1962

A Comparison and Evaluation of Graphic Arts Information Services

Richard D. Kast

A COMPARISON AND EVALUATION OF GRAPHIC

ARTS INFORMATION SERVICES

BY

RICHARD D. KAST

A thesis submitted
in partial fulfillment of the requirements for the
degree Master of Science, Department of
Printing and Journalism, South Dakota
State College of Agriculture and
Mechanic Arts

June, 1962

A COMPARISON AND EVALUATION OF GRAPHIC

ARTS INFORMATION SERVICES

This thesis is approved as a creditable, independent investi-
gation by a candidate for the degree, Master of Science, and is
acceptable as meeting the thesis requirements for this degree, but
without implying that the conclusions reached by the candidate are
necessarily the conclusions of the major department.

Thesis Adviser

Head of the Major Department

ACKNOWLEDGMENTS

The author expresses his appreciation to the respondent graphic arts information centers for their cooperation and assistance in undertaking this study.

Special recognition is given to P. H. Jess, G. H. Phillips, J. K. Hvistendahl, and E. G. Blinn of the Printing and Journalism Department at South Dakota State College for valuable guidance and assistance in carrying out this study.

RDK

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (CONTINUED)

CHAPTER I

INTRODUCTION

Reasons for Undertaking the Study

Information storage and retrieval has become one of the major problems facing the graphic arts industry today. Old-fashioned means of obtaining information, such as the standard library system, have fast become inadequate to serve the needs and interests of those persons in need of readily available facts and research information pertaining to their fields of endeavor. It has been estimated that 2,000 pages of books, newspapers, or reports are published somewhere in the world every 60 seconds. (1-3) If a person attempted to keep fully informed through reading everything published everywhere in the world, he would have to read nearly 1.1 billion pages a year. This problem faces industrialists, lawyers, military planners, scientists, and engineers, to mention just a few, in keeping abreast of what is published in their own specialized fields.

Persons who need information in order to ensure that they make a reasonable number of well-informed decisions have resorted to three alternate methods for obtaining information:

1. They have attempted to be highly selective in their reading and have relied on judgment to select the "one page in thousands" that might have the highest probability of containing information of potential future interest.

2. They have relied on abstracting and indexing services which

compress the amount of information that must be scanned.

3. They have attempted to develop special information files for individual or organizational use from special points of view. (1-3)

These three methods have their limitations, however, when attempting to cope with the ever increasing amount of literature available:

1. More and more material is lost to those persons who have tried to be highly selective because of the unpredictable scatter of material of interest through many publications. On the other hand, if there has been an attempt to make the reading general, facts which the reviewers might find pertinent can also be missed because of the tremendous amount of material available.

2. Those persons who rely on abstracting and indexing services run into two problems. First, these services have grown to tremendous proportions. In a survey conducted in 1958 by Allen Kent, Associate Director, Center for Documentation and Communication Research, Western Reserve University, it was found that more than 300 such services were used by various companies in an attempt to keep up with the literature of the field. This problem then seems to be one of specialization. Second, the coverage of material of most of these services has been far from complete, leading to the difficulty of selecting services which give reasonably complete coverage of a particular field. In the field of chemistry the American Chemical Society prides itself on its relatively complete coverage of the field--e.g., the Society abstracted approximately 130,000 items in 1960. There is a horrendous task in merely scanning the resulting publication.

3. Because of the potential scatter of pertinent information in a large number of publications, it is necessary to sacrifice completeness of coverage in most cases where an attempt has been made to develop special information files. Budget limitations for this type of work may be an important factor in all but the very large organizations. Despite budgetary limitations, a considerable amount of money is being spent today on individual information processing activities. (1-4)

The limitations on obtaining necessary information has been and is being faced by most fields of endeavor. The graphic arts industry is in no way divorced from these problems, and as Allen Kent has so aptly put it, ". . . the group that is most to blame for the documentation problem [is] the graphic arts industry." (1-3) At the Graphic Arts Information Conference in Rochester, New York, October 13, 1960, Mr. Kent went on to say:

> The invention of printing ruined everything. If scribes could have continued on their way of preparing by hand all copies of books and documents, our present-day problem would never have developed. There would not be enough recorded knowledge available to choke up libraries. But then again neither would our civilization have developed as we know it today. In any case, it is comforting to know that the graphic arts industry is now a victim of its own progress. (1-3)

The situation in the graphic arts reached the point where there seemed to be a serious lack of up-to-date storage and retrieval procedures used by information centers which service the industry. In addition, there seemed to be an overlapping of effort on the part of these information centers. As a result of these two notable inefficiencies, the service is possibly in need of a restatement of its goals. In

thinking about these problems, several members of the graphic arts in-
dustry have discussed the possibility of the establishment of a
"centralized" information service.

The following statements made in a personal letter on July 1,
1960 by Warren L. Rhodes, Head, Graphic Arts Research Department,
Rochester Institute of Technology, seemed to point up the situation:

> The trend we observe is that many organizations have estab-
> lished or are planning to establish small, separate, independ-
> ent information services for segments of the graphic arts. It
> seems to us that an establishment of additional information
> services over and above those operated by the Institute of
> Paper Chemistry, Lithographic Technical Foundation, National
> Printing Ink Research Institute, Printing and Allied Trades
> Research Association, Rochester Institute of Technology, and
> Technical Association of the Pulp and Paper Industry, will
> result in increased diffusion of effort. It can lead only
> to ineffectual services which are expensive and which do not
> satisfy the demands. If these information services could be
> accommodated by extending the existing services the result
> would be less expensive and more efficient.

> Even within the existing information services there is
> insufficient coordination. For example, in the case of micro-
> films, abstracts and other storage it should be possible to
> rapidly search all files to obtain bibliographic or informa-
> tive research reports. At the present time there is no common
> index which is used throughout the graphic arts so that cross
> referencing and searching of all the files could be done easily.
> As a result, it seems important that the industries should get
> together and adopt at least a common index by which all infor-
> mation could be stored.

> There is little or no coordination among the information
> services to prevent duplication. It is not common in the
> graphic arts for one organization to refer requests to another
> for answering. This is unfortunate because it leads to dupli-
> cation and in many cases to losses of information because of
> incomplete files. The existing information services should
> be exceedingly well coordinated so that this kind of expen-
> sive duplication and poor retrieval can be reduced.

Nearly a decade ago, American scientists and engineers found that

they could no longer rely on traditional library methods to provide them, within a reasonable period of time, the detailed information that they required to make informed decisions essential to their professional activities.

