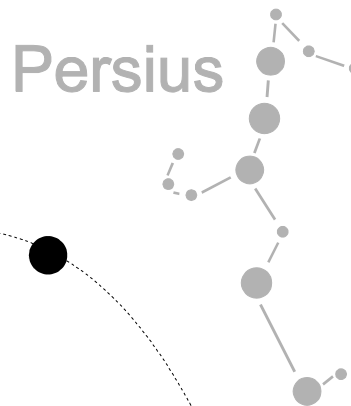
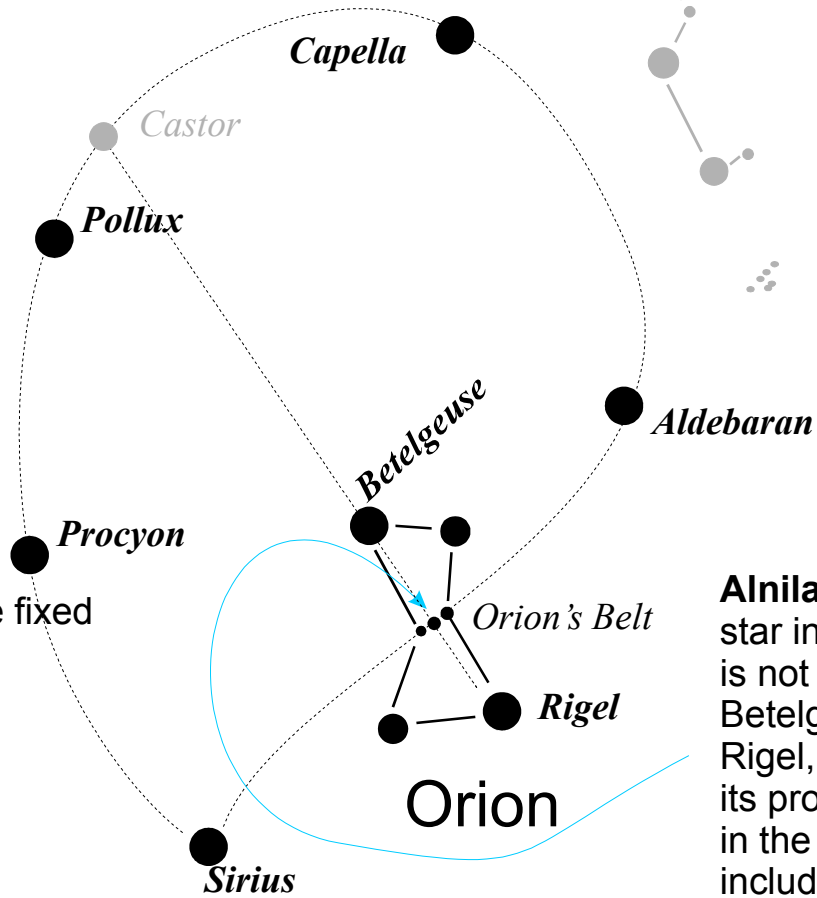


Big Dipper
(Ursa Major)



