

# Astrological charts with horoscop and starfont

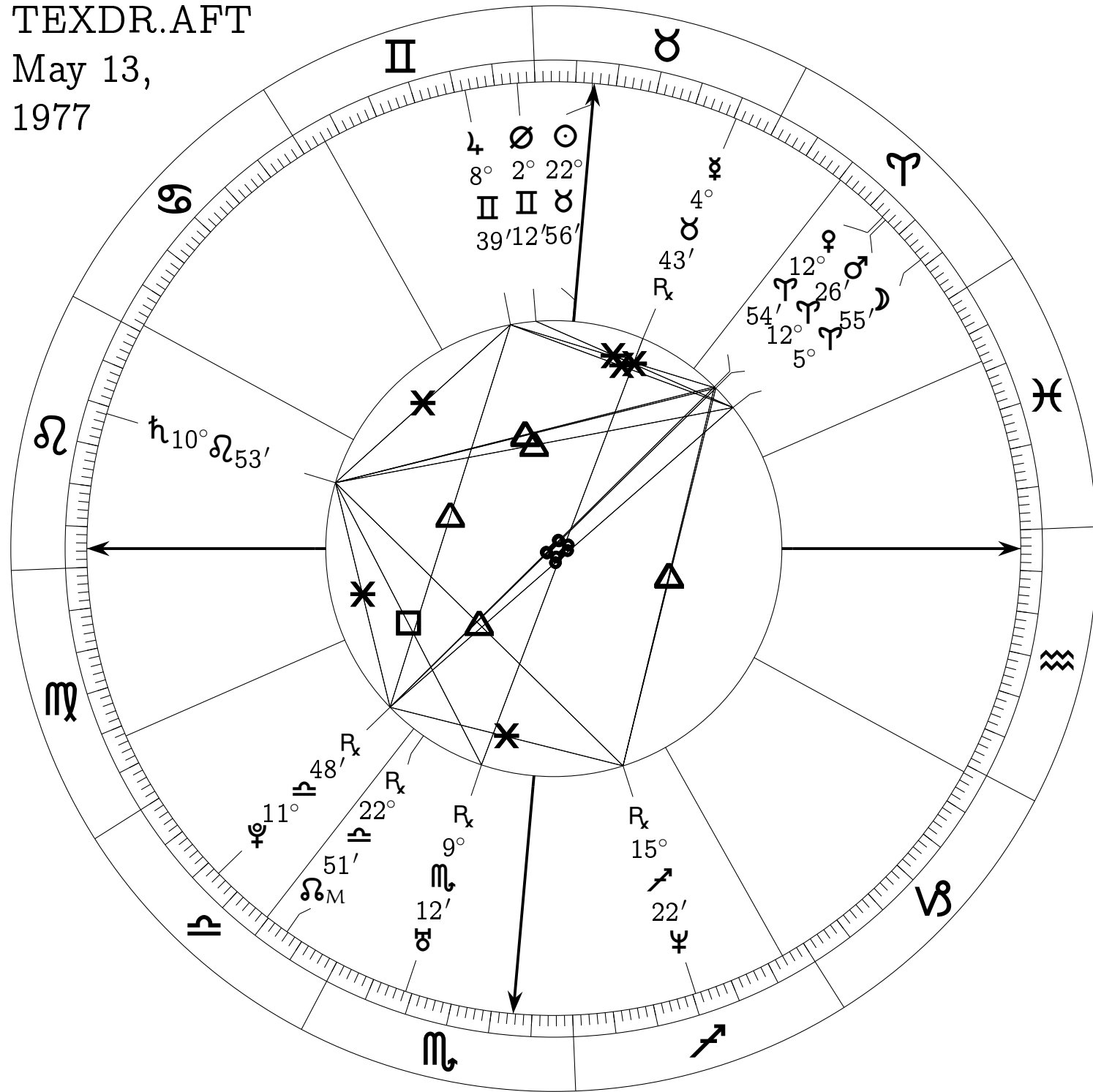
Matthew Skala

# Astrology

- The art of assigning meaning to time
- Human activity since prehistory
- Historically not distinguished from mathematics
- Unique symbolic notation and typesetting needs

