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Technical Report

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MECHANIZATION STUDY  
OF THE DMIC, BDIC, RACIC,  
AND REIC INFORMATION CENTERS  
OF THE BATTELLE MEMORIAL  
INSTITUTE, COLUMBUS, OHIO

Submitted to

Defense Supply Agency  
Defense Documentation Center  
Cameron Station, Virginia

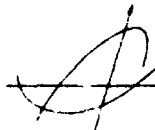
by

Booz, Allen Applied Research Inc.  
4733 Bethesda Avenue  
Bethesda, Maryland 20014

Under Contract No. DSA-7-15489

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BOOZ • ALLEN APPLIED RESEARCH INC.

WASHINGTON  
CLEVELAND  
CHICAGO  
LOS ANGELES

## ABSTRACT

Four of the information centers operated by the Battelle Memorial Institute were included in the BAARINC Library Mechanization Study. The CDC 3400 computer is used for any mechanization although this was not extensive at the time of the survey. A Flexowriter is used by BDIAC to produce a monthly list of documents for security classification downgrading and by REIC to produce a monthly accessions list with abstracts and a coordinate index, and a semiannual compilation of government-sponsored contracts relating to radiation-effects research. RACIC uses Flexowriter edge-punched cards to produce a security log of secret cards in the file. DMIC uses a Termatrix coordinate index system to store and retrieve references to government-sponsored contracts of interest to the Center. REIC uses a mechanized process to punch EAM cards which are used to produce a listing of clue words and a listing of reports with accession numbers. REIC has also initiated the development of a thesaurus. RACIC has mechanized its listing of clue words and is experimenting with a computer program to produce a clue-word coordinate index from a file of EAM punched cards. All four centers consider that their manually produced and searched files of extracts are preferable to a computerized system. However, they feel that additional mechanization of their printed outputs would be desirable as a time-saving feature wherever it would prove economical.

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## A P P E N D I C E S

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## **I. SUMMARY**

Four of the information centers operated by the Battelle Memorial Institute were included in the Library Mechanization Study and are discussed in this report. They are as follows:

1. Radiation Effects Information Center (REIC)
2. Remote Area Conflict Information Center (RACIC)
3. Battelle-DEFENDER Information Analysis Center (BDIAC)
4. Defense Metals Information Center (DMIC)

At the time of the survey, none of these centers was making extensive use of mechanization.

REIC uses a Flexowriter to produce a monthly accessions list with abstracts and a coordinate index, and a semiannual compilation of government-sponsored contracts that apply to radiation-effects research. The Center uses a mechanized process to punch EAM cards which in turn produce the following: a listing of the "clue words," used for subject indexing in the information filing system; a listing of processed, rejected, and ordered reports with accession numbers for use in duplication checking. In addition, the Center has initiated the development of a thesaurus prior to the mechanization of the coordinate index to its selected monthly accessions list.

RACIC is experimenting with a computer program to produce a clue-word coordinate index from a file of EAM punched cards. The Center has mechanized its listing of clue words and is using Flexowriter edge-punched cards to produce a security log of secret cards in the file.

BDIAC uses a Flexowriter to produce a monthly list of documents for security classification downgrading.

DMIC uses a Termatrix coordinate index system to store and retrieve references to government-sponsored contracts of interest to the Center.

BDIAC and DMIC elected not to introduce computer processing because of the adequacy of their present manual systems and the relative stability of their present clue-word collections. DMIC has, however, an experimental project to produce a machine-readable record on punched paper tape of each new accession reference added to their data file. This tape was requested by the Material Information Branch of Wright-Patterson Air Force Base to be used in an experimental mechanized information retrieval system.

The administrative organization of the centers within the Institute is shown in Appendix A. The four centers are currently operated under government contracts. Subject to the control of their sponsoring agencies,

they provide service to U. S. government agencies, their contractors, suppliers, and other authorized users such as universities and research institutes. These services include direct answers to requests for information and publication of accessions lists, bibliographies, formal reports, technical memoranda, technical notes, and state-of-the-art reports.

When a visitor comes to a center, he is assisted by the staff in pursuing his interest through the files, and conferences with appropriate scientists and engineers are arranged. Copies of extract cards are made available to him for his own use. A request by telephone or mail is referred directly to the proper engineer, and a copy is sent to the information specialist concerned. An appropriate reply is then developed by the engineer, with whatever assistance from the information specialist that is deemed necessary. Inquiries that are not considered to require the degree of engineering judgment which the technical specialists can provide are referred directly to the information specialists for reply. However, the drafts to such replies may be subject to the approval of the technical specialists concerned.

