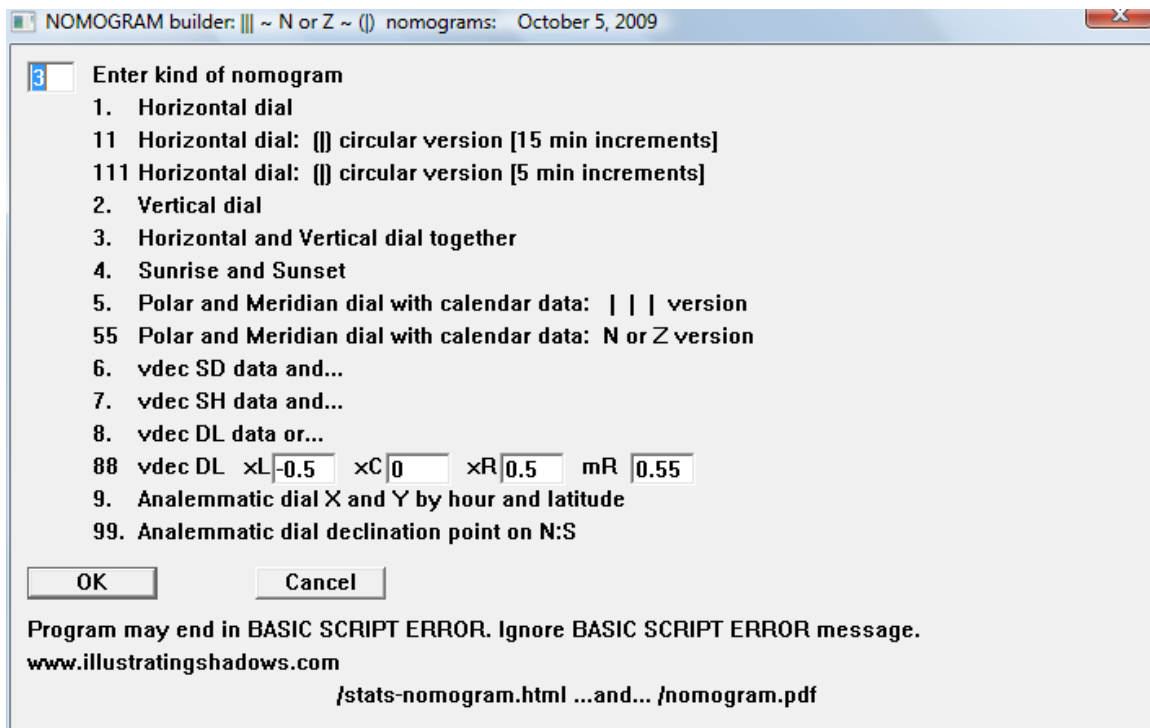


NOMOGRAMS FOR SUNDIALS

DeltaCAD

and

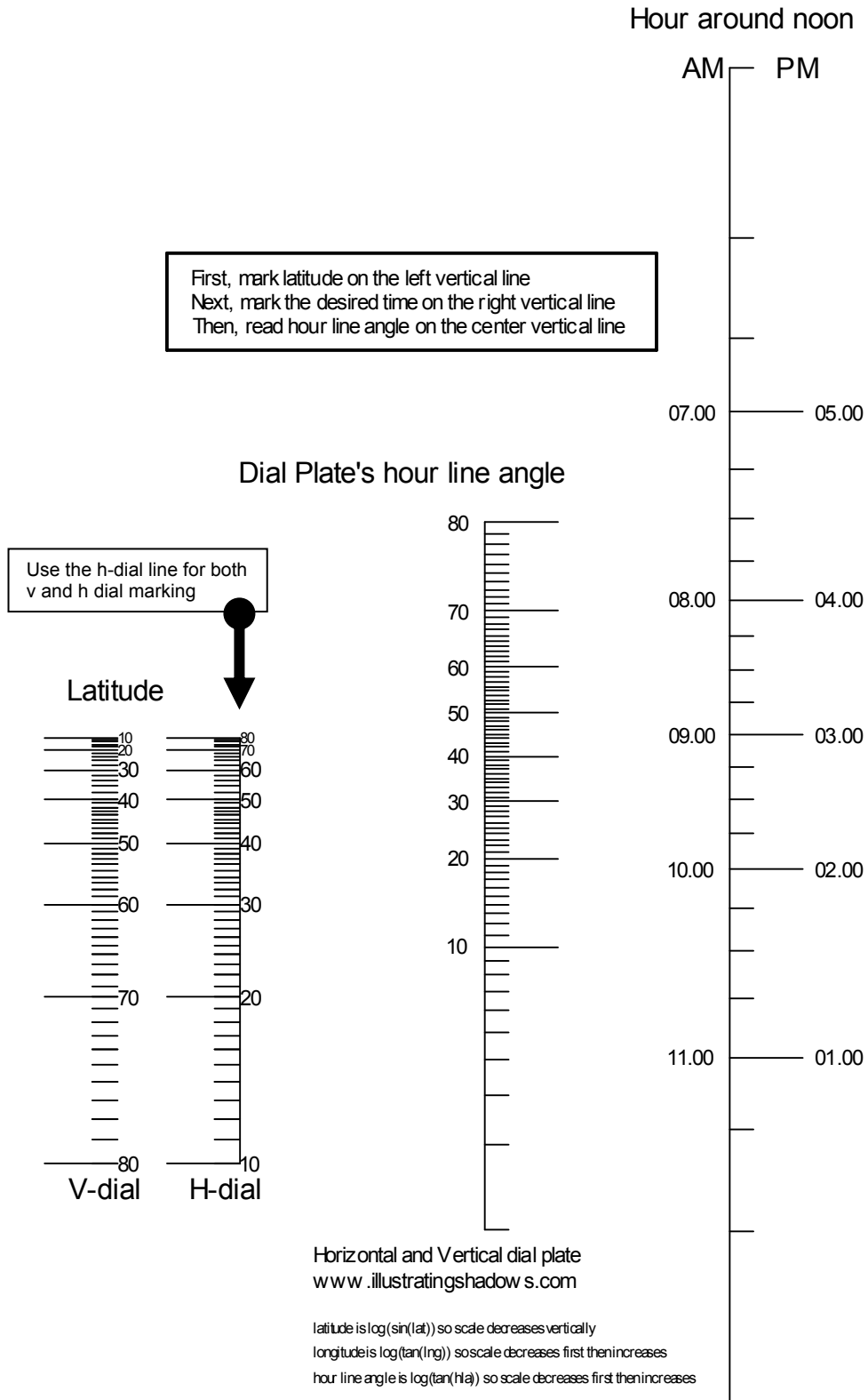
Lazarus/Pascal



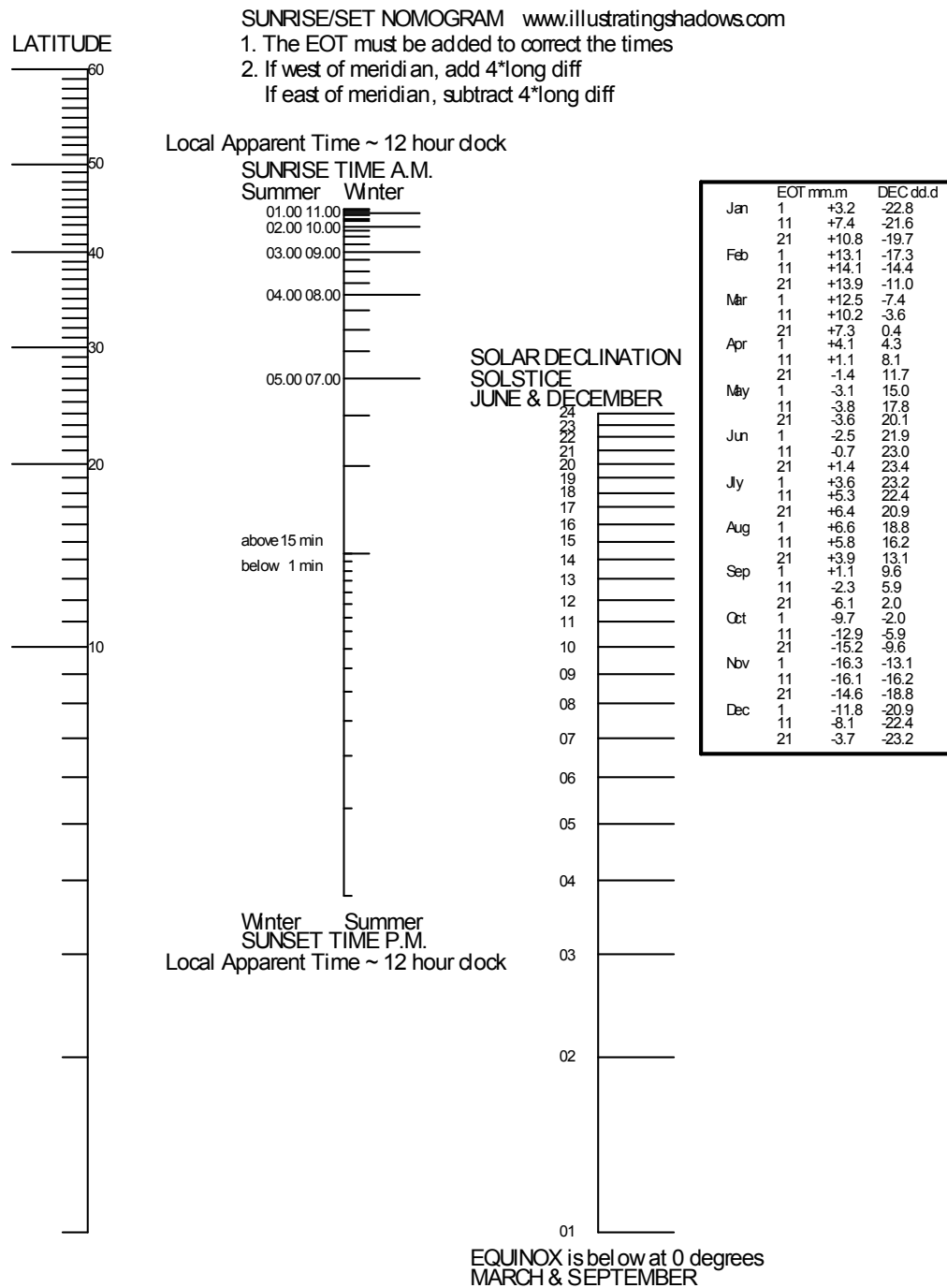
Feb 12, 2013 Added note that sunrise/set times are 12 hour clock local apparent time

DeltaCAD nomogram program results

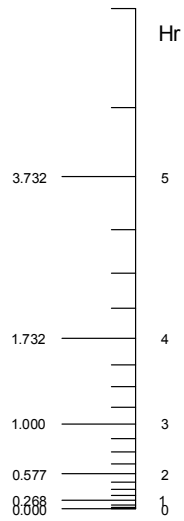
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LOCAL TIME FROM TRANSIT



DIST TO HR.LN
ANSWER 1

POLAR (and meridian E/W) DIAL www.illustratingshadows.com

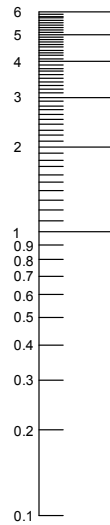
1. The EOT must be added to correct the times

2. If west of meridian, add 4*long diff

If east of meridian, subtract 4*long diff

Assumes a style linear height of 1.0

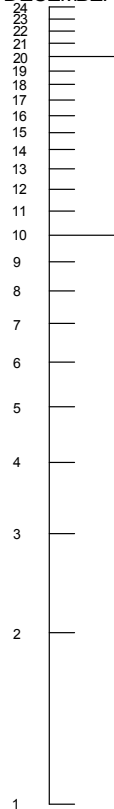
Draw line from hour to declination, read (1) HR LINE DIST as well as (2) distance on hour line to calendar point



