

## DATA PROCESSING IN THE TEXAS A & M UNIVERSITY LIBRARY

Bruce W. Stewart

The Texas A & M University Library embraced automation as a way of life when it became the first library in the Southwest to employ a Data Processing Supervisor as a full-time Library staff member in September, 1964. The creation of such a position as part of the Library staff was only one of several favorable circumstances which combined to provide the necessary foundation for the achievements outlined in this paper.

In addition to an enthusiastic University administration which provided requested supplemental funds for a special conversion project, the Library has access to the University's centralized data processing facility, which is one of the largest such University installations in the Southwest. The Data Processing Center houses an IBM 7094-1401 computer system with 14 magnetic tape drives, two separate off-line 1401 tape systems (one with a 1404 printer), and a battery of high speed sorters, collators, and card punches. This tremendous hardware capability has proved to be a great asset to our automation program.

A second asset of a more subjective nature is the Library's membership in a co-operative effort involving the libraries of Texas A & M, Rice University, and the University of Houston. While ninety miles separate College Station from the University of Houston and Rice in Houston, the association has proved very beneficial to each library. In the fall of 1964 the three libraries met to discuss their mutual interest in automation. Since available computer equipment varied tremendously with each University, an agreement was reached to share ideas and co-operative effort at the systems and design level, with meetings to be arranged roughly three times per year. Each library reviewed its most pressing needs, and the final result was that the University of Houston Library decided to tackle the acquisitions operation, Rice University Library was already preparing to automate its circulation operation, and Texas A & M elected to attack the serials control problem.

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Probably the most outstanding result of the co-operative agreement, in addition to the strong personal relationships that developed, was that Texas A & M was able to justify and implement an automated circulation system in an extremely short time due to the sharing of both experience and advice of the Rice Library. Although the two circulation systems are related only by the IBM 357 Data Collection Units used by each, considerable time and effort were saved by Rice's generosity. With implementation of Texas A & M's Automated Serials Control operation, the University hopes to be in a position to repay its debt to the co-operating institutions.

The Texas A & M University Library is wholeheartedly involved in data processing applications and the automation of clerical operations. While not concerned immediately with the more sophisticated area of information retrieval, the Library looks forward to the time when such systems will become a reality. Although the two applications just mentioned, serials and circulation, represent the two major areas of automation, several other routine functions also utilize punched cards. The Library's physical property inventory is maintained with a punched card system which allows rapid reconciliation with the University's inventory records at the close of each fiscal year. The Acquisitions Department also maintains a punched card file by purchase order number, coded to allow rapid breakdown of outstanding encumbrances by categories such as books, serials, and others. Finally, Acquisitions runs an annual analysis of vendor performance (primarily the state contract jobber which changes from year to year) by punching and analyzing on an IBM 1401, data which provides the percentage of books delivered by five day increments and the percentage of books delivered for each discount received.

### Automated Circulation System

In February 1965, the University approved a supplemental grant to the Library in response to a proposal which outlined and justified the conversion necessary to implement an automated circulation system. There were two major steps involved in the initial conversion of our collection for the automated system, viz., keypunching, and gluing pockets and inserting cards.

Of the Library's half-million volumes, it was necessary to produce IBM bookcards for a circulating collection of approximately 200,000 volumes. This represents the circulating collection in the main library only; branch libraries were not included in the conversion or in the plans for automation. The branches will be absorbed into a new \$3,800,000 library building to be completed in 1968; at that time the necessary IBM bookcards will be keypunched in another

crash project. In addition, since bound serial holdings are not circulated, it was unnecessary to produce a machine readable bookcard for the additional 200,000 bound serial volumes in the main library building.

After several methods of producing the necessary machine readable identification for each circulating volume were investigated, local keypunching under the Library's own management was selected as the most practicable approach. Alternate methods considered included optical scanning of pencil coded sheets and contract conversion by a private firm. Neither of these possibilities was acceptable, however, either because of simple unavailability of the service desired or because of the problem of shipping irreplaceable shelflist trays to and from the contract keypunching firm ninety miles away. The deciding factor in the final decision was the availability of the University Data Processing Center's keypunches on a second shift basis at no cost to the Library.

Five girls were hired at \$1.25 per hour to work 4-1/2 hours each weekday night, 5:30 p.m. to 10:00 p.m., plus 3-1/2 hours on Saturday morning. The girls read directly from the shelflist cards in their catalog trays, which were carried to the Data Processing Center and back each evening. The girls typed the accession number and call number for each bound volume except for those books which because of classification number or shelf card notation were known to be non-circulating, entering an average of 25 keystrokes per card. Figure 1 illustrates the full bookcard format. Only one of the girls was an experienced keypunch operator although all were capable typists. By the end of the first week they were averaging 1,000 cards per night per girl and maintained this average for approximately seven weeks, the time required to complete the project. Card output was limited not by punching speed but by the time required for the girls to interpret each shelflist card according to prescribed instructions.

The keypunched cards were kept in shelflist order and periodically listed on an IBM 1401. The listings were then sight-verified against the original shelflist cards by two additional girls employed full-time during the day for the duration of the project. Error cards, omitted cards, and cards for non-circulating volumes were pulled or repunched. All original cards, which were punched in regular blank card stock, were then input to an IBM 1401 program which scanned the fields, adding fill periods and 357 control punches, and then punched the final card into the Library's Master Bookcard stock. This program also printed each volume's accession number on a gummed 1/4" by 1-1/4" label.

The final master cards, kept in shelflist order in labeled boxes with the corresponding gummed labels, were then run through an IBM 557 interpreter. Costs for keypunching and verifying were as follows:

Wages

Keypunching: March 22 - May 11, 1965	
Sight verifying: April 5 - May 28, 1965	\$1800

Supplies

200,000 Master Bookcards	\$ 410
217,000 Stock Tab Cards	\$ 255
200,000 Pocket Labels	\$ 260

Non-billed Operations

Listing on IBM 1401 for verification	15 hours
Reproducing for Master Card on IBM 1401	20 hours
Interpreting on IBM 557	40 hours

The book collection lacked pockets which were glued in by high school students at \$.75 per hour. The boys worked from 8 a.m. to 5 p.m. in unairconditioned stacks during the summer months. Working in teams of two, ten boys averaged 7500 books per day. The gluing operation was virtually complete in five weeks.

These students plus an additional five people were also utilized to match the Master Bookcard to the book, insert it in the pocket, and attach the accession number label to the pocket. The insertion operation was in simultaneous operation by the second week in June and continued to August 20. Most of September was also spent with one regular library staff member working full-time on the backlog of snags.

Costs for the gluing and insertion operation were as follows:

Wages

Gluing Pockets: June 1 - July 7, 1965	
Match and Insert: June 15 - August 20, 1965	\$4600

Supplies

200,000 Bookpockets	\$ 991
5 Gluing Machines	\$ 55
30 gallons glue	\$ 105

Roughly, the total conversion cost was approximately 3.9¢ per book and the project, start to finish, took five months.

In addition to the conversion of the collection it was necessary for each Library patron to have a plastic card with borrower identification in machine readable form punched into it. The Registrar's office already provided a student identification card, which was modified to IBM 357 system specifications. This card is custom laminated by the University and embossed in the Registrar's office with student

permanent number, name, and birth date. Each currently enrolled student receives a new card at the beginning of each fall semester, which provides automatic yearly validation.

