

**Bar Code Reader Systems for Managing SSC Materiel
A Preliminary Feasibility Investigation**

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Introduction

The primary purposes of this paper are to determine

1. Availability of bar code systems,
2. Feasibility of using such a system in managing SSC Materiel,
3. Approximate labor and material costs to develop such a system.

An answer to the first item can be easily obtained by searching current magazines and journals, and by visiting stores stocking bar code systems. To provide answers to the second and third items, I investigated a system currently in use at LBL by the Administration Division's Property Accounting Department for property re-labeling and inventory control.¹

System Availability

Bar code reader wands are currently available for a number of popular desktop and portable computers. Wands for the Radio Shack TRS80 I became available in 1979, and I've seen them in use for various small applications ever since. Current PC magazines advertise bar code readers that plug into PC's and accompanying software for generating bar code labels on common dot-matrix printers. A sampling of this literature shows readers that will interface to the following systems:

PC's

IBM PC/XT/AT, PS/2
Tandy 1000SX/3000/4000
Zenith 248
Epson Equity I & III

Terminals

Wyse 50/75

Tandy DT 100

Kimtron KT-7/PC

Control Data Viking 721

Generic RS-232

As example, I found all of the above in a single advertisement in a March 1, 1988 issue of a trade journal. It was placed by American Microsystems of Texas. Just below this ad is another one for similar items from International Technologies & Systems Corp. of California. The advertised prices are \$79 for the bar code printing software, and \$495 for the device itself. These devices are simply keyboard interfaces, i.e., they plug into the system between the keyboard and the computer or terminal and ship the incoming data directly to the computer's console input for trapping by appropriate programs.

Integrated systems are available from several sources. These may consist of a small portable computer with a bar code reader attached. These units offer a variety of languages in which to program the reader and data handling software, some being proprietary and abstruse, and others being common such as BASIC.

Feasibility for Managing SSC Materiel

This may be best appreciated by examining the current LBL applications. The two I examined are re-labeling of Lab property, and property accounting and inventory control. The first consisted of adding bar code labels to all the current property not already labeled. This application required keying in large amounts of data corresponding to each item labeled. The re-labeling application has just been completed successfully.

The second application has been under development and is due for completion this month with implementation scheduled for June, 1988. The number of items that will be tracked and controlled is approximately 10,000. For this work four bar code portable readers and at least one IBM-PC will be used to transfer the data to the LBL IBM-4341 mainframe cluster.

Before these systems were in development, the LBL property accounting functions were handled by LLNL. A bar code system for this purpose has been in use at LLNL for a number of years.

One can see from these numbers that one or several similar systems could be used for the CDG effort and not initially be overloaded. At the SSC Laboratory itself, a group of such systems could handle the quantities of items that would be necessary.

Approximate Costs

The hand-held units selected by LBL were chosen for a number of reasons. Among them were its durability and the fact they are programmable in BASIC. This allows easier development and maintenance of the code than a unit using a little-known proprietary language. It also promotes initial development of a superior user interface program.

The units were acquired for approximately \$3000 each and are made by Mars Electronics.

Development of all the necessary programs plus general system design was carried out by a single FTE working on a as-time-permits basis since August 1987. This indicates a relatively small outlay in programming effort. Various programming tasks would include the hand-held reader user interface, the reader-PC interface and any peripheral data conditioning programs on the PC. In the case of LBL, these are done in BASIC and the PC-DOS Batch Language. The programs to manipulate and analyze the data could be written on systems such as the IBM-PC, Sun Workstations, VAX minicomputers, etc. This is another effort and is beyond the scope of this paper.

¹ Information on the LBL bar code systems was obtained by phone interview with Rich Nosek of LBL Data Processing Services