

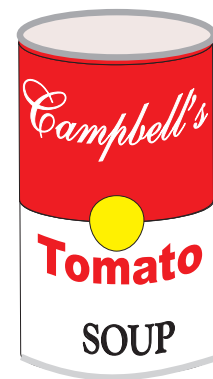
THE HOWARD WAY LETTER

A guide for improving productivity in warehousing and distribution

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M,m! M,m! Good!™ Warehouse Master II R/F, A Case History



Editors Note:

We try to blow our own horn only when we honestly think that it is appropriate to cover an important topic. It has been a long time since we have done an article about Warehouse Master II software. There have been many changes and improvements as well as adding the capability of working with Radio/Frequency systems.

As we have said before, if the reader objects to this article, we will be glad to extend your subscription by one month.

Warehouse Master R/F

Many exciting things have been happening in the field of warehouse management systems. One of the more exciting happenings is the reduction in the cost of WMS systems. We like to think that perhaps we had something to do with that trend because of the pressure we have exerted on the market with our low cost highly functional Warehouse Master II software.

We have waited to tell you about our R/F system until our most important installation had reached maturity and all of the

“bugs” were worked out. We will describe in detail, exactly how our client operated his warehouse in manual mode, what his objectives were, and how the warehouse presently operates. Judging from the picture above, you have probably figured out that our user is the Campbell Soup Distribution Center in Toronto, Ontario, Canada.

Almost one year ago, Howard Way & Associates completed installation of the warehouse and distribution center control system at Campbell Soup's Canadian distribution Center.

Facility Description

The 300,000 sq. ft facility receives 30 or more pallet loads per day of full pallets, primarily from the Toronto soup production facility, and from other Campbell's divisions. These divisions include such well known brands as Ramen Noodle soups, Prego sauces, V8 juices, and our personal favorite, Cream of Tomato soup.

The main method of storage is in floor slots stacking goods up to six high with a capacity of up to 54 pallets per slot. A separate area holds the equivalent of "forward pick slots" in racks

A severe space shortage makes staging space very tight in receiving. This in turn makes it necessary to quickly move goods from the receiving area to storage in the floor stacks.

Counterbalanced fork trucks, capable of lifting 2 pallets at a time are used for the put-away operation.

The warehouse, which runs 24 hours a day, 7 days a week, has 25 shipping doors where 200 orders per day are staged and shipped.

Of these, about half are full or single truck loads, and the rest are pooled shipments with multiple 'drops' (stops) or orders per truck

The Customer Profile

Campbell's customers are the large grocery chains and food wholesalers throughout Canada. (Some Western customers are served by a smaller facility in Alberta). In line with today's emphasis on smaller quantities and more

frequent deliveries, many orders contain not only full pallets orders but partial pallets comprised of mixed cases of product. The customers need to have both full and partial pallets identified with a bar coded label.

Distribution Activities

Since Campbell's is marketing a food product, safety regulations require that most received goods must be held or quarantined for 1-2 weeks until incubation tests are performed at the manufacturing plant. When favorable results of these tests are received, the lots may then be released for shipment to customers.

Because of the possibility of a product recall, good practice in the food industry dictates that lot numbers and production data be traceable all the way to the customer. If a problem shows up, the whole lot of that item can be easily identified and recalled with a minimum of trouble or public exposure.

A look at the order filling profile indicates that 80% of the line items picked are case lots, and 20% are full pallet orders.

Former Method

Receiving

A typical problem in a distribution center supplied by a manufacturing facility is the variance that sometimes occurs between the quantity manufactured and the quantity received at the distribution center. In order to reconcile the

quantities, received goods were manually checked against the truck manifest and the daily production planning reports to track errors that could result in the DC assuming responsibility for quantities of goods that might not even have been produced.

Storage

The prior system of storage was:

Fork truck drivers would cruise the warehouse in order to physically find a floor slot large enough to accommodate the load in question.

When successful, they would fill out a hand written put-away sheet noting the item, its location, its lot # and pallet ID.

These were then carried to a central control office and manually keyed into a stand-alone PC system. This was essentially a batch system and could only represent the stock at the time of entry or removal from inventory.

