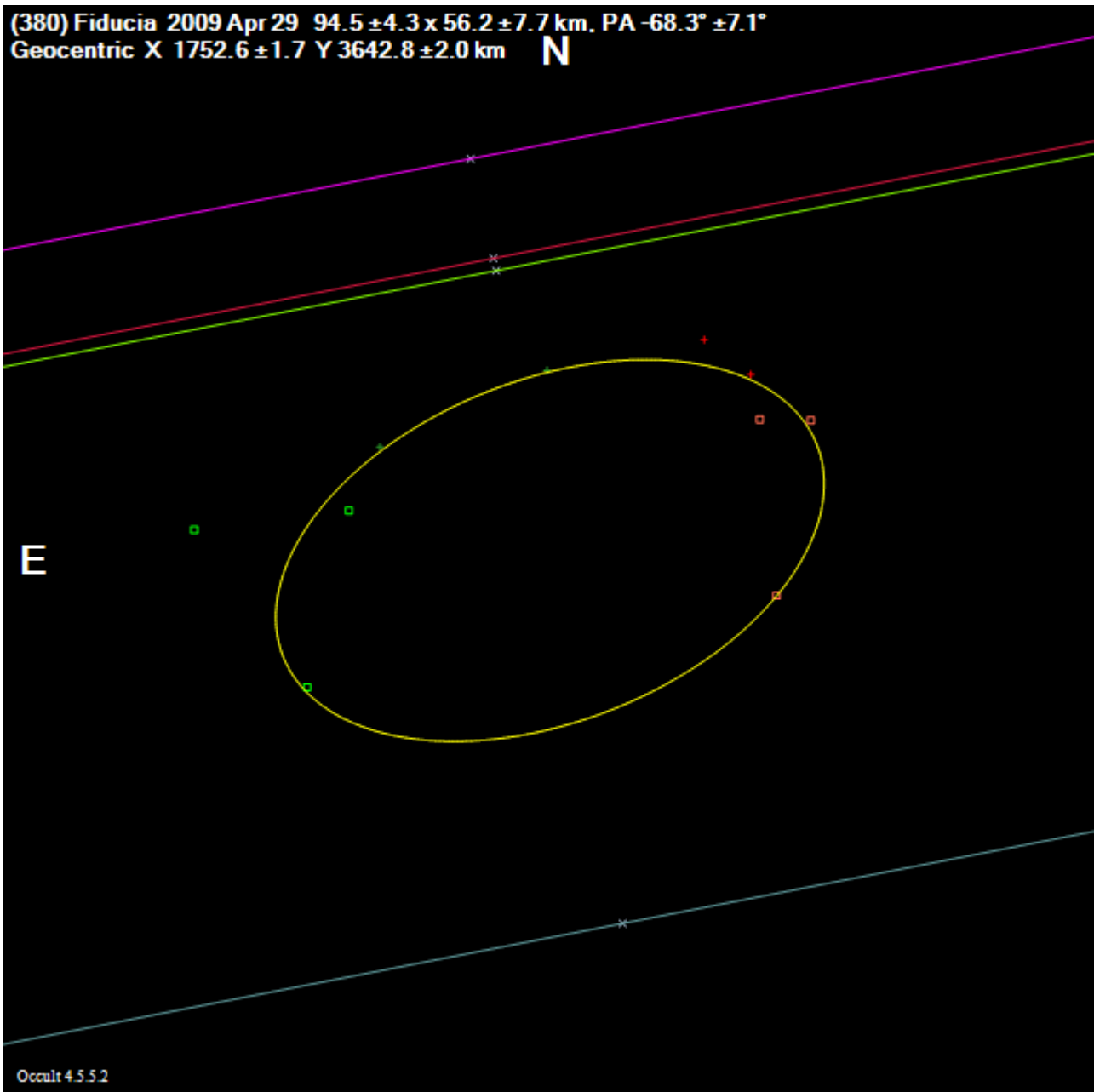
375Ursula2010Dec04

(375) Ursula 2010 Dec 4 $220.2 \pm 2.3 \times 188.2 \pm 1.2$ km, PA $-41.1^\circ \pm 2.8^\circ$
Geocentric X 4832.0 ± 0.4 Y 1123.2 ± 1.2 km **N**



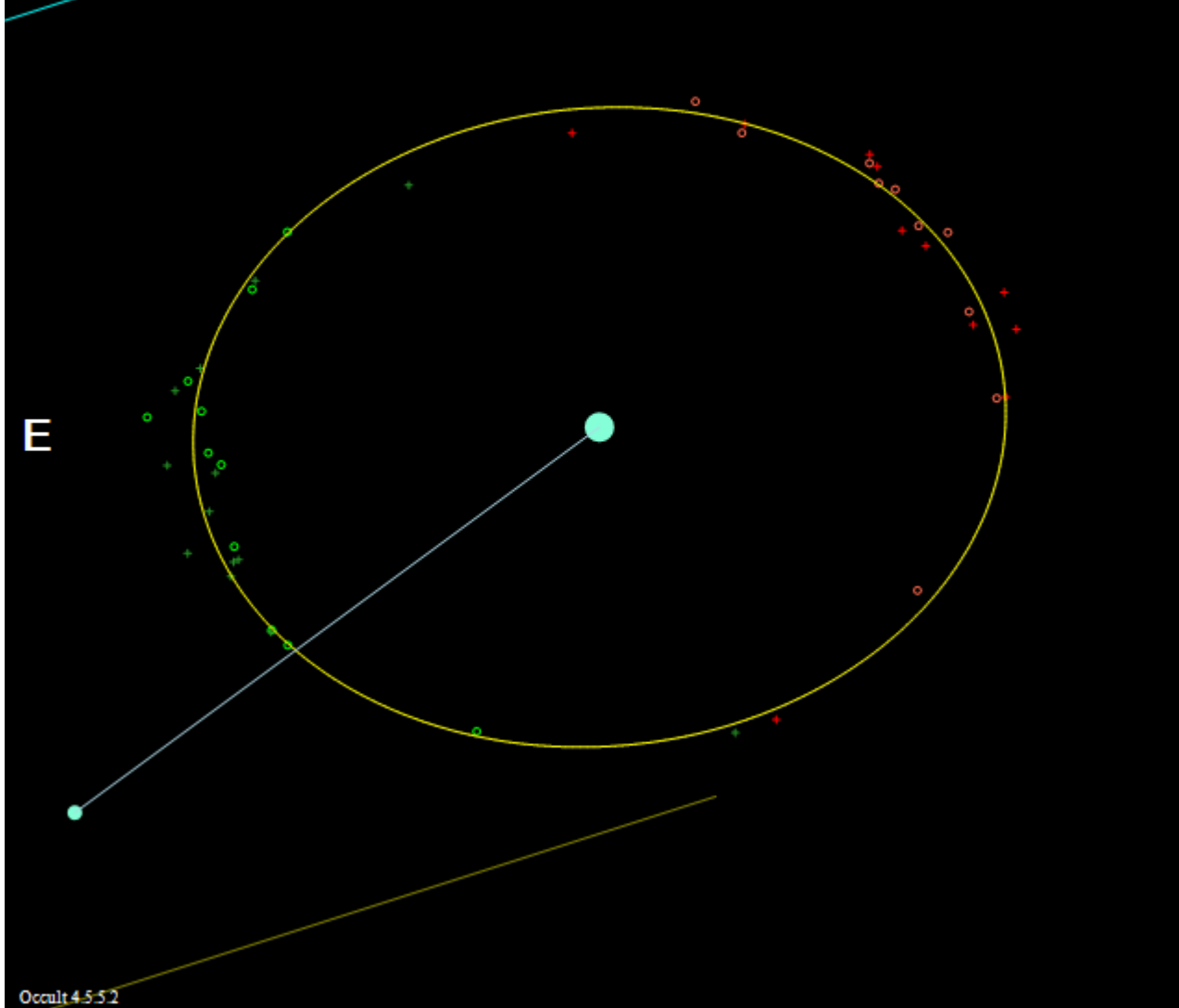
380Fiducia2009Apr29

(380) Fiducia 2009 Apr 29 $94.5 \pm 4.3 \times 56.2 \pm 7.7$ km, PA $-68.3^\circ \pm 7.1^\circ$
Geocentric X 1752.6 ± 1.7 Y 3642.8 ± 2.0 km **N**



381Myrrha1991Jan13

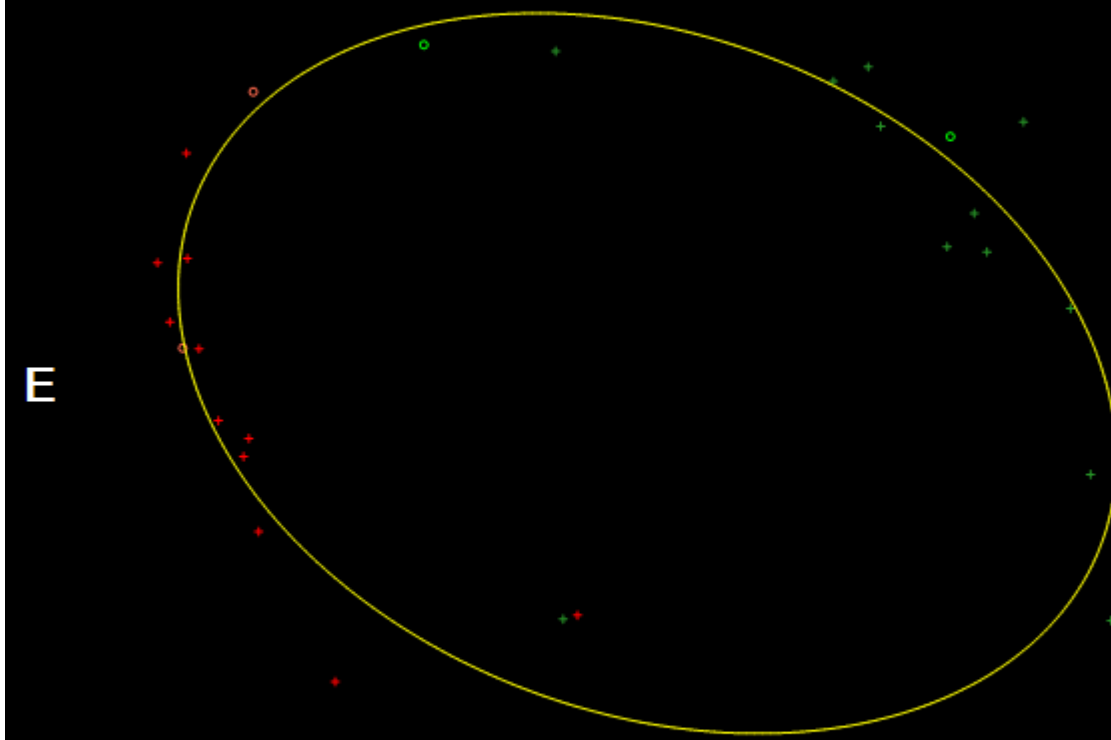
(381) Myrrha 1991 Jan 13 $147.5 \pm 1.5 \times 115.6 \pm 2.3$ km, PA $-84.6^\circ \pm 2.7^\circ$
Geocentric X -2471.5 ± 0.7 Y 2257.5 ± 0.9 km **N**
Double : Sep $0.0634 \pm 0.0013''$, PA $126.3^\circ \pm 6.5^\circ$



Occult 4-5-52

386Siegena1999Oct25

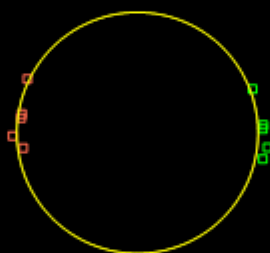
(386) Siegena 1999 Oct 25 $208.2 \pm 8.4 \times 145.4 \pm 6.5$ km, PA $69.3^\circ \pm 4.9^\circ$
Geocentric X 3183.0 ± 3.4 Y 3977.0 ± 3.3 km **N**



386Siegena2017May16

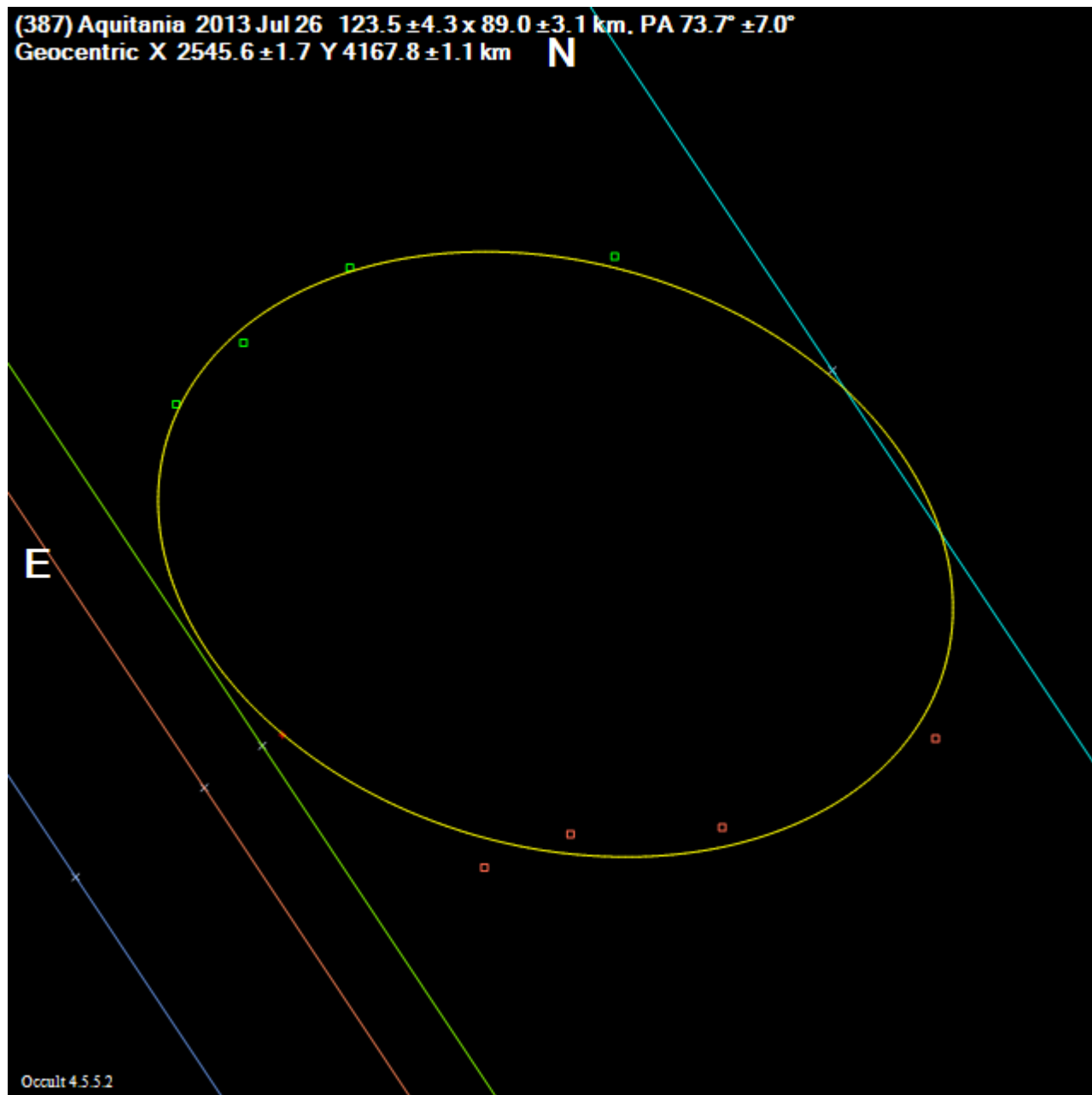
(386) Siegena 2017 May 16 $177.0 \pm 49.2 \times 177.0$ km, PA 0.0°
Geocentric X 2605.8 ± 1.2 Y 3287.9 ± 9.0 km **N**

E



387Aquitania2013Jul26

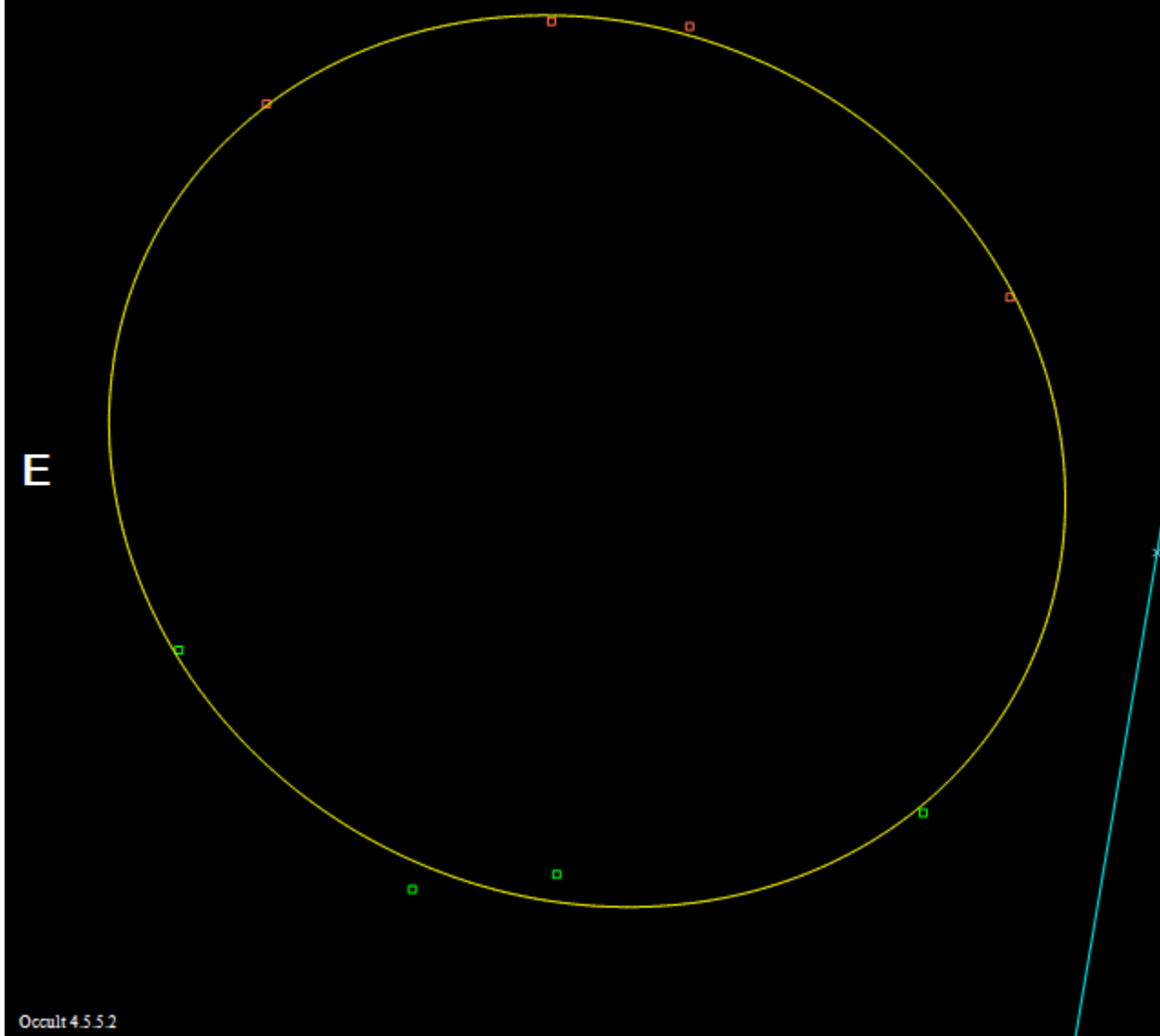
(387) Aquitania 2013 Jul 26 $123.5 \pm 4.3 \times 89.0 \pm 3.1$ km, PA $73.7^\circ \pm 7.0^\circ$
Geocentric X 2545.6 ± 1.7 Y 4167.8 ± 1.1 km **N**



Occult 4.5.5.2

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**

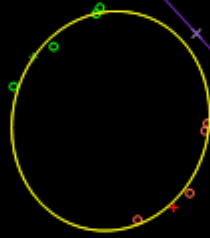


393Lampetia2014Aug24

(393) Lampetia 2014 Aug 24 $115.7 \pm 4.3 \times 102.7 \pm 1.4$ km, PA $-14.7^\circ \pm 13.3^\circ$
Geocentric X 1420.3 ± 1.0 Y 884.6 ± 1.0 km

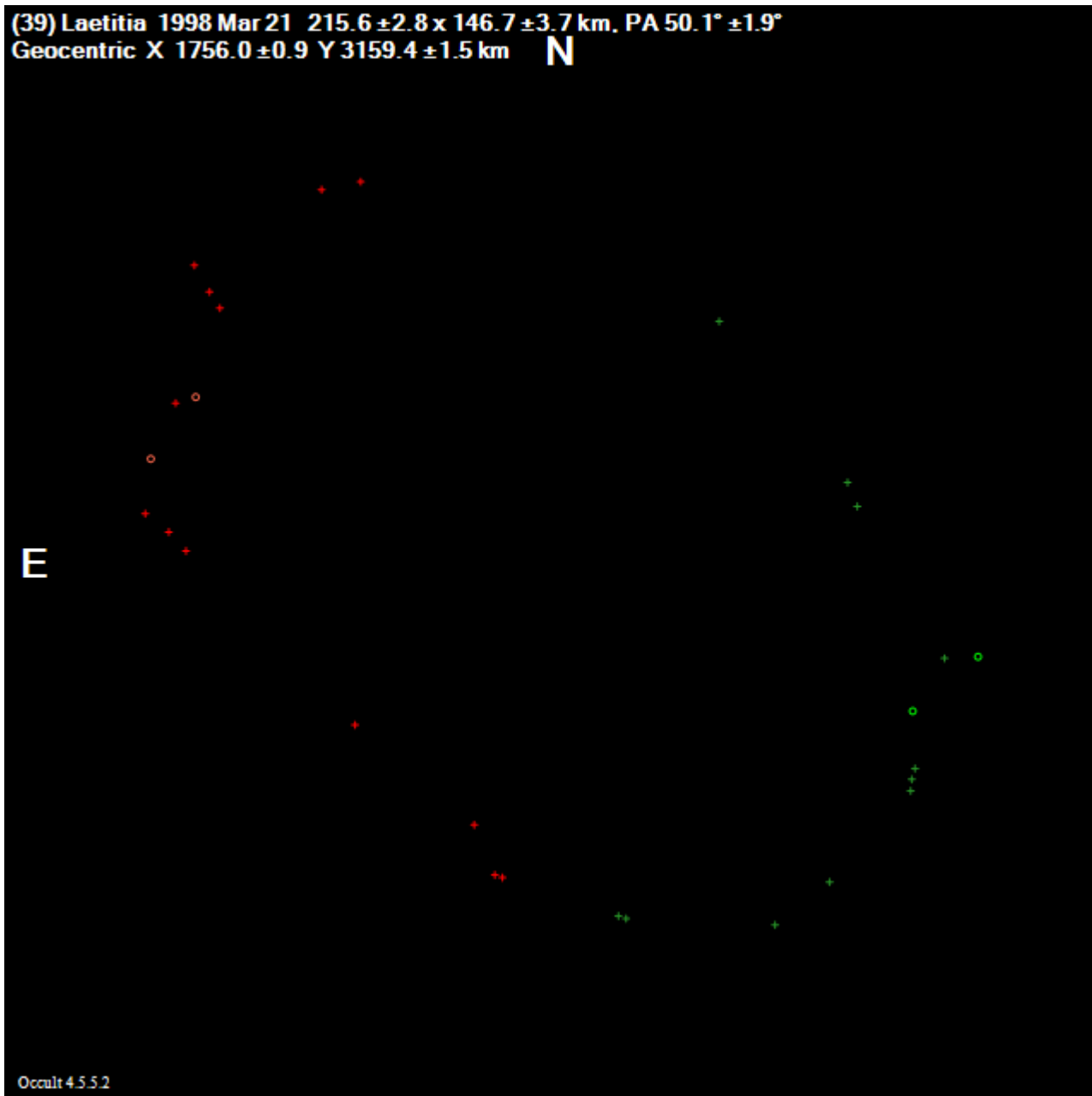
N

E



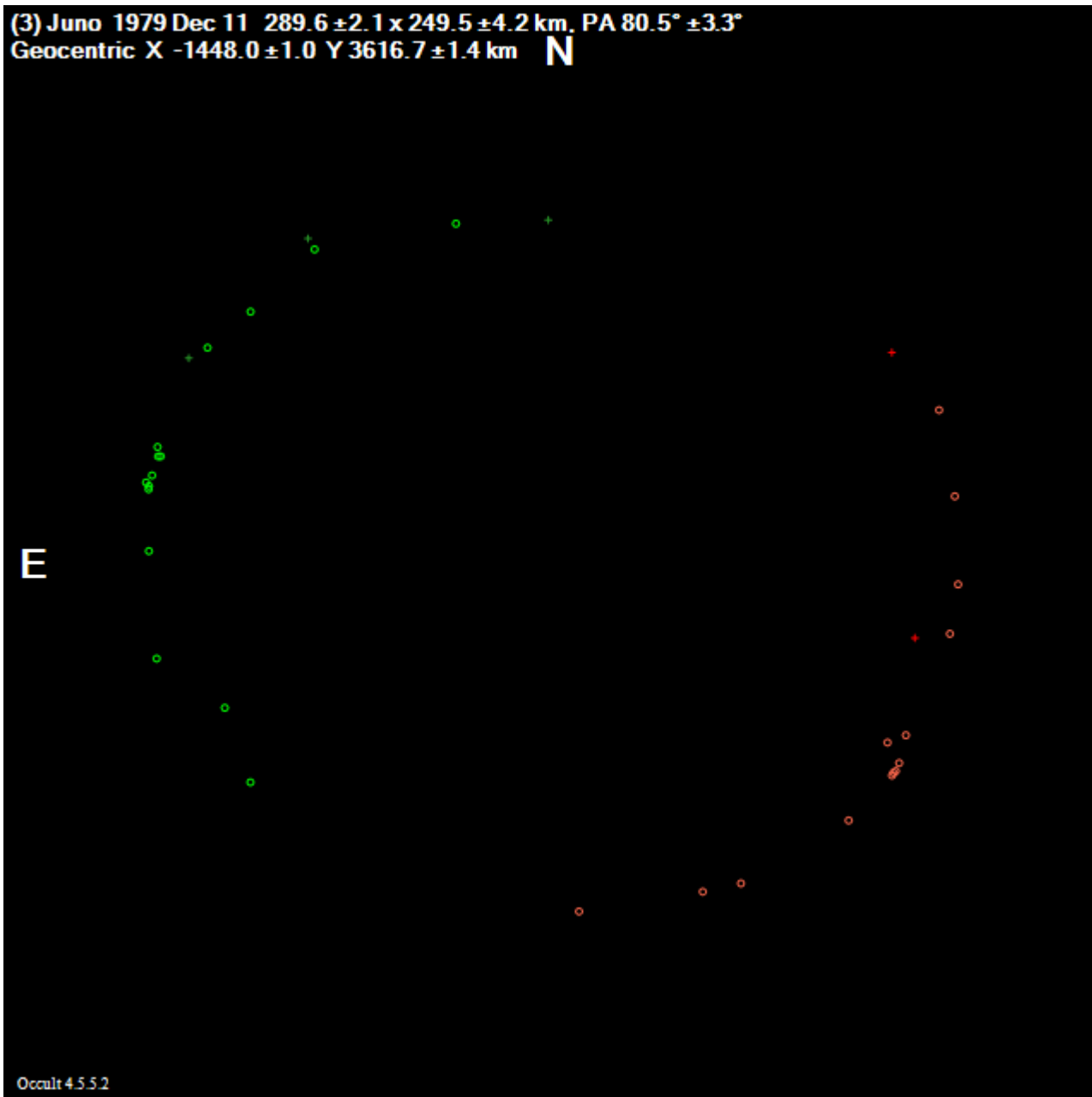
39Laetitia1998Mar21

(39) Laetitia 1998 Mar 21 $215.6 \pm 2.8 \times 146.7 \pm 3.7$ km, PA $50.1^\circ \pm 1.9^\circ$
Geocentric X 1756.0 ± 0.9 Y 3159.4 ± 1.5 km **N**



3Juno1979Dec11

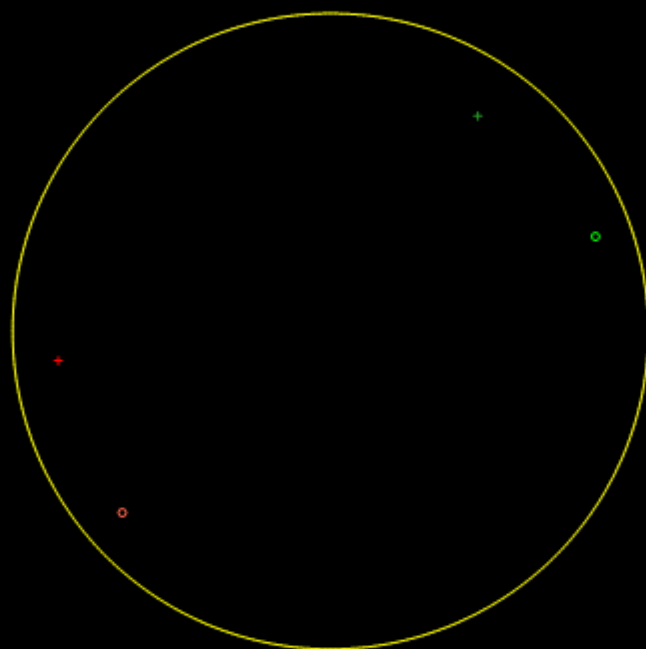
(3) Juno 1979 Dec 11 $289.6 \pm 2.1 \times 249.5 \pm 4.2$ km, PA $80.5^\circ \pm 3.3^\circ$
Geocentric X -1448.0 ± 1.0 Y 3616.7 ± 1.4 km **N**



3Juno2014Nov20

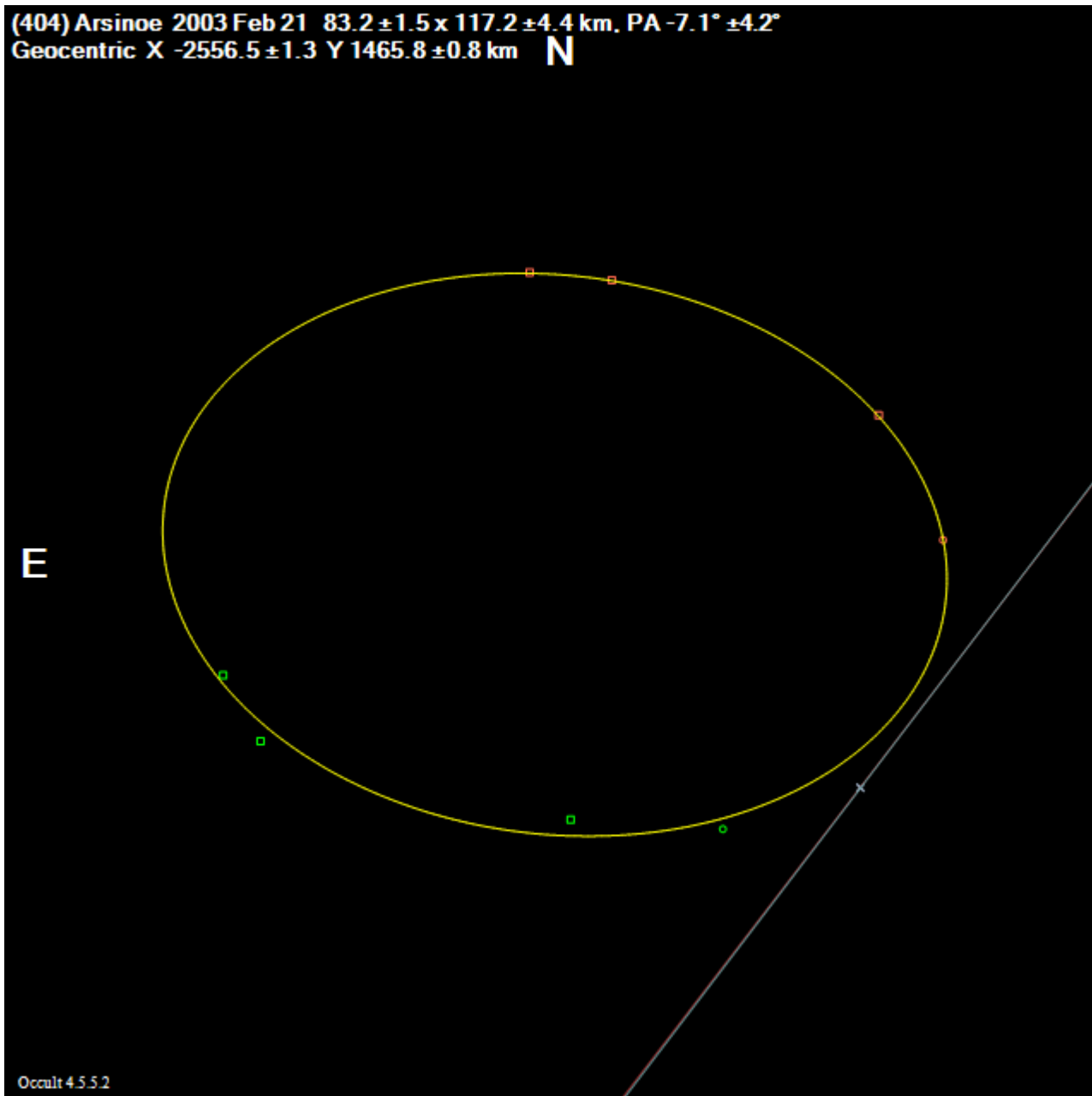
(3) Juno 2014 Nov 20 290.0 x 290.0 km, PA 0.0°
Geocentric X -3876.1 ±3.8 Y 4836.2 ±6.0 km N

E



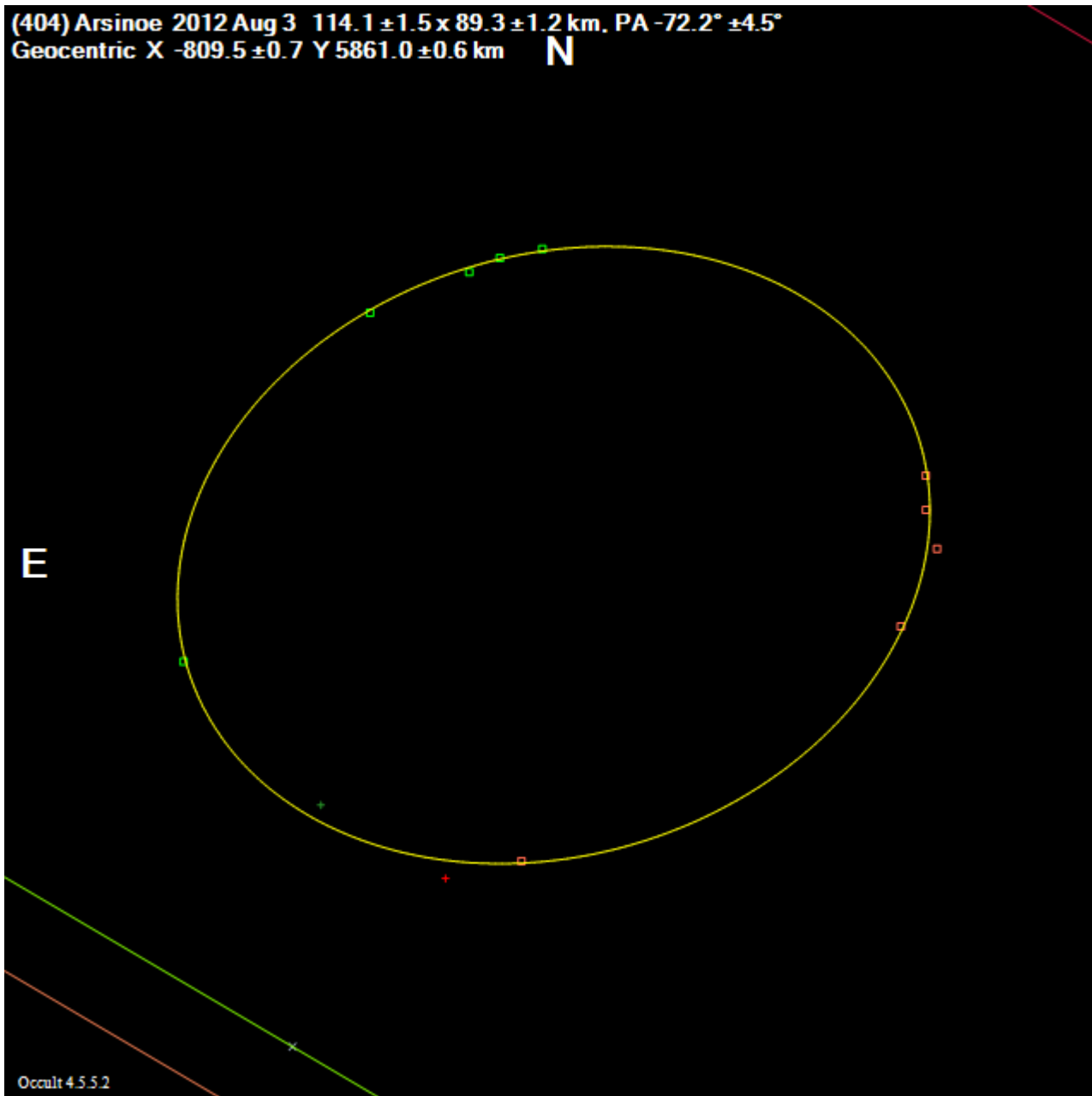
404Arsinoe2003Feb21

(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**



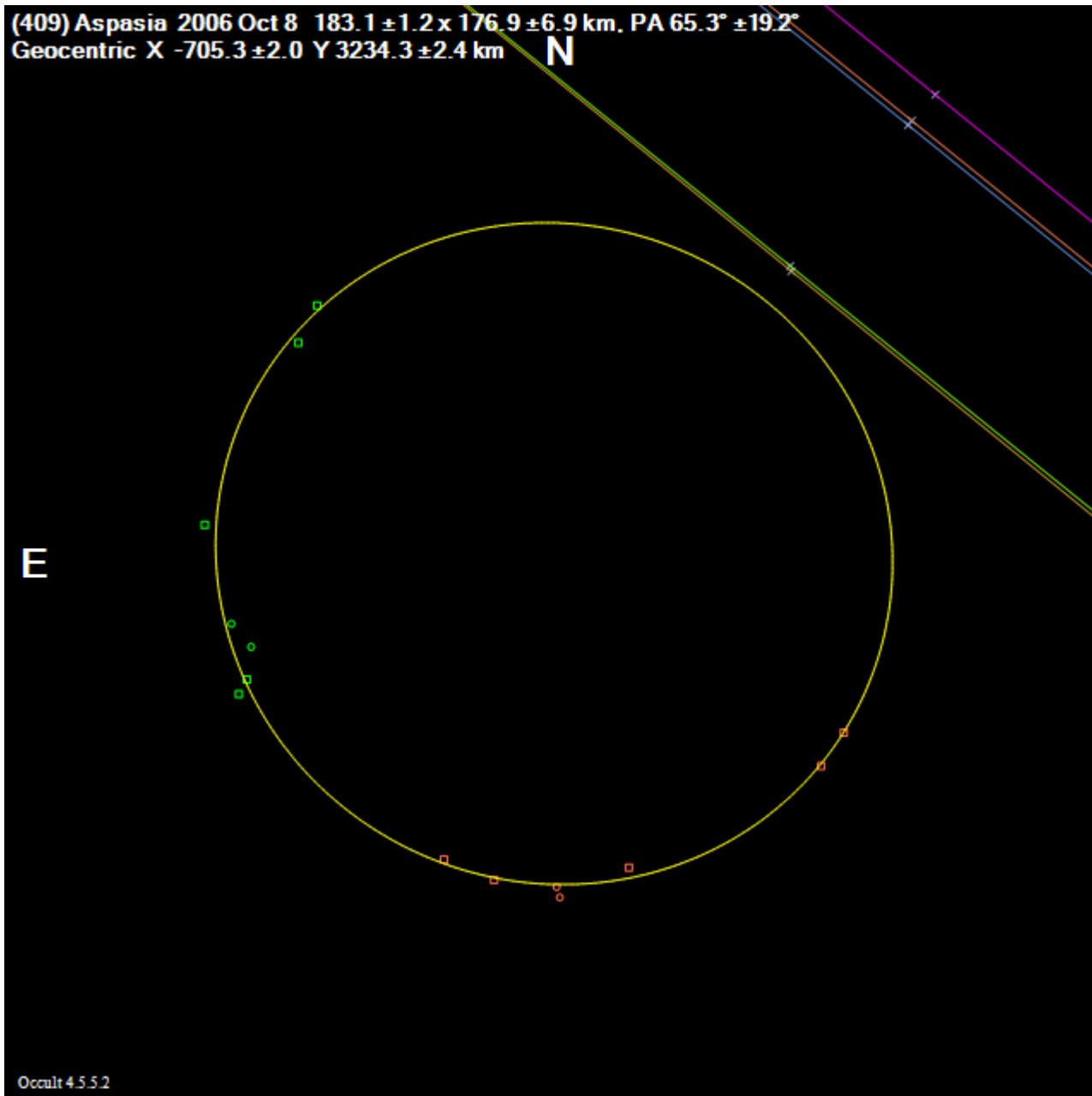
404Arsinoe2012Aug03

(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**



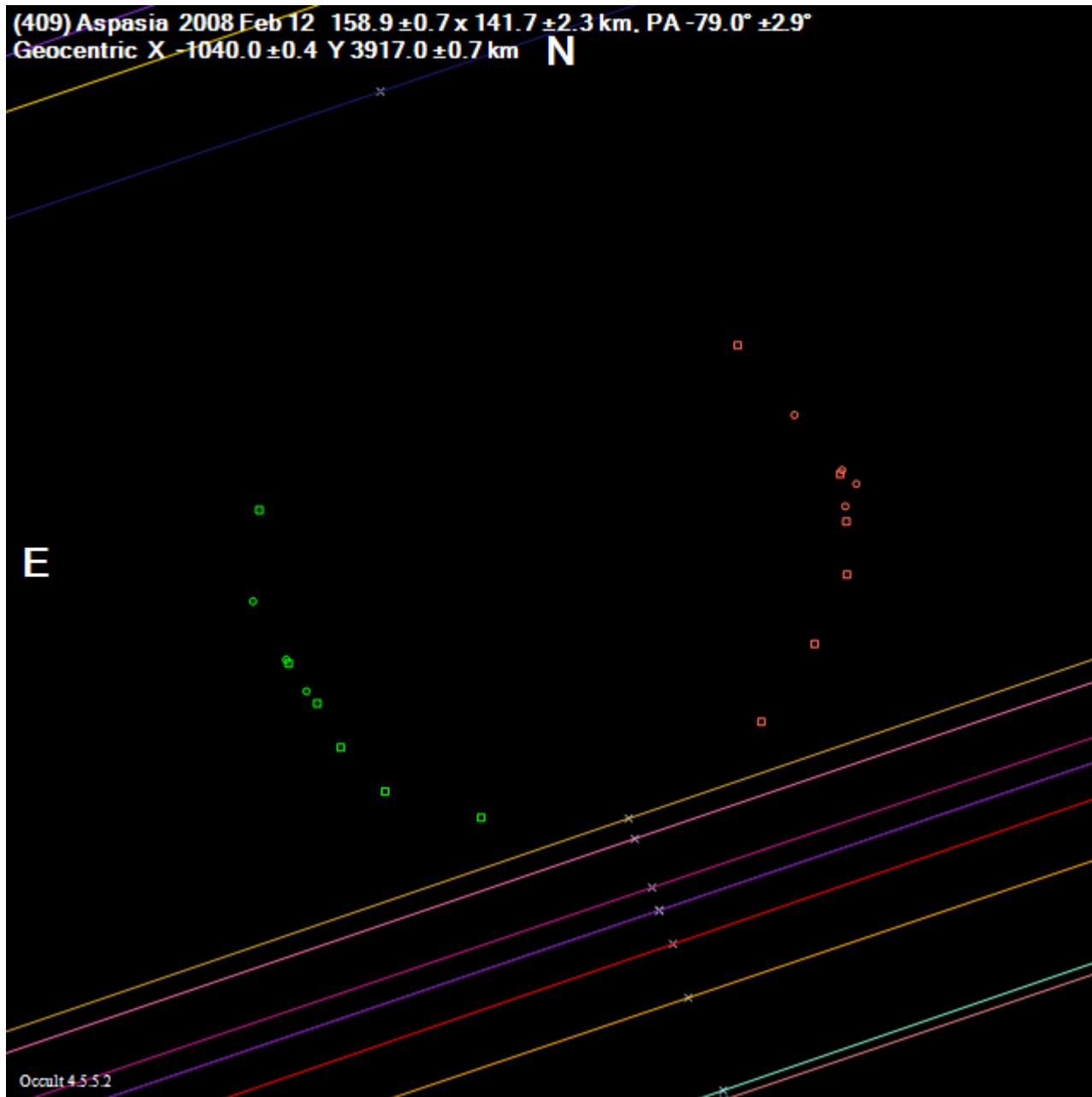
409Aspasia2006Oct08

(409) Aspasia 2006 Oct 8 $183.1 \pm 1.2 \times 176.9 \pm 6.9$ km, PA $65.3^\circ \pm 19.2^\circ$
Geocentric X -705.3 ± 2.0 Y 3234.3 ± 2.4 km



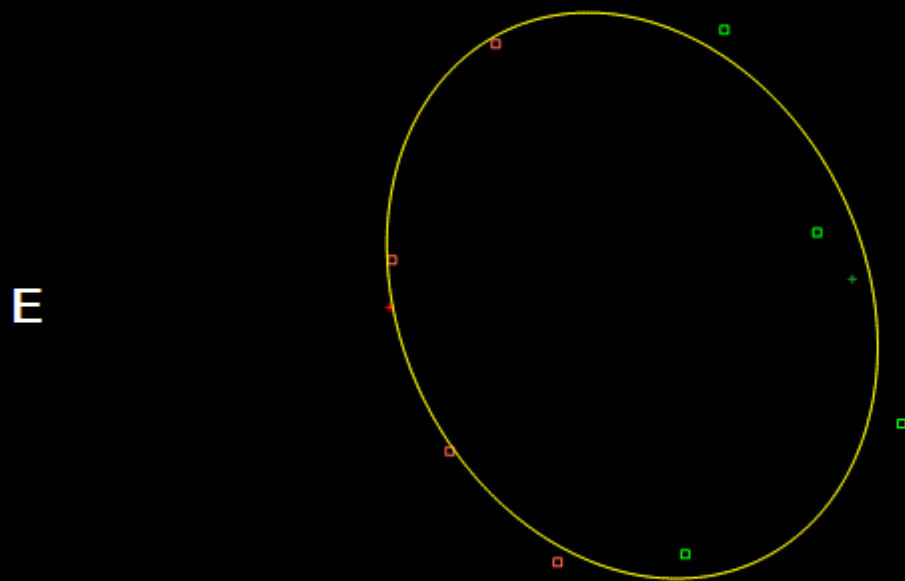
409Aspasia2008Feb12

(409) Aspasia 2008 Feb 12 $158.9 \pm 0.7 \times 141.7 \pm 2.3$ km, PA $-79.0^\circ \pm 2.9^\circ$
Geocentric X -1040.0 ± 0.4 Y 3917.0 ± 0.7 km



409Aspasia2015Sep04

(409) Aspasia 2015 Sep 4 $184.0 \pm 8.6 \times 145.9 \pm 6.2$ km. PA $25.8^\circ \pm 8.9^\circ$
Geocentric X -4387.1 ± 2.8 Y 2646.7 ± 3.2 km **N**



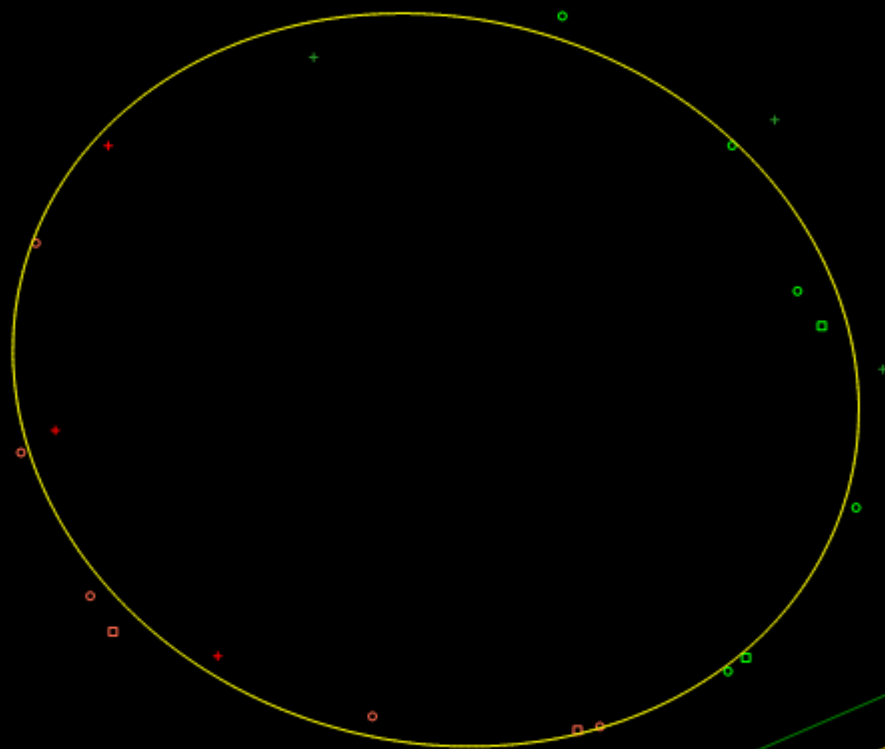
411Xanthe2007Apr18

(411) Xanthe 2007 Apr 18 $71.6 \pm 1.9 \times 84.4 \pm 1.9$ km, PA $-14.7^\circ \pm 6.5^\circ$
Geocentric X -16.5 ± 0.7 Y 384.3 ± 0.8 km

N

E

Occult 4.5.5.2



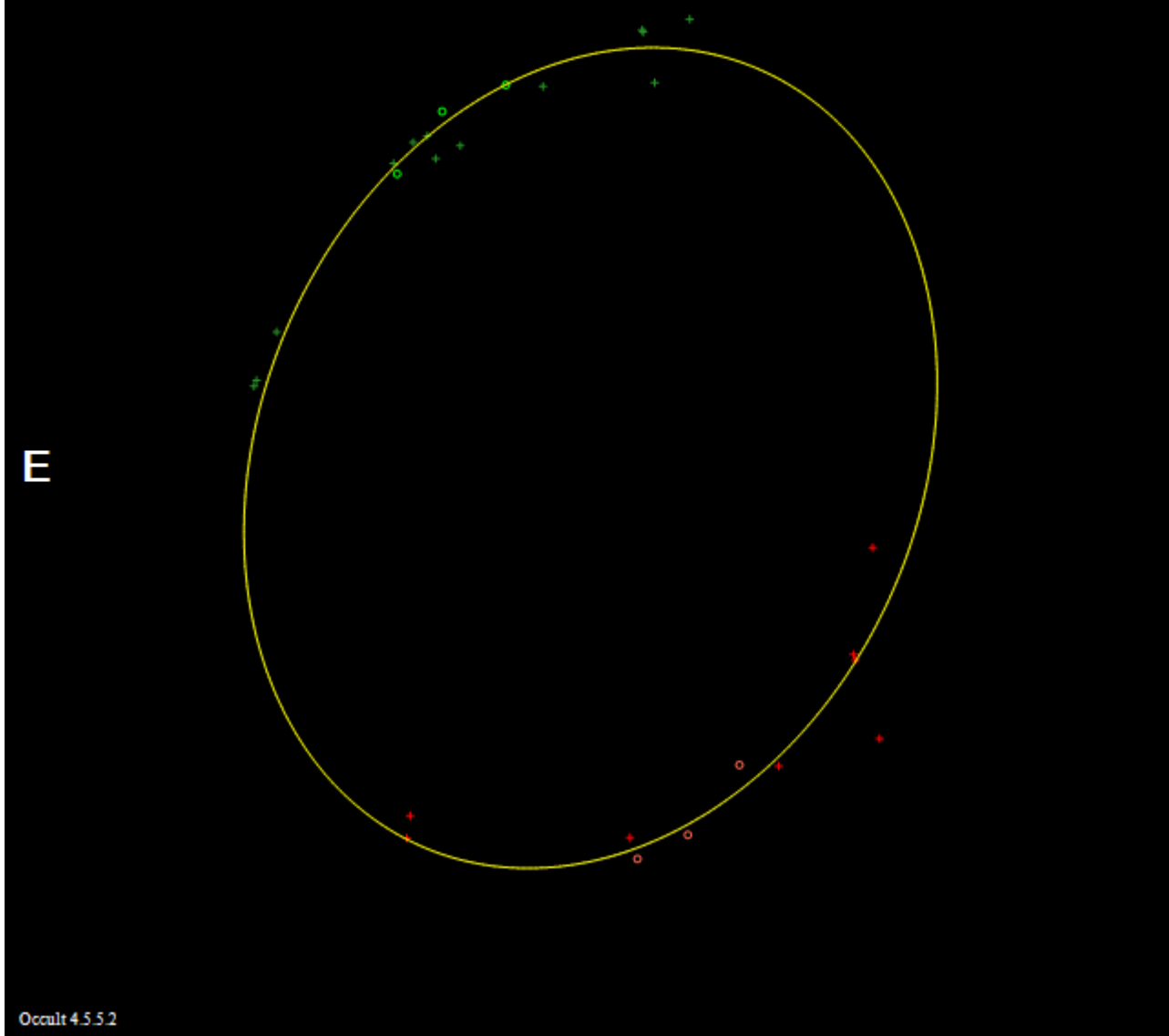
419Aurelia2006Dec05

(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**



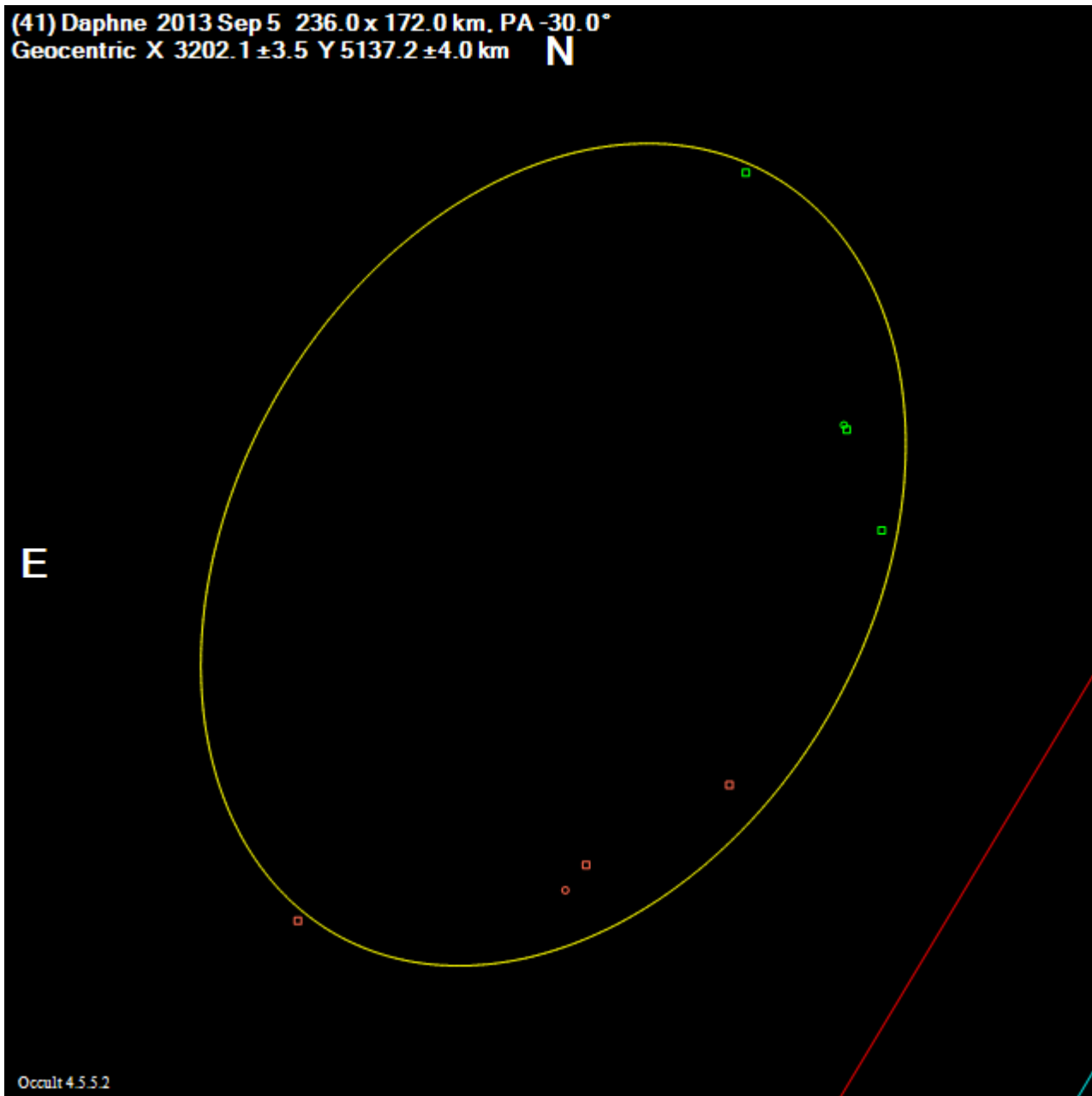
41Daphne1999Jul02

(41) Daphne 1999 Jul 2 $210.5 \pm 5.0 \times 164.1 \pm 3.7$ km, PA $-23.4^\circ \pm 4.9^\circ$
Geocentric X 1329.4 ± 1.9 Y 4238.9 ± 1.4 km **N**



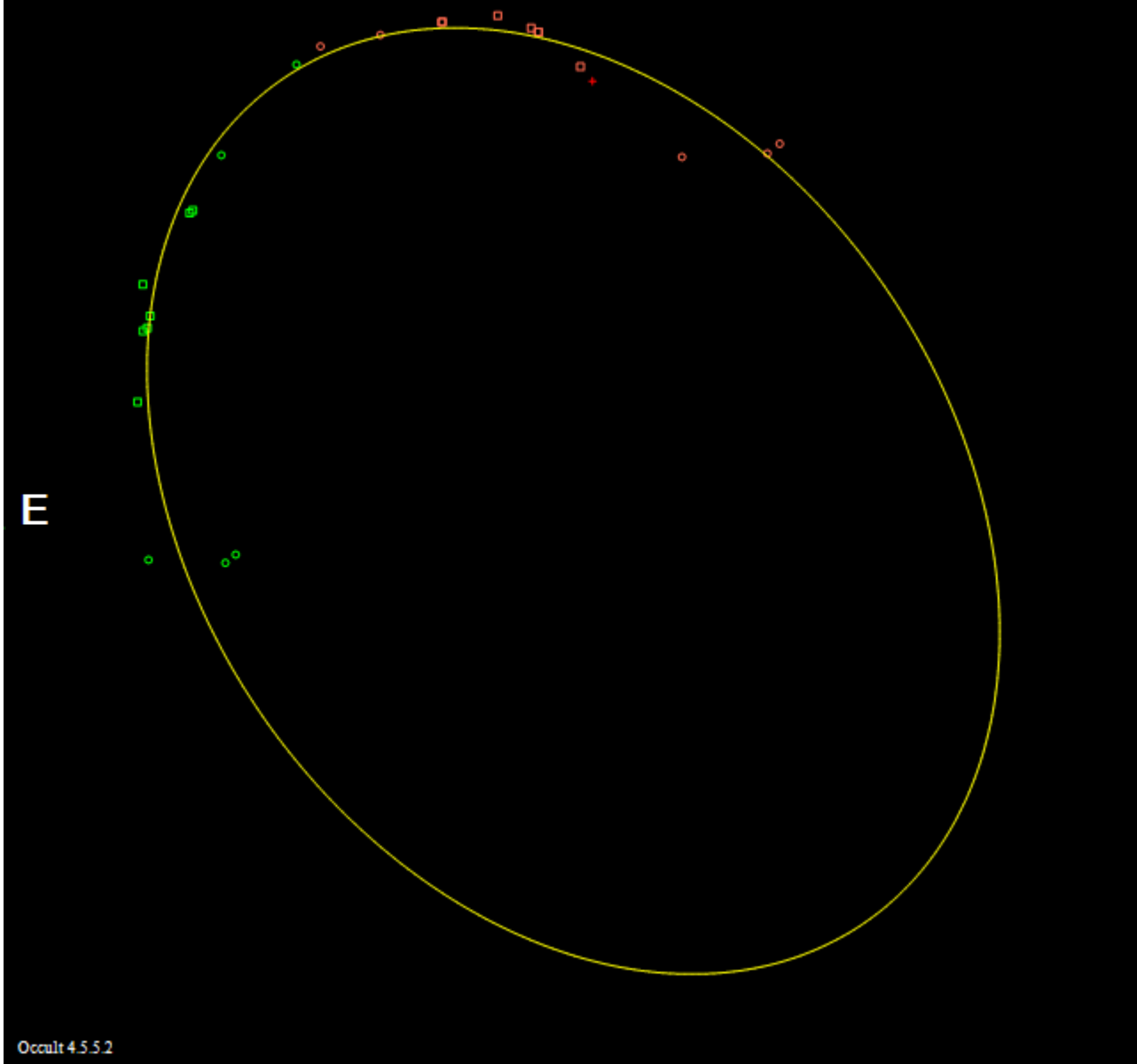
41Daphne2013Sep05

(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**



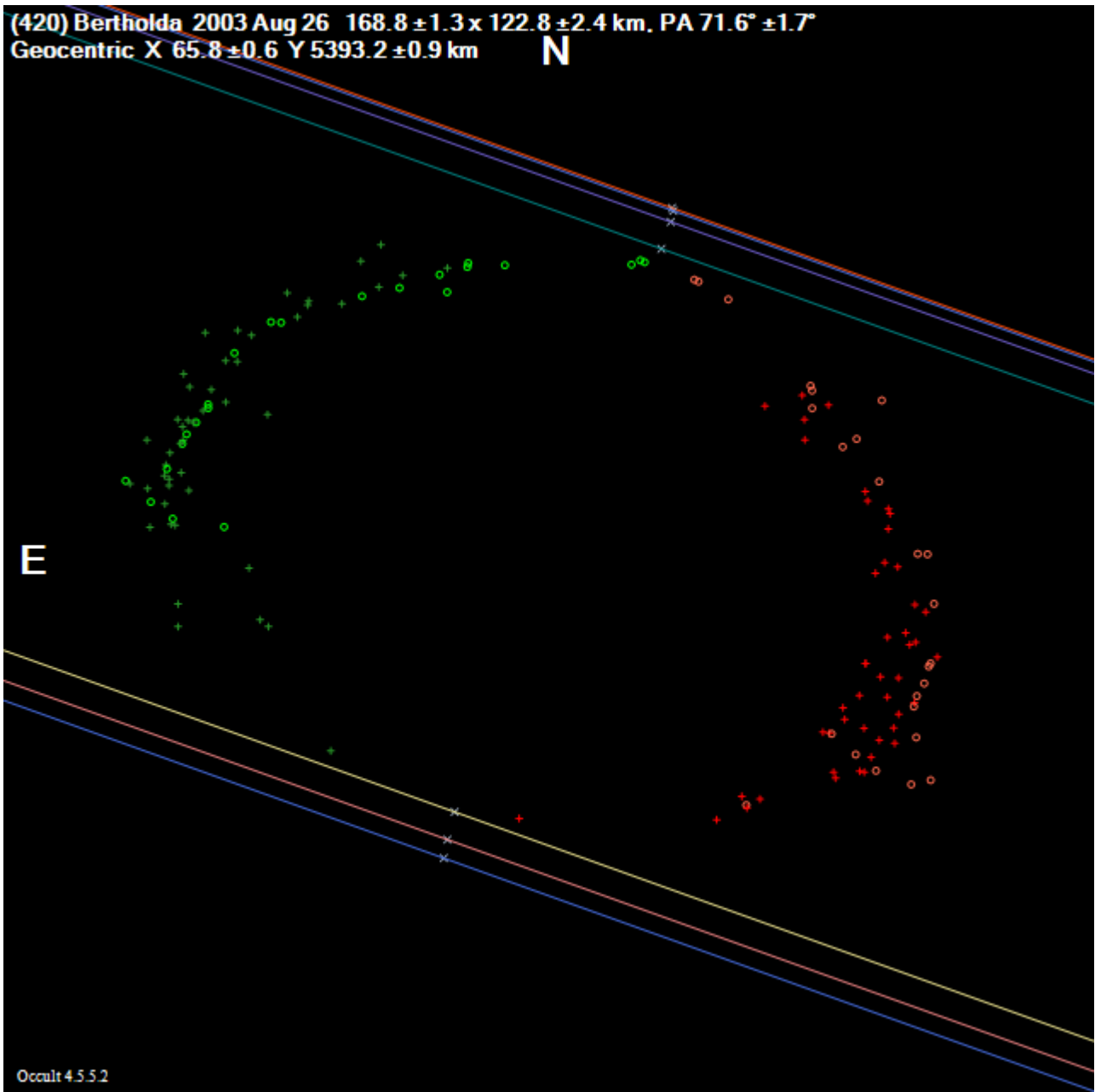
420Bertholda2003Aug26

(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

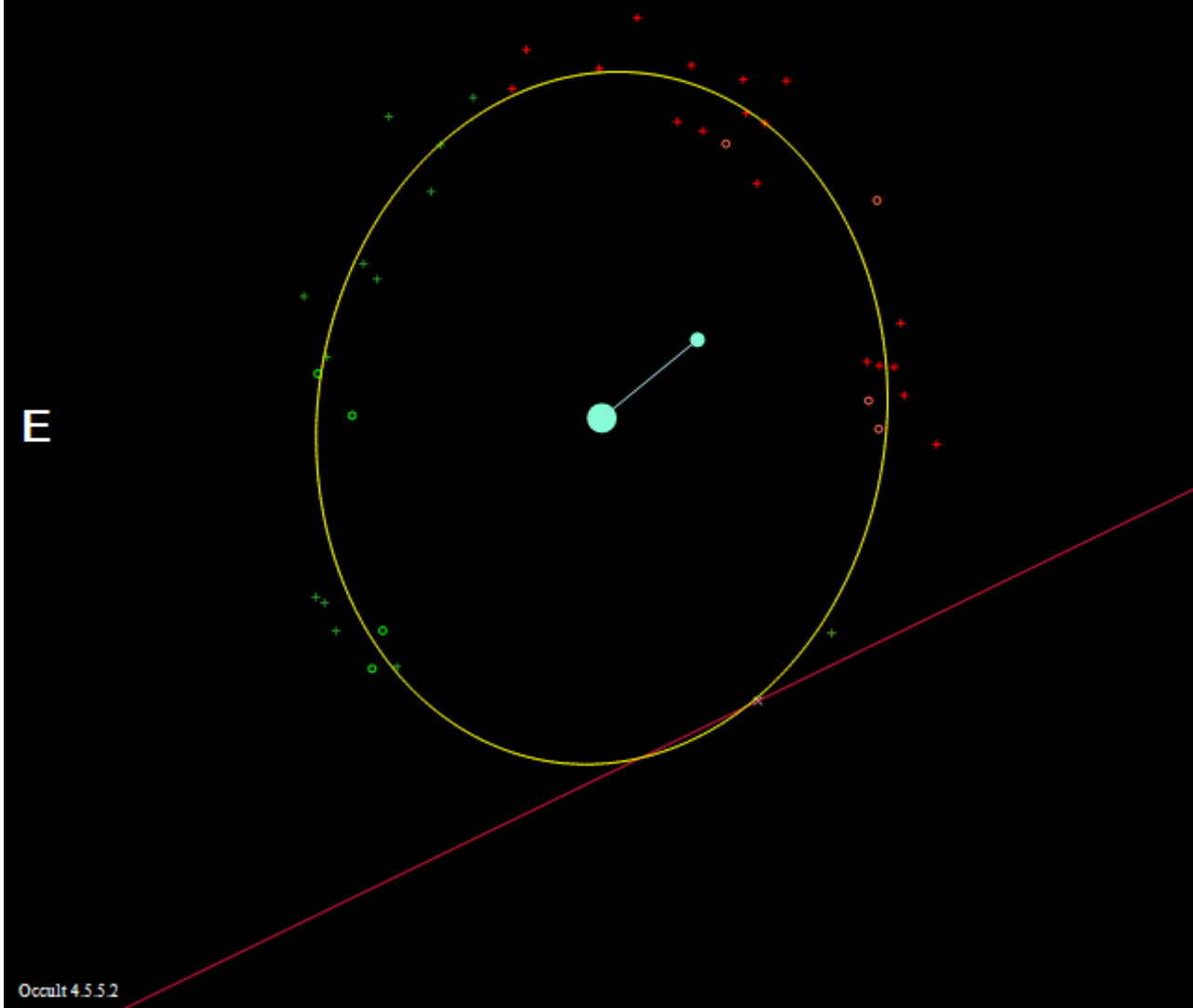
E

Occult 4.5.5.2



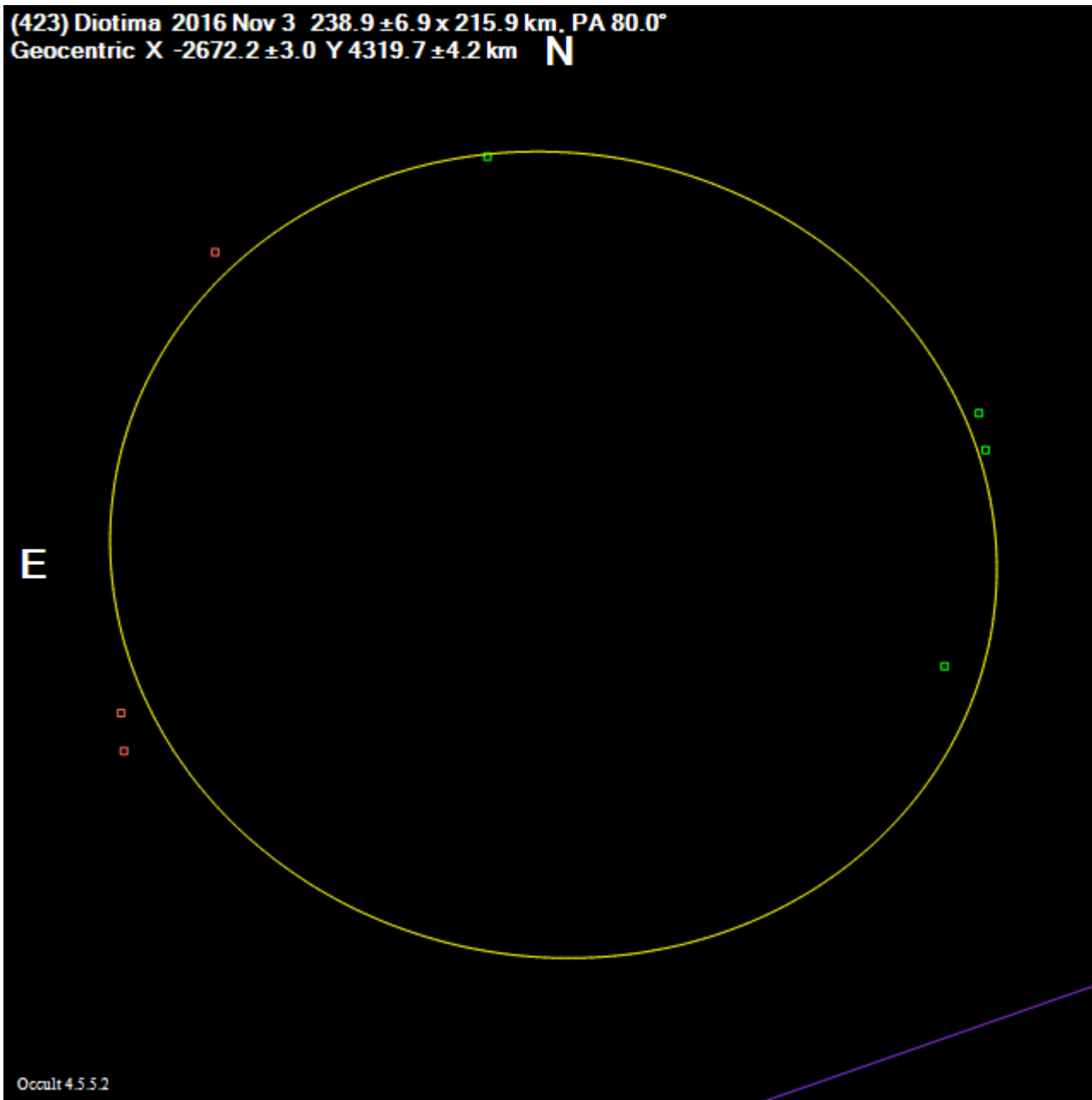
423Diotima2001Mar15

(423) Diotima 2001 Mar 15 $171.9 \pm 4.2 \times 140.7 \pm 3.6$ km, PA $-8.1^\circ \pm 5.9^\circ$
Geocentric X -3203.8 ± 1.4 Y 4069.1 ± 1.8 km **N**
Double : Sep $0.0197 \pm 0.0001''$, PA $-50.7^\circ \pm 0.1^\circ$



