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PROPOSAL FOR MICROCOMPUTER USE  
AT THE UNIVERSITY OF HAWAII AT  
MANOA LIBRARIES

SUMMARY

The University of Hawaii at Manoa (UHM) Libraries have been automating both public and technical services for approximately 10 years. End user hardware for automation activities has been limited to (1) dot matrix printers, (2) special use terminals for accessing a specific bibliographic utility (OCLC) and (3) general use dumb terminals for accessing the University of Hawaii Computing Center (UHCC), online literature searching and the in-house automated library system. Microcomputers have not yet been provided for use by the library staff and/or patrons.

This report was developed to expand upon the ideas expressed in "1985-1995 A Strategy for Academic Quality" prepared by the Strategic Plan Steering Committee for the University of Hawaii. The next ten years will bring rapid growth in communications and information technologies therefore it is crucial that the library staff, which serves the university community be as technology-literate as possible. Although a large percentage of the library staff currently use terminals or computers, their use is limited to 'special purpose' shared-systems and many are still not computer literate. The introduction of microcomputers for staff use should aid in quickly closing this literacy gap.

This proposal includes (I) a rationale and general specifications for the introduction of microcomputers to the library to replace terminals; (II) a list of existing and new activities which could be performed by library staff using microcomputers; (III) general hardware and communications requirements; (IV) specifications for use of microcomputer controlled word processors to increase library staff's "word production"; (V) Appendices which include (A) examples of microcomputer applications in libraries; (B) an ergonomics report by a subcommittee of the UHM Steering Committee for the Library Automation Program; (C) a preliminary list of components for a micro network using Macintosh hardware and software (no costs are included since the UHM discount will not be announced until May 1985); (D) a commercially prepared description of the Honeywell microSystem PC (compatible with the Ultimate computer used by UHM library) with IBM PC compatible hardware, bundled software and peripherals and the UHCC price list for IBM microcomputer purchase with a UHM discount.

## PROPOSAL FOR MICROCOMPUTER USE

### I. RATIONALE FOR THE INTRODUCTION OF MICROCOMPUTERS IN THE LIBRARY TO REPLACE TERMINALS:

The UHM library is currently in the process of automating the major tasks performed by the library staff. This includes ordering, receipt and purchasing, cataloging and circulating library materials. It is fundamental that the library staff become computer literate as part of this process. Much attention has been directed toward the automation of routine library activities yet little attention has been paid to what word processing alone could do for both the professional and paraprofessional staff. Recent expansion of Library Systems Office staff means the necessary technical support to guide and implement installation of microcomputers is available and will not jeopardize the on-going installation of the integrated automated library system. Specific factors which encourage and support introduction of microcomputers include:

1. The UHM library budget for the 1985-87 biennium requests \$80,000 to purchase 42 smart terminals, \$10,000 for an IBM PC-controlled laser disk reader and \$3,200 for microcomputers with enlarged displays for the visually impaired.
2. The cost of microcomputers has dropped drastically in the last five years. This reduction in costs has made it more feasible to consider the use of microcomputers in place of smart terminals. For example, the only terminal currently available which can display the full American Library Association (ALA) character set (TELEX) costs approximately \$3,500 each and can only function as a dedicated synchronous terminal. The Research Library Information Network (RLIN) terminal which supports a Chinese, Japanese and Korean character display costs approximately \$10,000 each and can only be used as dedicated special purpose terminals.

For approximately the same investment the library can have work stations which meet immediate needs for record display but which may also be used in other productive activities by staff. Appendix C provides a preliminary list of Macintosh hardware and software and an office layout design that would allow microcomputers to be utilized in place of special single purpose terminals and for other activities as well.

3. The additional effort required to develop custom software for the microcomputers can be offset by the additional productivity due to staff utilization of the microcomputers when the microcomputers are not in use for displaying the ALA character set or accessing laser disk stored records.

During scheduled off times, staff uses could include word processing (see section IV for a full justification of this application), generation of statistical reports, project planning, organization of small bibliographic databases (i.e.

new acquisitions, special pamphlet files, etc.). Availability of microcomputers would provide an opportunity to lighten the clerical load associated with routine tasks, increase productivity and free up time for implementation of many innovative projects and new services.

4. Microcomputers allow greater flexibility when used as terminals. Tasks which tie the microcomputers directly into the ADLIB system may be handled in one of three ways: (1) strictly as an exchange between two "alien" computers (a local editing microcomputer and the main integrated database management system) or (2) the microcomputer may be used strictly as a terminal, unless (3) the microcomputer supports the PICK operating system and the same software is run on both computer

## MICROCOMPUTER USE JUSTIFICATION

5. Online literature searching: Available software will allow for off-line input of search strategies and the automatic transmission via a telephone during off hours to reduce online costs. Microcomputer software could also improve searching by allowing for the storage of past search strategies and related information (e.g. the rate of successful retrieval within various data files). Online searches result in customized bibliographies which may be stored, updated using a microcomputer and distributed to other patrons with similar information needs.
6. Conventional text processing, prooduction of memos, procedures and other written materials, preparation of library maps and library use instructional materials, current acquisition lists could be

replaced with word processing.

