

[54] **HANDHELD SURVEYING DEVICE AND METHOD**

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5,903,235 5/1999 Nichols 342/357

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Related U.S. Application Data

[63] Continuation-in-part of application No. 08/842,699, Apr. 15, 1997, Pat. No. 5,903,235.

[51] **Int. Cl.**⁷ **G01S 5/02**; H04B 7/185

[52] **U.S. Cl.** **342/357.14**; 342/357.06; 342/357.17; 342/419; 701/213; 701/217

[58] **Field of Search** 342/357.01, 357.06, 342/357.14, 357.17, 419; 701/213, 216, 218

[57] **ABSTRACT**

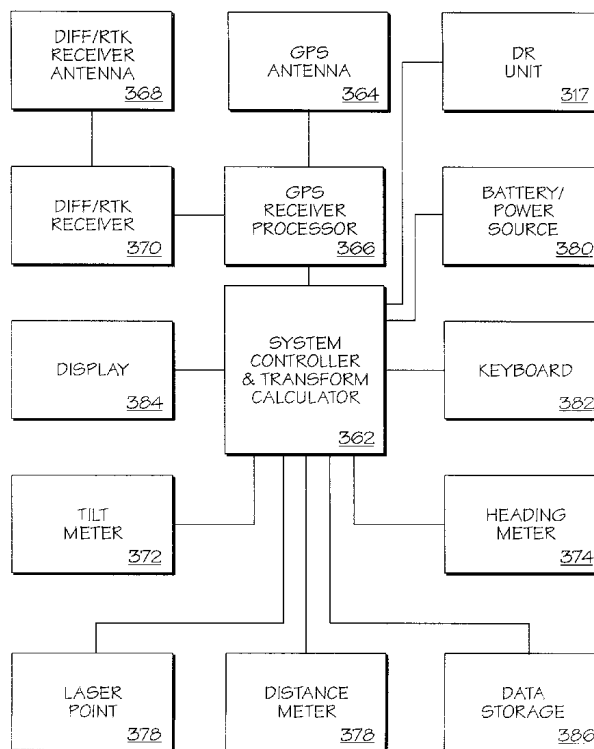
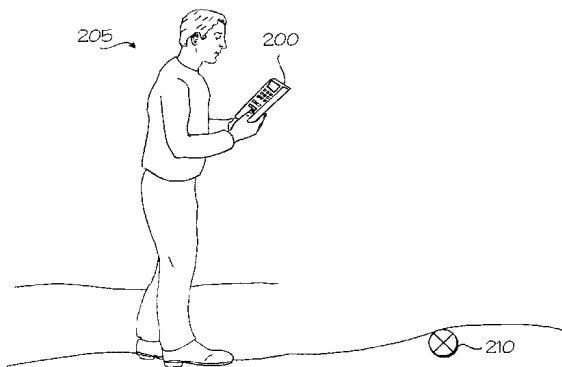
A handheld survey device includes a Global Positioning System (GPS) receiver for receiving position information, a pointer to point to the location to be measured, a measuring device to measure the distance between the handheld device and the location to be measured and a level and heading device to determine the level and heading of the handheld device. The GPS receiver may be a real time kinematic (RTK) GPS receiver and may be augmented by the use of a dead reckoning (DR) positioning unit. A processor located within the handheld device computes the position of the location using the position information provided by the GPS receiver and/or the DR system, the distance measured between the handheld device and the location, and the level and heading information. The position computed meets the stringent accuracy requirements dictated by survey applications without the use of a range pole.

[56] **References Cited**

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10 Claims, 10 Drawing Sheets