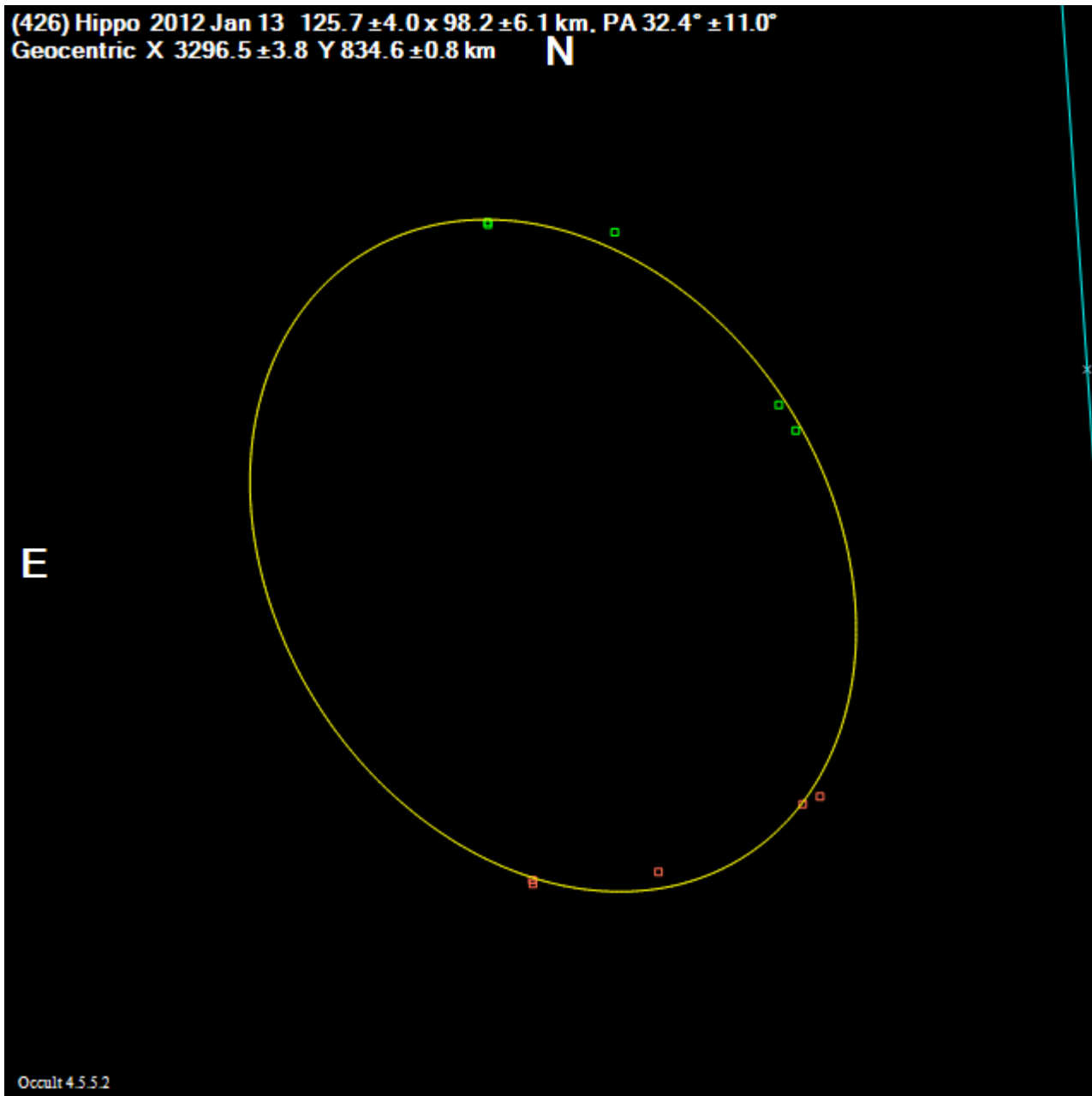
423Diotima2016Nov03

(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**



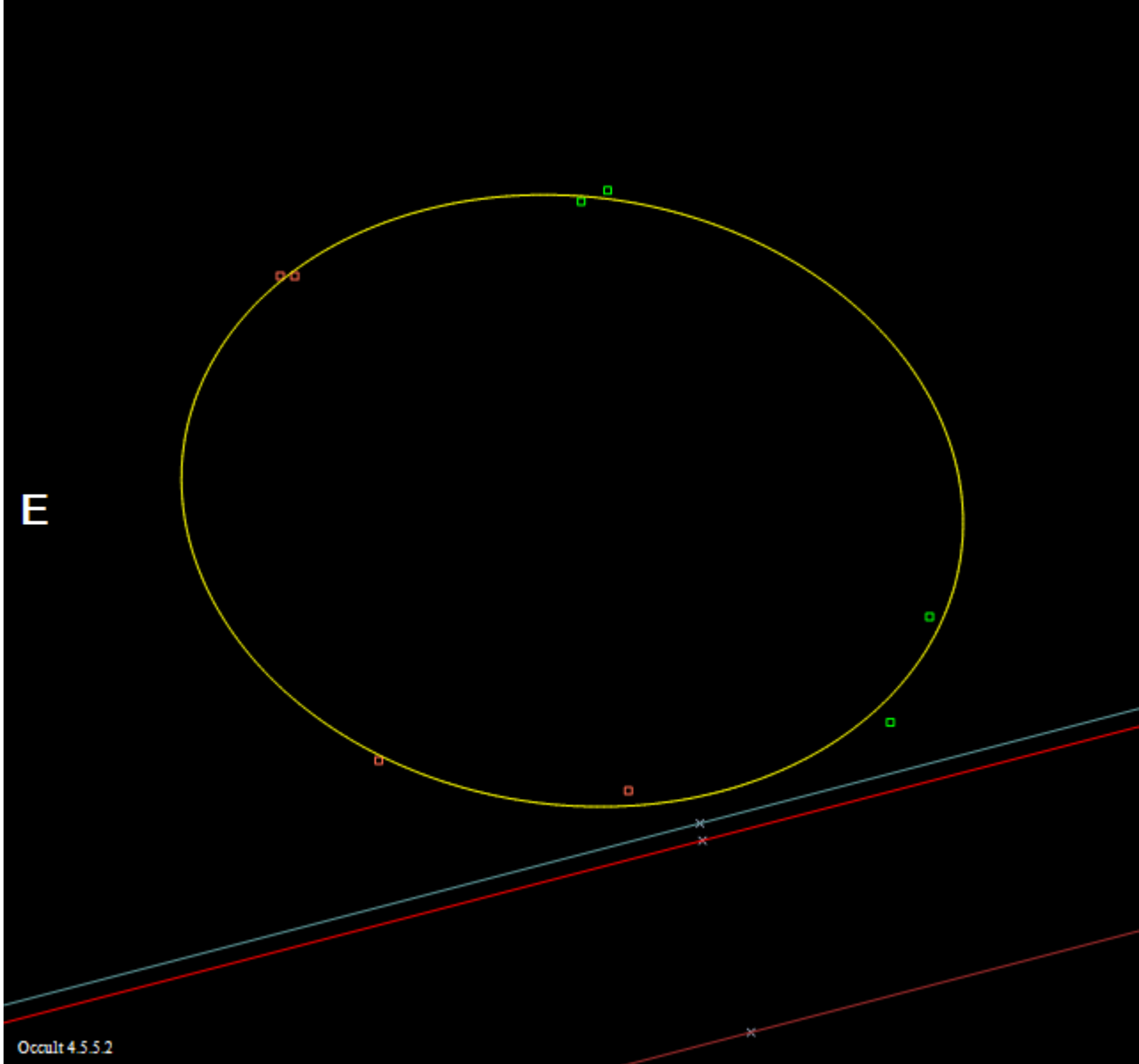
426Hippo2012Jan13

(426) Hippo 2012 Jan 13 $125.7 \pm 4.0 \times 98.2 \pm 6.1$ km, PA $32.4^\circ \pm 11.0^\circ$
Geocentric X 3296.5 ± 3.8 Y 834.6 ± 0.8 km **N**



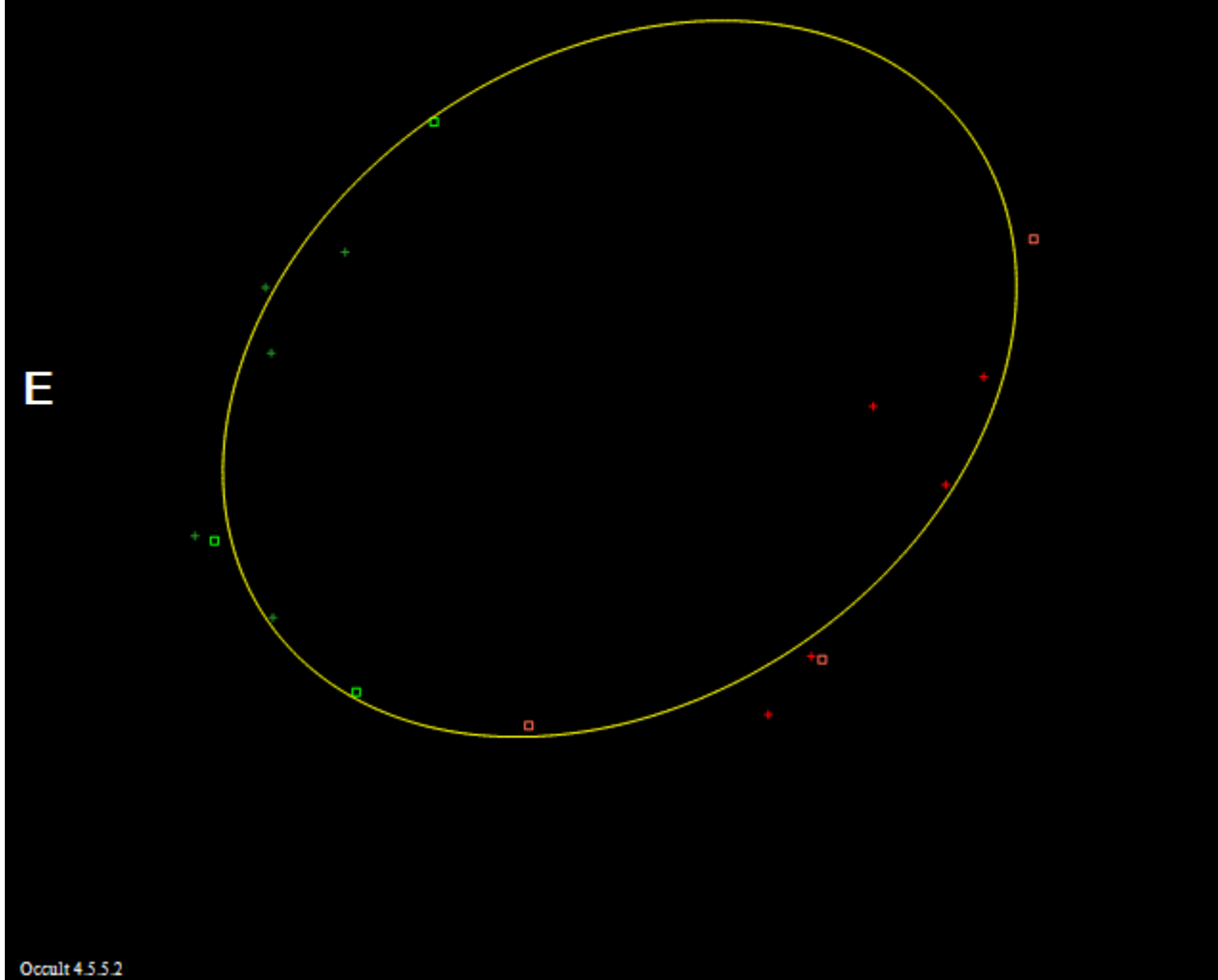
42Isis2011May03

(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**



431Nephele2002Nov03

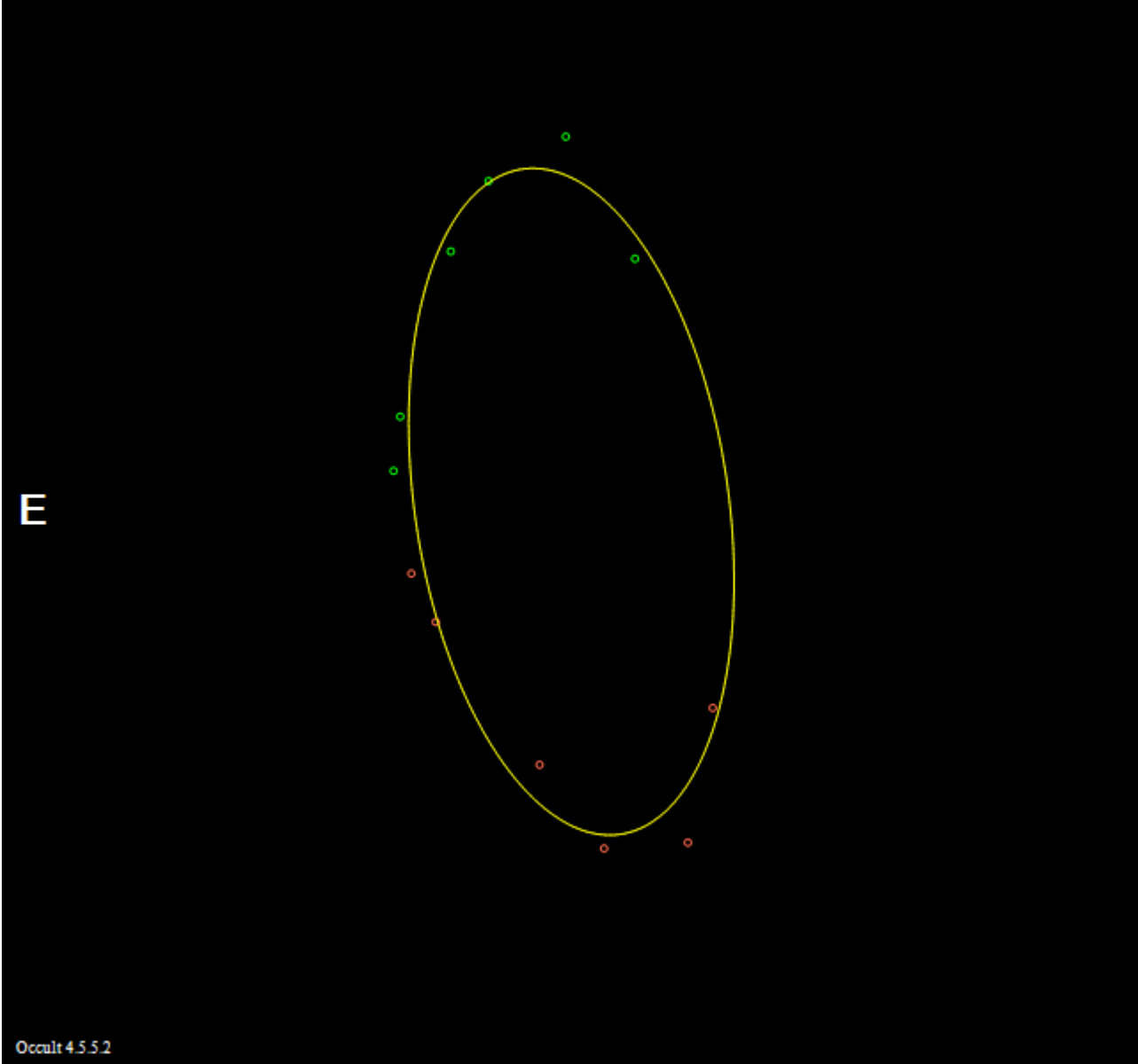
(431) Nephele 2002 Nov 3 $79.0 \pm 5.0 \times 59.4 \pm 3.1$ km, PA $-55.8^\circ \pm 11.1^\circ$
Geocentric X -4605.4 ± 1.5 Y 3327.7 ± 2.3 km **N**



Occult 4.5.5.2

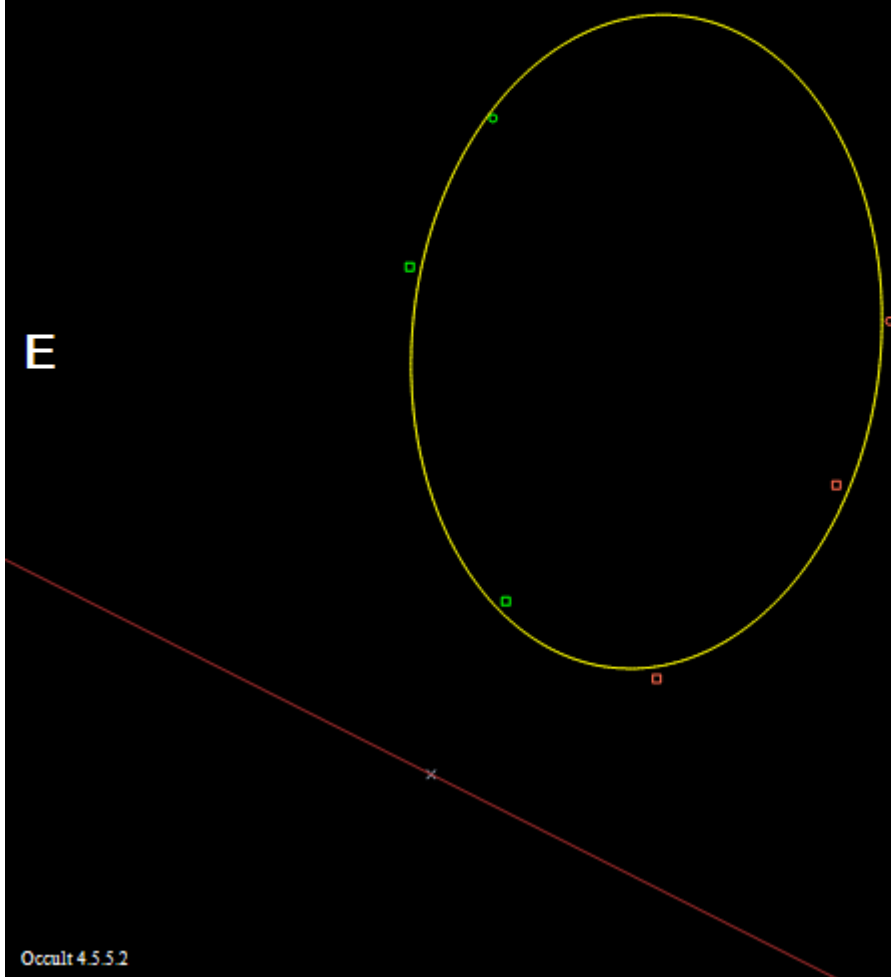
433Eros1975Jan24

(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**



43Ariadne2008Sep20

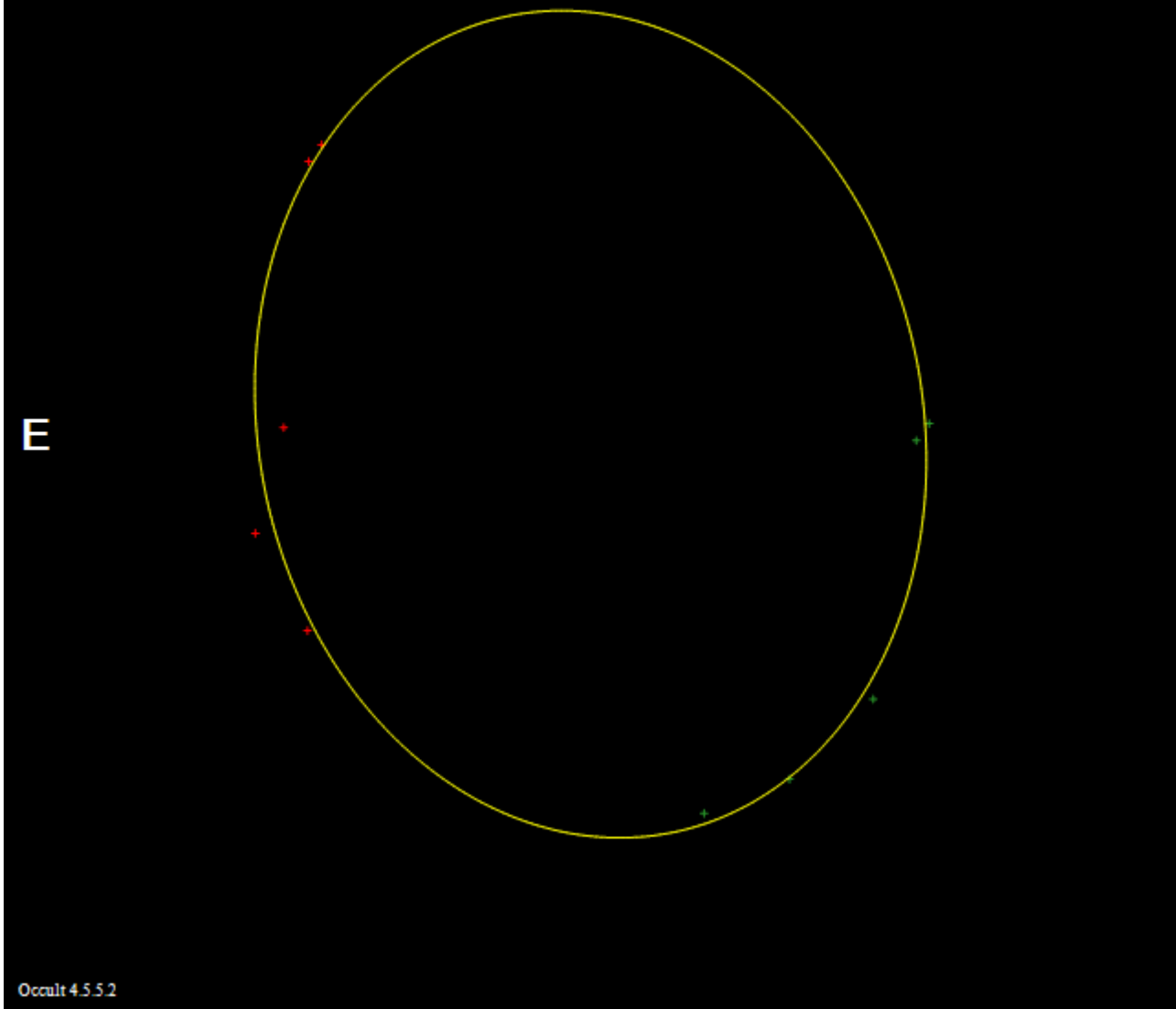
(43) Ariadne 2008 Sep 20 $61.4 \pm 1.9 \times 43.9 \pm 0.6$ km, PA $-5.8^\circ \pm 2.6^\circ$
Geocentric X 2784.8 ± 0.4 Y 4054.0 ± 0.8 km **N**



Occult 4.5.5.2

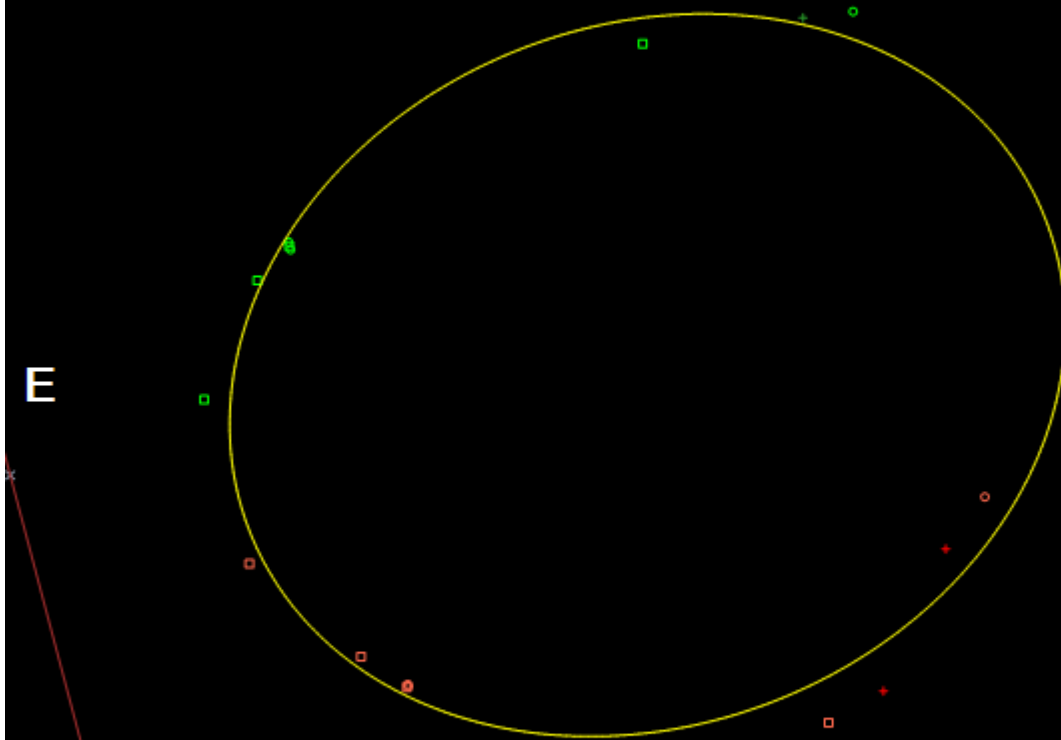
444Gyptis1994Jan08

(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**



444Gyptis2007Oct14

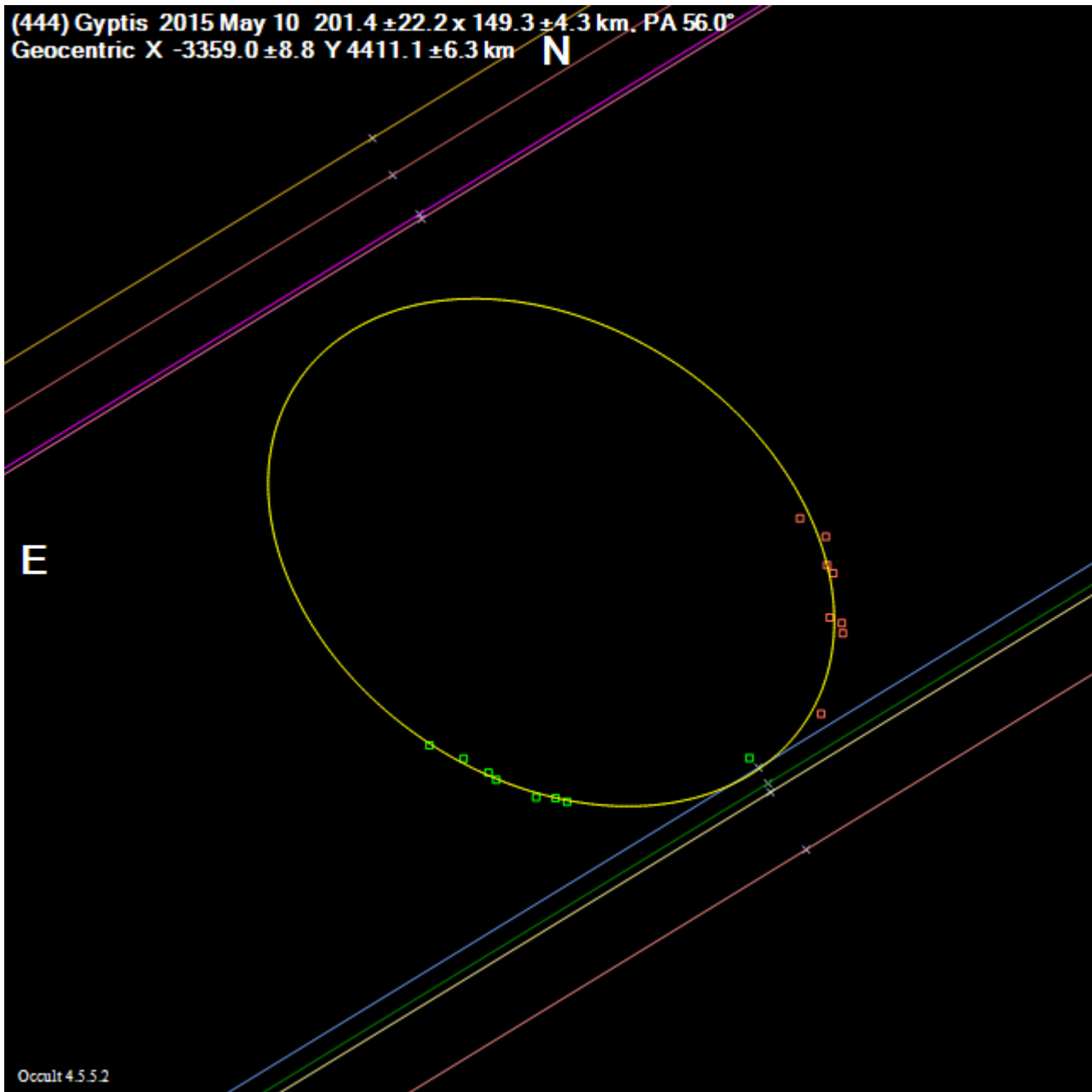
(444) Gyptis 2007 Oct 14 $181.3 \pm 4.2 \times 148.4 \pm 2.8$ km, PA $-68.5^\circ \pm 2.6^\circ$
Geocentric X -2265.9 ± 1.4 Y 4406.1 ± 1.0 km **N**



Occult 4.5.5.2

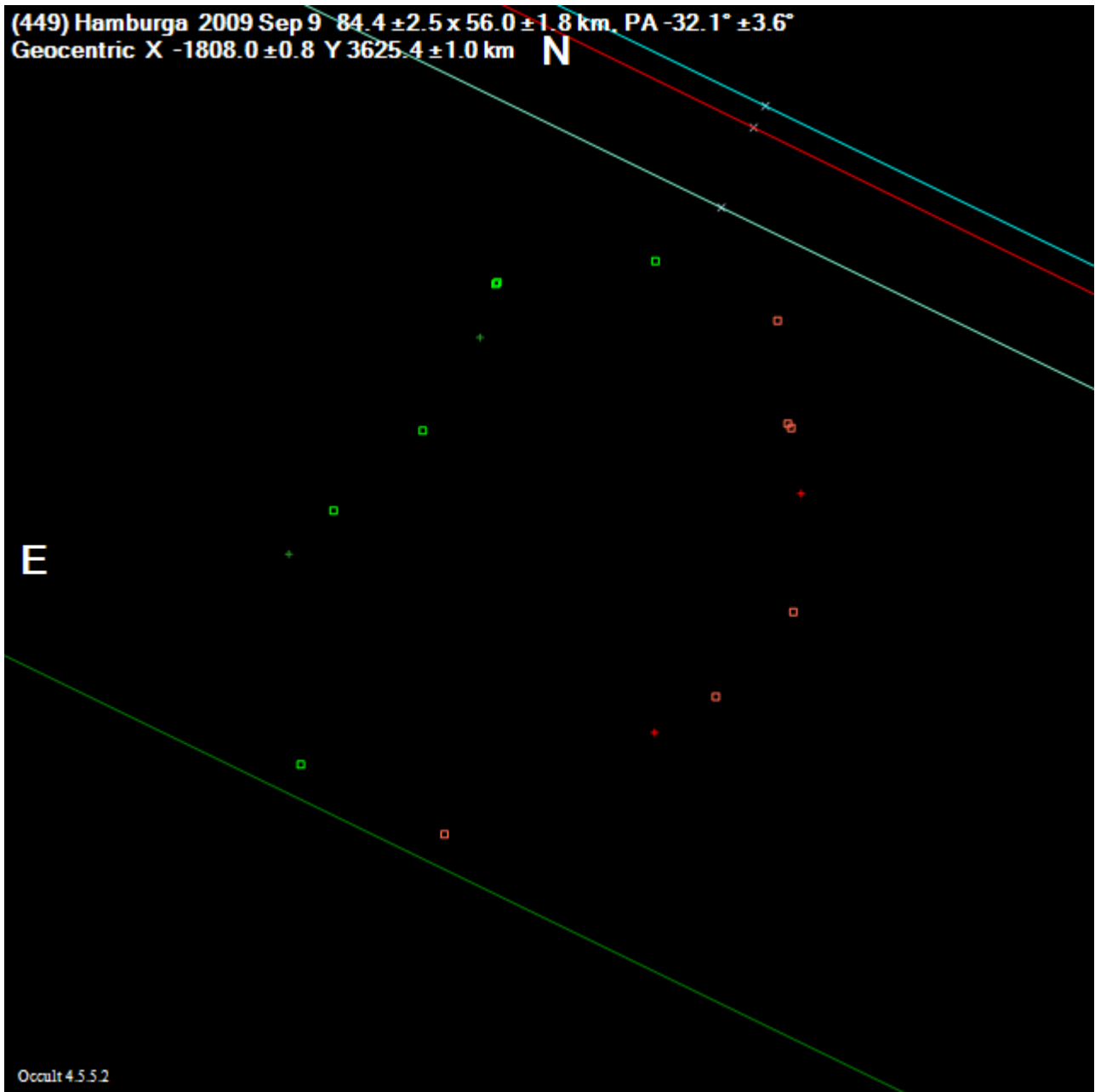
444Gyptis2015May10

(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**



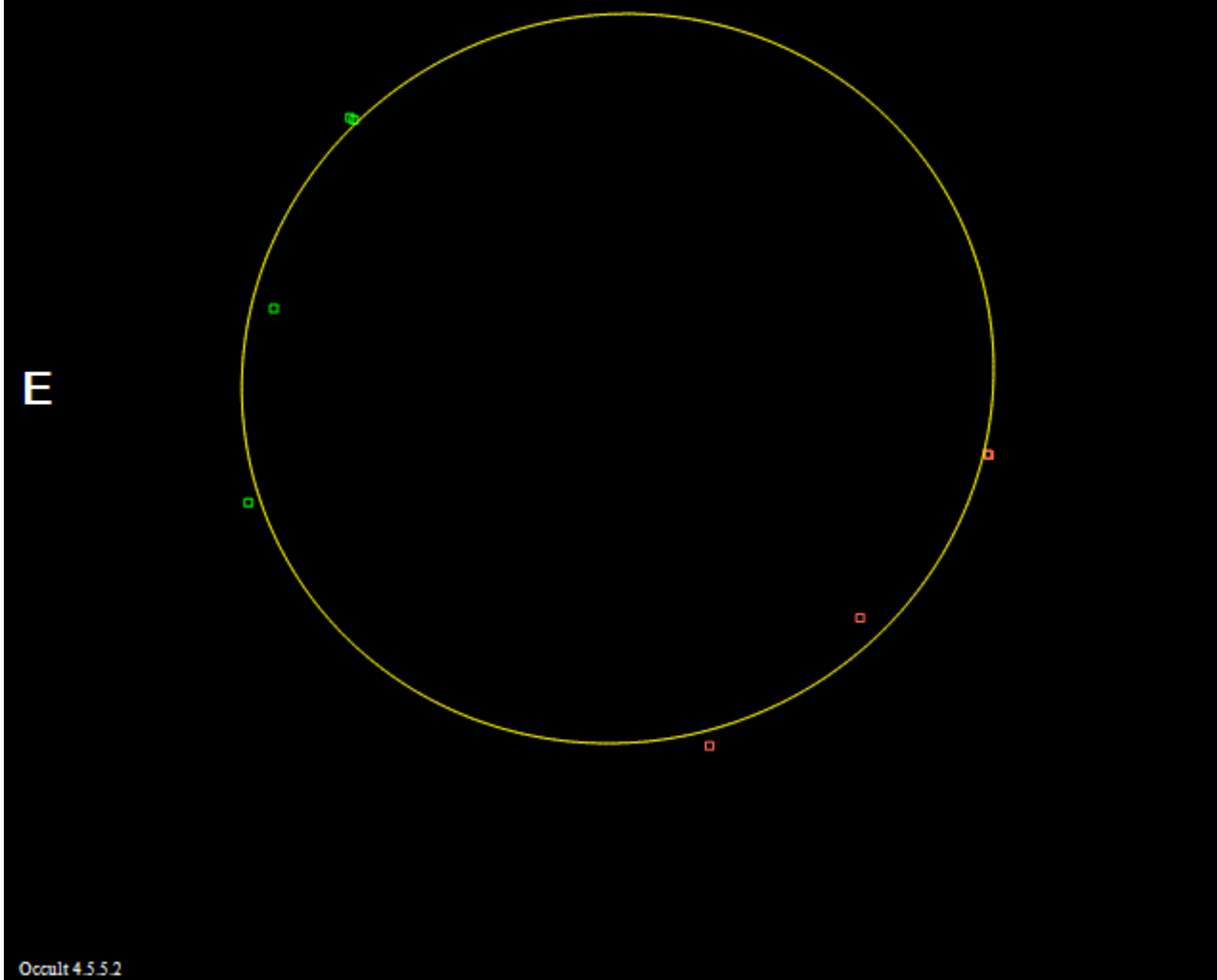
449Hamburga2009Sep09

(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**



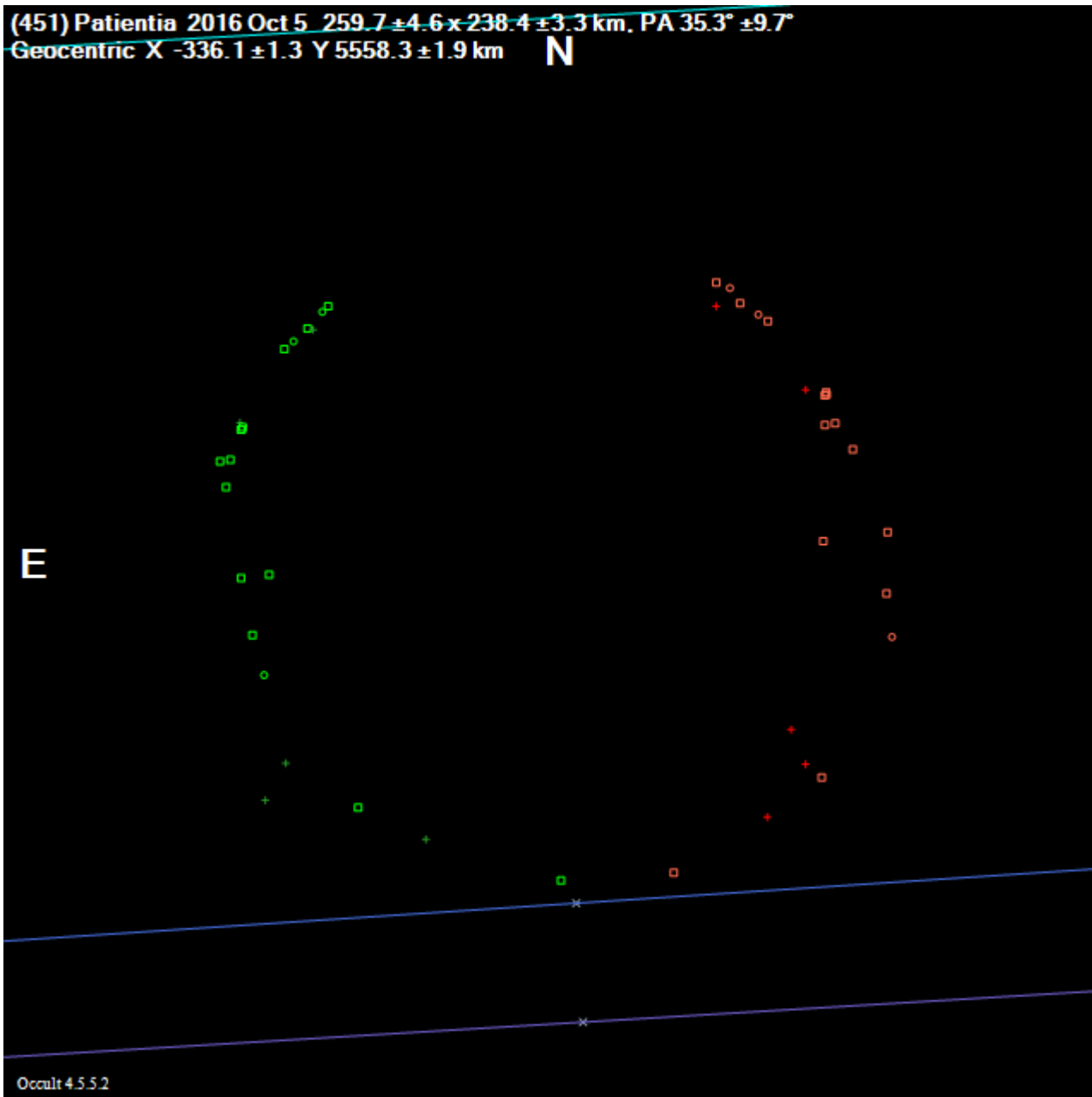
44Nysa2017Oct09

(44) Nysa 2017 Oct 9 $71.9 \pm 1.9 \times 69.1 \pm 1.6$ km, PA -70.0°
Geocentric X -4757.0 ± 0.7 Y 2861.3 ± 1.0 km **N**



451Patientia2016Oct05

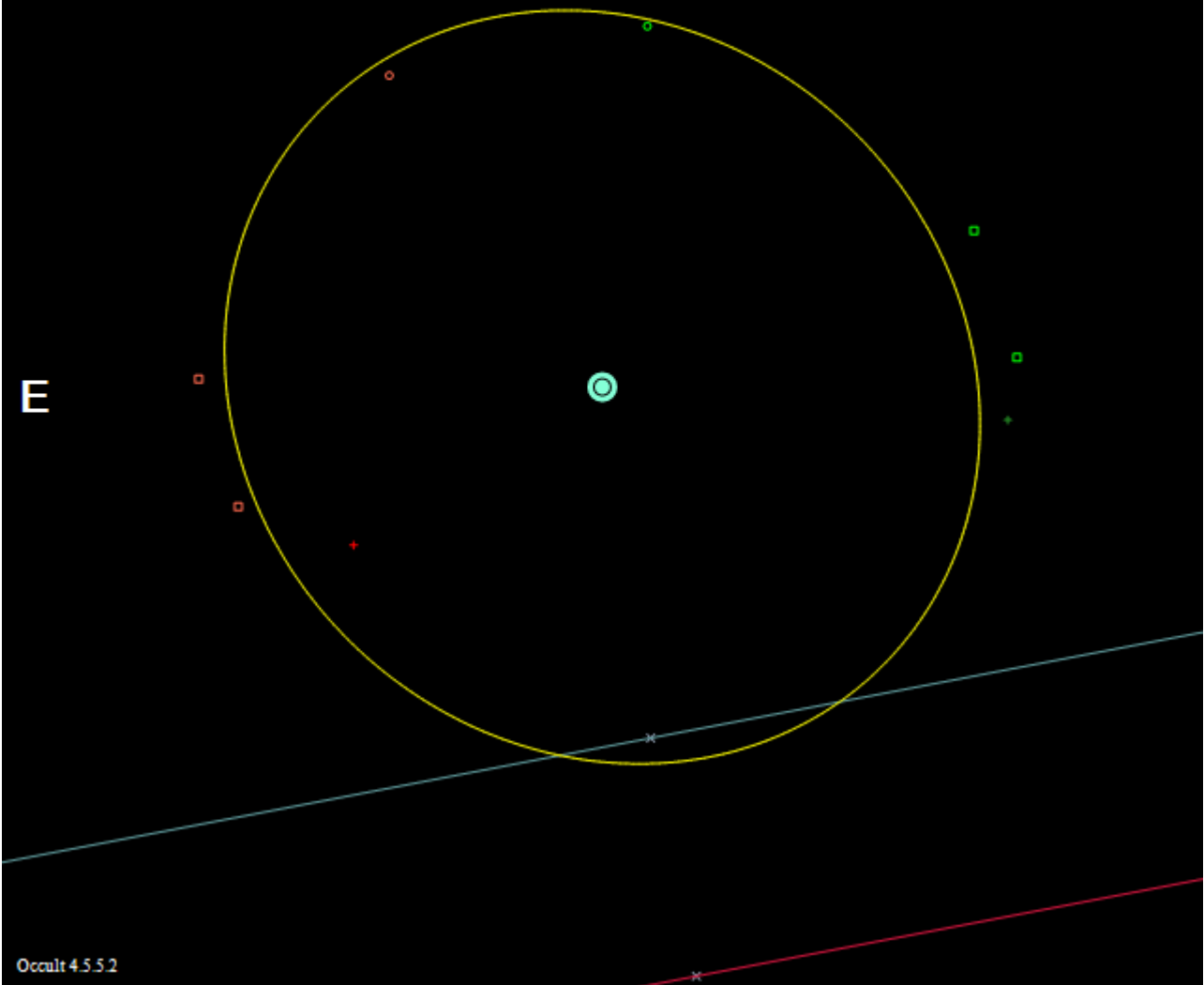
(451) Patientia 2016 Oct 5 $259.7 \pm 4.6 \times 238.4 \pm 3.3$ km, PA $35.3^\circ \pm 9.7^\circ$
Geocentric X -336.1 ± 1.3 Y 5558.3 ± 1.9 km



Occult 4.5.5.2

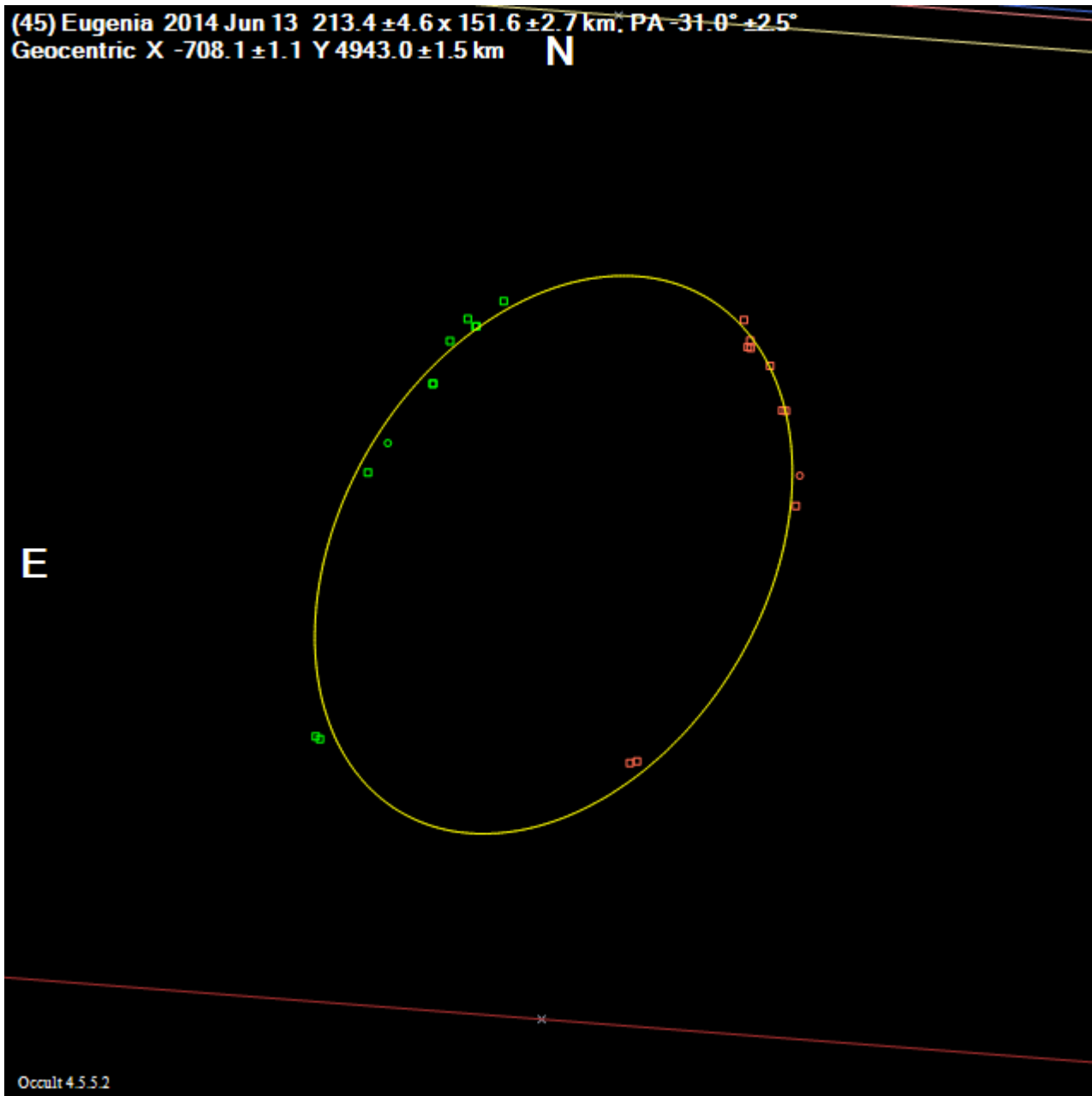
45Eugenia2013May20

(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°



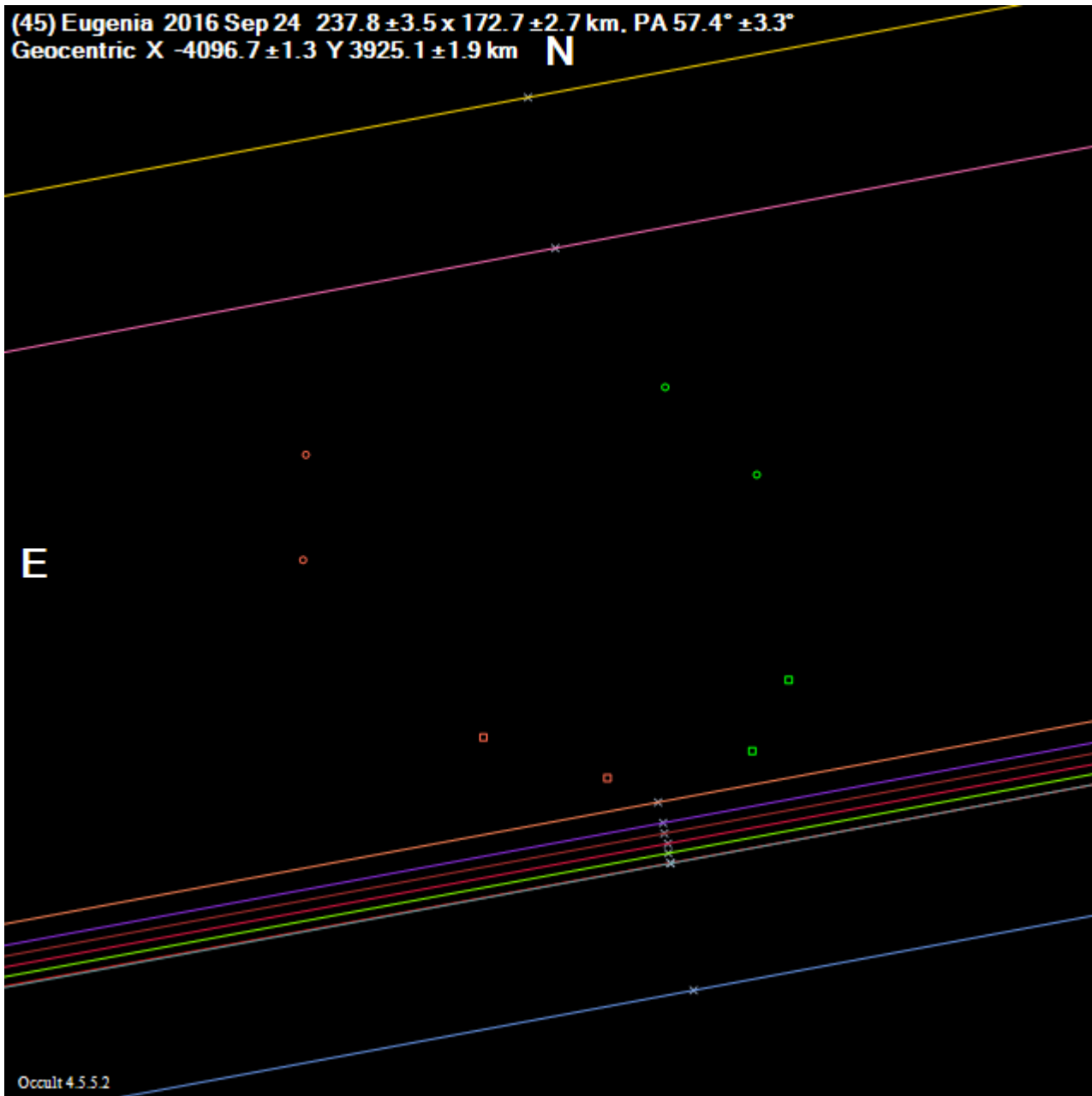
45Eugenia2014Jun13

(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**



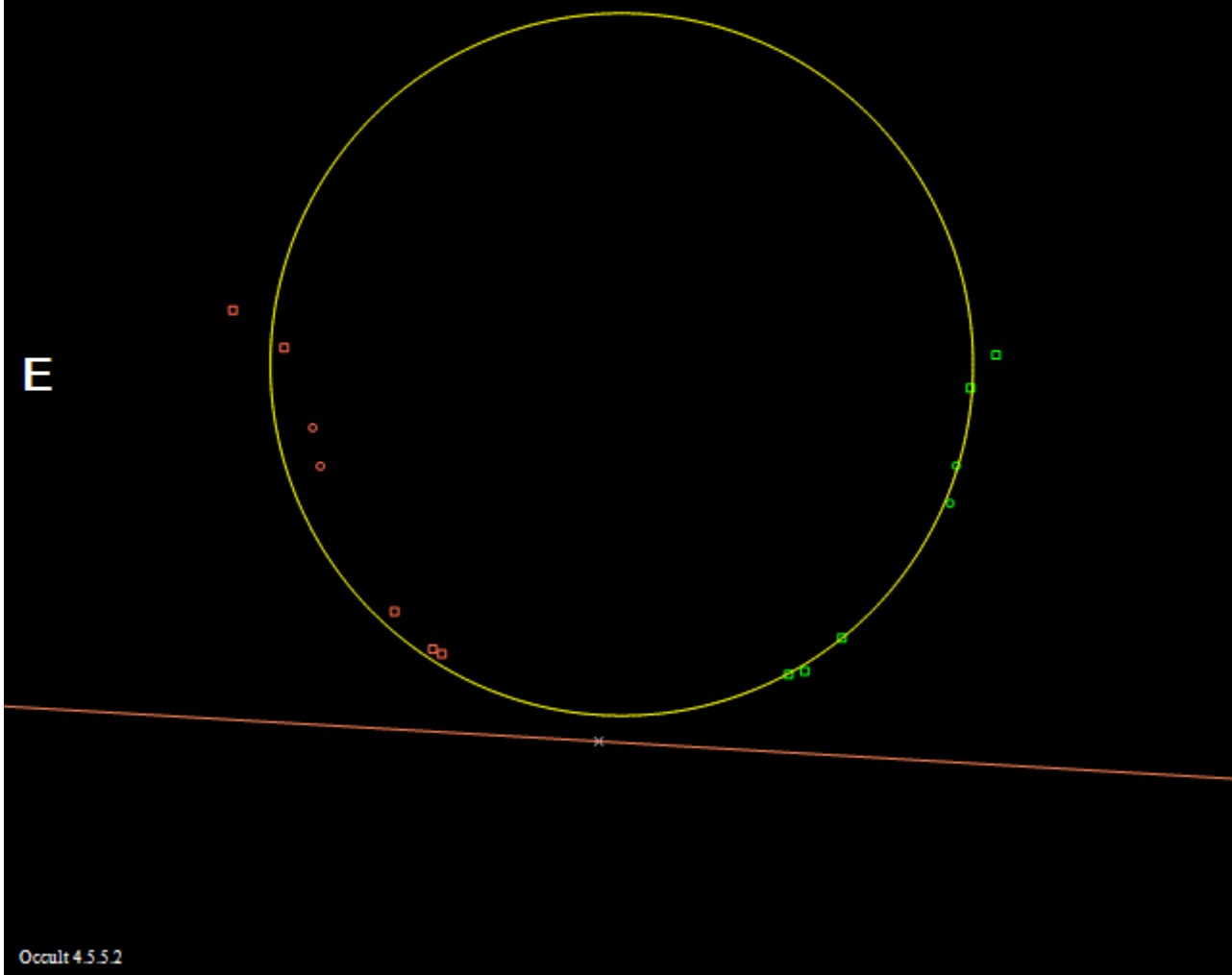
45Eugenia2016Sep24

(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**



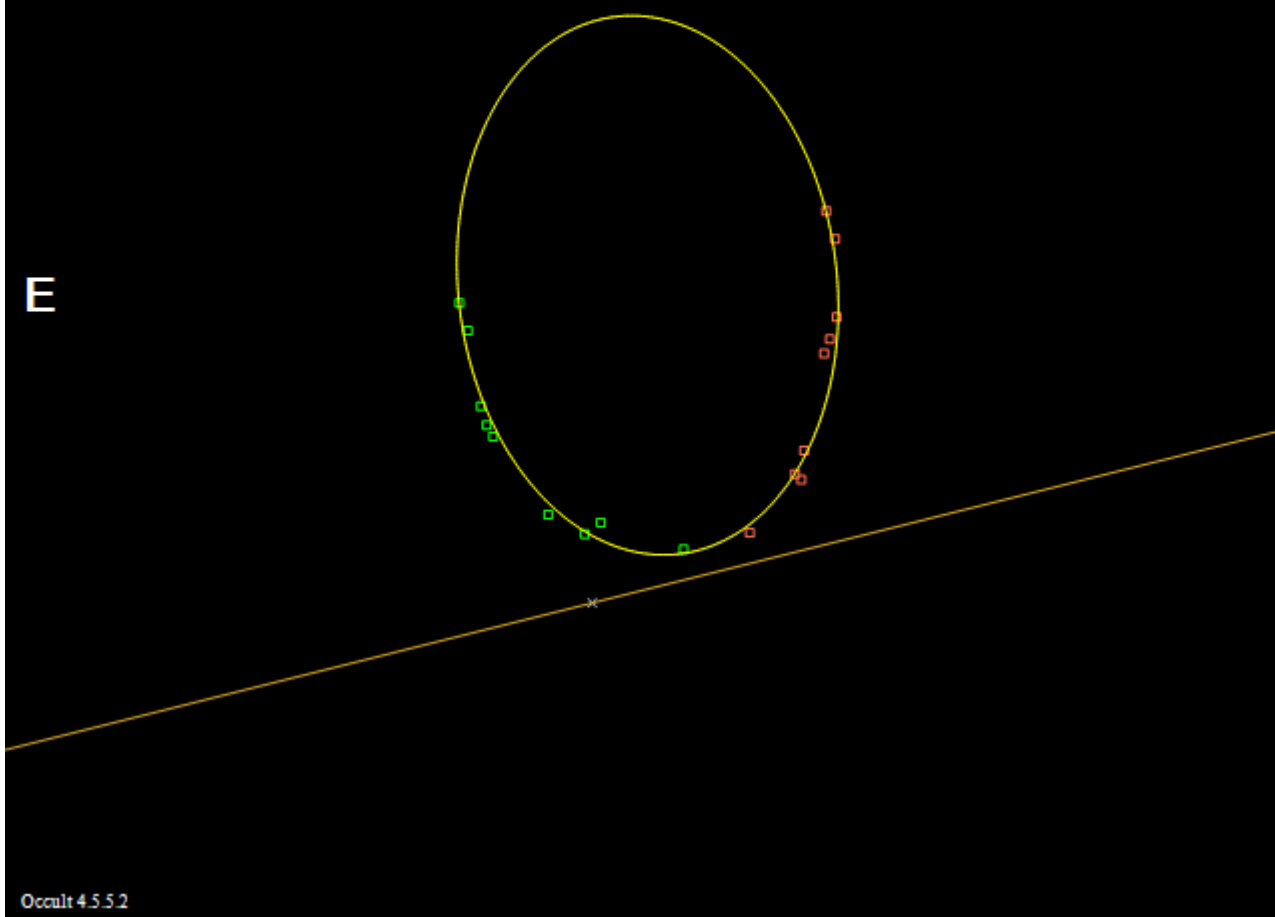
45Eugenia2017May02

(45) Eugenia 2017 May 2 $196.0 \pm 31.6 \times 196.0$ km, PA 0.0°
Geocentric X 4070.4 ± 1.8 Y 4504.2 ± 12.6 km **N**



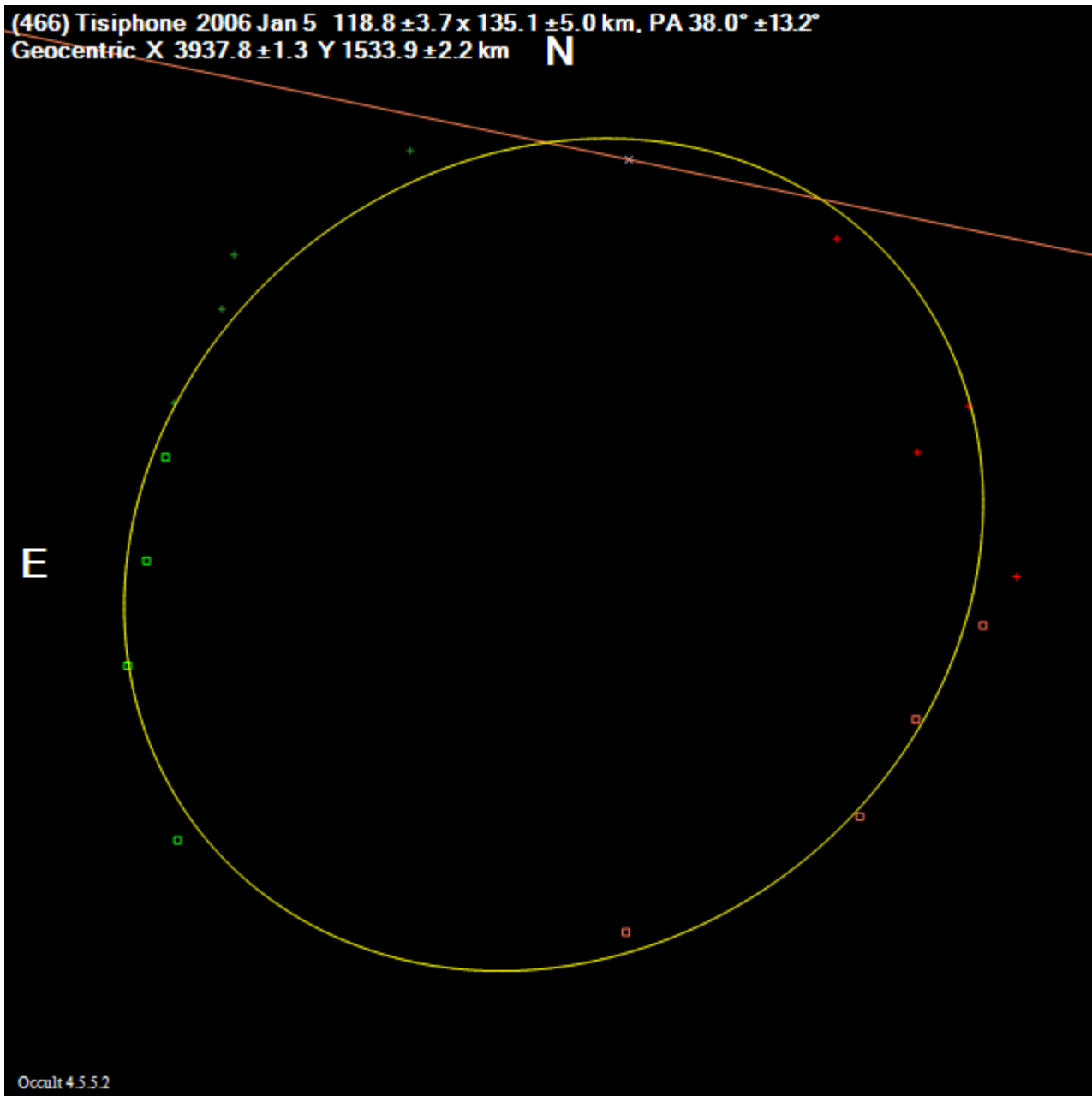
464Megaira2017Dec18

(464) Megaira 2017 Dec 18 $107.4 \pm 6.7 \times 75.2 \pm 1.1$ km, PA $6.7^\circ \pm 2.2^\circ$
Geocentric X 1698.4 ± 0.7 Y 1790.7 ± 3.0 km **N**



466Tisiphone2006Jan05

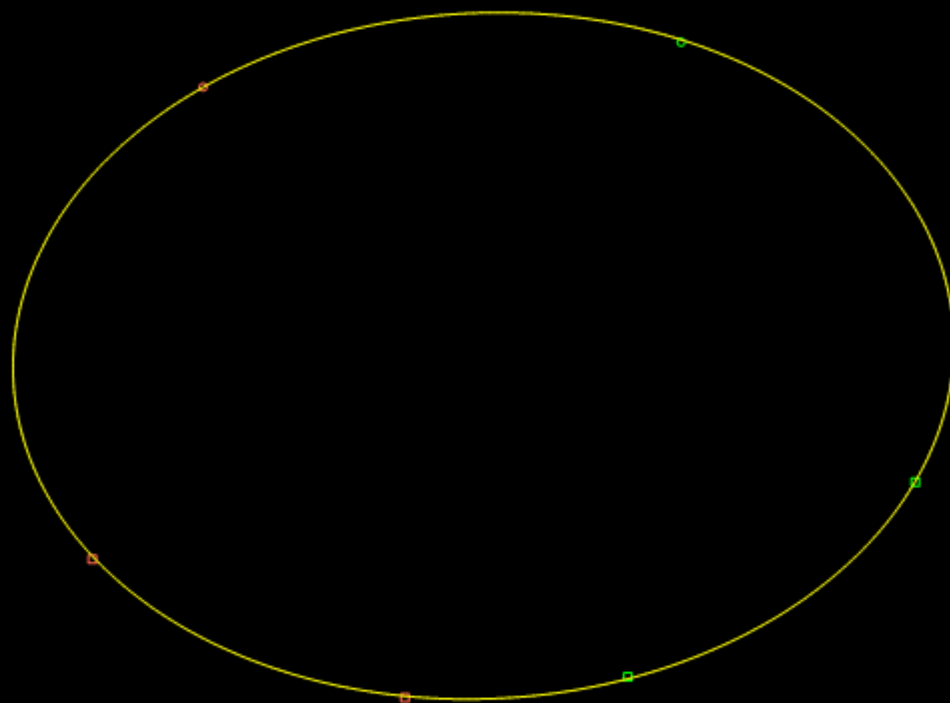
(466) Tisiphone 2006 Jan 5 $118.8 \pm 3.7 \times 135.1 \pm 5.0$ km, PA $38.0^\circ \pm 13.2^\circ$
Geocentric X 3937.8 ± 1.3 Y 1533.9 ± 2.2 km **N**



468Lina2009Sep21

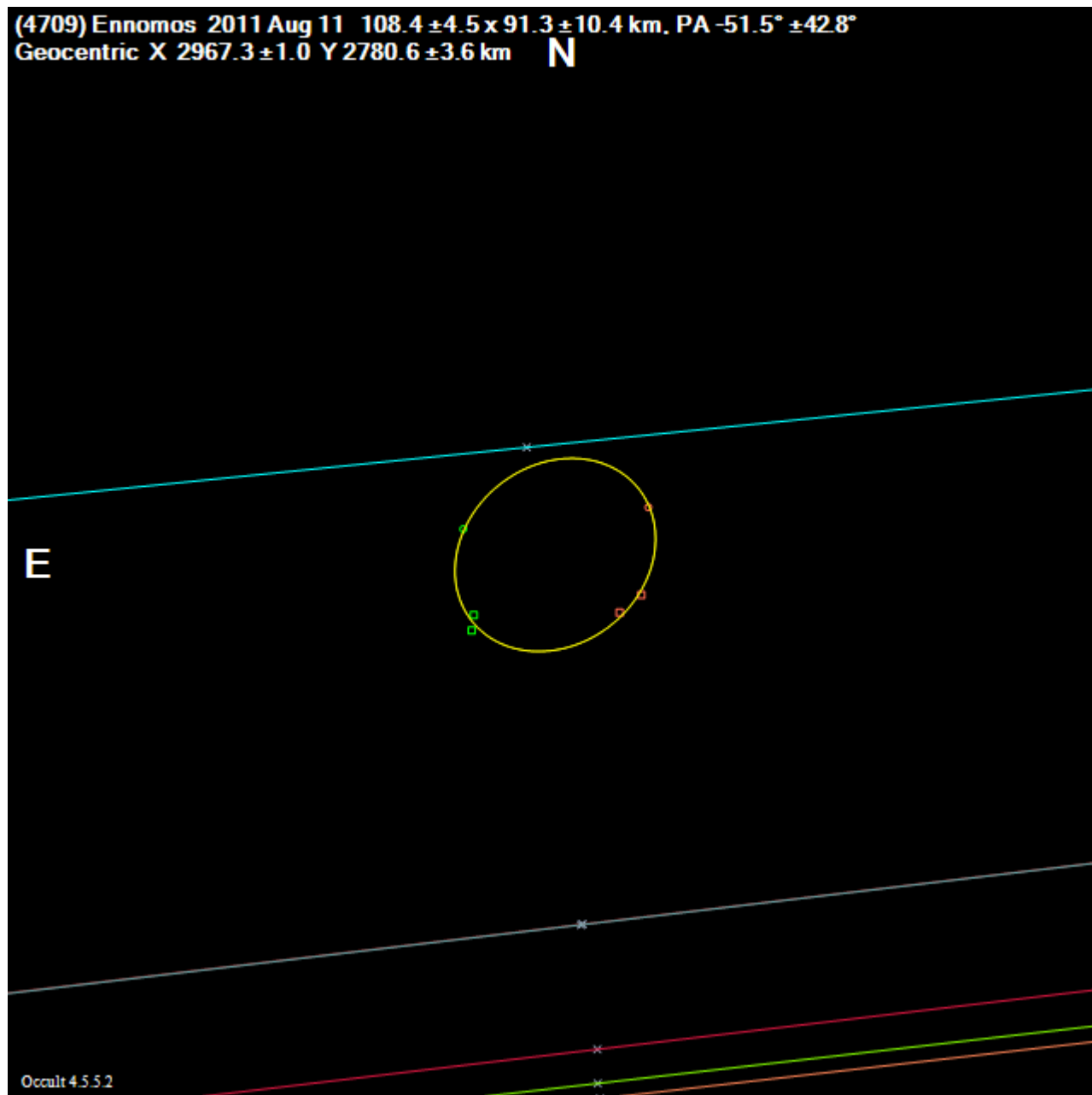
(468) Lina 2009 Sep 21 $78.4 \pm 0.3 \times 57.1 \pm 0.2$ km, PA $93.0^\circ \pm 0.4^\circ$
Geocentric X 2421.4 ± 0.1 Y 5769.4 ± 0.1 km **N**

E



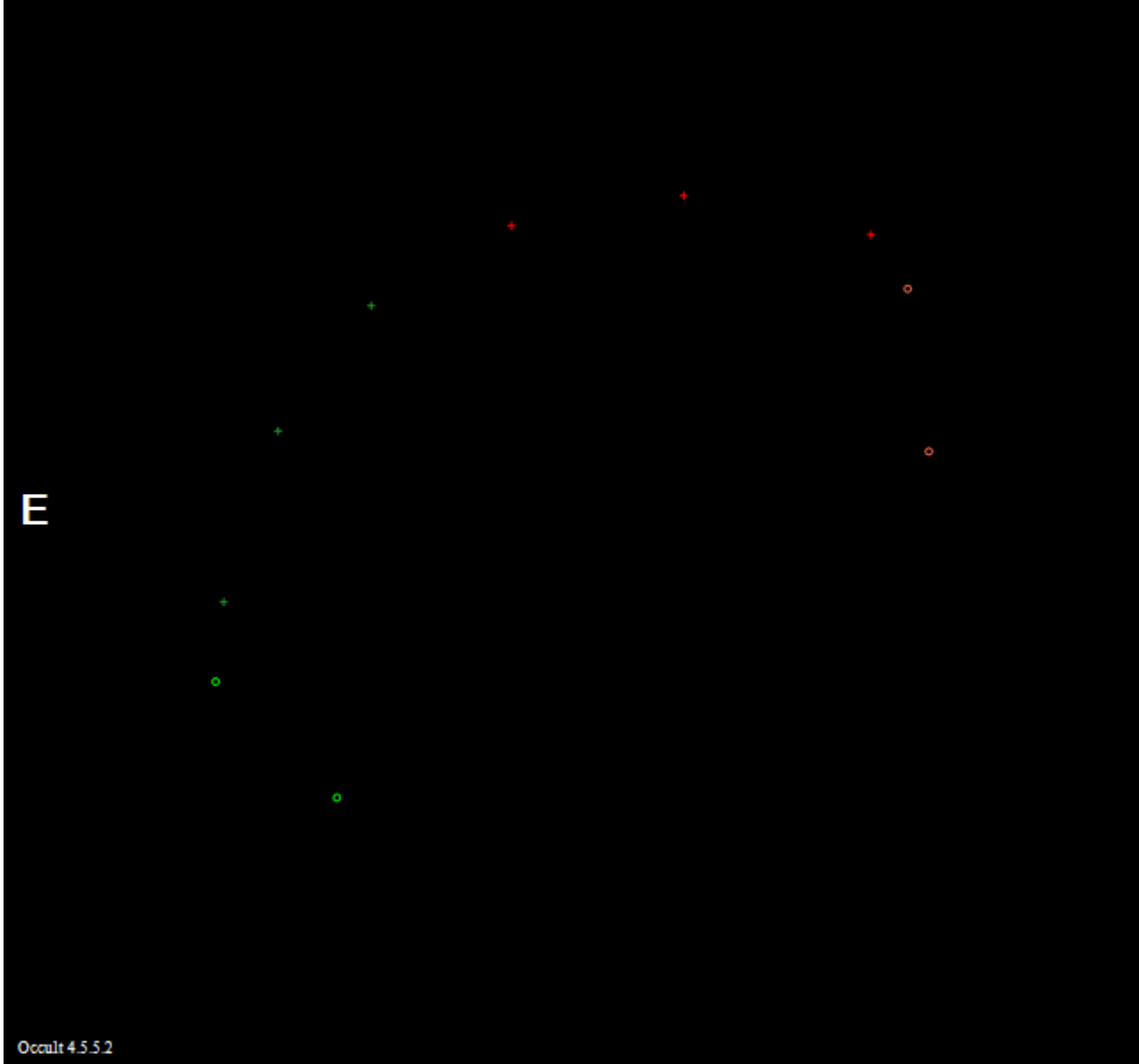
4709Ennomos2011Aug11

(4709) Ennomos 2011 Aug 11 $108.4 \pm 4.5 \times 91.3 \pm 10.4$ km, PA $-51.5^\circ \pm 42.8^\circ$
Geocentric X 2967.3 ± 1.0 Y 2780.6 ± 3.6 km **N**



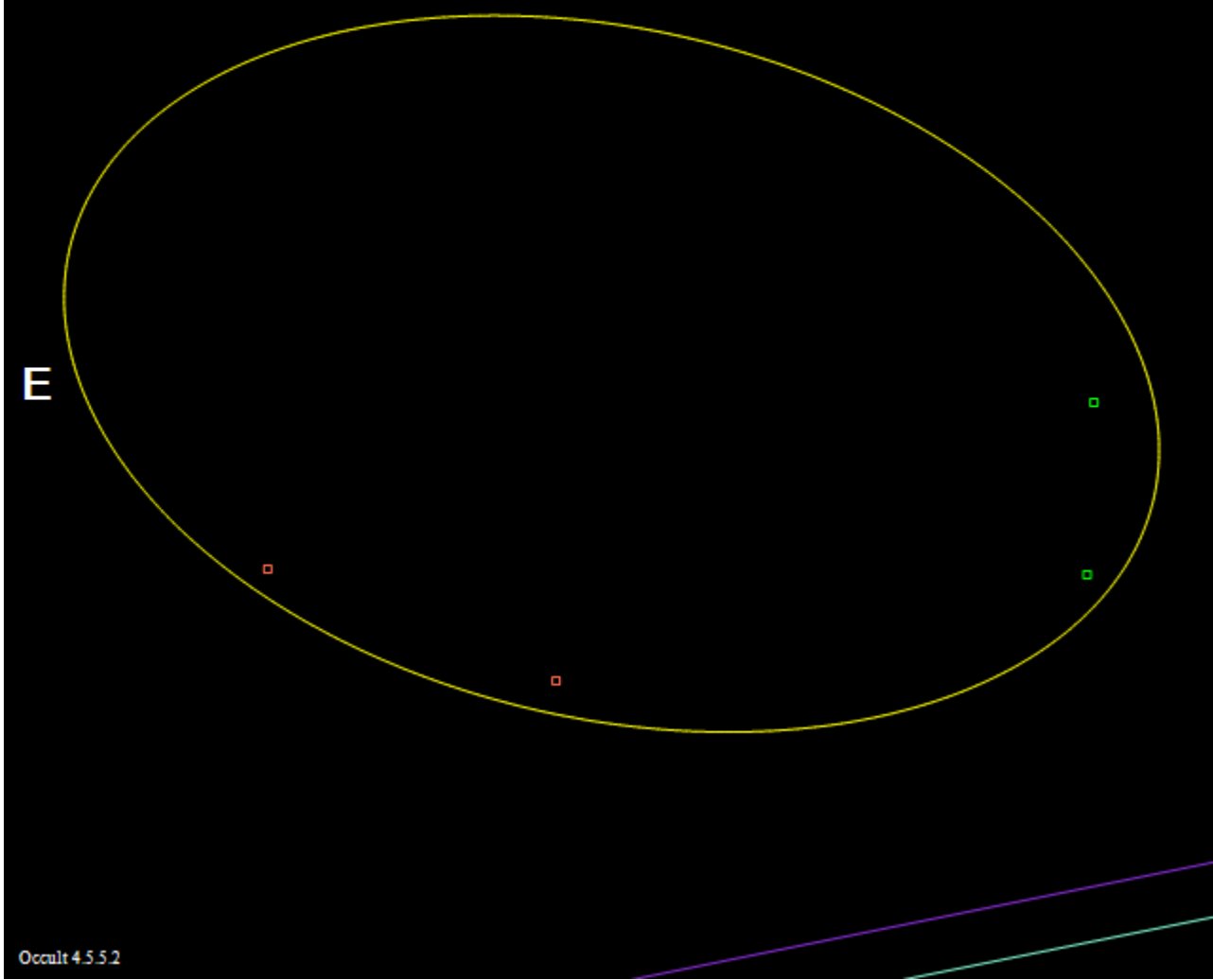
471Papagena1987Jan24

(471) Papagena 1987 Jan 24 $156.5 \pm 0.9 \times 105.3 \pm 1.8$ km, PA $-56.7^\circ \pm 1.1^\circ$
Geocentric X -3172.0 ± 0.4 Y 1929.2 ± 0.6 km **N**



