

Editor's Note: Beginning with this issue, NORTH CAROLINA LIBRARIES will publish at least one article that is unrelated to each issue's specific theme. The Editorial Board is delighted to introduce this feature to address the increase in excellent unsolicited manuscripts which merit publication.

On the Road to Automation: Technology and North Carolina Bookmobiles

by Karen Zeliff

Day to day library operations include a variety of data-intensive tasks requiring storage and retrieval of information about books, patrons, and the current status of both. Many libraries have installed computerized systems to facilitate access to their files, and dozens of turnkey vendors offer total packages of a central processing unit, CRT terminals, wands or laser scanners, and machine-readable labels (barcodes) for materials and borrower's cards. But while automated library systems have been growing in popularity throughout the country since the early 1980s, the development of mobile library automation has proceeded at a much slower pace.

It was only six years ago that the Westminster Public Library system in Colorado became the first bookmobile to go online with the assistance of a radio modem.¹ Since that time improvements in telecommunications and data storage techniques have reduced many problems associated with linking the bookmobile to the library mainframe. A 1989 study of rural bookmobiles conducted by the Center for the Study of Rural Librarianship indicated that one in every ten bookmobiles throughout the country is automated.² Cathy Alloway, author of the first monograph on bookmobiles to be published in the last twenty-five years, estimated the number of automated bookmobiles to be much higher — as much as 50 percent.³

These "national averages," however, do not reflect local trends in bookmobile automation. Although a study of the 1989

American Library Directory ranks North Carolina second in the top ten bookmobile states (having sixty-two bookmobiles in seventy-two libraries), only three of these bookmobile operations are automated despite the fact that a large percentage of the libraries supporting these mobile services is already using automated systems.⁴ It appears that, at least in our state, the automation of bookmobile services is frequently approached as an afterthought to the automation of fixed facilities.

Tracing the development of the Rockingham County Public Library bookmobile automation project - the motivation, options, choices, and results — should help to clarify some of the issues and concerns involved in the automation of mobile libraries. Hopefully, it will suggest that while some very real difficulties must be addressed when attempting to automate a mobile unit, the benefits — in terms of public service to bookmobile patrons — make the expenditures of time and effort to overcome these difficulties very much worthwhile.

OUR PROBLEM

In Rockingham County, the headquarters/technical services building and five branches use telephone lines to connect twenty-three CRT terminals with the databases on the CLSI LIBS 100 system which utilizes a UNIX platform. The library data contains title records for over 240,000 volumes, more than 31,000 patron records, and tracks the circulation of over 400,000 items annually.

In addition to these opera-

tions which are conducted at the fixed facilities, the bookmobile (a retrofitted Ford truck) carries 1,700 books and materials in other formats, services over 1,500 patrons in a service area of 525 square miles, and accounts for almost 15 percent of the library's annual circulation. Most importantly, the bookmobile brings the library to people who cannot get to the branches independently because of personal limitations. Many stops are located at retirement homes, senior citizens organizations, and daycare centers.

When the library first initiated a fully integrated online catalog, circulation, and acquisition system in 1984, little thought was given to automating bookmobile procedures although the Outreach collection was barcoded and its records converted as part of the total retrospective conversion process. At that time library automation was still in its infancy; there were no automated bookmobiles in service; and automation vendors had not yet addressed the demands of mobile service.

As time progressed, the limitations of the bookmobile's manual circulation system became increasingly intolerable. The Outreach circulation system utilized a Gaylord Chargecard machine to maintain a book-card file which was organized by bookmobile site. Inventory control was limited to manually searching over four thousand individual book cards arranged alphabetically in over one hundred card stacks. The total volume of book cards and a shortage of staff time made tracking overdue materials al-

most impossible, and a large number of non-traceable, lost books inevitable. Compounding the problem were the numbers of items with lost or missing cards, and of extra cards that were recovered after they had fallen out of the card pocket of the wrong book. Any item without the proper identification card had to be removed from circulation until the entire card file had been searched, the proper card located, or the item reprocessed with a duplicate book card. An interminable backlog of "snagged" items was the inevitable result.

