

Analyzing the early 19th century's local geographical points in latitude and longitude of 0.2 second level and geomagnetic declination through Japan from Tadataka Inoh's magnetic survey azimuth ledger simultaneously.

\*Motohiro Tsujimoto<sup>1</sup>, Akitoshi - Omotani<sup>2</sup>

1. none, 2. San-in.System Consultant Co.Ltd

The Santou-Houi-Ki is a national treasure of Japan recorded by Japanese cartographic surveyor Tadataka Inoh in 1800 to 1816, consist of 67 volumes survey ledger to produce the first survey map of Japan, called "Maps of Japanese Coastal Area" (1:216000) or Inoh Map (1:36000, 1:216000, 1:432000). In the Santou-Houi-Ki estimate 200,000 magnetic compass survey azimuth data by accuracy of 0 degree 05 minute unit were recorded, with the name or short description of magnetic compass survey execution reference point and target points. Inoh's team carried out the survey did not apply the correction of magnetic declination. Because before the start of his survey, Inoh tried to observe magnetic declination in Edo (Tokyo) was nearly zero. Inoh conducted the survey on the assumption that the influence of magnetic declination to his survey map of Japan is at least. The surveyed region extends from North eastern coast of Hokkaido Island to Yakushima Island in western Japan. However the geomagnetic declination at each province were different in long Japanese archipelago. We start the analysis, check the outline position of the survey execution reference point and target points from magnetic survey azimuth, or name of places recorded in Santou-Houi-Ki, Inoh Map, or from the description of places in Inoh's Survey Diary, early modern survey maps, today's digital maps, GPS, or local source books or maps etc. It is able to calculate backward the precise position of survey execution reference point, where the value of geomagnetic declination, subtracting the magnetic survey azimuth from the true azimuth to any target points are similar or approximate by using excel formula. Check the source books or maps of local history, and adjust the precise detail position. We must execute interdisciplinary and simultaneous analysis of precise position of the survey execution reference point (aim to latitude and longitude 0.2 second level), target points, real azimuth, geomagnetic declination from national treasure Santou-Houi-Ki. We cannot read the precise content of national treasure Santou-Houi-Ki or Inoh Map without this interdisciplinary simultaneous analysis. The importance to restore the precise position of the survey execution reference points and target points and geomagnetic declination in early 19th century's Japan from Tadataka Inoh's Santou-Houi-Ki must elucidate.

Keywords: Cartographic surveyor Tadataka Inoh, Inoh Map, magnetic survey azimuth, National treasure Santou-Houi-Ki, geomagnetic declination, interdisciplinary simultaneous analysis