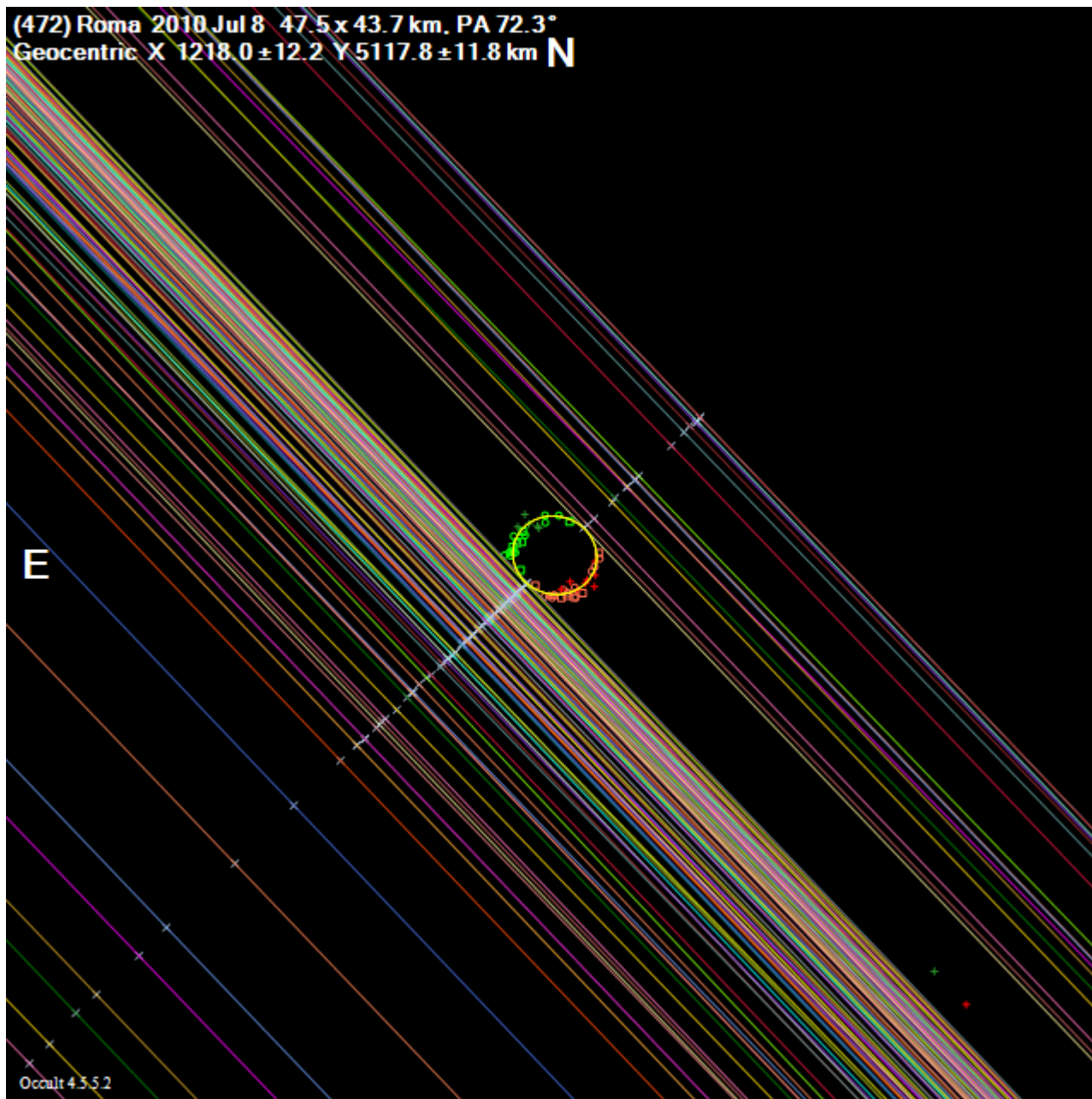
471Papagena2014Sep15

(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



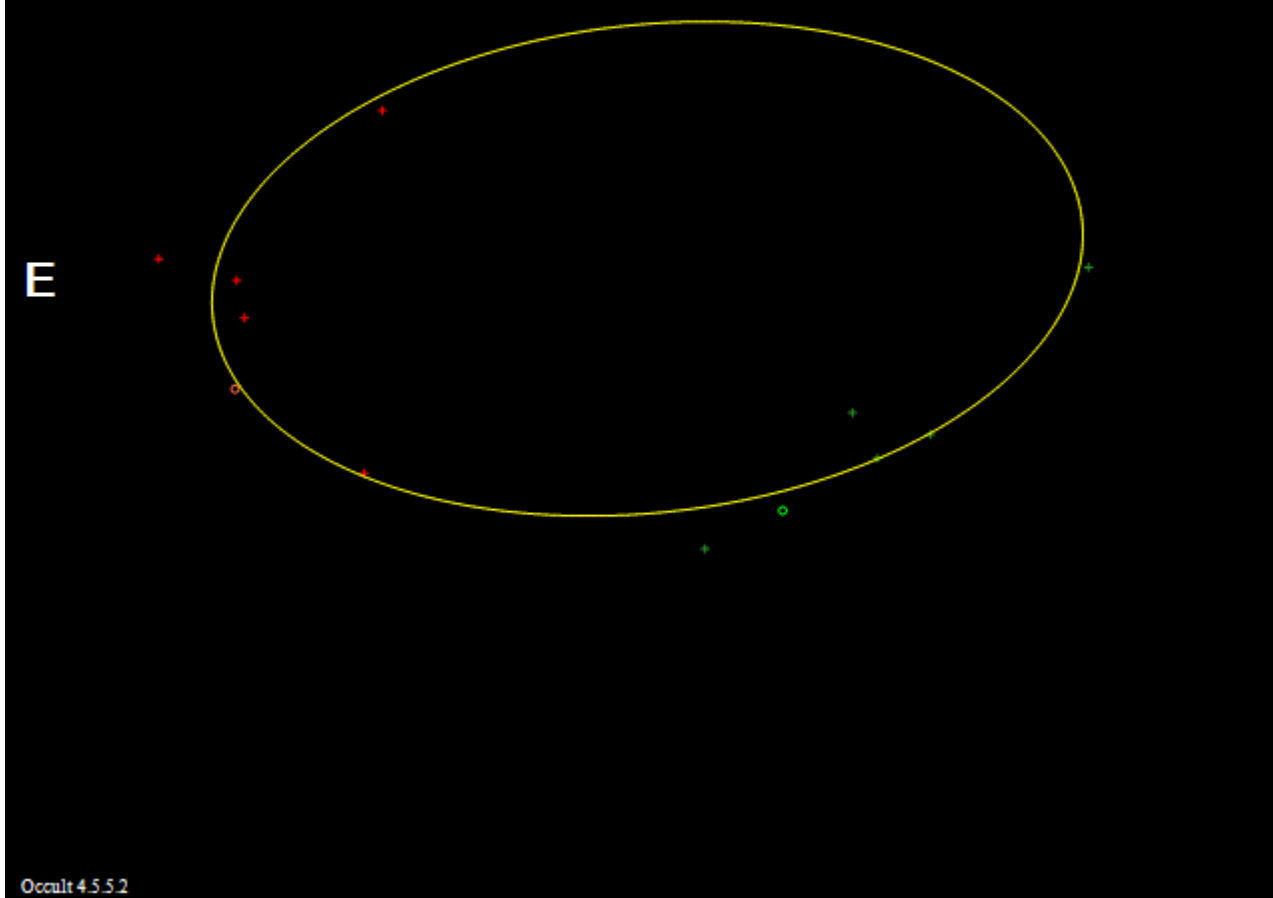
472Roma2010Jul08

(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



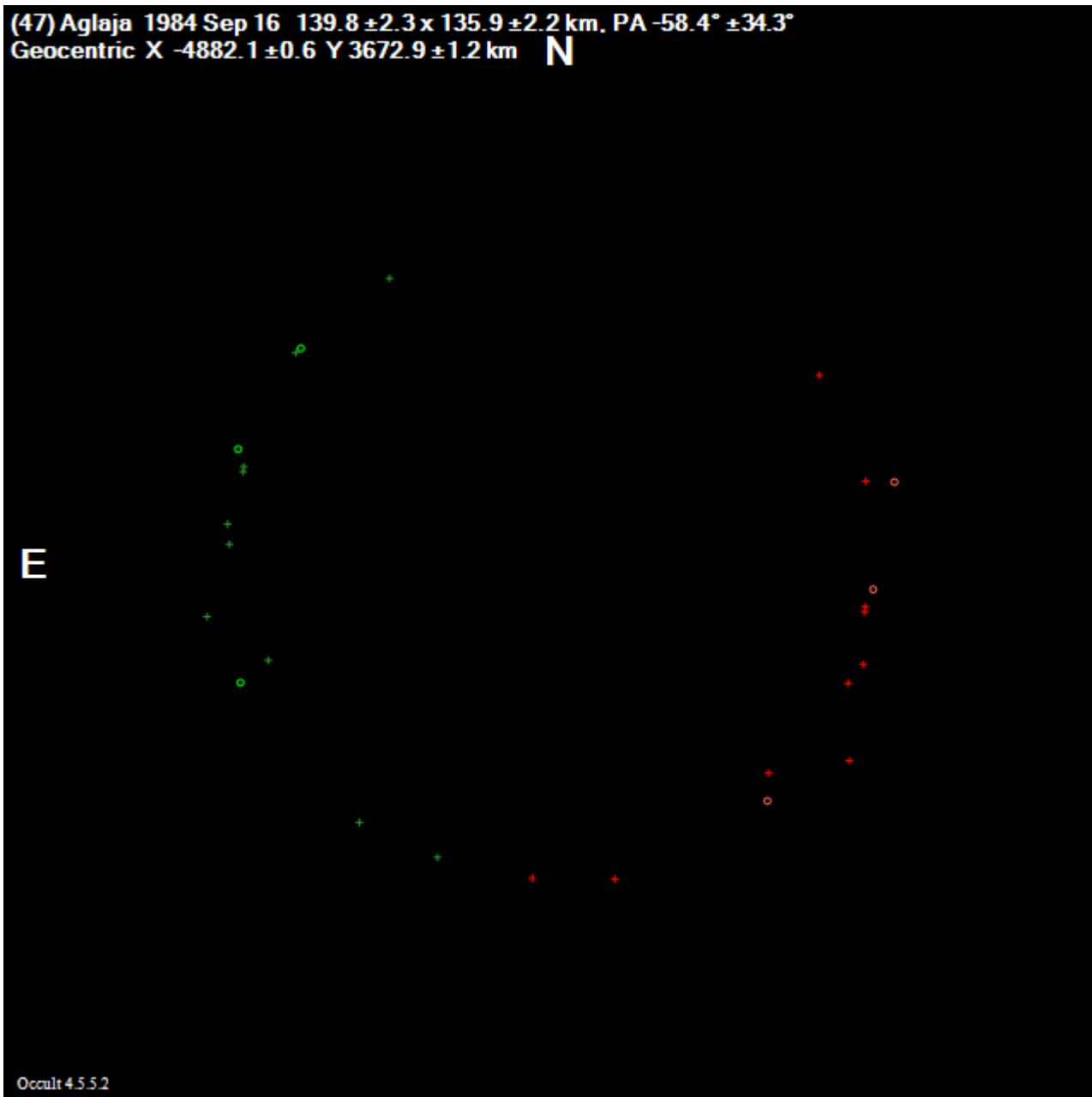
476Hedwig2000Nov07

(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**



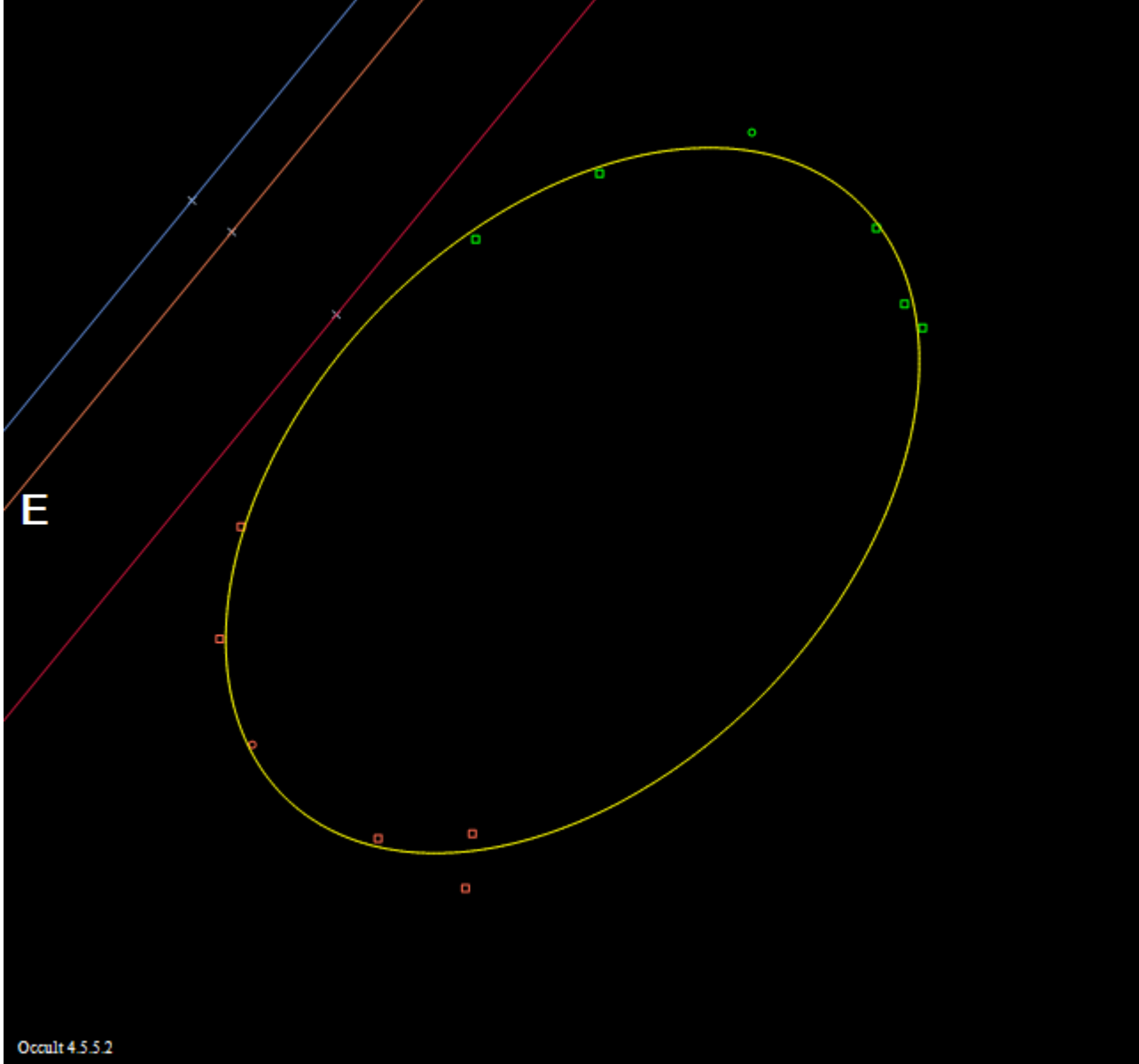
47Aglaja1984Sep16

(47) Aglaja 1984 Sep 16 $139.8 \pm 2.3 \times 135.9 \pm 2.2$ km, PA $-58.4^\circ \pm 34.3^\circ$
Geocentric X -4882.1 ± 0.6 Y 3672.9 ± 1.2 km **N**



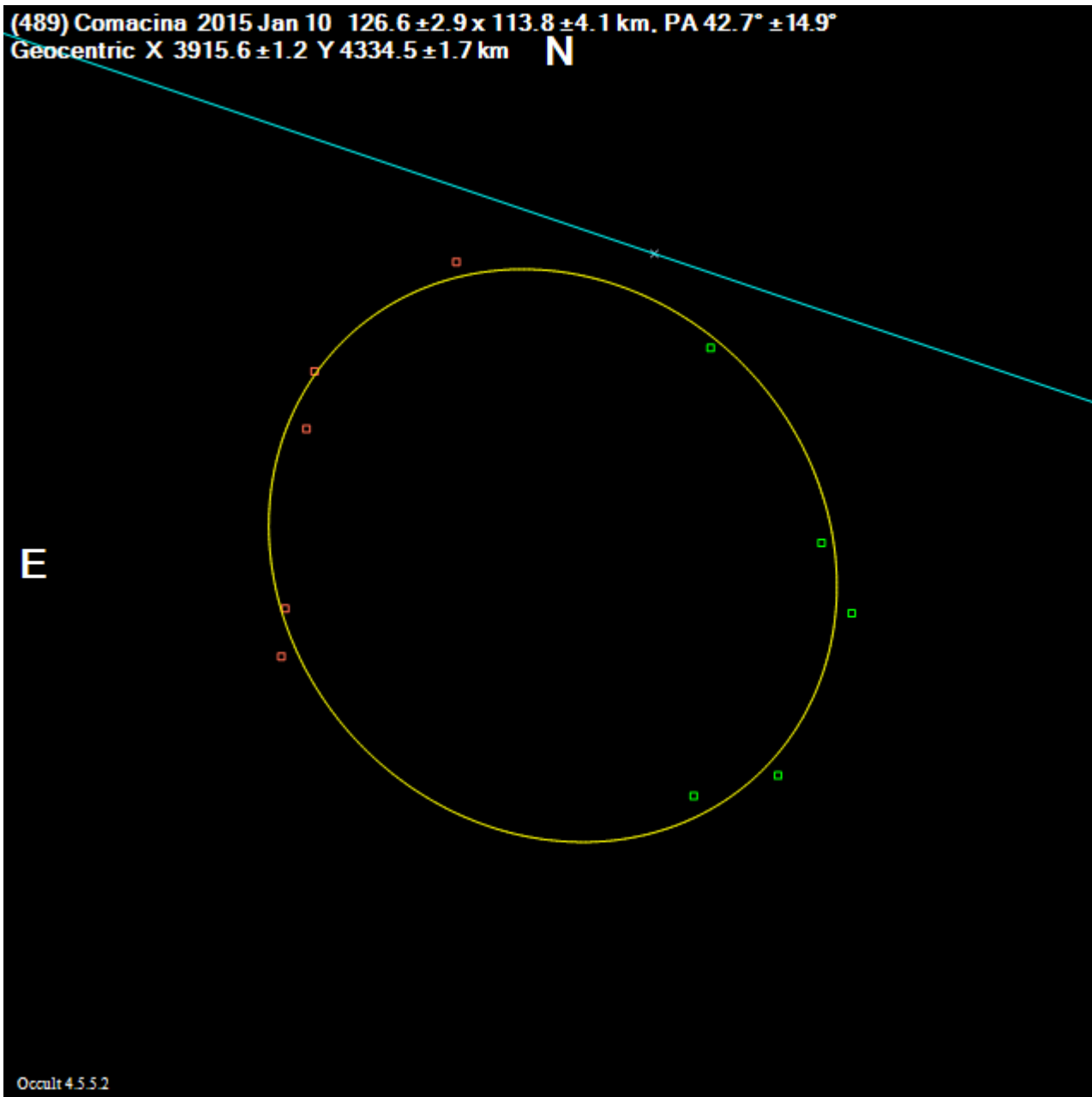
489Comacina2013Aug24

(489) Comacina 2013 Aug 24 $168.6 \pm 1.5 \times 110.9 \pm 2.4$ km, PA $-43.8^\circ \pm 1.0^\circ$
Geocentric X 3438.6 ± 0.7 Y 4637.1 ± 0.6 km **N**



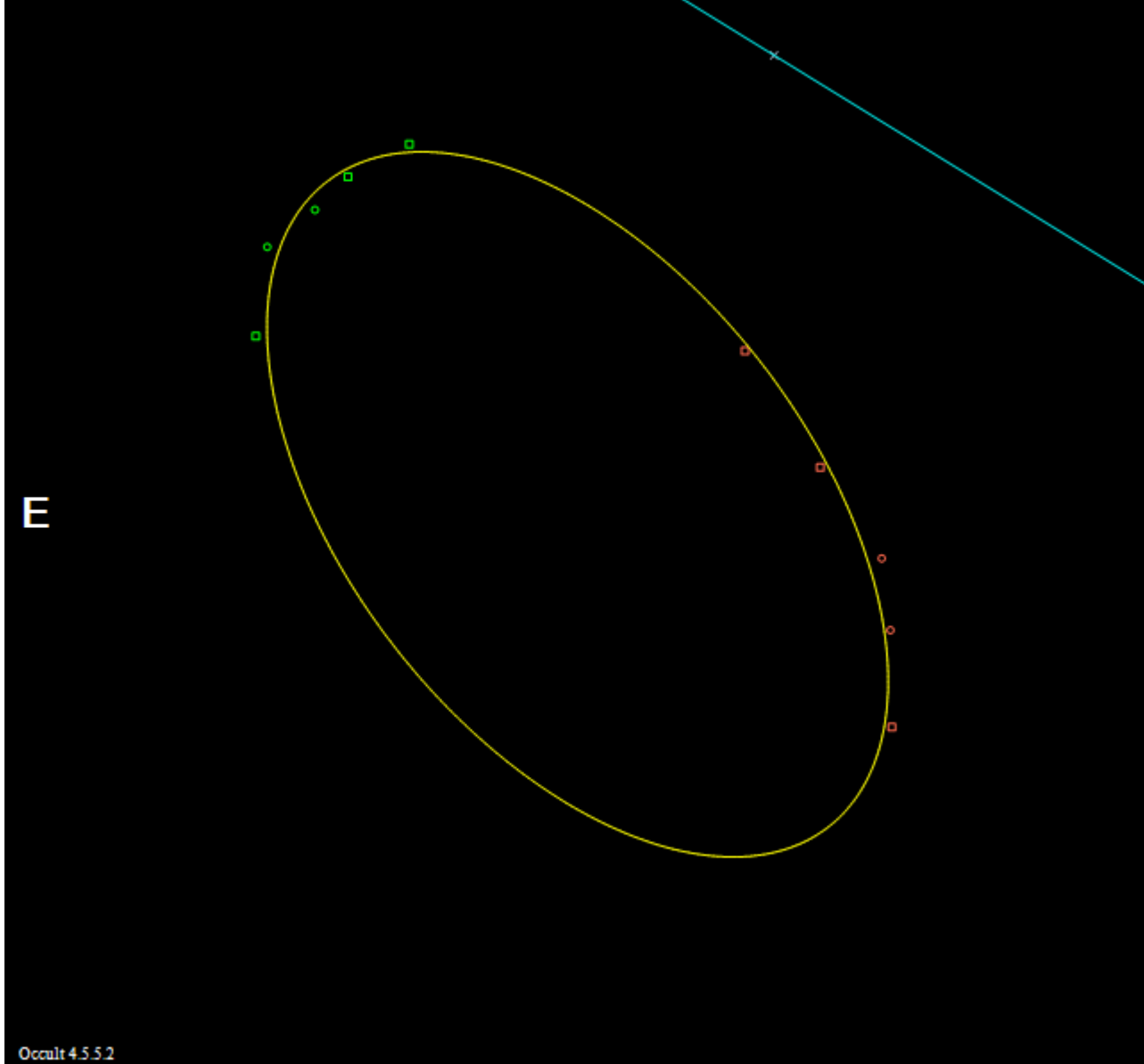
489Comacina2015Jan10

(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**



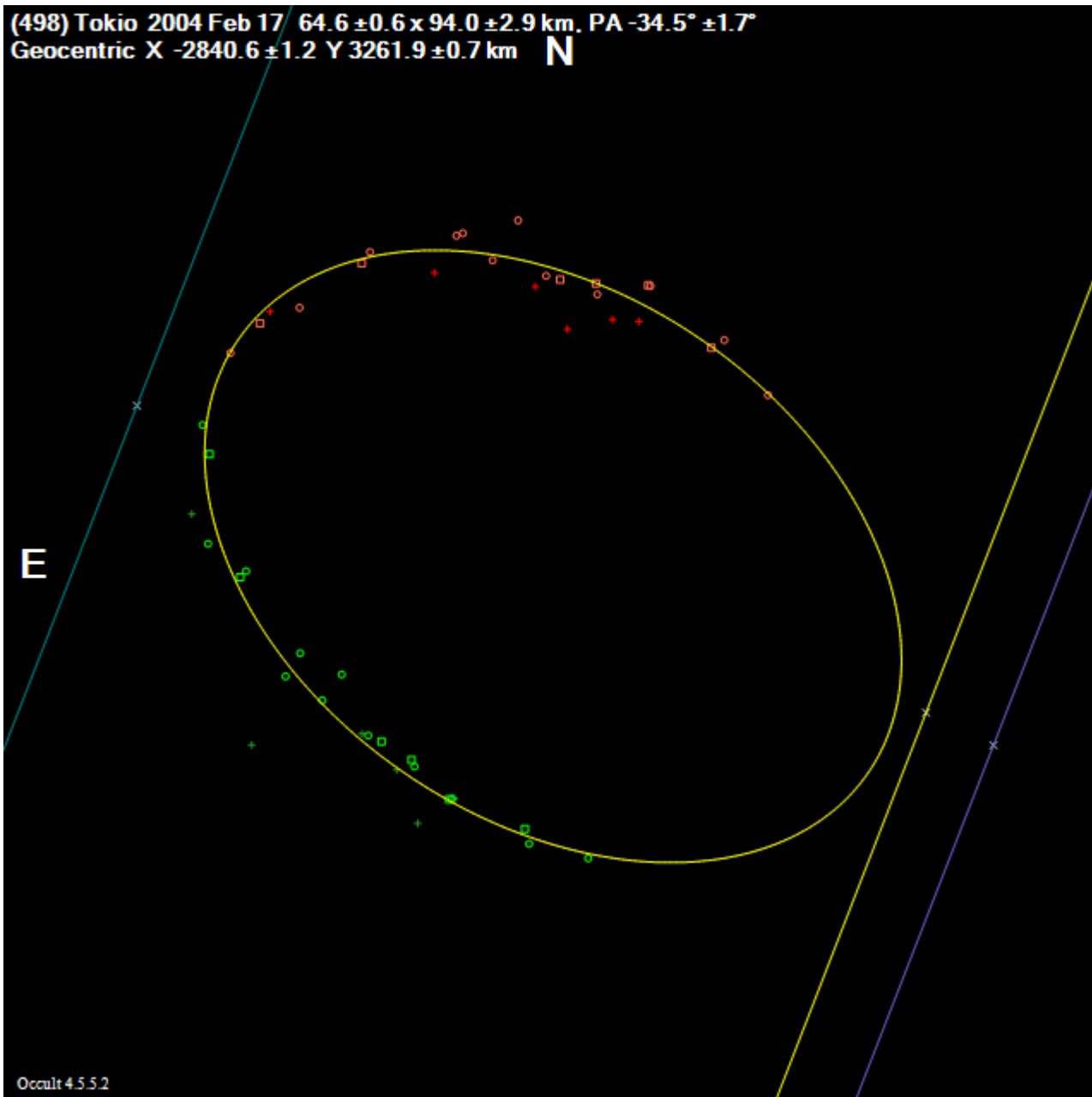
48Doris2011Sep14

(48) Doris 2011 Sep 14 $265.9 \pm 3.0 \times 150.9 \pm 4.3$ km, PA $37.9^\circ \pm 1.6^\circ$
Geocentric X -1919.8 ± 0.7 Y 4892.8 ± 2.5 km **N**



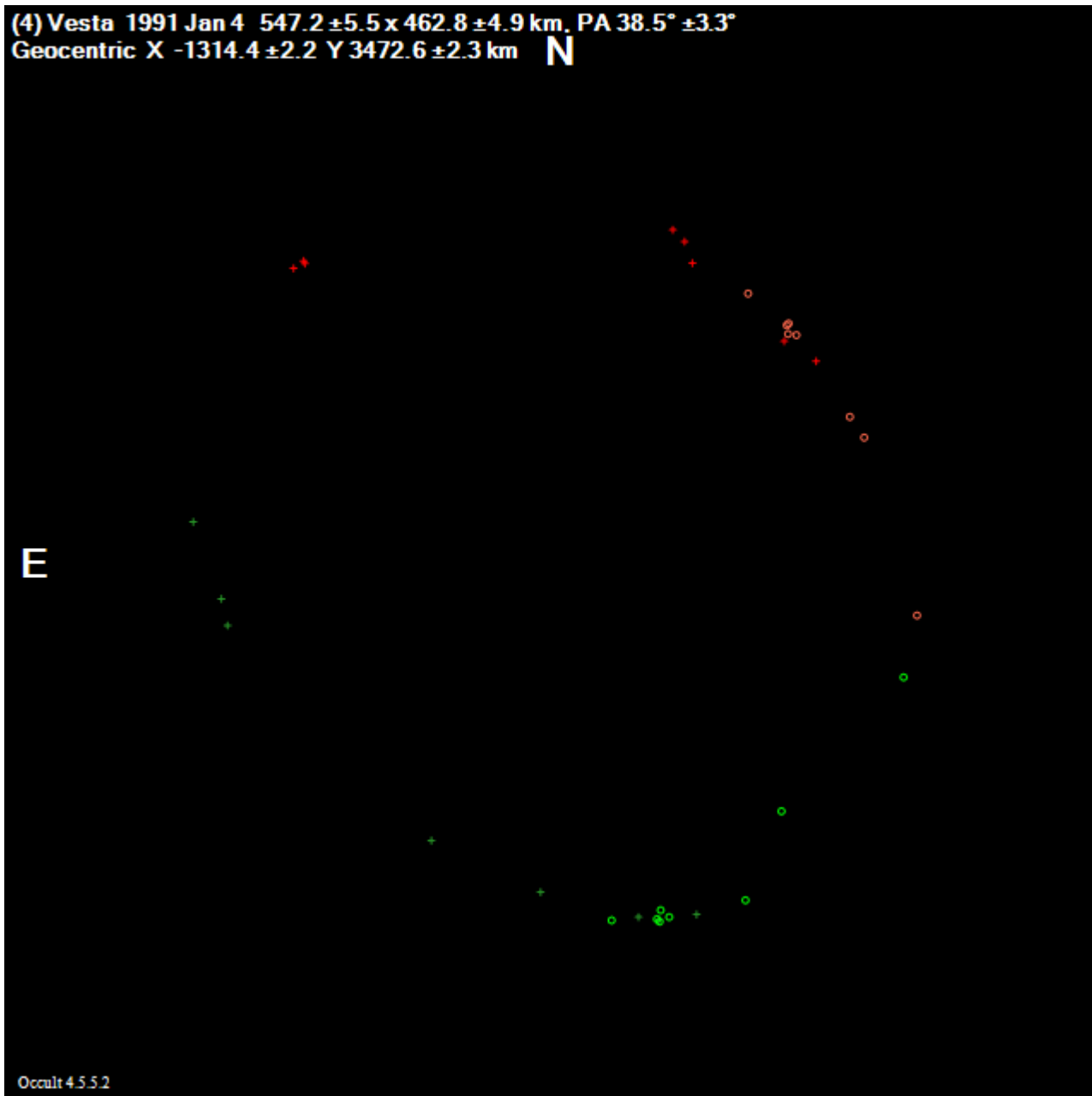
498Tokio2004Feb17

(498) Tokio 2004 Feb 17 $64.6 \pm 0.6 \times 94.0 \pm 2.9$ km, PA $-34.5^\circ \pm 1.7^\circ$
Geocentric X -2840.6 ± 1.2 Y 3261.9 ± 0.7 km **N**



4Vesta1991Jan04

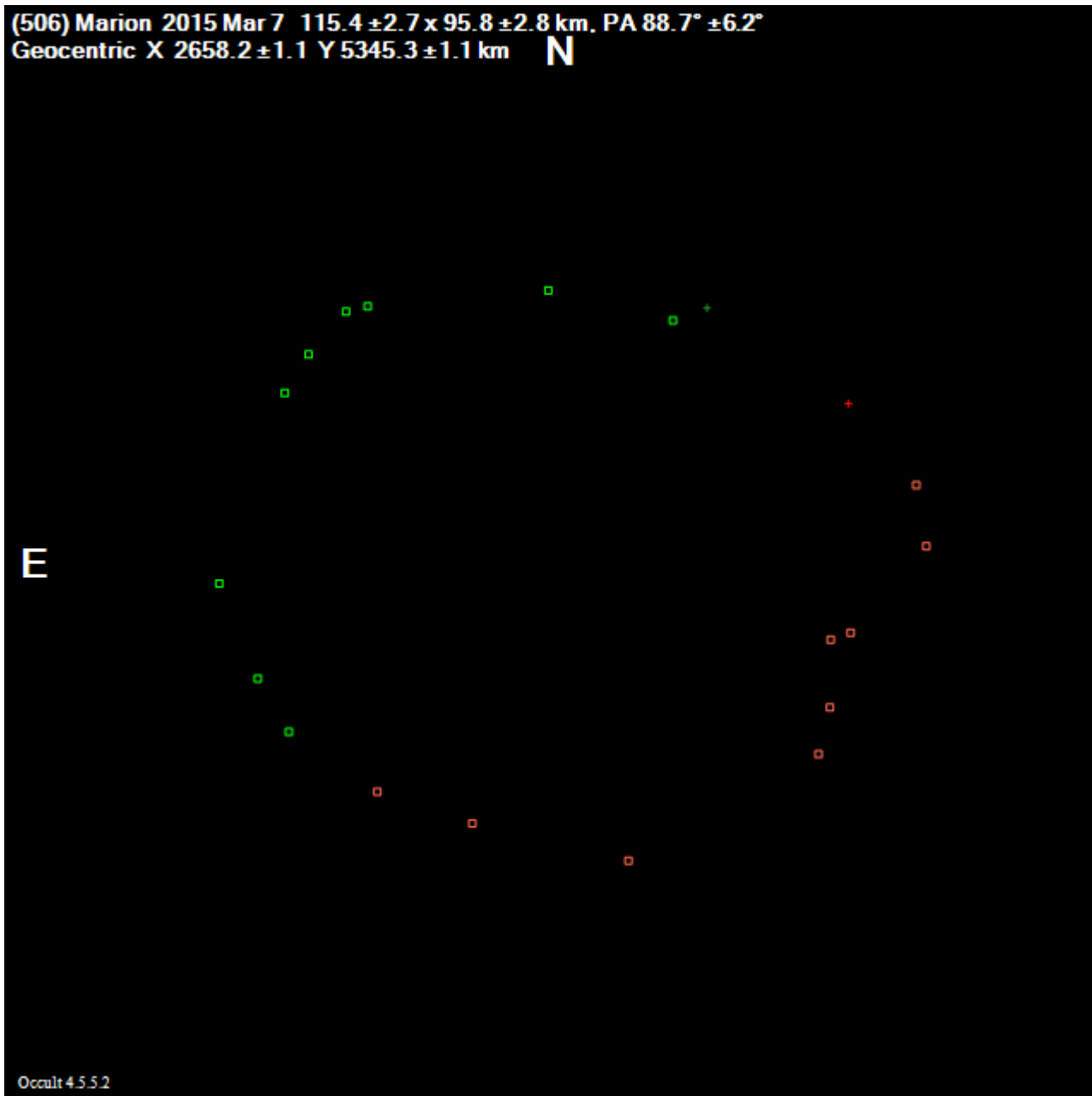
(4) Vesta 1991 Jan 4 $547.2 \pm 5.5 \times 462.8 \pm 4.9$ km, PA $38.5^\circ \pm 3.3^\circ$
Geocentric X -1314.4 ± 2.2 Y 3472.6 ± 2.3 km **N**



Occult 4.5.5.2

506Marion2015Mar07

(506) Marion 2015 Mar 7 $115.4 \pm 2.7 \times 95.8 \pm 2.8$ km, PA $88.7^\circ \pm 6.2^\circ$
Geocentric X 2658.2 ± 1.1 Y 5345.3 ± 1.1 km **N**



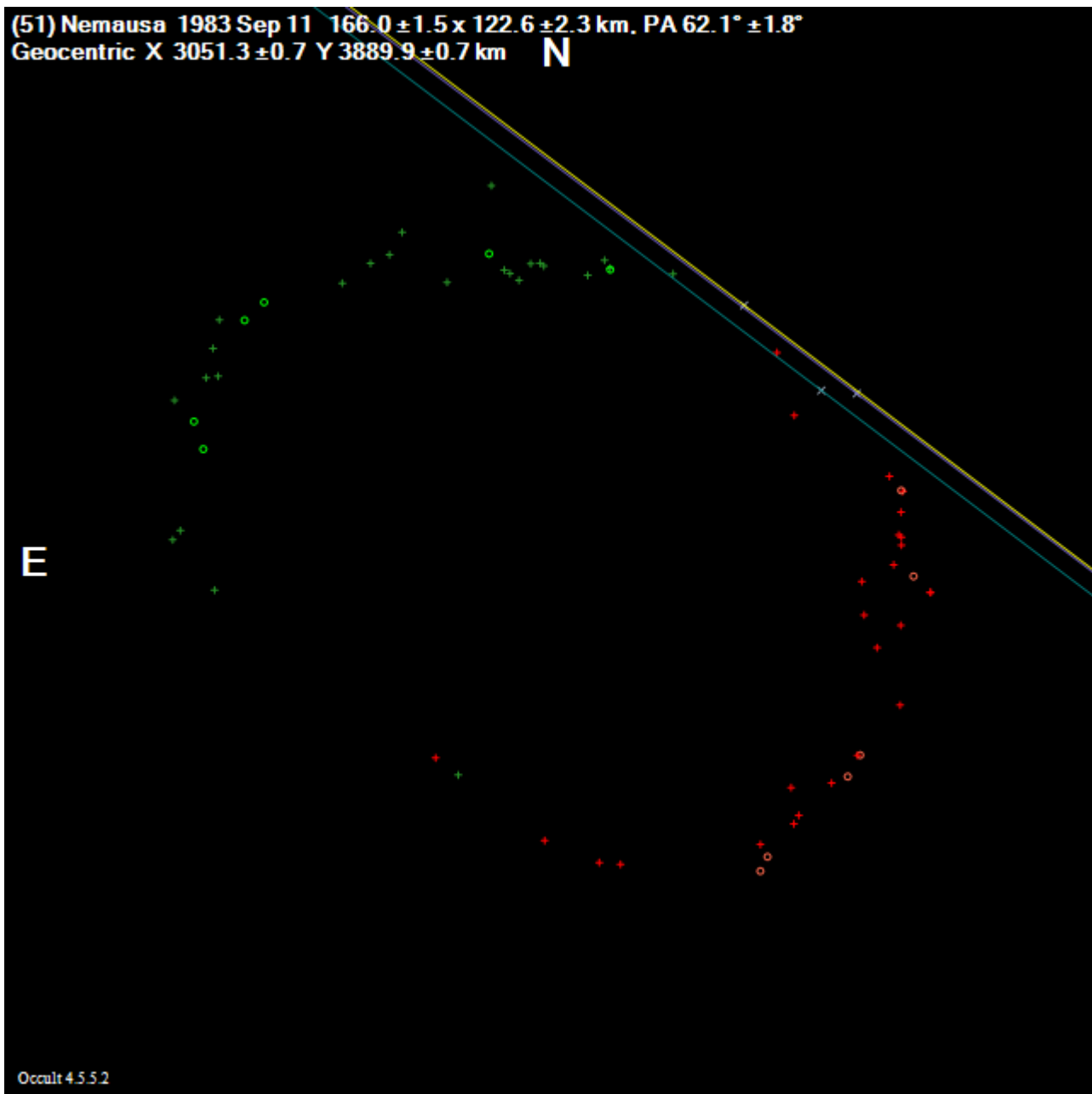
51Nemausa1983Sep11

(51) Nemausa 1983 Sep 11 $166.0 \pm 1.5 \times 122.6 \pm 2.3$ km, PA $62.1^\circ \pm 1.8^\circ$
Geocentric X 3051.3 ± 0.7 Y 3889.9 ± 0.7 km

N

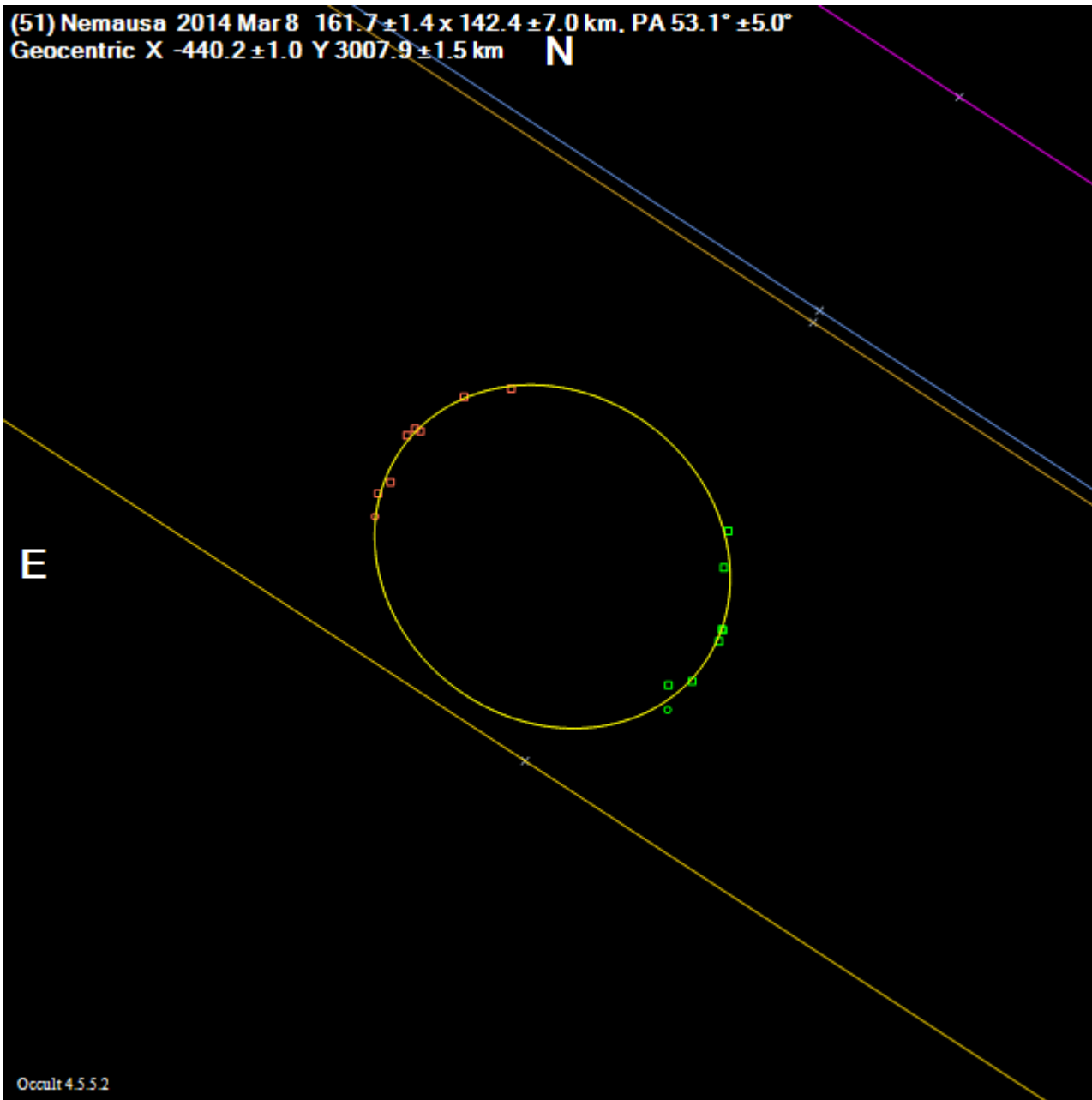
E

Occult 4.5.5.2



51Nemausa2014Mar08

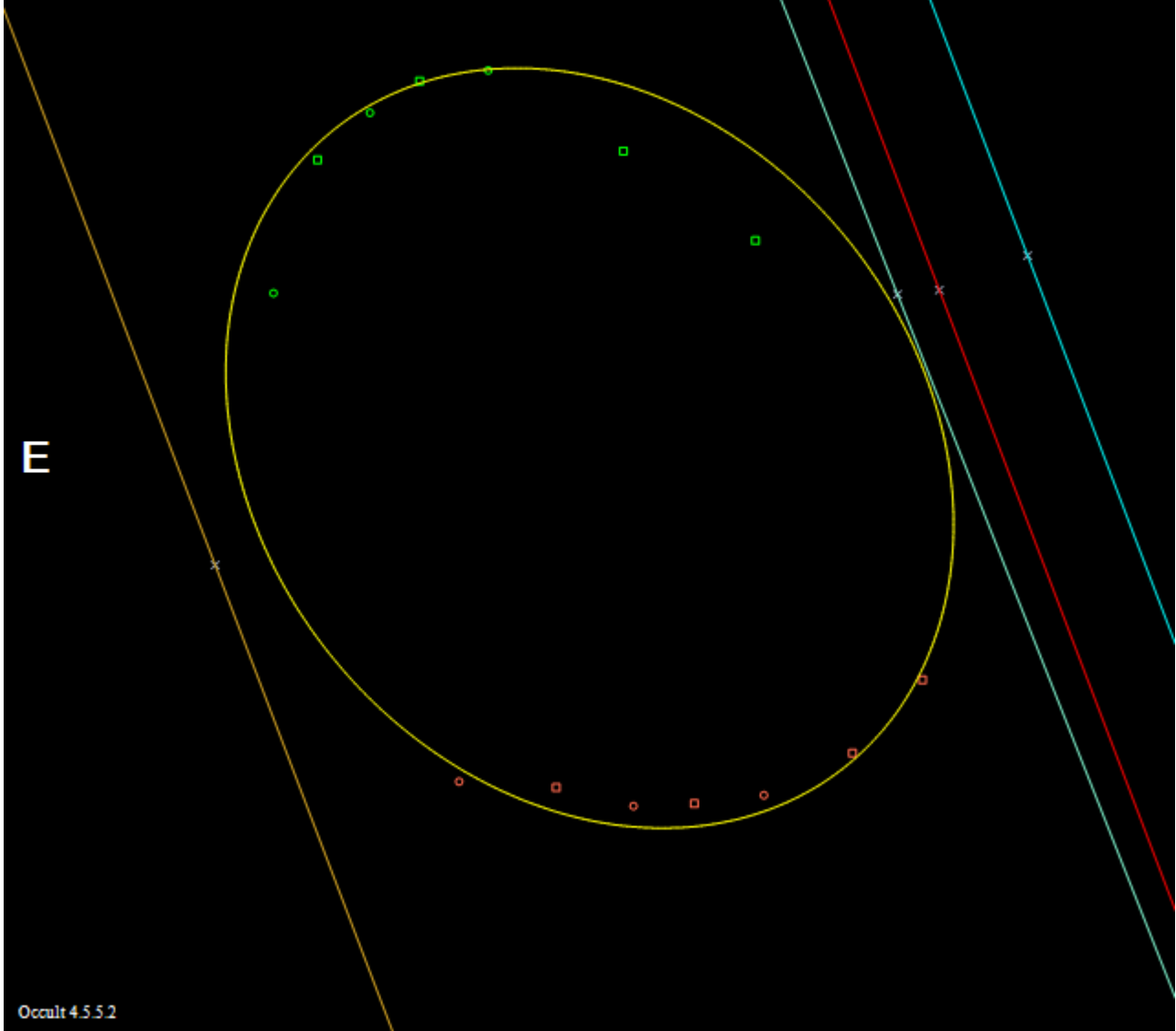
(51) Nemausa 2014 Mar 8 $161.7 \pm 1.4 \times 142.4 \pm 7.0$ km, PA $53.1^\circ \pm 5.0^\circ$
Geocentric X -440.2 ± 1.0 Y 3007.9 ± 1.5 km **N**



Occult 4.5.5.2

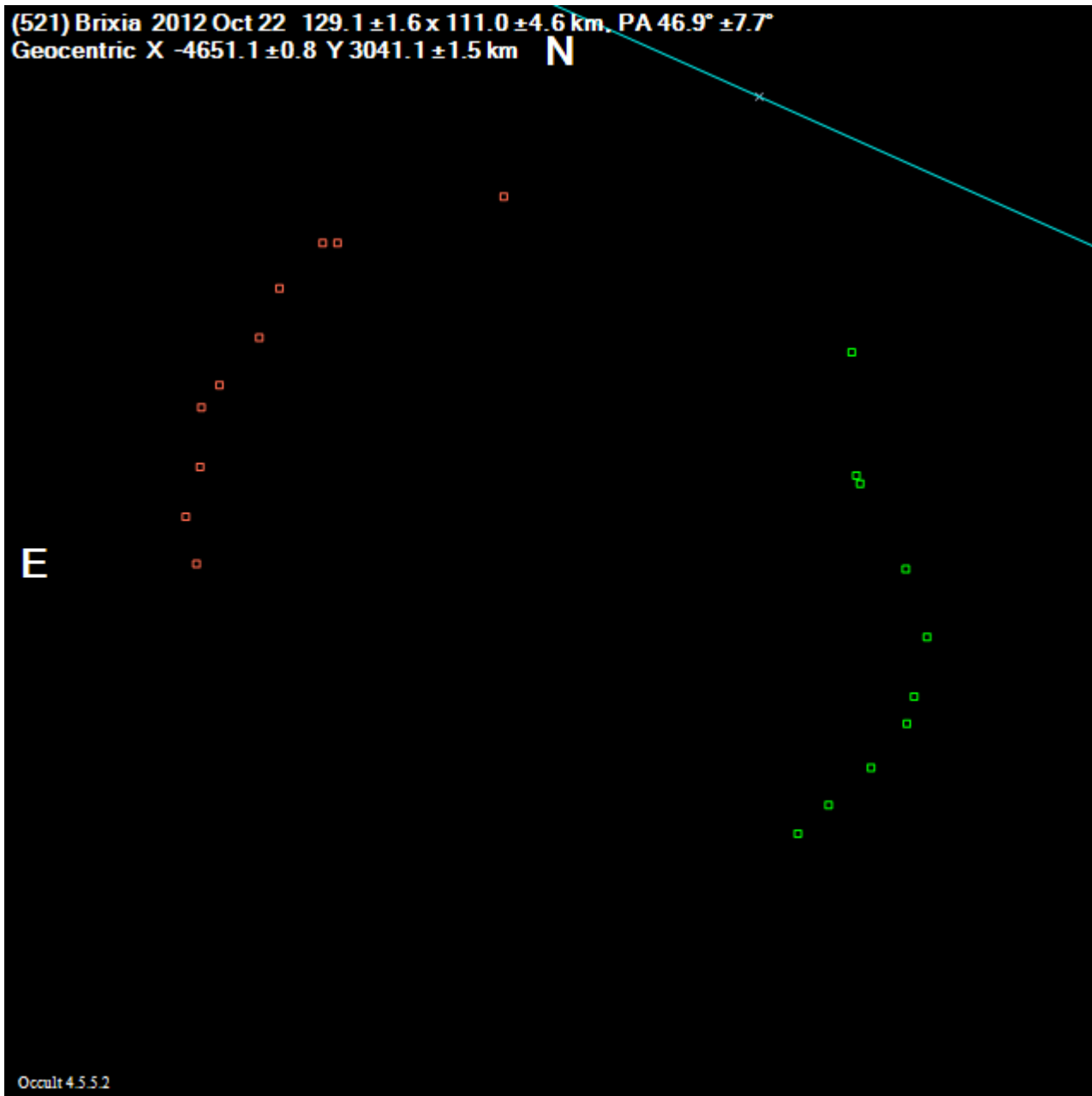
51Nemausa2016Sep03

(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**



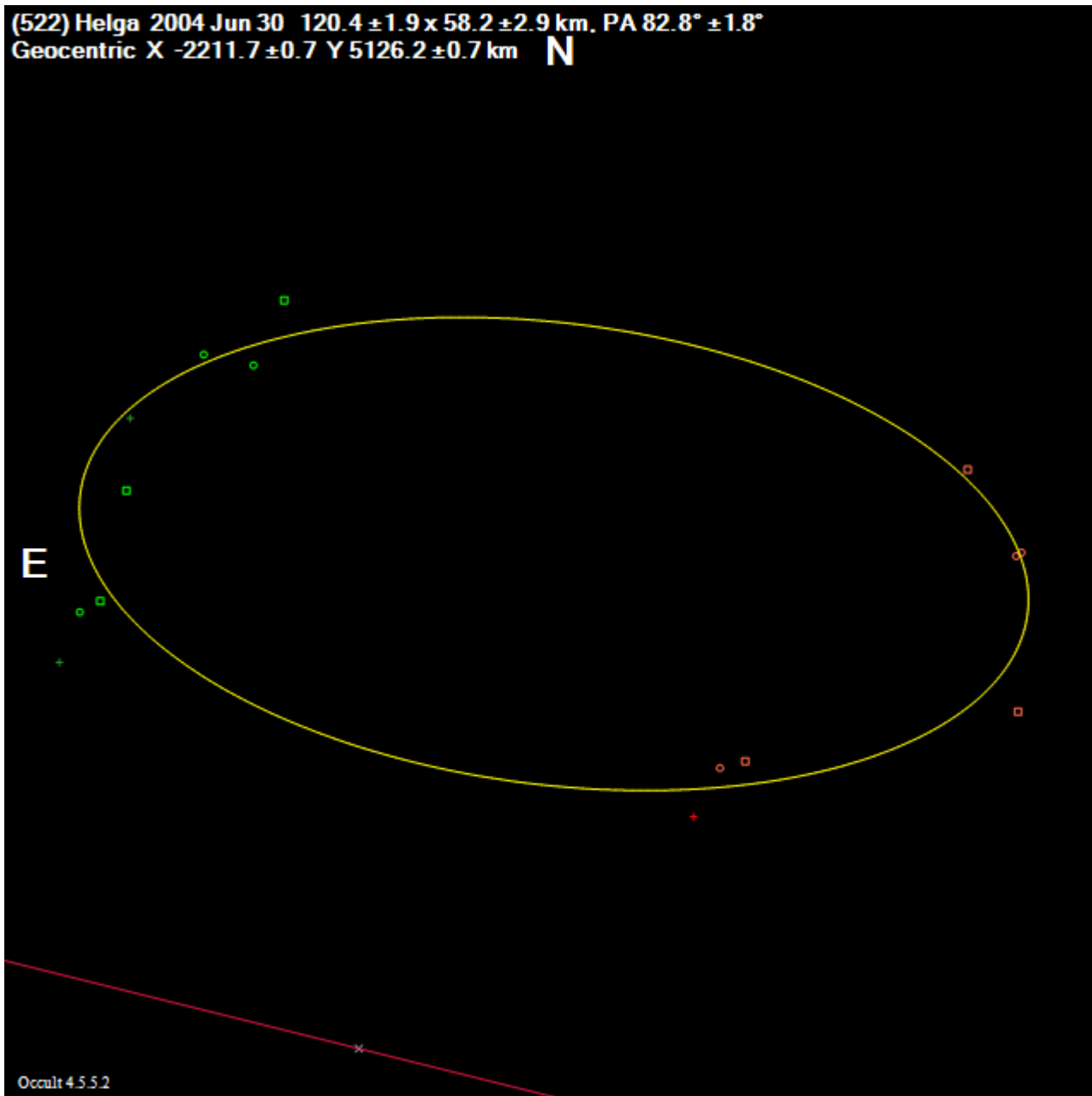
521Brixia2012Oct22

(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 **N**



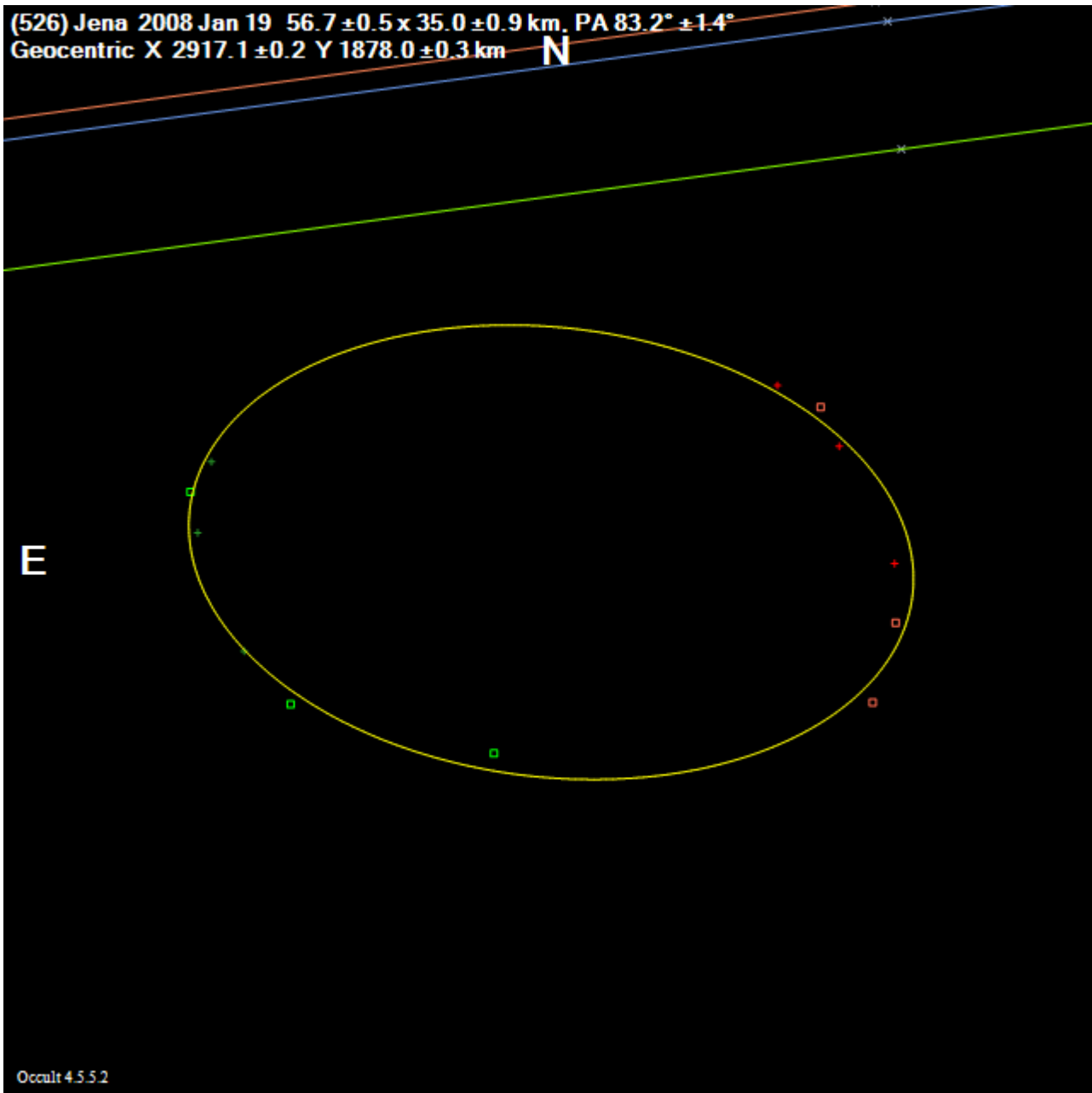
522Helga2004Jun30

(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**



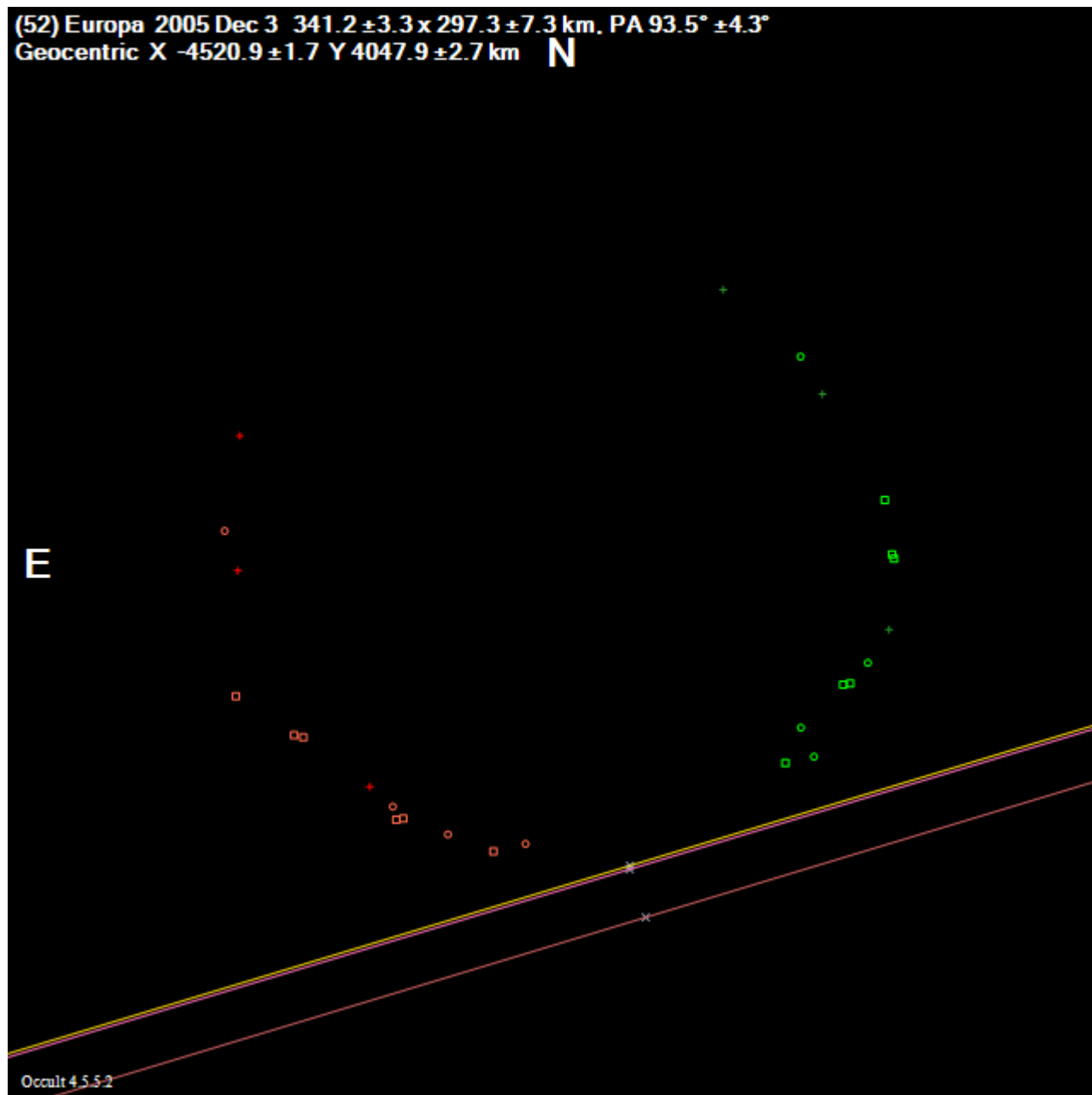
526Jena2008Jan19

(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



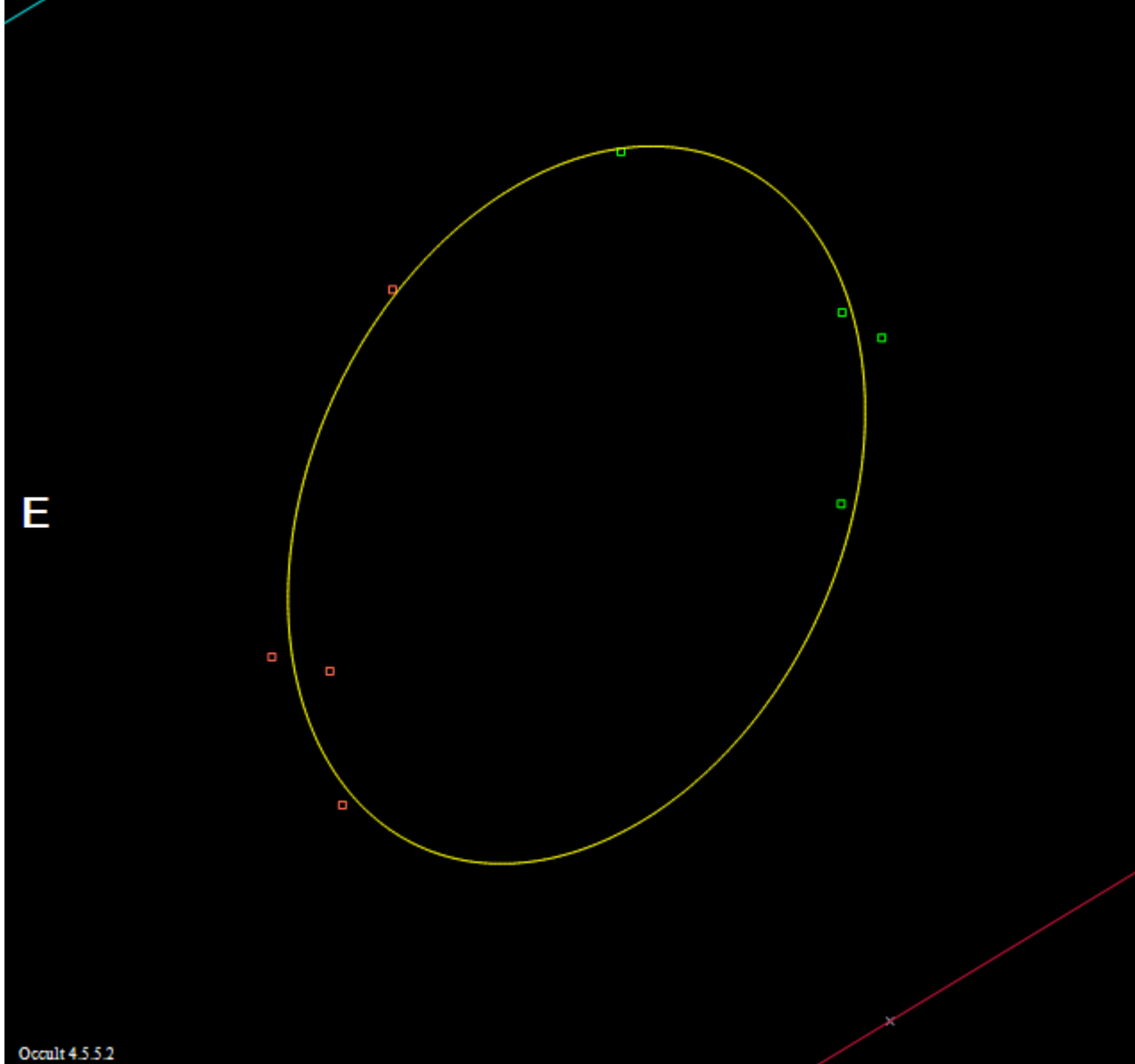
52Europa2005Dec03

(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**



52Europa2011Jul04

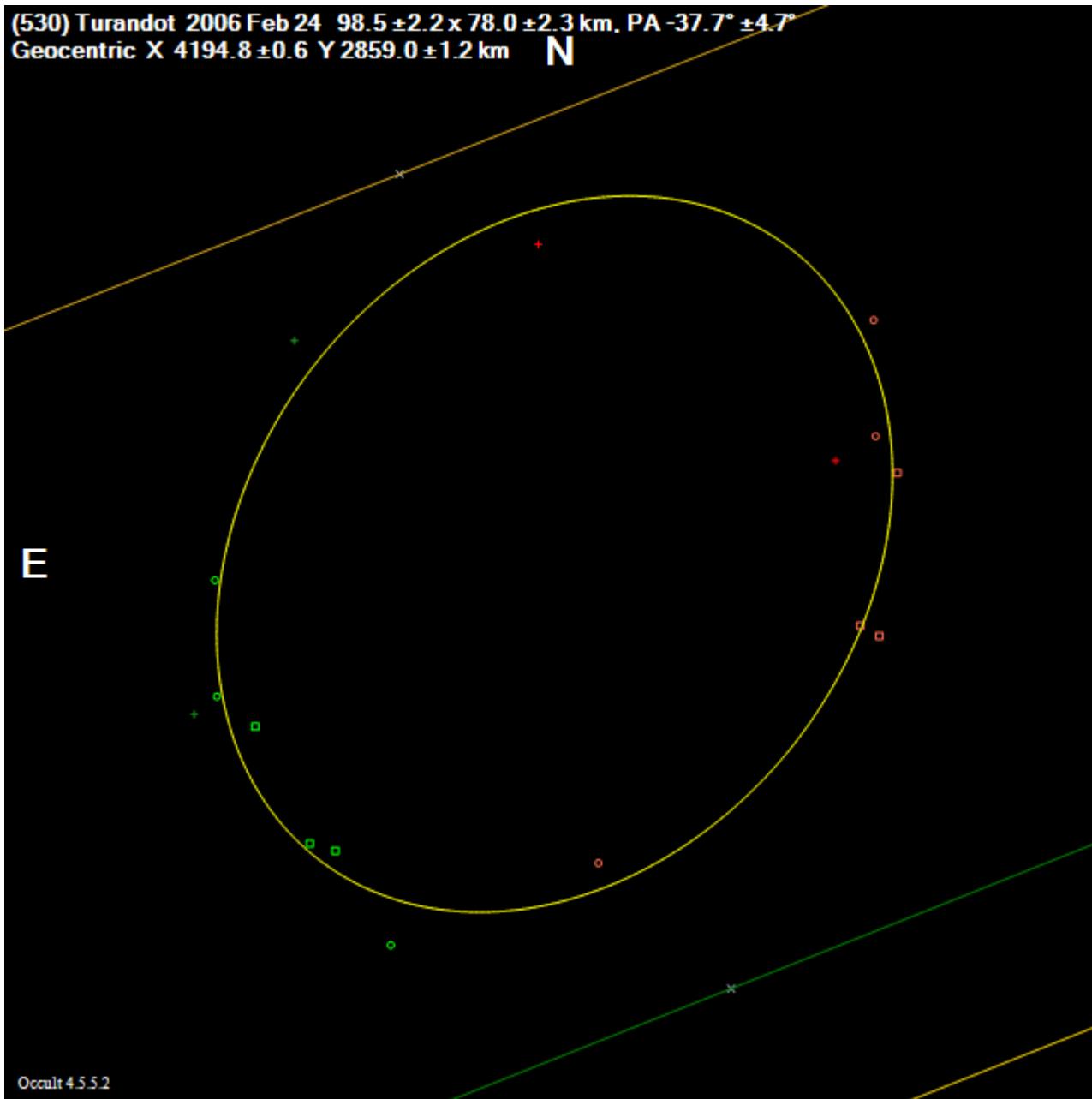
(52) Europa 2011 Jul 4 $366.3 \pm 8.8 \times 259.2 \pm 8.0$ km, PA $-25.0^\circ \pm 4.2^\circ$
Geocentric X 3118.6 ± 2.1 Y 3894.4 ± 5.4 km **N**