CAL PT DISTANCE
0.1 to 6

ANSWER 2

SOLAR DECLINATION
SOLSTICE
JUNE & DECEMBER



EQUINOX is below at 0 degrees
MARCH & SEPTEMBER

| | | EOT mm.m | DEC dd.d |
|-----|----|----------|----------|
| Jan | 1 | +3.2 | -22.8 |
| | 11 | +7.4 | -21.6 |
| | 21 | +10.8 | -19.7 |
| Feb | 1 | +13.1 | -17.3 |
| | 11 | +14.1 | -14.4 |
| | 21 | +13.9 | -11.0 |
| Mar | 1 | +12.5 | -7.4 |
| | 11 | +10.2 | -3.6 |
| | 21 | +7.3 | 0.4 |
| Apr | 1 | +4.1 | 4.3 |
| | 11 | +1.1 | 8.1 |
| | 21 | -1.4 | 11.7 |
| May | 1 | -3.1 | 15.0 |
| | 11 | -3.8 | 17.8 |
| | 21 | -3.6 | 20.1 |
| Jun | 1 | -2.5 | 21.9 |
| | 11 | -0.7 | 23.0 |
| | 21 | +1.4 | 23.4 |
| Jly | 1 | +3.6 | 23.2 |
| | 11 | +5.3 | 22.4 |
| | 21 | +6.4 | 20.9 |
| Aug | 1 | +6.6 | 18.8 |
| | 11 | +5.8 | 16.2 |
| | 21 | +3.9 | 13.1 |
| Sep | 1 | +1.1 | 9.6 |
| | 11 | -2.3 | 5.9 |
| | 21 | -6.1 | 2.0 |
| Oct | 1 | -9.7 | -2.0 |
| | 11 | -12.9 | -5.9 |
| | 21 | -15.2 | -9.6 |
| Nov | 1 | -16.3 | -13.1 |
| | 11 | -16.1 | -16.2 |
| | 21 | -14.6 | -18.8 |
| Dec | 1 | -11.8 | -20.9 |
| | 11 | -8.1 | -22.4 |
| | 21 | -3.7 | -23.2 |

POLAR (and meridian E/W) DIAL www.illustratingshadows.com

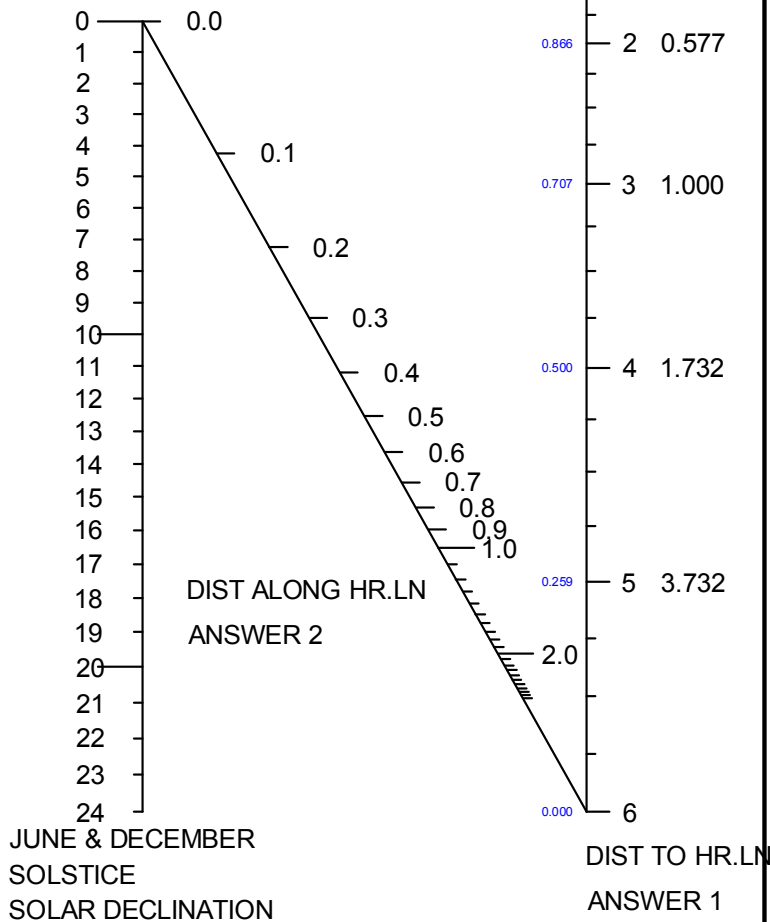
1. The EOT must be added to correct the times

2. If west of meridian, add 4*long diff

If east of meridian, subtract 4*long diff

Assumes a style linear height of 1.0

Draw line from hour to declination, read (1) HR LINE DIST as well as (2) distance on hour line to calendar point

