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A COMPUTER-ASSISTED STACKSHIFT IN A UNIVERSITY SCIENCE LIBRARY

BY PETER CZIFFRA

Fine Hall Library is the mathematics, physics and statistics library for Princeton University. It contains over 100,000 volumes, of which at least half are bound journals. The journals have traditionally been shelved by title in three separate sections, each corresponding to the three separate subject areas covered by the collection.

In 1986 it became painfully obvious that massive stack shifts had to be done in the physics and mathematics sections. Since our library shelved by title, a major complication was that although most of our journal titles still followed the AACR1 rules, our Serials Cataloging Department was recataloging journal titles into AACR2 whenever there was even the most minor title change. It was inevitable that soon all currently received journals would be recataloged to AACR2. In addition, our Binding Division tended to get rather balky whenever the spine title of a journal that was being sent to the bindery did not match the main entry. We had also found that patrons considered the AACR2 form of a title much more natural than the AACR1 form. Who but a librarian would think of looking for *Optical Society of America Journal*? It was therefore decided that the journals would have to be rearranged by AACR2 title during the stack shift,

making the shift immeasurably more complex.

An additional complication was introduced by the decision to shelve earlier "continued from" versions of a title with the most recent version. The titles of many foreign journals, especially East European titles, have not only changed form over the years but also language. We have, for example, a Finnish journal whose title changed from Swedish to Finnish to Latin over the years. Since it was impractical to alter the spines of the huge number of journal volumes whose titles did not conform to AACR2, some way had to be found help patrons find journals in a situation in which the spine titles appeared to be in no order whatever.

Use of a Computer

This was a situation tailor-made for a computer, and fortunately, the author is an avid avocational programmer who has a computer at home with Knowledgeman. Knowledgeman, or Kman, as it is also known, is a powerful relational database management system for MSDOS machines, similar to Dbase, with a flexible programming language.

In order to create our database, we went through the journal stacks and gave each journal an AACR2 shelving title, trying to predict as much as possible the

titles that our Serials Cataloging Division would choose, and in some cases consulting them. Older titles, AACR1 titles, and other possible titles were put into a separate cross-references file. At the beginning the titles were recorded on paper and then keyboarded into my home computer. Later the titles and cross-references were entered directly into a Radio Shack model 100 laptop computer that was taken into the stacks. The data was then transferred to the home computer. If a title was the continuation of another title and the two were not shelved together, then a link was recorded in the database. Similarly, linkages were recorded between titles that were translations of each other.

Next, we recorded the total shelf space currently required by each title, and the fraction of a shelf that each title had grown within the last two years. Finally, a file was created that basically contained a map of the stack structure. This contained information such as the order in which the ranges were to be filled, how many sections each range had, and how many shelves occurred in each section. The latter could vary because we have some short shelves near windows, and some sections have coat hangers for overcoats in place of the lower five shelves.

At this point a Kman program, or "perform file," was written that calculated the total number of shelves available, and gave each a consecutive shelf number. Next it assigned a so-called "proportional" starting shelf location for each shelving title, by distributing the unoccupied shelf space in proportion to the amount that the journal had grown in the last two years. Since the proportional shelf location was quite likely to locate

the beginning of a huge title like *Physical Review* 3.3 shelves into the second section of a range, the perform file also tried to assign an actual starting shelf location that would place the starting location of a major journal at a more reasonable point. Unfortunately, the algorithms that calculated the actual starting location did not, in many cases, work satisfactorily, so a second perform file was written that enabled me to go through the data to fine tune the starting locations.

Moving the Collection

After the starting locations were set, the computer printed a set of gummed labels that gave the shelving title and starting location for each journal, and these were glued to the edge of the shelf at each starting location. By compressing parts of the monograph collection that were no longer growing, we had been able to empty a number of ranges that could now be used for journals. We first moved the appropriate journals into their new locations in these empty ranges. Then, as much as possible, we moved titles in to their new locations into the gaps that had just been created by moving another title out. This way we were able to greatly minimize the number of times each title had to be moved.

Once the move was completed, another Kman program was used to prepare printed lists that are attached to the end of each journal range, identifying the journals that are shelved in that range. There is a separate list for each face, given as "face A" or "face B" of the range. The list gives the title of each journal whose starting location falls in that face, the section number and the position on the shelf on which it starts

(See figure 1). For example, "Sect. 2, sh. 7.80" means that the title starts 80 percent along the seventh shelf of the second section of that face. Since some titles may consist of as few as one volume, a precise location on the shelf may be necessary. The list also contains "SEE" cross-references referring the reader to the proper shelving title, links to earlier or later shelving titles, and in the case of titles, usually Russian, that have translations, a reference to the title of the translation. All of these are illustrated in figure 1.

Another product of this database is our *Reference list of serials*, which is an alphabetical list of all journals in the Fine Hall Library, which sector (mathematics, physics, or statistics) they are shelved in, plus a brief statement of holdings. An open holdings statement indicates that the journal or book series is still being received. The list includes cross-references, translations, and book series (recently added). For the latter, the list gives call numbers if the series is cataloged under a single call number. At the moment we are engaged in adding publishers so that we can better monitor the price increases of the bigger publishers. Because this is a computer database, any subset of the data can easily be extracted.

Since Knowledgeman is now very expensive, not widely used, and not available on my computer at work, I am in the process of transferring the database to Paradox, which is more widely available.

Figure 1.

Example of a range-end list

STACK: 3; RANGE: 2; FACE: B
Physics teacher [Sect. 1, Sh. 2.00]

Physikalische Zeitschrift der Sowjetunion
 [Sect. 2, Sh. 7.80]
Physikalisches Vereins zu Frankfurt am Main. Jahres-Bericht
 SEE: Jahres-Bericht des
 physikalischen Vereins zu Frankfurt am
 Main Pisa. Universita. Istituto di Fisica.
 Lavori
 SEE: Lavori eseguiti nell' Istituto di
 fisica dell' Universita di Pisa
**Pisma v zhurnal eksperimentalnoi
 teoreticheskoi fiziki** [Sect. 3, Sh. 1.50]
 Transl. in: JETP letters
Plasma physics [Sect. 3, Sh. 5.00]
 Poggendorf Annalen
 SEE: Annalen der Physik (Leipzig)

**Proceedings of the Cambridge
 Philosophical Society** [Sect. 5, Sh. 4.00]
 Later title: Mathematical proceedings of
 the Cambridge Philosophical Society [M]
Proceedings of the IEEE [Sect. 5, Sh.
 7.80]

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