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MARGARET MAXWELL

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Tails Wagging Dogs

A funny thing happened on the way to the form. In the past decade, many libraries believed they were developing or using automated systems to produce catalog cards, or order slips, or circulation control records. The trauma of AACR2 implementation has helped many to realize belatedly that they have, in fact, been building data bases.

Libraries must relate their own machine-readable records to each other in a new way as they face new applications. Further methods of relating and using records from different libraries, and even different networks, are becoming necessities in our increasingly interdependent world.

A narrow view of the process of creating records has often resulted in introduction of nonstandard practices that provide the required immediate result, but create garbage in the data base. In effect, letting the tails wag the dogs. For many years, John Kountz and the TESLA (Technical Standards for Library Automation) Committee addressed this issue forcefully, but were as voices in the wilderness.

The problems created are the problems of success. The expectations libraries have developed have outstripped their practices. Many libraries are only now seriously addressing the practices they have used to create data bases that already contain hundreds of thousands of records.

Precisely because of its success, the OCLC system is a useful case in point. In general, OCLC has adhered closely to MARC standards. In call number and holding fields, national standards have been late forthcoming, and libraries have often improvised. Meeting the Procrustean needs of catalog cards has ofttimes blinded libraries to the long-term effects of their practices. Multiple subfield codes to force call number "stacking" and omission of periods from LC call numbers are two examples of card-driven practice.

Not following recommended OCLC practice of fully updating the record at each use has created archive tapes requiring significant manual effort to properly reflect library holdings. Variant branch cataloging practices create dilemmas. Some malpractices have resulted from attempts to beat pricing algorithms. Some, like retaining extraneous fields or accepting default options when they are incorrect, merely reflect laziness or shortsighted procedures.

While implementing systems in the present, libraries must keep a weather eye to the future. What new requirements will future systems place on records being created today?

BRIAN AVENEY

Japanese Character Input: Its State and Problems

Ichiko MORITA: Ohio State University, Columbus.

Computer processing of information is highly advanced in Japan, and it continues to be researched and improved by the cooperative efforts of the government, private corporations, and individual scientists, who are among the best in the world. This paper introduces various approaches to the computer input of information currently developed in Japan, and discusses the possibility of their applications to the processing of East Asian–vernacular language materials in large research libraries in this country.

Processing of catalog information through an on-line shared-cataloging system has become a part of American libraries' common practice, and its financial and temporal savings have been proven. However, there are some materials not yet considered appropriate for computer processing. The Library of Congress' plans for romanizing catalog information for all non–roman language materials and putting them on MARC tapes for quick distribution of information have been objected to by a large number of specialists in the field. The opponents' reason has been that computerization of vernacular languages by means of transliteration is not satisfactory. Such materials are best handled in their own writing systems (the languages in this category include Chinese, Japanese, Korean, Hebrew, Arabic, and various languages in India). Those specialists in the field who see systems working for roman-alphabet materials generally agree that automated systems are very efficient and useful for their research. It would be best if non–roman language materials could be processed through computers using their own writing systems.

As far as technology goes, it is possible to process such materials in their original form. Systems that have the capability of handling those languages directly have been developed; among the most advanced are the Japanese systems. Japan has overcome numerous difficulties in developing systems that are capable of handling Japanese characters. Although automation of libraries is not as widespread as in the United States (due perhaps to a delay in the development of computers), some Japanese libraries have already a decade of experience with advanced

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systems. Many others have recently started to adopt them. Wide utilization of these systems seems to be just a matter of time.

It will be beneficial to review Japanese methods and consider possible adaptation of them to our systems. In the following sections, various Japanese approaches to inputting the Japanese language are explained with an eye to future automation of non–roman language materials in this country.

THE JAPANESE LANGUAGE AND THE COMPUTER

It should be noted, first of all, that the Japanese language is an entirely different language from Chinese, although they are often confused because they both use the same Chinese ideographs in writing. Each Chinese ideograph, or character, symbolizes a certain object or denotes a certain meaning. The Japanese use them in the Japanese language with its own pronunciation in the context of its own grammar, whereas the Chinese use them in the Chinese language with its own pronunciation in the context of its own grammar. This means that a Chinese ideograph could mean the same thing in both languages, but be pronounced or read differently and used in different grammatical environments. The Chinese ideographs used in Japanese are referred to as *Kanji*, which are, to complicate the matter, used along with Japanese syllabaries called *Kana*. *Kana*, in two styles called *Hiragana* and *Katakana*, total about 170 characters. Depending on whether a *Kanji* is used with another *Kanji* or *Kana*, the reading of it varies. At different times one set of *Kanji* may be read in two or three different ways.

The total number of *Kanji* is about 50,000. In comprehensive dictionaries, about 40,000 or more *Kanji* are included. Medium-sized ones, such as Ueda's *Daijiten*, include about 15,000; concise ones about 8,000 to 10,000.[1] According to several tests on frequency of *Kanji* occurrence made in various Japanese institutions, approximately 3,000 *Kanji* appear in high frequency, 3,000 are of moderate frequency, and several thousand more are of infrequent occurrence. As for geographical names, 2,279 *Kanji* will cover most of Japan and 1,500 *Kanji* will suffice to cover personal names, except for very unusual names.[2] Approximately 6,300 characters are needed for major newspapers such as *The Asahi* and *The Nikkei*.

The trends in the use of *Kanji* are to simplify the characters themselves, and not to use difficult *Kanji* with many strokes. In 1946, the Japanese government established 1,850 *Kanji* as those for daily use,[3] and today newspapers and official documents use only those *Kanji*, except for some personal and geographical names. The implication of this trend for computerization of *Kanji* is that, depending on the documents to be covered, the need in number and kind of *Kanji* varies. That is, institutions that deal with scientific or current information do not need as many *Kanji* as other types of institutions that handle documents cover-

ing longer periods and larger areas of knowledge. For example, Japan Information Center for Science and Technology, which mainly handles the latest scientific information, claims that with approximately 6,000 *Kanji* it can function satisfactorily. An example from the other extreme is the National Institute of Japanese Literature, whose collection covers older historical periods, during which a great number of *Kanji* were used and many *Kanji* went through changes, mostly simplification in style. The latter institute is constantly adding new *Kanji* to its system.

It is obvious then that the first problem in the computerization of Japanese materials is the number and kind of *Kanji* to be included in the system. This is a problem of hardware.

The other problem concerns software. When Japanese is written, its words are not divided as in English, for combination of *Kanji* and *Kana* helps visually to make sentences understandable without word division. Also, compound nouns are made by adding other words to a noun, so that, if a set of *Kanji* represents one noun, one can expand its meaning by adding another *Kanji* to it. Though word division has been a problem in transliteration and not new in computerization, both arbitrarily divided words and undivided words in particular become serious problems in the computer files and in the retrieval of information.

A question may be raised as to why we need *Kanji* processing in spite of these problems; why isn't computer handling of alphanumerics and *Kana*, which is in use today, sufficient? The answer to this is mainly that *Kanji* possess a definite visual effect. Also, if only romanized languages or *Kana* alone are used, many homonyms may make the meaning ambiguous. While it is quite possible to write Japanese only in *Kana* or in the romanized forms, as proven by the systems in use, it is better, for efficiency and precision, to express the language in the way it is actually written.

As for the problem of word division, study is in progress on methods of dividing words systematically and automatically, incorporating the latest research in the field of applied linguistics. This is more concerned with the development of software, and this paper will not delve into it.

INPUTTING

Various Japanese approaches to inputting *Kanji* and *Kana* are organized below into six major groupings according to different inputting devices. They are: (1) full keyboard, (2) component pattern input, (3) *Kana* keyboard, (4) stenotype, (5) optical character recognition, and (6) voice recognition. These six methods are further divided into subvariations as shown in table 1.[4]

Full keyboard

The main feature of this approach is use of a full character keyboard as the inputting device. The operator uses the full character keyboard

Table 1. Input Systems

Major Approaches	*Variations*	*Subvariations*	*Training Needed*	*Characters/ Minute*	*Characters Accommodated*
Full keyboard	Kanji teletypewriter		Medium–Extensive	40–100	2,300–4,000
	Japanese typewriter	Character location	Medium	30–50	2,205
		Coded-plate scanning			2,863
		Coded typeface			2,200–3,000
		Modified coded typeface			
	Tablet style	Electromagnetic	Medium–Small	30–70	3,000–4,096
		Electrostatic			2,800–4,000
		Photoelectric			2,800–4,000
Component pattern input					
Kana keyboard	Two-key stroke	Location correspondence	Extensive Association memory	60–120	4,096
	Display selection		Small	20–30	
	Kana-Kanji conversion	Word conversion			
		Sentence conversion			
Stenotype					
Optical character recognition					1,000–2,500
Voice recognition					

rather than codes or other symbols. The keyboard varies depending on models, usually consisting of frequently used *Kanji* and both sets of *Kana*, supplemented by Arabic numerals, Roman, Cyrillic, and Greek alphabets in upper and lower cases, often with italics, signs, and diacritical marks. To each character, a two-byte binary code (expressed by a four-digit numeral) is assigned, so that when the inputter types a character the code for the character is punched on paper or cassette tape.

Kanji Teletypewriter

The oldest method for *Kanji* inputting, still widely in use, is the *Kanji* teletypewriter system or multishift system. One variation of this approach, developed by the National Diet Library at an early stage of its computerization, has 192 character keys, each having fourteen characters in three columns and five lines, as shown in figure 1. In addition, there are fourteen selection keys arranged in three columns and five rows on the lower left of the keyboard to correspond to the pattern of characters on each character key. When an operator strikes the character key *B* with the right hand and the selection key *A* with the left hand at the same time, the code for the character *C* is punched on the tape.

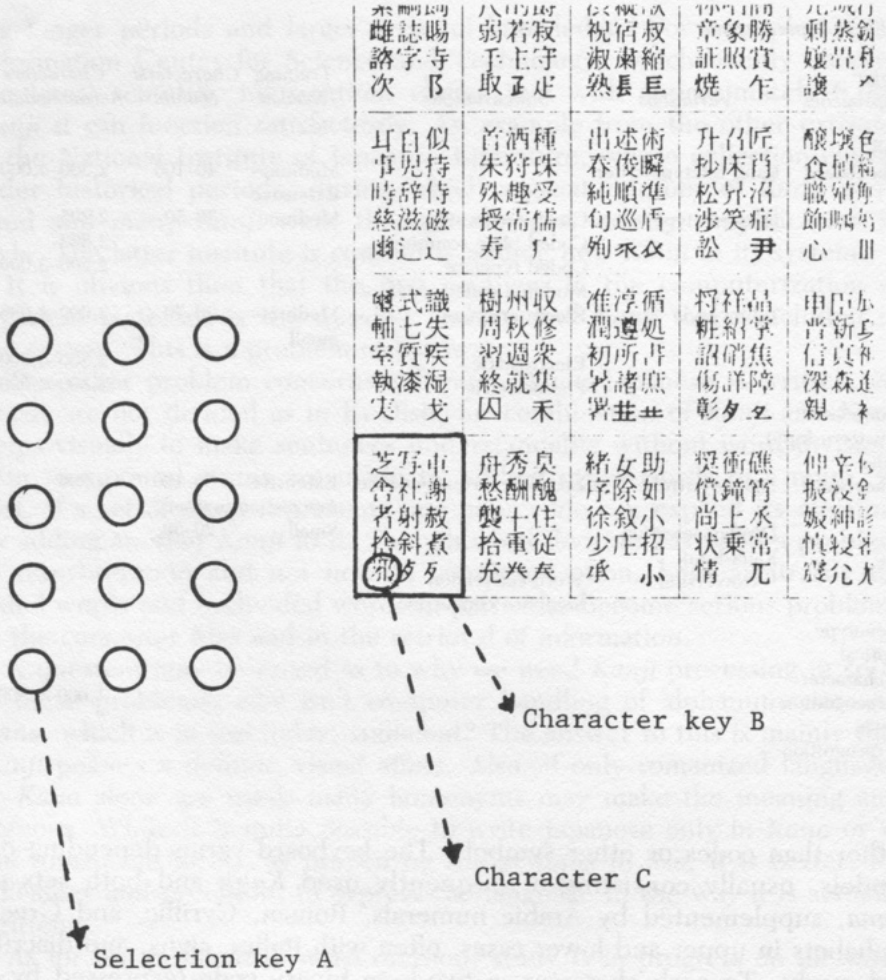

Fig. 1. Kanji Teletypewriter Keyboard of the National Diet Library.

Included on this keyboard are:

Kanji	2,006
Kana	90
Western alphabets	144
Numerals	20
Symbols and marks	210
Kanji pattern [5]	40
Kanji components	139
Space	1
Total	2,650[6]

By using shift keys on the upper left of the keyboard, *Kana* in both styles and alphabets in upper and lower cases can be input. For satisfac-

tory operation, the keyers must be professionally trained, and it is said that one to three months are necessary for them to be fully trained and able to input an average of fifty to sixty *Kanji* per minute. This is not as fast as most other methods discussed.

Japanese Typewriter

The second of the full keyboard approaches is the Japanese typewriter method, which uses a modification of the standard Japanese typewriter with a tray filled with *Kanji* printing types. The operator finds a character in the tray and punches it by moving a metal handle as the type bar is punched down to print the character. This is rather primitive and different in its operation from the English typewriter, which uses the ten-finger touch method. There are four variations:

Character Location Method. *Kanji* are arranged on a keyboard by their codes, so that when a key is punched, the *Kanji* is typed on regular paper as if it had been done by a regular Japanese typewriter. At the same time, the code is automatically read from the location of the key and is punched on tape.

Code-plate Scanning Method. Each type bar has a plate attached on its side, and the code for the character is marked on its plate. When a key is typed, the *Kanji* is printed on paper and the code from the plate is optically scanned at the same time.

Coded Typeface Method. Each typeface is made with a character on the upper half and a code for it on the lower half. When a key is typed, both the character and code are printed. The code on the bottom half is optically scanned from the printed paper.

Modified Coded Typeface Method. Instead of typing both characters and codes on the paper, this method prints only the characters on the front of the paper and, at the same time, prints a bar code on the back of the paper. The machine capable of doing this is complicated. The size of the character on a typeface can be bigger than in the variation above, and the bar code can be larger to make the scanning of the code easier and more precise.

As the discussion of the four variations indicates, the Japanese typewriter offers the advantage of being able to monitor input at the time of keying.

Since the Japanese typewriter has been in use for a long time in offices where a quantity of official documents are dealt with, and since ordinary Japanese typists can use this system without any additional training, the use of equipment similar in operation was considered advantageous. However, it should be noted that Japanese typewriters have never become as prevalent as English typewriters, and the demand for computers comes from more areas than just those where Japanese typewriters are used. For this reason, the use of Japanese typewriters is not as advantageous as its proponents claim. An obvious

disadvantage is its slow speed of operation—thirty to fifty characters per minute on the average. Another disadvantage is that the number of characters on the keyboard is limited to about 3,000.

Tablet Style

This method, also known as pen-touch method, was recently developed. Each character has a key, and characters are arranged in a certain order. The location of the characters on a matrix sheet determines the two-byte binary code, which consists of a two-digit numerical abscissa and two-digit numerical ordinate. The operator touches the key with a pen-shaped detector and the code for the character is punched on the paper tape. The operation is one-handed, requiring only a light touch of the key by a detector. Keys are on one flat keyboard and are color-coded by sections to make it easier for the operator to locate them. Light touch operation reduces operator fatigue. This method does not require special training. However, the number of *Kanji* on a keyboard of reasonable size is limited to approximately 3,500. By shifting, twice as many characters can be handled, though all characters are not indicated on the keyboard. Speed of input is not very high—thirty to seventy characters per minute. This system, already used in many libraries, is becoming increasingly popular because of its easy operation. There are three different technologies used: electromagnetic, electrostatic, and photoelectric. There are no differences in actual input operation for those electronically different methods.

Component Pattern Input

Although not a full keyboard method, component pattern input is closely related to these methods.

The idea behind this approach is that most *Kanji* are composed of one or more basic component units, two or more of which can be put together into one *Kanji* according to one predetermined pattern out of forty general patterns. The inputting device has keys for those forty patterns along with keys for individual components on a special keyboard. To compose a *Kanji*, a key for an appropriate pattern is selected and typed, and components are chosen to fill each individually numbered block of the selected pattern, following the established order as shown below.[7] Each pattern has a code, and so does each component. When a key is typed, the code is punched on a paper tape as shown in figure 2. There are cases where a *Kanji* with two components can be a component of another *Kanji*, as shown in the first and second examples in figure 2. A *Kanji* is constructed by punching at least three codes: one for a pattern and at least two for components. Then, a *Kanji* dictionary consisting of several thousand master-code combinations (see figure 3) is stored in a magnetic drum, and the several codes to compose a *Kanji* punched on paper or cassette tapes are converted through this diction-

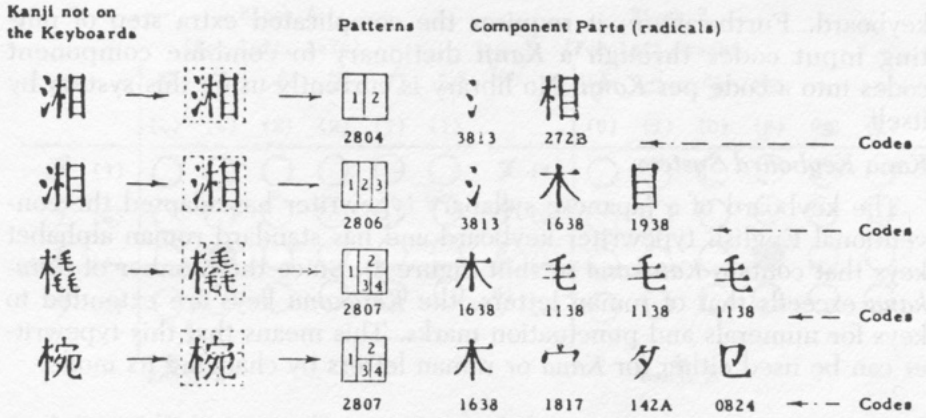

Fig. 2. Component Pattern Input.

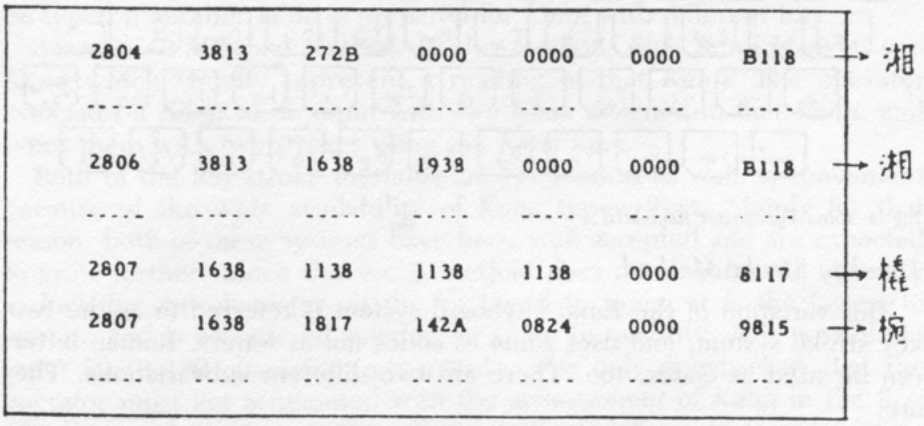

Fig. 3. Kanji Dictionary.

ary to a two-byte binary code assigned to that particular *Kanji*. These are then handled as other *Kanji* with an individual code.