MARCH & SEPTEMBER
EQUINOX

HOURS FROM TRANSIT

Hr tan

0 0.000

1 0.268

2 0.577

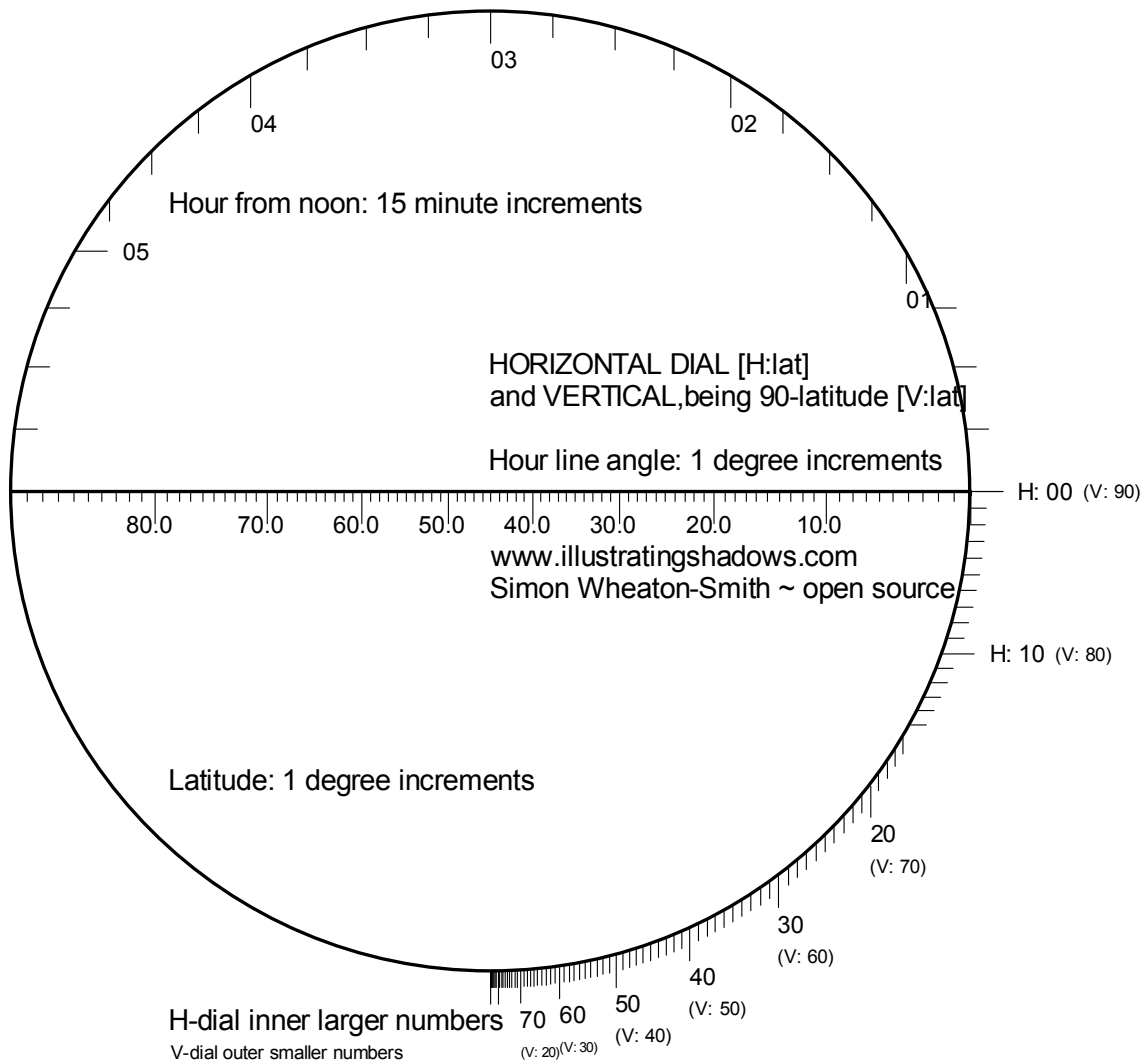
3 1.000

4 1.732

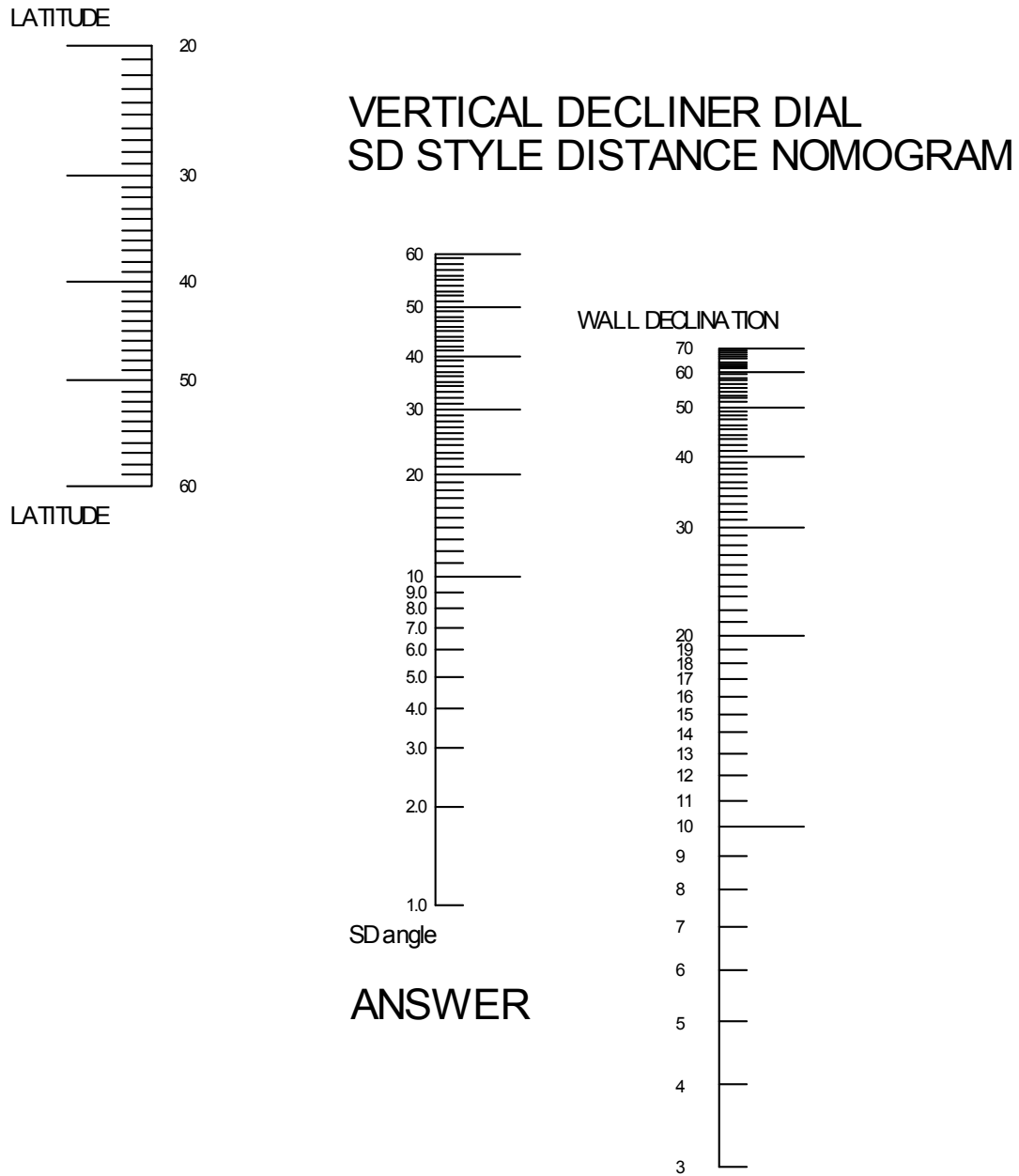
5 3.732

6 0.000

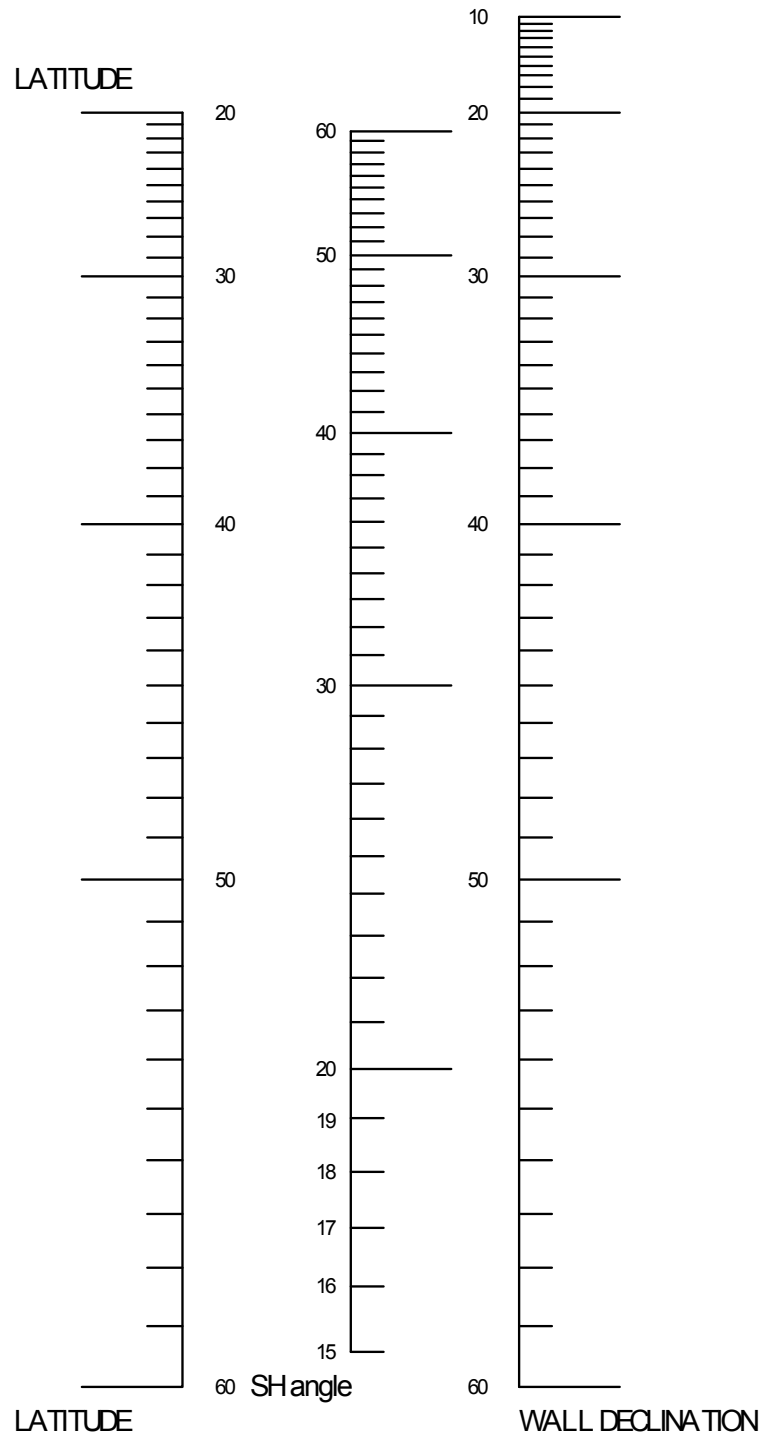
| | | EOT mm.m | DEC dd.d |
|-----|----|----------|----------|
| Jan | 1 | +3.2 | -22.8 |
| | 11 | +7.4 | -21.6 |
| | 21 | +10.8 | -19.7 |
| Feb | 1 | +13.1 | -17.3 |
| | 11 | +14.1 | -14.4 |
| | 21 | +13.9 | -11.0 |
| Mar | 1 | +12.5 | -7.4 |
| | 11 | +10.2 | -3.6 |
| | 21 | +7.3 | 0.4 |
| Apr | 1 | +4.1 | 4.3 |
| | 11 | +1.1 | 8.1 |
| | 21 | -1.4 | 11.7 |
| May | 1 | -3.1 | 15.0 |
| | 11 | -3.8 | 17.8 |
| | 21 | -3.6 | 20.1 |
| Jun | 1 | -2.5 | 21.9 |
| | 11 | -0.7 | 23.0 |
| | 21 | +1.4 | 23.4 |
| Jly | 1 | +3.6 | 23.2 |
| | 11 | +5.3 | 22.4 |
| | 21 | +6.4 | 20.9 |
| Aug | 1 | +6.6 | 18.8 |
| | 11 | +5.8 | 16.2 |
| | 21 | +3.9 | 13.1 |
| Sep | 1 | +1.1 | 9.6 |
| | 11 | -2.3 | 5.9 |
| | 21 | -6.1 | 2.0 |
| Oct | 1 | -9.7 | -2.0 |
| | 11 | -12.9 | -5.9 |
| | 21 | -15.2 | -9.6 |
| Nov | 1 | -16.3 | -13.1 |
| | 11 | -16.1 | -16.2 |
| | 21 | -14.6 | -18.8 |
| Dec | 1 | -11.8 | -20.9 |
| | 11 | -8.1 | -22.4 |
| | 21 | -3.7 | -23.2 |



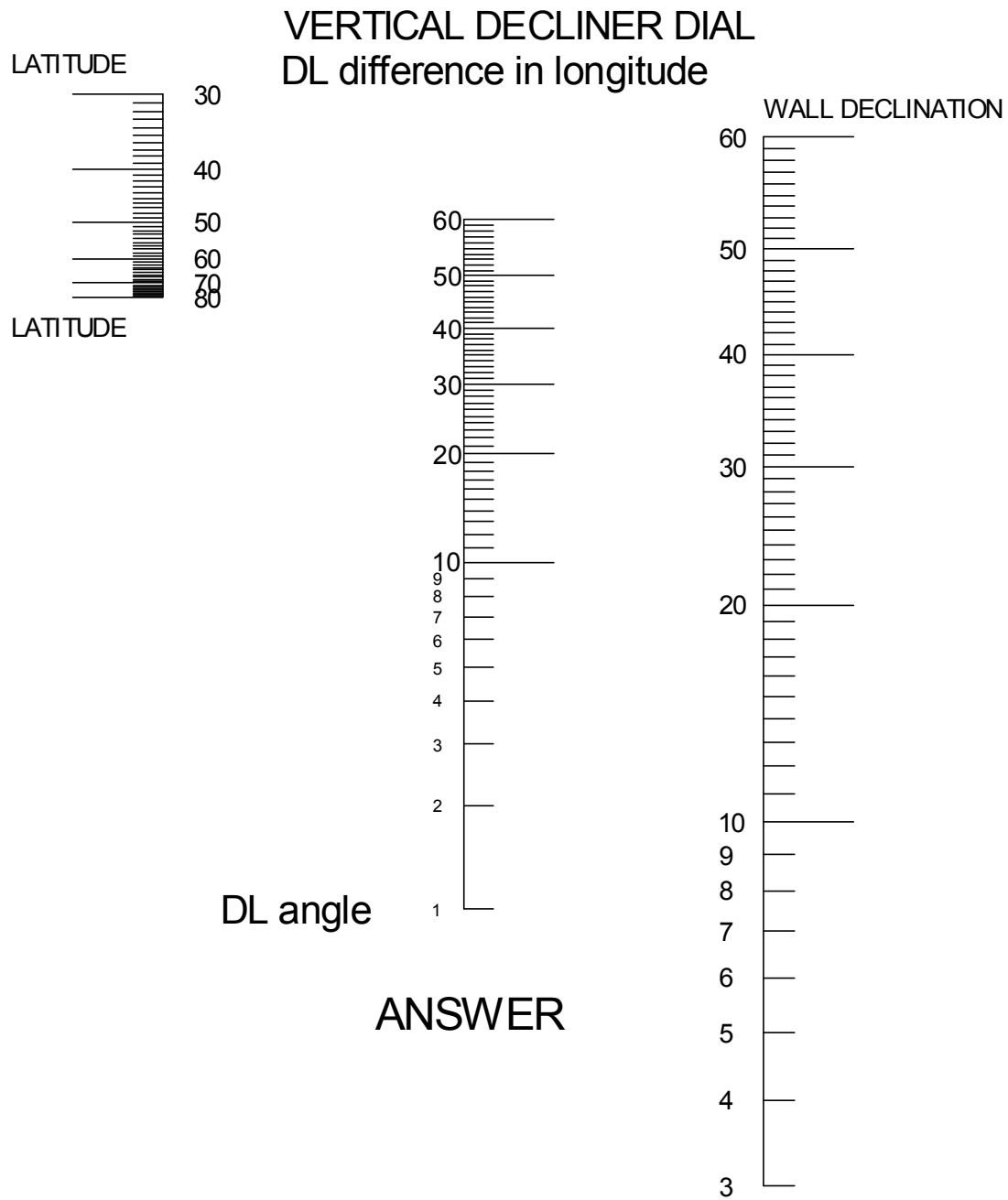
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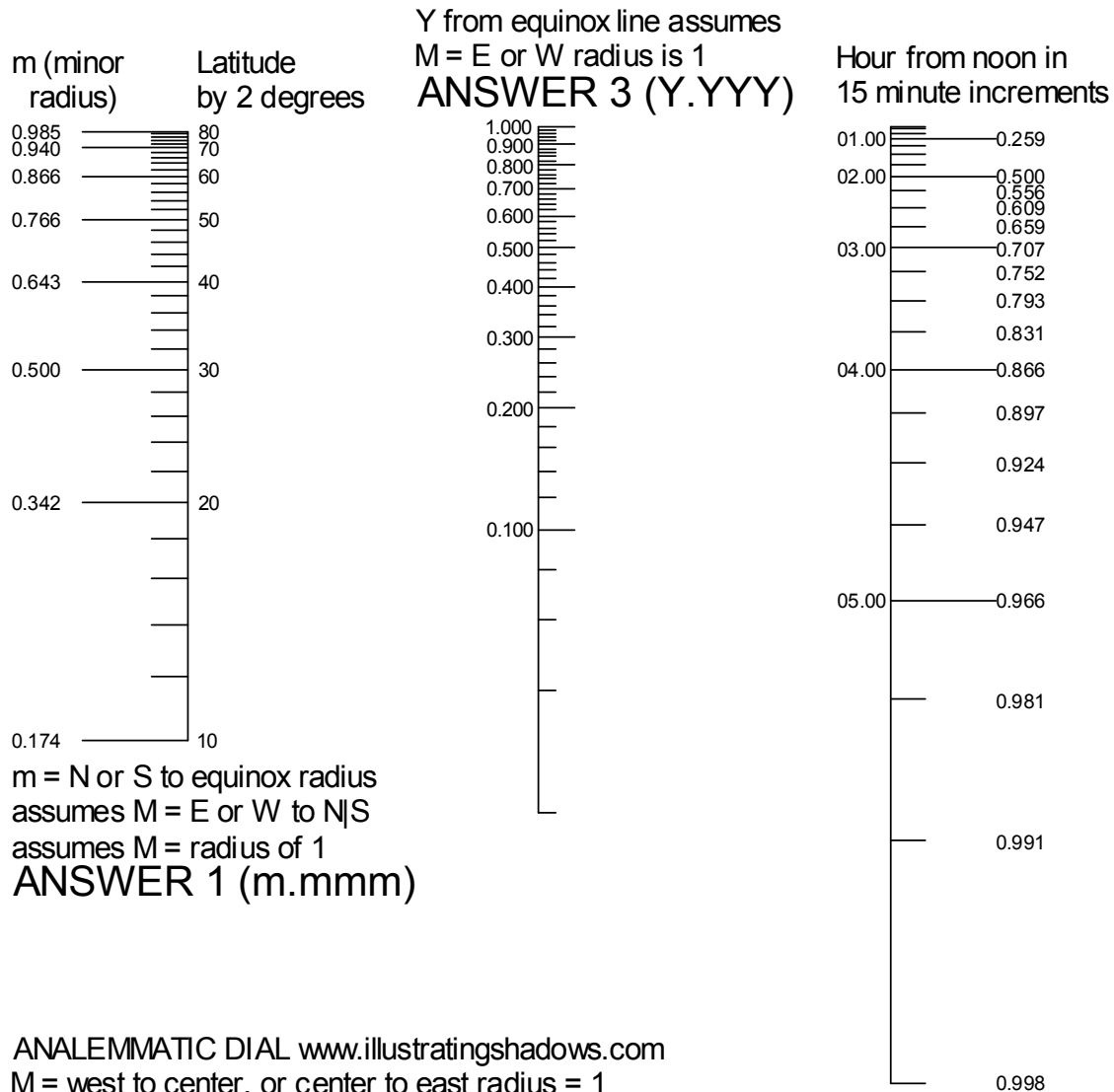


