

Source	Group	Element	Variable	Definition	Example	Derived_From	Action
Goethe	1	0	Date	Based on the Gregorian calendar. It is the international de facto civil calendar.	2018-02-16	Calendar	
Goethe	1	0	Time	A common temporal attribution based on an approximation of the periodicity of Earth's rotation	15:22:01	Watch, WWV Signal	
Goethe	1	1	h	hour of time, 60 minutes			
Goethe	1	1	m	minute of time, 60 seconds			
Goethe	1	1	s	second, SI base unit of time			
Goethe	1	1	Watch Time	Current Local Time on time piece used at sighting	15:22:01		
Goethe	1	2	Watch Error	hours, minutes and seconds the time piece is known to be fast or slow of UTC			
Goethe	1	3	-E	If Local Time is East of UTC 0, time is subtracted from it to derived UTC			
Goethe	1	3	+W	If Local Time is West of UTC 0, time is added to it to derived UTC			
Goethe	1	3	Zone Diff +W -E	Difference in hours, minutes and seconds between Watch Time and UTC	+7		
Goethe	1	4	UTC	Coordinated Universal Time, Universal Time Coordinated	22:22:01		
Goethe	1	5	Local Date	Calendar Date at current location	2018-02-16		
Goethe	1	6	UTC Date	Calendar Date at UTC time, derived from calculation or read directly off of a time piece set to UTC	2018-02-16		
Goethe	2	0	Dead Reckoning	Dead Reckoning, estimated position in Latitude and Longitude	N 48° 56.2' W 123° 33.1'	Careful record keeping	
Goethe	2	0	DR	Dead Reckoning, estimated position in Latitude and Longitude	N 48° 56.2' W 123° 33.1'	Careful record keeping	
Goethe	2	7	'	Minute, 1/60th part of a degree from a circle ( ° )			
Goethe	2	7	°	Degree, 1/360th part of a circle			
Goethe	2	7	DR Latitude	Estimated latitude, or dead-reckoning latitude: always includes Cardinal direction of N or S	N 48° 56.2'		Transfer 2-7 to 5-1
Goethe	2	7	N	North, Cardinal direction			
Goethe	2	7	S	South, Cardinal direction			
Goethe	2	8	DR Longitude	Estimated longitude, or dead-reckoning longitude: always includes Cardinal direction of E or W	W 123° 33.1'		Transfer 2-8 to 4-12
Goethe	2	8	E	East, Cardinal direction			
Goethe	2	8	W	West, Cardinal direction			

Source	Group	Element	Variable	Definition	Example	Derived_From	Action
Goethe	3	0	Corrections	Corrections made to raw sextant data to account for height of eye above water (dip) and instrument index error			
Goethe	3	0	IC	Index Correction	00.1'		
Goethe	3	0	Sextant Data	Measurements made with a sextant or measurements and calculations made as basic input for navigation calculations.			
Goethe	3	1	Body	The celestial object used as the basis of determining current latitude and longitude. Sun, Moon, Planets or a select list of navigation stars. Data found in annual Nautical Almanac.	SUN	Observation	
Goethe	3	1	LL	Lower limb of sun or moon		Observation	
Goethe	3	1	UL	Upper limb of sun or moon		Observation	
Goethe	3	2	Hs	Height Sextant. Altitude angle as reported on the sextant scale	16° 06.0'	Physical measurement	
Goethe	3	3	ft.	Feet, Non-SI Unit of Length	6 ft.		
Goethe	3	3	m	metre	2m		
Goethe	3	4	Dip	Correction for the difference between your height of eye and the center of the earth. Value is always subtracted and is found on the first page in the NA, or by the equation $.97\sqrt{(\text{Height of eye})}$ .	-0.25'		
Goethe	3	5	Hs <sup>corr</sup>	Height of sextant corrected		Hs + Dip (note: dip is always negative)	
Goethe	3	6	Index Err	Index Error of Sextant, Angular Minutes ( ' ) on or off arc error on a Sextant	00.0'		
Goethe	3	6	Index Err +off -on	If error is "on" the arc, subtract the value, i.e. take it "off". If the error is "off" the arc, add the value, i.e. put it "on". "If it's on take it off, if it's off put it on.")			
Goethe	3	7	Ha	The apparent altitude, when instrument errors and horizon errors are accounted for.			
Nomenclature	4	0	GHA	Greenwich Hour Angle			
Nomenclature	4	0	GP	Geographic Position of celestial body: GHA is equivalent to $\lambda$ and Declination is equivalent to Latitude (either N or S)			
Nomenclature	4	0	Nautical Almanac, NA	A publication containing annual calculations of celestial objects, calculation corrections and increments directly used in Celestial Navigation.			
Goethe	4	1	GHAh	Greenwich hour angle as tabulated at a specific integer hour		Nautical Almanac Main Pages	

