

EARLY EXPERIENCE WITH A TECHNICAL CORRESPONDENCE CENTER

The registration and file updating time and cost will depend on the size of the file which is to be updated. The larger the original file, the longer it will take to update it. In Table II are shown some costs and times accumulated when 15,000 compounds were added to a file containing 45,000 compounds. Reducing the total figures to the same basis as the preparation figures gives \$11.20 as the cost of registering 1000 compounds.

Table II. Time and Cost for Registration
(Computer Operation)

	Time	Cost
Reading onto tape and sorting notations alphabetically	11.75 min.	\$72.00
Registration and file updating (15,000 into 45,000)	41 min.	96.00
Total	52.75 min.	\$168.00

The average cost then of inputting a compound into the computer system described is approximately \$0.19 per compound.

LITERATURE CITED

- (1) "Survey of Chemical Notation Systems," Publication 1150, National Academy of Sciences-National Research Council, Washington, D. C., 1964.
- (2) "Survey of European Non-Conventional Chemical Notation Systems," Publication 1278, National Academy of Sciences-National Research Council, Washington, D. C., 1965.
- (3) Landee, F. A., "Computer Programs for Handling Chemical Structures Expressed in the Wiswesser Notation," Presented before the Division of Chemical Literature, 147th National Meeting of the American Chemical Society, Philadelphia, Pa., April 8, 1964.
- (4) Smith, E. G., "Line-Formula Chemical Notation," in press, McGraw-Hill Book Co., New York, N. Y.
- (5) Wiswesser, W. J., "A Line-Formula Chemical Notation," Thomas Y. Crowell Co., New York, N. Y., 1954.

Early Experience with a Technical Correspondence Center*

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Experiences associated with the establishment and first year's operation of a technical correspondence center are discussed. Methods of retrieval of shelf-filed documents via a punch card file, cross indexed in depth, are described. Present procedures and planned techniques for maintaining and improving distribution of information are also presented.

Management's desire to provide an improvement over individual filing systems in our Chemicals Group research center resulted in a decision to establish a central technical correspondence file. After conferences with key personnel plus field trips for outside study, we devised a system intended to serve our present needs and to allow for future development. The Center became operational in September 1965, only two months after management's decision to go ahead.

A set of ground rules was written which were introduced by a list of anticipated benefits, information on selection and submission of material, and other details. These rules were distributed to all technical personnel, accompanied by a cover letter from the Director of Research indicating his approval and requesting cooperation. As indicated in the ground rules, the purposes of this center, were to

assure that all technical correspondence pertaining to company business be brought together, adequately safeguarded, and made accessible for quick use as required. The specific goals included:

1. Speedier and more positive access to necessary information.
2. Elimination of need for maintaining large personal files.
3. More productive time utilization.
4. Cross-fertilization of ideas.
5. Ensuring safekeeping of company information regardless of personnel changes.

As an added incentive, management decided that no new filing cabinets would be purchased for use by individuals.

The ground rules specify that correspondence and related documents (preferably originals) received from whatever source are sent to the Technical Correspondence Center (TCC) within five working days of receipt. For memoranda and letters directed to individuals or organiza-

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tions other than Chemicals Group R and D, the first carbon is sent by the writer to TCC. Copies of all attachments are included (or clearly referenced) to make the correspondence more meaningful and complete.

We had considered sending all mail through TCC for opening and routing, but this idea proved undesirable in our situation. Delay of mail deliveries and increased workload were deciding factors.

Initially, only current correspondence was sent automatically. Earlier (noncurrent) correspondence is absorbed into the system as time and conditions permit. Files of any personnel who may leave the Corporation are sent, *in toto*, on or before the separation date of these individuals.

PLANNING

During the early stages of planning, it was decided to design an economical, partially automated system. However, we endeavored to plan the system so that it would lend itself to upgrading into a more sophisticated computer-based type if need developed and budget permitted.

Consideration was given to an intermediate system in which all material received by TCC would be microfilmed, a positive print made, and then mounted in aperture cards. These cards would then have been used as the working file, with hard copy being stored in another area. Since the aperture feature occupies a field of 24 columns on the card, this restricts the punching area 30%. This factor, plus cost of auxiliary reader-printers, caused us to forego this technique, at least for the present.

We finally decided to record file items on one or more IBM cards per item, with punch fields clearly identified for easy reading and manual searching. These would then be used as a means of retrieval of hard copy from the files.

Open-shelf filing in a restricted area was selected on the basis of lower cost, better utilization of available space, and elimination of safety hazards sometimes encountered with drawer files. Motorized files were eliminated from consideration because of cost and possibility of mechanical or electrical failure.

Selection of equipment for the correspondence center was finally resolved into the following: seven-foot steel double stacks, six shelves with intermediate dividers; an IBM 026 printing card punch; card file cabinet; electric date stamp; and desk with phone. An IBM 870 Document Writer is available when needed.

STAFFING

The operations of TCC are supervised by an experienced senior chemist. As this chemist has other important responsibilities, we sought to staff the center with a technical correspondence specialist with the intelligence and imagination to function with a minimum of direction. The individual selected is not a chemist, but is a college graduate with some knowledge of the physical sciences. With the present work load, this person is able to handle all of the TCC operations with a minimum of supervision.