VERTICAL DECLINER DIAL SH STYLE HEIGHT NOMOGRAM



ANSWER





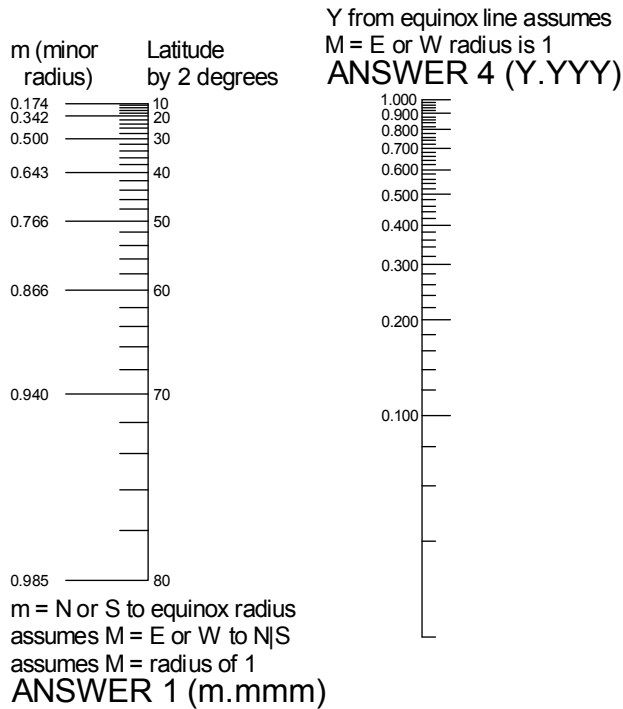
ANALEMMATIC DIAL www.illustratingshadows.com

M = west to center, or center to east radius = 1

m = equinox to north or to south radius, if M=1

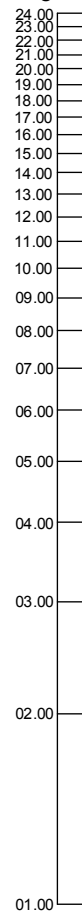
Chapter 21 of Illustrating Times Shadow

X from n|s line (assumes
M = E or W radius is 1)
ANSWER 2 (X.XXX)

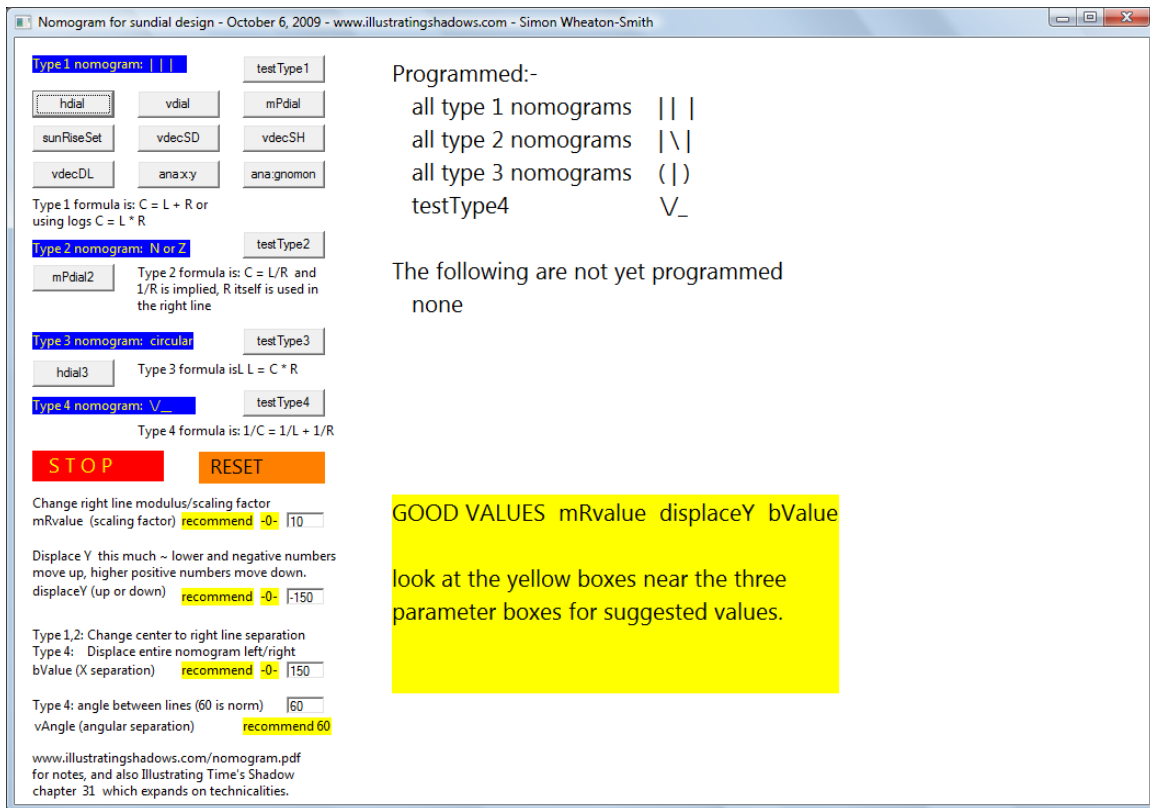


ANALEMMATIC DIAL www.illustratingshadows.com
Relative distance on N:S line for gnomon base
M = west to center, or center to east radius = 1
Chapter 21 of Illustrating Times Shadow

Declination in 1
degree increments



| | | EOT mm.m | DEC dd.d |
|-----|----|----------|----------|
| Jan | 1 | +3.2 | -22.8 |
| | 11 | +7.4 | -21.6 |
| | 21 | +10.8 | -19.7 |
| Feb | 1 | +13.1 | -17.3 |
| | 11 | +14.1 | -14.4 |
| | 21 | +13.9 | -11.0 |
| Mar | 1 | +12.5 | -7.4 |
| | 11 | +10.2 | -3.6 |
| | 21 | +7.3 | 0.4 |
| Apr | 1 | +4.1 | 4.3 |
| | 11 | +1.1 | 8.1 |
| | 21 | -1.4 | 11.7 |
| May | 1 | -3.1 | 15.0 |
| | 11 | -3.8 | 17.8 |
| | 21 | -3.6 | 20.1 |
| Jun | 1 | -2.5 | 21.9 |
| | 11 | -0.7 | 23.0 |
| | 21 | +1.4 | 23.4 |
| Jly | 1 | +3.6 | 23.2 |
| | 11 | +5.3 | 22.4 |
| | 21 | +6.4 | 20.9 |
| Aug | 1 | +6.6 | 18.8 |
| | 11 | +5.8 | 16.2 |
| | 21 | +3.9 | 13.1 |
| Sep | 1 | +1.1 | 9.6 |
| | 11 | -2.3 | 5.9 |
| | 21 | -6.1 | 2.0 |
| Oct | 1 | -9.7 | -2.0 |
| | 11 | -12.9 | -5.9 |
| | 21 | -15.2 | -9.6 |
| Nov | 1 | -16.3 | -13.1 |
| | 11 | -16.1 | -16.2 |
| | 21 | -14.6 | -18.8 |
| Dec | 1 | -11.8 | -20.9 |
| | 11 | -8.1 | -22.4 |
| | 21 | -3.7 | -23.2 |



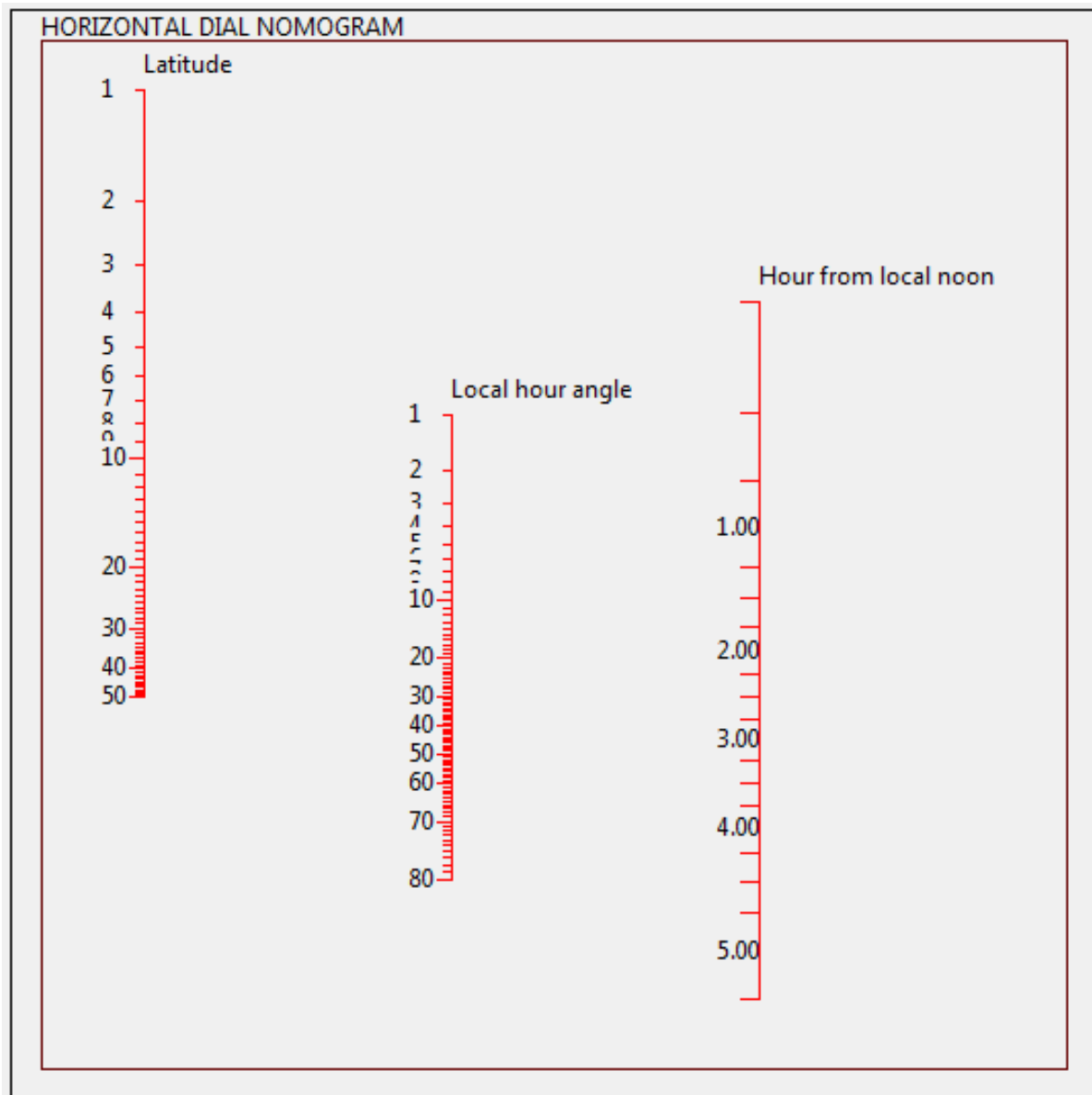
Lazarus/Pascal nomogram program results

The Lazarus program “nomogramProj.exe” allows you to manipulate the nomogram more, however it has no export ability, so a screen copy program is required. I use PhotoMAX Pro however, several free ones are available on the web.

