

AN INTEGRATED INFORMATION SYSTEM  
FOR EDUCATIONAL INNOVATIONS:  
A PRELIMINARY DESIGN AND COST STUDY

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## Abstract

Although many limited or general sources of information are available to schools, there is no single authoritative source which contains focused and comprehensive information about the new curricula, training programs, management systems, model projects, etc., which are available for adoption. For this reason the many products being developed through federally sponsored educational research and development are not being as widely disseminated as they could be. This preliminary design and cost study describes a system, synthesized from existing projects and systems, which would bring together such information, process it, and package it in several forms which would be inexpensive to produce, convenient to distribute, and easy for school practitioners to use. Some of the products proposed are: short-entry catalogues describing approximately 2650 innovations available for adoption; other catalogues describing more selected lists of innovations, but in more detail; on-line access to the total file of several thousand innovations; selected lists in certain subject areas; plus byproducts like machine readable lists of over 50,000 "key men" and organizations in the field of education.

The components and processes, are described. Operational cost for the initial year and succeeding years, and production and unit costs for each product are given.

## I. Introduction

In recent years information dissemination activities designed to acquaint practitioners in the schools with innovations available for adoption have increased greatly. At the federal level, USOE has sponsored many projects and the development of new information systems, particularly through the National Center for Educational Communications (NCEC). Several commercial ventures in this field have also addressed a nationwide audience of educators. Most state departments of education have increased their information dissemination activities. Regional and local information centers have grown up, sponsored by ESEA Title III and other federal and state sources or through county and local school funds. Yet with all of this activity, no single authoritative source of information exists through which one might learn about the thousands of innovative curricula, training programs, management systems, model project, etc., which are major new options available for adoption in schools. A member of a curriculum committee in a local school, for example, would have to do considerable research and tap several sources, including some which are not readily accessible in many parts of the country, and wade through much irrelevant material in order to locate information about all of the alternatives that might be considered for a curriculum adoption or an inservice program in fields like health or mathematics. And, even if this search were done well, he would have no assurance that he had not overlooked one or several important alternatives.

From another perspective, the problem being addressed can be considered a marketing problem. The federal government and other sponsors have invested hundreds of millions of dollars into the development of new curricula, programs and projects to improve educational practice. Hundreds of products of these

efforts are now ready for use. But adoptions are not as widespread as they might be simply because most curriculum decision-makers in the local schools are not aware of the existence of these options at the time that they commit funds. If the tremendous investment in educational research and development is to pay off in educational improvement in schools, more effort must be expended to provide decision-makers with timely, comprehensive and accurate information about the products of educational research and development.

The system outlined in this report is designed to solve a part of the problem by providing both comprehensive and selected information on educational research and development products. This information will be put into various packages designed to be inexpensive, easily distributed, and easy to use. The proposed system is not a radical departure, but a synthesis of systems already in existence, partaking of technology already well developed and operational.

There are four major goals of the system:

1. To bring curriculum decision-makers and developers to an awareness of the existence of all new curricula, systems and methodologies for pre-kindergarden through college which have been developed through federal or foundation grants.
2. To bring developers of educational products to an awareness of the existence and characteristics of all new curricula, systems and methodologies a) which are available for further development, or b) which need not be replicated (to avoid "reinventing the wheel").
3. To bring developers and potential adopters to an awareness of the existence and basic characteristics of educational products, systems and methodologies developed by the military which are available for public use.

4. To bring potential adopters of curriculum information to a state of motivation to either a) adopt, b) reject, or c) investigate further selected, validated curricula, systems and/or methods.

The nature of this document is a preliminary feasibility and design study. The data it contains are based on feasibility and cost data derived from operation of existing processes and systems, as well as expert estimates where hard data does not exist.

The information system developed in this report has three major components: data collection, processing, and output. The data collection process has two stages. The first stage involves generating lists of possible developers who may have products which meet criteria for inclusion in the system at some level. In the second stage telephone calls, letters and questionnaires will be used to solicit information about their projects from those on the lists. During the processing phase, trained researchers will evaluate the project information to determine if it is suitable for further dissemination and also to determine the appropriate level of treatment and dissemination medium. The output phase of the project will result in the production of various products such as product lists and catalogs, on-line computerized interrogation of the total list as recorded on tape, 3x5 card files, microfiche, etc.

In succeeding sections of this report we present a detailed description of the proposed information system followed by a cost analysis.

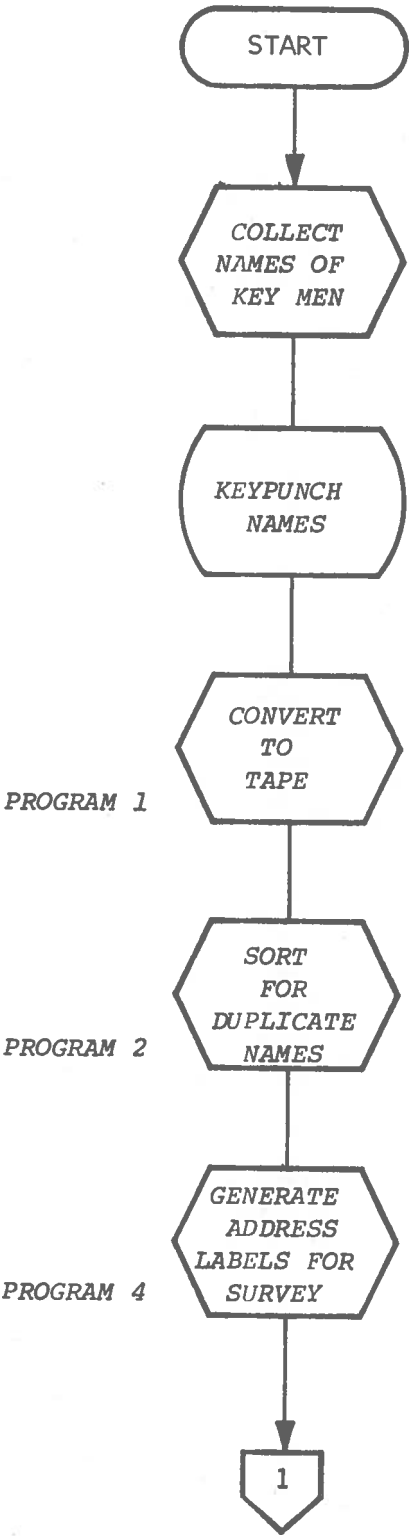


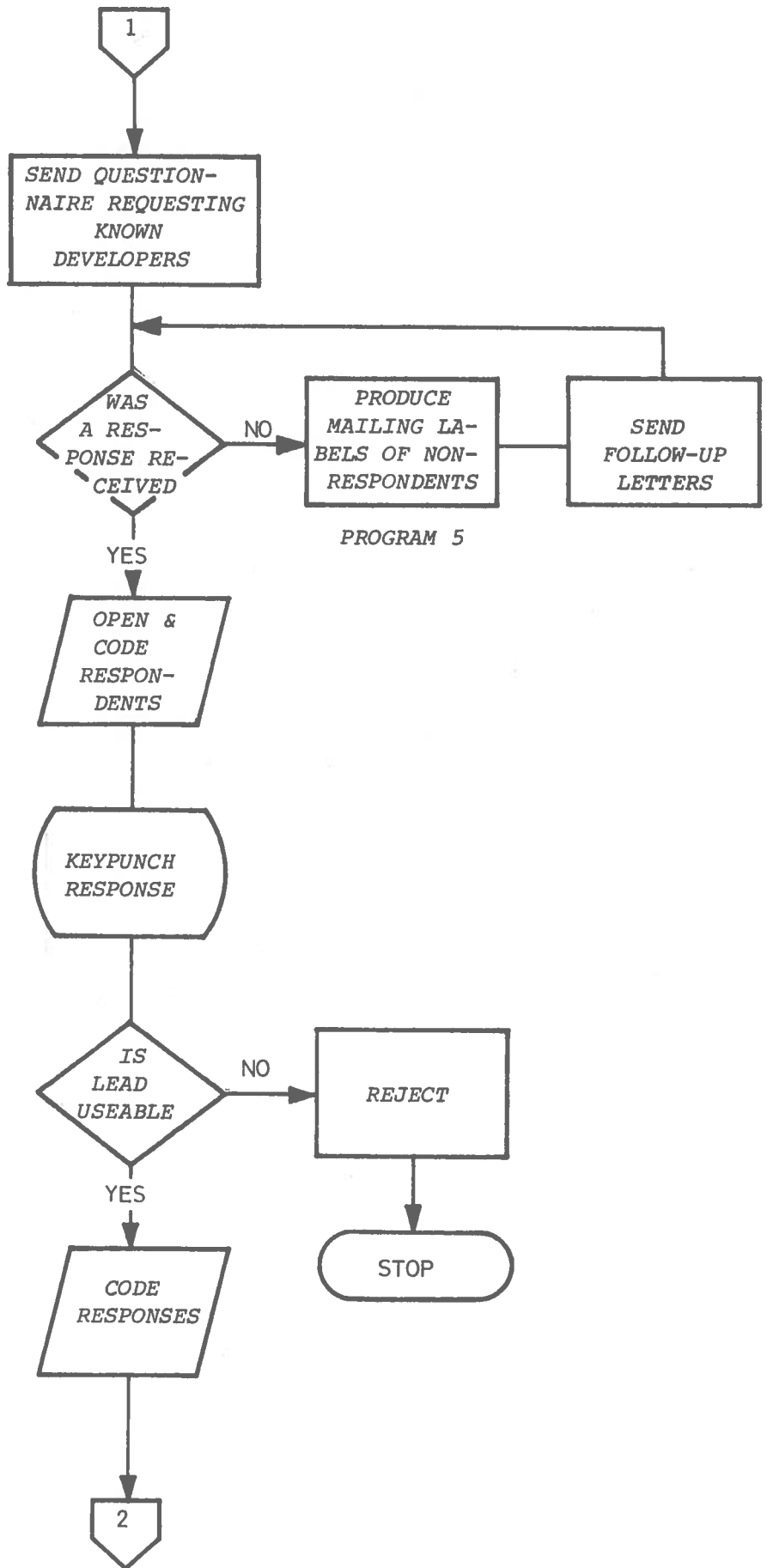
## II. System Description

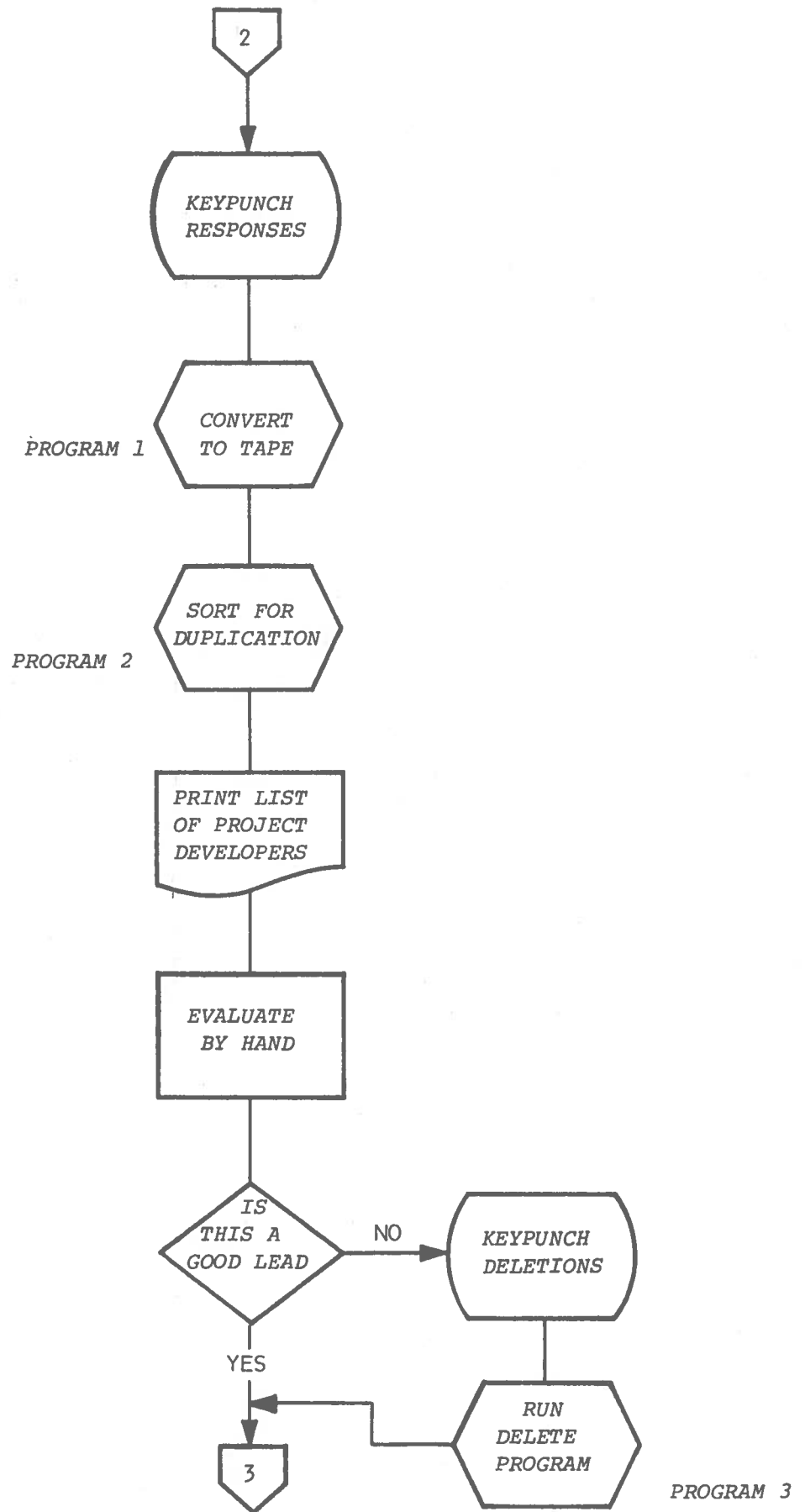
In this section the overall system and all of its components and processes will be described in detail. A flowchart is presented to give an overview of the system (see Exhibit 1, pp. 2-13), followed by a narrative description. The section will also suggest an organizational structure which incorporates elements of systems and projects already in existence.

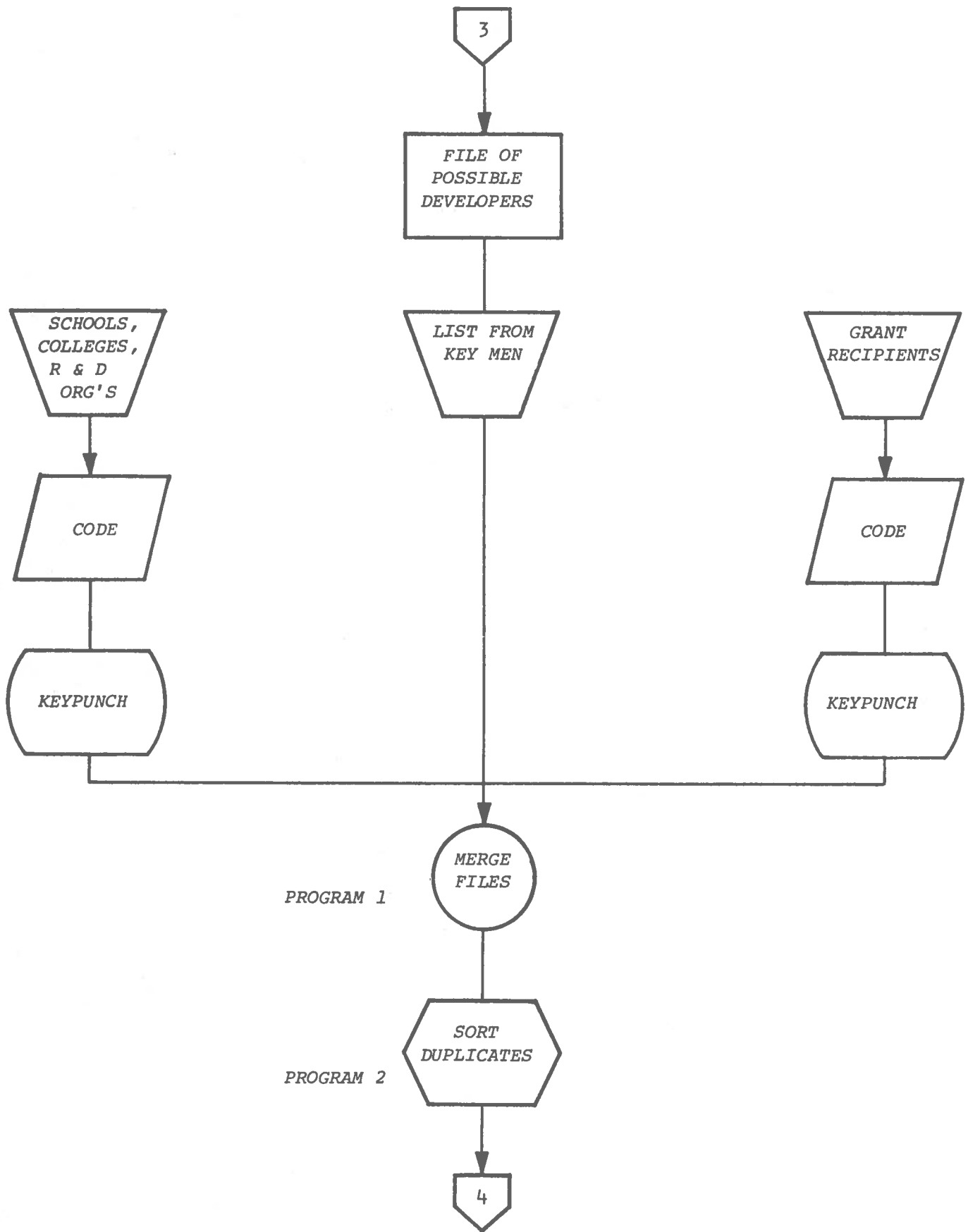
The methodology used to attempt to locate all of the appropriate innovations throughout the country, to collect information about them, to screen them to determine whether they meet criteria, to process the information, and to package it for distribution involves three stages: A) Data Collection; B) Evaluation and Screening, and C) Production of Products. This section is organized under these headings.