Occult 4.5.5.2

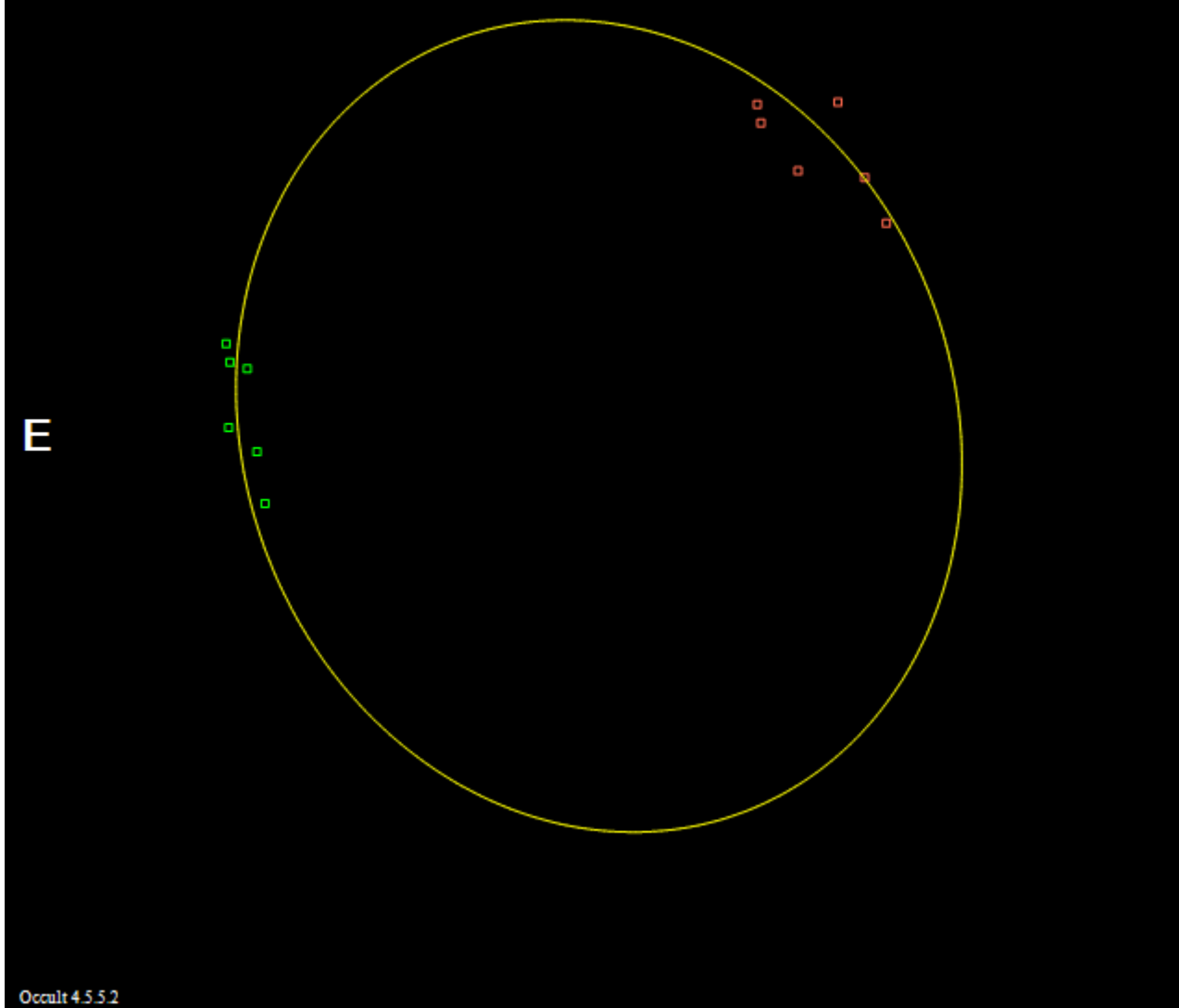
530Turandot2006Feb24

(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**



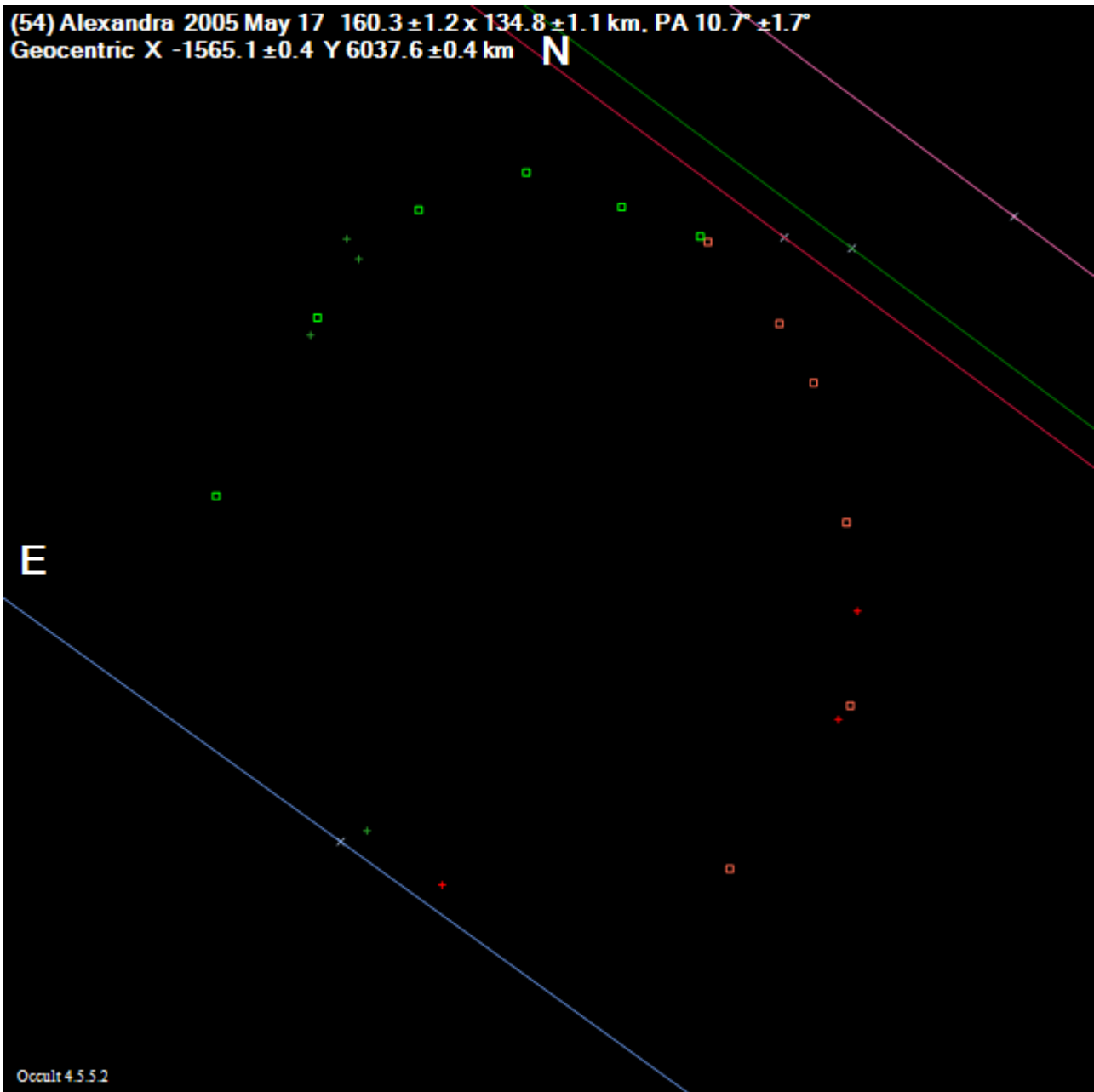
532Herculina2015Apr18

(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**



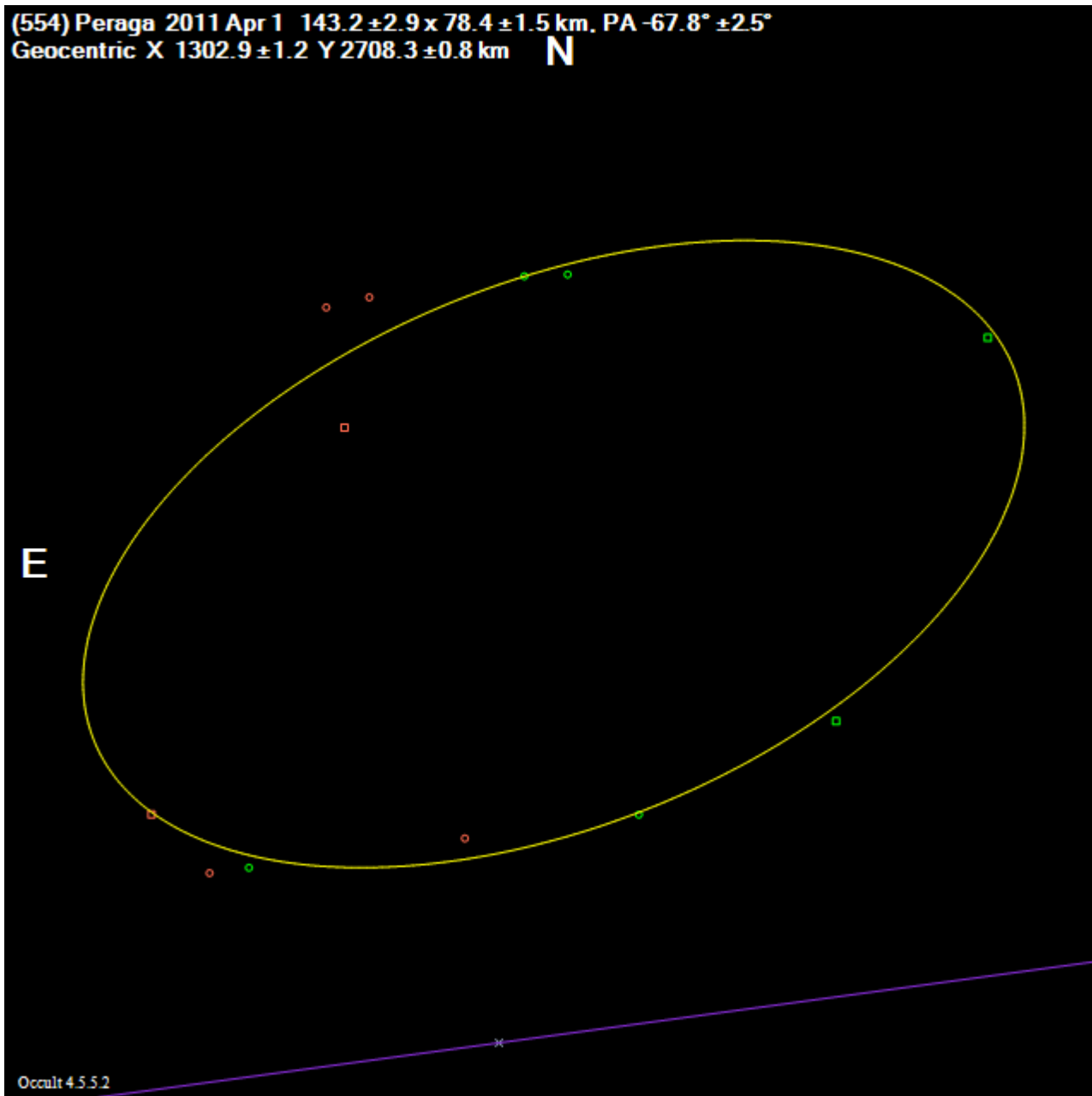
54Alexandra2005May17

(54) Alexandra 2005 May 17 $160.3 \pm 1.2 \times 134.8 \pm 1.1$ km, PA $10.7^\circ \pm 1.7^\circ$
Geocentric X -1565.1 ± 0.4 Y 6037.6 ± 0.4 km



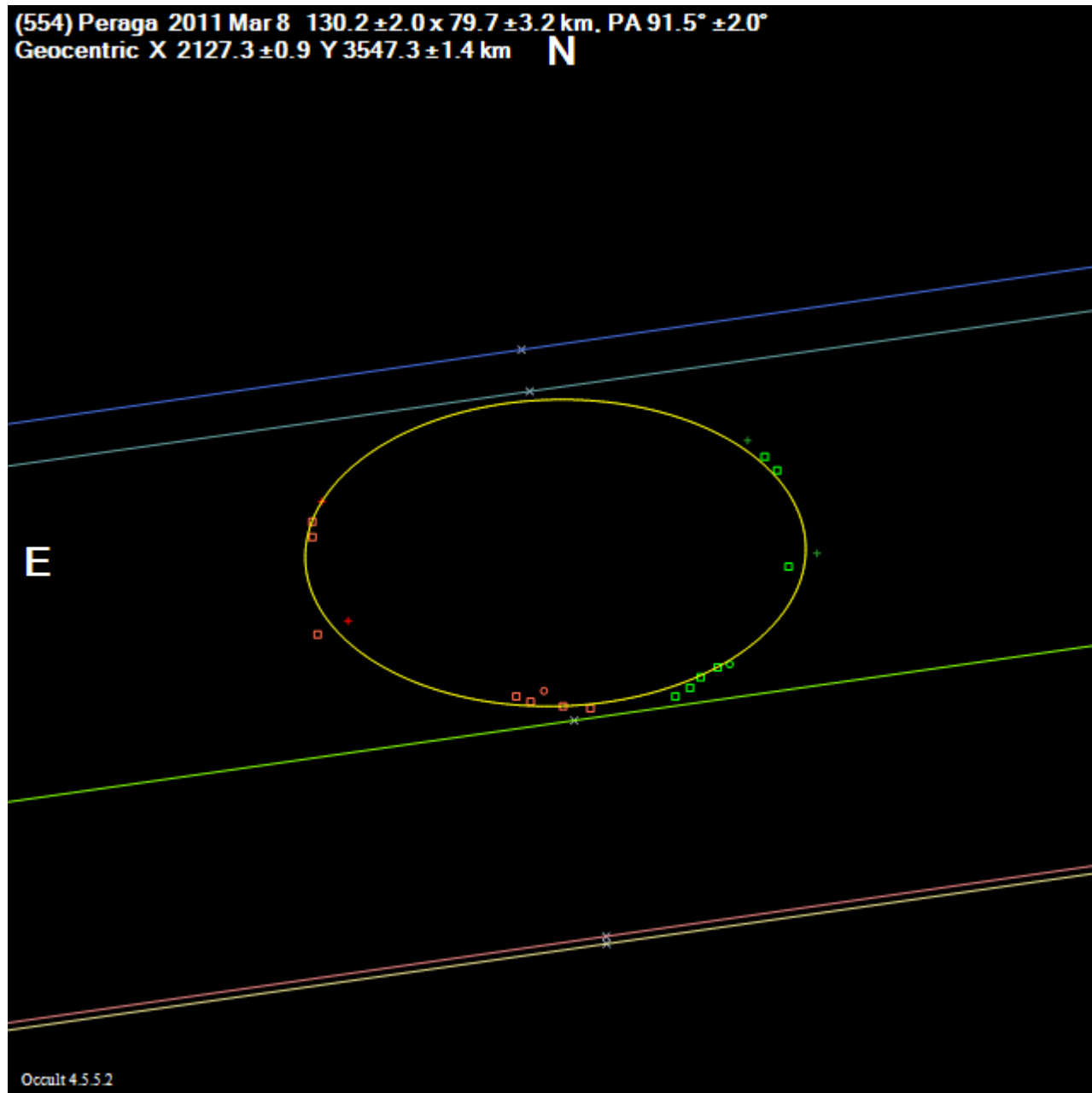
554Peraga2011Apr01

(554) Peraga 2011 Apr 1 $143.2 \pm 2.9 \times 78.4 \pm 1.5$ km, PA $-67.8^\circ \pm 2.5^\circ$
Geocentric X 1302.9 ± 1.2 Y 2708.3 ± 0.8 km **N**



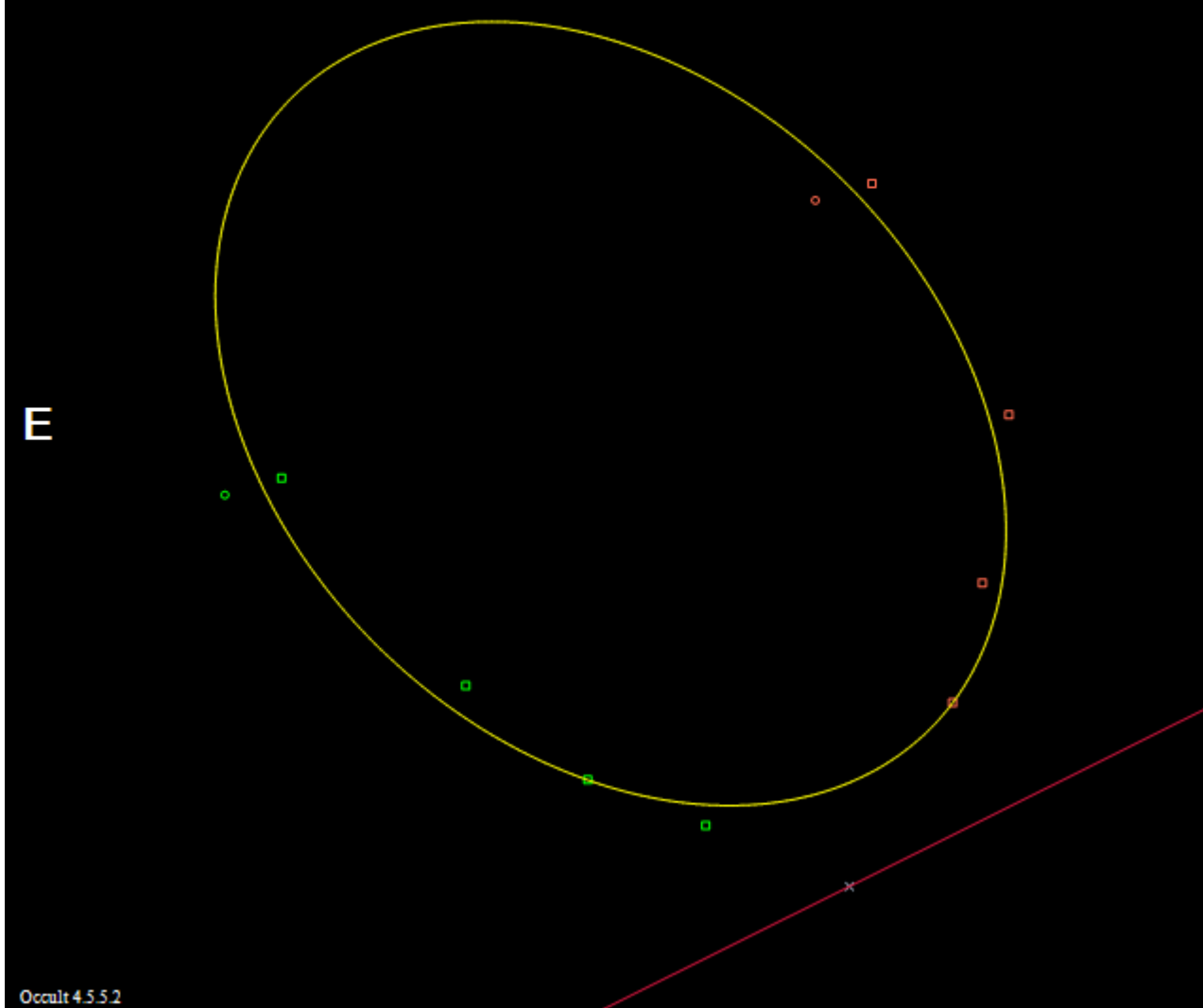
554Peraga2011Mar08

(554) Peraga 2011 Mar 8 $130.2 \pm 2.0 \times 79.7 \pm 3.2$ km, PA $91.5^\circ \pm 2.0^\circ$
Geocentric X 2127.3 ± 0.9 Y 3547.3 ± 1.4 km **N**



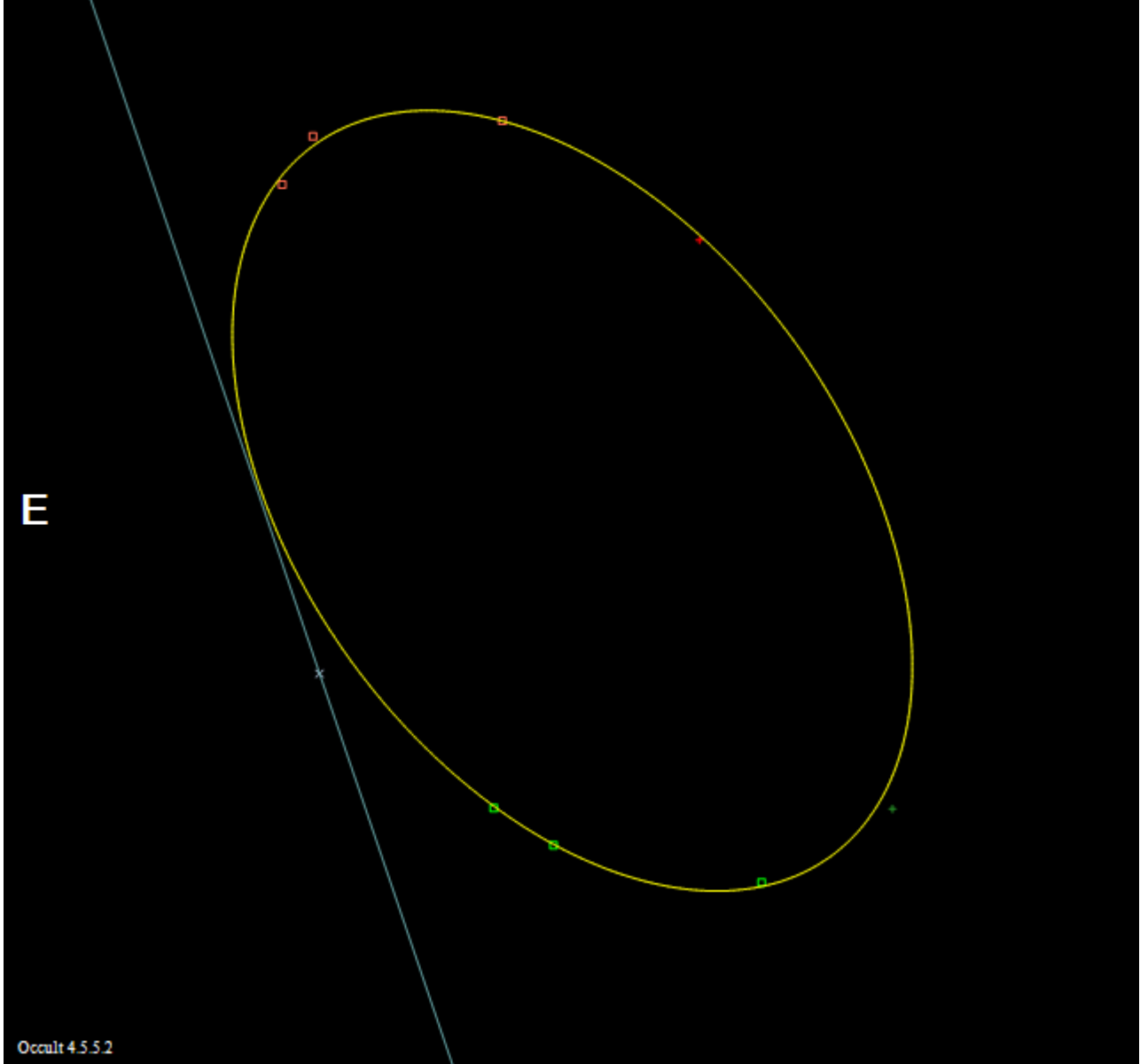
558Carmen2009Jan28

(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**



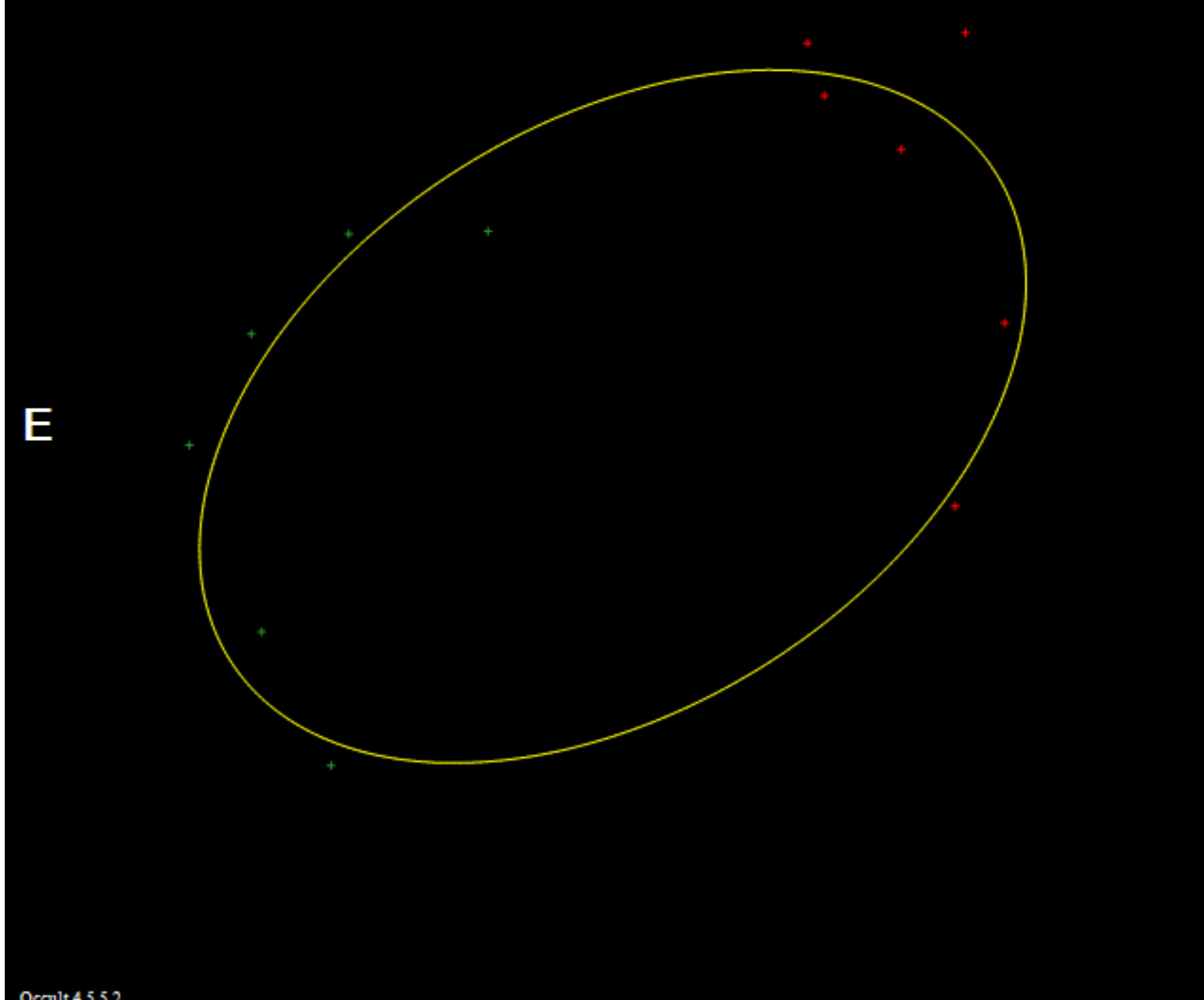
564Dudu2012Jan14

(564) Dudu 2012 Jan 14 $64.5 \pm 0.3 \times 40.1 \pm 0.4$ km, PA $36.0^\circ \pm 0.7^\circ$
Geocentric X 3829.2 ± 0.2 Y 2908.8 ± 0.1 km **N**



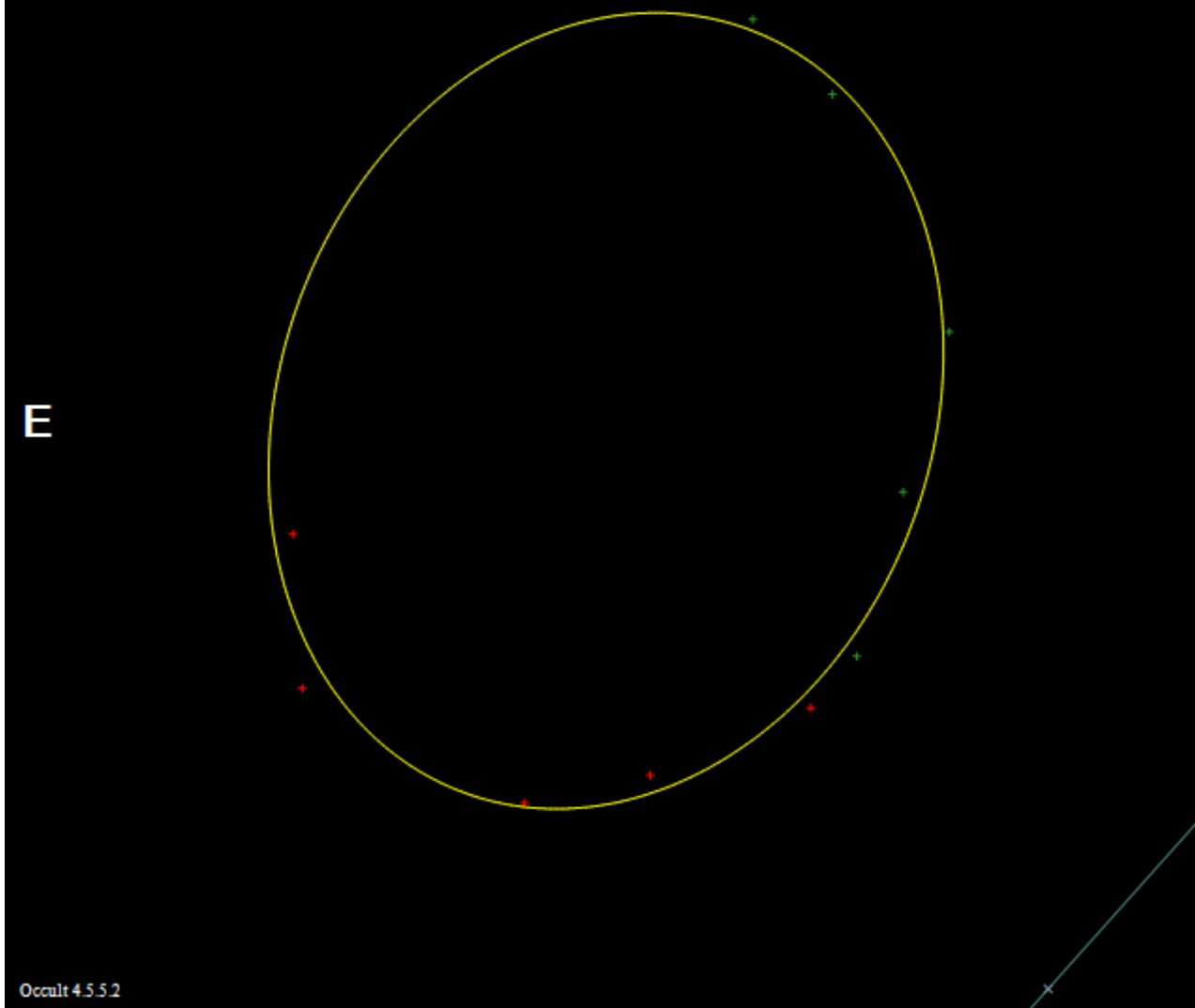
566Stereoskopia2004Mar23

(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**



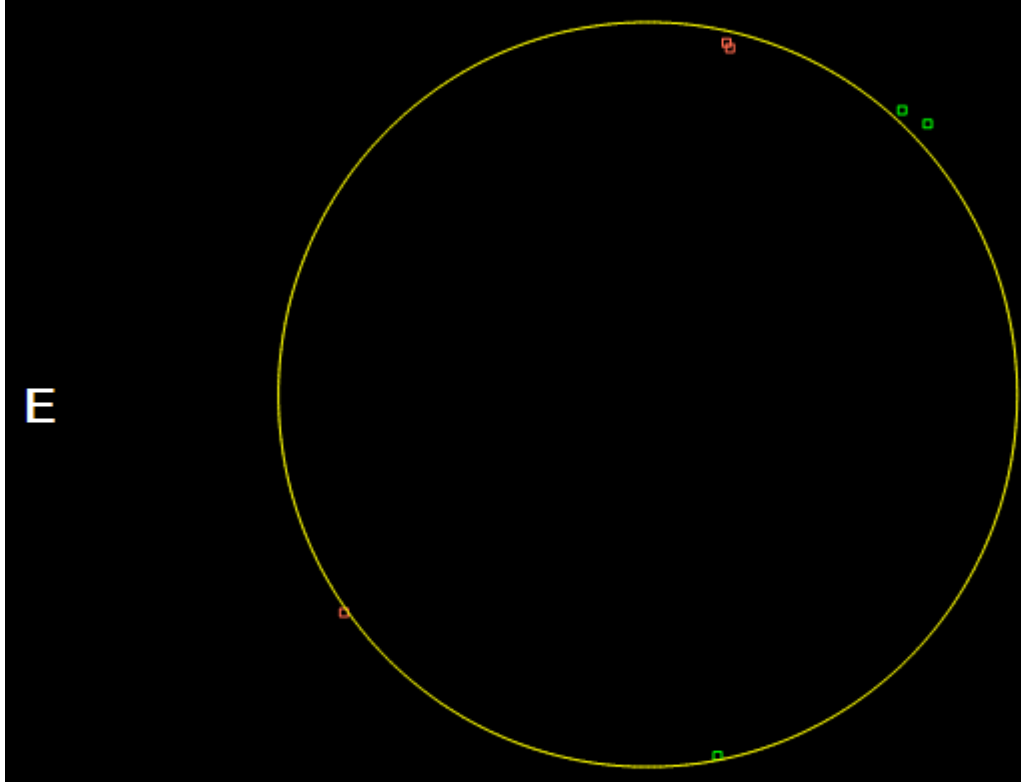
568Cheruskia1999Oct24

(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**



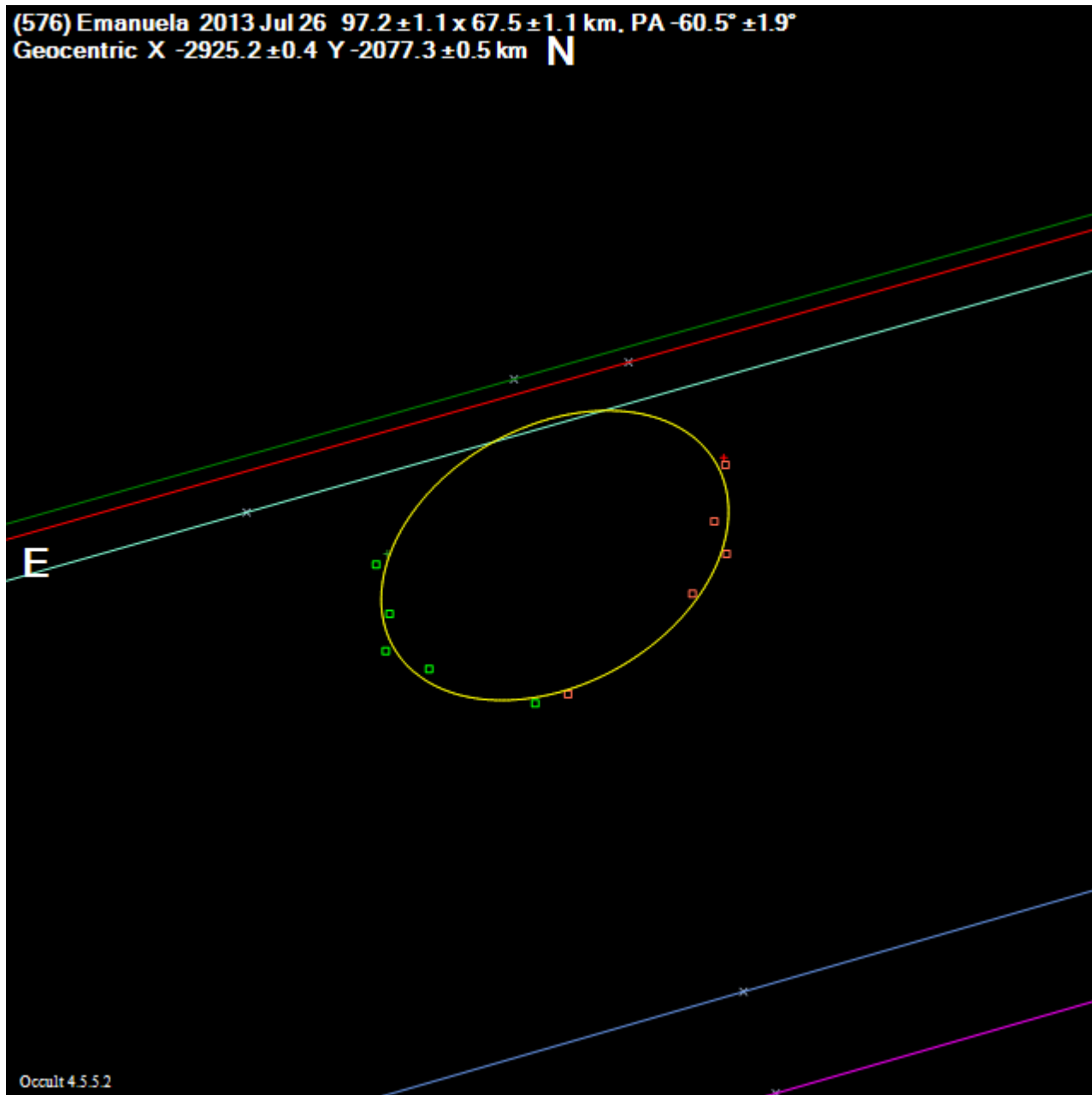
56Melete2016Apr20

(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**



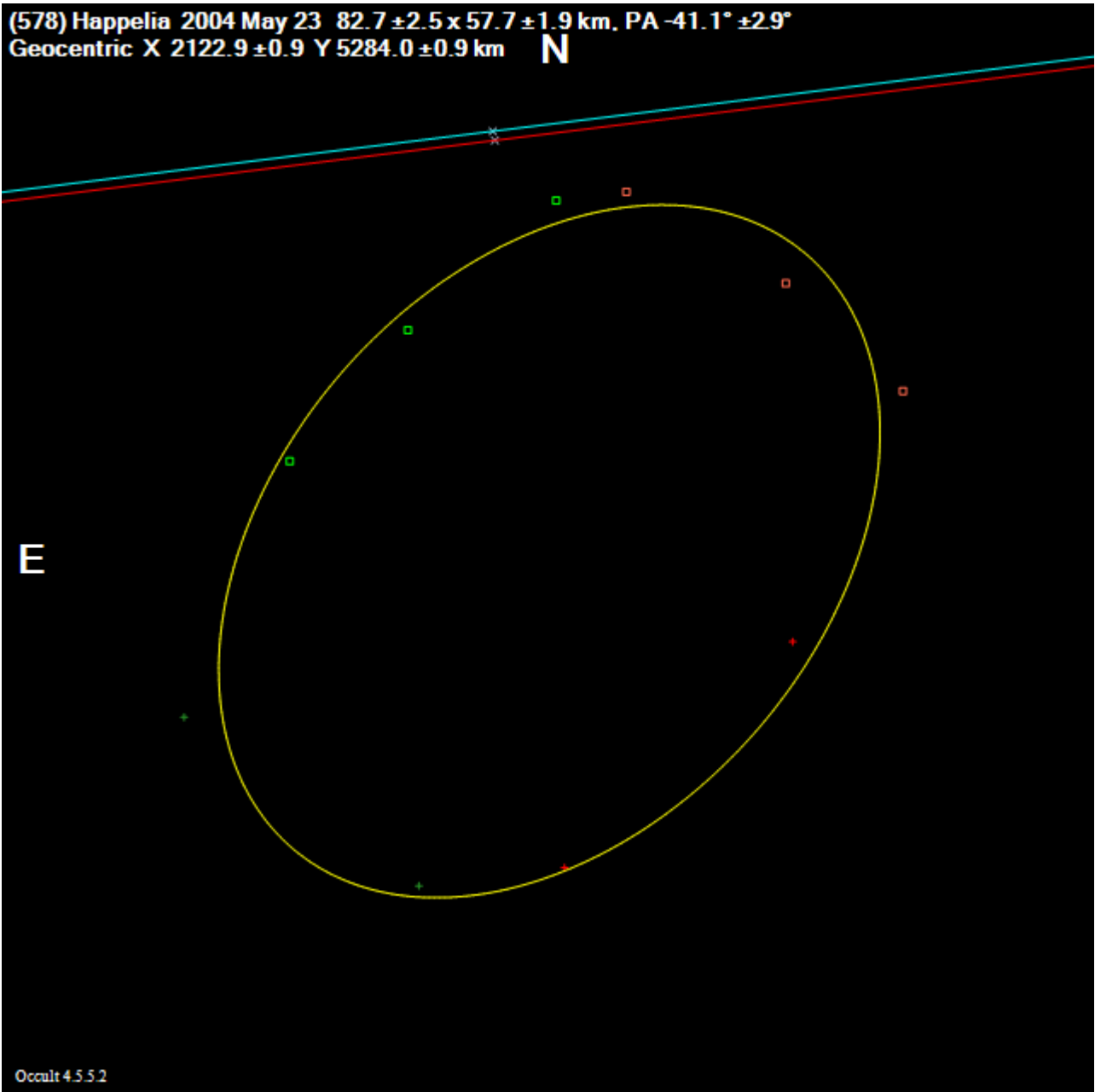
576Emanuela2013Jul26

(576) Emanuela 2013 Jul 26 $97.2 \pm 1.1 \times 67.5 \pm 1.1$ km, PA $-60.5^\circ \pm 1.9^\circ$
Geocentric X -2925.2 ± 0.4 Y -2077.3 ± 0.5 km **N**



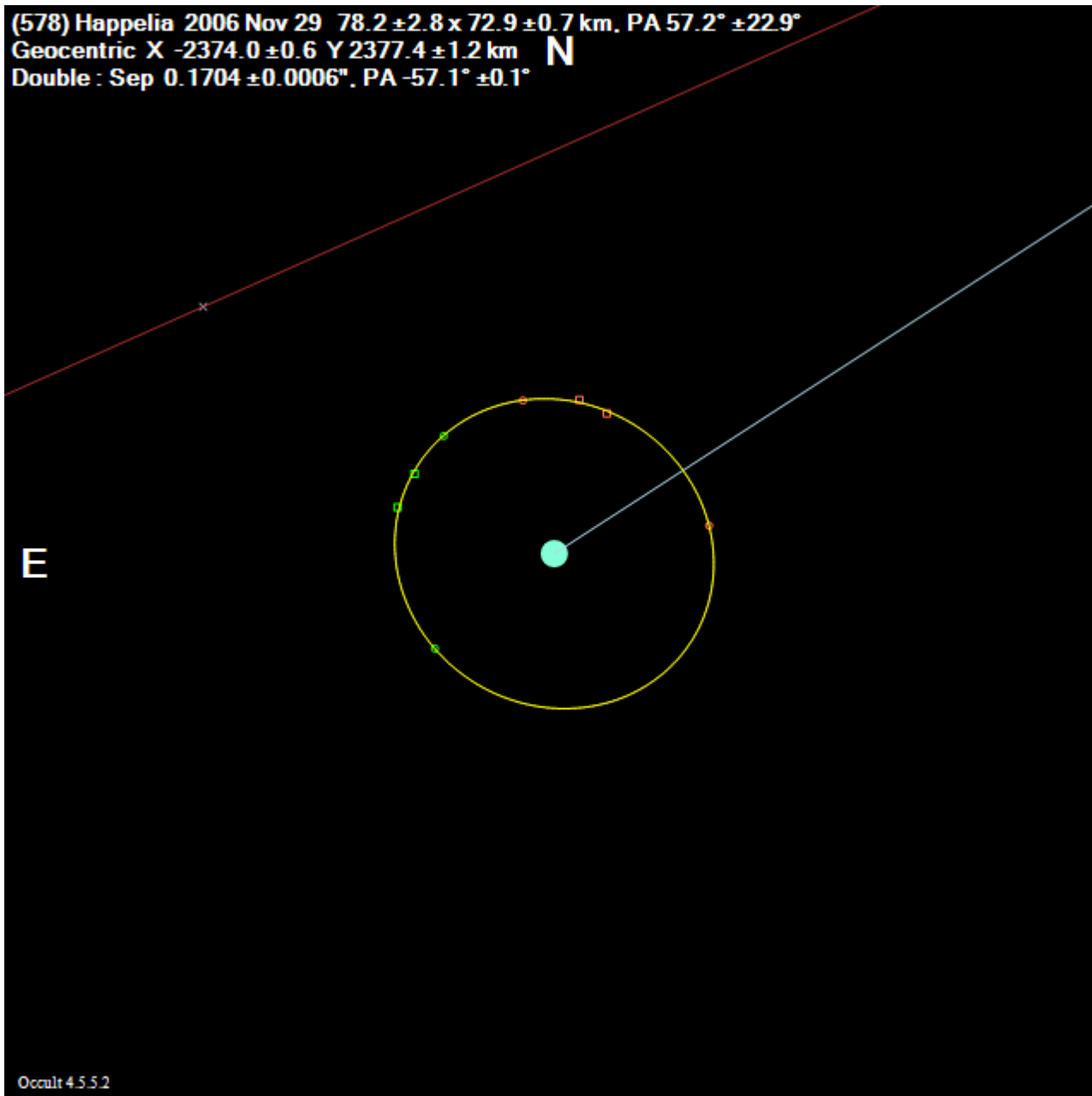
578Happelia2004May23

(578) Hapelia 2004 May 23 $82.7 \pm 2.5 \times 57.7 \pm 1.9$ km, PA $-41.1^\circ \pm 2.9^\circ$
Geocentric X 2122.9 ± 0.9 Y 5284.0 ± 0.9 km **N**



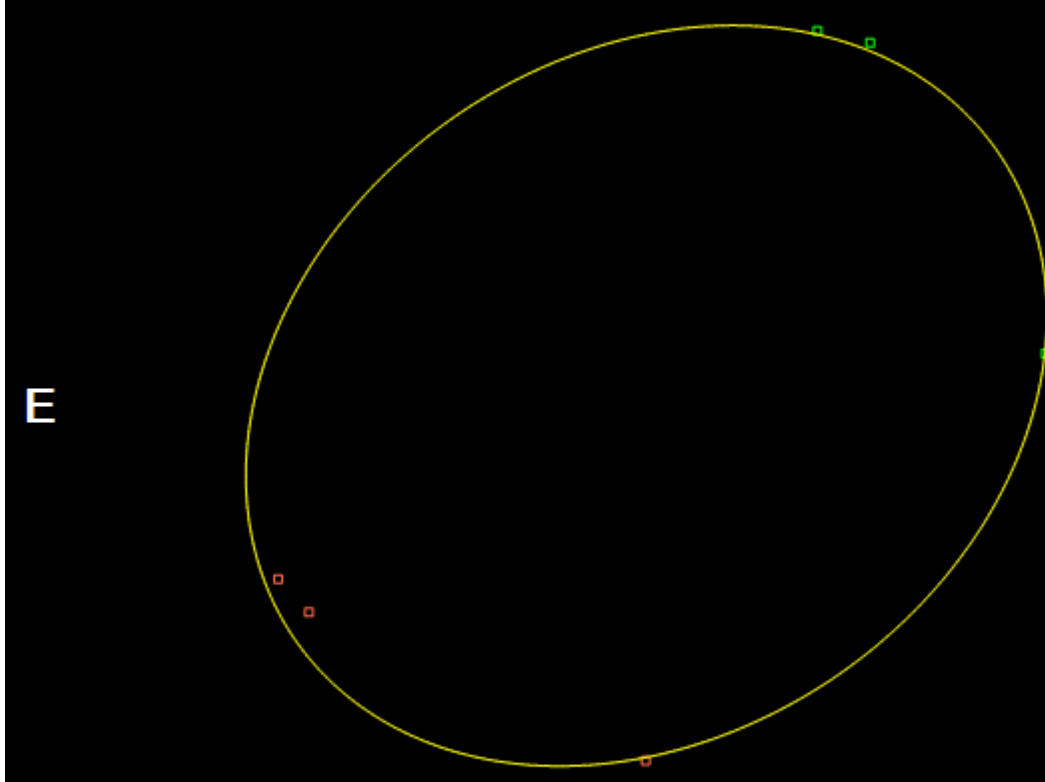
578Happelia2006Nov29

(578) Happelia 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 $-57.1^\circ \pm 0.1^\circ$



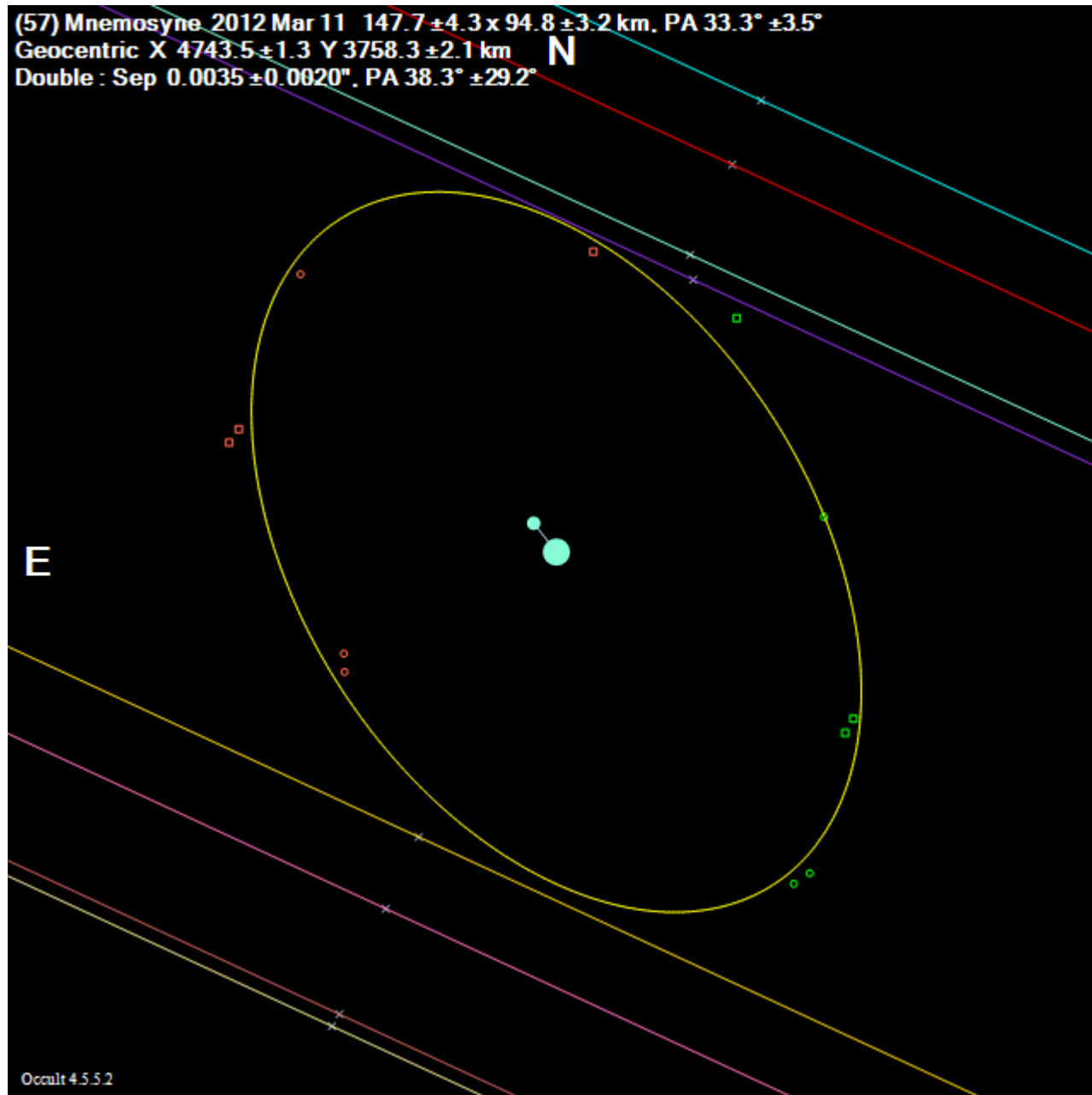
578Happelia2017May10

(578) Happelia 2017 May 10 $76.8 \pm 1.2 \times 60.8$ km, PA -55.0°
Geocentric X 1642.4 ± 0.7 Y 2821.6 ± 0.6 km **N**



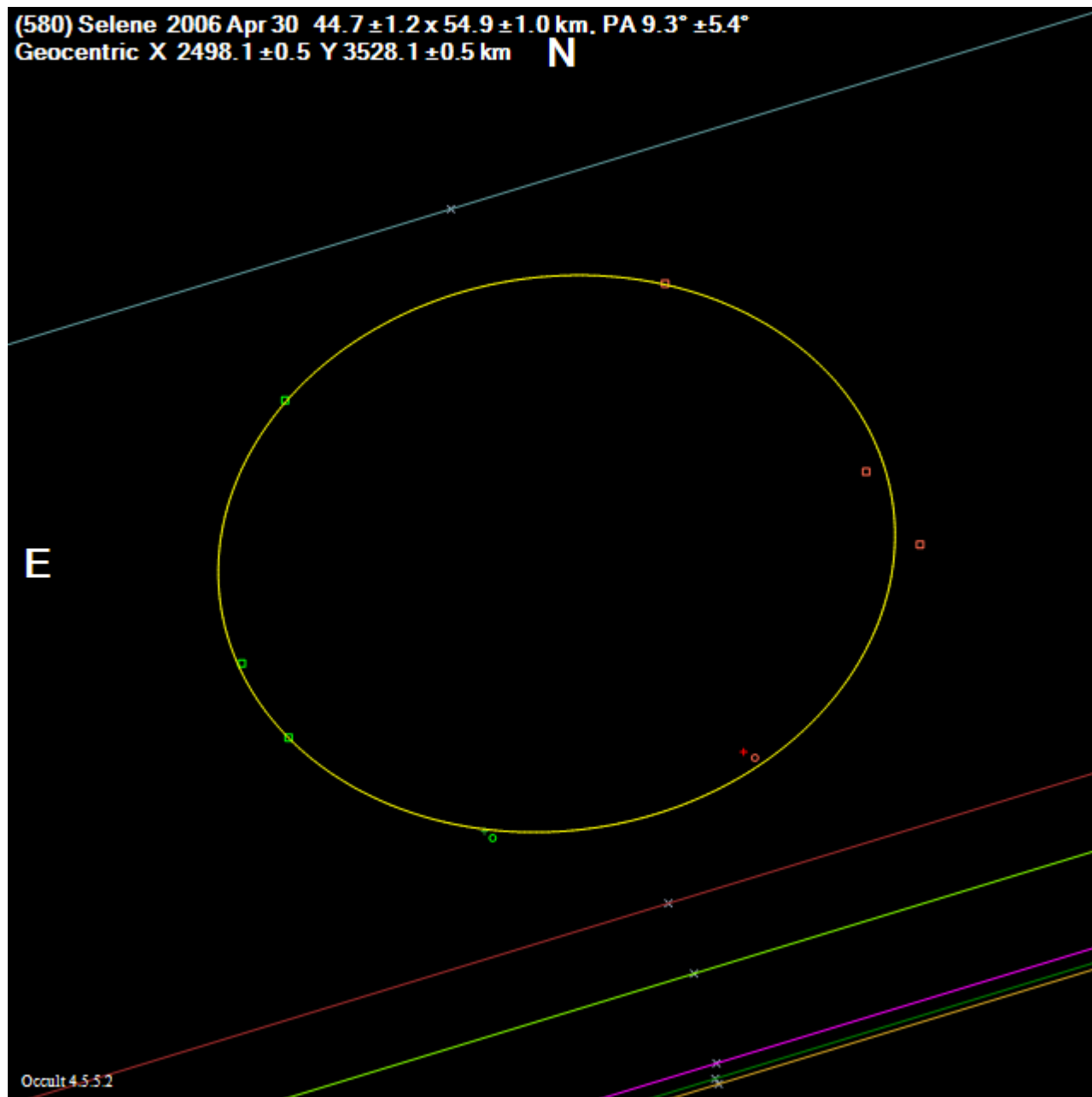
57Mnemosyne2012Mar11

(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 **N**
Double : Sep $0.0035 \pm 0.0020''$, PA $38.3^\circ \pm 29.2^\circ$



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**



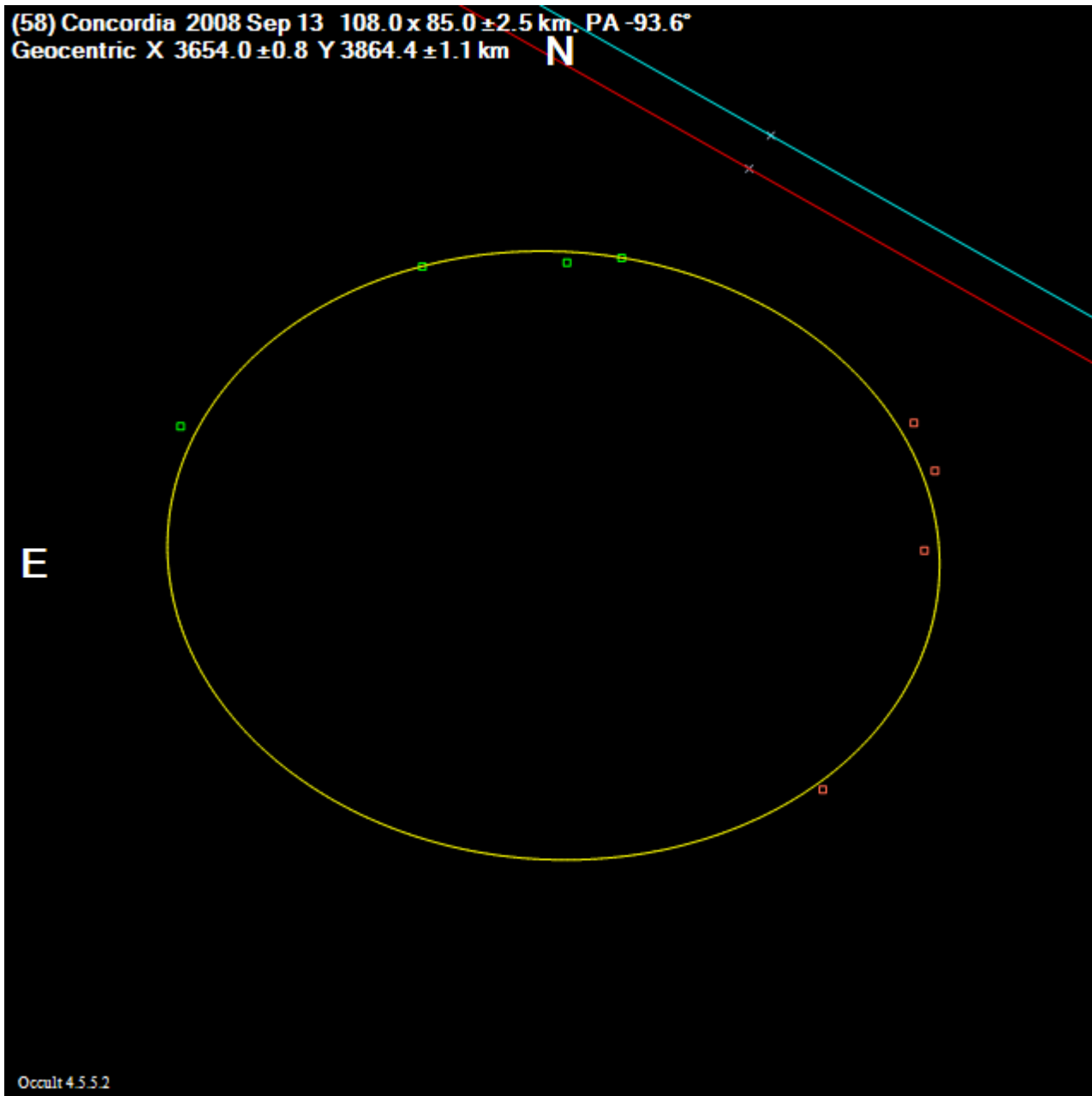
589Croatia2015Dec20

(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**



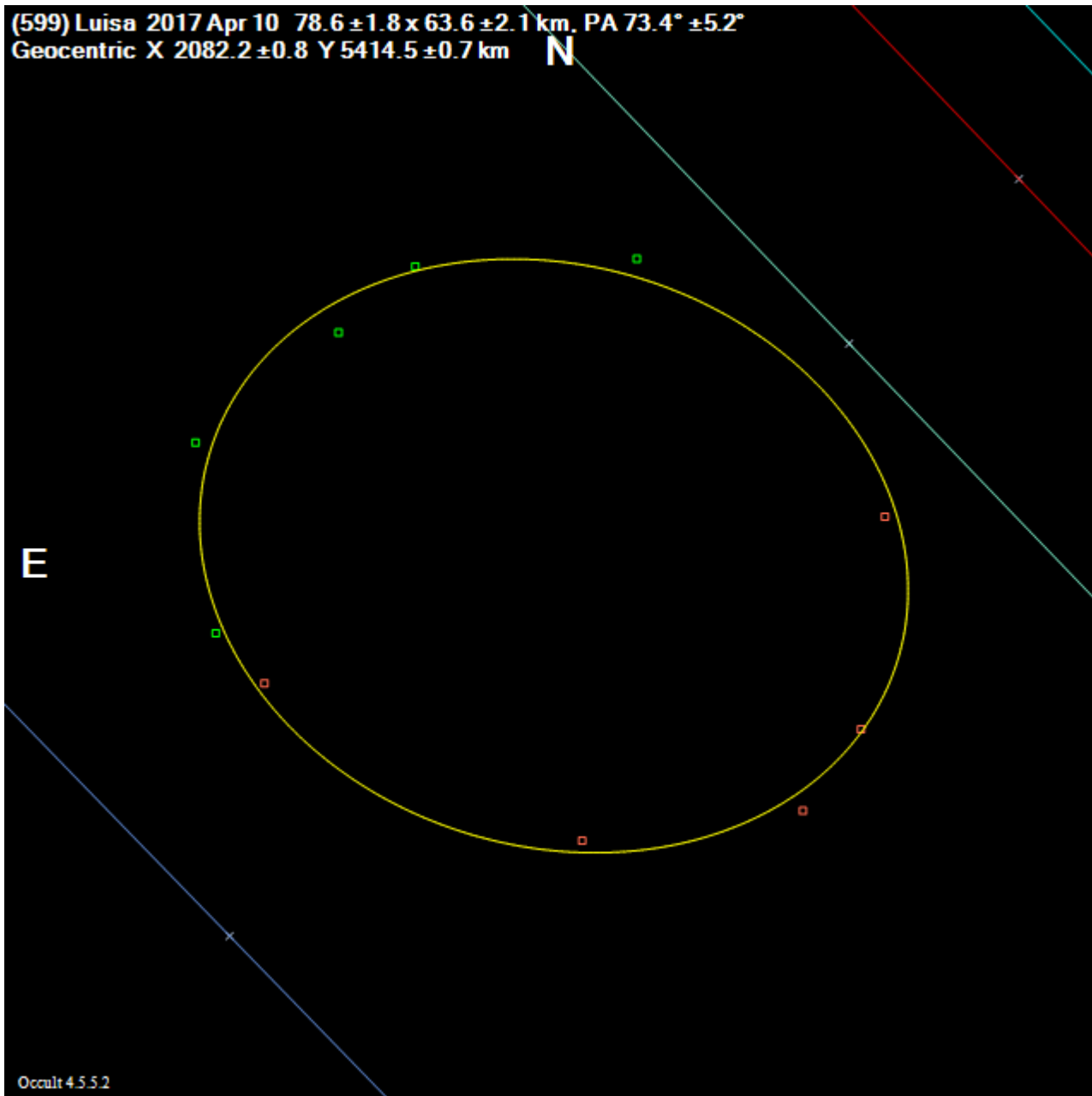
58Concordia2008Sep13

(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



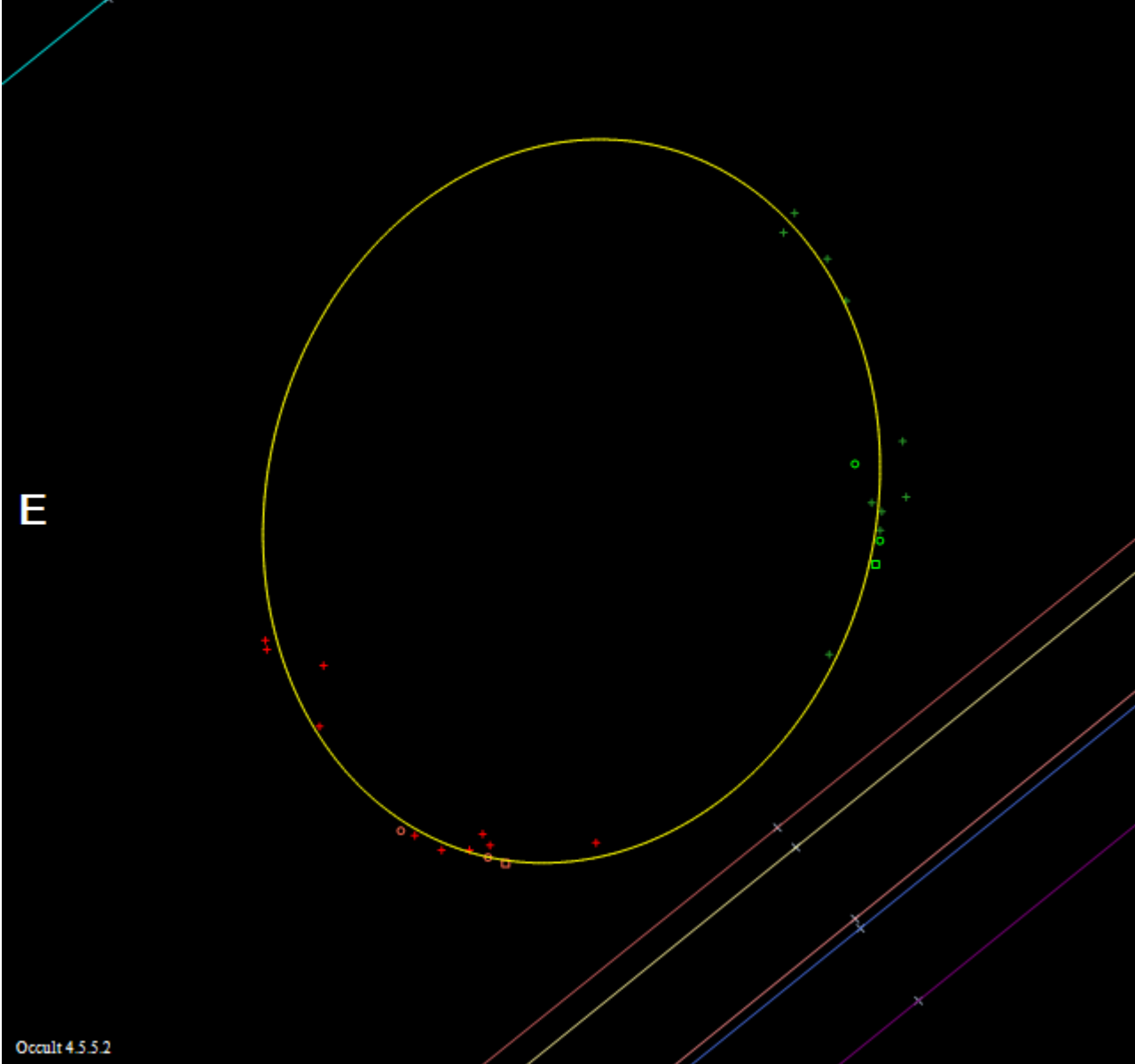
599Luisa2017Apr10

(599) Luisa 2017 Apr 10 $78.6 \pm 1.8 \times 63.6 \pm 2.1$ km, PA $73.4^\circ \pm 5.2^\circ$
Geocentric X 2082.2 ± 0.8 Y 5414.5 ± 0.7 km



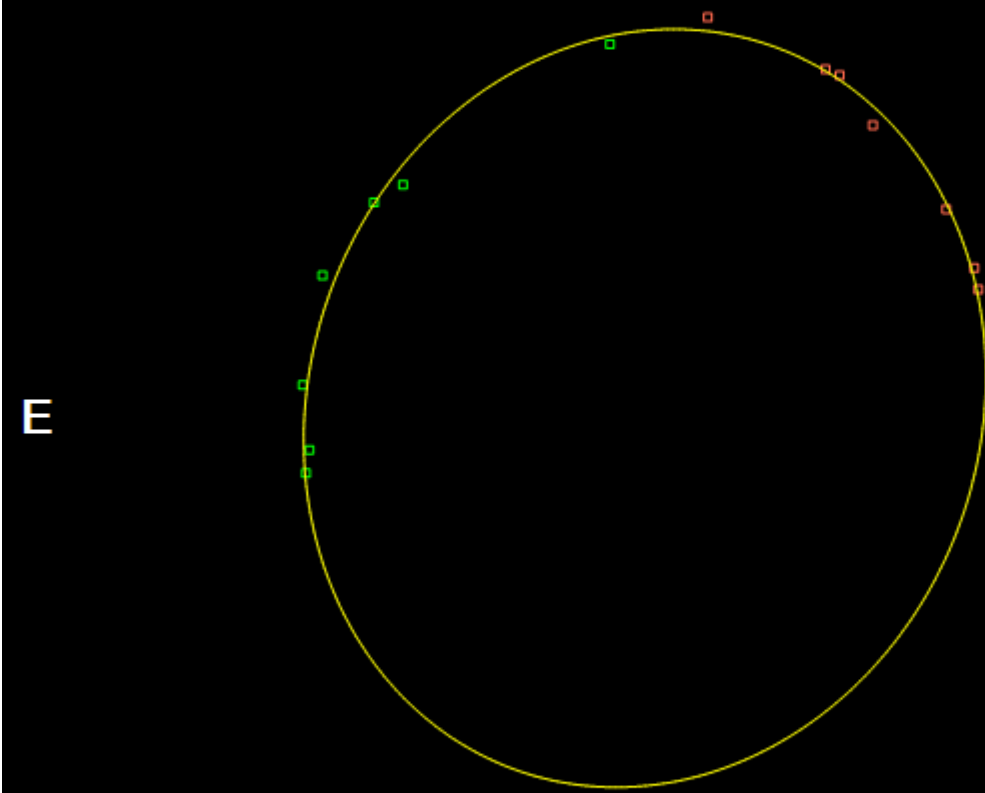
5Astraea2008Jun06

(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**



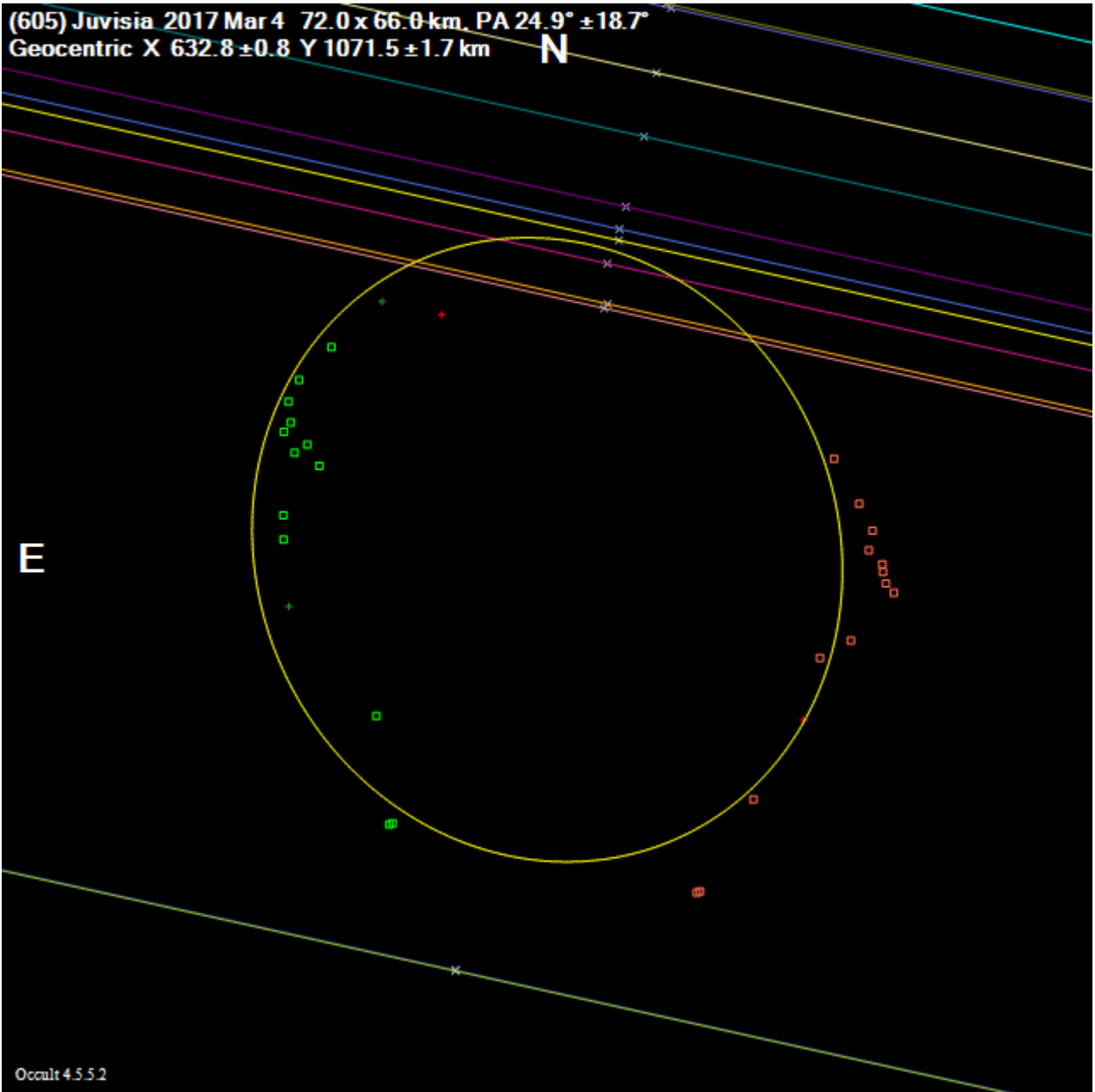
602Marianna2013Dec12

(602) Marianna 2013 Dec 12 $125.9 \pm 4.3 \times 110.0 \pm 2.0$ km, PA $-19.3^\circ \pm 7.4^\circ$
Geocentric X 2069.1 ± 0.5 Y 251.6 ± 2.4 km **N**



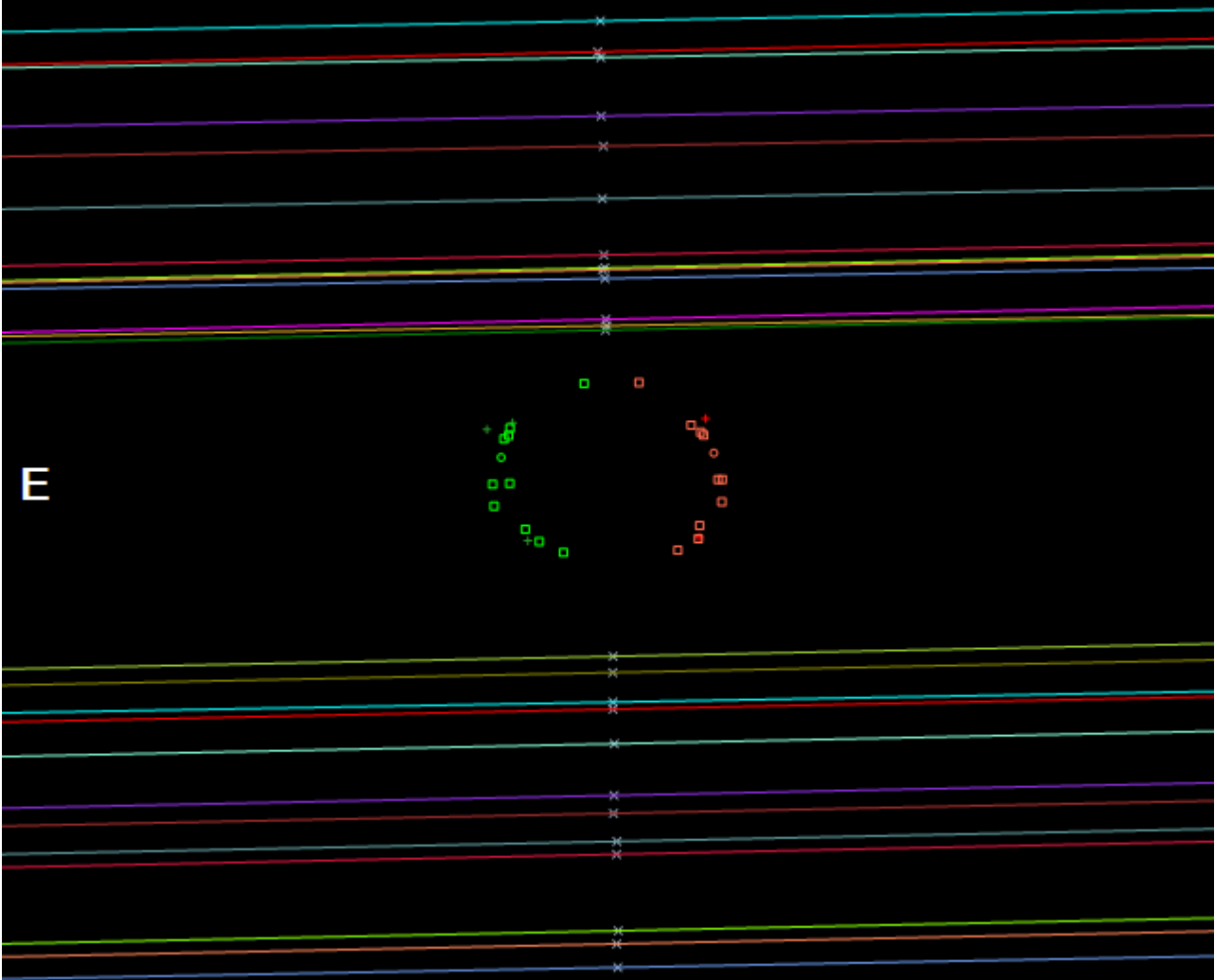
605Juvisia2017Mar04

(605) Juvisia 2017 Mar 4 72.0 x 66.0 km, PA 24.9° ± 18.7°
Geocentric X 632.8 ± 0.8 Y 1071.5 ± 1.7 km



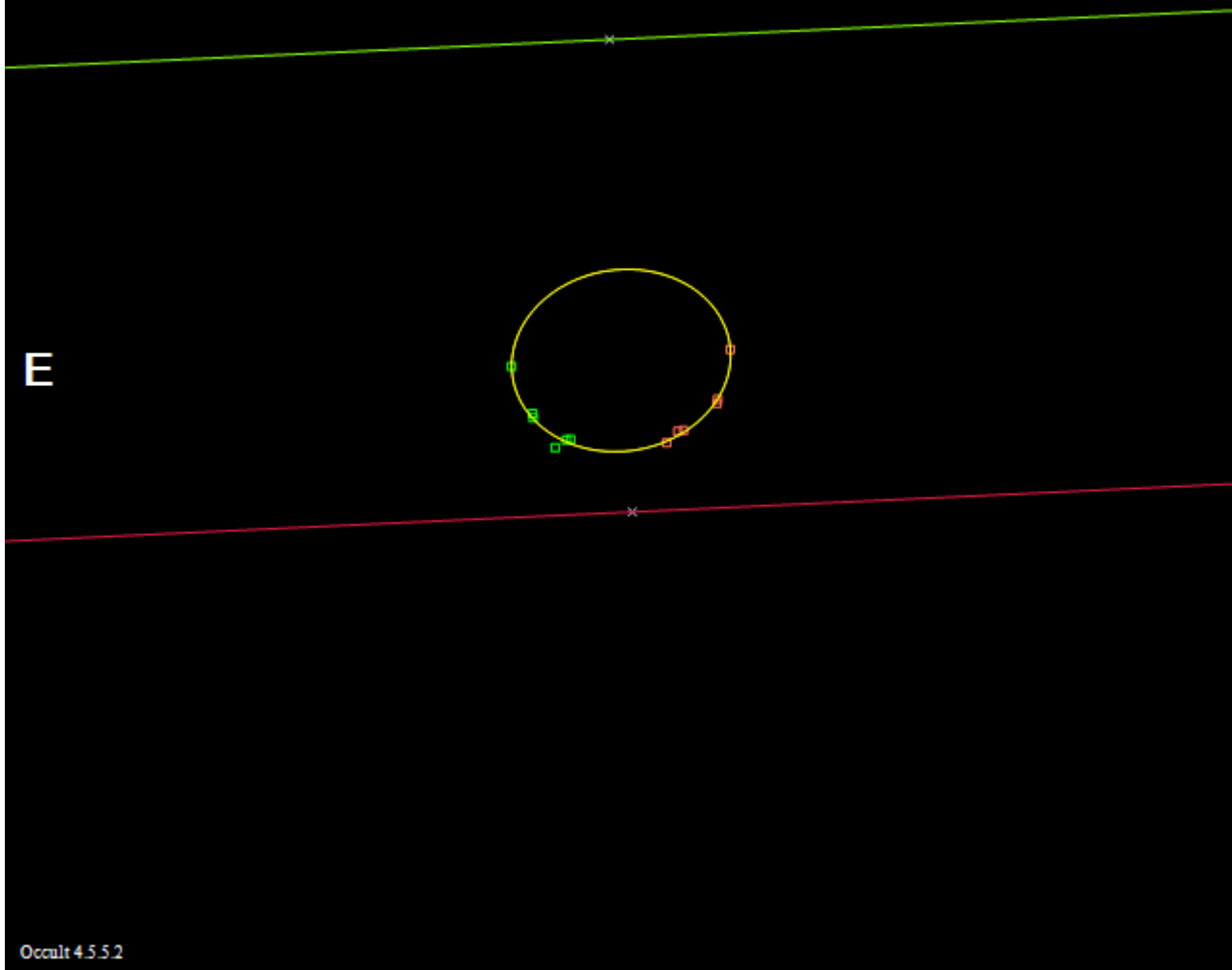
617Patroclus2013Oct21

(617) Patroclus 2013 Oct 21 $124.6 \pm 1.8 \times 98.2 \pm 2.0$ km, PA $82.8^\circ \pm 3.4^\circ$
Geocentric X 43.7 ± 0.8 Y 2521.7 ± 0.8 km
Sat: 93.0×117.2 km, PA -5.6° ; Sep $0.2470''$ at PA 265.7°



