

A PROGRAM FOR SELF-SERVICE PATRON INTERACTION
WITH AN ON-LINE CIRCULATION FILE

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ABSTRACT

Northwestern University Library's on-line system (Northwestern On-line Totally Integrated System) circulation module has used self-service check-out terminals for over six years. In September 1975 a new self-service module was added to the system to allow self-service inquiry into the circulation file via a Cathode Ray Tube (CRT) IBM model 3270. At that time the library faced a number of problems concerning internal security, ease of entry and user acceptance of this new library service. After nine months of operation, statistics and user comments indicate that the terminal has been accepted as a vital service of the library. Observation has shown that the users are willing to wait in line to use the terminal at peak hours and that its usage is comparable to the staff on-line circulation program usage. The consensus of the library staff is that this constitutes an additional user service because it has not changed the numbers of inquiries to the circulation desk, only their nature. User reluctance has not been a problem as anticipated and in fact, users have requested that data other than the circulation status of a book be made available from the terminals.

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INTRODUCTION

When the on-line circulation module was developed in 1970 as part of NOTIS (Northwestern On-line Totally Integrated System), one of the ideas for future development was a program to allow patrons to search the circulation file to check the status of a book. This idea was tabled at the time due to the lack of staff and the relatively slow printing time of the 2740 typewriter terminals. With the addition of another programmer to the staff and the upgrading of the 2740 terminals to 3270 Cathode Ray Tube (CRT) terminals in late 1974, a project was begun to develop a program for remote user access to the circulation file. The LCUS (Library Circulation User System) program was completed and added to the CRT located in the reference department in September 1975.

DESCRIPTION OF CIRCULATION FILE AND SYSTEM

Although a complete description of the circulation module of NOTIS including the circulation file can be found in several previous articles, some of the basic information needs to be presented to insure understanding of the constraints of the system. The circulation file contains information only on books which are charged out; all other books are presumed to be in their proper locations in the library. Books which are charged out through the circulation file include those charged out to users, carrels, library locations (e.g. Reserve Room), library functions (e.g. Bindery or Interlibrary Loan), and books which have been reported lost or missing, but which have not yet been withdrawn. The first forty characters of the Dewey Decimal based call number are used as the key to the records which are kept in a VSAM disk file on an IBM 370/135 computer. Included in each 67 character record are the full call number, the charge date, the borrower's ID, the renewal date, the discharge date, the save date, one saver's ID and the due date.

This file is accessed by a number of programs, both in on-line and batch modes as shown in Fig. 1. It can be updated by the IBM 1030 check-out terminals or by the circulation CRT's which are used to check the status of books and to place saves. The batch programs which are run against the file produce the fine notices, overdue notices, book needed notices, book available notices and the quarterly notices for the faculty.

The circulation CRT program displays the entire record for a book. This includes the borrower's ID and a saver's ID if a save has been placed on the book. Because a staff member was needed to interpret this display and to maintain security on the ID number(s), patrons were encouraged to consult the circulation desk only if they could not find the book in the stacks or if they desired to place a save on the book. Because of the physical distance involved, many patrons were reluctant to return from the stacks to the desk to ask for this information.

PROGRAM RESTRAINTS

The new program has been developed with the easiest possible data entry for the user with instructions which make it possible for anyone to walk up and use the terminal. A natural language type answer is used to help overcome user reluctance. The program therefore has to translate the information, which is input, into the key for the record. The program had to be as "user proof" as possible as remote terminals in other locations are being considered for future use. It is also necessary for the program control to be returned to the system after each transaction so that constant screen renewal and checking does not tie up more time and computer core than necessary.

The information which is available from the terminal is basically all the information that is obtainable in the circulation record, but in a more generalized format. In most cases the user is given the date on which the book is due. Since the library allows the faculty to keep books as long as needed, it was felt that some of the due dates might discourage potential borrowers. Therefore the program returns the simple message that IT IS OVERDUE for overdue books. The user is told if a save has been placed on the book together with the approximate date he could place a save for himself, based on the due date of the book. If the book is charged out to a department in the library, the user is given the location at which the book can be found or at least inquired about. If a book has been returned recently (returned book records are kept in the circulation file for one week after they are returned) the user is given that information and told to inquire about it at the circulation desk if it has not reached the shelves yet.