In response to this need, various professional groups began to engage in abstracting and indexing activities to serve the needs in specific subject fields. The magnitude of this job was such that the effort was not nearly enough; therefore, hearings were held in 1958 and 1959 before the Senate Subcommittee on Reorganization of the Committee on Government Operations to inventory the work being done. Editors of the major abstracting and indexing activities testified at these hearings, and the conclusion that was reached in some government circles was that additional effort was needed in order to coordinate this work and to stimulate further effort in improving the effectiveness of exploitation of recorded technical knowledge. This resulted in an assignment of responsibilities to the National Science Foundation under Public Law No. 85-864:

Sec. 901. The National Science Foundation shall establish a Science Information Service. The Foundation, through such Service, shall (1) provide or arrange for the provision of indexing, abstracting, translating, and other services leading to a more effective dissemination of scientific information, and (2) undertake programs to develop new or improved methods, including mechanized systems for making scientific information available. (1-10)

It seems that many segments of American industrial society have become cognizant of the problems involved with the diffusion of effort and overlapping of research brought about by many, small information

services. The seemingly wasteful duplication has probably been reduced by organizations such as the American Petroleum Institute which is the central information service for the oil industry; the National Shoe Manufacturers Association for the shoe industry; and the Automobile Manufacturers Association for the automobile industry. Then why not the "Centralized Graphic Arts Information Service" for the graphic arts industry? Mr. Norman R. Reamer, Graphic Analyst, Graphic Sciences Laboratory, Stanford Research Institute, in a letter, offered several reasons why this concept apparently has not appealed to the industry:

Printers generally are craftsmen, not accustomed to acquiring information through printed pages; suppliers of equipment and materials have been ready to give information to promote sales; trade associations have had selfish interest in acting as sources of information; trade and technical journals have done a good job in circulating information; and, only a few people are interested in technical information in depth and breadth that require a centralized information service.

As the industry becomes more complex and the processes require more technical ability, the need for a high-caliber information service may be apparent.

To sum up the situation, Warren Rhodes offers the following:

... we [the graphic arts industry] ought to take a long range view. If we continue to store information with different industries and different systems, over a period of twenty years we will undoubtedly find ourselves in the position where it will be necessary to pool this data in order to make it manageable. It will probably be necessary at that time to resort to some sort of machine storage and searching. If we have worked independently and if our files are all of a different form and stored by a different index the job of transcription to a common file will be fantastic. In fact it may be so expensive at that time as to be impossible. It seems to me important that while the amount of information is still manageable that we agree on some common indexing, storing and retrieval system which has the efficiency and sophistication capable of handling data in terms

of the demands which will be made on the librarian within the
next twenty years. (1-1)

Objectives of the Study

It is the main purpose of this study to determine if there may
be a need for a "centralized" information service for the graphic arts
industry. Perhaps there is this need if there are indications of over-
lapping, duplication, and diffusion of effort on the part of information
centers now servicing the industry. This study will in no way attempt
to show how such a service should be established: this would involve
research into data processing, individual "center" autonomy, financial
aspects, and various other areas. To keep this project within reasona-
ble bounds, the ultimate objective is limited to determining if there
is the need for a centralized service.

An additional objective of this study will be to show the present
status of graphic arts information centers in relation to their methods
of storage and retrieval, and to discover if their methods adequately
serve their members or inquirers. An attempt to compare the areas in
which the various information centers collect data will be included to
determine if there is duplication of effort among these centers. It is
probably also important to determine to what extent there is coordina-
tion between the various centers.

Methodology of the Study

A letter, accompanied by a questionnaire, was sent to the direc-
tor of each graphic arts information service. Also enclosed was a
self-addressed, stamped envelope. Two mailings were anticipated and

used in an attempt to obtain as high a percentage of return as possible.
This was important to the study because the number of existing services
was small and the validity of the survey rested upon answers from most
of these services.

The first mailing was a 100 per cent sample of all the informa-
tion services of the graphic arts known to this author. It consisted
of 82 letters and questionnaires. The second mailing included 16
letters and questionnaires sent to those information services that did
not respond to the first mailing.

The covering letter for the first mailing (Appendix A) intro-
duced the writer as a graduate student at South Dakota State College
who was working toward a Master of Science degree in Printing Manage-
ment. The recipient was asked to complete the enclosed questionnaire
from which it was hoped a comprehensive study could be made to deter-
mine the number of information services available in this country, and
in what ways they serve the graphic arts. The publication of a booklet
containing a detailed procedure for the use of information services and
a list of all the information services available was mentioned as a
plan for the future. The plan for this publication was in no way
connected to the findings of this thesis, but the returned questionnaire
served a dual purpose in this instance. The letter asked the recipi-
ent's cooperation in a task that was hoped would benefit the printing
and allied industries. So as not to put undue pressure on the recipi-
ent, it was mentioned in the letter that he could have another person
in his organization handle the matter if he so desired.

The covering letter for the second mailing (Appendix B) was a plea for help. It pointed out that the results of this study should be of great benefit to the printing and allied industries. It mentioned that information retrieval should become increasingly important as a result of technological progress in the graphic arts, and that a result of this study would be to provide a ready access to the use and services of the information centers.

In discussing the questions on the questionnaire (Appendix C), the term "center" refers to the individual or persons operating the information service.

Questions 1, 2, and 3 of the questionnaire simply asked the name and address of the organization and the director's name. These questions were asked to ascertain from where the returns came.

The purpose of question 4 was to determine how many centers offered their services to members of the organization only and how many offered services to anyone desiring information.

Question 5 dealt with the types of businesses with which the members of centers or persons desiring information were connected. These included such businesses as printing, advertising, publishing, sales, purchasing, merchandising, manufacturing, professional, government, and graphic arts in general. The purpose of this question was to find out the different, broad segments of business that were serviced by each organization.

Question 6 involved the financing of each information center. The financial means were broken down into four categories: (1) paid

membership, (2) dues, (3) charge for each inquiry, and (4) contributions. The latter could involve government grants, foundation grants, contributions from industry, etc.

If an organization charged dues, question 7 was asked to find out if charges were made on monthly, yearly, or on some other basis.

Question 8 was asked to determine which information centers charged dues plus an extra charge for each inquiry.

Question 9, although not entirely pertinent to this study, was asked to ascertain an average amount charged for individual inquiries. This question was asked to round out the questionnaire in the financial area so as not to give too much weight to the other aspects of financing.

To discover the sources of contributions of those information centers that were financed in this way, question 10 was included.

Question 11 was asked to determine the broad categories in which centers furnished information, and question 12 broke these categories down into specific areas. A broad category might be "printing" under question 11, and this might be broken down in question 12 into such areas as ink, paper, offset plates, plant layout, etc.

