Title   : COMPUTER MANAGEMENT OF AN ANESTHESIA BIBLIOGRAPHY

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Introduction. Bibliographic indexing of a scientific literature collection, eg. reprint files, can facilitate article retrieval and information searches. The availability of low-cost personal computers offer accessibility to sophisticated techniques for processing a bibliographic data base. A system is described to manage an anesthesia literature collection using a computerized data base.

Hardware characteristics. A Hewlett-Packard 9845A desktop system was used which included a CRT display, an 80-character per line thermal printer, dual tape drives, and enhanced BASIC language programming. Tape cartridges were used for program and data storage. The maximum memory used was 35,000 bytes.

Program characteristics. All portions of the program are interactive. The user responds to prompts from the CRT by answering on a typewriter keyboard and does not need any programming knowledge. At start up a task selection is made which corresponds to one of the following programs.
I. Date input program The input for each article consists of 3 elements: author, title and source. The bibliographic format selected is that used by ANESTHESIOLOGY with the exceptions that all authors are listed and only uppercase characters are used. Each element may contain up to 320 characters. To maximize storage capacity on entry, trailing blanks are trimmed, an end-of-element or end-of-entry marker is added, and the string is concatenated to a master data string. The initial nonnumeric characters for the source element are assumed to be the Index Medicus abbreviation of a journal and are matched against a master list of abbreviations. If no match occurs the operator is alerted so that incorrect abbreviations or spellings are identified and a subsequent search for the journal will be successful. When the master string length exceeds 21,200 characters, it is stored on tape and a new string is started. Up to a 300 character reserve is maintained on each string for subsequent entry editing. After entry the reprint is filed alphabetically by first author.

OBSERVED MEMORY REQUIREMENTS (MEAN + SEM)
Total bibliographic entries per tape = 1531
Master data strings per tape = 10
Characters (bytes) per string = 21264.6 ± 12.4
Entries per data string = 153.1 ± 1.1
Characters (bytes) per entry = 138.9 ± 1.1
Characters per author element = 31.1 ± 0.5
Characters per title element = 76.6 ± 0.9
Characters per source element = 31.3 ± 0.4

II. Source list editing program The list of journal abbreviations used in I. may be expanded, edited, or printed. For the first 1531 entries, 257 journals were listed.
III. Edit program By entering a unique set of characters all data strings are in-turn loaded and examined until the entry containing the characters is located. The user then may eliminate or edit the entry or edit adjacent entries. Worst case time requirements for locating an entry is given by the equation: Time (sec) = 20.2 x N - 2.0 where N=the number of the data string.
IV. Printout program A list of entries is printed in bibliographic form according to one of the following orders: 1) entry into the data base, 2) alphabetically by first author, 3) by title, or 4) by source.
V. Search program All entries containing a specific word or character group from any portion of the entry can be displayed on the CRT, displayed with operator option to print, or printed directly. Up to 3 additional words or word fragments may be added to increase specificity of the search. Up to 4 sets of terms may be searched for simultaneously to reduce total time requirements.

TIME REQUIREMENTS OF A SINGLE WORD SEARCH

Time(sec)=.33xEntries+195
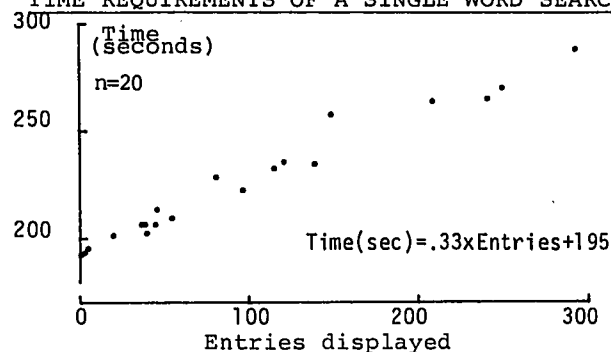
Discussion. Previous proposals for managing anesthesia literature require prior user effort to either abstract an article[1] or catagorize[2] it before it is included. In this system maintenance of both the literature collection and data base may be done by someone other than the user. The user's efforts may be directed toward conducting an effective search and retrieval of useful entries once a specific question is asked.

References.
1. Yeakel AE: An anesthesia literature abstracting and retrieval method (ALARM). Anesthesiology 25: 760-766, 1964
2. Petty WC, Carden WD: A personal cross-reference filing system for anesthetic literature. Anesthesiology 38:498-510,1973