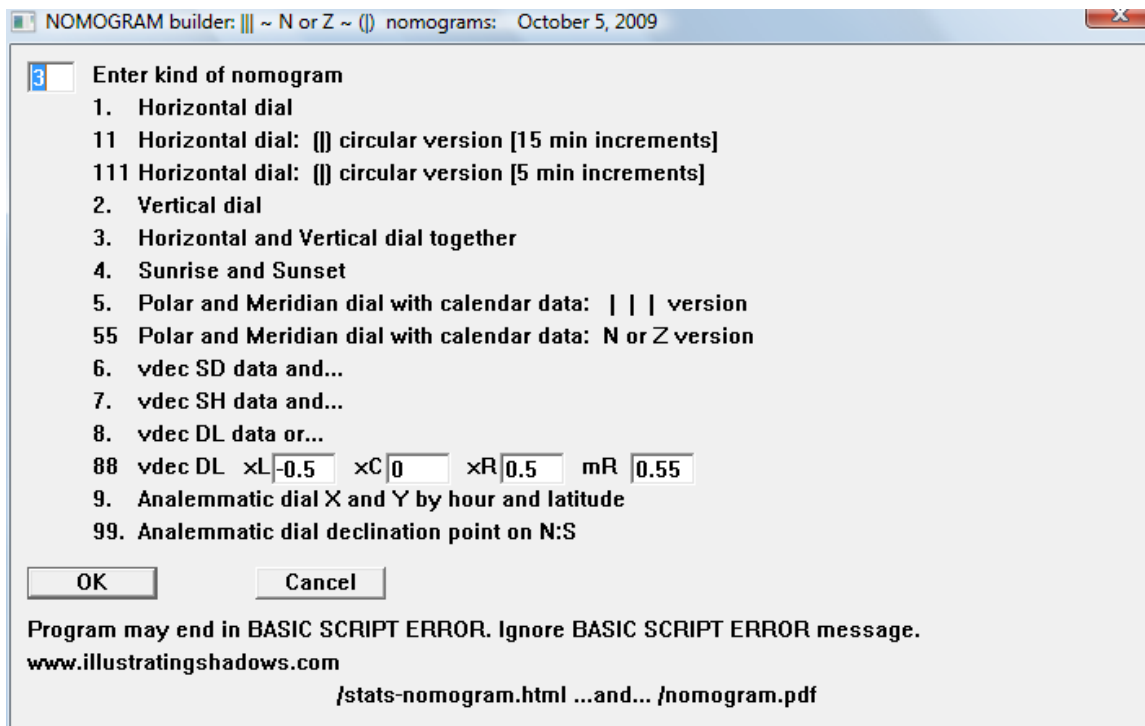


NOMOGRAMS FOR SUNDIALS

DeltaCAD

and

Lazarus/Pascal



DeltaCAD nomogram program results

This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.

First, mark latitude on the left vertical line
 Next, mark the desired time on the right vertical line
 Then, read hour line angle on the center vertical line

Hour around noon

AM PM

07.00 05.00

08.00 04.00

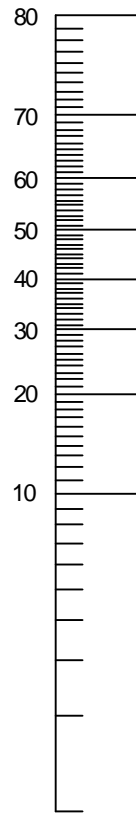
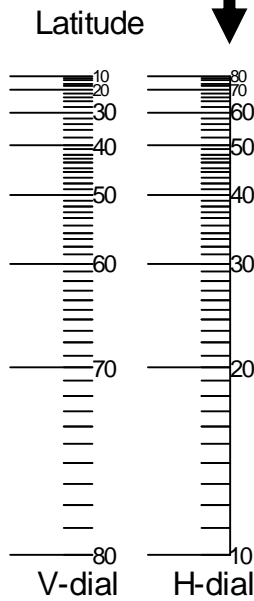
09.00 03.00

10.00 02.00

11.00 01.00

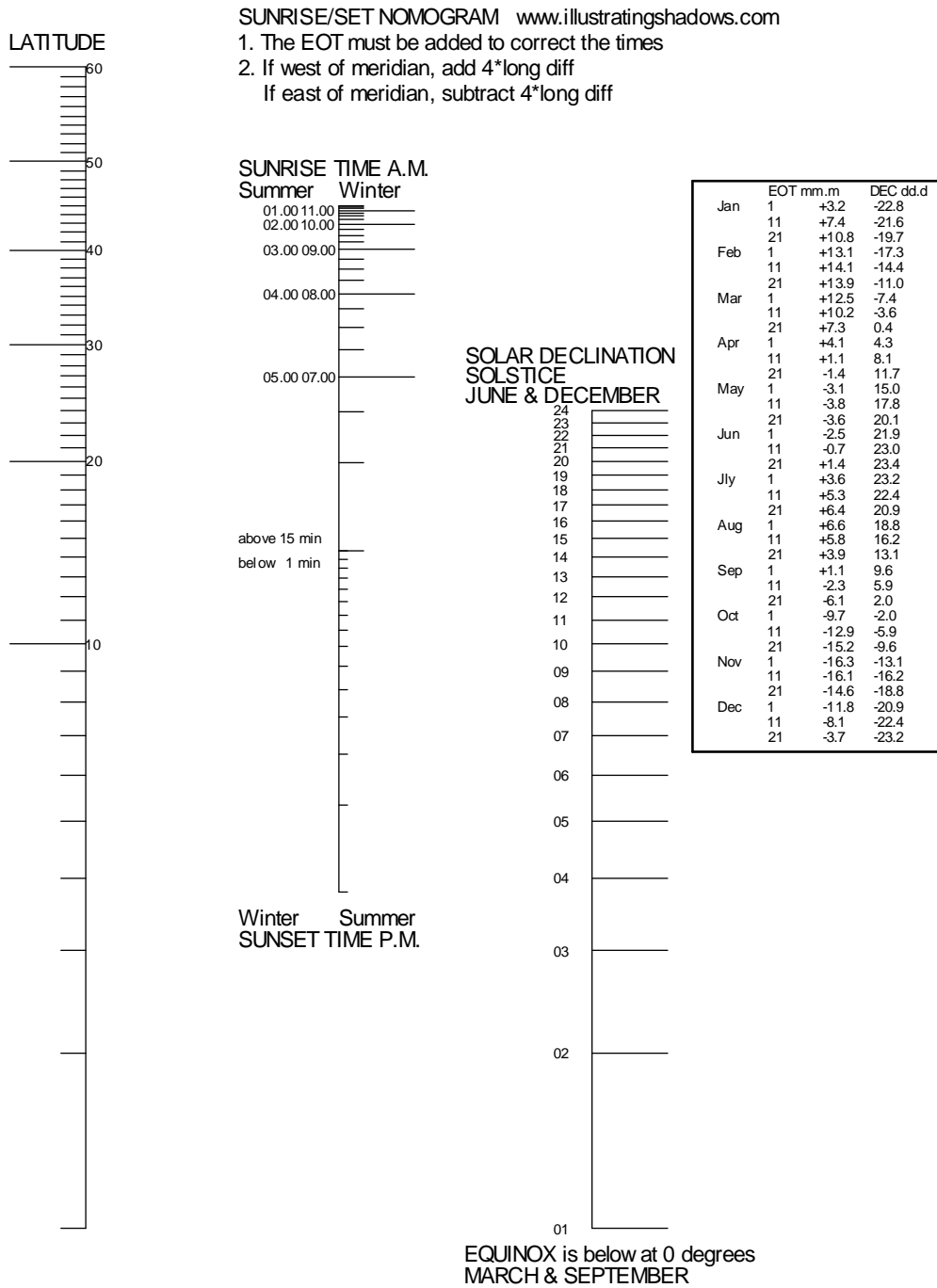
Dial Plate's hour line angle

Use the h-dial line for both
 v and h dial marking



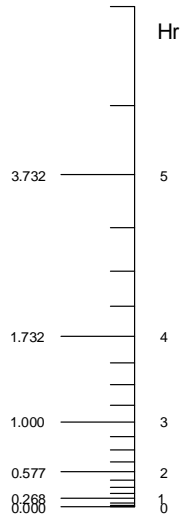
Horizontal and Vertical dial plate
 www.illustratingshadows.com

latitude is $\log(\sin(\text{lat}))$ so scale decreases vertically
 longitude is $\log(\tan(\text{lng}))$ so scale decreases first then increases
 hour line angle is $\log(\tan(\text{hla}))$ so scale decreases first then increases



This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.

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

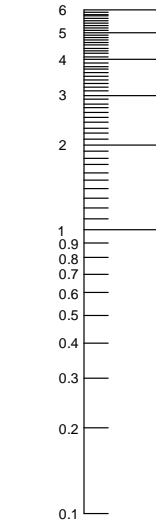
2. If west of meridian, add 4*long diff

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

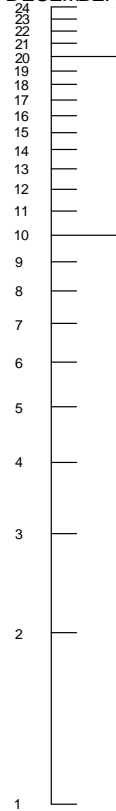
as well as (2) distance on hour line to calendar point