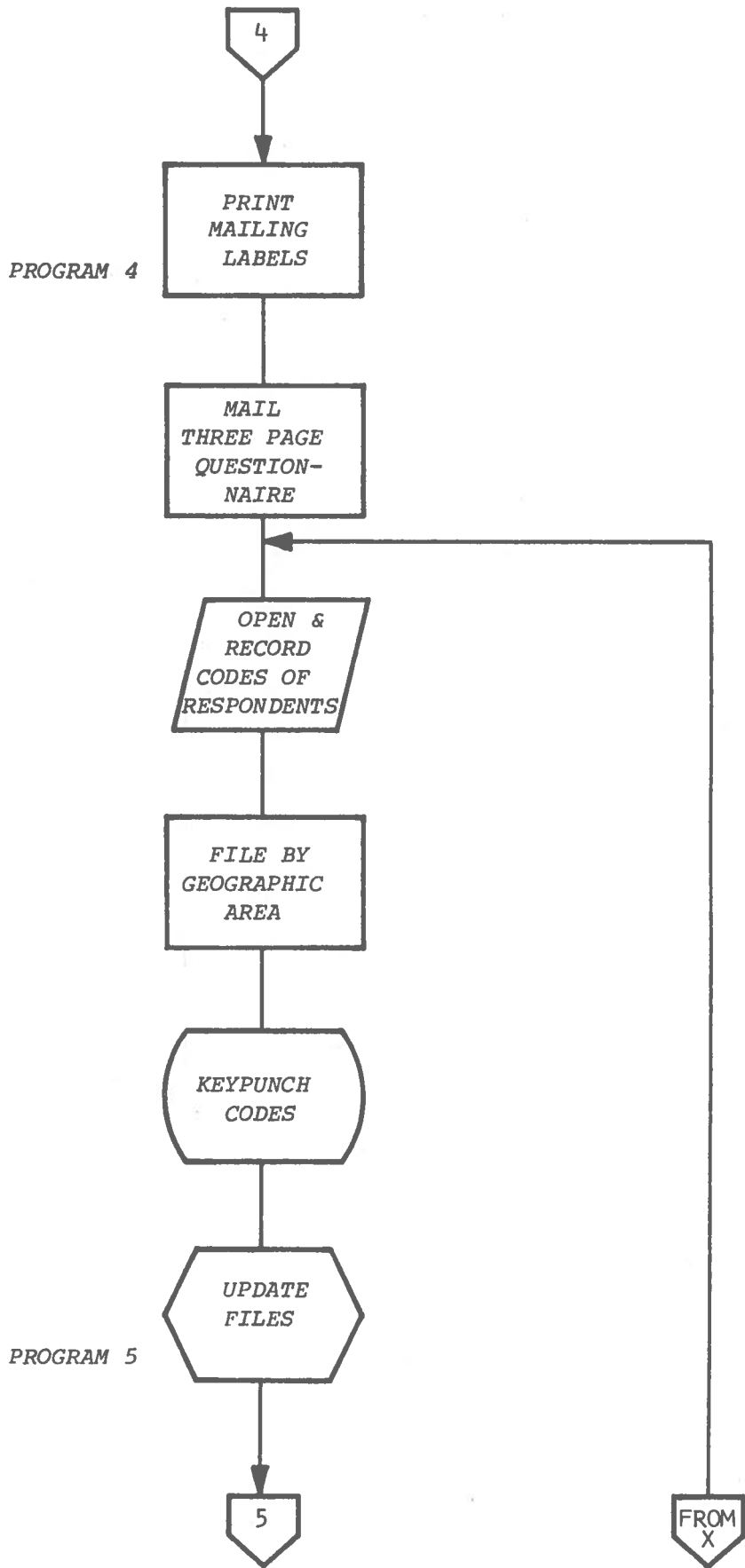
EXHIBIT 1: PROPOSED INFORMATION SYSTEM

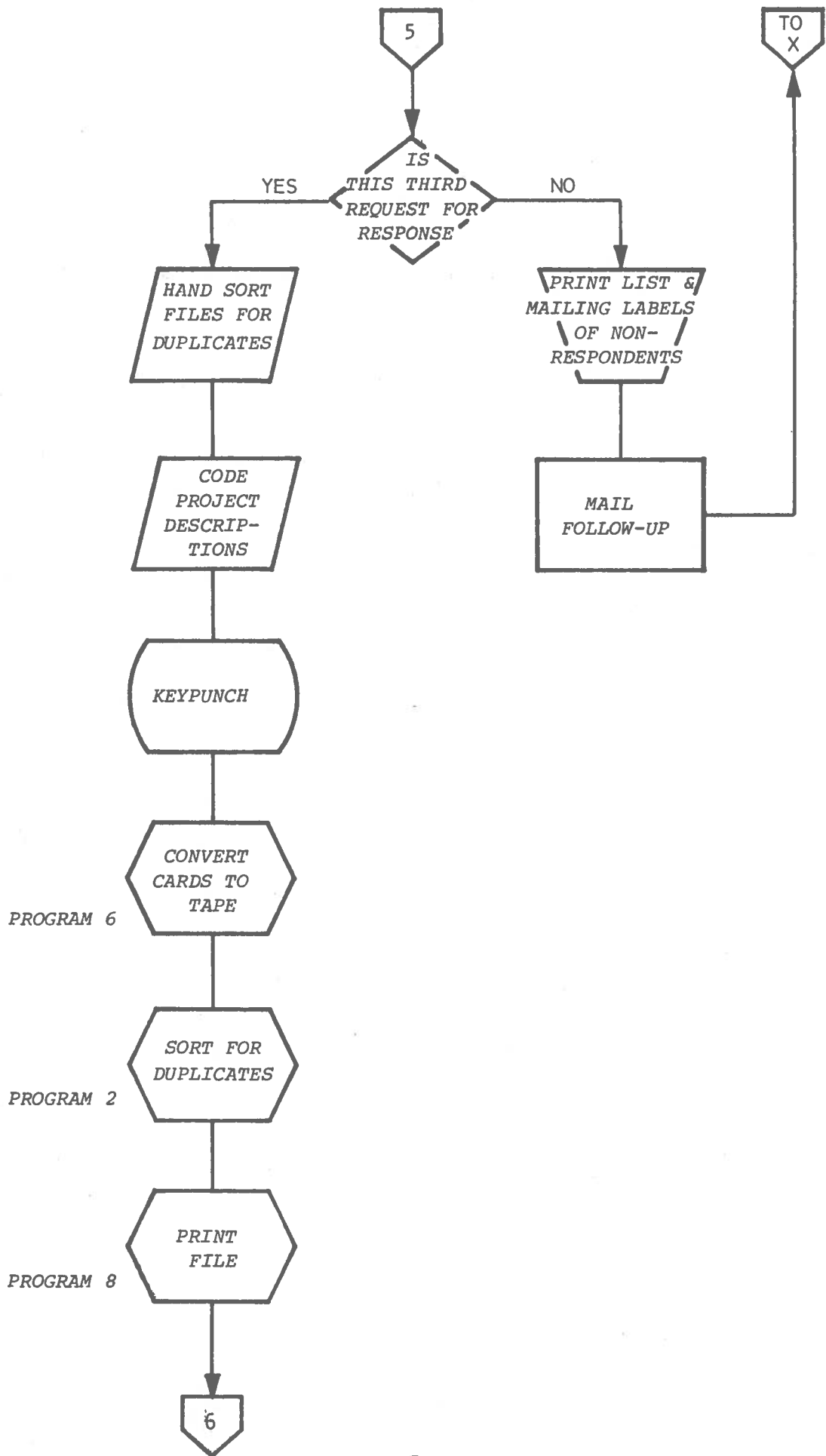


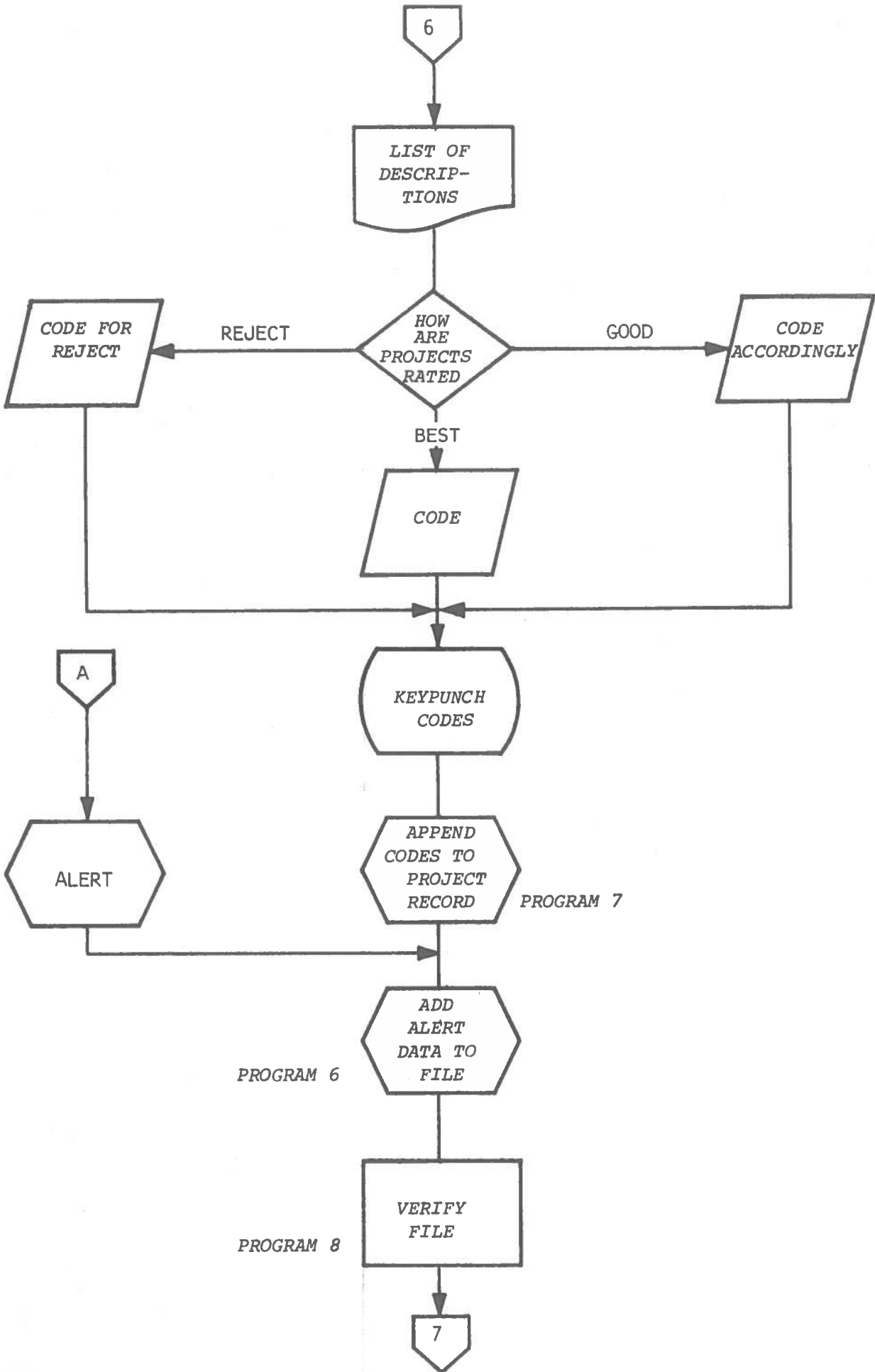










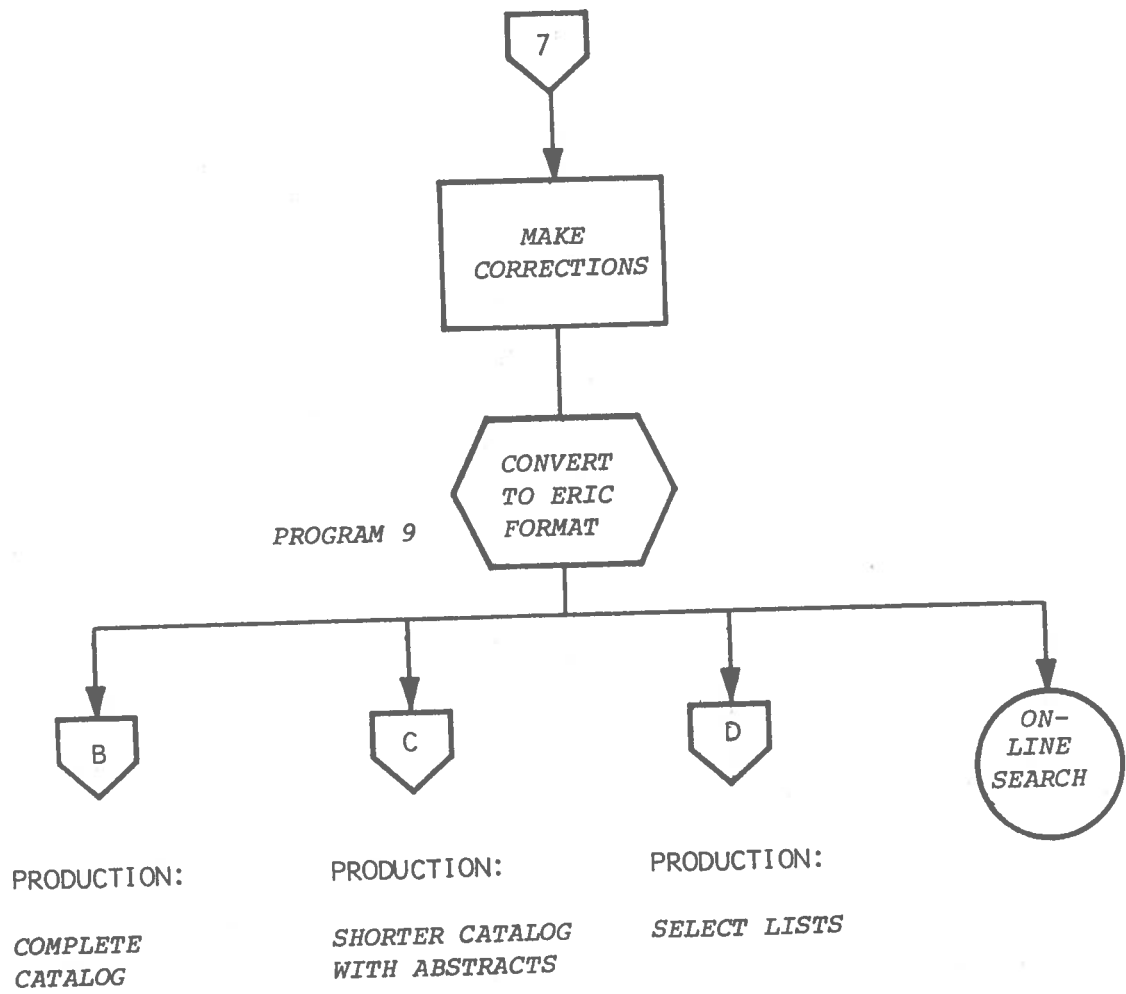


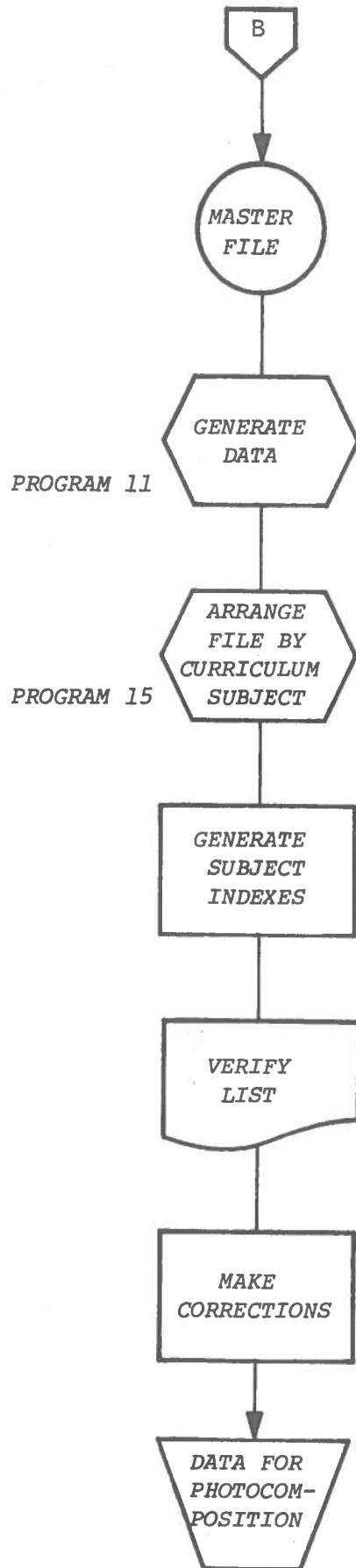
PROGRAM 6

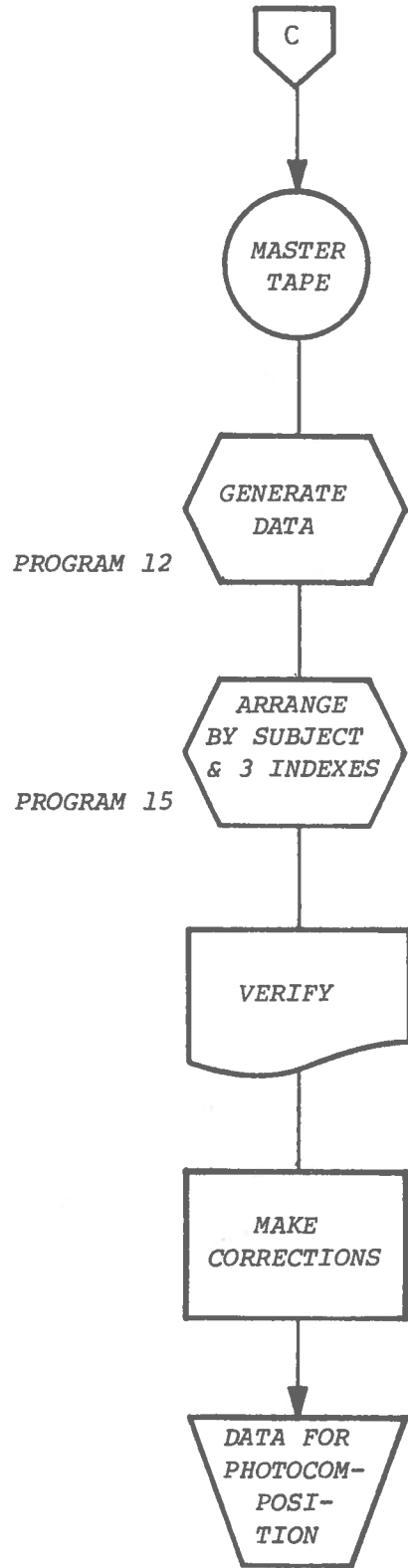
PROGRAM 7

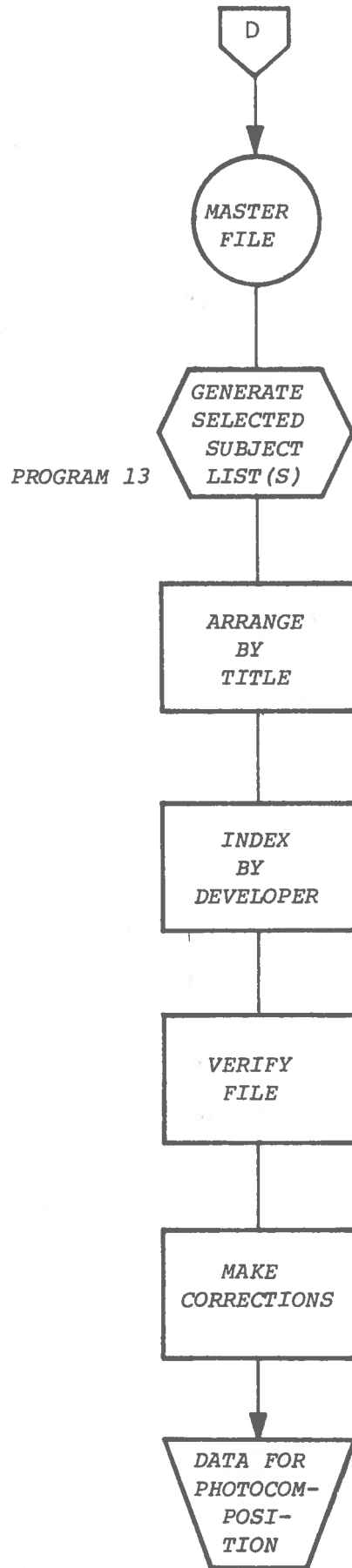
PROGRAM 8



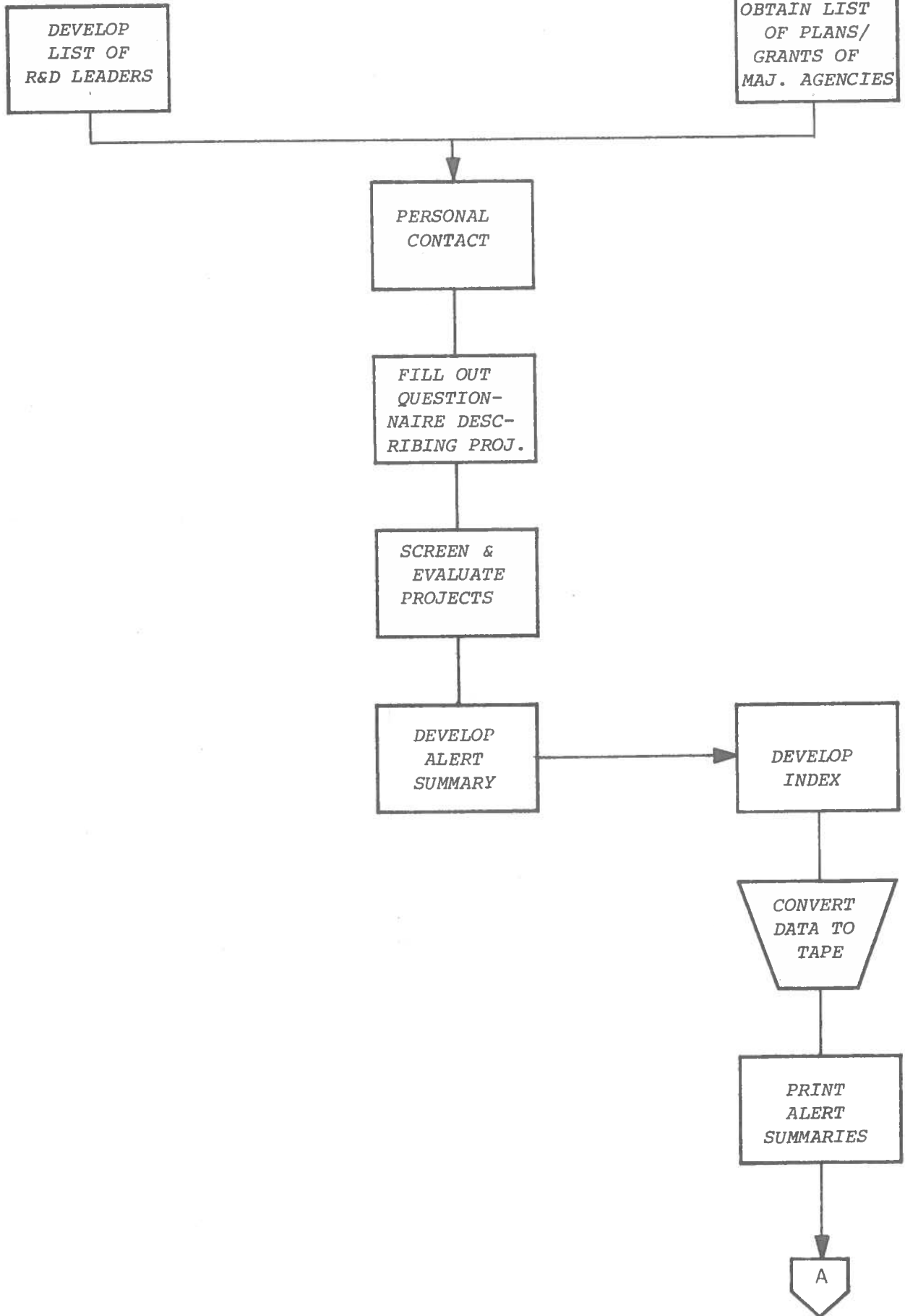








ALERT



## A. Data Collection

One of the more important considerations in designing a unified national system for information collection, processing and dissemination should be the requirement for comprehensive coverage of all candidate projects. In order to insure that all projects are discovered and evaluated, it is suggested that three sources be used to generate a list of potential developers: 1) an initial mail survey to query individuals (key men) who can direct us to potentially relevant projects. (This is the approach adopted by the TAP group in Oregon), 2) a library search to generate a list of current grant recipients, and 3) a library search to generate a list of school districts, university education departments, etc. Then using these lists a second stage of surveying will take place in which basic information about the projects will be solicited from the project developers themselves.

While this large scale data acquisition and screening process is underway, an additional much finer data collection process will be underway. This will be similar to that used in the ALERT system and will involve personal and telephone contacts with developers and recognized authorities in the field, screening of newsletters, journals and other publications, research into grant awards, etc., by educational writer/researchers.

### Key Man Survey and Library Searches

One initial source of data will be a survey of those people within the field of education or related fields who by reason of their position and/or achievements know the field and should be able to direct us to possible developers and/or projects. We expect this group to comprise 1% of the approximately 2.7 million people engaged in all aspects of education in the United States, or 27,000 key men.

The method of gathering their names will be any one or combination of the following:

- a) researchers will collect names from published directories;
- b) organizations using similar surveys will be contacted for their survey lists, e.g., TAP and Northwest Labs;
- c) membership lists of professional organizations will be screened or included entirely;
- d) existing machine-readable lists will be used (probably from any one of a. through c. above.)

Our cost estimates are based upon method a. which is the costliest and most time-consuming. The inclusion of any of b. through d. will reduce costs proportionately.

Once collected, these names will be put into machine-readable form and used to generate a mailing. Questionnaires will be sent to each requesting a) the titles of specific projects that one may know of that meet our criteria and their developers; b) the names of developers who might possibly be engaged in work that suits our concerns (see sample questionnaire Appendix 8).

Response to mail surveys is known to be not good; questionnaires and cover letters will be designed to be attractive and to convey the importance of the survey. If possible the recipients should be assured that this survey would serve to reduce the total number of such inquiries made, because the information would be used by all government agencies. Also, the non-profit aspect of the operation will be emphasized, as people in education are less responsive to commercial enterprises. Nevertheless, we expect to have to mail two follow-up surveys to non-respondents. Of the 27,000 in our initial survey, we expect 40% response to the first questionnaire, with the first follow-up bringing that figure up to 50% of the total, and the second increasing it to

60% for a total response of 16,200.

Of these 16,200 who return our questionnaire we expect that 50% will have nothing whatever to report and 50% (or 8,100) will report an average of 2 developers and/or projects each for a total of 16,200 names and addresses.

These responses will be keypunched and put on magnetic tape so that they may be computer sorted to eliminate any duplication of names. The file will then be printed and screened so that obviously unsuitable leads may be deleted. We expect 20% (or 3,000) to be dropped at this stage, leaving 13,200 names and addresses of possible developers.

