



THEORY OF CONSTRAINTS (TOC) SYSTEM IMPLEMENTATION REPORT

INTRODUCTION

At Astro Model Development our objectives state that we are “committed to providing customers with quality products, timely service and competitive pricing. We achieve these objectives through a continuous investment in skilled and creative employees utilizing the latest equipment and technology.”

Adopting and implementing TOC strategies afforded the opportunity to better achieve these goals.

START-UP

Astro Model first embarked upon this journey with the assistance of Constraints Management Group introduced through Lakeland Community College Center for Business and Industry. Astro Model took several opportunities to benchmark other companies who had also integrated TOC philosophies into their organizations. Using this foundation as leverage, Astro Model began building a suitable and effective system for their organization which is now known as the “Astro Pull System”.

Astro Model established core and support teams that developed and implemented the Astro Pull System. The teams educated, trained and integrated the elements of TOC in the form of the Astro Pull System corporate-wide. In addition, a minimum of fifty suppliers were also brought on board, as Astro’s supply chain was a key component to the system’s success.

SCOPE

The primary focus of the Pull System began on the largest assembled product line. This line consumes more than fifty percent of machining capacity at the main plant as well as the fabrication division. In addition, well over fifty outside suppliers are used for purchased components. The system involves every facet of the organization from sales to shipping. Today, the Astro Pull System is in practice at the main plant and two of its four divisions. The system is designed to fit each division’s unique product line and production requirements.

LESSONS LEARNED

Fortunately, Astro Model Development went into this journey with “their eyes open” understanding that this was a cultural change for the organization. Corporate-driven from the start, clearly executive management must drive and support the efforts for continued growth and success.

TOC strategies change an organization’s manufacturing paradigms. A great deal of time and effort has gone into educating the organization about product throughput, throughput dollars, lower inventory, schedules, and cash flow.

MEASUREMENTS

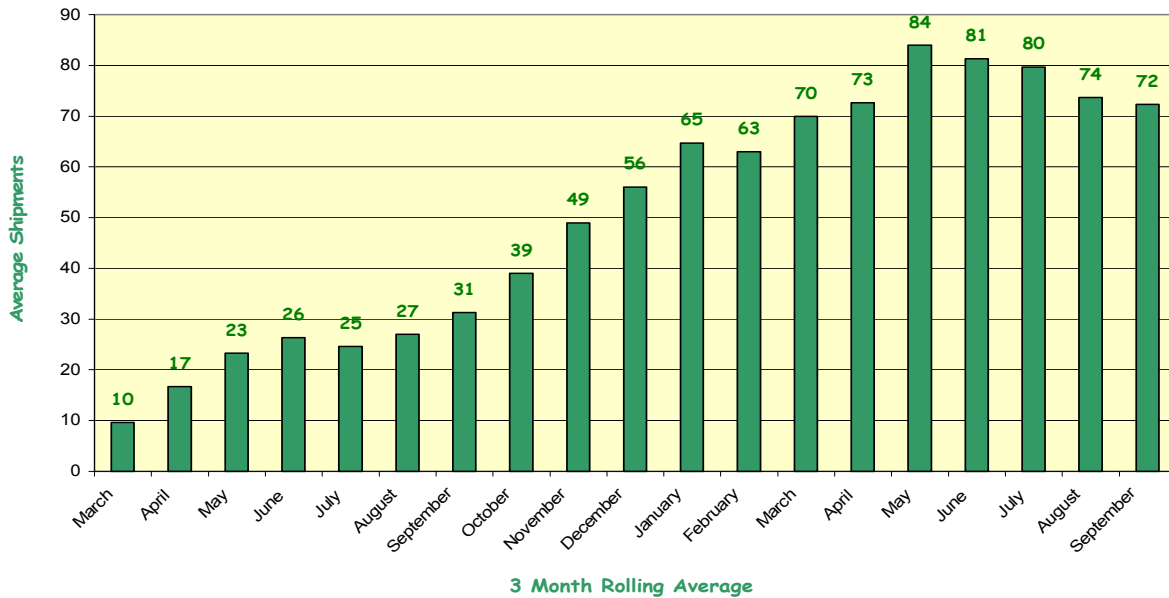
In order to recognize the performance of the system, measurements were put in place. For example, the chart below characterizes the shipping performance on the primary product lines involved.

TOC was first introduced to Astro Model in July of 2004. By September 04, the Astro Pull System was implemented. The graph below depicts the months of March 2004 through August before the system was fully functioning. What is significant to note here is that the customer's quantity demand was steadily increasing. In March 2004, the monthly demand was 40 and not being met successfully. By the second quarter of 2005 demand was up almost 50% and Astro was exceeding the demand.

In some cases the customer's "pull" decreased as seen in August and September of 2005. The system is able to react to this shift and decrease production which in-turn levels out inventory and increases capacity for other product lines.

10/24/05

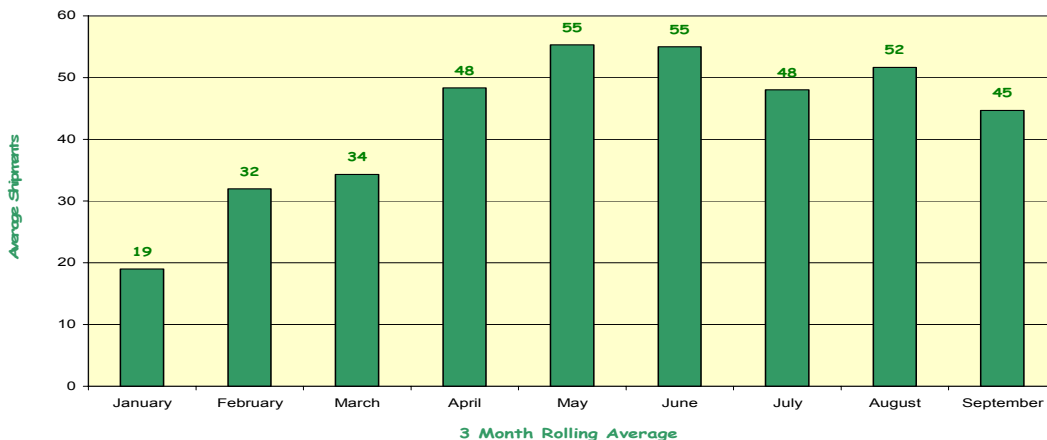
Product #1 - 2004/05 Shipments



The same scenario is seen with product line #2:

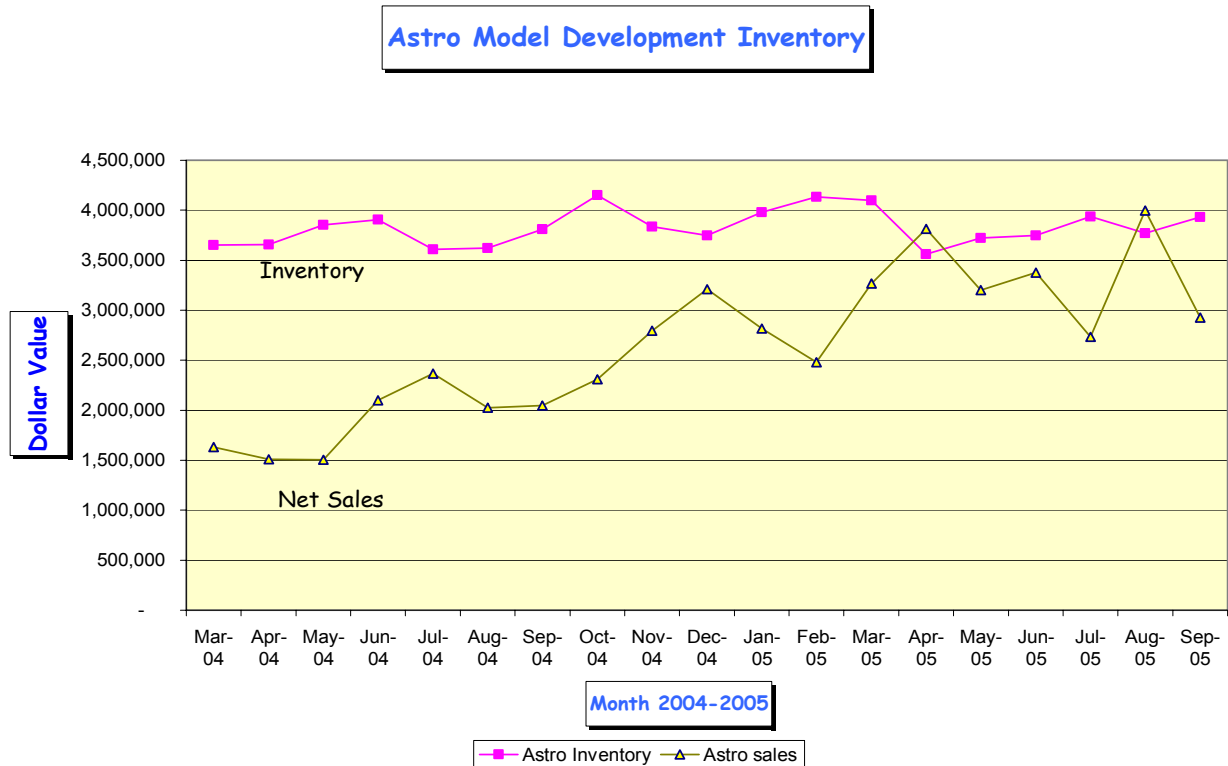
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Product #2 - 2005 Shipments



Again the customer's demand was increased throughout 2004/2005 by almost 50%. Astro has reached the point where we can out-produce the customer's shipping demands, therefore maintaining a managed "buffer" of finished goods. The finished goods buffer guarantees meeting shipping requirements whether there is an increase or decrease in demand without building excess inventory.

Inventory levels are another critical measurement. The chart below depicts a large gap between inventory levels and net sales before TOC implementation. Again, upon execution in September 04, the gap narrows even though volume demand increases. Inventory also begins to level out the second quarter 2005 despite fluxuating customer pull requirements.



A significant decrease in the number of Supplier maintenance issues were seen, particularly after conducting a supplier symposium. Astro's top 50 suppliers were invited to an all-day event which introduced them to the Theory of Constraints, explained their role in the Astro Pull System and reviewed supplier quality requirements. One-on-one sessions were conducted with high risk suppliers. Daily maintenance issues typically involving multiple suppliers was soon reduced to a manageable few.

At our Medical division, the Astro Pull System is designed to manage non-replenishment production. The system is customer due date driven per individual order. Customer satisfaction scores with on-time delivery were increased significantly due to the flexibility to meet fluxuating delivery demands.

BENEFITS

➤ Customer Satisfaction:

First and foremost is the benefit of customer satisfaction. Positive customer satisfaction results are experienced not only post implementation but also as a sales tool for existing and potential new customers.

➤ Employee Satisfaction:

Secondly, employee satisfaction is a benefit in that this is a visual system that all personnel can understand and operate. In assembly department areas, there is less disruption to work schedules due to having the right parts at the right time.

➤ Operational Improvement:

First, the system provides an environment for heightened operational awareness. The visual system creates a heightened awareness of possible internal and external quality, resource or capacity issues. Secondly, the visual priority system provides the opportunity to problem solve and recover without disrupting delivery schedules. The system provides insight as to where the constraints are in the organization therefore targeting resources most efficiently.

➤ Financial Benefits:

Decreased inventory volumes while maintaining required delivery schedules and more efficient utilization of appropriate resources (i.e. personnel, machines, materials) are financial benefits. Throughput dollars equates to greater cash flow.

CONTINUOUS FOCUS

Currently, ongoing progression of TOC and the Astro Pull System is in motion. High production products continue to be identified and incorporated into the replenishment process corporate-wide. In addition, program expansion also includes:

- Performance measures; throughput accounting vs standard costs
- TOC and market offers; finding customer and/or markets leverage point

TOC is an ongoing strategy that will continue to position the company to not only meet customer's requirements for quality products, timely service and competitive pricing but to exceed expectations by building value-added relationships with a thriving organization.