Though this can be a stand-alone approach to inputting *Kanji*, the principle has been adopted by the National Diet Library to supplement the inputting of *Kanji* on the full keyboard *Kanji* teletypewriter. The National Diet Library uses this system when inputting *Kanji* that are not included in its keyboard. Instead of having a special separate keyboard, the *Kanji* teletypewriter of the National Diet Library integrates patterns and components as equivalents to other characters. Its keyboard includes forty patterns and approximately 140 components.

This was the most elementary approach to computerize *Kanji*. Conceived in the early developmental stage of *Kanji* processing, it used one of the characteristics of *Kanji*, the composition from several components. In actual situations, this technique requires at least three key strokes for one *Kanji* and consumes time to locate the needed component on the

keyboard. Furthermore, it requires the complicated extra step of putting input codes through a *Kanji* dictionary to combine component codes into a code per *Kanji*. No library is currently using this system by itself.

Kana Keyboard System

The keyboard of a Japanese syllabary typewriter has adapted the conventional English typewriter keyboard and has standard roman alphabet keys that contain *Katakana* in shift (figure 4). Since the number of *Katakana* exceeds that of roman letters, the *Katakana* keys are extended to keys for numerals and punctuation marks. This means that this typewriter can be used either for *Kana* or roman letters by changing its mode.

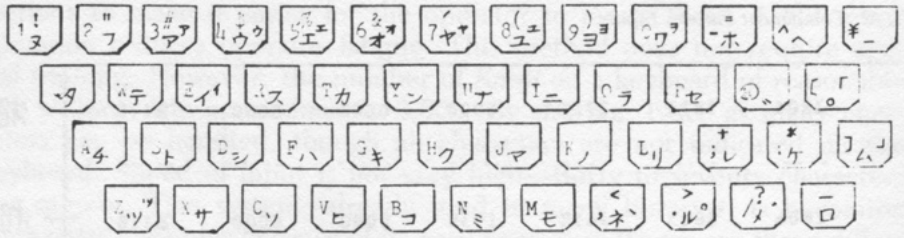

Fig. 4. Kana Typewriter Keyboard.

Two-key Stroke Method

This variation of the *Kana* keyboard system is referred to as the two-key stroke system, and uses *Kana* as codes not as letters. Roman letters can be used as codes, too. There are two different subvariations. They are:

Location Correspondence. Keys are divided into two sections: one for right hand, and the other for left hand. If two keys are to be stroked, there will be four possible combinations of key strokes: (1) left hand twice, (2) left and right, (3) right and left, and (4) right twice. The keyboard is accompanied by a *Kanji* table in which characters are arranged in several blocks and in a certain order within each block. Each block, which contains twenty-six *Kanji* in a four-by-six arrangement, is made according to each combination of strokes: first block is left and left; second block is left, right, etc. Within each block, the ordinate consists of keys for the first stroke and the abscissa for the second. A *Kanji* which is at the intersection of the above indicates which keys are to be typed. When *Kanji A* is to be typed (see figure 5), since it is in block *A* indicating the stroke combination as left and left, the operator types *A* and *W* by left hand. If *Kanji B* is to be typed, the operator types key *A* by left hand and key *P* by right. Each key has a byte code and a combination of two key strokes makes a composite, a two-byte binary code, for a *Kanji*. The bit may be changed by shifting, and different *Kanji* can

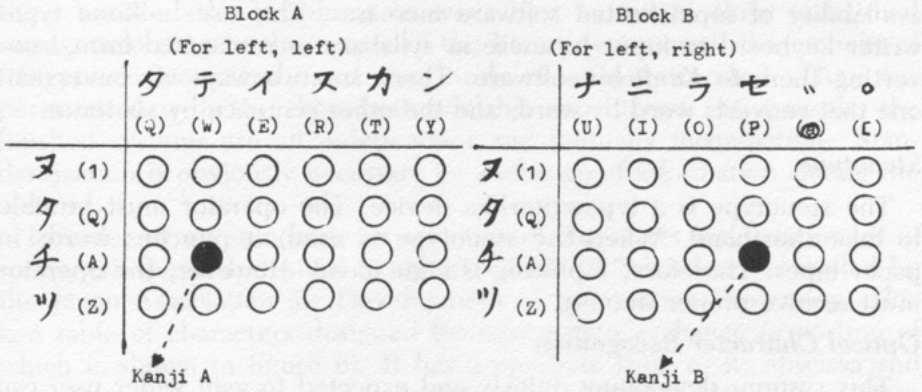

Fig. 5. Kanji Table for Location Correspondence Method.

be typed if another table is prepared for *Kanji* with different bits.

Association Memory Method. In this method, each *Kanji* is given two *Kana* which usually represent a reading of that *Kanji*. The operator associates a *Kanji* to be input with two *Kana* assigned to that *Kanji*, and types them with two strokes using the *Kana* keys.

Both of the key-stroke methods are economical as well as convenient because of the wide availability of *Kana* typewriters. Mainly for that reason, both of these systems have been well accepted and are expected to grow further. Since this touch method does not require the operator to look for the character on the keyboard to input, it is the fastest to operate and is considered suitable for input in quantity. It is possible to input 60 to 120 characters per minute. The only drawback is that the operator must get acquainted with the arrangement of *Kanji* in the first variation, and must memorize all the associated *Kana* spelling for many *Kanji* in case of the second variation. In either case, the operator must be professionally trained.

The Japan Information Center for Science and Technology, which indexes many scientific publications, employs a vendor who uses the location correspondence variation of this system for inputting information.

Display Selection

This also uses a *Kana* typewriter with a screen in front. When a word is typed in *Kana*, a group of *Kanji* with that sound are displayed on the screen. The operator chooses the right *Kanji* with a light pen—a slow but accurate operation. The operator does not have to be specially trained for this.

Kana-Kanji Conversion

In contrast to the conventional approach of full keyboard inputting, an entirely new method for inputting *Kanji* is gaining popularity as the

availability of sophisticated software increases. This uses a *Kana* typewriter keyboard to input Japanese in syllabary or romanized form, converting them to *Kanji* by software. There are two ways of conversion: one that converts word by word, and the other sentence by sentence.

Stenotype

The stenotype is a typewriterlike device. The operator must be able to take shorthand. When the stenotype is used, it punches words in paper tapes. Therefore, inputting is high speed. However, the operator must receive proper training.

Optical Character Recognition

This system, developing quickly and expected to gain wider use, can scan a maximum of 2,500 printed *Kanji*.[8] One variation connects a writing tablet to a computer so that as the operator writes *Kanji* on the tablet, the computer scans them in stroke order. This function of scanning by the stroke order is considered to be an advantage for processing some types of Japanese documents. The drawbacks are that the system is still very expensive, and the number of recognizable characters is fewer than 2,000.

Voice Recognition

This is an oral-visual system, in which the human voice is read by a computer. Obviously the most difficult to develop, this system is still in an experimental stage. However, a prototype has been demonstrated at various exhibitions, and the system apparently possesses great potential.

Summary

Pattern configuration and output devices for Japanese characters are basically the same as those for English. However, the pattern generation of characters is mechanically more complicated than that of the roman alphabet, because *Kanji* has a more complicated structure than the roman alphabet and the number of components is greater. Each *Kanji* is represented by a two-byte binary code rather than one byte as in roman alphabet. Because of this, the efficiency of retrieval is low. Presently, hard copy and typesetting for printing of hard copy are the major output forms, and very little on-line retrieval of information with *Kanji* is in current operation.

PROBLEMS PARTICULAR TO KANJI PROCESSING

Among numerous problems in processing *Kanji* through computers, major ones are: (1) which *Kanji* are to be included; (2) how many characters are to be handled; (3) what code should be assigned and how it should be arranged on the keyboard or table; and (4) how the *Kanji* not included on the keyboard should be treated.

In the early stage of *Kanji* computer development, different institu-

tions handled the problems in ways best suited to their individual needs, according to the nature of the literature covered, the amount of literature processed, and the kinds of output needed. They experimented with the then best available capabilities. As a result, the finished systems are all independent and mutually incompatible. Standardization is obviously necessary for exchange of information among the systems.

In order to set standards for selection of characters and assignment of codes, JIS (Japan Industrial Standard) C6226-1978 has been compiled by the Japan Association for Development of Information Processing. This is a table of characters designed for information exchange (a portion of which is shown in figure 6). It has a one-byte code as its abscissa and another as its ordinate. Characters are arranged so that the intersection of abscissa and ordinate determines a *Kanji* whose code consists of four numerals, two from the abscissa and two from the ordinate. Included in the table are *Kana* in both styles, Roman, Greek, and Cyrillic alphabets in upper and lower cases, diacritical marks, numerals, and punctuation marks, as follows:

1. Special characters	108
2. Numerals (Arabic)	10
3. Roman alphabets	52
4. *Hiragana*	83
5. *Katakana*	86
6. Greek alphabets	48
7. Cyrillic alphabets	66
8. *Kanji*	6,349
Total	6,802[9]

In the first section of the table, numerals, alphabets, *Kana*, and special characters are grouped. In the second section, the total of 2,965 frequently used *Kanji* are arranged as the first priority group, and an additional 3,384 *Kanji* are selected as the second group[10] in the bottom half of the table. *Kanji* are printed in the preferred style for printing typeface. This table will resolve problems 1 to 3 mentioned above. Institutions that had arranged their own codes for *Kanji*, including the National Institute of Japanese Literature, are now automatically translating their own codes into JIS codes.

In cases where needed *Kanji* are not included on the keyboard, handling varies. With the Japanese typewriter, because each *Kanji* is inscribed on a typeface, only the *Kanji* on that typeface is printed when the type bar is stroked. Therefore, only *Kanji* that have typefaces can be input in this system, while some other handling is possible in other methods.

While the number of characters that can be accommodated on keyboards is limited to 2,000 to 3,500, depending on the type of equip-

第2バイト	b7	b6	b5	b4	b3	b2	b1
	0	1	0	0	0	0	1
	0	1	0	0	0	1	0
	0	1	0	0	0	1	1
	0	1	0	0	1	0	0
	0	1	0	0	1	0	1
	0	1	0	0	1	1	0
	0	1	0	0	1	1	1
	0	1	0	1	0	0	0
	0	1	0	1	0	0	1
	0	1	0	1	0	1	0
	0	1	0	1	0	1	1
	0	1	0	1	1	0	0
	0	1	0	1	1	0	1
	0	1	0	1	1	1	0
	0	1	0	1	1	1	1
	0	1	1	0	0	0	0
	0	1	1	0	0	0	1
	0	1	1	0	0	1	0
	0	1	1	0	0	1	1
	0	1	1	0	1	0	0
	0	1	1	0	1	0	1

第1バイト	b7	b6	b5	b4	b3	b2	b1
区＼点	1	2	3	4	5	6	7	8	9	10	11	12	13
1	SP	、	。	，	．	・	：	；	？	！	゛	゜	´
2	◆	□	■	△	▲	▽	▼	※	〒	→	←	↑	↓
3													
4	ぁ	あ	ぃ	い	ぅ	う	ぇ	え	ぉ	お	か	が	き
5	ァ	ア	ィ	イ	ゥ	ウ	ェ	エ	ォ	オ	カ	ガ	キ
6	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ	Ι	Κ	Λ	Μ	Ν
7	А	Б	В	Г	Д	Е	Ё	Ж	З	И	Й	К	Л
8													
9													
10													
11													
12													
13													
14													
15													
16	亜	唖	娃	阿	哀	愛	挨	姶	逢	葵	茜	穐	悪
17	院	陰	隠	韻	吋	右	宇	烏	羽	迂	雨	卯	鵜
18	押	旺	横	欧	殴	王	翁	襖	鴎	鷗	黄	岡	沖
19	魁	晦	械	海	灰	界	皆	絵	芥	蟹	開	階	貝
20	凱	劾	垣	柿	蛎	慨	各	涯	碍	街	漢	感	喚
21	換	敢	棺	款	歓	汗	漢	環	甘	監	看	竿	管

Fig. 6. Code of the Japanese Graphic Character Set for Information Interchange.

ment, character generators have the capability of outputting more than the number of characters on the keyboard. Figure 7 shows their relationship. Characters that are in the generator but not on the keyboard must be frequently processed, because the number of characters needed for most documents could reach 6,000 to 6,500. Using a shift key to enter another mode is a fairly common technique for inputting uncommon *Kanji*. The keyboard may not have a character but, if the character generator has it, the code for that character can be input by shifting. For example, if a character on the keyboard has a code 0117, a bit is changed so the code 8117 can be typed by shifting and typing that key. If the code 8117 is assigned to another *Kanji* not on the keyboard but indexed in the dictionary, it can be input. This applies for the *Kanji* teletypewriter, tablet style, and the two-key stroke variations of the *Kana* typewriter.

In the *Kanji* teletypewriter system used by the National Diet Library, the keyboard accommodates 2,650 characters, while its character gener-

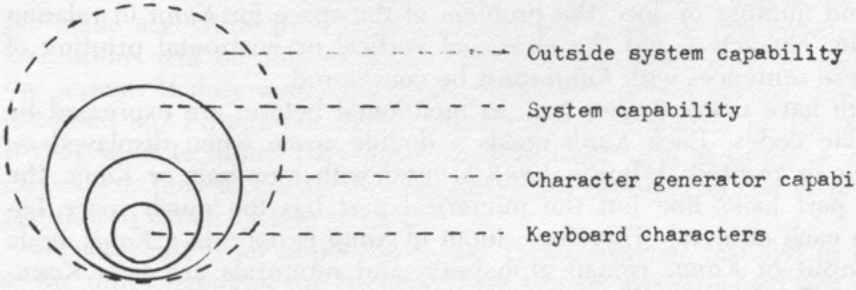

Fig. 7. Kanji Creating Capability.

ator has the capability for 5,717. Operators in the National Diet Library input *Kanji* that are not on the keyboard by using component pattern input method. Or, if the operator finds the *Kanji* code in the specially compiled dictionary in which codes for *Kanji* are indexed, a shift key is used to change the bit, thus creating the code for *Kanji* not on the keyboard. Most other tablet systems use code dictionaries. In the two-key stroke variations of *Kana* typewriters, tables of *Kanji* for second and third or more shifts can be built, especially when the location association method is used.

The handling of *Kanji* that are not in character generators is more difficult. Only the digital character generator, the kind that uses either dot or stroke, can add characters fairly easily. In the flying spot system, characters can be added, but it must be done professionally with an additional character cylinder and is very costly. The National Diet Library, which now uses flying spot, limits addition of *Kanji* to a minimum. Because its output is solely in printed book form, the National Diet Library inputs a fill character for *Kanji* not in the system. When

the phototypeset masters are made, the fill characters are replaced by typeset characters. The use of a fill character suffices only when the output is phototypeset, because there is a step to replace fill characters by typeface. However, as long as the data base includes many fill characters on the magnetic tapes, the on-line retrieval of information or later utilization of tapes becomes unsatisfactory.

The National Institute of Japanese Literature uses a dot matrix and prints by wiredot impact. If a *Kanji* is not in the character generator, the institute's staff composes the *Kanji* in an enlarged dot matrix and creates the capability for printing in the generator. If the *Kanji* made in such a way is used only once, the *Kanji* pattern is not stored in the character generator, so that the generator does not reach its full capacity quickly. The enlarged dot composite for *Kanji* created in the institute is filed and indexed for future use.

Most other institutions simply do not use those less commonly used *Kanji*, and substitute *Kana* for them.

In addition to the problems common to any character output, such as size and number of dots, the problem of the space for *Kanji* in relation to other characters and the choice of vertical or horizontal printing of Japanese sentences with *Kanji* must be considered.

Kanji have many strokes and, as mentioned before, are expressed by two-byte codes. Each *Kanji* needs a double space when displayed on screens or printed. When a *Kanji* is used with numerals or *Kana*, the *Kanji* part looks fine but the numerical part has too much space between each numeral. Therefore, input of *Kanji* is done in a *Kanji* mode and input of *Kana*, roman alphabets, and numerals are in a *Kana*-numerical mode. In this way a multidigit figure looks like one whole figure rather than a line of one-digit figures.

Some formal documents must be printed in the traditional vertical arrangement. To cope with this situation, some line printers have the capability to precompose a vertical page before printing it.

There are multicolor CRTs on the market that can be used for the retrieval of library-related information, e.g., main entry in red, series statement in yellow.

One last problem that must be considered is that most of these systems require trained operators, or else the operation is very slow. The information is edited and compiled by the editors and prepared for input in the form of worksheets. So are the revisions. At various stages of revising the text, the information must be printed, given to the editors, and revised. Further developments in simplifying input and revising texts for efficient flow are to be expected.

APPLICATION OF KANJI SYSTEMS

Processing of vernacular-language materials in their own writing systems is considered vital for research libraries in this country. In adopt-

ing the *Kanji* systems in such libraries, there are three major factors that must be considered: the objectives and needs of the institution, the cost, and the personnel.

First, the institution must know what it must accomplish by means of such a system. The needs may not be the same for all institutions. Is the system for retrieving catalog information, or for inputting catalog and other information? Is it for internal processing or patron use? Is it for a large bibliographic utility to distribute information to its subscribers, or for an individual institution to process its own information? Could the system be shared by the department of Asian studies in any way? The character set needs of the institution are a major factor in choosing the system.

Since input and output devices are different, i.e., one cannot input *Kanji* on a CRT and retrieve *Kanji* from the same CRT, the institution must consider how much it will need to input, or whether it can rely on available data bases. Some institutions may not need any input equipment if they utilize available data bases. If Japan MARC and other tapes are made accessible by a large bibliographic utility in this country, the institutions will be able to obtain bibliographic information in *Kanji* on the screen. If they want only catalog cards or a COM catalog, they will not need any equipment except the terminals supported by the utility. If they want to input, they must consider what form or forms of output they need, how to create the characters not included in the system, in addition to which system to choose.

Second, cost is an important factor. Is the expense justified in terms of the other needs of the library? What can be accomplished per dollar spent? The *Kanji* systems are still expensive, though the cost will eventually be reduced. How much can be spent and how much continuing support can be expected are factors that modify system expectations. The budget must include not only the one-time hardware cost, but also the software, maintenance, and personnel.

Third, the availability of personnel will affect the choice of system. What degree of language expertise does the system require in each stage of operation, such as inputting, maintenance, and programming? Does it need terminal operators trained in those languages? What other personnel does the system need as far as language-related qualification is concerned?

Apart from the three major factors discussed above, there are some technical aspects that must be adjusted to library situations in this country. Since Japanese, Chinese, and Korean use the same Chinese ideographs to different degrees and in different ways, libraries considering automated processing of these language materials are probably expected to handle all three languages by the same system, to say nothing about the other non-roman scripts. Problems will arise in selecting characters for inclusion in the system. As pointed out earlier with regard to

Japanese character processing, there are simply too many characters for the present capacity of any computer. If Korean and Chinese languages are to be handled by the same computer, this problem multiplies. The Korean alphabet, called *Hangul*, would have to be included. Chinese has more characters than Japanese. Worse yet is the fact that some *Kanji* are simplified in different ways in Japan and China, so that they are neither recognizable nor interchangeable between them. It will be an enormous task to accommodate both in the same system.