Some information was determined to be unavailable because of policy or restraints on the system. It was decided that the user would not be given the name or number of the person who had the book checked out. Since the circulation file maintains information on only the books which are in circulation at a given time, the user could not be informed by this terminal of the actual number of copies, which volumes or editions were held by the

library or whether a book is in the library's collection. Therefore as a part of the basic screen display (fig. 2) the user is told to check the shelflist for this information. This is also reinforced by another message returned at the end of a browsable display when there are a number of copies, volumes or editions in the circulation file.

PROBLEMS AND SOLUTIONS

One of the major problems was how to get enough of the call number into the system to be able to give a good reply. This stemmed from the fact that in order to get the full key, the user would need training in how to interpret the number including the workletters and key extension which delineates copies, volumes and editions. It was apparent that it would not be practical to try to teach the entire user community this, so it was decided that enough of the number was included in the first two lines of the call number to limit the output to a browsable selection. In order to keep the natural language output, any short key that had more than one entry in the file would access the entries one at a time and include a message on the bottom of the screen indicating that THERE IS ANOTHER COPY/VOLUME/EDITION IN THE FILE. The user is then instructed to PRESS THE ENTER KEY TO SEE IT. This solution has worked well in most cases, but has created a problem in the case of large volume or copy holdings. The entries are displayed in the order in which they are held in the circulation file. This means that they are in computer sorted order i.e., vol. 1, vol. 11, vol. 120, vol. 17, vol. 2, etc. It has been found that the user will get to vol. 11 and figure that vol. 2 is not checked out. It seems that user education is the best method of handling this problem.

Another problem in which this solution was unacceptable is in the case of the call numbers which are continued on the second line. Sometime in the history of the card catalog, a policy was used which allowed Dewey Decimal numbers to be broken at a zero and continued on the second line of the card. Thus Dewey number such as 331.30942 would appear as 331.3/.942. This situation was easily recognizable to the computer program because of the decimal point on the second line. Encountering the decimal therefore triggers a message to ENTER THE THIRD LINE OF THE CALL NUMBER, unblocks the third line area and moves the cursor to the first location in this area. The third line then corresponds to the second line of a common call number and is handled as such.

Another unusual call number format was found in the call numbers used for the classics. In this case the Cutter number is contained on the first line. In order for such a number to be processed, the program has to scan the entire first line for alpha-

abetic characters and recognize that in the second or third digit locations, characters are invalid and that after three digits, they are the start of the Cutter number. It should be noted at this time, however, that unless it is a hyphen or a small L, an alphabetic character in the first location is a valid location indicator. In such a case the letter is ignored and is not used in deriving the key for the book.

A hyphen in the second or third location of the first line is used as an indicator of an in-process number, which has a format of 999-999999. It was also decided that in the future it might be used in the first location to indicate a different type of call number, such as a Library of Congress number. Therefore when a hyphen is found in any of the Dewey number locations, the message that THIS NUMBER IS NOT A DEWEY DECIMAL NUMBER appears and the user is instructed to TAKE THIS CALL NUMBER TO THE INFORMATION DESK.

The small L is another character which is looked for in the locations reserved for the Dewey number. This was done to help reduce the number of non-hits due to the typing of a small L in place of a numeric one. When a small L is used in a location before the decimal point the following error message is given: USE THE NUMERIC 1 - NOT THE SMALL L. The location following the decimal point can not be searched for this error because it can legally be used as the initial letter in the start of the workletters for the call number.

One other problem number was found in the case of the dissertations which have been cataloged in numerous ways throughout the years. In all cases the dissertations have been assigned a Dewey number of 378 and no other books have been assigned this number without a decimal and following numbers. Therefore if any of these are entered the following message is returned: THIS BOOK IS A DISSERTATION. PLEASE TAKE THIS CALL NUMBER TO THE CIRCULATION DESK.

