

# Notes on Operations

## Floating Bibs and Orphan Bar Codes Benefits of an Inventory at a Small College

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*This paper describes an inventory project completed at a small college during summer 2004, including the approach used, problems encountered, and benefits that resulted. It provides a step-by-step account of how the inventory was conducted using Innovative Interfaces' Millennium software with a laptop and a laser scanner. The intent in providing this level of detail is to assist others who might be undertaking an inventory for the first time, in the hope that much of what applies to Millennium software will apply to other library software systems as well.*

In spring 2004, the Anne Bridge Baddour Library (ABBL) at Daniel Webster College began to plan for an inventory of its collections. Several reasons suggested the time was right for an inventory: the collections had not been inventoried in recent memory, a visit from the accreditation committee was scheduled for 2006, and, with no new books arriving during a budget freeze, staff had more time for a large project. This paper details the approach used, problems encountered, and benefits that resulted from an inventory at a small college. It concludes with practical suggestions for libraries embarking on an inventory project of their own.

Daniel Webster College is a four-year, private college located in Nashua, New Hampshire. While the college offers undergraduate degrees in traditional areas such as business management, computer science, and social science, it also attracts many students with its aviation curriculum. The campus has approximately 1,200 students, of which about half are residential students and half are nontraditional students. The library is correspondingly small, with a staff of five full-time and three part-time employees, and a collection of about 33,000 volumes. The library uses

Millennium software by Innovative Interfaces, Inc. (III).

### Literature Review

The recent literature surrounding library inventories describes the various approaches used in a regional library system, the hardware and software used for an automated inventory, and the benefits of an annual inventory.<sup>1</sup> Another recent publication details an inventory hampered by the dual impediments of moving to temporary quarters and a database made inaccurate by the retrospective conversion of this database to an integrated software system eleven years earlier.<sup>2</sup>

The following paper differs from these in its scope. It provides a step-by-step, practical account of how staff at a small library conducted an inventory using Millennium software with a laptop and a laser scanner. The author describes the problems encountered and the benefits that resulted. The intent in providing this level of detail is to assist others who might be undertaking an inventory for the first time, in the hope that much of what was learned in this project will apply to other libraries as well.

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## Testing

Since all of the items in the ABBL collection have bar codes and the library owns Millennium's inventory control module, the logical approach was to conduct an automated inventory. The small collection size of approximately 33,000 volumes prescribed a survey of each item in the collection, rather than the use of proportional sampling. The question then became whether to use the Percon portable bar code reader acquired from the library's software vendor (III), or to use a laptop in conjunction with one of the Metrologic MS951 laser scanners positioned at three workstations in the library. This became an issue because of the difficulties encountered during initial experiences using the Percon portable bar code scanner. This unit comes with an attached light pen so difficult to operate that it renders the entire device virtually unusable. This difficulty was identified during a preliminary scan of the small staff reference collection (seventy-two items) a few weeks before the inventory was to begin. During this test, one might have to run the light pen over a single bar code more than twenty times before it registered on the unit. At that rate, inventorying the thousands of volumes in the library's collection would take an inordinate amount of time. A call to the III help desk resulted in the software vendor promptly sending a new light pen to attach to the Percon reader. However, this new light pen functioned only slightly better than the old, so it was still not a feasible option for running an inventory.

The Innovative Users' Group (IUG) electronic discussion group was an invaluable source of information on workarounds. Through this group, library staff learned of the Top Gun laser module, a more user-friendly attachment to the portable bar code reader; however, the campuswide budget freeze prevented the purchase of any new hardware. As an

alternative, IUG members proposed obviating the light pen issues by using a laptop attached to a laser scanner instead. This was the approach used in the library.

The first obstacle the library needed to overcome was obtaining a laptop. At one time, four laptops had circulated to the campus community, but these were not replaced as each failed over the years, and the library had only one laptop remaining. A staff member had an old laptop at home with the necessary software (Notepad) and the requisite serial port for the scanner, so the library was able to use this rather than take the library's one laptop out of circulation. The library also used existing hardware rather than purchasing new equipment in consigning the seldom-used bar code scanner at the reference desk to the inventory project for the summer. When connected to the laptop, this scanner successfully read bar codes into Notepad on the first attempt, without requiring installation of any drivers. Using this configuration, all the items in the staff reference collection were scanned within about half an hour. The only additional tools needed for a large-scale inventory were a wheeled cart and an extension cord to eliminate battery-life issues with the laptop.