Orders and Replenishment

When goods were needed to fill customer orders or to replenish the case pick racks, a hand written work request was prepared and drivers were sent to seek the goods. This list was in no logical path order and so caused back-tracking and extra travel.

Using voice radios, they would contact the full time

computer clerk to look up a location for the desired product.

The system displayed dates and quarantine status so they clerk had the ability to select older, released product in rotation.

The driver would write down the pallet ID, SKU number and the quantity selected for the order.

The goods were then delivered to an outgoing staging area or to the case pick rack area.

The previous method used a lead picker to manually calculate the number of full and partial pallets to pick. This was necessary because all orders were expressed in cases. Many products have different case quantities per pallet and this further complicated the manual calculations.

The hand written sheets showing which pallets were pulled for what orders, were brought to the computer clerk for entry into the system so that lot numbers could be tracked to end users for recall control.

Campbell's Distribution Center Management Requirements

Management wanted a system that would be able to:

- ⇒ Use RF terminals on all fork trucks and for case pickers to work on-line with a networked computer system.

- ⇒ Automatically receive goods against production plans and tally shortages and differences.
- ⇒ Automatically allocate appropriate sized floor stacks for storage.
- ⇒ Keep lot numbers segregated.
- ⇒ Direct drivers to the stacks quickly and efficiently.
- ⇒ Assure that quarantined goods could not ship in error.
- ⇒ Add additional accuracy by using bar codes (applied at manufacturing time) on all pallets.
- ⇒ Direct pickers to "First In" goods, cleared from quarantine.
- ⇒ Replenish pick racks, using FIFO rules
- ⇒ Direct pickers to select case picks in a shortest path picking sequence,
- ⇒ Break down orders into full pallet and case picks.
- ⇒ Assign each task to the appropriate worker.
- ⇒ Scan every pick with a bar code reader and offer instant verification, against the order quantity and location for total accuracy.
- ⇒ Print shipping labels to show what goods are on a

mixed pallet to make it easier for Campbell's customers to correctly receive and check-in their orders.

The Alternatives

The Management team examined a number of alternatives, including upgrading their stand-alone PC system. Another avenue was to implement an AS/400 system similar to one then under pilot test at one of Campbell's US. facilities.

The Decision

The decision was finally made to purchase and implement the Howard Way & Associates Warehouse Master II software. Minimal but important enhancements were made to the standard Warehouse Master R/F program in order to make it truly fit Campbell's needs at a very cost effective investment.

The Radio Frequency hardware was supplied by Teklogix and the bar code printers were from Zebra. Hand held and fixed laser scanners for fork trucks were supplied by PSC. (See Figure 1 Automatic recognition of incoming pallet loads).

The facility has 16 Teklogix model 8050 full screen fork mounted terminals, each with a hand held moving beam laser scanner. Two hand held 7025 terminals are used for smaller orders, inventory takes or special management control activities.

Two base stations provide 100% RF coverage throughout the facility. The reason for using two base

stations was because of the distribution center's unique layout which included several interior fire walls, smaller walled off storage areas and a large outside parking area where goods may be stored in trailers.

A Teklogix 9200 network controller links the base stations to the Warehouse Master II network via a dedicated PC at one workstation that is configured as the R/F server.

In preparation or anticipation of a worldwide implementation of an AS/400 manufacturing system, Campbell's configured the Teklogix RF system to work with both the Howard Way & Associates PC LAN system and allow for concurrent AS/400 sessions. The fork terminals were outfitted with full screen displays, so that drivers could see both an AS/400 and Howard Way & Associates display and have the capability of using a hot key to alternate between them.

For even higher productivity, the four trucks used for receiving have fixed scanners that automatically scan the pallets being unloaded in a hands free manner. This speeds up operations, assures all pallets are read, and makes accidental damage less likely as the drivers' hands stay on the controls. (See Figure 1 Automatic recognition of incoming pallet labels)

The Howard Way & Associates software, Warehouse Master II is a PC package running on a Novell network. Thirteen workstations are presently connected, and more may be added if needed. Another PC workstation is configured as the RF Server; controlling all displays

and messages for the 18 RF terminals.

