FLAT BYGRAVE SLIDE RULE EMULATOR.

COMBINED EXAMPLE AND MINI TUTORIAL.

We assume that the emulator’s settings are in the default configuration of 45 rows, 1200 pixels per row and maximum value of 89°.

We shall use the same example as in Gary’s post and pro forma.

Latitude = 34N, Dec = 20N, Hour Angle (H) = 14, derived on pro forma from LHA = 346.

Step 1.

A. Set RED scale 0° mark over Dec (20°) on BLACK scale.

B. Read off intermediate value “W” (20° 33’) on BLACK scale below H (14°) on RED.

Method:

A1. If required, use ‘Ctrl + wheel’ to change zoom so that the entire WIDTH of the scale is within the screen.

A2. Use ‘wheel’ to scroll screen down until the RED Zero mark and BLACK 20° are both on screen.

A3. Use ‘left button + drag’ to move the RED scale down and right until the zero mark is approximately over 20° on the BLACK scale.

A4. Note that the RED scale automatically snaps to the correct vertical position.

A5. Fine adjust the RED scale horizontally using ‘left/right click’ (or ‘l’/’r’ keys).

A6. Now that is set, press mouse middle button (or ‘f’ key). The scale is now locked to protect against accidental movement.

B1. You now observe that 14° is off the right-hand side of the scale. (This is a good example!)

B2. Mouse over the left red border (it turns green) and click. This will ‘S’nap the scale to the left side of the next row up. (Alternatively press ‘s’ key.)

B3. Now read off ‘W’ value (20° 33’) on the BLACK scale against 14° on the RED scale.

Step 2.

A. Deduce intermediate value ‘Y’ on pro forma from ‘W’ and co-latitude. In this example Y = 76° 33’.

B. Set RED scale ‘W’ value (20° 33’) over Hour Angle ‘H’ (14°) on BLACK scale.

C. Read off ‘Az’ (45° 09’) on BLACK scale below ‘Y’ (76° 33’) on RED scale.

D. Deduce body azimuth (Zn) from ‘Az’ using pro forma. (134° 51’).

Method.

B1. Press mouse middle button (or ‘f’ key) to unfreeze RED scale.

B2. If required, scroll down using mouse wheel till ‘H’ (14°) on BLACK scale is in view.

B3. Use ‘left button + drag’ to move the RED scale down and right until RED scale ‘W’ value (20° 33’) is approximately over 14° on the BLACK scale.

B4. After the RED scale has snapped level, fine adjust it horizontally using ‘left/right click’ (or ‘l’/’r’ keys).

B5. As before, freeze scale with mouse middle button (or ‘f’ key).

C1. If required, scroll up using mouse wheel till ‘Y’ (76° 33’) on RED scale is in view.

C2. Read off ‘Az’ (45° 09’) on BLACK scale below ‘Y’ (76° 33’) on RED scale.

Step 3.

A. Set RED scale ‘Az’ value (45° 09’) over ‘Y’ (76° 33’) on BLACK scale.

B. Read off ‘Hc’ (71° 17’) on BLACK scale below ‘Zero’ mark on RED scale.

Method.

A1. Press mouse middle button (or ‘f’ key) to unfreeze RED scale.

A2. As before, drag red scale, fine adjust to place RED 45° 09’ over BLACK 76° 33.

A3. Freeze scale as before.

B1. Read off ‘Hc’ (71° 17’) on BLACK scale below ‘Zero’ mark on RED scale.

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Other features.

VERNIER. Select by pressing Mouse middle button (or ‘f’ or ‘v’ key).

* Mouse position must be within vernier area.
* Coarse movement with ‘left button + drag’ as with cos scale.
* Fine left/right movement with ‘left/right click’ (or ‘l’/’r’ keys).
* Fine vertical movement with mouse wheel.
* To use vernier, set the outer lines exactly on the outer marks of the required division of the scale.

Then use the four inner lines to help estimate tenth's of the appropriate unit.

* You may like to use the edge lines as a cursor. Do not use a vernier line as none are vertical!

ZOOMING.

You can improve definition by zooming the entire window. (‘Ctrl + wheel’). To keep the desired area on the screen, use wheel alone to scroll vertically and scroll bar (bottom of window) to scroll horizontally. Always ‘freeze’ (‘f’ key) before zooming to prevent accidental movement.

KEYBOARD KEY SUMMARY

l, L, r, R Move the cos scale (or vernier) 1 pixel left/right.

f, F Freeze the cos scale and display the vernier. Press again to return to normal.

v, V Same as F above.

s, S Snap cos scale exactly 1 width and to next row.

u, U, d, D Move vernier up/down one increment.

MOUSE SUMMARY

Wheel within vernier area Move vernier up/down one increment.

Wheel outside vernier area Scroll entire window

Wheel/ middle button press down Freeze the cos scale and display the vernier.

Ctrl key + wheel Zoom entire window.

Left / right button click Move the cos scale (or vernier) 1 pixel left/right.

Left button + drag Drag cos scale (or vernier) to desired location.

Left / right button click (on green edge) Snap cos scale exactly 1 width and to next row.