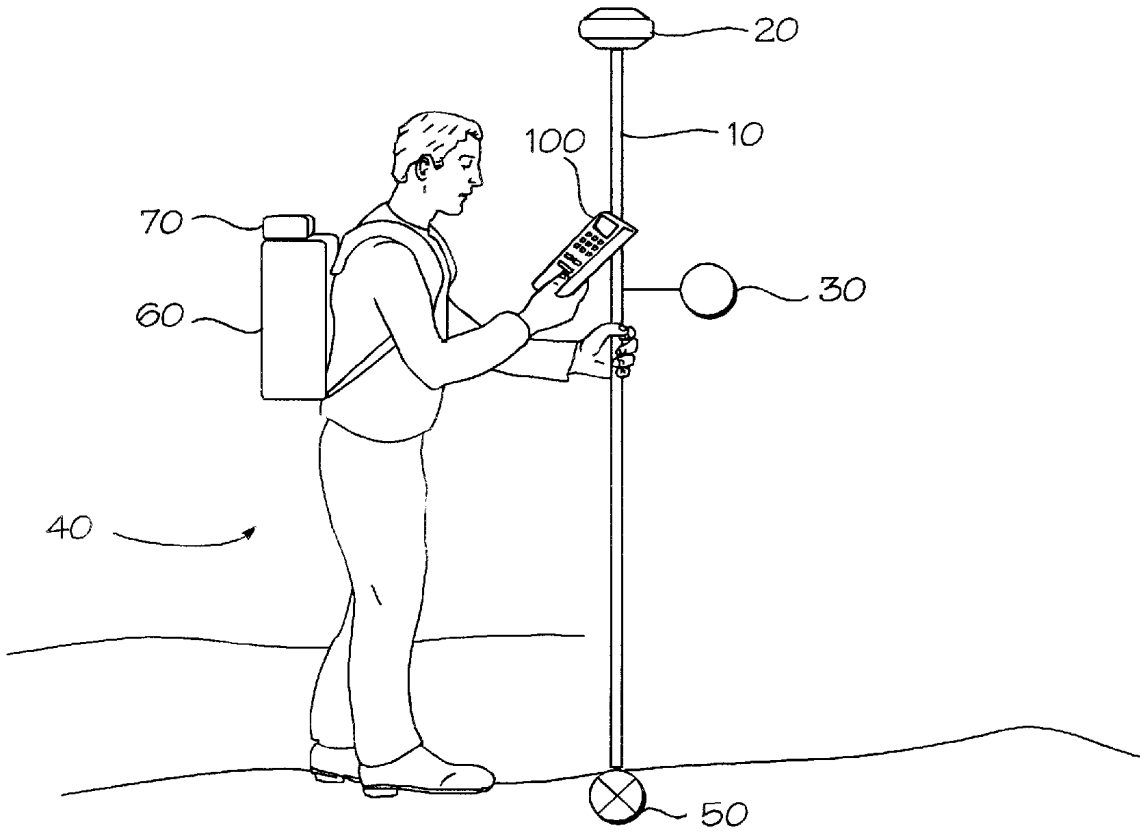


Fig. 1
(Prior Art)