The RF system provides a smooth work flow and 100% accuracy. The project was wisely implemented in two stages. The first being pallet receiving, putaway and pallet order filling. The second stage was to accommodate case picking and mixed pallets. Both have now been fully implemented and de-bugged.

Campbell's and Howard Way & Associates chose this phased approach to simplify training and make the transition smoother.

"a phased approach to simplify training"

The New Method

The new approach is one that has paid dividends in both productivity and accuracy. The traceability and communication with the production facility has improved as well.

Order Entry

Now, production orders are entered into the Warehouse Master II system. (They will later be downloaded via modem). They are pre-allocated daily in anticipation of that day's receipts. "Allocation" merely means that the system sug-

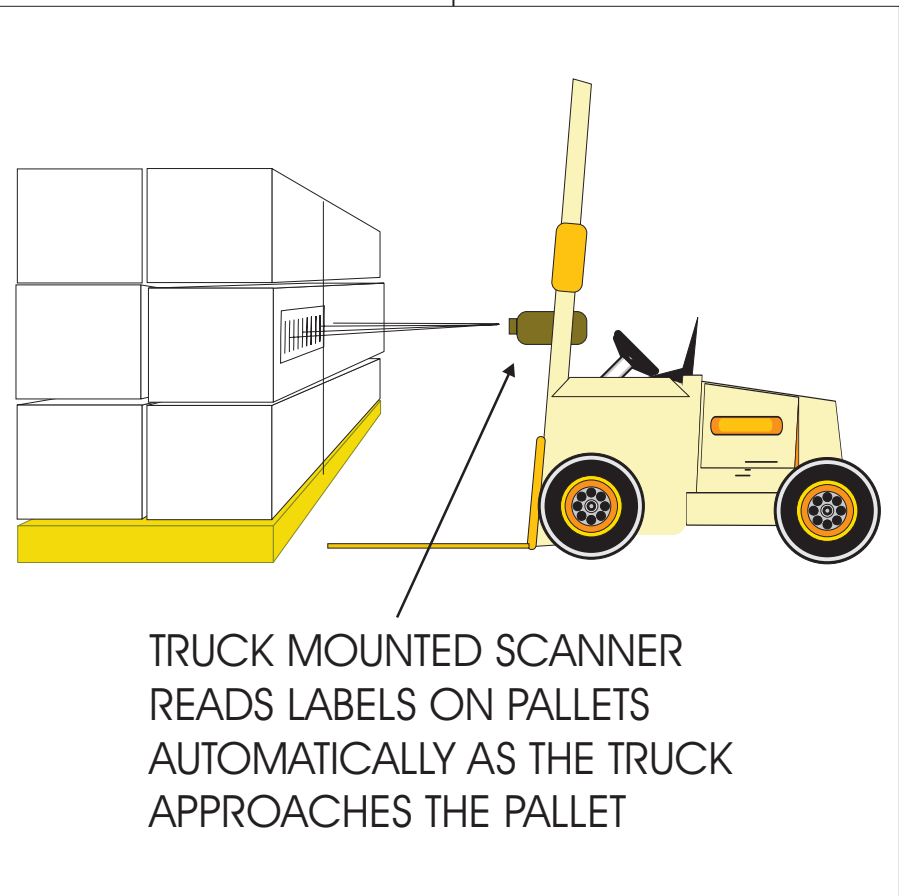


Figure 1 Automatic recognition of incoming pallet labels

gests and holds appropriate storage spots based upon the product, the receipt size and the popularity. In effect, the system assigns slot locations for the expected loads.

Receiving

As loads are received, The receiving operator scans each pallet and puts it on the dock, stacking them double to save space.

The RF system verifies that the particular pallet was ordered and pre-allocated. If there is an identity problem, an error message tells the driver to seek supervisor assistance.

Putaway

The put-a-way driver approaches the pallet, scans it and is directed to a put-a-way location via

the R/F screen.. (If the goods weren't properly received, an error message will appear). The pallet is taken to the indicated address, the driver then scans that directed location, and the putaway is confirmed. Each pallet has a special combination bar code that includes the SKU, Lot #, quantity on the pallet and a Pallet ID. One scan collects all of the information and directs it to the appropriate place.



