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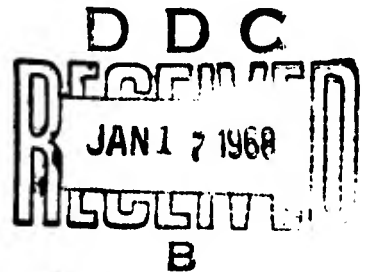
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ADMINISTRATIVE REPORT

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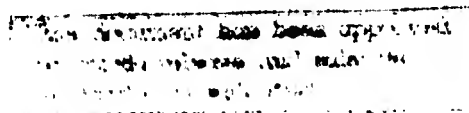
by

Cathryn C. Lyon, Head
Technical Library Division



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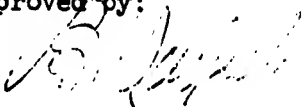
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by

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Technical Library Division

1 January 1968

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U.S. Naval Weapons Laboratory
Dahlgren, Virginia 22448

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FOREWARD

This report was written at the suggestion of Captain Walter E. Scholz of DDC. It is our desire to share our experiences in automating our library in the hope that others will be able to save time if one of our programs can be useful to them. The entire library staff has worked hard to make the transition from conventional methods to ADP methods. They did this and gave full service during the period of transition.

ABSTRACT

This is a detailed description of the Automatic Data Processes in use in the Technical Library Division of the U.S. Naval Weapons Laboratory. Further details and programs can be obtained by writing to the author.

Inside a Research and Development Laboratory, the most important communication is the flow up and down to management of information concerning work in progress or accomplished. At the Naval Weapons Laboratory, this flow up and down is served in part by a network of small, internal departmental information collections and the large overall Computer Storage and Retrieval Program of the Technical Library (Appendix p. 1) which serves to consolidate into one location, the computer, the results of laboratory research, development, and test. These, of course, serve the research scientists, engineers, and technicians.

The formal report collection in the Document Section contains approximately 65,000 documents. Their information is stored in the Computer Program. A Library Technician (Appendix p. 2) key punches the descriptive cataloging directly from the document on an IBM Document Writing System 870, and the document is circulated within 48 hours of receipt. Those not directed to specific persons are shelved to be indexed by Information Specialists. Those circulated are returned, after use is over, for indexing.

The keypuncher has combined three jobs formerly needed for processing the descriptive cataloging---the cataloger, clerk-typist, and keypuncher. The products of this process are:

- 1) Bi-weekly Accession Bulletins (Appendix p. 3)
- 2) Long Range Management Accession Bulletin
- 3) NWL Reports Abstract Bulletin
- 4) Supporting Card Files (Appendix p. 4)
 - a. Sources and Series File
 - b. Contract File
DICTIONARY FILE
 - c. Author File
 - d. Title File
 - e. Source File

When indexing is completed, (Appendix p. 5) using up to 40 place natural language descriptors, the abstract and indexing are keypunched and all the IBM cards are forwarded to the Computer Laboratory for up-dating the Storage and Retrieval Program.

The print-out (Appendix p. 6) for a literature search contains for each document the descriptive cataloging, natural language descriptors and the abstract. They are scanned by the Information Specialists before giving them to the researcher in order to be sure the print-out is succinct and will not waste a researcher's time in useless reading.

The Technical Library has two information specialists, one in Ordnance and the other in Electronics. The specialist does all the literature searching and indexing in his subject specialty. He will compile tables, etc., for the researcher if the search requires it; he is knowledgeable of all the expertise in NWL as recorded in an informal index of local skills; he knows all the outside sources, and whenever possible puts the researchers in touch with others in their related fields. Literature searching includes both the open literature as well as the classified sources.

The satellite programs illustrated in Appendix p. 1 are made up of letter reports, telcons, tech-correspondence, internal evaluation and test reports, etc., and are monitored by the Information Specialist in his responsible areas. The collections are usually indexed manually by a Uniterm System and when necessary selected descriptors are entered in the Central Computer Program for print-outs to go off station. The various collections are differentiated in the print-out by alpha-numeric accession numbers. The individual and formal collections contain information concerning mathematics, physics, chemistry, electronics, biology, metallurgy, meteorology, oceanography, safety, etc. as they pertain to weapon systems. Another product published by the Documents Section is a Confidential KWIC (Key Word In Context) index of all 4,000 Naval Weapons Laboratory produced reports and memos. This contains Author, Series, and KWIC Title Sections. It is updated annually with a minimum of effort since it only requires keypunching of the current year's in-put and sending the cards to the Computer Program. (Document Section Flow Chart, Appendix p. 7)

The Technical Library has a Book Collection of 22,000 and 750 Serial titles. There are three branch book libraries (Mathematics, Chemistry/Metallurgy, and Management), separated geographically. (Appendix p. 8)

Automation in the Book Section covers acquisitions, cataloging and accession bulletins with the keypunching of one set of cards. Initially when a book is to be ordered, the descriptive cataloging information in the Publisher's Weekly is used for keypunching a set of cards. The classification is adjusted so that when the book is received it only requires processing.