All other non-student users, including University faculty and staff, faculty and staff family, and local area and special users are issued a permanent factory-produced card purchased by the Library. These are non-embossed cards on which the name and user number are handwritten. All non-student users are required to provide their Social Security number as identification. A library user thus either presents his student ID card to be punched or requests a Library Card the first time he enters the Library during the year. The patron's name, mailing address, and identification number are recorded for keypunching and addition to a magnetic tape file of names and addresses. The punched ID card is immediately returned, and the patron is ready to charge his book. The six digit student identification number is recorded with three trailing zeros, and an additional prefix number is assigned to both Social Security and student numbers to indicate the status of the borrower for later analysis of Library usage.

The data processing equipment in the Library consists of an 082 Sorter, an 085 Collator, an 026 Key punch, an 013 Badge Punch, and the IBM 357 Data Collection System. The IBM 357 system includes two model six input stations with cartridge manual entry, mounted at the Circulation Desk on either side of a 358 control unit and receiving key punch which are enclosed in a soundproof plywood box built into the desk. The regular 026 Key punch services the needs of other Library departments upon request as well as all regular processing of new acquisitions and other Circulation Department key-punching.

A brief description of operation of the IBM 357 system is as follows: A patron presents a book to be checked out with a valid current identification card. The Circulation clerk selects the correct date due cartridge to be used for the charge and inserts the bookcard, identification card, and cartridge to activate the IBM 357 input station. The output key punch produces two cards, each containing book identification, borrower identification, and date due (see Figure 2). The two cards are uniquely coded in cc 80. The first card is placed in the pocket with the bookcard as proof of charge and as notification to the borrower of date due. The second card remains on the key-punch stacker, and the accumulated charge cards are input to the nightly computer processing run.

As books are returned, they are held on a booktruck with their corresponding return cards. Immediately before the truck is released for shelving, the return cards are sorted into accession number order and matched with the collator against a deck containing one card (see

Figure 3), for each book on Hold. The Hold cards are likewise maintained in accession number order and contain only the accession number in machine readable form. Any matching cards that merge flag books that are to be removed from the truck before it is released to the stacks. While a low-volume operation, the sorter and collator in the Library are necessary even in a computer-based system such as this one, not only for Circulation processing but for various other IBM card filing routines that can be done more conveniently on a mechanical basis.

A manual back-up charging procedure is available in the event the IBM 357 system breaks down, or in the event a book is presented at the Circulation Desk with the Master Bookcard missing or mutilated. The procedure utilizes a three-part IBM card-size form (see Figure 4), which is used manually to record book identification, borrower number, and date due. One part then goes with the book in place of the Return Card, one part is filed as a temporary record of charge, and the third part is sent to the keypunch operator to have the required Master Card or Charge and Return Card set keypunched. The Charge Card thus produced is entered into the day's accumulation of charge cards and processed normally by the computer. The Master Bookcard or Return Card is filed manually to await the return of the book. All returns containing the temporary return form must have the Bookcard or Return Card waiting in the file pulled, and then must be processed through the normal Hold procedure.

The Library believes that a book should either be in its proper place on the shelf, or it should be reflected by a charge to a person or a location. Location charges are achieved by some fifteen special plastic charge cards kept in the Circulation Office which are punched with special numbers for "Reserve," "Bindery," "Interlibrary Loan," etc. All charges are maintained in one circulation file in call number sequence so that location and patron charges are interfiled for easy reference on the circulation listing.

One additional feature of the system is worth special note. The use of an accession or item number unique to each volume permits a thief-proof door check system. In a "two-card" system such as this, all information is machine recorded: book identification, borrower identification, and date due. No manual stamping or validating is required. The accession number is stamped both in the book and on a pocket during initial processing, and this pocket is then glued firmly in the book. The accession number labels which were computer printed during the conversion period also provide the item number for back holdings. The Library Doorman thus matches item number on the pink Return Card and item number on the pocket as proof of valid charge. Other information, including date due, need not be checked. The unique item number guarantees the current validity of the charge and also prevents the common dodge of charging a book

and then using the Return Card in a second book to get it past the door check.

Regular nightly operation, which has continued without interruption since October 1965, proceeds as follows. The Circulation Department delivers to the Data Processing Center by 10:30 each night except Sunday the accumulated Charge and Return cards in random order. These updates are sorted, edited, and processed by the IBM 7094, and a new listing of books in circulation (see Figure 5) is printed on a two part paper. Error messages, daily statistics, and a listing of extreme overdues immediately follow on the listing (see Figure 6). First and second overdue notices and fine notices (see Figure 7) are printed on continuous form postcards with addresses ready for mailing. The update cards and printed outputs are returned to the Library by 8:15 each morning. The two copies of the circulation listing are bound unburst and placed on the desk for patron use, and the postcards are separated and mailed. One copy of the error messages and statistics is retained by Circulation for further action, and the second copy is forwarded to the Data Processing Supervisor for inspection.

Currently, there are about 10,000 charge records on tape and probably an average of 700 updates (charges and returns) for each day. The nightly run requires less than three minutes of IBM 7094 time, plus ten to fifteen minutes of off-line printing on a 600 lpm IBM 1403. The program is written entirely in COBOL except for an assembly language core sort library subroutine. The program was written and checked out in approximately one month's time early in the fall of 1965. The most recent modification, however, was made in February 1966; it seems that odd situations which were not provided for in the program will continue to occur.

The total cost for rental of the data processing equipment located in the Library, less various standard educational discounts, is \$355 per month. A flat charge of \$400 per month is paid to Data Processing for use of machine time, resulting in a yearly cost of \$9,060. The continuous forms for the printed listing and the postcard stock, plus the other special card forms needed, result in an additional cost of approximately \$1,000 per year.

While the automated circulation system can be justified by virtue of performing at least the work of the approximately three and one-half clerks represented, the advantages of the mechanized operation over any traditional manual system cannot be over-emphasized. The system now provides better control than was ever possible under the old manual system. At the same time, it accommodates patrons by providing rapid, easy charging of books and by keeping an up-to-date, error free record of the location of books charged out.

Elimination of manual handling and filing of records as well as the tremendous saving of time effected by automatic processing of

overdue charges and delinquent returns has freed the circulation staff to assume additional duties while still maintaining almost immediate reshelving of books as they are returned. Perhaps most significant of all is the fact that the present system can accommodate double or triple the present volume of circulation with only a minimum increase in personnel. The automated system also offers great promise in aiding investigation of library usage at Texas A & M by analysis of accumulated charge data in conjunction with the Registrar's machine readable student records.

### Automated Serials Control

The Library's decision to attempt automation of the Serials Record operation was made early in 1965. At that time a report outlining basic concepts of the system was prepared, based on the results of a Master's thesis investigation.<sup>1</sup> Initial programming and experimental operation of this proposed system were delayed, however, until January 1966 because of the higher priority assigned to the completion of the design and implementation of the automated circulation system just described. When completely operational, the automated serials system will perform three major tasks: (1) ordering and renewing subscriptions and recording payment for each, (2) recording arrivals and flagging delinquent arrivals, as well as keeping track of all serial holdings to date in the collection, and (3) providing the information required for more efficient control and analysis of operations. In addition, the data in the computer's records can be used to produce listings in various formats for use in public service areas. Such a mundane use alone of the stored data can almost justify the conversion to machine readable form.

Basic Concepts. The basic design concept of the data processing system which supports the serials operation is in some aspects a departure from traditional approaches. Historically, data processing techniques have been developed to accommodate what was considered a basic hardware limitation. This limitation may be described as the necessity for conserving data storage and processing time at nearly any cost. This concept dates from the early years of card oriented computer and unit record equipment systems. In the past, relatively slow interval operating speeds and relatively slow access to mass data storage dictated heavy coding and extreme abbreviation of data for applications involving extensive computer processing. The result has been data processing systems which in reality were designed to accommodate the machines involved and not the personnel who must ultimately handle and analyze the information produced.