The data base in each center consists of filed 5 x 8 cards containing extracted information from technical reports, journal articles, correspondence, trip reports, conference papers, books, and any other



material that may be pertinent. The extract, a unique feature of the Battelle system, is the reference element of the data base containing segments of actual text, charts, graphs, tables, and the like. The holdings amount to about 60,000 extract card references in DMIC, 25,000 in REIC, 16,000 in RACIC, and 10,000 in BDIAC. Each center acquires material related only to its own field of interest and endeavors not to duplicate material in any of the other centers. The centers have conducted selective retrospective literature searches to develop detailed backgrounds in their areas of specialty. Active acquisition efforts are engaged in by each of the centers so that current information is available to the users of the centers

After a desired item is received and checked into one of the centers, it is given to one of the Institute staff scientists or information specialists who marks important pertinent information for extraction. (Staff scientists devote up to 25 percent of their time to this activity; the average in DMIC is 17 percent.) In addition to the information to be extracted, certain clue words are underlined for use in subject-filing the extract.

The clue words are not subject headings or keywords from a pre-established thesaurus but are words which, in the opinion of the specialist or scientist performing the review, provide the best clues to the content.

New clue words may be added to the clue-word list any time it is necessary. Besides the clue words, bibliographic entries (author, journal, contract number, etc.) are also indicated.

The item with bibliographic data, clue words, and portions to be extracted (all indicated by hand markings) then goes to the typing pool where the extracts to be added to the files are typed on multilith masters in 5 x 8 card format. Graphic material, if it is to be included, is reduced to fit the 5 x 8 card format through the use of photodirect multilith masters.

A complete set of cards is then produced to be filed under each underlined clue word and bibliographic entry in the extract. Filing under each clue word is random. An example of a set of cards is shown in Appendix B. The original document may be placed in the center for more extensive perusal or sent to the Institute Library. (BDIAC retains all original items processed.) An objective of the extract system, however, is to minimize the necessity for reference to original documents, insofar as this is economically feasible.

## II. MECHANIZATION

### 1. CHRONOLOGY

The Radiation Effects Information Center decided in May 1957 that the rate of change of their clue-word collection justified the use of an EAM punched card file of the words and high-speed punching of the cards by computer. The first printout of the mechanized clue-word list was in October 1957 following the punching of the clue-word collection on EAM cards. In early 1959, the Center identified a need for a single means of listing AEC documents by AEC report number for loan purposes. (AEC documents represent 40 percent of the incoming material.) The first printout of the list occurred three months later after the necessary references were keypunched.

The Remote Area Conflict Information Center began consideration of mechanized process applications when the Center was established in April 1963. The first machine-produced clue-word listing was made in February 1964 from an EAM punched card file of 200 clue words. By February 1965, the card file had been increased to 990 words and by May to 2,500 words. Currently, the Center is experimenting with a computer program to produce a clue-word coordinate index with links to be used with their manually produced accession/abstract publication.

This index is intended to be used with the Center's accessions list by clients in remote areas for their own retrospective search and selection of desired documents.

## 2. DESCRIPTION OF PROCESSES

### (1) REIC

#### 1. Monthly Accessions List

An information specialist prepares an abstract of the documents to be included and assigns clue words for the coordinate index. A draft is typed, and a punched tape is produced on a Flexowriter. The draft is edited, and the edited tapes are used to prepare the accessions list.

A page of the accessions list (August 1965) is illustrated in Appendix C-1, and a page from the corresponding coordinate index (October 1964 through September 1965) is shown in Appendix C-2a with an explanation of the index given in Appendix C-2b.

The list contains selected documents from the month's acquisitions. The coordinate index is produced monthly on a cumulative basis with a dual coordinate index prepared annually on a contract year basis (November 1 - October 31). It is

intended for users who desire to perform their own retrospective searches. Both publications are distributed to a mailing list of about 900 names, representing about 800 companies.

2. Contract List

A form is sent to the contractor or his sponsor or both requesting information on title, termination date, contract number, sponsor, contract monitor, contractor, chief investigator, and a brief description of the program as it applies to radiation-effects research. When this information is received from the various contractors, it is reviewed by an information specialist and the Project Director to determine the relevancy of the contract to the REIC's field of interest. The edited and correctly formatted contract information is entered on punched paper tape by a Flexowriter. The punched paper tape is attached to control cards on which the typed information appears. The paper tape and associated control cards are sorted into subject categories prior to printout of the compilation. A contractor and contract number index is prepared manually for the compilation.

A printout of the contract information from the tape is produced twice a year and averages 110 to 115 pages for each run. This document formerly was classified Confidential but is now unclassified and is distributed to qualified users.

3. Clue-Word List

The clue-word list contains about 18,000 words at present, and about 1,000 new terms are being added each year. They are numerically keypunched on EAM cards, coded, and filed manually in a card file that is manually updated continuously as new clue words are reflected. Filing of the EAM cards is by the code number.

The machine-produced clue-word list, which is updated at intervals of one to one and a half years, is printed from the EAM card file and is made available to assist the Center's users in determining applicable clue words.

4. Report Number List

When reports which have recognized alphanumeric report numbers\* are received or are learned of through the Center's screening program, they are entered into the Report

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\* H. B. Mayfield, et al., "Report Number Series," TID-85, U. S. AEC.