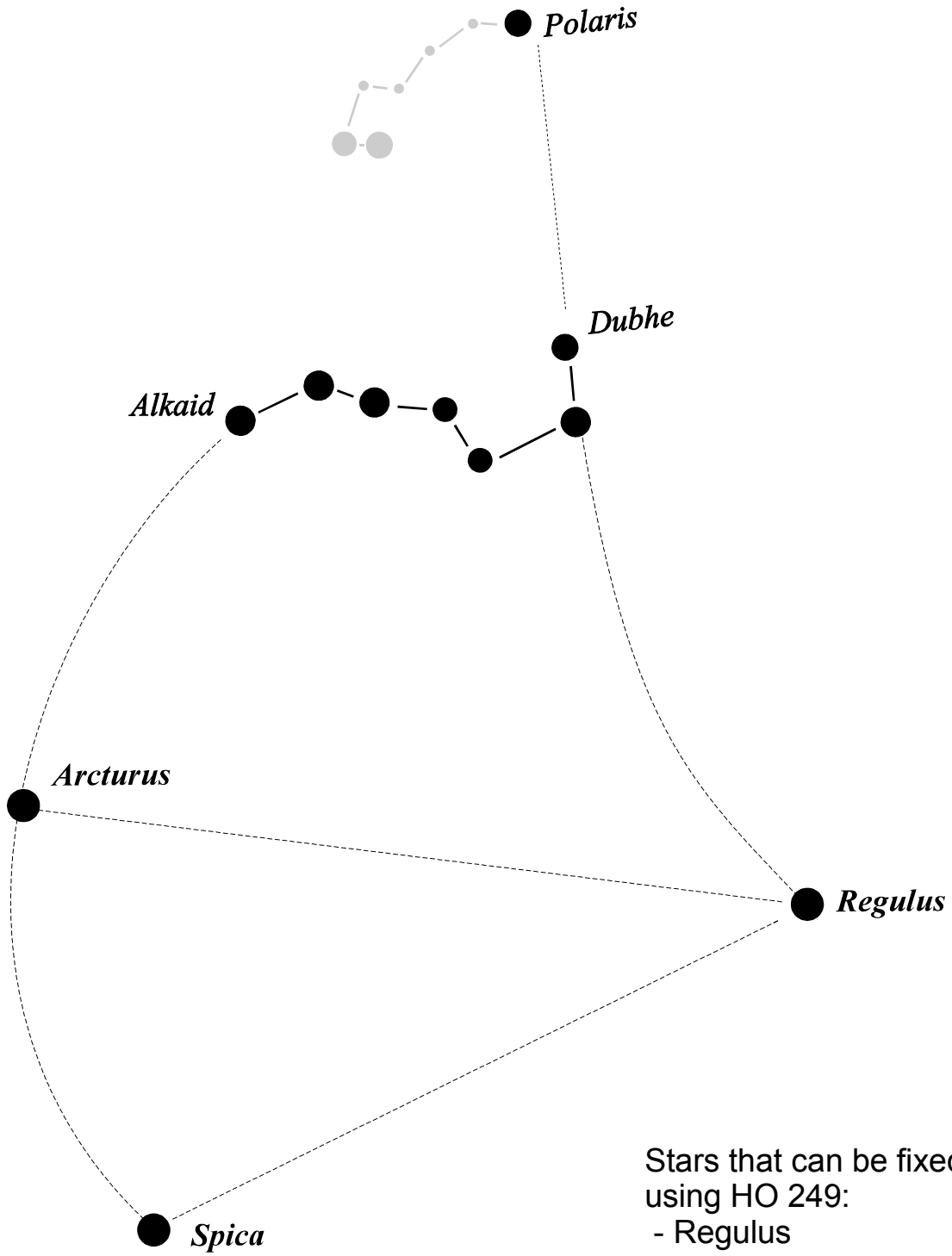
Pleiades
Cluster



Stars that can be fixed
using HO 249:

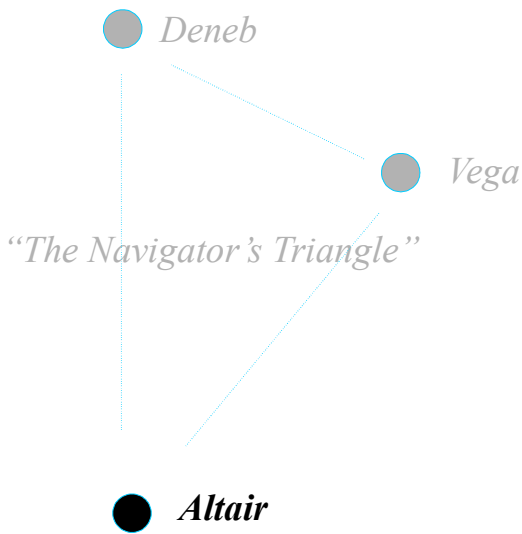
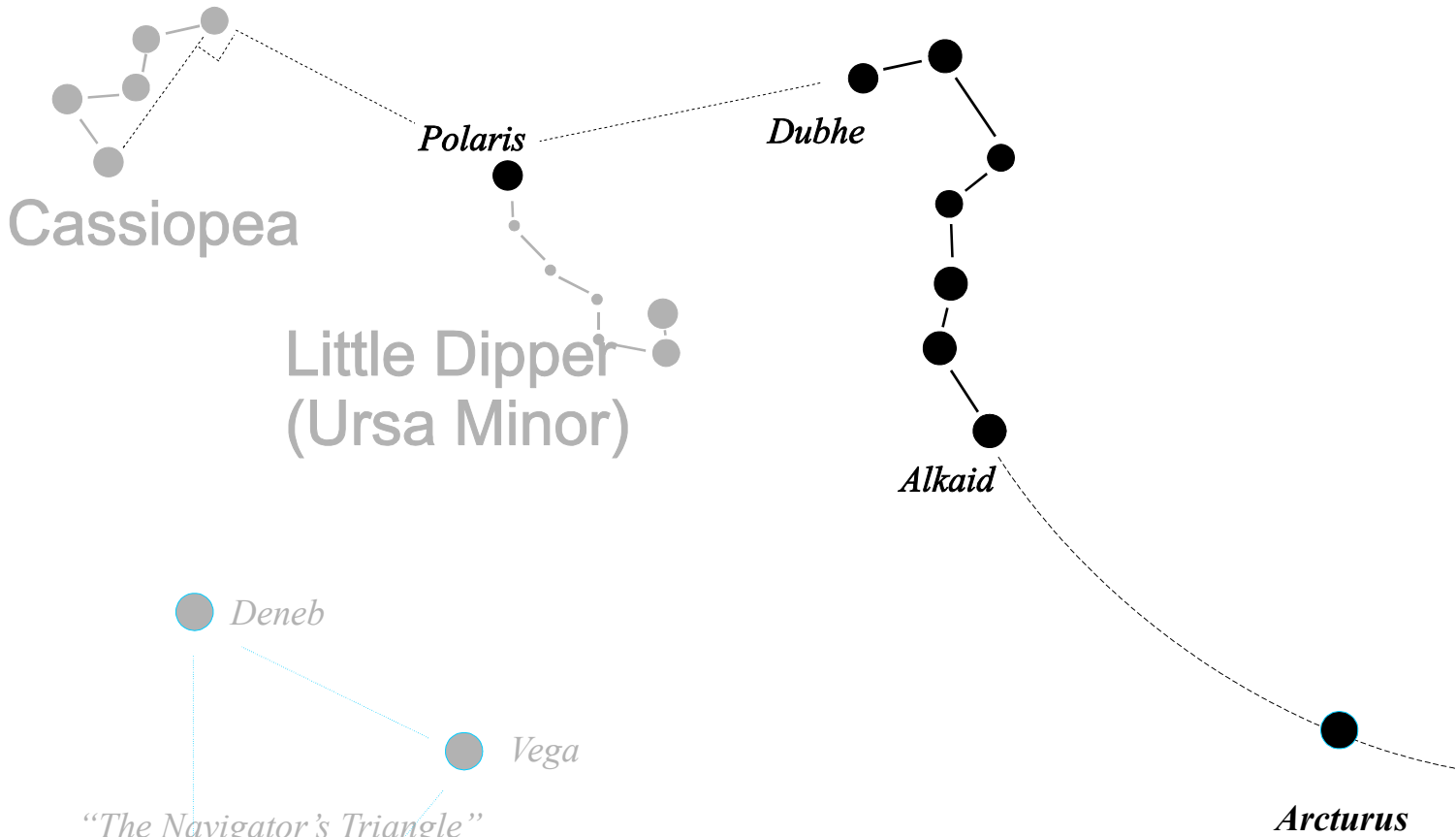
- Alnilam
- Aldebaran
- Betelgeuse
- Pollux
- Procyon
- Rigel
- Sirius

Alnilam, the center star in Orion's belt, is not as bright as Betelgeuse or Rigel, but because of its prominent position in the belt, it is also included among the navigational stars.



Stars that can be fixed
using HO 249:
- Regulus
- Arcturus
- Spica

Big Dipper (Ursa Major)



Stars that can be fixed using HO 249:

- Arcturus
- Altair

Altair does NOT need to be memorized for the Sail Canada celestial exam. But it IS useful navigationally.

If Orion is below the horizon, then Altair will likely be above the horizon, and usable for a sextant observation.

While there is no easy line or curve you can draw from other constellations to help you find Altair, it is the case that it is in a relatively empty section of sky.

Altair, Deneb and Vega constitute a fairly prominent triangle of stars (called by some “the navigator’s triangle” - a play on the words in the phrase “the navigational triangle”), and are fairly easy to locate.