Current sophistication of computer hardware and the promise of additional technological advance dictate that completely efficient hardware utilization is no longer the prime measure of effectiveness. Modern high speed computers with practically unlimited rapid access data storage capability allow feasible design of data processing systems suitable to the needs of the application as well as the personnel involved. While relatively inefficient internal processing procedures may be called for, the resulting performance of the system as a whole is the criterion that must be paramount. Input and output of information and data handling procedures are, therefore, organized to accommodate the library personnel involved. Data are stored in the computer uncoded and of variable length wherever possible, especially when coding and decoding would become cumbersome for clerical personnel. Stored in this form, the data can also logically be utilized by or converted to the format required for nearly any conceivable processing system.

The Serials Department personnel will be involved as little as possible in data processing lore or systems of special abbreviations and other confusing requirements. The automated system is, therefore, divided logically into two subsystems: the clerical system and the data processing system. Only very limited familiarity with the computer system is required on the part of library personnel, and the two systems meet only through the interface required to convert data to machine readable form. It should also be understood in considering the approach outlined in this paper that the system is designed as a compromise between the ideal environment of a random store of data accessible on a real-time basis and the actual fact of presently available equipment. While the eventual goal, based on expected future hardware delivery is the more sophisticated operation just mentioned, the system is planned, for the present, to provide the most efficient operation possible utilizing the capabilities of a computer located at a physically remote facility with only limited processing time available for library operations.

File Organization. Each item of data must be uniquely identifiable and individually retrievable. The master tape file is composed of a master unit record for each entry. Desired items of data will be grouped in various printed outputs for use as working files by Serials Department personnel. The master tape record for each entry is grouped logically into several sections: publishing and frequency data, financial and ordering data, bound holdings data, and bibliographic data, for example. In addition, some master records will contain only one section, cross reference data, to the exclusion of all others. This method of processing also requires that each copy of a serial subscription be represented by a separate master record with the appropriate logical sections.

Each master record is identified by a unique six-digit serial identification number (SIN). This number is assigned to the master records so that numerical arrangement by SIN will produce an alphabetical arrangement of entries in the Serials Record. In addition to its use as an alphabetical sequence number, the SIN serves as the unique sequential processing number required for a magnetic tape file application. The SIN was initially assigned at intervals of 100 to allow future insertion of new entries in proper sequence. Whenever an individual interval becomes full, the computer renumbers the entire master file, re-establishing the required interval.

Individual data elements are stored and processed by the computer as both fixed and variable length alphanumeric character strings. A system reserved symbol, the dollar sign, is used to indicate the length of the variable length strings and is the only character not available for use within a string. The character strings are uniquely identified by the SIN and a keyword which has a high mnemonic value for use by Serials personnel.

The keyword is a ten-digit maximum English language word used to identify individual character strings. There is also a special class of keywords that do not have character strings attached but are used to set flags for control purposes. Allowable keywords (see Figure 8) comprise a Serials Record "dictionary" which is open-ended. Addition of new data elements, for example, may be provided by simple modification of the program's keyword table. Keywords for each logical record section of the Master Record are additionally divided into two groups: required keywords and optional keywords. Extensive editing is built into the program and all required keywords must be present, for example, for the particular record section to be accepted. Presence or absence of optional keywords is governed by the nature of the individual entry.

An additional open-ended feature is the ability to introduce an English language "note" into the master file whenever necessary. The keyword XNOTE is used, where "X" represents the first character of the name of the logical record section in which the note is to be included. This feature is the fail-safe measure; if all else fails, hopefully the file can contain a short note to the effect that manual processing is the preferred course of action. The master records are maintained in sorted keyword within SIN order. Bound and unbound holdings record sections are additionally sorted, however, by the major sequence number for the particular title as included in the bound character string. Holdings data thus also require interpretation of the character string for unique identification.

Input Requirements. Input to the computer system is presently in the form of punched cards. The serial identification number (SIN) occupies cc 1-6. The keyword (KYWD) occupies cc 15-28. Card columns 13 and 14 are used for sequence numbering (SEQ) of input

cards when variable length character strings extend beyond one card. Card columns 25-80 contain the character string (DATA). Card columns 7-12 contain a six character maximum operation codeword (OP). This codeword instructs the computer program to perform one of several operations such as ADD, DELETE, or UPDATE.

Clerical procedures require data collection forms similar to that shown in Figure 9. Data are recorded in a manner familiar to clerical personnel whenever feasible. Months, for instance, are entered as common three letter abbreviations and converted to the numeric representation required for calculation. Figure 10 is a sample listing of input cards.

As soon as practicable, a paper tape typewriter will be used in the Serials Department instead of the hand written data collection form. The typed copy will serve to verify data to be entered in the computer file and will serve as the necessary audit trail until the master file is updated. The punched paper tape produced simultaneously will then be used as direct input instead of punched cards. Availability of a keypunch, however, will always be essential for processing punched card arrival files for current receipts.

Output. The output can be divided into two categories: punched and printed. Printed outputs include both the working files for the Serials Department as well as the various listings for public service areas. The working files will be produced monthly and will consist of four physical files: (1) subscription information, (2) bound holdings and bibliographic data, (3) current and unbound items, and (4) a want list. The bound holdings file, for example, will describe each bound volume individually, indicating accession number, inclusive dates, and published volumes included. The computer will produce an item by item shelflist record for inventory control by the Serials Department (see Figure 11) while any holdings information produced for public service areas will probably be printed as inclusive holdings in the form of a union list. In addition to regularly scheduled output, the number of special reports and statistical listings which can be easily produced from the machine records is limited only by the ingenuity of the programmer and the amount of storage space in the Serials Department.

Direct subscription renewals will be initiated by a monthly listing indicating those titles requiring attention. The annual list of domestic serials required for bidding purposes in selection of a state contract jobber will also be printed on continuous multilith masters and reproduced in the required number of copies. The possibility of completely automatic subscription renewal with computer printed purchase orders seems remote, however, considering the complexity of existing state regulations.

The punched card output is used for inventory control and check-in of expected arrivals. At the beginning of each month, one card is

produced for each item expected during the month. Prepunched into each card will be the serial identification number, the operation code-word UPDATE, the keyword UNIT, and a description of the serial issue. Information printed on the arrival card for use by clerical personnel will include this date, plus all other information required to check-in and distribute the issue. This information may also include an optional forty character note, such as "ROUTE" or "CHECK LOOSE INSERTS." As the card is produced, the SIN punched into the card is checked to insure that the correct information is being printed on the card.

Arrival cards are maintained in two separate card files: cards for expected arrivals and cards for received arrivals. Clerical procedure involves matching serial issues and marking them for distribution, as well as the transfer of the corresponding arrival card to the received file. Library files thus show serial holdings as issues expected or issues received in the card files, as issues recorded in the unbound holdings record, as bound volumes, or as missing items appearing in the want list.

One arrival card will be produced for every anticipated individual item. An index, for example, will have a separate arrival card if it arrives separately, or it will be indicated on the arrival card for the issue in which it is bound. Predictable arrivals of supplements will be indicated by separate arrival cards. Each copy of a serial subscription would also require separate arrival cards. A serial subscription for two copies with index separate, for example, would require four arrival cards for the last issue (see Figure 12).

All active subscriptions will be coded as regular or irregular arrivals. A regular subscription is by definition any predictable pattern of publication for which arrival cards can be produced. All other irregular serials with completely unpredictable frequency will be indicated by a printed list. When received, these unexpected items will require manual keypunching of an arrival card to update the master file. Claiming of delinquent arrivals will be aided by inspection of the arrival cards remaining in the file at the end of each month. The decision to claim missing material, however, must be based on the knowledge and judgment of an experienced staff member. "Claimed" cards are flagged and returned to the expected arrivals file.