7. Computer program development for uploading onto the UHCC computers and for in-house documentation of those programs
8. Use of spreadsheet programs to prepare statistical reports and to calculate and predict expenditure of funds. (See Appendix A for an example of the use of microcomputers to track student help funds).
9. The control of sensitive information (see Appendix A or an example of use of PFS to control library staff identifiers and menu assignments for the in-house system).
10. Library skills instruction.
11. Chinese, Japanese, Korean and other vernacular languages catalog card production, correspondence and other word processing type tasks.
12. Online display of vernacular language cataloging requiring graphics oriented character sets (such as Chinese, Japanese and Korean).
13. Creation and editing of cataloging records employing the full ALA character set.
14. A design for accessing, displaying, inputting, and creating the Chinese, Japanese and Korean characters using microcomputer capabilities must be completed in order to determine what modifications to standard microcomputers are necessary to accommodate these vernacular language activities (e.g. RAM disk or PROM storage of character set, expanded CPU to facilitate the extensive screen use and interface, hard disk storage for the creation and storage of new characters as needed, special communications hardware to speed up data flow, etc.).
15. Computer-aided instruction for training student assistants new library staff members and to enhance current staff skills (e.g. typing tutors, computer literacy).
16. Current awareness/electronic bulletin board service.
17. Word processing and bibliographic software to replace typewriters available to students and faculty for preparation of classroom materials and for use by library staff and other faculty members for preparation of customized bibliographies using information downloaded from the UHM library database and other online databases.
18. Online storage of graphic representations of rare material and non-book materials such as artifacts, art prints, etc. This application would require hardware and software which can be used to make a digitized image of the item which could then be stored and retrieved as a graphic. The system must be small and portable, able to make image of three dimensional objects, and should be easy and fast to learn and use. The graphic images should be stored using a format that is already supported by the system (e.g. Koala MacVision stores the digitized image as a

MacPaint document).

19. Database display of enlarged characters for the visually impaired.
20. Microcomputers could serve as smart front-end processors to minimize CPU time required while performing online cataloging on the UHM library automated system.

## II. GENERAL HARDWARE REQUIRMENTS:

1. The microcomputers must interface with the Ultimate computer system and it is highly desirable that they interface with the UHCC's IBM 3081 and DEC 2060. (NOTE: UHCC has already written software for IBM PC's to link to these computers and they are currently in the process of writing this software for the Macintosh.)
2. The display screen must minimize health hazards and maximize comfortable use (e.g. have high resolution black lettering on white non-glare screens). (See the report by the SCLAP ergonomics subcommittee in Appendix B).
3. Laser and dot matrix graphics printers must be compatible with the microcomputer and allow for the printing of any character or image that can be displayed on the screen. The printers should be able to utilize both tractor and friction feed for paper.
4. The microcomputers must have Local Area Network (LAN) capabilities. They should be able to interconnect and share common peripherals such as Optical Character Recognition devices (OCR), laser printer and modems. LAN system requirements include the need for an intelligent file server with a 20-megabyte hard-disk system for electronic mail facilities and print spooling. (Apple talk and IBM PC LAN have these capabilities.)
5. There must be the capability for synchronous and asynchronous data communications at a minimum of 56K bits per second (bps).
6. The capability to support 32 network nodes must exist for attachment of workstations, output (printers) and input (OCR) devices at a distance of approximately 200-300 meters between nodes (distributable). The microcomputers must be flexible enough to allow for easy relocation of workstations and devices.
7. Software must be available which supports integrated word processing, spreadsheet generation, graphics, relational database creation, and communications and be easy to use and learn. The software should include the ability to have multiple documents open at once and to cut and paste between them; to update multiple files without opening them all individually; to suppress sensitive information through the use of varying display formats; to produce graphics such as charts and graphs and telephone communications with or without modems.

## III. GENERAL REQUIREMENTS FOR COMMUNICATIONS:

The microcomputers must be:

1. Resistant to radio frequency interference (RFI) or static discharge;
2. provide 16 to 32 network nodes without requiring special network configuration;
3. be capable of a 64-192 kilobits per second (bps) data transfer rate using CCITT (Comite Consultatif International Telephonique et Telegraphique) standards;
4. allow 150-300 meters maximum distance between nodes;
5. be compatible with the International Standards Organization (ISO) Open Systems Interconnections (OSI) model. Protocol must be equivalent to the ISO OSI layers 1 through 5 (physical, data link, network, transport and session);
6. operate using an access scheme based on a carrier sense multiple access with collision avoidance (CSMA/CA) model.