From page 1, Alnilam (on Orion’s belt) does not have to be labelled by name on the Sail Canada celestial nav exam. Bob includes it because he simply LIKES this star.

On pages 1 & 2, stars that are dark are ones that you need to be able to draw from memory for the Sail Canada celestial exam...complete with lines showing how you would find them.

The ones that are in light grey are either a) stars that can help you find the important stars, or b) stars that Bob likes (e.g. Perseus is Bob’s favorite constellation...which he thinks looks like an exuberant soccer player, kicking the Pleiades Cluster along through the sky).

For the exam, you do not need to show Regulus, and you do not need to label Alkaid...but you need to be able to show everything else from page 2.

The chart on the previous page displays constellations and the 57 navigational stars used in the *Air* and *Nautical Almanacs*. The navigational stars are distinguished by their proper names.

Those stars used in Pub. No. 249 Vol. 1 (Selected Stars) have their name and number underlined; other bright stars in the constellations are identified by their Greek letters. This chart also appears in the Air Almanac.

The sidereal hour angle (SHA) and declination of stars can be seen on the chart. The SHA is measured westwards (0 to 360 degrees) from the Vernal Equinox (Aries) at 0 degrees. The rectangular shape of the chart distorts the relative positions of the stars in the polar regions.

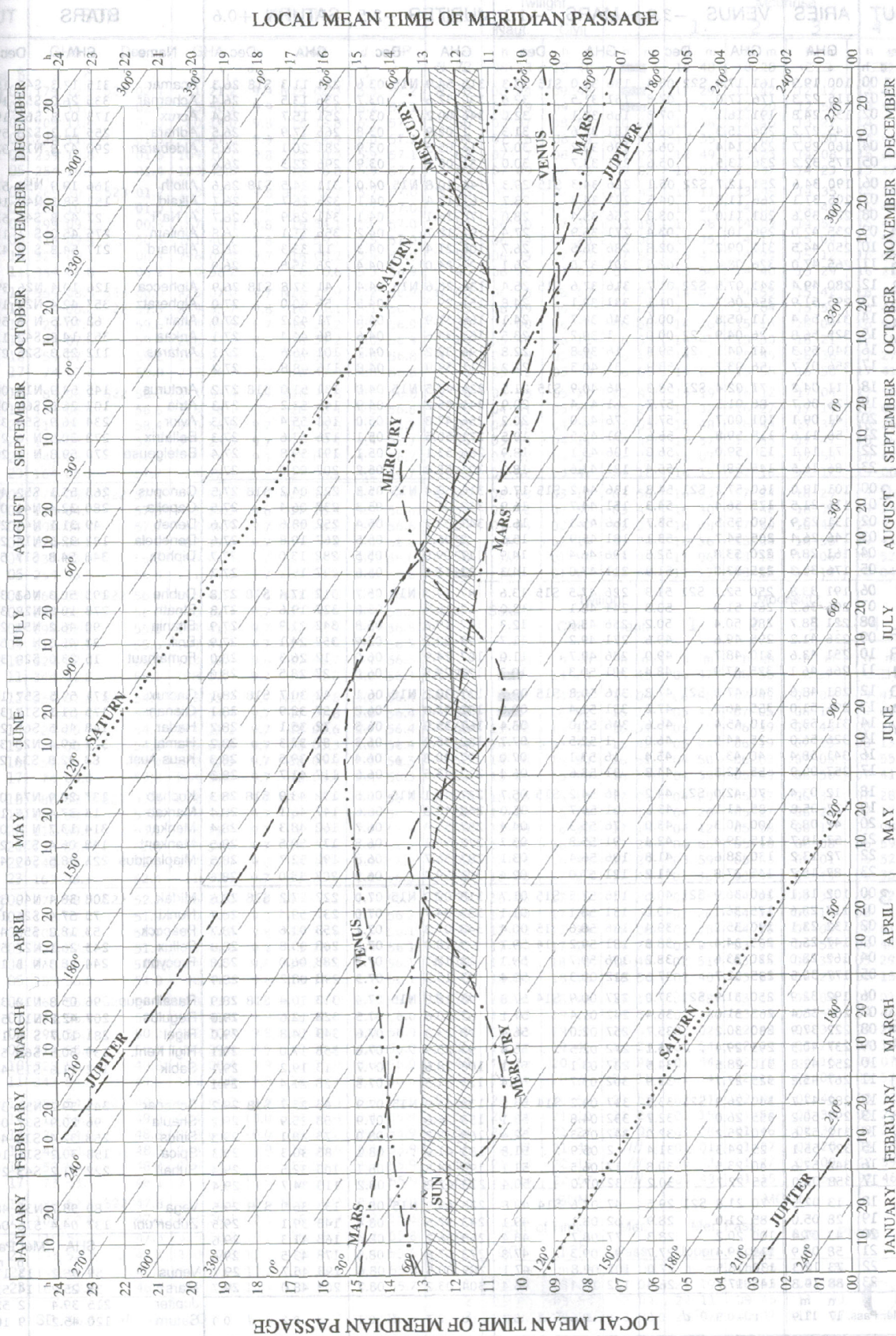
What this distortion means practically is that this chart is helpful for identifying stars that lie to the south of Edmonton. Stars that are overhead, or to the North, do appear in the chart, but their relative positions are distorted.