Patron access to Outreach holdings was also severely handicapped by the restrictions of the manual circulation system. Because Outreach services draw from an independent collection stored in the basement of the library's headquarters building, patrons at other locations in the system had access to the Outreach collection of seven thousand titles (including the system's five thousand volume large-print collection) only by request. Reserves for requested items could be processed only by individually searching the book-card stacks and flagging the appropriate card. In addition, poor circulation control prevented the OPAC of system holdings at other branch locations from accurately reflecting the current status of any Outreach book. Numerous requests for titles already on loan or missing from circulation were made by patrons at other branches. Patron and staff dissatisfaction was high when requested titles were received in a hit-or-miss

fashion and the status of Outreach hold requests could not be guaranteed.

Collecting accurate circulation statistics and records of patron activity was also severely hampered by the unmanageable book-card system. Monthly statistics were gathered through a labor-intensive process of counting each book card individually (including cards that reflected unidentified lost items and snags), and "guessing" in which statistical category to place the item. Results could not be considered totally representative of the circulation activity of Outreach operations, which consequentially reduced their value as tools for evaluation and planning.

OUR SOLUTION

By July 1988, the loss of a full-time staff person accelerated the already intolerable circulation control problems, and library administrators decided that an automated circulation system should be provided on the bookmobile. In May of the following year an Offline Circulation Workstation configuration which included a WYSE 2108-20 personal microcomputer (an IBM compatible), lightpen barcode reader, other required hardware components, and applications software, was purchased from CLSI. The Offline Circulation Workstation is able to support up to four concurrent local or remote users in the same agency. It includes both Offline Circulation software and Terminal Emulation software which permits the workstation to be used for Offline Circulation features. Total costs for the system were approximately \$7,400.

Once purchased, the Offline Circulation System could not be installed on the bookmobile due to auxiliary generator malfunctions.⁵ On July 1, 1989, the Outreach Department decided to automate its circulation process even though the offline workstation had not yet been installed on the bookmobile. Patrons were reregistered and given barcoded

library cards, and circulation records were recorded manually on the bookmobile to be keyed into the PC after each day's run. A UPS device (uninterruptible power source to prevent power surges and abrupt power loss) was purchased in April 1990 and installed on the bookmobile (at an additional cost of \$400), and full bookmobile services resumed with the microcomputer onboard on May 8, 1990.

Automating Outreach circulation procedures has been a great success, and has resulted in the following improvements to patron service: 1) intralibrary loan requests to the Outreach department have greatly increased as other agencies have become confident that OPAC readings give accurate information about the status of Outreach holdings; 2) Outreach patron records are now complete and accurate, and can be called up by patron request at any facility; 3) Outreach staff have access to patron records and can restrict borrowing privileges for delinquent patrons; 4) overdue notices are generated automatically, facilitating tracking of delinquent materials and substantially reducing the number of lost items; and 5) circulation reports can now be accurately and automatically produced in the format established for other agencies.

The automated system has worked well under actual operation conditions on the bookmobile with only minor adjustments, and no major problems are anticipated in the future. There are, however, alternatives to the microcomputer based circulation system purchased by the RCPL which should be investigated prior to making any decision about automating mobile library services.

OPTIONS

Mobile computer systems are generally of two types: 1) online — linking a terminal on the bookmobile to the main computer system via packet radio transmissions, an acoustic coupler located at each bookmobile stop, or a cellular telephone to provide dial-in access to the pri-

mary database; or 2) offline — relying on batch transaction of circulation activity stored on a microcomputer system or a portable, battery operated barcode scanner and downloaded into the central computer databases at the end of the day. There are two other libraries in the state which have each used a different process to automate successfully their bookmobile operations.

The Onslow County Public Library utilizes the Highland Library System which is designed on the Pick operating system and runs on an IBM RT model 16151.⁶ The OCPL purchased a "Porta-Scan" portable, battery-operated barcode reader which is used for circulation control on the bookmobile; collection inventory for the library system; and branch backup when the primary system is down. The scanner operates from two databanks, has a 32K memory (which holds 3,300 circulation transactions and is able to track site statistics as well as patron statistics), and can be

downloaded in about fifteen minutes. The Porta-Scan was added as an afterthought to the original automation package for a cost of about \$1000. Operators have reported very satisfactory results with both the Highsmith System and the compatible barcode scanner. The library is investigating a future purchase of dataradio equipment to provide online service to its bookmobile.

