

# Latitude without meridian shots or UT

Simultaneous observation of stars.

*Without error in time*

**AstroNavigation**

File Algorithms!

Home Identification of Stars and Planets Nautical Almanac Sights **Celestial Fix** About

**Time**

Date: 10/06/2011  
UTC: 12:46:16  
**Now**

**Observer Position**

B [+N/-S] = 43.316666 °  
L [+E/-W] = -2.000000 °

**Celestial Body**

Sun  
 Moon  
 Planet: Mercury  
 Star: Acamar  
 Aries

**Observations**

	Date	UTC	Body	Dec	GHA	Ho	Hs
1	10/06/2011	03:52:18	Altair	8.8994	18.3970	52.7222	
2	10/06/2011	03:52:18	Alpheratz	29.1523	313.9923	49.4023	

**LOPs & Fix**

**Estimated Position at time of Fix**

Date: 10/06/2011  
UTC: 03:52:18  
B = 43.3167 °  
L = -2.0000 °

**Rhumb between observations**

COG = 0.0 °  
SOG = 0.0 kt

**LS Calculation**

max iter = 1  
% Prob = 95  
**Do**

**Output**

Fix Position  
B = 43° 19.0'  
L = -2° 0.0'  
Error  
DO = 0.00 nm  
**Results**  
**Iterations**

**Plot CoPs**

**Coastlines WVS**  
**GPX**

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With error in UT = 00:07:00

**AstroNavigation**

File Algorithms!

Home Identification of Stars and Planets Nautical Almanac Sights **Celestial Fix** About

**Time**  
 Date: 10/06/2011  
 UTC: 15:02:37  
 Now

**Observer Position**  
 B [+N/-S] = 43.316666 °  
 L [+E/-W] = -2.000000 °

**Celestial Body**  
 Sun  
 Moon  
 Planet: Mercury  
 Star: Acamar  
 Aries

**Observations**

	Date	UTC	Body	Dec	GHA	Ho	Hs
1	10/06/2011	03:59:18	Altair	8.8994	20.1518	52.7222	
2	10/06/2011	03:59:18	Alpheratz	29.1523	315.7471	49.4023	

New  
Delete

**Estimated Position at time of Fix**  
 Date: 10/06/2011  
 UTC: 04:52:18  
 B = 43.3167 °  
 L = -2.0000 °

**Rhumb between observations**  
 COG = 0.0 °  
 SOG = 0.0 kt

**LS Calculation**  
 max iter = 2  
 % Prob = 95  
 Do

**Output**  
 Fix Position  
 B = 43° 19.0'  
 L = -3° 45.3'  
 Error  
 DO = 1.74 nm  
 Results  
 Iterations

**Plot CoPs**  
 Coastlines WWS  
 GFX

**LOPs & Fix**

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**Output**  
 Fix Position  
 B = 43° 20.7'  
 L = -3° 45.2'  
 Error  
 DO = 76.54 nm

Two iterations are needed. The first one gives:

With error in UT = 01:00:00

The screenshot shows the AstroNavigation software interface. The 'Observations' table is as follows:

	Date	UTC	Body	Dec	GHA	Ho	Hs
1	10/06/2011	04:52:18	Alpheratz	29.1523	329.0334	49.4023	
2	10/06/2011	04:52:18	Altair	8.8994	33.4380	52.7222	

The 'LOPs & Fix' plot shows a green line of position (LOP) and a red vertical line of position (LOP) intersecting at a fix point labeled 'Fix(43.317, -17.041)'. The plot axes range from -10 to 10 on both the horizontal and vertical axes.

On the right side, the 'Estimated Position at time of Fix' is shown as:

Date: 10/06/2011  
 UTC: 04:52:18  
 B = 43.3167 °  
 L = -2.0000 °

The 'Rhumb between observations' section shows:

COG = 0.0 °  
 SOG = 0.0 kt

The 'LS Calculation' section shows:

max iter = 3  
 % Prob = 95  
 Do

The 'Output' section shows:

Fix Position  
 B = 43° 19.0'  
 L = -17° 2.5'  
 Error  
 DO = 2.77 nm

Buttons for 'Results' and 'Iterations' are present. The 'Plot CoPs' section has buttons for 'Coastlines WWS' and 'GFX'.

Three iterations are needed.

Fix Position  
 B = 45° 7.7'  
 L = -16° 41.4'

Error  
 DO = 650.45 nm

Fix Position  
 B = 43° 20.3'  
 L = -17° 5.8'

Error  
 DO = 108.78 nm

The first one gives:

and the second: