



# Discount Auto Parts

FKI Logistex Case Studies Series





## “The Right Parts ... Right Away”

*New Discount Auto Parts DC employs a unique and scalable high tech approach to automated material flow which increases picking efficiency by 50%, reduces overall staffing by 40%, and offsets up to \$1 million dollars per year by shortening trucking hauls.*

**D**iscount Auto Parts Inc. (NYSE: DAP), one of the nation’s leading automotive aftermarket retailers, operates 660 stores in six Southeastern states. At the end of 1998, Discount was rapidly outgrowing their existing 621,500 sq. ft. Lakeland, Florida DC. What Discount needed was a new DC that was able to relieve pressure on the Lakeland facility and cost effectively service the daily needs of new retail outlets opening in Alabama, Florida, southern Georgia, Louisiana, Mississippi and east Texas.

After settling on plans for a new 413,000 sq. ft. facility capable of servicing an additional 500 stores, Discount began searching for the right location to cater to its westward expansion. After reviewing over 20 possible locations, Discount selected Gallman, Mississippi both for its central location in the





projected growth area and an available workforce. “We undertook the project for several reasons; we were looking for a competitive advantage by increasing accuracy and shortening our order fulfillment lead times,” cites DAP’s Randy Peters the Senior Project Manager for the new facility. The new DC opened in the spring of 2001.

### **Building on Experience**

Discount’s existing Lakeland facility is a four building complex which has been added to and expanded on over the years. The facility relies on a conventional RF-based system, with little integration and minimum picking automation.

The goal of the new Gallman facility was to build on the Lakeland experience choosing a design that would be scalable and utilized the latest material handling technology to create a new baseline for cost-effective, efficient and accurate fulfillment.

**Today, the new Discount Auto Parts DC serves over 150 stores with ample expansion capacity to serve 450 new stores. The DC utilizes the very latest in automated picking and palletizing solutions and is a model of efficiency for the entire automotive aftermarket and distribution industry.**

To create this state-of-the-art material handling solution, Discount partnered with FKI Logistex. By integrating its palletizing, picking and carousel expertise, the FKI Logistex team created a scalable, seamless, single-source solution with a unique high tech approach to automated ma-

terial flow. “We knew the distribution center would require a variety of picking technologies to achieve its goals. Discount needed a total solution for its order fulfillment process.” said Hank Kirk, an FKI Logistex National Accounts Manager.

Within 13 months, FKI Logistex designed, installed and commissioned a system that provides increased productivity with an estimated 50% efficiency gain over its Lakeland counterpart today, and the flexibility to allow the distribution center to double in size and volume over the coming years.

### **Automating Auto Parts Distribution**

The Gallman facility was designed from the ground up to fit the specific needs of Discount Auto Parts retailers. Because their stockroom space is limited, these retailers place frequent and diverse product orders. Discount needed a facility that could maximize

storage space and efficiently build mixed orders. Ultimately, Discount sought to reduce store inventories by shortening delivery cycles and improving accuracy. “We wanted to offer better service for our stores. The cost of inaccuracy is very high, especially for loss leaders during sales times. Once an order is delivered to a store it is prohibitively expensive to bring back to the warehouse,” said Peters

Account Manager Kim Baudry says that the FKI Logistex worked closely with Discount to develop the initial picking design. “Discount wanted tools that would allow them to manage work flow and measure productivity. The greatest opportunity to improve accuracy and efficiency lay in automating their picking systems.”

During the design process, one of the most important hurdles was making the decision about which SKUs should be assigned to the various picking technologies. Discount found that over 35% of the case volume orders processed were comprised of only 15 SKUs. FKI Logistex won the project due to their unique approach to handling high volume SKUs, coupled with the ability to design and integrate multiple picking technologies and to piece pick another 28,000 SKUs to complete the total store fulfillment process.

The FKI Logistex design utilizes five different picking technologies, including a robotic gantry with pallet-load carousels, picking carousels, a light-directed order fulfillment system, picking carts and an RF-based picking system. The FKI Logistex Order Processing Software (EASYPick® OPSv2.1) was implemented to provide a real time interface with the WMS supplied by EXE Technologies (an FKI Logistex strategic partner), while integrating and managing these multiple picking technologies.



### **EASYPICK® OPSv2.1 functions to balance workloads, minimize walk times, and increase overall order filling efficiency and accuracy.**

At each of the five picking areas at least two weeks worth of inventory is stocked in the forward pick area from storage pallet racks. Incoming orders from individual store locations are batched in quantities of 10 and then picked across the DC in waves. FKI Logistex OPSv2.1 provides the comprehensive batch picking solution for the Gallman facility, providing a single, real time interface for the WMS to optimize productivity, workload planning, and order throughput-reducing overall time, costs and risks. OPSv2.1 functions to balance workloads, minimize walk times, and increase overall order filling efficiency and accuracy. Because it is critical to complete the wave of orders at one time, OPSv2.1 allows

the warehouse manager to see if there are picker delays and can immediately compensate by reallocating resources.

Installing OPSv2.1 across the system allows one DAP supervisor to oversee the picking process in the building as well as in shipping with a single supervisor screen. These tasks would normally have been allocated to 2 or 3 people.

### **Gold at the end of the rainbow**

FKI Logistex, known in part for its innovative palletizing solutions, designed a gantry robotic palletizing system to build mixed layer pallets. To feed the gantry, FKI Logistex utilized pallet carousels equipped to store and move heavy-duty pallets. This completely automated system saves valuable time, labor, and other associated costs.

The 15 highest velocity items in the DC are picked mostly in full pallet layers. This part of the picking system is comprised of three major elements—a set of FKI Logistex pallet carousels, A-520 Series Gantry Robotic Palletizer and FKI Logistex Order Manager, custom-built order

management software. These combine to create a unique solution capable of building rainbow loads by layer. Heavy-duty, multi-position pallet carousels are used to buffer and position full or partial pallets of product for the gantry depalletizer/palletizer. FKI Logistex Order Manager software directs the carousels and the palletizer to coordinate the entire pallet-building process.

The software interfaces with the machine control systems of the pallet carousels and the gantry robot. Ultimately, it manages SKU data and pick locations and optimizes order configurations to enable the gantry to pick pallet layers from the carousels and build a rainbow load. In addition, the software directs SKU replenishment. As layers are picked from the pallet loads, and the

carousel positions are emptied, the software alerts an operator to replenish the empty carousel position with the proper SKU. The order management software then indexes the empty carousel position to the pallet in-feed where the operator loads a new pallet load of product for induction.

The pallet carousel features multiple positions capable of handling 2,500 lbs. per position. It offers a



**According to Roy Martin, VP of Supply Chain and Logistics at Discount Auto Parts, “Gantry items are untouched by human hands and I really do believe the technology has a lot of merit for the relatively small number of full case items that make up a larger portion of our full case volume. There are direct labor reductions and savings associated with heavy lifting, labor turnover, reduced training times and potential workers compensation exposure.”**



## Split case order picking is accomplished with pick to light and 28 double tiered bottom drive carousels.

small footprint, making it ideal for high-density storage. In addition, the carousels enable efficient picking, allowing a high volume of SKUs to be picked within a small gantry work envelope. Operators can also use multiple positions to maximize picking efficiency, based on SKU turns. By loading a single SKU in multiple carousel positions, rotation cycles are not as long, thus picking is more efficient. Directed by the order management software, the carousels rotate pallets to the proper pick location within the gantry work envelope.

Once pallets are positioned within the gantry's work envelope, a vision system located above the gantry captures an image of the incoming pallet load and feeds it to the gantry's control system. The vision system works as a safeguard detecting any

shifts in the pallet load. If a pallet load has shifted during travel from the manufacturer to the distribution center, the vision system directs the robot to adjust its position for proper depalletization.

Traveling along the gantry frame, the robot stops at the designated location and employs its end-effector to pick a pallet layer. The end-effector's vacuum cups lift the layer, and its side clamps stabilize the load as the gantry transfers it to one of the multiple palletizing positions. After completing this activity, the carousel is directed to move the next required product into a depalletizing position and a layer is removed from this load and transferred to the rainbow load. This process is repeated until the rainbow load is completed, at which point the load is discharged via a pallet conveyor. The pallet conveying system takes the load through a fully automated stretch wrapper and a pallet labeler. The load is then discharged onto accumulation conveyors to await pickup by forklifts.

