



## Bar Code Integrators, Inc. Project Summaries & References

The below represent just a few of the many types of projects completed for our clients...

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### Shipping & Receiving Applications

#### Abbott Laboratories – Finished Goods Shipping

BCI has developed and successfully installed a large number of bar code data collection systems with Abbott Laboratories. One of the earliest applications installed was a Finished Goods Shipping System in which BCI worked closely with Abbott Project Managers, Programming Personnel and Engineers. The goal was to automate Abbott's Finished Goods Shipping Department and reduce the time and errors inherent to the current paper system. Prior to automation, warehouse employees were required to manually write down all part numbers, serial numbers, and location of blood pumps that got shipped to hospitals. We automated this system by writing custom C code on the PC and Symbol PDT3000 terminals that imports shipment confirmations into a database on a PC. This allows users to download the shipments to the portable terminal. Warehouse employees can then scan the part number, serial number, and bin location of pumps being shipped. Scrollable screens were created to make the PDT software more user-friendly. Data validation was incorporated to ensure users were shipping the correct pumps and fulfilling all shipment requirements. Collected data was uploaded back to a PC and integrated with other Abbott software systems for further use and reporting. This six to nine month project was completed in just three months. Because 100 percent of all systems installed by BCI have been successful, we have continued to work on many other projects at Abbott Laboratories. Most business we obtain from Abbott, as well as other larger clients, are through referrals from their employees.



#### Norell Corporation – Package Tracking System for Sears, Incorporated

BCI, in conjunction with Norrell Corporation, created and installed the Norrell Package Tracking system at Sears Corporate offices. Sears has about 6,000 employees in their corporate offices and receives about 1,200 packages per day. Because Sears received packages that were extremely valuable, they wanted record of all packages received onto their dock. To achieve these volume efficiencies, a system was designed to allow delivery staff to track packages from Receiving (UPS, FedEx, RPS, etc.) to delivery of packages to employees. Custom programming was written on the PC and PPT 4100 terminals to create this turnkey system. When Sears' employees deliver packages, they scan the building location, scan all packages to be delivered, and obtain an electronic signature. When package inquiries are made, the receptionist simply contacts the receiving dock for the package tracking number. The number is entered into the PC and a package tracking screen is displayed showing which carrier delivered the package, when it was staged for delivery, when it was delivered, and the signature of the Sears employee that received the package. The user name of the employee handling the package and a date and time stamp of each transaction also appears on that screen. Ameritech, Kemper National Insurance Companies, and McDonald's had all expressed interest in implementing similar internal controls.

#### Federal Mogul – Shipping, Receiving, Inventory Control, and Locator System

BCI was also brought into Federal Mogul Corporation to design and implement a Radio Frequency (RF) data collection network. This application incorporates custom programming utilizing Visual Basic and WaveLink Studio to facilitate RF data transfer between multiple Symbol PDT6840 terminals and Federal Mogul's SAP host system. A separate, BCI-created database was used to house On-Hand Inventory totals by Part Number and Location. This database captures AIDC transactions for Shipping, Receiving, Inventory Moves, Cycle Counting, and Physical Inventory. A Locator Option has also been added to allow operators to perform random item checks. Users simply enter a Part Number and the PDT displays the current bin locations for that item in all Warehouses. For Picking Transactions/Inventory Moves, a part number prompt is displayed and the PDT directs the user to bin location where the oldest product resides (enabling FIFO inventory management). Throughout all transactions, the system validates in real-time that the information entered is correct (i.e. a Receiving transaction checks to verify that the PO, PO Line Number, Part Number, and Quantity Received are valid). If errors are found, users are notified with a description of the problem and are required to enter valid data before proceeding. The data collected for each transaction is written to a database for storage as well as an ASCII file to allow importation into their Syspro Encore and Accounting ERP packages. To complete the system, custom reports have been written to allow Management to review and utilize Receiving, Shipping, and Inventory Move transaction information to increase plant productivity. Additional reports are being written to aid Federal Mogul in the tracking and validation of vendor shipments.



#### Field Container Corporation – Shipping / Receiving and Finished Goods Tracking

BCI has also quickly completed mission critical projects for a number of clients including Field Container Corporation. We were brought in by Field Container to quickly design and implement a shipping, receiving, and finished goods tracking system. Quick success was crucial because the client's current system was not working correctly. Downtime and inefficiencies were costing the company a great deal of money. The solution implemented for Field Container included use of Symbol MCL Spectrum 24 software tools in conjunction with best of breed Symbol PDT 6840 RF portable data terminals. The overall project included installations at three separate locations and handled receiving, shipping and finished goods tracking. Custom programming was also done to massage the data collected prior to uploading it to Field Container's AS400 host system.