A second punched output planned is a bindery "tickler" card. This card will be produced in a preassigned month so that the binding load is staggered evenly over a twelve-month period. The bindery clerk will receive a card at the beginning of each month for each title to be bound. The card will list receipts as recorded by the computer. These cards constitute a "tickler" file only; if visual inspection indicates missing issues or insufficient bulk for binding, the card will be refiled until the missing material is received or until the next bindery card for the title is produced.

Serial issues are normally bound into physical volumes of a size to "fit the hand." The decision to bind a given number of issues into a physical volume must be based on the judgment of the bindery clerk. In addition, physical size of individual issues may change drastically and unexpectedly, requiring an exception to the normal routine frequency of binding. The backlog of cards in the bindery file will also aid the clerk in estimating the backlog of unbound material in the collection.

When fully implemented, the computer system will automatically compile monthly operating statistics in addition to routine maintenance of the master file just described. The system is being programmed for an IBM 7094-1401 combination, which includes a model 1404 printer off-line. All non-1401 programs are being written in COBOL whenever possible to insure compatability both for the expected expansion to IBM system 360 equipment, and for the different computer configurations at Rice University and the University of Houston.

The computer facility is made available to other University departments by the Data Processing Center at a reduced rate, and the Center operates as a service facility for University operations as well as serving as an educational facility. For present purposes the Library's need is paramount, and no attempt is being made to present a solid economic justification for the system which is being developed.

Present Accomplishments. In preparation for the approaching conversion of the Serials Record, a Serials Data Processing Clerk was employed as a full-time staff member in the fall of 1965. This young lady, working under the direction of the Serials Librarian, acts as the interface between the sometimes unintelligible serials record files and the keypunch operators by re-ordering and organizing the information on a form suitable for keypunching.

Any data input to a machine records system must be complete and accurate, particularly bound and unbound holdings information used for inventory control. To achieve this lofty goal the Library also employed last fall a crew of full-time clerks to begin a physical inventory of holdings to verify the existing but unreliable records. Holdings information will be converted to machine readable form only after being verified by the inventory crew. It is expected that this project will last at least another year.

The conversion of other Serials Record data to machine readable form was begun in February 1966. Initially, a serial identification number, location, call number, title, and the control keywords, SERIAL or PERIODICAL and ACTIVE or INACTIVE were coded for each of the approximately 7000 entries in the serials holding file and transferred to a magnetic tape file. All cross references were also keypunched and added to the file. In addition, the necessary procedure was established in the Serials Department to insure that title changes and new subscriptions would henceforth be keypunched so

that an updated file could be maintained. All keypunching is being done as much as possible by the regular keypunch operator during the day, who is also responsible for keypunching for the Circulation Department as well as all other library work. A second keypunch operator is employed part-time on a second-shift basis to cope with the volume of data waiting to be keypunched.

Two listings were immediately produced from the data. The first was what might be called a Union List of Serial Titles for Texas A & M University Library. No holdings information whatsoever is reflected, but all cross references are included. This listing, which up to now has been printed only once on Multilith masters and reproduced for campus distribution, will be reprinted only as the need dictates.

The second listing includes only current periodical subscriptions by current title; no cross references are provided. This listing contains the approximately 3500 titles which are available in the current periodical reading rooms in both main and branch libraries, and in the main library Reference Department. It is available in several copies in public service areas in both main and branch libraries and is reprinted presently on a twice monthly basis (see Figure 13).

A little imagination will suggest numerous other uses for the presently limited amount of data now available in machine readable form. One can get simple statistical counts by selected characteristics or listings arranged by call number or location, or combinations of the above. The question is, Do we really want this particular breakdown at this point? There is a temptation to bury the operation in mounds of needless printouts of unwanted information.

The next step is the complete conversion of financial and subscription information, as well as beginning in earnest the conversion of the verified holdings records for the inventoried portion of the collection. The Data Processing Clerk records the ordering and subscription data on mimeographed data collection forms, which are batched and sent to the keypunch operator. Meanwhile, holdings information is keypunched directly from shelflist cards in their catalog trays. As the ordering and subscription data are converted, the computer will immediately begin to flag subscription renewals, and the periodicals list required by the state for bidding purposes will be produced in August 1966 from the information in the magnetic tape file. Our approach to conversion and to the associated experimental programming and debugging is that each mass conversion of a segment of the Serials Record will justify its own existence by immediate utility. Long before complete holdings information is available in machine readable form, the automated serials system will be performing nearly all of the other functions outlined previously.

## Conclusion

The progress made in applying data processing techniques to library operations in less than two years is frankly astonishing. One system operates beyond expectations, and a second major operation should be successfully automated within the next year or two. Several lessons have been learned in the course of the last two years. There is no such thing as a completely accurate record where serials are concerned. Attempting to convert data for a computer operation tends to spotlight any weakness in accurate recording of information and, for that matter, in the procedures which supposedly insure that this accuracy is maintained.

There is an old axiom that a computer can best be considered as exceedingly stupid, but it can be letter-perfect where repetitive filing and record maintenance are concerned. We are convinced that perfection is a gift with which mere humans are not yet ready to cope; the perfect error-free input called for cannot be presented, and consequently we spend quite a bit of time correcting mistakes that we created ourselves only the run before. We have also discovered the great need for rethinking what must be done. It is easy to mechanize existing processes, without reviewing the whys of the operation or, in many cases, its usefulness in the first place.

Finally, we believe that our progress can be substantially increased if the library staff is given instruction in basic punched card and computer concepts and then kept abreast of the immediate as well as overall objectives. To accomplish this, a continuing program of lecture and demonstration meetings has been established in which the professional librarians and most of the clerical employees participate. They are encouraged to read new publications of potential interest. In the past, representatives of other libraries have also been invited to attend the two major staff seminar meetings.

## REFERENCE

1. Stewart, Bruce W. A Computerized Serials Record System for the Texas A & M University Library. College Station, Texas, Texas A & M University Library, 1965.

## DATA PROCESSING CENTER

DPG CONTROL NUMBER: \_\_\_\_\_  
 PROGRAMMER: \_\_\_\_\_  
 PAGE \_\_\_\_ OF \_\_\_\_  
 CARD TYPE: \_\_\_\_\_

LIBRARY MASTER BOOK CARD

0	.....																																1
1					2																												
2					3																												
3	(7)	(12)	(9)	(17)	4																												
4					5																												
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	.....																																
	.....																																
	1	2	3	4	5	6	7	8																									
	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890																									
	2	9	21	30																													

<u>Card Col.</u>	<u>Begins</u>	<u>Shift</u>
2	Item # Field	numeric
9	Dewey # Field	numeric (col. 12 is always ".")
21	Cutter # Field	col. 21 Alpha 22 numeric 23 numeric 24 numeric 25 Alpha 26 numeric 27 " 28 " 29 "
30	"Other" Field	numeric

REVISION DATE:

Figure 1  
Format and Directions for Key punching the Bookcards



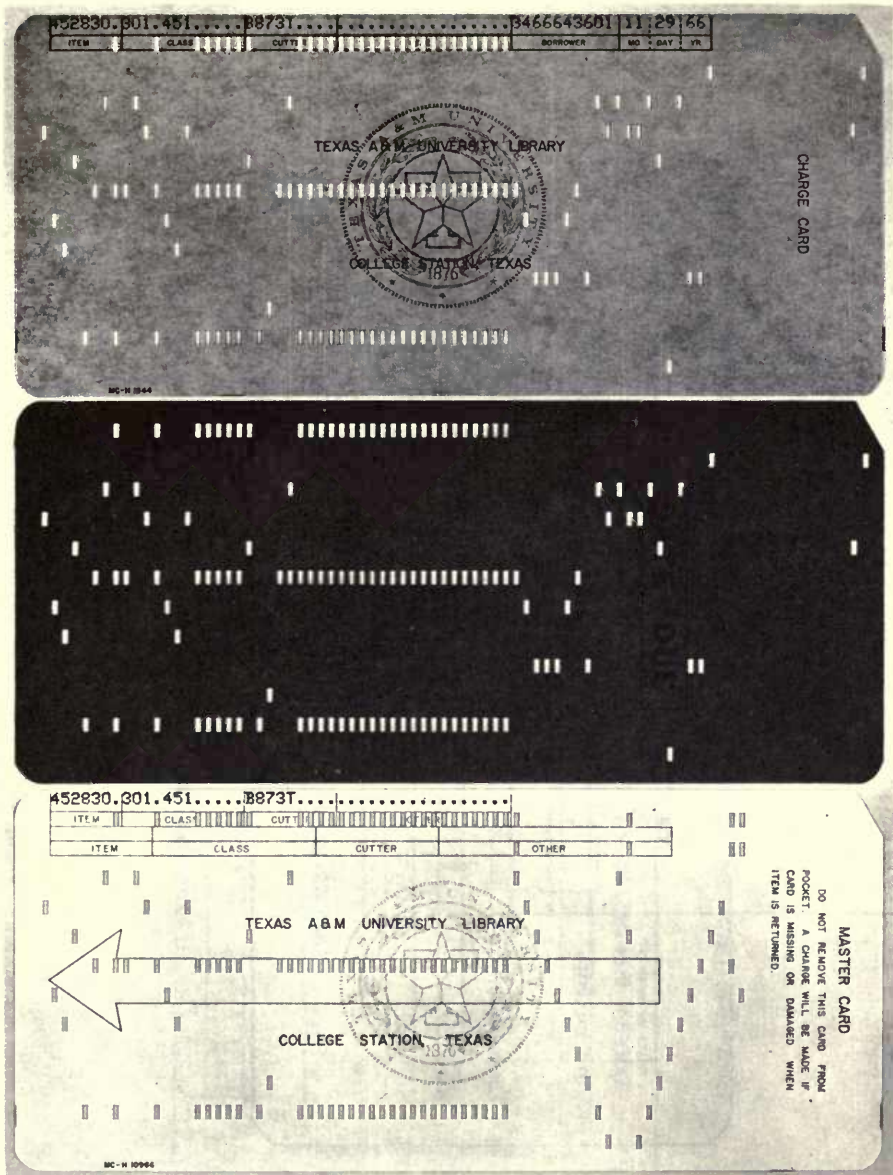


Figure 2

Examples of the Three Punched Cards Used in the Automated Circulation System

	<b>HOLD</b> <input type="checkbox"/>	<b>CALL IN</b> <input type="checkbox"/>	
00000 <small>71 72 73 74 75 76</small>	11111 <small>71 72 73 74 75 76</small>	22222 <small>71 72 73 74 75 76</small>	33333 <small>71 72 73 74 75 76</small>
44444 <small>71 72 73 74 75 76</small>	55555 <small>71 72 73 74 75 76</small>	66666 <small>71 72 73 74 75 76</small>	77777 <small>71 72 73 74 75 76</small>
88888 <small>71 72 73 74 75 76</small>	99999 <small>71 72 73 74 75 76</small>		

**HOLD UNTIL:** \_\_\_\_\_ **DATE** \_\_\_\_\_

**FOR:** \_\_\_\_\_ **NAME** \_\_\_\_\_

**AUTO CHARGE:** \_\_\_\_\_ **MANUAL CHARGE FILE**

**AUTHOR/VOL.** \_\_\_\_\_

**TITLE** \_\_\_\_\_

C  
A  
L  
L  
#

**CHARGED TO:** \_\_\_\_\_

Figure 3  
Example of Hold Card for Reserving a Book in Circulation

APPROVED \_\_\_\_\_ DUE DATE \_\_\_\_\_

FILL OUT THIS PORTION FOR AUTO SYSTEM CHARGE.

C I T E M	C L A S S	C O U N T E R	O T H E R
-----------------------	-----------------------	---------------------------------	-----------------------

MASTER CARD MISSING  CHARGE/RETURN ONLY

---

**TEXAS A & M UNIVERSITY LIBRARY**      UNIVERSAL CHARGE SET      No. 38875

Figure 4  
 Example of Three-part Form Used in Place of the IBM 357 Data Collection System

BORROWER #

FILL OUT THIS PORTION IF AUTO SYSTEM NOT USED

CALL NO.

AUTHOR/VOL.