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

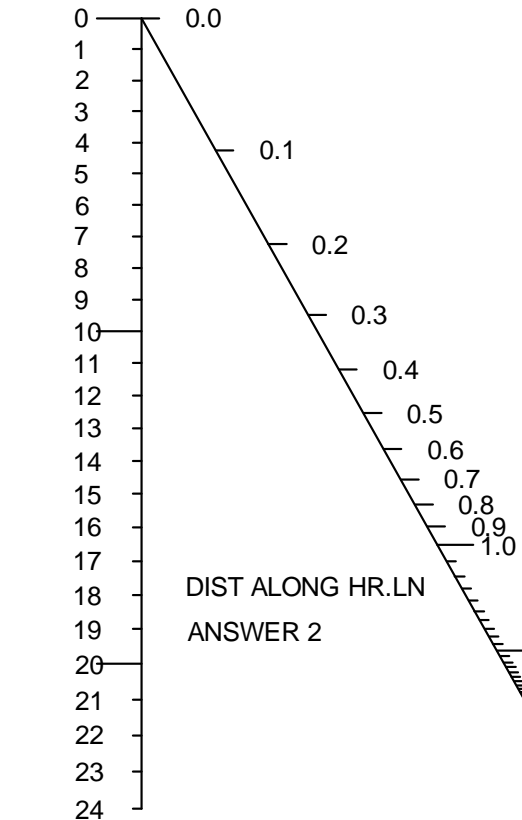
2. If west of meridian, add 4*long diff

If east of meridian, subtract 4*long diff

Assumes a style linear height of 1.0

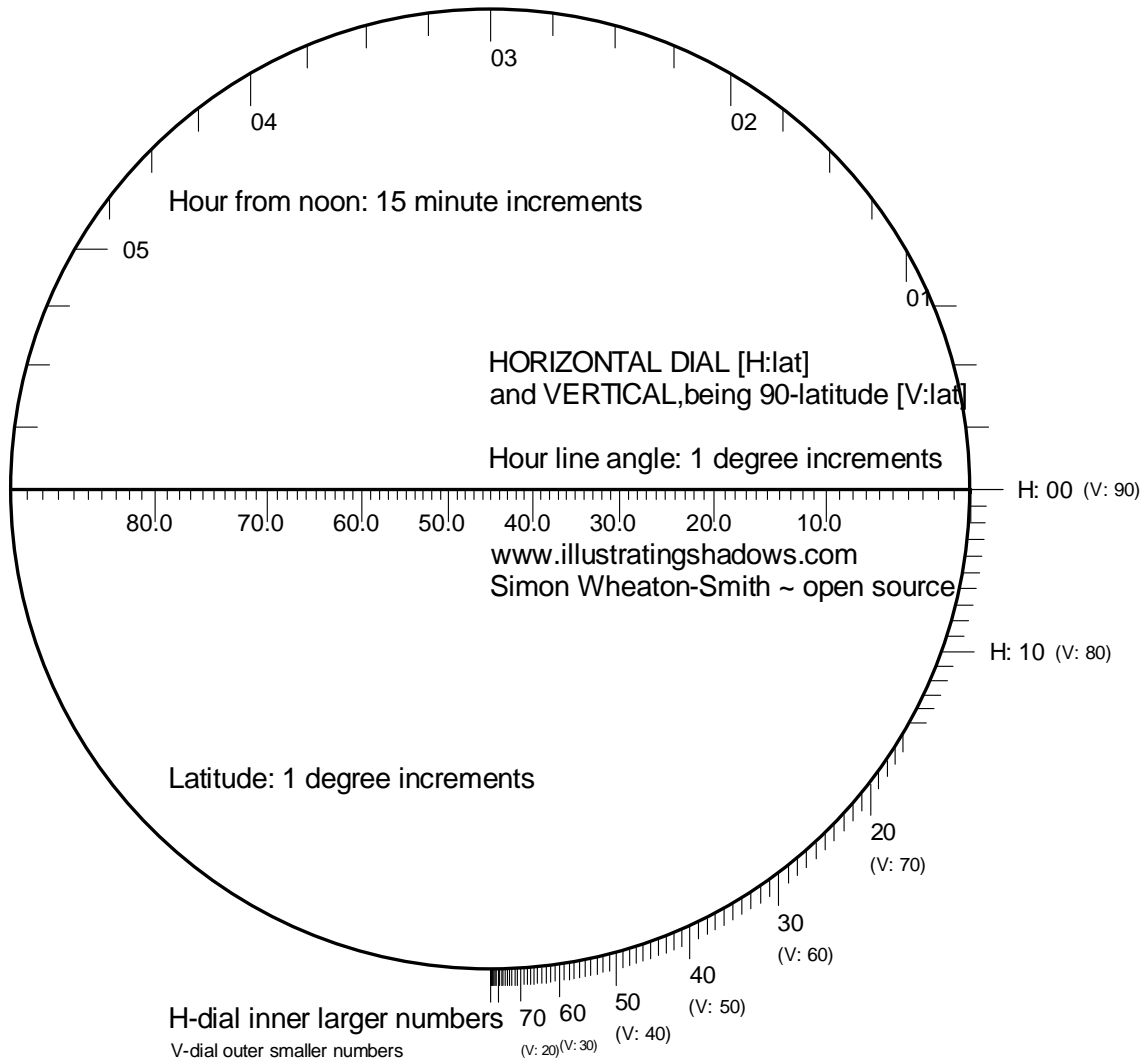
Draw line from hour to declination, read (1) HR LINE DIST as well as (2) distance on hour line to calendar point

MARCH & SEPTEMBER
EQUINOX

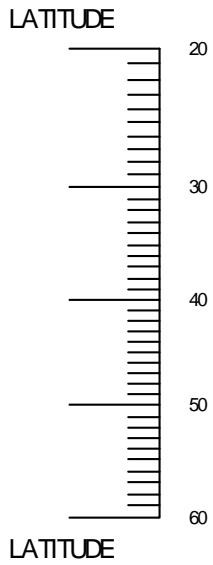


JUNE & DECEMBER
SOLSTICE

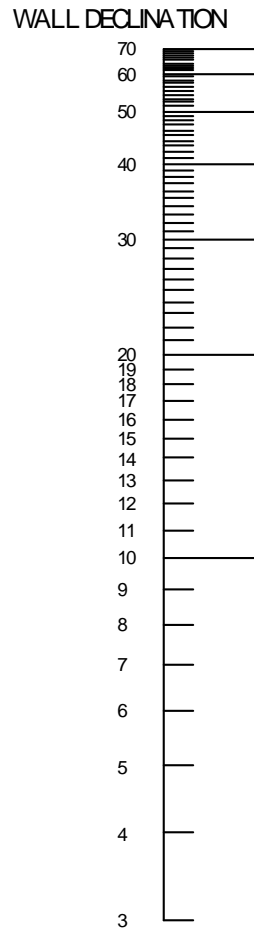
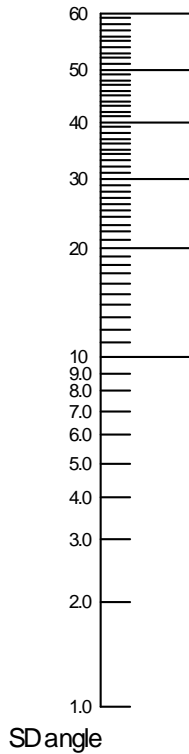
		EOT mm.m	DEC dd.d
Jan	1	+3.2	-22.8
	11	+7.4	-21.6
Feb	21	+10.8	-19.7
	1	+13.1	-17.3
Mar	11	+14.1	-14.4
	21	+13.9	-11.0
Apr	1	+12.5	-7.4
	11	+10.2	-3.6
May	21	+7.3	0.4
	1	+4.1	4.3
Jun	11	+1.1	8.1
	21	-1.4	11.7
Jly	1	-3.1	15.0
	11	-3.8	17.8
Aug	21	-3.6	20.1
	1	-2.5	21.9
Sep	11	-0.7	23.0
	21	+1.4	23.4
Oct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



This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.