## Small footprint, high throughput

Split-case order picking is accomplished for the 28,000 plus SKUs utilizing an integrated system of carton flow rack modules with pick-to-light and 28 double-tiered FKI Logistex bottom drive horizontal carousels. The highest moving 9,000 SKUs are stored in carton flow racks and the slower moving remaining 19,000 SKUs are located in the carousels. There are 4 carousels per pod. Each carousel is 8 ft. tall and consists of 50 bins with a capacity of 1,000 lbs. per bay. Each bay has 24-36 bins, depending on the size and velocity of each SKU. The carousel system delivers high throughput, density and accuracy for single SKUs, inner packs, and some small case items. Terry Hinton, a Systems Sales Manager for FKI Logistex, stressed that efficient use of floor space was an essential element of Discount's expansion planning. "We introduced several different concepts that radically changed the design and gained a lot of floor space. The carousel installation comprised three levels, and squeezed in as many SKUs as possible. This design allowed us to keep aisles wide enough to accommodate more economical standard-sized forklifts," said Hinton.

Split-case order picking in the carton flow rack occurs at one of two 400-foot long 3-level pick-to-light systems. The system employs EASYpick pick-to-light technology, a paperless, light-directed order fulfillment system created by FKI Logistex that uses flashing lights to direct order fillers to the exact pick locations. To help ensure order accuracy, LED displays are used to show the order filler the correct pick quantity. Break pack items are put in totes that are then sent to the sortation system to be shipped to the stores. Pick-to-light is also used with full case items, which are placed directly on a sortation conveyor. Waist level placement of the



conveyors in the pick-to-light areas increases ergonomic safety by reducing heavy lifting and also eliminates wasted movement, thereby speeding up the picking process.

Discount Auto Parts allocates special RF pick areas for aerosol products, hazardous materials (like auto paint) and high dollar items (like car stereos). The RF picking is combined with FKI Logistex light-directed GoKarts.

For these areas, the order filler scans a barcode on the pick ticket to identify a pick location on the scanner, takes a GoKart with 10 totes to the correct pick location. Items are then batch picked and put into totes based on light-specified quantities on each tote before moving on to the next scanner-identified pick location until the order is completed.

In the RF pick areas, non-conveyable items and promotional store displays are located from scanning a pick ticket, put onto pallets and then moved by pallet jack to the appropriate shipping lane location.

While Gantry and RF picked pallets of items are staged directly to the shipping lanes, all other pick area products are placed on pick conveyors which connect with accumulation zones on the upper level mezzanines. From there, the products are merged, metered, and scanned

## **Gallman DC has special pick areas that combine RF picking with light directed GoKarts.**

onto an FKI Logistex UniSort X flat slat shoe sorter that sends orders to the appropriate shipping lane for each store location in the batch of 10. Toted and full case items are then stacked on the Gantry and RF pallets to fill out incomplete pallet layers in the order. The pallet layers are then stretch-wrapped for transportation to individual stores.

### **At the finish line**

Every area in the Gallman facility was designed with room for growth over the next five years. Serving 150 stores at startup, the DC has the capability to ultimately serve 450. Space provision has been made to service a total of 16 shipping destinations as well as for the addition of 20 more picking carousels. The gantry arm also has the ability to pick from the top 27 highest velocity SKUs, expandable from the current program of the top 15. Already thinking of long-term development beyond the next five years, Discount Auto Parts purchased enough land at the site to build a second mirror facility adjacent to the first. The sortation system, with a design rate of 85 cases/totes per minute to support the current DC configura-

tion, is mechanically capable of rates in excess of 200 sorts per minute and can therefore handle the output from a second building as well.

Overall, the financial investment in the Gallman facility had distinct advantages over a more conventional installation. The decrease in conveyor length required and carousel modules used and the corresponding savings in warehouse floor-space offset the additional expense incurred by the choice of the robotic gantry arm. "Between the Gantry system and the carousels, Discount Auto Parts was able to significantly reduce the operating space in terms of process and storage, relative to pick modules, racking and conveyor lengths," said Peters. The gantry system alone picks approximately 1100 cases per hour, a tremendous improvement over the previous average rate of 170 per hour at the Lakeland facility.