TITLE

MOORE BUSINESS FORMS, INC., NY PATENTED SPEEDITAB®

CALL NUMBER	ITEM	BORROWER	DATE DUE	CALL NUMBER	ITEM	BORROWER	DATE DUE
301.15	C329C	220949	3452583543 03/23/66	301.152	H986B	301153	1632840000 03/22/66
301.15	C329E	1960	330814 3396347664 04/10/66	301.152	S291P	309540	1613195000 04/04/66
301.15	C487P		157762 3456329564 05/28/66	301.152	S8731	400472	1612170000 04/09/66
301.15	C618P	1956	301120 162214000 03/09/66	301.1522	M1353	116613	1604226000 03/23/66
301.15	C671S		405989 3452583543 03/23/66	301.1523	0743R	314788	1653490000 03/23/66
301.15	C777E		365737 1638070000 04/04/66	301.1523	H835T	362251	1490157000 04/11/66
301.15	G371E		132925 1638070000 04/04/66	301.1523	H835T	362251	1490157000 04/11/66
301.15	G371E		132925 1638070000 04/04/66	301.1523	M3811	294364	1617410000 04/11/66
301.15	F932S		266730 1561867000 03/15/66	301.1523	B458C	230369	RESERVE 02/28/66
301.15	G227E		330979 3462093143 03/28/66	301.153	0965	415904	1561867000 03/16/66
301.15	H274S		251502 RESERVE 11/03/65	301.153	0965	415922	1654154000 03/16/66
301.15	H332F		215552 1632605000 04/08/66	301.154	C537P	410549	RESERVE 02/28/66
301.15	H763H		184906 RESERVE 11/03/65	301.154	G347P	305905	1640794000 04/02/66
301.15	H763H		242822 RESERVE 11/03/65	301.154	L477H	209634	1539339000 04/08/66
301.15	H763S		417266 RESERVE 02/17/65	301.154	S678P	265965	1630667000 04/07/66
301.15	K64W	1963	243306 RESERVE 02/17/65	301.1548	01408	315100	1638070000 04/07/66
301.15	K64W	1954	243306 RESERVE 02/17/65	301.155	836AL	315050	RESERVE 10/28/66
301.15	K921		558018 1631368000 04/06/66	301.155	836AL	343314	L.L.L. 03/18/66
301.15	L346RE		235414 RESERVE 11/03/65	301.155	836AL	343314	3464323010 TERM
301.15	L529C		67634 1612197000 04/09/66	301.155	F828H	255189	1650224000 03/25/66
301.15	L754H	1	241767 3711147623 TERM	301.155	F828H	266794	BINDERY 01/21/66
301.15	L754H	2	245475 3711147623 TERM	301.155	G665G	257890	3464323010 TERM
301.15	M262M	1940	101845 RESERVE 11/03/65	301.155	G665G	364467	3464323010 TERM
301.15	M262M		102686 RESERVE 11/03/65	301.155	G665G	194006	3462847122 03/20/66
301.15	R388A		113704 1638070000 04/04/66	301.155	G665G	306303	3462847122 03/20/66
301.15	R388A		113704 1638070000 04/04/66	301.155	G147E	306303	3462847122 03/20/66
301.15	R662M		151455 RESERVE 11/04/65	301.155	H151C	300922	3464323010 TERM
301.15	R662M		151457 RESERVE 11/04/65	301.155	H491S	180938	RESERVE 11/03/65
301.15	R662M		151458 RESERVE 11/04/65	301.155	H737L	404464	3464323010 TERM
301.15	R662M		151459 BINDERY 02/09/66	301.155	H945C	229904	RESERVE 02/08/66
301.15	R662M		151554 RESERVE 11/04/65	301.155	J54	327859	L.L.L. 03/17/66
301.15	R662M		261399 RESERVE 11/04/65	301.155	J54	347878	3464323010 TERM
301.15	R662M		261397 RESERVE 11/04/65	301.155	M982G	241930	3464323010 TERM
301.15	R662M		261399 RESERVE 11/04/65	301.155	S554T	267707	BINDERY 02/21/66
301.15	R662M		261399 RESERVE 11/04/65	301.155	S554T	267707	BINDERY 02/21/66
301.15	R662M		414474 1562310000 04/03/66	301.155	S469L	288862	RESERVE 11/04/65
301.15	R662M		414474 1562310000 04/03/66	301.155	S469L	288862	RESERVE 11/04/65
301.15	S5520	1956	309550 1650933000 03/17/66	301.155	S873M	268493	1650814000 04/10/66
301.15	S5520	1956	327210 1582330000 04/10/66	301.155	U76H	230466	BINDERY 10/01/65
301.15	S5555		335922 1582330000 04/10/66	301.155	U76H	208057	3464323010 TERM
301.15	S5555		300723 BINDERY 02/09/66	301.1574	H741E	322141	1650898000 03/16/66
301.15	S6772K3		266274 1622694000 03/24/66	301.1584	H462H	300724	3464323010 TERM
301.15	S792P		299383 1631395000 04/08/66	301.1583	S966H	357805	3464323010 TERM
301.15	U575S		330480 1640993000 03/18/66	301.1583	S977C	401520	3464323010 TERM
301.15	W297C		270481 343266000 03/18/66	301.1583	T785C	247653	3464323010 TERM
301.15	W297C		270481 343266000 03/18/66	301.1584	H741E	247653	3464323010 TERM
301.15	W6290		276182 1631052000 03/28/66	301.1584	H741E	297571	BINDERY 01/12/66
301.15	W6290		289331 RESERVE 02/28/66	301.1584	H741E	322142	BINDERY 02/07/66
301.15	W6290		411941 3456329564 05/28/66	301.1584	H741E	394016	5457584057 03/19/66
301.15	Y735		83585 1632435000 04/08/66	301.1584	R643L	191615	3464323010 TERM
301.15	Z22C		405953 1622435000 04/08/66	301.1584	R643L	264624	3464323010 TERM
301.1508	F771M		314315 RESERVE 02/04/66	301.1584	R659C	193535	3464323010 TERM
301.152	G678A		406128 1631395000 04/04/66	301.188	R183S	403726	3389186733 03/27/66
301.152	H986B		301191 3451265732 03/23/66	301.183	E83C	415233	RESERVE 04/06/66
301.152	H986B		301191 3451265732 03/23/66	301.183	E83C	415233	RESERVE 04/06/66
301.152	H986B		301152 1602109000 03/18/66	301.183	E83C	415233	RESERVE 01/04/66

1962

Figure 5  
Sample Page of List of Books in Circulation

TEXAS A-M UNIVERSITY LIBRARY AS OF 03/10/66

DAILY AUTOMATED CIRCULATION STATISTICS

	UNIVERSITY STUDENTS	UNIVERSITY FACULTY/STAFF	FACULTY/STAFF FAMILY	LOCAL AREA USERS	OTHER USERS	TOTAL
CHARGES PROCESSED	292	77	0	44	0	413
RETURNS PROCESSED	305	44	0	25	1	375
BOOKS IN CIRCULATION	4,725	2,048	123	433	64	
	**** TOTAL CIRCULATION 7,393 ****					
	I PLUS 5,385 LOCATION CHARGES I					
OVERDUE BOOKS NOT RETO						
- FIRST NOTICE SENT	1	12	0	0	0	13
- SECOND NOTICE SENT	3	1	0	0	0	4
- OVERDUE 30 DAYS PLUS		50	1	3	0	115

CIRC SYSTEM DIAGNOSTIC MESSAGES. AS OF 03/10/66

THE FOLLOWING COMMENTS INDICATE PROBLEMS ENCOUNTERED WHILE UPDATING THE CHARGE FILE AND PREPARING OVERDUE AND FINE NOTICES.

SEVERITY LEVEL PRECEDES EACH COMMENT.

(WARNING - THE RECORD WAS PROCESSED AS INDICATED, BUT CORRECTION MAY BE NECESSARY.)  
 (ERROR - THE RECORD RECEIVED NO FURTHER PROCESSING AND CORRECTIVE ACTION IS NEEDED.)  
 (DISASTER - MACHINE UNABLE TO COPE WITH SITUATION.)

ERROR UNRECOGNIZABLE DUE DATE IN RETURN CARD --- CARD IGNORED. CORRECT AND RESUBMIT.  
 LITER#23475. CALL NO\*674.....BUNDRWER1653615000. TERM FLAG\*0. DATE DUE\*05/03/61\*1

ERROR UNRECOGNIZABLE DUE DATE IN RETURN CARD --- CARD IGNORED. CORRECT AND RESUBMIT.  
 LITER#11492. CALL NO\*933.....BUNDRWER3486540736. TERM FLAG\*0. DATE DUE\*03/01/66\*1

ERROR UNRECOGNIZABLE DUE DATE IN RETURN CARD --- CARD IGNORED. CORRECT AND RESUBMIT.  
 LITER#12621. BUNDRWER7621310006. TERM FLAG\*0.