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Goethe	4	2	v (moon/planets)	Variation in GHA compared to sun. Hourly variance from the nominal GHA rate, arcminute per hour.		Nautical Almanac Main Pages	
Goethe	4	3	Dec h	Declination angle		Nautical Almanac Main Pages	
Goethe	4	4	d	Difference in declination from hour to hour. Hourly declination rate, d is negative (-) if declination is decreasing hour by hour; is positive (+) if declination is increasing hour by hour.		Nautical Almanac Main Pages	
Goethe	4	5	HP (Moon)	Horizontal Parallax, only applied when observing the moon. Found in the Daily Pages of the NA?		Nautical Almanac Main Pages	
Goethe	4	6	GHA + min/sec	GHA Increments and Corrections.			
Goethe	4	7	d corr	d corr is positive (+) if d is positive; is negative (-) if d is negative.			
Goethe	4	8	v corr	v corr is positive (+) if v is positive; is negative (-) if v is negative.			
Goethe	4	9	Dec corr	Corrected Declination based on values [4-3] + [4-7]. Value of [4-7] may either be + or -.			Transfer integer degrees from 4-9 to 5-3; Transfer minutes from 4-9 to 6-4
Goethe	4	10	SHA+	Sidereal Hour Angle, used in calculations of star sights.			
Goethe	4	11	GHA	Greenwich hour angle (= $\lambda$ )			
Goethe	4	12	DR Longitude	Estimated longitude, or Dead Reckoning longitude			
Goethe	4	13	a $\lambda$	Assumed Longitude, always includes Cardinal direction of E or W			
Goethe	4	14	t (LHA)	If GHA > a $\lambda$ , then t is West; If GHA < a $\lambda$ , then t is East.			
Goethe	4	14	t (LHA)	t = MA = LHA = difference between a $\lambda$ and GHA. With the sun, t is West if it is after local apparent noon at sighting position.			
Goethe	5	0	AP	assumed position, aL and a $\lambda$ pair. N 48° 56.0' W 123° 17.5' is an example.			
Goethe	5	1	DR Latitude	Estimated latitude, or dead-reckoning latitude: always includes Cardinal direction of N or S			
Goethe	5	2	aL	Assumed Latitude, always includes Cardinal direction of N or S			
Goethe	5	2	Contrary	Declination has the CONTRARY name as Latitude, that is one is N and the other is S			
Goethe	5	2	Same	Declination has the SAME name as Latitude, that is both are either N or S			

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Goethe	5	3	Dec (whole degree)	Whole (Integer) Declination value with Cardinal value, either N or S			
Goethe	5	4	t (LHA)	t = MA = LHA = difference between $a\lambda$ and GHA. With the sun, t is West if it is after local apparent noon at sighting position.			
Nomenclature	6	0	Hc	Calculated altitude angle			
Nomenclature	6	0	PUB 249	Sight Reduction Tables for Air Navigation. Also known as H.O. 249 and PUB. NO. 249. Assumed to be Volume 3 (Latitudes 39° - 89° , Declinations 0° - 29°)			
Goethe	6	1	Tab Hc	Correction to Tabulated Altitude for Minutes of Declination (PUB 249, TABLE 5)			
Goethe	6	2	d + -	d is positive (+) if Declination is increasing; d is negative (-) if Declination is decreasing			
Goethe	6	3	Z	Azimuth angle			
Goethe	6	4	Dec min	Declination minutes			
Goethe	6	5	d corr	d corr is positive (+) if d is positive; is negative (-) if d is negative.			
Goethe	6	6	Hc	Height corrected, corrected altitude			
Goethe	7	0	a	a is the difference between Hc and Ho			
Goethe	7	0	Away	If Hc > Ho then a is Away			
Goethe	7	0	Corrections	Sight corrections made for Ho, Hc and a			
Goethe	7	0	Toward	If Ho > Hc then a is Toward			
Goethe	7	1	MainCorr	Refraction + semi-diameter combined correction for all sights			
Goethe	7	2	Additional Corr	Moon (HP), Mars or Venus			
Goethe	7	3	UL Moon	Subtract 30'			
Goethe	7	4	Ho	Observed, or true observed altitude, correcting Ha for atmospheric refraction and geometric viewing errors associated with the particular heavenly object.			
Goethe	7	4	Ho	Height observed, Observed Altitude			
Goethe	7	5	Hc	Height corrected, corrected altitude			
Goethe	7	6	Intercept T A (a)				
Goethe	7	7	Zn	Azimuth. If object is East of sighting then $Z_n=Z$ ; if object is West of sighting then $Z_n=360^\circ-Z$			
Goethe	7	8	aL	Assumed Latitude, always includes Cardinal direction of N or S			
Goethe	7	9	a $\lambda$	Assumed Longitude, always includes Cardinal direction of E or W			

