Manual
for the Use of the Instruments in the Virtual Edition of Apian's *Ein kunstlich Instrument*

Lars Gislén

You can browse in the book using the left and right arrow keys on the keyboard. When a page with an instrument is open you create that instrument by clicking on that page.

1. Solar Instrument (Orthographic Projection of the Sphere)

You can click and set the latitude in the quadrant scale by dragging close to the INDEX. The TRIGONUS sets the altitude of the Sun and is dragged close to the little flower where the vertical string is attached. Times can be read off where the red plumb line crosses the solar longitude lines. Times before noon are taken below, after noon above, moving more or less perpendicularly to the longitude lines (i.e., parallel to the nearest curved hour line).

 If you click on the "Trigonus Mode" text, the instrument will enter the Twilight Mode and the twilight strip becomes visible. If necessary, the TRIGONUS can be dragged aside for better visibility. The crossings of the left edge of the strip by the longitude lines show the times for sunrise and sunset for different solar longitudes. The intersections with the crepuscular line (visible through the partially transparent twilight strip) show the beginning of dawn and end of dusk.

2. Theorica Solis

You can drag the red blob around, and the red central line (which would be a string in Apian's instrument) goes around with it. Let the central line pass through the date in the Julian calendar. The intersection of the central line with the zodiac indicates the true longitude of the Sun on that date. (If you wish to use the modern Gregorian calendar, the longitude has to be diminished by about 13˚.) The true longitude of the Sun is used in the Orthographic Solar Instrument and in the Horizons Instrument.

3. Horizons Instrument

Set the index to the time of day (ordinary clock time), by grabbing near the end of it. Then grab the ecliptic disk at the starry little three-sphere handle and rotate it until the true longitude of the Sun is below the index fiducial line. Find the horizon curve for your geographical latitude. The rising point of the ecliptic can be read off where the horizon curve cuts the outer rim of the ecliptic disk on the left side of the instrument.

4. Night Clock

When you click on the Night Clock page a Nocturlabe (or nocturnal) will also become visible and can be used in the second mode described below.

1) To tell time by the Moon, set the Moon tab to the "Moon hour" as indicated by the Moon's shadow on an ordinary Sun dial. Then drag the Sun tab to the age of the Moon. The hour of the day can then be read off where the Sun tab cuts the hour scale.

2) To tell time by the stars in the Big Dipper, first determine the current "star time" with the Nocturlabe app. Use the arrow keys of the keyboard to center Polaris in the sighting hole of the nocturlabe. Drag the index pointer until it aligns with the two pointer stars of the Big Dipper and read off the star time on the nocturlabe. Then set the Moon index tab of the Night Clock to that hour. Finally set the Sun tab to the current date on the year scale and read the time on the hour scale under the Sun tab. For dates in the 21st century add a calendar correction of about one hour. To get the mean

solar time you also have to add the equation of time. While the nocturlabe window is visible, page browsing is deactivated. To reactivate you simply close the nocturlabe window.