PROGRAM DESCRIPTION

In looking for a basic screen display layout several formats were considered, but the one which seemed to give the best usage of available space was the split screen approach used by the University of Connecticut at Storrs. It had the advantage of keeping the information that remained on the screen and that entered by the user separated from the information returned by the computer. The information which was put into the basic screen display contained both information which the user would need to operate the terminal and information which he should keep in mind when using it. A layout for this display is given in figure 2.

When the program is first called, the screen display is put on the CRT. The program then returns control of the CRT to the CICS management system and it polls the terminal as if it were waiting for a program call. When data is entered on the screen the program is again called and the check on the location of the data on the screen transfers control to the second segment of the program which then does the error checking and construction of the key for the record in the circulation file. Control is then passed to the third segment of the program which looks up the record. After the record is checked, the message is made up from a table of separate lines based on the conditions which exist in the record. If the record is found, the next record in the file is checked to see if it is another copy, volume or edition of the book. If it is, the full key is stored on the CRT screen in a non-displayed mode and the following message is added to the screen display: THERE IS ANOTHER COPY/VOL/ED CHARGED OUT. PRESS THE ENTER KEY TO SEE IT. Control is then passed back to the management system again. If the program is entered again in this situation without changing the initial data, the non-displayed key is found and control is again passed directly to the third segment of the program. When the final record matching the original short key is found, the screen message is changed to read THIS IS THE LAST COPY/VOL/ED CHARGED OUT. CHECK THE CREDIT LIST FOR OTHER COPY/ED HELD BY THE LIBRARY.

On any screen display after the initial screen display, the following message is displayed at the bottom of the screen: PRESS THE CLEAR KEY WHEN YOU HAVE FINISHED. This will automatically generate an original call for the program and replace the basic screen display. Specific codes are available to clear the screen and allow access to other programs.

USAGE STATISTICS

Daily usage statistics are kept by the CICS management system for all of the programs used on-line in NOTIS. From these statistics it is possible to determine how many program entries to complete one transaction. The statistics show that LCUS usage follows the same general week to week library usage pattern as the rest of the Library with slow periods at the beginning and after the end of the academic quarters (see figure 3). Maximum daily usage for the period measured has been 1400 program entries. This corresponds to approximately 700 item lookups in a period from 8 a.m. to midnight.

A second concern was the effect that this terminal might have on the staff circulation lookup program usage. According to the circulation staff, inquiries have not dropped off but have consi-

derably changed in nature. The users are asking to have saves put on books more often as opposed to asking why a book is not on the shelf. Comparing the circulation program usage for the same periods of time, the programs seem to be used about the same number of times with staff usage being slightly heavier toward the end of a quarter when the largest number of books are being returned (see fig. 4).

One of the major concerns when this project was begun was user acceptance and ability to use an on-line terminal. In order to determine the number of users and their desire to use LCUS, a system of random counts of the number of people at the terminal was set up. These counts were done on the half hour on a random sampling from all three quarters for all hours the library was open. It was found that the number of people in line rarely exceeded one person other than the person at the terminal (see figure 5). It was found that the usage curve peaks and lows followed the same general usage pattern of the library within each day. When the total number of users were divided by the number of times a count was taken it was found that there was an average 1.06 users at the terminal. This indicates an overall queue of 0.06.

CONCLUSIONS

This data supports our observation that the LCUS program has made a substantial addition to the library services offered at Northwestern. The high usage of the program and number of users make it apparent that the program has achieved the goal of being usable by, as well as being helpful to, library users. The LCUS program has also reinforced Northwestern's belief that a self-service on-line catalog with access to bibliographic and holdings information, as well as circulation data, is acceptable as well as feasible in an academic library.

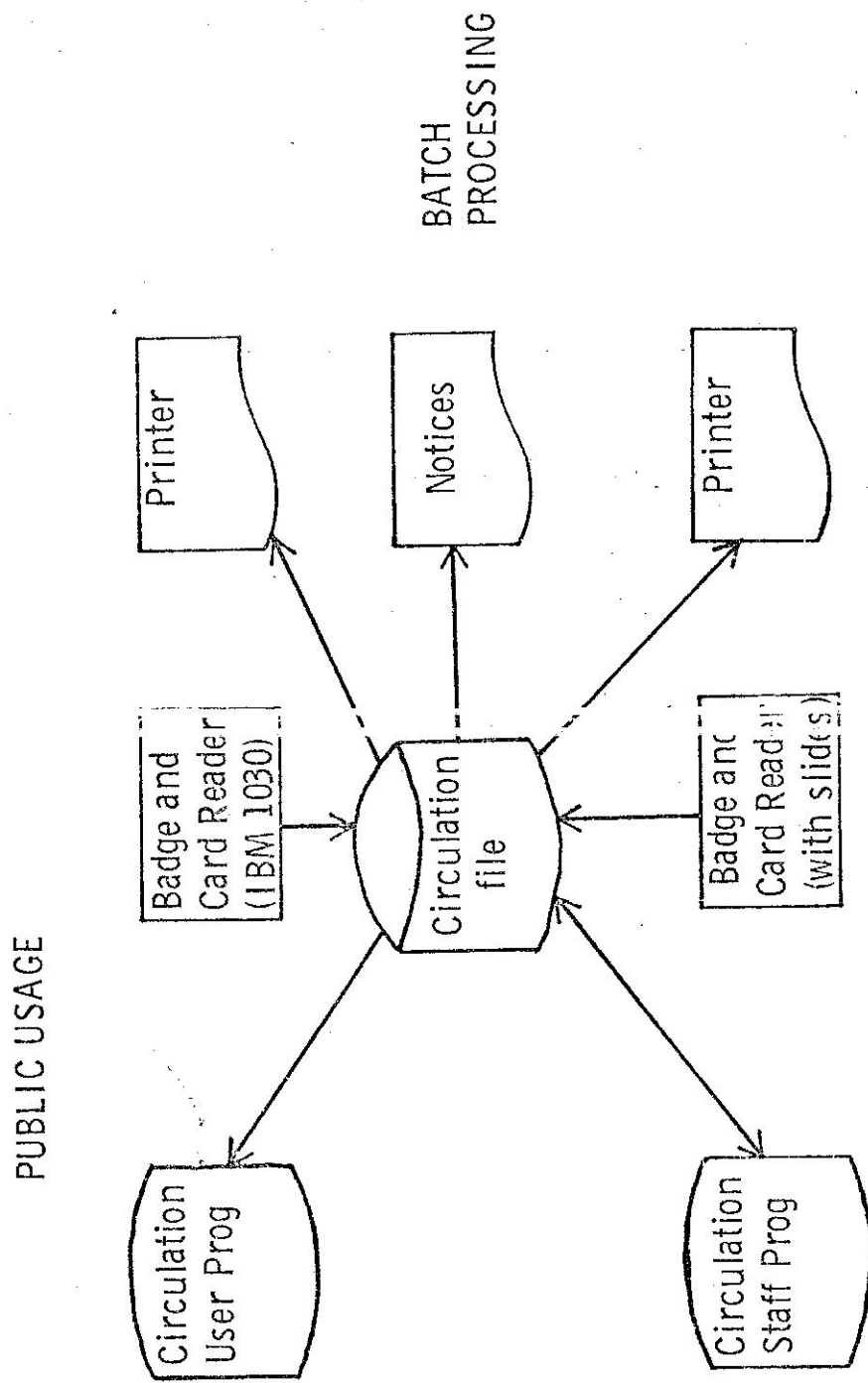


Figure 1. Circulation File Uses

LCUS-CIRCULATION USER SERVICE

THIS TERMINAL CAN BE USED TO DETERMINE IF A BOOK IS CHARGED OUT.

>>CHECK THE CARD CATALOG (SHELF LIST SECTION)

FOR OTHER COPIES OR EDITIONS HELD BY THE LIBRARY.

INSTRUCTIONS:

1. FIND THE CALL NUMBER OF THE BOOK *
YOU NEED IN THE CARD CATALOG. *
2. TYPE IN THE FIRST LINE OF THE CALL *
NUMBER (EXACTLY AS IT APPEARS ON *
THE CATALOG CARD. *
PRESS THE TAB KEY. *
3. TYPE IN THE SECOND LINE. *
4. PRESS THE ENTER KEY. *
5. WAIT FOR A RESPONSE. *

CALL NUMBER:

>
>

Figure 2. Basic Cathode Ray Tube Screen Display

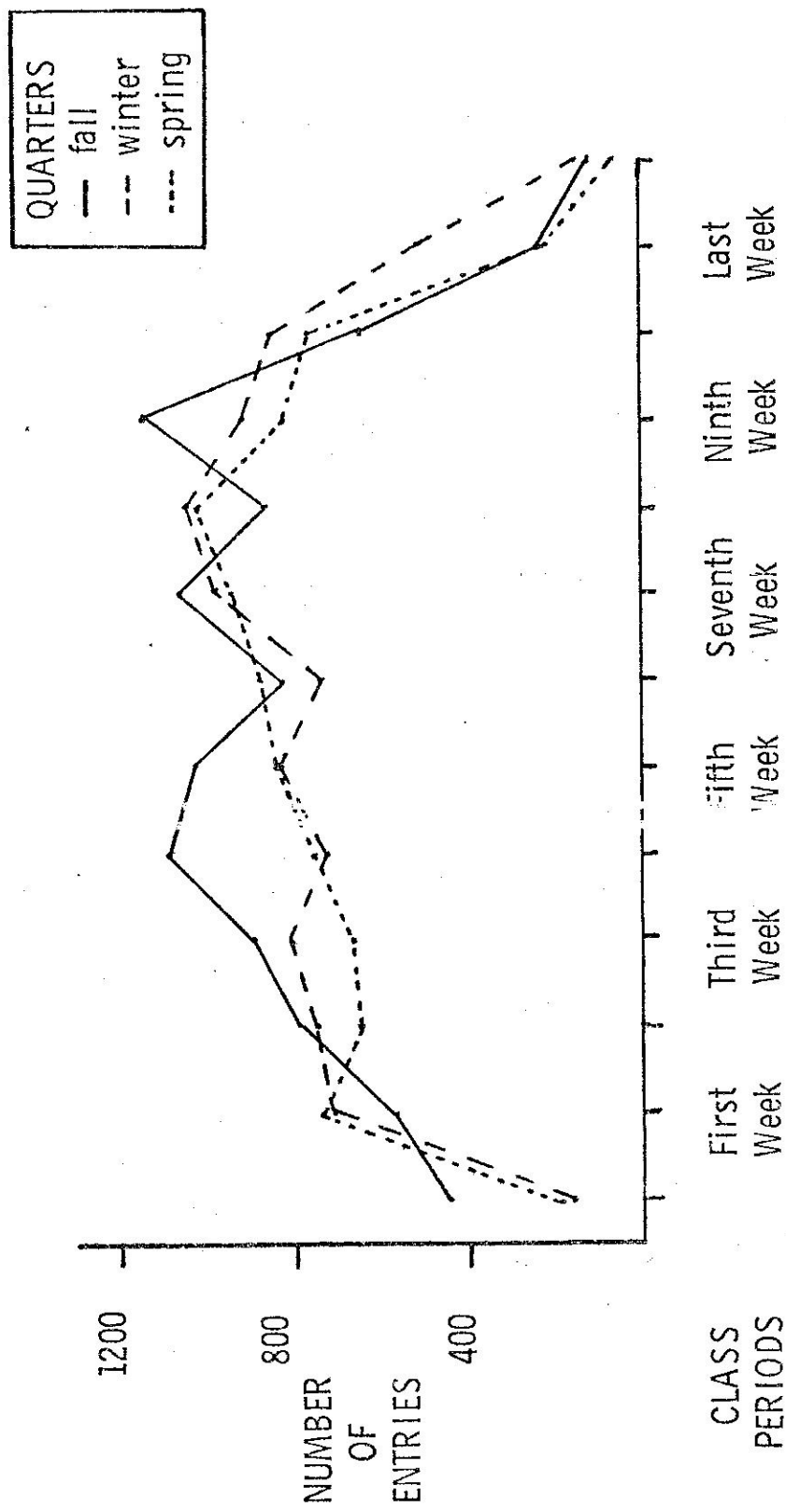


Figure 3. LCUS Program Usage Graph.

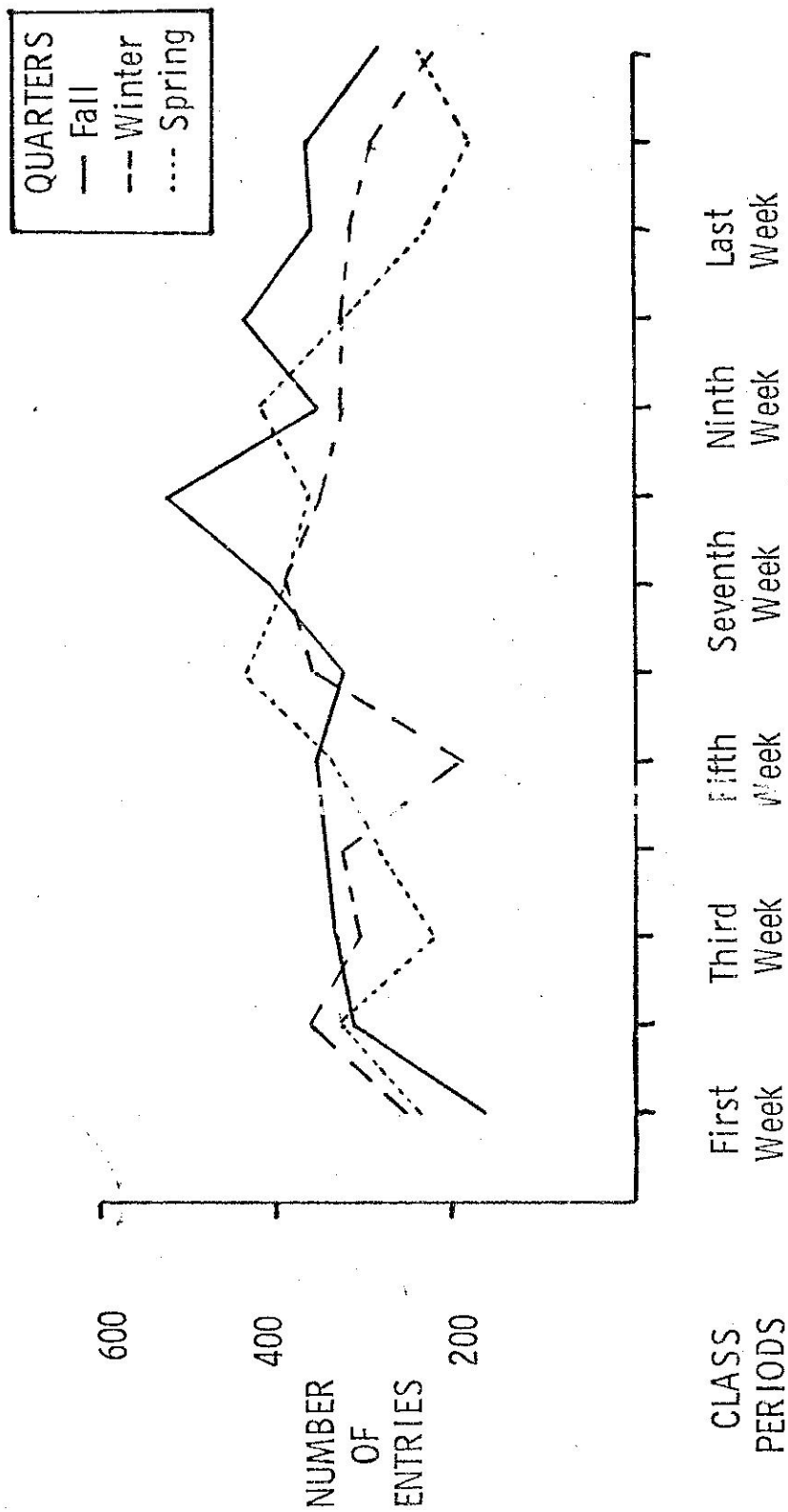


Figure 4. Circulation Program Usage Graph