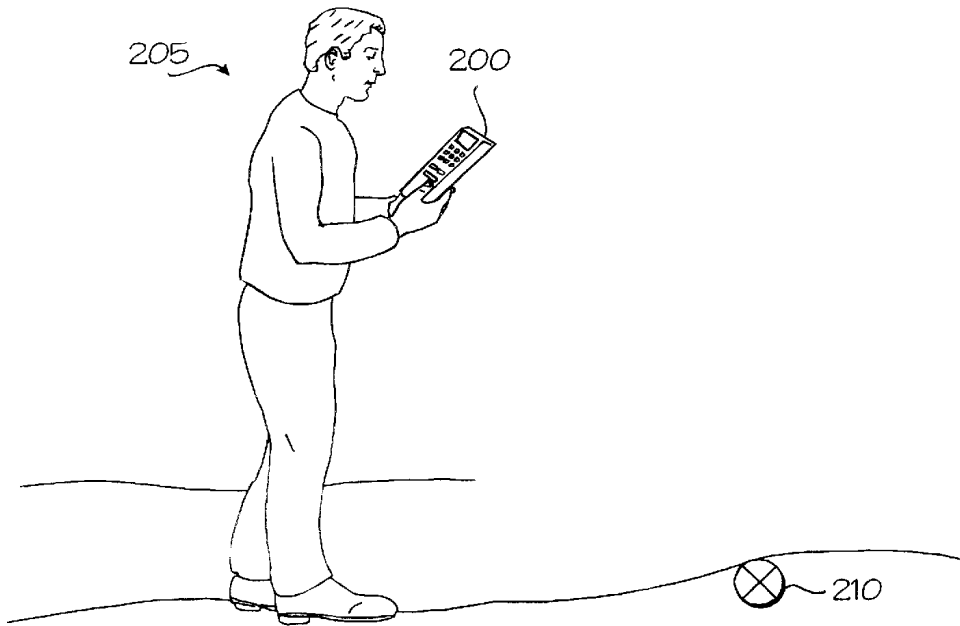


Fig. 2A

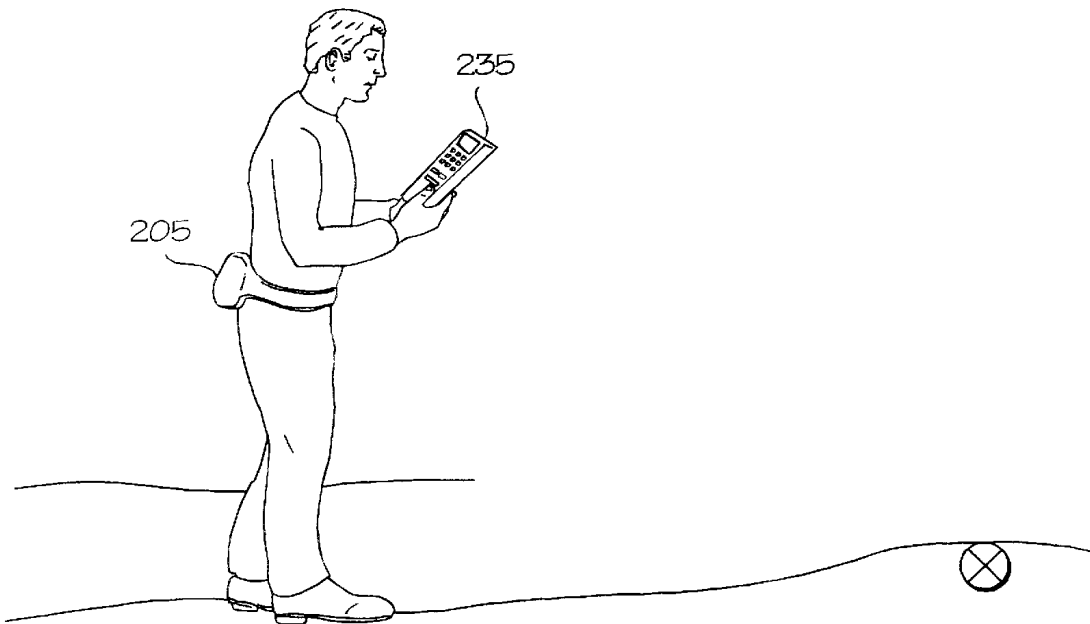


Fig. 2B

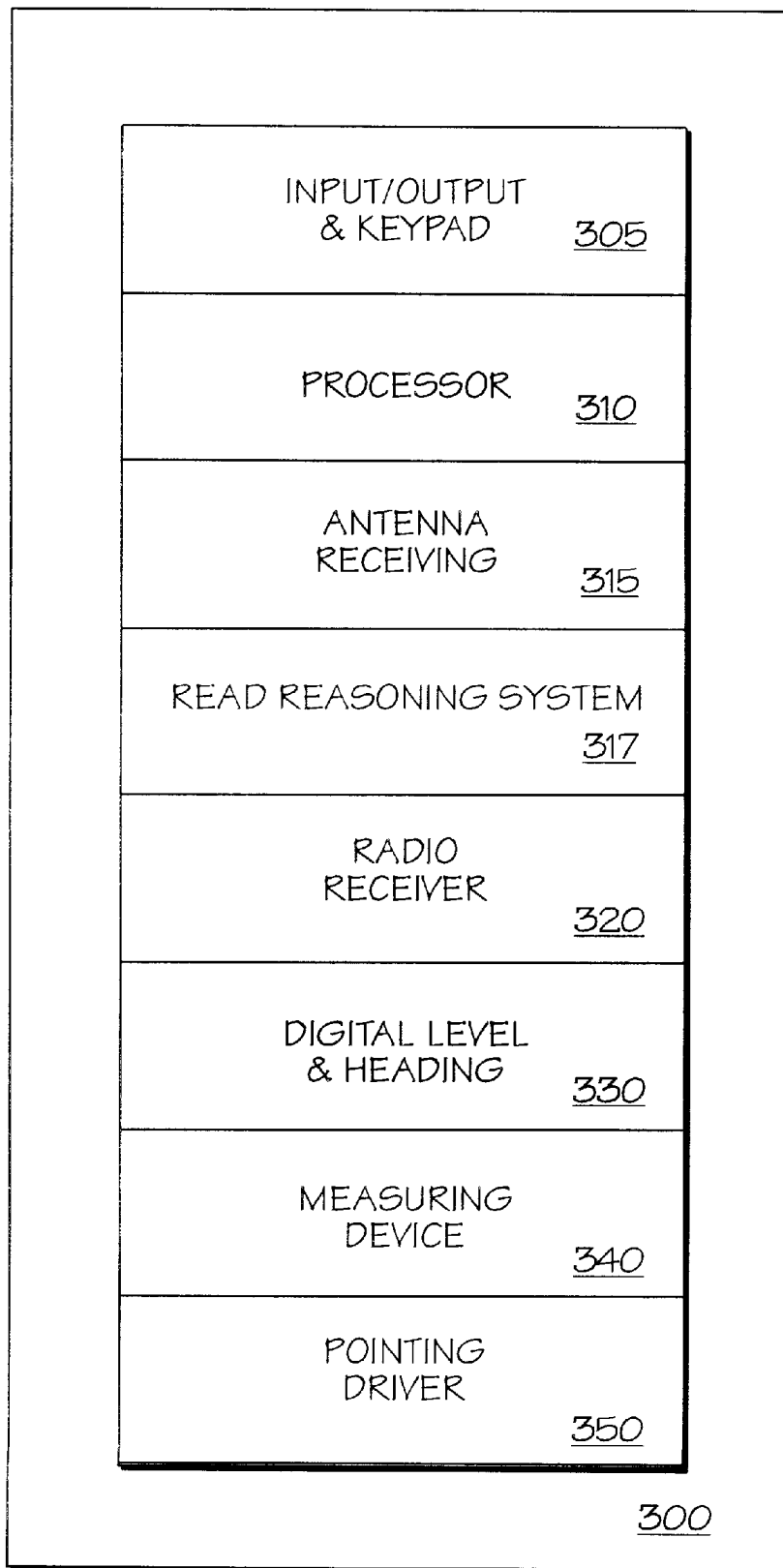