## Timing

The best time in an academic library to conduct any project that is disruptive, even if only mildly so, is during a school vacation. The summer vacation was the best time to do this at Daniel Webster College because it was the longest break and inventory was expected to take several weeks. The library's goal was to begin the inventory in mid-May, after the students left, and to have it done by July 1. As the halfway point of the summer, this seemed the likely time for the staff to turn its attention to other projects

that had been slated for the school break. In addition, July 1 was the date when the part-time reference librarian would leave for a six-week vacation and the priority of staffing her hours at the reference desk would limit staff availability to carry out the inventory.

The inventory was begun in late May, as soon as possible after the students graduated May 15. Staff started with the circulating collection, the largest at 28,404 items, and finished that area in fifteen days. Staff then moved on to the reference collection and finished this area of 4,522 items in four days. Next was 310-item aviation video collection, which took only one hour to scan. A small flight center collection is located off site. Because this collection only contains forty-five items, printing the shelf list for this location and checking off those items that were present was easier than bringing the laptop to the off site location. A small feature video and DVD collection had been inventoried in the same manner over winter break; those collections were not reinventoried. In addition, the library has a small paperback collection that was not inventoried; because it exists purely for entertainment purposes and consists entirely of donations, the time necessary to survey it was not justified. Neither was the collection of audiovisual equipment inventoried, since these items are kept in a locked closet and anyone working at the circulation desk is prompted to inventory the contents of each item upon check in or check out. All of the bar code scanning, from start to finish, took almost exactly one month, from May 25 to June 24. The scanning was done in two- to three-hour shifts by two people, working about six hours a day, at an average of 307 volumes per hour. Since only one laptop was available, only one person could scan at a time. Examination of the reports generated from uploading the bar codes into the Millennium system was carried out simultaneously with

the actual scanning of items. The systems librarian also worked with these reports during the week between the time scanning was completed and the July 1 deadline.

## Staffing

While the systems librarian did much of the scanning, one person could not do this alone, if only because one's arm tended to ache too badly after about four hours of the repetitive motion. The cataloging assistant, who had some free time owing to the lack of new acquisitions, was recruited to help. The part-time reference librarian assisted by shelf-reading the collection a few steps ahead of those doing the scanning. The reference librarian also helped to comb through the reports produced by Millennium's inventory control module. In addition, the circulation supervisor supported the project by shelf-reading areas of the collection that the reference librarian could not get to before they were due to be scanned. Since ABBL has only five full-time and three part-time staff members, the inventory process effectively involved half of the staff.

## Software

Millennium's inventory control module is a separate area of the integrated library system that perform three functions: printing a shelf list, comparing a file of bar codes to the shelf list in the system, and transferring a set of bar codes to a review file. Review files in the Millennium system are a means of creating lists based on specific criteria; these lists can then be used to run statistical reports or to isolate a group of records for maintenance purposes. ABBL used this module for the second purpose listed above, comparing a file of bar codes to the shelf list order in the system. Once a file of bar codes has been uploaded

to the inventory control module and compared to the internal shelf list, the inventory date field in the record for these items is populated with the date the report was run.