Figure 6  
 Sample Page of Daily Circulation Statistics and Error Messages

3790	<p>OUR RECORDS INDICATE THAT THE FOLLOWING BOOK IS OVERDUE AT TEXAS A+M UNIVERSITY MAIN LIBRARY. PLEASE PRESENT THIS NOTICE WHEN RETURNING BOOK.</p> <p>CALL NUMBER 832.....G599FH.....</p> <table border="0"> <thead> <tr> <th>ITEM NO</th> <th>DATE DUE</th> <th>6462846350</th> </tr> </thead> <tbody> <tr> <td>247710</td> <td>12/01/65</td> <td>MISS JEAN M MARTIN 210 FAIRWAY BRYAN TEXAS</td> </tr> </tbody> </table> <p>(NOT RETURNED AS OF 12/08/65)</p>	ITEM NO	DATE DUE	6462846350	247710	12/01/65	MISS JEAN M MARTIN 210 FAIRWAY BRYAN TEXAS			
ITEM NO	DATE DUE	6462846350								
247710	12/01/65	MISS JEAN M MARTIN 210 FAIRWAY BRYAN TEXAS								
	<p>OUR RECORDS INDICATE THAT THE FOLLOWING BOOK WAS RETURNED 9 DAYS OVERDUE AT THE TEXAS A+M UNIVERSITY MAIN LIBRARY. YOUR DELINQUENT FINE IS \$2.25.</p> <p>CALL NUMBER 949.5.....F688.....</p> <table border="0"> <thead> <tr> <th>ITEM NO</th> <th>DATE DUE</th> <th>DATE RETO</th> <th>638202</th> </tr> </thead> <tbody> <tr> <td>21177.</td> <td>11/29/65</td> <td>12/08/65</td> <td>MR RICHARD A JOHNSON 2801 N HWY 6 BRYAN TEXAS</td> </tr> </tbody> </table> <p>PLEASE CONTACT THE MAIN LIBRARY CIRCULATION DESK IN ORDER THAT WE MAY RESOLVE THIS MATTER TO THE SATISFACTION OF ALL CONCERNED. UNPAID FINES ARE BILLED THROUGH THE FISCAL OFFICE FOR COLLECTION.</p>	ITEM NO	DATE DUE	DATE RETO	638202	21177.	11/29/65	12/08/65	MR RICHARD A JOHNSON 2801 N HWY 6 BRYAN TEXAS	
ITEM NO	DATE DUE	DATE RETO	638202							
21177.	11/29/65	12/08/65	MR RICHARD A JOHNSON 2801 N HWY 6 BRYAN TEXAS							
	<p>OUR RECORDS INDICATE THAT THE FOLLOWING BOOK WAS RETURNED 9 DAYS OVERDUE AT THE TEXAS A+M UNIVERSITY MAIN LIBRARY. YOUR DELINQUENT FINE IS \$2.25.</p> <p>CALL NUMBER 949.5.....F688.....</p> <table border="0"> <thead> <tr> <th>ITEM NO</th> <th>DATE DUE</th> <th>DATE RETO</th> <th>638202</th> </tr> </thead> <tbody> <tr> <td>21177.</td> <td>11/29/65</td> <td>12/08/65</td> <td>MR RICHARD A JOHNSON 2801 N HWY 6 BRYAN TEXAS</td> </tr> </tbody> </table> <p>PLEASE CONTACT THE MAIN LIBRARY CIRCULATION DESK IN ORDER THAT WE MAY RESOLVE THIS MATTER TO THE SATISFACTION OF ALL CONCERNED. UNPAID FINES ARE BILLED THROUGH THE FISCAL OFFICE FOR COLLECTION.</p>	ITEM NO	DATE DUE	DATE RETO	638202	21177.	11/29/65	12/08/65	MR RICHARD A JOHNSON 2801 N HWY 6 BRYAN TEXAS	<p>*** FILE COPY ***</p>
ITEM NO	DATE DUE	DATE RETO	638202							
21177.	11/29/65	12/08/65	MR RICHARD A JOHNSON 2801 N HWY 6 BRYAN TEXAS							

Figure 7  
Sample Page of Overdue Notices Prepared by the Computer

# DATA PROCESSING CENTER

DPG CONTROL NUMBER: \_\_\_\_\_  
 PROGRAMMER: \_\_\_\_\_  
 PAGE \_\_\_\_ OF \_\_\_\_  
 CARD TYPE: SERIALS RECORD INPUT

OP Codewords:  
 NEWSIN  
 ADD  
 DELETE  
 CHANGE  
 UPDATE  
 BLANK

SIN	OP	SEQ	KYWD	DATA
1				
2				
3				
4				
5				
6				
7				
8				

1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0

Keywords:

	(1) .DATA	(2) -ORDER	(3) UNIT
Required	.ADDED	-CLASS	UNIT
	.ENTRY	-COPIES	
	.KIND	-LANGUAGE	UNOTE
	.LOCATE	-PUBLISHED	
		-SOURCE	(4) BOUND
		-TYPE	BOUND
Optional	.ARRNOTE	-ADSBILLS	
	.BEGIN	-BIDNOTE	BNOTE
	.BIND	-DOCUMENT	
	.CEASED	-FUND	(5) HISTORY
	.CURRENT	-INDEXED	HISTORY
	.CUTTER	-MEMBER	
	.DEWEY	-ORDERED	(6) LACK
	.FREQUENCY	-PAYOK	LACK
	.NUM/VOL	-PREVIOUS	
	.NUM/YR	-PRICE	INOTE
	.SUPPL	-RENEW	
	.TITLE		(7) XREFER
	.TPI	-NOTE	XREFER
	.NOTE		
Control	.ACTIVE	-NEWBID	
	.CFT		
	.CONTINUED		
	.NOUNITS		

REVISION DATE:

Figure 8  
Format for keypunching the Serials Record Input

<b>DATA FORM</b> <small>SERIALS RECORD</small>			Keypunched _____ Date _____	SIN <u>2243</u> Page <u>5</u> of <u>7</u>
SIM <u>2243.09</u> OF _____ <small>1 6 7 12</small> <small>A.D.D.</small>			<b>NEW ENTRY -ORDER</b> <small>Complete For Original Copy Only</small>	
-CLASS _____	<u>PERIODICAL</u>		-NEWBID <input type="radio"/>	
-TYPE _____	<u>RENEWAL</u>			
-SOURCE _____	<u>B.I.O. LIST</u>			
-LANGUAGE _____	<u>ENGLISH</u>			
-PUBLISHED _____	<u>UNITED STATES</u>			
-COPIES _____	<u>2</u>	-INDEXED _____		
-MEMBER <u>AMERICAN MANAGEMENT ASSOCIATION</u>				
-DOCUMENT _____				
-FUND <u>19120-503</u>	<small>fund</small>	<small>order</small>	-PAYK <u>01105165</u>	-RENEW <u>408</u> month
-PRIZE \$ <u>35.09</u>	-ADSBILLS \$ _____			
-PREVIOUS \$ <u>35.09</u>				
-ORDERED <u>091031644-01315, 454</u>				
<small>date material and/or period covered</small>				
-BIBNOTE _____				
_____				
_____				
_____				
-NOTE Attached <input type="radio"/>				

Figure 9  
Form for Preparing Serials Record Input



107840NEWSIN			
107840ADD	XREFER	AMERICAN MANAGEMENT REVIEW. SEE MANAGEMENT REVIEW.\$	
108350NEWSIN			
108350ADD	1XREFER	ASSOCIATION OF CORPORATION TRAINING. BULLETIN. SEE	
108350ADD	2XREFER	MANAGEMENT REVIEW.\$	
238350NEWSIN			
238350ADD	XREFER	CORPORATION TRAINING. SEE MANAGEMENT REVIEW.\$	
784350NEWSIN			
784350ADD	1XREFER	NATIONAL ASSOCIATION OF CORPORATION SCHODLS. BULLETIN.	
784350ADD	2XREFER	SEE MANAGEMENT REVIEW.\$	
865450NEWSIN			
865450ADD	XREFER	PERSONNEL ADMINISTRATION. SEE MANAGEMENT REVIEW.\$	
778300NEWSIN			
778300ADD	.ACTIVE	\$	
778300ADD	.ADDED	JAN65\$	
778300ADD	.BEGIN	JAN\$	
778300ADD	.BIND	001000000000\$	
778300ADD	.CURRENT	V54NIY1965\$	
778300ADD	.CUTTER	M266\$	
778300ADD	.DEWEY	650.5\$	
778300ADD	.ENTRY	MANAGEMENT REVIEW.\$	
778300ADD	.FREQUENCY	REG111111111111\$	
778300ADD	.KIND	ORIGINAL\$	
778300ADD	.LOCATE	H-SS\$	
778300ADD	.NUM/VOL	12\$	
778300ADD	.NUM/YR	12\$	
778300ADD	.TPI	SEPDEC\$	
778300ADD	-CLASS	PERIODICAL\$	
778300ADD	-COPIES	2\$	
778300ADD	-FUND	14120-5003\$	
778300ADD	-LANGUAGE	ENGLISH\$	
778300ADD	-MEMBER	AMERICAN MANAGEMENT ASSOCIATIONS	
778300ADD	-ORDERED	09/03/64J-01965,V54\$	
778300ADD	-PAYDK	01/05/65\$	
778300ADD	-PREVIDUS	25.00\$	
778300ADD	-PRICE	25.00\$	
778300ADD	-PUBLISHED	UNITED STATES\$	
778300ADD	-RENEW	AUG\$	
778300ADD	-SOURCE	BID LIST\$	
778300ADD	-TYPE	RENEWAL\$	
778300ADD	BOUND	25831V1,1914\$	
778300ADD	BOUND	25832V2,1915\$	
778300ADD	BOUND	25833V3,1916\$	
778300ADD	BOUND	25834V4,1917\$	
778300ADD	BOUND	154352V5,1918\$	
778300ADD	BOUND	154353V6,1919\$	
778300ADD	BOUND	154230V7,1920\$	
778300ADD	BOUND	154231V8,1921\$	
778300ADD	BOUND	375602V9-12,1922-23\$	
778300ADD	BOUND	243104V13,1924\$	
778300ADD	BOUND	243105V15,1926\$	
778300ADD	BOUND	243106V18,1929\$	
778300ADD	BOUND	243107V20,1931\$	
778300ADD	BOUND	154354V21,1932\$	
778300ADD	BOUND	154355V22,1933\$	
778300ADD	BOUND	154356V23,1934\$	