Number List. When a reference to a report of interest is obtained, the report number is manually entered in the list. When the full-length copy is obtained, an accession number is assigned and entered both on the report and in the Report Number List with the associated report number. Periodically the hand-posted entries are keypunched on EAM cards. From this card file, a list is printed out alphabetically by report numbers with associated accession numbers. Appendix C-2c shows the format. Reports with different recognized report number series are cross-referenced. It is used to show holdings and to check for duplication of documents at the time of ordering or receipt or both. It has been updated 12 to 14 times in the past eight years.

(2) RACIC

1. Clue-Word List

Clue words used in the Center's files are each key-punched on an EAM card. Also punched on cards are card sequence number, a clue-word classification number, and the higher order hierarchical clue word (if any). This format is shown in Appendix C-3 along with a page of the

Clue-Word List (Appendix C-4) to which the illustrated EAM cards apply. The classification numbers are used in sorting the clue-word file into one of six general subject areas. In addition, a completely alphabetical listing is prepared by merging all six subject areas and suppressing duplicate entries. These are as follows:

<u>Classification Number</u>	<u>Area</u>
1	Biological Science
2	Chemistry
3	Electronics and Communication
4	Mobility
5	Social Studies
6	Weapons

In the mechanized printing of the clue-word list, however, the numbers are not printed.

## 2. Clue-Word Index

The Center is experimenting with a computerized coordinate index of terms with related accession numbers and utilizing links and roles. A controlled thesaurus with specific-to-general relationships is part of the overall system. Appendix C-5 illustrates three of the EAM cards



being used in the experiment; these samples do not have the links or codes punched. The list is machine-produced from EAM cards. Appendix D illustrates the present card format, the magnetic tape file structure, and the programs, but, since this project is still experimental, these forms may change.

(3) BDIAC—Security Classification Downgrading List

The following information is keypunched on EAM cards for the classified documents: accession number, downgrading group number, classification, and document date. These cards are run periodically to produce a list of documents for downgrading.

(4) DMIC—Flexowriter Format for Computer Input

The Center has prepared, at the request of the Materials Information Branch at Wright-Patterson Air Force Base, a record format on Flexowriter punched paper tape suitable for use in an experimental information retrieval program. This program will provide, in machine-readable form, both bibliographic data and subject category identification. The same tapes may be used internally to produce DMIC's accessions list.

### III. PROGRAM SYSTEM DATA

Two experimental systems are discussed in this section. One is RACIC's system for producing a clue-word coordinate index; the other is DMIC's machine-readable record on punched paper tape.

#### 1. RACIC—DESCRIPTION OF FILES AND RUNS

The following magnetic tape files are used in the experimental runs for RACIC: Thesaurus Tape, Index File Update Tape, and Index File Tape.

The formats for these three tapes are shown in Appendices D-2 and D-3. EAM punched cards are used to convey updating information for each update run; these are described in Appendix D-1. Each card has a code number punched in column 80 according to how the information on the card is to be used.

Five operations are performed with these files:

- Update Thesaurus Tape
- Generic Posting Generation
- Update Index File
- Search and Retrieval
- Print Files

These runs are illustrated in Appendices D-2 to D-5.

In the Update Thesaurus run, new terms (clue words) and all corresponding broader, narrower, and related terms (if any) are each punched on a separate EAM card. These are combined with Type 8 deletion cards, overpunch deletion cards, and the old thesaurus tape to produce the updated thesaurus tape. Index addition cards, which do not contain generic references, are then run with the updated thesaurus tape to produce an expanded update index file which contains new terms, their higher generic correspondents, accession numbers, roles, and links. This is combined with deletion cards and the old index file to produce the updated index file. Search and retrieval are possible by reading cards containing a logical statement of the search request expressed as terms, roles, and the logical operators AND, OR, and NOT, and comparing this stated request with the entries in the index file. The files themselves may be printed out in three ways as indicated in Appendix D-5 and as specified by the input cards.

## 2. DMIC—DESCRIPTION OF PAPER TAPE FILE

A paper tape of each new item record in the DMIC is being prepared for use as input to an experimental information retrieval system. The tape is made on a Flexowriter as a by-product of the typing of normal bibliographic records. However, certain symbols are included in the typing which, while not appearing on the page copy, occur in the punched paper tape. These nonprint symbols are used to set off information fields.

Appendix E is an illustration of a typical record with the nonprint symbols included as underlined letters. The record begins with a series of five carriage returns followed by DMIC's control number and accession number in a fixed field of 39 characters. (The control number occupies the first 32 characters of the field and is provided for computer reference in searching on several items, e. g., company, contract number, journal title, etc.) This field and the others are separated from one another by two carriage returns and a tabulate shift. The second field is the author line with each separated by two spaces. The two-space entry identifies for the computer the boundaries of the "phrases."

The third field contains the title. Corporate author or journal title appears in the fourth field. The fifth field contains a subject category code for materials class and linking index terms. Where several classes of materials are involved, a field for each class is used.