Question 13 was designed to find out the ways (consulting, written answer, bibliographies, etc.) in which centers responded to inquiries for information.

An attempt was made in question 14 to find out if a center had a current awareness service or publication that would keep their members or inquirers up to date in their particular field on current happenings

and events. Question 15 was asked in conjunction with question 14 to determine, if a center did publish information regarding their field of endeavor, which publications were offered.

Question 16 dealt with the subject of retroactive searches; that is, if a request for information involved looking through past articles on the subject, would the center perform this search for its clients.

Question 17 related to the sources from which information was obtained. These sources may have included periodicals, reference aids lists (abstracts, etc.), or other such references.

Question 18 was asked to determine the type of storage procedures used by a center whether it be by original article or document, abstract, microfilm, title lists, or other form. Question 19 was tied to question 18 in an attempt to depict the method of searching for the information that a center may have in storage such as individual searching of articles, card files, IBM or other punch card system, etc. The purpose of this question was to determine the main method of such searching procedure.

Question 20 was asked to find out if a center kept indexes on file. These would include lists of manufacturers, service organizations, trade associations, and others.

Question 21 was asked to determine if a center maintained its own library.

If information was not available from a particular center, question 22 was asked to find out if that center would refer or could refer the client to another source of such information.

Question 23 was asked to determine whether or not a center was engaged in any type of research, regardless of its type or extent.

Question 24 was asked to find out if the center had ever been approached about the subject or was in any way familiar with the subject of a "centralized" information service for the graphic arts and allied industries.

Question 25 was asked to determine the reaction of the center to the subject of a "centralized" information service among those familiar with the subject.

If respondents were not familiar with the subject mentioned in question 24, question 26 was designed to determine the reaction of a center to the possible establishment of a "centralized" information service.

In the first mailing, 82 letters and questionnaires were mailed. A response of 66, or 80.50 per cent was received from this mailing. The second mailing included 16 letters and questionnaires, which mailing brought a response of 10, or 62.50 per cent. The overall response for both mailings was 76 out of 82, or 92.68 per cent.

The universe of all information centers servicing the graphic arts industry was chosen as the sample for this study. This universe was drawn from a list of centers formulated by the Graphic Arts Research Department of the Rochester Institute of Technology. The addresses of these centers were obtained from the Encyclopedia of Associations, Volume I, National Organizations of the U. S. (Gale Research Company, 1961).

CHAPTER II

RESULTS AND FINDINGS

Eighty-two information centers servicing the graphic arts indus-
try were included in the mailings for this study. They were located in
all sections of the United States and their aggregate services covered
all segments of the industry.

Table 1 shows that, of the 68 respondents, 42, or nearly 62 per
cent, offered their services to members only. Twenty-six, or 38 per
cent of the information centers, offered services to anyone desiring
information. It would appear, therefore, that a person must in most
cases be a member of an organization in order to receive information
from that organization. Of the 76 questionnaires returned, eight failed
to answer this question.

Table 1. Persons to Whom Services of 68 Information
Centers in the Study were Offered

	Number of respondents	Percentage of respondents
Offered services to organization members only	42	61.76
Offered services to anyone desiring information	26	38.24
Total	68	100.00

Table 2 shows the various business connections of persons desir-
ing information. Heaviest association appears to be in the general

category of the graphic arts industry. Of the 73 respondents, 43, or
nearly 59 per cent of the centers, serviced members and inquirers in
this field. Business connections under the manufacturing category came
to 27, or nearly 37 per cent. This was nearly twice the number of
associations of the third largest category, "other," which included
metals, materials, and process engineering, trade associations, research
and development, banks, documentation, and students.

Table 2. Business Connections of Those Desiring Services of
73 Information Centers in the Study

Business	Number of information centers	Percentage of information centers*
Merchandising	9	12.33
Sales	12	16.44
Purchasing	7	9.59
Graphic Arts	43	58.90
Manufacturing	27	36.99
Professional	12	16.44
Government	11	15.07
Other	14	19.18

*Total number of information centers that responded was 73. Information
centers often service a variety of businesses; therefore, the total
exceeds 73 or 100 per cent.

Table 3 shows that several of the 73 centers serviced a variety
of businesses, and that some centers serviced the same or similar busi-
nesses. These facts apparently point up an overlapping and duplication

of effort.

Table 3. Businesses Serviced by 73 Responding Information Centers

Type of business serviced	Number of information centers	Percentage of information centers
All businesses	3	4.11
Graphic Arts only	33	45.20
Graphic Arts and		
Sales	3	4.11
Manufacturing	5	6.85
Sales and manufacturing	2	2.74
Merchandising, sales, manufacturing, and government	1	1.37
Manufacturing, professional, and government	1	1.37
Purchasing and manufacturing	1	1.37
Manufacturing and government	1	1.37
Manufacturing and professional	1	1.37
Merchandising, sales, and professional	1	1.37
Merchandising only	1	1.37
Merchandising, sales, and manufacturing	3	4.11
Sales and manufacturing	1	1.37
Purchasing only	1	1.37
Purchasing and		
Manufacturing and government	1	1.37
Manufacturing, professional, and government	1	1.37
Manufacturing only	6	8.22
Manufacturing and professional	1	1.37
Professional only	3	4.11
Professional and government	3	4.11
Total	73	100.00

Information centers had a variety of ways in which they obtained financial support. The major portion of this support, nearly 86 per cent, as shown in Table 4, came from paid membership or dues. These two categories seemed to be synonymous, therefore they were combined during the tabulation. One respondent to this question added a category to the questionnaire; therefore, the means of financial support, "taxes," has been added to the list.

Table 4. Means by which 69 Responding Information Centers
Obtained Financial Support

Financial means	Number of respondents	Percentage of respondents*
Paid membership or dues	59	85.51
Charge for each inquiry	7	10.14
Contributions	9	13.04
Taxes	1	1.45

*Total number of information centers that responded was 69. Finances may be obtained from more than one source; therefore, the total exceeds 69 or 100 per cent.

Information centers varied slightly in their dues charging practices, but the majority seemed to charge on a yearly basis. Table 5 shows that 38, or more than 64 per cent of the respondents that answered this question, charged in this manner; four, or nearly seven per cent, charged on a monthly basis; and 17, or nearly 29 per cent, charged on "other" bases such as dues based on annual payroll of a member's company, initiation fees, percentage based on annual sales of a member's company,

so much per ton of paper produced by a member's company, etc. Although
amounts were asked for in the questionnaire, insufficient information
regarding this point was received for tabulation.