In addition to the 13,200 names generated by the key man survey, we will collect from published lists: a) the names and addresses of the approximately 2,000 current recipients of federal grants for developing educational materials, b) the addresses of 33,000 school districts, colleges and universities with education departments, and c) the addresses of educational R&D organizations.

All of this information will be put in machine-readable form and merged. After duplicate entries have been eliminated, we expect a file of 40,000 names and addresses for our developer survey.

#### Developer Survey

The next step will be to send questionnaires to the people on the final list of 40,000. The developer survey instruments will consist of a cover letter and a 3 page questionnaire asking details about the project(s) in which each recipient is engaged. Most of the questions will be of the 'check one' variety, to facilitate response and hopefully ensure a reasonable rate of response. A 100-300-word abstract of the project will also be requested (see sample questionnaire in Appendix 8).

Follow-up letters and questionnaires will again be required. Response is expected to be 40% to the 1st mailing, another 10% of the total from the



2nd mailing, and 10% from the 3rd for a total response of 60% or 24,000.

Of these 24,000, we anticipate 50% to have no project to describe, leaving 12,000 responses to be coded, keypunched, put onto tape, and sorted for duplication. After merging and elimination of those which are not development type projects, we expect 3,000 discrete projects that meet the criteria for inclusion to emerge at this stage.

#### B. Evaluation and Screening

At this point the entire file of 3,000 projects and the descriptions provided by the developers will be printed from the computer tapes for screening by experienced educational researchers. The projects will be sorted in 3 groups: a) unavailable or otherwise unsuitable, to be deleted and stored for future reference (750 projects); b) good, but in categories that are less important to potential public school adopters (1500 projects); c) the best of the file (750 projects). Groups b. and c. will be stored in one machine file, but each project will be coded to indicate its grouping. At this point, the projects reported in ALERT (400) will be merged with group c.

This file of approximately 2650 projects will be the basis for all of the products of the proposed information system, except the ALERT type catalog.

In a separate process research assistants (i.e., people with a good background in education and in a particular subject area), possibly employed at the various ERIC Clearinghouses, will seek out the most significant projects in their subject areas. Using a variety of search techniques, but relying mainly on personal contact, they will filter the projects that come to their attention and produce detailed descriptions of the most worthwhile projects. The selections of the 400 products to be described will be made through a system developed at Far West Laboratory for Educational Research and Development which takes into account both the state of the art in the field and

expressed user need. Each of these will be described in considerable detail, in a parallel format designed to provide the kinds of information teachers and other school people find most useful. The 400 product descriptions will be compiled into an "ALERT type" catalog of 600 to 800 pages (including front matter and indexes).

Tying the development of the ALERT catalogs into the larger information system will mean that the ALERT researchers will be able to feed into the system not only the projects selected, but also those discarded, in the form of either contacts for the developer survey or full project descriptions as compiled during the ALERT search.

#### C. Products from the Information System

From the final file of all projects a number of products will be produced:

1. A "telephone book" catalog of brief entries (basic data, but no abstract) for all 2650 projects. (see Table 1)
2. A select "R.I.E. type" catalog of the 1200 projects from group c. (the elite) plus those from the ALERT type catalog. Entries in this catalog will include both basic data and 100-300 word abstracts. (see Table 2)
3. Special catalogs of all of the projects in this final file that fall into certain subject areas for which a high demand is expected, including same detail of information as in 2.
4. Copies of the tape itself on which the file is stored will be distributed to information centers or to a central computer with which information centers can communicate via telephone lines to do demand searches for clients.
5. In addition to these four, an ALERT type catalog will have been produced by the separate process described previously.