The keypunching is done on the IBM 870. (Appendix p. 9) A program has been devised so that the original keypunching also produces a snap set on the output typewriter with copies for the Book Dealers' order and Supply Department records. The cards are filed to await book receipt. Upon receipt, the punched cards are pulled, the book is processed and circulated or shelved. The

punched cards are accumulated and a Book Accession Bulletin is produced every two weeks on the 870. Supporting file cards are produced from the punched cards by another program. The punched cards are then forwarded to the Computer Program for updating the Handbook. The Handbook of the Book Card Catalog is in three sections---Author, Classification number, and KWIC title index.

The Classification Section of the Handbook allows anyone to browse as though looking at the shelves. (Appendix p. 10 - 12) The KWIC title index is now our only subject approach to the books but when economics indicate, there will be some depth indexing done and stored in the Central Computer Program. Computer literature searches will then produce a combined book and document print-out. The Handbook is placed in strategic places throughout the Laboratory thereby eliminating costly trips by scientists to the Library to check the Public Card Catalog.

In the Management Library, the Technical Library maintains a KWIC index of Training Courses available to the Laboratory which includes Industrial and University, as well as Federal courses. A supervisor needs only to check the Index to find a subject course in the space of minutes.

A Computerized Serials Holdings (Appendix p. 14) and Literature Searching Abstracts List are also produced by the Book Section. Serials Inventory and Circulation procedures are not automated because computer procedures are not warranted for an inventory of 750 serial titles and we do not send overdues to borrowers. Materials are returned when use is over or on request by Library for someone else. (Flow Chart of Section, Appendix p. 15)

The Librarian is allotted 15 minutes for orientation of new employees on Orientation Day. This only allows for a brief once over lightly of library facilities and services. An additional two day Library Training and Orientation Program is scheduled periodically. The first day the Library Staff speak on their responsibilities and how their services are available. The second day the special systems such as VSMF, Dun and Bradstreet, NARDIS, etc., are spoken to by the representatives from these groups. The Program is sponsored by the Training Division of Industrial Relations. All NWL staff members are invited to attend any or all of the lectures. Anyone may also request one or two hours with the Librarian to go into details about his particular subject sources. An informal Handbook of the Technical Library (Appendix p. 16 - 17) is distributed to everyone on the Station and a Formal Library Brochure is included in the NWL Recruiting Brochure.

The Naval Weapons Laboratory is cooperating in the NASA/SCAN as a part of its SDI program. With the inauguration of the DDC Automatic Distribution and GAB program, the Library's Current Awareness Program (CAP) will only lack a current Unclassified part and AEC items. The NARDIS SDI when it is begun will add valuable information to the CAP.

Our microfiche program was originated to alleviate impending storage problems. When it was introduced to the users, a thorough orientation was given which stressed the need for using; how to use; and the advantage of a better local, readily accessible collection as a result of the reduction of storage space by microfiche. Most of us are aware of the built-in resistance to the use of microfilm so in introducing microfiche, the comfort of the user was our foremost concern.

Thirty (30) portable readers are now placed about the Laboratory, usually kept in the branch libraries where they can be borrowed. When there is no branch library near by for the user, his division may have one of its own. A 3M Reader-Printer is available in the main library for blow-ups when needed. Three large readers are being placed in the branch libraries for use there. These are not printers. The user is not encouraged to reproduce whole reports. Rather it is suggested that he reproduce by page if he needs to consult a formula or table as he is reading.

