

## Reprocessing the Western Australian *STATEFIX* Geodetic GPS Network Using the *AUSPOS* On-Line Data Processing System

<b>Degree:</b>	Honours
<b>Keywords:</b>	geodesy, geodetic networks, GPS, Internet, Geocentric Datum of Australia
<b>Entry:</b>	Bachelors degree in geoscience, physics, mathematics, or any related discipline, or invited entry to the Honours program in the Department
<b>Supervisor:</b>	Professor Will Featherstone ( <a href="mailto:W.Featherstone@curtin.edu.au">W.Featherstone@curtin.edu.au</a> ), <a href="#">Western Australian Centre for Geodesy</a> , Department of Spatial Sciences, Curtin University of Technology
<b>Project Funding:</b>	Western Australian Centre for Geodesy
<b>Student Funding:</b>	The student will receive some assistance with the costs of thesis production and photocopying
<b>Resources:</b>	STATEFIX GPS data and field notes
<b>Collaboration:</b>	Western Australian Department of Land Administration, Geoscience Australia
<b>Starting Date:</b>	Unrestricted

### Project Description:

The STATEFIX GPS network was observed over Western Australia in 1996 to establish the new Geocentric Datum of Australia (GDA94) in this State. Over 250 GPS baselines were processed using in-house software developed by staff in the Western Australian Centre for Geodesy (eg Stewart *et al.*, 1998). This software uses advanced processing and modelling algorithms not normally available in commercial software. As such, it allows the user to exercise more control over the data processing to determine high-precision results.

In 2001, a Curtin student project reprocessed the same GPS data using commercial GPS post-processing software (Trimble Geomatics Office) and compared the resulting coordinates with the existing STATEFIX solution. The results showed that Trimble Geomatics Office (version 1.0) could not deliver accurate results over the long baselines used. This new project will reprocess the data using the AUSPOS on-line GPS data processing facility (eg Featherstone and Dent, 2001), which is operated by the National Mapping Division of Geoscience Australia (formerly AUSLIG). The student will compare the results with the original STATEFIX coordinates and the TGO-derived coordinates to assess the AUSPOS service. If time permits, the network will also be adjusted onto the International Terrestrial Reference Frame 2000 (ITRF2000) to determine by what amount the coordinates have changed over time due to the effects of tectonic plate motion.

The results of this research will be useful for those who wish to establish large-area geodetic networks using on-line GPS software. It will also determine how much absolute coordinates have changed since

the GDA94 was established, thus permitting predictions to be made of the longevity of the new datum. This project has attracted interest from the Western Australian Department of Land Administration, and some extra funding may be available to the student.

**Further Reading:**

- Agustan and W.E. Featherstone (in preparation) Reprocessing the Western Australian *STATEFIX* geodetic GPS network using commercial software, GPS Solutions.
- Dawson, J., R. Govind and J. Manning (2001) The AUSLIG on-line GPS processing system (AUSPOS). Proceedings of the 5<sup>th</sup> International Symposium on Satellite Navigation Technology and Applications, Canberra, July; and Proceedings of the 42<sup>nd</sup> Australian Surveyors Congress, Brisbane, September.
- Featherstone, W.E. (2000) The future of geodetic networks: a Western Australian perspective, Contract Report for the Department of Land Administration.
- Featherstone, W.E. and V. Dent (2001) Transfer of vertical control using only one GPS receiver: a case study, *The Australian Surveyor*, 46(2): (in press).
- Stewart, M.P., X.L. Ding, M. Tsakiri and W.E. Featherstone (1997) The 1996 STATEFIX Project, *Final Contract Report* to the Department of Land Administration, Perth, Australia, 100pp.