6. Other primary products may include 3x5 index cards containing the same information as the catalogs, microfiche of all products of the system, etc. Possible spin off products include the machine readable key man list, grant recipient list, institution list, and developers list, data for study of trends in development, etc.

Table 1

Sample Entry for the "Telephone-book" Type Catalog

|                          |   |
|--------------------------|---|
| Accession Number:        | 097-462   |
| Program or Project Name: | Confrontation: A Human Relations Training Unit<br>for Teachers and Administrators   |
| Developer:               | Far West Laboratory for Educational Research<br>and Development<br>1 Garden Circle, Hotel Claremont<br>Berkeley, California 94705 |
| Distributor:             | Anti-Defamation League of B'nai B'rith<br>315 Lexington Avenue<br>New York, New York 10016  |
| Type of Project:         | Inservice training in multi-ethnic schools  |
| Subject Area:            | Intergroup relations  |
| Target Audience:         | Teachers and administrators in multi-ethnic<br>elementary and high schools  |
| Availability:            | Available now   |

Table 2

Sample Entry for the "RIE type" Catalog

Accession Number: 097-462

Program or Project Name: Confrontation: A Human Relations Training Unit for Teachers and Administrators

Developer: Far West Laboratory for Educational Research and Development  
1 Garden Circle, Hotel Claremont  
Berkeley, California 94705

Sponsor or Funding Agency and Grant No. USOE

Distributor: Anti-Defamation League of B'nai B'rith  
315 Lexington Avenue  
New York, New York 10016

Type of Project: Inservice training in multi-ethnic schools

Subject Area: Intergroup relations

Target Audience: Teachers and administrators in multi-ethnic elementary and high schools

Availability: Available now

Abstract:

Confrontation is a human relations training unit for elementary or high school teachers and staff. It was developed in 1968 by the Far West Laboratory for Educational Research and Development in cooperation with the large urban school districts of the San Francisco Bay Area. It has been adapted and disseminated by the Anti-Defamation League in order to help staff in multi-ethnic schools to analyze their own specific problems related to race and to find solutions. The ten-hour course consists of (a) "discussion stimulator" films showing teacher/student and school/parent confrontations, (b) a pattern for organizing discussion groups throughout a school district, and (c) a training course for discussion leaders. The unit is designed to be used at school sites in five separate sessions; the staff of the school view the films all together and then split into groups of ten for two-hour discussion sessions. Each group is led by a discussion leader from the school's staff. Success of the unit depends largely on the dynamics of the small-group process and thus on the effectiveness of the discussion leaders. The pilot study conducted by the Far West Laboratory indicated that teachers thought the unit increased their awareness and understanding of racial problems. The Anti-Defamation League intends that the small discussion groups and leaders should be considered as a continuing resource for solving school problems after the course is completed.

#### D. On-Line Searching

One output that can easily be developed as a result of storing and updating the information in computer form is the ability to use computer equipment to search the file for specific projects matching a particular user requirement. There are two alternatives available in this respect. One is batch processing and the other is on-line searching. With a batch processing search system, a user submits a request for information to a central clearinghouse and then waits days or weeks for a final set of documents that satisfy his needs. An on-line system is one in which the user engages in a dialog with the computer system via a typewriter-like console connected by telephone lines to a computer. On-line access to the curriculum file would have the advantage of immediate response. The user (or an intermediary) at the terminal interacts directly with the computer, shaping his request for information according to the machine's responses.

Both batch processing and on-line services are commercially available. The cost estimates used here are those for a commercial on-line system known as ORBIT, developed by System Development Corporation. A batch processing system might conceivably cost less but would have a longer response time and higher user dissatisfaction.

Since ERIC Centers exist that provide approximately the same on-line search service but for an ERIC data base, we recommend the use of those facilities and have only estimated 1) the costs of tying an ERIC center into the data base, and 2) the additional costs to the ERIC center of the increased workload generated by our expected initial demand of 7-8 requests per week to each of 12 ERIC centers. We have not gone on to project cost figures for increased demand as the data base becomes better known, since all costs are derived from the costs per unit of time in each category. Because the average

time required for each search will remain the same, the unit cost for each search will also, regardless of demand.

#### E. Alternatives

A system as complicated as this leaves room for much variation. Some of the important alternatives to the design described herein are as follows:

##### A. Different media for the products.

- 1) Microfiche is a possibility;
- 2) Product 2, a select catalog, may be produced as a set of 3x5 index cards;
- 3) A market for the file on magnetic tape may develop.

B. Intermediate products may also be developed. The key man, grant recipient, and institutions' lists, and the file of developers' names may be valuable to other projects, since the names have not only been gathered but also put into machine-readable form and are therefore easily manipulated. The programs developed to manipulate this data may also be applied to similar projects.

#### F. Relationship of the Proposed Information System to Existing Systems; Management of the System

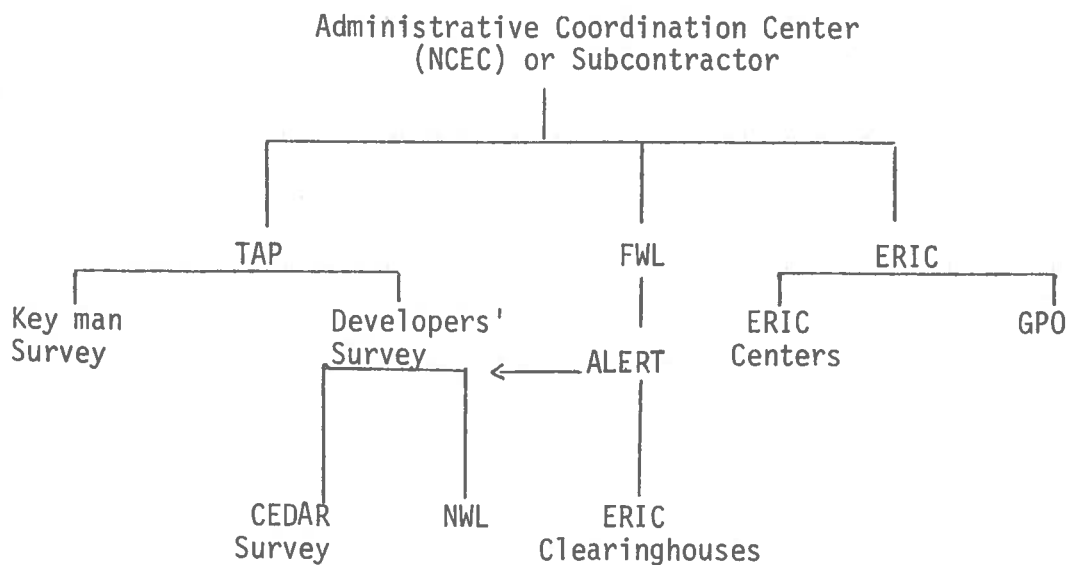
In the preceding description of the system, we have discussed the way in which data would be gathered for screening. We view this process as one which can be performed through existing agencies and institutions. We have also described how existing systems for automated data storage, on-line access, and generation of print products, microfiche, etc., can be employed.

About the only new element necessary to build and operate the system is an administrative-coordination center. This center would handle such functions as: 1) subcontracting tasks to the agencies which carry out the various func-

tions, 2) fiscal management and control, 3) planning, design, and evaluation, 4) system management, 5) coordination with funding agencies, 6) coordination with other federally sponsored information dissemination efforts. Such a center could be operated out of NCEC or subcontracted to an outside agency. (See Figure 1)

Figure I  
ORGANIZATION

Key man survey: TAP, NWL  
 Developers' survey: TAP, CEDAR, NWL  
 Alert: FWL and ERIC Clearinghouses  
 Printing: ERIC and/or GPO  
 On-line searches: ERIC Centers



The existing organizations which might participate in the system are as follows:

- 1) Technological Applications' Project (TAP) - currently engaged in a survey of 18,000 key men with the eventual aim of acting as a clearinghouse for information about, and reproduction of, curriculum materials.
- 2) Northwest Labs - collects information about projects developed by the military and other government agencies on request for contracting agencies. Uses key man surveys, developer surveys, personal contact.
- 3) CEDAR - does a loosely-structured survey of developers within its membership.
- 4) Far West Laboratory - uses research, review of journals and other literature, and personal contacts to gather data for its highly selective ALERT system.
- 5) ERIC Clearinghouses filter large quantities of information in their respective subject areas.
- 6) ERIC Centers provide on-line access to the ERIC files.

Participation of these agencies would not need to interfere with their present missions or operations, since this system has been conceived to be compatible with work already being done by them.



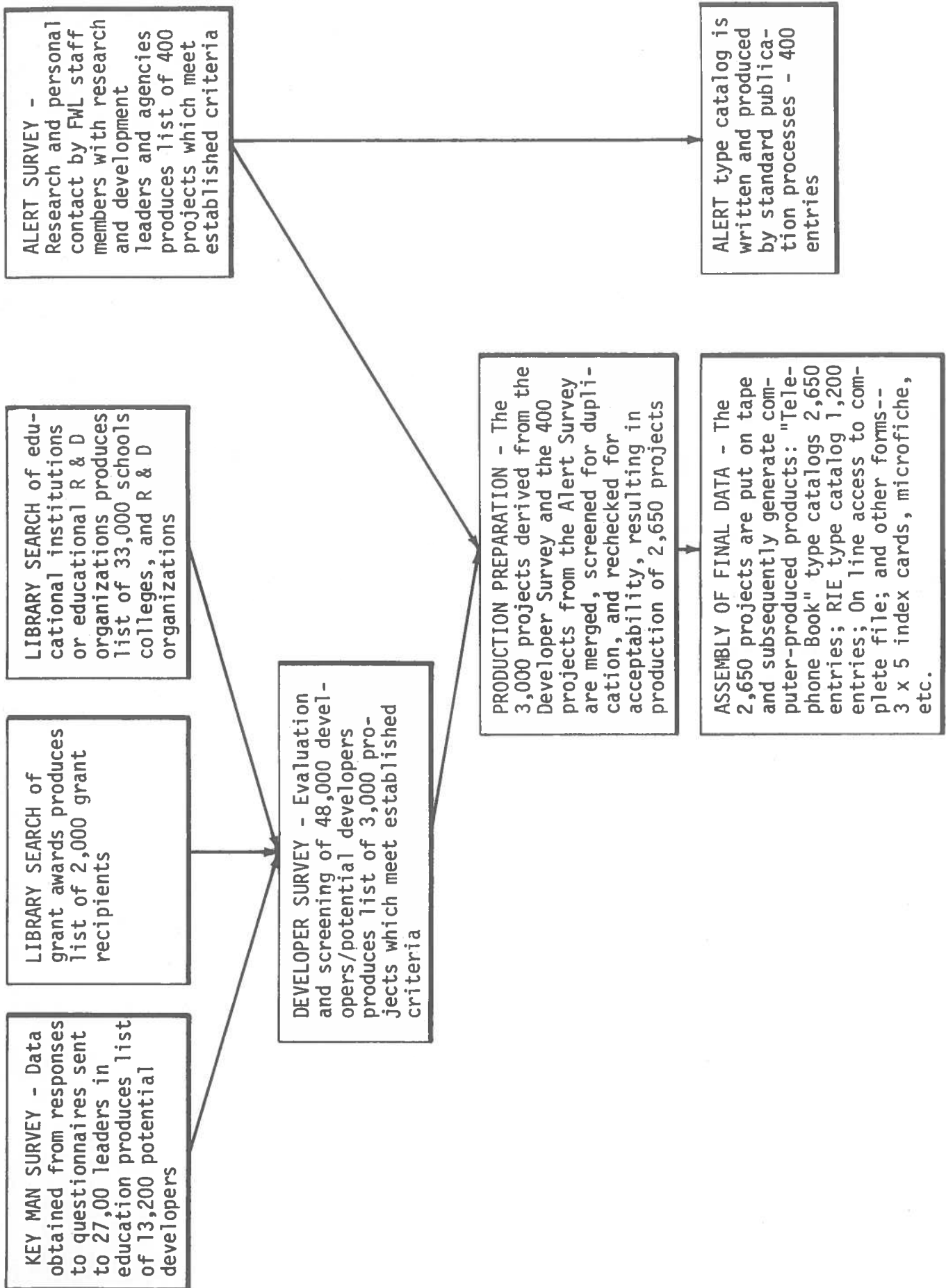
### III. Cost Analysis

The projected costs for the proposed information system are presented in this section.

Figure 2 shows the volume of transactions that are expected to be processed in order to arrive at 3050 projects which will be disseminated. For example, we expect to survey 27,000 educational leaders to give us leads as to the existence of curriculum projects. From the educational leaders we expect 13,200 potential project developers to be discovered. Adding an additional 33,000 schools, colleges and research and development organizations, plus 2,000 federal grant recipients, we expect to survey 48,200 individuals and organizations to determine if they have, or know about, projects that could be relevant. Out of the total of 48,200 leads, we expect to find 3,000 projects that meet the criterion for inclusion in the curriculum data base. In addition to the information obtained from the educational leaders as to the existence of projects, we expect to use a number of highly trained researchers to ferret out particularly significant projects via informal communication's channels. This approach is expected to yield 400 relevant projects.

FIGURE 2

UNIT FLOW



### A. Data Gathering Costs

The data gathering phase of the project involves three major steps. The first is the library searches and key man survey, next the survey to the developers of projects, and third the ALERT survey of potentially relevant projects. The total costs for this phase are given in Table 3. Table 4 shows the steps that are involved in each of the processes. Appendix 1 presents the detailed cost analysis of the procedures together with the computer processing required. Estimated times to perform each of the processes will be found in Appendix 5.

Table 3  
Data Gathering Cost Summary

| <u>Process</u>                       | <u>Direct<br/>Cost</u> | <u>Indirect<br/>Cost</u> | <u>Total<br/>Cost</u> |
|--------------------------------------|------------------------|--------------------------|-----------------------|
| Clerical Assistance                  | \$ 11,962              | \$ 4,961                 | \$ 16,923             |
| Questionnaire design & testing       | 1,410                  | 581                      | 1,991                 |
| Mailing of Questionnaire             | 26,475                 | 1,024                    | 27,499                |
| Key punching                         | 25,518                 | 12,759                   | 38,277                |
| Key punch rental                     | 4,050                  | -                        | 4,050                 |
| Computer programming                 | 3,269                  | 1,105                    | 4,374                 |
| Computer time                        | <u>4,260</u>           | <u>-</u>                 | <u>4,260</u>          |
| Subtotal                             | 76,944                 | 20,430                   | 97,374                |
| ALERT data gathering                 | <u>26,079</u>          | <u>11,657</u>            | <u>37,730</u>         |
| TOTAL                                | \$103,023              | \$32,081                 | \$135,104             |
| Total Plus<br>50% Contingency Factor |                        |                          | \$202,656             |

Table 4  
Data Gathering Costs

| <u>Key Man Survey</u>     |          | <u>Developers' Survey</u>  |          |
|---------------------------|----------|----------------------------|----------|
| Collecting names          |          | Collecting names           |          |
| Direct:                   | \$ 1,700 | Direct:                    | \$ 1,700 |
| Indirect:                 | 340      | Indirect:                  | 340      |
| Reading & Coding          |          | Reading & Coding           |          |
| Direct:                   | 4,012    | Direct:                    | 4,300    |
| Indirect:                 | 2,131    | Indirect:                  | 2,150    |
| Key punching              |          | Key punching               |          |
| Direct:                   | 12,600   | Direct:                    | 12,918   |
| Indirect:                 | 6,300    | Indirect:                  | 6,459    |
| Design & Programming      |          | Design & Programming       |          |
| Direct:                   |          | Direct:                    |          |
| Computer time             | 425      | Computer time              | 375      |
| Salary                    | 1,182    | Salary                     | 1,087    |
| Indirect:                 | 561      | Indirect:                  | 544      |
| Computer running          | 1,935    | Computer running           | 2,525    |
| Key punch rental          | 1,960    | Key punch rental           | 2,060    |
| Questionnaire Development |          | Questionnaire Development  |          |
| Direct:                   | 145      | Direct:                    | 1,015    |
| Indirect:                 | 73       | Indirect:                  | 508      |
|                           |          | fee to participants (dir.) | 250      |
| Mailing                   |          | Mailing                    |          |
| Salaries:                 | 820      | Salaries:                  | 1,227    |
| Other direct:             | 10,000   | Other direct:              | 14,428   |
| Indirect:                 | 410      | Indirect:                  | 614      |
| TOTAL                     | \$44,874 | TOTAL                      | \$52,500 |

Table 4 (continued)

ALERT

|  | <u>Direct</u> | <u>Indirect</u> | <u>Total</u> |
|--|---------------|-----------------|--------------|
| Research Assistant Salaries<br>(6 FTE @ \$830/mo.) | \$14,928      | \$ 7,464        | \$22,392     |
| Managers (1 FTE)                                   | 4,375         | 2,187           | 6,562        |
| Typists (2 FTE)                                    | 4,000         | 2,000           | 6,000        |
| Materials, Telephone, etc.                         | <u>2,776</u>  | <u>---</u>      | <u>2,776</u> |
| TOTAL  | \$26,079      | \$11,651        | \$37,730     |

B. Screening and Evaluation Costs

The second phase in the process involves analysis of the survey results and selection of the projects that meet the criterion for inclusion in the system. The costs for this phase are summarized in Table 5. Appendix 2 presents the detailed steps in the process together with a description of the computer programs needed to perform the tasks. Appendix 6 gives the times required to perform the functions.