Three spaces separate the subject code and the index term; the index terms are separated from each other by two spaces. The end of the record is indicated by three backspaces. Empty fields are accounted for by two backspaces following the boundary marker which indicates the beginning of the field. However, each character in the control number field must be accounted for; this is accomplished with four plus signs in place of any missing elements and zeros if the element does not fill the sort.

#### IV. EQUIPMENT, COSTS, AND EVALUATION

##### 1. EQUIPMENT

###### CDC 3400

Battelle's Digital Computer Facility uses a Control Data 3400 and associated peripheral equipment. The CDC 3400 will be replaced by a CDC 6600 in mid-1966.

6

Central processor with 32K 48-bit words  
of internal storage

IBM compatible tape units

1,000 line-per-minute printer

1,200 card-per-minute reader

250 card-per-minute punch

on-line point plotter

paper tape reader/punch

The facility also includes the following:

082

sorter

314

reproducer

077

collator

OSCAR J

oscillograph reader coupled to a 16-mm  
single-frame projector

##### 2. COSTS

###### RACIC

Development of clue-word index program—16 man-hours

Keypunching (clue-word list and index)—10 man-months

Computer (average for all RACIC users)—\$270/month

### REIC

- . Flexowriter (including tape, amortization, etc.)—\$140/month
- . Development of clue-word list system—one man-month
- . Computer and keypunching (average for card coding, keypunching, updating, printing, etc.)—\$2,000/year

### 3. FACILITY'S EVALUATION OF SYSTEM

All four centers consider that their manually produced and searched files of extracts are preferable to a computerized system. They point out that up to 80 percent of the requests for information can be answered by direct reference to the extract files alone. In addition, a user of the files is automatically "referred" to other positions of the files by other clue words underlined on the cards he is using. A user who makes a personal visit to the centers, usually on a tight air travel schedule, has immediate access to the information itself, not merely to bibliographic citations. Furthermore, the subject specialists who deal with telephone queries often can answer questions on the spot by reference to the files. On the other hand, additional mechanization of the Centers' printed outputs would be considered desirable for time-saving features where it is economically advantageous.

The use of links in a coordinate index such as RACIC's experimental clue-word index with accession numbers is considered valuable. It is felt that roles, however, would have a lesser utility.

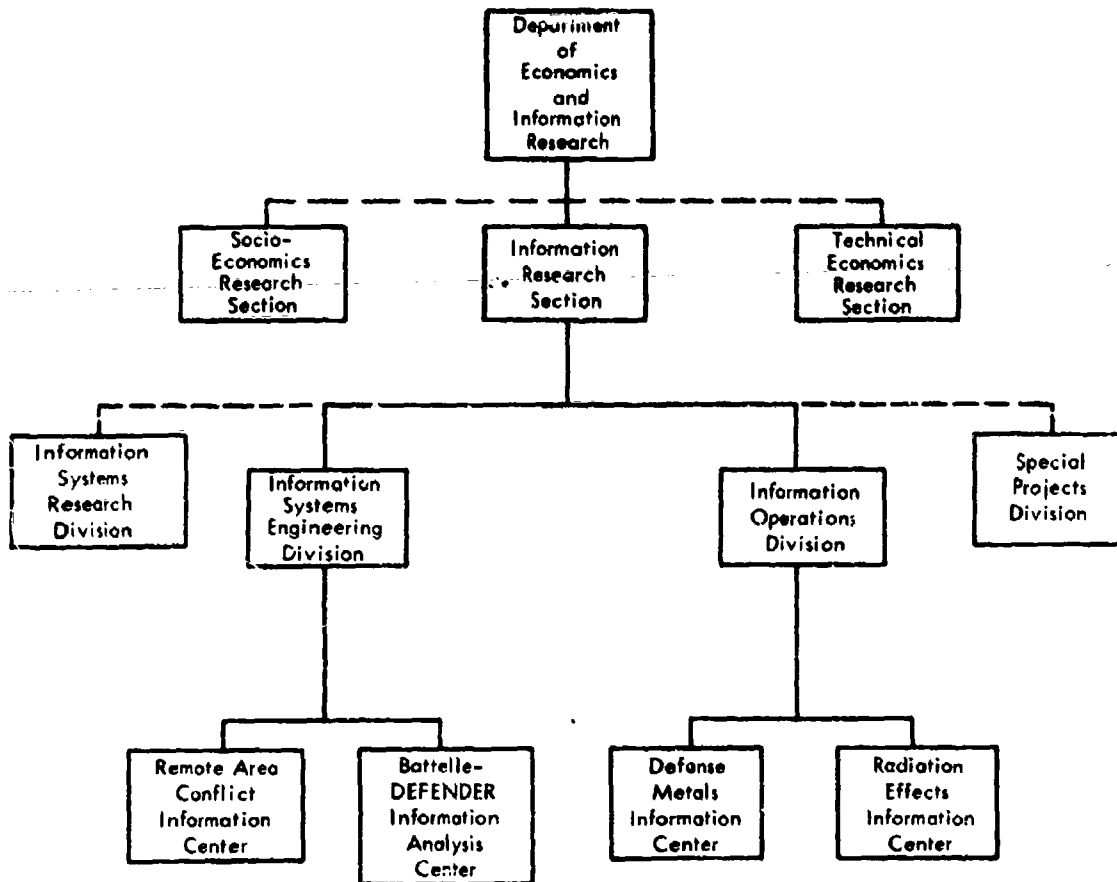
The use of a coordinate index system, where introduced, will probably remain as an auxiliary to the existing system of "clue words-in-context," since there is only a limited demand for information involving combinations of environments, etc.

