

An On-Line Validation Component for the Curtin RTK GNSS Calibration Facility

Degree:	Honours
Keywords:	geodesy, GPS, RTK, geodetic network, validation and calibration
Entry:	Bachelors degree in geoscience, physics, mathematics, or any related discipline, or invited entry to the Honours program in the Department
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Project Funding:	Western Australian Centre for Geodesy
Student Funding:	The student will receive some assistance with the costs of thesis production and photocopying
Resources:	Some software and spreadsheets, control data over the network
Collaboration:	Western Australian Department of Land Administration, Main Roads Western Australia
Starting Date:	Unrestricted

Project Description:

In 1997, the Western Australian Department of Land Administration (DOLA) and Main Roads Western Australia (MRWA) established a first-order control network of more than 60 points in order to verify the results from several real-time kinematic (RTK) GPS systems. This was to ascertain whether this technology could be used to satisfy MRWA's survey specifications for hard and soft surfaces. The data were analysed for height determination (Featherstone and Stewart, 2001) and horizontal positions (Thomson, 2000).

This work has been extended to form a Western Australian RTK GNSS calibration and testing facility (Featherstone et al., 2001). Contract surveyors to MRWA can use this network to validate their RTK equipment and procedures (Featherstone and Stewart 2000a and 2000b). It is believed that the community may be better served by having on-line access to the facility. Therefore, this project will take existing on-line information of this facility (eg on the Western Australian Centre for Geodesy's, DOLA's and/or MRWA's web-pages) to create a new on-line validation component of this facility. An existing computer program will be modified to allow the on-line input of RTK GNSS results and the user will be e-mailed with a validation certificate of their equipment and procedures.

The benefits of this project are numerous. All RTK GPS users in Western Australia, rather than those conducting contract surveys for MRWA and DOLA, will be able to validate their RTK GNSS systems, thus adding a new dimension of quality control to the client.

Further reading:

- Edwards, S.J., Cross, P.A., Barnes, J.B., and Betaille, B. (1999) A methodology for benchmarking real-time kinematic GPS, *Survey Review*, 35(273), 163-174; reprinted in *The Hydrographic Journal*, 94: 11-15.
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- Featherstone, W.E. and M.P. Stewart (2000) RTK GPS work instruction, *Final Contract Report to Main Roads Western Australia*, Perth, Australia, 25pp.
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- Featherstone, W.E., M.P. Stewart, M. Tsakiri, T.A. Forward, N. Penna, R. McCarthy, H. Houghton, G. Xanthis (2001) Establishment of GNSS Testing and Validation Facilities in Perth, Western Australia, *Proc. 5th International Symposium on Satellite Positioning and Applications*, Canberra, July.
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- Stewart, M.P., Tsakiri, M., Martin, D. and Forward, T.A. (1998) Traceability and the calibration of satellite positioning systems, *Survey Review*, 34(269): 437-446.
- Thompson, S.G. (2000) An evaluation of real-time kinematic GPS in three dimensions over the Curtin test network, *BSurv (Hons) thesis*, Department of Spatial Sciences, Curtin University of Technology, Perth, Western Australia.
- Wylde, G.P., and Featherstone, W.E. (1995) An evaluation of some stop-and-go kinematic GPS survey options. *The Australian Surveyor*, 40(3): 205-212; reprinted (1996) in *The New Zealand Surveyor*, 34(286): 36-42.