TEXDR.AFT

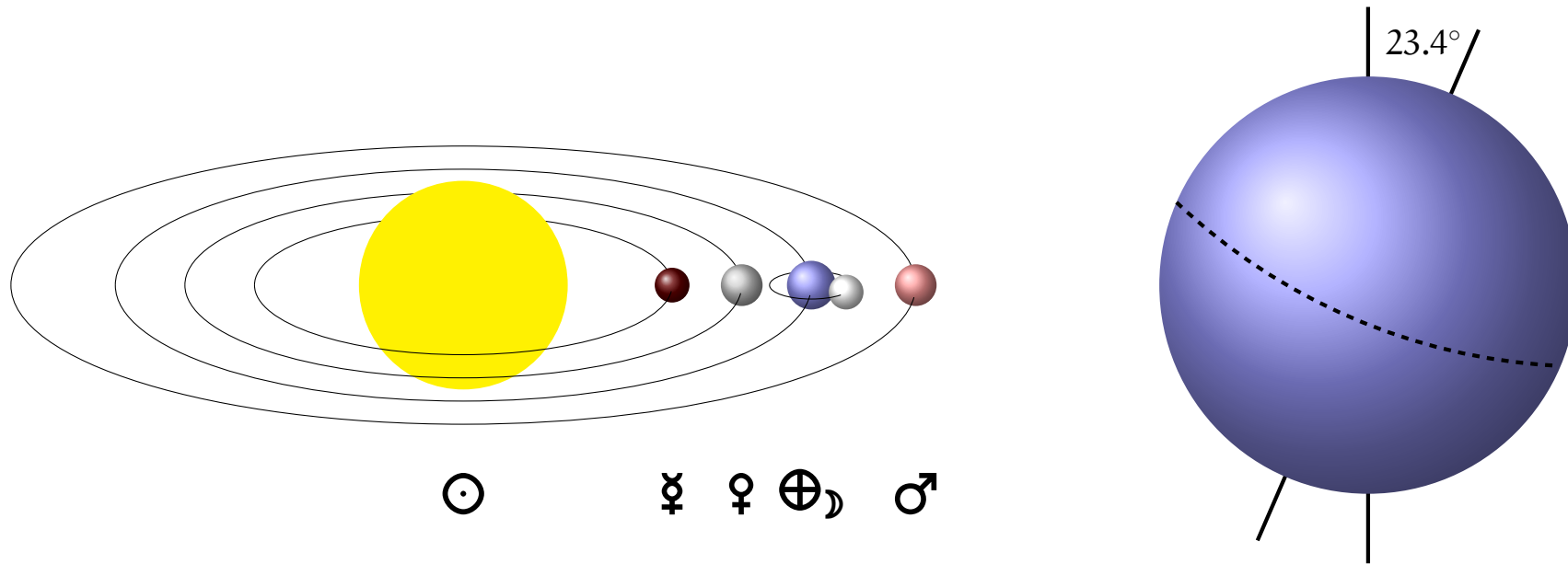
May 13,  
1977



## Terms of reference for horoscop/starfont

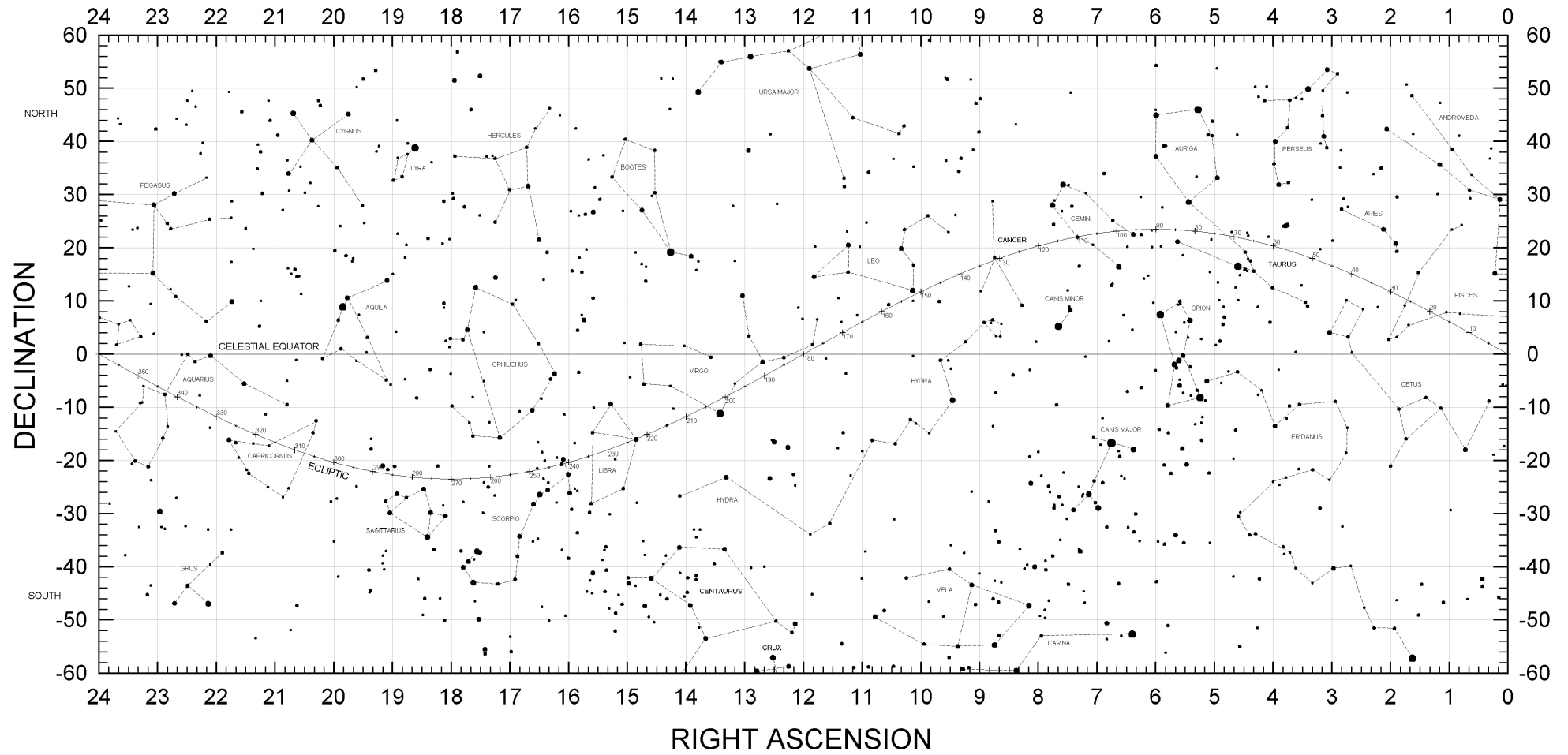
- “Classic” L<sup>A</sup>T<sub>E</sub>X as much as possible
- Focus on typesetting
- Customizability
- Best-of-breed defaults

The Solar System is more or less planar...



...but the Earth's rotational axis, and thus equator, are tilted.