For the past four years the Durham County Public Library System has operated a fully integrated Dynix 120 system which is accessed through a remote mainframe shared with other county government departments.⁷ The automation of bookmobile operations was incorporated into the original system planning and was initiated simultaneously with the automation of fixed facilities. The DCPL bookmobile is linked online to the main computer through an ASCII terminal connected to a radio modem. The packet radio system, designed by Dataradio of

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When the system is operational, the packet radio system allows the bookmobile to have full online access to system and

patron records. It allows bookmobile staff and patrons to take advantage of all the options available through the online catalog and offered to patrons at fixed locations. Yet bookmobile operators report that there has been some difficulty servicing the dataradio when repairs were necessary. At one point the bookmobile was offline for three months awaiting parts. There is no local support for servicing the equipment; the supply vendor is overextended on maintenance contracts; and service is extremely slow. Other difficulties are that antennas are hard to install and adjust, and the device does not have the option of running a printer.

RECOMMENDATIONS

Looking back, the decision to automate the RCPL bookmobile using a microcomputer system to download circulation transactions into the primary database was probably the least practical choice of the three discussed above. It has no greater capacity (in terms of actual checkout and checkin func-

tions) than does the portable barcode scanner; relies on an external power source; is not portable (and therefore cannot be used for inventory); and is at least seven times more expensive. While the microcomputer does have greater potential for use in other library applications (as a wordprocessor, terminal emulator, etc. — probably the reason behind its selection), and it does allow for multi-terminal use (for two circulation desks in the front and rear of the vehicle), its use on the bookmobile is limited. It requires special handling to prevent terminal and hard-drive damage while in transit, and is sensitive to environmental stress (heat, humidity, etc.) typical of on-road situations. Downloading is a time consuming process that requires that data first be transferred to disk, or cabling be run between the bookmobile and the main computer.

The most effective and economical system currently available for bookmobile automation is the packet radio transmission system. It is the only system which can provide full-service access at a minimal cost. Other full-service options requiring the use of leased telephone lines are frequently impractical to implement and are expensive to maintain. Yet the service restrictions on the packet radio system currently marketed warrant serious consideration before contracting. At this time the best advice that can be given to bookmobile librarians wishing to automate their vehicles is to adopt an intermediary circulation control system — best

represented by the portable barcode scanner — and wait until future improvements in data radio or telecommunications technology provide a product which will be a more satisfactory solution for mobile library automation.

Editor's Note: *Onslow County Public Library's bookmobile was taken off the road because of 1991 budget cuts. The portable scanner described in Zeliff's article is still an excellent mechanism for both inventory and emergency backup when the online circulation system is down.*

References

¹"Bookmobile Claims a First in Online Mobility," *American Libraries* 16 (September 1985): 534.

²Bernard Vavrek, "Rural Library Service: An Interim Report," *Wilson Library Bulletin* 63 (May 1989): 30.

³Cathi Alloway, "Bookmobile Service: A National Perspective," Presentation made at Bookmobile Conference, Greensboro, North Carolina, May 1, 1990.

⁴"For Your Information," *On the Road* 1 (Winter 1989-1990): 12.

⁵OSHA issued an abatement notice for use of the bookmobile's auxiliary generator because of toxic fumes emissions which was not lifted until May 1, 1990, after repairs had been completed.

⁶Information on the Onslow County Public Library Automation System was derived from an interview with Debbie French, Computer Specialist, May 1, 1990.

⁷Information about the Durham County Public Library Automation System was derived from an interview with Joanne Abel, Bookmobile Librarian, May 1, 1990.

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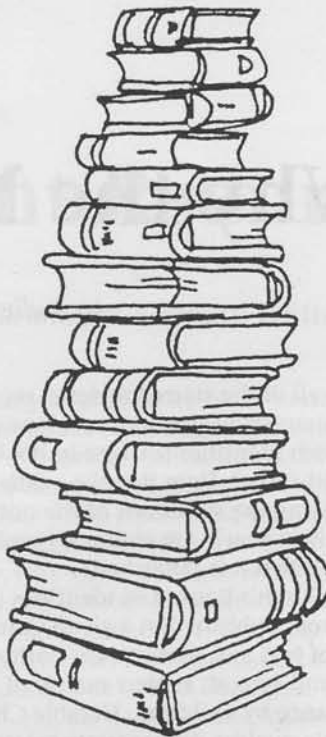
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— North Carolina Libraries, Winter 1962, p. 43.

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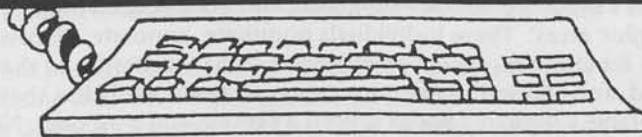
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