Table 5  
Screening and Evaluation Cost Summary

|  | <u>Direct<br/>Cost</u> | <u>Indirect<br/>Cost</u> | <u>Total<br/>Cost</u> |
|--|------------------------|--------------------------|-----------------------|
| Clerical: read and code  | \$ 225                 | \$ 113                   | \$ 338                |
| Decision-making personnel  | 14,000                 | 7,000                    | 21,000                |
| Key punching   | 102                    | 51                       | 153                   |
| Key punch rental   | 15                     | --                       | 15                    |
| Computer programming   | 6,135                  | 3,068                    | 9,203                 |
| Computer time  |                        |                          |                       |
| Development  | 2,535                  | --                       | 2,535                 |
| Running  | 2,880                  | --                       | 2,880                 |
|  | <u>\$ 25,892</u>       | <u>\$ 10,232</u>         | <u>\$ 36,124</u>      |
| ALERT screening, writing,<br>validating, & preparation<br>for printing | <u>79,740</u>          | <u>33,450</u>            | <u>113,190</u>        |
| TOTAL  | \$105,632              | \$ 43,682                | \$149,314             |
| Total Plus<br>50% Contingency Factor                                   |                        |                          | \$223,971             |

### C. Product Costs

In this section we present the costs for producing various products. (see Table 6). All of those listed can be derived from the machine-readable data base, with the exception of the ALERT type catalog which contains more detailed information and is written by educational writer/researchers and produced by standard typesetting and printing methods. The list of products is as follows:

1. An "ALERT-like" catalog of 250-400 selected innovations.
2. A "telephone-book" type catalog containing abbreviated listings and indexes of the 2,650 curriculum projects.
3. A "Research in Education type" catalog containing full descriptions of 1,200 projects including abstracts and indexes.
4. Microfiche copies of the products.
5. Sets of 3x5-inch cards each containing the curriculum project descriptions.
6. Special selected lists or limited catalogs of projects, such as lists pertaining to early childhood development or social studies.

Table 6

#### Summary of Product Production Costs

| <u>Product</u>  | <u>Low Estimates of Press Run</u> |                   |                  | <u>High Estimates &amp; Press Run</u> |                   |                  |
|---|-----------------------------------|-------------------|------------------|---------------------------------------|-------------------|------------------|
|   | <u>Press Run</u>                  | <u>Total Cost</u> | <u>Unit Cost</u> | <u>Press Run</u>                      | <u>Total Cost</u> | <u>Unit Cost</u> |
| Alert-type catalog                                    | 3,500                             | \$ 8,000          | \$2.28           | 5,000                                 | \$ 8,400          | \$1.68           |
| Telephone-book type catalog without project abstracts | 5,000                             | 15,180            | 3.01             | 6,000                                 | 15,840            | 2.64             |
| Catalog with abstracts of selected projects           | 8,000                             | <u>16,540</u>     | 2.07             | 10,000                                | <u>17,620</u>     | 1.76             |
| TOTAL   |                                   | \$39,720          |                  |                                       | \$41,860          |                  |
| Total Plus 50% Contingency Factor                     |                                   | \$59,580          |                  |                                       | \$62,790          |                  |

The costs for the limited catalogs covering specific subject areas (Item 6) are particularly difficult to calculate because the demand is uncertain. Since we expect 10 different subject area catalogs, the uncertainty is multiplied by a factor of 10 and becomes very difficult indeed. Since the same function can be served by an on-line search within the given subject area, and with a higher degree of specificity, low-demand catalogs may be dropped entirely.

Accordingly, we have omitted this group of products from our major calculations. They may be considered a bonus category: the cost of data collection and screening is borne entirely by the other products, only the printing costs need be considered if this product is to be included. These are shown in Table 7.

Table 7

Printing Costs, Subject Area Catalogs

Assumed: 10 catalogs, averaging 270 entries per catalog.

| <u>Low Press Run</u> |                  |            |           | <u>High Press Run</u> |                  |            |           |
|----------------------|------------------|------------|-----------|-----------------------|------------------|------------|-----------|
| Copies each Catalog  | Production Total | Total Cost | Unit Cost | Copies each Catalog   | Production Total | Total Cost | Unit Cost |
| 5,000                | 50,000           | \$30,600   | \$0.61    | 8,000                 | 80,000           | \$42,000   | \$0.50    |

Besides the cost summaries presented for the three basic products in the preceding table, we consider the possibility of the production of microfiche and 3x5 inch cards as other potential products. Unit costs for these products are difficult to calculate without knowing the exact product mix.

In the calculations that follow it is assumed that both types of catalogs (the "RIE like," and the "telephone book like" catalogs) are produced on fiche

and that fixed costs for the products are divided on the basis of number of microfiche cards produced for each product.

The 3x5 index cards (Item 5) are designed to be used in a situation where individual records of the projects are desirable. Each card has printed on it all the information that would be in the "telephone book like" catalog. There are a total of four cards describing each project, all the same except for the main entry. In other words, access is provided through four different attributes of each project.

Table 8  
Production Costs Alternative Products

| Product  | Press Run                       | Total Unit Cost Per Set |
|--|---------------------------------|-------------------------|
| Microfiche copy of telephone book type catalog   | 4800                            | \$ 0.55                 |
| Microfiche copy of RIE-like catalog              | 3000                            | 0.62                    |
| 3x5 inch cards containing telephone like catalog | 4800 cards per set for 900 sets | 10.64                   |

The final product that results from the system is the on-line searching capability. In the cost analysis of providing such a searching capability, we assume that a commercially available on-line information retrieval system (such as ORBIT from SDC) is used and that there are no design and programming costs of developing such a system. A number of additional factors influence the derivation of these costs. First we assume a regional network of twelve search centers each with its own terminal (ERIC centers or their equivalent). In addition we assume that each center averages eight requests per week that can be handled by an on-line search of the curriculum data base. Each search is assumed to take 15 minutes of connect time with the central computer and an additional 30 minutes of preparation time per query for a total of 6 hours



of professional time per week. It is also assumed that existing information centers are used in providing this additional service so that no capital outlays are required for buildings, etc.

Table 9  
Cost of Providing an On-Line Search  
Facility Base of the Curriculum Data

| Cost Element   | Yearly Cost for<br>One Search Facility | Yearly Cost for<br>12 centers |
|--|--|-------------------------------|
| <u>Yearly Costs</u>  |  |                               |
| Personnel: 6 hrs./week<br>at \$14,000/year                               | \$2,500                                | \$ 30,000                     |
| Connect change to on-line<br>system \$35/hour                            | 3,500                                  | 42,200                        |
| Line charges at \$10/hour  | 1,000                                  | 12,000                        |
| Terminal rental \$100/month  | 1,200                                  | 14,400                        |
| Print search results \$.05/page<br>for average of 10 pages per<br>search | 200                                    | 2,400                         |
| Total Yearly Cost  | \$8,400                                | \$100,800                     |
| <u>Initial Start-up Costs<br/>(first year only)</u>                      |  |                               |
| Training fee   | 200                                    | 2,400                         |
| Start-up fee   |  | 500                           |
| Total Start-up Costs   | <u>\$ 200</u>                          | <u>\$ 2,900</u>               |
| Total first year costs   | \$8,600                                | \$103,700                     |
| Total Plus 50% Contingency Factor  | \$12,900                               | \$155,550                     |

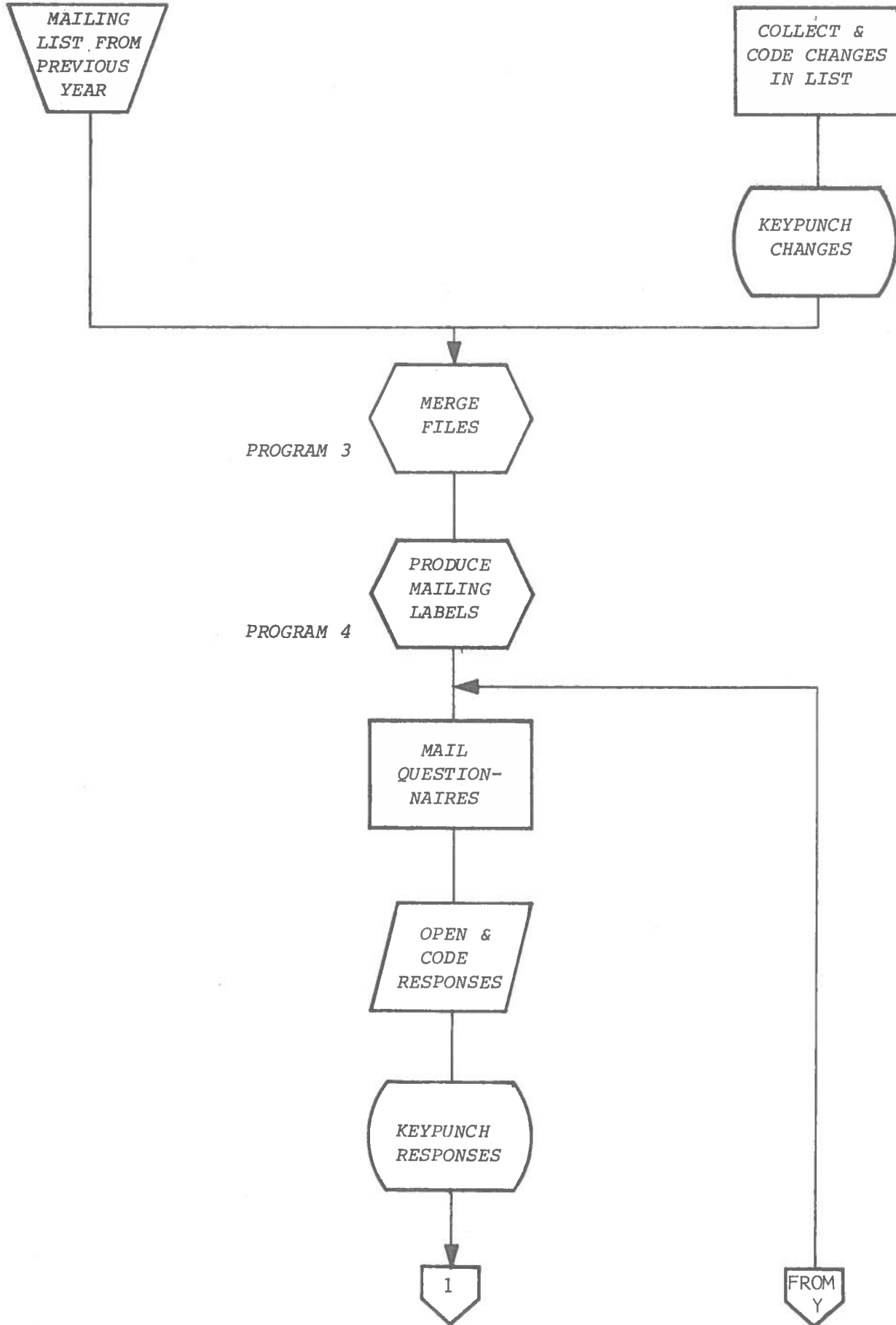
Based on the data given in Table 9 we can calculate the unit cost per search, estimating eight searches per week per center for 4800 searches per year. The unit cost of \$15,50 per search for the first year and \$14,90 per search for each succeeding year.

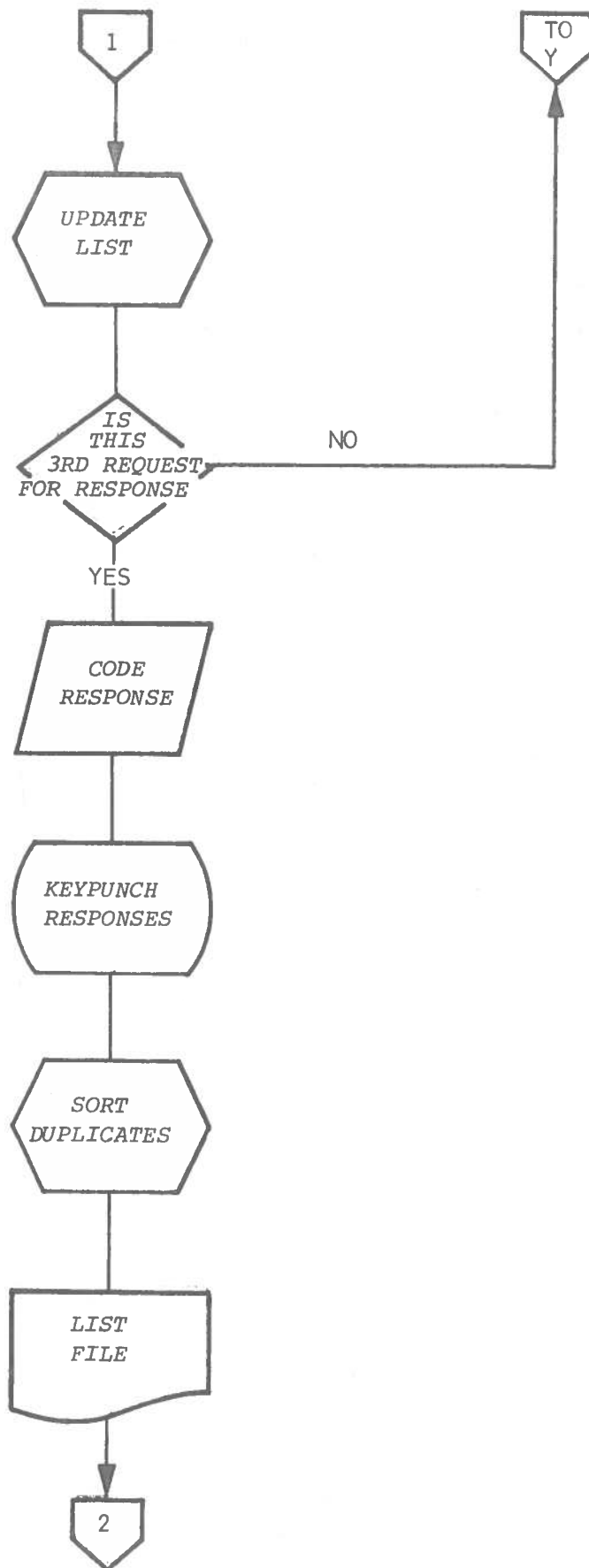
#### D. Update Costs

In addition to consideration of costs of the initial cycle of gathering the curriculum information, analyzing and evaluating the projects and finally producing the products, there is an additional step in the cost analysis. It is assumed that the information system is an ongoing project and that the data base of projects will be updated periodically. A number of initial costs related to program development only occur in the first year of the project, so that updating costs will be less. (see Exhibit 2)