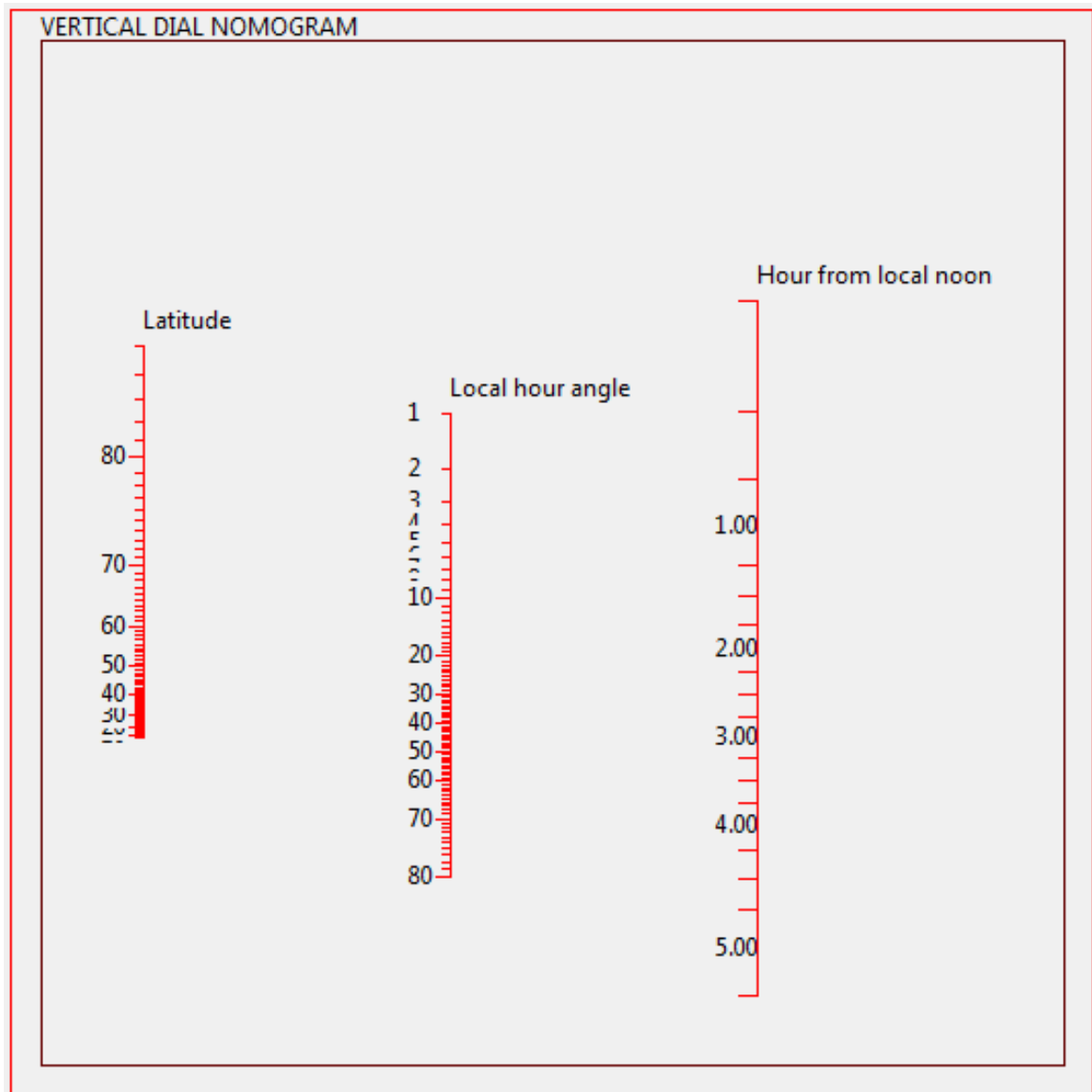
Also, the Lazarus program is standalone, runs on Windows XP and Vista win64, and you may recompile it on other platforms, and is free.

NOTE: The Lazarus program “nomogramProj.exe” may have better nomograms that have been refined, so please use it.

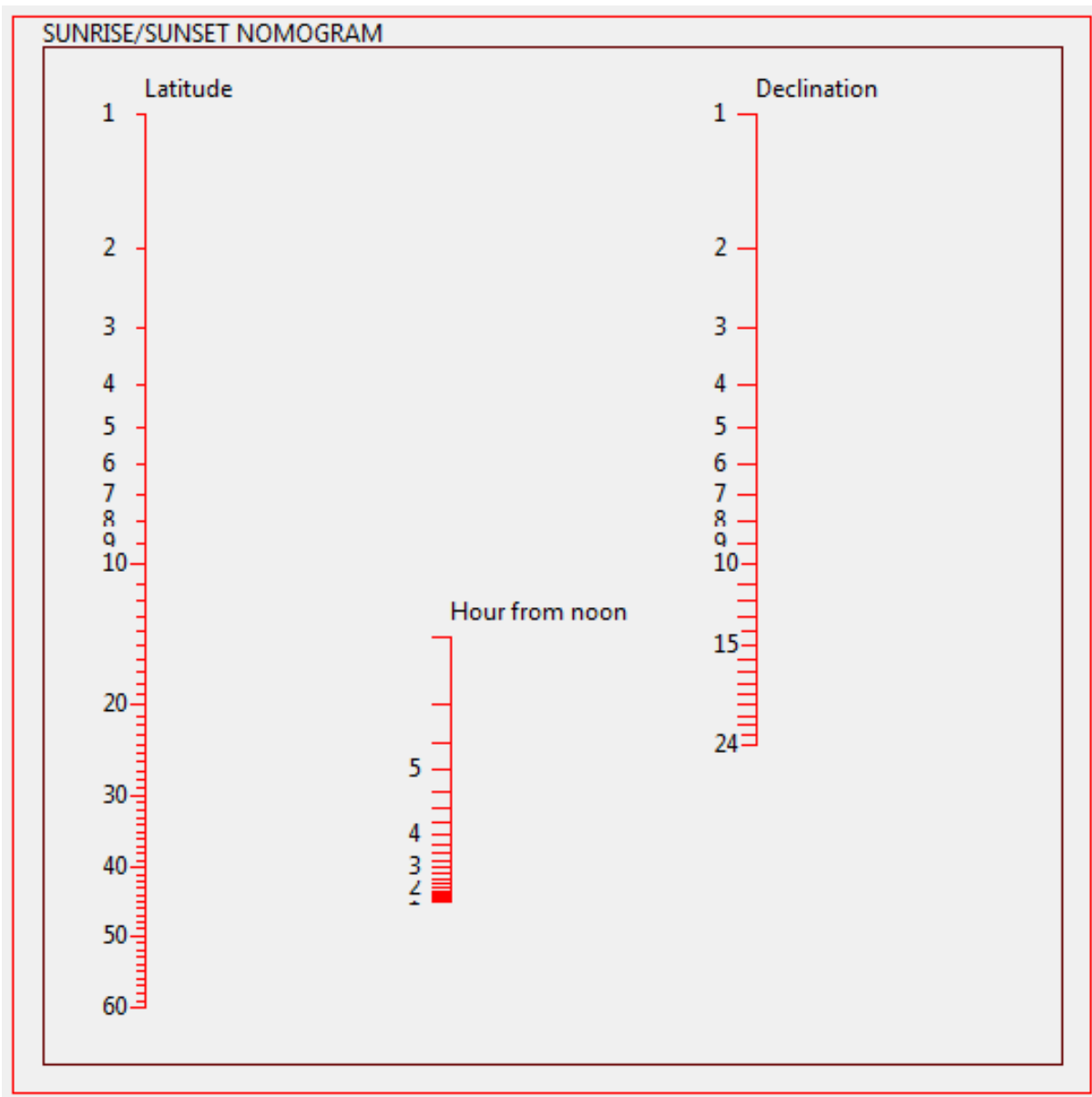
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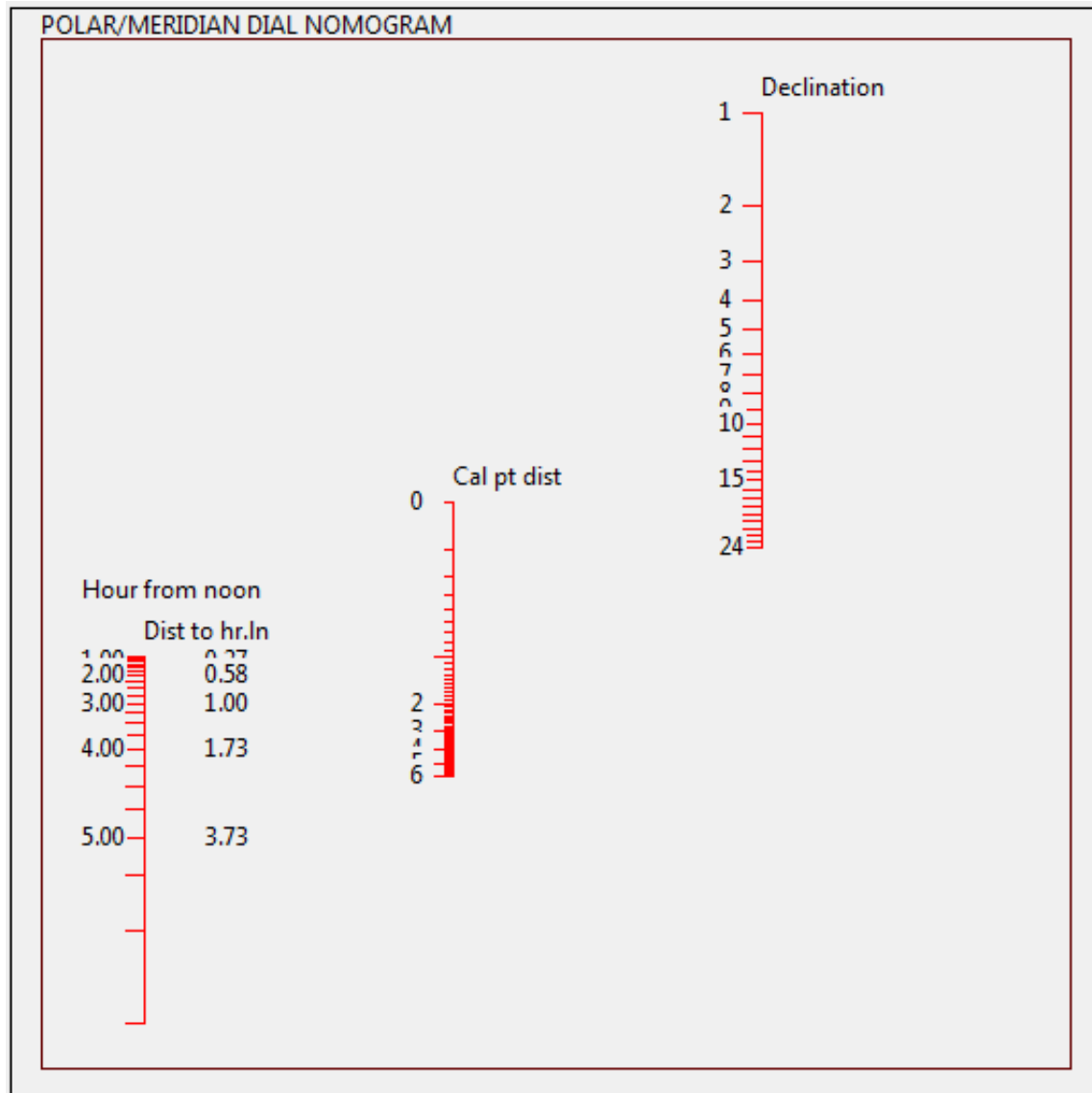
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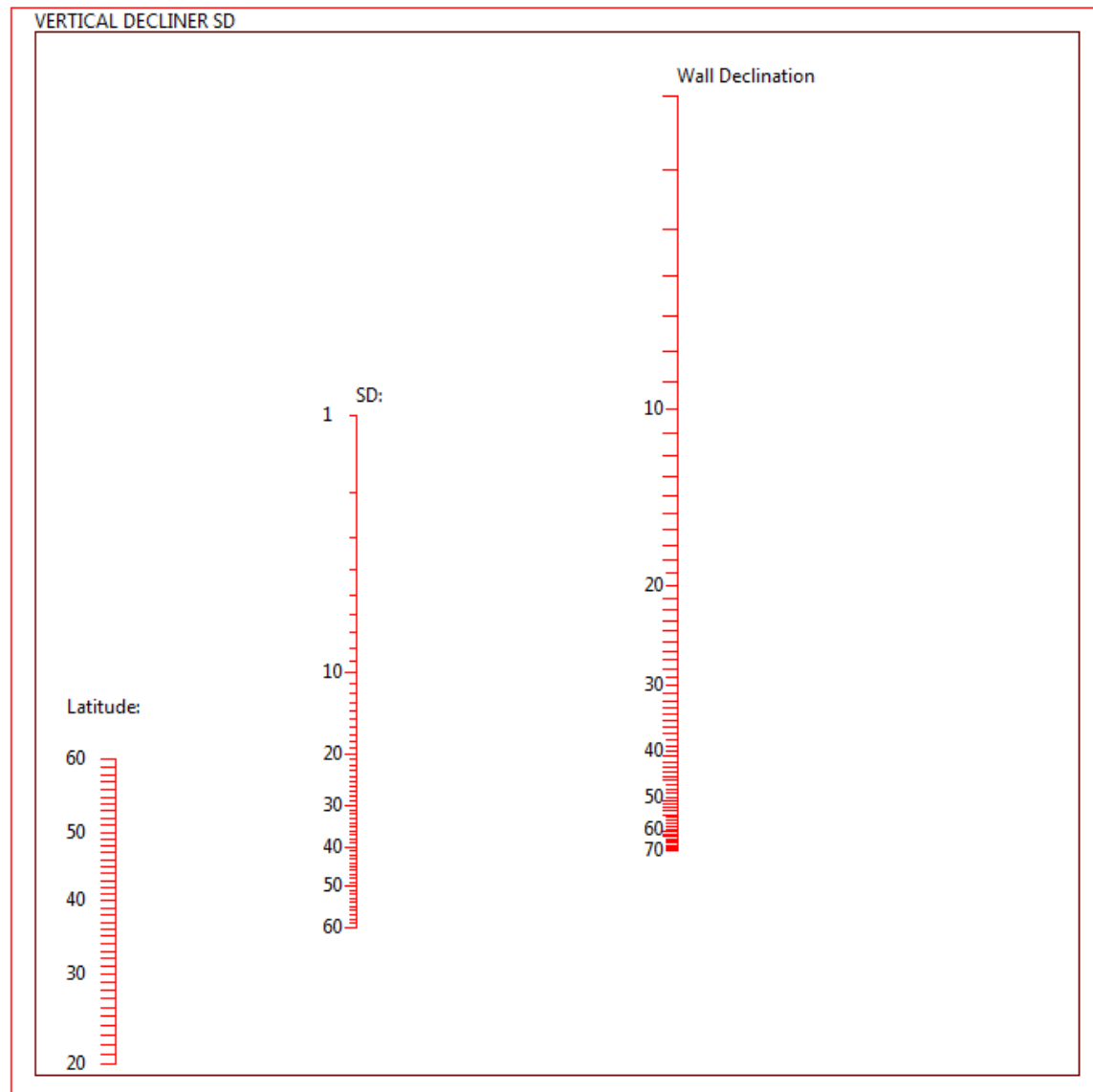


