AN AUSTRALIAN PILOT PROJECT FOR A REAL TIME KINEMATIC GPS NETWORK USING THE VIRTUAL REFERENCE STATION CONCEPT

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ABSTRACT

The Virtual Reference Station (VRS) concept from Trimble Navigation is designed to support high-precision positioning over a wide area. The system involves permanently running GPS reference stations, at spacings up to 70km, then feeding GPS data to a central processing computer via a computer network. The central processing facility then models spatial errors that limit GPS accuracy. Corrections are then generated and made available for roving receivers as required. VRS systems support a multitude of positioning applications and enable roving receivers to be positioned anywhere inside the network with an accuracy better than a few centimetres in real time. The concept is an extension of the so-called real time kinematic (RTK) technique developed for GPS surveying and other forms of high precision positioning. VRS overcomes three main limitations of the current RTK technique. Firstly, operators no longer need to establish and run their own base GPS receiver and base radio every time they want to work. Secondly, the use of mobile phone technology overcomes the limitation of the range of radio communications. Thirdly, multiple base stations increase the redundancy and thus the confidence in the resulting rover positions.

A pilot network has been established over the south-east corner of the state of Queensland as a partnership between the Queensland Department of Natural Resources and Mines (NRM), Trimble Navigation and Ultimate Positioning. The pilot network is the first of its kind in the Southern Hemisphere and capitalises on existing infrastructure using four NRM offices and the computer network linking them and on NRM's existing GPS equipment and expertise. At the time of writing this paper, the pilot network has been established but full testing of rover receivers is yet to begin. Therefore, this paper outlines the establishment of the network and plans for investigating the technical and financial feasibility of the VRS approach. The project is planned for completion prior to this conference and latest progress will be presented at the conference.

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BIOGRAPHICAL NOTE

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