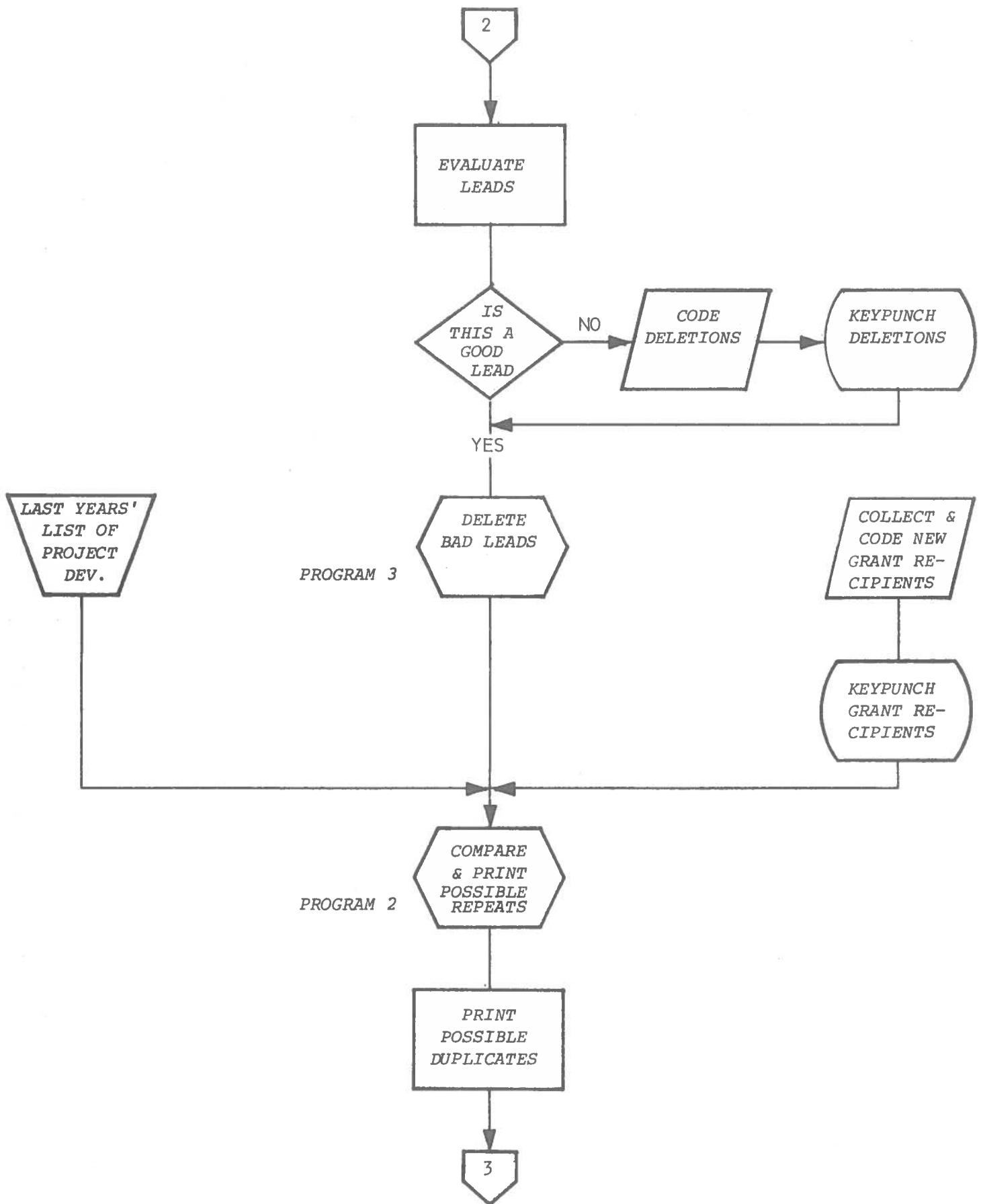
The update processing is intended to use the information from the previous year as much as possible in order to eliminate the cost of redoing things; e.g., developers whose projects have been published and for which project descriptions are therefore already available on tape are to be sent copies of the descriptions as they exist and asked to indicate changes. This avoids the confusion of trying to decide which projects are redundant and the waste of re-keying essentially the same 500-words of description each year.

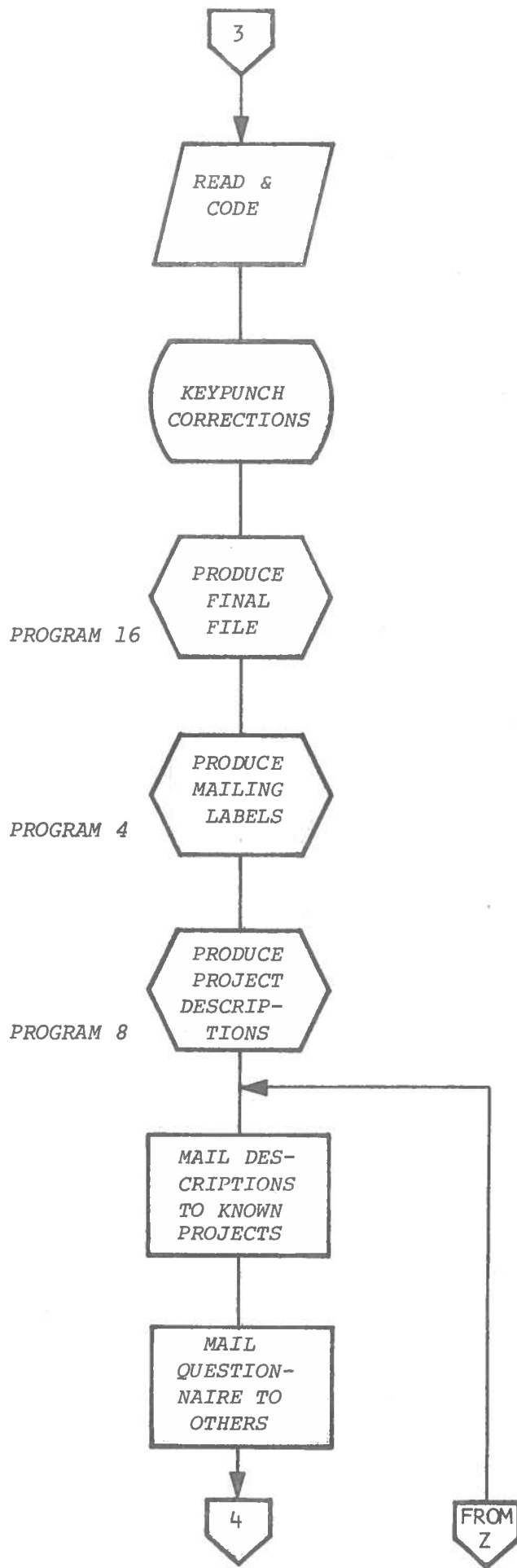
EXHIBIT 2: UPDATING CYCLE

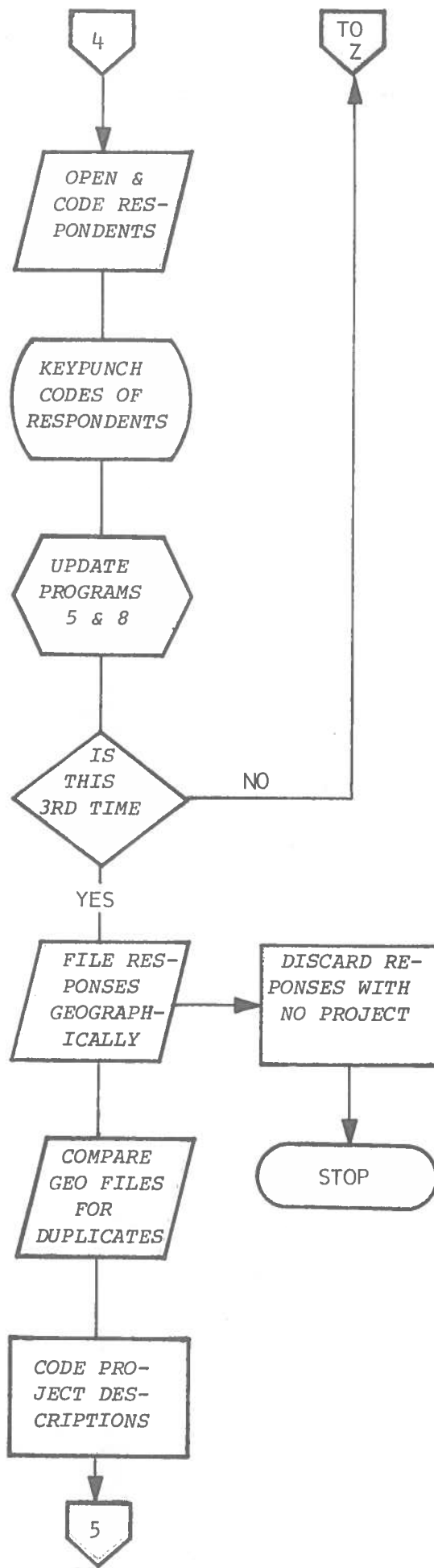


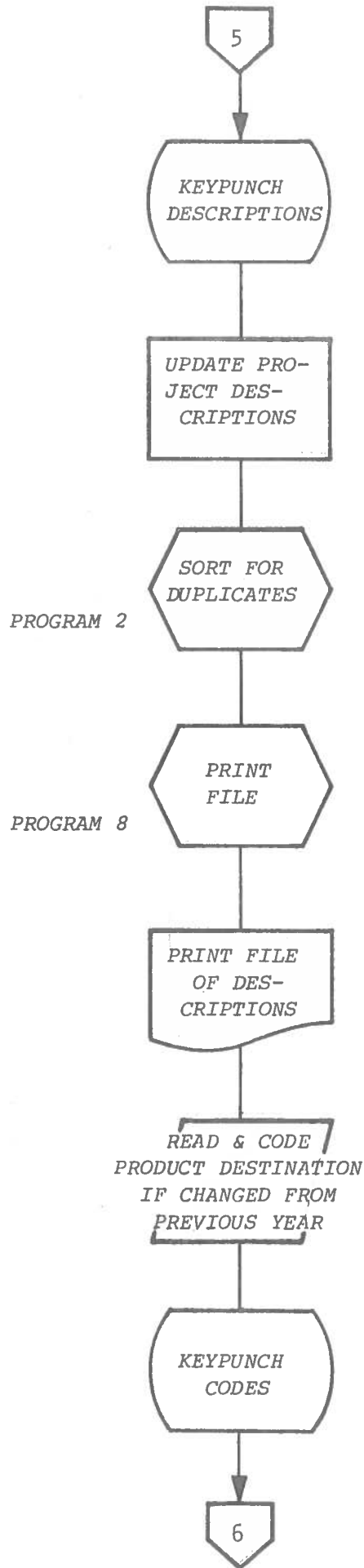


PROGRAM 2











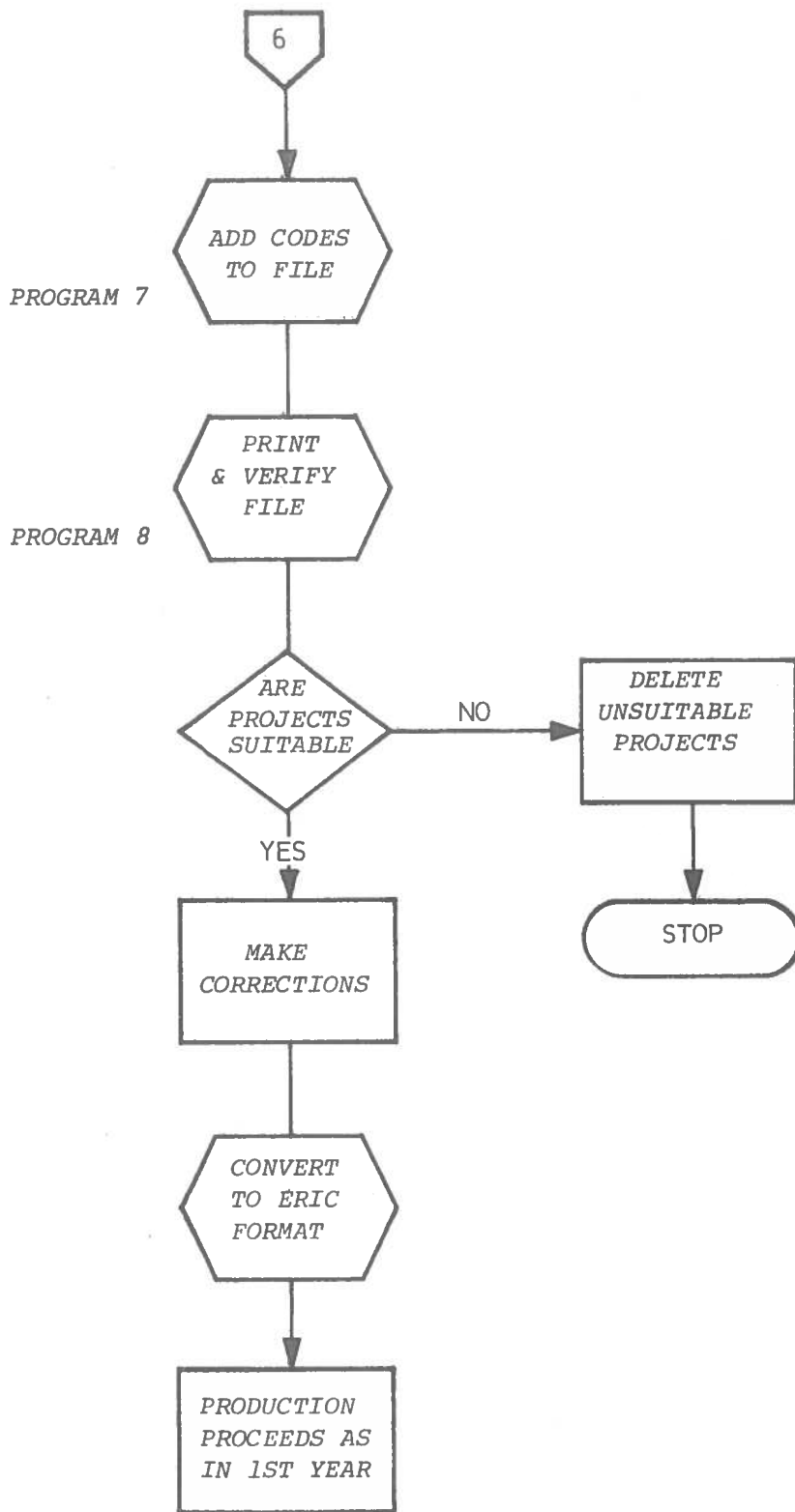


Table 10 presents a summary of the data gathering costs for each year after the first year, and Table 11 provides the cost summary for the screening and evaluation phase. Table 12 presents the production costs. Appendix 3 presents a detailed breakdown of the update costs of the data gathering phase and the steps in the updating process of conducting the library searches, and key man and developers surveys. Appendix 4 gives the detailed steps in the process of screening and evaluating the updated information (except for ALERT) and Appendix 7 presents the number of man days required to perform the updating for data gathering and screening and evaluation (including ALERT.)

Table 10  
Data Gathering Cost Summary (Update)

|                                   | <u>Direct<br/>Cost</u> | <u>Indirect<br/>Cost</u> | <u>Total Cost</u> |
|-----------------------------------|------------------------|--------------------------|-------------------|
| Clerical                          | \$ 7,462               | \$ 3,731                 | \$11,193          |
| Keypunching                       | 9,000                  | 4,500                    | 13,500            |
| Mailing                           | 27,990                 | 1,275                    | 29,175            |
| Computer Time                     | 3,755                  |                          | 3,755             |
| Keypunch Rental                   | <u>1,475</u>           |                          | <u>1,475</u>      |
| Subtotal                          | 49,682                 | 9,506                    | 59,188            |
| ALERT Data Gathering*             | <u>13,283</u>          | <u>2,554</u>             | <u>15,837</u>     |
| Total                             | \$62,965               | \$12,060                 | \$75,025          |
| Total Plus 50% Contingency Factor |                        |                          | \$112,538         |

\*ALERT will be almost completely repeated every two years. These are the amortized figures.

Table 11

## Screening and Evaluation Cost Summary (Update)

|  | <u>Direct<br/>Cost</u> | <u>Indirect<br/>Cost</u> | <u>Total Cost</u> |
|--|------------------------|--------------------------|-------------------|
| Clerical   | \$ 75                  | \$ 38                    | \$ 113            |
| Decision-making personnel  | 14,000                 | 7,000                    | 21,000            |
| Keypunching  | 16                     | 8                        | 24                |
| Keypunch Rental  | 5                      |                          | 5                 |
| Computer Time  | <u>2,860</u>           |                          | <u>2,860</u>      |
| Subtotal   | \$16,956               | \$ 7,046                 | \$24,002          |
| ALERT screening, writing,<br>validating and preparation<br>for printing* | <u>39,849</u>          | <u>7,661</u>             | <u>47,510</u>     |
| Total  | \$56,805               | \$14,707                 | \$71,512          |
| Total Plus 50% Contingency Factor  |                        |                          | \$107,260         |

\*ALERT will be almost completely repeated every two years. These are the amortized figures.