## B I B L I O G R A P H Y

1. The Operation and Management of Scientific Information Centers at Battelle, by A. B. Westerman, Battelle Memorial Institute.
2. Battelle-DEFENDER Information Analysis Center, brochure, Battelle Memorial Institute.
3. Remote Area Conflict Information Center, brochure, Battelle Memorial Institute.
4. DMIC Flexowriter Format for Preparation of Materials Information Branch Computer Input, draft instruction, Battelle Memorial Institute.



ORGANIZATION CHART OF FOUR CENTERS  
WITHIN BATTELLE MEMORIAL INSTITUTE



This chart does not reflect overall Battelle organization, nor does it show the relationship of the centers to the other divisions of Battelle, many of which are highly involved with operations.

Bonded specimens have been annealed for ten hours at the respective bonding temperatures and tested over a range of cryogenic and elevated temperatures. The testing of this series of specimens is essentially complete and if this report has not been as-bonded joints are also available for comparison purposes.

... Do not reference, loan or reproduce this report without permission of the issuing agency.  
 2.1 HEAT TREATMENT OF TD NICKEL  
 Two diffusion heat treatments are to be used with the TD Ni-Pd-Pt-Pdium-nickel system -

10 hours at 2100°F 10 hours at 2400°F  
 Two attempts have been made to vacuum anneal TD nickel specimens at 2100°F at vacuums of 5 x 10<sup>-6</sup> Torr, but evaporation of nickel onto the furnace heating element caused localized heating and melting. Annealing in a hydrogen atmosphere provided an alternative but subsequent microexamination of heat treated specimens revealed extensive void formation....Exploratory bonds were made with pure palladium foil and 60 Pt-40 Ni foil rolled from 1/16 inch diameter wire to 0.003 inch foil. Kirkendall void formation was experienced after diffusion heat treatment with specimens bonded with pure palladium foil; nickel diffused into the intermediate faster than palladium diffused into the nickel, and a line of vacancies was formed in the TD nickel adjacent to the interface. However, with the Pd-Ni foil no void formation was evident after 1-1/2 hours at 2350°F.

The voids shown in Fig. 2 are not typical of Kirkendall void formation in this system; voids are large and any Kirkendall void formation would be expected

B (continued)

60581

NiB, Ta, Cb, Mo

Card 3/13

in the ID Nickel rather than the intermediate. Palladium has high solubility for hydrogen which decreases with nickel content. Void formation ~~WARNING~~ explained by solution of hydrogen in the intermediate during diffusion. ~~WARNING~~ explained by subsequent precipitation at the interface as nickel deposited. ~~WARNING~~ explained by diffusion heat treated specimens fell to approximately 60% of original strength or with strengths of 66,000 psi in the as-bonded condition of the issuing agency.

...

**WARNING**

~~all~~ Elevated temperature and cryogenic tensile data has been gathered together with room temperature and elevated temperature lap shear and lap peel data. High and low temperature tensile data have been plotted graphically, and mechanical properties of as-bonded joints compared with joints exposed for 10 hours to elevated temperature heat treatments. [ductility] ~~all~~

...

[15 pages, 9 tables, 14 figures]

[Disposition - Shelf]