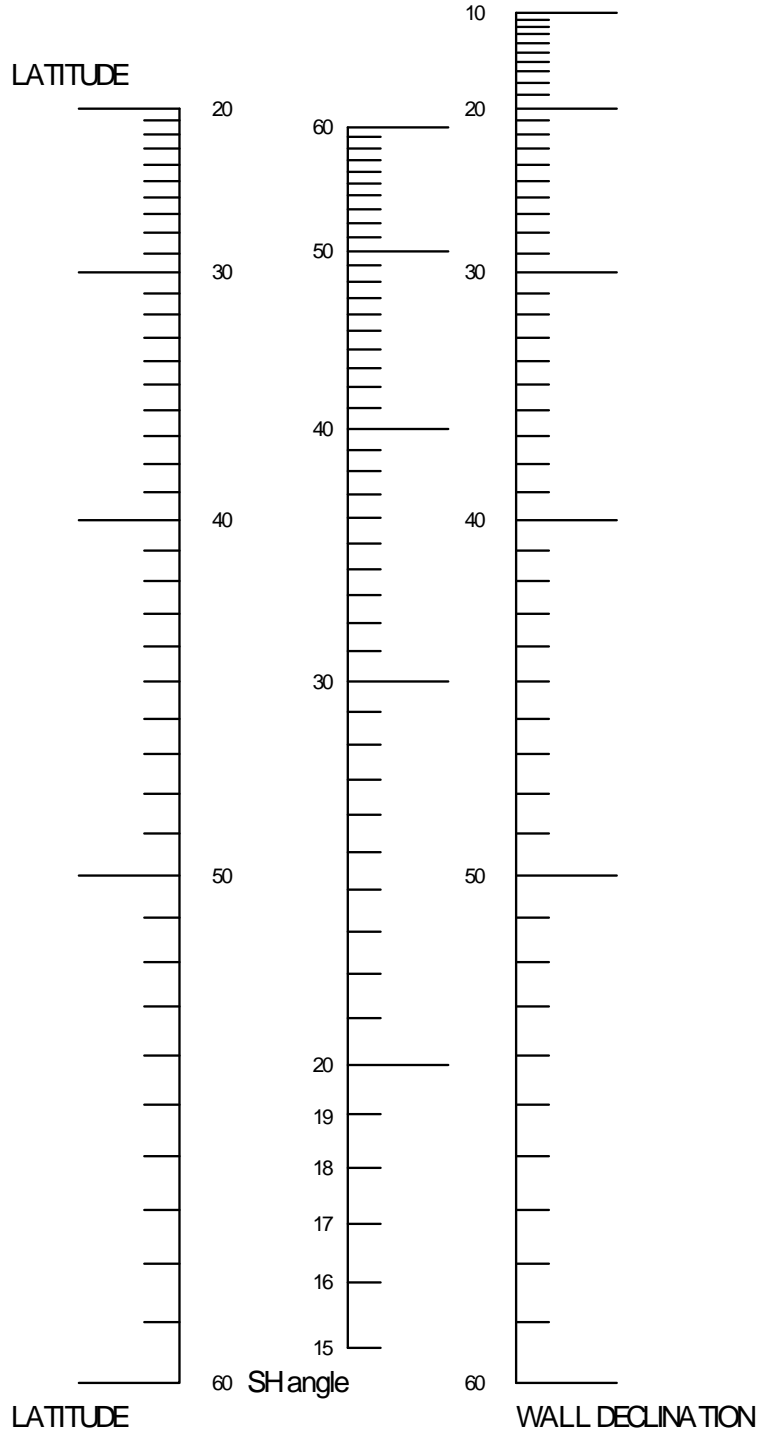


VERTICAL DECLINER DIAL SD STYLE DISTANCE NOMOGRAM

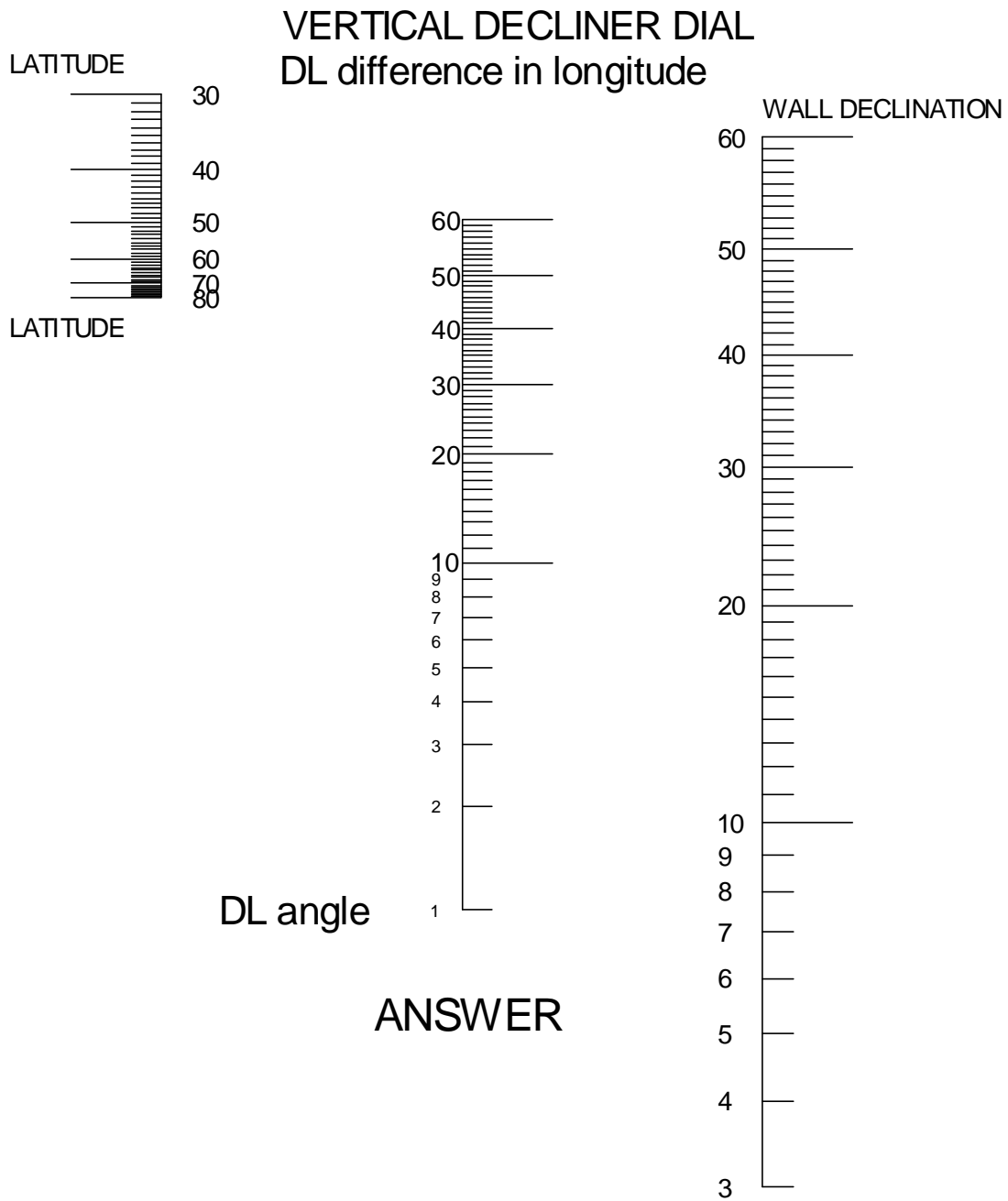


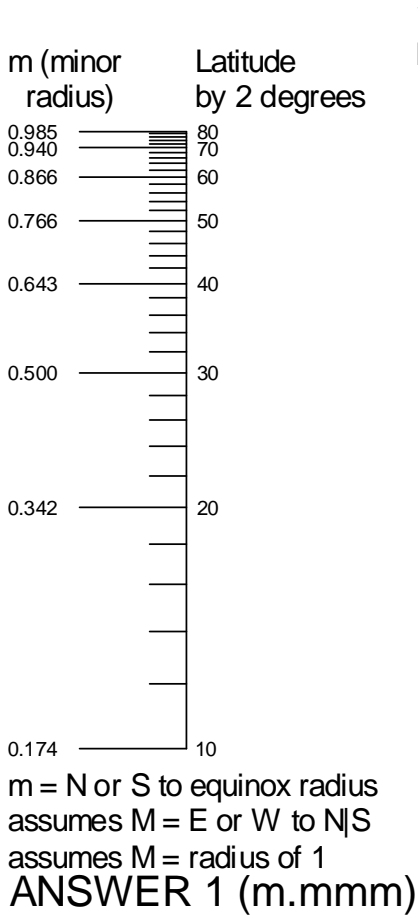
ANSWER

VERTICAL DECLINER DIAL SH STYLE HEIGHT NOMOGRAM

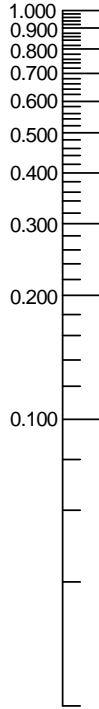


This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.

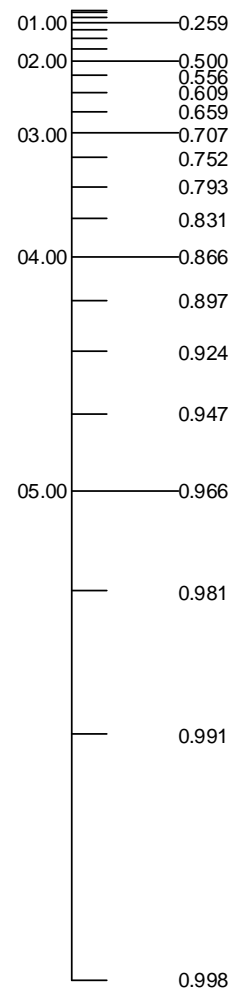




Y from equinox line assumes
 M = E or W radius is 1
ANSWEAR 3 (Y.YYY)



Hour from noon in
 15 minute increments

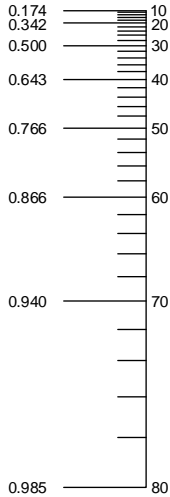


X from n|s line (assumes
 M = E or W radius is 1)
ANSWEAR 2 (X.XXX)

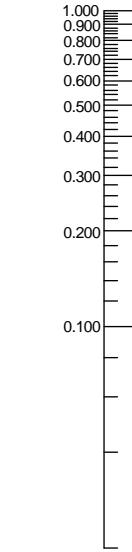
ANALEMMATIC DIAL www.illustratingshadows.com
 M = west to center, or center to east radius = 1
 m = equinox to north or to south radius, if M=1
 Chapter 21 of Illustrating Times Shadow

Y from equinox line assumes
M = E or W radius is 1
ANSWER 4 (Y.YYY)

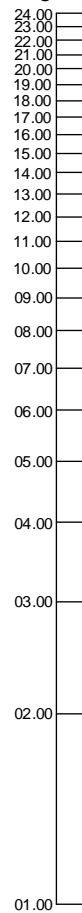
m (minor radius)
Latitude by 2 degrees



m = N or S to equinox radius
assumes M = E or W to N|S
assumes M = radius of 1
ANSWER 1 (m.mmm)