Another problem is the arrangement and indexing of *Kanji*. If a full keyboard, a Japanese typewriter keyboard, or two-key stroke system, especially its location association method by *Kana* typewriter, is considered for Japanese, Chinese, and Korean, the arrangement of the characters must be indexed and accessed for the three languages, in addition to the multiple readings found in Japanese. For example, *Kanji* on the Japanese keyboard are usually arranged by the initial sound of the Japanese reading of the *Kanji*. This arrangement will be useless for Chinese and Korean, because Japanese readings are not the same as Chinese or Korean readings. The arrangement of *Kanji* on the keyboards must be on some new principle common to these languages.

Even if the *Kana-Kanji* conversion is used, and roman alphabet–*Kanji* conversion software is adopted, software to handle those three languages must be developed. Such software would have to be highly sophisticated. The presence of many homonyms in Chinese will cause a great problem to the extent that the system relies on transliterated or romanized forms of the language. Recognition of the many identical spellings in different language contexts will be extremely difficult.

The above discussion is based on what is currently available in Japan. The combination of existing inputting, generating, and outputting equipment developed by Japanese technology opens up various possibilities for us to build effective systems in this country.

ACKNOWLEDGMENT

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EDITOR'S NOTES

Most *JOLA* readers are aware of significant delays in publication in the last volume. Susan K. Martin, a former editor of *JOLA*, and Richard D. Johnson, a former editor of *College & Research Libraries*, gave freely of their time and energy to bring the journal back on schedule. Mary Madden, Judith Schmidt, and the members of the Editorial Board under the leadership of Charles Husbands all worked closely with Sue and Richard in this effort. This was a second time around for Sue, who undertook a similar task when she assumed the *JOLA* editorship in 1972. The *JOLA* readership and this editor owe debts of gratitude to Sue, Richard, and all the others who helped.

We do not foresee major changes in the format of the journal as established principally under the editorships of Kilgour and Martin. We look for increased strength in our Book Reviews section under the editorship of David Weisbrod. The addition of Tom Harnish as assistant editor for Video Technologies indicates our recognition of the growing importance of video-based information systems.

We encourage reader suggestions. We welcome brief communications of successes or failures that might be of interest to other readers. Letters to the editor about any of our feature articles or communications are solicited.

Cost Analysis of an Automated and Manual Cataloging and Book Processing System

Joselyn DRUSCHEL: Washington State University, Pullman.

A comparative cost analysis of an automated network system (WLN) and a local manual system of cataloging and book processing at Washington State University Libraries indicates that the automated system is about 20 percent less costly than the manual system. A per-unit cost approach was used in calculating the monthly cost of each system based on the average number of items processed per month under the automated system. The process and the results of the analysis are presented in a series of charts which detail the tasks, items processed, unit and total monthly costs of both the manual and automated systems. The higher costs of the manual system were essentially staff costs.

The Technical Services Division (TSD) of Washington State University Libraries (WSUL) has had considerable experience in the use of automated techniques in selected areas of technical processing. An in-house automated acquisitions system was developed and implemented in 1967; that in-house system was eventually replaced by the acquisitions component of the Washington Library Network (WLN). Since November 1977, the Technical Services Division of WSUL has used the WLN bibliographic component for data verification (searching) and cataloging of materials.

Although the Library has generally known its total automation expenditures, it has lacked a more precise breakdown of cost data on automated processing. Moreover, the library has practically no cost data on manual processing. This report deals only with the costs of using the WLN bibliographic system, *not* the WLN acquisitions component. An analysis was made of the total costs of both the automated and manual book processing systems. The objectives in undertaking the cost analysis were threefold: (1) to identify the essentially unknown costs of manual processing; (2) to provide more exact cost data on automated processing; and (3) to develop comparable data on the costs of each system.

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METHODOLOGY

The methodology used in this cost analysis was a per-unit cost approach. First, each process or task in which the staff were engaged in cataloging and book processing was identified. Second, the per-unit cost—e.g., staff, data base, materials—of each process was calculated. Finally, monthly costs were determined by multiplying the average number of items processed per month by the unit cost per task. The cost analysis charts (tables 1(a)–1(e)—manual system; tables 2(a)–2(d)—automated system), which detail the tasks, items processed, and unit and total costs form the body of the analysis. Equipment costs—purchase, lease, maintenance—were calculated separately, and are included in the summary cost data for each system (table 3).

IDENTIFICATION OF PROCESSES

The staff of the TSD Cataloging and Book Processing Unit perform the following functions: bibliographic verification, bibliographic record production, bibliographic record maintenance, the marking of materials, binding preparation and receipt (for most of the library system), and the preparation of book cards.

Table 1(a). Cost Analysis: Manual Cataloging and Book Processing System

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Bibliographic Searching							
IDC Microfiche Search (LC and CIP Copy)							
LT I (.084/min @ 3 min/item)	$ .252		$ .21		$ .462	2484	$1,148
LT II (.094/min @ 3 min/item)	.282		.21		.492	496	244
LT III (.117/min @ 3 min/item)	.351		.21		.561	992	557
Subscription costs—IDC ($10,000/yr ÷ 47,664 searches/yr = .21/search)							
Microfiche Search Subtotal						3972	$1,949
National Union Catalog, etc., Search							
LT I (.084/min @ 15 min/item)	$1.26		$ .19		$1.45	588	$ 853
LT II (.094/min @ 15 min/item)	1.41		.19		1.60	169	270
LT III (.117/min @ 20 min/item)	2.34		.19		2.53	418	1,058
LT III (.117/min @ 40 min/item)	4.68		.19		4.87	100	487
Subscriptions ($2,940/yr ÷ 15,300 searches/yr = .19/search)							
Manual Search Subtotal						1275	$2,668
Bibliographic Searching Total						5247	$4,617

Table 1(b). Cost Analysis: Manual Cataloging and Book Processing System

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Bibliographic Record Production-Processing and Products							
1. Cataloging with LC Microfiche Copy							
Type abbreviated fanfold (4-part 3x5 slips)							
Timeslip (.03/min @ min/item x 72)	$ .803			$.02/ fanfold			
LT I (.084/min @ 10 min/item x 985)							
Check Series							
LT I (.084/min @ 2 min/item)	.168						
Revise fanfold							
Supervisor I (.126/min @ 3 min/item)	.38						
Check fanfold against book; separate fanfold							
LT II (.094/min @ 2 min/item x 540)	.22						
Supervisor I (.126/min @ 2 min/item x 517)							
Arrange and file shelflist copy of fanfold							
Timeslip (.03/min @ 1.5 min/slip)	.045						
Revise shelflist filing of fanfold slips							
LT II (.094/min @ 1 min/slip)	.094						
Verify Authorities (Subject and name) (1057x4)							
Timeslip (.03/min @ 4 min/item)	.12						
Type multilith master for card production							
LT I (.084/min @ 6 min/master)	.504			.06/ master			
Revise typed multilith master							
LT I (.084/min @ 3 min/master)	.252						
Run multilith masters							
Multilith Operator (.13/min @ 3.5 min/set)	.455			(Cost of cards see below)			
Microfiche Copy Cataloging Subtotal	$ 3.04			$.08/ item	$3.12	1057	$3,298
2. Cataloging with Modified Copy (NUC/LC)							
Type fanfolds (4-part 3x5 slips)							
LT I (.084/min @ 15 min/item)	$ 1.26			$.02/ fanfold			

Table 1(b) (cont.)

Check Series					
LT I (.084/min @ 2 min/item)	.168				
Revise fanfold					
Supervisor I (.126/min @ 5 min/item)	.63				
Review fanfold cataloging					
Librarian (.155/min @ 5 min/item)	.775				
Separate fanfolds					
LT II (.094/min @ 30 sec/item)	.047				
Arrange and file shelflist copy of fanfold					
Timeslip (.03/min @ 1.5 min/slip)	.045				
Revise filing of shelflist copy					
LT II (.094/min @ 1 min/slip)	.094				
Verify authorities (984 x 4)					
Timeslip (.03/min @ 4 min/item)	.12				
Type multilith master for card production					
LT I (.084/min @ 6 min/master)	.504	.06/ master			
Revise typed multilith master					
LT I (.084/min @ 3 min/master)	.252				
Run multilith masters					
Multilith Operator (.13/min @ 3.5 min/set)	.455	(Cost of cards see below)			
Modified Copy Cataloging Subtotal	$ 4.35	$.08/ item	$4.43	984	$4,359
3. Original Cataloging					
Catalog material					
Librarian (.155/min @ 60 min/item x 200)	$ 9.60				
Librarian (.205/min @ 60 min/item x 22)					
Revise cataloging					
Librarian (.205/min @ 5 min/item)	1.03				
Type fanfolds (4-part 3x5 slips)					
LT I (.084/min @ 15 min/item)	1.26	$.02/ fanfold			
Check Series					
LT I (.084/min @ 2 min/item	.168				
Revise fanfold					
Supervisor I (.126/min @ 5 min/item)	.63				
Separate fanfolds					
LT II (.094/min @ 30 sec/item)	.047				
Arrange and file shelflist copy of fanfold					
Timeslip (.03/min @ 1.5 min/item)	.045				
Revise filing of shelflist copy					
LT II (.094/min @ 1 min/slip)	.094				

Table 1(b) (cont.)

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Type multilith master for card production							
LT I (.084/min @ 6 min/master)	.504			.06/ master			
Revise typed master							
LT I (.084/min @ 3 min/master)	.252						
Run multilith master							
Multilith Operator (.13/min @ 3.5 min/set)	.455			(Cost of cards see below)			
Original Cataloging Subtotal	$14.085			$.08/ item	$14.165	222	$ 3,145
Catalog Cards (7 cards/set @ .055/card)							
Subtotal				$.385/ set		4297	$ 1,654
Cataloging Total						2263	$12,456
4. Miscellaneous Bibliographic Record Production							
Assign class numbers to theses							
Supervisor I (.126/min @ 2 min/item)	$ .252				$ .252	30	8
Assign subject headings for audio visual materials							
Librarian (.155/min @ 2 min/set)	.31				.31	30	9
Type multilith masters for catalog cards for A-V materials							
LT I (.084/min @ 6 min/master)	.504			$.06/ master	.564	30	17
Revise multilith masters							
LT I (.084/min @ 3 min/master)	.252				.252	30	8
Run multilith masters							
Multilith Operator (.13/min @ 3.5 min/set) (20 cards)	.455			1.10/ set	1.555	30	47
Resolve problems; general supervision							
Supervisor I (7.56/hr x 52 hrs/mo)							393
Librarian (9.32/hr @ 22 hrs/mo)							205
Miscellaneous Bibliographic Record Production Subtotal							$ 687
Bibliographic Record Production Total							$13,143

Table 1(c). Cost Analysis: Manual Cataloging and Book Processing System

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Bibliographic Record Maintenance							
Count sets of cards and match against cataloging copy							
LT I (.084/min @ 2 sets/min)	$ .042				$ .042	4297	$ 180
Type subject and added entries on card sets							
Timeslip (.03/min @ 3 min/set)	.09				.09	4297	387
Revise card sets							
LT II (.094/min @ 3 min/set)	.282				.282	2520	711
LT III (.117/min @ 3 min/set)	.351				.351	1803	633
Type subject and name authority slips							
Timeslip (.03/min @ 1 min/slip)	.03				.03	4526	136
File subject and name authority slips							
Timeslip (.03/min @ 1 min/slip)	.03				.03	4526	136
Separate card sets							
LT I (.084/min @ 2 sets/min)	.042				.042	4297	180
File subject catalog cards (2263x2)							
LT II (.094/min @ 1 min/card)	.094				.094	4526	425
File A/T catalog cards (2263x3)							
LT I (.084/min @ 1 min/card)	.084				.084	6789	570
File shelflist cards (2)							
Timeslip (.03/min @ 1 min/card)	.03				.03	4526	136
Revise subject card filing							
LT III (.117/min @ 1 min/card)	.117				.117	4526	530
Revise A/T card filing							
LT III (.117/min @ 1 min/card)	.117				.117	6789	794
Revise shelflist filing (2)							
LT II (.094/min @ 1 min/card)	.094				.094	2340	220
Supervisor I (.126/min @ 1 min/card)	.126				.126	2186	275
Alphabetize and date workslips							
LT I (.084/min @ 4 slips/min)	.021				.021	2263	48
Pull card sets (withdrawals and card corrections							
Timeslip (.03/min @ 10 min/set)	.30				.30	100	30
Revise card pulling (100 sets/month)							
Supervisor I (.126/min @ 2 min/set)	.252				.252	100	25
Correct card sets (50 sets/month)							
LT II (.094/min @ 5 min/set)	.465				.465	50	23
Revise card corrections							
Supervisor I (.126/min @ 2 min/set)	.252				.252	50	13
Process added copies (Record accession # on shelflist; record call # in book; type slip for marking)							
LT II (.094/min @ 15 min/item)	1.41				1.41	50	71

Table 1(c) (cont.)

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Locate materials in process							
LT II (.094/min @ 15 min/item)	$1.41				$1.41	50	$ 71
Prepare books for binding decision							
Supervisor I (.126/min @ 1 min/item)	.126				.126	50	6
General Supervision							
Librarian ($12.34/hr @ 65 hours/month)							802
Bibliographic Record Maintenance Total							$6,402

Table 1(d). Cost Analysis: Manual Cataloging and Book Processing System

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Marking							
Sort materials for processing (marking)							
OA II—Typing (.105/min @ 30 sec/item)	$ .053				$ .053	2263	$ 120
Place materials on table							
OA II—Typing (.105/min @ 20 items/min)	.005				.005	2263	11
Process materials (type and paste labels, pockets, & date due slips; type book cards)							
Timeslip (.03/min @ 20 min/item)	.60			$.029/ label; pocket; date due slip; book card	.629	400	252
Process materials with tab book cards (type and paste labels, pockets, & date due slips)							
Timeslip (.03/min @ 16 min/item)	.48			.032/	.512	1555	796
OA II—Typing (.105/min @ 16 min/item)	1.68			label; pocket; date due slip; book card	1.712	308	527

Table 1(d) (cont.)

Keypunch bookcards					
LT I (.084/min @ 2.4 min/card)	.201		.201	1863	374
Verify book cards					
LT III (.117/min @ 1.6 min/card)	.187		.187	1863	348
Revise Processing					
LT I (.084/min @ 2 min/item)	.168		.168	1500	252
LT III (.117/min @ 2 min/item)	.234		.234	763	179
Sort materials for delivery					
OA II—Typing (.105/min @ 1.5 items/min)	.07		.07	2263	158
Unpack bindery materials, pull slips					
LT I (.084/min @ 1 min/item)	.084		.084	550	46
Verify bindery slips; check price					
LT III (.117/min @ 2 min/item)	.234		.234	550	129
General supervision, bindery account & statistical data					
LT III (7.04/hr @ 15 hrs/mo)					106
Supervisor II (8.97/hr @ 128 hrs/mo)					1,148
Librarian (12.34/hr @ 15 hrs/mo)					185
Marking Total					$ 4,631
Cataloging and Book Processing Total					$28,793

Table 1(e). Total Monthly Costs (Summary)

Staff Costs Per Month	*Data Base Costs/Month*	*Subscription Costs Per Month*	*Material Costs Per Month*	*Total Cost Per Month*
$25,775		$1,076	$1,942	$28,793

Table 2(a). Cost Analysis: Automated Cataloging and Book Processing System

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Bibliographic Searching							
1. WLN Data Base Search							
Items searched, no Inquiry charges							
LT II (.094/min @ 1 min/item)							
Terminal use (4 @ .06)	$ .094		$ .24		$ .334	2443	$ 816
Terminal use (3 @ .06)	.094		.18		.274	100	27

Table 2(a) (cont.)

Process	Staff Costs Per Item	Data Base Costs/ Item	Subscription Costs/Item	Materials Costs/Item	Total Cost Per Item	Average Number Processed Per Month	Total Cost Per Month
Items searched, Inquiry charges assessed							
LT II (.094/min @ 1 min/item)							
Inquiry (3 @ .069)	.094		.39		.484	1429	692
Terminal use (3 @ .06)							
Data Base Search Subtotal						3972	$1,535
2. National Union Catalog, etc. Search (Manual)							
LT II (.094/min @ 10 min/item)	.94		.31		1.25	508	635
Subscriptions ($1,860/yr ÷ 6096 searches/yr)							
Manual Search Subtotal						508	$ 635
Bibliographic Searching Total						4480	$2,170

Table 2(b). Cost Analysis: Automated Cataloging and Book Processing System

Process	Staff Costs Per Item	Data Base Costs/ Item	Subscription Costs/Item	Materials Costs/Item	Total Cost Per Item	Average Number Processed Per Month	Total Cost Per Month
Bibliographic Record Production—Processing and Products							
1. Materials Cataloged Via WLN							
a. *Cataloging with WLN Data base copy*							
Attach holdings; order cards							
LT II (.094/min @ 6 min/item)	$ .564						
Data Base Costs							
Inquiry costs (no charge)							
Cost per record use		$1.60					
Cost per request		.15					
Shelflist cards (4 @ .055)		.22					
COM (cost per record)		.43					
Terminal use (1 @ .06/use)		.06					
WLN Data Base Copy Subtotal	$ .564	$2.46			$3.024	1376	$4,161
b. *Cataloging with CIP Copy*							
Upgrade data base copy							
LT II (.094/min @ 11 min/item)	$1.034						
Revise upgraded copy							
Librarian (.155/min @ 5 min/item)	.775						
Attach holdings order cards							
LT II (.094/min @ 6 min/item)	.564						

Table 2(b) (cont.)

Data Base Costs					
Cost per record use		$1.60			
Cost per request		.15			
Shelflist cards (4 @ .055)		.22			
COM (cost per record)		.43			
Terminal use (1 @ .06/use)		.06			
CIP Copy Subtotal	$2.373	$2.46	$4.833	153	$ 739
c. Cataloging with Modified Copy (e.g., NUC/LC copy)					
Prepare cataloging worksheets					
LT II (.094/min @ 15 min/item)	$1.41				
Revise cataloging worksheets					
LT II (.094/min @ 10 min/item)	.94				
MARC TAG Worksheets					
Supervisor II (.15/min @ 15 min/item)	2.25				
Revise MARC tagged worksheets					
Librarian (.155/min @ 8 min/item)	1.24				
Input cataloging data; attach holdings; order cards					
Timeslip (.03/min @ 25 min/item)	.75				
Revise data input and verify authorities					
Librarian (.155/min @ 10 min/item)	1.55				
Data base costs					
Cost of input per record		$ .14			
Cost of Authority checks (7 checks @ .069/entry)		.48			
Shelflist cards (4 @ .055)		.22			
COM (cost per record)		.43			
Terminal use (7 @ .06/use)		.42			
Modified Copy Subtotal	$8.14	$1.69	$9.83	95	$ 934
d. Original Cataloging					
Catalog and MARC Tag material					
Librarian (.155/min @ 60 min/item)	$ 9.30				
Revise Cataloging and MARC tagging					
Librarian (.205/min @ 5 min/item)	1.03				
Input Cataloging data; attach holdings; order cards					
LT II (.094/min @ 25 min x 104)					

Table 2(b) (cont.)

