

## Case Study

Boeing Aircraft &  
Missiles Systems  
St. Louis, MO



Boeing Aircraft and Missiles Systems-Southern California is a component of the Boeing Military Aircraft and Missiles Systems Group. Headquartered in St. Louis, MO, this division is one of the four major organizational divisions of The Boeing Company, the world's largest aerospace company. The Aircraft and Missiles Systems division distributes parts to military customers, including all branches of the U.S. military and foreign countries. The primary product of this division is the C-17 Globemaster III, the Air Force's newest and most versatile cargo aircraft. With the C-17 aircraft also on order for the United Kingdom's Royal Air Force, the company expects further international sales and a commercial freighter version in the future.

### Boeing Challenge

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Delivering 120 C-17's to the Air Force by the year 2004 is an enormous challenge unto itself. Each C-17 is 179 feet long, 55 feet high and is comprised of over 43,000 part numbers (including subassembly part nos.). With a two-year lead-time required to fabricate, assemble and deliver a single C-17 Globemaster III and the need to reduce costs for more sales, Boeing Aircraft and Missiles Systems faced significant challenges. The company needed to support a higher rate of aircraft production while sustaining the current headcount. In addition, inventory consolidation goals required the C-17 warehouse to reduce square footage requirements. Boeing planned to increase production from 10 to 15 aircraft per year, decrease its warehouse footprint by 25 percent and allow for inventory consolidation from other Boeing warehouses, all with the current staff in place.

### Boeing Goals

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Following the merger with McDonnell Douglas, the company underwent an intense scrutiny of all of its business processes. Facing declining defense procurement budgets, Boeing knew it was necessary to lower the cost to produce each aircraft to make them more attractive to purchase.

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*"Catalyst was the only supplier whose current product had the functionality to support our business processes and could be easily configured to meet our needs."* **Boeing Aircraft & Missiles Systems**

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In an effort to drive down costs and meet their business commitments, the company planned many improvements, one of which was a warehouse modernization project to improve labor and space efficiency, supporting the C-17 production rate ramp up and overall cost reduction goals.

Receiving parts from over 800 suppliers to build each \$198.3 million aircraft, it was necessary for the company to streamline its warehousing and manufacturing operations. The warehouse operations had two major objectives to meet. They needed to reduce storage space requirements and trim the time needed to pick parts. To meet these objectives, planned improvements included upgrading storage and handling equipment, rearranging stocking locations for more efficient work flow and purchasing a warehouse management system (WMS). According to John Horvath, Boeing Project Manager, "We knew we had to bring in warehouse automation in order to reach our cost savings and productivity objectives, it was obvious our manual processes had reached their limits."

## Catalyst Solution

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After a selection process that included 17 WMS suppliers, Catalyst software was installed as a key part of the warehouse modernization project. "Catalyst was the only supplier whose current product had the functionality to support our business processes and could be easily configured to meet our needs," Horvath notes. Catalyst software integrates the Boeing mainframe host computer to the carousel system, directs part storage and order picking throughout the carousel system, directs order consolidation activity and provides radio frequency (RF) data communications and bar code scanning throughout the warehouse. The mainframe computer downloads all parts information to Catalyst for receiving parts and delivering assembly orders. Mainframe generated bar code labels identify the approximate 21,000 part numbers stored across 60,000 available carousel locations. Scanning the label with the RF device turns the parts record over to WMS which then searches for the best storage location and manages the part storing process. Assembly orders are downloaded nightly to WMS for inventory allocation and subsequent order picking in the carousels. Other functions managed by Catalyst include order consolidation, packing, shipping and cycle counting.

Catalyst WMS V7.1 runs on HP UX 10.20 server with an Oracle RDBMS for the 200,000 square-foot facility in Long Beach, CA. The software communicates with Intermec radio frequency equipment and interfaces with 12 Diamond Phoenix horizontal carousels. These carousels store approximately 60 percent of the inventory previously stored across the entire warehouse. The inventory is picked into one of 600 available totes, all of which are recognized by Catalyst software. The totes are then transported by conveyor to the order consolidation, packing, and shipping area.

## Technical Facts at a Glance

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**WMS Version:** Release 7.1

**Configuration:** HP UX 10.20; Oracle RDBMS; HK Conveyor systems; Intermecc RF terminals; Diamond Phoenix automated horizontal carousels

**Warehouse:** 200,000 square-feet; 60,000 carousel locations

## Boeing's Return on Investment

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The company needed to deliver a 15 percent internal rate of return on investment within five years for the overall warehouse modernization project. Storage efficiency and picking accuracy are two of the critical benefits received from implementing Catalyst software. Based on the cube size of parts being stored, Catalyst selects the 'best fit' carousel storage location for maximum storage efficiency. Also, before automation, many bins stored multiple part numbers, resulting in increased pick time and chance for errors. Now, each new receipt is stored into a unique location allowing better age control and first-in-first-out inventory management. With the combination of Catalyst and automated carousels, picking productivity has improved 5:1, resulting in an increased number of daily work orders being processed and considerable labor cost savings. Finally, Boeing realized a savings of over 70,000 square-feet of warehouse space and was able to consolidate inventory from two other locations.

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