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**

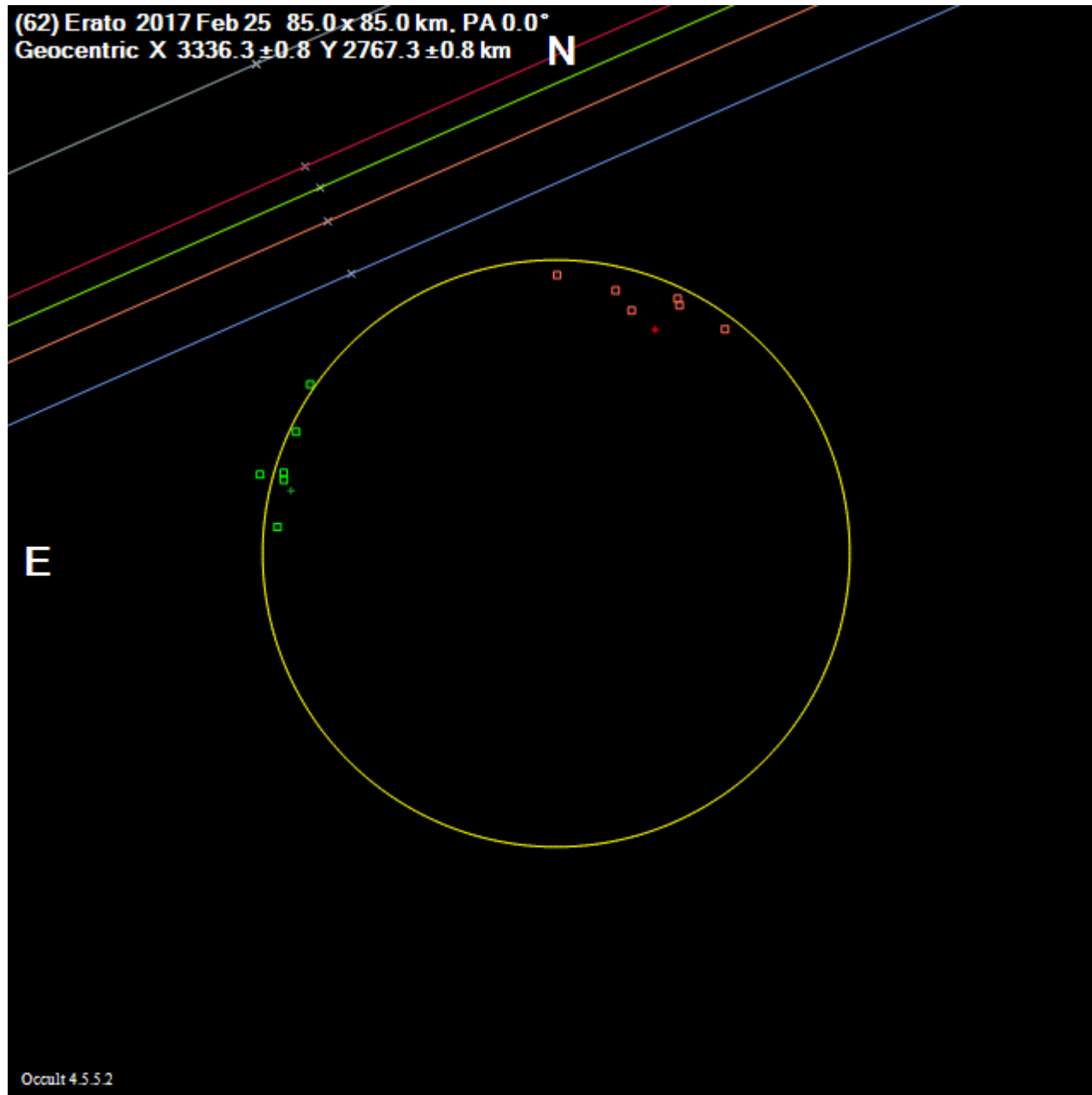


62Erato2017Feb25

(62) Erato 2017 Feb 25 85.0x85.0 km, PA 0.0°
Geocentric X 3336.3 ± 0.8 Y 2767.3 ± 0.8 km

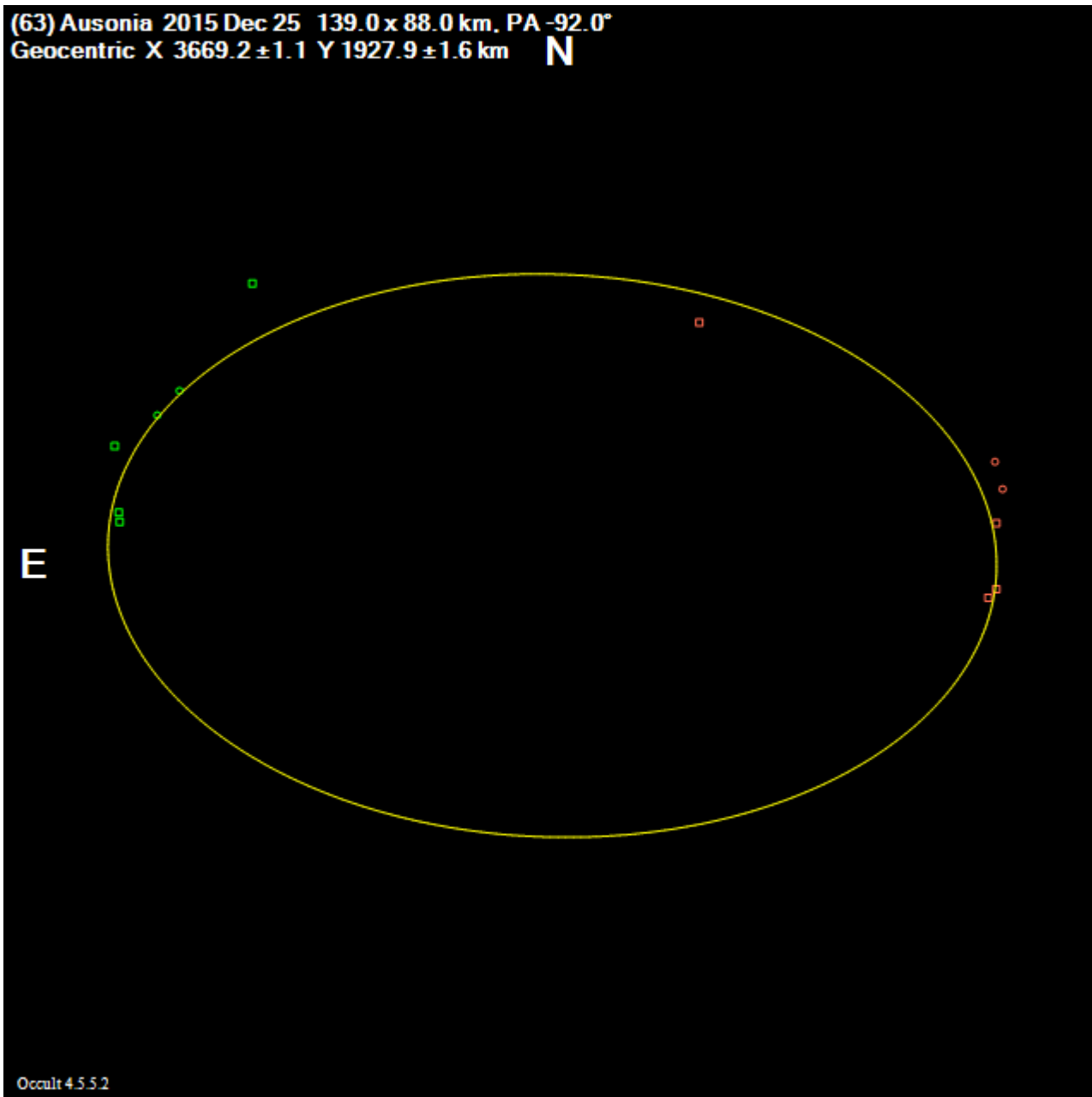
N

E



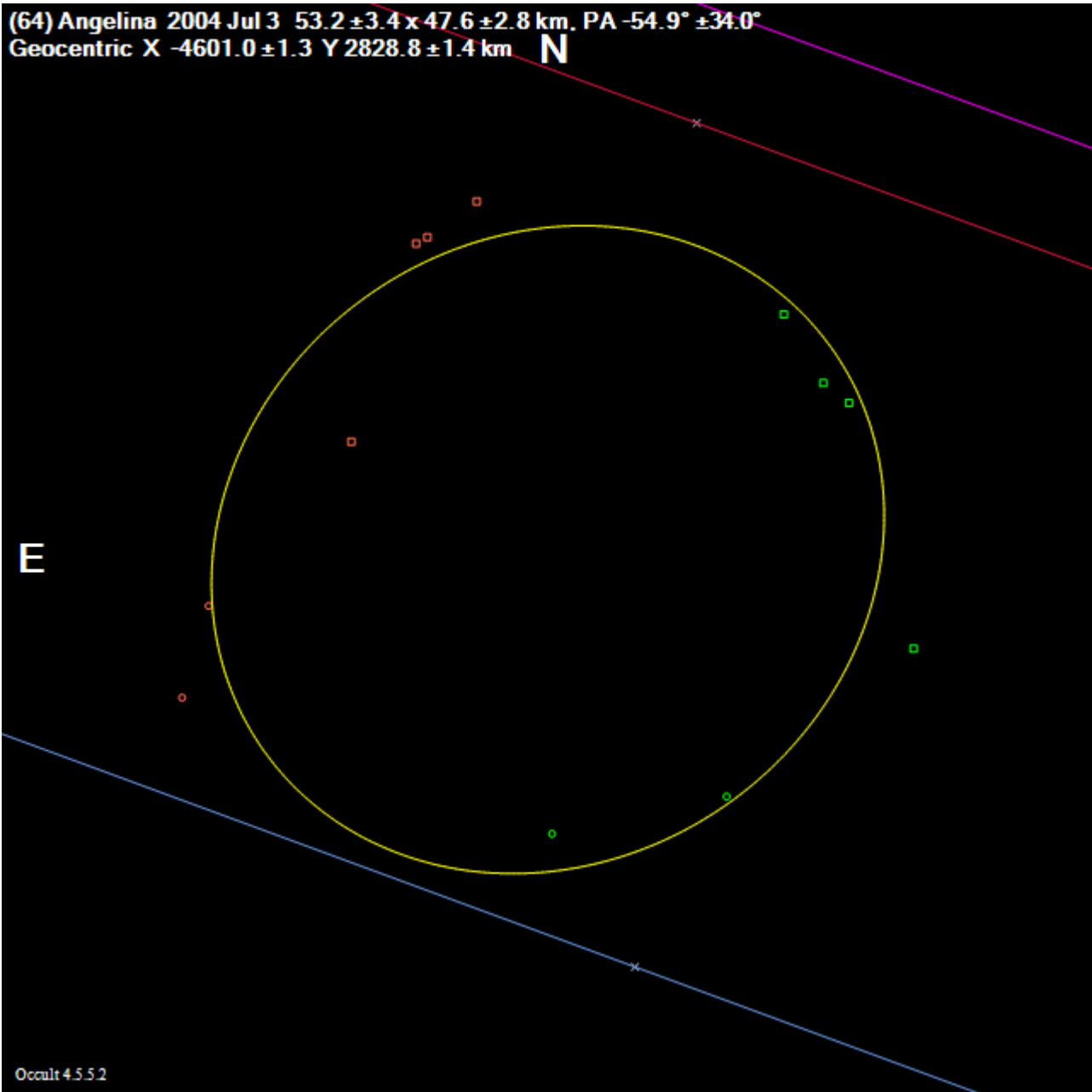
63Ausonia2015Dec25

(63) Ausonia 2015 Dec 25 139.0 x 88.0 km, PA -92.0°
Geocentric X 3669.2 ± 1.1 Y 1927.9 ± 1.6 km **N**



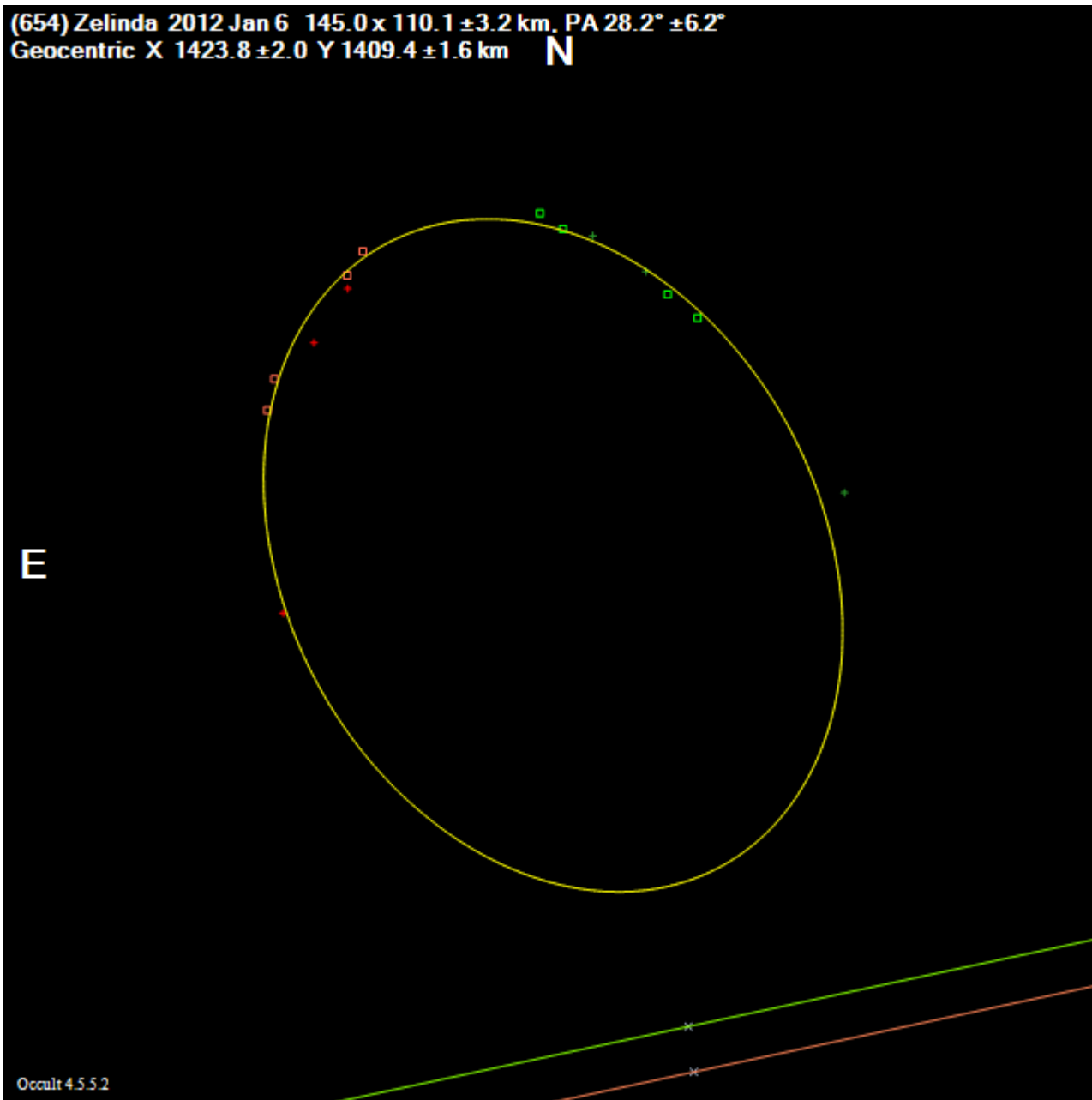
64Angelina2004Jul03

(64) Angelina 2004 Jul 3 $53.2 \pm 3.4 \times 47.6 \pm 2.8$ km, PA $-54.9^\circ \pm 34.0^\circ$
Geocentric X -4601.0 ± 1.3 Y 2828.8 ± 1.4 km **N**



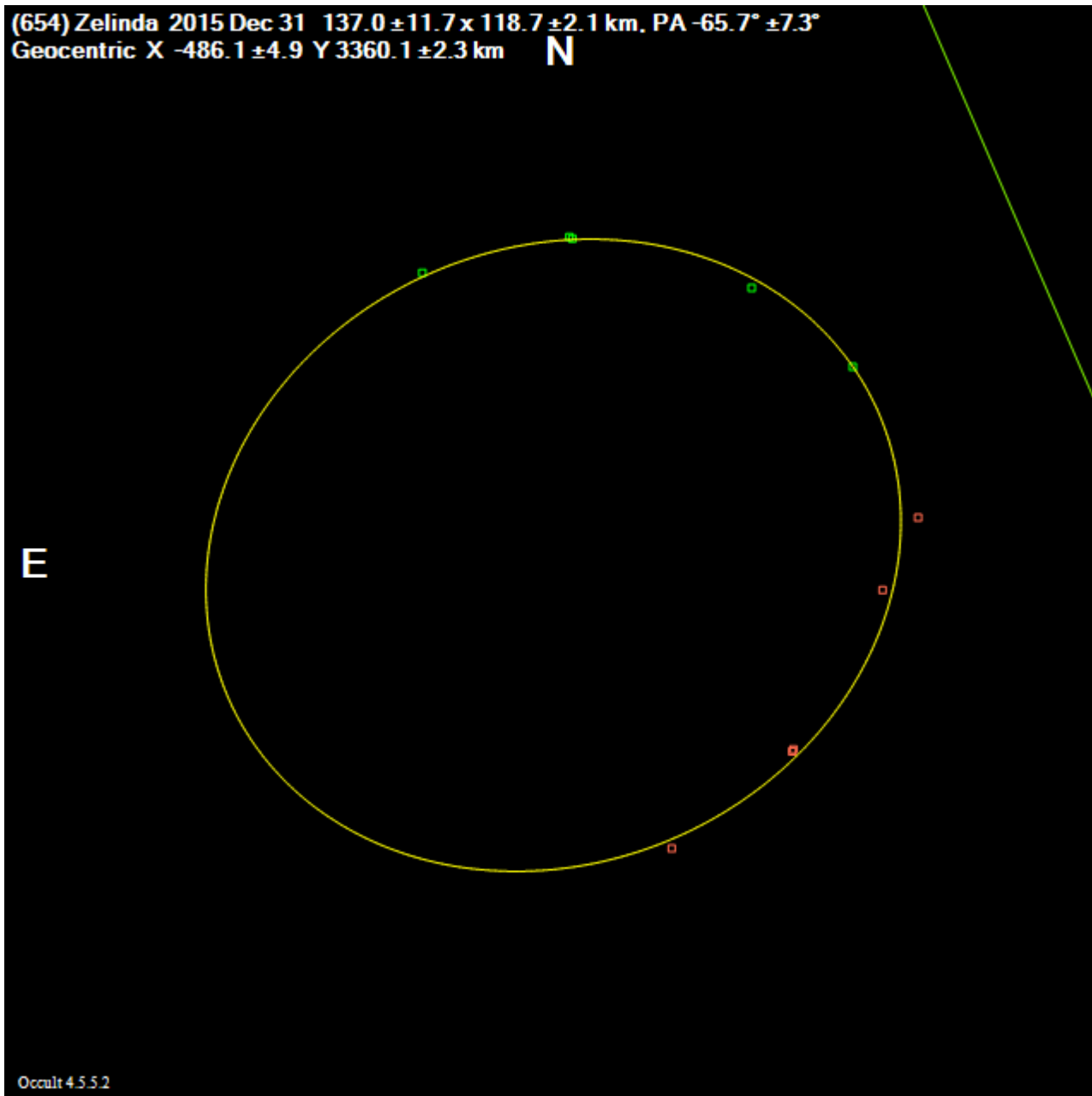
654Zelinda2012Jan06

(654) Zelinda 2012 Jan 6 145.0 x 110.1 ±3.2 km, PA 28.2° ±6.2°
Geocentric X 1423.8 ±2.0 Y 1409.4 ±1.6 km N



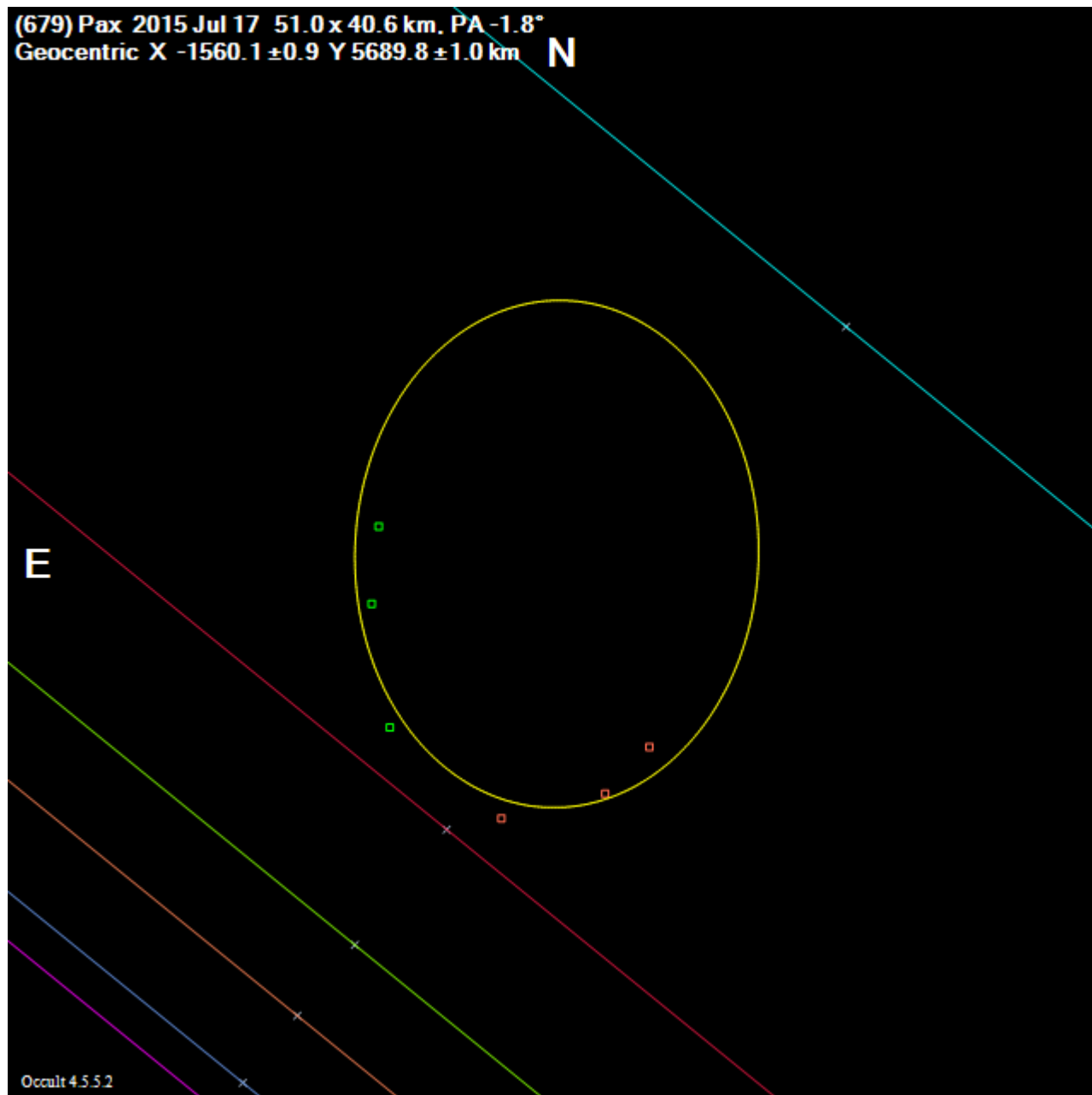
654Zelinda2015Dec31

(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**



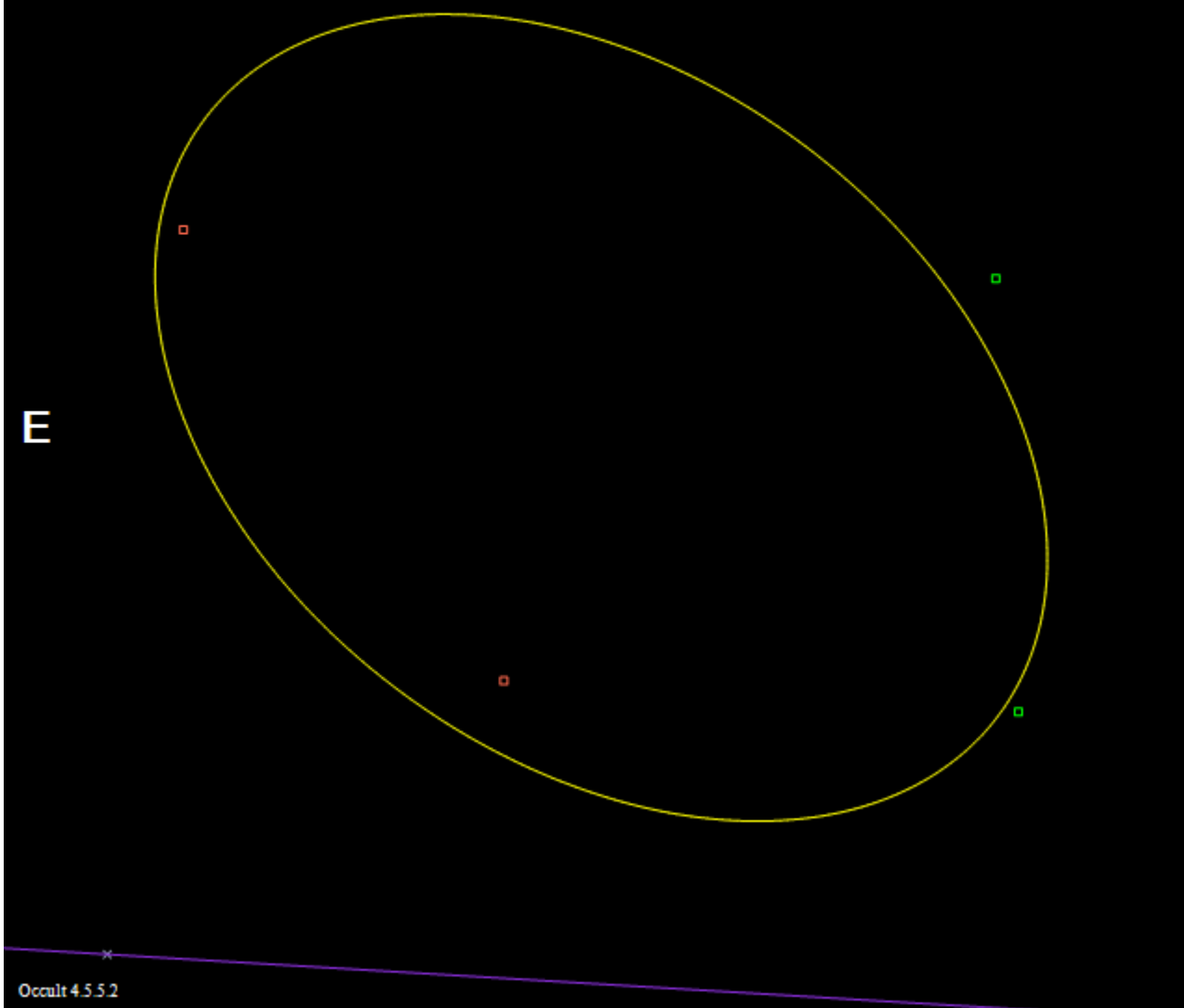
679Pax2015Jul17

(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**



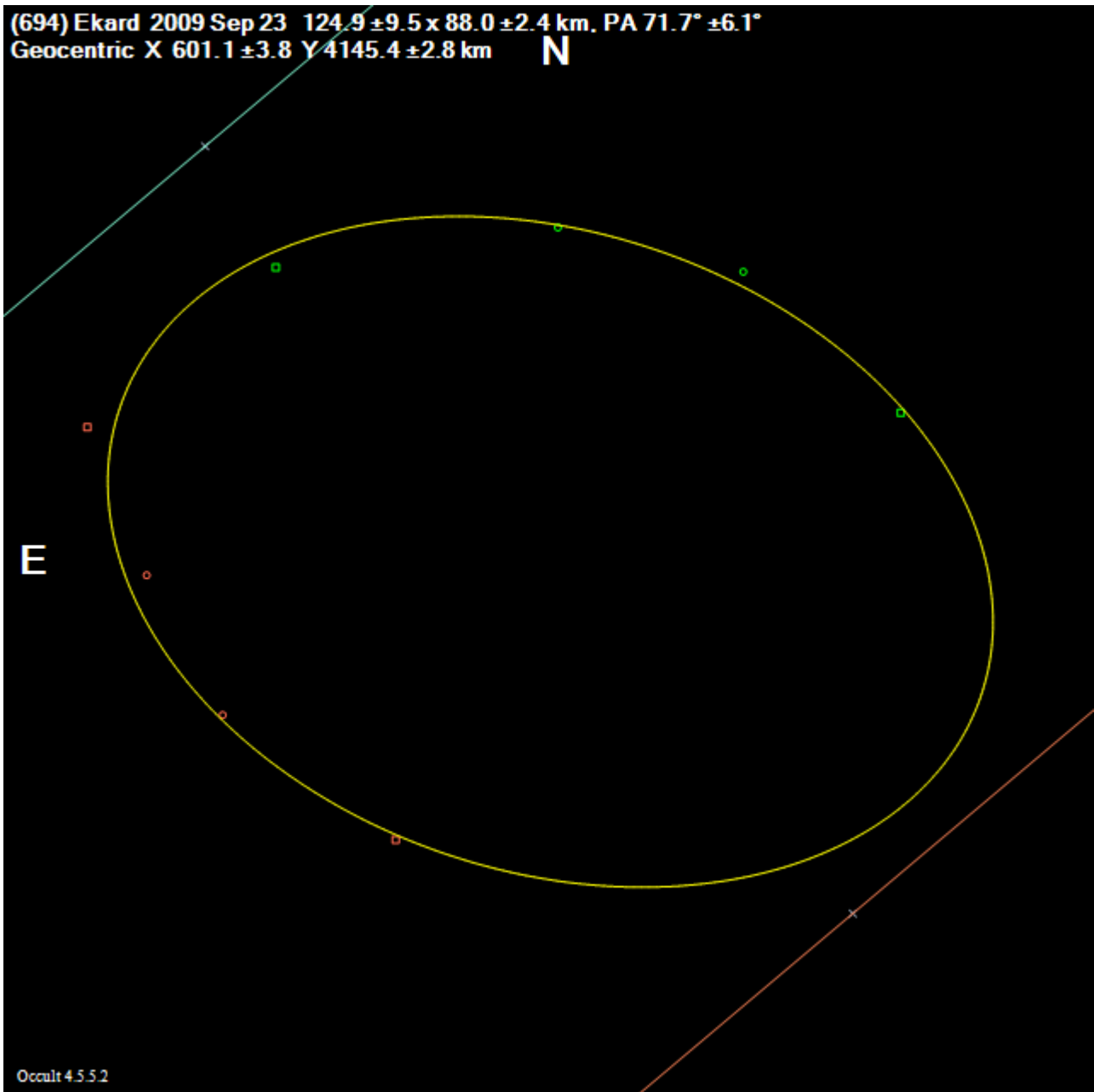
686Gersuind2017Mar08

(686) Gersuind 2017 Mar 8 57.0 x 39.0 km, PA 53.0°
Geocentric X -1118.1 ± 1.6 Y 5885.9 ± 2.1 km **N**



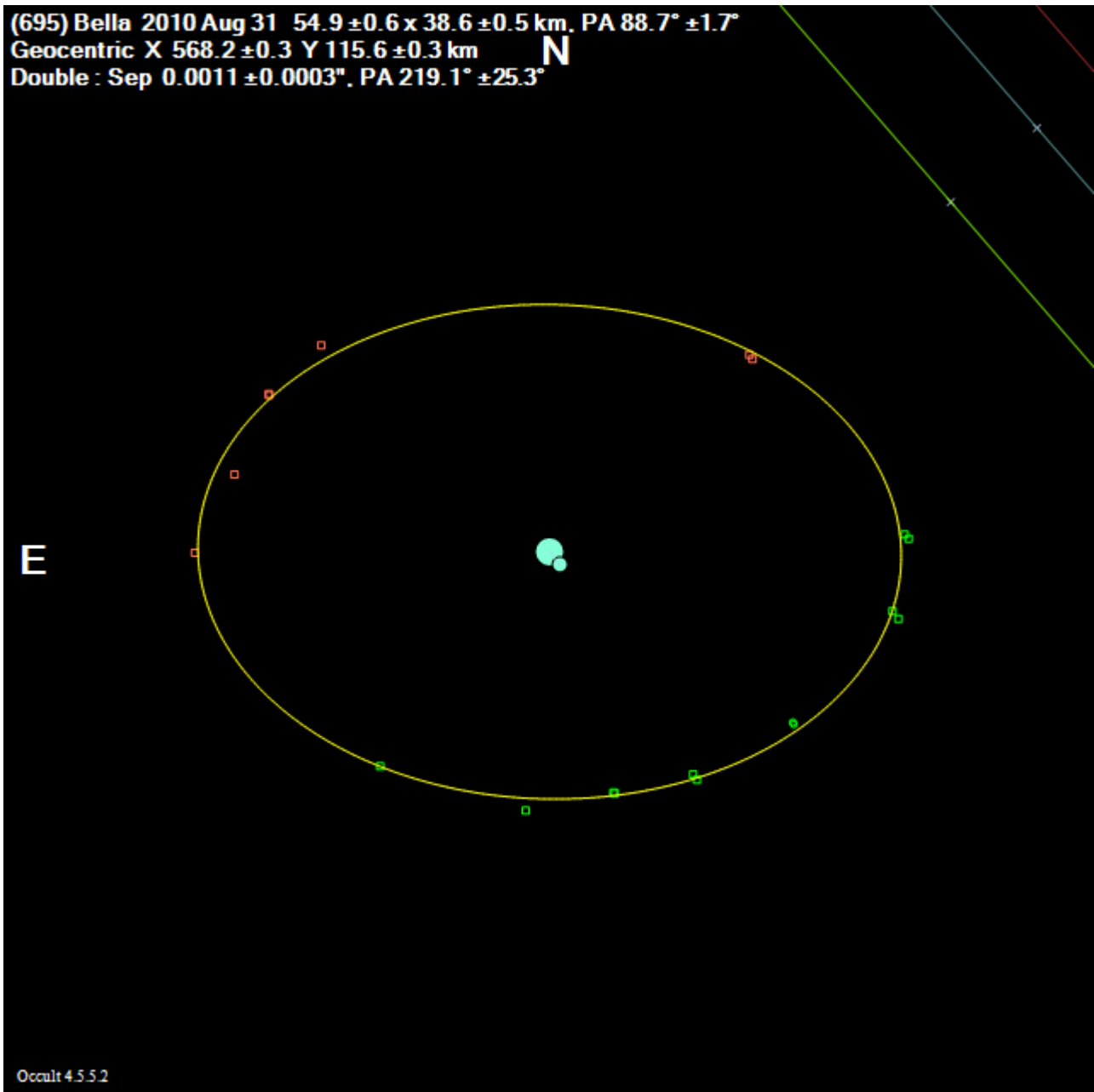
694Ekard2009Sep23

(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**



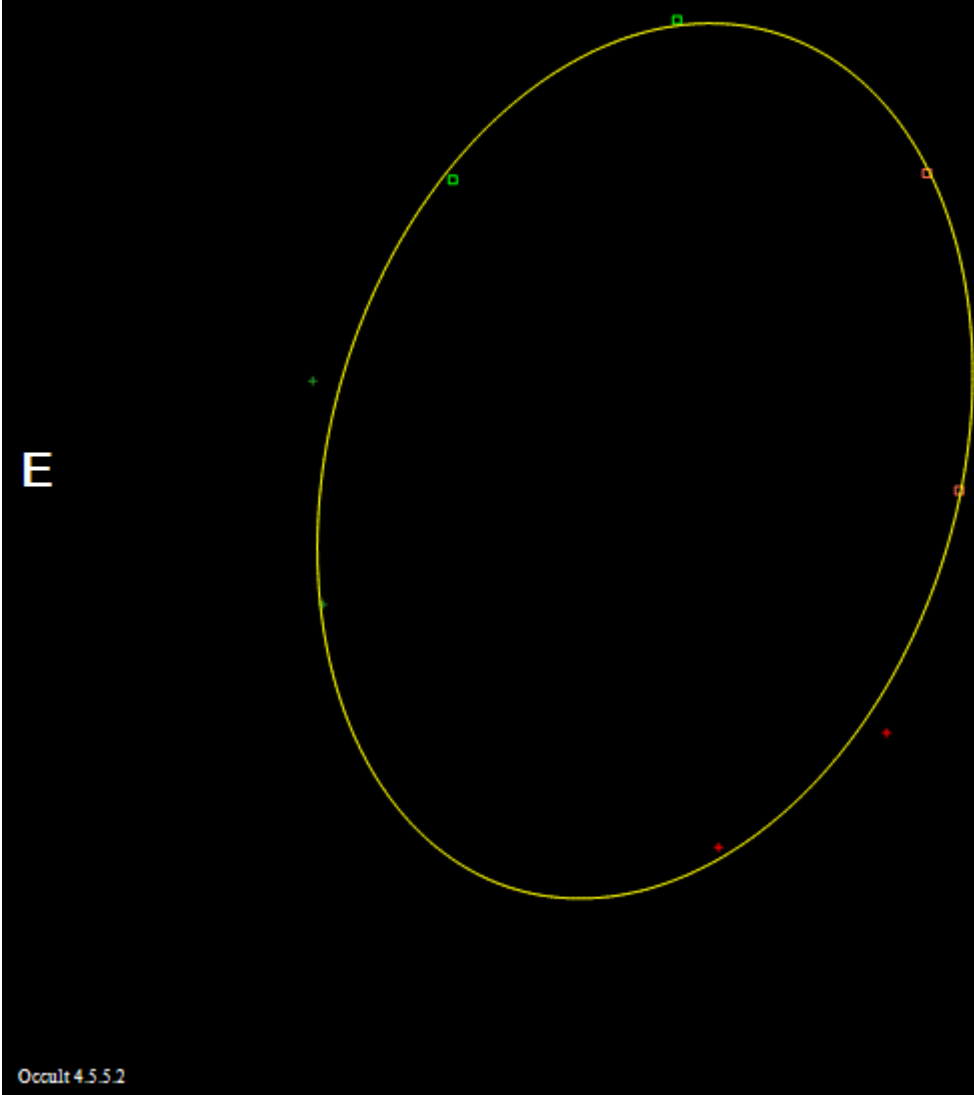
695Bella2010Aug31

(695) Bella 2010 Aug 31 $54.9 \pm 0.6 \times 38.6 \pm 0.5$ km, PA $88.7^\circ \pm 1.7^\circ$
Geocentric X 568.2 ± 0.3 Y 115.6 ± 0.3 km **N**
Double : Sep $0.0011 \pm 0.0003''$, PA $219.1^\circ \pm 25.3^\circ$



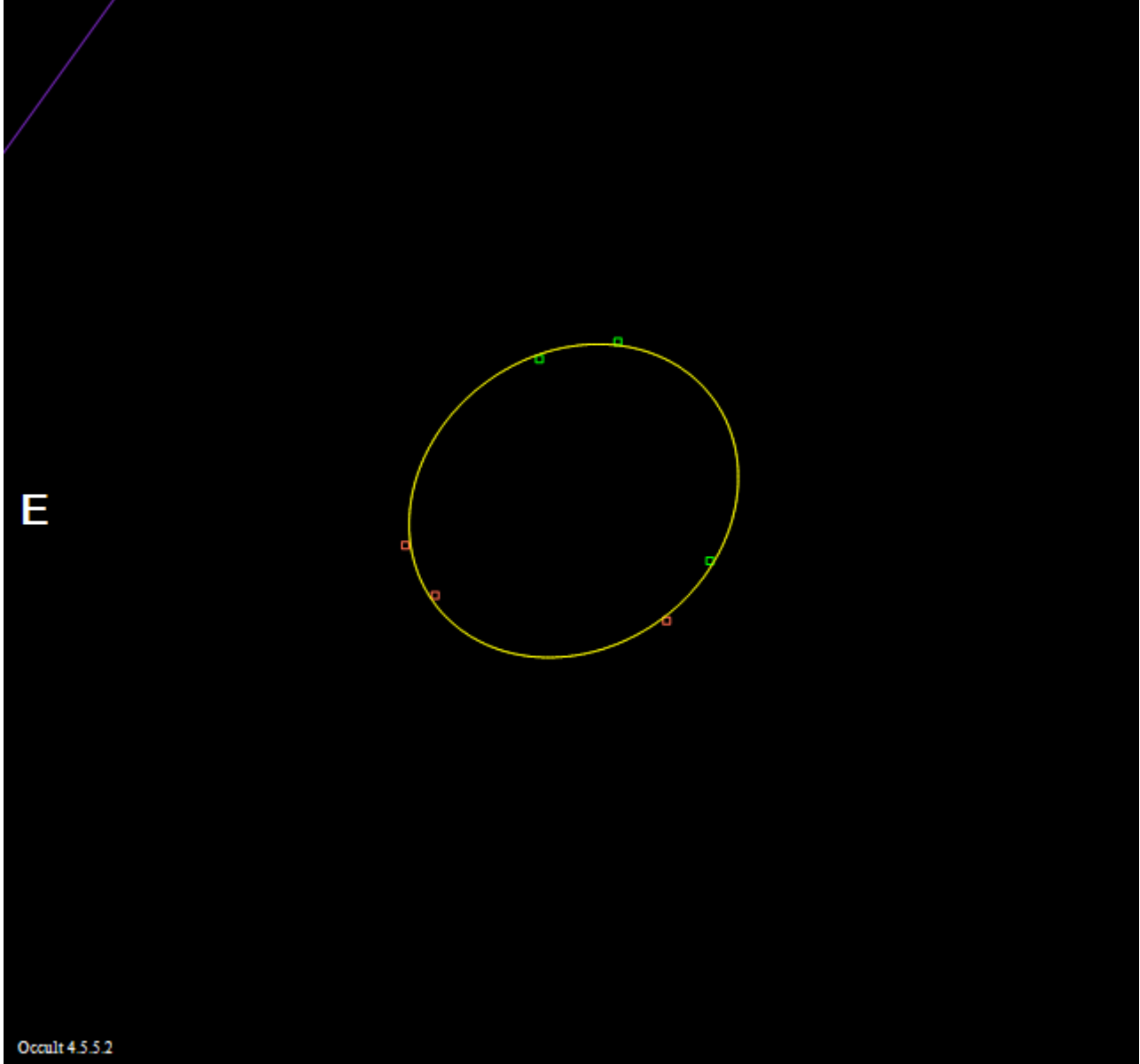
697Galilea2007Jan08

(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**



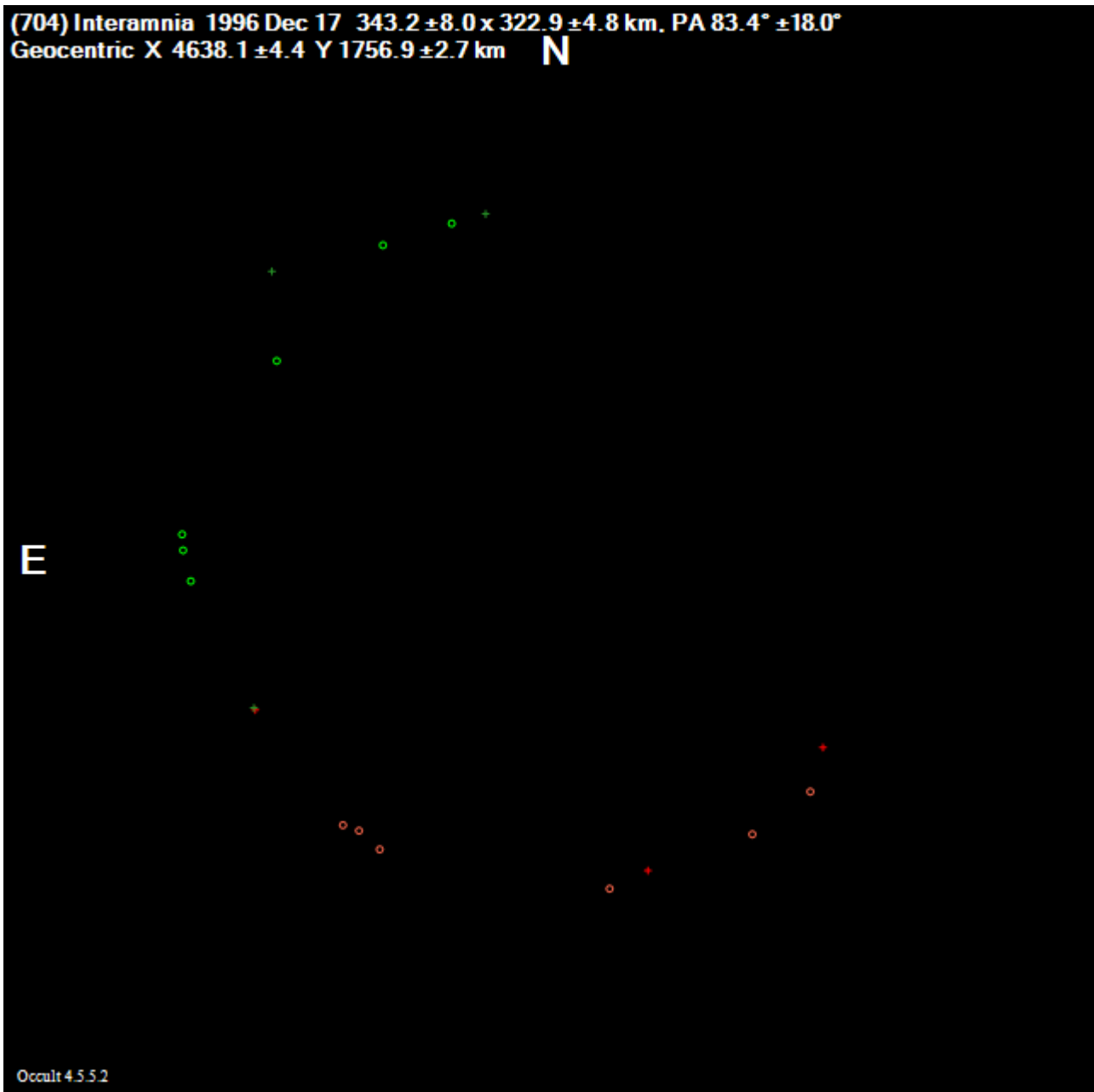
702Alauda2008Dec24

(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**



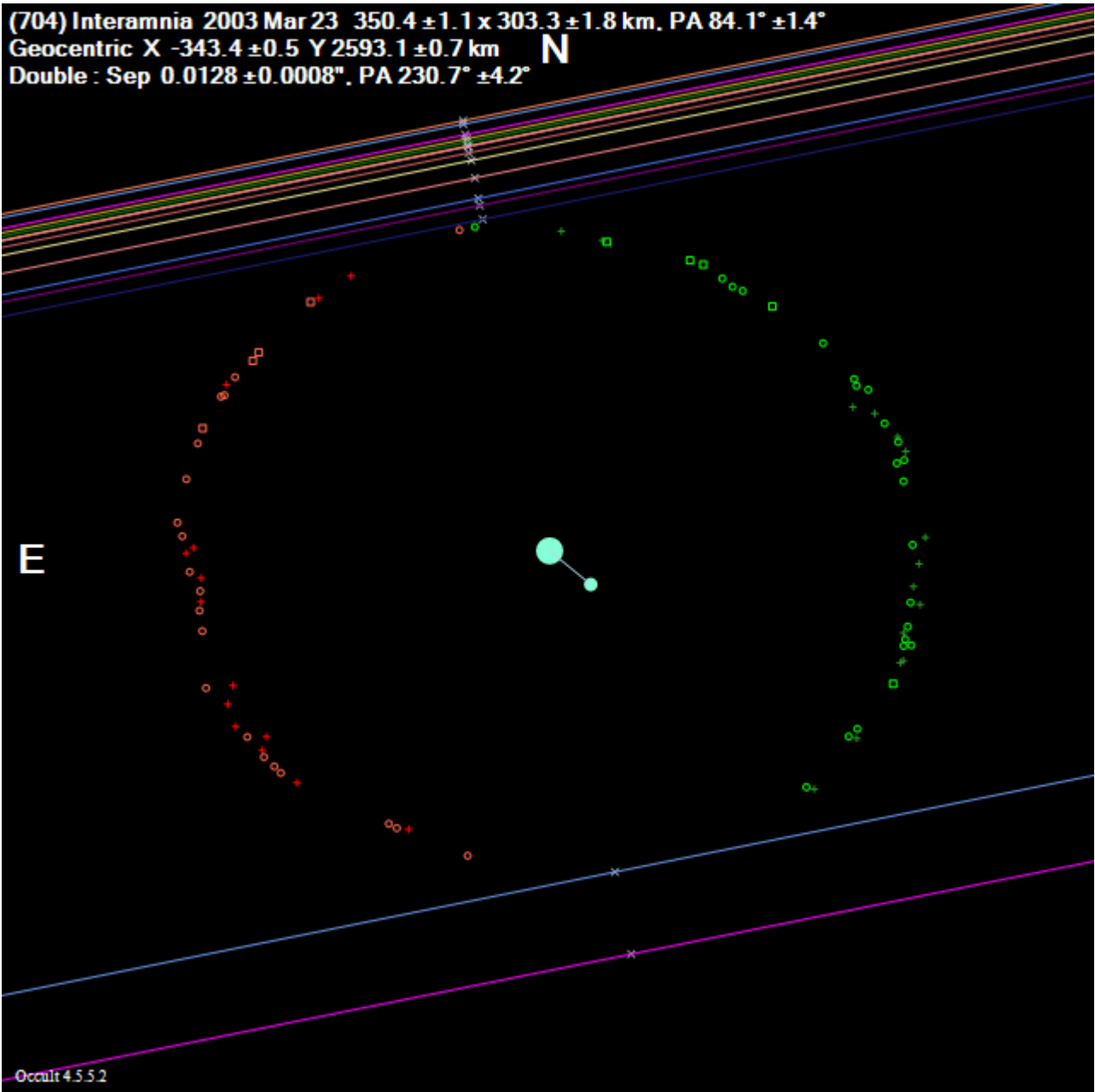
704Interamnia1996Dec17

(704) Interamnia 1996 Dec 17 $343.2 \pm 8.0 \times 322.9 \pm 4.8$ km, PA $83.4^\circ \pm 18.0^\circ$
Geocentric X 4638.1 ± 4.4 Y 1756.9 ± 2.7 km N



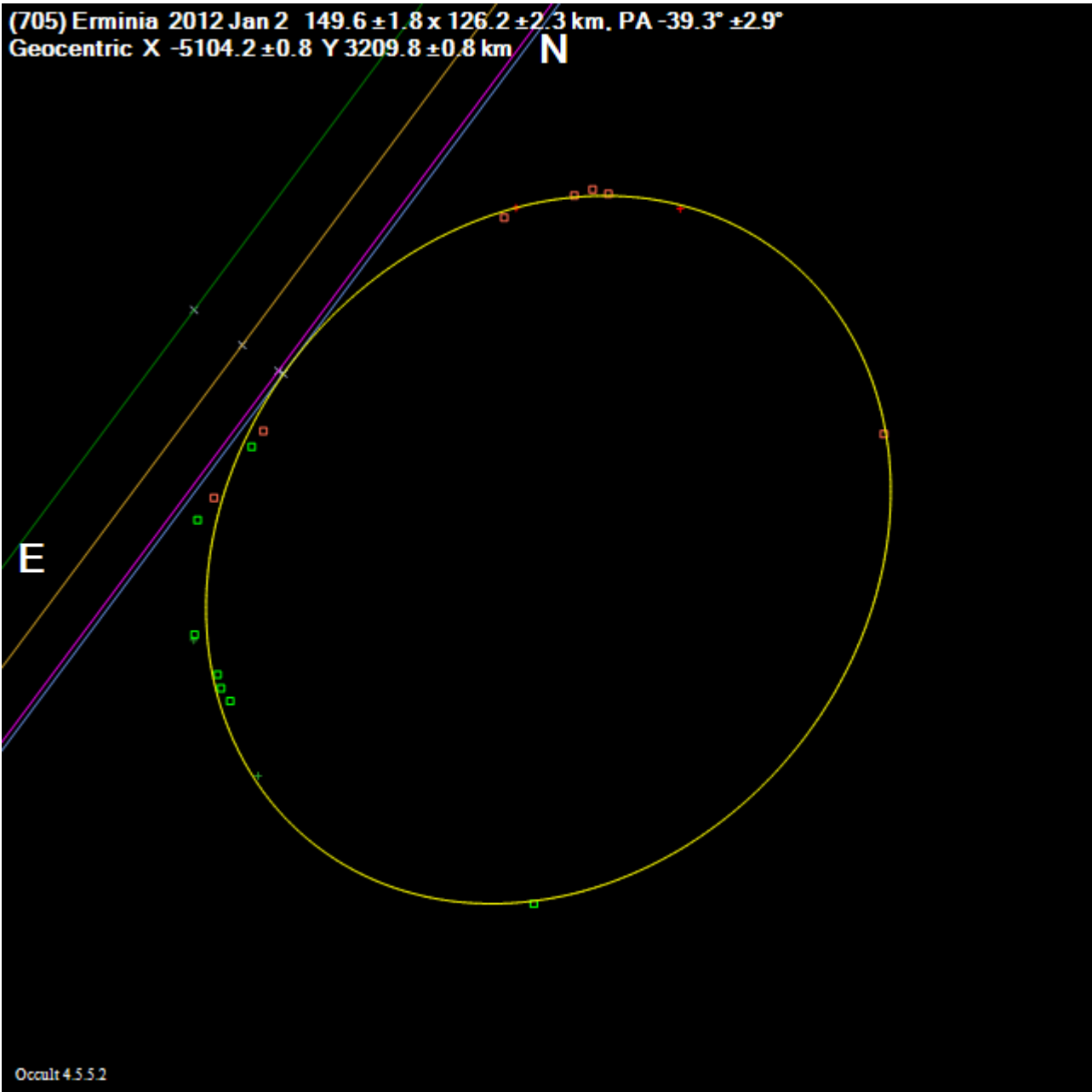
704Interamnia2003Mar23

(704) Interamnia 2003 Mar 23 $350.4 \pm 1.1 \times 303.3 \pm 1.8$ km, PA $84.1^\circ \pm 1.4^\circ$
Geocentric X -343.4 ± 0.5 Y 2593.1 ± 0.7 km **N**
Double : Sep $0.0128 \pm 0.0008''$, PA $230.7^\circ \pm 4.2^\circ$



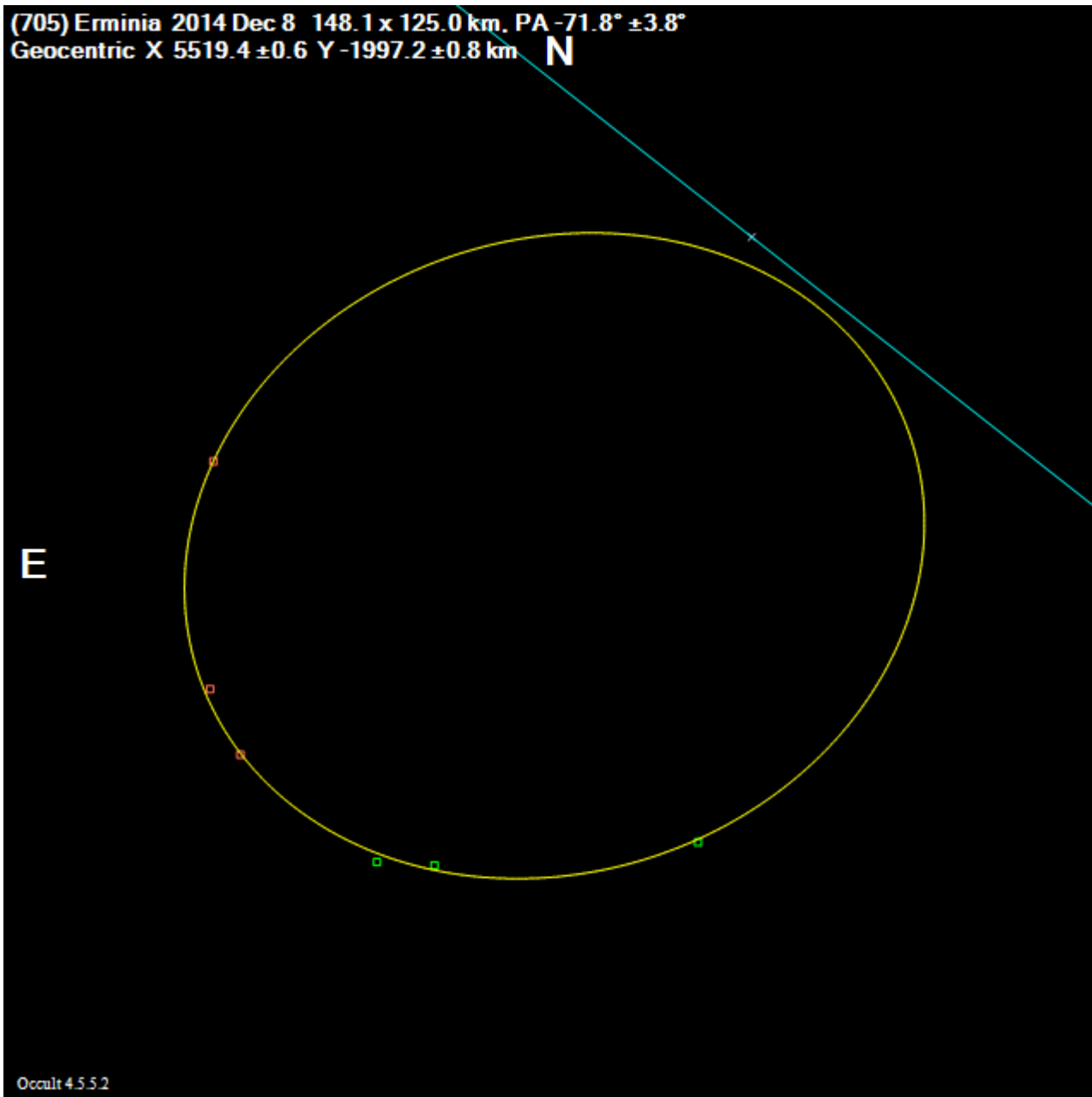
705Erminia2012Jan02

(705) Erminia 2012 Jan 2 $149.6 \pm 1.8 \times 126.2 \pm 2.3$ km, PA $-39.3^\circ \pm 2.9^\circ$
Geocentric X -5104.2 ± 0.8 Y 3209.8 ± 0.8 km



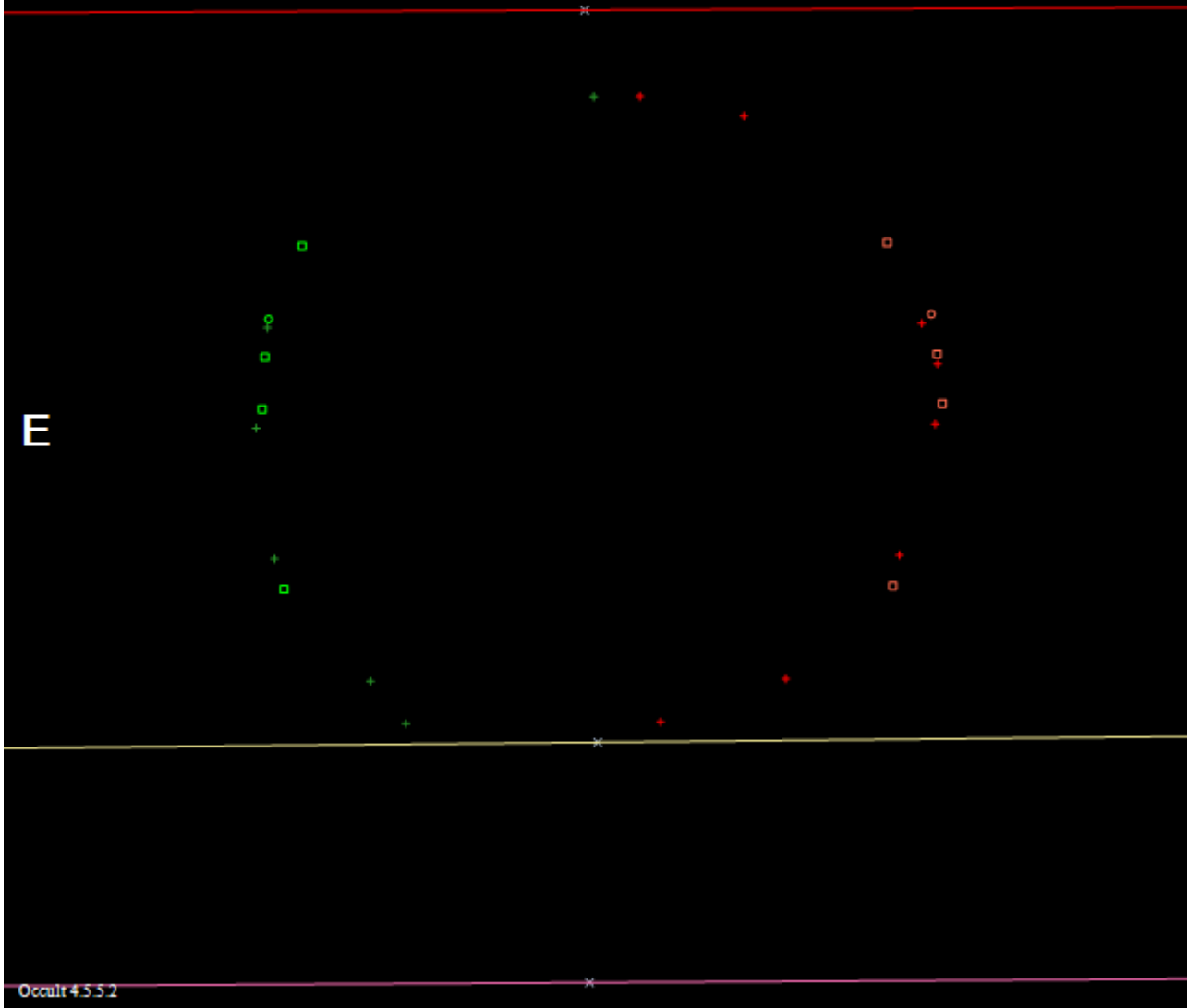
705Erminia2014Dec08

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



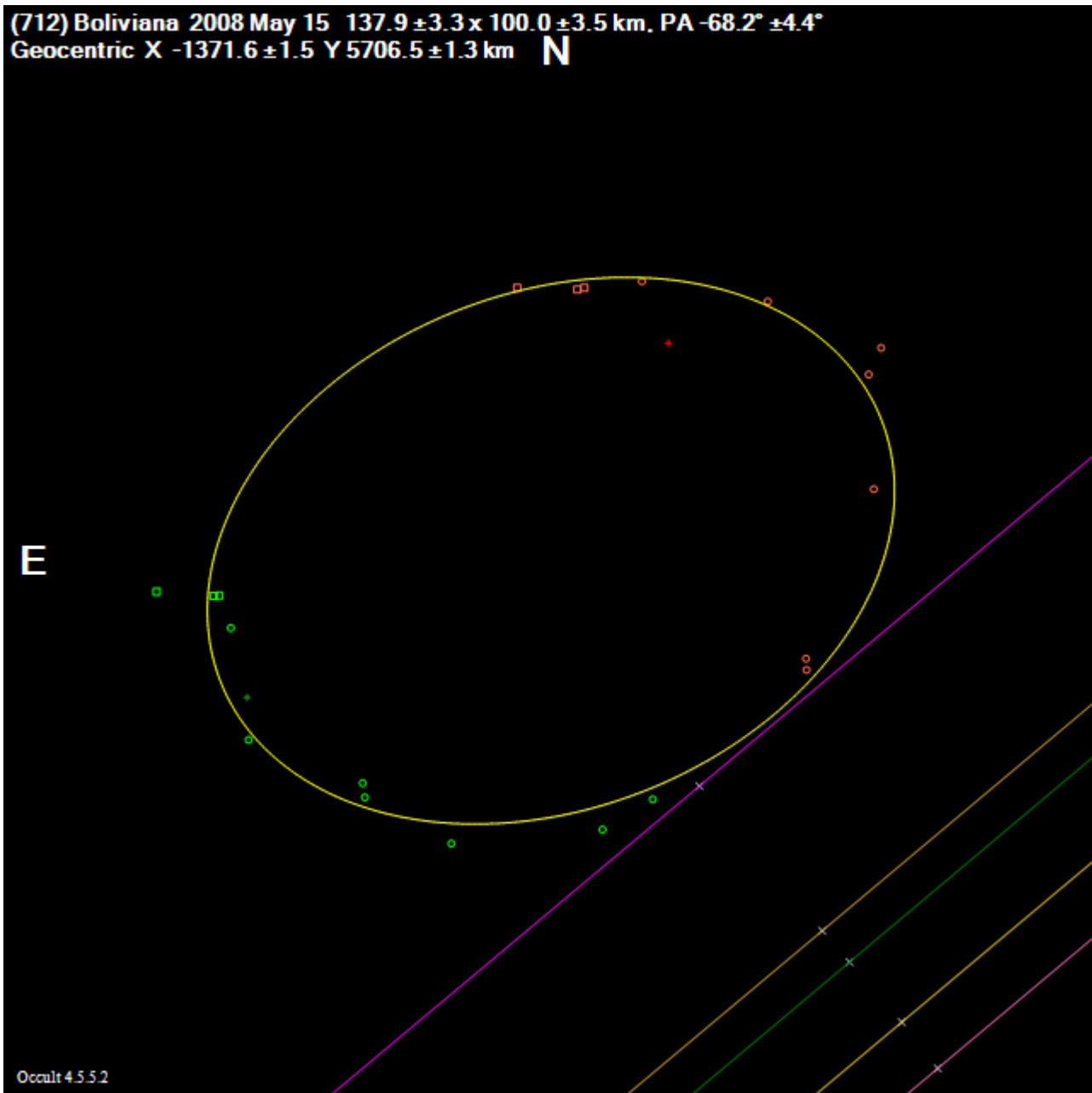
70Panopaea2006Dec14

(70) Panopaea 2006 Dec 14 $136.4 \pm 0.9 \times 126.2 \pm 1.4$ km, PA $-72.0^\circ \pm 4.9^\circ$
Geocentric X -2222.1 ± 0.3 Y 1088.9 ± 0.5 km **N**



712Boliviana2008May15

(712) Boliviana 2008 May 15 $137.9 \pm 3.3 \times 100.0 \pm 3.5$ km, PA $-68.2^\circ \pm 4.4^\circ$
Geocentric X -1371.6 ± 1.5 Y 5706.5 ± 1.3 km **N**

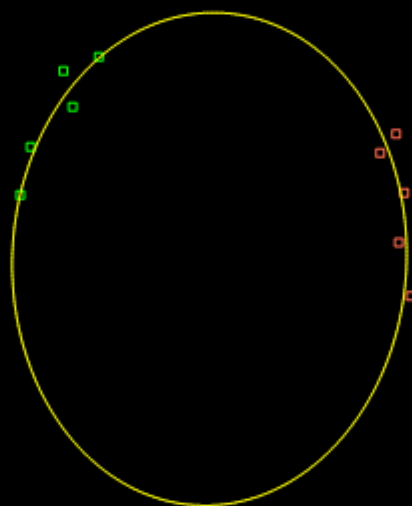


Occult 4.5.5.2

71Niobe2015Feb18

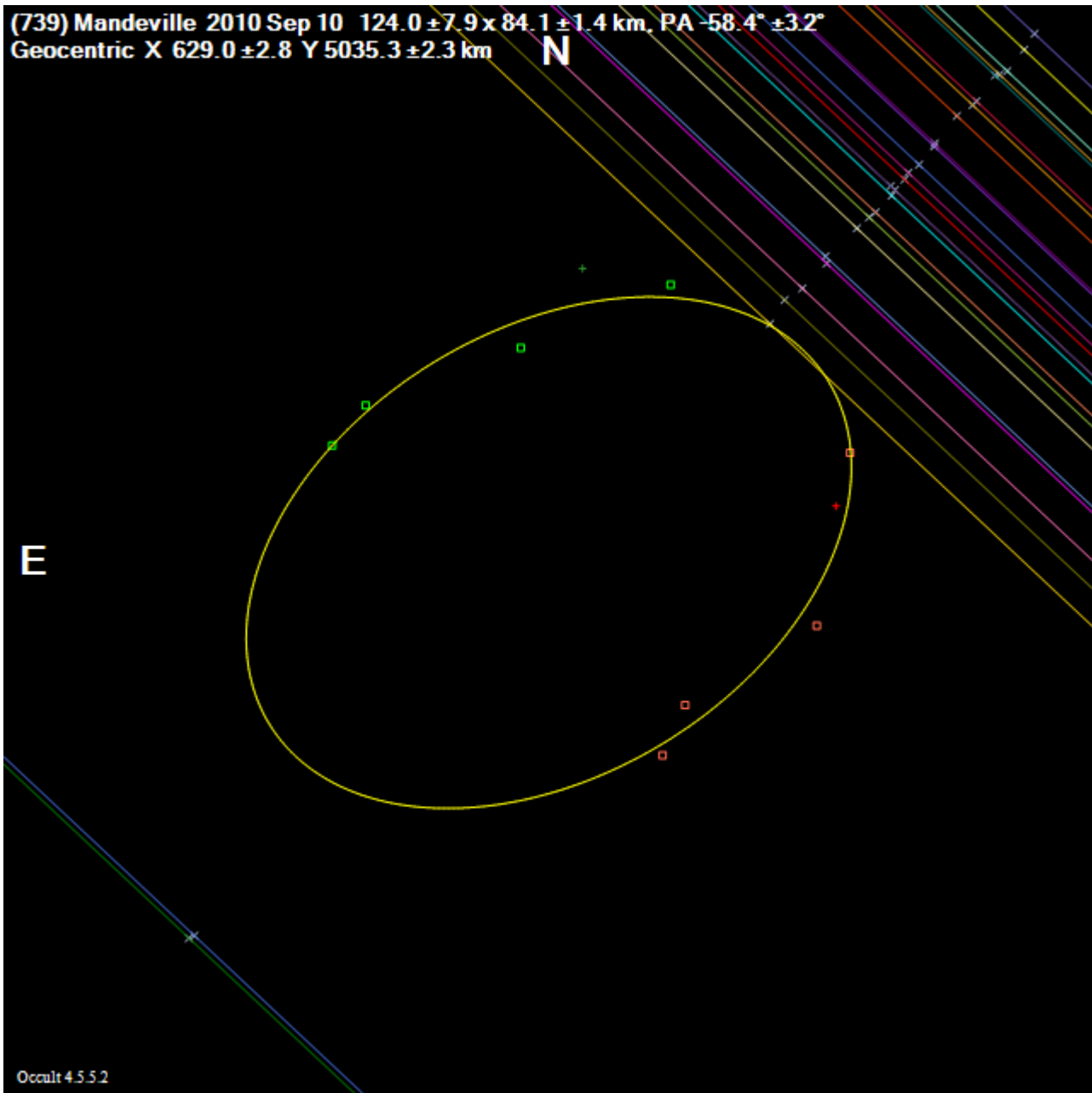
(71) Niobe 2015 Feb 18 $106.3 \pm 38.1 \times 85.0 \pm 4.6$ km, PA $-2.8^\circ \pm 17.7^\circ$
Geocentric X 4129.7 ± 3.1 Y 2215.3 ± 13.7 km **N**

E



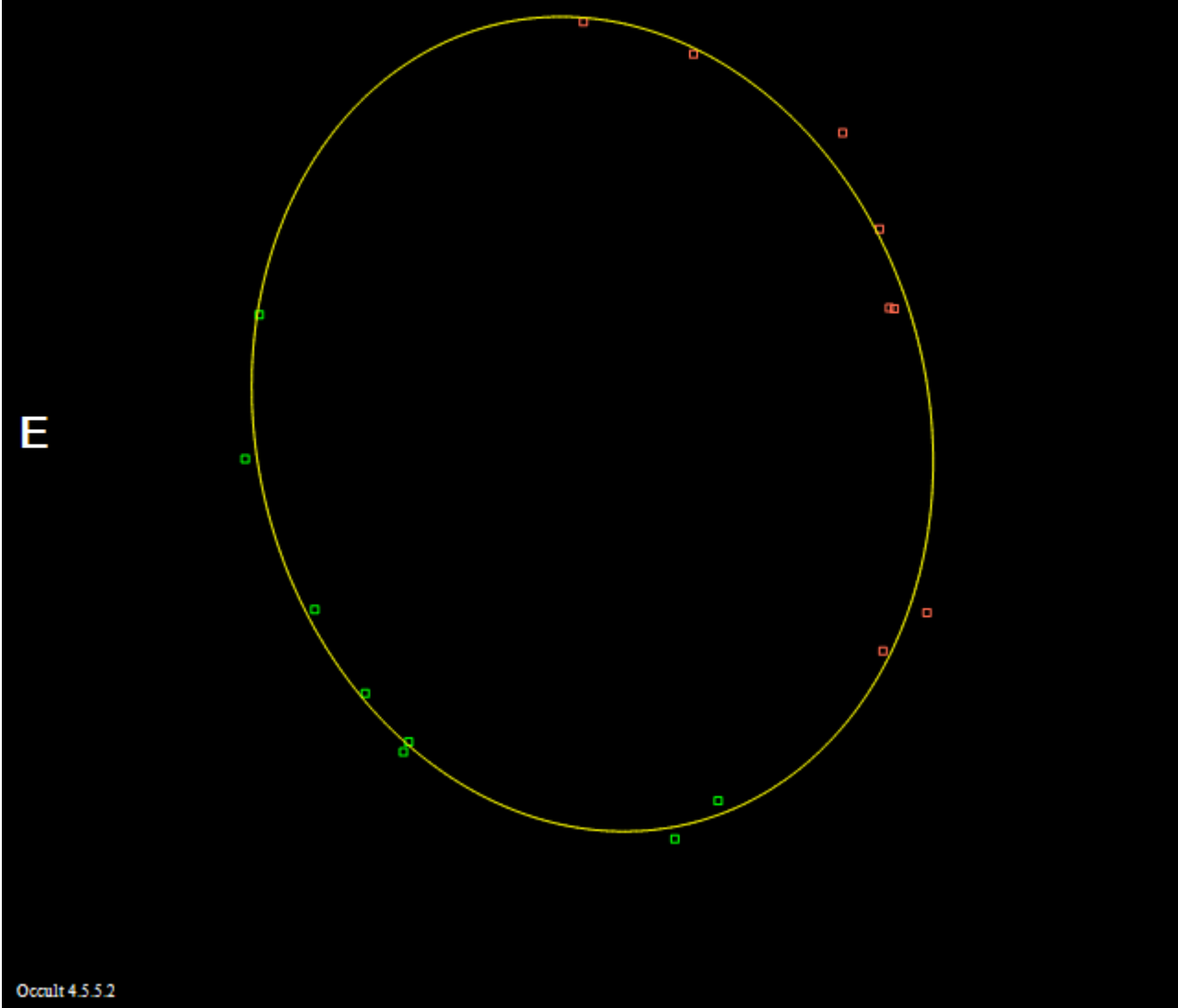
739Mandeville2010Sep10

(739) Mandeville 2010 Sep 10 $124.0 \pm 7.9 \times 84.1 \pm 1.4$ km, PA $-58.4^\circ \pm 3.2^\circ$
Geocentric X 629.0 ± 2.8 Y 5035.3 ± 2.3 km