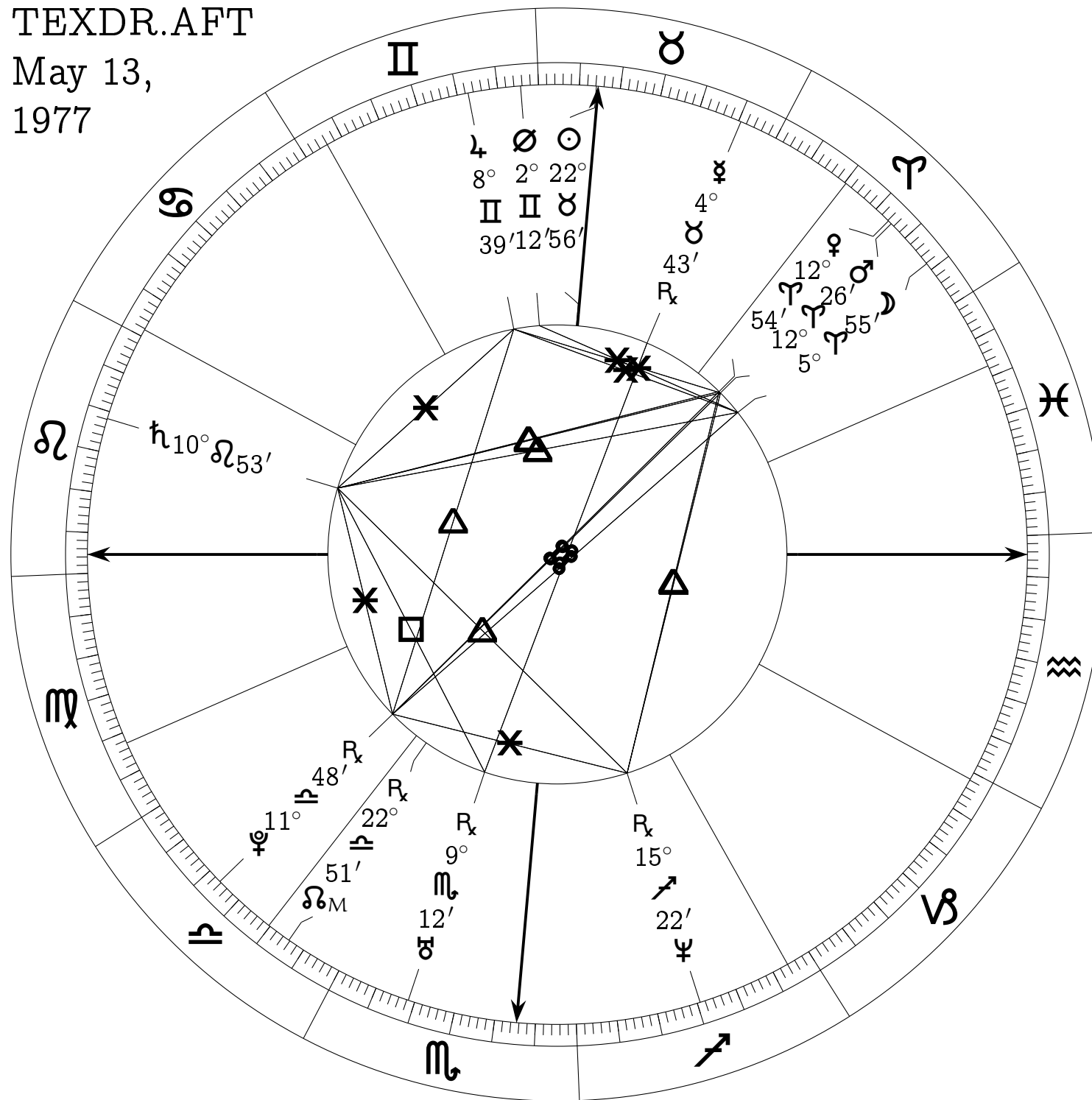
# EQUATORIAL SKY CHART



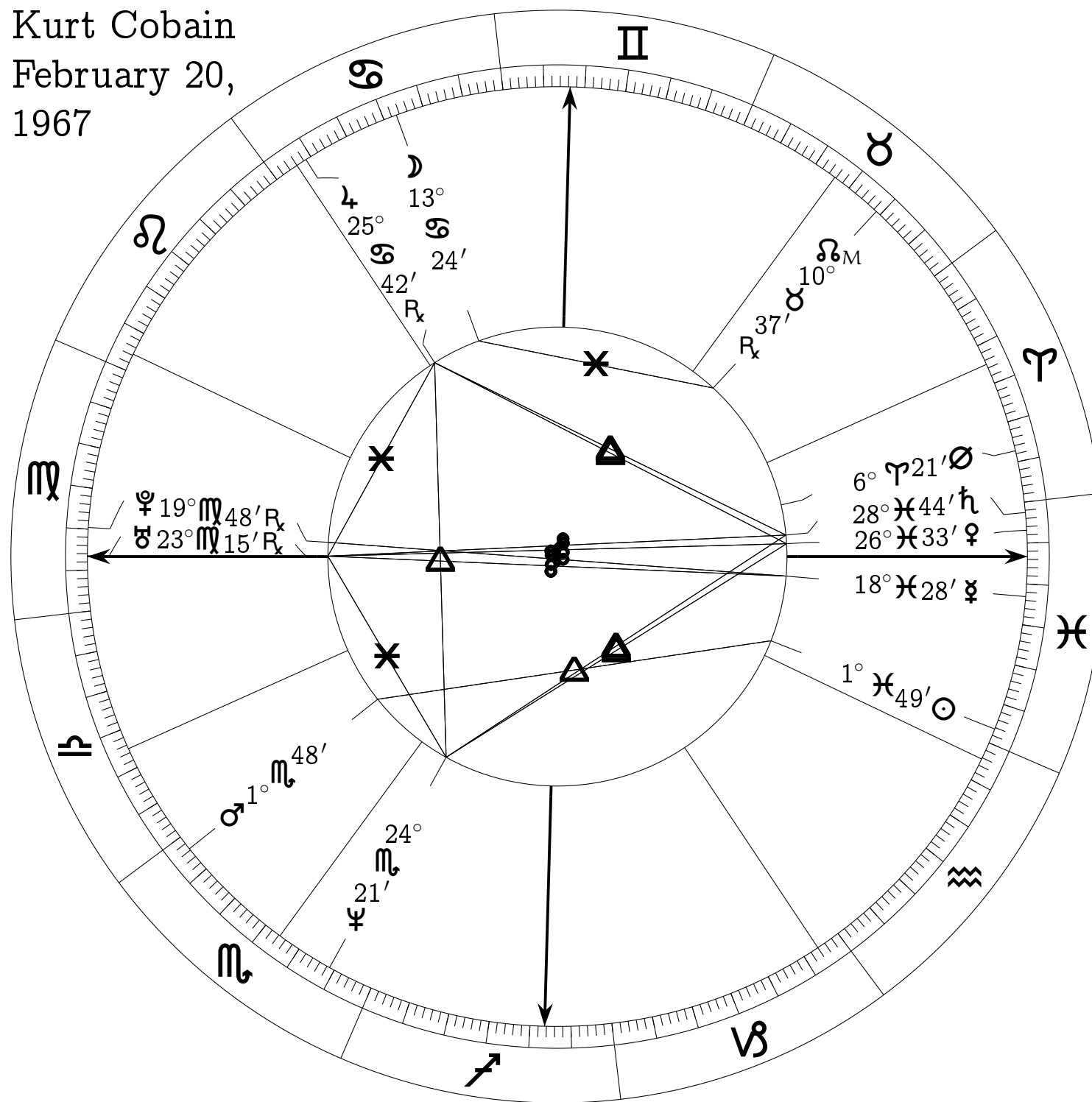
TEXDR.AFT

May 13,

1977

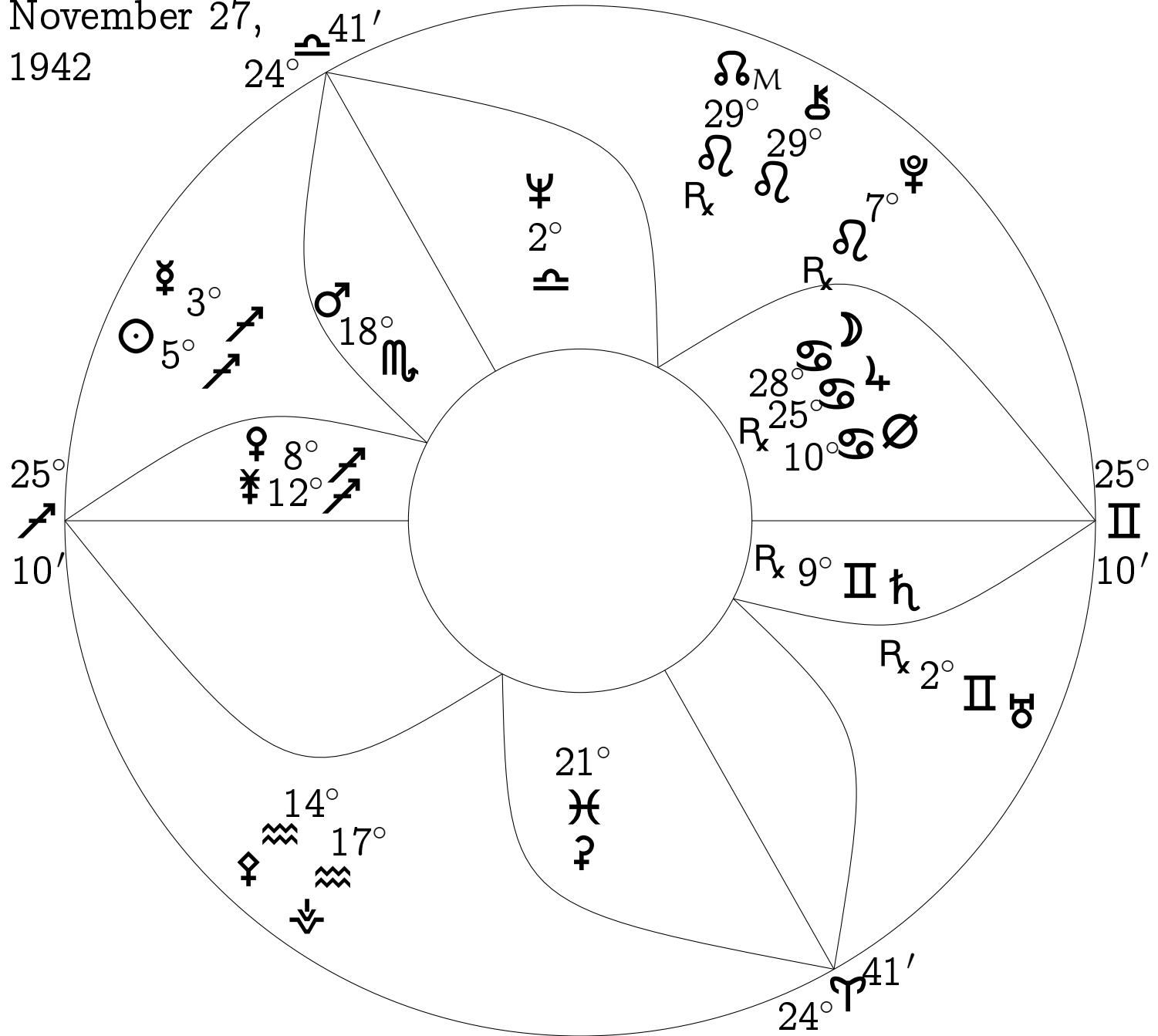


Kurt Cobain  
