

MANN LIBRARY INSTRUCTIONAL COMPUTING FACILITY

Part III -- Computer Hardware

The layout proposed for the Mann Library Instructional Computing Facility in the "Physical Arrangement of the Facility" section of this report would require a total of 38 microcomputers, 3 modem connections, and 6 printers, to be distributed as follows:

Classroom (21 microcomputers; 1 modem)

- 20 microcomputers for students
- 1 microcomputer for the class instructor
- 1 modem connection to enable the instructor's microcomputer to access online databases

General-Use Area (15 microcomputers; 6 printers; 2 modems)

- 2 microcomputers dedicated to online bibliographic searches
- 2 modems to enable the above 2 microcomputers to access on-line databases
- 2 microcomputers enabled for communication with Cornell's mainframe computers
- 11 microcomputers for general student use
- 3 letter-quality printers
- 3 dot-matrix printers

Staff Area (2 microcomputers)

- 1 microcomputer to maintain the queuing system
- 1 microcomputer for staff use

Facing the College of Agriculture in the immediate future is the problem of where to place the 20 IBM PC-XT units which have been acquired to support Professor Robert Cooke's computer course Agricultural Engineering 151. This course will be offered during fall semester of the 1983-84 academic year and will be centered around the IBM personal computers and software which will be delivered with them. According to the Computer Services Department, these units are heat sensitive and should be placed in an air-conditioned room. As the facility that will eventually be established in Riley-Robb Hall for students enrolled in courses taught by Professor Cooke and others cannot be made ready for the fall semester, it has been proposed that the 20 IBM PC-XTs be installed in the classroom of the Mann Library computer facility on a temporary basis.

Mann Library would be eager to accept these computers, and to assist Professor Cooke to the best of our abilities, with the following conditions:

- That there be a clear understanding with the College of Agriculture that the classroom in the Mann Instructional Computing Facility be equipped with a similar number of suitable microcomputers when and if the IBM PC-XT computers

are moved to Riley-Robb Hall.

-- That although Mann Library is prepared to defer to Professor Cooke's scheduling requirements until the Riley-Robb instructional facility is operating, we have plans for an instructional program of our own and must be able to schedule blocks of time when the IBM PC-XT computers will be reserved for classes or workshops in that program.

-- That although Mann Library is prepared to offer students in Professor Cooke's courses (or students in other courses in the College of Agriculture who have been assigned class work that requires the use of these machines) priority if it proves that the demand for computer time at the Mann facility is high, we should be permitted to make the 20 computers available for use by other students whenever demand allows us to do so.

If the 20 IBM microcomputers just described are installed in the Mann Library facility, we would need an additional 18 microcomputers to complete the computer rooms in the Mann Informal Study. (Of course, if the original 20 PC-XTs are later moved to Riley-Robb Hall, we would then have a need for a further 20 microcomputers to make up the loss). In developing recommendations concerning the type and make of these 18 computers, the following conditions pertain:

- 1) The instructor's microcomputer in the classroom should be identical to the student units (although the instructor's machine will have modem and monitor connections that the student machines do not).
- 2) The 21 microcomputers in the classroom end of the Mann computer facility will not be equipped with printers. We therefore believe that it will be necessary to designate two of the units in the general-use area as express machines for the use of students who want to print their work. One of these microcomputers will be connected to a dot-matrix printer and one to a letter-quality printer. These two computers will have to be compatible with the machines in the classroom.
- 3) The 2 microcomputers in the general-use area which are to be dedicated to bibliographic searching must be able to run a software package known as "Sci-Mate" (developed by the Institute for Scientific Information). This program permits the searching of the principal bibliographic databases used in science and agriculture with a unified, menu-driven search language, and allows the user to store and sort the results of an online search.

4) The microcomputer designated for staff use, although it will be used extensively in keeping statistics connected with the computer facility and in assisting student computer users with questions, will also give the Programmer a tool to use in developing applications programs in the course of library automation. This computer should therefore be compatible with the microcomputers elsewhere in Mann Library.

5) The 2 microcomputers connected to the Cornell mainframe computers must function as efficiently as possible in communication with an IBM system. We should be reasonably well assured that communications software is and will continue to be available for these machines.

6) The microcomputer located at the reception and loan counter, which will support the queuing system, should be capable of running the program which Computer Services has developed for this purpose.

7) Our original memo of June 17 stated that we thought it would be valuable to provide some variety of microcomputers in the Instructional Computing Facility, so that students could gain exposure to different types of equipment. We continue to feel that there is merit in this idea, but we want to avoid a smorgasbord approach. First, we will be providing students instruction in the classroom on one variety of microcomputer, and with a uniform set of software. Students will reasonably expect similar equipment to be available to them when they come on their own time to work in the general-use area. Secondly, some degree of uniformity, in software as well as in the microcomputers themselves, will reduce the detail that staff need to know in order to answer user's questions competently. Finally, in the interests of securing good service on the machinery, we do not think it wise to carry on relationships with a great number of vendors. In conclusion, we feel that two types of microcomputers will offer as much 'variety' as we are prepared to support.

If the College of Agriculture decides to install the 20 IBM PC-XTs described above in the Mann Library facility a number of conclusions may be drawn based upon the constraints outlined in the previous section.

-- The instructor's microcomputer should be an IBM PC-XT. (See number 1 above).

-- The two microcomputers dedicated to express printing should be IBM PCs with disk drives identical to those of the IBM PC-XTs. It must, in other words, be possible to read data to disk at any of the PC-XT stations, and then to

print data from this disk at either of the express printing units. (See number 2 above).