Table 12

Summary of Product Production Costs  
(Update)

|   | Low Estimates of Press Run |                       |                      | High Estimates of Press Run |                       |                      |
|---|----------------------------|-----------------------|----------------------|-----------------------------|-----------------------|----------------------|
|   | <u>Press<br/>Run</u>       | <u>Total<br/>Cost</u> | <u>Unit<br/>Cost</u> | <u>Press<br/>Run</u>        | <u>Total<br/>Cost</u> | <u>Unit<br/>Cost</u> |
| ALERT type catalog  | 5,000                      | \$ 8,400              | \$1.68               | 8,000                       | \$ 8,900              | \$1.11               |
| "Telephone book-type"<br>catalog without abstracts        | 6,000                      | 15,840                | 2.64                 | 10,000                      | 24,080                | 2.41                 |
| Catalog with abstracts of<br>selected projects "RIE type" | 10,000                     | 17,620                | 1.76                 | 15,000                      | 25,720                | 1.61                 |
| Total   |                            | <u>\$41,860</u>       |                      |                             | <u>\$58,700</u>       |                      |
| Total Plus 50% Contingency Factor                         |                            | \$62,790              |                      |                             | \$88,050              |                      |

#### IV. Cost Summary

The total cost of the proposed information system is given in Table 13. Unit costs for the data gathering and screening and evaluation phases are supplied in Tables 14 and 15. The unit costs for producing the various products have been presented previously in Tables 6 and 12. Tables 16 and 17 gather all of this together to present unit costs for gathering and screening the data and printing the products. (See Appendix 10 for a discussion of the method of assigning burdens in Tables 16 and 17.)

Table 13

Total Cost of System Based on  
Complete Efficiency and 1972 Prices

|                        | Initial Year     |                   | Succeeding Years |                   |
|------------------------|------------------|-------------------|------------------|-------------------|
|                        | Low Press<br>Run | High Press<br>Run | Low Press<br>Run | High Press<br>Run |
| Data gathering         | \$135,104        | \$135,104         | \$75,025         | \$75,025          |
| Screening & evaluating | 149,314          | 149,314           | 71,512           | 71,512            |
| Product costs          | 39,720           | 41,860            | 41,860           | 58,700            |
| On-line costs          | 103,700          | 103,700           | 100,800          | 100,800           |
| TOTAL                  | \$427,838        | \$429,978         | \$289,197        | \$306,037         |

Table 13a

Total Cost of System  
Including 50% Contingency Factor

|                        | Initial Year     |                   | Succeeding Years |                   |
|------------------------|------------------|-------------------|------------------|-------------------|
|                        | Low Press<br>Run | High Press<br>Run | Low Press<br>Run | High Press<br>Run |
| Data gathering         | \$202,656        | \$202,656         | \$112,538        | \$112,538         |
| Screening & evaluating | 223,971          | 223,971           | 107,268          | 107,268           |
| Product costs          | 59,580           | 62,790            | 62,790           | 88,050            |
| On-line costs          | 155,550          | 155,550           | 151,200          | 151,200           |
| Total                  | \$641,757        | \$644,967         | \$433,796        | \$459,056         |

Table 14

Function Unit Costs (Initial Year)  
Based on Complete Efficiency and 1972 Prices

|  | <u>Number of Units<br/>Processed</u> | <u>Unit Cost</u> |
|--|--------------------------------------|------------------|
| Data gathering (less ALERT)            | 3000 projects                        | \$32.46          |
| Screening & evaluation<br>(less ALERT) | 2650 projects                        | 13.41            |

Table 14a

Function Unit Costs (initial year)  
Including 50% Contingency Factor

|  | <u>Number of Units<br/>Processed</u> | <u>Unit Cost</u> |
|--|--------------------------------------|------------------|
| Data gathering (less ALERT)              | 3000 projects                        | \$48.69          |
| Screening and evaluation<br>(less ALERT) | 2650 projects                        | \$20.12          |

Table 15

Function Unit Costs (Update)  
Based on Complete Efficiency and 1972 Prices

|  | <u>Number of Units<br/>Processed</u> | <u>Unit Cost</u> |
|--|--------------------------------------|------------------|
| Data gathering (less ALERT)            | 3000 projects                        | \$19.72          |
| Screening & evaluation<br>(less ALERT) | 2650 projects                        | 9.32             |

Table 15a

Function Unit Costs (Update)  
Including 50% Contingency Factor

|  | <u>Number of Units<br/>Processed</u> | <u>Unit Cost</u> |
|--|--------------------------------------|------------------|
| Data gathering (less ALERT)            | 3000 projects                        | \$29.58          |
| Screening & evaluation<br>(less ALERT) | 2650 projects                        | \$13.98          |

Table 16

Complete Product Unit Costs for Development and Production  
(Initial Year) Based on Complete Efficiency and 1972 Prices

| <u>Product</u>                                 | <u>Low Press Run</u> |                   |                  | <u>High Press Run</u> |                   |                  |
|--|----------------------|-------------------|------------------|-----------------------|-------------------|------------------|
|  | <u>Units</u>         | <u>Total Cost</u> | <u>Unit Cost</u> | <u>Units</u>          | <u>Total Cost</u> | <u>Unit Cost</u> |
| ALERT-type catalog                             | 3,500                | \$158,920         | \$45.34          | 5,000                 | \$159,320         | \$31.86          |
| Telephone book-catalog<br>without abstracts    | 5,000                | 88,411            | 17.68            | 6,000                 | 89,071            | 14.84            |
| Catalog with abstracts<br>of selected projects | 8,000                | 46,577            | 5.82             | 10,000                | 47,657            | 4.77             |
| On-line searches                               | 4,800                | 103,700           | 15.50            |                       |                   |                  |

Table 16a

Complete Product Unit Costs for Development and Production  
(Initial Year) Including 50% Contingency Factor

| <u>Product</u>                                 | <u>Low Press Run</u> |                   |                  | <u>High Press Run</u> |                   |                  |
|--|----------------------|-------------------|------------------|-----------------------|-------------------|------------------|
|  | <u>Units</u>         | <u>Total Cost</u> | <u>Unit Cost</u> | <u>Units</u>          | <u>Total Cost</u> | <u>Unit Cost</u> |
| ALERT-type catalog                             | 3,500                | \$238,380         | \$68.01          | 5,000                 | \$238,980         | \$47.79          |
| Telephone book-catalog<br>without abstracts    | 5,000                | 132,617           | 26.52            | 6,000                 | 133,607           | 22.26            |
| Catalog with abstracts<br>of selected projects | 8,000                | 69,866            | 8.73             | 10,000                | 71,486            | 7.16             |
| On-line searches                               | 4,800                | 155,550           | 23.25            |                       |                   |                  |

Table 17

Complete Product Unit Costs for Development and Production  
(Update) Based on Complete Efficiency and 1972 Prices

| <u>Product</u>                                   | <u>Low Press Run</u> |                   |                  | <u>High Press Run</u> |                   |                  |
|--|----------------------|-------------------|------------------|-----------------------|-------------------|------------------|
|  | <u>Units</u>         | <u>Total Cost</u> | <u>Unit Cost</u> | <u>Units</u>          | <u>Total Cost</u> | <u>Unit Cost</u> |
| ALERT-type catalog                               | 5,000                | \$159,320         | \$31.86          | 8,000                 | \$159,820         | \$19.97          |
| Telephone book-type catalog<br>without abstracts | 6,000                | 88,062            | 14.67            | 10,000                | 96,302            | 9.63             |
| Catalog with abstracts of<br>selected projects   | 10,000               | 38,588            | 3.86             | 15,000                | 46,688            | 3.11             |
| On-line searches                                 | 4,800                | 100,800           | 14.90            |                       |                   |                  |

Table 17a

Complete Product Unit Costs for Development and Production  
(Update) Including 50% Contingency Factor

| <u>Product</u>                                   | <u>Low Press Run</u> |                   |                  | <u>High Press Run</u> |                   |                  |
|--|----------------------|-------------------|------------------|-----------------------|-------------------|------------------|
|  | <u>Units</u>         | <u>Total Cost</u> | <u>Unit Cost</u> | <u>Units</u>          | <u>Total Cost</u> | <u>Unit Cost</u> |
| ALERT-type catalog                               | 5,000                | \$238,980         | \$47.79          | 8,000                 | \$239,730         | \$29.96          |
| Telephone book-type catalog<br>without abstracts | 6,000                | 132,093           | 22.01            | 10,000                | 144,453           | 14.45            |
| Catalog with abstracts of<br>selected projects   | 10,000               | 57,882            | 5.79             | 15,000                | 70,032            | 4.67             |
| On-line searches                                 | 4,800                | 151,200           | 22.35            |                       |                   |                  |

Appendix 1

Key Man Survey and Library Search  
(Not including ALERT data gathering costs)



Key Man Survey and Library Search

|  | Salaries        | Computer       | Other           |
|--|-----------------|----------------|-----------------|
| 1. Collecting & coding names   | \$1700          |                |                 |
| 2. Keying names  | 6000            |                | 900             |
| 3. Program #1 to convert to tape file<br>development<br>running costs                  | 60              | 50<br>235      |                 |
| 4. Program #2 to sort duplicate names<br>development<br>running costs                  | 250             | 75<br>430      |                 |
| 5. Program #4 to print mailing labels<br>development<br>running costs                  | 132             | 50<br>135      |                 |
| 6. Writing questionnaire & letters   | 145             |                |                 |
| 7. Mailing   | 820             |                | 10,000          |
| 8. Opening & recording responses   | 230             |                |                 |
| 9. Keying codes of respondents   | 250             |                |                 |
| 10. Program #5 to update file & produce<br>follow-up mailing<br>development<br>running | 130             | 50<br>500      |                 |
| 11. Code responses   | 3850            |                |                 |
| 12. Key responses  | 6000            |                | 1000            |
| 13. Program #16 to convert to tape file<br>development<br>running                      | 30              | 25<br>80       |                 |
| 14. Program #2 sorting duplicates & printing<br>development<br>running                 | 250             | 75<br>335      |                 |
| 15. Read file & code deletions   | 162             |                |                 |
| 16. Key deletions & verify   | 400             |                | 60              |
| 17. Program #3 to delete entries<br>development<br>running                             | 330             | 100<br>220     |                 |
| <b>Total Cost</b>  | <b>\$20,739</b> | <b>\$2,360</b> | <b>\$11,960</b> |

Developers' Survey

|  | Salaries        | Computer       | Other           |
|--|-----------------|----------------|-----------------|
| 1. Collect additional names & code   | \$1700          |                |                 |
| 2. Keying names  | 9750            |                | 1560            |
| 3. Program #16 to convert to tape file<br>development<br>running                               | 30              | 25<br>275      |                 |
| 4. Program #2 to sort for duplicate names<br>development<br>running                            | 250             | 75<br>800      |                 |
| 5. Program #4 to produce mailing labels<br>development<br>running                              | 132             | 50<br>300      |                 |
| 6. Writing of field testing questionnaires;<br>fee to participants                             | 1015            |                | 250             |
| 7. Mailing   | 1227            |                | 14,428          |
| 8. Opening, recoding, filing responses   | 350             |                |                 |
| 9. Keying codes of respondents   | 288             |                | 50              |
| 10. Program #5 to update file & produce<br>follow-up mailing (twice)<br>development<br>running | 130             | 50<br>800      |                 |
| 11. Sort geographic files for duplicates   | 625             |                |                 |
| 12. Code descriptions of projects  | 3325            |                |                 |
| 13. Key descriptions of projects   | 2880            |                | 450             |
| 14. Program #16 to convert to tape file<br>development<br>running                              | 295             | 100<br>150     |                 |
| 15. Program #2 to sort duplicates<br>development<br>running                                    | 250             | 75<br>200      |                 |
| <b>Total Cost</b>  | <b>\$22,247</b> | <b>\$2,900</b> | <b>\$16,738</b> |

Appendix 2

Screening and Evaluation  
(Not including ALERT)

Screening and Evaluation

|   | Salaries | Computer   | Other |
|---|----------|------------|-------|
| 1. Program #8 to print file<br>development<br>running   | 200      | 75<br>150  |       |
| 2. Read file & code product destinations  | 14000    |            |       |
| 3. Key & verify codes   | 70       |            | 10    |
| 4. Program #7 to append codes<br>development<br>running                                       | 400      | 115<br>30  |       |
| 5. Key data from Alert  | 32       |            | 5     |
| 6. Program #6 to add Alert data<br>development<br>running                                     | 295      | 100<br>20  |       |
| 7. Program #8 to print file<br>development<br>running   | 200      | 75<br>150  |       |
| 8. Read file to verify  | 150      |            |       |
| 9. Program #9 to convert to ERIC -<br>compatible format<br>development<br>running             | 1190     | 560<br>450 |       |
| 10. Program #13 to generate select<br>subject area lists & print<br>development<br>running    | 730      | 350<br>160 |       |
| 11. Program #15 to index<br>development<br>running  | 510      | 170<br>320 |       |
| 12. Read to verify  | 25       |            |       |
| 13. Program #12 to generate short catalog<br>with abstracts & print<br>development<br>running | 730      | 350<br>160 |       |
| 14. Program #15 to index<br>development<br>running  | 510      | 170<br>640 |       |

Screening and Evaluation -- page 2

|   | Salaries | Computer   | Other |
|---|----------|------------|-------|
| 15. Read to verify  | 25       |            |       |
| 16. Program #11 to generate complete<br>brief-entry catalog<br>development<br>running | 860      | 400<br>160 |       |
| 17. Program #15 to index<br>development<br>running                                    | 510      | 170<br>640 |       |
| 18. Read to verify  | 25       |            |       |
| Total Cost  | \$20,462 | \$5,415    | \$15  |

Update Data Gathering

| Library Searches and<br>Key Man Survey |          | Developers' Survey |          |
|--|----------|--------------------|----------|
| Reading & coding                       |          | Reading & coding   |          |
| direct:                                | \$ 4,462 | direct:            | \$ 3,000 |
| indirect:                              | 2,231    | indirect:          | 1,500    |
| Keypunching                            |          | Keypunching        |          |
| direct:                                | 6,664    | direct:            | 2,336    |
| indirect:                              | 3,332    | indirect:          | 1,168    |
| Mailing                                |          | Mailing            |          |
| salaries:                              | 820      | salaries:          | 1,730    |
| other direct:                          | 10,000   | other direct:      | 15,440   |
| indirect:                              | 410      | indirect:          | 865      |
| Computer time                          | 1,135    | Computer time      | 2,620    |
| Keypunch rental                        | 1,100    | Keypunch rental    | 375      |
|  | \$30,154 |                    | \$29,034 |

Appendix 3

Update Data Gathering  
(Not including ALERT)

Key Man Survey - Update

|  | Salaries        | Computer       | Other           |
|--|-----------------|----------------|-----------------|
| 1. Collecting & coding changes in list                       | \$ 200          |                |                 |
| 2. Keying changes  | 64              |                | 10              |
| 3. Program #3 to update list from previous year              |                 | 165            |                 |
| 4. Program #4 to produce mailing labels                      |                 | 135            |                 |
| 5. Mailing   | 820             |                | 10,000          |
| 6. Opening & recording responses                             | 250             |                |                 |
| 7. Keying codes of respondents                               | 200             |                | 30              |
| 8. Program #5 to update & produce follow-up mailings (twice) |                 | 400            |                 |
| 9. Code responses  | 3850            |                |                 |
| 10. Key responses  | 6000            |                |                 |
| 11. Program #16 to convert to tape                           |                 | 80             |                 |
| 12. Program #2 to sort for duplicates & print                |                 | 235            |                 |
| 13. Read file & code deletions                               | 162             |                |                 |
| 14. Key deletions & verify                                   | 400             |                | 60              |
| 15. Program #3 to delete                                     |                 | 120            |                 |
| <b>Total Cost</b>  | <b>\$11,946</b> | <b>\$1,135</b> | <b>\$10,100</b> |



Developers' Survey - Update

|   | Salaries | Computer | Other    |
|---|----------|----------|----------|
| 1. Collect & code new grant recipients                                    | \$ 250   |          |          |
| 2. Key new grant recipients   | 576      |          | 100      |
| 3. Use program #2 to compare new<br>developers' list with previous year   |          | 800      |          |
| 4. Read & code corrections  | 575      |          |          |
| 5. Key corrections  | 160      |          |          |
| 6. Program #16 to produce final file                                      |          | 270      |          |
| 7. Program #4 - mailing labels  |          | 200      |          |
| 8. Program #8 - descriptions of projects<br>from previous year for review |          | 150      |          |
| 9. Mail   | 1730     |          | 15400    |
| 10. Update list - program #5 -<br>produce follow-up                       |          | 800      |          |
| 11. Program #8 for follow-up of no. 8                                     |          | 200      |          |
| 12. Open, code, file responses  | 1850     |          |          |
| 13. Review geographic files   | 325      |          |          |
| 14. Key descriptions  | 1600     |          | 250      |
| 15. Program #6 to create final file                                       |          | 100      |          |
| 16. Program #2 to sort duplicates   |          | 100      |          |
| Total Cost  | \$7,066  | \$2,620  | \$15,750 |