NWL receives all of its NASA distribution on microfiche and all available microfiche from DDC. Duplicates are made of the master microfiche on Kalvar equipment and circulated. The copies are expendable unless they are classified. One of the advantages of microfiche is the ability to reproduce copies upon request. In this way the user does not have to wait until someone is finished with the report he needs. One thousand (1000) microfiche will fit in a filing drawer on a man's desk, as compared with a 2 1/2' X 1 1/2' filing cabinet. The microfiche is 4" X 6" and contains 60 pages. The ratio of shelving space to microfiche drawer space is 140:1. It is important that the original microfiche be clear and this of course is dependent upon the clarity of the original document and the quality of the work done by the microform processor. If one estimates 1000 documents to a section of library shelving, the 20,000 microfiche reports in the NWL Library have saved 20 sections of shelving. For other costs see reference 1.

Special Systems feature the VSMF Manufacturers Catalog on microfilm cartridges, including Specifications needed by the Department of Defense. There are approximately 4000 manufacturers

listed and are available to the scientists, engineers, technicians and Supply Department. The Document Section also maintains a NAVAIR Aeronautical Manual Collection of some 3500 items.

The Technical Library is a service organization and it behooves us constantly to consider the economics, research, and personnel needs of the local laboratory to keep our methods up-to-date in information service procedures.

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APPENDIX

MISSILE SAFETY
INFORMATION CENTER
All of collection
stored in Technical
Library Computer
Program. O.D. accession
numbers.

PHYSICAL EFFECTS OF
RADIATION. COLLECTION
Manual Units locally.
Descriptors entered in
Computer Program

ELECTRONIC WARFARE
COLLECTION
Jokers program locally.
Focal information pro-
cessed for Computer
Program.

STATIC & DYNAMIC
PROPERTIES OF STEEL AND CER-
AMICS
Manual Units locally.
Descriptors entered in Com-
puter Program.

HEPD (HYPERTONIC CP)
ELECTROMAGNETIC INTERACTION
TO ORDNANCE
In planning stage. Will
include internal group col-
lection and extensive elec-
tronic manu., literature.

CHEMICAL AND BIOLOG-
ICAL LITERATURE COLLECTION
Internal material. In
planning stage.

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/GEN-29/
THE PROMISE OF THE NEW ASIA - UNITED STATES POLICY IN THE FAR EAST AS
STATED BY PRESIDENT JOHNSON ON HIS PACIFIC JOURNEY
0000 U

042694
OFFICE OF ASSISTANT SECRETARY OF DEFENSE /SYSTEMS ANALYSIS/
RESULTS OF DEPARTMENT OF DEFENSE COST RESEARCH SURVEY
0067 U

ARTS

042678
MARINE CORPS LANDING FORCE DEVELOPMENT CENTER /PROJ 20-65-12/
PHOTOGRAPHIC EQUIPMENT REQUIREMENT STUDY, FINAL REPORT
0367 U

MATHEMATICS

042646
OPERATIONS EVALUATION GROUP /424-64/
OPERATIONS EVALUATION GROUP MEMORANDA
0564 U **ICR**

042690
TORONTO U., INSTITUTE FOR AEROSPACE STUDIES /TR 101/
A COMPUTER STUDY OF A WING IN A SLIPSTREAM
N.D. ELLIS
0267 U

042693
ILLINOIS U., DEPARTMENT OF COMPUTER SCIENCE /R 197/
A LANGUAGE FOR DESCRIBING DIGITAL COMPUTERS
J.A. WILBER
0266 U

042699
ILLINOIS U., DEPARTMENT OF COMPUTER SCIENCE /R 211/
MULTI-THRESHOLD THRESHOLD LOGIC
Y.T. YEN
0265 U

042711
SANDIA CORP. /DA-65-523/
A COMPUTER PROGRAM FOR PERFECTING RELIABILITY ANALYSIS
A.M. BRIPCHL & R.A. HERNQUIST1265 U

CHEMISTRY & BIOLOGY

(2)

039585

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AP. /R-201/

NONLINEAR PROGRAMMING AND MULTIPARA
METER SENSITIVITY IN LINEAR TIME-III
VARIANT NETWORKS

G.L. KELLY

U

0666

CATALOG CARD

035503
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INTERPRETATION OF ELECTRON DIFFRACTION PATTERNS FROM THIN PLATELEYS

G. THOMAS & M.M. OTTE 1265 U

(NO. ABSTRACT AVAILABLE)

ELECTRONIC THIN FOILS MATRIX LATTICES
CRYSTALS PATH PLATES

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035500

ILLINOIS -U.. COORDINATED SCIENCE LAB. (R-294)