Table 5. Dues Charging Practices of 59 Information
Centers in this Study

	Number of respondents	Percentage of respondents
Monthly	4	6.78
Yearly	38	64.41
Other	17	28.81
Total	59	100.00

Few information centers charged their members an additional fee
for an inquiry for information. Table 6 shows that 30, or more than 81
per cent of the respondents that answered this question, charged no
additional fee. Of the 76 questionnaires returned, only 37 respondents
answered this question. Perhaps this question was not understood. None
of the respondents answered question 9 which asked for an average amount
that was charged for individual inquiries, except that a few mentioned
that it would be difficult to state an average amount.

Table 6. Information Centers in Study Which Charged Fees for
Individual Inquiries in Addition to Dues or Paid Membership

	Number of respondents	Percentage of respondents
Additional fee charged	7	18.92
No additional fee charged	30	81.08
Total	37	100.00

Question 10, which asked for the sources of contributions from those centers which received financial support in this way, was not answered. Perhaps this question delved too deeply into the personal affairs of the centers.

Table 7 shows the categories in which information was furnished by centers. Heaviest emphasis seemed to be in the technical aspects of graphic arts--more than 59 per cent of the centers that responded in the study offered such information. In addition to the classifications listed, the "other" category included accounting, sales, government, public relations, insurance, costing, publishing, management, and labor relations.

Table 7. Classifications of Information Furnished by
71 Centers Responding in the Study

Classification of information	Number of information centers	Percentage of information centers*
Technical	42	59.15
Business statistics	19	26.76
Employment	16	22.54
Sources of equipment and supplies	25	35.21
Printing methods	25	35.21
Education	26	36.62
Other	19	26.76

*Total number of information centers that responded was 71. Information centers may have offered information in more than one classification; therefore, the total exceeds 71 or 100 per cent.

Question 12, which was designed to break the main information categories of question 11 down into specific areas, was answered insufficiently to tabulate. Perhaps the respondents felt that the answers to question 11 were sufficient to cover both questions.

Information centers used many methods of responding to inquiries for information. The one most often used, as seen from Table 8, was the "written answer." Sixty per cent of the centers responding to this question used this method. Consulting directly concerning a problem was in second place; 35 per cent of the centers used this system. The lowest percentage for types of response was listed under the "automated" methods, such as microfilm and facsimiles. The "other" methods of response included telephone calls, literature reviews, reports, course of study, instructional aids, bulletins, forum proceedings, reprints, periodic and reference publications, newsletters, brochures, loose leaf services, blowlines, actual lending of reference material, and "as requested."

Table 9 shows that 41, or 82 per cent of the information centers responding to this study, offered a current awareness service. This type of service might have included publication of recent developments in a particular field. This would seem to be important to persons in an industry if they are to keep up in a supposedly fast-moving society. The open-end portion of question 14 was not answered sufficiently.

Table 8. Methods of Response to Inquiries for Information used by
60 Information Centers in the Study

Methods of response	Number of information centers	Percentage of information centers*
Consulting	21	35.00
Microfilm	3	5.00
Written answer	36	60.00
Facsimiles	9	15.00
List of titles	11	18.33
Bibliographies	13	21.67
Compilation of abstracts	9	15.00
Other	17	28.33

*Total number of information centers that responded was 60. Information centers may have responded to inquiries in more than one way; therefore, total exceeds 60 or 100 per cent.

Table 9. Information Centers in the Study that Maintained
Current Awareness Services

	Number of respondents	Percentage of respondents
Maintained a current awareness service	41	82.00
Did not maintain a current awareness service	9	18.00
Total	50	100.00

Most of the information centers published information pertaining to their particular fields. Slightly more than 81 per cent of the centers which answered this question, as seen in Table 10, published information relating to their organizational services and areas of business. These publications included monthly or quarterly periodicals, special reports, or newsletters. They also included the proceedings of organizational meetings. Specific titles of publications were generally not given.

Table 10. Centers in the Study that Published Information Pertaining to Their Organizational Services and Areas of Business

	Number of respondents	Percentage of respondents
Published	43	81.13
Did not publish	10	18.87
Total	53	100.00

A majority of the information centers responding to question 16 did not provide retroactive searches regarding informational inquiries. As Table 11 shows, 21, or about 48 per cent of the centers that answered this question, indicated that they provided searches of past events and articles.

Question 17 which asked for the sources that information centers used to obtain information was not answered sufficiently. Many respondents stated that the list was too long to include; others stated that they used all trade publications relating to the graphic arts; etc.

Table 11. Information Centers in the Study that
Provided Retroactive Searches

	Number of respondents	Percentage of respondents
Provided retroactive searches	21	47.73
Did not provide retroactive searches	23	52.27
Total	44	100.00

The foremost procedure used by centers to store information was by the original document or article. Slightly more than 57 per cent of the centers which answered this question stored information by this means (Table 12). In contrast to this, abstract and microfilm storage were each used by 12.5 per cent of the centers. "Other" storage procedures included such items as machine "library" on tape and photocopies.

Table 12. Storage Procedures Used by 56 Information
Centers in the Study

Type of storage	Number of respondents	Percentage of respondents*
Original document or article	32	57.14
Abstract	7	12.50
Microfilm	7	12.50
Title lists	6	10.71
Other	5	8.93
None	2	3.57

*Total number of information centers that responded was 56. Information centers may have used more than one procedure for storage; therefore, the total exceeds 56 or 100 per cent.

The data in Table 13 show that 25, or more than 46 per cent of
the centers which answered this question, used the method of individual
searching of articles in searching for stored information. 13, or
slightly more than 24 per cent, used the card file method, and 4,
slightly more than seven per cent, used the IBM or similar punch-card
method. "Other" methods included the use of bibliographies or indexes.

Table 13. Principal Methods Used by 54 Information Centers
in the Study in Searching for Stored Information

Searching methods	Number of respondents	Percentage of respondents
Individual searching of articles	25	46.30
Card files	13	24.07
IBM or similar punch-card system	4	7.41
Other	10	18.52
None	2	3.70
Total	54	100.00

Responding for the American Society of Metals, Allan R. Putnam,
Managing Director, seemed to be in favor of a change in the systems
employed for information storage and retrieval:

From the start, 'manual' literature searching has been an
arduous, costly task. Even today, when performed at its
maximum degree of efficiency, one must still doubt its
thoroughness . . . and one constantly wishes that literature
searching could be done faster, because today's productive world
is a world of races: some with international implications,
others of domestic competitive significance. (4-2)

Table 14 refers to the indexes maintained by information centers. More than 66 per cent of the respondents who answered this question reported that they maintained no indexes. A few centers reported that they maintained "other" indexes such as an index of their own publications, college guides, printing abstracts indexes, graphic arts indexes, credit services, publishers, suppliers, trade press annual buyer's guides, cumulative book indexes, and periodical indexes. The index that was maintained by a majority of the respondents to this question was the Thomas Register. Few other specific titles were mentioned.