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Timeslip (.03/min @ 25 min x 118)	1.49						
Revise input; verify authorities							
Librarian (.155/min @ 10 min/item)	1.55						
Data base costs							
Cost of input per record		$ .14					
Cost of authority checks (7 checks @ .069/entry)		.48					
Shelflist cards (4 @ .055)		.22					
COM (cost per record)		.43					
Terminal use (7 @ .06/use)		.42					
Subtotal	$13.37	$1.69			$15.06	222	$ 3,343
WLN Cataloging Total						1846	$ 9,177
2. *Materials Cataloged via Other Methods*							
a. Microform Cataloging from Publisher's Copy							
Review and revise copy; complete processing; revise card sets							
Librarian (.25/min @ 2.7 min/item)	$ .675						
Xerox card sets (10 cards/set)							
Timeslip (.03/min @ 1 min/title)	.03			$.55/ set			
Microform Subtotal	$ .705			$.55/ set	$1.255	407	$ 511
b. Cataloging Music Scores							
Catalog scores; prepare for card production; revise card sets							
Librarian (.25/min @ 28 min/item)	7.00						
Xerox card sets (14 cards/set)							
Timeslip (.03/min @ 2 min/title)	.06			.77/ set			
Music Score Subtotal	$ 7.06			$.77/ set	$7.83	10	$ 78
Non-WLN Cataloging Total						417	$ 589
Cataloging Total						2263	$9,766

Table 2(b) (cont.)

3. Miscellaneous Costs						
Assign class numbers to theses						
Supervisor II (.15/min @ 2 min/item)	$ .30			$ .30	30	$ 9
Retrieve "RUSH" monographs						
Supervisor II (.15/min @ 15 min/item)	2.25			2.25	75	169
Correct/update WLN data base information						
LT II (.094/min @ 10 min/item)						
Terminal use (1 @ .06/use)	.94	$.06		1.00	360	360
Assign Subject Headings for Audio Visual Materials						
Librarian (.155/min @ 2 min/set)	.31			.31	30	9
File Subject Authority Slips for Microform Materials						
Librarian (.155/min @ 1.15 min/slip)	.18			.18	55	10
Resolve Problems; General Supervision						
LT II (5.68/hr x 13 hrs/mo)						74
Supervisor II (8.97 hrs x 89 hrs/mo)						798
Librarian ($12.34 hr x 52 hrs/mo)						642
Miscellaneous Costs Subtotal						$ 2,071
Bibliographic Record Production Total						$11,837

Table 2(c). Cost Analysis: Automated Cataloging and Book Processing System

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Bibliographic Record Maintenance—TSD							
Collate card sets from WLN (7384 cards)							
LT I (.083/min @ 30 sec/card)	$ .042				$ .042	7384	$ 310
Insert card sets in books							
LT II (.094/min @ 1.6 min/item)							
Process New Books (1846)	1.51				.151	1846	279
Review cards against books; add accession number and stamp date on shelflist card; carrect series (when needed); separate card sets and distribute							
Timeslip (.03/min @ 10 min/item)	.30				.30	145	44

REMARC DATABASE NEWS

VOLUME I, NUMBER 1 MARCH, 1981

NEGOTIATIONS ADVANCE TOWARD NETWORK DISTRIBUTION PACTS

But Individual Libraries that Sign-up Now Get the Guaranteed Low-Price-per Hit plus a "Most Favored Nation" Clause

Proposed online and offline distribution agreements between Carrollton Press and major library systems, utilities, and database vendors are in various stages of negotiation.

Meanwhile, individual library systems are negotiating directly with Carrollton for custom retrospective conversion projects. (Details of how these will work are described in the "Question & Answer" column on page 2 of this issue.) The advantages to libraries that sign these four or five-year contracts are that the low price of 50 cents per hit will remain firm during the life of the contract and that, in case the records are later made available for less per hit by one of the organizations with whom Carrollton signs an agreement, Carrollton will match that price (this is the "most favored nation" clause).

Meanwhile, these libraries would be under no restrictions against transferring their records to any network or utility that signs a distribution agreement with Carrollton. This means that they can begin their retrospective conversion projects now and not be concerned that they will conflict with future arrangements that might be negotiated between Carrollton and their networks.

Proposed distribution agreements are now in the most advanced stages with UTLAS, WLN, and Lockheed. Carrollton has also offered to make REMARC records available to OCLC and some of its brokers under different plans which are still under discussion.

On the Inside Pages

Data entry at the Carrollton Press office in Irvine, Scotland.

THE DON'T-BELIEVE-EVERYTHING-YOU-HEAR DEPARTMENT

Six Rejects from the REMARC Rumor Factory

Have you heard that 1) the REMARC project is being fully funded by the Library of Congress, 2) the REMARC records are in the public domain and will eventually be distributed by the MARC Distribution Service, 3) the REMARC records have truncated titles, 4) almost all of the REMARC records are already in the OCLC Database, 5) REMARC records contain a 35% error rate introduced by LC's format recognition programs, or that 6) Carrollton Press and REMARC have been acquired by (a) Chrysler (b) the CIA (c) Pravda (d) The Tehran University Press?

Continued on page 2

DELIVERIES TO LC INCREASE STEADILY AFTER EARLY DELAYS

A shallow learning curve plus additions to the REMARC entry itself combined with delays in equipment deliveries to put Carrollton several months behind schedule in delivering records to the Library of Congress.

In December, however, 51 thousand records were delivered to LC and this rate increased to 62 thousand during the month of January as they approached their full production goal of 100,000 records per month. In all, some 200,000 records have been delivered to LC on magnetic tape since the project began.

THE REMARC RECORD — AND HOW IT GREW

Coverage Now Includes All Major MARC Fields Except Dewey Numbers and Notes. Collation Data Latest Added.

The REMARC records which are available to libraries online and offline contain important items which are not called for in the Carrollton Press contract to supply copies of these records to the Library of Congress.

Longer titles, edition statements, full imprints, and most recently, collation data, have been added to the content of the original REMARC records. These enhancements, are being supplied to LC at no additional charge.

Addition of the collation data was announced following conversion with a large number of libraries attending ALA Midwinter meeting in Washington. These additions however, apply only to the estimated 5 million records that have not yet been added to the system at that time (96% of the collection).

In the beginning . . .

. . . the original machine language record was to be limited to the information appearing in the entries of the 132-volume *Cumulative Title Index to the Classified Collections of the Library of Congress.* (TLC): namely; title, author, date of publication, LC Class Number, LC Card Number, and indications as to whether or not the record was in MARC and had been transliterated.

Gradually, Carrollton accumulated suggestions of items that should be added

Continued on page 4

REMARC RECORDS ONLINE AT ALA MIDWINTER

Workshop Set for San Francisco

Librarians attending ALA's Midwinter meeting in Washington were able to inspect REMARC records displayed online at a terminal connected to UCLA's Technical Processing Center.

Because of the fact that the REMARC project was discussed in various retrospective-conversion workshops at the meeting, a large and steady flow of interested librarians visited the Carrollton Press booths in the Exhibit Area.

Meanwhile, Carrollton has scheduled a REMARC workshop during the ALA Annual Meeting in San Francisco. It will be held on Monday afternoon, June 29th from 4:15 until 5:30 and will be immediately followed by the semi-annual Carrollton/HDI cocktail reception.

Representatives from libraries, networks, vendors, and consulting firms are expected to appear on the program or in panel discussions. Space will be limited, so interested librarians should call or write Carrollton Press for invitations.

COMPLETE RETROSPECTIVE CONVERSION PACKAGES OFFERED TO LIBRARIES

MARC and Non-LC Records Can Now Be Acquired Along with REMARC

In spite of the impression that "everybody and his brother" offers MARC records, those libraries which have not yet acquired them in machine language can buy them along with REMARC records as part of the same retrospective conversion project for only 20 cents per hit (even less for large projects). Carrollton acquired the MARC tapes in order to merge them with REMARC records to produce its *Title Index.*

Meanwhile, for those non-MARC records which also register as non-hits when matched against REMARC, Carrollton on will create new REMARC records

Continued on page 4

UCLA & ENOCH PRATT NEGOTIATING CUSTOM CONVERSION PROJECTS

Probably the first two major libraries to contract for retrospective conversion projects using REMARC will be one of the nation's largest university research libraries and one of its major public library systems.

The Enoch Pratt Free Library of Baltimore, Maryland has signed a letter of intent to purchase REMARC records for its system-wide retrospective conversion program, while UCLA and Carrollton are in advance stages of negotiating an agreement which would make REMARC

Continued on page 3

Note:

This is a slightly reduced copy of page one of the first issue of our new newsletter. It will appear irregularly and will attempt to keep you informed on developments related to the massive REMARC Database Project. If you have not received a copy by mail, or would like to make certain that you're on our mailing list for this free publication, please call or write Carrollton Press, Inc., 1911 Ft. Myer Drive, Arlington, Virginia 22209, (703) 525-5940.

Table 2(c) (cont.)

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
LT I (.083/min @ 10 min/item)	$.83				$ .83	1701	$1,412
Revise Book Processing (1846)							
LT III (.117/min @ 1 min/item)	.117				.117	1846	216
File Central and Holland Shelflist							
Timeslip (.03/min @ 1 min/card)	.03				.03	4526	136
Revise Central and Holland Shelflist							
LT I (.083/min @ 30 sec/card)	.042				.042	4526	190
Separate and Alphabetize Microform Card Sets							
Timeslip (.03/min @ 1 min/set)	.03				.03	2000	60
File Author/Title/Subject Microform Cards in General Catalog							
Timeslip (.03/min @ 1 min/card)	.03				.03	2000	60
Revise Filing General Catalog							
LT III (.117/min @ 1 min/card)	.117				.117	2000	234
Pull Card Sets (withdrawals and card corrections—40 sets/mo)							
Timeslip (.03/min @ 10 min/set)	.30				.30	20	6
LT I (.083/min @ 6 min/set)	.498				.498	20	10
Revise Card Pulling							
LT III (.117/min @ 2 min/set)	.234				.234	40	10
Correct Card Sets (20 sets/mo)							
LT I (.083/min @ 6 min/set)	.498				.498	20	10
Revise Card Corrections							
LT III (.117/min @ 2 min/set)	.234				.234	20	5
Process Added Copies (Record Accession number on shelflist; record call number in book; type slip for marking)							
LT I (.083/min @ 15 min/item)	1.25				1.25	50	63
Locate Materials in Process							
LT I (.083/min @ 15 min/item)	1.25				1.25	33	41
Prepare Books for Bindery Decision							
LT III (.117/min @ 1 min/item)	.117				.117	50	6
Supervise Staff and Timeslip							
LT III (7.04/hr @ 68 hrs/mo)							479
Librarian (12.34/hr @ 50.5 hrs/mo)							623
Bibliographical Record Maintenance Total							$4,194

Table 2(d). Cost Analysis: Automated Cataloging and Book Processing System

Process	*Staff Costs Per Item*	*Data Base Costs/ Item*	*Subscription Costs/Item*	*Materials Costs/Item*	*Total Cost Per Item*	*Average Number Processed Per Month*	*Total Cost Per Month*
Marking							
Sort Materials for Processing (Marking)							
OA II—Typing (.105/min @ 30 sec/item)	$ .053				$ .053	2263	$ 120
Place Materials on Table							
OA II—Typing (.105/min @ 20 items/min)	.005				.005	2263	11
Process Materials (type and paste labels, pockets and date due slips; type book cards)							
Timeslip (.03/min @ 16 min/item)	.60			$.029/ date due slip; label pocket; book card	.629	400	252
Process Materials with Tab Book Cards (type and paste labels, pockets and date due slips)							
Timeslip (.03/min @ 16 min/item)	.48			.032/	.512	1555	796
OA II—Typing (.105/min @ 16 min/item)	1.68			date due slip; label; pocket; book card	1.712	308	527
Keypunch Bookcards							
LT I (.083/min @ 2.4 min/card)	.20				.20	1863	373
Verify Book Cards							
LT III (.117/min @ 1.6 min/card)	.187				.187	1863	348
Revise Processing							
LT I (.083/min @ 2 min/item)	.166				.166	1500	249
LT III (.117/min @ 2 min/item)	.234				.234	763	179
Sort Materials for Delivery							
OA II—Typing (.105/min @ 1.5 items/min)	.07				.07	2263	158
Unpack Bindery Materials; Pull slips							
LT I (.083/min @ 1 item/min)	.083				.083	550	46
Verify Bindery Slips and Check Price							
LT III (.117/min @ 2 min/item)	.234				.234	550	129
General Supervision; Bindery Accounts and Statistical Data							
LT III (7.04/hr @ 36 hrs/mo)							253
Supervisor II (8.97/hr @ 128 hrs/mo)							1,148
Marking Total							$ 4,589
Cataloging and Book Processing Total							$22,790

Table 2(e). Total Monthly Costs (Summary)

Staff Costs Per Month	*Data Base Costs/Month*	*Subscription Costs Per Month*	*Materials Costs Per Month*	*Total Cost Per Month*
$16,849	$5,480	$157	$304	$22,790

Table 3. Cataloging and Book Processing System: Summary Comparison Costs

Manual System		*Automated System*	
Category	*Costs/Month*	*Category*	*Costs/Month*
Staff	$25,775	Staff	$16,849
Data Base		Data Base	5,480
Subscriptions	1,076	Subscriptions	157
Materials	1,942	Materials	304
Equipment	462	Equipment	890
Total	$29,255/month	Total	$23,680/month

Cost Comparison—Difference

Manual	$29,255/month
Automated	$23,680/month
	$ 5,575/month/$66,900/year

Since 1978 this unit, as well as all units in the Technical Services Division, have periodically analyzed unit activities, and recorded the data collected on Work Assignment/Staffing profile sheets (see table 4 for sample profile sheet). The primary purpose of the profiles was to develop a detailed account of work distribution throughout TSD in order to determine the staffing requirements necessary for each unit to maintain an even workflow. In the cost analysis, the Cataloging and Book Processing (CBP) profile was used to identify each unit process, as well as to provide the basic data on the number and level of staff and the time required to perform each process. Additionally, for the automated system, the CBP profile sheets, together with WLN invoices (see figure 1 for sample invoice) and WLN monthly activity reports (see figure 2 for sample activity report) were used to determine the average number of items processed per month. For example, since about 85 percent of the cataloging done in TSD is via WLN, it was possible to derive exact figures from WLN invoices for the average number of items cataloged per month. The WLN invoices also differentiated between data-base copy cataloging and original data entry. The CBP profile sheets were used to determine average number of non-WLN items cataloged.

Using a combination of WLN invoice and profile data, a chart was constructed of the average number of items searched and cataloged per month under the automated system (see table 5). In order to make costs comparable, an assumption was made that the same average number of items was searched and cataloged under the previous manual system and a similar chart was made for it (see table 6). In reality, the available staff under the manual system *could not* process the same amount of material per month.

Table 4. Technical Services Division Work Assignment/Staffing Profile: November 1978

Unit: Cataloging and Book Processing. Subunit: LC Copy Editing.

Tasks or Processes	*Average Number of Items Received for Processing*	*Average Time Per Item*	*Average Number of Items Processed*	*Staff Hours Needed Per Task*	*Level of Staff*	*Total Staff Hours Available at Designated Level*
Order card sets, check item against data base, enter holdings	2100/mo(monos)	6 min/item	10/hr	210/mo	LT I	124.1
					LT II	85.9
	63/mo(serials)	6 min/item	10/hr	6.3/mo	LT III	6.3
Prepare worksheets	210/mo	10 min/item	6/hr	35/mo	LT I	17.5
					LT II	17.5
Prepare TSD series cards	126/mo	2 min/item	30/hr	4.2/mo	LT I	4.2
Do series check	350/mo	2 min/item	30/hr	11.7/mo	LT I	22.3
Update CIP records	134/mo	10 min/item	6/hr	22.3/mo	LT II	22.3
Input original cataloging data	210/mo(mono)	25 min/item	2.4/hr	87.5/mo	LT II	87.5
	21/mo(serials)	25 min/item	2.4/hr	8.75/mo	LT III	8.75
Process "RUSH" monographs	168/mo	15 min/item	4/hr	42/mo	LT II	42
Process corrections—data base information	360/mo	10 min/item	6/hr	60/mo	LT II	30
					Sup II	30
Receive materials—sort series	2100/mo	3 items/min	180/hr	11.6/mo	LT II	11.6
Resolve problems; locate materials	NA	NA	NA	31.2/mo	LT II	18.6
					LT III	13
Prepare and sort series decisions materials	168/mo	8 min/item	7.5/hr	22.4/mo	LT III	22.4
Sort Mail	NA	NA	NA	42/mo	LT III	42

STAFF COSTS

In the cost analysis of the automated system, the monthly wages for staff members of the Cataloging and Book Processing Unit were based on current monthly salaries (as of February 1980) plus estimated fringe benefits (21 percent). The total wages were added together for each level of staff and divided by the number of staff at that level to give an

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PAGE NO. 0001

	QUANTITY	UNITS	TOTAL CHARGES	CREDITS	NET CHARGES
SERVICES CHARGES					
COM CATLG PROCESSING W/S HOLD	18,750.00	@ 4¢ A TITLE	750.00		750.00
COM CATLG FICHE COPIES	459.00	@ 15¢ A COPY	68.85		68.85
ONLINE-ATTACH SUM HOLD-COL 1	810.00	@$1.60 RECRD	1,296.00		1,296.00
ONLINE-REQ CAT CARDS-COL 1	1,003.00	@ 15¢ EACH	150.45		150.45
ONLINE INPUT OF BIB REC-COL 1	378.00	@ 14¢ EACH	52.92		52.92
ONLINE INQUIRY INTO DATABASE	5,335.00	@ 6.9¢ EACH	368.11		368.11
CATALOG CARDS	5,541.00	@ 5.5¢ CARD	304.75		304.75
TOTAL SERVICES CHARGES			2,991.08		2,991.08 *
TOTAL CHARGES			2,991.08		2,991.08 *

Fig. 1. Washington Library Network Customer Invoice.

MONTHLY ACTIVITY REPORT FOR PERIOD 11/01/79 TO 11/30/79

LIBRARY **********	TOTAL HOLDINGS AS OF 11/30/79	HOLDINGS ADDED	RECORDS INPUT	CONTRIBUTION FACTOR	RCPS FROM 11/01 TO 11/28	ACQ ORDERS CREATED	INQUIRY TRANSACTIONS
WaPaC	2,059	38	0	.0%	0	0	311
WaPlP	41,549	416	385	92.5%	588	1,472	6,607
WaPoN	33,801	566	89	15.7%	616	0	5,243
WaPS (WSU LIBRARY)	44,866	1,630	197	12.0%	2,013	1,674	19,013

Fig. 2. Washington Library Network Monthly Activity Report (selective sample).

average monthly wage. This average was then divided by 174 (the standard figure for university staff hours per month) to determine the average hourly rate. To calculate staff costs per minute, it was necessary to carry the per-minute costs to the third decimal to approximate the total dollars expended for staffing (see table 7). No other indirect costs, e.g., breaks, annual leave, or holidays, were included in staff wages; however, in order to determine the staff hours available to perform the functions being analyzed, nonproductive hours or staff hours devoted to other assignments had to be calculated and deducted. These calculations were made according to the following formula:

hours/year	committee assignment (varied)
hours/year	unit meetings (varied)
120 hours/year	breaks (standard)
hours/year	annual leave (varied)
88 hours/year	holidays (standard)
96 hours/year	sick leave (standardized)
	based on hours earned per month
hours/year ÷ 12 =	____ hours/month

The primary reasons for variation in the nonproductive hours were length of service and whether a staff member was faculty or classified. Staff costs under the manual system were based on current monthly wages; however, the number and level of staff are essentially that which existed at the time the manual system was functioning (see table 8). Timeslip costs were *not* based on the minimum hourly wage, since a large number of hours were work/study during the period of the analysis. The total hours worked were divided by the total monthly expenditure to derive the per-minute timeslip costs. No effort was made to reconstruct actual timeslip costs under the manual system, but the same per-minute timeslip costs were used in order to avoid unnecessary skewing of staff costs under the manual system.