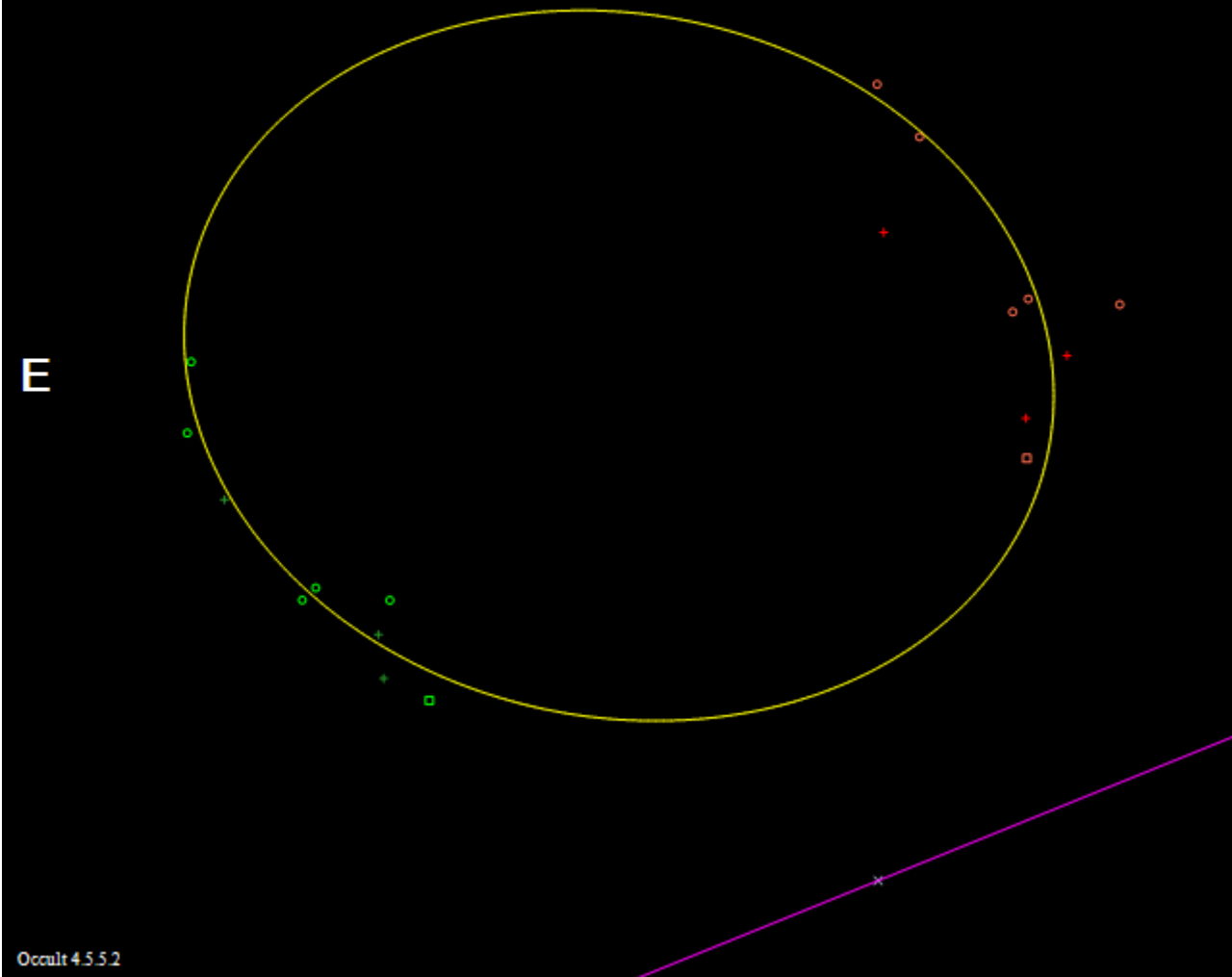
739Mandeville2017Jan01

(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**



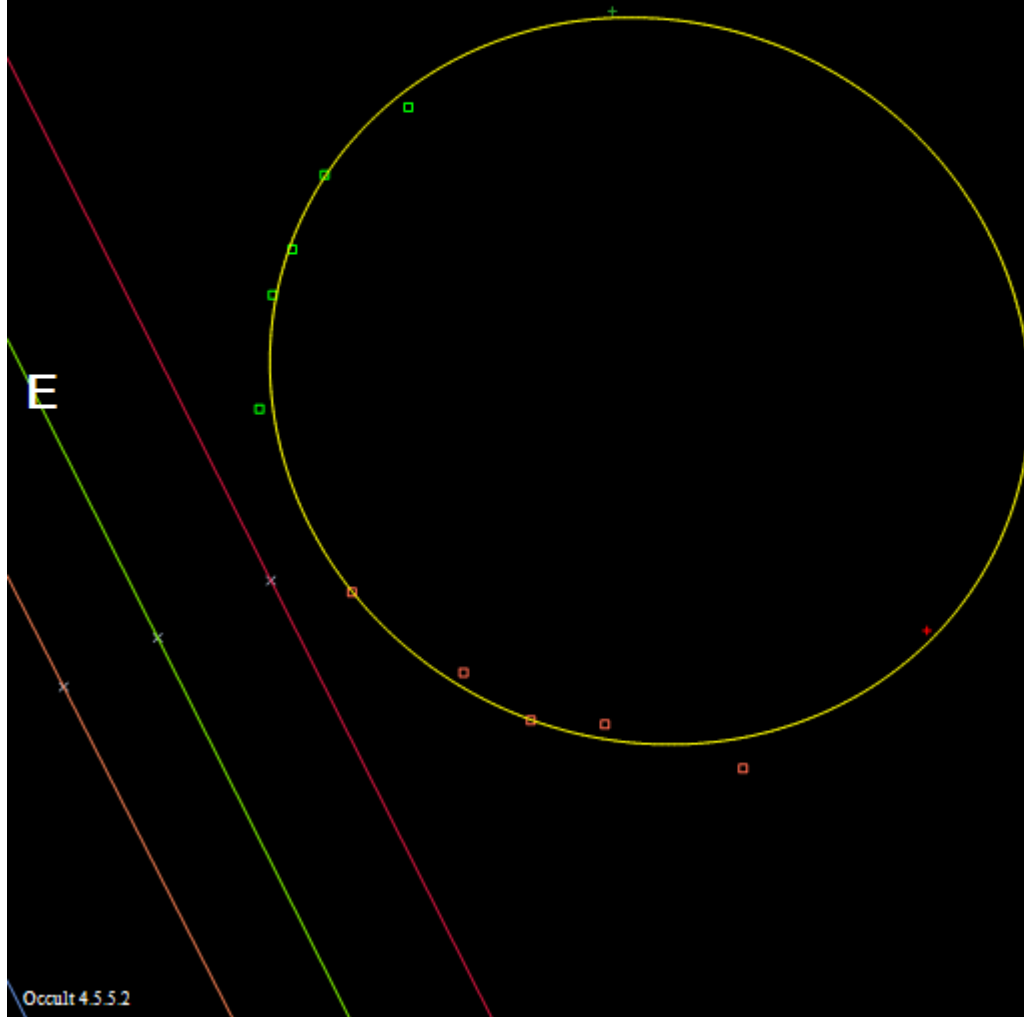
747Winchester2008May01

(747) Winchester 2008 May 1 $202.4 \pm 6.9 \times 162.5 \pm 9.7$ km, PA $78.7^\circ \pm 13.6^\circ$
Geocentric X -507.3 ± 2.1 Y 4820.4 ± 2.9 km **N**



747Winchester2009Sep05

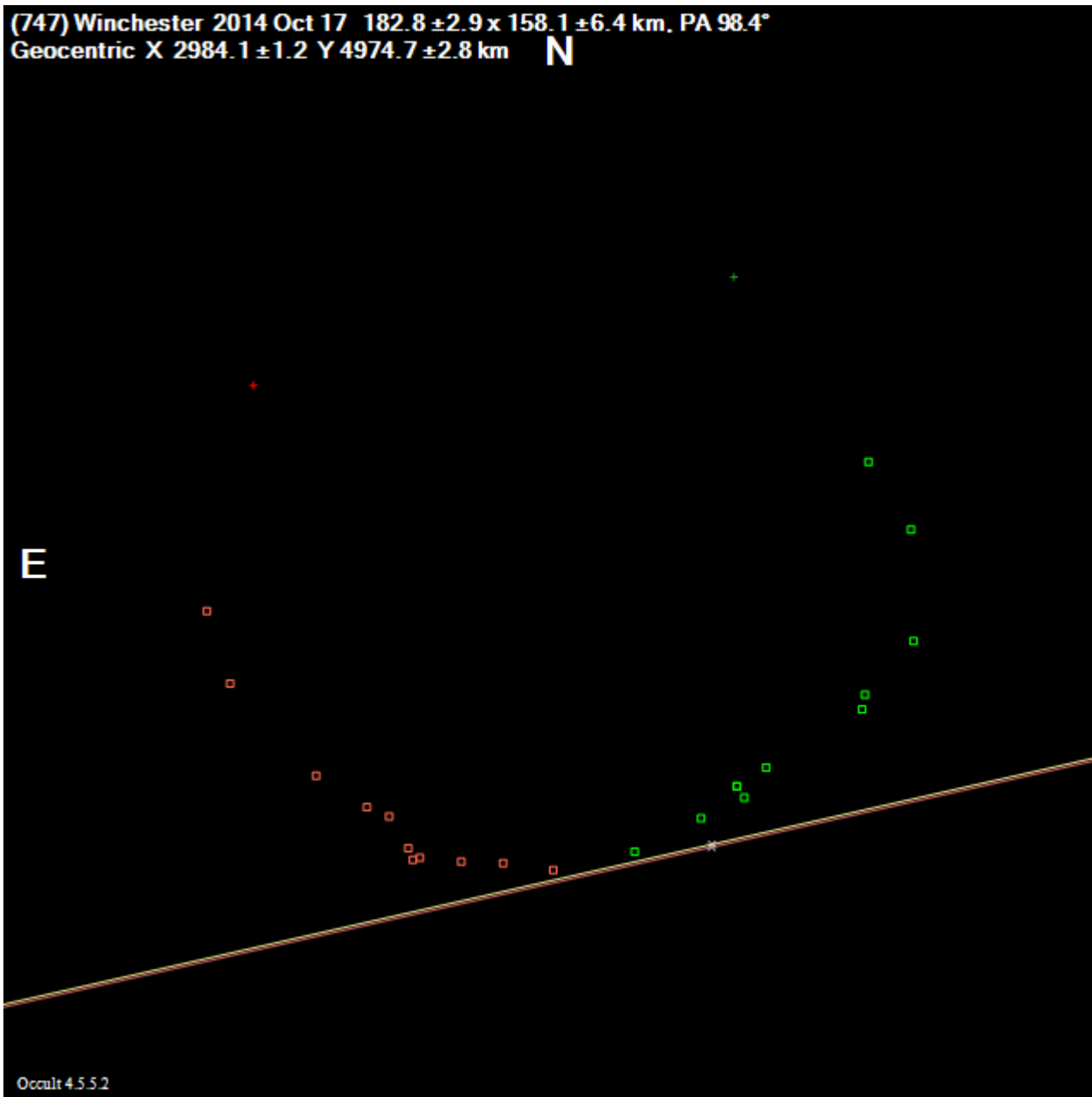
(747) Winchester 2009 Sep 5 $171.1 \pm 2.0 \times 159.7 \pm 2.4$ km, PA $65.3^\circ \pm 11.4^\circ$
Geocentric X 979.5 ± 1.4 Y -1019.0 ± 0.8 km **N**



Occult 4.5.5.2

747Winchester2014Oct17

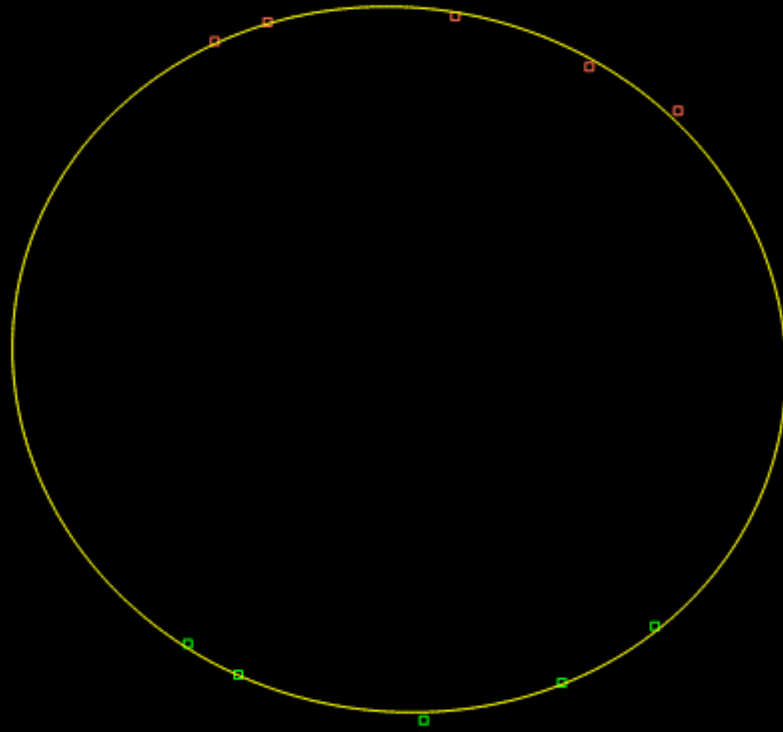
(747) Winchester 2014 Oct 17 $182.8 \pm 2.9 \times 158.1 \pm 6.4$ km, PA 98.4°
Geocentric X 2984.1 ± 1.2 Y 4974.7 ± 2.8 km **N**



747Winchester2016Jan19

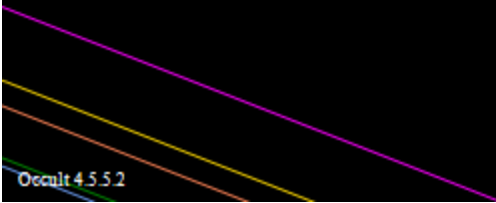
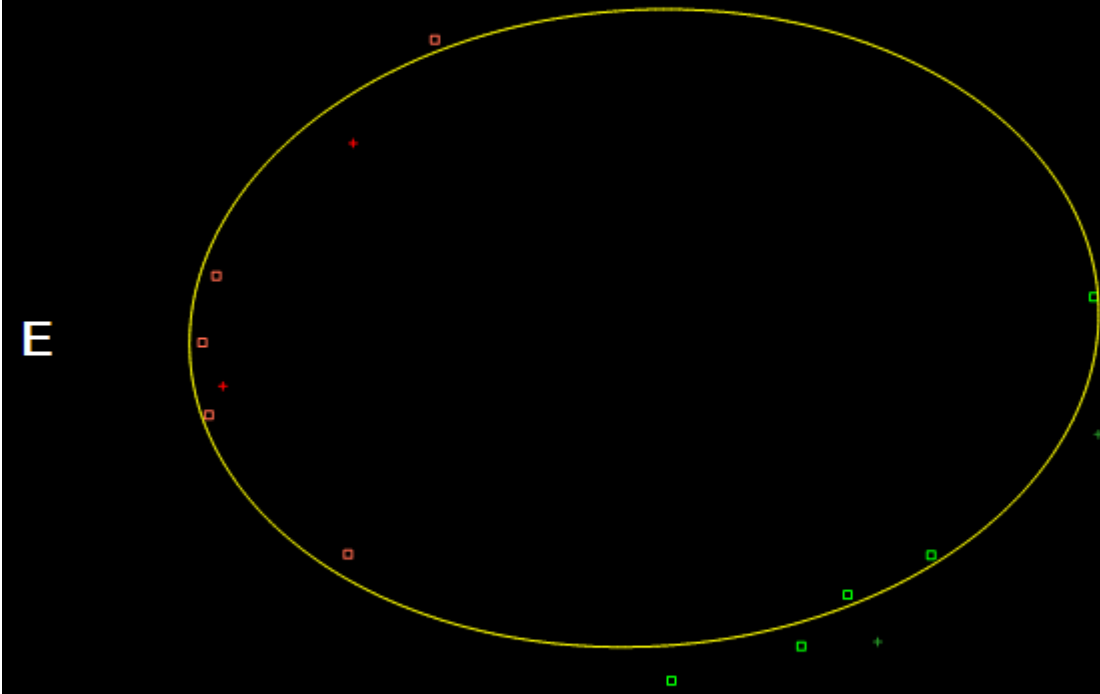
(747) Winchester 2016 Jan 19 $172.6 \pm 4.6 \times 156.5 \pm 1.3$ km, PA $80.0^\circ \pm 4.1^\circ$
Geocentric X -1663.1 ± 0.9 Y 3268.5 ± 0.4 km **N**

E



747Winchester2016Mar22

(747) Winchester 2016 Mar 22 $202.5 \pm 4.7 \times 141.6 \pm 6.3$ km, PA $93.7^\circ \pm 5.0^\circ$
Geocentric X 4691.9 ± 2.3 Y 2979.8 ± 2.5 km **N**



74Galatea2002Jan12

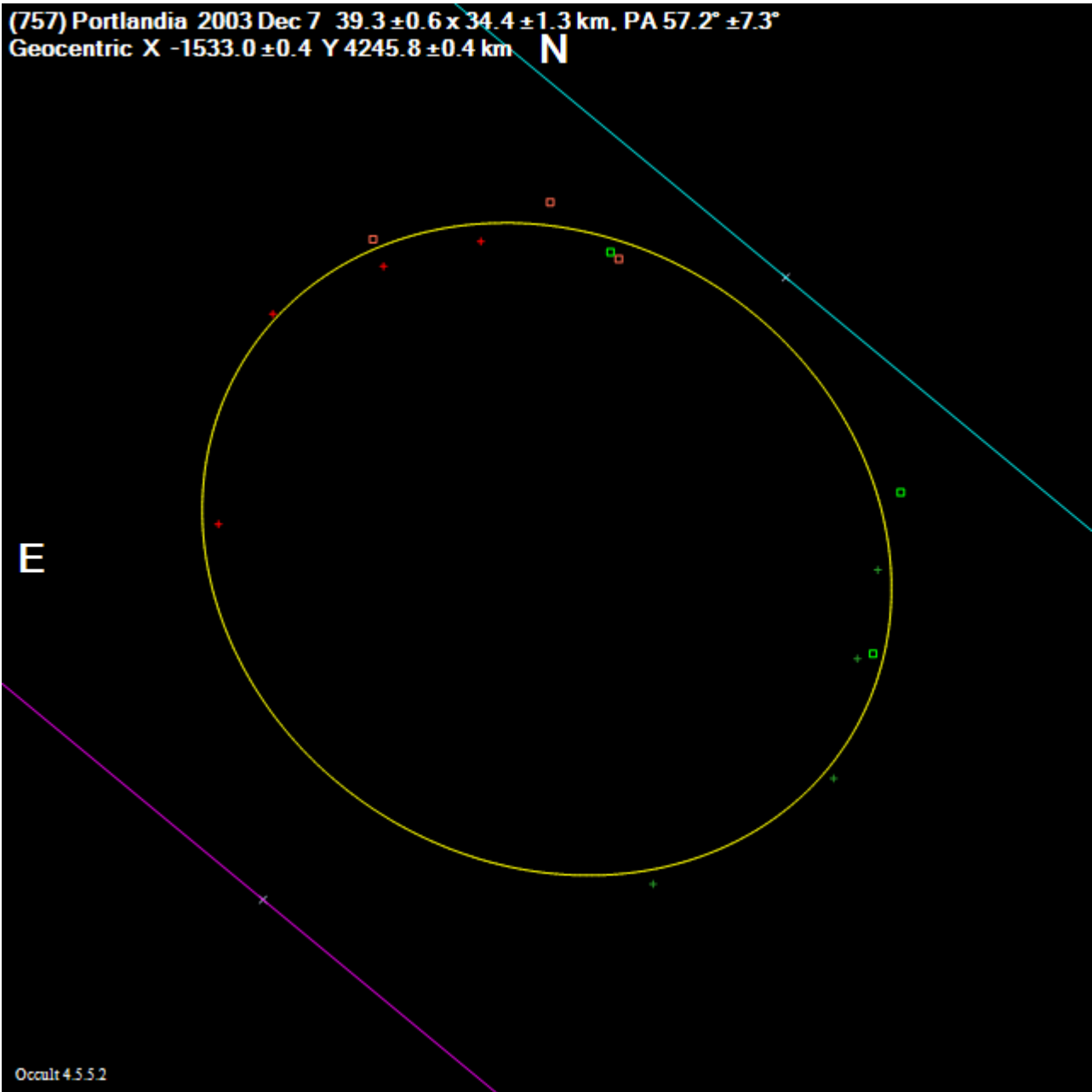
(74) Galatea 2002 Jan 12 $101.3 \pm 2.7 \times 94.5 \pm 1.2$ km, PA $13.7^\circ \pm 19.1^\circ$
Geocentric X 2739.7 ± 0.7 Y 3372.6 ± 1.4 km **N**



Occult 4.5.5.2

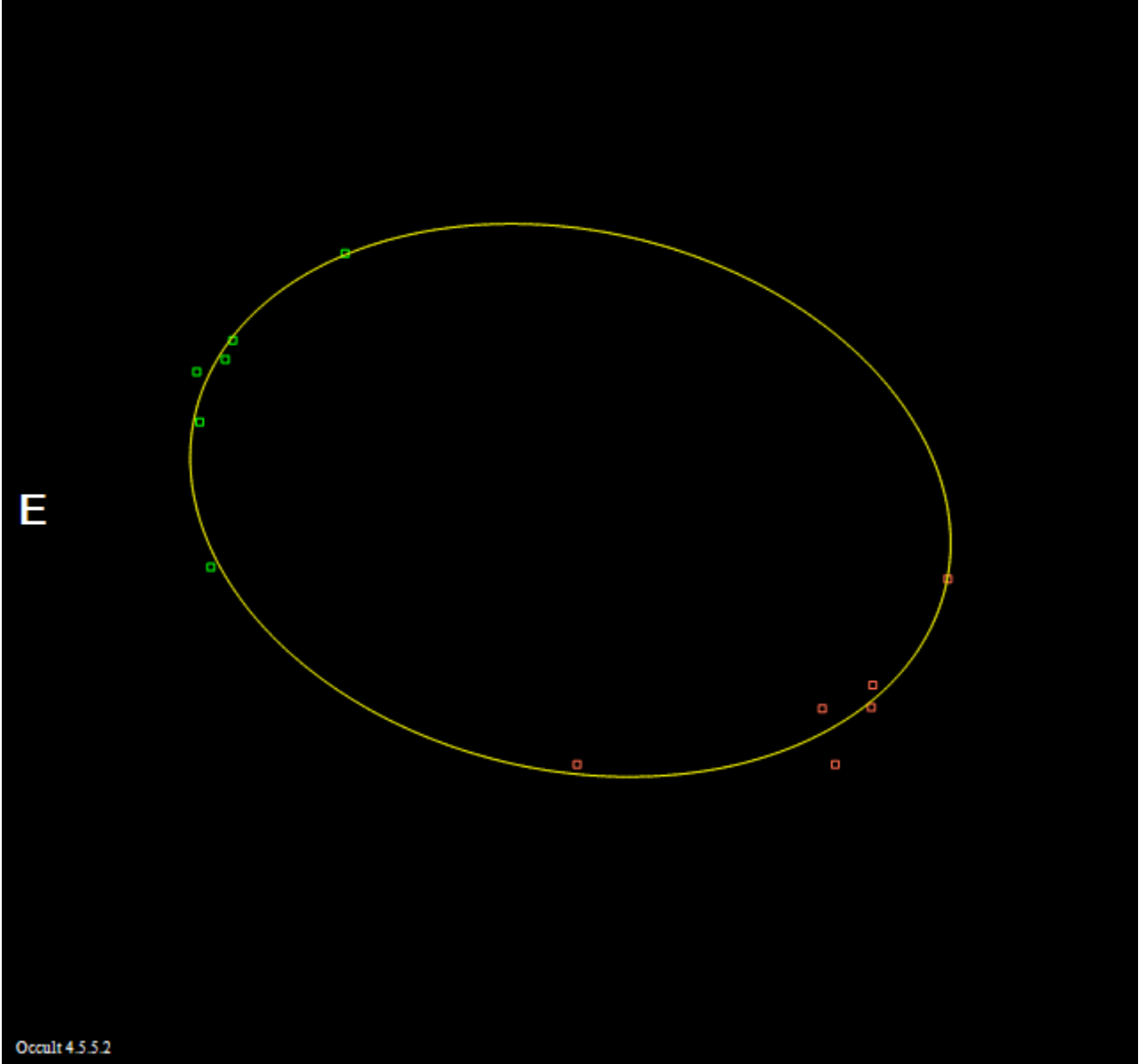
757Portlandia2003Dec07

(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 **N**



760Massinga2012Feb29

(760) Massinga 2012 Feb 29 $80.2 \pm 0.7 \times 56.2 \pm 1.8$ km, PA $77.2^\circ \pm 2.2^\circ$
Geocentric X -3710.9 ± 0.5 Y 4464.4 ± 0.5 km **N**

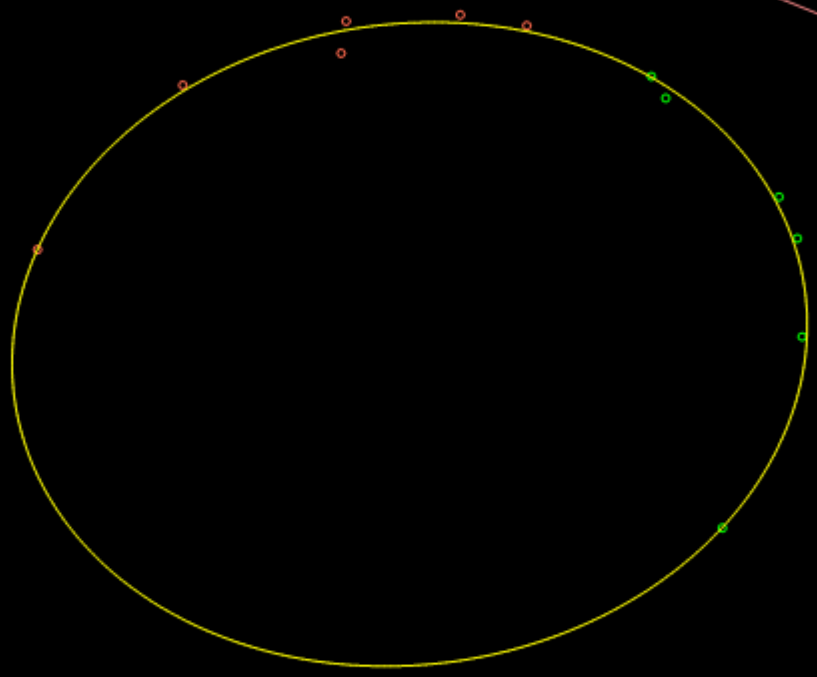


76Freia2007Jan14

(76) Freia 2007 Jan 14 $131.7 \pm 2.5 \times 164.0 \pm 2.0$ km, PA $7.9^\circ \pm 3.4^\circ$
Geocentric X 2697.6 ± 1.0 Y 3379.8 ± 1.4 km

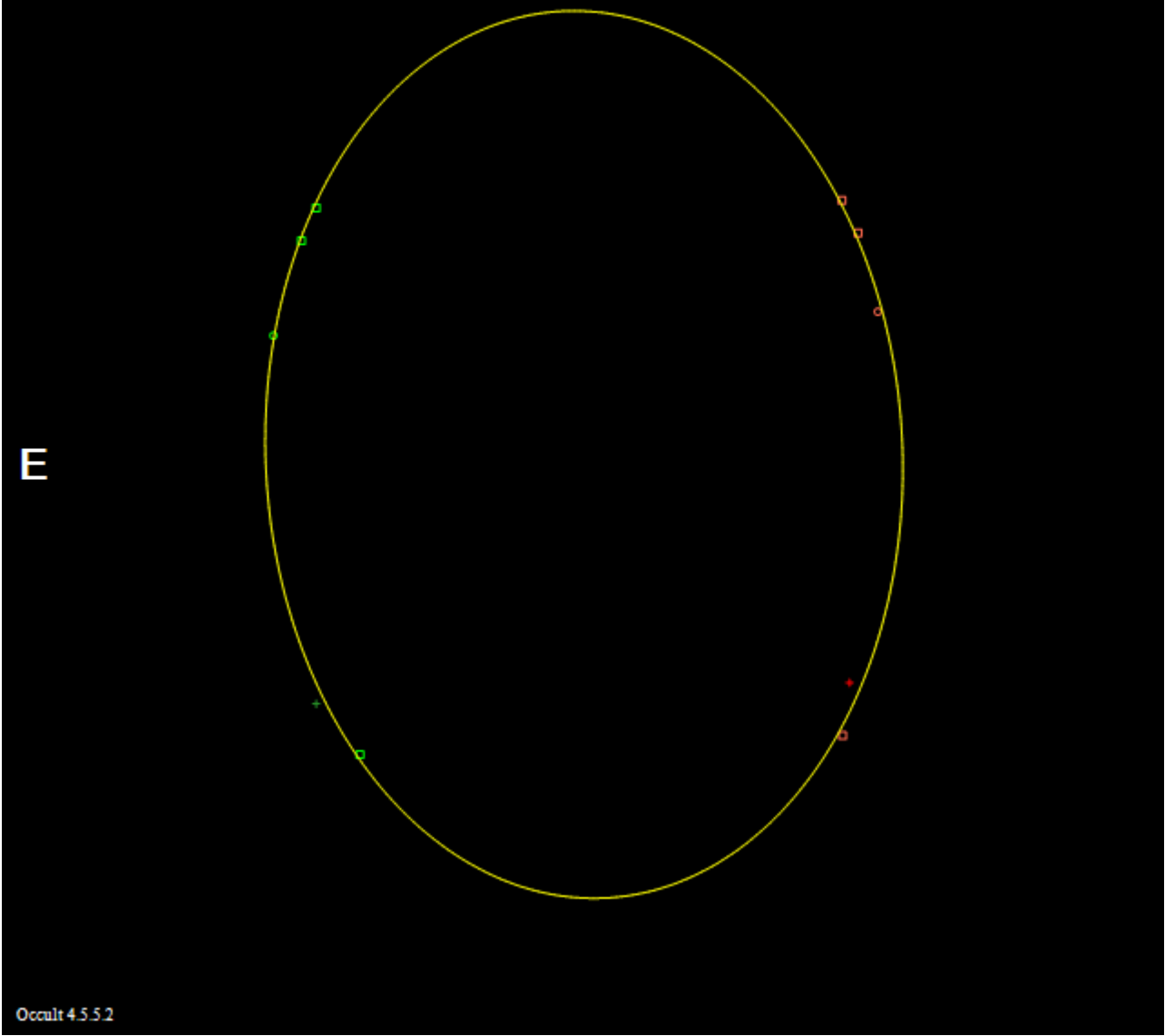
N

E



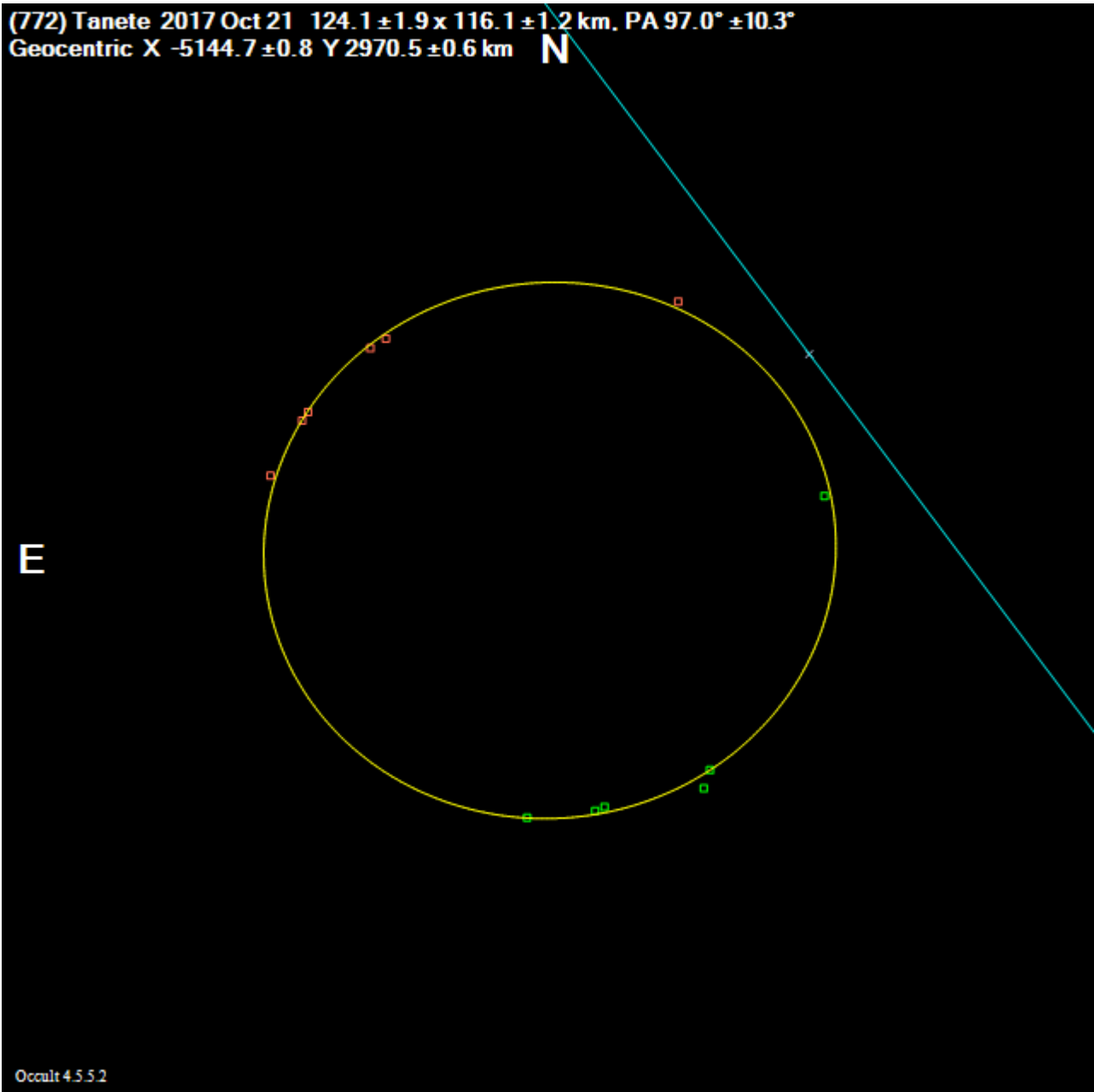
76Freia2008Jan17

(76) Freia 2008 Jan 17 $201.2 \pm 3.8 \times 144.3 \pm 1.2$ km, PA $2.7^\circ \pm 0.5^\circ$
Geocentric X -3791.9 ± 0.2 Y 3309.0 ± 0.7 km **N**



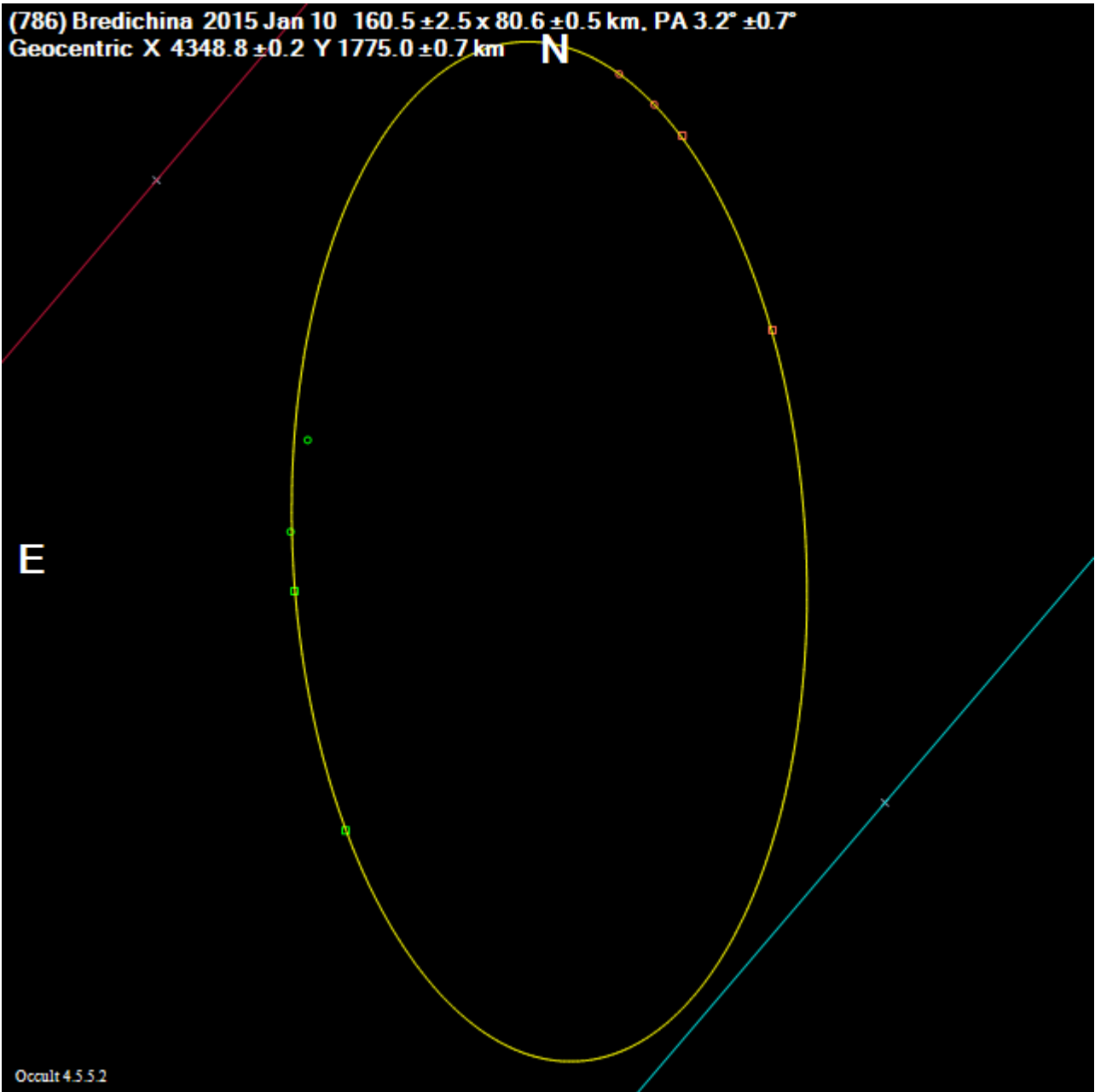
772Tanete2017Oct21

(772) Tanete 2017 Oct 21 $124.1 \pm 1.9 \times 116.1 \pm 1.2$ km, PA $97.0^\circ \pm 10.3^\circ$
Geocentric X -5144.7 ± 0.8 Y 2970.5 ± 0.6 km **N**



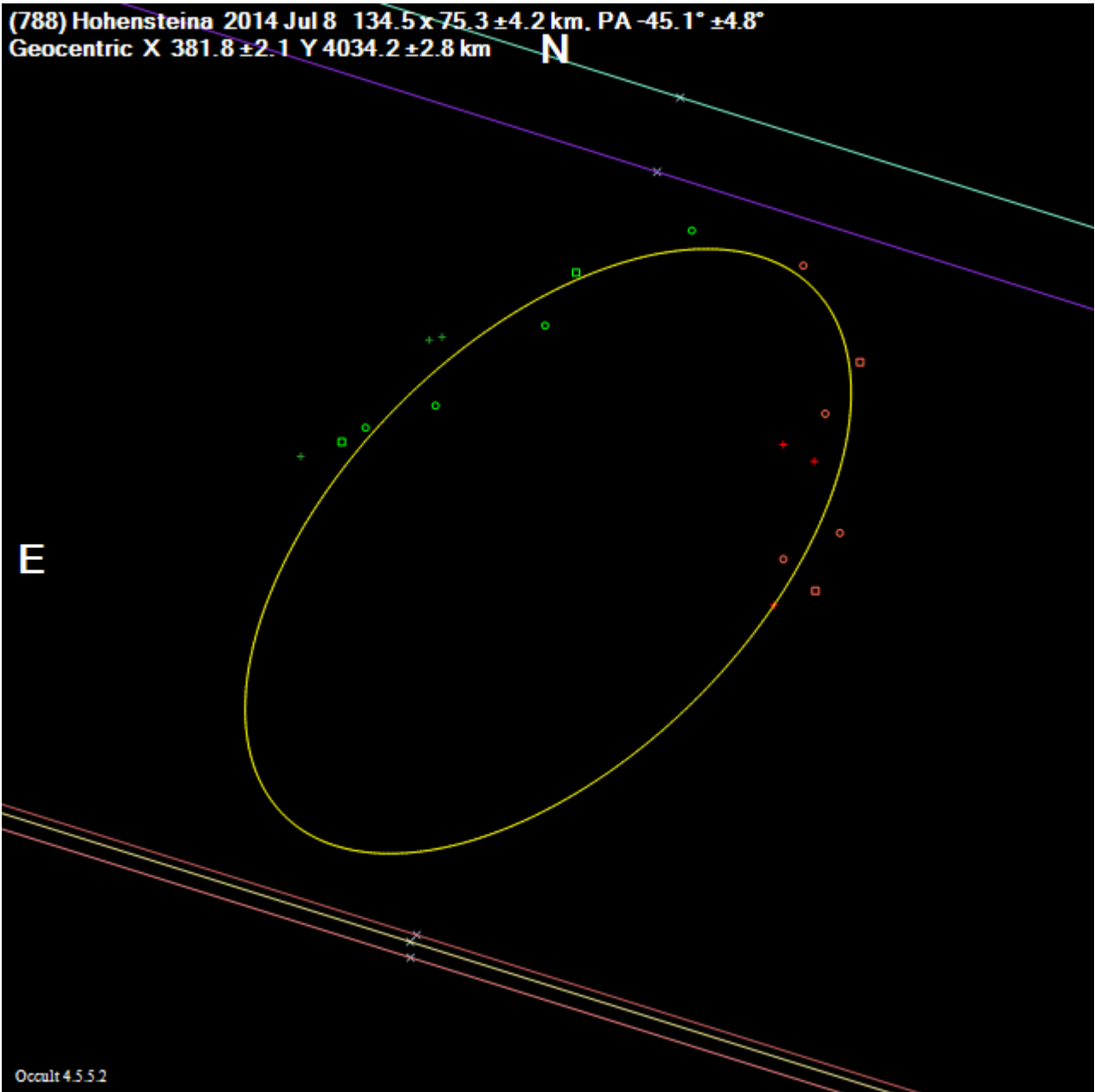
786Bredichina2015Jan10

(786) Bredichina 2015 Jan 10 $160.5 \pm 2.5 \times 80.6 \pm 0.5$ km, PA $3.2^\circ \pm 0.7^\circ$
Geocentric X 4348.8 ± 0.2 Y 1775.0 ± 0.7 km



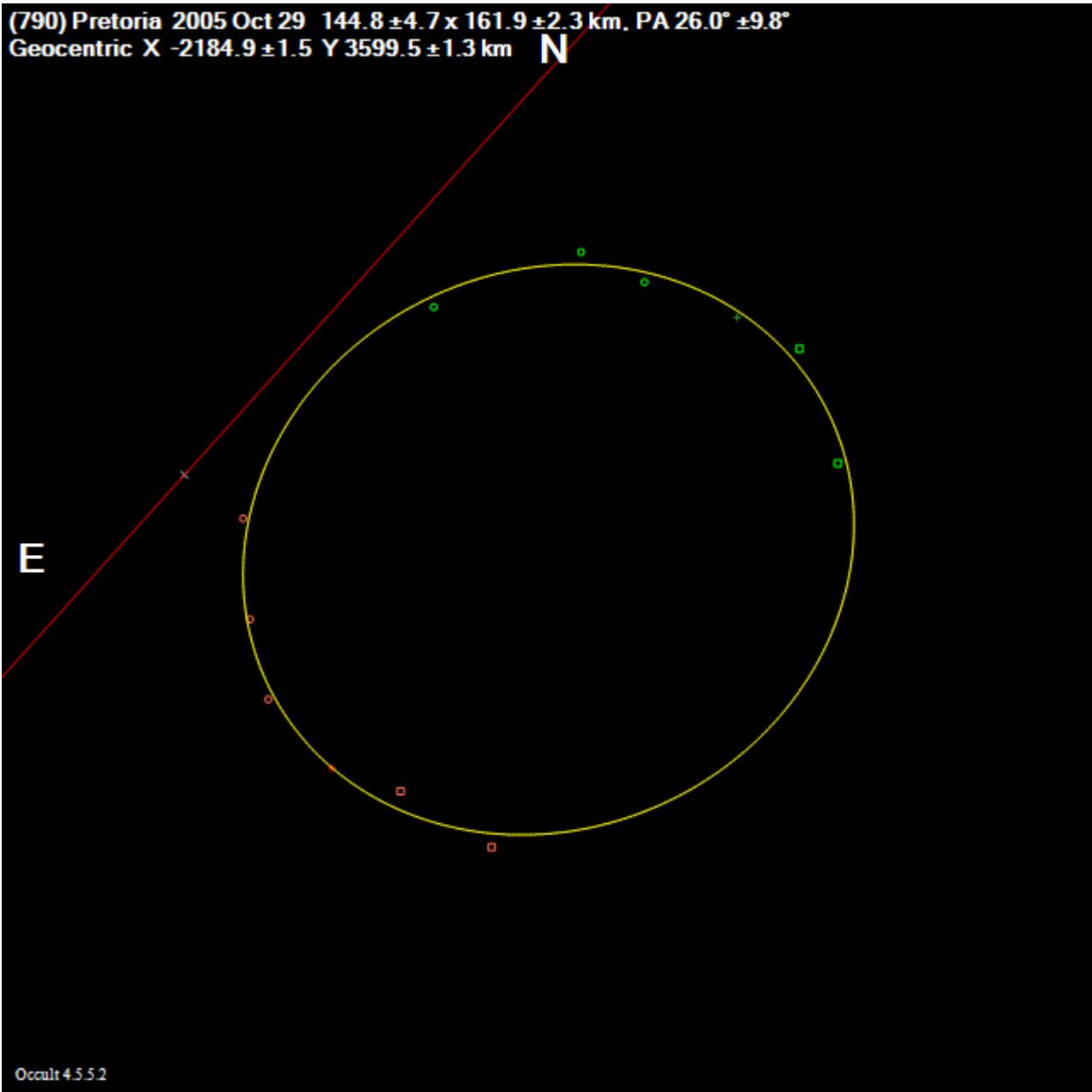
788Hohensteina2014Jul08

(788) Hohensteina 2014 Jul 8 134.5 x 75.3 ± 4.2 km, PA -45.1° ± 4.8°
Geocentric X 381.8 ± 2.1 Y 4034.2 ± 2.8 km



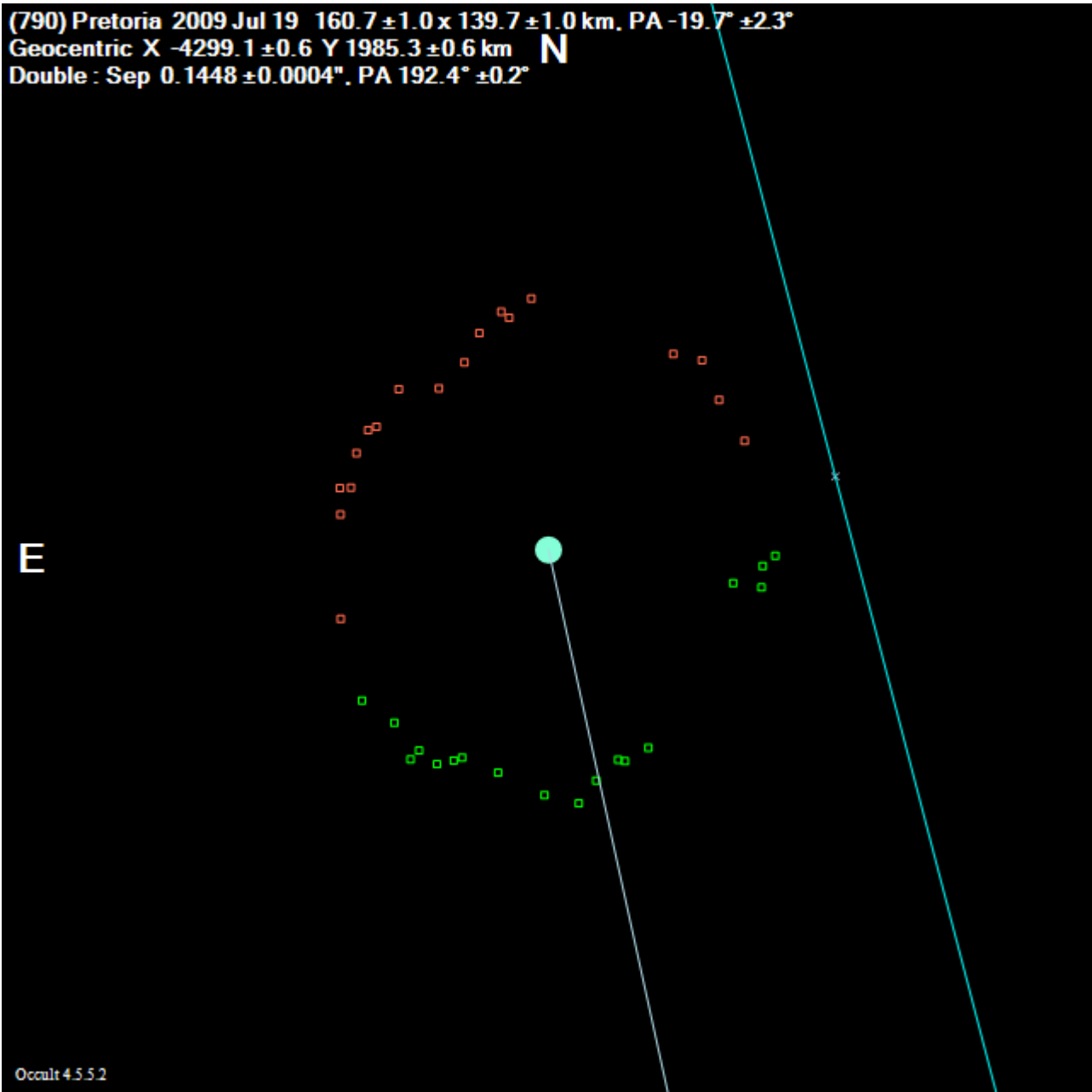
790Pretoria2005Oct29

(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**



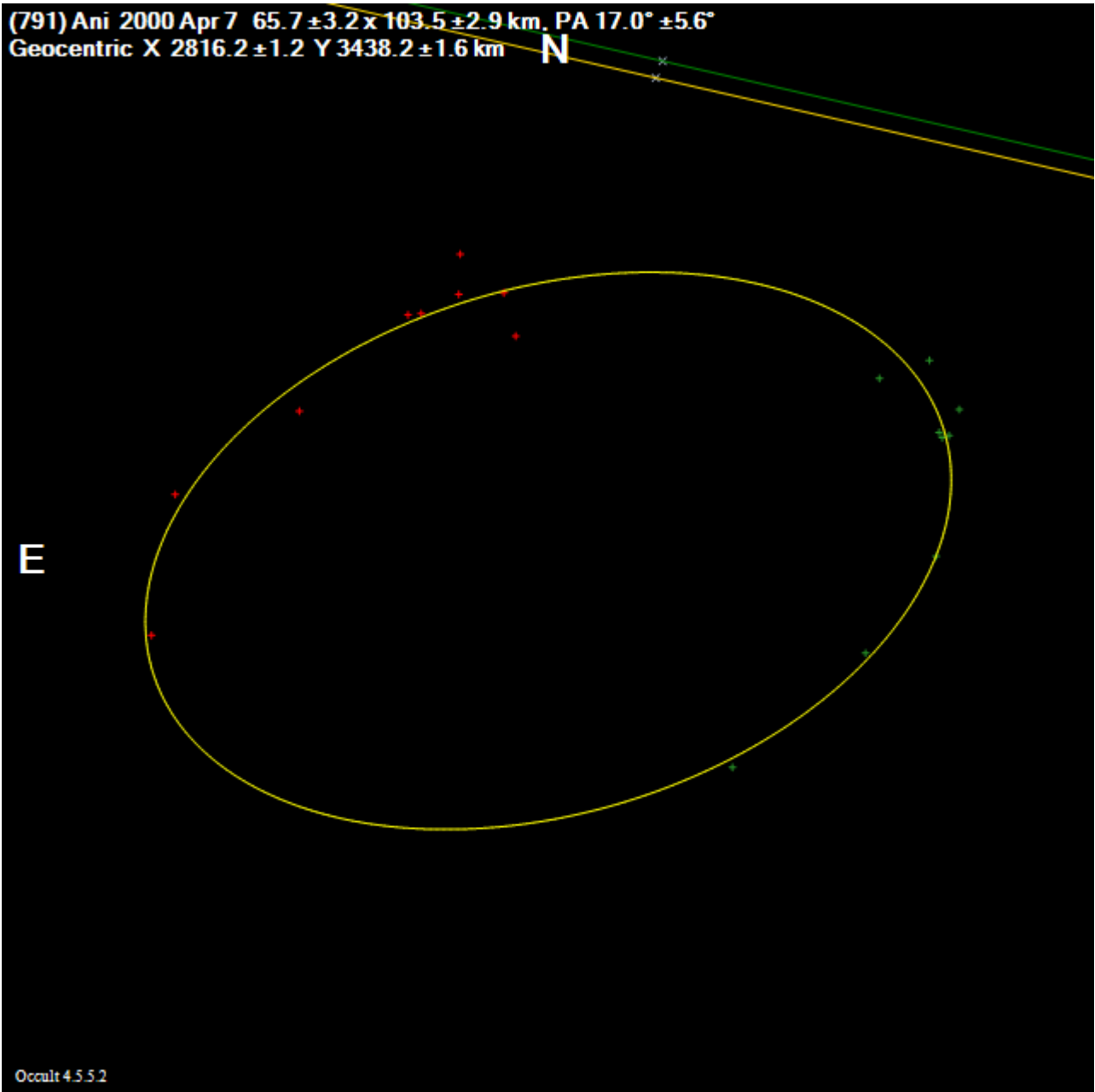
790Pretoria2009Jul19

(790) Pretoria 2009 Jul 19 $160.7 \pm 1.0 \times 139.7 \pm 1.0$ km, PA $-19.7^\circ \pm 2.3^\circ$
Geocentric X -4299.1 ± 0.6 Y 1985.3 ± 0.6 km **N**
Double : Sep $0.1448 \pm 0.0004''$, PA $192.4^\circ \pm 0.2^\circ$



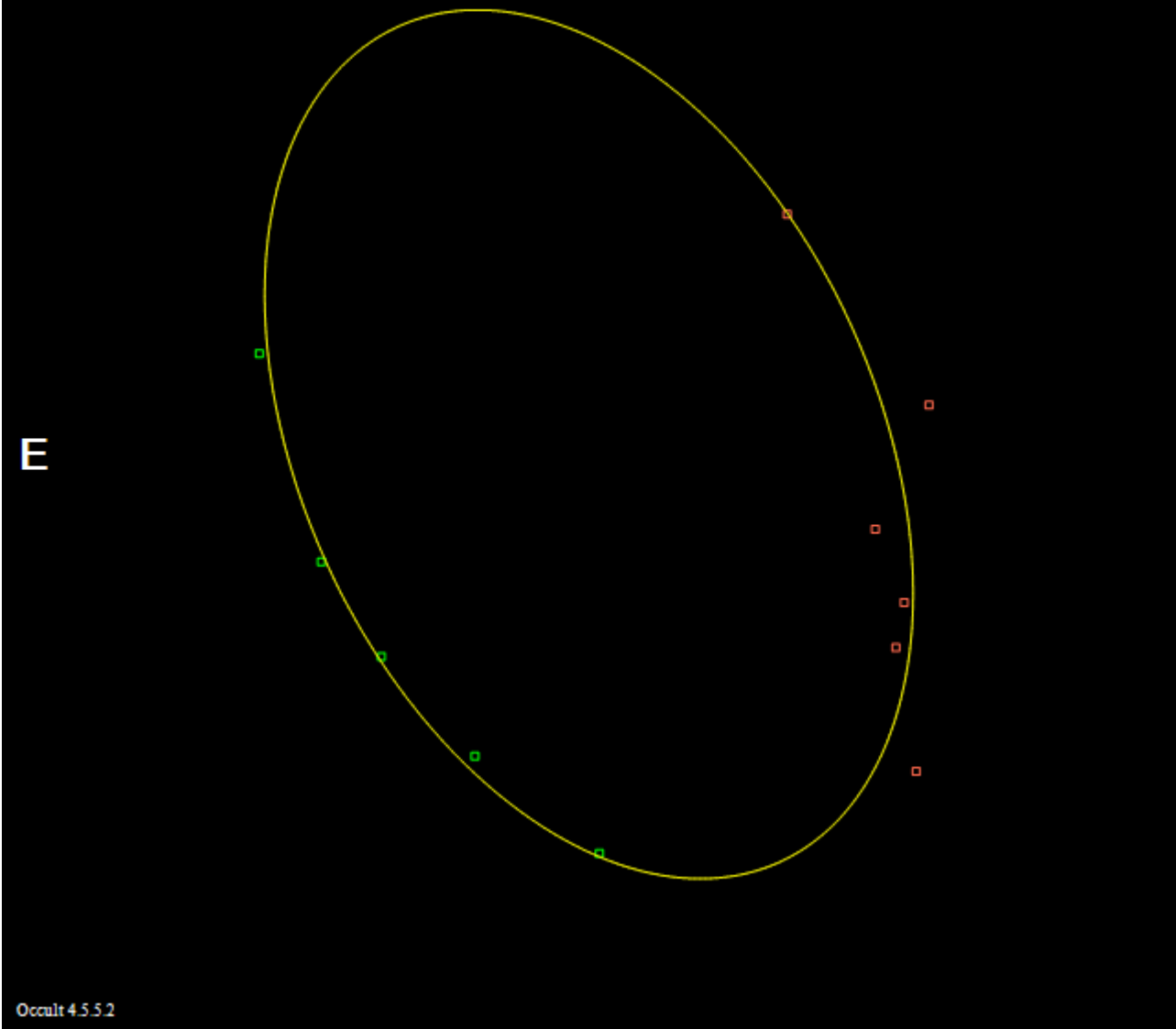
791Ani2000Apr07

(791) Ani 2000 Apr 7 $65.7 \pm 3.2 \times 103.5 \pm 2.9$ km, PA $17.0^\circ \pm 5.6^\circ$
Geocentric X 2816.2 ± 1.2 Y 3438.2 ± 1.6 km



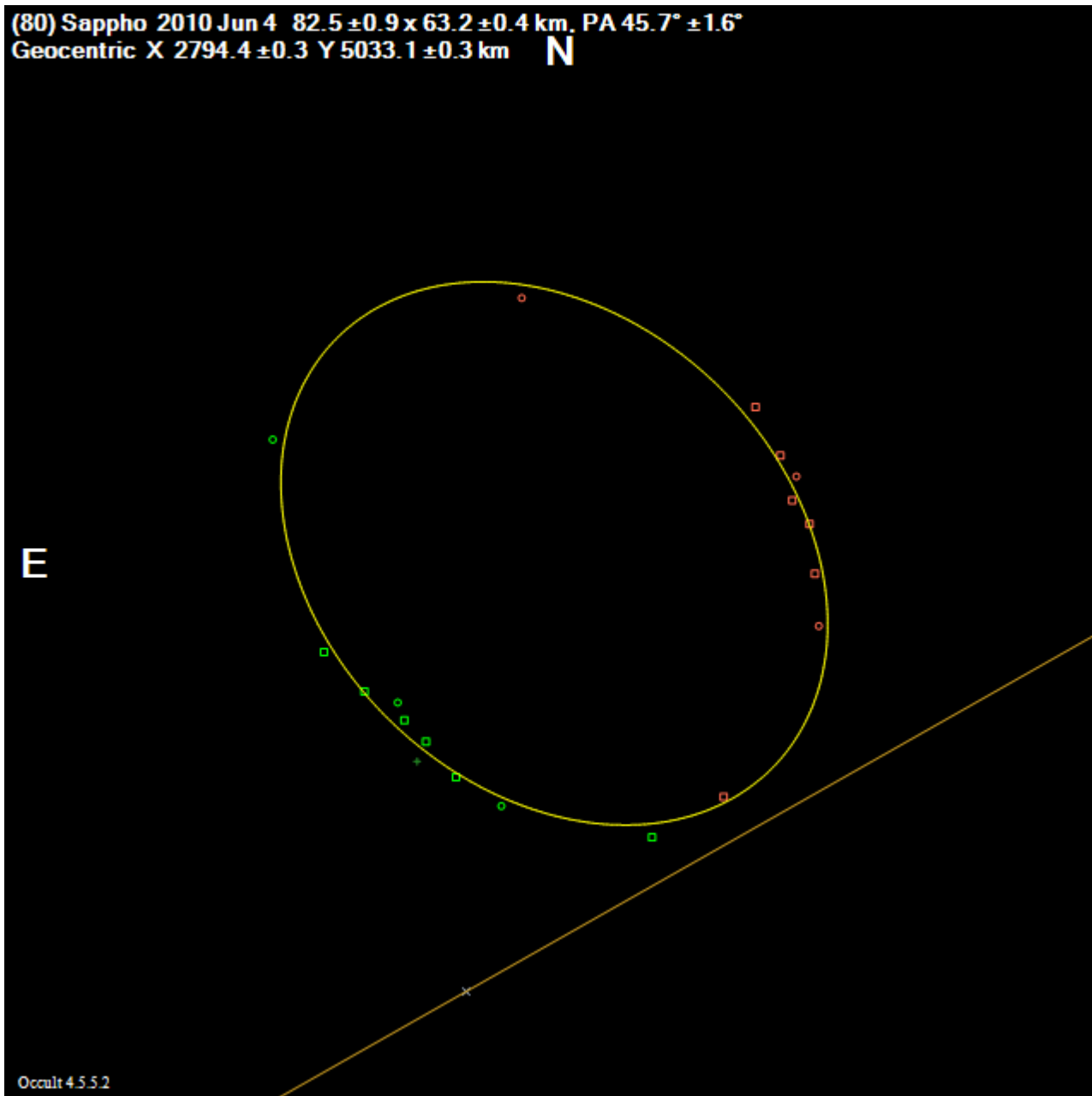
7Iris2011Feb19

(7) Iris 2011 Feb 19 $259.5 \pm 14.6 \times 162.7 \pm 2.8$ km, PA $24.6^\circ \pm 1.8^\circ$
Geocentric X 1528.3 ± 2.4 Y 4093.7 ± 5.5 km **N**



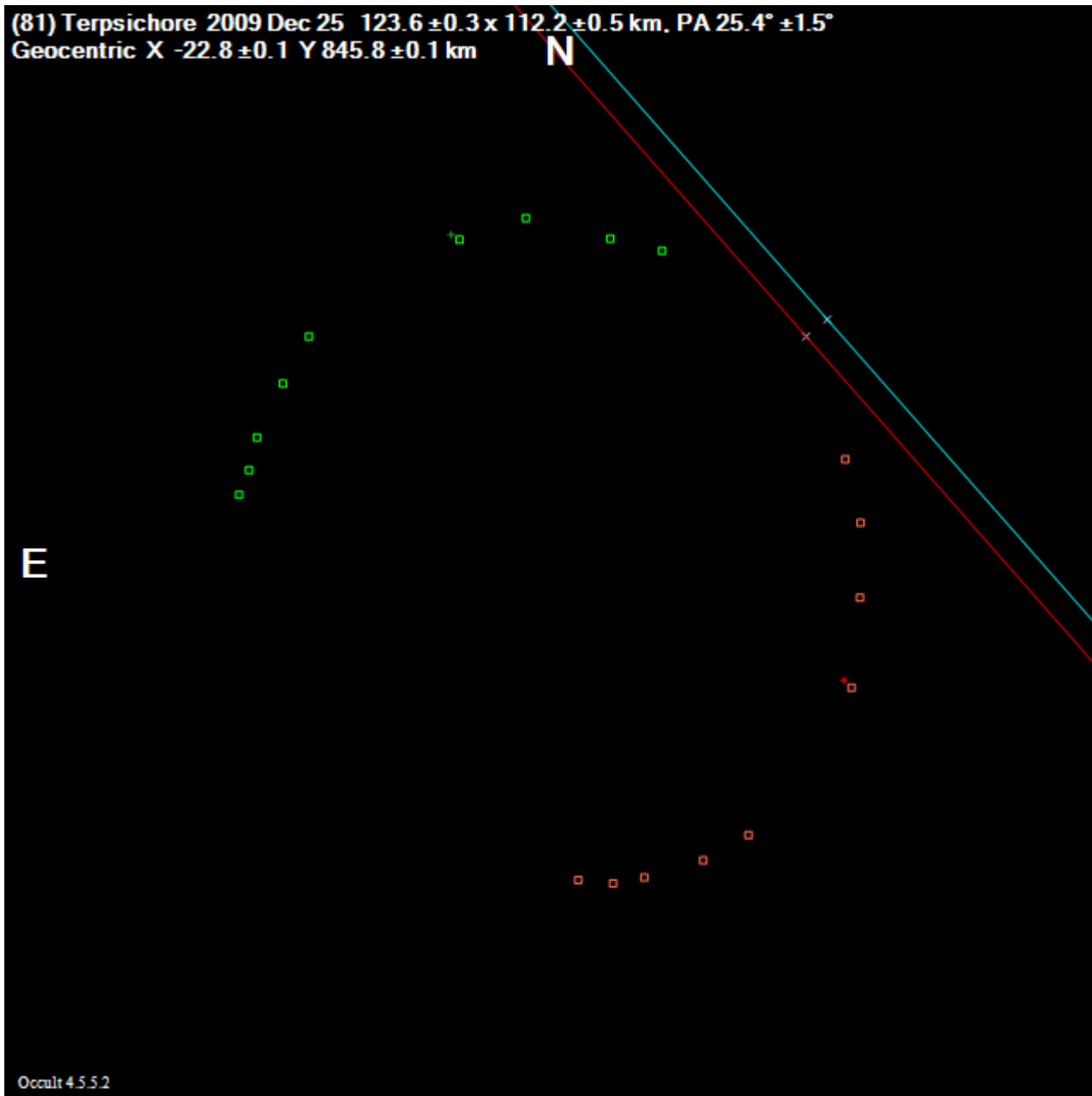
80Sappho2010Jun04

(80) Sappho 2010 Jun 4 $82.5 \pm 0.9 \times 63.2 \pm 0.4$ km, PA $45.7^\circ \pm 1.6^\circ$
Geocentric X 2794.4 ± 0.3 Y 5033.1 ± 0.3 km **N**



81Terpsichore2009Dec25

(81) Terpsichore 2009 Dec 25 $123.6 \pm 0.3 \times 112.2 \pm 0.5$ km, PA $25.4^\circ \pm 1.5^\circ$
Geocentric X -22.8 ± 0.1 Y 845.8 ± 0.1 km



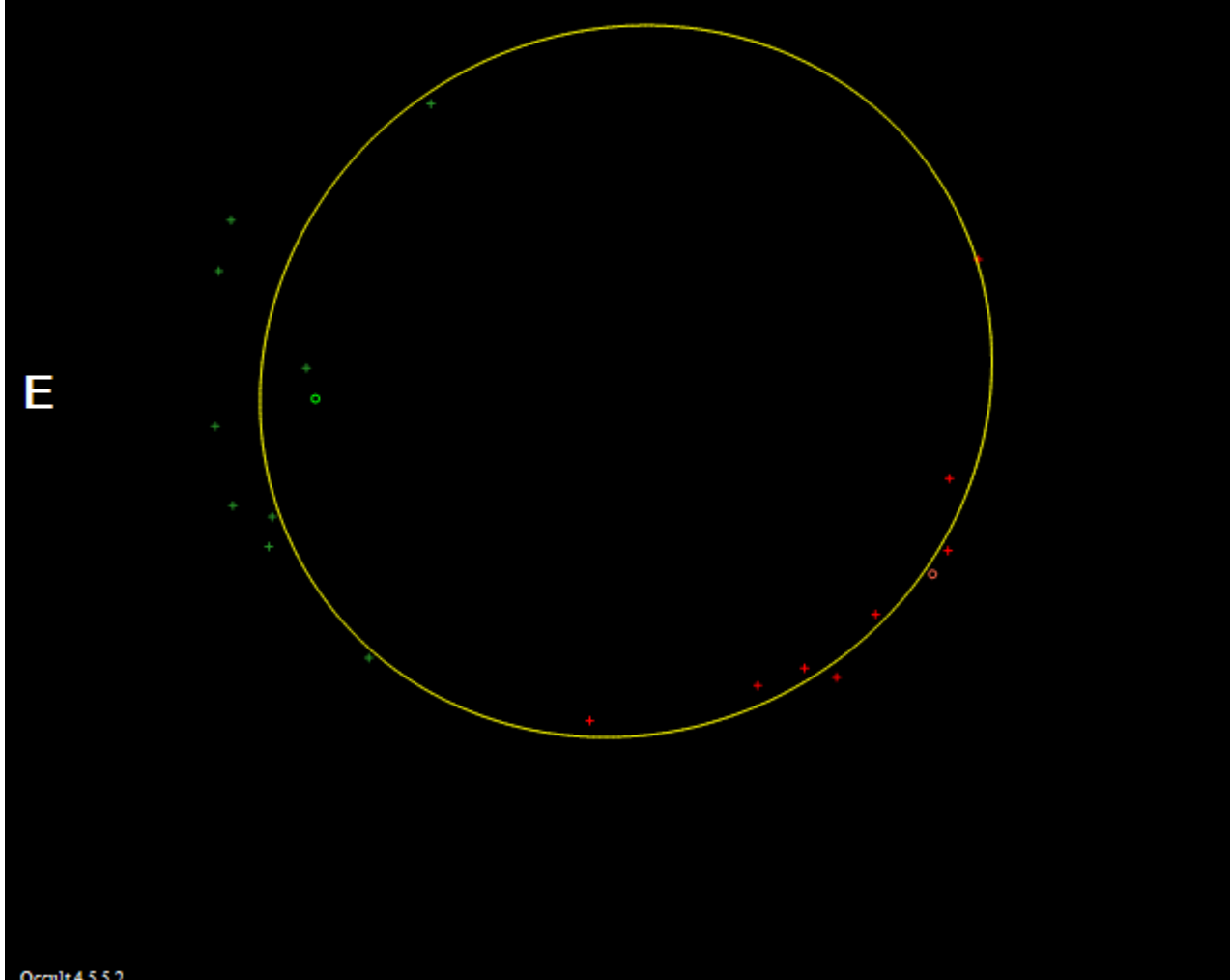
81Terpsichore2009Nov19

(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**



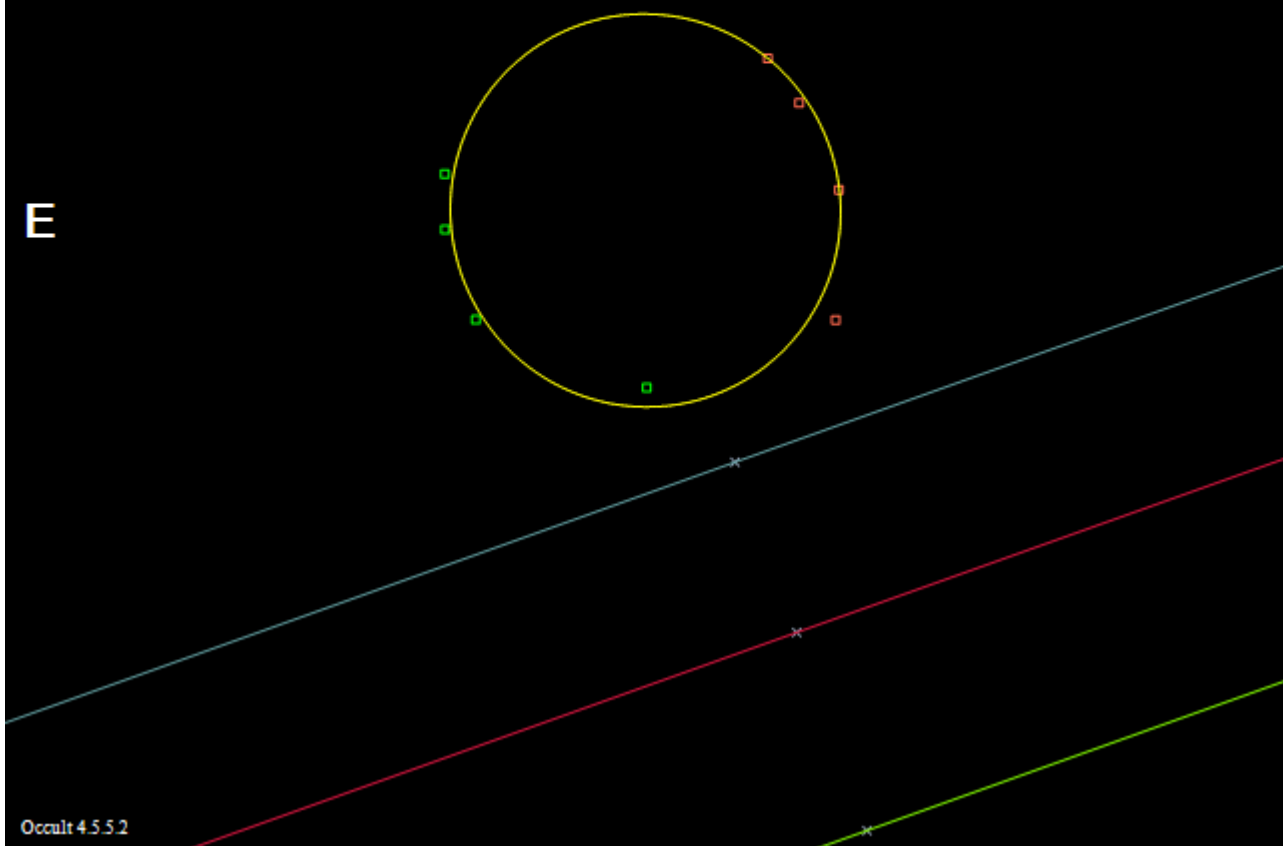
828Lindemania2002Nov10

(828) Lindemania 2002 Nov 10 $53.1 \pm 2.3 \times 49.9 \pm 1.8$ km, PA $-58.5^\circ \pm 35.4^\circ$
Geocentric X 772.6 ± 0.7 Y 1401.0 ± 1.0 km **N**



