The discussion in chapter 1 on the origins of the navicula highlighted a problem particular to this instrument: it is one of a number of instruments which all use the same geometry, and which are linked together in different ways by scholars discussing the navicula. The geometry in question is as follows:\textsuperscript{1}

1. Part of the celestial sphere containing the ecliptic is projected onto a flat surface to give parallel hour lines (it is a rectilinear dial).
2. In order that the instrument can be set for any date and latitude, the suspension point of a weighted thread must move relative to these hour lines. These suspension points fall within a triangular area above the hour lines (it is universal for latitude and date).
3. There are several ways that this geometry was turned into a working instrument: the best known are the so-called Regiomontanus dial (the hour lines and latitude/date grid are on a plate, fixed relative to each other, and the suspension point moves over the grid by means of a jointed arm) and the navicula (the hour lines are on the body of the instrument, and the latitude/date are set by means of a slider moving vertically on a rotating rule, graduated for latitude), but there are several others.

These practical solutions to the geometry necessary for a universal rectilinear dial may or may not be linked. For example, the fact that the navicula and the Regiomontanus dial share similar geometry may indicate that one developed from the other, but it may equally indicate that they represent different practical solutions to the same geometrical problem and are otherwise unrelated. It is therefore essential to turn to the manuscript sources describing the instruments in order to understand the relationship between them.

\textsuperscript{1} Mills, “Altitude sundials for seasonal and equal hours.”
Problems surrounding the relationship between the navicula and its mathematically very close relatives are compounded when this relationship is used to make a point about another instrument. For example, Frederick Stebbins suggests that the navicula was based on the Regiomontanus dial, which developed from the single-latitude capuchin dial, which in turn had developed from the solution of spherical geometry for an altitude dial by some unknown mathematician or astronomer.² David King has another suggestion: that the Regiomontanus dial developed from either the navicula or the organum ptolomei:

...the four surviving examples of the navicula from before ca. 1500 are all English. But there was another tradition which surfaced in Vienna in the mid 15th century, of which only manuscripts and one instrument survive. In this tradition, an instrument resembling the navicula, but now without prow and poop, was called by another name usually associated with another instrument, namely, the organum Ptolomaei. It was apparently from the navicula, or at least from this device, that Regiomontanus in the mid 15th century developed his better-known Uhrtäfelchen—the underlying theory is identical, but the new device was easier to use.³

King takes his information on the organum ptolomei from Ernst Zinner, who briefly discussed the development of texts on it in fifteenth—and sixteenth-century Vienna in his astronomische Instrumente.⁴ There, as well as in his Handschriften, Zinner describes manuscript texts with two incipits, one starting ‘organum ptolomei ita sit...’ and the other beginning ‘organum ptolomei ad multas prouincias...’⁵ However, consultation of the surviving manuscripts shows that the second group are not as homogeneous as Zinner’s listings would suggest, and also that there are a number of texts not discussed by him which can help make sense of what the organum ptolomei is (as well as what it is not).

The organum ptolomei ita sit text survives in four copies currently accessible to scholars, along with another listed by Zinner whose current location is unknown.⁶ The earliest manuscript copy may have been copied in or around 1434 and closely related to it is another of the four manuscripts. Of the five copies of the text currently known,

---

² Stebbins, “A medieval portable sundial.”
³ King, World-Maps, 352. See also an extended version of the same argument, in King, In Synchrony with the Heavens, 22 and 267–335.
⁴ Zinner, Deutsche und niederländische astronomische Instrumente, 111.
⁵ Zinner, Verzeichnis der astronomischen Handschriften, nos. 9778–9781.
⁶ See appendix 9.