E. Inventory Operations

Not all discrete event simulations involve queues.

In this section you will learn:

1. About (S, s) inventory policies and pick and place operations
2. To simulate a pick and place inventory operation.

E1. Computer Exercise -- (S, s) Inventory Policies and Pick and Place Operations

There are two general classes of inventory management systems, continuous review and periodic review. In periodic review the inventory level is examined only at certain intervals, such as every weekday at 8:00am, at the beginning of each hour, etc. Under some fairly general assumptions about the structure of the costs, (S,s) policies can be shown to be the optimal form of inventory management for periodic review systems. In an (S,s) policy, inventory levels are reviewed on a fixed cycle and if the inventory level is below s an order is placed of a size necessary to bring the inventory on hand and on order up to level S.

What three types of costs would you take into account in adjusting S and s to their optimal values in order to minimize annual inventory system cost?

A pick and place operation puts received shipments into storage locations according to type and removes items later for use in manufacturing operations. Consider a simplified operation with two component types. The Receiving Department places shipments into storage and the Manufacturing Department removes them from storage as needed. The storage locations are designated as 1 and 2 for components of types 1 and 2.

a) Access PICKPLCE and produce an annotated event graph of it.

b) Run PICKPLCE.MOD in single step mode and explain what is going on. Illustrate this explanation with future events lists.

c) Run PICKPLCE.MOD in high speed mode and produce step plots of the number of components in each storage location. Comment on these plots.

d) Play around with the values of S and s to try to minimize stock outs without making S and s too big. (Carrying inventory is expensive.)