## Pick/Put Away

### WarehouseVision/MCL Pick-Path

Bar Code Integrators, Inc., designed and installed a warehouse planning and optimization package within W.W. Grainger. This flexible off-the-shelf package, called [Warehouse Vision](#), was created by BCI to enable warehouse managers to maximize the efficiency and usage of their facility's storage space. [Warehouse Vision](#) is user configurable and allows Grainger Warehouse Managers to create stocking rules and fixtures to optimize cube space within the warehouse, thereby eliminating the need for facility expansion (and saving millions of dollars in warehouse space purchase and rental fees). The program sorts parts by activity and item class so that Grainger's picking and put away warehouse functions can be completed more efficiently. Additional custom C++ software was developed to create efficient Pick-Path strategies for work zones within the warehouse. Once [Warehouse Vision](#) finds the optimal slot for each SKU, RF terminals are utilized to move each SKU to its proper slot within the warehouse. This integrated warehouse management tool provides assistance in the startup of Grainger facilities, as well as continued efficient operations of their warehouses.



## Asset and Item Tracking

### RF Touch Screen Application

BCI created a radio frequency based touch screen application that assists Abbott's overseas distribution center in tracking and repacking of kits for distribution to other countries. This system incorporates Symbol RF equipment, PC touch screen technology, data matrix bar code readers, and customized data validation to provide the framework needed for proper packing, re-labeling, and reporting of work order items. We also service Abbott's many divisions with a variety of equipment and service needs including handheld and fixed scanners, portable and desktop printers, labeling software, custom media, bar code verification equipment and equipment repairs.



## Work-In-Process

### Abbott Laboratories – Work In Process / Finished Goods Verification

BCI has also been chosen to deliver a Radio Frequency verification system for Abbott Laboratories, an international pharmaceutical and diagnostic equipment manufacturer. The objective of one awarded project was to implement a system based on Abbott validation processes that would ensure, with 100% certainty, that finished goods being assembled contained the correct testing apparatus and chemical agents. The project utilized MCL developer and Symbol RF Spectrum 24 terminals to allow Abbott's operators to create work in process rules by scanning bar codes. During set up of a production line, as well as production, use of the system enables operators to verify that various Kit Packs being manufactured contain the correct assays and lot numbers. This is crucial as Kit Packs being manufactured are used for Pregnancy testing as well as testing for infectious viruses such as HIV, Hepatitis, and others. This verification system has been installed by Abbott personnel in Lake County as well as Sligo, Ireland and has been scheduled for installation in other Abbott international facilities. More recent projects included the creation of a radio frequency based touch screen application that assists Abbott's overseas distribution center in tracking and repacking of kits for distribution to other countries. This system incorporates Symbol RF equipment, PC touch screen technology, data matrix bar code readers, and customized data validation to provide the framework needed for proper packing, re-labeling, and reporting of work order items. We also service Abbott's many divisions with a variety of equipment and service needs including handheld and fixed scanners, portable and desktop printers, labeling software, custom media, bar code verification equipment, and equipment repairs.

## Parking Violation Tracking



### The Village of Oak Park - Parking Violation Tracking and Citation Printing

The Village of Oak Park was already using mobile terminal and printing technology for the issuance of parking violations when they came to BCI for assistance for a new system. They were interested in a solution that would allow them to integrate with their People Soft ERP software and the ability to easily modify and enhance any part of the solution. This would allow them to quickly adjust to changes that the Village made in parking laws. The Village also wanted the ability to perform host communications via RF (Radio Frequency) to provide ticket issuers to transfer the issued ticket data back to the city when near a village fire station or other city venue that had an RF access point. The above would facilitate more real-time data communications versus having to go to a specific location for batch communications.

BCI developed a solution for The Village of Oak Park using MCL Technologies development tools, Symbol Technologies PDT8146 RF terminals, and the rugged O'Neil MF2T mobile printer. Highlights of the systems functionality include:

- Vehicle "Chalking" Capture: The ability to log the time, date, vehicle information and vehicle location of a vehicle parked in areas designated for specific time limits.
- Scofflaw or Boot List Notification: Data on repeat offenders is held in the mobile terminal memory to allow instant notification for the user to take immediate action (boot or tow).

Validation files for input choices are downloaded to the mobile terminal for entry of plate state, violation type, vehicle make, vehicle location, and vehicle body type, and data inputs can be set for default ("IL" for Illinois, "Sedan" for Body Type, etc.) Collected data is uploaded to a flat file or ODBC compliant database or table on a host PC using either batch (RS-232) or RF (802.11b) communications and custom formats can be created for citations.

## Custom Solutions

### Cross Dock/Receiving/Delivery application developed with custom C++ programming



Using custom C++ programming, BCI developed a Cross Dock/Receiving/Delivery application for USF Logistics. This application is used in conjunction with the service USF provides a number of its clients, including Radio Shack, Music Land, JCPenney, Gap and Disney. The application was designed to run on Symbol PDT6100s, which were configured by BCI personnel in their Lake Bluff offices before being sent to several USF locations throughout the country. In addition to the initial application development and configuration, BCI manages several maintenance contracts for USF. More than 250 units nationwide are currently being supported by BCI with a Symbol Service Contract.