DATA BASE COSTS

The per unit costs of using the WLN bibliographic system, both for performing processes and securing products, were based on the 1979–80

Table 5. Type and Average Number of Items Searched/Cataloged Per Month on Automated System (Based on WLN Invoice Data and CBP Work Assignment/Staffing Profile)

	Searched (WLN)/Month	*Found/Month*	*Not Found/Month*	*NUC Searched/Month*
Book Approvals	600	420 (70%)	180	
Firm Orders	700	406 (58%)	294	
Form Approvals		244 (60%)		
Regular		162 (40%)		
New Acquisitions (Re-searched)	295	90 (30%)	205	
Precats	1380	414 (30%)	966	
Documents	125	25 (20%)	100	50
Serials	100	10 (10%)	90	30
RUSH	75	32 (42%)	43	43
Gifts	100	5 (5%)	95	95
Monographic Series	300	120 (40%)	180	—
Originals	222	0 (0%)	222	222
Reinstates	75	7 (10%)	68	68
	3972	1529 (38.5%)	2443	508

Type and Quantity of Bibliographic Data Found in Data Base

1529	1376 LC Copy
	153 CIP Copy (10%)

Type and Quantity of Original Data Entry

Monographs	192
Serials	30
NUC/LC	95
Total	317

Total Materials Cataloged

WLN Data Base Copy	1529
WLN Original Data Entry	317
Non-WLN Microform	407
Non-WLN Music	10
	2263

WLN schedule of charges. The average number of items processed was derived from the WLN invoices. The per-record cost of the COM catalog was calculated by taking the total costs of producing the COM catalog from July 1979 to February 1980 and dividing these costs by the number of titles contained in the COM catalog. Although the WLN schedule of charges stipulates a charge of .069 cents per data-base inquiry, three kinds of processes allow a given number of inquiries without charge. Since not all allowable inquiries are always used for these processes, there are generally a number of inquiries which can be made without charges being assessed. Between July 1979 and February 1980, the average number of monthly inquiries for which there was a charge was 11,800; the average number per month for which there was no charge assessed was 8,044. For this reason, in the cost analysis of the automated system (table 2(a)), there appears a category "Items Searched, No Inquiry Charges" under the Bibliographic Searching section.

Table 6. Type and Average Number of Items Searched/Cataloged Per Month on Manual System (Based on CBP Work Assignment/Staffing Profile)

	Searched (IDC)/Month	*Found/Month*	*Not Found/Month*	*NUC Searched/Month*
Book Approvals	600	300 (50%)	300	
Firm Orders	700	280 (40%)	420	420
New Acquisitions (Re-searched)	295	59 (20%)	236	
Precats	1380	276 (20%)	1104	
Documents	125	12 (10%)	113	113
Serials	100	5 (5%)	95	95
RUSH	75	23 (30%)	52	52
Gifts	100	5 (5%)	95	95
Monographic Series	300	90 (30%)	210	210
Originals	222	0 (0%)	222	222
Reinstates	75	7 (10%)	68	68
Total	3972	1057 (26.5%)	2915	1275

Type and Quantity of Materials Cataloged	
IDC Copy	1057
Modified Copy	984
Original Cataloging	222
	2263

(Note: Part of the "no charge" inquiries are generated and used by the Acquisitions Unit and are therefore not included in this analysis.)

Although the terminal service and line charges might simply have been added as a total amount to the data-base costs, it seemed more meaningful to distribute these costs on a per-use basis. The method used to distribute these charges was to identify each use of the bibliographic data base, and to divide the total monthly costs of terminals and lines by the total monthly units of use (see table 9). This method of distributing terminal service and line charges not only provided per-unit terminal use costs, but also served to categorize kinds and quantity of data-base use.

SUBSCRIPTION AND MATERIAL COSTS

Subscription costs include only those bibliographic tools purchased for use in TSD for the purpose of bibliographic searching. As a result of the increased growth of the bibliographic data base, fewer tools are being used for searching under the automated system than under the manual system. Prior to the implementation of WLN, the library subscribed to bibliographic data (LC and CIP copy) on microfiche supplied by the Information Dynamics Corporation (IDC). The per-unit costs of all subscriptions are presented in the cost analysis charts (tables 1(a) and 2(a)).

Material costs include only those materials unique to cataloging and book processing; general supplies, such as pencils and paper, are not included. The calculation of the per-unit cost of most materials is generally straightforward. It should be noted, however, that under the automated system, products, i.e., materials, are included in the data-base

Table 7. Staff Costs: Automated Cataloging and Book Processing System

Staff Costs/Month	*Salaries Month*	*Plus 21% (Fringe Benefits)*	*Costs/ Month*
Classified Staff			
OA II	$ 912	$192	$ 1,104
LT I (4)	2,888	606	3,494
LT II (4)	3,269	686	3,955
LT III (2)	2,024	425	2,449
Supervisor II (2)	2,578	541	3,119
		Subtotal	$14,121
Faculty			
Catalogers (3½) (Monos)	$4,691	$985	$ 5,676
Unit Head	1,774	373	2,147
		Subtotal	$ 7,823

Staff Costs/Minute	
Timeslip	$1,456/mo ÷ 809 hrs = 1.80/hr ÷ 60 = .03/min
OA II	1,104/mo ÷ 174 = 6.34/hr ÷ 60 = .105/min
LT I (4)	3,494/mo ÷ 4 = $874/mo ÷ 174 = 5.02/hr ÷ 60 = .083/min
LT II (4)	3,955/mo ÷ 4 = $989/mo ÷ 174 = 5.68/hr ÷ 60 = .094/min
LT III (2)	2,449/mo ÷ 2 = $1,225/mo ÷ 174 = 7.04/hr ÷ 60 = .117/min
Supervisor II (2)	3,119/mo ÷ 2 = $1,560/mo ÷ 174 = 8.97/hr ÷ 60 = .15/min
Catalogers (3½)	5,676/mo ÷ 3.5 = $1,622/mo ÷ 174 = 9.32/hr ÷ 60 = .155/min
Unit Head	2,147/mo ÷ 174 = 12.34/hr ÷ 60 = .205/min

Total Staff Costs/month	
Timeslip—809 hrs @ $1,456/mo	$ 1,456
Special Projects Librarian	345*
Classified Staff	14,121
Faculty	7,823
Total (All Staff)	$23,745

*Amount of time (wages) assigned to cataloging.

costs, and only those materials used independent of the data base, e.g., book pockets and book cards, are listed as material costs on the charts. Under the manual system, due to the divisional arrangement of the library system and the number of card catalogs being maintained, the formula for producing sets of cards for a single title was complex. For this reason, the costs and number of cards produced for the titles cataloged per month are listed as a separate line item.

EQUIPMENT COSTS

Equipment costs include only equipment unique to cataloging and book processing, i.e., required for processing or products. General equipment, such as desks, book trucks, typewriters, are not included.

Equipment—Automated System

During the period covered by the cost analysis, November 1977 to February 1980, the following equipment was purchased for the automated system:

7 Bibliographic terminals	$24,360
10 Modems or modem contention units	5,433
2 Printers	6,500
	$36,293
Tax	1,887
	$38,180

Two pieces of equipment are currently being leased (maintenance included):

Keypunch	@$ 92.61
Verifier	@ 101.12
	$193.73/month

Summary of Monthly Equipment Costs

Purchases (5-year amortization)	$636.33
Maintenance	60.00
Leased equipment	193.73
	$890.06/month

Equipment—Manual System

If the automated system had not been implemented, the following equipment would have been purchased during this period:

2 Card catalogs	$ 3,755
5 Kardex units	4,475
2 Linedex units	2,944
	$11,174
Tax	581
	$11,755

Although the anticipated life span of this equipment should be considerably greater than that of terminals and modems, it has also been amortized over a five-year period. The rationale for this period of amortization is that the rate of growth of the files for which the equipment is used results in the purchase of additional equipment equivalent to the expected replacement of electronic equipment. Therefore, the initial cost of these purchases amortized would have been $196/month.

Since the multilith has been owned by the library for more than twenty years, its purchase price is not applicable to this analysis. However, maintenance on the multilith is $72.24/month. Two pieces of equipment were being leased under the manual system (maintenance included):

Keypunch	@$ 92.61
Verifier	@ 101.12
	$193.73/month

Summary of Monthly Equipment Costs

Purchases (5-year amortization)	$196.00
Maintenance	72.27
Leased equipment	193.73
	$462.00/month

SUMMARY AND CONCLUSION

The cost analysis clearly indicates that at Washington State University Libraries the automated cataloging and book processing system is less expensive than its previous manual system. By using the bibliographic component of the Washington Library Network, the library has reduced the costs of searching, cataloging, and record maintenance by almost 20 percent (see table 10—summary comparison costs by function). The higher costs of the manual system are essentially staff costs. Under that

Table 8. Staff Costs: Manual Cataloging and Book Processing System (Based on the 1977 Staffing Levels at Current Staff Costs)

Staff Costs/Month	Salaries *Month*	*Plus 21%* (Fringe *Benefits)*		Costs/ *Month*
Classified Staff				
OA II—Typing	$ 912	$ 192		$ 1,104
LT I (11)	7,950	1,670		9,622
LT II (3)	2,434	511		2,945
LT III (5)	5,060	1,063		6,123
Supervisor I (2)	2,175	457		2,632
Supervisor II	1,289	271		1,560
Offset Duplicator Operator	1,135	238		1,373
			Subtotal	$25,359
Faculty				
Catalogers (3.5)	4,691	985		5,676
Unit Head	1,774	373		2,147
			Subtotal	$ 7,823

Staff Costs/Minute	
Timeslip	$2,174/mo ÷ 1208 hrs. = 1.80/hr ÷ 60 = .03/min.
OA II—Typing	1,104/mo ÷ 174 = 6.34/hr ÷ 60 = .105/min
LT I (11)	9,622/mo ÷ 11 = 875/mo ÷ 174 = 5.03/hr ÷ 60 = .084/min
LT II (3)	2,945/mo ÷ 3 = 982/mo ÷ 174 = 5.64/hr ÷ 60 = .094/min
LT III (5)	6,123/mo ÷ 5 = 1,225/mo ÷ 174 = 7.04/hr ÷ 60 = .117/min
Supervisor I (2)	2,632/mo ÷ 2 = 1,316/mo ÷ 174 = 7.56/hr ÷ 60 = .126/min
Supervisor II	1,560/mo ÷ 174 = 8.97/hr ÷ 60 = .149/min.
Offset Duplicator Operator	1,373/mo ÷ 174 = 7.89/hr ÷ 60 = .13/min
Catalogers (3.5)	5,846/mo ÷ 3.5 = 1,670/mo ÷ 174 = 9.60/hr ÷ 60 = .155/min
Unit Head	2,147/mo ÷ 174 = 12.34/hr ÷ 60 = .205/min.

Total Staff Costs/Month	
Timeslip—1208 hrs @ $2,174/mo	$ 2,174
Classified Staff	25,359
Faculty	7,823
Total (All Staff)	$35,356

Table 9. Bibliographic Data Base Use Per Month (One Unit = One Access to or Process in Data Base)

Category	*Quantity of Terminal Use*
Searching	10688
Cataloging (Data Base Copy)	1529
Cataloging (Original Data Entry)	317
Authority Verification (317 x 7)	2219
Bibliographic Changes/Corrections	360
ILL, REF, General	537
Total Units	15650

WLN Terminal Service and Telecommunication Line Charges/Month

5½ terminals @ $140/mo	= $770/mo
5½ lines @ $40/mo	= 220/mo
	$990/mo

$990 ÷ 15650 = $.06/terminal use for Cataloging and Book Processing System

Table 10. Cataloging and Book Processing System: Summary Comparison Costs by Function (Excluding Equipment Costs)

Function	*Number of Items*	*Costs Per Month*
Manual System		
1. Bibliographic Searching	5247	$ 4,617
2. Bibliographic Record Production (Cost of Catalog Cards Distribution)	[2263]*	[$13,143]†
LC copy cataloging	1057	4,092
Modified copy cataloging	984	5,021
Original cataloging	222	3,343
Miscellaneous	NA	687
3. Bibliographic Record Maintenance	NA	6,402
4. Marking	NA	4,631
Total		$28,793
Automated System		
1. Bibliographic Searching	4480	$ 2,170
2. Bibliographic Record Production (Cost of Catalog Cards Included)	[2263]*	[$11,837]†
LC and CIP copy cataloging	1529	4,900
Modified copy cataloging	512	1,523
Original cataloging	222	3,343
Miscellaneous	NA	2,071
3. Bibliographic Record Maintenance	NA	4,194
4. Marking	NA	4,589
Total		$22,790

*Total of items listed below.
†Total of costs listed below.

system, eleven more staff and 1,365 more timeslip hours were needed per month to process the same amount of materials as is processed under the automated system. In fact, compared to the staff costs of both the manual and automated systems, the costs of equipment, data-base use (including products), terminal service, and telecommunication lines

of the automated system are a relatively small percentage (27 percent) of the total cataloging and book processing costs. This analysis serves to underscore a basic reality of the current library organization: personnel is one of its largest expenditures and staff-intensive systems are very costly.

This cost analysis has not directly addressed the issue of the quality of processing and products of either the manual or automated systems. The analysis suggests, however, that the automated system is more efficient in terms of staff time. Moreover, the TSD staff has found that not only can more be done with fewer staff, but the automated system also provides more accurate data and has the flexibility to accommodate with relative ease the many corrections and changes that must be made to the library's bibliographic files.

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Communications

How Long the Wait until We Can Call It Television

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This brief article will review videotex and teletext. There is little need to define terminology because new hybrid systems are being devised almost constantly (hats off to OCLC's latest buzzword—*Viewtel*). Most useful of all would be an examination of the types of technology being used for information provision. The basic requirement for all systems is a data base—i.e., data stored so as to allow its retrieval and display on a television screen. The interactions between the computer and the television screens are means to distinguish technologies. In teletext and videotex a device known as a decoder uses data encoded onto the lines of a broadcast signal (whatever the medium of transmission) to generate the display screen. In videotex, voice grade telephone lines or interactive cable are used to carry data communications between two points (usually 1200 baud from the computer and 300 baud or less from the decoder and the television screen). In teletext the signal is broadcast over airwaves (wideband) or via a time-sharing system (narrowband). The numerous configurations possible make straightforward classification of systems questionable.

A review of the systems currently available is useful to illustrate these terms, videotex and teletext. CompuServe, the Columbus, Ohio–based company, provides on-line searching of newspapers to about 4,000 users. *Reader's Digest* recently acquired 51 percent of The Source, a time-sharing service that provides more than 100 different (nonbibliographic) data bases to about 5,000 users. The Warner and American Express joint project, QUBE (also Columbus-based), utilizes cable broadcast with a limited interactive capability. It does not allow for on-demand provision of information; rather, it uses a polling technique. Antiope, the French teletext system, used at KSL in St. Louis last year and undergoing further tests in Los Angeles at KNXT in the coming year, is only part of a complex data transmission system known as DIDon. Antiope is also at an experimental stage in France, with 2,500 terminals scheduled for use in 1981.

CEEFAX and Oracle, broadcast teletext by the BBC and IBC in Britain, have an estimated 100,000 users currently. Two thousand adapted television sets are being sold every month. Prestel, BBC's videotex system, currently has approximately 5,000 users, half of whom are businesses.

All other countries in Europe are conducting experiments with one of the technologies. In Canada, Telidon, the most technically advanced system, has 200 users. Experiments involving Telidon are being conducted nationwide due to government interest in telecommunications improvements. Telidon will also be used in Washington in the spring of 1981 for consumer evaluation.

These cursory notes should indicate the breadth of interest in alternative means of information provision. Video and electronic publishing newsletters (see references) keep track of the number of users and are the best way to keep informed of activities and developments.

Several important trends are becoming evident. Perhaps the most evident is the realization that videography is being developed in countries other than the U.S.

*The views expressed in this paper do not necessarily represent those of the Library of Congress or of the Congressional Research Service.

as a result of strong support by the National Posts and Telecommunications (PTT) authorities. Until recently there was a feeling that the U.S. was technically behind Europe. What is now evident is that in the free market system of the U.S. manufacturers or other potential system providers have had insufficient impetus to provide videotex/teletext technology. The technology of information display (see Borrell, *Journal of Library Automation*, V.13 (Dec. 1980), p.277–81) in the U.S. is an order of magnitude more sophisticated than in Europe. The point being that in the absence of strong PTT pressure, videography in the U.S. developed for specialized markets in which telecommunications were not a central need. In the one area of great demand, teletext services for the hearing impaired, decoders were developed and have been employed for a number of years (about 25,000 are currently in use). As the high cost of telecommunications bandwidth is eased by data compression, direct broadcasting by satellite, enhanced cable services, and fiber optic networks, then videotex and teletext will become available on a wide scale in the U.S.

The Computer Inquiry II decision by the FCC involving reinterpretation of the Communications Act of 1934 has given AT&T permission to enter the data processing market. In fact, AT&T, in its third experiment with videotex, is taking such an aggressive stance that it seems to be doing everything that its critics have feared: providing updatable classified ads (dynamic yellow pages), allowing users to place information into the system memory, and providing voice mail services—thereby taking on the newspapers, home computer manufacturers, and the U.S. Postal Service. In addition, banking services will be offered. As the largest company in the U.S., this stance cannot be ignored. AT&T supplies about 80 percent of the phone service in the U.S., and has the potential, if allowed, to become a broadcaster, data processor, publisher, and banker; cross-ownership was never allowed up to this time.

The trend toward specialized services provision is also exemplified by the French and British systems. Prestel, which was originally targeted for a home market, is now promoted with the tacit policy of being a special business service allowing financial and private data to be provided to subscribers. Sofratev, the marketers of the French teletext system, are acknowledging the importance of transactional markets in two ways, based on technology they have named "smart card," a credit card–size (in one configuration) plate with a built-in microprocessor or chip. The card will allow system users to access material that will have controlled readership. An example would be a magazine of financial data provided to those who need such information (or, more importantly, are willing to pay for it). In a more complex effort, the largest retailer in Paris will advertise material via teletext and system users will be able to make acquisitions with their smart card, which can be programmed with financial data.

Nor is this the end of the effort by the French to market information display technology. The electronic phone directory, being offered by Bell in Austin, is replicated in a more modest way by the French, who plan to produce a six-by-eight-inch black-and-white display unit that will provide phone directory information (both white and yellow pages) to all of France by the 1990s. Developed as part of the "Telematique" program of the French government, the terminals represent to some (the parent company of The Source has tendered an offer for up to 250,000 of the terminals) a low-cost alternative for providing videotex to a mass market. The Tandy home computer in its videotex configuration seems to fill the same market slot.