RME/RTN-mjc

August 4, 1965

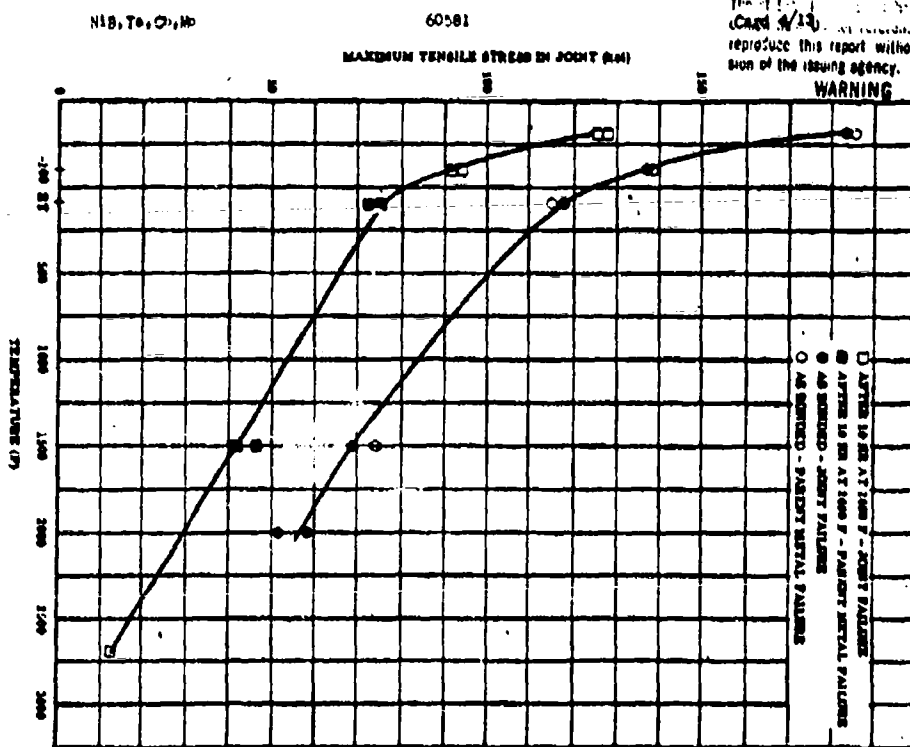


FIGURE 5. THE EFFECT OF HYPERSON HEAT TREATMENT ON 507A - 10W REWELD WITH 0.0003 INCH TANTALUM INTERMEDIATE FOIL

## Accessions List

27896

F. C. Hardtke, Argonne National Lab., Argonne, Ill.  
THERMOELECTRICITY IN IRRADIATED DIELECTRICS. I. SOME  
GENERAL FEATURES

The Journal of Chemical Physics, 42, (9), May 1, 1965,  
pp 3000-3009

A transitory charge displacement has been observed in gamma-irradiated solid dielectrics when the 3.2-mm-thick samples are heated subsequently in temperature gradients of 5 to 40 C/mm. Several glasses melted in our laboratory and a few commercial glasses were irradiated at room temperature in a cobalt-60 radiation facility at an exposure rate of  $1 \times 10^5$  R/h. The charge displaced was found to be directly proportional to the temperature gradient and, below a megarentgen, to the radiation exposure. With further exposure it approaches a maximum of a few nanocoulombs per square centimeter. Electric fields above 100 V/mm applied to the sample during heating produce only slight changes in the magnitude of the thermoelectric discharge. A marked reduction in the discharge magnitude is observed in samples that are shielded from the radiation source by metal plates approximately 0.1 g/cm<sup>2</sup> thick. This suggests that the phenomenon may arise from the thermal release of trapped electrons which have entered the sample as Compton recoils.

ORGANIC MATERIALS

27897

J.J.J. Myron and G. R. Freeman, University of Alberta,  
Edmonton, Alberta, Canada  
THE RADIOLYSIS OF ETHANOL IV. DEUTERATED ETHANOLS IN  
THE LIQUID AND GAS PHASES

Canadian Journal of Chemistry, 43, (5), May, 1965,  
pp 1484-1492

The value of G(-ethanol) in the vapor phase is nearly double that in the liquid phase. Part of the difference appears to be due to the recombination of radicals in liquid cages. Ethanol molecules, on the average, break into smaller fragments in the gas than in the liquid phase radiolysis. The isotopic compositions of the hydrogen produced from various deuterated ethanols are consistent with the suggestion that the reaction  $\text{CH}_3\text{CH}_2\text{OH}^\cdot + \text{CH}_3\text{CH}_2\text{OH} \rightarrow \text{CH}_3\text{CH}_2\text{OH}_2^\cdot + \text{CH}_3\text{CH}_2\text{O}^\cdot$  occurs to a significant extent in the liquid not in the gas phase. This reaction probably involves the shift of a hydrogen atom along a hydrogen bond. The reaction  $\text{C}_2\text{H}_5\text{OH}_2^\cdot + \text{e}_{\text{solv}}^- \rightarrow \text{C}_2\text{H}_5^\cdot + \text{H}_2$  does not occur to an appreciable extent in the liquid phase. In the liquid phase the relative contributions of the three different groups in the ethanol molecule to hydrogen production are in the order  $\text{CH}_2 > \text{OH} > \text{CH}_3$ . A similar trend occurs in the gas, although the contributions of the three groups are more nearly equal in this phase. Isotope effects, in the range  $k_{\text{H}}/k_{\text{D}} = 2.213.9$  per bond, occur in the methane formation mechanism. The isotope effects are somewhat smaller in the liquid than in the vapor phase and somewhat smaller in the inhibited than in the uninhibited systems. A comparison of product distributions in the liquid and gas radiolyses of several compounds by  $\gamma$ -rays and by  $\alpha$ -particles indicates that L.E.T. effects can also occur in the gas phase. Ethanol and its solutions were irradiated at a temperature of  $105 \pm 3$  degrees and a pressure of about 800 Torr. The liquid ethanol samples were irradiated at 28 degrees. The dose rate in the Gammacell-220 was about  $6 \times 10^{19}$  ev/g h for both liquid and gas samples.



