# Sumner Line of Position

**Point A**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Assumed Latitude | 48 | deg. | 12.00 | min. | N | ----------> | $Log_{10}[1/COS(Lat_A)]$ | 0.17618 | | |
| Declination of Sun | 22 | deg. | 33.00 | min. | N | ----------> | $Log_{10}[1/COS(Dec)]$ | 0.03454 | | |
| Σ | 25 | deg. | 39.00 | min. | 25.65 | -----> Nat. COS(Σ) = | 90145 | | | |
| Ho | 19 | deg. | 35.62 | min. | ----------> | -----> Nat. SIN(Ho) = | 33534 | | | |
| | | | | | | Diff = | 56611 | $Log_{10}$[Diff] | 4.75290 | |

| | | | | |
|---|---|---|---|---|
| 5:41:36 | Time from Noon | <-------- Log Rising | 4.96362 | $Log_{10}[1/COS(Lat_A)]+Log_{10}[1/COS(Dec)]+Log_{10}$[Diff] |
| 12:00:00 | Local Apparent Noon | Calculated Log Rising | 4.96362 | $5+LOG_{10}$[1-COS(Meridian Angle)] |
| 17:41:36 | Apparent time @ Ship | Meridian Angle | 85.3984 | deg. |
| 17:46:21 | Mean Time @ Ship | LHA | 85.3984 | deg. |
| 1:46:21 | GMT @ Ship | | | |
| 2:00:00 | GMT by Chronometer | | | |

ΔT = -13.6563 — Estimated Longitude for Point A: 123 deg. 24.84 min. W

ΔLo = 3.414081 deg.

**Point B**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Assumed Latitude | 48 | deg. | 8.50 | min. | N | ----------> | $Log_{10}[1/COS(Lat_B)]$ | 0.17568 | | |
| Declination of Sun | 22 | deg. | 33.00 | min. | N | ----------> | $Log_{10}[1/COS(Dec)]$ | 0.03454 | | |
| Σ | 25 | deg. | 35.50 | min. | 25.59167 | -----> Nat. COS(Σ) = | 90189 | | | |
| Ho | 19 | deg. | 35.62 | min. | ----------> | -----> Nat. SIN(Ho) = | 33534 | | | |
| | | | | | | Diff = | 56655 | $Log_{10}$[Diff] | 4.75324 | |

| | | | | |
|---|---|---|---|---|
| 5:41:31 | Time from Noon | <-------- Log Rising | 4.96346 | $Log_{10}[1/COS(Lat_B)]+Log_{10}[1/COS(Dec)]+Log_{10}$[Diff] |
| 12:00:00 | Local Apparent Noon | Calculated Log Rising | 4.96346 | $5+LOG_{10}$[1-COS(Meridian Angle)] |
| 17:41:31 | Apparent time @ Ship | Meridian Angle | 85.3791 | deg. |
| 17:46:16 | Mean Time @ Ship | LHA | 85.3791 | deg. |
| 1:46:16 | GMT @ Ship | | | |
| 2:00:00 | GMT by Chronometer | | | |

ΔT = -13.7337 — Estimated Longitude for Point B: 123 deg. 26.01 min. W

ΔLo = 3.43343 deg.

**Enter Data Into Yellow Cells**

**Point C**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Assumed Latitude | 48 | deg. | 4.00 | min. | N | ----------> | $Log_{10}[1/COS(Lat_C)]$ | 0.17505 | | |
| Declination of Sun | 22 | deg. | 33.00 | min. | N | ----------> | $Log_{10}(1/COS(Dec))$ | 0.03454 | | |
| Σ | 25 | deg. | 31.00 | min. | 25.51667 | -----> Nat. COS(Σ) = | 90246 | | | |
| Ho | 19 | deg. | 35.62 | min. | ----------> | -----> Nat. SIN(Ho) = | 33534 | | | |
| | | | | | | Diff = | 56712 | $Log_{10}$[Diff] | 4.75367 | |

| | | | | |
|---|---|---|---|---|
| 5:41:25 | Time from Noon | <-------- Log Rising | 4.96327 | $Log_{10}[1/COS(Lat_C)]+Log_{10}[1/COS(Dec)]+Log_{10}$[Diff] |
| 12:00:00 | Local Apparent Noon | Calculated Log Rising | 4.96327 | $5+LOG_{10}$[1-COS(Meridian Angle)] |
| 17:41:25 | Apparent time @ Ship | Meridian Angle | 85.3547 | deg. |
| 17:46:10 | Mean Time @ Ship | LHA | 85.3547 | deg. |
| 1:46:10 | GMT @ Ship | | | |
| 2:00:00 | GMT by Chronometer | | | |

ΔT = -13.8311 — Estimated Longitude for Point C: 123 deg. 27.47 min. W

ΔLo = 3.457766 deg.

| | | | | | | |
|---|---|---|---|---|---|---|
| Body | SUN | Limb | LL | | | |
| Height of eye | 6 | ft. | | | | |
| hs | 19 | deg. | 24.70 | min. | | |
| | (+) | | (-) | | | |
| IC | | min. | | min. | | |
| Dip | | | 2.38 | min. | | |
| (±) Totals | 0.00 | min. | 2.38 | min. | | |
| Corr | -2.38 | min | | | | |
| ha | 19 | deg. | 22.32 | min | | |
| | (+) | | (-) | | | |
| Main | 13.30 | min. | | min. | | |
| Add'l Ref. | | min. | | min. | | |
| (±) Totals | 13.30 | min. | 0.00 | min. | | |
| Corr | 13.30 | min | | | | |
| Ho | 19 | deg. | 35.62 | min. | | |

| | Day | Month | Year | | | |
|---|---|---|---|---|---|---|
| Date @ Greenwich | 7 | July | 2016 | GMT | 2:00:00 | by Chronometer |
| Declination of Sun | 22 deg. | 33.00 min. | N | | | |
| Equation of Time | 4 min. | 45.00 sec. | | | | |
| Time of Meridian Passage @ Greenwich | 12:05 | | | | | |
| Estimated DR Longitude | 123 deg. | 26.00 min. | W | | | |
| Zone Description | 8 | Zone Meridian | 120 deg. | W | | |
| Zone Time | 18:00:00 | | | | | |

Click to view Time from Noon vs. Log RisingTable & Graph