Table 14. Indexes Maintained by 68 Information Centers in the Study

Type of index	Number of respondents	Percentage of respondents*
Manufacturers	18	26.47
Service Organizations	12	17.65
Other	9	13.24
None	45	66.18

*Total number of information centers that responded was 68. Information centers may have maintained more than one index; therefore, total exceeds 68 or 100 per cent.

The majority of the information centers in this study maintained their own library. Several of the respondents to question 21 stated that their library facilities included the storage of publications—books, periodicals, reports, abstracts, journals, etc.—pertinent to the center's fields of endeavor. Nearly 41 per cent of the centers that

answered this question, however, reported that they maintained no library facilities (Table 15).

Table 15. Information Centers in the Study that Maintained Libraries

	Number of respondents	Percentage of respondents
Maintained a library	29	59.18
Did not maintain a library	20	40.82
Total	49	100.00

If an information center cannot supply its members or inquirers with the requested information, it is probably advantageous to these persons that the center involved have a referral service. Table 16 shows that nearly 85 per cent of the centers answering this question had services through which they referred the inquiries to other possible sources of the desired information.

Table 16. Information Centers in the Study that Had
Referral Services

	Number of respondents	Percentage of respondents
Had a referral service	39	84.78
Did not have a referral service	7	15.22
Total	46	100.00

Two-thirds of the information centers that responded to question

23 were engaged in research (Table 17). These research areas were many and varied and included publication use of photocomposition, newspaper accounting methods, gravure printing problems, education in the graphic arts, pulp and paper, chemistry, mechanical and electrical engineering, printing, photography, market preferences for packaging, newspaper production, publishing industry sales statistics, economics, industrial relations, typographic design, printing inks, quality control, raw materials, manufacture of ink, documentation, book component and measurement, labor relations, paperboard process and product improvement, and surveys of a firm's experiences and ideas. Specific responses to this question follow:

> . . . the American Chemical Society conducts much research into the area of use of scientific publications and the problems in connection with their publication. The latter would include research and exploration into new production methods and processes. At the moment we now are conducting what might be called an experiment on the use of photocomposition in scientific publication.

> Stanford Research Institute conducts contract research, and the results are the property of clients. Present and anticipated project work requires us to be prepared for literature searching in a wide range of technical and practical fields related to the graphic arts, printed communication, and visual communication.

> Our organization [PIA, Washington, D. C.] is not a research organization but we do have research projects which we have sponsored for our members.

> The Research Data and Information Services Program of the Office of Science Information Service is concerned with the functions and activities of scientific and technical information services in the United States and it informally performs a clearinghouse function in this field to the extent permitted by its limited resources and information.

Our [The Institute of Paper Chemistry] research effort is
divided into three categories. Our graduate students carry on
thesis research. Our staff engages in research on behalf of
our supporting companies and of various segments of allied
industries and government. Our staff also carries on institu-
tional research, in the sense that the research problems are
fundamental ones of specific interest to the individual staff
members.

The statements directly above, made by five separate information centers,

describe some of the research that was being undertaken in the graphic

arts and related industries at the time the study was conducted.

Table 17. Information Centers in the Study that
were Engaged in Research

	Number of respondents	Percentage of respondents
Engaged in research	38	66.67
Did not engage in research	19	33.33
Total	57	100.00

In October, 1960, a conference was held in Rochester, New York,

to discuss the possibility and need of a "centralized" information serv-

ice for the graphic arts. In attendance at this conference were repre-

sentatives of various segments of American industry: printing, photog-

raphy, chemistry, ink, paper and equipment manufacturers, documentation

experts, the federal government, publishers, automotive technical serv-

ices, education, and newspapers. Because the Graphic Arts Information

Conference seems to have been the only one of its kind ever held, the

centers included in this study were asked if they were familiar with the

subject. Of the 47 centers that responded to this question, 29, or nearly 62 per cent, said that they were familiar with the subject (Table 18).

Table 18. Respondents in the Study Who Had Been Asked About the Subject, A "Centralized" Information Service for the Graphic Arts

	Number of information centers	Percentage of information centers
Had been asked	29	61.70
Had not been asked	18	38.30
Total	47	100.00

Of the respondents familiar with the subject, a "centralized" information service for the graphic arts, 15, or nearly 52 per cent, said that they were in favor of the establishment of such a service. Eight, or nearly 28 per cent of the respondents, said that they were interested in the establishment of one. Only one respondent, just more than three per cent, was against the idea (Table 19).

As was to be expected, of the respondents not familiar with the subject, a "centralized" information service for the graphic arts, 11, or slightly more than 61 per cent, voiced no opinion. Six respondents, or 33 per cent, were favorable to the subject even though they were not familiar with it (Table 20).

Table 19. Reaction of Respondents in the Study, who were Familiar
with the Subject, as to the Establishment of a "Centralized"
Information Service for the Graphic Arts

	Number of information centers	Percentage of information centers
Favored	15	51.72
Interested	8	27.59
No opinion	4	13.79
Not interested	1	3.45
Against	1	3.45
Total	29	100.00

Table 20. Reaction of Respondents in the Study, who were Not Familiar
with the Subject, as to the Establishment of a "Centralized"
Information Service for the Graphic Arts

	Number of information centers	Percentage of information centers
Favorable	6	33.33
No opinion	11	61.11
Unfavorable	1	5.56
Total	18	100.00

CHAPTER III

SUMMARY AND CONCLUSIONS

The question now looms ominously: Is there a need for a "central-
ized" information service for the graphic arts? In the following dis-
cussion, an attempt will be made to draw several conclusions that may
help find the answer to this question.

As seen in Table 1, page 13, a majority of the information
centers in this study offered information or service only to those
persons who were members of the pertinent organization. This would
seem to indicate that in many cases persons who were not members and
who desired information on a specialized subject could not obtain this
information unless they joined the organization. This might lead to
many persons being denied information that they need. This problem
could possibly be lessened if all information centers offered their
services to anyone desiring information. A special rate could be
offered to members, with a higher rate for non-members. A "centralized"
information center might eliminate this problem by offering its serv-
ices to anyone desiring information in an area in which the "center"
has coverage.