Perhaps the most disturbing trend, at least from a librarian's point of view, is the fact that contemporary data systems are being created which could benefit greatly from the experience of librarians and libraries. For instance, research into the methods of access—keyword, phonetic and geographical—by the French is intended to provide a flexible and easily used system for untrained persons searching for directory information, and is being performed by an advertising and yellow pages

publishing firm. With a feeling of déjà vu I listened to an explanation of how difficult it is to develop a system for the novice; one proposed solution is to allow only the first four letters of a word to be entered (one of the search methods used at the Library of Congress, which does suggest some cross-fertilization).

Whatever the trends, the reality is that librarians and information scientists are playing decreasing roles in the growth of information display technology. Hardware systems analysts, advertisers, and communications specialists are the main professions that have an active role to play in the information age. Perhaps the answer is an immediate and radical change in the training of library schools of today. Our small role may reflect our penchant to be collectors, archivists, and guardians of the information repositories. Have we become the keepers of the system? The demand today is for service, information, and entertainment. If we librarians cannot fulfill these needs our places are not assured.

Should the American Library Association (ALA) be ensuring that libraries are a part of all ongoing tests of videotex—at least in some way—either as organizers, information providers, or in analysis? Consider the force of the argument given at the ALA 1980 New York Annual Conference that cable television should be a medium that librarians become involved with for the future. Certainly involvement is an important role, but we, like the industrialists and marketers before us, must make smart decisions and choose the proper niche and the most effective way to use our limited resources if we are to serve any part of society in the future.

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Data Processing Library: A Very Special Library

Sherry COOK, Mercedes DUMLAO, and Maria SZABO: Bechtel Data Processing Library, San Francisco, California.

The 1980s are here and with them comes the ever broadening application of the computer. This presents a new challenge to libraries. What do we do with all these computer codes? How do we index the material? And most importantly, how do we make it accessible to our patrons or computer users?

Bechtel's Data Processing Library has met these demands. The genesis for the collection was Bechtel's conversion from a Honeywell 6000 computer to a Univac 1100 in 1974. All the programs in use at that time were converted to run on the Univac system. It seemed a good time to put all of the computer programs together from all of the various Bechtel divisions into a controlled collection. The librarians were charged with the responsibility of enforcing standards and control of Bechtel's computer programs.

The major benefits derived from placing all computer programs into a controlled library were:

1. Company-wide usage of the programs.
2. Minimize investment in program development through common usage.
3. Computer file and documentation storage by the library to safeguard the investment.
4. Central location for audits of program code and documentation.
5. Centralized reporting on Bechtel programs.

Developing the collection involved basic cataloging techniques which were greatly modified to encompass all the information that computer programs generate, including actual code, documentation, and list-

ings. Historically, this information must be kept indefinitely on an archival basis. The machine-readable codes themselves are grouped together and maintained from the library's budget. Finally, a reference desk is staffed to answer questions from the entire user community.

Documentation for programs is strictly controlled. Code changes are arranged chronologically to provide only the most current release of a program to all users. Historical information is kept and is crucial to satisfy the demands of auditors (such as the Nuclear Regulatory Commission). Additionally, the names of people administratively connected with the program are recorded and their responsibilities defined (valuable in situations of liability for work completed yesteryear).

The backbone of the operation is a standards manual that spells out and discusses the file requirements, documentation specifications, and control forms. This standard is made readily available throughout Bechtel. In addition, there are in-house education classes about the same document.

Indeed, the Central Data Processing Library is the repository of computer information at Bechtel. The centralization and control of computer programs eliminates the chaos that can occur if too many individuals maintain and use the same computer program.

News and Announcements

Public Service Satellite Consortium Launches Library Survey

The Public Service Satellite Consortium (PSSC), headquartered in Washington, D.C., has announced an upcoming survey targeted for libraries involved with cable television; specifically, libraries active in community access. As one result of a PSSC meeting with the American Library Association (ALA), this survey is being launched to identify libraries that can be effectively networked via cable systems with satellite receivers.

The PSSC's National Satellite Network (NSN) has been providing ad hoc networking services for more than two years. NSN's primary operating mode is one-way video through satellite telecast, with audio interaction provided by telephone. However, cable television systems have been conspicuously absent from ad hoc, nonbroadcast operations. The public television satellite system, which interconnects 156 PBS-affiliated TV stations, has been NSN's primary resource.

In its usual operating mode, NSN telecasts involve groups of people who convene at a facility equipped to receive live, satellite-transmitted programs. These groups "participate" in the live program through telephone hookups to the originating studio—wherever that might be. NSN clients, people who pay for this ad hoc networking service, have included educators, health professionals, members of religious denominations, labor union members, ethnic minorities, and others. Programs have varied from continuing professional education courses to corporate management meetings. The cost-efficiency of this group communications technique can be very attractive. Satellite-assisted interactive television is a publicly available form of teleconferencing which does not require a large front-end investment in hardware.

Two years ago, when PSSC took its first serious look at cable as a possible medium for NSN's specialized services, community access centers, so-called cable libraries, and institutional channels were nowhere near as promising as they are today, or as they will become through newer cable system franchises. "Local programming" is what community access was and is all about. As a resource for handling national, essentially closed-circuit-type transmissions, community access would not seem to be a likely resource. But NSN is used to "piggybacking" on systems and facilities not dedicated to NSN services. The public television satellite system, for instance, was developed to distribute PBS programming. Teleconferencelike services through that system are consequential; in effect, a "bonus" for stations hooked up.

Why a bonus? NSN clients pay for the use of facilities. When an organization contracts for an ad hoc network hookup the contract budget includes per-hour or per-occasion fees to local viewing facilities, as well as many other costs incurred through the process. But when the "bottom line" is compared to options for communicating among the same people (for example, travel) the cost-efficiency and superiority of the medium is still blatant to most cost-conscious users.

If PSSC finds through this survey that a significant number of libraries are administratively and technologically capable of providing closed-circuit viewing facilities for local audiences, it predicts the user base for National Satellite Network services will expand appreciably; in fact, libraries themselves are expected to use the medium for exchange of video programming and for teleconferencing. A library is more congenial, from the outside user's perspective, than a public television studio, and a library will probably be less expensive than a hotel or motel equipped to

provide similar services. PSSC also hopes that provisions for viewing closed-circuit telecasts fit within a library's mandate to serve the information needs of its community.

Whether or not libraries involved with community access cable are positioned to entertain a revenue-generating business remains to be determined.

If your library is currently wired to receive local cable programming, or if your library is involved in community access programming, and you would like to ensure your participation in PSSC's survey, please write to Mary Diebler, Service Development Specialist, Public Service Satellite Consortium, 1660 L Street, NW, Suite 907, Washington, DC 20036; or call (202) 331-1154.

So You Want To Be an Information Broker: Running a Successful and Profitable Business

A two-day workshop will be sponsored by the School of Library and Information Science, State University of New York at Albany, on Friday and Saturday, May 1 and 2, 1981.

The workshop will offer a forum for the exchange of ideas and management techniques. The history and future of this exciting and demanding new profession; the art of interpreting and attending to client needs; the getting and keeping of customers; the role of the special librarian as information counselor; financial planning; legal matters; and promotional advertising are among topics to be covered. The workshop format will encourage interaction between speakers and audience. Two experienced brokers, Barbara Whyte Felicetti, Director of Info/motion (Lenox, Massachusetts) and Kelly Warnken, owner of Information Alternative (Woodstock, New York) will coordinate the workshop; assisting them will be Matthew Lesko, chairman of Washington Researchers (Washington, D.C.); Alice Sizer Warner, owner and consultant, The Information Guild (Lexington, Massachusetts) and cofounder and former president of Warner-Eddison Associates, Inc.; Constance Steward, manager, Information Services, General Electric (Syracuse, New York); and other nationally known professionals. Publication, films, graphics, and other materials for the information broker will be on display.

Registration fees for the workshop are $75 for librarians and information specialists; $50 for students and retired librarians. Luncheon on both days is included in the registration fee. Early application is advised because attendance will be limited. Checks should be made payable to State University of New York at Albany and mailed to Richard S. Halsey, dean, School of Library and Information Science, State University of New York at Albany, 135 Western Ave., Albany, NY 12222; (518) 455-6288.

Position papers predicting the prospects for information brokering over the next decade will be requested from master's degree students enrolled in accredited library schools as of spring 1981. Winners, to be selected from the submitting schools, will have their registration fees waived and the writer of the best statement on the subject will receive a grand prize and have her/his paper read and distributed at the workshop.

For further information on workshop speakers and content contact: Kelly Warnken, Information Alternative, Box 657, Woodstock, NY 12498, (914) 679-2549 or Barbara Whyte Felicetti, Info/motion, 214 W. Mountain Rd., Lenox, MA 01240; (413) 442-0215.

New Publications on Word Processing Systems and Small Computers

Datapro Research Corporation, the nation's largest publisher of unbiased reports, ratings, analyses, and news about commercially available information processing products and services, has recently announced two new publications.

All About Word Processors, a recently updated report summarizing the characteristics of more than 150 word processing systems, describes the word processor's impact on text-handling tasks and the evolution of word processing systems to incorporate data-handling capabilities as well as communications. The word processor has become a total system capable of handling all phases of office operations.

The 110-page report defines general features, applications, advantages, and tradeoffs of various types of stand-alone and shared-logic word processors. More than eighty pages of detailed comparison charts describe the overall characteristics of each system, including information on system configuration, display and printer station features, communications peripherals, arithmetic capabilities, pricing, and text input, edit, and merge features. There is also an alphabetical listing of all the vendors in the report complete with addresses and phone numbers.

All about Word Processors, reprinted from a recent supplement to *Datapro Reports on Word Processing*, is available for $19.

Datapro Directory of Small Computers, designed to help EDP professionals and managers of all types efficiently locate, compare, and evaluate small computer systems and the companies that manufacture and distribute them as well as software, peripherals, and services, is now available from Datapro at a special prepublication subscription rate.

This new directory service, updated monthly, offers its subscribers hundreds of succinct, easy-to-read reports on more than 200 small computer systems such as Apple III, IBM 5120, and Durango F-85. Each system report contains a concise summary including current models, memory, base list price, typical list price, primary uses, popular options, principal applications, first shipments, number installed, and availability. In addition to background information and system characteristics, the reports include details on hardware/packaging covering processor/memory, display, keyboard, direct access storage, printers, data communications, and I/O electronics. Software information in the report covers programming languages, operating system, utilities, database management systems, communications support, and applications programs.

A comprehensive listing of more than 16,000 companies, categorized by manufacturer/integrators, system vendors and stores, system distributors, software vendors, peripherals vendors, computer services vendors, maintenance companies, and other vendors is provided. Entries within each group are listed alphabetically and by zip code.

Other sections in the new directory include personal computers, basic computer concepts, user ratings, glossary, user groups/associations, and newsletters.

Prepublication subscriptions are offered at $280, a $50 reduction from the regular $330 subscription rate. Each subscription to the *Datapro Directory of Small Computers* includes two loose-leaf volumes, twelve monthly supplements, twelve monthly newsletters, and use of Datapro's popular telephone inquiry service.

To order, or for more information, contact Datapro Research Corporation, 1805 Underwood Blvd., Delran, NJ 08075; (609) 764-0100.

SAMANTHA Now Being Offered in Separate Components

SAMANTHA, the award-winning software system for the automation of information publications, is now being offered in separate components. SAMANTHA, System for the Automated *MAN*agement of *T*ext from a *H*ierarchical *A*rrangement, is a generalized text processing system designed to generate computer-printed reports and camera copy from information data bases. The SAMANTHA software system can be readily customized to satisfy a wide variety of text processing, information data base, and publishing applications. One of SAMANTHA's strengths lies in its ability to extract elements of text from a consistent data base and arrange these elements into different formats, thereby presenting different cuts of the same information. Many of the separate components of SAMANTHA can be utilized to great advantage by publishers who do not need the full system. These components are:

- Update system—performs sequential updates on the data base and generates operating reports and data base proof lists.
- DM1 and DM2—data manipulation component of SAMANTHA to process textual data, create new arrangements, and combine these arrangements to produce a publication.
- Page-2/OS and Typo—typesetting sys-

tem and specification macros used to define characteristics of pages and book sections within a publication.

- Formatter and Typo—print facility and specification macros that allow the user to define complex pages for printing on a line printer, Xerox 9700, or COM device.
- DM3—a tailored piece of software from SAMANTHA components that interfaces from a text file to Page-2/OS, consisting of substitution functions and typographic parameters from DM1 and DM2. With Page-2/OS and Typo (see above), this function is a complete composition system, ideal for in-house publishing where the typographic requirements are limited.
- Library Book Catalog System—for libraries, I&PS offers a special book catalog system for the production of book catalogs and library catalog cards.

The full SAMANTHA system will continue to be offered for purchase, lease/rental, and service bureau usage. In addition, I&PS offers a Xerox 9700 interface for the SAMANTHA formatter, a VideoComp 500 Driver Program Module for Page-2/OS, and Set-Width Tables for GPO fonts. For more details, contact the I&PS Marketing Department, 4720 Montgomery Lane, Bethesda, MD 20014; (301) 652-5424.

Computer Interactive Videotape

The TecLar system is inexpensive because it enables anyone to use color broadcast quality videotapes to illustrate educational material at about 10 percent of the traditional cost for similar instructional services. It is easy to use because the instructional programs are all individualized and self-paced. No computer skills are required to operate the TecLar display system and an electronic interface between the videotape player and the small computer enables users to quiz themselves on important segments of the videotape, and arbitrarily select or "random access" any portion of the program for purposes of review.

The standard TecLar display has a color television monitor, a videotape player, a computer and disk drive (or special TecLar responder boards can also be used in place of a computer), and a TecLar interface, which operates with any computer and is compatible with videodisc technology.

The TecLar Corporation offers complete services for this form of computer interactive videotape instruction including media assessments and audits, instructional systems design, videotape production, computer programming, equipment leasing, and in-house training seminars. For more information contact Frank McLaughlin, The TecLar Corporation, P.O. Box 2106, Placerville, CA 95667; telephone (916) 626-1322.

Statewide LCS

On October 27, 1980, the Founders Memorial Library, Northern Illinois University (DeKalb), became the eleventh Illinois academic library to begin utilizing the Library Computer System (LCS) for circulation purposes, under the auspices of the LCS Network Project. Founders Memorial Library joins the libraries of Triton College (River Grove), Governors State University (Park Forest South), DePaul University (Chicago), Millikin University (Decatur), Chicago State University (Chicago), Judson College (Elgin), Kankakee Community College (Kankakee), Lake Forest College (Lake Forest), St. Xavier College (Chicago), and Illinois State University (Normal) as active participants in the project. The libraries of an additional three more Illinois academic institutions are scheduled to begin utilizing the system within the next month. In addition to these fourteen libraries, the libraries of the five campuses of the University of Illinois are already using the system.

The LCS Network Project is an attempt to develop an on-line library resource-sharing network based upon the circulation control and bibliographic searching capabilities of the University of Illinois' Library Computer System (LCS). Statistical analysis of the LCS network transaction activity has been under way during the fall of 1980. Statistical summaries and requests for additional information concerning this project should be directed to: Bernard G. Sloan, LCS HECA Coordinator, Statewide

LCS, 54 Administration, University of Illinois at Urbana-Champaign, Urbana, IL 61801.

Cassettes Available from LITA Serials Institute

The papers presented at ALA's Library and Information Technology Association's institute on "Serials Automation, Acquisition and Inventory Control" held on September 4–5, 1980, in Milwaukee, are now available on audiocassette. Recordings are unedited.

The speakers and their topics are: Keynote speaker, Dan Tonkery, associate university librarian, University of California, Los Angeles; "Check-in Function," Jim Fayollat, systems analyst, University of California, Los Angeles; "Subscription and Financial Functions," Millard Johnson, research associate in machine methods, Washington University Medical Library, St. Louis; "Inventory and Holdings Features," Susan Miller, coordinator for library automation, Ohio State University; "Patron Access," Velma Veneziano, library systems analyst, Northwestern University; "Role of Serials Control in Future Library Organization," Michael Gorman, director of technical services, University of Illinois; "Serials Control by Agents," Betsy Humphreys, head, Serial Record Section, National Library of Medicine; and "Panel Discussion of Available Automated Serials Check-in Systems," Millard Johnson, PHILSOM; Gerald R. Lowell, F. W. Faxon Co.; J. T. Stephens, EBSCO Subscription Services; and Ronald A. Gardner, OCLC, Inc.

A full set of eight cassettes is priced at $30. Individual cassettes are $4.25 each. LITA members and institute registrants receive a 10 percent discount. Cassettes may be ordered from: Information Yield, 311 Stonecrest Drive, Syracuse, NY 13214.

Report of Z39*
UNESCO/PGI

Z39 has recently become a member of the U.S. National Committee for the UNESCO General Information Program (UNESCO/PGI). This committee serves as the central coordinating body of the U.S. national information community responsible for representing and promoting its needs, interests, and views with respect to the UNESCO General Information Program. Both UNESCO and the U.S. Department of State have accepted the committee as the focal point within the U.S. for matters relating to the UNESCO/PGI.

The committee gathers information and monitors activities concerning ongoing and future UNESCO/PGI plans, policies, programs, budgets, and operations. It disseminates such information to the U.S. information community as is relevant to the interests of various sections of the community and associated policymaking agencies. Through the solicitation of comments on the UNESCO/PGI, the initiation of meetings on the PGI program, and preparation of occasional studies related to PGI affairs, the committee is able to advise the Department of State, concerned federal agencies, and U.S. representatives on the UNESCO/PGI Intergovernmental Council and Advisory Committee regarding the establishment of their policies respecting the UNESCO/PGI.

Membership in the U.S. National Committee for the UNESCO/PGI is limited to twenty-five governmental and nongovernmental agencies, organizations, associations, and institutions whose principal functions are concerned with information and five members-at-large, individual U.S. citizens with professional backgrounds in main information fields.

The committee meets annually in plenary session to consider reports of activities of the past year and to establish basic policy and program guidelines for the ensuing year. A bureau, consisting of ten individuals elected by the committee, is responsible for the committee's activities between plenary sessions. Robert Wedgeworth, executive director of the American Library Association, is the current chairperson of the U.S. National Committee for the UNESCO General Information Program.

Z39 Finances

As of July 1980, Z39 estimated that sufficient funds were on hand or pledged to

*Information in this article excerpted from *Voice of* Z39 V.2, no.3, July 1980.

carry Z39 at least through the first calendar quarter of 1981. Major contributions have been made by: ALA ($5,000 by October 1, 1980 and $5,000 pledged after that date), NCLIS ($5,000 in FY '81 budget), NTIS ($1,000), ARL ($500), Faxon ($400), AMIGOS ($300), OHIONET ($300), Five Associated University Libraries ($300), and ASME ($100).

Z39 Annual Meeting

The 1981 annual meeting of Z39 will be held at the Library of Congress on April 29, 1981.

New and Revised Standards Published

Two new and two revised Z39 standards were published in May 1980 and may now be purchased from ANSI, 1430 Broadway, New York, NY 10018.