February 20,  
1967





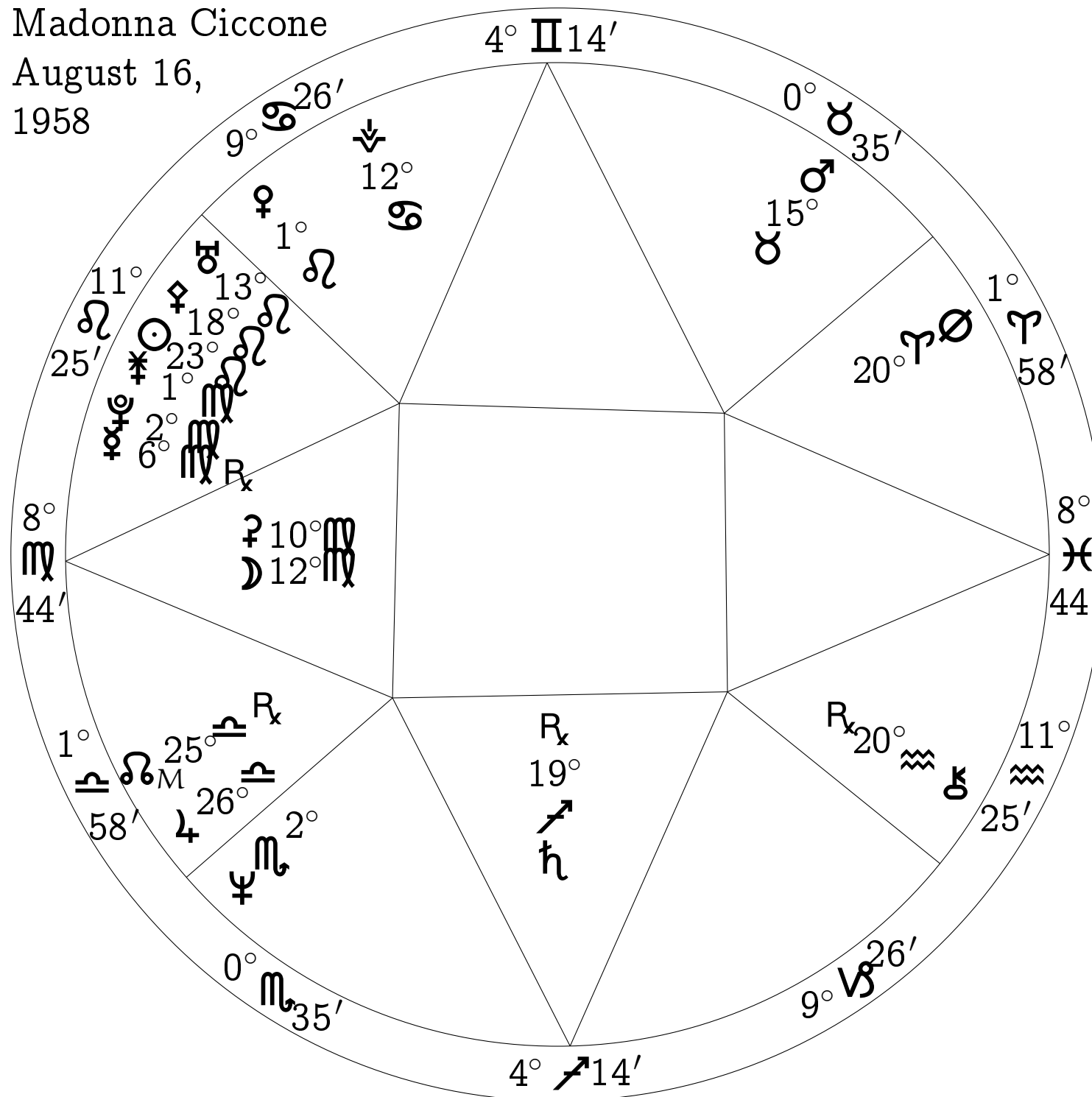
Jimi Hendrix  
November 27,  
1942



Madonna Ciccone

August 16,

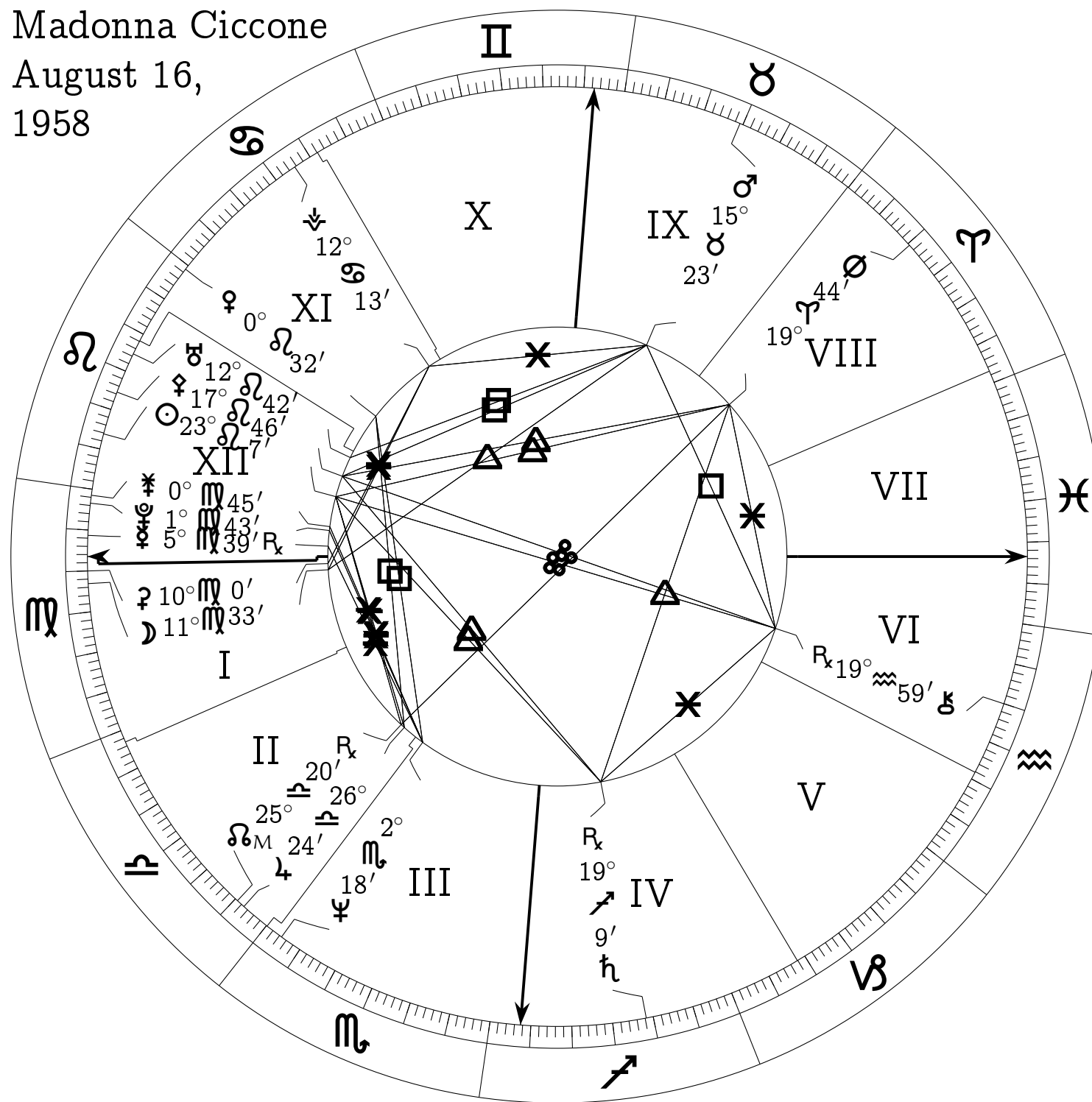
1958



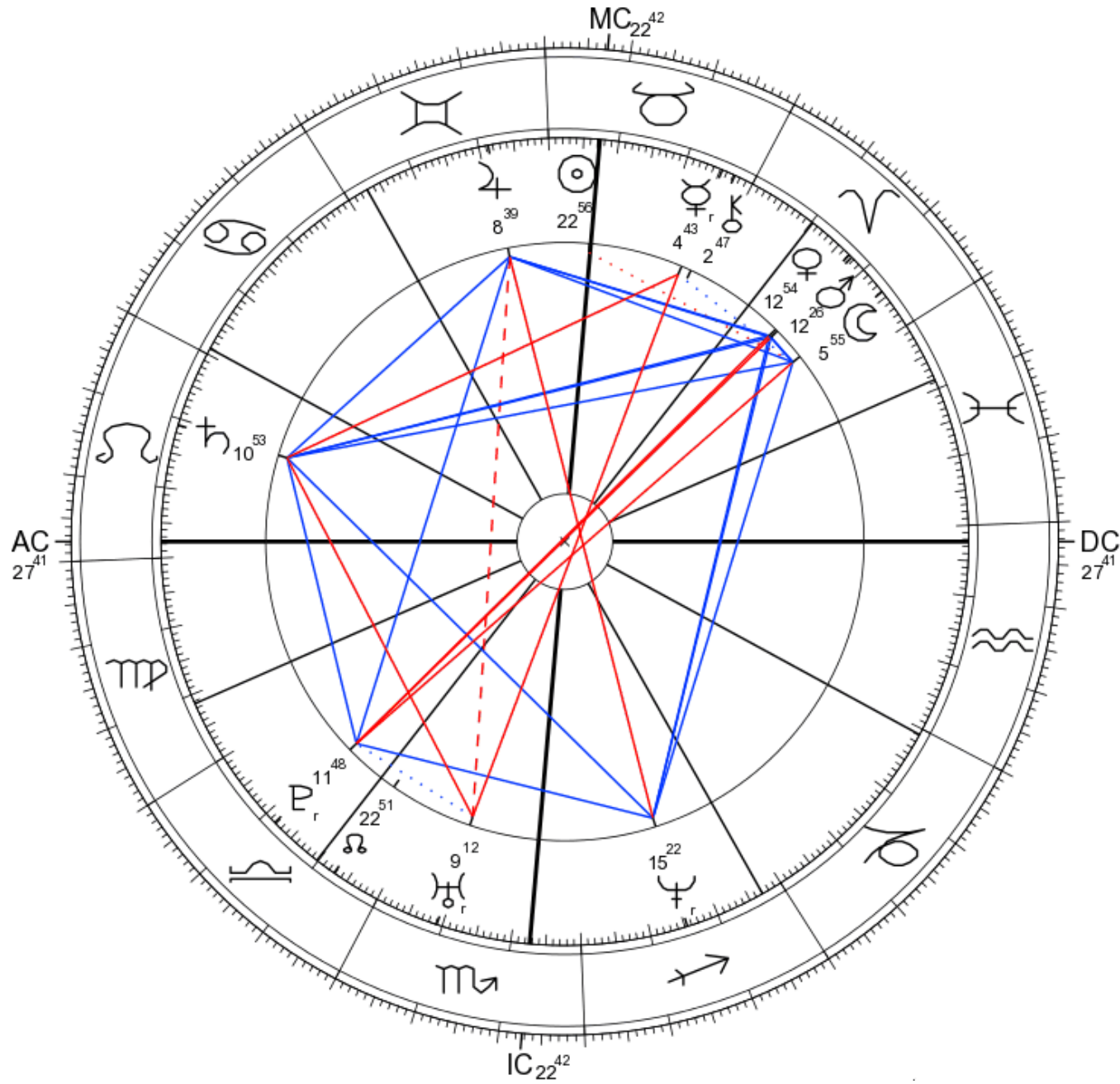