ALGEBRAIC GENERATION AND ACTIVE NETWORK REALIZATION OF STATE EQUATIONS

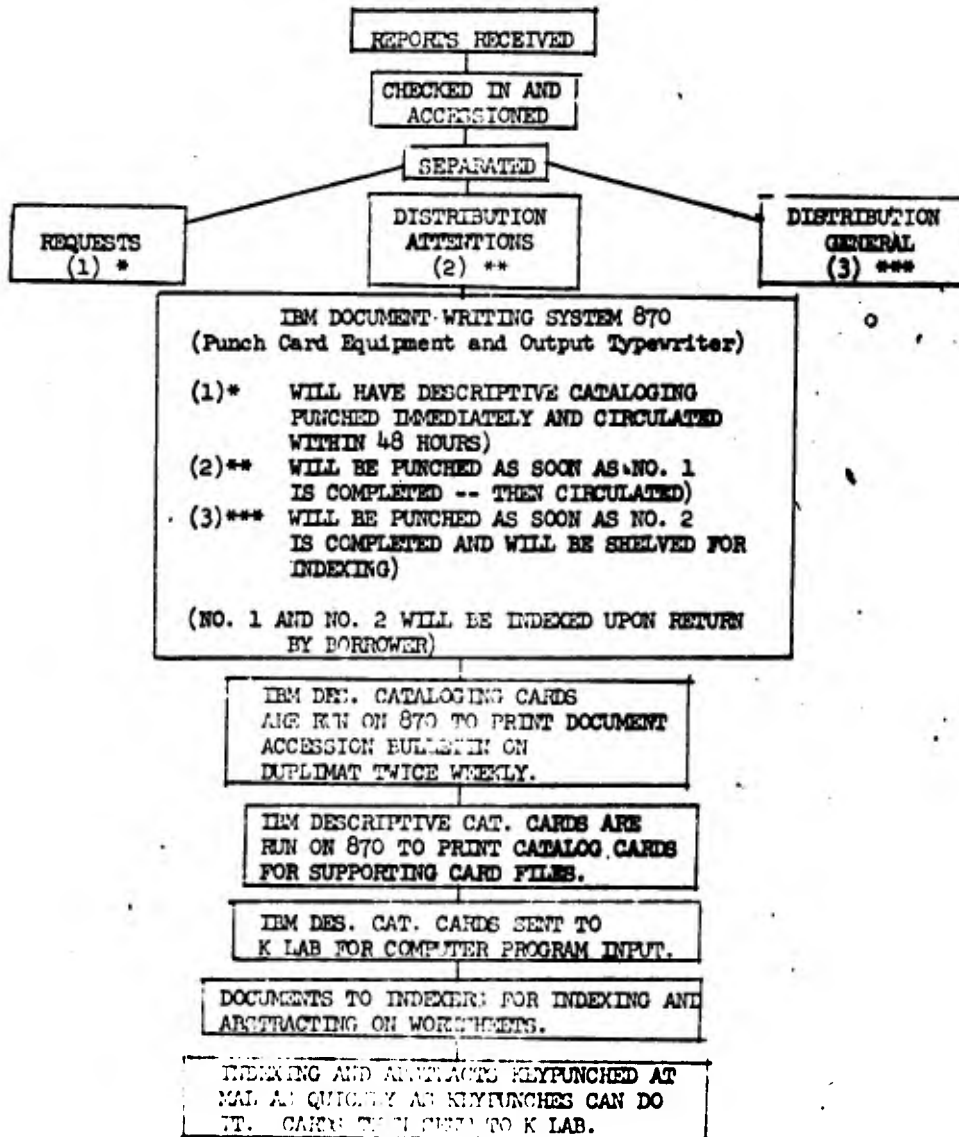
G.O. MARTENS 0566 U

A CHARACTERIZATION IS GIVEN FOR THE STATE EQUATIONS OF AN RLC NETWORK WITH SOURCES. IT IS SHOWN THAT THE COEFFICIENT MATRIX OF THE STATE EQUATIONS MUST BE REPRESENTABLE AS A PRODUCT OF TWO FACTORS SATISFYING NECESSARY SYMMETRY CONDITIONS. EACH FACTOR MUST BE REALIZABLE AS THE INPUT-OUTPUT MATRIX OF A RESISTIVE NETWORK. IT IS ALSO SHOWN THAT, EXCEPT FOR DEGENERATE CASES, AN INPUT-OUTPUT MATRIX SINGULAR AS WELL AS NON-SINGULAR MUST SATISFY A DIVISIBILITY PROPERTY: THE DIVISIBILITY PROPERTY IS THEN UTILIZED TO INSERT VARIABLES TO GENERATE A NEAR-PRIMITIVE HYBRID MATRIX FROM AN INPUT-OUTPUT MATRIX. THIS PROCESS IS ALGEBRAIC AND DOES NOT REQUIRE THE FACTORING OF POLYNOMIALS. THE NEAR-PRIMITIVE HYBRID MATRIX DETERMINES A POSITIVE DEFINITE DIAGONAL MATRIX AND A HYBRID MATRIX WHICH, AFTER THE PERMUTATION OF SUBMATRICES, YIELD THE REQUIRED PRODUCT REPRESENTATION FOR THE COEFFICIENT MATRIX OF THE STATE EQUATIONS. THE CHARACTERISTIC POLYNOMIAL OF THE A MATRIX IS IDENTICAL WITH THE MINIMAL POLYNOMIAL OF A AND THE MONIC COMMON DENOMINATOR OF THE INPUT-OUTPUT MATRIX.