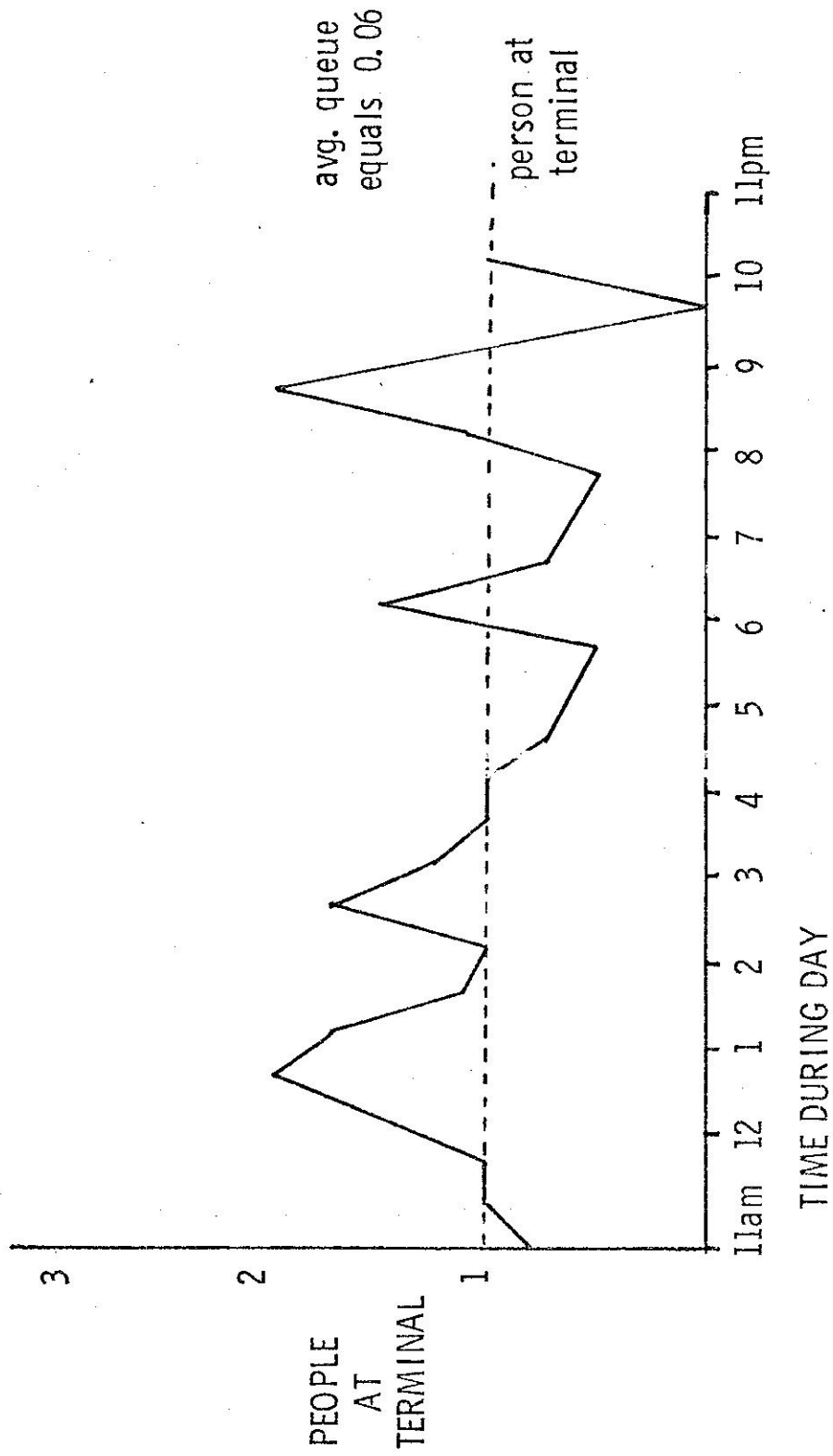


Figure 5. Average Number of Users at the Terminal Versus Time of Day