Martin already sees a ROI on labor costs with the new DC: "After only a few weeks of full operation we have already found the design and technology has allowed us to reduce our original projected staffing levels by 29%. The facility's location has allowed us to offset up to \$1 million



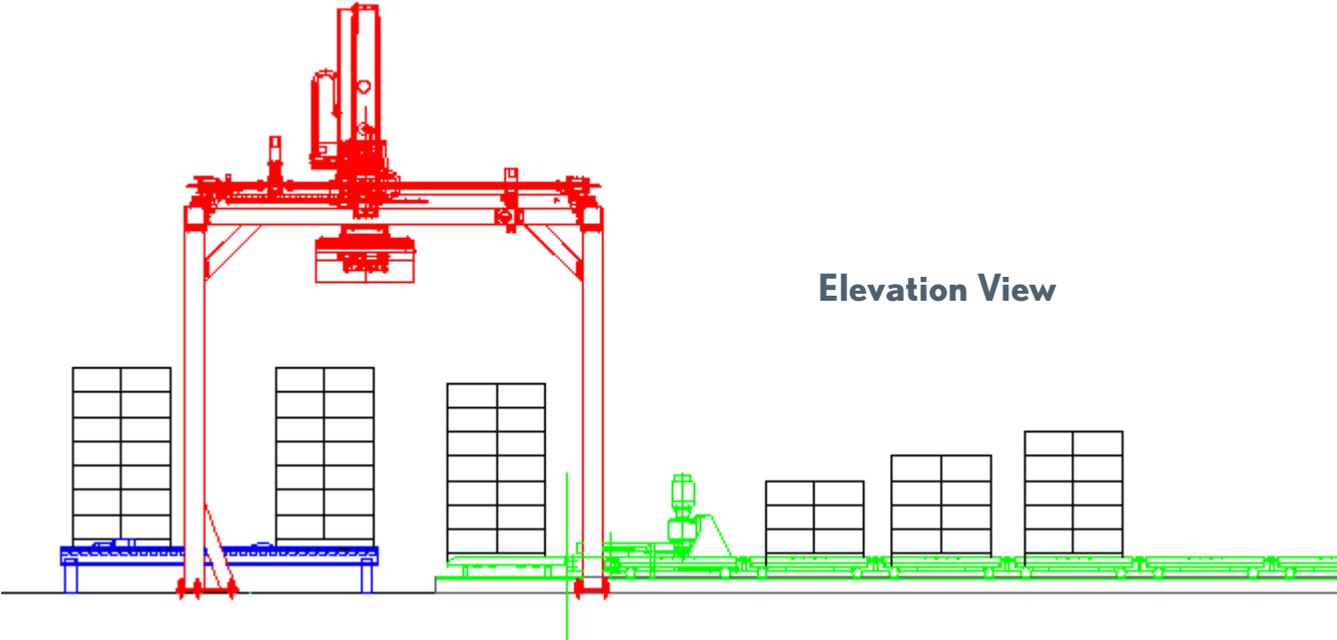
dollars per year due to shortened truck routes. We are currently fulfilling 25% of the Lakeland volume at what we feel are higher quality rates, and what appear to be higher overall order-filling rates—a nice combination to have! The icing on the cake is that the facility is operating at only a fraction of its ultimate capacity and is designed to be more efficient as we add more volume—a very bright note for the future.”

Much of the improvement in labor productivity can be attributed to the ease with which order fillers could be trained to use FKI Logistex pick-to-light systems. Previously, training