Figure 2 Truck Mounted Terminal (Teklogix 8050)

Order Picking

For picking, the orders are entered into the Howard Way & Associates system. They are presently implementing the ability to download the orders directly from the main frame order entry system.

Full Pallet Orders: Drivers are directed, again with the large screen RF terminals, to the precise location based on proper stock rotation and lot control. They scan the pallet bar code label to verify and record lot # and pallet identity, and at verification, are then directed to the order staging area.

Replenishment Of The Case Pick Slots: Similarly, drivers are directed to a specific location address based on proper stock rotation and lot control. When the address and the pallet ID are scanned to verify and record lot # and pallet identity, the stock is directed to a specific address in the case pick area for replenishment.

Case Picking: A fork truck driver signals via R/F, that he is ready for a case pick task. An order is assigned to that picker and each line item is sent to his terminal in proper picking sequence along with the address, the item and the quantity needed. This sequence avoids back tracking and offers a "least distance travel route" for the pick. As the mixed pallet is progressively built, the system stores the information necessary to print out a new pallet label that lists the items and quantities on the pallet.

A staging address is relayed by the terminal and the mixed pallet is placed there.

Moves

Obviously, if control is to be maintained, every transaction must be tracked. When merchandise is moved within the warehouse, it is tracked and verified with the use of the R/F screen and the bar-codes on the pallets and the locations. There are two types of move that may take place, a directed move in which a move task is sent to the driver, and a direct move in which the driver initiates the move. In either case, the pallet and the location (from spot and to spot) are scanned and compared by the system. Verification results in a system record change in real time. The same activity takes place in a direct move by the operator. Here, he reads the address and the pallet from which he takes the load and scans the address to which he moves it. The system makes the adjustment internally in real time.

Inquiries

No system is absolutely fool proof. A driver may just make a mistake or manually key in error, a pallet label number that has been lost. The important thing is to be able to find out what should have been done. The operator can make a terminal inquiry that is based on address or pallet Identification number. In effect, he may ask, "what belongs here, or where does this pallet actually belong?". The answer leads to a correction and a fix for the problem.

Address Labels Or Signs

Location labels have been placed on all floor stacks, just to the right of the pallet position. A polyurethane coating was applied over each label to protect it from scrapes. A few fork drivers were found to destroy labels shortly after application, mostly due to ignorance of their purpose. Driver awareness training has resolved some of the label damage problems. In spite of the polyurethane protection, labels have a somewhat limited life on the floor. Overhead labels were examined at several other facilities but rejected due to cost and difficulty of installing in the building. There are also expense and difficulty factors involved in scanning labels placed over 40' from the fork driver. A number of alternative methods are under test and we will report on progress later. Label life is a universal problem and as such is worthy of more thought.

System Performance

Due to the architecture of the RF system and the Warehouse Master II software, most RF transactions have a response time of less than 1/2 second. Drivers are not delayed by the need to wait for a system response.

The system architecture allows each workstation full access to all files (under password control) and uses concurrent multi-tasking processing such that every worker has 100% CPU time on their client station, without sharing processing cycles with a larger machine.

Quality Control

The system has the ability to automatically quarantine selected products on receipt and putaway. This effectively prevents their use in filling an order until they have been approved as safe. This quarantine operation is in truth an *electronic* quarantine and does not necessitate the physical movement of goods into an out of a physically designated quarantine area.

The Quality Control manager gets daily reports from his counterpart at the manufacturing facility. The on-site person responsible for quality can clear quarantined goods automatically and make them available for order filling. The QC department has direct access to the system and will soon start clearing the goods directly themselves rather than sending a message to the DC to do it.

Management Reports

Regular reports show management which goods are expected, allocated, received, put-a-way and automatically quarantined. There are many specialized reports, a few that have been important to Campbell's are as follows:

The Inventory Report

This shows the on hand quantity and the production dates or lot numbers of all on hand.

History Report

This is a record of every Radio/Frequency transaction and data as to quantity, type of transaction, who did it and when.

Partial Pallet Report

This shows where partial pallets are located and allows them to be easily moved to the forward rack case pick slots. Partial pallets in the full pallet area can be a nuisance.