## Explanation of REIC Coordinate Index

## PART II

## COORDINATE INDEX

INTRODUCTION

The REIC staff have determined that the Monthly Accession List is being used for retrospective searches as well as a current awareness facility. Consequently, the staff and the sponsor feel that an adequate index should be supplied to serve as a rapid search tool.

The following inverted concept-coordinate index is based upon terms generated in the REIC subject files. The index is cumulative throughout the year, and the staff will provide a "dual dictionary" at the end of each contract year to facilitate the retrospective search capabilities for the accession list abstracts.

The index is subdivided into two sections. The first, Radiation Environment, includes dosimetry and energy aspects of all electromagnetic and particulate radiation sources, with the exception of space radiation. Section two deals with materials, properties, secondary environment (including space environments), devices, and all other subject concepts. An author section and a generating organization section will be added to the index quarterly.

Under each concept term in the index are listed the accession numbers of the abstracts which have been indexed by that term. Links have been added where necessary to obviate improper coordination with the resulting false retrieval. Experience demonstrated that only four of the proposed EJC standard role indicators would have been required with any significant number of the entries.

To use the index, take those terms, authors, organizations, etc. which collectively describe the idea, or ideas, for which the search is required. A comparison of the accession numbers will show those abstracts whose accession numbers are common to all desired terms. These abstracts should contain information on the desired subject matter.

Two important facts must be remembered in the use of this coordinate index:

- (1) This is a SELECTED ACCESSION LIST. Not all the documents extracted for the REIC File are abstracted for inclusion in this list. Approximately forty per cent are felt to be inappropriate. Consequently, to insure completeness in any search, it is essential that the REIC be contacted.
- (2) This dissemination service is not intended to replace direct contact at the various locations remote to the Center. Direct contact with the Center and its technical staff is encouraged.

[illegible]

GENERAL PURPOSE - FIELD

ECHO ANTARCTICA 2007-08

104500

[illegible]

GENERAL PURPOSE - 20 FIELD

00117 10.05

1045

[illegible]

GEORGE W. BURNETT - 2013



## RATIC Clue-Word List

PACKS  
SOURCE  
SUPPLY  
POWERLINE SECURITY  
POWER WAGON  
PPS

PPS-4 AN/PPS-4

PUS  
PR

PR-155  
PR-156

PRC

PRC-06 AN/PRC-06  
PRC-09 PRC-09  
PRC-10 AN/PRC-10  
PRC-25 AN/PRC-25  
PRC-35 AN/PRC-35  
PRC-64 AN/PRC-64

PRECIPITATION

PRESERVATIVE

PRESS

PRESSURE

PRESTIGE

PRINTER/PRINTING

PRISON/PRISONERS

PROBLEMS

PROCUREMENT

PROGRAM/PROGRAMMING

PROJECTILE

PROJECTOR

PROPAGANDA

COMMUNIST

DISSEMINATION

PROPAGATION

RADIO

TROPICAL

PROPELLANT

PROPELLER

PROPERTY

PROPULSION

PROSYMS (PROJECT)

PROTECTION

PROTEINS

PROTOGA

PRS

FRS-4 AN/PRS-4

PRT

PSYCHOCHEMICAL

PSYCHOLOGICAL

EFFECT

OPERATION

WAR

WARFARE EQUIPMENT

WARFARE OPERATIONS

PUBLIC ADDRESS SYSTEM

PUBLIC INFORMATION

PUBLIC ORDER

PUBLIC RELATIONS

PUBLIC WELFARE

PUBLICATION

PULMONARY

PULSE

PUMP

PURCHASE

PURPLE

PURSUIT

PYROPHORIC

PIROTECHNICS

QUESTIONNAIRE

QUICK-FIX

RACE/RACIAL

RADAR

AIRBORNE

AIRBORNE RADAR

RADAR DETECTION OF PERSONNEL

DOPPLER PERSONNEL SURVEILLANCE

RADAR MAPPING

ECHO AREA-CROSS SECTION..

RADAR MAPS

MAP

RADAR METEOROLOGY (WEATHER)

MTI RADAR

MTI

NAVIGATION RADAR

OPTICAL RADAR

SET

RADAR PHOTOGRAPHY

RADAR SET

SIDE-LOOKING RADAR (SLR)

SIDE-LOOKING

SURVEILLANCE

SURVEILLANCE RADAR

RADIATION

RADIO

EQUIPMENT

FREQUENCY

HAMLET

JUNGLE

MAN-PACK

RELAY

RYAN RIFLE-BUTT

SET

SET 77 AM

STATION

### Samples for Experimental RACIC Clue-Word Coordinate Index

100-443887-100

[illegible]