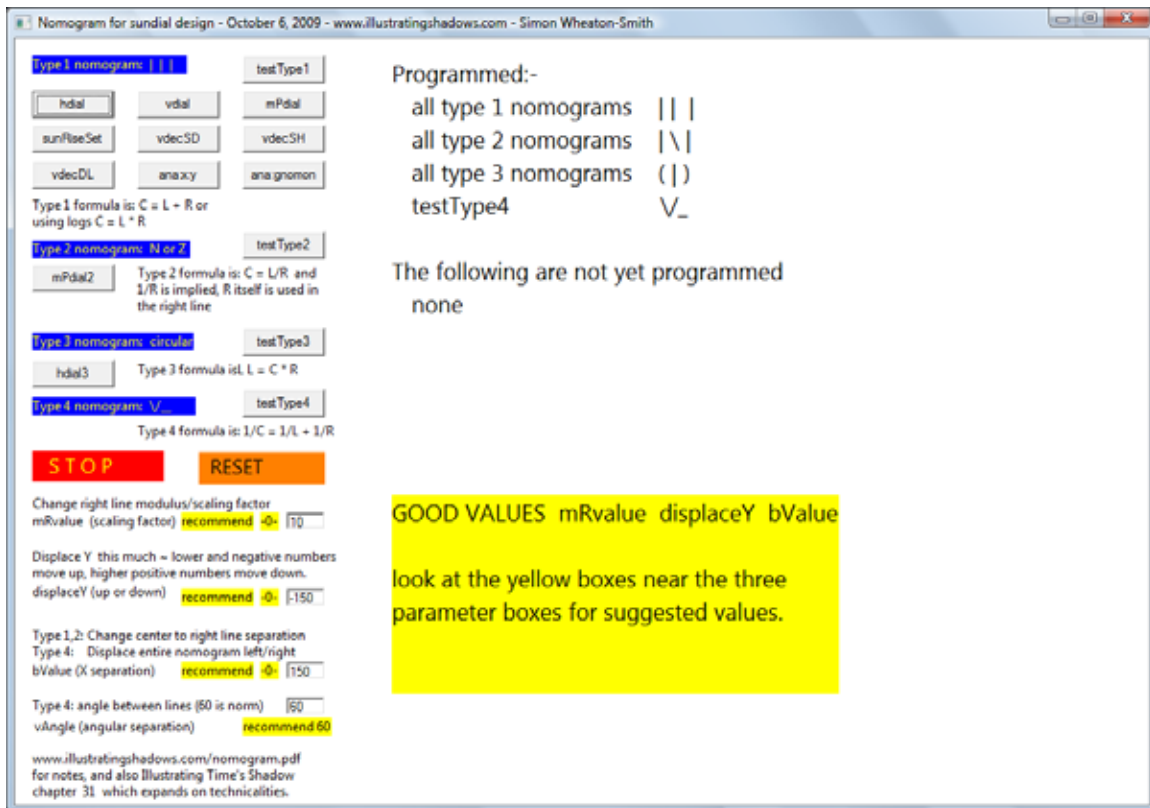


Declination in 1
degree increments



		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

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



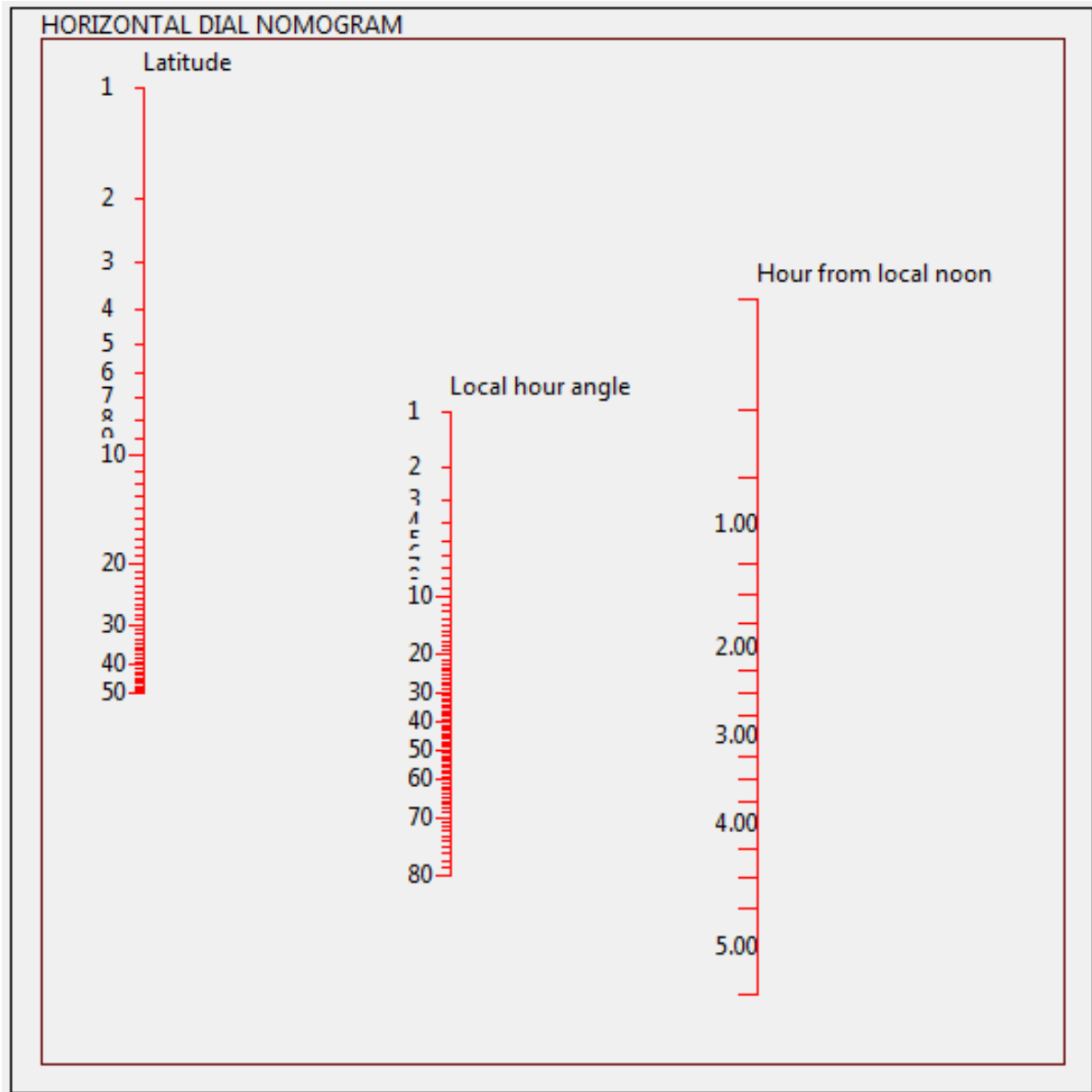
Lazarus/Pascal nomogram program results

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.

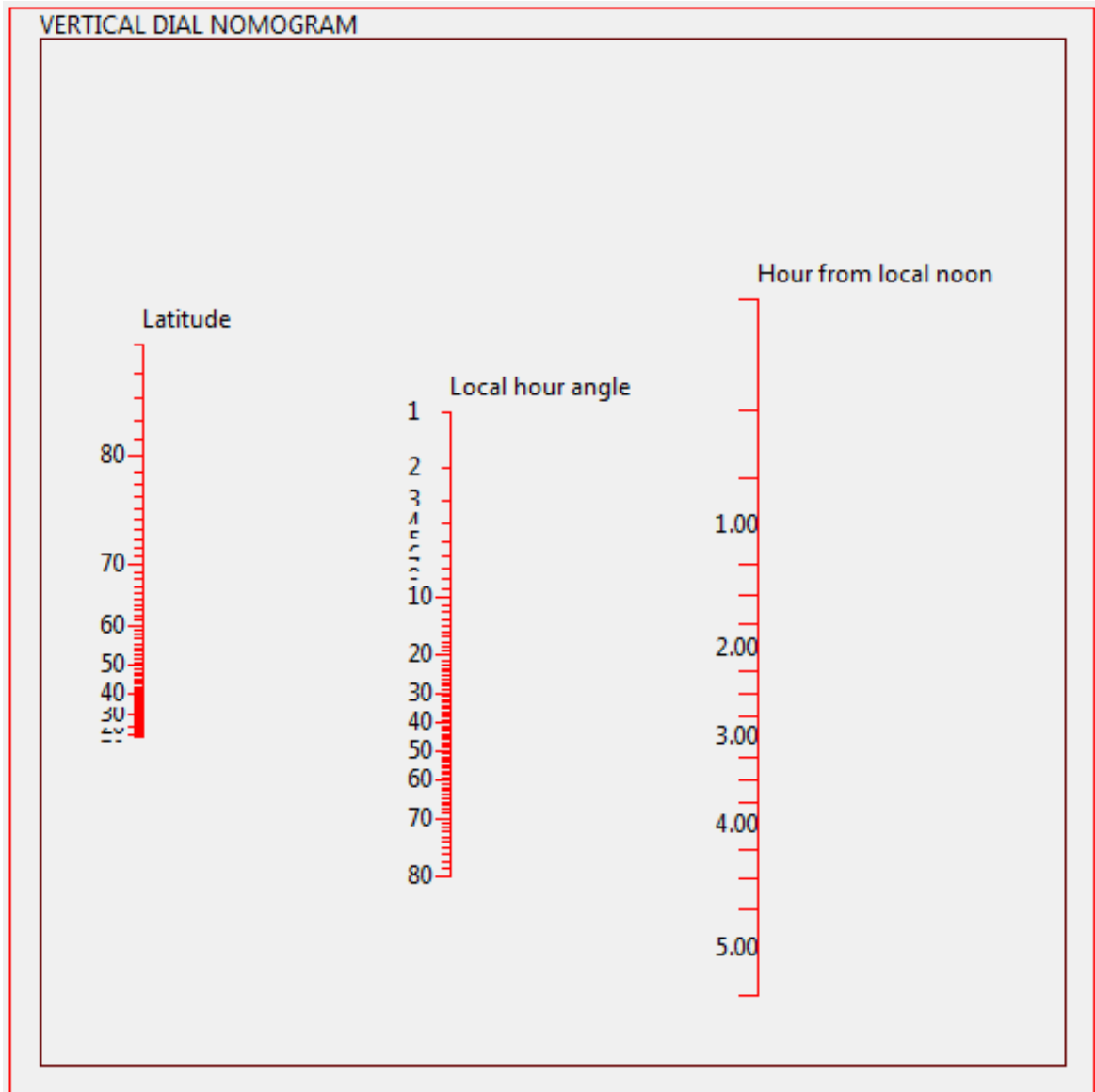
Also, the Lazarus program is standalone, runs on Windows XP and Vista win64, and you may recompile it on other platforms, and is free.