Madonna Ciccone

August 16,

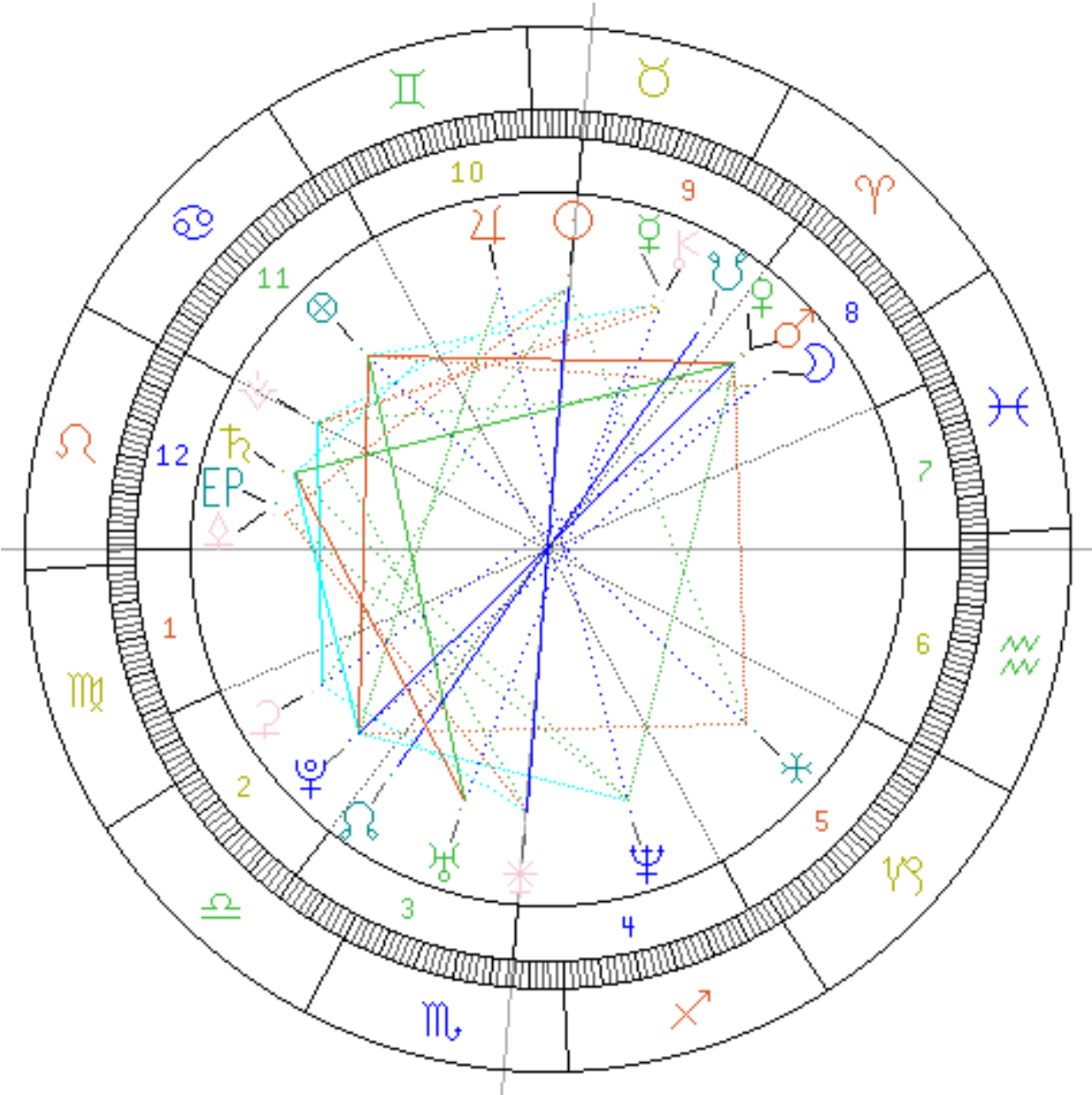
1958



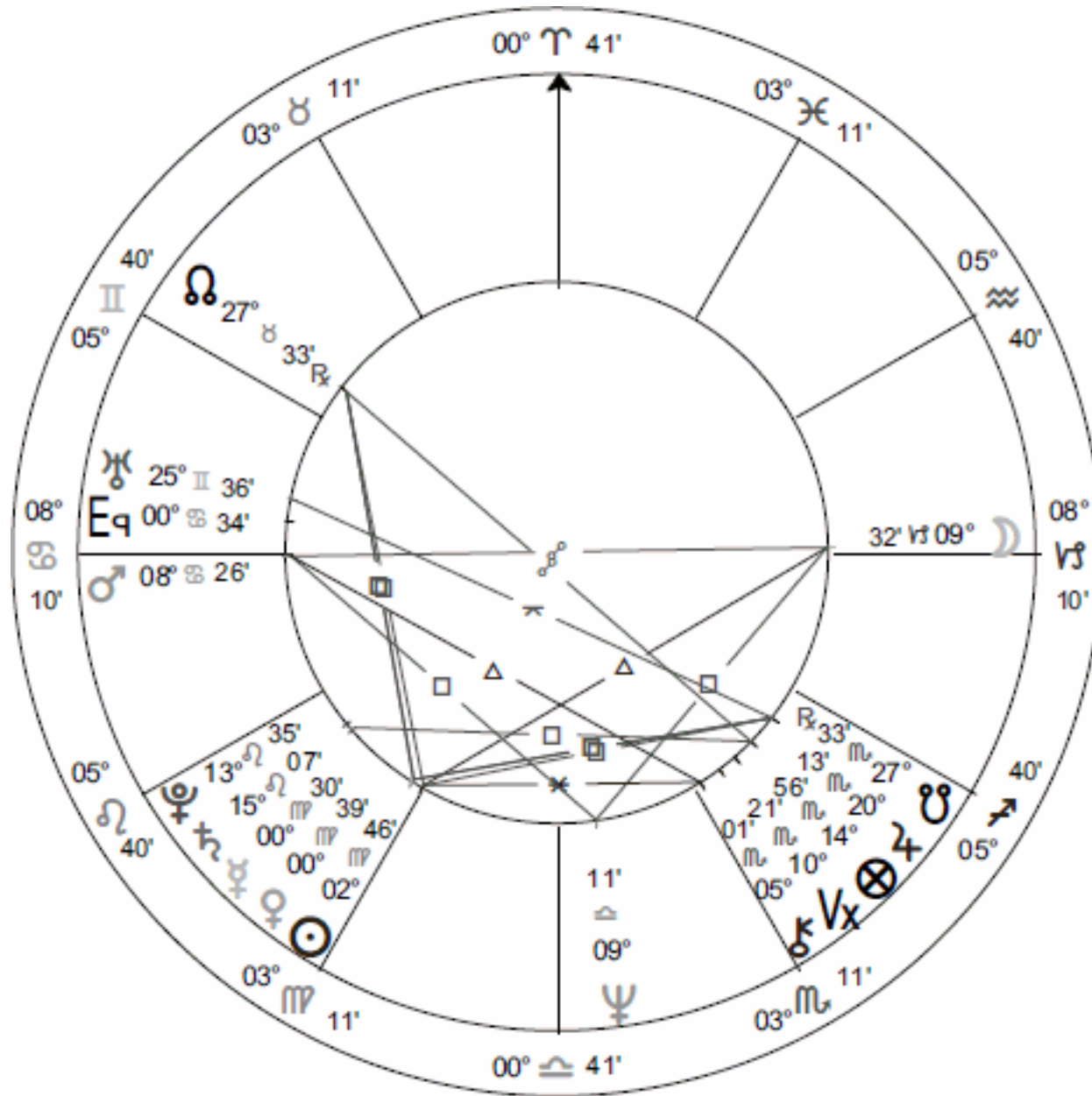
“Brand X” (free online service)



“Brand Y” (free desktop software)



“Brand Z” (commercial Windows software, \$360)



# Challenges for astrological typesetting

- Fonts
- Astronomical computations
- Layout
- Colliding labels and cusp shifts
- Rounding