Appendix 4

Update Screening and Evaluation  
(Not including ALERT)

Update Screening and Evaluation

|  | Salaries | Computer | Other |
|--|----------|----------|-------|
| 1. Program #8 to print file  |          | 150      |       |
| 2. Read & code product destination if<br>change from previous year | \$14000  |          |       |
| 3. Key & verify codes  | 16       |          | 5     |
| 4. Program #7 to add codes   |          | 30       |       |
| 5. Program #8 to print & verify                                    |          | 150      |       |
| 6. Program #9 to convert to ERIC format                            |          | 450      |       |
| 7. Program #13 to generate select subject<br>area lists & print    |          | 160      |       |
| 8. Program #15 to index 7)   |          | 320      |       |
| 9. Read to verify  | 25       |          |       |
| 10. Program #12 to generate short catalog<br>with abstracts        |          | 160      |       |
| 11. Program #15 to index 10)                                       |          | 640      |       |
| 12. Read   | 25       |          |       |
| 13. Program #11 to generate complete,<br>brief-entry catalog       |          | 160      |       |
| 14. Program #15 to index 13)                                       |          | 640      |       |
| 15. Read to verify   | 25       |          |       |
| Total Cost   | \$14,091 | \$2,860  | \$5   |

Appendix 5

Time-Key Man Survey and Library Searches  
(Not including ALERT)

Time-Key Man Survey and Library Searches

|                                | Survey    | 6000<br>Clerical | In Work Days<br>7500<br>Keypunch | 7000<br>Higher | 14000<br>Highest |
|--------------------------------|-----------|------------------|----------------------------------|----------------|------------------|
| Collecting & coding names      |           | 64               |                                  |                |                  |
| Keying names                   |           |                  | 184                              |                |                  |
| Write questionnaire/letters    |           |                  |                                  |                | 2                |
| Opening & coding respondents   |           | 10               |                                  |                |                  |
| Elapsed time survey 1          | 10        |                  |                                  |                |                  |
|                                | 2         |                  |                                  |                |                  |
|                                | 3         |                  |                                  |                |                  |
| Code responses                 |           | 154              |                                  |                |                  |
| Key codes of respondents       |           |                  | 6                                |                |                  |
| Key responses                  |           |                  | 200                              |                |                  |
| Read responses & code discards |           |                  |                                  | 6              |                  |
| Key & verify deletions         |           |                  | 6                                |                |                  |
| <b>Total Working Days</b>      | <b>35</b> | <b>228</b>       | <b>396</b>                       | <b>6</b>       | <b>2</b>         |

Time-Developer Survey

|                                       | Survey    | 7500<br>Keypunch | 6000<br>Clerical | 7000<br>Higher | 14000<br>Highest |
|---------------------------------------|-----------|------------------|------------------|----------------|------------------|
| Keying additional names               |           | 315              |                  |                |                  |
| Collecting & coding these names       |           |                  | 40               |                |                  |
| Writing & field testing questionnaire |           |                  |                  |                | 15               |
| Opening, recording, filing responses  |           |                  | 14               |                |                  |
| Keying codes of respondents           |           | 9                |                  |                |                  |
| Sort thru geographic files            |           |                  | 25               |                |                  |
| Key descriptions of projects          |           | 90               |                  |                |                  |
| Survey: elapsed time 1                | 10        |                  |                  |                |                  |
| 2                                     | 10        |                  |                  |                |                  |
| 3                                     | 15        |                  |                  |                |                  |
| Code descriptions of projects         |           |                  | 113              |                |                  |
| <b>Total Working Days</b>             | <b>35</b> | <b>414</b>       | <b>182</b>       |                | <b>15</b>        |

Appendix 6

Time-Prepare Data For Production  
(Includes both Data Gathering and  
Processing Time for ALERT)

Time-Prepare Data For Production

|                                     | 7500<br>Key | 6000<br>Clerical | 7000<br>Higher | 14000<br>Highest |
|-------------------------------------|-------------|------------------|----------------|------------------|
| Screen list of 3000 projects & code |             |                  |                | 225              |
| Key & verify                        | 2           |                  |                |                  |
| Key data from ALERT                 | 1           |                  |                |                  |
| Read entire file to verify          |             | 6                |                |                  |
| Totle Working Days                  | 3           | 6                |                | 225              |



ALERT Data Gathering and Processing:

ALERT type materials can continue to be developed by Far West Laboratory for Educational Research and Development or can be subcontracted to ERIC Clearinghouse and other similar agencies. This table indicates the full time equivalence FTE of research assistants' time necessary to produce 400 entries in the period of one year. The FTE estimates have been broken down by subject area, following those assigned to ERIC Clearinghouses as much as possible.

Clearinghouse research assistants, based on 50 projects/yr. = .75 FTE

|                          |   |
|--------------------------|---|
| Disadvantaged            | .60 FTE   |
| Early Child.             | .30   |
| Foreign Languages        | .30   |
| Reading & Commun.        | 1.00  |
| Sci. & Math              | .80   |
| Soc. Studies             | .50   |
| Teacher educ.            | .50   |
| Aesthetics and Fine Arts | .20   |
| Affective educ.          | .20   |
| Career educ.             | .50   |
| Drug educ.               | .20   |
| Environmental educ.      | .20   |
| Ethnic educ.             | .20   |
| Bilingual educ.          | .30   |
| Health/Sex educ.         | .20   |
| Total                    | <hr/> 6.00 FTE @ \$9,960/yr. or<br>\$830/mo. = \$59,760 |

\$59,714 Salaries for Research Assistants

Appendix 7

Updating-Time  
(Not including ALERT)

Updating-Time

Key Man Survey

|                                     | Elapsed | Keypunch | Clerical |
|-------------------------------------|---------|----------|----------|
| Collecting & coding changes in list |         |          | 8        |
| Keying changes                      |         | 2        |          |
| 1st mailing                         | 10      |          |          |
| 2nd mailing                         | 10      |          |          |
| 3rd mailing                         | 15      |          |          |
| Opening & recording responses       |         |          | 10       |
| Keying codes of respondents         |         | 6        |          |
| Code responses                      |         |          | 154      |
| Key responses                       |         | 200      |          |
| Read & code discards                |         |          | 6        |
| Key & verify deletions              |         | 6        |          |
| Total Working Days                  | 35      | 214      | 178      |

Updating-Time  
Developers' Survey

|  | Survey    | Keypunch  | Clerical   |
|--|-----------|-----------|------------|
| Keying additional names                            |           | 18        |            |
| Collecting & coding these                          |           |           | 10         |
| Read list to compare changes<br>from previous year |           |           | 23         |
| Opening, recording, etc. responses                 |           |           | 72         |
| Code changes in previously published<br>projects   |           |           | 2          |
| Sort geographic files for duplicates               |           |           | 13         |
| Key 2000 descriptions                              |           | 50        |            |
| Survey elapsed time: 1                             | 10        |           |            |
| 2  | 10        |           |            |
| 3  | 15        |           |            |
| <b>Total Working Days</b>                          | <b>35</b> | <b>68</b> | <b>120</b> |

Updating-Time  
Prepare for Production

|                                  | Keypunch | Clerical | 14,000<br>Highest |
|----------------------------------|----------|----------|-------------------|
| Read & code product destinations |          |          | 220               |
| Key codes & verify               | .5       |          |                   |
| Total Working Days               | .5       |          | 220               |

Appendix 8  
Questionnaires

Developers' Questionnaire

Please enter any corrections in your mailing address here:

Name \_\_\_\_\_

Organization \_\_\_\_\_

Street Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Project title (if it has no final title, please supply a working title in brackets):

\_\_\_\_\_

Name of organization supplying development funds: \_\_\_\_\_

\_\_\_\_\_ Grant No.: \_\_\_\_\_

Distributing organization: \_\_\_\_\_

Address: \_\_\_\_\_

Target Audience (check one)

- |   |   |
|---|---|
| <input type="checkbox"/> Students General             | <input type="checkbox"/> Physically Handicapped       |
| <input type="checkbox"/> Gifted                       | <input type="checkbox"/> Parents, Community Group     |
| <input type="checkbox"/> Slow Learners                | <input type="checkbox"/> Administrators/Supervisors   |
| <input type="checkbox"/> Educationally Disadvantaged  | <input type="checkbox"/> Teachers & Paraprofessionals |
| <input type="checkbox"/> Ethnic Group                 | <input type="checkbox"/> Other (specify) _____        |
| <input type="checkbox"/> Learning Disability Students |   |

Grade Level (check all appropriate)

- |  |  |
|--|--|
| <input type="checkbox"/> Early Childhood | <input type="checkbox"/> Grades 10-12              |
| <input type="checkbox"/> Kindergarten    | <input type="checkbox"/> Adult Basic Education     |
| <input type="checkbox"/> Grades 1-3      | <input type="checkbox"/> College or University     |
| <input type="checkbox"/> Grades 4-6      | <input type="checkbox"/> Professional ed. training |
| <input type="checkbox"/> Grades 7-9      | <input type="checkbox"/> Other (specify) _____     |

Type of Project (check all appropriate)

- |  |  |
|--|--|
| <input type="checkbox"/> Curriculum                  | <input type="checkbox"/> Model or Demonstration Project  |
| <input type="checkbox"/> Preservice Training         | <input type="checkbox"/> Community-School Relations      |
| <input type="checkbox"/> Inservice Training          | <input type="checkbox"/> New Instructional Methodology   |
| <input type="checkbox"/> Planning and Administration | <input type="checkbox"/> New Organizational Arrangements |
| <input type="checkbox"/> Alternative Schools         | <input type="checkbox"/> Other (specify) _____           |

Subject Area (check all appropriate)

- English & Language Arts
- Reading
- Foreign Language, Bilingual
- Social & Behavioral Science
- Ethnic Studies
- Math & Science
- Environment Studies & Ecology

- Fine Arts
- Thinking Skills
- Vocational or Career Educ.
- Health Educ.
- Special Educ.
- Other (specify) \_\_\_\_\_

When Available (check one)

- presently available
- within 6 mos. or less
- within 6-12 mos.

- Indeterminate
- Definitely Long Term
- Other (specify) \_\_\_\_\_

Abstract (In the space below, please describe the purpose and essential features of the project in 100-300 words):



Key Man Questionnaire

[Cover letter will explain project and need, and ask the "key man" to list projects of his own as well as to supply names of people who might have projects.]

Name of Project (If project is unnamed or title is unknown, please supply a descriptive title in brackets.)

\_\_\_\_\_

Principal Investigator: \_\_\_\_\_

Developing Organization: \_\_\_\_\_

Street Address: \_\_\_\_\_

City, State: \_\_\_\_\_

Please supply any comments that may help us identify and/or evaluate the project:

Appendix 9  
Programs

## Programs

The proposed information system will consist of a relatively small number of project descriptions once the initial data has been screened and evaluated. But in order to arrive at the three thousand item data base nearly seventy thousand questionnaires will have to be processed. Because of the magnitude of the surveys, it is felt that the data collection and processing activities should be automated. A side benefit of this decision is that there will be no additional costs in producing a machine readable data base that can be searched on-line. In addition, since all the records describing the projects will be in machine-readable form the cost to produce catalogs and indexes will be less because computer controlled composition techniques can be employed in the printing process.

The tables that follow briefly describe sixteen general purpose programs that will be used in the processing of the curriculum survey data and transforming it into tapes ready for use in photocomposition or for use as input to an on-line search program's data management system. The tables assume a programmers salary of \$16,000 per year and the salary estimates include both design and programming time.

| Program Number | Program Description  | Computer Costs for Program Development | Programmers Salary - Direct Labor |
|----------------|--|--|-----------------------------------|
| 1              | Create list of key man from punched cards onto tape  | \$ 50                                  | \$ 60                             |
| 2              | Sort list of names for duplicates (Design algorithm and implement)   | 300                                    | 990                               |
| 3              | Develop generalized program to add and/or delete records from address tape   | 100                                    | 330                               |
| 4              | Generate address labels from address tape and print listings of addresses  | 100                                    | 260                               |
| 5              | Update mailing list tape with codes representing people who have responded to questionnaire. Generate new mailing labels and new list of non-respondents | 100                                    | 260                               |
| 6              | Create project developers file from output of second questionnaire   | 200                                    | 590                               |
| 7              | Add and/or delete fields for developers file   | 150                                    | 400                               |
| 8              | Print a formatted list of all information about projects   | 150                                    | 400                               |
| 9              | Convert tapes to a format suitable for input to a photocomposition program   | 600                                    | 3300                              |
| 10             | Selectively print fields of a tape   | 150                                    | 395                               |
| 11             | Generate from the base tape the tape containing names and addresses only for telephone-type catalog  | 400                                    | 860                               |
| 12             | Generate from the base tape the tape to be used for creating the ERIC type catalog   | 350                                    | 730                               |
| 13             | Generate from the base tape the special catalog tapes  | 350                                    | 730                               |

| Program Name | Program Description  | Computer Costs for Program Development | Programmers Salary - Direct Labor |
|--------------|--|--|-----------------------------------|
| 14           | Format the base tape so as to produce input for printing the 3x5 cards | 250                                    | 460                               |
| 15           | Create an index for any set of records within a file                   | 810                                    | 1530                              |
| 16           | Create file of developers names from output of first questionnaire     | 50                                     | 60                                |
| Total Cost   |  | <u>\$4,110</u>                         | <u>\$11,355</u>                   |

**Appendix 10**  
**Methodology of the Report**

## Methodology of the Report

### Basic Steps

The basic steps in preparing this report were:

- 1) design the proposed system, including step-by-step description of processes;
- 2) estimate the unit flow within the system, using the experiences of similar projects and estimates provided by knowledgeable people;
- 3) calculate the time and cost of each process from such considerations as unit time, number of units, and salary of personnel required;
- 4) derive overall costs and unit costs of products.

### Cost Assumptions

All costs are current as of this writing; changes due to inflation or price changes cannot, of course, be predicted. The following is a list of basic cost assumptions:

|   |             |
|---|-------------|
| Clerical Salaries--   | \$6000/yr.  |
| rote work, opening envelopes, transferring information to code sheets for keypunching, etc. |             |
| Keypunchers Salaries--  | \$7500/yr.  |
| Clearinghouse Research Assistants Salaries--  | \$9960/yr.  |
| Professional Information Specialists salaries--   | \$14000/yr. |
| Rental of Key punching Machines--   | \$100/mo.   |
| Computer Time--   | \$300/hr.   |

### Contingency Factor

Summary data is presented in two ways: 1) directly as derived from the figures presented throughout the report. These figures are based upon a condition in which all parts of the system work as planned and in which 1972

prices for materials, equipment, services and salaries prevail; 2) with a 50% contingency factor built in to account for the inevitable problems encountered in implementation of a new system and also to allow for inflation. The factor of 50% was decided upon arbitrarily - a guess based on experiences with other new systems and current rates of inflation.

#### Amortization of Data Gathering and Screening Costs

Generally, our method of assigning burdens is quite straightforward. However, the division of the data gathering and screening costs between phone book-type and select catalogs needs elaboration.

Certain project descriptions that appear in the phone book-type catalog make up the entire file of the select catalog with abstracts, 1200 of the total 2650 projects. Up to this point, the handling of the data has been the same, and so has the cost of collection.

Since the 1200 projects appear twice in our output, the unit costs of collecting these should be charged 50% to each product. The remaining 1450 appear only in the short entry (phone book-type) catalog and should be charged 100%.

The 1450 projects are .55 of the whole, therefore .55 of the total cost goes to the short entry catalog, along with half the cost of the 1250, or  $.5 \times .45 = .225$ . Thus the short entry catalog is charged  $.55 + .225 = .775$  of the whole. The remaining .225 is charged to the catalog with abstracts.

A similar problem exists for development of the "ALERT like" catalogs in allocating costs between data gathering activities and screening, writing, validation activities. Since both types of activities are carried out by the same personnel continuously, we have arbitrarily assigned 25% of the total cost to data gathering and 75% to the processing type activities.