Z39.15-1980	*Titles Leaves of a Book* (revision) $3.50
Z39.21-1980	*Book Numbering (ISBN)* (revision) $3.50
Z39.42-1980	*Serial Holdings Statements at the Summary Level* $5.50
Z39.43-1980	*Identification Code for the Book Industry (Standard Address Number—SAN)* $3.50

Library Information Programs

Prepared programs on the care and storage of nonbook materials in active informational collections are now available to the public in various parts of the country at a minimal rental fee. The programs consist of tape recordings and accompanying slides for viewing.

John W. Ellison, associate professor in the School of Information and Library Studies at the State University of New York at Buffalo, and three research assistants produced the slide-tape programs under a $14,000 U.S. Office of Education Title II library research grant.

Persons interested in renting any of the six informational programs relating to the care and storage of film, tape, maps, microforms, phonorecords, or photographs for the cost of handling and postage are advised to contact any one of five regional film libraries.

The libraries, their location, and their phone numbers are as follows:

- Krasker Memorial Film Library, Boston University, 765 Commonwealth Ave., Boston, MA 02215; (617) 353-5272.
- Regional Film Library, Instructional Support Center, Florida State University, Tallahassee, FL 32306; (904) 644-2820.
- Audio Visual Center, University of Iowa, C-215 East Hall, Iowa City, IA 52242; (319) 353-3724.
- Audio Visual Services, Merrill Library and Learning Resources Program, Utah State University, Logan, UT 84322; (801) 752-4100, ext. 7954.
- Film Library, The General Libraries, University of Texas at Austin, Drawer W, University Station, Austin, TX 78712; (512) 471-3573.

In Buffalo, New York, the programs are available on a rental basis from the SUNY Buffalo School of Information and Library Studies. The telephone number is (716) 636-2411.

The slide-tape programs carry the following titles:

- Storage and Care of Films, Filmstrips, Filmloops, Transparencies, and Slides.
- Storage and Care of Magnetic Tapes (Audio, Video, and Computer).
- Storage and Care of Maps.
- Storage and Care of Microforms (Film, Fiche, and Ultra-Fiche).
- Storage and Care of Phonorecords.
- Storage and Care of Photographs and Negatives.

Persons interested in purchasing any of the slide-tape programs should write to the National Audiovisual Center, Washington, DC 20409.

Electronic Yellow Pages

Electronic yellow pages, carrying both local and national advertising, may soon be offered by American Telephone & Telegraph, according to a newly published analysis in *VideoPrint* newsletter. The analysis predicts a "major" impact on the use of classified advertising in newspapers, because the new electronic yellow pages can be updated constantly and will carry notices of prices, sales, special offers, etc. According to *VideoPrint* editor Alan P. Brigish, "This is the worst news for the

newspaper industry since the advent of radio sixty years ago." Brigish expects that the electronic yellow pages, together with other related electronic advertising, will cut into 25 percent or more of the newspaper classified advertising market, which is currently about $4.6 billion.

Total annual revenues from yellow-page advertising are in the $2 billion range, according to the *VideoPrint* analysis, which points out that AT&T is therefore the world's largest publisher. Most people do not immediately associate the telephone company with publishing, making AT&T a hidden—almost secret—participant in the publishing industry, according to Brigish.

According to the analysis, AT&T is already actively experimenting with electronic directories. Recently, AT&T ran a "concept trial" in the Albany, New York, area to test the reactions of both residential and business participants to the idea of a telephone directory information service using a video terminal, which included a telephone set, visual display screen, and a typewriterlike keyboard. Users could reach more than 500,000 Bell System and independent telephone company directory listings within the ten thousand square miles encompassed by the 518 area code, as well as 180,000 yellow-page listings for Manhattan. Also included were public announcements about the weather and sports, horoscopes, and comments by psychologist Joyce Brothers, along with police, fire, and hospital emergency numbers. According to Celeste Hynes of the *VideoPrint* staff, "AT&T is being extremely secretive about the results from the experiment, but in a public statement Bell has indicated that overall reaction to the electronic information system was very positive."

AT&T is the most logical company to install on-line information services, as cost justifications will begin to appear with the increasing rise in paper costs plus the decreasing cost of hardware. *VideoPrint* predicts that by the end of the decade it may be less expensive for the telephone company to install a videotext terminal than it will be to hand out a free telephone book. In 1979, more than 300,000 tons of paper went into making directories, and by 1985 paper requirements are expected to exceed 500,000 tons. The cost of paper meanwhile is expected to soar from $450 per ton to more than $800 per ton.

New OCR System

Scan-Data Corporation, Norristown, Pennsylvania, has announced a new, high-speed OCR system, the 2280/1. The firm reports that the 2280/1 is the culmination of years of experience in OCR with guidance from a number of industry groups. It steps around the limitations of previous systems in the market to provide the highest throughput and maximum versatility available on a combination page and document reader.

Features of the system include: document reading rates of up to 750 per minute; page reading rates of up to 3,000 per hour (30 lines with 2,400 characters); continuous scanning with large-area scan window for look-ahead and rotated data (90, 180, or 270 degrees from the leading edge of the form); document loading and unloading on the fly; doubles detection; in-line or simultaneous multiple reject correction stations with Scan-Plex I at full resolution (1,280 bits per character frame); serial numbering; microfilming; SWAMI heuristic software recognition; 1287/1288 forms compatibility.

New Computer Printer from Howard

Howard Industries, Inc., Anaheim, California, has announced the Typrinter 221™ intelligent computer printer. The Typrinter 221 is a letter-quality daisy wheel printer with five built-in microprocessors, providing complete text formatting, including right justification, proportional spacing, and a variety of other features. Based on the Olivetti model ET-221 electronic typewriter, the Typrinter 221 also functions as an electronic typewriter, which is reported to bring new economies to the office or personal computer user.

Howard Industries describes the Typrinter 221 as compatible with all micro, mini, and mainframe computers. It utilizes a parallel Centronics interface, with RS-232C and IEEE-488 interfaces also avail-

able. The Typrinter 221 can respond to formatting commands embedded in the text, eliminating the need for additional text-formatting software. The Typrinter 221 can automatically provide many text-formatting functions, including right justification, with or without proportional spacing; tabbing; bold and/or underlined characters; title centering; and decimal-point location.

The user can select from three different sizes of type (elite, pica, or mikron) as well as proportional spacing. Each standard daisy wheel has all the characters necessary to print in Spanish, Italian, French, and German, as well as English, with more than twenty fonts currently available. Correctable carbon ribbons in five colors as well as reusable nylon ribbons are available.

One of the novel features of the Typrinter 221 is its ability to print in reverse, that is, white characters on a black background for highlighting critical information. The Typrinter 221 can also function as an advanced electronic typewriter. It features an alphanumeric display showing the current line, column position, and lines remaining to the end of the page, as well as other useful information.

First deliveries were scheduled for September 1980. A brochure describing the Typrinter 221 is available from Howard Industries, Inc., 2031 E. Cerritos Ave., Bldg. 7K, Anaheim, CA 92806; (714) 778-3443.

Financial Aspects of Library and Information Services

The Centre for Library and Information Management today publishes a bibliography on the financial aspects of library and information services. The compiler is Alan Cooper, research fellow at Loughborough University.

The necessity for good financial management in libraries today makes this bibliography a working tool of importance in libraries and information services of all types. The coverage of the bibliography is wide—"financial aspects" is interpreted broadly to include budgeting, cost-effectiveness, fees, funding, prices, and financial management generally. While not claimed to be comprehensive, the bibliography provides a wide-ranging collection of references to English-language documents published from 1969 to 1979.

There is an index of names, listing authors, the titles of anonymous works and publications, and corporate bodies as subjects. Entries are annotated and arranged in classified order. For example:

COOPER, Alan
Financial aspects of library and information services: a bibliography
Loughborough: CLAIM, 1980
(CLAIM reports; no. 5)
vi, 117p; 30 cm. ISBN 0 904924 23 8 Pbk: £10.00

For further details, or for ordering information, write to the Information Officer, CLAIM, Loughborough University, Loughborough, Leics LE11 3TU, U.K.

An Introduction to Open Systems Interconnection

Standards for open systems interconnection (OSI) will allow computers, terminals, and other computing devices to be linked together, regardless of their source or manufacturer. This important subject is covered by the The National Computing Centre in a guide for computer users and professionals who have not appreciated the significant developments that are taking place.

OSI has been the subject of considerable international effort since 1977, and last year NCC and the Commission of the European Community (CEC) decided that information on these developments should reach a wider audience. It was therefore decided to produce a guide to OSI, with NCC providing the text, and the CEC setting up an international working party of experts to provide comment. The English-language version of this guide is now available from the Publications Department, The National Computing Centre, Oxford Road, Manchester, M1 7ED, U.K.

ALA FILING RULES

Filing Committee of the Resources and Technical Services Division, ALA

The new filing rules specify the arrangement of bibliographic records of library materials, whether displayed in card, book, microfilm, or online format, and do not depend on any particular cataloging principles by which bibliographic records have been formulated.

The rules reflect, with very few exceptions, the "file-as-is" principle. They specify that character strings should be considered in exactly the form and order in which they appear, emphasizing the way they look rather than the way they sound or their meaning. Punctuation is not considered, and there is no distinction among persons, places, things, and titles. Similar elements that differ in form are filed in different positions. The basic order of filing is word-by-word.

The rules consist of an introduction, which states the general features and principles of the work and gives a number of suggestions for the assistance of users of bibliographic files arranged by these rules; general rules, which cover the most frequent and basic principles of filing; special rules, which are intended to apply to less frequent filing distinctions and which are, for the most part, extensions of the general rules; two appendixes—modified letters and special characters and articles in the nominative case in various foreign languages; and a glossary. The final section of the *Filing Rules* is an index to the entire work.

64 pages Paper LC 80-22186 025.3 ISBN 0-8389-3251-9 (1980) $3.50

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Book Reviews

Archivists and Machine-Readable Records: Proceedings of a Conference on Archival Management of Machine-Readable Records, February 7–10, 1979, Ann Arbor, Michigan. Edited by Carolyn L. Geda, Erik W. Austin, and Francis X. Blouin, Jr. Chicago: Society of American Archivists, 1980. 248p. $10 ($7 to SAA members). ISBN 0-931828-19-8. (Available from the Society of American Archivists, 330 S. Wells St., Suite 810, Chicago, IL 60606.)

The records archivists collect, arrange, describe, preserve, and make accessible, which were once nearly all in the form of ink on paper, are now coming to them, increasingly, as magnetic tapes, disks, punched cards, and the like. These are the proceedings of a conference organized and prepared by some of the first archivists to recognize and address the resulting problems and by some of the computer scientists with whom they have begun to discover new ways to handle records in nontraditional formats. Although much of it reflects the inexperience of archivists new to a challenging and foreign field, this collection of papers is an important and extremely informative one, and a good introduction to a complex situation and the current thinking and programs arising from it.

The volume concerns itself with a variety of topics related to the conference's goals of "improving the definition of the archival problems presented by machine-readable records; sharing practical experience and information already gained by archivists and others working with machine-readable records; assessing the nature, problems, and opportunities of computer technology; and identifying, on a preliminary basis, the training needs and opportunities of archivists."

Five of the eight conference sessions consisted of formal papers, and these represent the first five "chapters" of the proceedings. "Research Opportunities of Machine-Readable Records" discusses potential uses of today's computerized data for future historical research, and the problems archivists face now in determining which of these data will be useful then. Each of the five papers in chapter 2 explains a currently operating archival program for machine-readable records, three at large national archives, one at a state archives, and one in business. Although there is some duplication among the papers, there is much to be gleaned from the experiences, successful and otherwise, of these pioneering repositories.

The third chapter comprises two papers describing social-science data archives, another source of experience and assistance to archivists grappling with holdings in nontraditional formats. While the nature of their collections differs from that of institutional records, the staffs of these data archives are quite familiar with many of the problems more and more archivists are facing in incorporating machine-readable records into their collections.

Chapter 4, "Developments in Computer Technology," is especially interesting. It reviews past, present, and future hardware and the implications of the rapid advances in computer technology on archival collections. In addition, it treats hardware, especially mass storage technologies and software, not only as sources of archival material, but as answers to the problems of how to deal with it. Both repositories holding records in machine-readable form and those using machines to manage their collections need a higher profile; these papers hint at efforts to make the originators of machine-readable data aware of archival concerns, and at steps archivists in need of computer expertise can take.

"Confidentiality and Privacy," the fifth chapter, discusses privacy and confidentiality legislation, and the practices and experiences of the Bureau of the Census and social-science data archives. While these are topics of immeasurable importance to archivists, these papers should be of great interest to those responsible for current sensitive machine-readable data as well.

Although the Society of American Archivists' decision to make the volume available at low cost is commendable, this required some sacrifices. The very reduced type size is a minor detraction, but the lack of an index seriously reduces the book's utility, especially since many topics, such as appraisal, staffing, preservation, and cost estimates are treated in several papers and in several chapters, under titles not entirely descriptive of content. There are, however, extremely helpful introductions to chapters 1–5, summarizing the issues presented and mentioning highlights of the papers included in each. These, together with the introduction and summary papers in chapter 6, lead to the wealth of material in the volume. Topics covered in discussions rather than formal papers at three conference sessions were mentioned throughout the book and it is hoped that writing will be forthcoming that treats these in more detail. These topics were "Implications of Machine-Readable Records for Conventional Archival Practices and Procedures," "Needs and Opportunities for the Training of Archivists," and "Plans and Strategies for Future Action."

Mentioned repeatedly in the proceedings, although not discussed in depth, are ways in which archivists can relate to and take advantage of the experience and expertise of their close colleagues, including librarians, in dealing with machine-readable archival materials. Those experienced in library automation techniques, especially in libraries associated with archival operations, can expect to be asked for advice and assistance. This volume offers a solid overview of the challenges archivists face in machine-readable records, and a look at ways in which, with the help of those conversant with automation, they are addressing these increasingly complex and increasingly important problems and issues. In addition, the volume, by offering a better understanding of archival concerns, might serve to convince those it reaches who are responsible for generating machine-readable records of the potential archival importance of their own files.—*Jane Wolff, Center for History of Physics, American Institute of Physics, Berkeley, Calif.*

Closing the Catalog: Proceedings of the 1978 and 1979 Library and Information Technology Association Institutes. Edited by D. Kaye Gapen and Bonnie Juergens. Phoenix: Oryx Press, 1980. 194p. $16.50.

In the institute's keynote address, Paul Fasana points out that closing catalogs is "a complex, costly, and disruptive activity, wherein one quickly finds that there are no real solutions, only compromises and adjustments. . . . We have not done the kind of research and analysis that is essential for planning." The participants in this institute attempt to assess the problems associated with catalog closures, present the experiences of other libraries that have closed their catalogs, and suggest alternatives for coping with these problems. While they succeed in accomplishing the first two purposes, providing an excellent overview of the rapidly changing state of the art, the alternatives are somewhat limited given the generally held view that AACR2 represents the death knell for many traditional methods.

There are many good reasons for putting the unwieldy and somewhat senile white elephant known as the card catalog out to pasture: creation and maintenance costs, growth factors, preservation and security, and limited search options. The majority of speakers here argue for closure based on AACR2 adoption despite Fred Kilgour's dissenting voice that "nothing inherent in AACR2 requires closing an existing catalog."

Kilgour's opinion supports the view of Seymour Lubetzky that "a scarred catalog is still vastly preferable to a dismembered one. . . . The effectiveness of a single catalog is greater than that of any combination of partial catalogs." Pauline

Atherton also questions whether split files can be effectively used by the public. Her table of twelve "Unheeded Research Findings about Catalog Use" is required reading, a gem worth the cost of the entire volume. Such research findings should be kept in mind when deciding whether to: (a) maintain a single card catalog, integrating old and new headings, (b) start a new card catalog, (c) start (or continue) a COM catalog, or (d) go on-line.

Sanford Berman joins Lubetzky by asserting that "both information theory and common sense dictate single files" and argues that AACR2 will have little impact on small or medium-sized libraries. He calls for the revitalization of the catalog through "people-oriented catalogs," not for its closure.

In "The Prospective Catalog," Michael Gorman bids good riddance to old card files but recommends temporary add-on card catalogs until the "New Jerusalem" of the on-line catalog has arrived; COM catalogs are dismissed for financial reasons. Maurice Freedman, Peter Paulson, and Carol Weiss defend COM for the following reasons: (a) COM catalogs can be widely distributed, improving access and enhancing resource sharing; (b) COM moves the library away from labor-intensive card files and helps wean the public from the old format; (c) COM is a good backup for on-line systems; (d) COM can be a "self-refreshing" catalog subject to automated authority control and more amenable to AACR2 type changes. Freedman refers to improved access and authority control as "opening the catalog." It should also be noted that most research libraries already have a fairly considerable body of machine-readable records that could be displayed in COM format, while add-on card files would be skimpy and ephemeral.

Both COM and card catalogs, however, are intrinsically inferior to on-line systems. Ohio State's on-line catalog is lucidly described by Susan Miller. Retrospective conversion, authority control, and other automation issues are discussed in several of the papers, sometimes in novel ways. Valentina DeBruin describes integrating data bases as being "akin to taking a tossed salad and converting it into a head of lettuce."

Also included is a fine "Process for Planning for the Bibliographic Future" by Joe Rosenthal as well as articles about LC plans, networking, ARL perspectives, and the impact of catalog closures on library organization. Despite a few flaws and the availability of more recent information, *Closing the Catalog* is highly recommended to anyone contemplating closing, altering, or changing the format of their catalog.—*James R. Dwyer, University of Oregon, Eugene.*

Directory of United Nations Information Systems. 2d ed., 2v. New York: United Nations Publications, 1980. V.1, "Information Systems and Data Bases." $22 (specify English, French, or Spanish language version). Publication no.: G.V.80.0.1. V.2, "Information Sources in Countries." $13. Publication no.: G.V.80.0.2.

If the publications of international organizations can be considered a highly specialized field of documents librarianship, a basic knowledge of the information systems that underlie these publications is even more elusive. The *Directory of United Nations Information Systems* is a unique and important tool which goes far toward making United Nations information systems more comprehensible, more accessible, more "harmonized," to quote an objective of the UN Inter-Organization Board for Information Systems, which coordinated the joint effort that culminated in this greatly expanded and updated version of the 1978 first edition.

The two soft but substantially bound volumes of some 680 pages contain comprehensive, detailed, comparative descriptions of more than 400 UN information systems and data bases.

The first volume is organized by UN agency (listed, with unnerving but impartial neutrality, in chronological order by date of founding). A brief mission statement for each major UN agency (on colored pages) is followed by its subordinate information systems, one to a page. *System* is broadly defined to include libraries, referral centers, clearinghouses, analysis centers, and data banks; not so broadly as

to include public press or media information offices, which are specifically excluded. Where one or several specific data bases support each system, it is further described on following pages, also one to a page.

For systems, location of headquarters and (for those that can be considered networks) service node "focal points" are given. Also included are: type of center, scope, size and language of materials, access restrictions (if applicable), services offered, and published guides.

For subordinate data bases, the type, subjects and scope, target users, and availability (locations, conditions, and prices) are listed. Also included are file details such as size, growth per year, update frequency, availability through online telecommunications networks, and search software. Each page display is a model of clarity, a significant improvement upon and reflecting the best of many suggestions of users of the first edition.

About two-thirds of the entries are for broad systems; the remainder describe specific supporting data bases. The data bases are about evenly divided between statistical or computational and bibliographic types. There is a scattering of full-text data bases and machine-readable registers. Some of the resources described are restricted to the use of headquarters or field staffs, national or member governments, or regulatory agencies. But most are general access resources.