# Fonts

textsym

Ar Ta Ge Cn Le Vi Li Sc Sg Cp Aq Pi Su Mo Me Ve Ma Ju Sa Ur Ne Pl  
No SNo Lil Con Opp Tri Sqr Sex

wasysym

⌈ ⌋ ⌌ ⌍ ⌎ ⌏ ⌐ ⌑ ⌒ ⌓ ⌔ ⌕ ⌖ ⌗ ⌘ ⌙ ⌚ ⌛ ⌜ ⌝ ⌞ ⌟ ⌠ ⌡ ⌢ ⌣ ⌤ ⌥ ⌦ ⌧ ⌨ 〈 〉 ⌫ ⌬ ⌭ ⌮ ⌯ ⌰ ⌱ ⌲ ⌳ ⌴ ⌵ ⌶ ⌷ ⌸ ⌹ ⌺ ⌻ ⌼ ⌽ ⌾ ⌿ Ⓚ Ⓛ Ⓜ Ⓝ Ⓟ Ⓠ Ⓡ Ⓢ Ⓣ Ⓤ Ⓥ Ⓦ Ⓧ Ⓨ Ⓩ ⓐ ⓑ ⓓ ⓔ ⓖ ⓗ ⓙ ⓚ ⓛ ⓞ ⓟ ⓠ ⓡ ⓢ ⓣ ⓤ ⓥ ⓦ ⓧ ⓨ ⓩ ⓪ ⓫ ⓬ ⓭ ⓮ ⓯ ⓰ ⓱ ⓲ ⓳ ⓴ ⓵ ⓶ ⓷ ⓸ ⓹ ⓺ ⓻ ⓼ ⓽ ⓾ ⓿ Ⓚ Ⓛ Ⓜ Ⓝ Ⓟ Ⓠ Ⓡ Ⓢ Ⓣ Ⓤ Ⓥ Ⓦ Ⓧ Ⓨ Ⓩ ⓐ ⓑ ⓓ ⓔ ⓖ ⓗ ⓙ ⓚ ⓛ ⓞ ⓟ ⓠ ⓡ ⓢ ⓣ ⓤ ⓥ ⓦ ⓧ ⓨ ⓩ ⓪ ⓫ ⓬ ⓭ ⓮ ⓯ ⓰ ⓱ ⓲ ⓳ ⓴ ⓵ ⓶ ⓷ ⓸ ⓹ ⓺ ⓻ ⓼ ⓽ ⓾ ⓿

marvosym

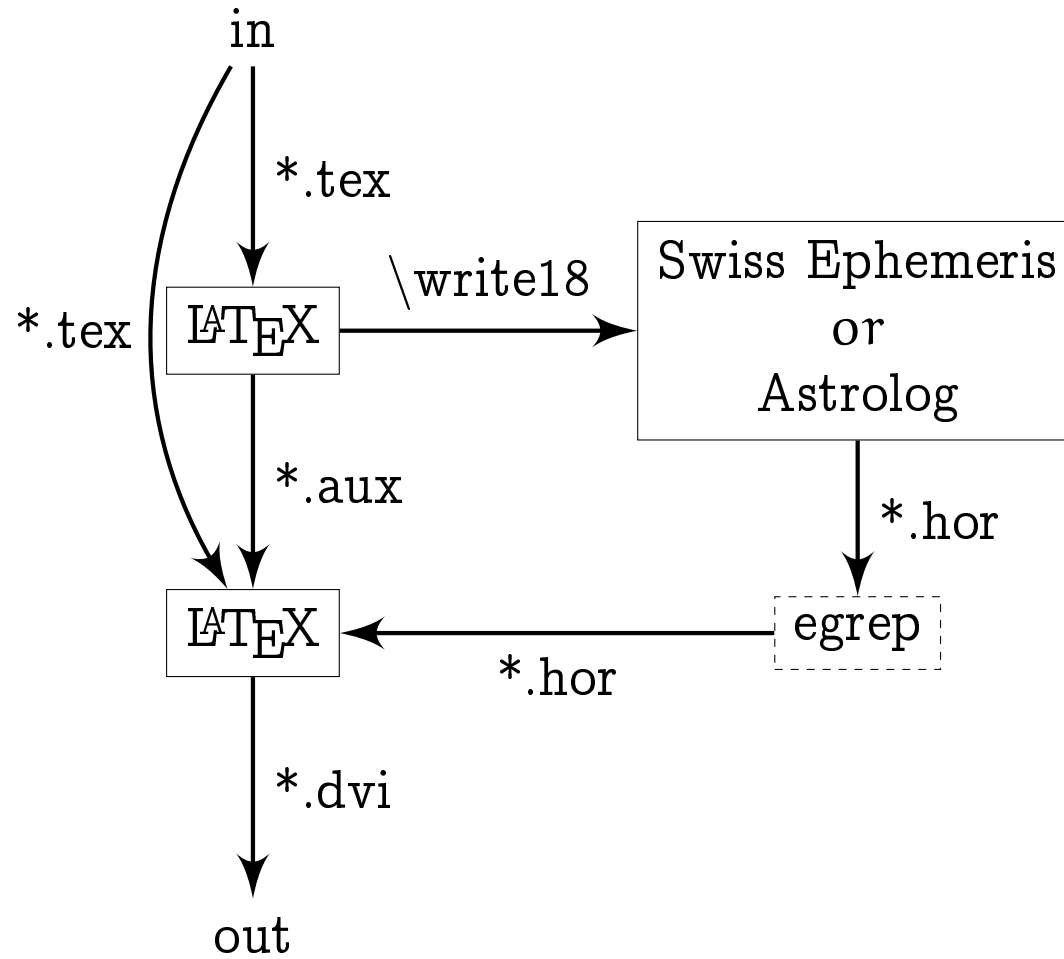
⌈ ⌋ ⌌ ⌍ ⌎ ⌏ ⌐ ⌑ ⌒ ⌓ ⌔ ⌕ ⌖ ⌗ ⌘ ⌙ ⌚ ⌛ ⌜ ⌝ ⌞ ⌟ ⌠ ⌡ ⌢ ⌣ ⌤ ⌥ ⌦ ⌧ ⌨ 〈 〉 ⌫ ⌬ ⌭ ⌮ ⌯ ⌰ ⌱ ⌲ ⌳ ⌴ ⌵ ⌶ ⌷ ⌸ ⌹ ⌺ ⌻ ⌼ ⌽ ⌾ ⌿ Ⓚ Ⓛ Ⓜ Ⓝ Ⓟ Ⓠ Ⓡ Ⓢ Ⓣ Ⓤ Ⓥ Ⓦ Ⓧ Ⓨ Ⓩ ⓐ ⓑ ⓓ ⓔ ⓖ ⓗ ⓙ ⓚ ⓛ ⓞ ⓟ ⓠ ⓡ ⓢ ⓣ ⓤ ⓥ ⓦ ⓧ ⓨ ⓩ ⓪ ⓫ ⓬ ⓭ ⓮ ⓯ ⓰ ⓱ ⓲ ⓳ ⓴ ⓵ ⓶ ⓷ ⓸ ⓹ ⓺ ⓻ ⓼ ⓽ ⓾ ⓿

