

Airservices Australia ILS Monitoring SCADA System

The Client

Airservices Australia is a Government-owned commercial authority responsible for the management of air traffic control over 11 percent of the world's surface. Airservices Australia's principal functions are: Air traffic control and airspace management, aeronautical information, communications, radio navigation aids, search and rescue, alerting airport rescue and firefighting services.

Airservices contracted Semaphore to supply, install and commission a telemetry system to monitor and control certain ILS nav aids relating to the Tullamarine and Essendon airports. The contracted system was to be installed into existing nav aid sites without disruption to service, and integrate with existing telemetry equipment (some previously supplied by Semaphore). Supervisory functions were to be performed by PC SCADA software on LAN-networked PCs.

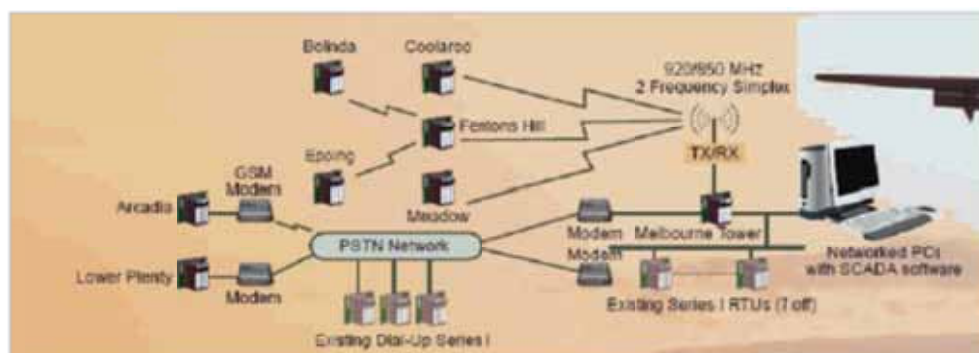
Project Overview

The telemetry Master RTU is installed at the Tullamarine (Melbourne) Airport control tower, and communicates with the remote RTUs via a mixture of UHF radio links and dial-up PSTN connections. The Master RTU also interfaces with existing telemetry equipment, and presents a single network interface to the SCADA-PC network. The radio solution is generally preferred for cost reasons, but not all sites have a clear radio path, being blocked by hills and buildings.

The store-and-forward capability of Kingfisher RTUs allows communications with some of these sites by relaying through others that are mutually 'visible'. This feature saved the client thousands of dollars in landline installation cost, with ongoing operating savings.

The Solution

During pre-commissioning tests we found that a previously confirmed radio communications path had become 'marginal'. Epping was losing its link with Coolaroo, a store-and-forward relay to the Master RTU at Tullamarine. The problem may have been caused by construction activity and seasonal changes in vegetation along the radio propagation path.



A diagnostic visit to Epping and Coolaroo confirmed there was no 'classical' solution; both stations were already at the limits. (That is, highest power, highest gain antennas, tallest masts) The prospect of a landline connection to this site was also daunting, having to traverse a buried radial earth mat. Some lateral thinking and the flexibility of Kingfisher II telemetry led us to try another approach.

Using Kingfisher Toolbox Configuration and Diagnostic Software (via the failing Coolaroo link), and with the cooperation of Airservices' technical staff, we re-assigned Fenton's Hill as the store-and-forward relay for Epping. After redirecting the Epping antenna toward Fenton's Hill, there were just enough signals to establish communications.

The antenna at Fenton's Hill was adjusted for best compromise between Tullamarine and Epping (final fade margins of 32dB and 26dB respectively were achieved). Not bad, considering Fenton's Hill - Epping is an obstructed path over about 47km! In three hours, major configuration changes were made to the telemetry system that would leave it fully operational without further site visits. Should this link deteriorate in the future, Airservices would be advised to consider a cellular telephone data modem as a simple retrofit.