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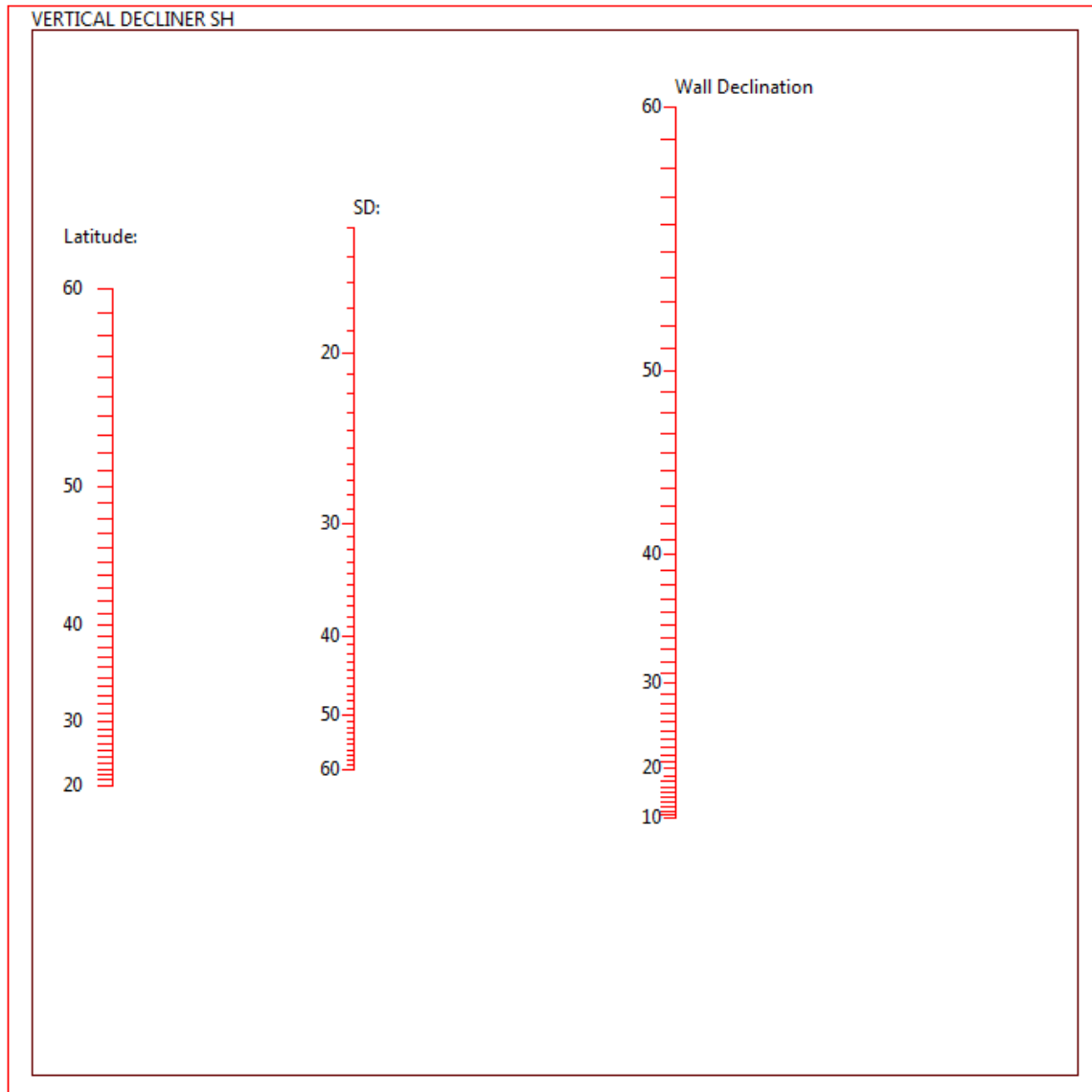


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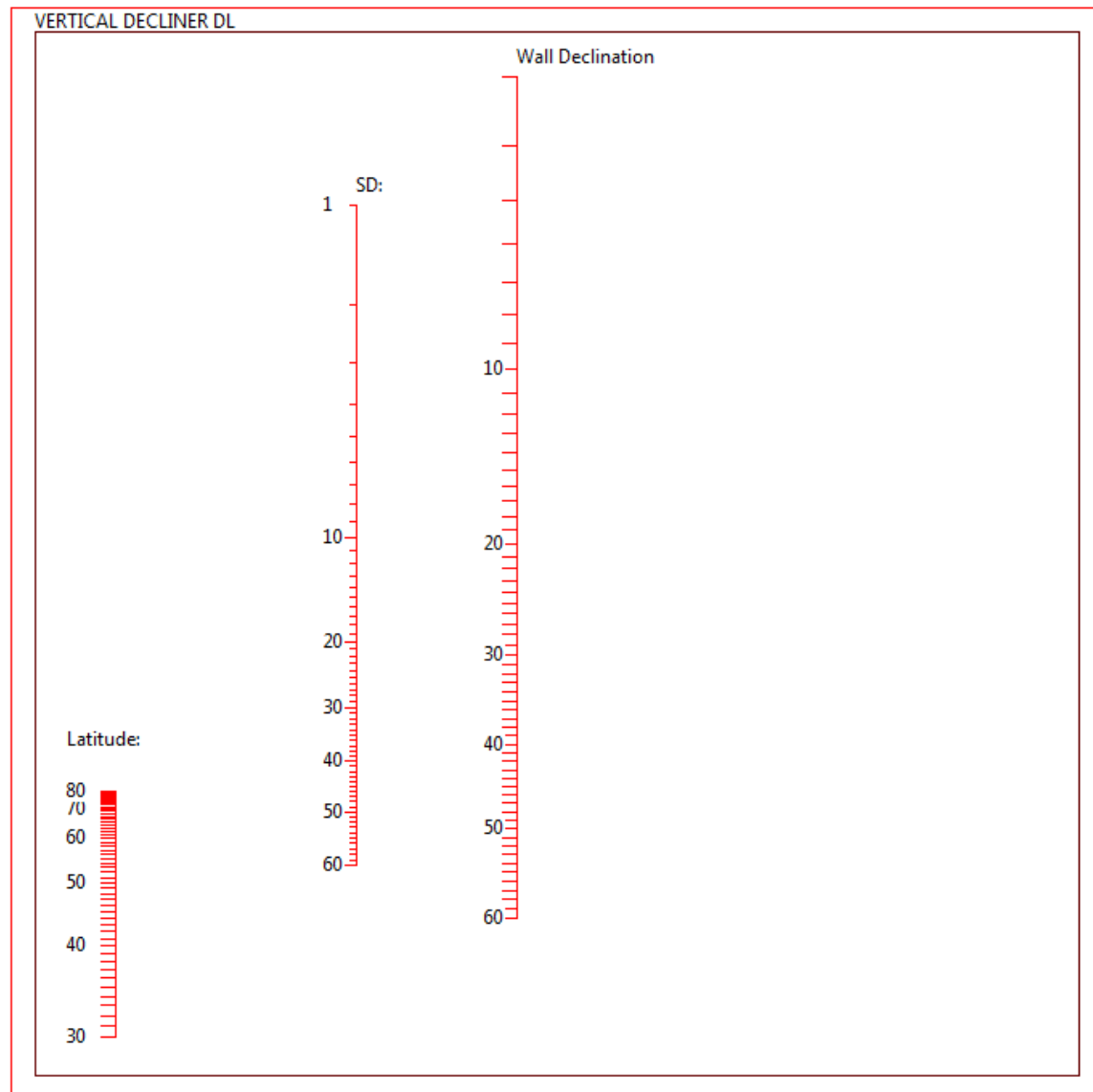