As seen in Table 2, page 14, the largest group of persons who
desired information were connected with businesses in the graphic arts
industry. Table 3, page 15, shows that three, or slightly more than
four per cent of the 73 centers that answered this question, serviced
all businesses listed whereas 33, or more than 45 per cent of the

centers that responded, offered services to businesses of the graphic arts only. It would appear, in looking at Table 3, that there was a definite overlapping of effort on the part of the information centers that responded to this question. If this were true, the duplication of effort by these centers could mean that a great deal of money was being wasted.

Allen Kent of Western Reserve University draws an analogy to a duplication of effort that could apply in this situation:

Consider an article:

'Measurement of Corrosion Products in High Temperature, High Pressure Water Systems.' A. A. Sugalski and S. L. Williams. Paper from 'Symposium on Corrosion by High Purity Water.' Corrosion, v. 13, 1957, p. 57t-574t.

Highly efficient sintered nickel graphite imbedded filter used to remove corrosion products from hot water systems for analysis. Data on performance in removing iron, manganese, chromium and cobalt corrosion, products. (1-6)

According to Mr. Kent, this article could conceivably be of interest to a corrosion engineer, metallurgist, hydraulic engineer, mechanical engineer, inorganic chemist, chemical engineer, heating engineer, and maybe even to a sanitary engineer. It may seem obvious that an analysis of this article, performed once, could serve many purposes; yet, this article was abstracted, or otherwise processed for the following: Review of Metal Literature, Corrosion Abstracts, Engineering Index, the Cobalt Information Center, Corrosion Engineers Abstracts, Chemical Abstracts, Magnesium Review and Abstracts, Metallurgical Abstracts, Prevention of Deterioration Abstracts, and others. (1-6) Mr. Kent goes

on to say:

> . . . doesn't it make sense that there be available today
> a centralized service that would abstract the article in
> question and which would serve the various interests covered
> by the services [mentioned above] . . . ? (1-7)

Possibly a pooling of funds and efforts by the responding information centers could lead to less diffusion of effort and more beneficial research for persons utilizing these centers.

The aggregate moneys collected by the responding information centers for financial support could possibly be used by a "central" organization much more effectively. Either the cost to the members or inquirers of such an organization could be lowered or if the same amount of money were obtained, it could lead to an increased effort on the part of the "one" organization and could be used to broaden the areas of information storage and retrieval, and research.

The centers that responded in this study furnished information under a variety of classifications. Of the 71 respondents to this question, 42, or more than 59 per cent of the centers, furnished information in the technical area, 25, or slightly more than 35 per cent of the responding centers, offered information in each of printing methods and sources of equipment and supplies classifications. This again seems to point up a definite overlapping of effort by the information centers that responded. This would also seem to point up that a pooling of finances by the responding centers could lead to a much broader coverage of the field with much less diffusion of effort.

Of the 60 centers that responded to the question concerning the

methods of response to inquiries, 36, or 60 per cent of the respondents, used the written answer method of response, whereas only three, or five per cent of the respondents, used the "automated" form of response, microfilm. Nine, or 15 per cent of the centers that answered this question, used the other automated form of response, the facsimile. It would seem that the written answer form of response would be slower than the automated forms, and that if service was to be expedient, more information centers would adopt the faster methods. This could possibly lead to more persons receiving information, or the persons now receiving information might obtain it at a faster rate after requesting it.

Forty-three, or slightly more than 81 per cent of the 53 responding centers, reported that they published information relating to their organizational services and areas of business. This seems to point up once again the wasted effort and money through overlapping and duplication of effort.

The storage procedures used by information centers that responded in this study weighed heavily toward the original document or article procedure. Thirty-two, or more than 57 per cent of the centers that answered this question, used this procedure, whereas only seven, or 12.5 per cent of the respondents, reported that they used the microfilm procedure for storage. The use of the original document or article procedure for storage would seem to point up possible storage-space problems in the future if an information center were to have thorough coverage of the field of endeavor.

The principal methods used by the 54 information centers that

responded to the question of methods of searching for stored information weighed heavily in the direction of individual searching of articles and card files. These seemingly slow methods of searching for information were used by 38, or slightly more than 71 per cent of the responding centers. Four, or more than seven per cent of the responding centers, used the IBM or similar punch-card system. It would seem if the latter method were used more extensively, information could be given to the persons requesting it at a more rapid rate.

There are many other examples in this study where there was an overlapping and duplication of effort on the part of the information centers that responded: maintaining of indexes; maintaining of library facilities; and in research. It would seem that this further points up the need to combine some of the services now offered by the information centers that responded in this study. This could possibly save money or perhaps the combined finances could be used to broaden the scope of activity of these centers and offer more adequate, effective services to users.

Whether or not the storage and retrieval systems employed by information services of the graphic arts industry will be adequate in the future is a controversial question. Will the storage of information by the original document or article form and the retrieval of this information by searching for the individual document or article be adequate for the graphic arts industry, or if used, will such methods be adequate for any industry? "No," according to Warren L. Rhodes of the Rochester Institute of Technology, unless some type of common

indexing, storage, and retrieval system is agreed on by all information centers, so that the librarian will be capable of handling the demands that will be made upon him in the next twenty years. (1-2)

According to editorial writer Dael Wolfle of Science magazine:

The United States, which invested $13 billion for research this year [1960], is spending more and more dollars to buy less and less research--to be precise, 4½ times more dollars in 1960 than in 1950, to buy only twice as much research. (6-132)

There are probably many reasons why research productivity is decreasing steadily, but the two that appear to be most widely accepted are the inadequate availability and ineffective utilization of recorded knowledge. Because of these reasons, it has been estimated that 45 per cent of each research dollar is wasted. "This loss seems to be increasing, and is probably a major factor in any competitive situation, whether among individuals, profit-making organizations, or nations." (2-64)

A human being's efficiency drops sharply when the quantity of information he must absorb exceeds a certain point. (5-62) Referring to Chapter I, more than 2,000 pages of books, newspapers, or reports are published in the world every 60 seconds. The Control Systems Laboratory of the University of Illinois reports that "if an individual with an average reading speed attempted to keep fully informed about everything going on in the world he would fall behind in his reading an estimated 1,000,000,000 pages per year, even though he devoted his entire time to it." (3-2)

This seems to dramatize the problem faced by persons in any field

of endeavor in their attempts to keep informed of relevant developments.