### WW Grainger – Portable Data Collection Simulation

For W.W. Grainger, BCI created custom C code to allow Grainger to run the software on any of the Symbol Series 3000 terminals. A custom program was written to simulate data collection routines and used as a training tool for future RF systems. The project included assessing Grainger's various business needs, working closely with IT and Operations staff, and creating a C program that allows managers to create their own custom data collection routines on the Symbol terminals. This is a powerful tool for Grainger as they can create data collection programs for various systems in only a few minutes – without doing any actual programming. The data collected on the Symbol terminals is then uploaded to a PC and integrated with other Grainger ERP and MRP software systems.



### APL Logistics – Terminal Emulation & Custom Programming

APL Logistics (APL) was in need of a mobile computer RF solution that could accommodate AS400 terminal emulation and a custom application for a PC-based warehouse management system. Such flexibility would allow portable terminal users to perform look ups and update their customer's host computer while also allowing the terminal to be used for their own internal warehouse management solution.



BCI accommodated APL's needs using Symbol Technologies PDT6846 terminals, and Wavelink Corporation's Avalanche and Studio software products. The Avalanche System provides wireless device and application management and allows quick and easy site installations and software upgrades. PC-based Avalanche is used to load software and updates to terminals and can use RS-232 or RF interfaces for configuration and software downloads, thus simplifying any changes to mobile device applications and configurations. Changes can be made for a specific terminal, a group of terminals, or globally. RF enabled Avalanche also provides APL with the ability to send text messages from the Console to a specific terminal.

BCI introduced APL to Wavelink Studio for the custom portion of the project. Studio sped and simplified wireless application development by allowing use of programming languages that APL internal staff already knew and could support. Studio's ActiveX libraries support OLE-compliant languages and allow APL to make global application changes, as applications reside on the server. APL can download the Studio application simultaneously with the emulation software via the Avalanche System allowing a terminal user to access both applications.

APL's goal was to increase accuracy and capture more information concerning their processes. Though the system and tools that BCI helped implement, APL is pleased to have eliminated 95% of errors that previously had not been caught and to have accurate information on what is being done, who is doing it, and when.

### Birds Eye Foods – Moving Computer Technology to the Manufacturing Floor

Birds Eye Foods was referred to BCI by APL Logistics when they were looking for fork truck mobile terminal technology for their facility in Coloma, MI. This facility provides labeling for canned food products and is a distribution facility for food products. Birds Eye was looking for a full screen terminal that would allow them to access an AS400 host and perform 5250 telnet sessions. They also needed the ability to scan location labels and other labels from a long distance. This was accomplished using Symbol Technologies VRC8946 terminal with a tethered LS3203ER variable range scanner. The terminals have a separate full sized keyboard. The terminal operator can either scan or key-enter data. BCI provided a site survey that specified the placement of the access points for the RF backbone as well as installation of the access points and system software.



## Label Design and Printing

### Advanced Transformer Company – Host Integrated Label Printing

BCI also does extensive consultation for customers. We have done work for Advance Transformer Company to reengineer their bar code and product labeling throughout the corporation. Advance is a division of Philips Corporation and has manufacturing plants throughout the United States, Mexico, and the Far East. They currently have a wide range of preprinted labels, thermal transfer printers, label generation software, and databases. All work independently of each other. Our first project with Advance was to create a bar code printing solution for their HID label family. Label Matrix was used to create label formats that are printed on a Zebra 105S thermal transfer printer. We reengineered their current printing solution to run Label Matrix on Windows NT and utilize their current SQL Server databases. This resulted in a user-friendly system for the operators who print the labels and saved Advance countless hours of label generation development.



### Peer Bearing Company – Label Design and Management

Peer Bearing generates thousands of labels each day from numerous workstations. Using a Network version of Label Matrix and printing to Zebra Thermal Transfer Printers, BCI developed a label generation and printing solution to ensure these labels are compliant with the customers' specifications.

One critical piece to the solution involved the integration of data from a proprietary database. Using the OLE db capabilities of Label Matrix, BCI developed labels that draw the data directly from the proprietary database, thereby eliminating the need for manual data entry by Peer associates.

In addition, BCI designed a number of labels for Peer's clients, ensuring that they met the specifications required and were then certified compliant. Existing labels were modified to meet certification requirements and ensure best print quality.

Peer employees are now able to generate compliant labels from any one of their several workstations, saving the employees valuable time and the company money previously lost to customer charge backs.

*Please call BCI directly for reference contacts. We look forward to helping you achieve your data collection goals!*