Fig. 3A

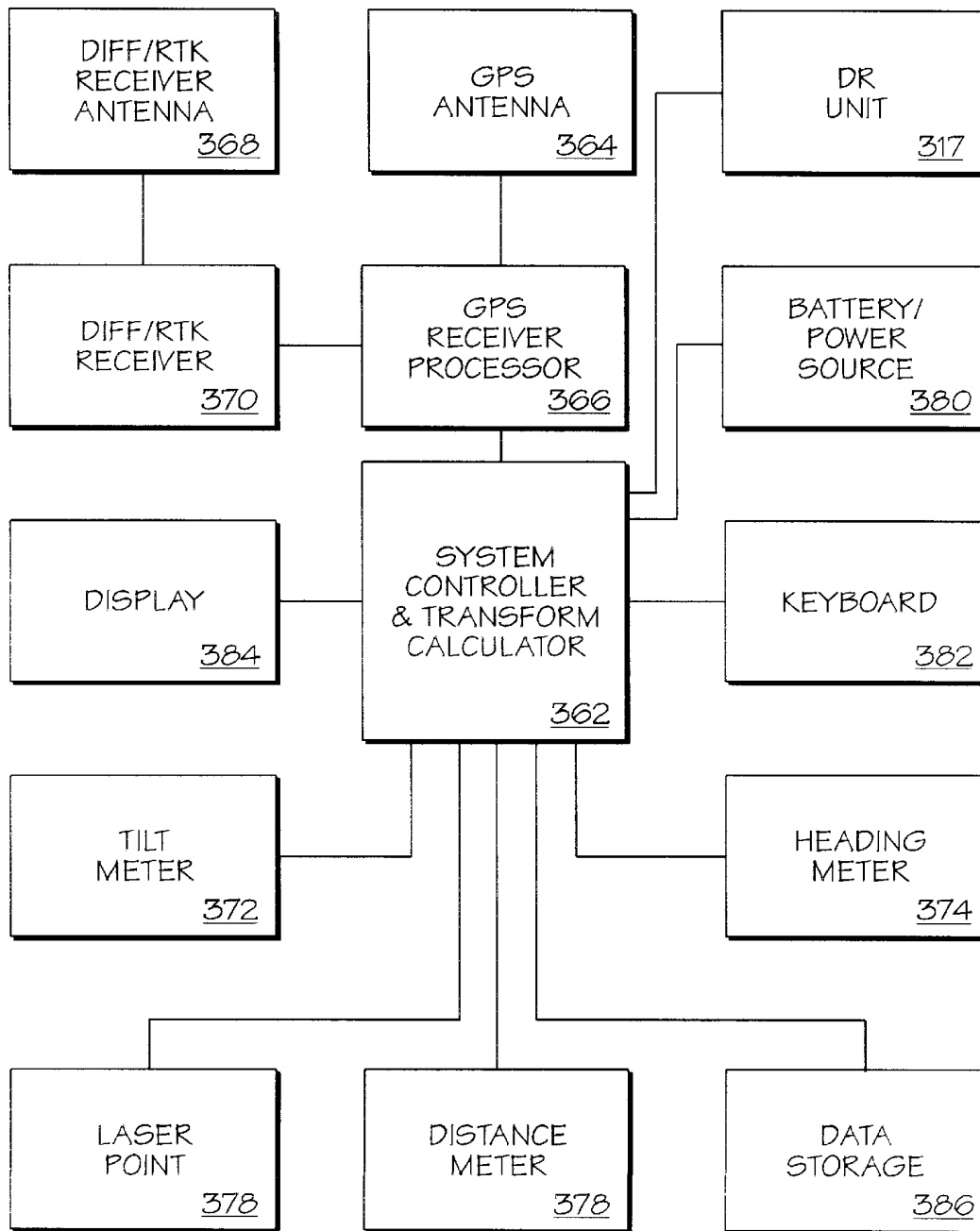


Fig. 3B

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