HANDLING OF INCOMING MATERIAL

All incoming material for the TCC first crosses the supervisor's desk for screening (rejection of personal, personnel, and similar items); awareness and cross-fertilization checking (Did it circulate to those with a need to know? If not, send Xerox copies to them); and sorting. Material is then handed to the technical correspondence specialist, who performs the following steps:

1. All incoming material date stamped as received.

2. Mark material for key-punching:

Column No. 1

Deck

Six decks as follows:

1-subject, 2-Olin Key List Compound No., 3-Project number, 4-patents, 5-outside company, and 6-government

Column No. 2-3

Year

Last two digits

Column No. 4-5

Month

Numerical (Jan. = 01, etc.)

Column No. 6-7

Location of author

By initials according to established list (NH = New Haven)

Column No. 8-22

Author

Surname followed by initials

Column No. 23-37

Recipient

Individual if in Olin or by organization if other (truncate if necessary)

Column No. 38-71

Subject

Use acceptable thesaurus terms (*cf.* flip file of about 2000 items)

Column No. 72-76

Olin Key List No.

If given

Column No. 77-80

Project No.

If given

3. Key punch as per indications in step 2 above. Use extra cards if two or more subjects, or if decks 2, 3, 4, 5, or 6 indicated. All cards are identical except column 1 punch. If the item is filed under two or more subjects, then the cards will differ, but only in columns 38-71.
4. File hard copy in author folder, by date within folder, most recent on top. In case of important customer or service correspondence, place in file under company involved and add Xerox copies of New Haven letters to establish a readily available and complete story where this has been requested specifically by top management.
5. File tab cards by deck classification in a manner appropriate to the deck:

Decks 1, 4, and 6 are filed alphabetically by subject.

Decks 2 and 3 are filed numerically.

Deck 5 is filed alphabetically by non-Olin organization name, whether author or recipient of correspondence.

Both correspondence and tab cards for each year are kept separate from other years.

RETRIEVAL

The nature of a request for information determines

WEIGHTED TERM SEARCH:

the approach used. The following sequence of steps has proven most effective:

1. Author known
Go directly to author folder.
2. Subject known
 - a. Visually examine subject deck, retrieve documents from author folders.
 - b. Consider alternate subjects if material retrieval in (a) is insufficient.
3. Olin Key List Compound or Project number known
 - a. Visually examine decks 2 or 3.
 - b. Use the subjects listed in 2 or 3 as a clue to the subject deck.
4. Patent information (memoranda of invention, active files, etc.)
Visually examine deck 4.
5. Correspondence with Olin subsidiary or affiliated corporations and with outside companies
 - a. Material from others to Olin will be in file folder of respective author or company.
 - b. Material to outside will be filed in Olin author folders. These are sectioned by the location of the authors as listed on the tab card.Visually examine deck 5 in fields 8-22 and 23-37 under the appropriate name (as given on letterhead of organization).
6. A "zero" deck has been created and the cards therein filed alphabetically by author and then by recipient within the author group. By means of an IBM 870 Document Writer or by use of a Xerox machine, it is possible to provide any author with a listing of his correspondence for any given period in a matter of minutes. For those with voluminous correspondence, this service has proven

valuable for checking purposes and will probably be continued only for these specific individuals rather than for all authors.

COMMENTS

As the volume of material in our center has grown, the chance of finding desired information in this centralized location has also grown. Although a few individuals were reluctant to participate at the outset, our present ability to retrieve information rapidly has converted them. We now have a total of approximately 8500 items after not quite one year of operation.

Current work load is about 1100 to 1200 items filed per month, with an average of 2.23 punched cards per item. Thus, the load on the system is roughly 50 items per day, requiring the punching of about 125 cards per day. Input is steadily increasing as acceptance grows. However, increasing operating efficiency has so far been able to keep step. We expect the value of TCC to increase as the years go by.

A fringe benefit of TCC has been reduction of space devoted to file cabinets in offices and laboratories. In fact, a surplus of used cabinets is soon going to present a problem in some areas.

Merging of individual file contents has resulted in a marked deproliferation of paper—we save only one copy of each document. Our "burn" box must be emptied frequently and stacks of accumulated and unfiled papers are disappearing from atop files, desks, and tables in the various offices and laboratories. The unofficial motto appears to be "send it to TCC, let them worry about it," and that is exactly the purpose of our service.

Weighted Term Search: A Computer Program for an Inverted Coordinate Index on Magnetic Tape*

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Ten to 15 years ago, much technical literature was accurately indexed according to strict rules of classification. Today, because of the large amount of technical data written, it is no longer practical to apply the same rigid indexing procedures. We should therefore be concerned with new search techniques which will allow us to handle input at the lower level we are forced to accept. This paper describes such a search technique.

The problem of searching a coordinate index is discussed by Fairthorn (1). The classical method is to use a logic based on Boolean algebra. Combinations of terms using

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this logic involve a series of operations which are fully discussed by Becker and Hayes (2) and Williams (3). The argument is that the possible relevance of a document is worth investigating if a stated combination of terms is found in the document. Since in coordinate indexing