DR position at 12:30:00 GMT on 1978.02.28: 06° 02.5' N 090° 40.0' E
Height of eye: 23 m
Track: 110° True
Groundspeed: 16 knots

	Capella	**Procyon**	**Canopus**	**Hamal**
GMT	12:20:26	12:27:17	12:28:31	12:33:04
Declination	45.977	5.278	- 52.690	23.358
Hour Angle*	5.032	39.087	20.105	- 45.425
H sextant	50° 06.0'	51° 06.4'	28° 51.2'	43° 23.8'
ic	0.0	0.0	0.0	0.0
dip	- 8.5'	- 8.5'	- 8.5'	- 8.5'
star corr	- 0.8'	- 0.8'	- 1.8'	- 1.0'
H observed	49° 56.7'	51° 57.1'	28° 40.9'	43° 14.3'
H computed	49° 49.7'	51° 06.3'	28° 50.2'	43° 02.2'

* Hour Angle = – LHA (if LHA is between 0° and 180°), or Hour Angle = 360° – LHA
(if LHA is between 180° and 360°).

Calculated/Constructed Most Probable Position at 12:30 GMT:
06° 09.7' N 090° 30.2' E

Almanac Data For Hamal
Geographical Position (lat, lon) = 23.4624 -314.4483
GHAAST = 346 14.5'
SHA = 328 12.4'
GHA = 314 26.9'
Dec = N 23 27.7'
SD = 0.0'
HP = 0.0'

Formulas used to calculate sight

Index Error is 0.0000 degrees

Eye Height is 23.0000 meters
Height Correction Degrees = 1.758*sqrt(23.0000) / 60.0
Height Correction Degrees = 0.1405

Apparent Altitude (Ha)
ApparentAltitude = Measurement - IndexCorrection - EyeHeightCorrection
ApparentAltitude = 43.3967 - 0.0000 - 0.1405
ApparentAltitude = 43.2561

Refraction Correction
x = tan(Pi/180*ApparentAltitude + 4.848e-2*(Pi/180) / (tan(Pi/180*ApparentAltitude) +
.028))
x = tan(Pi/180*43.2561 + 4.848e-2*(Pi/180) / (tan(Pi/180*43.2561) + .028))
x = 0.9426

RefractionCorrection = .267 * Pressure / (x*(Temperature + 273.15)) / 60.0
RefractionCorrection = .267 * 1010.0000 / (x*(10.0000 + 273.15)) / 60.0
RefractionCorrection = 0.0168

Corrected Altitude
CorrectedAltitude = ApparentAltitude - RefractionCorrection - LimbCorrection
CorrectedAltitude = 43.2561 - 0.0168 - 0.0000
CorrectedAltitude = 43.2393

Observed Altitude (Ho)
ObservedAltitude = CorrectedAltitude - ParallaxCorrection
ObservedAltitude = 43.2393 - 0.0000
ObservedAltitude = 43.2393

Almanac Data For Canopus
Geographical Position (lat, lon) = -52.6957 -249.1131
GHAAST = 345 6.1'
SHA = 264 0.7'
GHA = 249 6.8'
Dec = S 52 41.7'
SD = 0.0'
HP = 0.0'

Formulas used to calculate sight

Index Error is 0.0000 degrees

Eye Height is 23.0000 meters
Height Correction Degrees = 1.758*sqrt(23.0000) / 60.0
Height Correction Degrees = 0.1405

Apparent Altitude (Ha)
ApparentAltitude = Measurement - IndexCorrection - EyeHeightCorrection
ApparentAltitude = 28.8533 - 0.0000 - 0.1405
ApparentAltitude = 28.7128

Refraction Correction
x = tan(Pi/180*ApparentAltitude + 4.848e-2*(Pi/180) / (tan(Pi/180*ApparentAltitude) + .028))
x = tan(Pi/180*28.7128 + 4.848e-2*(Pi/180) / (tan(Pi/180*28.7128) + .028))
x = 0.5497
RefractionCorrection = .267 * Pressure / (x*(Temperature + 273.15)) / 60.0
RefractionCorrection = .267 * 1010.0000 / (x*(10.0000 + 273.15)) / 60.0
RefractionCorrection = 0.0289