The only other software programs used were Notepad, Microsoft Excel, and the file transfer software WS\_FTP LE. Notepad and Excel are fairly standard on most computers, and WS\_FTP LE is freely available for download on the Web. Bar codes were scanned into a simple text file in Notepad. The Percon portable bar code reader would have automatically converted the bar codes into a format the inventory control module could read; since this portable reader was not being used, the text files had to be manipulated before being transferred to the Millennium system. This was accomplished by using Excel to add the prefix "n:" to every bar code, then saving the file back to a text file. The result is illustrated in figure 1. This formatted text file was uploaded to the library's Millennium server using WS\_FTP LE; reports were then run within Millennium.

```

n:34652000569788
n:34652000547461
n:34652000132801
n:34652000147551
n:34652000132793
n:34652000132819
n:34652000582096
n:34652000620854
n:34652000333334
n:34652000328326
n:34652000504728
n:34652000147676
n:34652000430437
n:34652000504645
n:34652000445054
n:34652000132868
n:34652000132876

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**Figure 1.** Formatted text file with "n" added.

## Files

Had the library been using the Percon bar code reader, the size of a given

text file would have been limited to this hardware unit's capacity of about 3,000 bar codes. Because the inventory was being conducted with a laptop, however, the only limitation on the size of the files was the space on a floppy disk. For logistical purposes, small text files were created, each corresponding to a given bookcase. To manage these files, creating a numbered diagram of the bookcases in each collection was necessary. Text files were named according to the bookcase with which they corresponded in this diagram. As an example, a file called "circ1A.txt" would correspond to side A of bookcase number one in the circulating collection; "ref2B.txt" represented side B of bookcase number two in the reference collection, and so on.

## Sequence of the Project

The largest collection should be inventoried first; items that are missing from smaller collections often have been misshelved in the larger collection. The circulating collection at ABBL is the largest collection. When student workers reshelve books and overlook a reference or aviation label on the spine of the book, they usually place them (in error) in the circulating collection. These misshelved books were discovered when, for instance, an item listed as missing in an inventory report for the reference collection also would contain an inventory date corresponding to a date when staff had been scanning bar codes in the circulating collection. These items were not missing altogether, but rather missing from their home collections.

## Problems

Since items in the new books or display case areas are ultimately bound for the circulating collection, the library does not maintain separate location codes for these new arrivals. Thus these are

technically located in the circulating collection, even though they are not physically located there. As a result, the inventory reports flagged these items as missing from the circulating collection. This oversight was detected early in the process. If the item's home bookcase was in a part of the circulating collection that had not yet been scanned, the item was simply shelved in the appropriate home bookcase in the circulating collection. If, however, the appropriate location in the circulating collection already had been scanned, its bar code was inserted into the proper place in the text file and the report for that row was run again.

The error message that appeared most frequently on the inventory reports was "error misshelved." Often, particularly with multivolume sets, consultation with the shelves showed that, in fact, these items were in the right place. The error occurred because of the way the records are stored in the system. Millennium has bibliographic records that represent the intellectual content of a work. Item records representing the physical item itself are attached to these bibliographic records. The Millennium software expects items to be on the shelf in the same order that their item records are attached to a bibliographic record in the system. If volume 3 of a work is cataloged a few minutes before volume one, then volume three will appear as item one in the system, though it is item three on the shelf. Figure 2 illustrates the record for a multivolume set, in this case the series American National Biography.

As the illustration shows, the bibliographic record in the top pane has an order record and several item records attached to it in the lower frame. The item records are attached to the bibliographic record in reverse chronological order, a manner opposite to the way the Millennium system would expect. Volume 24, which Millennium would expect to be the last attached item, is in this case item