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

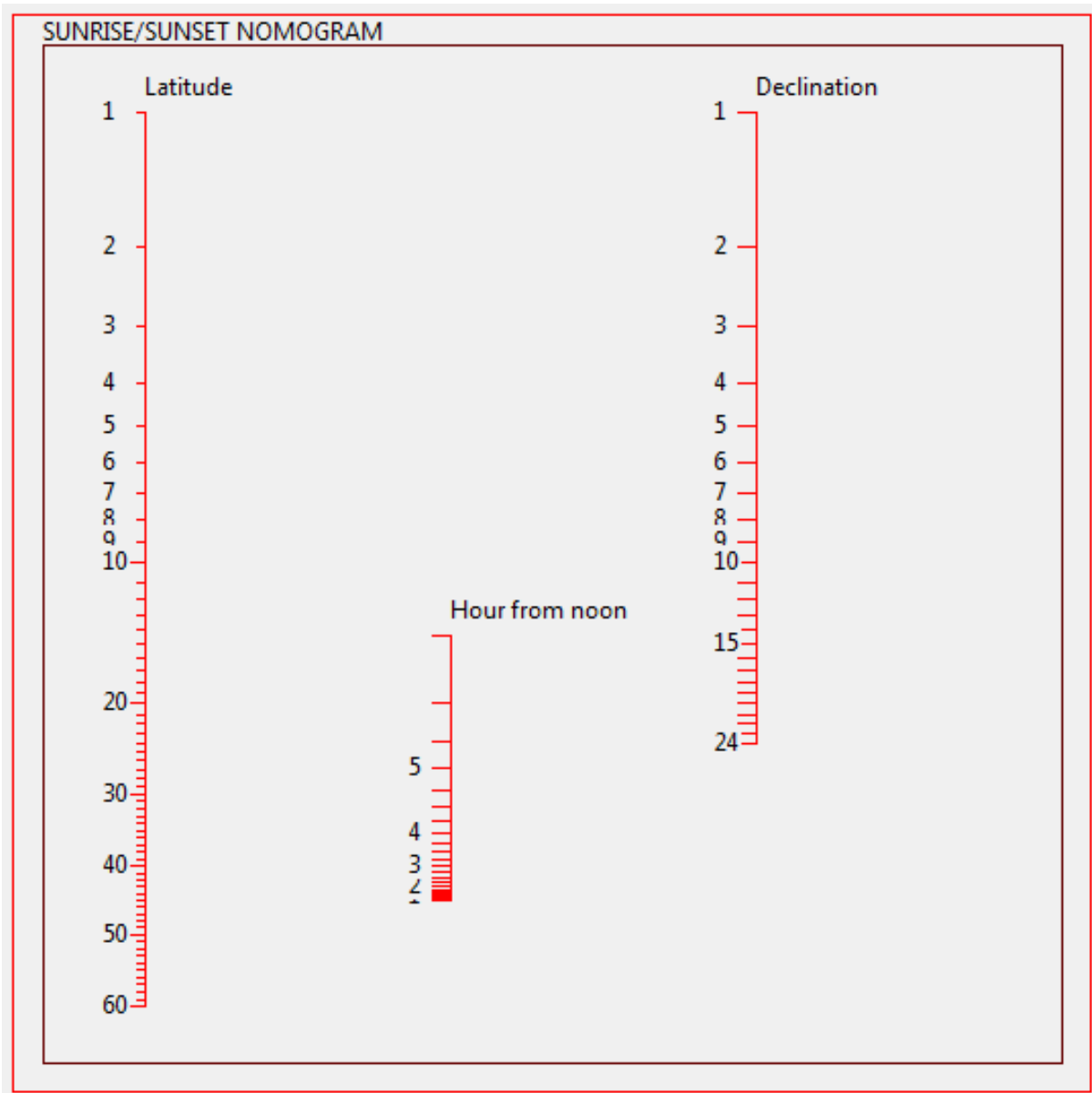
This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in Illustrating Time's Shadow expands on this topic.



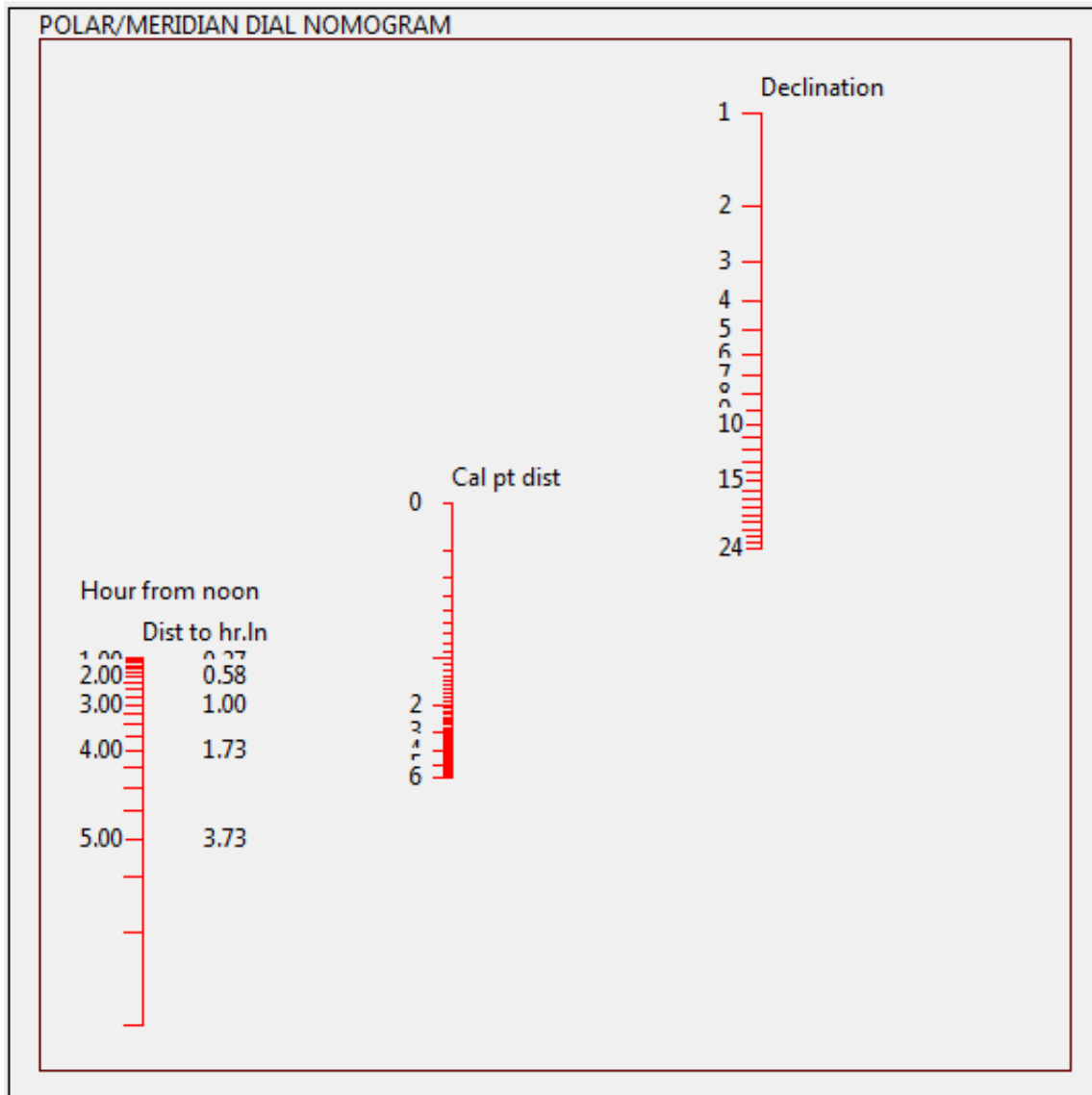
This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.



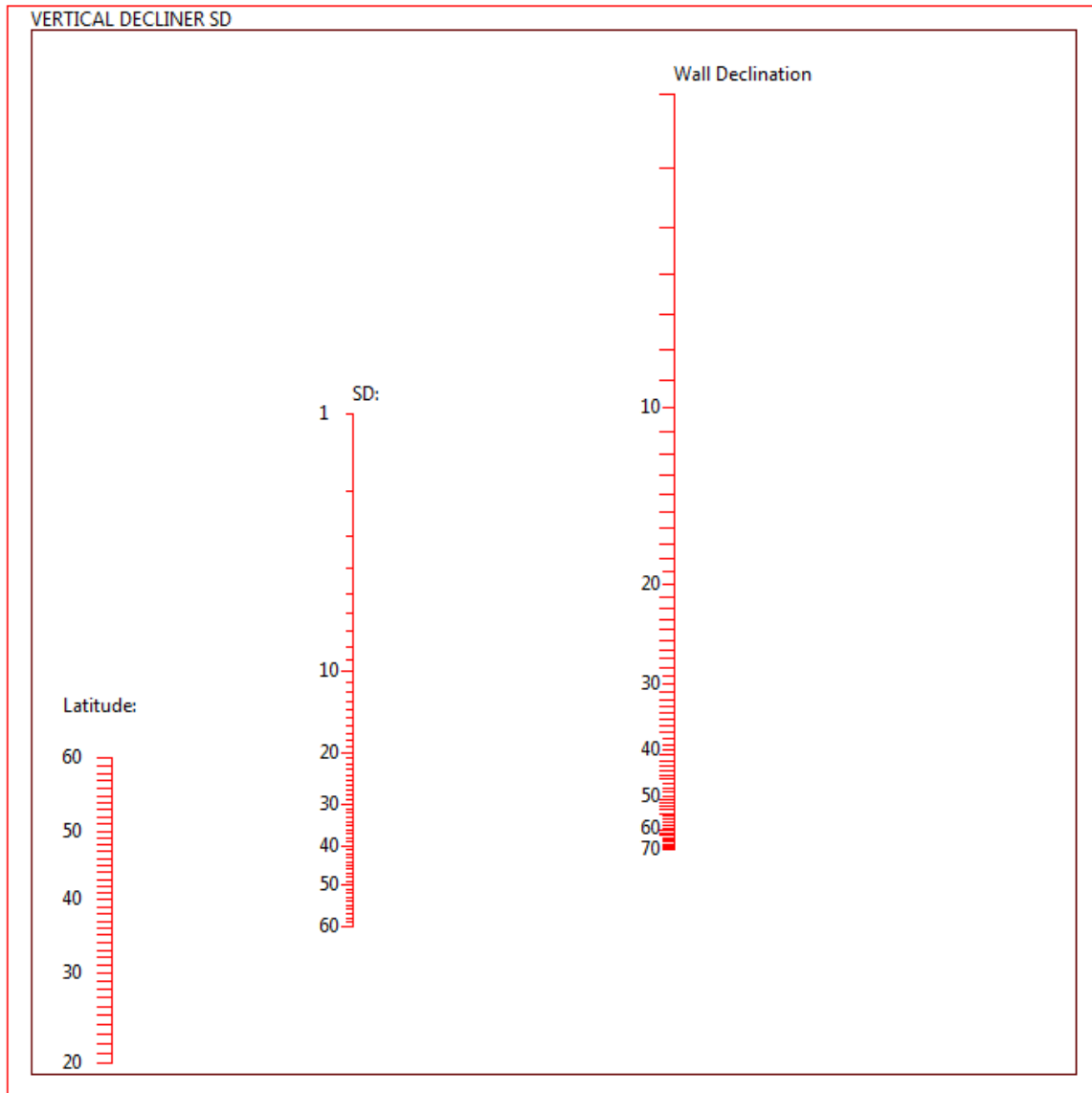
This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.



