



Pentland is the UK-based group behind some of the best known brands in sports and leisure: Speedo, Berghaus, Ellesse and Kickers, amongst others. As well as the design and marketing of product ranges under these brands, a central part of its operation is the sourcing of these products from a range of manufacturers – often overseas – and then their distribution on to the customer, in the form of retail chains and independents both in the UK and abroad. Such an operation requires a slick supporting logistics function and Pentland have invested heavily in radio-based technology, which has transformed their operation.

Pentland's solution to their initial warehousing need was to seek to acquire an existing warehouse facility on a turnkey basis. Pentland thus negotiated the purchase of the Glover Warehouse in Washington, Tyne & Wear that was being operated by Nike. With obvious parallels in the type of product that was to be held within the warehouse, Pentland acquired the whole operation, including the existing LXE Radio Frequency infrastructure. As Ian Sayle, IT Project Manager, remarks "it was a case of the existing owners vacating on one day and Pentland moving in the next".

One of the principal reasons for the smoothness of the transaction was the software underpinning the Glover warehouse facility was run on an IBM AS400 platform. The bulk of Pentland's business systems are run on the same platform and supported centrally from the Group Head Quarters in Finchley. Thus, the establishment of a physical ISDN link and creation of multiple interfaces between the WMS and host business software packages was relatively straightforward. Functions such as invoicing are handled by the Finchley administration team.

The success of the initial Glover implementation and the subsequent growth of the two brands distributing from the warehouse were such that the Group decided that further investment in the Glover facility was warranted. Ian Sayle explains "the square footage of the original warehouse facility was quite modest and the planned extension effectively expanded the warehouse by 25% (to 174K sq. ft). We took this opportunity to review the overall methodology of the warehouse, in particular the Warehouse Management System and the possibility of an upgrade to the existing radio frequency system".

The additional floor space involved an extensive reconstruction of the warehouse and an extensive building development that was eventually knocked through to the original warehouse. The Goods-In department was relocated from the front of the warehouse to the rear. The dispatch and bulk areas were extended considerably and the number of picking locations was significantly increased. The racking within the extended area of the warehouse is eight pallets high, in contrast with the five pallets of the existing areas. This necessitated the purchase of K15 forklift trucks from Lansing. This truck is the biggest available and prevented Pentland having to consider the adoption of cranes in the new area. The entire process was undertaken between January and September 1998.

In conjunction with the physical changes that were taking place, Pentland's own IT team worked on enhancements to the existing WMS. One of their core objectives was to make further use of the radio frequency technology. A major enhancement was to allow the cycle count team, who are responsible for perpetual stock-taking of both bulk and picking locations, the use of a suitable hand held radio frequency unit for scanning at pick locations, technology that had not previously been adopted by Pentland. A second major initiative involved the elimination of all paperwork from truck-based activities.

It became obvious that an upgrade to the RF equipment was essential and an exercise commenced to evaluate the product offerings of Symbol, Microlise and **Belgravium**. According to Ian Sayle, the truck mount product offerings of all three companies were broadly the same. However, at that time, **Belgravium had launched a new handheld unit, the Geneva 6000**. The Pentland operational personnel particularly favored this unit, as it was lightweight and comfortable to use for extended periods.

The newly enhanced warehouse management system and communications infrastructure went live in August 1998. The **Belgravium** truck mount and handheld terminals were linked to the enhanced WMS via terminal emulation, running within a narrow band radio framework.

The whole logistics process commences with a third party shipping company. Many of the product lines handled by Pentland are sourced from overseas and it is the Shipping Company's responsibility to accurately track the progress of such consignments. The Shipping Company enters on to their system the full consignment details and this information can be downloaded directly by the Glover warehouse system. In the past, the Shipping Company would manually enter

consignment details from a docket. Copies of this document would then be forwarded to the Glover warehouse for re-keying in by Pentland staff. The automation of this process has eliminated mis-match errors that were occurring because of the double entry of data.