number 2; volume 23, which should be the next-to-last item, is item number 3, and so on. In reality, volume 1 was first on the shelf, followed by volume 2 and so on, but the inventory report flagged these volumes as misshelved because the items were attached in a different order in the system. Figure 3 shows the resulting inventory report. The "Last Item Shelved" message in this illustration

shows that the last item the system considered to be correctly shelved was volume one. Volumes two and three are shown as misshelved. Not shown in figure 2 are the remaining twenty-one volumes, all of which are tagged as misshelved in the report. Once the item records had been rearranged chronologically in the system, the inventory report no longer flagged these as misshelved.

B10308520		BIBLIOGRAPHIC Information	
CALL #	CT213 .A68 2002		
TITLE	American national biography. Supplement 1 / editors Paul Betz, Mark C. Carnes.		
IMPRINT	New York : Oxford University Press, 2002.		
Summary of Attached Records			
ORDER	01 >	LOCATION: ref; FUND: ref; STATUS: a	
ITEM	02 >	LOCATION: ref; BARCODE=34652000633808; VOLUME=v.24	
ITEM	03 >	LOCATION: ref; BARCODE=34652000633782; VOLUME=v.23	
ITEM	04 >	LOCATION: ref; BARCODE=34652000633766; VOLUME=v.22	
ITEM	05 >	LOCATION: ref; BARCODE=34652000633725; VOLUME=v.21	
ITEM	06 >	LOCATION: ref; BARCODE=34652000633733; VOLUME=v.20	
ITEM	07 >	LOCATION: ref; BARCODE=34652000633774; VOLUME=v.19	
ITEM	08 >	LOCATION: ref; BARCODE=34652000633741; VOLUME=v.18	
ITEM	09 >	LOCATION: ref; BARCODE=34652000633717; VOLUME=v.17	
ITEM	10 >	LOCATION: ref; BARCODE=34652000633618; VOLUME=v.16	
ITEM	11 >	LOCATION: ref; BARCODE=34652000633626; VOLUME=v.15	
ITEM	12 >	LOCATION: ref; BARCODE=34652000633667; VOLUME=v.14	

Figure 2. Record for a multivolume set.

SHELF LIST INVENTORY REPORT Mon Nov 29 2004 for LOCATION REFERENCE - 1st Floor			
Beginning barcode and call #	34652000542934	CT213 .A68 2002 v.	
Ending barcode and call #	34652000201697	E175.8 .F37	
Total number of items that exist in this range	247		
Number currently checked out	0		
Number of items with off-shelf status	0		
Number expected to be on the shelf	247		
A. Number of barcodes in input file	265		
B. Number of barcodes in input file that do not belong in this area of the shelves	24		
C. Number of barcodes in input file that are in wrong place in this area of the shelves	36		
D. Number of barcodes that are MISSING from the input file	6		
ERROR REPORT FOR LOCATION REFERENCE - 1st Floor			
Status	Call Number	Title	
LAST ITEM SHELVED	542934 CT213 .A68 2002 v.1	American national bi	
ERR msh	632545 CT213 .A68 2002 v.2	American national bi	
ERR msh	632511 CT213 .A68 2002 v.3	American national bi	

Figure 3. Inventory report.

The shelf order of items, as understood by the Millennium system, also could be thrown off if a call number had been keyed with extra spaces. However, in many cases an item was, in fact, misshelved, in spite of the library staff's best efforts to catch these errors through shelf reading. These were repositioned in the correct location, thereby making the shelves more accurate.

The bar code scanner's occasional tendency to misread a bar code was an unexpected and, at times, very misleading, complication in the inventory process. At one point, the scanner input every bar code as a string of symbols into Notepad. Fortunately the manual for the bar code reader contained a bar code which, when scanned, restored the reader to its default settings. When the bar code misread a single digit, this could be more problematic. A 4 might be read as a \$, or a 7 as a /. Where the bar code scanner misread numbers as symbols, they were fairly easy to catch, as they leapt out to the eye when scanning a report. However, the scanner periodically misread a number as another number, with a 4 being read as a 6, a 9 as a 7, and so on. These were indicated on the reports with the message "bar code not in database," and a good deal of time was spent tracking down the correct digit. The best way to identify the correct number was to open the text file in Notepad, and use the "find" command in the Notepad toolbar to locate at least a portion of the flagged bar code. Based on the bar code preceding this one, staff was able to locate the book on the shelf and correct its bar code in the report. An example of Notepad's "Find" command highlighting a portion of a bar code is shown in figure 4.

The "bar code not in database" error message also alerted staff to bar codes that had been keyed incorrectly during cataloging. A great many such errors were corrected. These might otherwise have been detected only

sporadically, through failed checkouts and the like.