The Accomplishments

In summary, the benefits achieved have met management goals as follows:

Lot numbers are automatically tracked to customers,

Pallets are tracked throughout the facility,

Receiving is completed without manual entry,

Put-a-way drivers need not manually record information.

Put-a-way drivers do not spend time searching for empty slots.

Merchandise is always picked in First-In-First-Out order.

Space is allocated to maximize capacity.

A running tally is kept that reconciles production records and distribution center receipt records.

Minimum picking travel to the pick areas.

Increased accuracy from bar coded information.

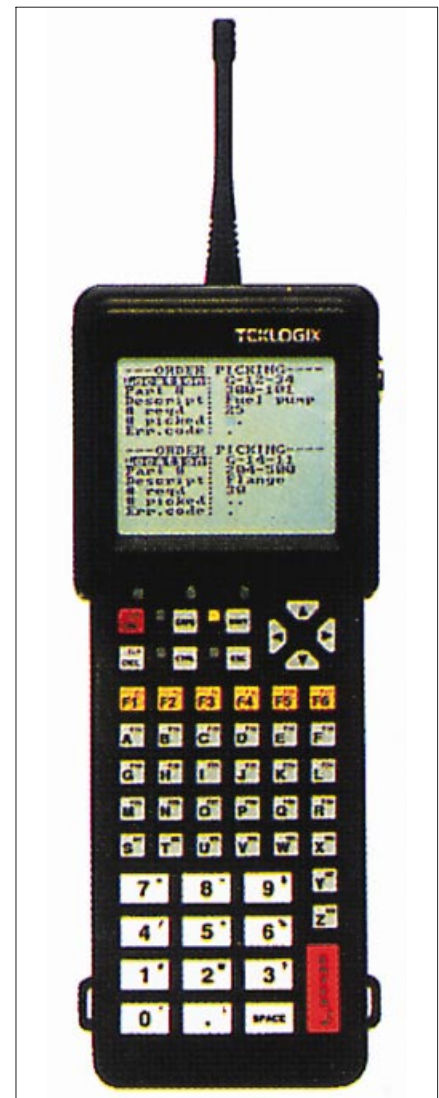


Figure 3 Handheld Terminal (Teklogix 7025)

Strict control of quarantined goods to eliminate the possibility of shipping uncleared merchandise.

True FIFO picking and rotation

FIFO replenishment of pick racks.

Automatic breakdown of orders into pallets and cases for more accurate picking.

Customized shipping labels for full and mixed pallets.

Increased accuracy of inventory.

Perhaps as important as any individual benefit is the increased confidence and accuracy offered by the discipline and inherent in such a system.

Training

Never under-estimate the importance of training and motivation to ensure the success of a project. Both were accomplished in as effective a manner as we have ever seen. Allow us to sincerely say that the success of the whole project is as much due to Campbell's management and their training and motivation as any clever system design that we might have done. The workers themselves, on their own, put together a training and instruction manual that has proved more useful to them than our standard documentation.

The Last Word

Campbell's Distribution Center Coordinator, Steve Skinner, said of the system. "Its a great system (Warehouse Master II) that we 'Campbellized' to fit our needs. Howard Way and Associates were very flexible and helpful in adapting the system to meet our special requirements. That approach of using an existing solution and modifying parts to suit, saved us a great deal of money over purchasing either a custom system or one of the very costly systems we had seen." (*Editor's note: We had hoped that he would say, 'M,m! M,m! Good!™' but no such luck.*)

UNIVERSITY SEMINARS



Fall is here

Despite the date on this issue, fall is here. We are giving an important seminars in October and we want you to know about them well in advance. Your editor regularly schedules such seminars to help you stay abreast of the newest technology and the best practice basics. Often you will have an employee who would benefit from exposure to a learning experience. The particular seminar will be held under the sponsorship of **The George Washington University** in Washington, DC.

AUTOMATING WAREHOUSE OPERATIONS will be held on October 7th through 8th, 1998 at Washington DC. This course outlines the methods for designing and implementing an automated system and goes more heavily into implementation of computerized and automated warehouse systems. To register or for more information please call 800/424-9773 or Fax 202/872-0645. Also see the **GWU Home Page**. The Web address is <http://www.gwu.edu/~ceep>

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