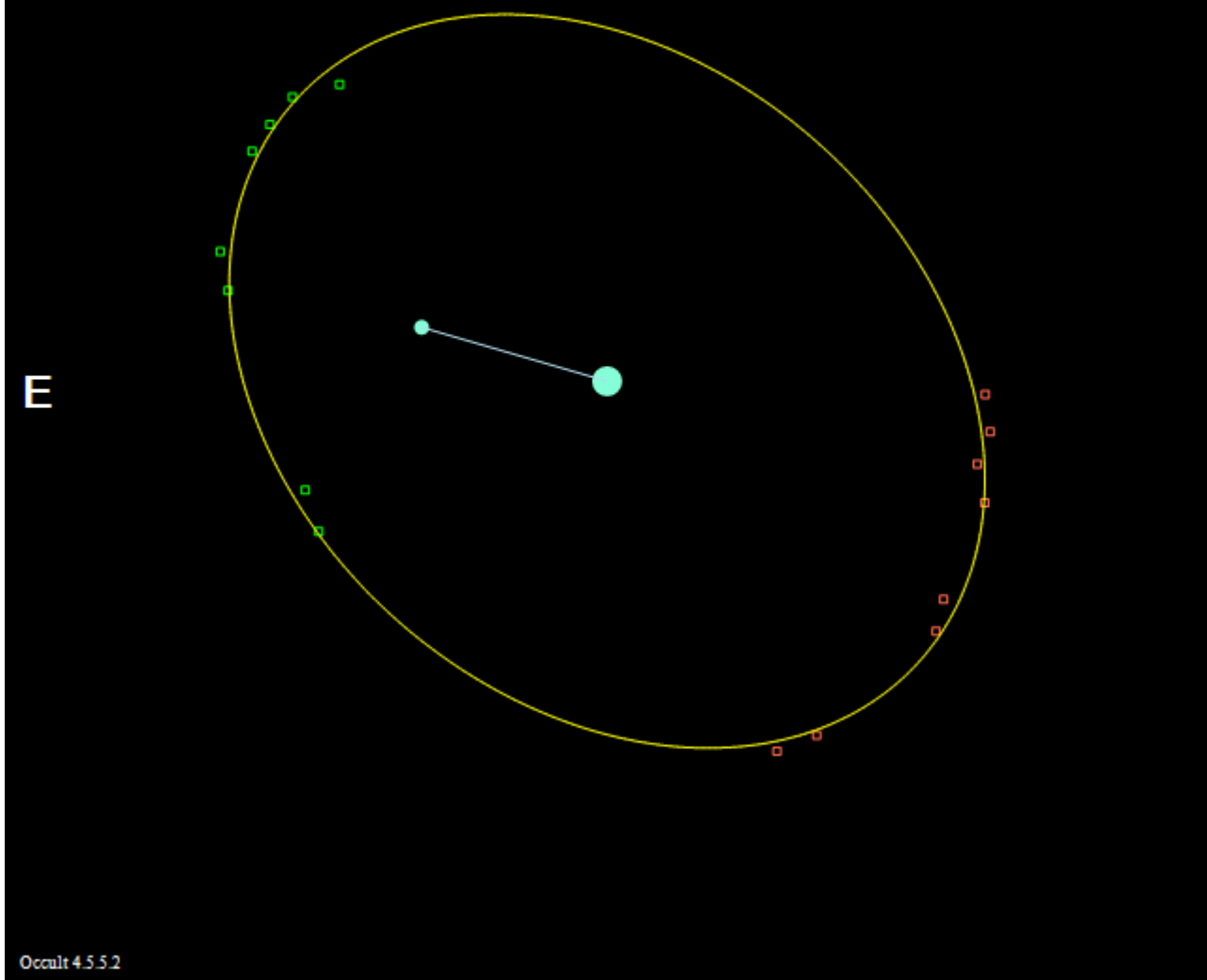
82Alkmene2014Sep18

(82) Alkmene 2014 Sep 18 $59.1 \pm 2.4 \times 58.5 \pm 1.0$ km, PA $24.0^\circ \pm 87.4^\circ$
Geocentric X 2686.0 ± 0.4 Y 5361.2 ± 0.8 km **N**



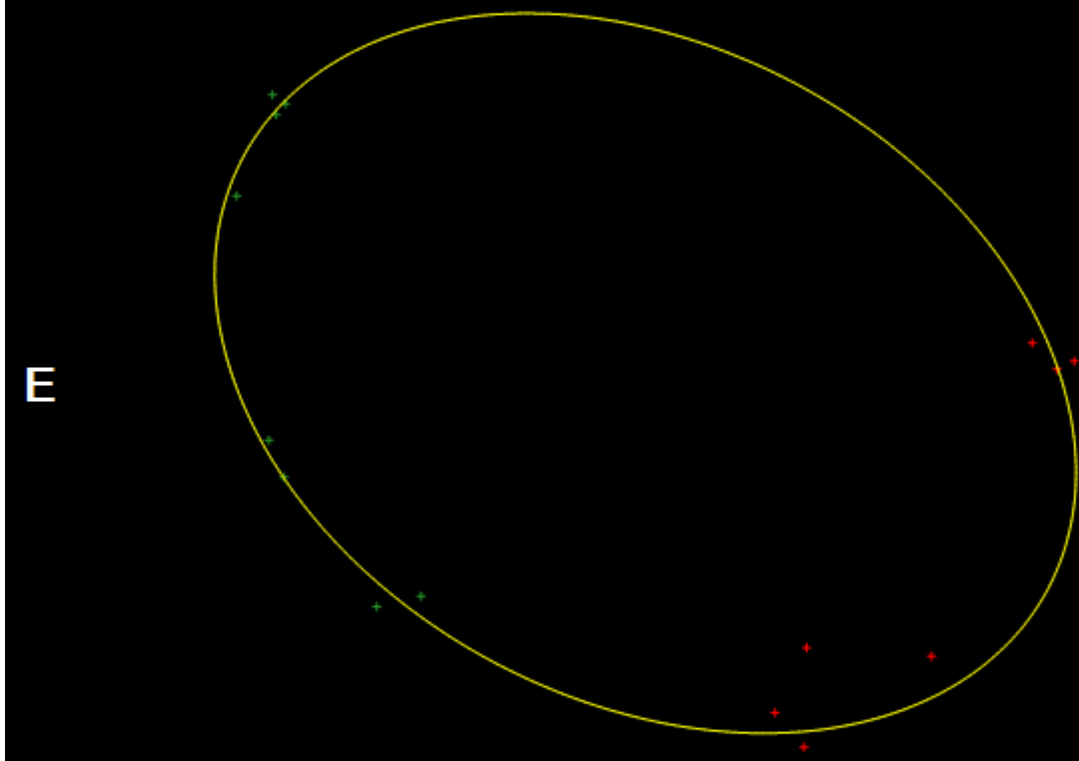
834Burnhamia2017Aug23

(834) Burnhamia 2017 Aug 23 $76.6 \pm 0.6 \times 58.1 \pm 1.7$ km, PA $48.1^\circ \pm 2.9^\circ$
Geocentric X -1907.9 ± 0.4 Y 4913.5 ± 0.6 km **N**
Double : Sep $0.0143 \pm 0.0004''$, PA $73.8^\circ \pm 2.7^\circ$



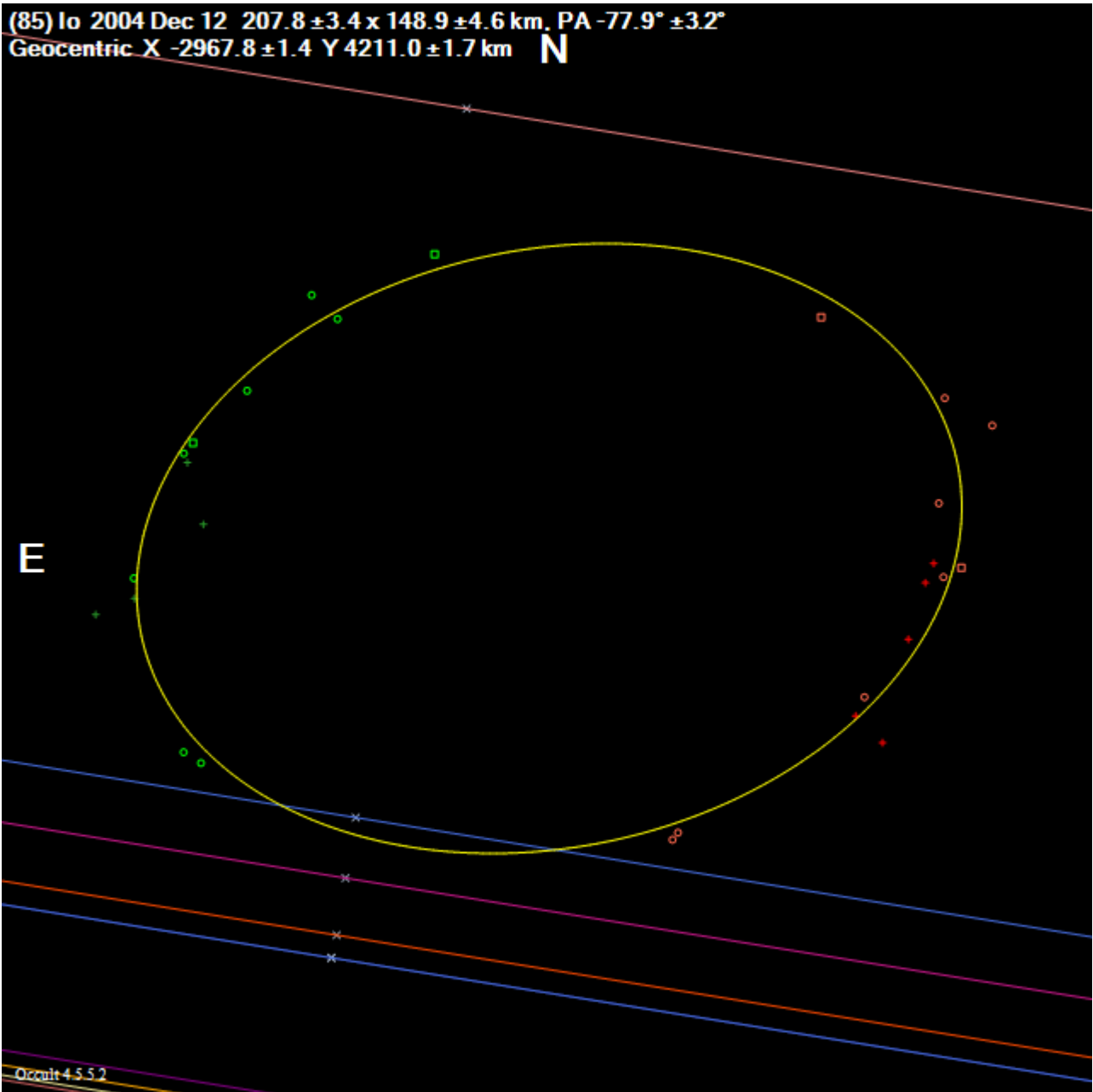
85Io1995Dec10

(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**



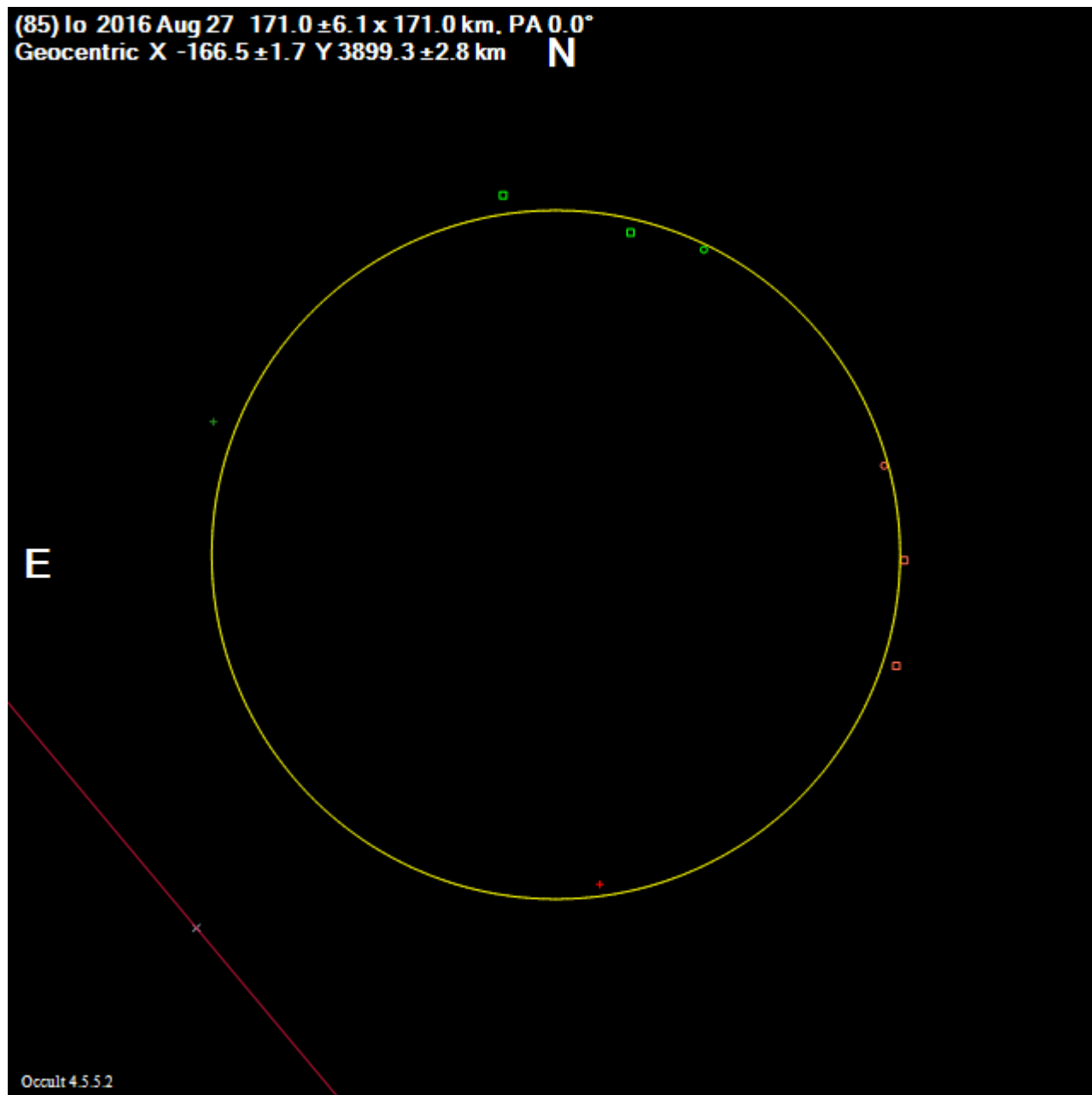
85Io2004Dec12

(85) Io 2004 Dec 12 $207.8 \pm 3.4 \times 148.9 \pm 4.6$ km, PA $-77.9^\circ \pm 3.2^\circ$
Geocentric X -2967.8 ± 1.4 Y 4211.0 ± 1.7 km **N**



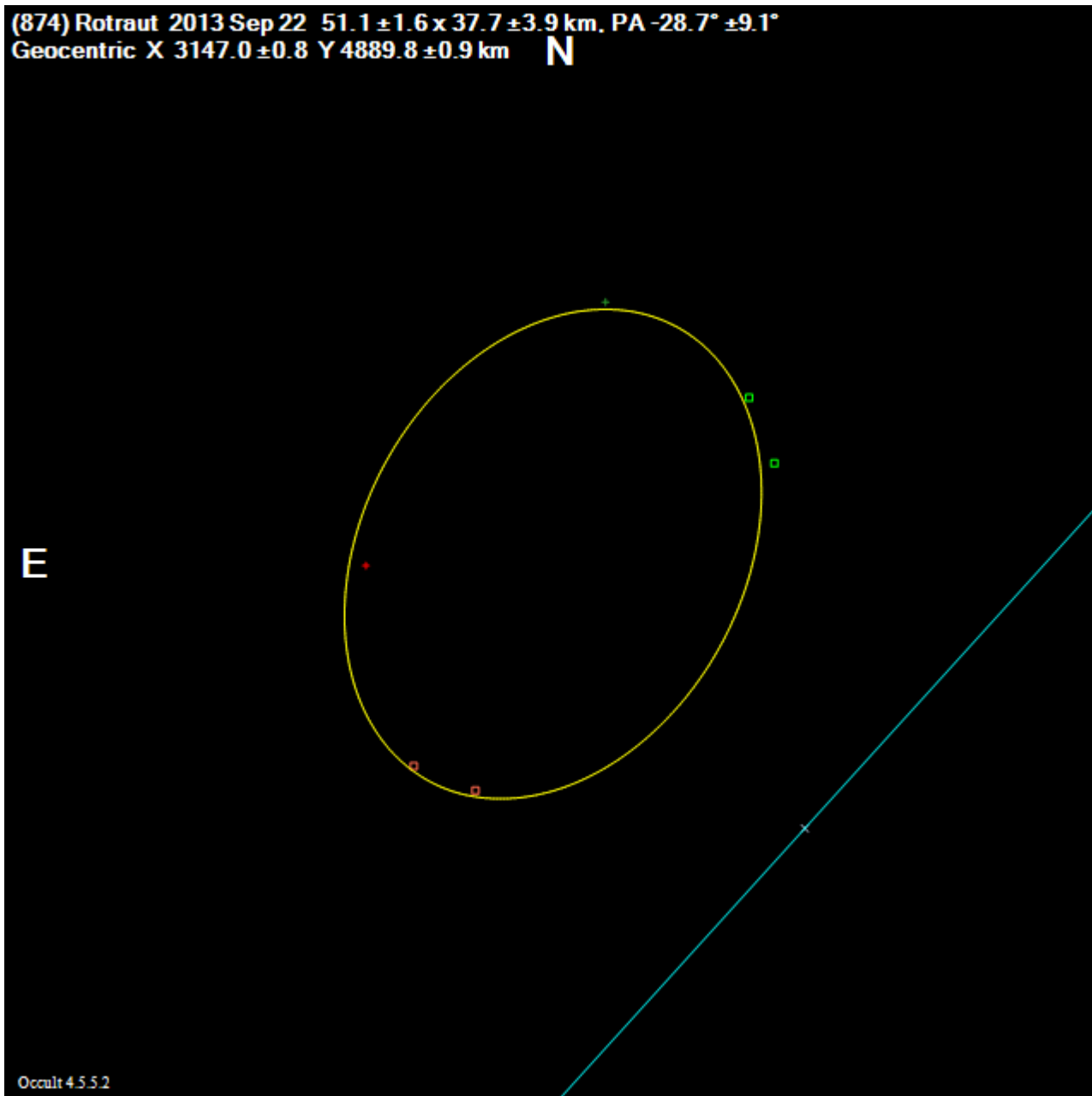
85Io2016Aug27

(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**



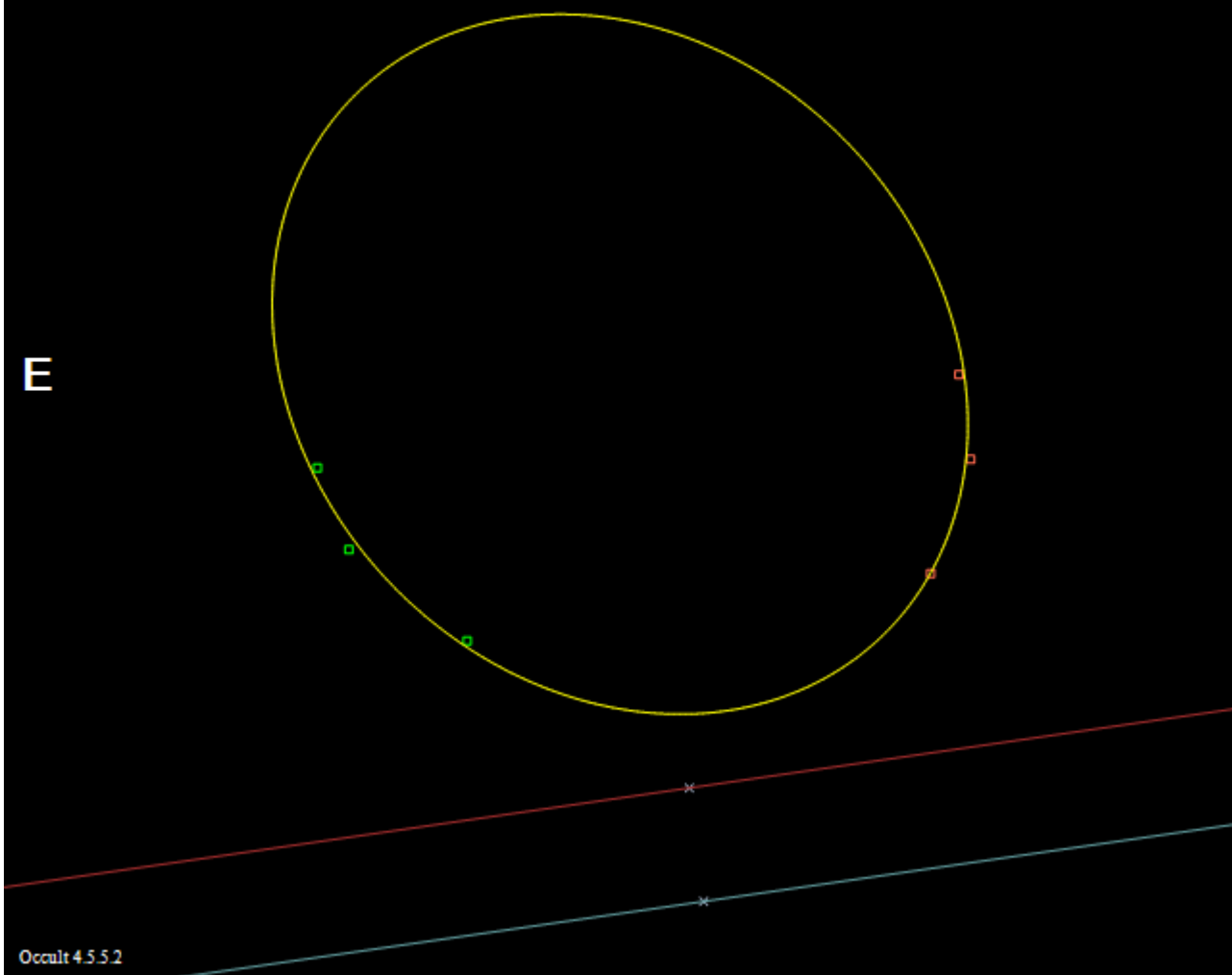
874Rotraut2013Sep22

(874) Rotraut 2013 Sep 22 $51.1 \pm 1.6 \times 37.7 \pm 3.9$ km, PA $-28.7^\circ \pm 9.1^\circ$
Geocentric X 3147.0 ± 0.8 Y 4889.8 ± 0.9 km **N**



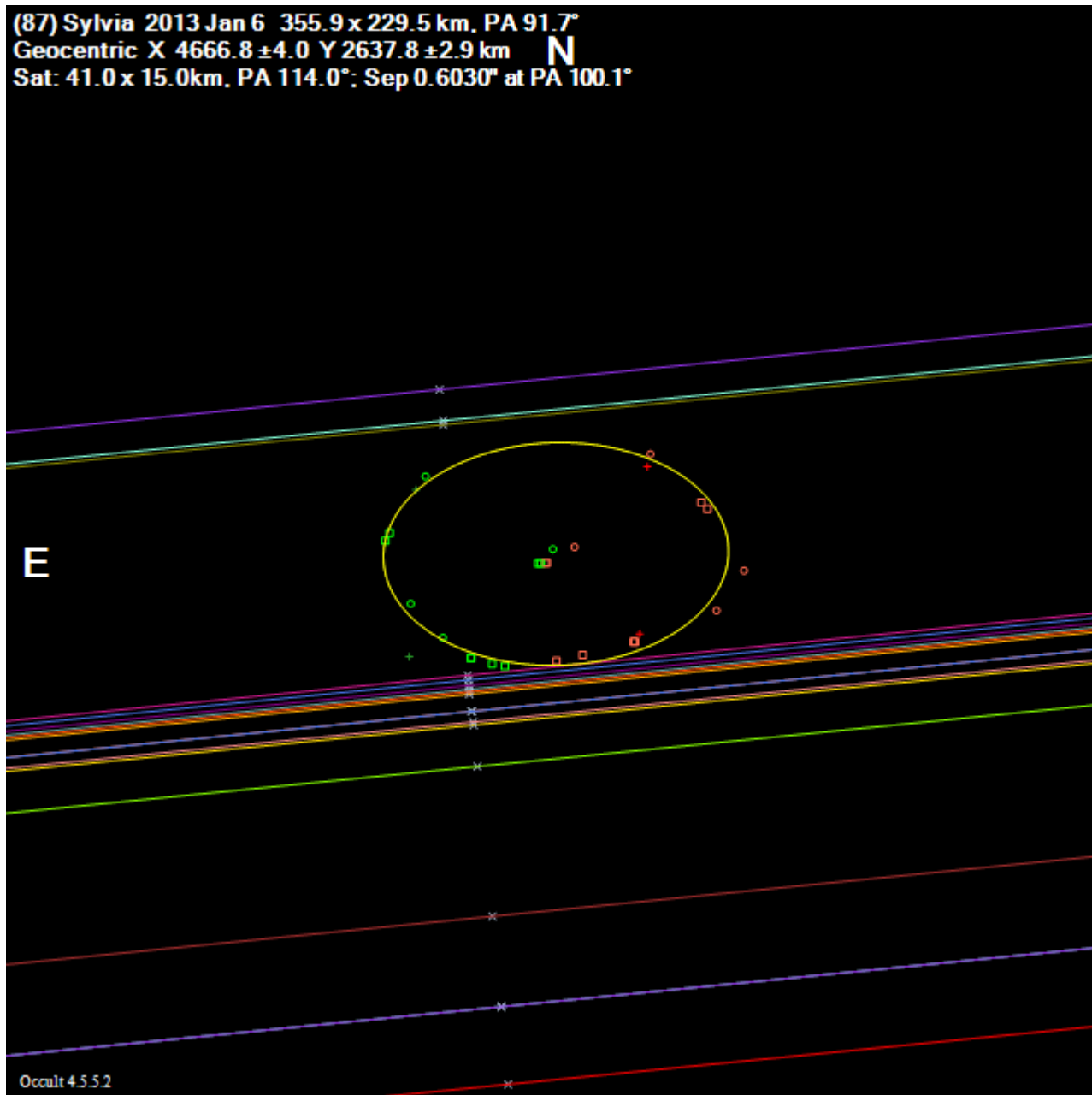
87Sylvia2012Dec22

(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**



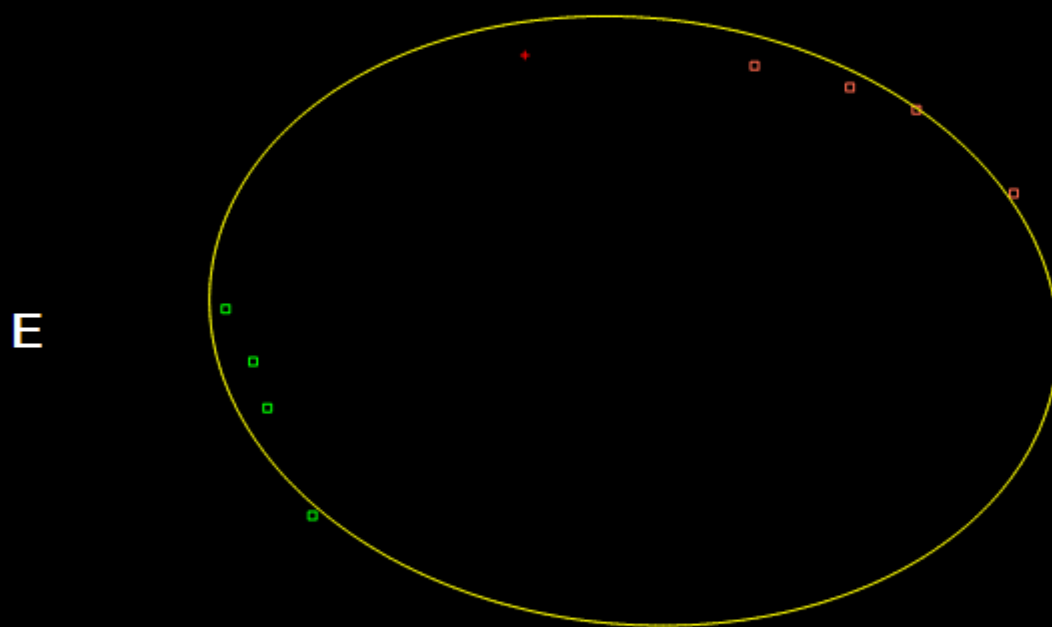
87Sylvia2013Jan06

(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

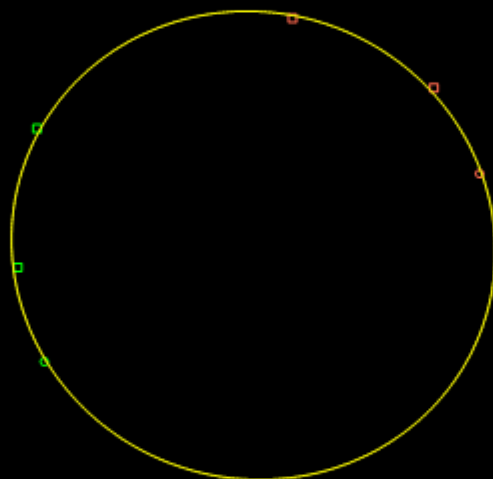
(87) Sylvia 2014 Feb 10 $318.7 \pm 21.0 \times 227.3 \pm 22.2$ km, PA $84.3^\circ \pm 12.0^\circ$
Geocentric X 1465.1 ± 8.8 Y 925.6 ± 9.3 km **N**



886Washingtonia2013Nov25

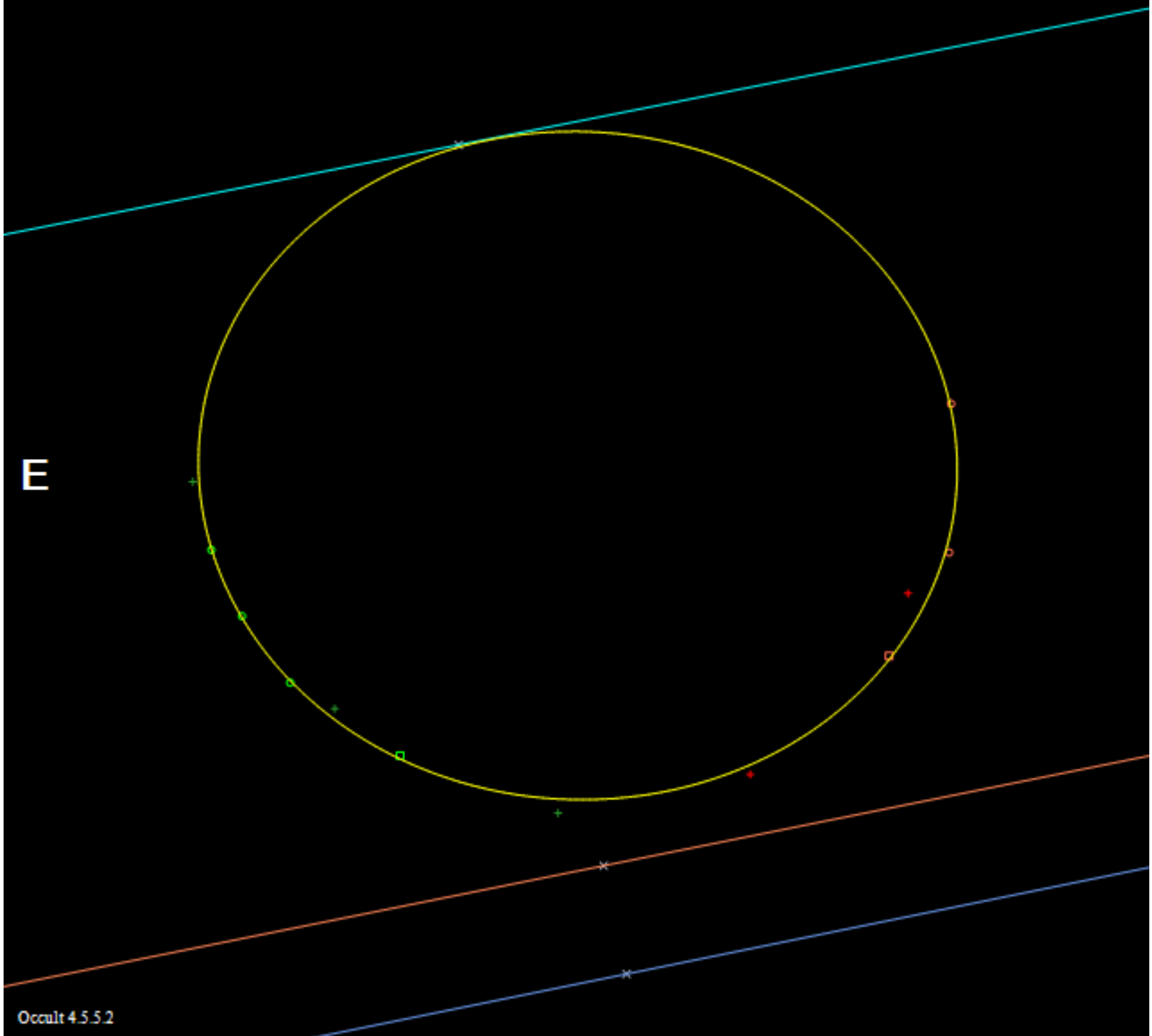
(886) Washingtonia 2013 Nov 25 $83.4 \pm 1.3 \times 80.0 \pm 1.3$ km, PA $70.4^\circ \pm 20.2^\circ$
Geocentric X -1970.8 ± 0.4 Y 897.2 ± 0.8 km **N**

E



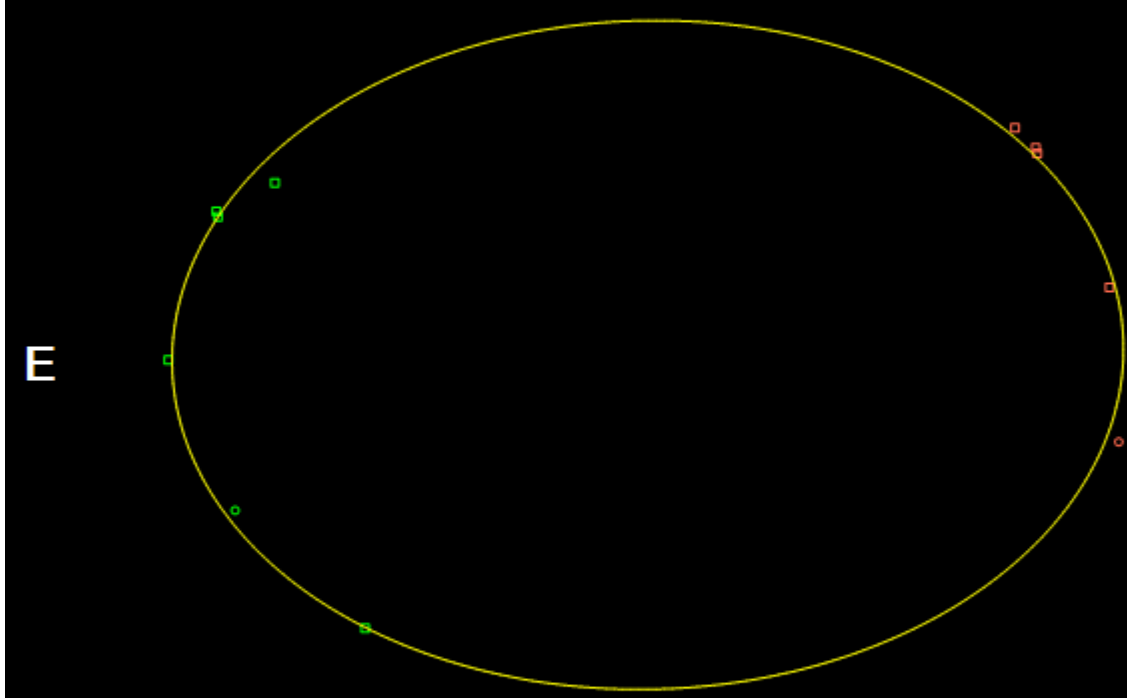
88Thisbe2007Feb21

(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**



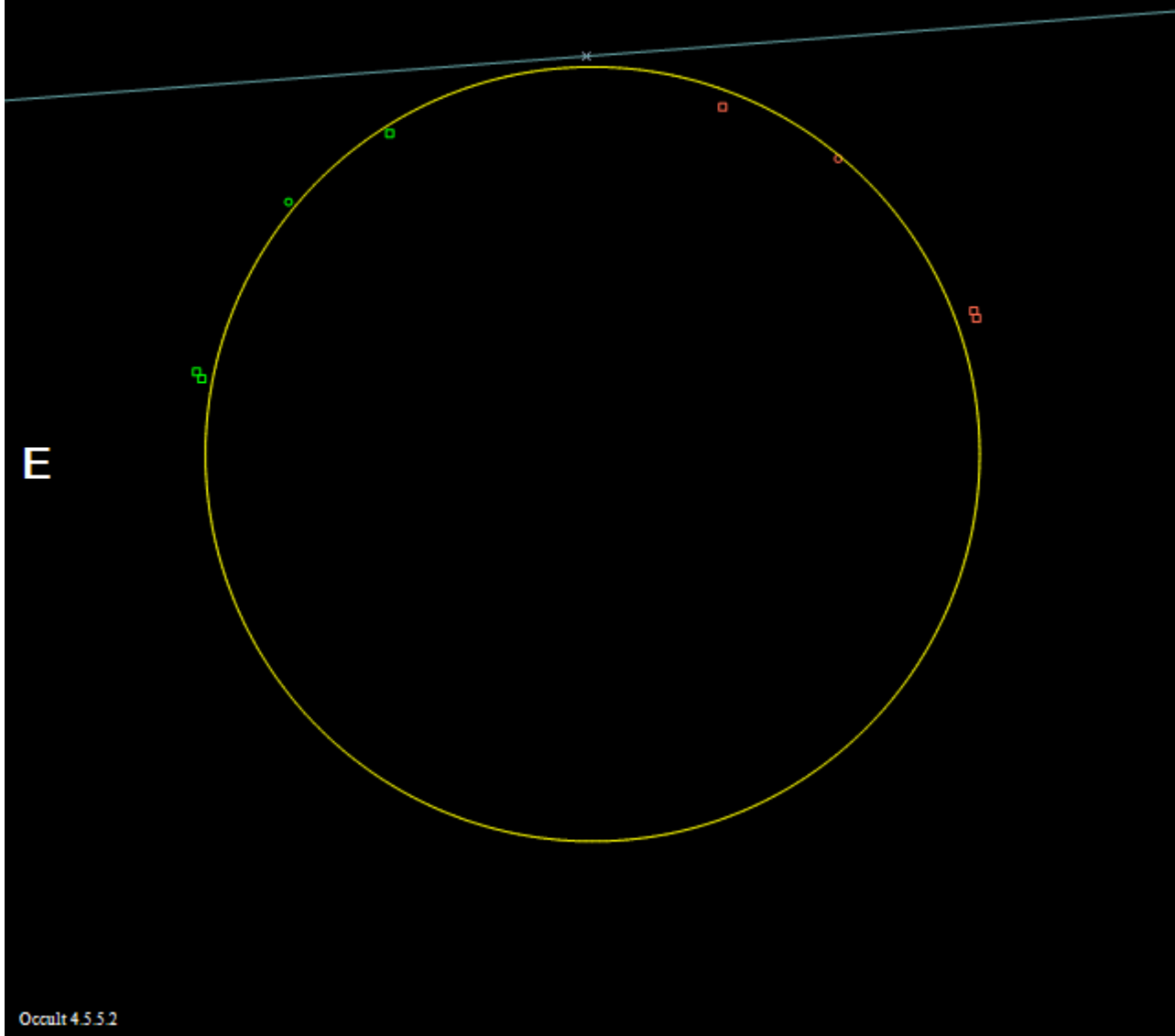
88Thisbe2016Jan13

(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**



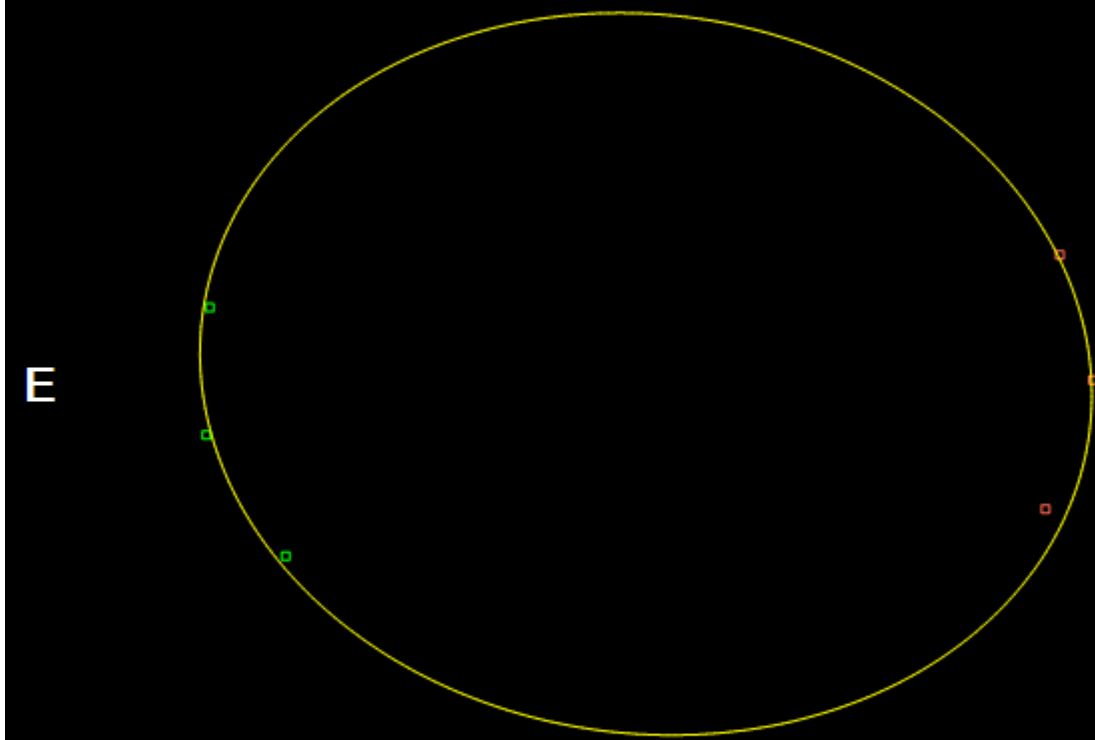
88Thisbe2016Jan14

(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**



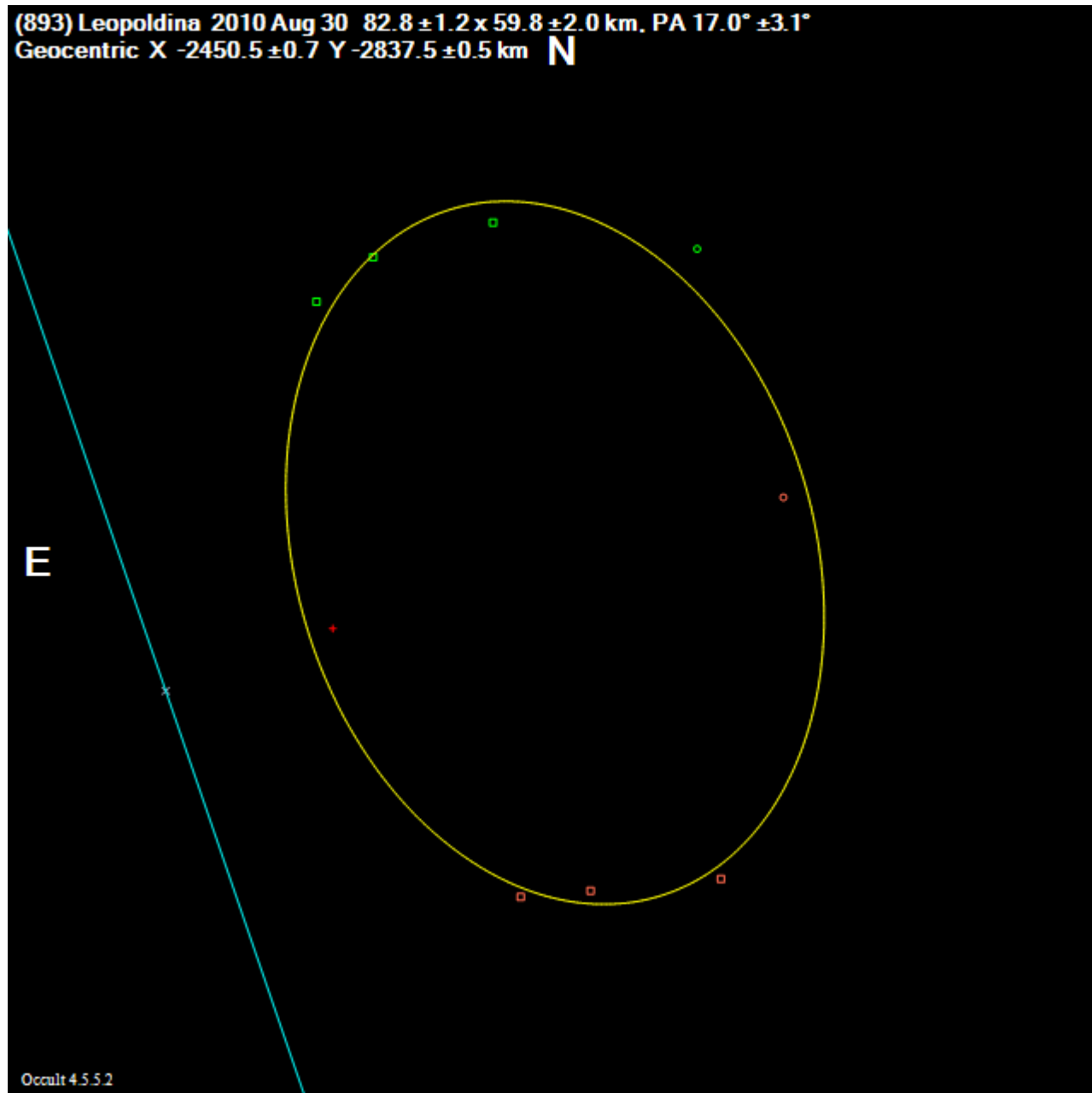
88Thisbe2016Jan21

(88) Thisbe 2016 Jan 21 $232.8 \pm 2.5 \times 187.0$ km, PA $82.3^\circ \pm 4.0^\circ$
Geocentric X 5105.1 ± 1.1 Y -3714.9 ± 2.6 km **N**



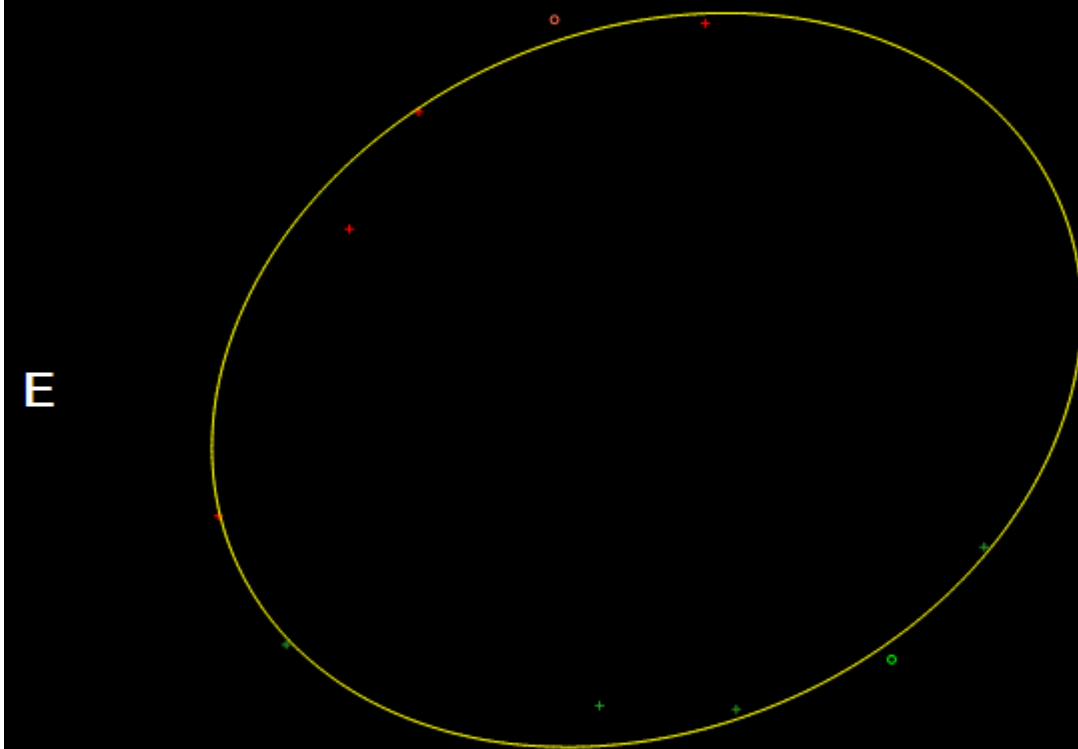
893Leopoldina2010Aug30

(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**



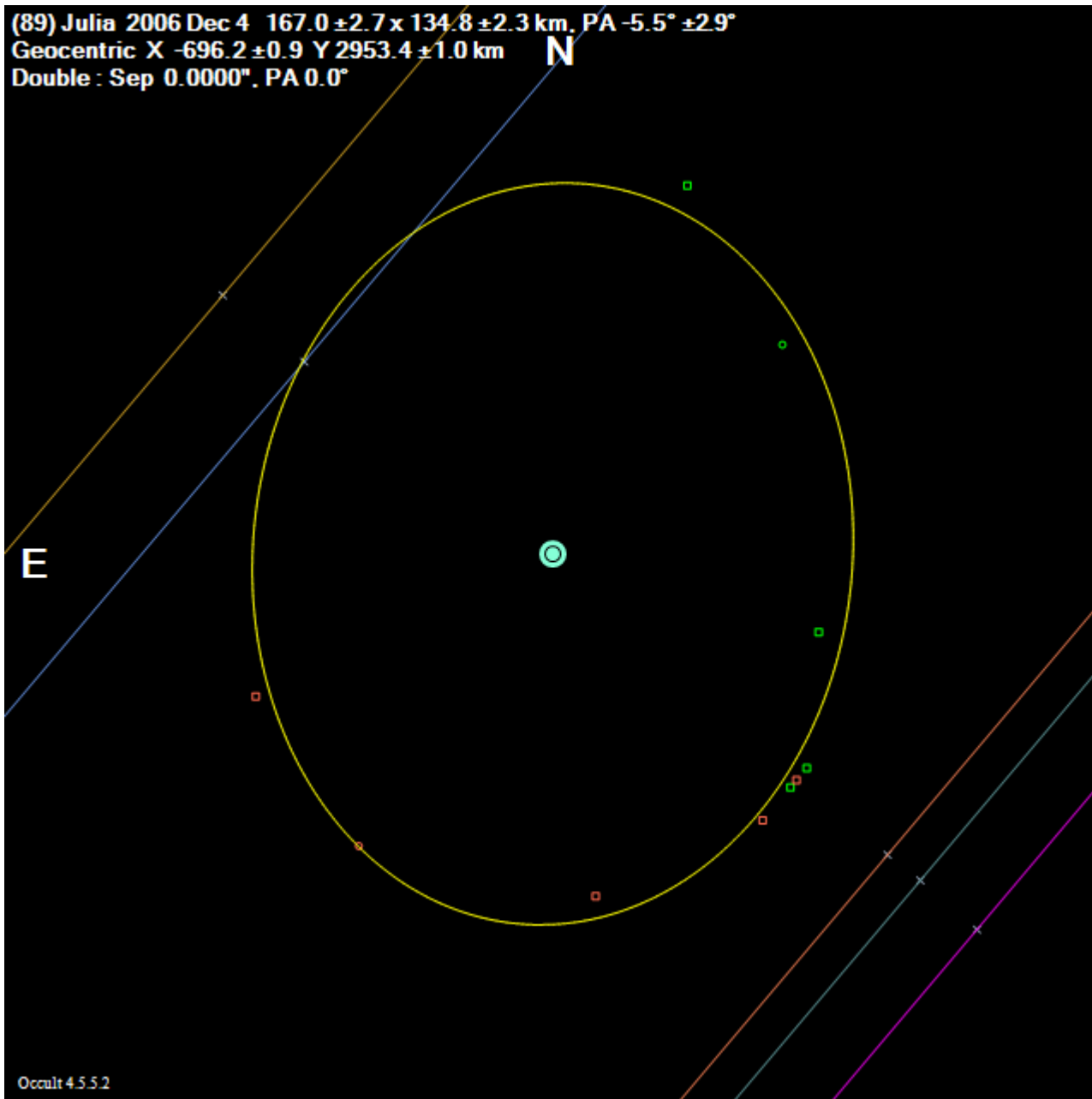
89Julia2005Aug13

(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**



89Julia2006Dec04

(89) Julia 2006 Dec 4 $167.0 \pm 2.7 \times 134.8 \pm 2.3$ km, PA $-5.5^\circ \pm 2.9^\circ$
Geocentric X -696.2 ± 0.9 Y 2953.4 ± 1.0 km
Double : Sep $0.0000''$, PA 0.0°



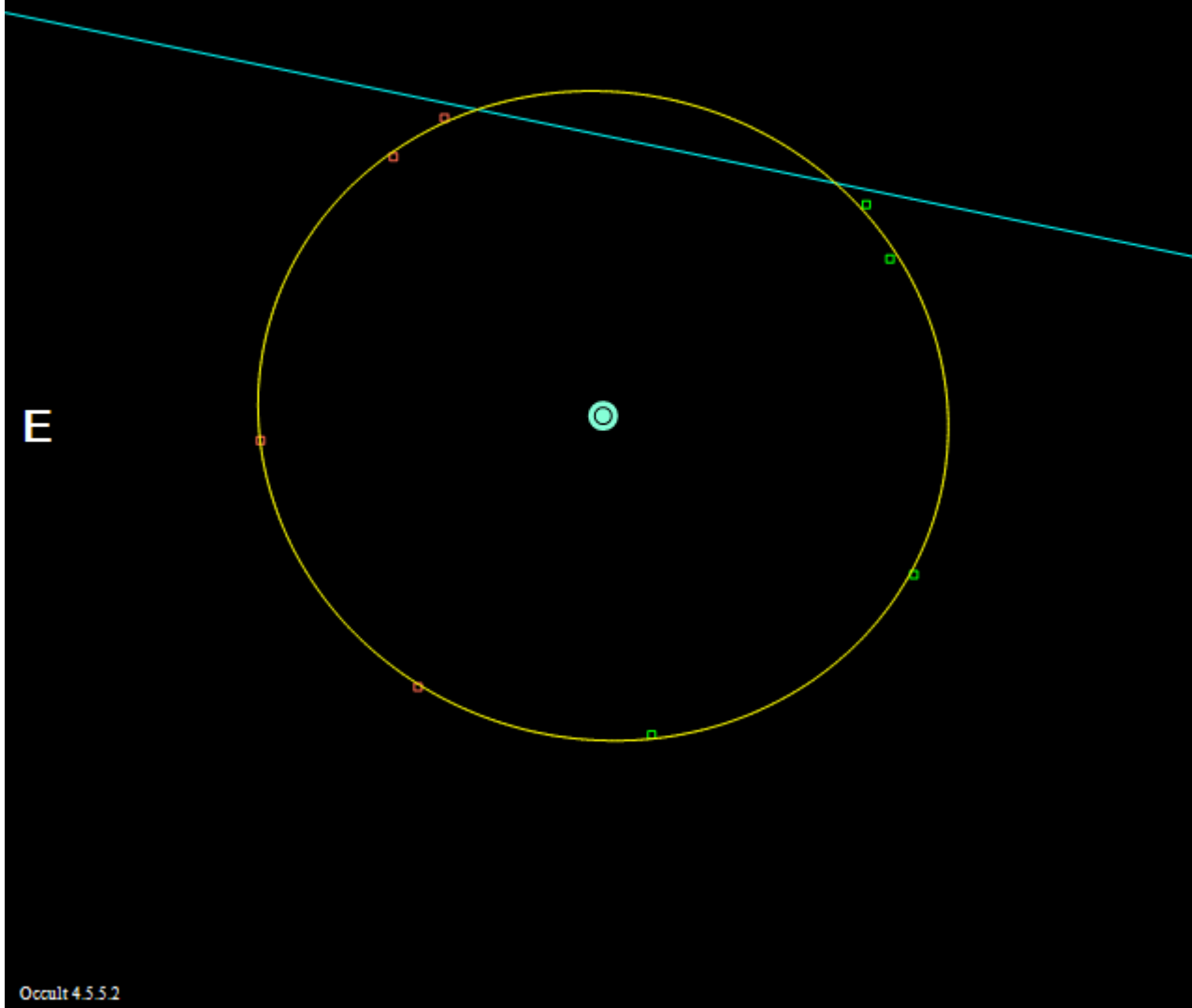
8Flora2004Oct29

(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**



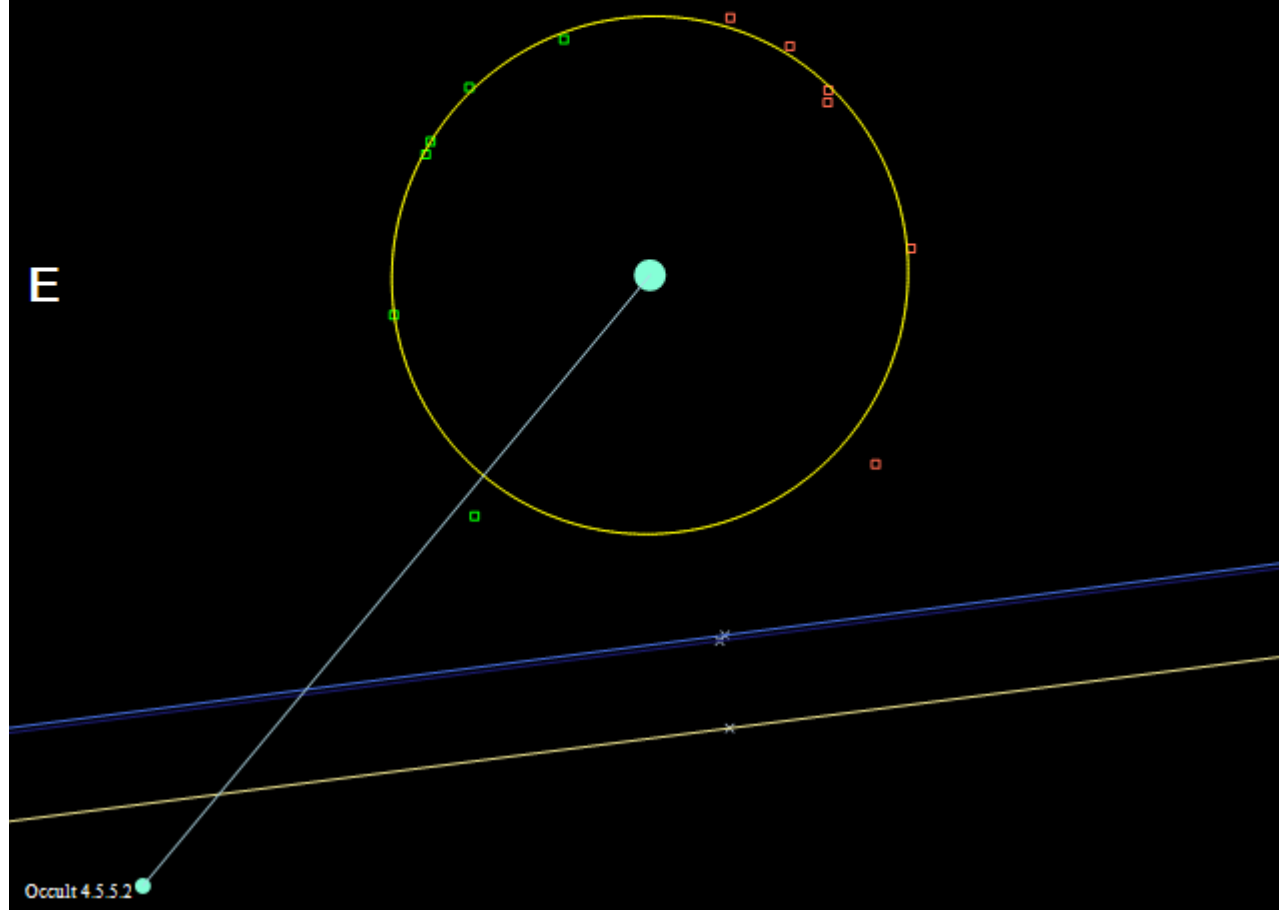
8Flora2013Oct25

(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°



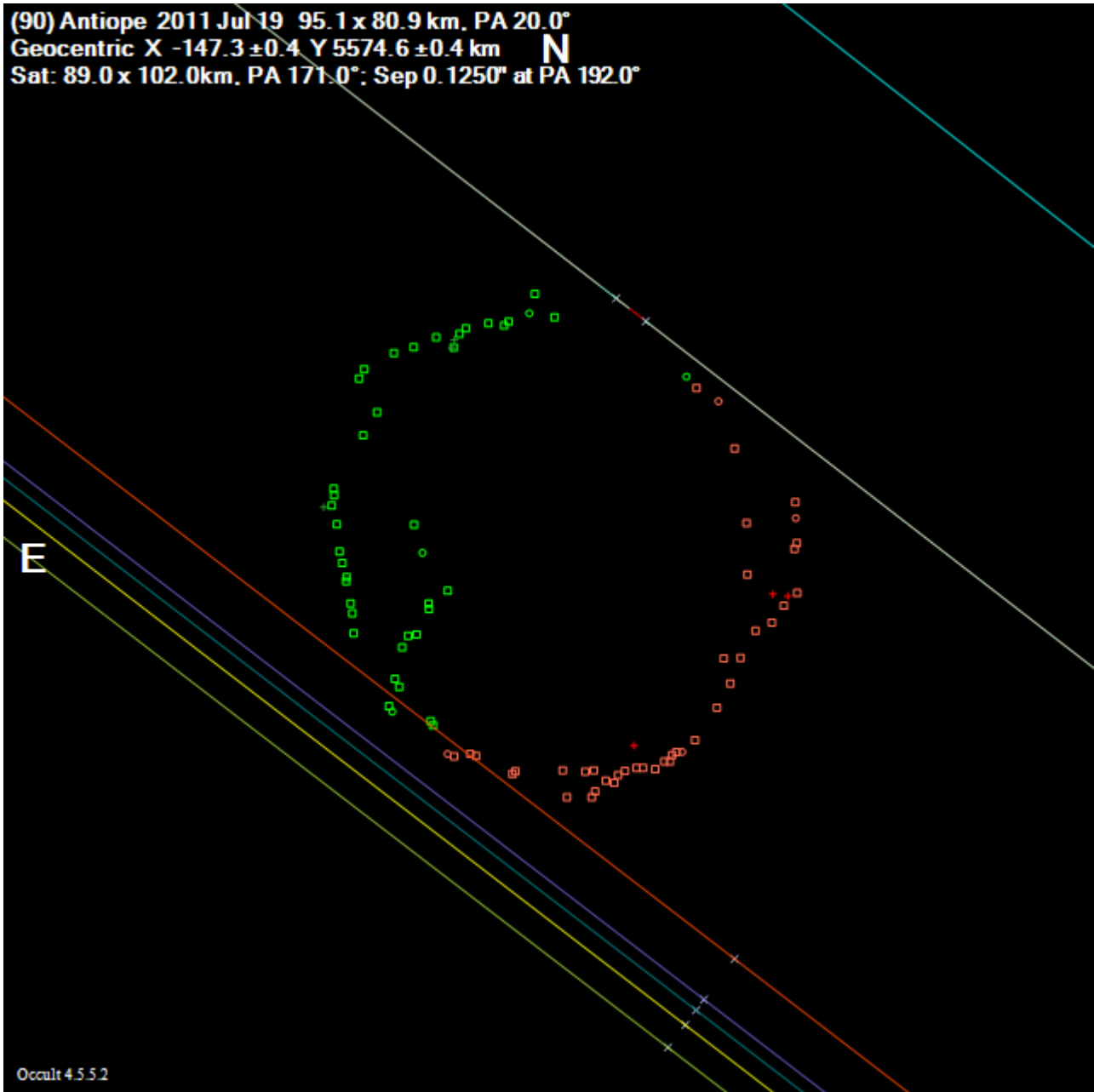
90Antiope2008Jan02

(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°



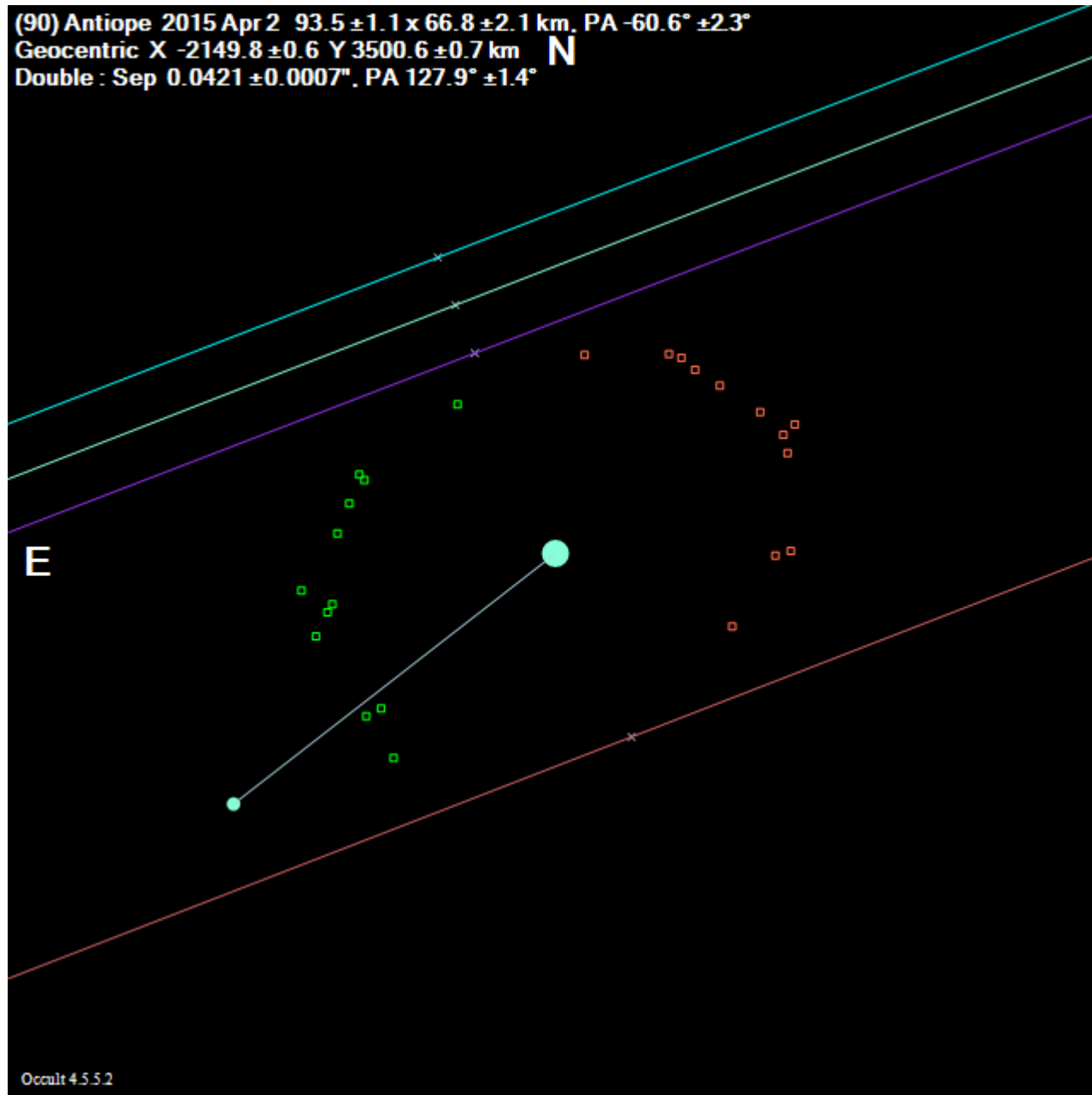
90Antiope2011Jul19

(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 **N**
Sat: 89.0 x 102.0 km, PA 171.0°; Sep 0.1250" at PA 192.0°



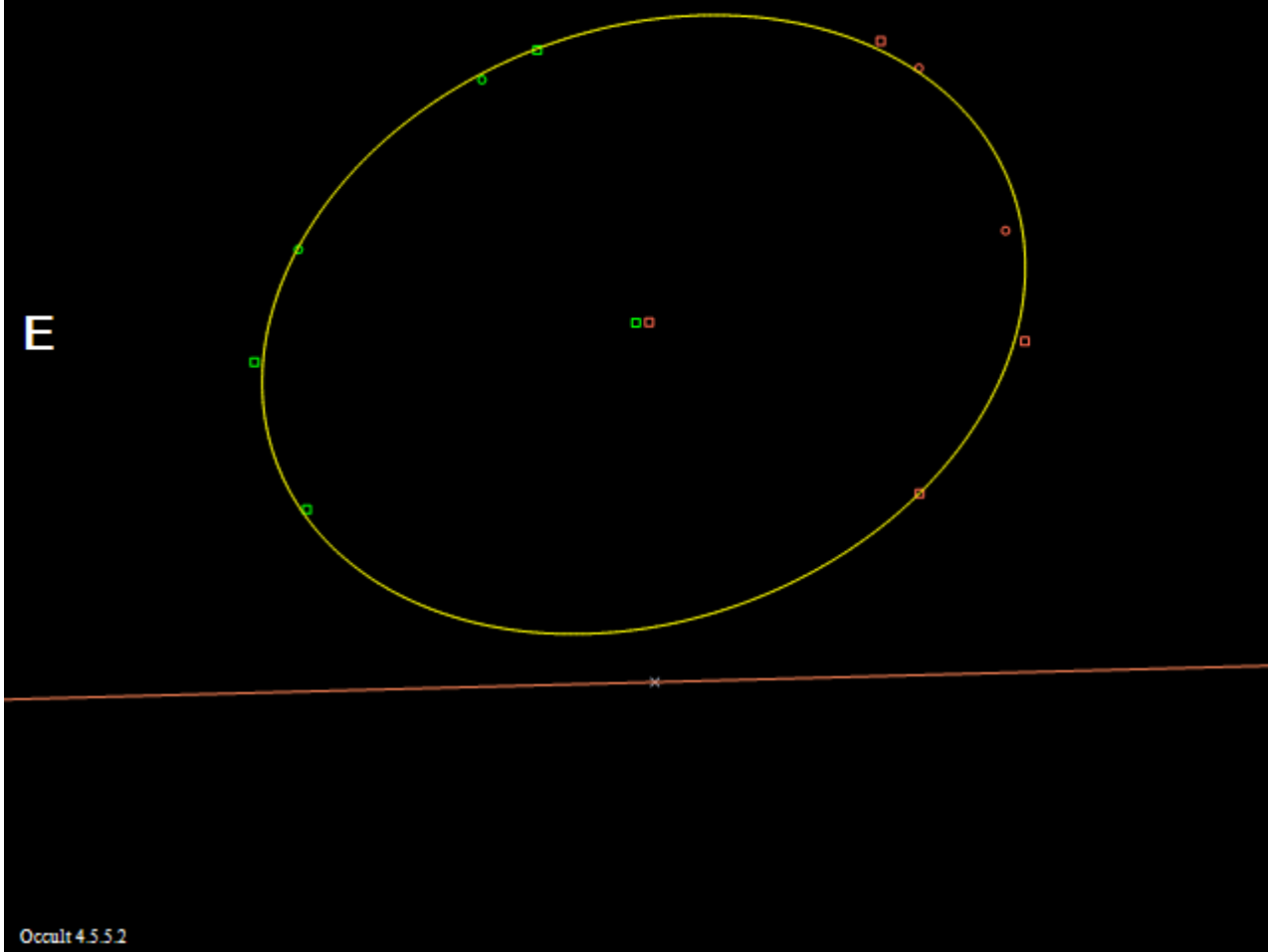
90Antiope2015Apr02

(90) Antiope 2015 Apr 2 $93.5 \pm 1.1 \times 66.8 \pm 2.1$ km, PA $-60.6^\circ \pm 2.3^\circ$
Geocentric X -2149.8 ± 0.6 Y 3500.6 ± 0.7 km **N**
Double : Sep $0.0421 \pm 0.0007''$, PA $127.9^\circ \pm 1.4^\circ$