Corrected Altitude
CorrectedAltitude = ApparentAltitude - RefractionCorrection - LimbCorrection
CorrectedAltitude = 28.7128 - 0.0289 - 0.0000
CorrectedAltitude = 28.6839

Observed Altitude (Ho)
ObservedAltitude = CorrectedAltitude - ParallaxCorrection
ObservedAltitude = 28.6839 - 0.0000
ObservedAltitude = 28.6839

Almanac Data For Procyon

Geographical Position (lat, lon) = 5.2236 -229.9673
GHAAST = 344 47.5'
SHA = 245 10.5'
GHA = 229 58.0'
Dec = N 5 13.4'
SD = 0.0'
HP = 0.0'

Formulas used to calculate sight

Index Error is 0.0000 degrees

Eye Height is 23.0000 meters
Height Correction Degrees = 1.758*sqrt(23.0000) / 60.0
Height Correction Degrees = 0.1405

Apparent Altitude (Ha)
ApparentAltitude = Measurement - IndexCorrection - EyeHeightCorrection
ApparentAltitude = 51.1067 - 0.0000 - 0.1405
ApparentAltitude = 50.9661

Refraction Correction
x = tan(Pi/180*ApparentAltitude + 4.848e-2*(Pi/180) / (tan(Pi/180*ApparentAltitude) + .028))
x = tan(Pi/180*50.9661 + 4.848e-2*(Pi/180) / (tan(Pi/180*50.9661) + .028))
x = 1.2351
RefractionCorrection = .267 * Pressure / (x*(Temperature + 273.15)) / 60.0
RefractionCorrection = .267 * 1010.0000 / (x*(10.0000 + 273.15)) / 60.0
RefractionCorrection = 0.0129

Corrected Altitude
CorrectedAltitude = ApparentAltitude - RefractionCorrection - LimbCorrection
CorrectedAltitude = 50.9661 - 0.0129 - 0.0000
CorrectedAltitude = 50.9533

Observed Altitude (Ho)
ObservedAltitude = CorrectedAltitude - ParallaxCorrection
ObservedAltitude = 50.9533 - 0.0000
ObservedAltitude = 50.9533

Almanac Data For Capella

Geographical Position (lat, lon) = 45.9980 -263.9024
GHAAST = 343 4.5'
SHA = 280 49.7'
GHA = 263 54.1'
Dec = N 45 59.9'
SD = 0.0'
HP = 0.0'

Formulas used to calculate sight

Index Error is 0.0000 degrees

Eye Height is 23.0000 meters
Height Correction Degrees = 1.758*sqrt(23.0000) / 60.0
Height Correction Degrees = 0.1405

Apparent Altitude (Ha)
ApparentAltitude = Measurement - IndexCorrection - EyeHeightCorrection
ApparentAltitude = 50.1000 - 0.0000 - 0.1405
ApparentAltitude = 49.9595

Refraction Correction
x = tan(Pi/180*ApparentAltitude + 4.848e-2*(Pi/180) / (tan(Pi/180*ApparentAltitude) + .028))
x = tan(Pi/180*49.9595 + 4.848e-2*(Pi/180) / (tan(Pi/180*49.9595) + .028))
x = 1.1917
RefractionCorrection = .267 * Pressure / (x*(Temperature + 273.15)) / 60.0
RefractionCorrection = .267 * 1010.0000 / (x*(10.0000 + 273.15)) / 60.0
RefractionCorrection = 0.0133

Corrected Altitude
CorrectedAltitude = ApparentAltitude - RefractionCorrection - LimbCorrection
CorrectedAltitude = 49.9595 - 0.0133 - 0.0000
CorrectedAltitude = 49.9462

Observed Altitude (Ho)
ObservedAltitude = CorrectedAltitude - ParallaxCorrection
ObservedAltitude = 49.9462 - 0.0000
ObservedAltitude = 49.9462