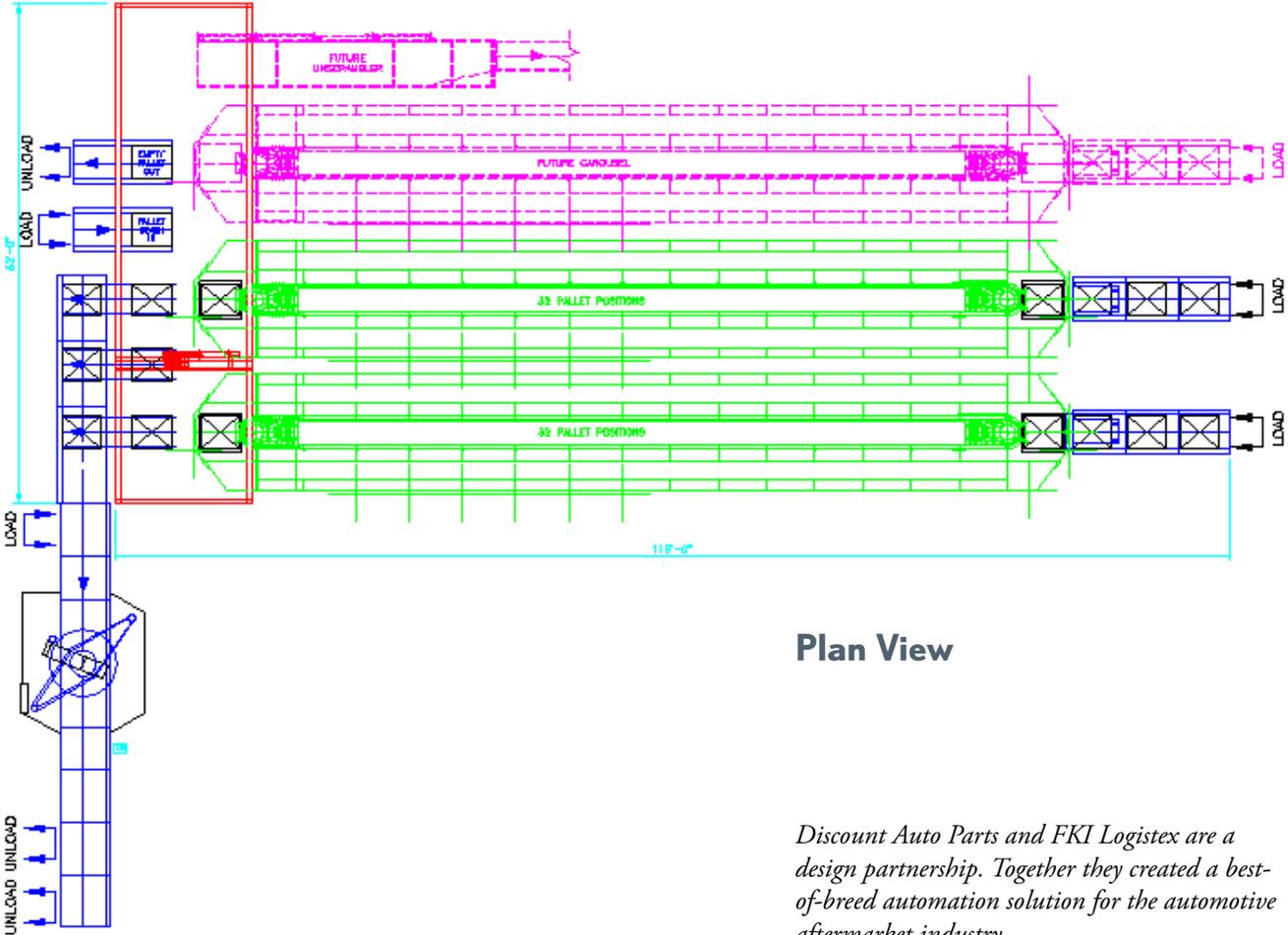
in picking systems often took up to three weeks, but the pick-to-light system was so simple to use that order fillers at the Gallman facility were proficient by the end of the first day. According to Martin, “In some areas of the operation, after only 3 weeks we were seeing Gallman pick rates exceed Lakeland pick rates. There is emerging a healthy competition between the two facilities - with Gallman actually having the edge due to technology and systems, more than offsetting Lakeland’s experienced workforce and management team.”

In relation to their five-year growth strategy, Discount Auto Parts’ new DC is running ahead of plan, providing reduced costs, increased efficiencies, and reliable service to existing stores with plenty of room for growth. Martin compares the leading edge technology included in its design to “a high performance sports car only traveling at a fraction of its capacity.” Thanks to its partnership with FKI Logistex, Discount Auto Parts has created a DC in Gallman that should keep it leading the race to supply the expanding automotive aftermarket for years to come.

# Discount Auto Parts System



Elevation View



Plan View

*Discount Auto Parts and FKI Logistex are a design partnership. Together they created a best-of-breed automation solution for the automotive aftermarket industry.*



## DISCOUNT AUTO PARTS

### Location

Gallman, Mississippi

### Size

413,000 sq. ft.

### Stores served

150 with expansion capability to serve 450

### Integrator

FKI Logistex

### WMS

EXE Technologies

### Order Processing Software

FKI Logistex EASYpick®, OPSv2.1 and Order Manager Software

### Conveyor

Over 21,000 linear feet of FKI Logistex Systems conveyor

### Pallet carousels

2 FKI Logistex 32-position pallet carousels with automated pallet insertion for gantry integration

### Picking carousels

28 FKI Logistex picking carousels with 50 bays each

### Pick-to-light

Over 8,000 FKI Logistex pick-to-light locations

### RF picking

Over 2,700 RF picking locations

### GoKarts

5 FKI Logistex EASYpick GoKarts

### Sortation

FKI Logistex UniSort X flat shoe sorter

### Palletizer

FKI Logistex A-520 gantry robotic palletizer building mixed pallets

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