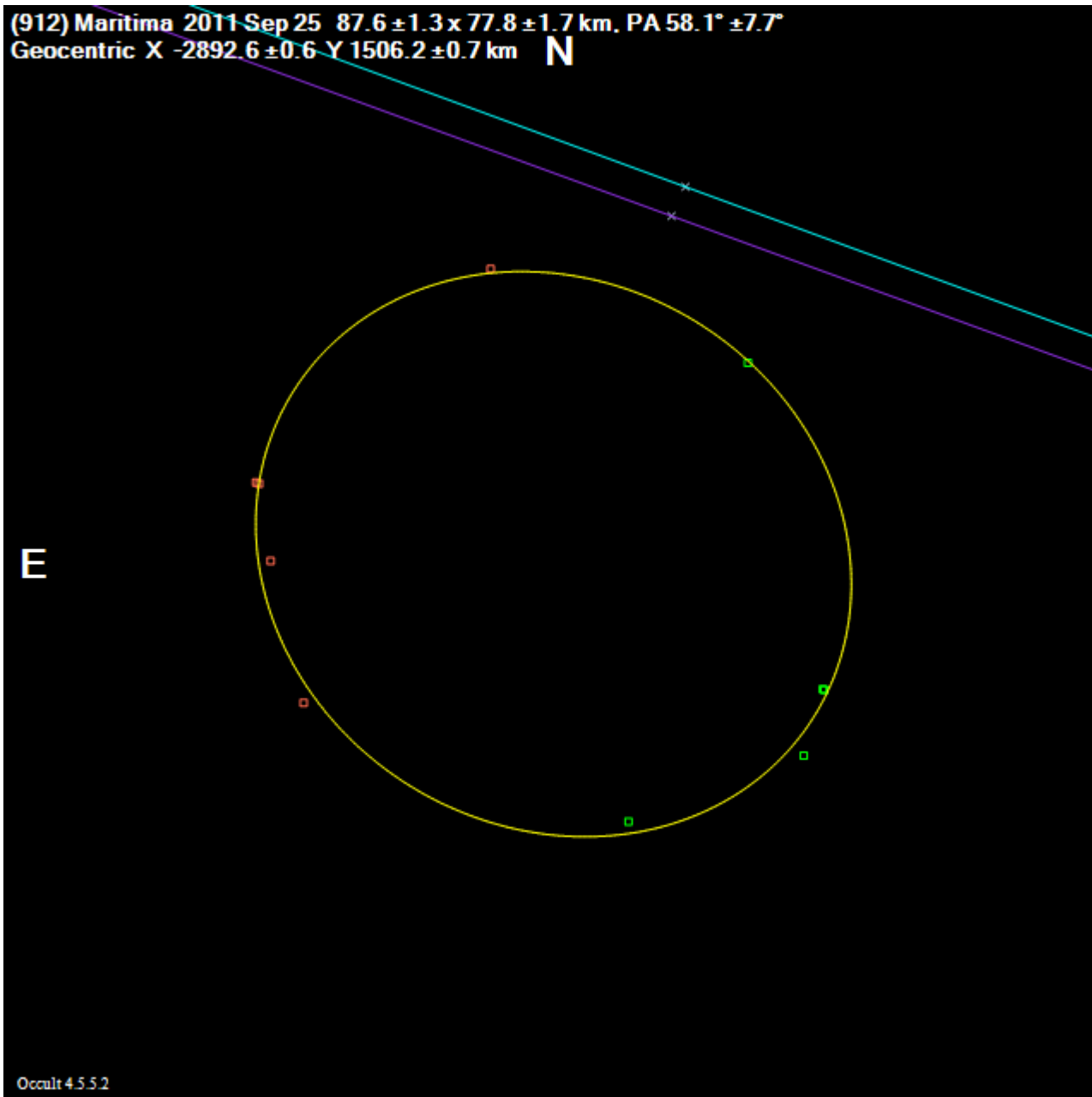
911Agamemnon2012Jan19

(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°



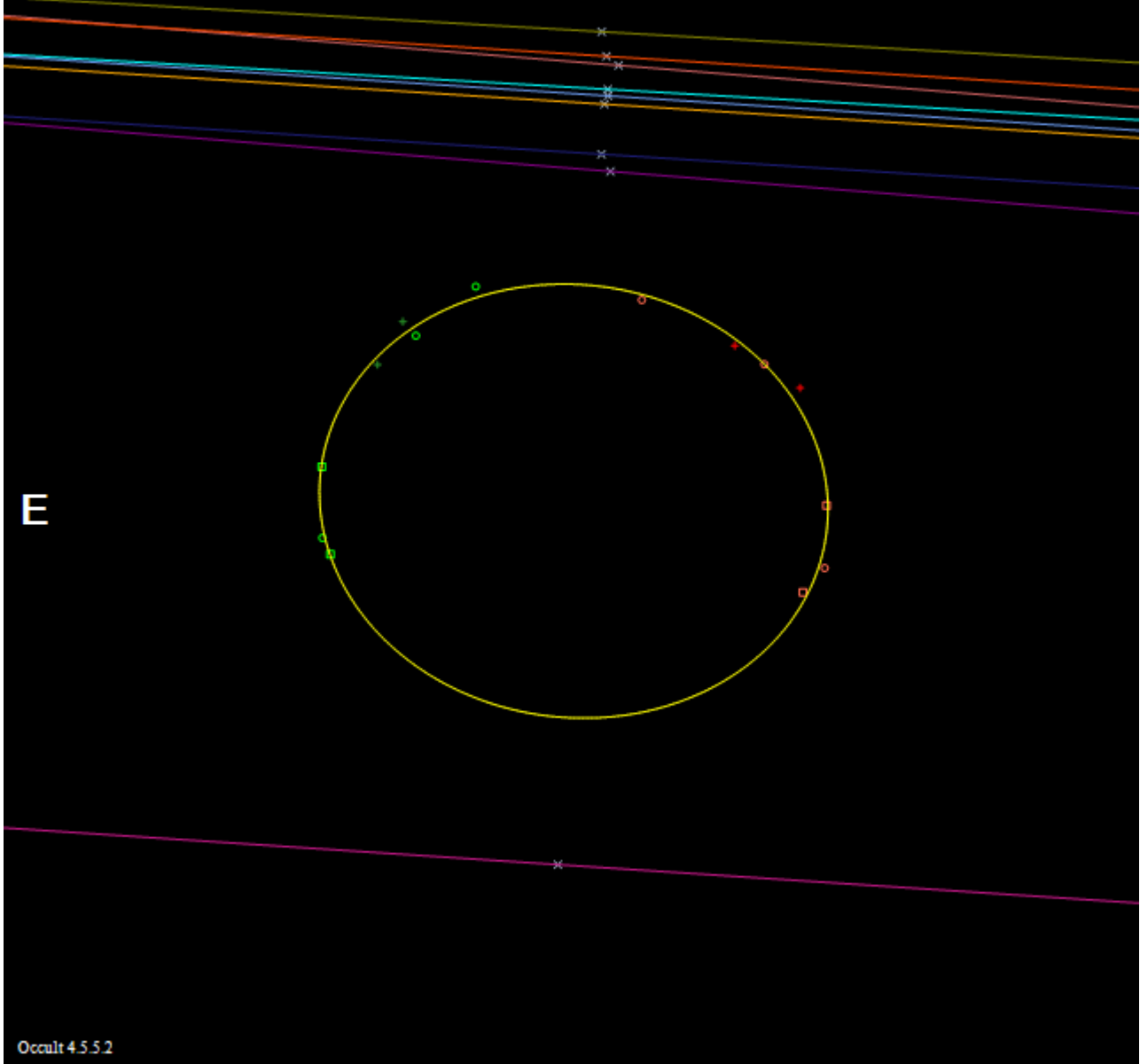
912Maritima2011Sep25

(912) Maritima 2011 Sep 25 $87.6 \pm 1.3 \times 77.8 \pm 1.7$ km, PA $58.1^\circ \pm 7.7^\circ$
Geocentric X -2892.6 ± 0.6 Y 1506.2 ± 0.7 km **N**



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**



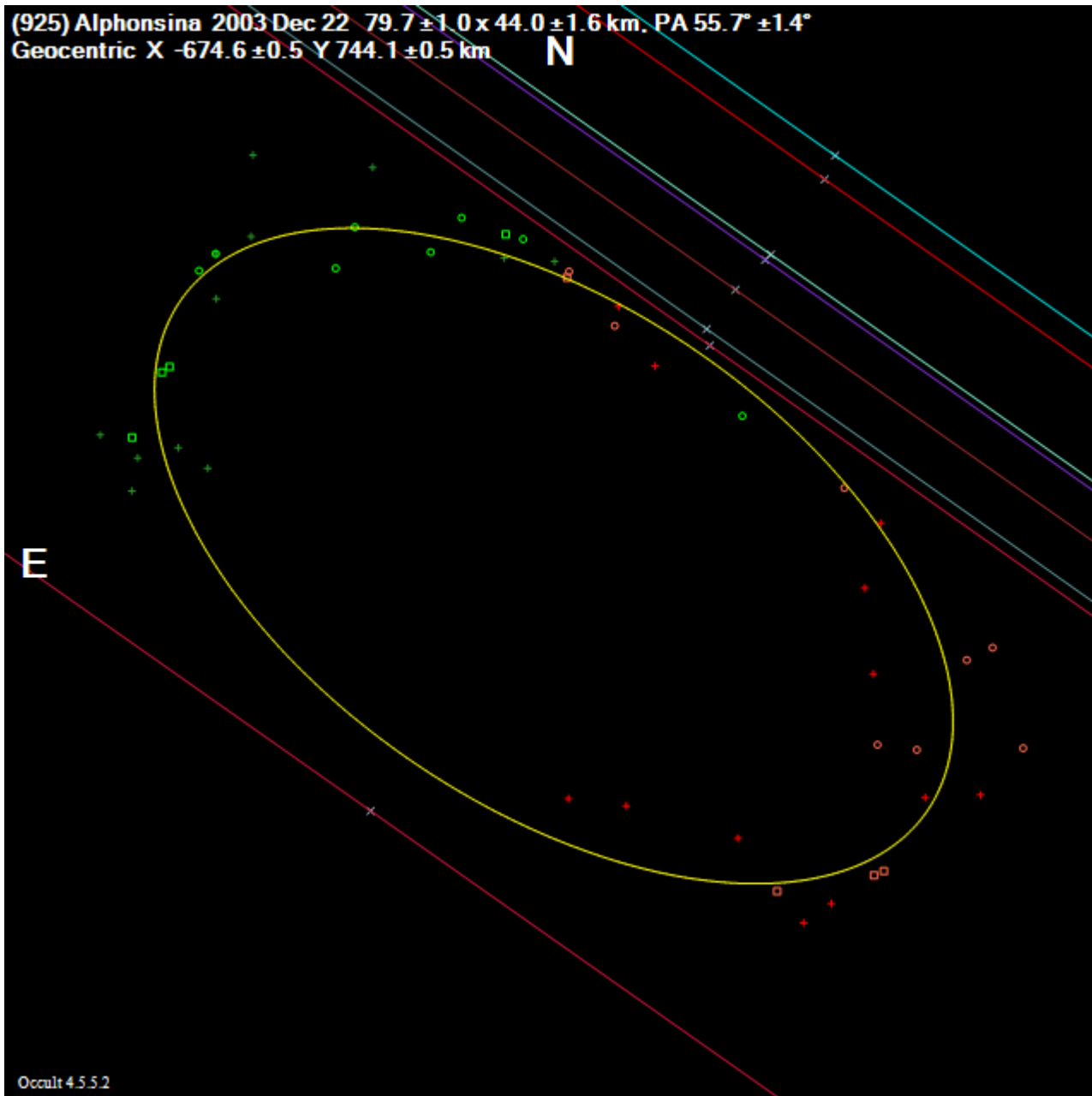
91Aegina2011Jul27

(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**



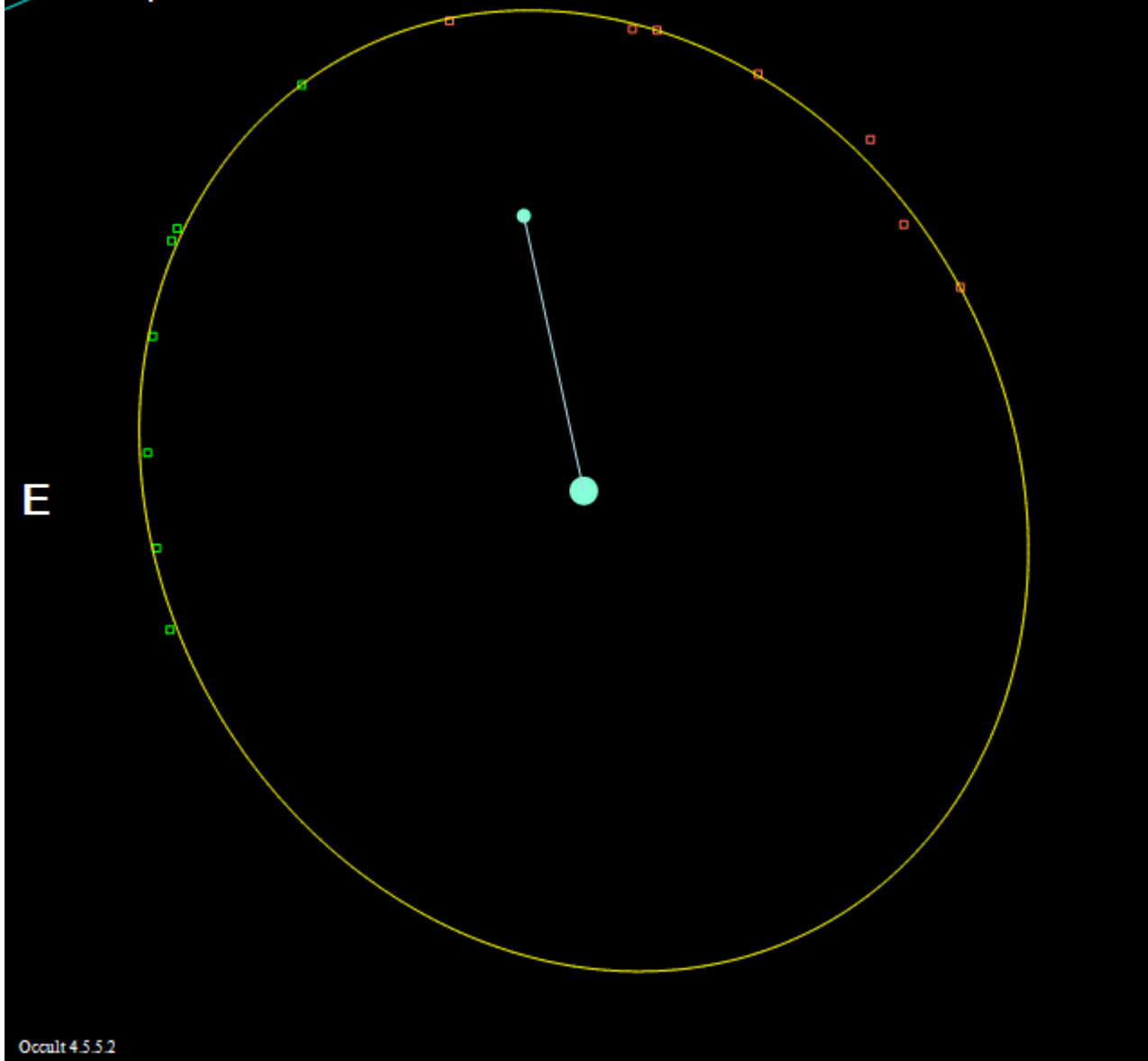
925Alphonsina2003Dec22

(925) Alphonsina 2003 Dec 22 $79.7 \pm 1.0 \times 44.0 \pm 1.6$ km. PA $55.7^\circ \pm 1.4^\circ$
Geocentric X -674.6 ± 0.5 Y 744.1 ± 0.5 km



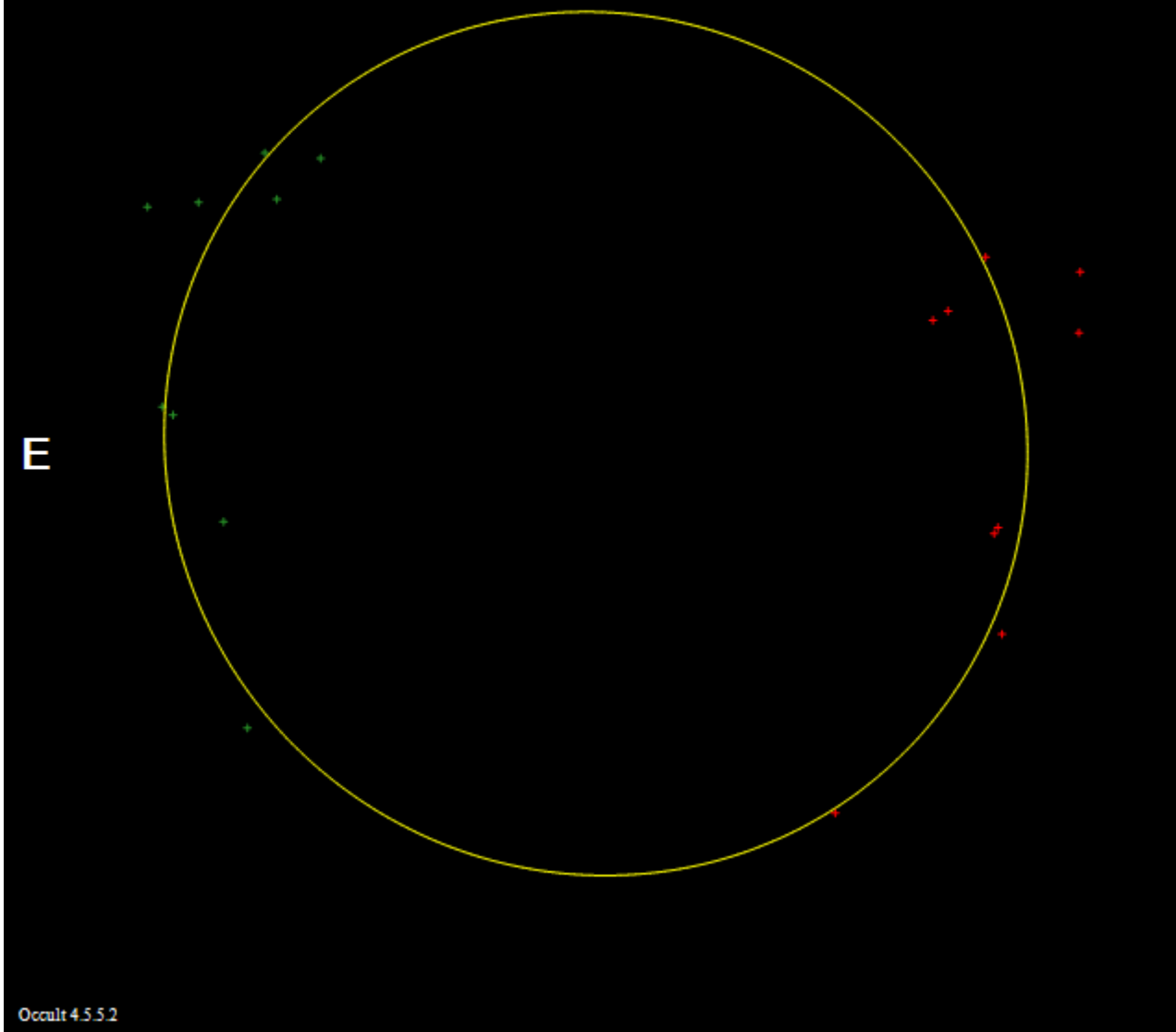
92Undina2013Feb06

(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 **N**
Double : Sep $0.0283 \pm 0.0008''$, PA $12.3^\circ \pm 1.5^\circ$



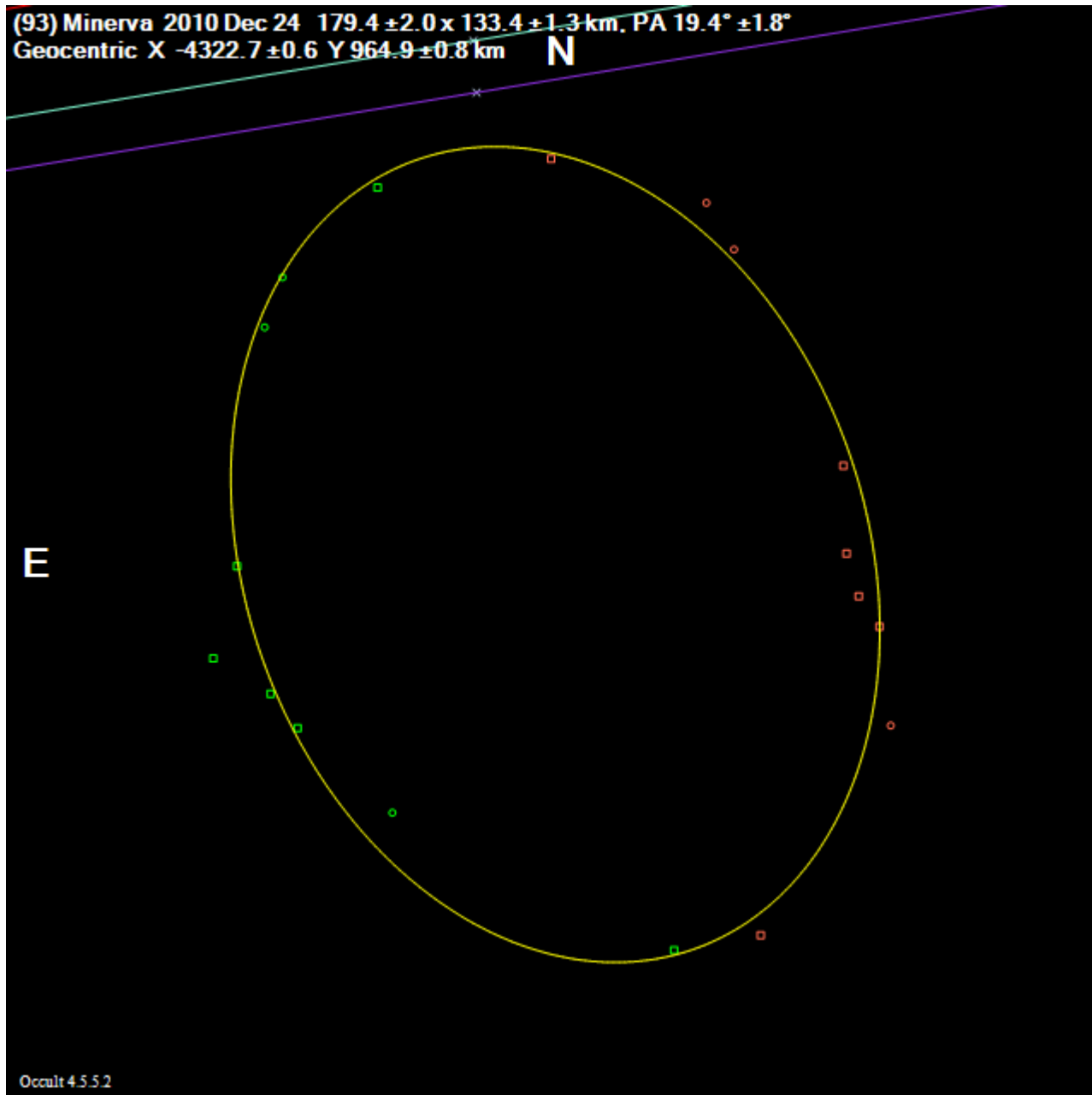
93Minerva1982Nov22

(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**



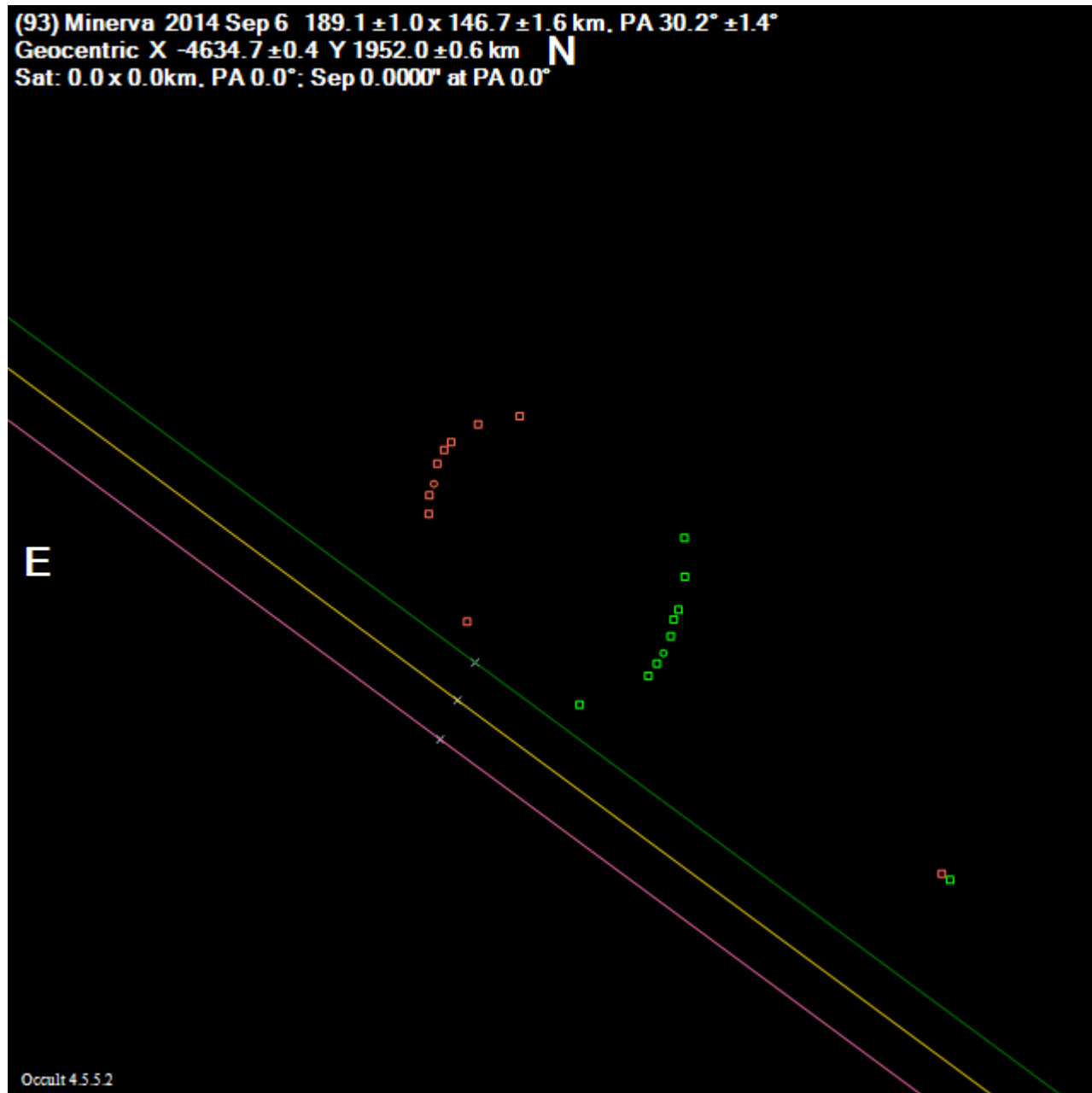
93Minerva2010Dec24

(93) Minerva 2010 Dec 24 $179.4 \pm 2.0 \times 133.4 \pm 1.3$ km, PA $19.4^\circ \pm 1.8^\circ$
Geocentric X -4322.7 ± 0.6 Y 964.9 ± 0.8 km



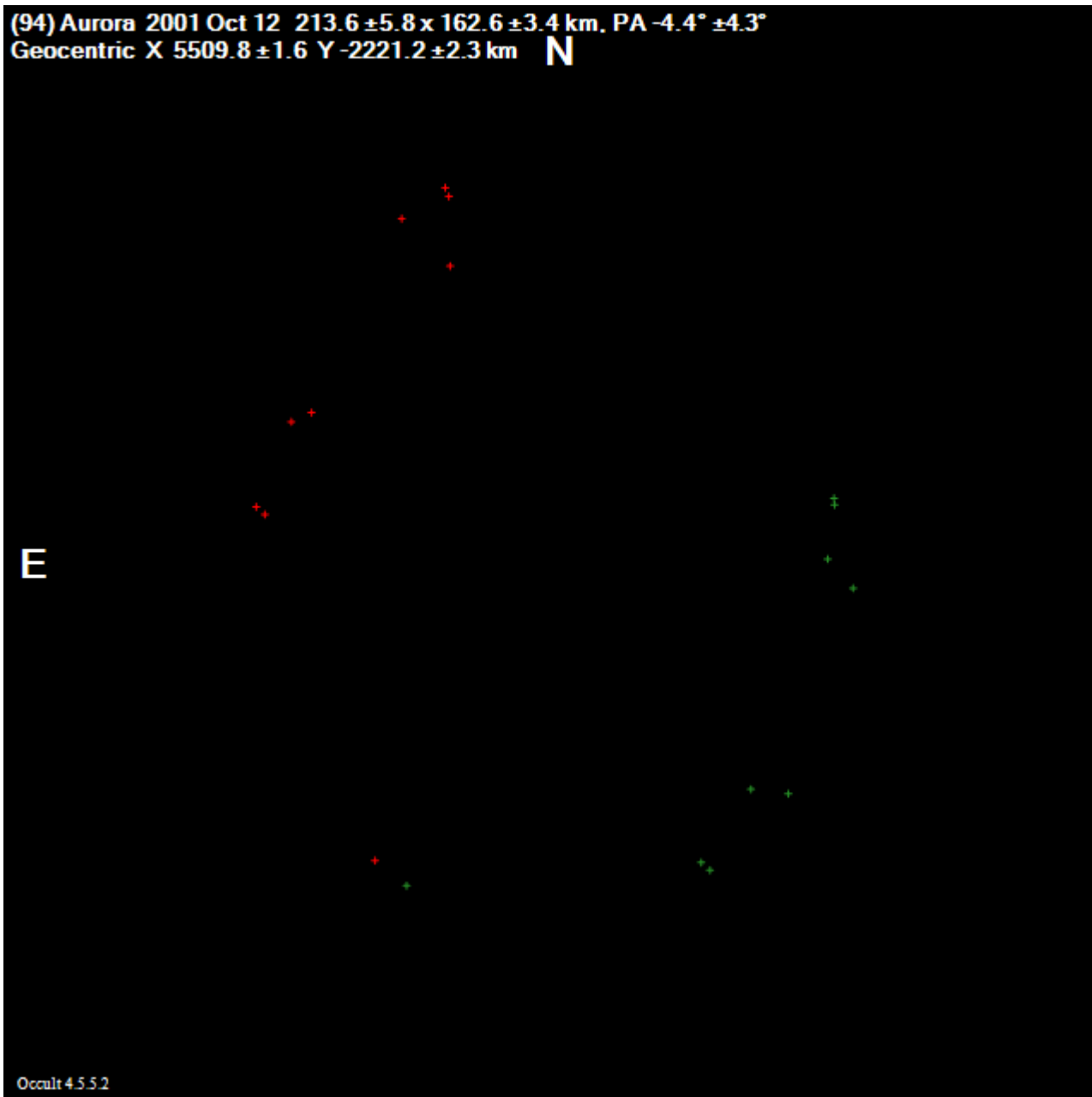
93Minerva2014Sep06

(93) Minerva 2014 Sep 6 $189.1 \pm 1.0 \times 146.7 \pm 1.6$ km, PA $30.2^\circ \pm 1.4^\circ$
Geocentric X -4634.7 ± 0.4 Y 1952.0 ± 0.6 km **N**
Sat: 0.0×0.0 km, PA 0.0° ; Sep 0.0000° at PA 0.0°



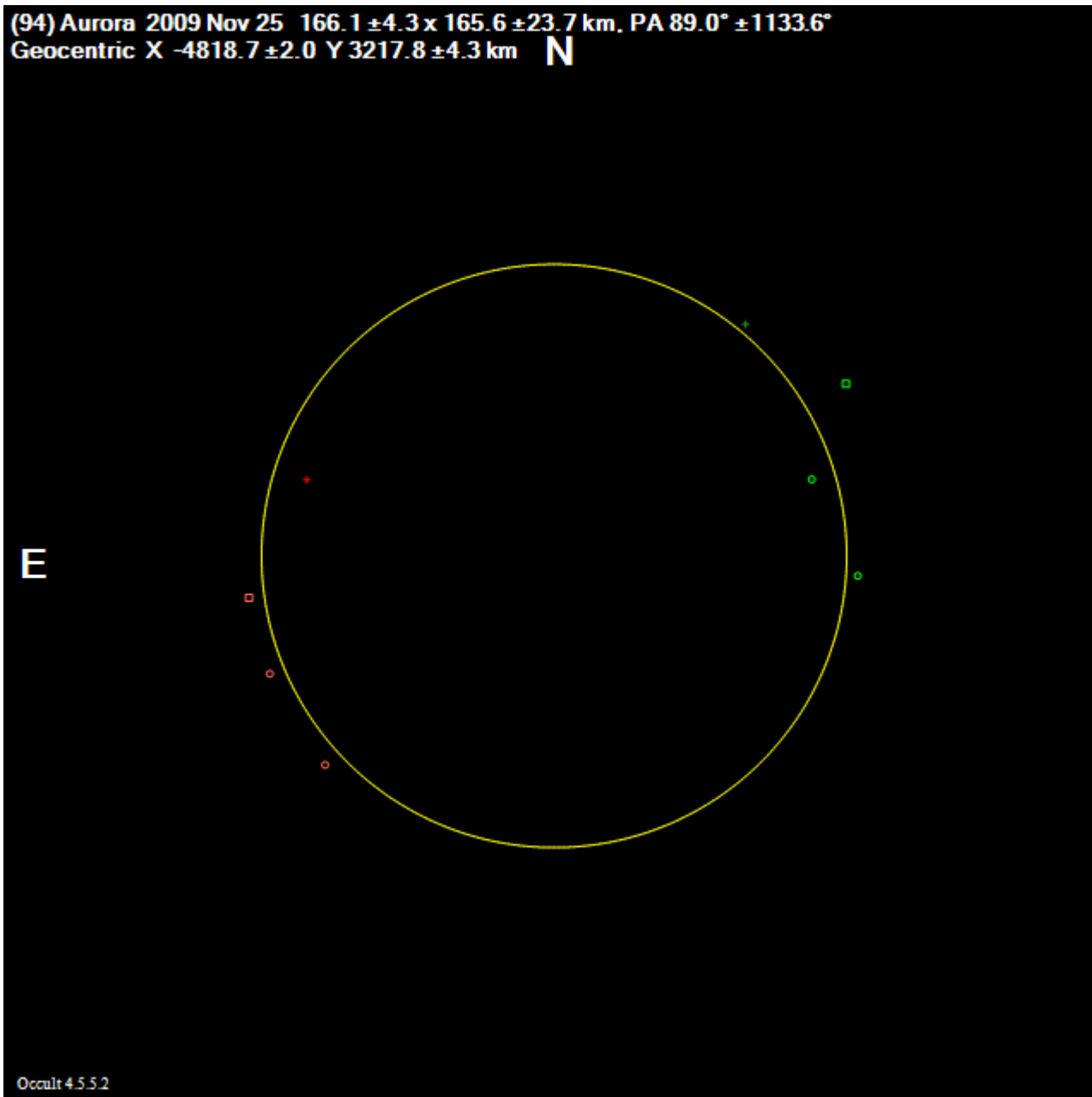
94Aurora2001Oct12

(94) Aurora 2001 Oct 12 $213.6 \pm 5.8 \times 162.6 \pm 3.4$ km, PA $-4.4^\circ \pm 4.3^\circ$
Geocentric X 5509.8 ± 1.6 Y -2221.2 ± 2.3 km **N**



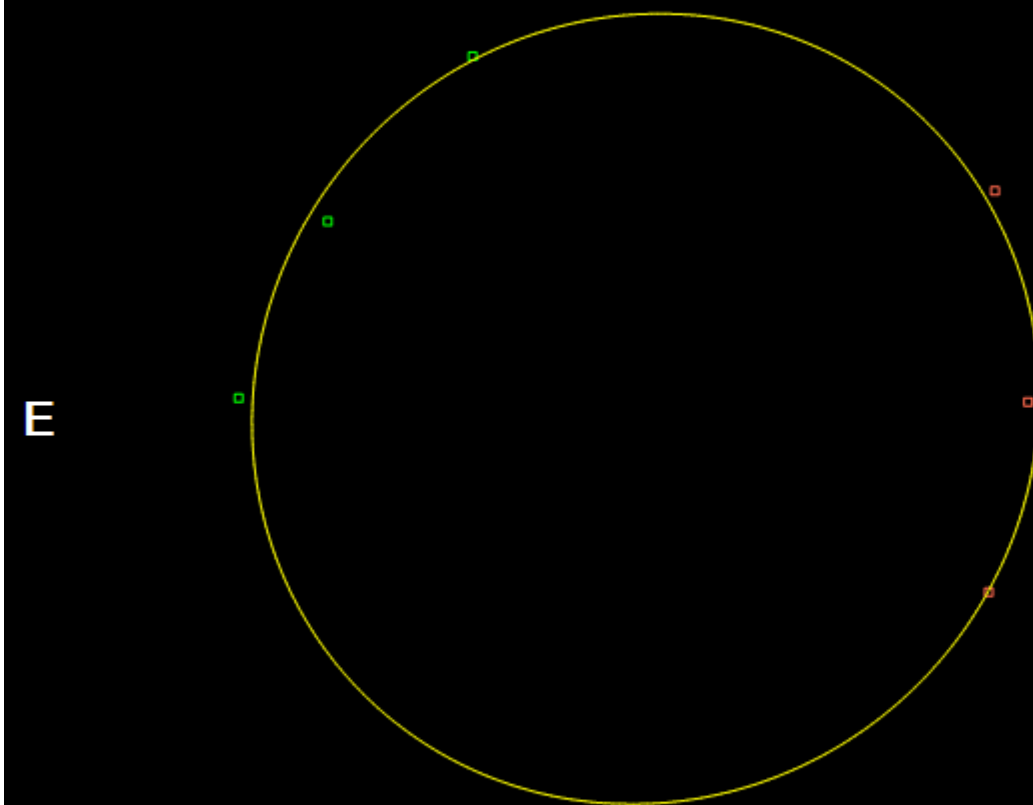
94Aurora2009Nov25

(94) Aurora 2009 Nov 25 $166.1 \pm 4.3 \times 165.6 \pm 23.7$ km, PA $89.0^\circ \pm 1133.6^\circ$
Geocentric X -4818.7 ± 2.0 Y 3217.8 ± 4.3 km **N**



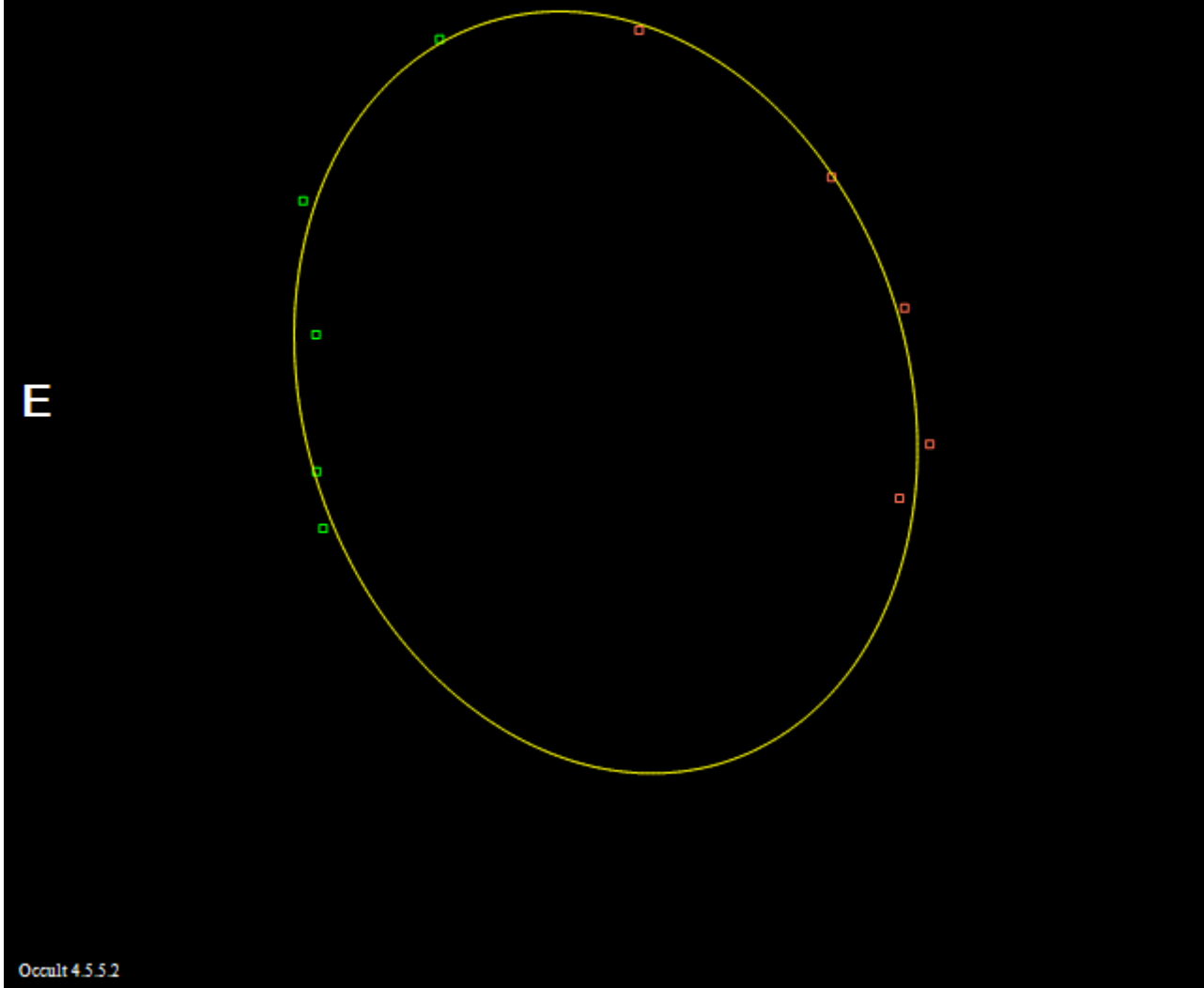
94Aurora2012Jun23

(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**



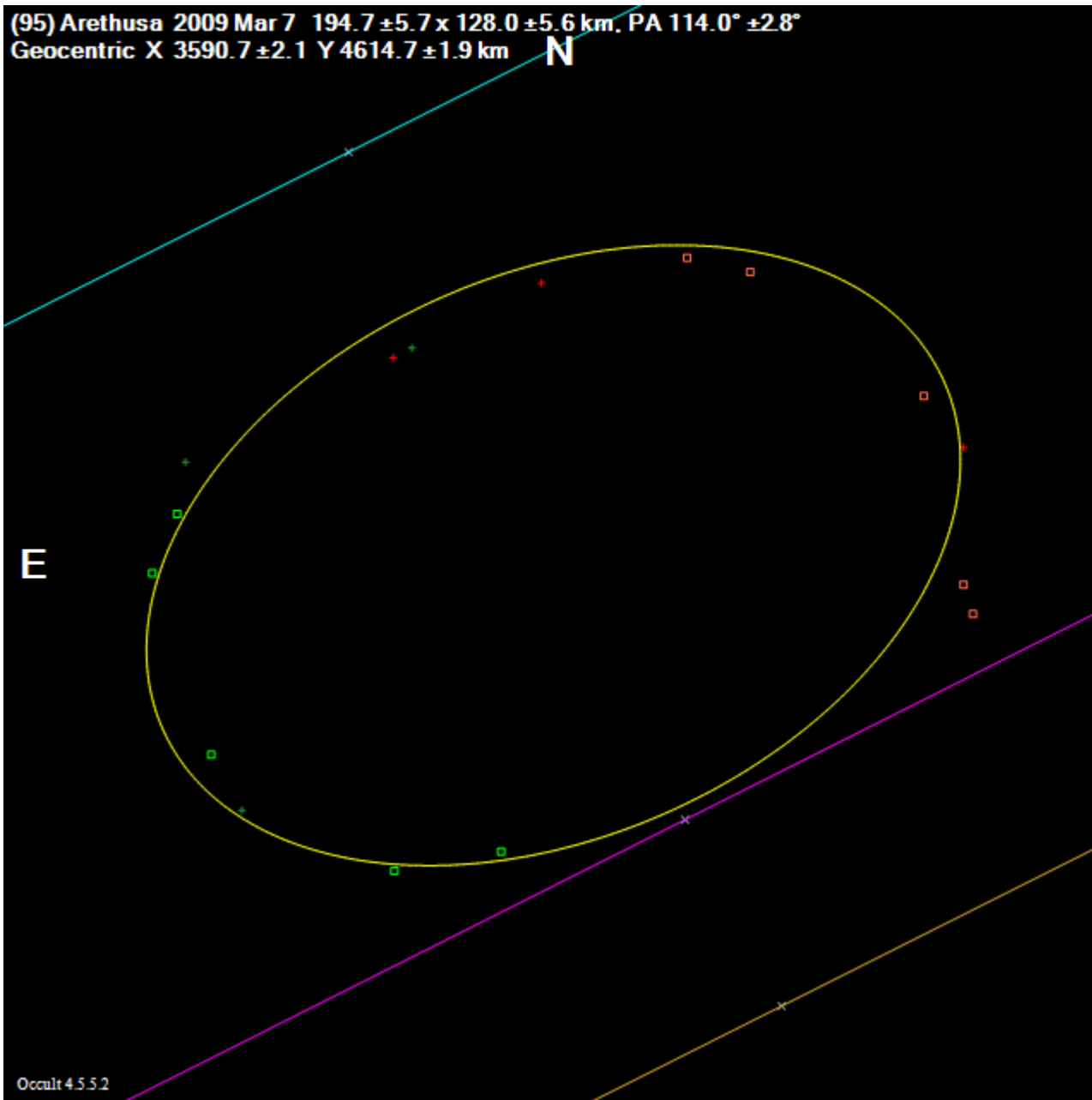
952Caia2016Feb14

(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**



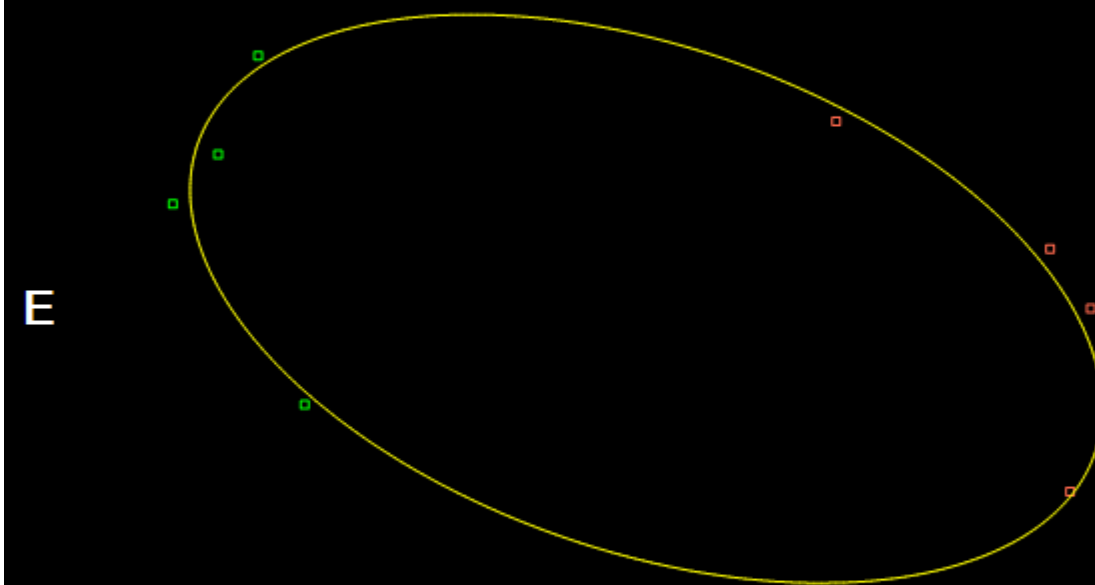
95Arethusa2009Mar07

(95) Arethusa 2009 Mar 7 $194.7 \pm 5.7 \times 128.0 \pm 5.6$ km. PA $114.0^\circ \pm 2.8^\circ$
Geocentric X 3590.7 ± 2.1 Y 4614.7 ± 1.9 km



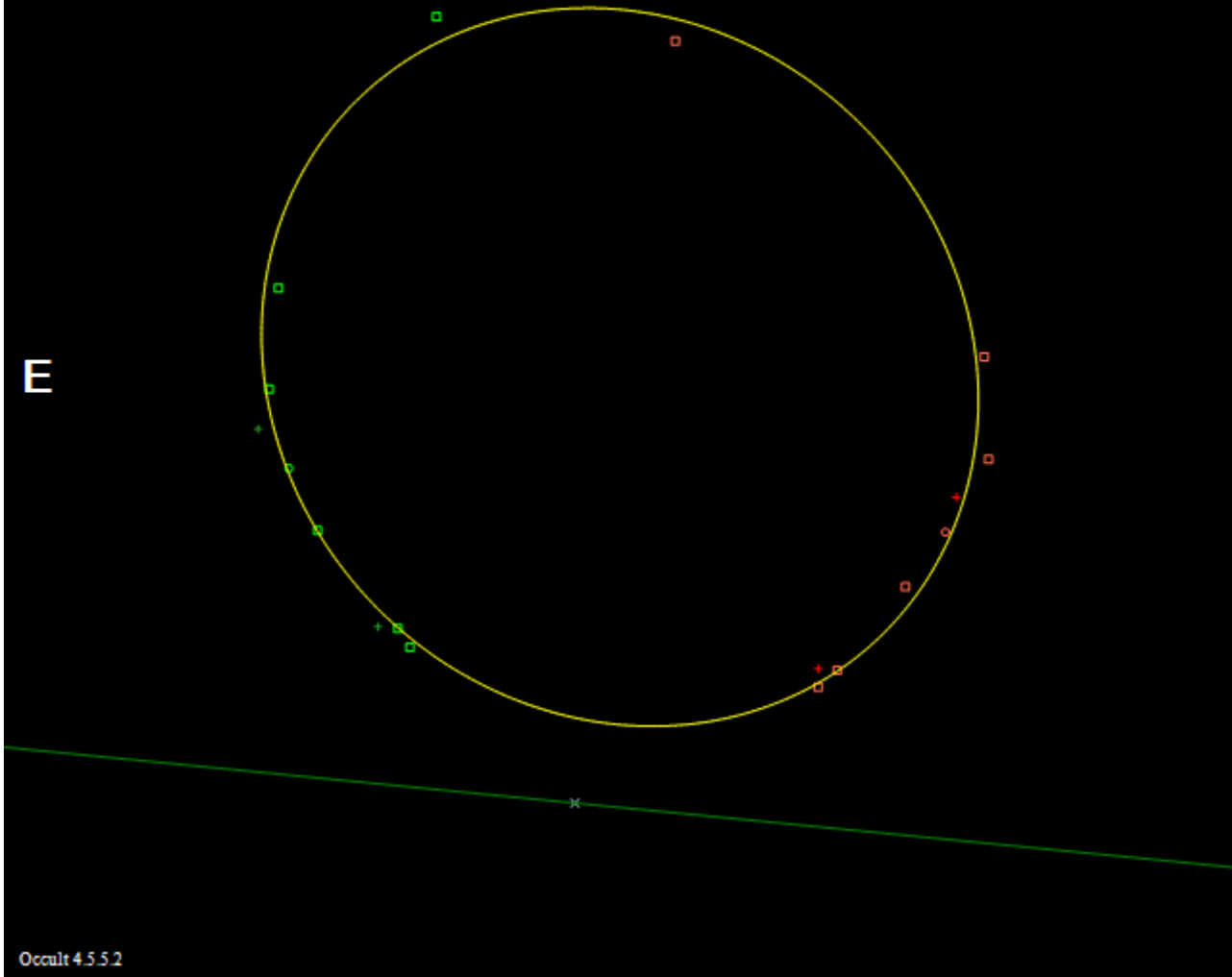
95Arethusa2011Aug03

(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**



96Aegle2010Oct29

(96) Aegle 2010 Oct 29 $172.5 \pm 1.4 \times 157.5 \pm 1.5$ km, PA $44.3^\circ \pm 4.1^\circ$
Geocentric X 2224.9 ± 0.6 Y -243.6 ± 0.6 km **N**



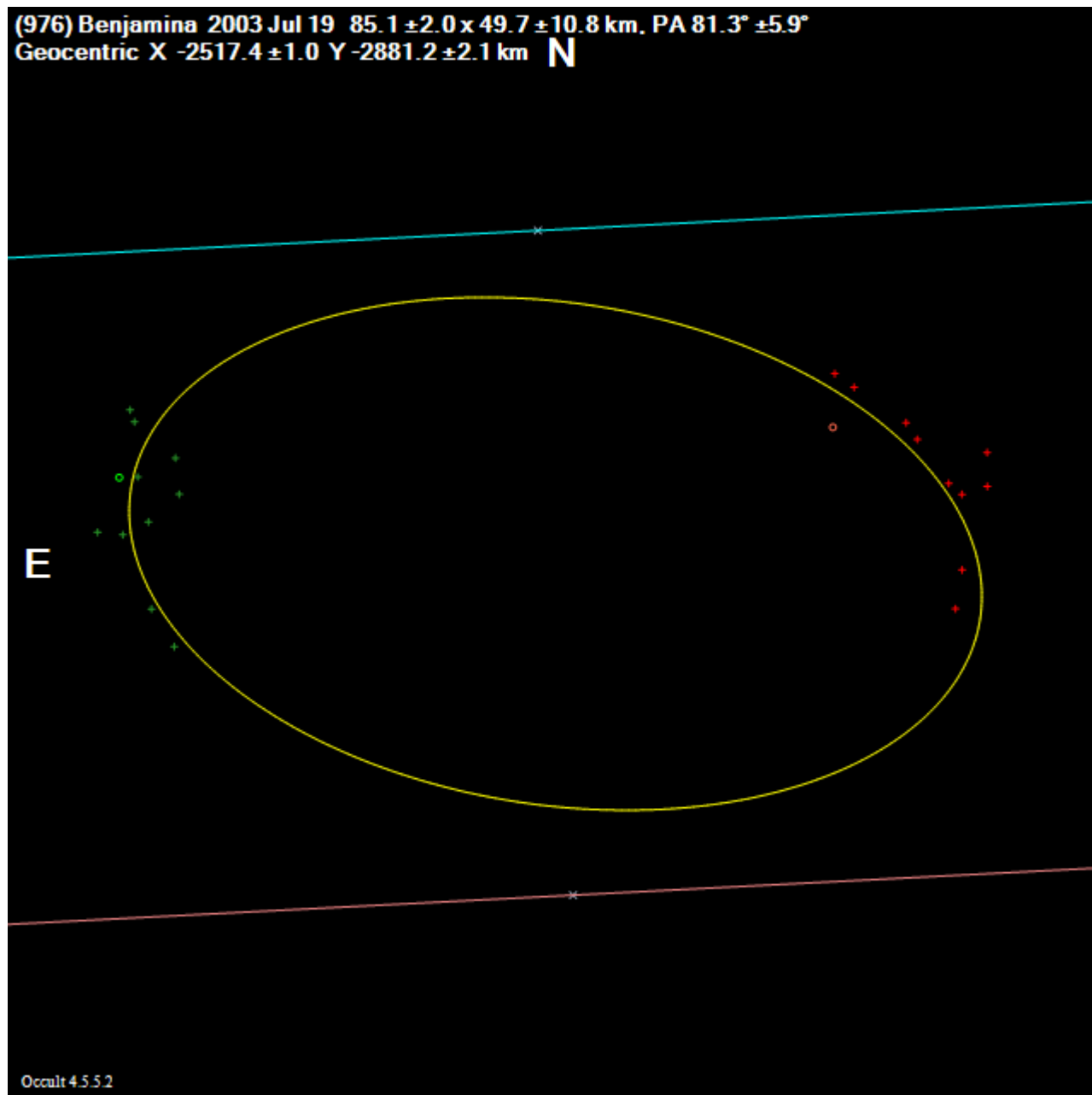
96Aegle2015Dec30

(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**



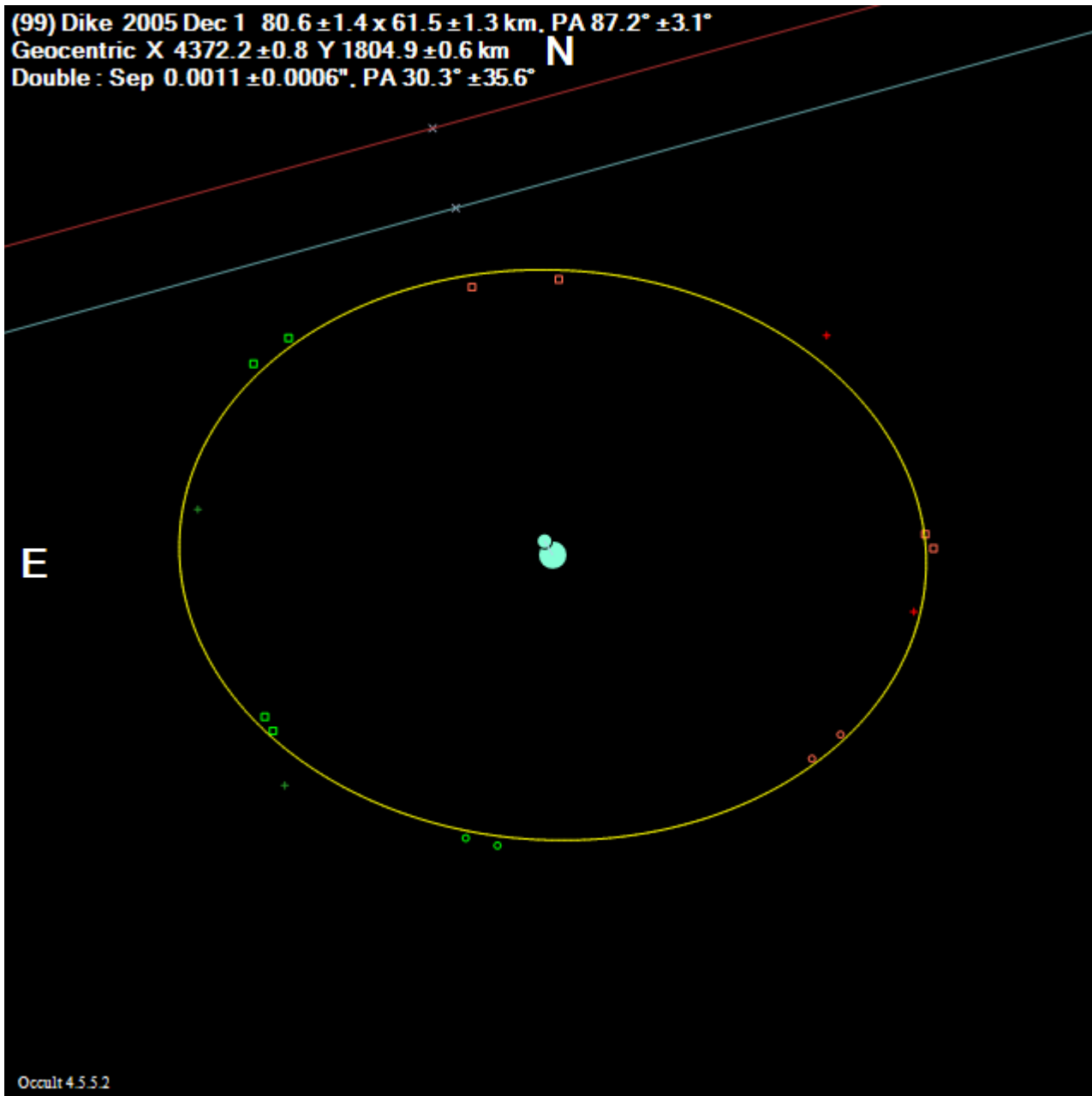
976Benamina2003Jul19

(976) Benamina 2003 Jul 19 $85.1 \pm 2.0 \times 49.7 \pm 10.8$ km, PA $81.3^\circ \pm 5.9^\circ$
Geocentric X -2517.4 ± 1.0 Y -2881.2 ± 2.1 km **N**



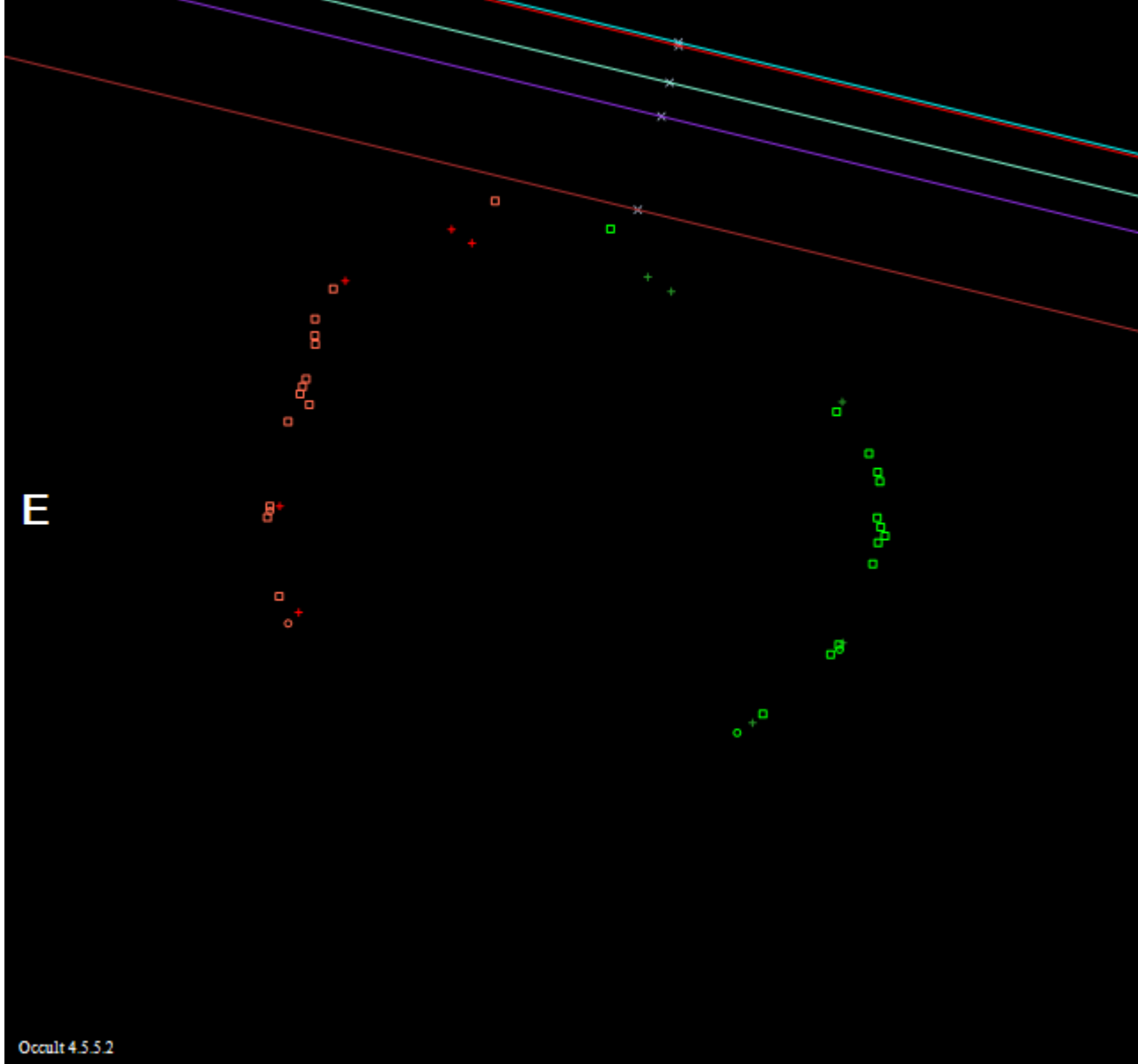
99Dike2005Dec01

(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 $30.3^\circ \pm 35.6^\circ$



9Metis2008Sep12

(9) Metis 2008 Sep 12 $176.1 \pm 1.0 \times 161.1 \pm 2.6$ km, PA $76.0^\circ \pm 4.4^\circ$
Geocentric X -5032.3 ± 0.5 Y 3338.8 ± 0.8 km **N**

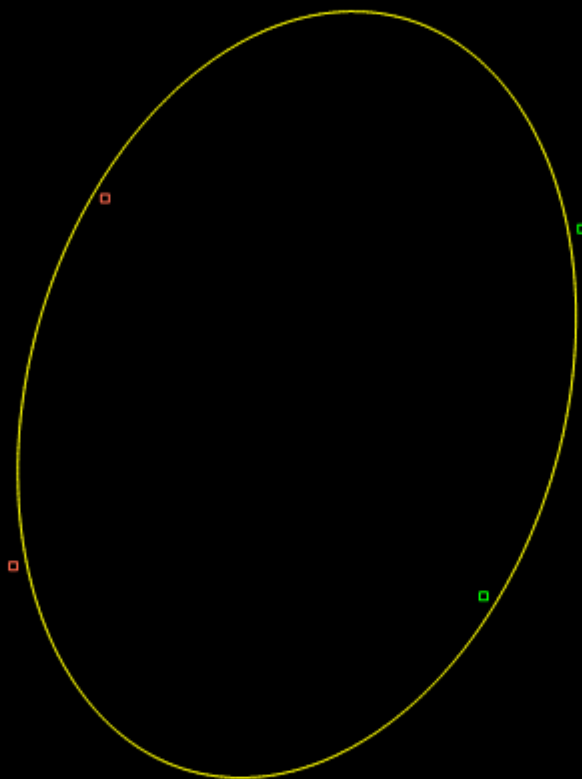


9Metis2012Oct08

(9) Metis 2012 Oct 8 200.5 x 137.3 km, PA -16.0°
Geocentric X -2667.5 Y 1572.4 km

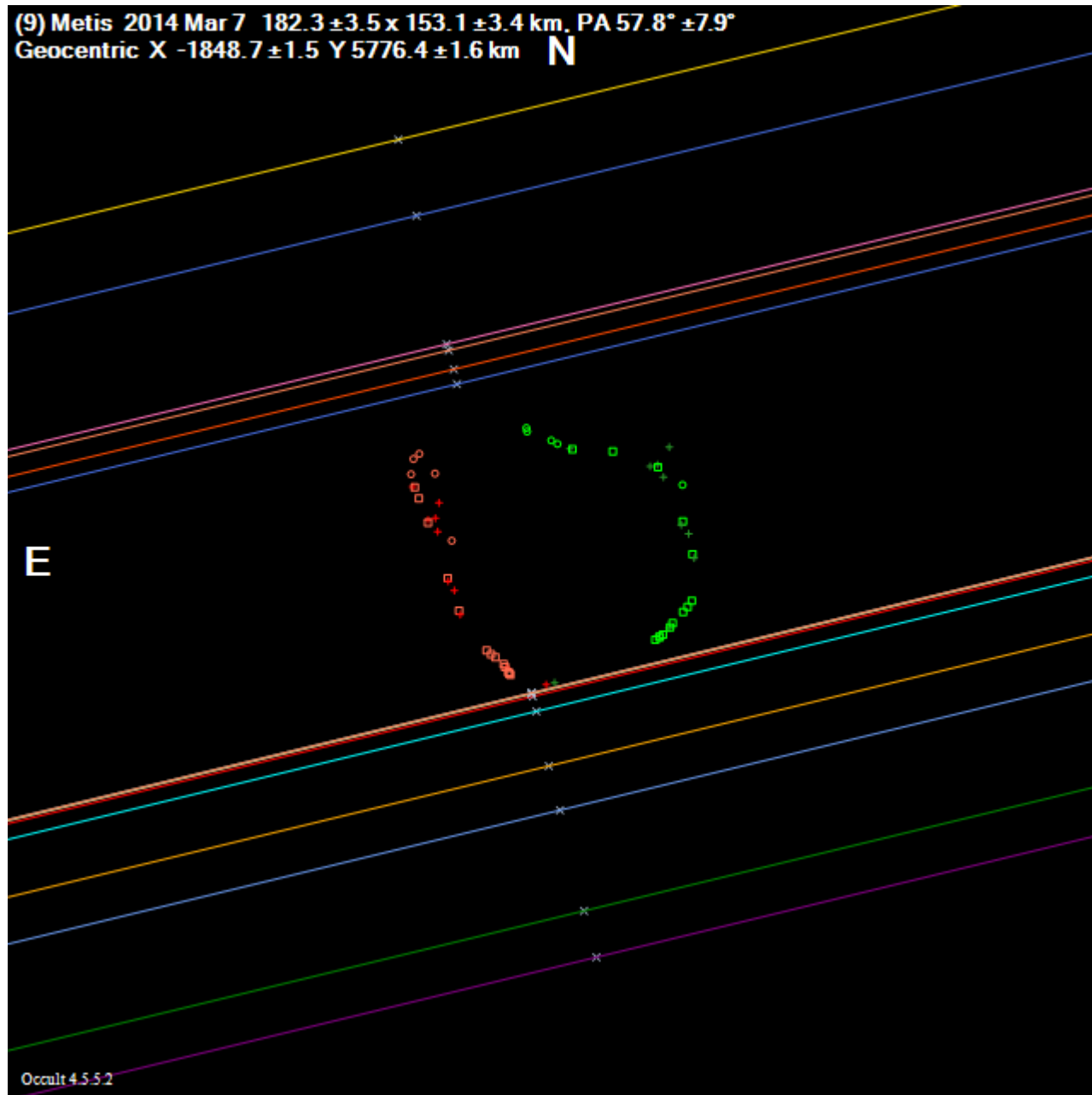
N

E



9Metis2014Mar07

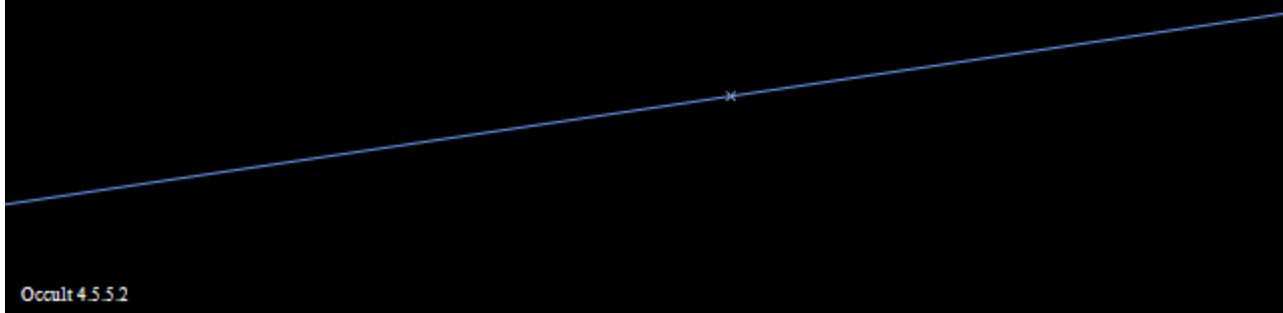
(9) Metis 2014 Mar 7 $182.3 \pm 3.5 \times 153.1 \pm 3.4$ km, PA $57.8^\circ \pm 7.9^\circ$
Geocentric X -1848.7 ± 1.5 Y 5776.4 ± 1.6 km **N**



P6M03Tethys2002Dec15

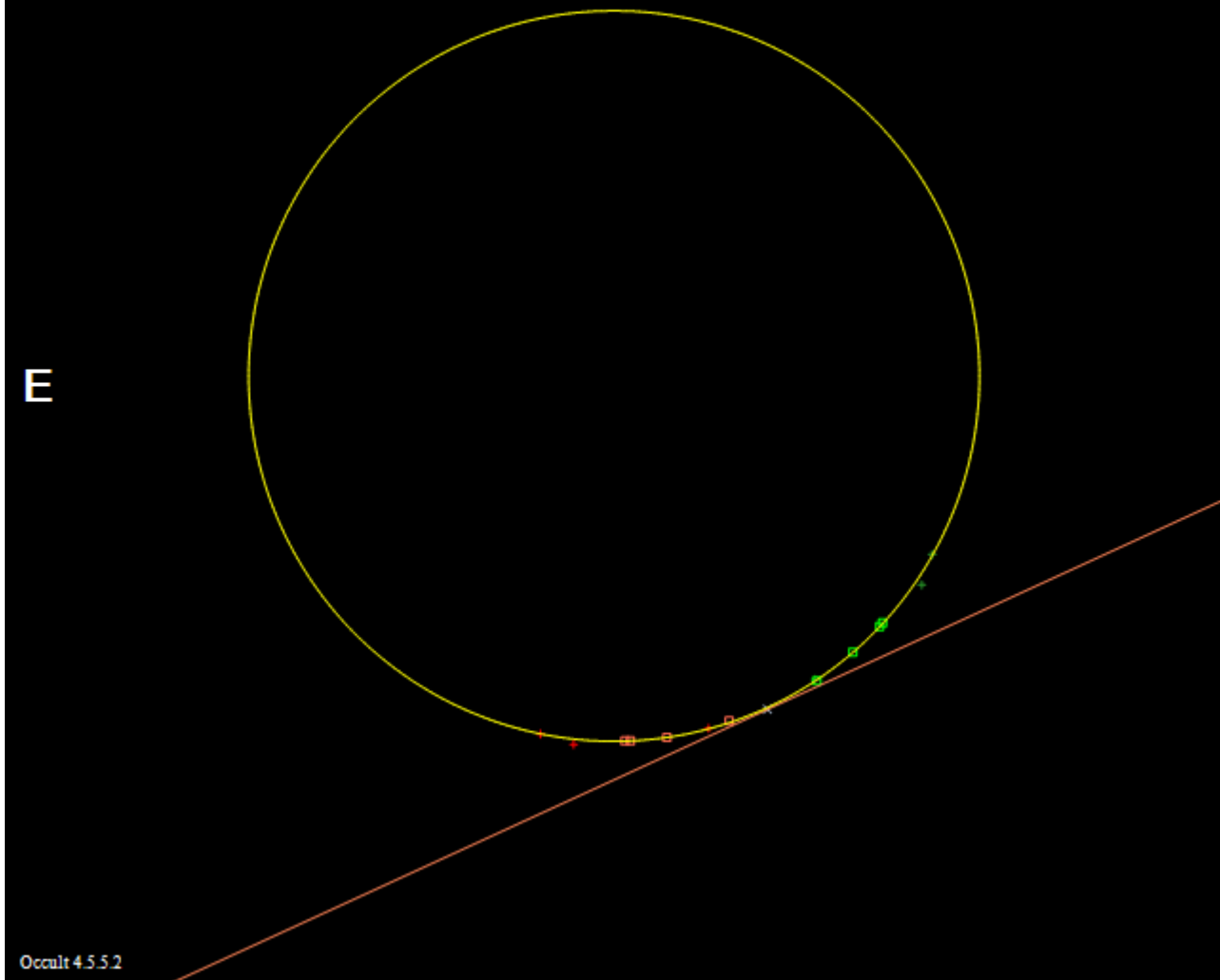
Tethys 2002 Dec 15 1058.0 ±140.7 x 1058.0 km, PA 0.0°
Geocentric X -2058.4 ±4.6 Y 3801.6 ±39.1 km **N**

E



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**



P6M09Phoebe2017Jul06

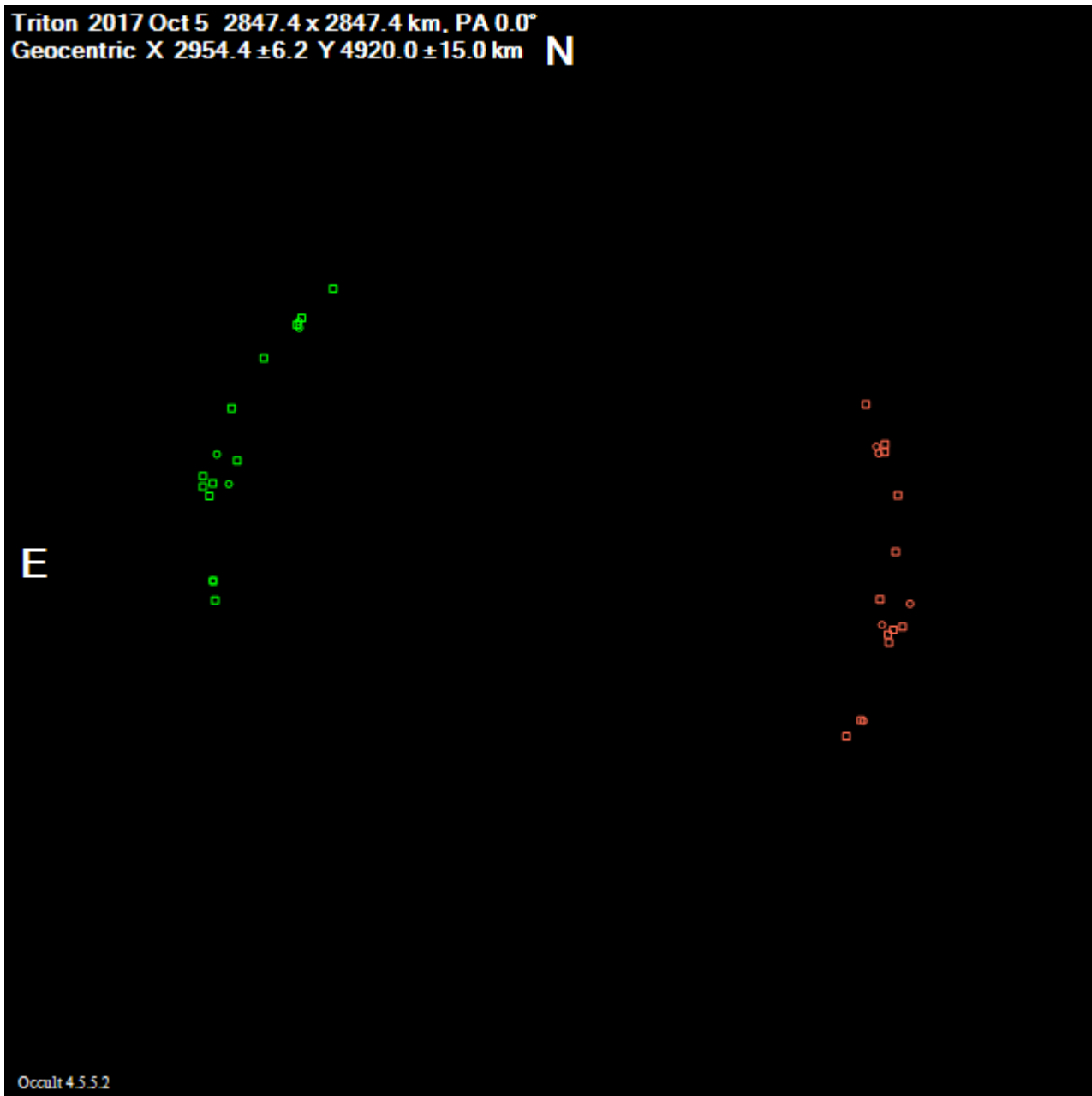
Phoebe 2017 Jul 6 212.0 x 212.0 km, PA 0.0°
Geocentric X 3431.2 ± 0.3 Y 4855.1 ± 0.3 km

N

E

P8M01Triton2017Oct05

Triton 2017 Oct 5 2847.4 x 2847.4 km, PA 0.0°
Geocentric X 2954.4 ± 6.2 Y 4920.0 ± 15.0 km **N**



P9M01Charon2005Jul11

Charon 2005 Jul 11 $1211.2 \pm 3.0 \times 1204.2 \pm 7.7$ km, PA $69.1^\circ \pm 29.8^\circ$
Geocentric X 1554.0 ± 1.2 Y -1475.5 ± 3.2 km **N**

