

THE DME LEO DME STORY

There are three major elements as to why the requirement for LEO III DME came about. The first was the long-term sustenance of a low-population / difficult-to-maintain computer range. The second was the performance and facilities shortfall of 2900 on delivery. The third was the extended development of the Post Office's New Billing System (NBS).

On the first element, LEO 326 maintenance, the seeds of this problem had come to light during my six-month sojourn at Charles House from sales. In this period I managed to return the four machines to their contractual performance levels. I paid a visit with the Post Office Sales region support manager and found multiple reruns taking place, often going back two runs before they could produce the latest telephone bills. In general over the years engineering expertise had become watered down. Engineers could see System 4 had passed them by and the opportunity of getting onto 2900 was slim as long as the LEOs stayed in service. The main problem was the magnetic tape system. Tape decks were in dire need of mechanical refurbishment, both Ampex (the Rolls-Royce) and Potter (the British Leyland) types, so mixed expertise was needed although they had one 1900 engineer on-site who really did understand the Potter deck. With 51 decks on site they were huge incompatibility problems. There were also spares problems. On the customer side there was no tape library maintenance system. I was asked to spend two days a week there on secondment. I then assessed that three months straight might be enough, but in the end I elected to complete six months there. During this period tape cleaning was introduced, all decks were mechanically inspected and refurbished, a revised compatibility setting up procedure implemented and spares reviews introduced which, in cooperation with Spares Division, were extended to all ranges of machines on all Post Office sites. There were other problems associated with modifications that had eventually been introduced as a result of my dossier (see LEO III COMMISSIONING – PEOPLE AND MEMORIES) but not applied retrospectively. Another result was the standardisation of one type of deck at any one Post Office site so that expertise was concentrated. Also training courses were set up covering advanced techniques, specialised equipment and software/applications awareness. Apart from myself, the lecturers were top field support engineers and managers, engineers-in-charge, an original equipment designer and customer personnel.

On the second element, 2900 performance and facilities, the order was for four 2970's to run NBS, a trials machine for Barbican, the first operational machine for Edinburgh and further machines for Derby and Bristol. The facilities shortfall was in the available release of VME. The performance issue was solved by providing 2980's in lieu of the 2970's for Derby and Bristol! The facilities issue had to await a VME release that satisfied the contract.

On the third element, NBS development, this became the final straw. It was a highly ambitious specification designed to take advantage of the potential of the new computerised System X exchanges. I used to get revised schedules showing the

transfer of telephone areas to the new system and therefore hopefully leading to the reducing need for LEO 326's and the release of engineers. Eventually the VME facilities shortfall was satisfied and software licenses were paid (another story, but possibly of no real interest). Then in early 1979 I got another revised transfer plan introducing a TWO-year delay due to major NBS system problems. I roared into my Post Office Regional Sales manager's office saying, "Jim (Lessey), this is no longer ICL's problem, it's the Post Office's!") He set up a senior meeting with the Post Office at which a project team was set up to investigate all possibilities. These included printing and sorting on System 4's, transferring tapes via the few and fragile Standard Interface Assemblers. But the increase in run times in itself would have been unacceptable and the LEO's would still be required. Because of the successful implementation of DME 1900 and DME System 4 the idea of DME LEO was floated. The Post Office paid for a feasibility study to be carried out by the Dalkeith software development centre. The report was accepted and the DME LEO project was born.

The DME LEO project, with a first meeting on 11th April 1979, was set up not only to develop the microcode, but to supply a trials 2960 to be installed at Llanishen, near Cardiff and to pay for the recruitment and training of twenty new LEO engineers and the one-off purchase of key LEO spares such as Anelex print-barrel segments and Ampex and Potter magnetic tape heads. At the third meeting on 17th May 1979 a project milestone of 'First system live' was set of January 1981. The first thing I did was to provide Dalkeith with a copy of the LEO 326 microprogram flow charts. I also asked Colin Hiscock, a LEO support engineer with a strong software bent if he could get the six main main-frame LEO test programs (T8 - Simple actions, T9 - Multiply/Divide, etc.) onto an industry compatible magnetic tape which could be run on a 2960 when the time came. Meanwhile spares were ordered and training courses were organised. There were four types of course: Induction, Peripherals, Input/Output Assemblers and System. Each was run twice, each for groups of ten new engineers. For the assemblers course I got functional drawings reproduced, via microfiche at the Letchworth training school. Each of the assembler courses was two-weeks long and were run one after the other because the LEO being used for the practicals needed to be withdrawn to make way for front-end processors for the 2900's. I did most of the lecturing on this course and on three days on each course I did all four lectures. The regular project meetings with the Post Office continued until one day we heard that at Dalkeith they had tried the Master Routine. Now on 1900 they debugged the microcode with George, on System 4 they debugged it with J: rather a time consuming way of doing it. I immediately contacted Colin Hiscock and Dick Etherington, a top LEO 326 support engineer, and we flew up to Edinburgh with Colin's tape and the LEO test program manuals in two plastic carrier bags. At two o'clock that afternoon the Dalkeith programmers tested their latest patch and got a dump. We then ran T8 and got a dump. The next day they tested their patch and got a dump, we ran T8, passed point and got a dump. We asked if there was time to try T9, OK, and got a dump. The next day we passed both points and by the end of the week all test programs ran and the Master Routine loaded. The bulk of the further microprogram work related to input/output where they had utilised the work they had done for System 4. This to me was the end of phase one of DME LEO implementation.

The second phase was the installation of the 2960 at Llanishen and getting it accepted before acceptance trials of the microcode could begin. At this point I was told that a consultant LEO operator had been hired to organise and run the microcode acceptance trials. To my amazement he turned out to be Brian Norris who had been one of my operating team leaders at Minerva Road, one of the fastest operators I ever came across. I enjoyed working with Brian again throughout the rest of the project, being a closet operator myself. Also Brian was a motor racing man having appeared on the front of the MG Car Club magazine going off backwards at Brands Hatch. He later overturned a Formula V (V for the Volkswagen engine, not Roman five) at Silverstone and was trapped under it while it caught fire. I learnt he was in Stoke Mandeville Hospital and visited him. He had skin grafts to his back and one arm but recovered to his normal operating speed (I'm not sure about track speed). The scars were still evident on the back of one hand. The 2960 was accepted on 31st August 1980 (target August 1980) and Release 1 of the microcode was available for testing on 17th November 1980 (on target) and accepted on 28th November 1980 (again on target). The only discrepancies turned out to be due to faults on the Cardiff LEO 326 leading to incorrect telephone bills (sounds familiar!). These faults were probably in the magnetic tape track-sum logic. Live take-on trials then commenced and the first system was declared 'Live' on 15th December 1980 (on revised target, original target January 1981). Implementation moved to Kensington and then Portsmouth using the dual 2960 installations. A release 2 microcode was implemented at Llanishen only, and by then NBS conversion was on (the revised) schedule. However the final shot was that the Cardiff LEO (III/44, never a very reliable machine, having been the Docos House, London trials machine, moved and enhanced to full telephone billing configuration at the time of the extra five 326s) gave up the ghost and the final two telephone areas were processed live on DME LEO. One area I believe was Hull. That of course was independent of the Post Office and was a cross-billing operation similar to mobile/BT billing operations of today.

The project was on-time, on-budget but in the end turned out to be a (relatively cheap) insurance policy bearing in mind the hundreds, probably thousands of millions of pounds that telephone billing represented. It was great to see a 2900 behaving like a LEO.

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