Source	Group	Element	Variable	Definition	Example	Derived_From	Action
Nomenclature	99	0	"	Second, 1/60th part of a minute from a circle ( ' )			
Nomenclature	99	0	(+E/-W) Longitude	Longitude at the time of observation. If in West longitude, subtract this value from GHA to find LHA. If in East longitude, add this value to GHA to find LHA.			
Nomenclature	99	0	+m/s	Minutes and Seconds corrections, always added. Found in the Increments and Corrections section (back yellow pages) of the NA.			
Nomenclature	99	0	arcminute	A unit of angular measurement equal to 1/60 of one degree.			
Nomenclature	99	0	CorrALT	Correction to the sextant altitude for refraction, parallax, and semidiameter			
Nomenclature	99	0	Corrd	Correction to the tabular declination using rate d			
Nomenclature	99	0	CorrDIP	Correction for dip of the horizon due to eye height			
Nomenclature	99	0	Corrected GHA of Aries	Sum of initial GHA of Aries and m/s correction.			
Nomenclature	99	0	CorrGHA	Correction to the tabular GHA for the minutes and seconds			
Nomenclature	99	0	Corrv	Correction to the tabular GHA for the variance v			
Nomenclature	99	0	DEC <sub>hour</sub>	Declination angle as tabulated at a specific integer hour			
Nomenclature	99	0	Declination	declination (abbreviated dec; symbol $\delta$ ) is one of the two angles that locate a point on the celestial sphere in the equatorial coordinate system, the other being hour angle.			
Nomenclature	99	0	D <sub>offset</sub>	Offset distance using the intercept method, nautical miles			
Nomenclature	99	0	GHA <sub>hour</sub>	Greenwich hour angle as tabulated at a specific integer hour			
Nomenclature	99	0	GMT	Greenwich Mean Time			
Nomenclature	99	0	Goethe	Robert Goethe, eminent celestial navigator and instructor of the arcane art of squinting at the sun, moon or stars to determine one's place in the world.			
Nomenclature	99	0	Hack Watch	Watch used during observation with a known error from UTC			
Nomenclature	99	0	h <sub>eye</sub>	Eye height above the water, meters or feet			

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<b>Nomenclature</b>	99	0	HP	Horizontal Parallax, only applied when observing the moon. Found in the Daily Pages of the NA?			
<b>Nomenclature</b>	99	0	LAN	Local Apparent Noon			
<b>Nomenclature</b>	99	0	LAT	Latitude			
<b>Nomenclature</b>	99	0	LATA	Assumed Latitude			
<b>Nomenclature</b>	99	0	LATDR	Estimated latitude, or dead-reckoning latitude			
<b>Nomenclature</b>	99	0	LHA	Local Hour Angle			
<b>Nomenclature</b>	99	0	LHA	Local Hour Angle			
<b>Nomenclature</b>	99	0	LHA of Aries	Local Hour Angle of Aries (angle from you to Aries). Sum of GHA of Aries and your longitude as described above.			
<b>Nomenclature</b>	99	0	LMT	Local Mean Time			
<b>Nomenclature</b>	99	0	LON	Longitude			
<b>Nomenclature</b>	99	0	LONA	Assumed Longitude			
<b>Nomenclature</b>	99	0	LONDR	Estimated longitude, or dead-reckoning longitude			
<b>Nomenclature</b>	99	0	LOP	Line of Position			
<b>Nomenclature</b>	99	0	MA	Meridian Angle			
<b>Nomenclature</b>	99	0	Mars	The fourth planet orbiting the Sun, Orbital period 686.971 days, 1.88082 years			
<b>Nomenclature</b>	99	0	Moon	The natural satellite of the Earth, Orbital period of 27.321661 days (27 d 7 h 43 min 11.5 s			
<b>Nomenclature</b>	99	0	R	Correction for atmospheric refraction			
<b>Nomenclature</b>	99	0	Refraction	Refraction is the change in direction of wave propagation due to a change in its transmission medium.			
<b>Nomenclature</b>	99	0	SD	Angular semi-diameter of sun or moon			
<b>Nomenclature</b>	99	0	Semi-diameter	the semidiameter or semi-diameter of a set of points may be one half of its diameter; or, sometimes, one half of its extent along a particular direction.			
<b>Nomenclature</b>	99	0	SHA	Sidereal Hour Angle			
<b>Nomenclature</b>	99	0	SI	System International is a coherent system of units of measurement built on seven base units: ampere, kelvin, second, metre, kilogram, candela, mole.			
<b>Nomenclature</b>	99	0	t	an occasional abbreviation for MA			
<b>Nomenclature</b>	99	0	Tab	Tabulated			

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Nomenclature	99	0	Time Zone	A time zone is a region of the globe that observes a uniform standard time.			
Nomenclature	99	0	Variation	Magnetic declination or variation is the angle on the horizontal plane between magnetic north (the direction the north end of a compass needle points, corresponding to the direction of the Earth's magnetic field lines) and true north			
Nomenclature	99	0	Venus	The second planet orbiting the Sun, Orbital period 224.701 days, 0.615198 year			
Nomenclature	99	0	Year	The mean length of the Gregorian calendar year is 365.2425 days; this is within one ppm of the current length of the mean tropical year (365.24219 days) and even closer to the current March equinox year of 365.242374 days that it aims to match.			
Nomenclature	99	0	Zn	Azimuth angle from true north			
Nomenclature	99	0	Zo	Uncorrected azimuth angle			
Nomenclature	99	0	Zulu	UTC time = Zulu time. If time is given as UTC, a "Z" is may be added after the time without a space. Z is the zone designator for the zero UTC offset.			
Nomenclature	99	0	$\lambda$	Longitude			