## Database Cleanup

The inventory provided for database cleanup on both simple and more complex levels. On a simple level, the status of many items was corrected. For instance, books that were marked as missing or checked out but were present in the expected location on the shelves were updated to reflect a status of available. Conversely, items marked as available that were never scanned during the inventory were marked missing. Some items turned up that were not in the system at all, for whatever reason. Having been identified during the inventory, these have now been cataloged. Four items were located that had been marked lost and paid. Staff attempted to contact the patrons who had paid for the replacement cost of these items in order to reimburse them.

The locations in the catalog were another simple area where the inventory enabled greater accuracy. Sometimes items are intentionally relocated to another collection, as when a previous year's edition of a reference book is transferred to the circulating collection upon the arrival of the current edition in the reference collection. In many cases, the location code in the system had not been updated to reflect this change. All such items were corrected in the catalog, and thus the findability of the collection is greatly improved.

Many simple bar coding errors were discovered using the inventory reports. Bar codes that had been attached to a book but never entered into the system were indicated by the "bar code not in database" message. These orphan bar codes were reunited with their corresponding bibliographic parents. The reports also flagged cases where a single bar code, intended to represent only one item, had been assigned to the records for two different items. New bar codes were insert-

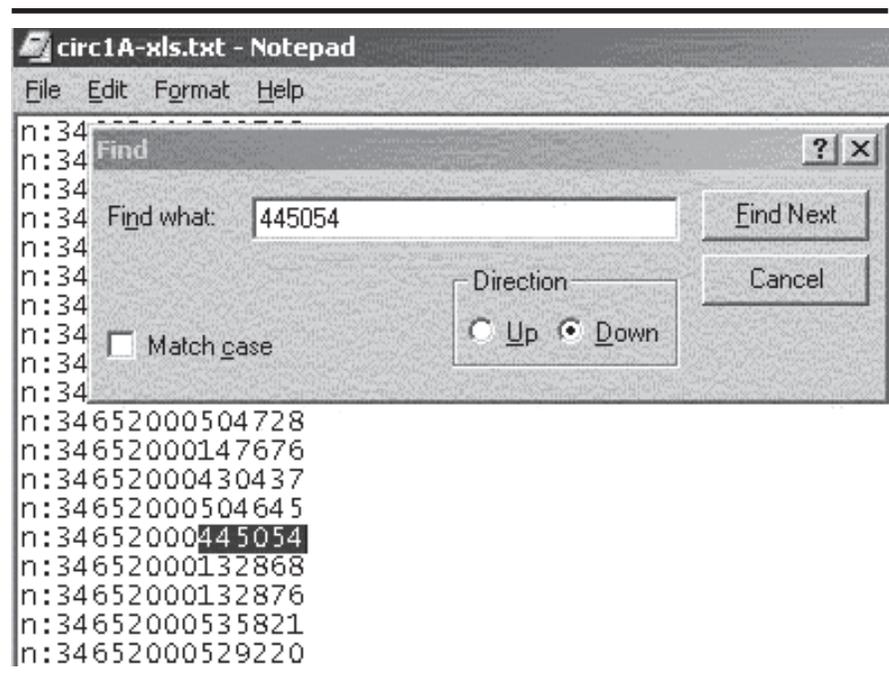


Figure 4. Use of Notepad's "find" command to find a portion of bar code.

ed into these records. Bibliographic records that had no attached item records at all were indicated in the reports by the message “error no item record.” These floating bibs have now been anchored to their item-level counterparts in the system.

In addition to these types of simple errors, the catalog had more complex cataloging inaccuracies that the inventory enabled the library to amend. Ever since the library had migrated from Data Research Associates’s MultiLIS system to Innovative’s Millennium in October 2000, the library had a problem with the MARC tags 090 (local call number) versus 050 (Library of Congress call number) in certain records. For a large number of items, the catalog would display the number in the 050 field, while the number in the 090 field was what actually appeared on the spine of the book. Where these two numbers differed, sometimes wildly, this would render the book virtually lost. The previous systems librarian had come up with an ingenious software-based solution to this problem, but a small group of records had escaped this correction. When investigating the reports, these items were very apparent; they would have an “error misshelved” message next to them. Simply eyeballing the report would show that the call number for that particular item differed greatly from the surrounding ones.

## Results

The inventory showed that a very small portion of the collection was missing—only about 0.68 percent. This may be a tribute to either the integrity or the students or of the library’s 3M security system, but it also could be attributed to the low circulation of the collection; there were 2,552 circulation transactions from the circulating collection and 10,710 from the library as a whole in the 2003/2004 academic year. These small circulation

figures reflect the small size of Daniel Webster College.

## Going Forward

For items flagged as missing in the reports, the shelves were checked and then the records were either marked as missing or updated with an inventory date if the items were found. If the item was still found to be missing, a note was added in the item record stating, “Missing in Summer 2004 inventory.” Lists of items with this note will be generated and searched for on a quarterly basis. The records for these items will be deleted if they have still not been located after the fourth quarter, at which time decisions about replacement will be made.

## Conclusion

The inventory was beneficial on several levels. First, in giving an accurate picture of what was on the shelves, it allowed the corresponding records in the system to be corrected. Second, it improved the shelf order of books in the ABBL collection. Third, it gave the staff a meaningful project during a budget crisis, when no new books were arriving. Finally, in anchoring orphan bar codes and floating bibs to either their parents or children, the inventory improved the usability of the collection and the catalog. Other libraries likely will find many of the same benefits when they conduct inventory. This paper concludes by offering practical suggestions (based on the author’s experiences) for libraries considering, or already committed to, an inventory project.