In at least one field of science, chemistry, the amount of recorded in-

formation has been doubling every eight years. (3-2)

Mr. Kent points to one of the results of the increase of recorded

knowledge:

One of the results of the increase has been the growth of
specialization, as a way to limit the amount of knowledge
required by any one individual to the point where he can deal
with it effectively. However, the benefits of increasing
specialization have been more than offset by the barriers
it has raised to communication among specialists. (3-2)

Speaking for the other side on this controversial subject, D.

Ward Pease, Librarian, Lithographic Technical Foundation, makes the fol-

lowing comment in a personal letter:

A previous five-year experience in this field /graphic
arts/ has convinced me that the rate of growth is nothing
to get excited about.

Dr. Ben-Ami Lipetz of the Itek Corporation adds to this side of

the argument by saying:

I think there are several problems which can be analyzed
as whether an association for processing data would be
useful. I think perhaps if you look more in detail you
can find that you need to collect data before processing.
Would an association help to improve data collected?
Would new types of information become available through
an association? I don't think so. Types of information
wouldn't be very much different from the way it is now.
(1-19)

Mr. Vincent Hall of _Time_, Inc., points out that a "centralized"

service must be able to compete:

In general, single references can be found in about 15
minutes by furnishing a general description of the data
wanted. If a photocopy or reprint is needed, several days

to a week or more is required, at an average cost of perhaps
$5.00. A complete graphic arts information service would
of necessity have to compete with these costs, even though
having the very attractive pluses of (a) keeping current
through rapid insertion into the library of published
material, (b) thoroughness due to cross-indexing potential,
and (c) eventual space-saving through the building up of a
reference library in a condensed physical form. (1-19)

The data collected for this study does not show any trend that
information storage and retrieval is taking. They do not show whether
the situation is good or bad. The testimony included here seems to
weigh in favor of the side that contends that the situation is indeed
bad, although the question as to the seriousness of the situation cannot
be answered adequately. This raises yet another question: if a trend
does prove to be serious in the future, will the industry be able to
right the situation? The industry will have to make up its mind to one
of three alternatives: (1) the situation is not bad and there is no
further need for discussion on the subject; (2) the situation might be
bad and further discussion and investigation should be made, and (3)
the situation is indeed bad and serious thought followed by positive
action must be undertaken now.

Table 19, page 29, showed that nearly 52 per cent of the re-
spondents familiar with the subject, a "centralized" information service
for the graphic arts, were in favor of its establishment. Table 20,
page 29, showed that more than 33 per cent of the respondents were in
favor of the establishment of such a service, even though they were not
familiar with the subject. Based on this evidence, it can be concluded
that there is a definite need for a "centralized" service.

CHAPTER IV

SUGGESTIONS FOR FURTHER STUDY

Further studies should be made before conclusive answers on the subject of information storage and retrieval in the graphic arts industry can be forthcoming.

A survey has been made of the information centers that service the graphic arts industry. A survey should now be made of the persons directly involved with the centers—the users of information: the printers, the manufacturers, the suppliers, to name a few. A study should be made of these persons to determine if existing information centers adequately serve their needs. If a trend toward inadequacy became evident, perhaps the users of these centers would welcome the establishment of a "centralized" information service if it could adequately meet their needs.

A thorough study into the mechanics of setting up such a "centralized" system should be made; this could include such items as means of financial support, indexing, storage and retrieval systems available, possible locations, and organizational set-up.

LITERATURE CITED

1. Anon., _Proceedings of the Graphic Arts Information Conference_ (Rochester, New York: Rochester Institute of Technology, 1960).

2. L. H. Flett, _Information Resources_ (New York: Interscience Publishers, Inc., 1958).

3. Allen Kent, "Documentation and Communication Researching," Wilson Library Bulletin (June, 1961).

4. Allan Ray Putnam, _Information Searching_ (Novelty, Ohio: Documentation Service of the American Society for Metals, 1961).

5. Henry Quastler and Associates, _R-62_ (Urbana, Illinois: Control System Laboratory, University of Illinois, 1955).

6. Dael Wolfle, _Science_, 517 (August 26, 1960).

APPENDIX A

Example of the Covering Letter that Accompanied the Questionnaire on the First Mailing

As a graduate student in graphic arts, I am interested in the various information services throughout the graphic arts industry.

I am presently enrolled at South Dakota State College, and in June, 1962, shall qualify for a Master of Science degree in Printing Management.

Would you kindly complete the enclosed questionnaire from which I hope to make a comprehensive study of the information services available in this country, and how they serve the graphic arts. On the basis of my thesis, I plan to compile a booklet for the printing industry that will present a detailed procedure for using information services, and, in addition, list the services available in every center that disseminates information to members of the graphic arts.

I would appreciate your cooperation in a task that I hope will benefit the printing and allied industries.

If you would rather have another person in your organization handle this matter, will you kindly forward this to him, or inform me of his name and address, so that I may contact him.

Very truly yours,

Richard D. Kast

Enc. (2)

APPENDIX B

Example of the Covering Letter that Accompanied the Questionnaire on the Second Mailing

I need your help. The results of my questionnaire about Information Services should be a great benefit to the printing and allied industries.

Information retrieval will become increasingly important as a result of technological progress in the graphic arts. It is my purpose, as a result of this study, to provide a ready access to the use and services of the information centers.

The return of the questionnaire, sent to you two weeks ago, is most vital to this study. If you did not happen to receive it, I am enclosing another, along with a self-addressed, stamped envelope, for your convenience. I would greatly appreciate your returning the completed questionnaire as soon as you can fit it into your schedule.

Thank you very much.

Very truly yours,

Richard D. Kast

Enc. (2)

APPENDIX C

Example of the Information Services Questionnaire

1. Name of Organization _____

2. Address _____

   _____ Phone _____

3. President's or Director's Name _____

                          Title _____

4. To whom are your services available?

   a. Organization members only ___ b. Anyone desiring information ___

5. With what types of businesses are your members or inquirers connected?

   a. Merchandising ___   b. Sales ___   c. Purchasing ___

   d. Graphic Arts (Printing; Advertising; Publishing; etc.) ___

   e. Manufacturing ___   f. Professional ___

   g. Government (local, state, or federal) ___

   h. Other _____   _____   _____

      _____   _____   _____

6. How is your service financed?

   a. Paid membership ___   b. Charge for each inquiry ___

   c. Dues ___   d. Contributions ___

7. If your organization charges membership fees, how much are they?

   a. Monthly $___   b. Yearly $___

   c. Other ___ (please specify) $_____

8. If membership fees are charged, is there an additional charge for each individual inquiry?

a. Yes ____ b. No ____

9. If fees are charged for individual inquiries, what is the average amount?

_____

10. If your organization is partly or wholly financed from contributions, please state the source(s) of such contributions.