Volumes 2 and 3 of Pub. 249 are designed primarily to be used with the sun, moon, and planets. Since the Sun and planets go as far north/south as 23.5° , and the moon can be as much as 5° north or south of the path of the sun, Volumes 2 and 3 are set up to be used with celestial objects that lie within 29° of the equator.

I think the novice navigator would do well to be able to locate BRIGHT stars (i.e. visible even from inside the city limits of Edmonton) whose GPs lie within 29° of the equator. These stars are listed on the next page.

The Navigational Stars Brighter Than Magnitude 1.5 That Can Be Reduced by Pub. 249

Star	Magnitude	Constellation	Comments
Aldebaran (al-DEB-ah ran)	0.85	Taurus	Arabic for "Follower" (i.e. of the Pleiades, which rise before Aldebaran)
Alnilam (ALL-nil-ahm)	1.70	Orion	Arabic for "String of Pearls" Magnitude less than 1.5...but identification is a snap with Alnilam the middle star in the belt of Orion
Altair (AL-tair)	0.77	Aquila	Arabic for a flying eagle
Antares (an-TAIR-ease)	1.09	Scorpio	"Mars" in Greek is Ares. "Antares" is a "rival to Mars", in light of its reddish color.
Arcturus (arc-TOUR-russ)	-0.04	Bootes	Greek for "the bear's guard" because of its location near Ursa Major (Latin for the Big Bear, in Greek: Arktos)
Betelgeuse (BET-el-jooz)	0.58	Orion	Arabic for "the armpit" (i.e. of Orion, the Hunter)
Pollux (POL-lucks)	1.15	Gemini	Latin name of one of Zeus' twin sons (the other is Castor, which is a dimmer star right next door)
Procyon (PRO-see-on)	0.34	Canis Minor	Greek for "before the dog" because it rises ahead of the dog star, Sirius. Dog in Greek is Cyon.
Regulus (REG-you-luss);	1.35	Leo	Latin for "the prince."
Rigel (RYE-jel)	0.12	Orion	Arabic for the "foot" (i.e. of Orion)
Sirius (SEER-ee-us)	-1.47	Canis Major	Greek for "the scorching one" – popularly called the dog star. The brightest star visible from planet earth.
Spica (SPY-ka or SPEE-ka)	1.04	Virgo	Latin for "the ear of corn"



The diagonal lines on the previous page indicate what the Sidereal Hour Angle (SHA) is on your meridian at various times of day, at various times of the year.

So, on January 20, 2015, at 2000 h, SHA 300° will be meridian that is directly overhead and extending to your southern and northern horizons.

One can combine this information with the chart on the next page. We can mark on the chart what will be the zenith for us, i.e. the point that is directly overhead. It will be SHA = 300° and our latitude = 53° .

We can then draw an ellipse (it is an ellipse because the horizontal and vertical scales on this chart are not the same; if they were the same, we would draw a circle) that is 90° from the zenith to the south and 90° to the north, 90° to the east and 90° to the west.