starfont

⌈ ⌋ ⌌ ⌍ ⌎ ⌏ ⌐ ⌑ ⌒ ⌓ ⌔ ⌕ ⌖ ⌗ ⌘ ⌙ ⌚ ⌛ ⌜ ⌝ ⌞ ⌟ ⌠ ⌡ ⌢ ⌣ ⌤ ⌥ ⌦ ⌧ ⌨ 〈 〉 ⌫ ⌬ ⌭ ⌮ ⌯ ⌰ ⌱ ⌲ ⌳ ⌴ ⌵ ⌶ ⌷ ⌸ ⌹ ⌺ ⌻ ⌼ ⌽ ⌾ ⌿ Ⓚ Ⓛ Ⓜ Ⓝ Ⓟ Ⓠ Ⓡ Ⓢ Ⓣ Ⓤ Ⓥ Ⓦ Ⓧ Ⓨ Ⓩ ⓐ ⓑ ⓓ ⓔ ⓖ ⓗ ⓙ ⓚ ⓛ ⓞ ⓟ ⓠ ⓡ ⓢ ⓣ ⓤ ⓥ ⓦ ⓧ ⓨ ⓩ ⓪ ⓫ ⓬ ⓭ ⓮ ⓯ ⓰ ⓱ ⓲ ⓳ ⓴ ⓵ ⓶ ⓷ ⓸ ⓹ ⓺ ⓻ ⓼ ⓽ ⓾ ⓿



# Astronomical computations



# Layout

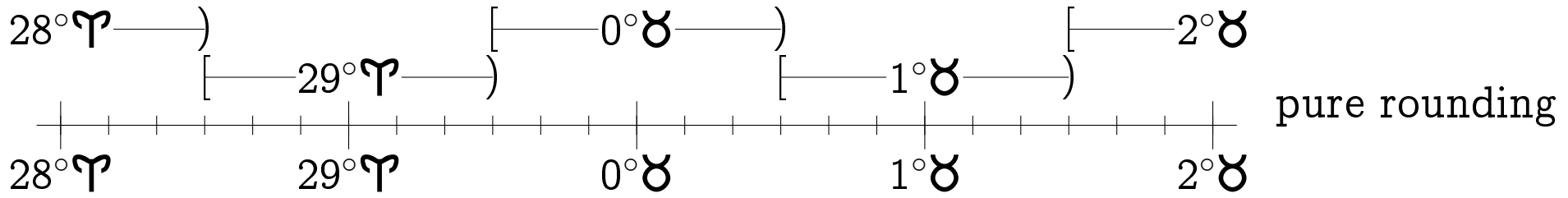
- polar coordinates: `trig`
- large circles, arbitrary-slope lines: `pict2e`
- Why not use TikZ or something?

## Colliding labels and cusp shifts

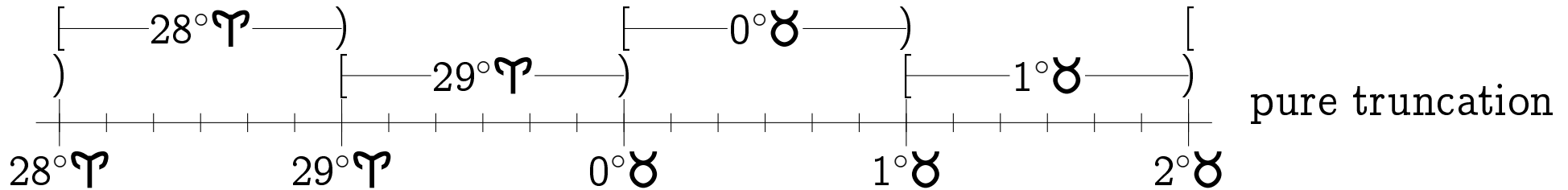
- spring-tension system
- two passes, with and without cusp shifts

# Rounding

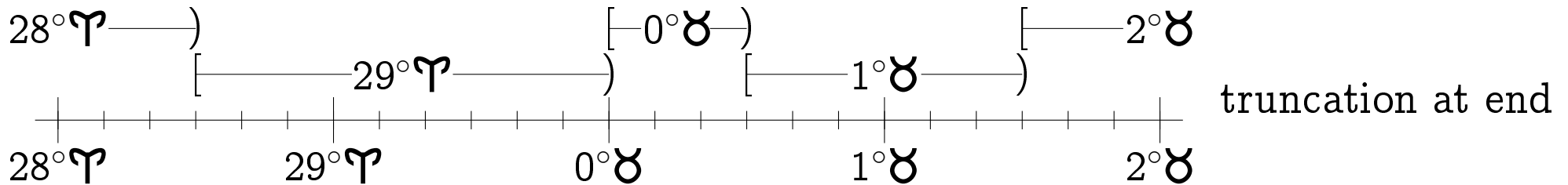
Near the edge of a sign, we care about which side we're on.



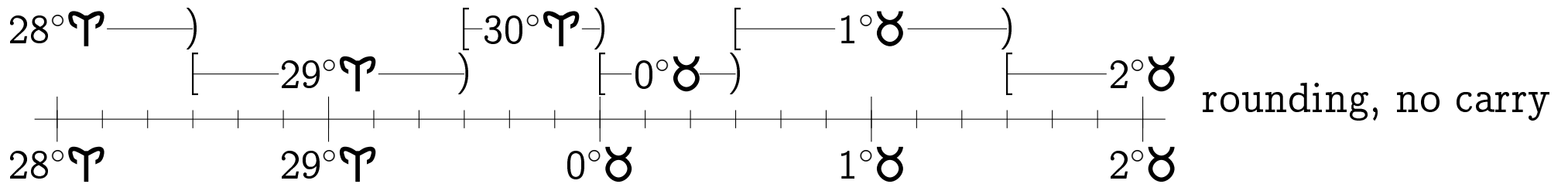
pure rounding



pure truncation



truncation at end



rounding, no carry

## Code example

```
\horocalparms{1977}{5}{13}{20:04:0}{W122:10:11}{N37:25:40}  
\def\horoobjects{Sun,Moon,Mercury,Venus,Mars,Jupiter,Saturn,%  
Uranus,Neptune,Pluto,MeanNode,Lilith}  
\horocalculate  
\centering  
\begin{horoscope}  
  \renewcommand{\horotextsize}{1}  
  \horowheelVancouver  
  \horoULnote{TEXDR.AFT\\May 13,\\1977}  
\end{horoscope}\par
```

## Running without a backend

```
\def\horoSunPos{122.9934486}\def\horoSunVel{ 0.9551501}  
\def\horoMoonPos{14.1677023}\def\horoMoonVel{14.0958020}  
\def\horoMercuryPos{141.5060223}\def\horoMercuryVel{ 1.7002741}  
\def\horoVenusPos{136.3436876}\def\horoVenusVel{ 1.2288741}  
.   
.   
.   
\def\horoCuspXPos{57.7879392}  
\def\horoCuspXIPos{93.3485543}  
\def\horoCuspXIIPos{125.8024553}  
\def\horoobjects{Sun,Moon,Mercury,Venus,Mars,Jupiter,Saturn,%  
    Uranus,Neptune,Pluto}  
\horocopyvar{\horoobjects}{Pos}{DPos}  
\horocopyvar{\horocusps}{Pos}{DPos}  
\horocalculatedtrue
```

## Future possibilities

- Documentation updates
- Externalization
- Manual tweaking, annotations
- Interpretation/packaging