

1	WT	11	h	02	m	2	s	date	10-Jul-1982	body	Sun L/L	Hs	49°	24.5
	WE +S-F				m	00	s	DR Lat	36° 31' N	log	1066	index corr. + off, - on		00
	ZD +W-E	+7						DR Lon	133° 28' W	HE ft	9	DIP	-	-2.9
	GMT	18	h	02	m	2	s	GMT date / LOP label	Sights #13 10-Jul-1982	C- S-	276 5.7	T Kt	49°	21.6
2	GHA hr.	88	°	40.6	'	v moon planets	DEC hr	N22	°	12.7	'	d +-	-0.3	HP moon
3	GHA + m.s.	0	°	30.5	'	d corr.	+ -			0	'	additional altitude corr. moon, mars, venus	+	
	SHA + or v corr.	360	°		'	stars or moon, planets	DEC deg	N22	°	DEC min	12.7	altitude corr. all sights	+ -	15.2
	GHA	449	°	11.1	'	tens d		4.3	d upper			upper limb moon subtract 30'		
	a-Lon -W+E	133	°	11.1	'	units d		2.0	d lower			Ho	T	49° 36.8
LHA	316	°	00' W/60' E		dsd corr.	+		dsd			Hc	A	49° 32.9	
4	LHA	316	°			d corr.	Pub. 229	6.3				a =	3.9 T	
	Dec deg	22	N	N		5	tab Hc	49° 26.6	d +-	29.7	Z	97.9	Zn =	097.9
	a-Lat	36	N	N		d corr.	Pub. 249 & 229	6.3	Dec min.	12.7		a - Lat =	36° N	
						Hc	49° 32.9					a - Lon =	133° 11.1' W	
6														

L.H.A. greater than 180 Zn = Z
L.H.A. less than 180 Zn = 360 - Z

L.H.A. greater than 180 Zn = 180 - Z
L.H.A. less than 180 Zn = 180 + Z

1	WT	13	h	34	m	46	s	date	10-Jul-1982	body	Sun L/L	Hs	74°	42.0
	WE +S-F				m	00	s	DR Lat	36° 32' N	log	1082	index corr. + off, - on		0
	ZD +W-E	+7						DR Lon	133° 46' W	HE ft	9	DIP	-	-2.9
	GMT	20	h	34	m	46	s	GMT date / LOP label	Sights #14 10-Jul-1982	C- S-	276 5.7	T Kt	74°	39.1
2	GHA hr.	118	°	40.4	'	v moon planets	DEC hr	N 22	°	12.1	'	d +-	- 0.3	HP moon
3	GHA + m.s.	8	°	41.5	'	d corr.	+ -			-0.2	'	additional altitude corr. moon, mars, venus	+	
	SHA + or v corr.	360	°		'	stars or moon, planets	DEC deg	N 22	°	DEC min	11.9	altitude corr. all sights	+ -	+15.7
	GHA	487	°	21.9	'	tens d		10.0	d upper			upper limb moon subtract 30'		
	a-Lon -W+E	134	°	21.9	'	units d		1.0	d lower			Ho	T	74° 54.8
LHA	353	°	00' W/60' E		dsd corr.	+		dsd			Hc	A	74° 54.9	
4	LHA	353	°			d corr.	Pub. 229	11.0				a =	0.1' A	
	Dec deg	22	N	N		5	tab Hc	74° 43.9	d +-	55.4	Z	154.6	Zn =	154.6
	a-Lat	36	N	N		d corr.	Pub. 249 & 229	11.0	Dec min.	11.9		a - Lat =	36° N	
						Hc	74° 54.9					a - Lon =	134° 21.9' W	
6														

Leads to a plotted fix of 36° 31.1' N, 133° 0.9' W see red plot in Figure 8 Blog post

Starpath LOP Plot Checker

	Sight Time	a-Lat		a-Lon		a-Value	Zn
1	<input type="text" value="1:00:00"/>	<input type="text" value="36"/>	<input checked="" type="radio"/> N <input type="radio"/> S	<input type="text" value="133.111"/>	<input type="radio"/> E <input checked="" type="radio"/> W	<input type="text" value="3.9"/> <input type="radio"/> A <input checked="" type="radio"/> T	<input type="text" value="097.9"/>
2	<input type="text" value="1:00:00"/>	<input type="text" value="36"/>	<input checked="" type="radio"/> N <input type="radio"/> S	<input type="text" value="134.219"/>	<input type="radio"/> E <input checked="" type="radio"/> W	<input type="text" value="0.1"/> <input type="radio"/> A <input checked="" type="radio"/> T	<input type="text" value="154.6"/>

Course(T) Speed (knots)

Calculate Fix

133.009 W, 36.310 N

Conventions

Fix is calculated for time of second sighting.
Degrees are in 'DD.MMddd' convention
(12.345 = 12 degrees 34.5 minutes)
Time is on the 24 hour clock; 2:06:13pm = 14:06:13
time2 > time1; seconds are optional