The directory is a gallery of interesting resources. Some of the information-processing services identified are: the Register of International Telecommunications Union, the International Referral Center for Information Handling Equipment, the Technological Information Exchange System, the International Serials Data System, the International Information System on Research in Documentation, the World Intellectual Property Organization, and the UNESCO UNISIST Division of the General Information Programme. Predictably, there are many more specialized sources indentified: in international trade and development; agricultural and marine production; industrial affairs, health and safety; education, health, and welfare of populations; inventories of energy and other natural resources.

The second volume is a listing by UN member country of information focal points within national boundaries. Three classes of service nodes are displayed and located: officially established field or branch offices of UN agencies, "system contact points" that serve as UN information resources, and libraries participating in the UN documents depository program. Although it is less immediately useful, volume two is evidence of the far-reaching tentacles of international information-gathering organisms. More useful, I think, would be a display of the transnational resources that are available through on-line access via telecommunications networks: the UNIDO Industrial Information System; INFOTERRA Register of Environmental Research; International Labour Office abstracts of occupational safety and LABORDOC; FAO, AGRIS, and ASFA (Fisheries Information Service); UNESCO International Serials Data; and World Intellectual Property Office Patent Information Network are all included in the directory, but they must be ferreted out.

The directory is a thorough response to the need expressed by Luciana Marulli in her *Documentation of the UN System* (Scarecrow, 1979). In our era of powerful communications capabilities, it is to be expected that there are many more international information systems than those administered by the UN family of organizations. Many are commercial (Dialog, Orbit, and BRS are examples headquartered in this country); others are financial or computational; many are sponsored (or controlled) by national governments. Comprehensive, objective comparisons of these systems are not readily available. One could do worse than hope that the UN example would set a standard for future works that are yet more inclusive.—*Bruce C. Miller, Federal Library and Information Network (FEDLINK), Federal Library Committee, Washington, D.C.*

Legal and Legislative Information Processing. Edited by Beth Krevitt Eres. Westport, Conn.: Greenwood, 1980. $29.95.

328p. LC: 79-7063. ISBN: 0-313-21343-7.

This is a collection of eighteen essays dealing with the use of electronic data processing in the legal and legislative environments. Seven of the essays deal specifically with the introduction and management of information processing in Congress and in state legislative bodies. The remaining essays cover computerized legal research, litigation support, and "other applications of computers to the law."

In presenting the collection, editor Eres asserts that the information processing capacity of the computer is particularly useful to the legal profession since the need "to keep abreast of current events," and "to acquire comprehensive topic- or case-related knowledge," are ongoing concerns. The effect, Eres states, of applying computer technology to solving legal information problems has "in some areas . . . been that a greater quantity of work can be done and at greater speeds . . . [however] in all areas, the qualitative results have been impressive."

Assuming that Eres' diagnosis of the problems and evaluative judgments has provided one with the context, albeit brief, for all that follows, the reader plunges into the essays. One is soon disappointed to discover, however, that instead of a structured collection of complementary articles, one finds a potpourri of unrelated and often repetitious essays. Eres attempts to pull together her material by creating five groupings of essays, each preceded by headnote comments. This device fails to provide the needed framework. The grouping titles lack specificity (e.g., "Information Processing and the Law" and "Other Applications of Computers to the Law") and the headnotes serve to summarize certain portions of the articles rather than to alert the reader to key points regarding the relationship between information processing and the law. For example, in her headnote to "Federal Legislative Information Processing," Eres states: "Neal Gregory enumerated the similarities and differences between the two houses with regard to history, committee activities, budget, size and seniority. The chapters also stress the manifold character of congressmen as legislators, representatives of their constituency, party members, and overseers of government policy." Gregory's article does, in fact, deal with the topics listed but only to provide background to his discussion of evolving methods of handling specific information needs of Congress.

The lack of focus apparent both in the headnotes and in the organization of the material may relate to Eres' desire "to appeal to a wide audience of readers . . . practicing lawyers, legislators, librarians, information specialists and computer scientists." Each of these professional groups has "technical" knowledge, a contextual background, and, indeed, a unique vocabulary related to its specific area of expertise.

In order to make her material understandable to these very different professional groups, Eres elected to ask chapter authors to provide "a brief history of the topic of their chapter," to keep the articles nontechnical, and to ignore completely the problems presented by the lack of common vocabulary. The net result of this approach is that the reader is confronted with three histories of federal legislative processing, is never given an in-depth view of any aspect of the subject matter of the collection, and is occasionally confused by terms used but not defined.

The essays vary from good to very good, taken as individual efforts. Each is of merit and, in its own context, is worthy of appearing in print. It is the reason for this particular grouping that remains unpersuasive.

The publisher's attempt to justify this grouping is also unconvincing. It does not fulfill our understanding of either a "ready reference" or "a useful introduction to a complex field."

Considering the apparent diversity of subjects covered and the lack of a cogent unifying thread, these articles might have reached a broader audience of interested readers if they had been individually published and indexed in periodical literature.—*Stanley K. Pearce and Jaine Urban, O'Melveny & Myers. Los Angeles, Calif.*

Micrographics: A Users Manual, by Joseph L. Kish, Jr. New York: Wiley,

1980. $20.95. 196p. LC: 80-16798 ISBN: 0-471-05524-7.

In terms of cost/performance, sophisticated microforms are competitive with technologies such as floppy disc, networked on-line storage and retrieval, and videotape/videodisc. The variety of microforms presents valuable choices for both original publication of data (computer output microfilm) and for source document micrographics applications in which information was originally published in another medium.

Kish's manual discusses micrographics systems, mostly with regard to the business and office environments, but with some limited applications to library use in terms of hardware, types of film, microimage configuration, and indexing techniques.

Five elements of hardware are discussed: source document cameras, microfilm processors and duplicators, readers, reader/printers, and COM devices. As is the case elsewhere in the manual, Kish offers criteria that can aid in the selection process. Librarians will find the discussion of hardware useful.

The process of microimage creation, maintenance considerations, and relative costs are examined with regard to silver halide, diazo, and vesicular films. A checklist of film characteristics will acquaint the reader with the vocabulary of micrographics. Explanations of terms such as *polarity* and *density* will enable the reader to discuss micrographics with greater precision.

A separate chapter on COM too briefly discusses the process of microimage creation. Of particular interest to librarians is the discussion of the storage requirements and archival stability of the various films. Specific figures and recommendations for temperature and relative humidity are given.

A variety of indexing techniques are reviewed. As a general introduction to micrographics indexing techniques, librarians will find the discussion valuable. However, the brevity of the treatment precludes the possibility of relying on this manual as a detailed guide for application of the techniques discussed.

In this age of budget cuts and belt tightening, perhaps the most valuable contribution that a manual of this type can make is in the area of cost analysis. The chapter on systems analysis and design discusses costs associated with the conversion of office records. Elsewhere, the author briefly compares hard copy to microforms in terms of floor-space requirements and reproduction, mailing, and maintenance costs. Rules of thumb are proposed, again in an office-records environment. The treatment of costs could have been substantially enhanced, and its applicability in a library environment could have been increased, by citing studies (the book has no footnotes) and by discussing methods of ascertaining and comparing costs in this complex field where one project rarely resembles another.

The manual contains a 100-word glossary and index. It is appropriate for librarians in need of an introduction to the technology and organization of micrographics. Embarking on costly projects will require more in-depth literature.—*Dan Miller, Blackwell North America, Beaverton, Oregon.*

Research Report on a Method for Correcting Typographical Errors in Subject Headings in OCLC Records, by Edward T. O'Neill and Rao Aluri. Columbus, Ohio: OCLC, Inc., Office of Planning & Research, 1980. 24p. Free. Report Number: OCLC/OPR/RR-80/3.

This twenty-four-page report's title implies application only to the OCLC data base. However, the techniques described by the authors could be usefully applied to any bibliographic data base and, therefore, this document should be of interest to and read by all system designers concerned with maintaining the integrity of bibliographic data by use of an authority file. It proposes techniques for analyzing subject headings for common input errors, when the heading from a bibliographic record has not been matched with a corresponding heading on an authority file.

The techniques described are limited to detection of one character errors: one excess character, one dropped character, an incorrect substitution, or a transposition. "Normalized" primary and reverse keys

are built for each subject heading on an authority file, and for headings from bibliographic records that are to be validated. A normalized key has all characters in a heading converted to a single case (usually upper case) and blanks, punctuation, diacritical, and other special characters removed. For example, using the rules presented by O'Neill and Aluri, the heading:

Dvořák, Anton, 1841–1904
is normalized to
DVORAKANTONL84LL904

Note that the numeric character "1" is converted to the alphabetic "L" to normalize for a common error. The reverse normalized key is established from the last characters of the primary key in reverse order. For example, the reverse key for the heading above would be:

409LL48LNOTNAK

The error-detection algorithm first looks for errors in the last half of the subject heading by temporarily assuming the first half of the heading is correct. It uses the first half of the primary key to find records on the authority file that match this half key. The second half of the heading is then analyzed for single-character adjustments which make the test heading match one of the headings on the authority file. Using the example from the report, the process followed is:

Heading from bibliographic record:	INVENITONS (an obvious error)
First half of key for authority search:	INVE
Yield from authority file:	INVENTIONS
	INVENTORIES
	INVESTORS
	INVESTMENT
	INVESTMENTS

Only headings which are equal, one character less or one character more in length than the test heading are retrieved for analysis. By making tests for possible one-character errors, the transposition error in the test heading can be detected and corrected to verify against INVENTIONS. If the heading cannot be verified by this test on the last half of the heading, then the heading is tested for error in its first half using the reverse key for retrieval from the authority file. For example, the incorrect test heading is INEVNTIONS, and the last half of the reverse key for this test heading is "SNOIT" which yields:

SNOITCEJNI	INJECTIONS
SNOITCNUF	FUNCTIONS
SNOITCNUJNI	INJUNCTIONS
SNOITNEVNI	INVENTIONS

Using this subset of relevant headings, the analysis described above will produce verification against INVENTIONS.

The techniques described are very intriguing, and possibly would produce results worth the cost of setting up and using the reverse key disk indexes. Most authority control designs already include normalized primary key access.

Unfortunately, as a research report, this document is deficient in statistical support for many of its assertions. The major omission is some indication of the predicted yield from using the described technique. The reported test on subject form headings can hardly be called representative. Assurances such as, "In the majority cases, subject headings contain only one error involving only one character or one pair of characters," are not sufficient. What does "majority" mean in this context? 51 percent or 95 percent—an important difference. How many headings are corrected by the last half analysis, and how many by the first half analysis? Is the establishment of the reverse key indexes worth the cost? Why were twenty-eight characters chosen for the length of the primary key, and fourteen for the reverse key? How many headings does this leave truncated and, therefore, not as fully treated by the error detection algorithm?

Many of these questions need to be answered by a report that would show the results of a full-scale test using the Library of Congress subject authority file and a randomly drawn, statistically significant sample of test headings with various categories of errors. In addition, further elaboration of the correction algorithms would be useful for systems designers, along with some indication of computing resources

required. While waiting for further results, we can all read this report by acquiring it directly from OCLC, Inc., which should be commended for making such research results available.—*John F. Knapp, Ringgold Management Systems, Beaverton, Oregon.*

Special Librarianship: A New Reader. Edited by Eugene B. Jackson. Metuchen, N.J.: Scarecrow, 1980. 773p. $27.50. ISBN: 0-8108-1295-9. LC: 80-11530.

Special Librarianship: A New Reader is an anthology of seventy readings intended for the new professional in librarianship. The book is a successor to Harold Sharp's *Readings in Special Librarianship*, published by Scarecrow in 1963, but the Jackson volume differs in its emphasis on original chapters over reprints.

Half of the papers in the book were written specifically for this volume by experienced professionals in the field. Another eleven chapters are updated versions of material previously available, such as a revision of "Special Library Reference Work," from William Katz' *Introduction to Reference Work* (1969). The remaining twenty-four chapters are reprints of classic articles from the literature of the '70s, such as "Libraries Are Businesses, Too!" by Shirley Echelman (*Special Libraries*, 1974) and "Managing the Costs of Information" by Paul A. Strassman (*Harvard Business Review*, 1976). Several articles from the nonlibrary literature are a welcome inclusion, e.g., the Strassman article and "Special Libraries," by Giuliana Lavendel in *Chemical and Engineering News* (1977). The original chapters were solicited by invitation. The reprints reflect the recommendations of SLA division officers and instructors of special libraries classes in graduate library schools across North America.

The contributions are arranged under seven headings: "The Past, Present and Future of Special Libraries," "The Special Librarian as an Individual," "The Special Librarian—Managed and Managing," "Host-Organization-Related," "Public Relations-Related," "Tool/Format-Related," and "The Special Librarian as Information Scientist." The last contains sixteen papers, of which five are originals; its scope is described by the editor as "a transition zone covering the special librarian's opportunity to engage in broader horizons as the information manager of tomorrow."

With the exception of the last section, section headings were apparently considered by the editor to be self-explanatory; no scope notes are provided. However, since the collected papers are an eclectic assortment at best (and one could quibble over the placement of some papers in one section or another), some introductory description of the papers in each section would have been helpful to tie the various papers together, to fill out the framework outlined in the contents, and to provide a stronger element of continuity throughout.

The papers in the volume range from broad overviews, such as Audrey Grosch's original contribution, "Applications of Systems Analysis to the Special Library," to descriptions of specific cases, studies, and institutions, e.g., a personal history of one IBM library. Those looking for information on cataloging and acquisitions in the special library will be disappointed that this book contains very little material on technical services. The one article on cataloging, oddly, is "Innovations in Cataloging," a short, five-year-old reprint from *Sci-Tech News*.

On-line systems and searching are mentioned only briefly. In addition to the Grosch paper mentioned above, chapters dealing significantly with aspects of library automation include "Information Handling Technology," by R. L. Wigington and Charles Costakos; "A Cost-Effective Machine-Readable Technical Data Base," by Stanley A. Elman; and "Criteria for Evaluation and Selection of Data Bases and Data Base Services," by Martha E. Williams. However, this is not the book for the special librarian—new or experienced—seeking either an overview or organized specifics on library automation.

Many of the papers deal with the managerial aspects of special libraries—personnel, public relations, the role of the library in the organization, etc. Jackson says in his introduction that "most master's students are not yet at the stage where they clearly see the need for be-

coming *both* a professional librarian and a professional manager of special library resources. Exposure to the realities of the job environment brings this need for co-careers into focus—and this collection is intended to fill that need for help." On the whole, the book succeeds very well in that mission; it can provide considerable insight, support, and useful management techniques for the new special librarian. The more experienced professional will not find new information here, but the book is a handy, if somewhat uneven, compilation of what the special librarian should know.

This is not a particularly easy or comfortable book to peruse. The use of section headings rather than chapter titles at the top of each page makes it difficult for the reader to browse. The table of contents thus becomes an essential access point. The index is spotty in some places (for example, the "Academic Libraries" heading overlooks one of the academic library papers) and needlessly repetitive in others. (Does *one* article about *Engineering Index* deserve *ten* subheadings in the index?) It would have been useful for the editor to give the author's affiliation along with the author's name at the beginning of each paper, since this book is intended for the novice librarian who may not recognize the names of all the luminaries in the field. (In fact, no single reader is likely to recognize every name.) What the editor chose to do instead is list a brief description of each contributor in a section at the back of the volume, which is not nearly as convenient for the reader.

This Reader is an important contribution to the literature of special librarianship. With a book of readings it is always easy—even natural—to quarrel with what was included and what was left out. Nonetheless, this volume should be useful to those needing to have it told "like it is" (the editor's phrase) in special libraries.—*Julie Kawabata, Northwest Information Enterprises, Beaverton, Oregon.*

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INSTRUCTIONS TO AUTHORS

The *Journal of Library Automation* welcomes manuscripts related to all aspects of library and information technology. Some specific topics of interest are mentioned on the masthead page. Feature Articles, Communications, Letters to the Editor, and News Items are all considered for inclusion in the journal. Feature Articles are refereed, other items generally are not. All material is edited as necessary for clarity or length.

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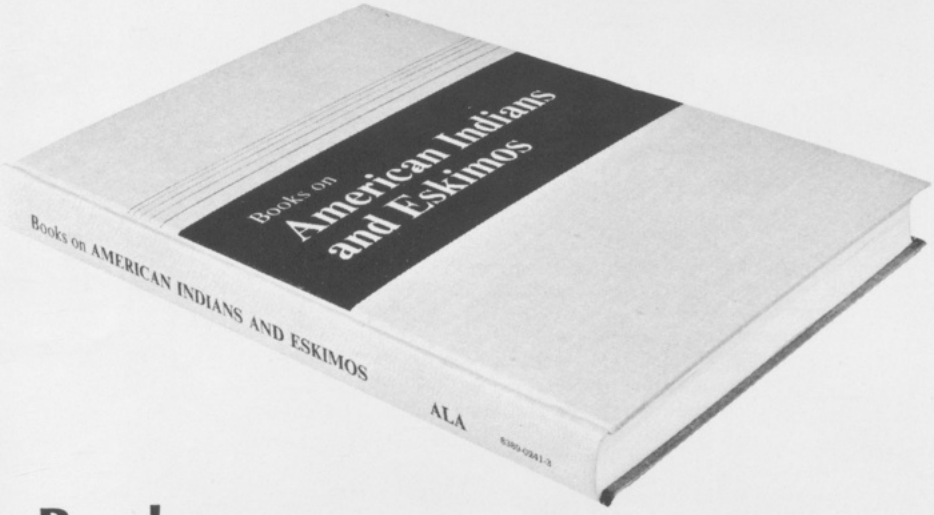

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Mary Jo Lass-Woodfin, editor

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286 pages Cloth LC 77-17271 ISBN 0-8389-0241-3 (1977) $20.00

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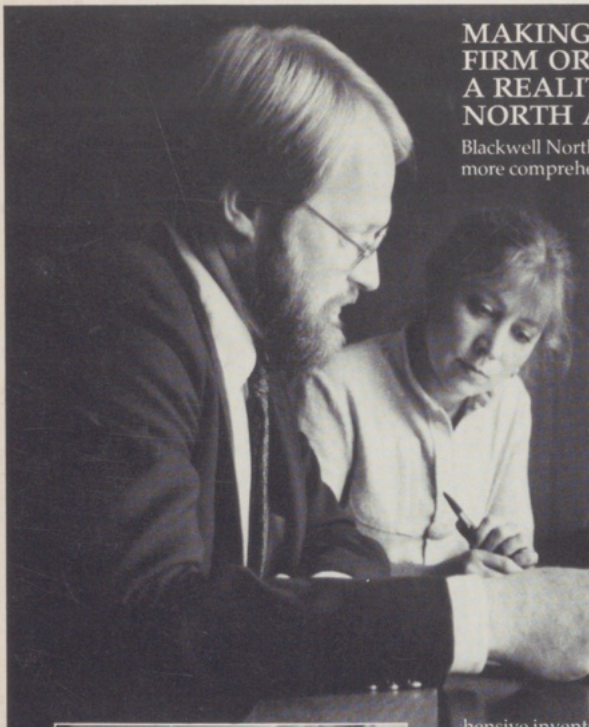

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