Figure 10  
Sample Page of Entries in the Serial Record

## BOUND HOLDINGS

778300 MANAG

650.5  
M266

MANAGEMENT REVIEW.

## HISTORY

V1-7N8, 1914-AUG1920 AS NATIONAL ASSOCIATION OF CORPORATION SCHOOLS.BULLETIN. V7N9-V8, SEP1920-JAN1922 AS NATIONAL ASSOCIATION OF CORPORATION TRAINING.BULLETIN. V9, FEB-APR1922 AS CORPORATION TRAINING. V10-11, MAY1922-MAR1923 AS PERSONNEL ADMINISTRATION. V12-14, APR1923-DEC 1925 AS AMERICAN MANAGEMENT REVIEW.

## BOUND

25831	V1, 1914	154360	V29, 1940
25832	V2, 1915	295913	V30, 1941
25833	V3, 1916	295912	V32, 1943
25834	V4, 1917	176760	V33, 1944
154352	V5, 1918	243143	V34, 1945
154353	V6, 1919	295911	V35, 1946
154230	V7, 1920	225311	V36, 1947
154231	V8, 1921	216622	V37, 1948
375602	V9-12, 1922-23	216623	V38, 1949
243104	V13, 1924	243108	V39, 1950
243105	V15, 1926	224965	V40, 1951
243106	V18, 1929	224966	V41, 1952
243107	V20, 1931	243109	V42, 1953
154354	V21, 1932	344483	V43, 1954
154355	V22, 1933	341556	V44, 1955
154356	V23, 1934	341557	V45, 1956
154357	V24, 1935	304755	V46, 1957
176761	V25, 1936	341558	V47, 1958
295888	V26, 1937	341559	V48, 1959
154358	V27, 1938	341560	V49, 1960
154359	V28, 1939	502564	V50, 1961
		586431	V51, 1962

Figure 11  
Sample Page of the Bound Holdings File

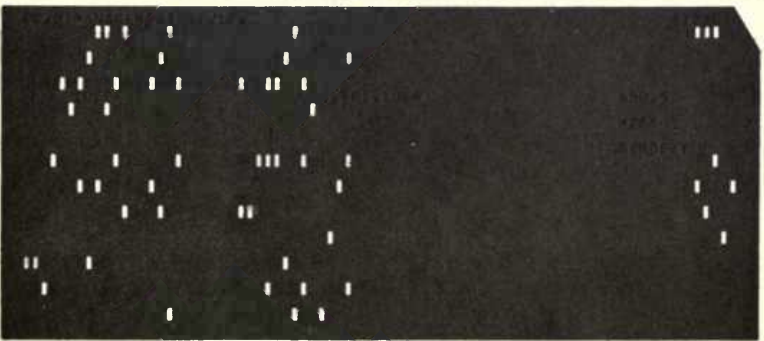
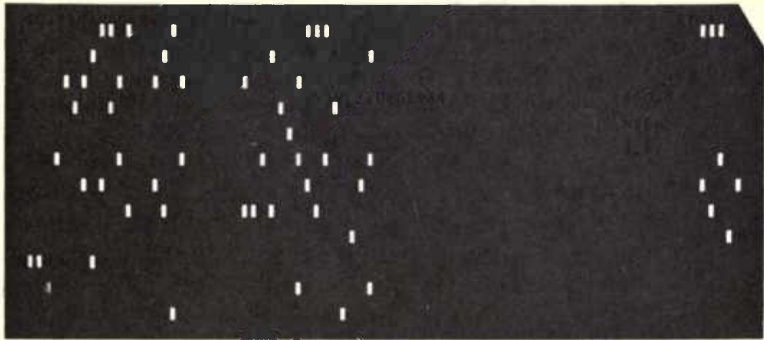
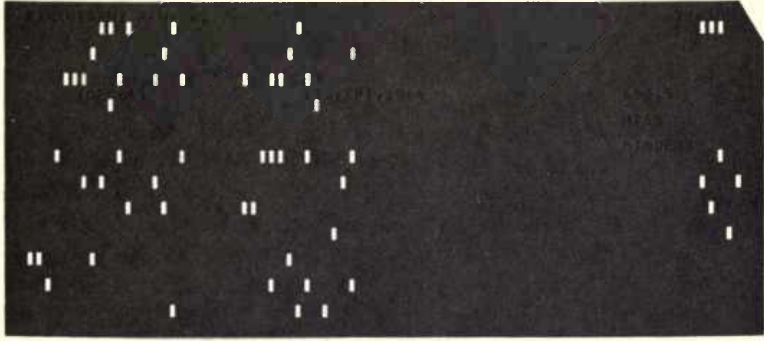
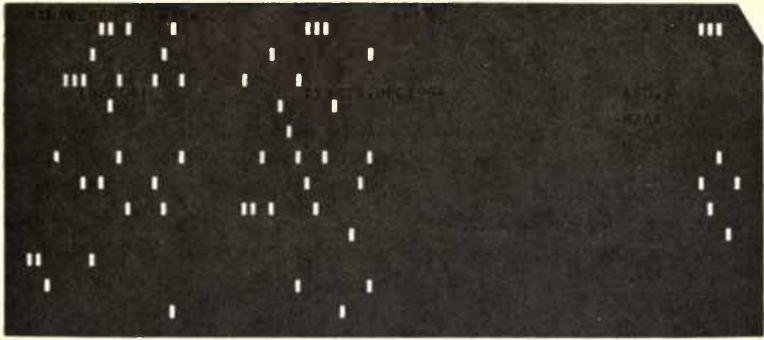


Figure 12  
Examples of Arrival Cards for Two Copies of a Serial, with Separate  
Volume Indexes

TEXAS A+M UNIVERSITY LIBRARY		FEED
PERIODICAL LIST		
02/14/66		
636.505/H361	FEED AND FARM SUPPLIER	630
636.08505/F295	FEED BAG	630
636.08505/F2957	FEEDS ILLUSTRATED	630
658.93305/F295	FEEDSTUFFS	650
	FELSMCHANIK UND INGENIEURGEODLOGIE	EL
631.805/F411	FERTILISER NEWS	630
616.6905/F411	FERTILITY AND STERILITY	610
	FERTILITY AND STERILITY	VET
665.05/F421	FETTE-SEIFEN-ANSTRICHMITTEL	660
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