NETWORKS EQUATIONS MATRIX EQUATIONS LINEAR
MATHEMATICS

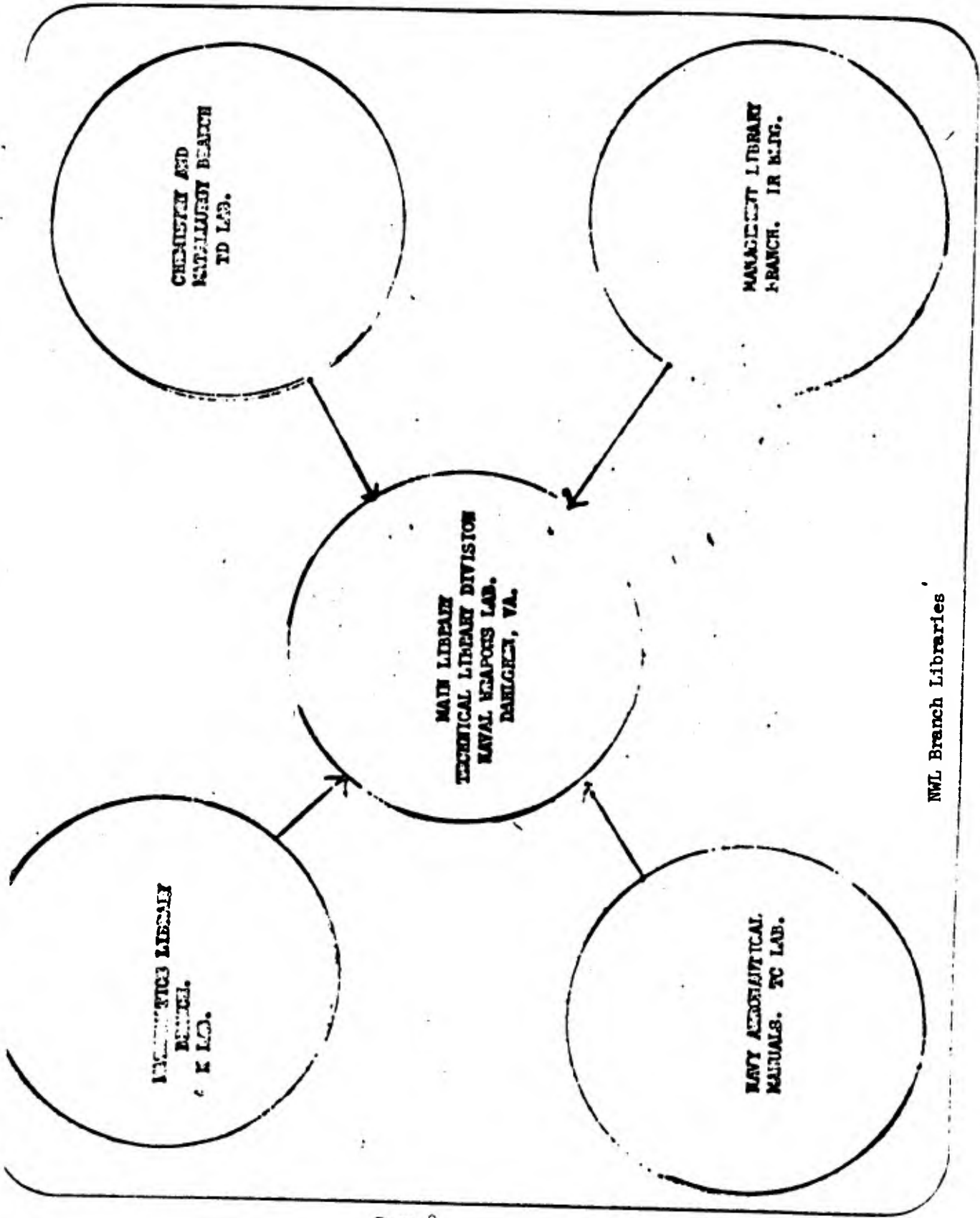
