Ferranti Inertial Land Surveyor – FILS3

By: Peter Jensen

In May 1987 RA Svy was equipped with a Ferranti (Scotland) Inertial Land Surveyor 3 (FILS3) for rapid densification of three dimensional survey networks. It was used in-conjunction with conventional terrestrial, Transit Doppler and GPS surveys. FILS3 was based on the artillery Position and Azimuth Determination System Mark 2 (PADS Mk2) comprising an inertial measuring unit of three accelerometers and two gyroscopes, a computer, a control display unit and a power supply. Adding a tape recorder, an off-line IBM PC and Ferranti post-processing software for data processing made it the FILS3. Like all inertial navigation/surveying systems, system errors accumulate over time. These can mostly be accounted for by stopping movement regularly. So-called zero-velocity updates every four minutes, where the system derived velocity from the accelerometers was compared with the actual velocity of zero, errors can be reduced to about 1m in 5km. Off-line post-processing of the raw data improved the precision by nearly an order of magnitude.

In 1986 Major Bruce Keeley undertook on-the-job-training with the US Geodetic Survey Squadron (using Litton Inertial Survey System) to be the RA Svy specialist for the FILS3 introduction into service including initial training.

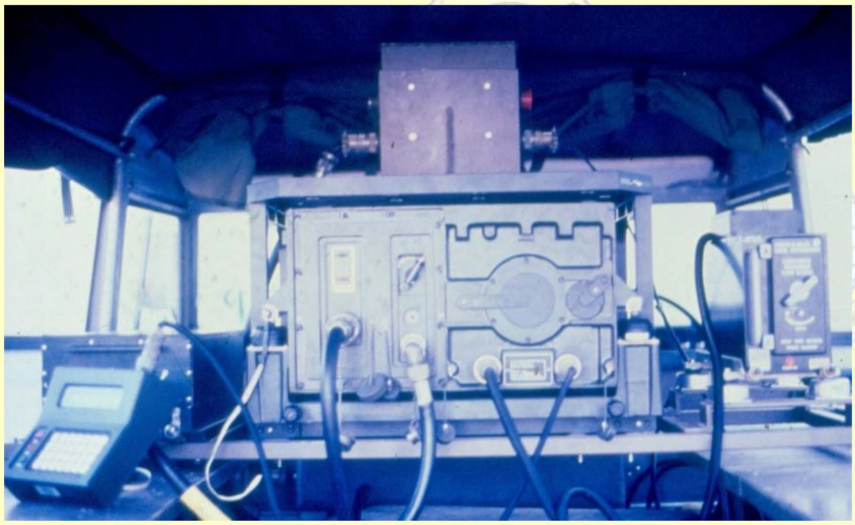
FILS3 could be fitted to an Army Kiowa light observation helicopter, a Land Rover Series 3 FFR (Fitted For Radio) and the Land Rover 110 Perentie survey variant vehicle. FILS3 was initially assigned to 2 Field Survey Squadron, later transferred to 1 Topographic Survey Squadron and then to Divisional Artillery. By the 1990s rapid developments in GPS equipment replaced the RA Svy need for the FILS3. In August 1987, 2 Field Survey Squadron used the FILS3 and GPS TI4100 on Exercise Long Guns 87, a Divisional Artillery exercise with 8/12 Medium Regiment live firing 155mm guns. What would have taken sixty man-hours by conventional artillery survey was completed in half-an-hour with the FILS3.

The photographs below were from the equipment acceptance trials and initial training at School of Military Survey, Latchford Barracks, Bonegilla VIC in May 1987.

The Landrover FFR provided power for the helicopter mounted inertial measuring unit (IMU) for system initialisation which took about forty-five minutes

CAPT Terry Lord - Kiowa LOH fitted with FILS3. The white cable is for power from the Landrover FFR.

FILS3 control display unit (CDU) on the survey operators seat in the Kiowa LOH cockpit



FILS3 IMU and CDU fitted in the Landrover FFR