_____   _____

_____   _____

11. In which categories do you furnish information?

a. Technological ____   b. Business statistics ____

c. Employment ____   d. Sources of Equipment and Supplies ____

e. Printing methods ____   f. Education ____

g. Other _____   _____   _____

_____   _____   _____

12. Under the main categories of question 11, in which areas do you collect data? (Examples: Printing -- ink; paper; offset plates; plant layout
Management -- sales; operation; accounting; etc.)

a. Main category _____ Areas: (1) _____

(2) _____ (3) _____ (4) _____

b. Main category _____ Areas: (1) _____

(2) _____ (3) _____ (4) _____

c. Main category _____ Areas: (1) _____

(2) _____ (3) _____ (4) _____

13. What are your forms of response?

    a. Consulting ____   b. Microfilm ____

    c. Written answer ____   d. Facsimiles ____

    e. List of titles ____   f. Bibliographies ____

    g. Compilation of abstracts ____

    h. Other _____ _____ _____

14. Do you have a current awareness service, or publication, that keeps your public up to date on current happenings and events?

    a. Yes ____   b. No ____

    If yes, please explain briefly _____

    _____

    _____

15. Does your organization publish?

    a. Yes ____   b. No ____

    If yes, please list titles of publications _____

    _____ _____ _____

16. Do you provide retroactive searches, that is, do you search for material relevant to past events and articles?

    a. Yes ____   b. No ____

17. What are your sources of information?

    a. Periodicals ____ (please list)

    _____ _____ _____

    _____ _____ _____

    b. Reference aids lists (abstracts, etc.) ____ (please list)

    _____ _____ _____

    _____ _____ _____

c. Other ____ (please list)

_____ _____ _____

18. What is your form of storage?

    a. Original document or article ____   b. Abstract ____

    c. Microfilm ____   d. Title lists ____

    e. Other _____ _____ _____

19. What methods do you use in searching for information you have on file?

    a. Individual searching of articles ____   b. Card files ____

    c. IBM or other punch card system ____

    d. Other _____ _____ _____

20. What indexes do you keep on file?

    a. Manufacturers ____   b. Service organizations ____

    c. Other ____

    Please list, by title, those most used or referred to _____

_____ _____ _____

21. Do you maintain a library?

    a. Yes ____ b. No ____

22. Do you have a referral service, that is, if you are unable to supply the requested information, do you refer your inquiries to the source that can?

    a. Yes ____ b. No ____

23. Is your organization engaged in any type of research?

    a. Yes ____ b. No ____

    If yes, please explain briefly _____

_____

_____

24. Have you ever been approached about the subject of a "centralized" information service for the graphic arts and allied industries?

    a. Yes ____   b. No ____

25. If your answer to question 24 is yes, what was your reaction?

    a. Favored ____

    b. Interested ____

    c. No opinion ____

    d. Not interested ____

    e. Against ____

26. If your answer to question 24 is no, what would be your reaction to the establishment of a "centralized" information service?

    a. Favorable ____

    b. No opinion ____

    c. Unfavorable ____

27. Please list additional comments or information on the reverse side of this sheet.

I would appreciate your sending any pamphlets or brochures you may have concerning your organization. Thank you very much for your cooperation. You may return this questionnaire in the enclosed self-addressed, stamped envelope.

Please address all future inquiries to:

    Richard D. Kast
    Printing and Journalism Department
    South Dakota State College
    College Station
    Brookings, South Dakota

APPENDIX D

List of Information Centers to Whom Letters and Questionnaires Were Sent

Amalgamated Lithographers of America
American Book Publishers Council
American Chemical Society
American Institute of Electrical Engineers
American Institute of Graphic Arts
American Management Association
American Newspaper Publishers Association
ANPA Research Institute
American Paper and Pulp Association
American Photo-Engravers' Association
American Society for Testing Materials
American Society of Metals
American Technical Society
Association of Printing Technologists
  Bexleyheath, Kent, England
Battelle Memorial Institute
Book Manufacturers Institute
Box Association of America
Boxboard Research and Development Association
Center for Documentation and Communication Research
  Western Reserve University
Department of Information Services, Research Laboratories
  Eastman Kodak Company
Education Council of the Graphic Arts Industry
Employing Photo-Engravers Association of America
Flexographic Technical Association
Folding Paper Box Association of America
Graphic Arts Association Executives
Graphic Arts Information Service
  Rochester Institute of Technology
Graphic Arts Research Department
  Rochester Institute of Technology
Graphic Sciences Laboratory
  Stanford Research Institute
Gravure Research, Inc.
Gravure Technical Association
Greater New York Folding Box & Display Manufacturers Association
Illuminating Engineering Society
Institute of Newspaper Controllers and Finance Officers
Institute of Paper Chemistry
Institute of Radio Engineers
International Association of Electrotypers and Stereotypers
International Association of Printing House Craftsmen

International Center for the Typographic Arts
International Graphic Arts Education Association
International Graphic Arts Society
International Printers Supply Salesmen's Guild
International Printing Pressmen's Union
International Typographic Composition Association
Inter-Society Color Council
      Eastman Kodak Company
Lithographers and Printers National Association
Lithographic Technical Foundation
National Association of Litho Clubs
National Association of Photographic Manufacturers
National Association of Photo-Lithographers
National Association of Printing Ink Makers
National Association of Purchasing Agents
National Metal Decorators Association
National Newspaper Publishers Association
National Paper Box Manufacturers Association
National Paper Box Supplies Association
National Printing Equipment Association
National Printing Ink Research Institute
National Science Foundation, RDIS/OSIS
Office of Documentation, National Academy of Sciences
      National Research Council
Packaging Institute, Inc.
Paper Industry Management Association
Paper Mill Fourdrinier Wire Cloth Manufacturers Association
Photo-Engravers Research
Photo Methods for Industry
Printing and Publishing Industries Division
      U. S. Department of Commerce
Printing Industry of America
      Washington, D. C.
Printing Paper Manufacturers Association
Pulp and Paper Machinery Association
Pulp & Paper Prepackaging Association
Pulp Refining Equipment Manufacturers Association
Radio and Television Executives Society
Radio-Newsreel-Television Working Press Association
Research and Engineering Council of the Graphic Arts Industry
      Washington, D. C.
Rotogravure Association
Screen Process Printing Association International
Society of Motion Picture & Television Engineers
Society of Photographic Scientists and Engineers
Society of Typographic Arts
Technical Association of the Graphic Arts
Technical Association of the Pulp and Paper Industry
Time, Inc., Springdale Laboratories
Wirebound Box Manufacturers Association