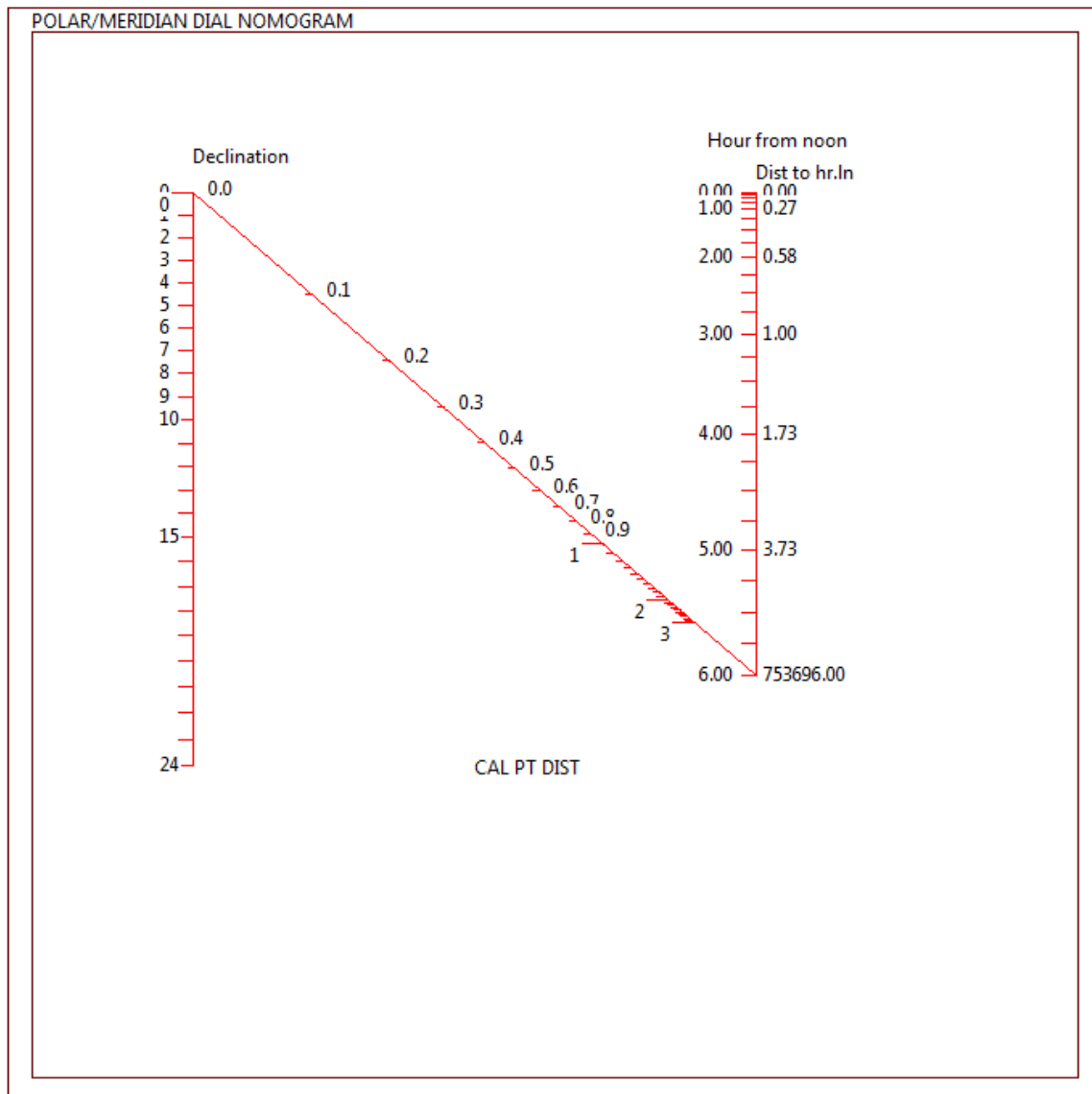
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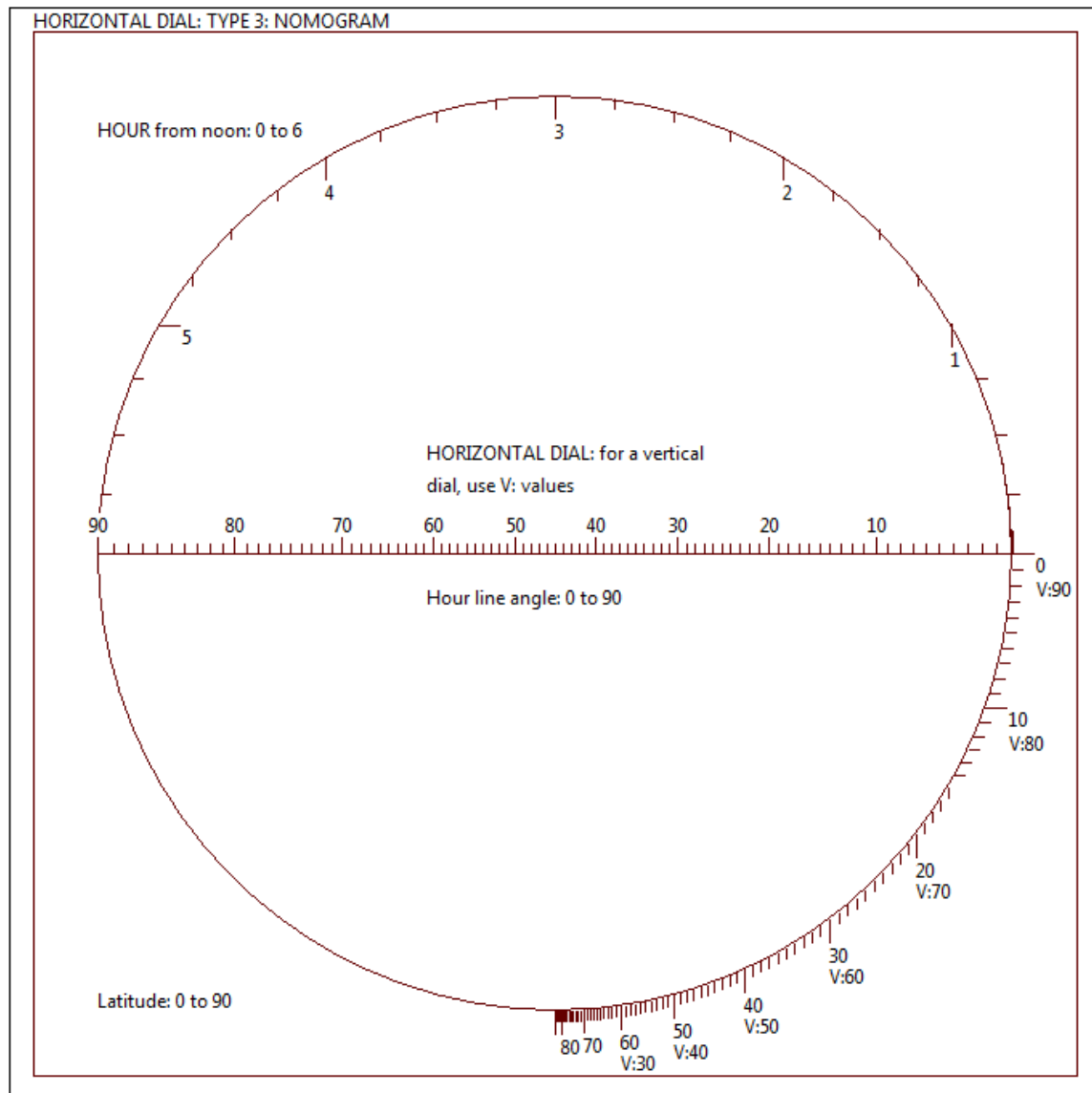


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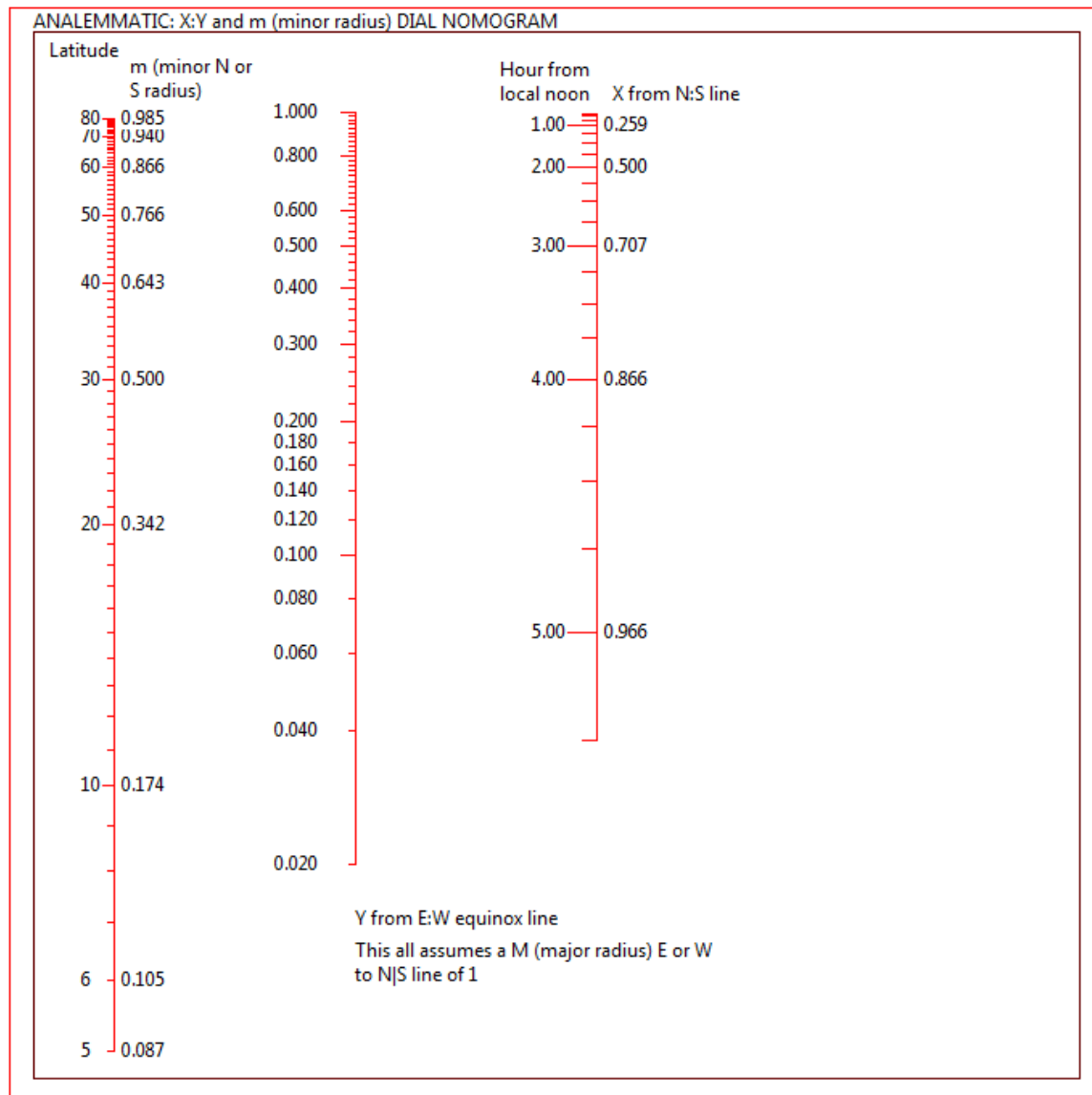