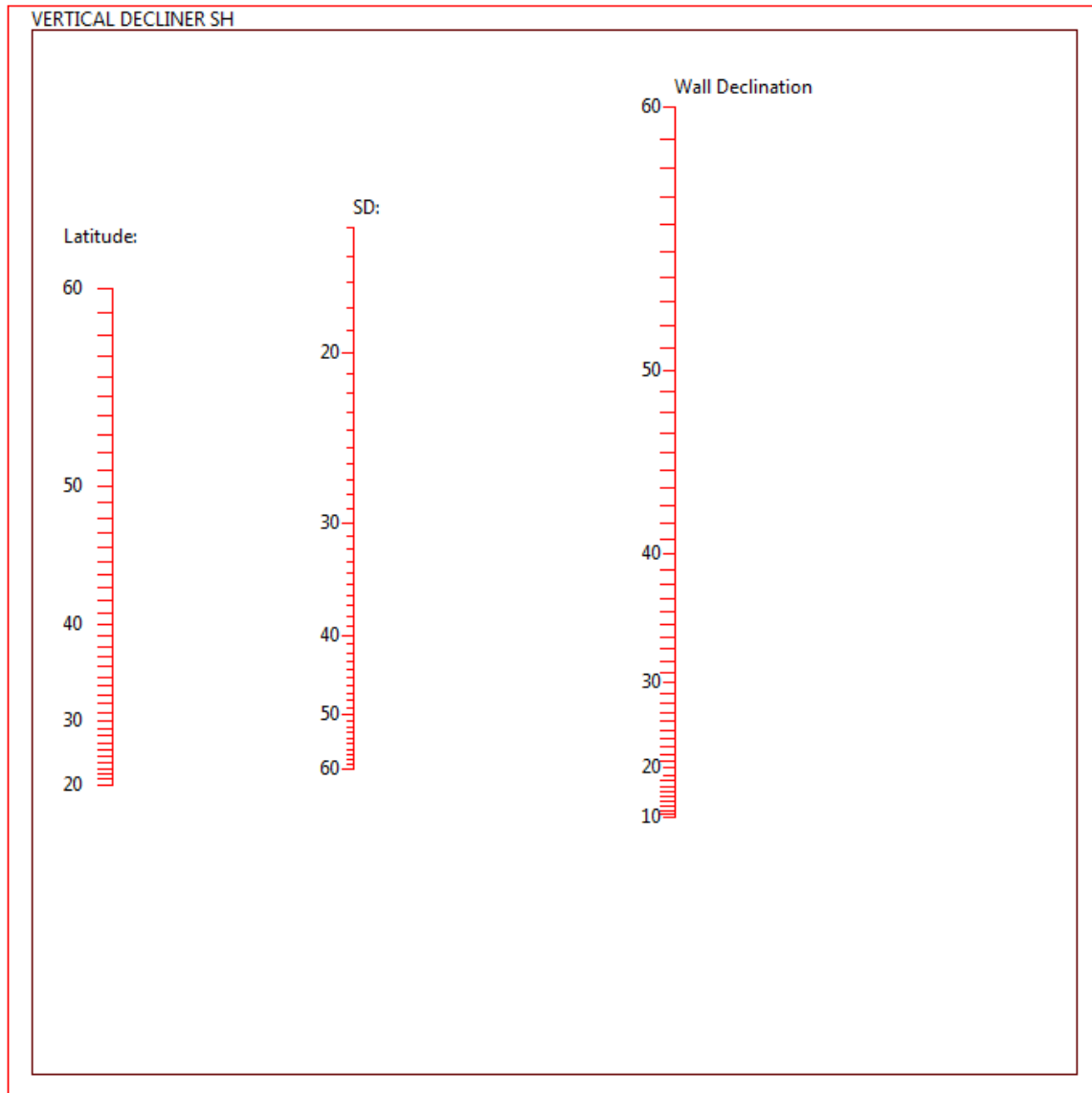
This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.



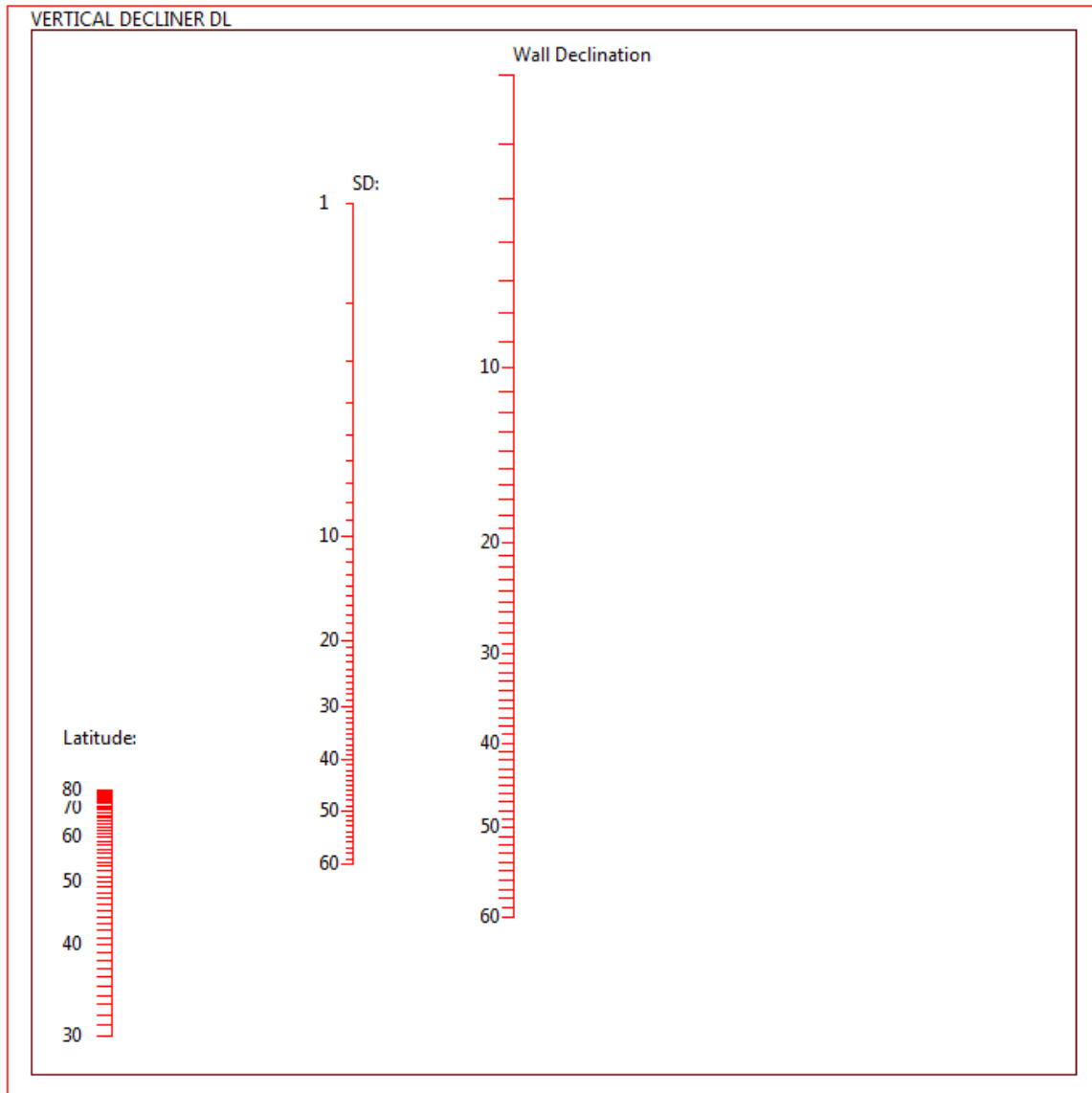
This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.



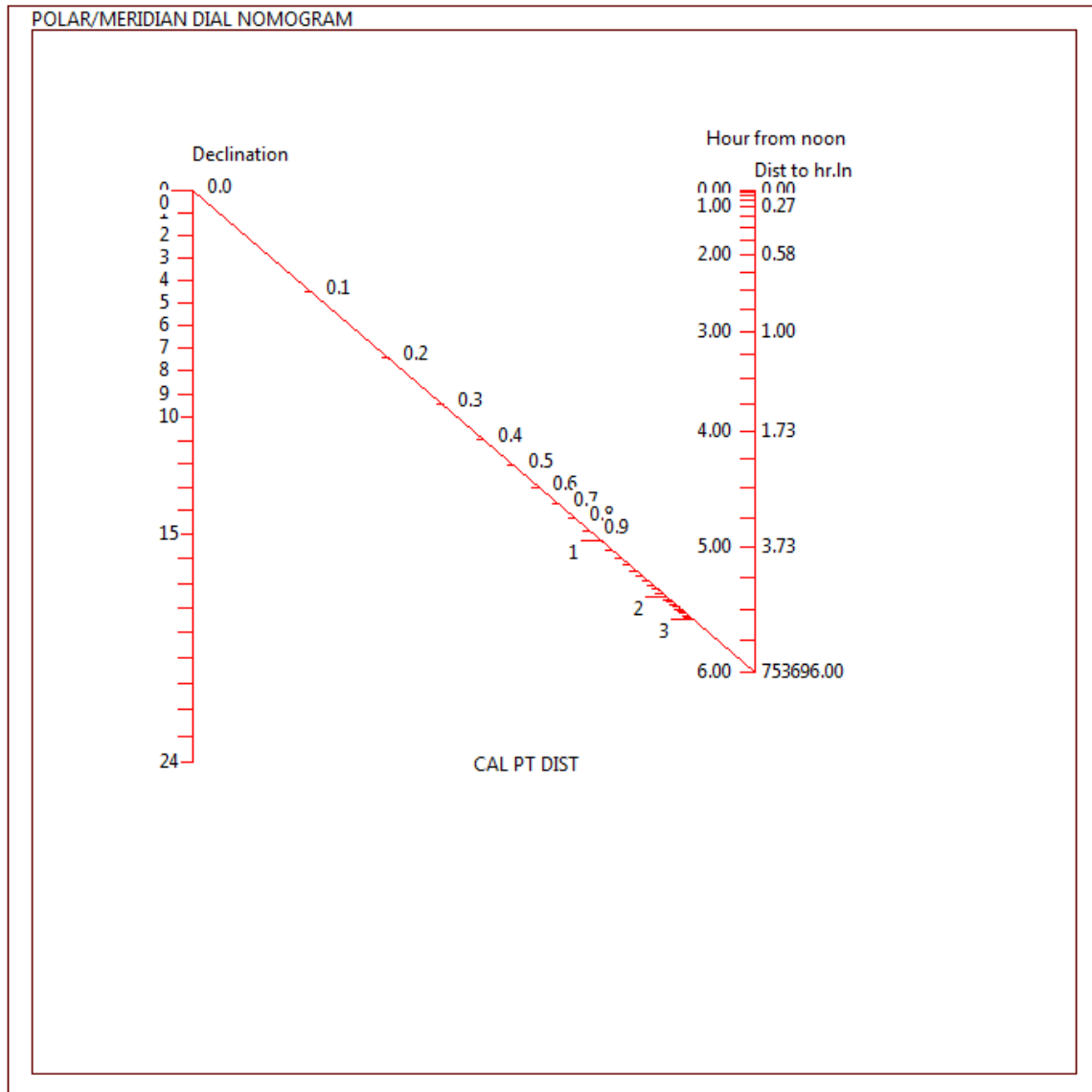
This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.