Once the consignment container arrives it is unloaded at the rear of the warehouse. Each carton is individually bar coded as it comes through the Goods-In door and then immediately palletized. Using the **Geneva** radio scanners the goods-in personnel associate the product with the pallet, by entering a container number, scan the pallet ID and then scan every carton on the pallet. In parallel with this a quality control team will be conducting a physical check of the product. In the case of new suppliers this will often be a 100% check.

As an integral part of the radio frequency checking, a further 'balance consolidation' is automatically undertaken by the system. The system compares the anticipated consignment details from the Shipping Company's docket to what goods-in have actually logged with the **Belgravium Geneva** units. Once the figures have been balanced by the system the stock is released for put-away into the bulk storage area. At this point, radio frequency is again employed but, this time, via **Belgravium truck-mounted units**. Pentland have termed this process 'pick up and put away' as it entails directing the operative to a location in order to take out a pallet and once the process is complete, on the return journey, the driver is requested to place a further pallet back into a location. The overnight replenishment runs generated by the WMS determine what stock replenishments and pick notes will be required for the following day's operation. As the truck proceeds down the aisle to pick up the next pallet the driver will take a pallet with him and inform the system that he is undertaking a put-away activity. The system provides an instruction, via the truck-mount terminal, as to the optimum location for that pallet. The optimum location for the put away is generally as close to the next pick as possible, in order to restrict the amount of driver and truck movement. The location and pallet are both re-scanned as a further level of check to ensure that the stock is being put-away or extracted correctly.

When product is extracted from the bulk area it is taken to the 'break bulk station', where operatives are guided by the system as to how much product to remove from a particular pallet and place on a conveyor. If the pallet is totally emptied it is returned to a storage area. If only part of the pallet's contents is utilized then that pallet becomes a put-away pallet. Once placed onto the conveyor the cartons are guided by a Process Logic Control (PLC) Unit to a particular location, one of fifteen spurs feeding off the conveyor each one defined as a picking area for a particular product type. The conveyor is equipped with a series of fixed laser scanners. As each carton approaches a spur, the carton bar code is read and the system determines whether it is due to exits to that spur or continue on the main conveyor.

The PLC unit is linked to the Glover AS400 for receipt of the overnight replenishment run data. Data on the product and the intended location are uploaded by the PLC, which utilizes the data to control the feeding of cartons to the spurs. There are three types of spur defined by Pentland. Firstly, there is the 'Pick location spur'. This is where a box is opened and its contents are placed onto a rack from where products can be picked when required. Secondly, there is a 'Bulk spur' for the bigger customers who are ordering in complete pallet quantities. Thirdly, there is a spur designated for 'Value Added Service'. This is where staff will be involved in some form of product modification, typically the application of 'own brand' labeling. Algorithms within the software define which spur type is appropriate.

At the spurs, pick notes are generated, which include location instructions and, once the pick is fulfilled, the product is sent to dispatch. In the dispatch area, the product is 100% re-scanned to ensure that the correct goods are leaving the Glover warehouse. Prior to placement on to the truck a final check, again utilizing radio frequency equipment, ensures that there are no problems sending this consignment to the customer and recording that this consignment has left the warehouse.

Every evening the consolidation of the pick note and dispatch data takes place on the Glover AS400, flagging those dispatches that can be invoiced. The Finchley AS400 is then timed to undertake an 'invoice run'. Via the ISDN link, the Finchley computer extracts the flagged data. The automation of this stage of the process has obvious enormous benefits in terms of speed of invoicing transaction and improved cash flows.

The extension of the Glover warehouse has been an unmitigated success and Ian Sayle considers that there is "little that could now be added to improve the efficiency of the logistics operation. The combination of **Belgravium's radio frequency equipment**, our own WMS enhancements and the PLC system has produced a highly efficient operation that has also proved to be stable and reliable. In particular, the bulk picking operation has been totally transformed. Previously, drivers concluded a pick or put-away operation by generating paperwork that would be re-keyed into the AS400 at some later point in the day. By automating this process, we're effectively running on a completely error-free basis. Combining automation with sensible load planning by our Glover management team balances potential peaks and troughs, thus allowing the warehouse to run at optimum levels (almost 100% of the time). We're highly delighted with the performance of the system to-date".