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Redo with DR now = to fix from previous form

Celestial Navigation Work Form

Marine Education & Publications, Seattle, WA

Pub. 249 (Volumes 2 and 3) or Pub. 229 (All Volumes)

1	WT	11	h	02	m	2	s	date	10-Jul-1982	body	Sun L/L	Hs	49°	24.5
	WE +S-F				m	00	s	DR Lat	36° 31' N	log	1066	index corr. + off, - on		00
	ZD +W-E	+7						DR Lon	133° 01' W	HE ft	9	DIP	-	-2.9
	GMT	18	h	02	m	2	s	GMT date / LOP label	Sights #13 10-Jul-1982		C- T	276	Ha	49°
										S-	5.7	Kt		
2	GHA hr.	88	°	40.6	'	v moon planets	DEC hr	N22	°	12.7	'	d +-	-0.3	HP moon
	GHA + m.s.	0	°	30.5	'	d corr.	+ -			0	'			
3	SHA + or v corr.	360	°		'	stars or moon, planets	DEC deg	N22	°	DEC min	12.7			additional altitude corr. moon, mars, venus altitude corr. all sights upper limb moon subtract 30'
	GHA	449	°	11.1	'	tens d	6.4	d upper						
	a-Lon -W+E	133	°	11.1	'	units d	0.2	d lower						
	LHA	316	°	00' W/60' E		dsd corr.	+	dsd						
4	LHA	316	°			d corr.	Pub. 229	6.6						
	Dec deg	22	N	S	N	5	tab Hc	49°	17.8	'	d +-	31.1	Z	99.0
	a-Lat	37	N	S	N	d corr.	Pub. 249 & 229	6.6	Dec min.	12.7				
						Hc	49°	24.4						
6														

L.H.A. greater than 180 Zn = Z
L.H.A. less than 180 Zn = 360 - Z

L.H.A. greater than 180 Zn = 180 - Z
L.H.A. less than 180 Zn = 180 + Z

1	WT	13	h	34	m	46	s	date	10-Jul-1982	body	Sun L/L	Hs	74°	42.0
	WE +S-F				m	00	s	DR Lat	36° 31' N	log	1082	index corr. + off, - on		0
	ZD +W-E	+7						DR Lon	133° 01' W	HE ft	9	DIP	-	-2.9
	GMT	20	h	34	m	46	s	GMT date / LOP label	Sights #14 10-Jul-1982		C- T	276	Ha	74°
										S-	5.7	Kt		
2	GHA hr.	118	°	40.4	'	v moon planets	DEC hr	N 22	°	12.1	'	d +-	- 0.3	HP moon
	GHA + m.s.	8	°	41.5	'	d corr.	+ -			-0.2	'			
3	SHA + or v corr.	360	°		'	stars or moon, planets	DEC deg	N 22	°	DEC min	11.9			additional altitude corr. moon, mars, venus altitude corr. all sights upper limb moon subtract 30'
	GHA	487	°	21.9	'	tens d	10.0	d upper						
	a-Lon -W+E	133	°	21.9	'	units d	1.3	d lower						
	LHA	354	°	00' W/60' E		dsd corr.	+	dsd						
4	LHA	354	°			d corr.	Pub. 229	11.3						
	Dec deg	22	N	S	N	5	tab Hc	74°	07.6	'	d +-	57.0	Z	159.2
	a-Lat	37	N	S	N	d corr.	Pub. 249 & 229	11.3	Dec min.	11.9				
						Hc	74°	18.9						
6														

This leads to a plotted fix of 36° 27.7' N, 133° 01.8' W. see green position in Figure 8 of blog post.

Starpath LOP Plot Checker

	Sight Time	a-Lat		a-Lon		a-Value	Zn
1	<input type="text" value="1:00:00"/>	<input type="text" value="37"/>	<input checked="" type="radio"/> N <input type="radio"/> S	<input type="text" value="133.111"/>	<input type="radio"/> E <input checked="" type="radio"/> W	<input type="text" value="12.4"/> <input type="radio"/> A <input checked="" type="radio"/> T	<input type="text" value="099.0"/>
2	<input type="text" value="1:00:00"/>	<input type="text" value="37"/>	<input checked="" type="radio"/> N <input type="radio"/> S	<input type="text" value="133.219"/>	<input type="radio"/> E <input checked="" type="radio"/> W	<input type="text" value="35.9"/> <input type="radio"/> A <input checked="" type="radio"/> T	<input type="text" value="159.2"/>

Course(T) **Speed (knots)**

Calculate Fix

133.018 W, 36.277 N

Conventions

Fix is calculated for time of second sighting.
Degrees are in 'DD.MMddd' convention
(12.345 = 12 degrees 34.5 minutes)
Time is on the 24 hour clock; 2:06:13pm = 14:06:13
time2 > time1; seconds are optional

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