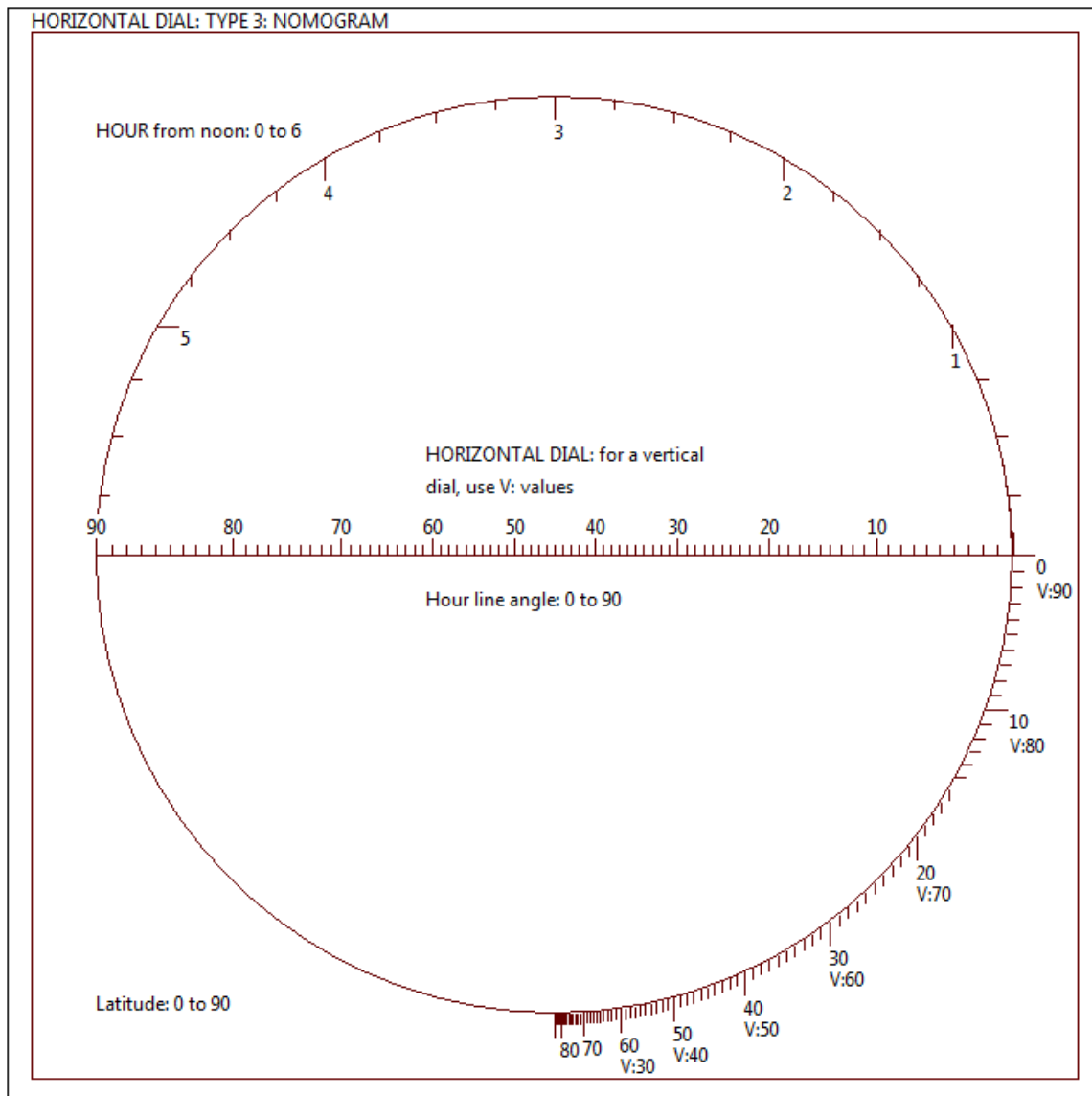
This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.



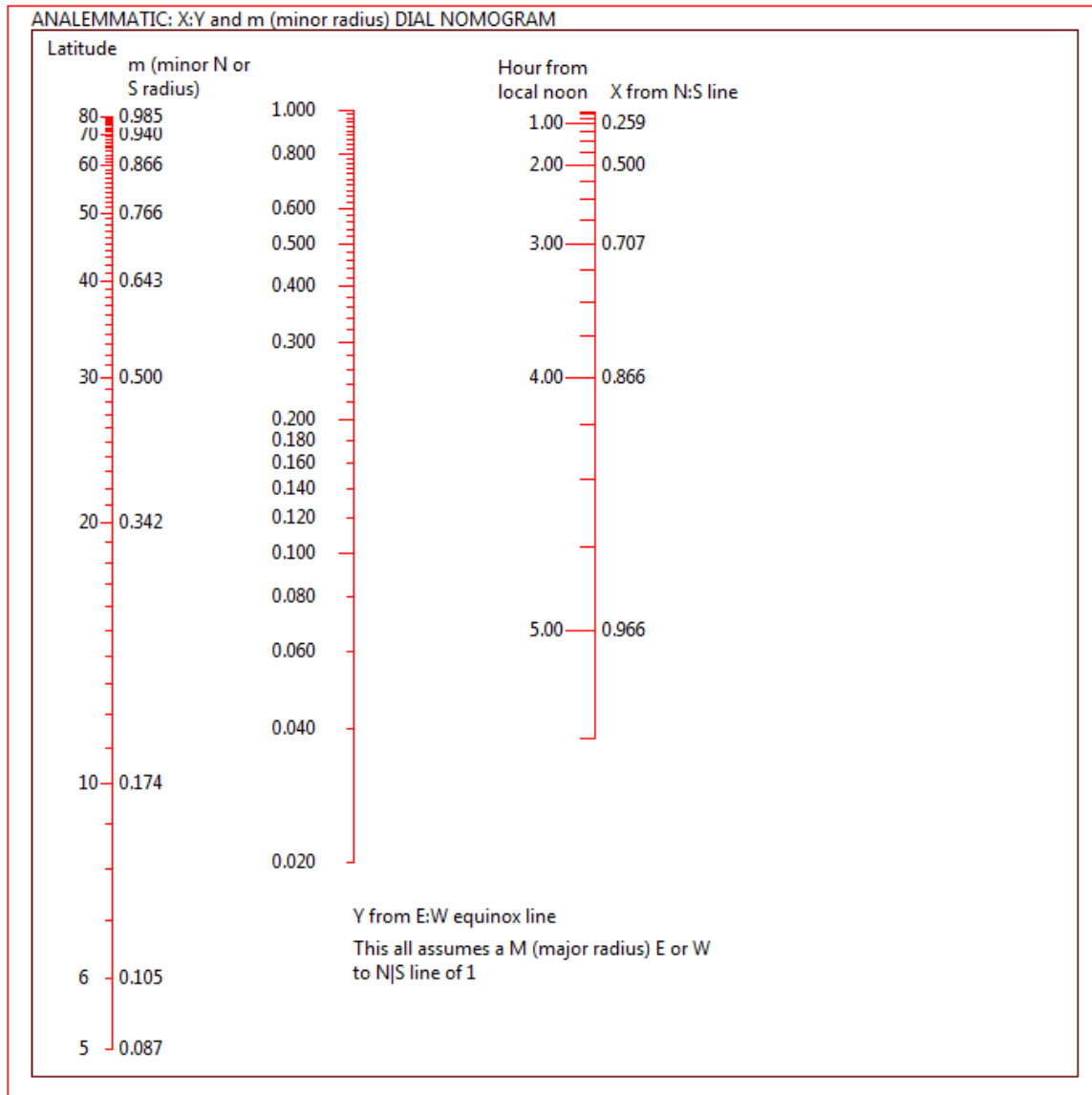
This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.