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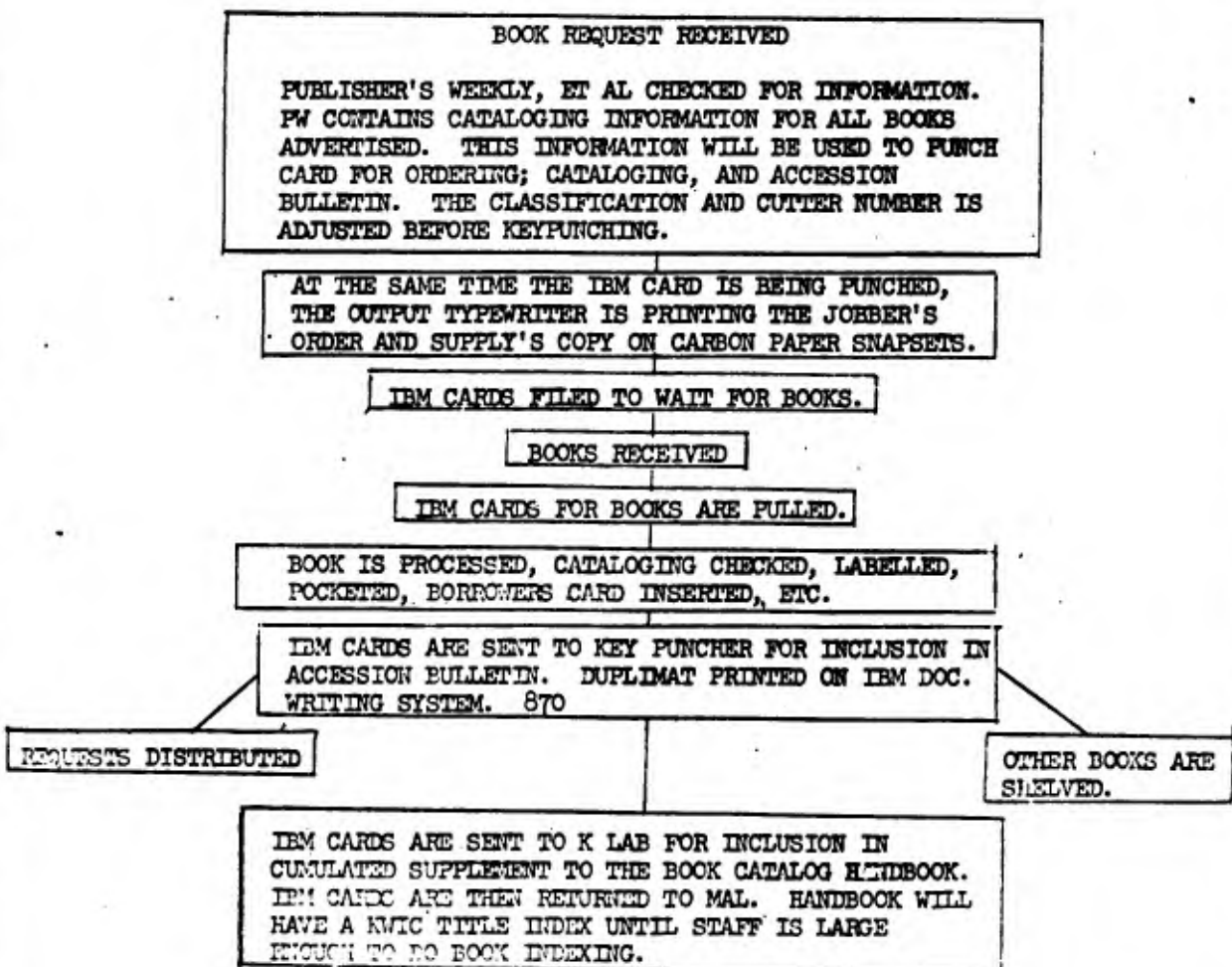
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