## PROPOSAL FOR MICROCOMPUTER USE

### II. LIST OF POSSIBLE USES OF MICROCOMPUTERS IN UHM LIBRARIES

#### A. CURRENT ACTIVITIES WHICH CAN BE ENHANCED:

1. Online literature searching.  
Available software will allow for off-line input of search strategies and the automatic transmission via a telephone during off hours to reduce online costs. Microcomputer software could also improve searching by allowing for the storage of past search strategies and related information (e.g. the rate of successful retrieval within various data files). Online searches result in customized bibliographies which may be stored, updated using a micro-computer and distributed to other patrons with similar information needs.
2. Conventional text processing, prooduction of memos, proce dures and other written materials, preparation of library maps and library use instructional materials, current acquisition lists could be replaced with word processing.
3. Computer program development for uploading onto the UHCC computers and for in-house documentation of those programs
4. Project planning, time-lines and other administrative and management organizational tasks.
5. Scheduling of personnel to cover public service areas.
6. Use of spreadsheet programs to prepare statistical reports and to calculate and predict expenditure of funds. (See Appendix A for an example of the use of microcomputers to track student help funds).
7. The control of sensitive information (see Appendix A or an example of use of PFS to control library staff identifiers and menu assignments for the in-house system).
8. Library skills instruction.

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### B. ADDITIONAL ACTIVITIES WHICH COULD BE PERFORMED:

1. Chinese, Japanese, Korean and other vernacular languages catalog card production, correspondence and other word processing type tasks.
2. Online display of vernacular language cataloging requiring graphics oriented character sets (such as Chinese, Japanese and Korean).
3. Creation and editing of cataloging records employing the full ALA character set.

ALA expanded character set-to-microcomputer translation table(s) would have to be developed to allow for the display of constructed characters (characters which are built from other characters). There is commercially available software which supports a one-to-one translation for all ALA defined characters. UHM would have to develop software which combines the full character sets into an appropriate display for public viewing.

A design for accessing, displaying, inputting, and creating the Chinese, Japanese and Korean characters using microcomputer capabilities must be completed in order to determine what modifications to standard microcomputers are necessary to accommodate these vernacular language activities (e.g. RAM disk or PROM storage of character set, expanded CPU to facilitate the extensive screen use and interface, hard disk storage for the creation and storage of new characters as needed, special communications hardware to speed up data flow, etc.).

4. Control and monitoring of communications equipment.
5. Computer-aided instruction for training student assistants new library staff members and to enhance current staff skills (e.g. typing tutors, computer literacy).
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### IV. SPECIFICATIONS FOR WORD PROCESSORS TO IMPROVE UTILIZATION OF UHM LIBRARY STAFF TIME

#### INTRODUCTION

The library staff consists of 160 full time employees, including professionals, paraprofessionals, and APTs in clerical technical, and administration positions as well as many part-time student employees. In addition to performing tasks which will be automated upon implementation of the ADLIB intergrated library software system staff members are also involved in the production of training and instructional materials, library guides, memos and letters, procedural documentation, articles for journals and monographs, and research manuscripts.

The major "product" of any univerisity is knowledge, and knowledge is most frequently transmitted in the form of "words". A university library facilitates access to knowledge which in essence improves the quality of the "product" of the university. The processing of words in the library is steadil increasing, but is inhibited by a lack of personnel to support the various administrative, research, and other writing tasks such as those outlined above.

The existing clerical and support staff attempt to handle the major writing tasks which serve instructional and adminis- trative needs but cannot adequtely meet the needs of indivi- dual library professionals, researchers and the unique needs of the specialized library collections. This results in a backlog of word processing tasks and forces individuals to seek alternatives such as paying private typists or using text composition programs at UHCC.

The diverse nature of the UHM library collection adds addi- tional complications to automating the processing of words. The library not only provides access to materials which are romanizeed using an expanded ALA defined character set it also supports vernacular catalogs in graphics oriented character sets such as Chinese, Japanese and Korean.

## PROPOSAL FOR MICROCOMPUTER USE

### A. ADVANTAGES OF MICROCOMPUTER-CONTROLLED WORD PROCESSING:

Word processing software relieves staff of the burden of constantly retyping text, simplifying the performance of edits and eliminating the common problem of introducing new errors to the with each retyping.

Word processing greatly increases the ability to manipulate and print text to specification. Text can be copied, moved, searched, replaced or deleted; documents may be merged to create customized form letters and substantially more typing in a manual system.

Word processing allows individuals control over their own documents without requiring the supervision of a central system manager. Each user's work is secure and there is minimal opportunity for an inexperienced user to cause any system-wide problems. Word processing requires a minimum use of paper by providing electronic display and modification capabilities.

Word processing programs are simple to use and do not require great familiarity with computers. They can provide a minimally stressful initiation to computer use and may serve to reduce the training time required for other uses of computerized systems.

### B. SPECIFICATIONS:

The word processor must (1) telecommunicate, (2) interface with optical character scanners, and (3) photocomposition devices, in order to reduce the amount of time spent inputting and outputting documents which originate and terminate with another system. The word processor must also support multiple character sets for production of written material in non-Roman languages.

1. Telecommunication provides the ability to receive, write and store computer programs, user documentation, and library data as if it were a text document. When the user is ready, the "text" can then be telecommunicated to the main computer for processing, optimizing time on the main computer.
2. An interface with optical character scanners enables the system to "read" standard type-written pages and greatly decreases the time spent in basic entry of text.
3. An interface with photocomposition devices allows preparation of professional quality typesetting without requiring that the text be retyped into a typesetter. This eliminates the proofing of the newly input text

and reduces the overall production time of photo-read copy.