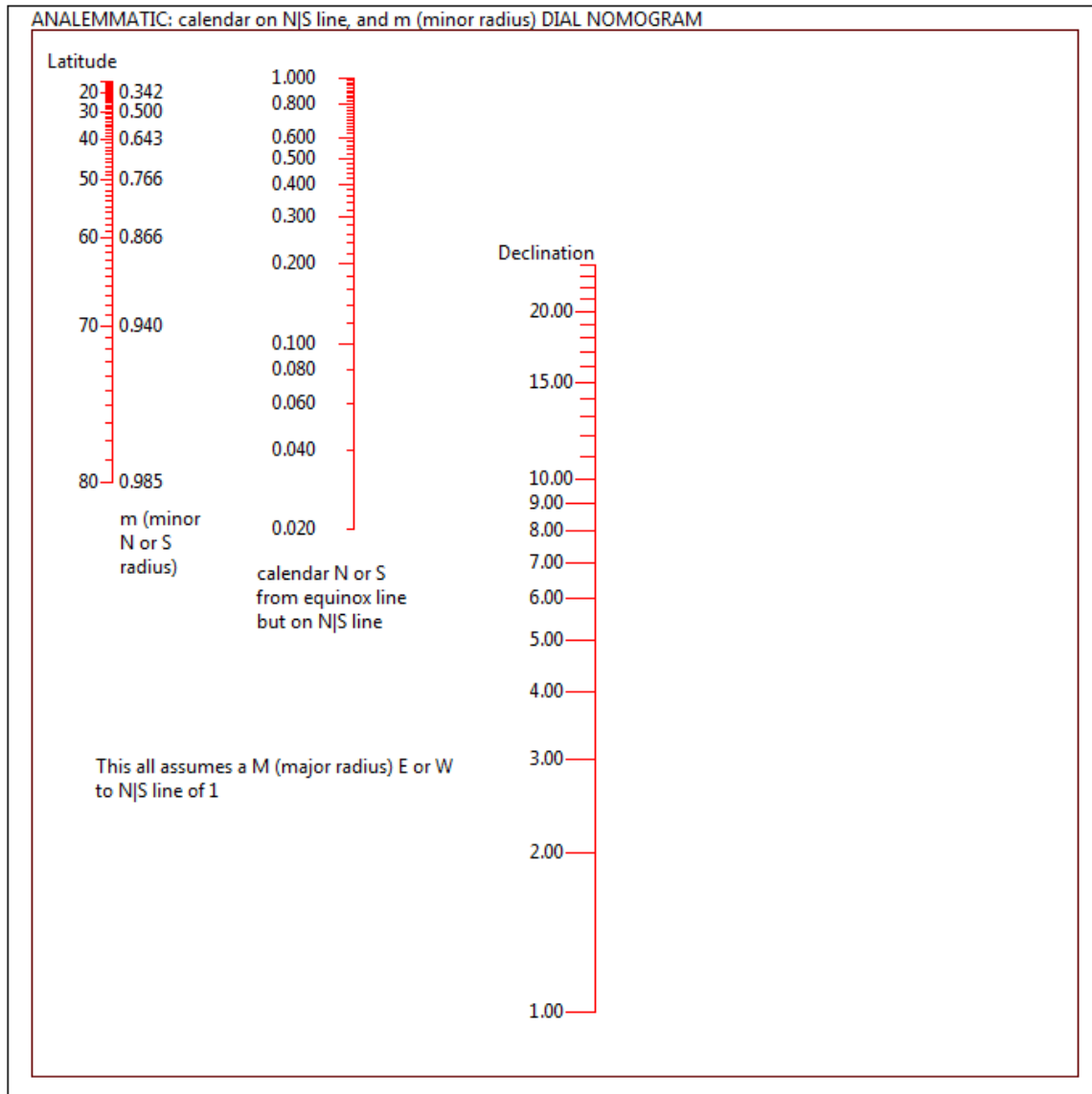
This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.



This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.

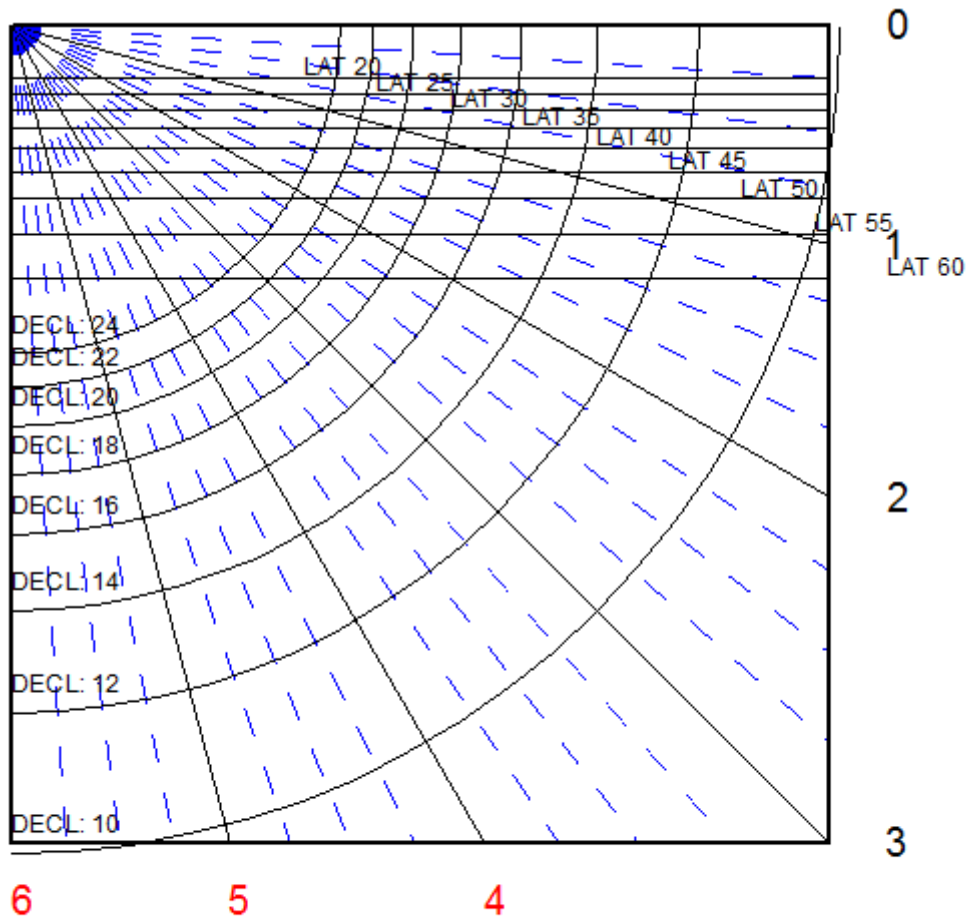


This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.



This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.

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

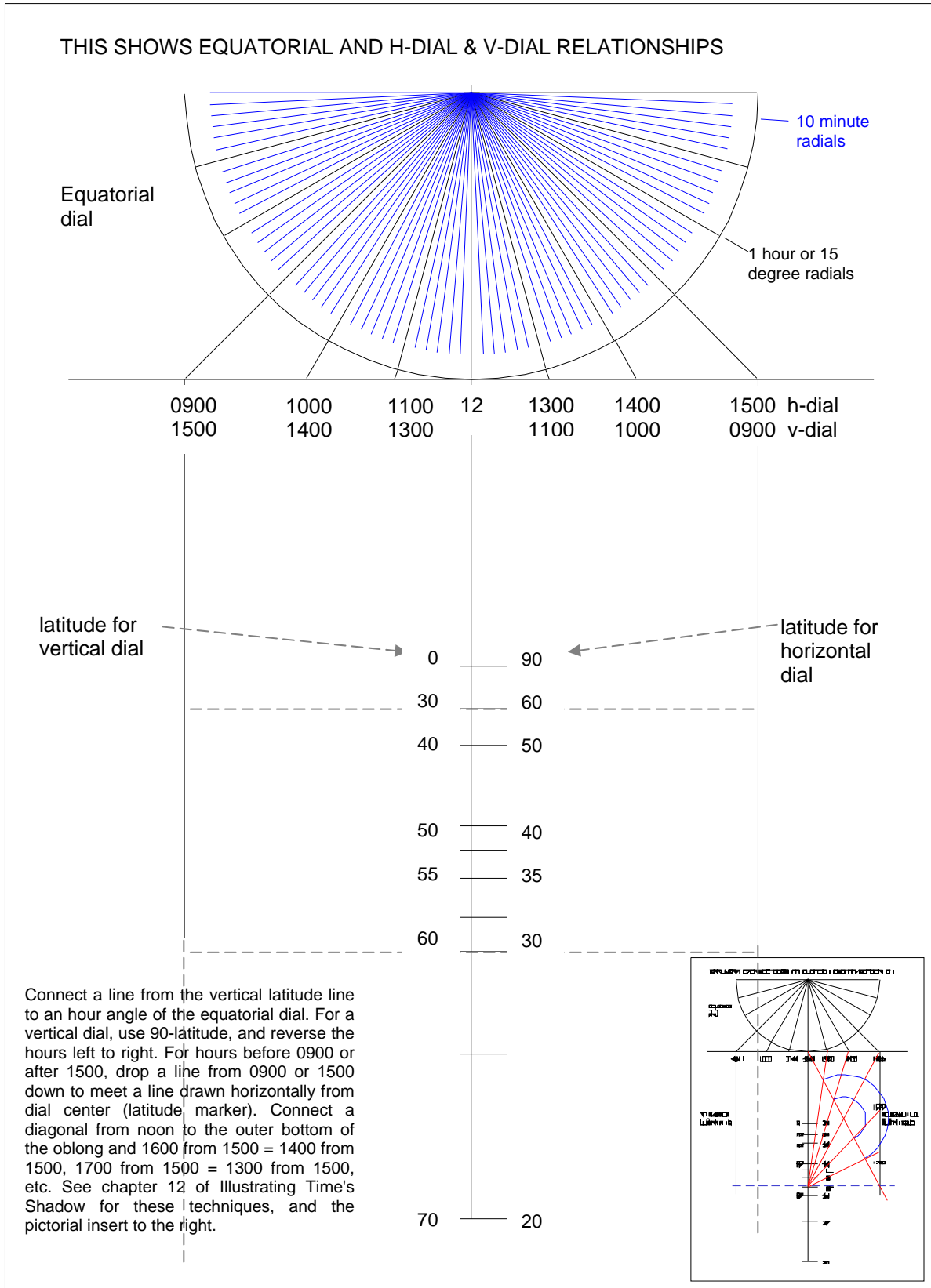


**NOMOGRAM FOR SUNRISE/SET BASED ON Q-DIAL
HOURS FOM 0600 or 1800 for sunrise/set**

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



This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in Illustrating Time's Shadow expands on this topic.

THE END

This document may be freely distributed provided the credit to the web site and author is retained above. Remember that updates may exist on the web site. Chapter 31 in *Illustrating Time's Shadow* expands on this topic.