## Practical Suggestions

- *Decide whether or not you are going to allow items to circu-*

*late while you are conducting the inventory.* I decided to let items circulate because our system would account for these items as “OK checked out” in the inventory reports. The inventory date field in the item record would not get populated for these items; however, the last checkout field of the item record should provide enough proof that the physical item was released from the library on a particular date.

- *If you do allow items out, decide what you are going to do with them when they come back.* Some libraries might decide to collect returned items on a cart for several months after the inventory and update the inventory date field for these items as they come back. I decided the need to get items back into circulation as quickly as possible outweighed the benefits of updating the inventory date in the records for these books. Instead, I am relying on the last check-in field in these records to indicate to staff members the last time this item was ever seen, as opposed to the inventory date field that I am using for the bulk of the collection.
- *Reshelve display books and any other items that may be separate from other collections if they are not listed as having a separate location in the catalog.* Otherwise these will turn up missing in the reports.
- *Shelf-read first.* Items that are out of order on the shelves will lengthen the error reports generated by the software.
- *Draw a map.* Create a diagram of the stacks holding your collections and label them with the range of call numbers they contain. Then number each bookcase. For instance, in our circulating collection, I started

with the bookcase containing call numbers that begin with A and labeled this bookcase 1, with the left side being 1A and the right side being 1B, and so on. Then I could point to a location on the map when updating other workers on our progress. Be sure to write the dates you inventoried a given row on the map as you go along; if you are cannot find an item, and the inventoried date field of its item record contains a recent date, at least you will be able to consult your map to determine approximately where that item is. Then you can bring up the corresponding text file of bar codes, and use the find command on the Notepad toolbar to locate the bar code in the file. Note the bar code preceding it, and look up the corresponding call number in your system to determine location on the shelf.

- *Inventory your largest collection first.* Our work-study students, who do much of our reshelving during the academic year, can not always keep our various small collections straight, and so the circulating collection becomes the catchall for items that should be shelved in reference, new books, aviation, and so on. If you do your default collection first, these misshelved items can be identi-

fied and returned to their proper homes in time to provide smoother reporting on smaller collections.

- *Clean up the database as much as you can before you start running the reports.* When items are withdrawn, we mark them with either the letter d or w in the suppress field of the bibliographic record. The presence of either of these letters in this field suppresses them from the public catalog, while allowing us to retain the records in our system should we need to consult them for statistical or accounting purposes. However, the Millennium inventory control module still expects these types of records to be on the shelf, and so these throw off the reports. Extract the data you need from these withdrawn items, then delete the records altogether before running any reports.
- *Try to keep up with the reports.* Because we are a small operation, I was heavily involved with the actual scanning of bar codes, and almost entirely responsible for examining the resulting reports. I kept the scanning going at a brisk pace, but was not always able to look at the results as soon after the scanning as I would have liked. Since our collections were still open to the public, getting an accurate picture of what was

on the shelves was like trying to hit a moving target, which worsened as time passed and items were checked out from or returned to the shelves.

- *Check and double check.* The inventory reports will list an item as missing even if it correctly has a status in the system of lost and paid, or withdrawn. Be careful to check and double check all items listed as missing so that you do not include them in your inventory statistics when they are not, in fact, missing. Although they may not be on the shelves, they are accounted for in other ways.

#### References

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