-- As "Sci-Mate" runs on the IBM PC computer (with the addition of the CP/M-80 operating system), we would suggest this equipment for the bibliographic search units. (See number 3 above).

-- Mann Library strongly favors the IBM PC in its own automation program. We currently have two PCs, one in the Administrative Office and one in Technical Services. We therefore request that the microcomputer dedicated to staff use in the Instructional Computing Facility be an IBM PC. (See number 4 above).

-- We would also recommend that the microcomputers enabled for communication with the Cornell mainframe system be IBM PCs. (See number 5 above).

-- Computer Services uses an Apple II microcomputer to support a user logon queuing system at its Carpenter microcomputer facility. Although the queuing system that we envision is closer to what Computer Services uses at its mainframe terminal facilities, the Apple computer should be completely adequate to its implementation. (See 6 above).

This leaves a balance of nine microcomputers to which the constraints listed above do not apply. We believe that four of these machines should also be IBM PCs. These four would be located in the block of carrels at the southwest corner of the general-use area and would be connected to a letter-quality printer. This configuration would be attractive to students for word processing, and at times of high demand we might wish to limit word processing to these four machines.

We feel that there are strong arguments in favor of orienting the Instructional Computing Facility toward IBM equipment. Among them are the following:

* The IBM Personal Computer has seized a dominant position in the microcomputer market. There can be no question that new software will be written for the IBM PC for years to come. IBM's history in the computer business also suggests that the PC will be integrated into the ongoing development of microcomputer technology, and that upgrades will be made available which will keep the machine from becoming obsolete for the longest possible span of time.

* If a set of standards emerges in the American microcomputer industry, it is likely that IBM will play a major role in setting them.

* Decentralized Computer Services (DCS), which handles microcomputer orders from around the Cornell campus, has told us that Cornell as a whole is now inclining toward the IBM PC.

* DCS has arranged site licences for several software packages that operate on the IBM PC and PC-XT. Taking advantage of these will result in considerable savings in the development of a software library (see the discussion of software below). It is likely that DCS will make further arrangements of this kind in the future.

* Some possibility exists that IBM will make a large contribution of microcomputers to Cornell in the near future. If this occurs before the Riley-Robb facility is prepared, we would, in terms of both our software collection and hardware compatibility, be in an excellent position to take advantage of this contribution.

Thus, if the 20 IBM PC-XTs that have been purchased to support Professor Cooke's courses should not be placed at Mann Library, we would still urge the College of Agriculture to provide the classroom of the Instructional Computing Facility with IBM equipment. In this case, the IBM PC would be adequate. In order to accommodate the larger applications programs that are beginning to appear, however, we would suggest that these PCs be provided with more than the minimum of 64 K of random-access memory.

We recommend that the final five microcomputer positions in the General-Use Area be filled with Osborne Executive computers. The Osborne Executive is a sophisticated portable microcomputer that runs the CP/M operating system. Professor Michael Thonney, of the Animal Science Department, is a strong proponent of this machine. The Osborne is to be recommended on the following grounds:

- It is reasonably priced.
- Included in the purchase price is all the software that we would initially need in our software collection for these microcomputers. This could represent a considerable savings over a computer for which we must purchase software separately.
- The Osborne Executive offers compatibility, albeit a limited compatibility, with the IBM PC.
- The presence of the Osbornes in the facility will provide students with a microcomputer which, without alteration, can run software written for the popular CP/M system.

The chief disadvantages of the Osborne Executive are its small display

screen and the increased security risk associated with having portable microcomputers in the Instructional Computing Facility. We believe, however, that these shortcomings can be overcome without undue expense. If students complain that the Osborne's screen is too small, these computers could be provided with full-size screens purchased separately. (Five screens would cost less than one average microcomputer). Also, as the Osborne computer consists of just one unit, with the keyboard attached to the body, we will be able to fasten these five computers to their carrels and tables at reasonable cost.

The following is a summary of microcomputer needs by type, as outlined above:

Classroom

- 20 IBM PC-XT microcomputers (the 'Cooke' computers)
- 1 additional IBM PC-XT microcomputer (instructors unit)
(If the instructional PC-XTs are placed elsewhere, 21 IBM PC microcomputers, with extended RAM memory).

General-Use Area

- 2 IBM PC microcomputers with CP/M-80 capability (online bibliographic search units)
- 2 IBM PC microcomputers with mainframe communications capability
- 6 other IBM PC microcomputers
- 5 Osborne Executive microcomputers

Staff Area

- 1 IBM PC microcomputer
- 1 Apple II e microcomputer

Total Microcomputer Request

- 21 IBM PC-XT microcomputers
- 11 IBM PC microcomputers
- 1 Apple microcomputer
- 5 Osborne Executive microcomputers

Other Hardware Needs

- 3 modems
- 2 sets of hardware required for mainframe connection
- 3 dot-matrix printers
- 3 letter-quality printers
- 6 television-style monitors
- Any hardware necessary to monitor online time for the 2 bibliographic search units

Hardware Maintenance

As we stressed in the June 17 memo, it is important that we secure solid maintenance arrangements with vendors whenever we purchase computer equipment for the Instructional Computing Facility. Standard warranties will cover most repair costs during the first 90 days of operation, but with the expiration of warranty coverage we should expect that the maintenance of equipment will require ongoing expenditures. The rule of thumb with microcomputers is that 10 percent of purchase price should be budgeted for annual maintenance. Printers, because they are mechanical devices and will see hard service, may cost us more than 10 percent.

If we are able to train the Computer Operator to undertake routine trouble-shooting and repair work at the facility, we will be able to realize some savings on maintenance costs. We feel that this is an area where discussion with the Computer Services Department would be valuable.