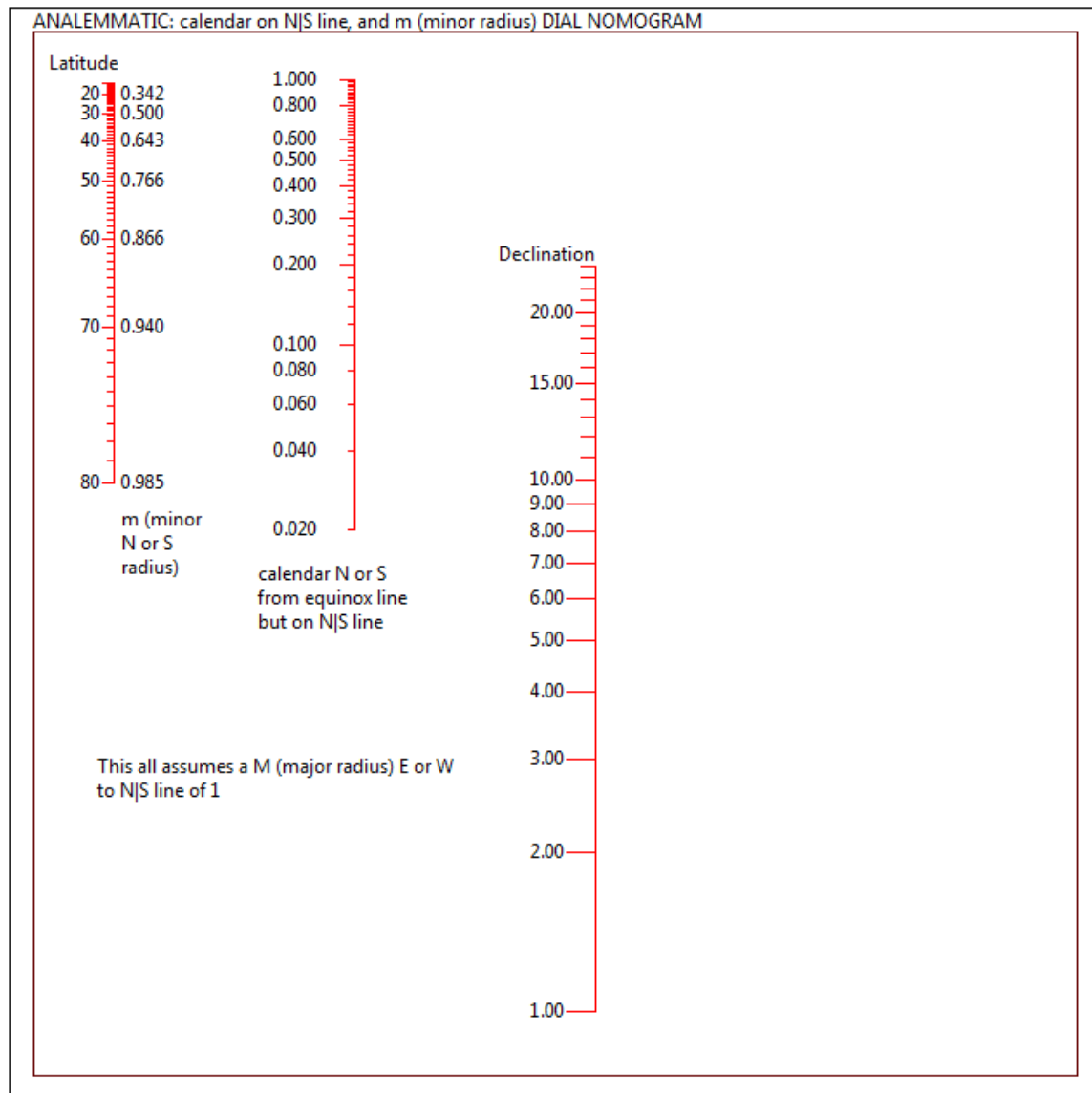
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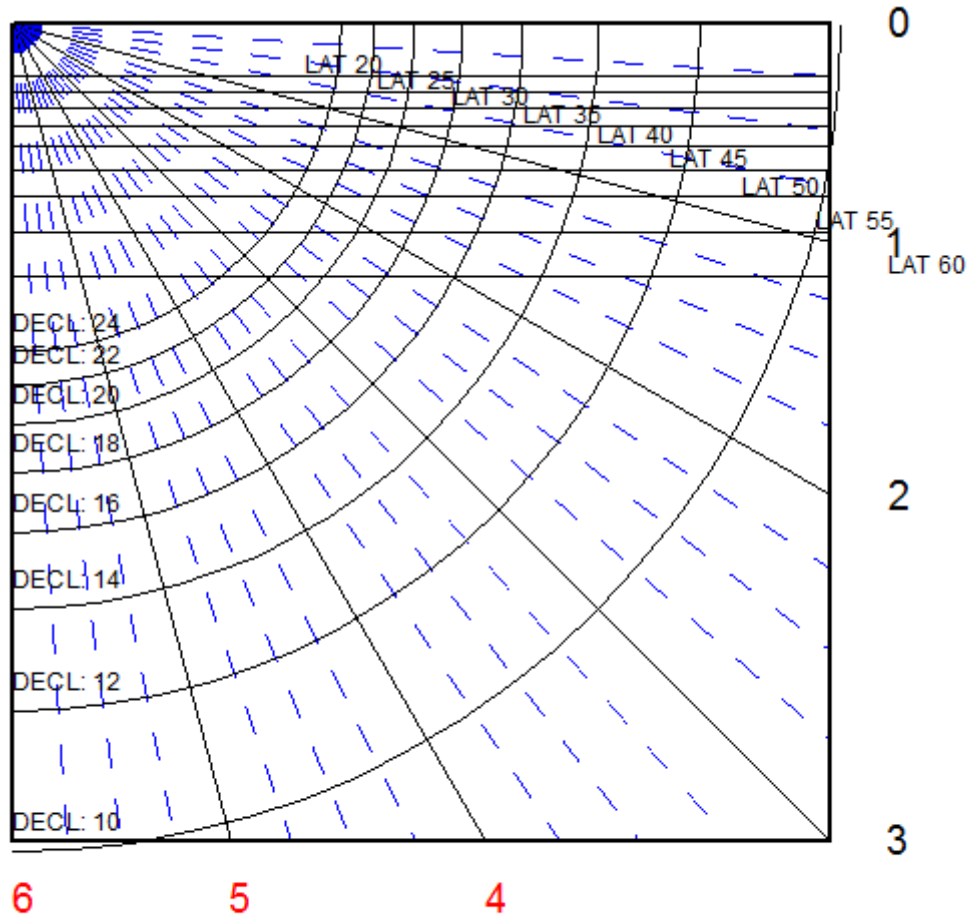


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A DELTACAD NOMOGRAM FOR SUNRISE/SET BASED SOLELY ON AN EQUATORIAL DIAL

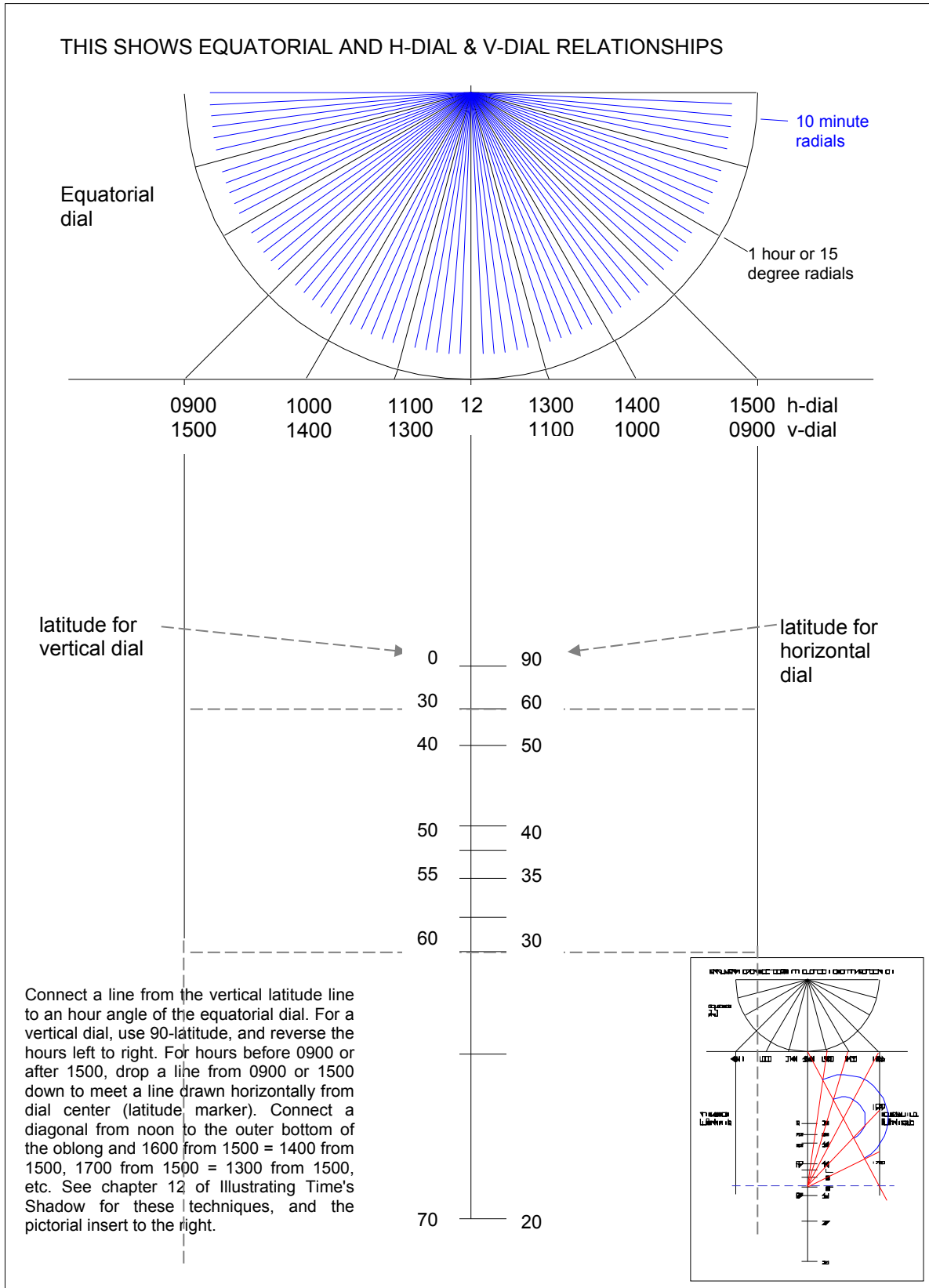


NOMOGRAM FOR SUNRISE/SET BASED ON Q-DIAL HOURS FROM 0600 or 1800 for sunrise/set

For the theory of this, refer to chapter 9 of *Illustrating Time's Shadow*, and chapter 23, also appendix 6

This shows the hour from 6 am for sunrise, + for winter, – for summer as well as the hour from 6 pm for sunset, + for summer and – for winter (note sign reversal). The longitude and EOT must still be applied.

A TEMPLATE FOR HORIZONTAL (AND VERTICAL DIAL DESIGN). SEE CHAPTER 12



THE END