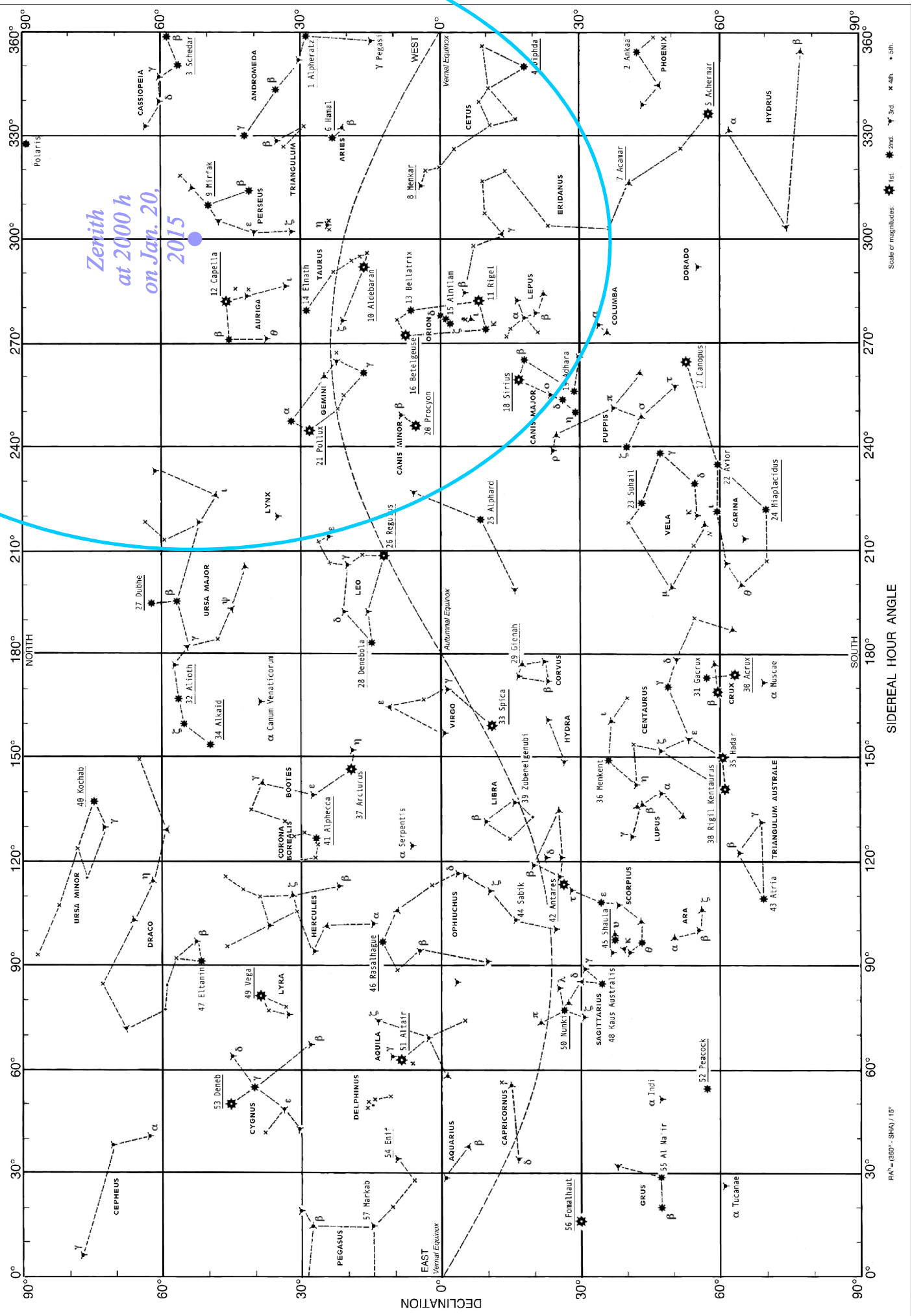
This tells us what we are going to see in the sky. It tells us that Sirius will be visible to us bearing SSE and low in the sky. It tells us that Capella will be almost directly overhead, but bearing a little east.

Perseus will also be almost directly overhead, but will bear a little to the west.

Procyon will be just slightly higher above the horizon than Sirius, more or less directly to the SE.

Pollux will be higher above the horizon, and lying ESE from us.

NAVIGATIONAL STAR CHART



Zenith
at 2000 h
on Jan. 20,
2015

Scale of magnitudes: ★ 1st. ★★ 2nd. ★★★ 3rd. ★★★★★ 4th. ★★★★★★ 5th.

RA^h = (880° - SHA) / 15°