Sight Reduction: All

Fill out the top-left box as indicated.

Find dead-reckoning (DR) position using previous fix, heading and speed, using the time of observations. Write into the top-center box.

Perform observations. For each,

- (1) Write body, indicate UL/LL for Upper Limb/Lower Limb for Moon and Sun.
- (2) Use watch GMT time, subtract known error and write GMT time..
- (6) Height Sextant (Hs) observed

From YP

- (3) Using Height from top-left, find Dip on YS
- (4) Write known Index Correction (IC/I.C.)
- (5) Sum (3)+(4) into (5)
- (7) Add (5) to Hs (6) into (7) for Apparent Altitude (App.Alt aka Height Adjusted (Ha)).
- Copy (7) to between (12) and (13) to make later addition easier.

Altitude Corrections for **Sun, Stars, Planets** (Use +/- columns)

- (9) Alt. Corr. lookup from YS/A2 for body type. Use A3 for App.Alt < 10˚.
- (10) Adtl. Corr. lookup from YS for body type.
- (11) If Sun Upper Limb observation, write -30'
- (12) Add (9) + (10) + (11) into (12)
- (13) Add (12) to (7) to (13) for Ho. Copy to below (29)

Altitude Corrections for **Moon** (Use +/- columns)

- (8) Lookup Horizontal Parallax (HP) on DP
- (9) Lookup Alt.Coor. from Alamanc Alt.Correction.Tables Moon,
    - Read App.Alt. degree on X, down to Y for degree/mins,
    - (10) In lower table, match HP row to LL/UL colun
- (11) If Moon Upper Limb observation, write -30'
- (12) Add (9) + (10) + (11) into (12)
- (13) Add (12) to (7) to (13) for Ho. Copy to below (29)

Altitude Corrections for **Polaris**:

- (9) Alt. Corr. lookup from YS/A2 for Stars.
- (10) Adtl. Corr. lookup from YS for Stars. Use A3 for App.Alt < 10˚.
- (11) Q from HO249Vol1, Table 6, or sum a0+a1+a2 from Polaris table in Almanac
- (12) Add (9) + (10) + (11) into (12)
- (13) Add (12) to (7) to (13) for Ho
- This is the latitude, **stop**, this can be drawn as a LOP onto the UPS

Altitude Corrections for **Stars (selected and non-selected)**

- (9) Alt. Corr. lookup from YS/A2 for body type.
- (12) is (9)
- (13) Add (12) to (7) to (13) for Ho. Copy to below (29)

LHA for **Planets and Moon**

- From DP, for the planet or moon
    - (15) write GHA
    - (14) write v

        - (22) write d, negative if Decl declining over day
        - (23) write Decl, note N or S
- From increments and corrections for minutes/seconds of time
    - (16) write GHA Min&S increments for **sun/planets *or* moon**
    - (18) write v correction
    - (24) write d correction
- (19) Add (15), (16) and (18) to get planet GHA
- (20) Write DR Long, when West, subtract, when East, add, result must end in 00'0.
- (20) is a result used for determining Hc and Z later.

LHA for **Sun**

- From DP, for the sun
    - (15) write GHA
    - (22) write d, negative if Decl declining over day
    - (23) write Decl, note N or S
- From increments and corrections for minutes/seconds of time
    - (16) write GHA Min&S increments for **sun/planets**
    - (24) write d correction
- (19) Add (15) and (16) to get Sun GHA
- (20) Write DR Long, when West, subtract, when East, add, result must end in 00'0.
- (20) is a result used to lookup Hc and Z later.

LHA for **Selected Stars**

- From DP
    - (15) write GHA ♈
- From increments and corrections for minutes/seconds of time
    - (16) write GHA Min&S increments for **Aries**
- (19) Add (15) and (16) to get Star GHA
- (20) Write DR Long, when West, subtract, when East, add, result must end in 00'0.
- (20) is a result used to lookup Hc and Z later.

LHA for **Non-Selected Stars**

- From DP
    - (15) write GHA ♈
- From increments and corrections for minutes/seconds of time
    - (16) write GHA Min&S increments for **Aries**
- (17) Lookup SHA
    - The set of navigational stars are on the DP
    - Other stars are… **todo**
- (19) Add (15), (16) and (17) to get Star GHA
- (20) Write DR Long, when West, subtract, when East, add, result must end in 00'0.
- (20) is a result used to lookup Hc and Z later.

Decl, used for **Sun, Moon, Planets**, skip for selected stars, use for **other stars**.

- From LHA step
    - From DP
        - (22) write d, negative if declining over day
        - (23) write Decl, note N or S
    - From increments and corrections for minutes/seconds of time
        - (24) write d correction
- (25) Add (23) to (24) to get declination, note N or S

- (25) is a result used to lookup Hc and Z later.

Result for **Sun, Planets, Moon and Non-Selected Stars**

- Lookup LHA Declination for the latitude in HO249vol2
- Match North/South to latitude, find LHA on right or left side, decl on vertical.
- (27) Write Alt Hc from table
- (26) Write d from table
- (32) Write Z from table

- (28) Lookup d correction using d (26) horizontal and Decl minutes vertical
- (29) Add d correction (28) to (27) to get Hc.
- (31) Difference between (29, Hc) and (13, Ho) is Throw. If Hc>Ho, throw is Away, otherwise Toward, Mark as A/T.
- (33) Compute Zn from Z
    - N lat, LHA > 180, Zn = Z, LHA < 180 Zn = 360 - Z
    - S lat LHA > 180, Zn = 180 - Z, LHA < 180 Zn = 180 + Z
- (33) and (31) are the results to use for LOPs

Result for **Selected Stars**

- In HO249 Vol1
    - Lookup Hc (29) and Zn (33) using latitude and LHA ♈
    - (31) Difference between (29, Hc) and (13, Ho) is Throw. If Hc>Ho, throw is Away, otherwise Toward, Mark as A/T.
- (33) and (31) are the results to use for LOPs

Result for **Non-Selected Stars**

- In HO249 Vol1
    - Lookup Hc (29) and Zn (33) using latitude and LHA ♈
    - (31) Difference between (29, Hc) and (13, Ho) is Throw. If Hc>Ho, throw is Away, otherwise Toward, Mark as A/T.
- (33) and (31) are the results to use for LOPs

Terminology

- **(X)** Cell labelled X
- ♈ Aries
- **CT** Civil Twilight
- **DP "Daily page"** Almanac page for GMT Date **(G)**
- **YS** Yellow Sheet
- **A1-4** Table A1-4 in Almanac
- **DR** Dead Reckoning
- **GHA** Global Hour Angle
- **GMT** Greenwich Mean Time
- ***Hs*** = sextant angle
- ***Ho*** = angle observed (from Hs)
- ***Hc*** Altitude = angle over horizon
- **LHA** Local Hour Angle
- **UPS** Universal Plotting Sheet
- **SHA** Sidereal Hour Angle
- **RA** Right Ascension
- ***Zn*** Azimuth = direction on horizon