GENERAL PURPOSE - 20 FIELD

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652 2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665 2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678 2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694 2695 2696 2697 2698 2699 2700 2701 2702 2703 2704 2705 2706 2707 2708 2709 2710 2711 2712 2713 2714 2715 2716 2717 2718 2719 2720 2721 2722 2723 2724 2725 2726 2727 2728 2729 2730 2731 2732 2733 2734 2735 2736 2737 2738 2739 2740 2741 2742 2743 2744 2745 2746 2747 2748 2749 2750 2751 2752 2753 2754 2755 2756 2757 2758 2759 2760 2761 2762 2763 2764 2765 2766 2767 2768 2769 2770 2771 2772 2773 2774 2775 2776 2777 2778 2779 2780 2781 2782 2783 2784 2785 2786 2787 2788 2789 2790 2791 2792 2793 2794 2795 2796 2797 2798 2799 2800 2801 2802 2803 2804 2805 2806 2807 2808 2809 2810 2811 2812 2813 2814 2815 2816 2817 2818

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GENERAL PURPOSE - 20 FIELD

2547483

## EXPERIMENTAL PROCEDURE

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GENERAL PURPOSE - ZC FIELD

IN 755727

D-1

RACIC Card Format and Card Type Code

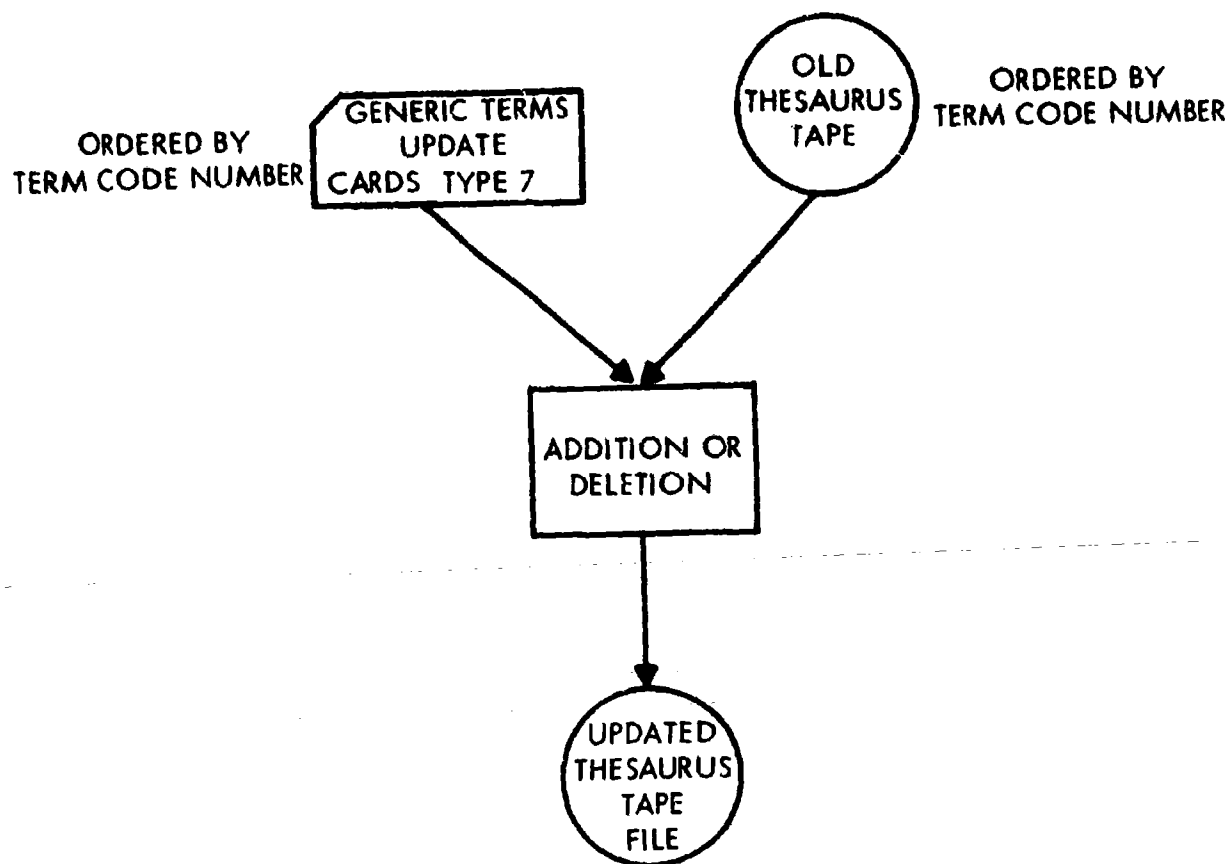
General Card Format

<u>Card Columns</u>	<u>Description</u>
1-7	Accession Number
8-9	Link Code
10-11	Role Code
12-18	Term (clue word) Code
19	Sequence Number
20-79	Term Alphabetic
80	Subsection 1D

Summary of Index Card Input Codes

<u>Type Code Number</u>	<u>Description</u>
1, 2, 3	Add accession number-link-term code-term alphabetic to index tape
6	Delete accession number-link- term code-term alphabetic from index tape
8	Delete accession number and link
9	Search

# RACIC Update Thesaurus Run and Thesaurus Tape Format

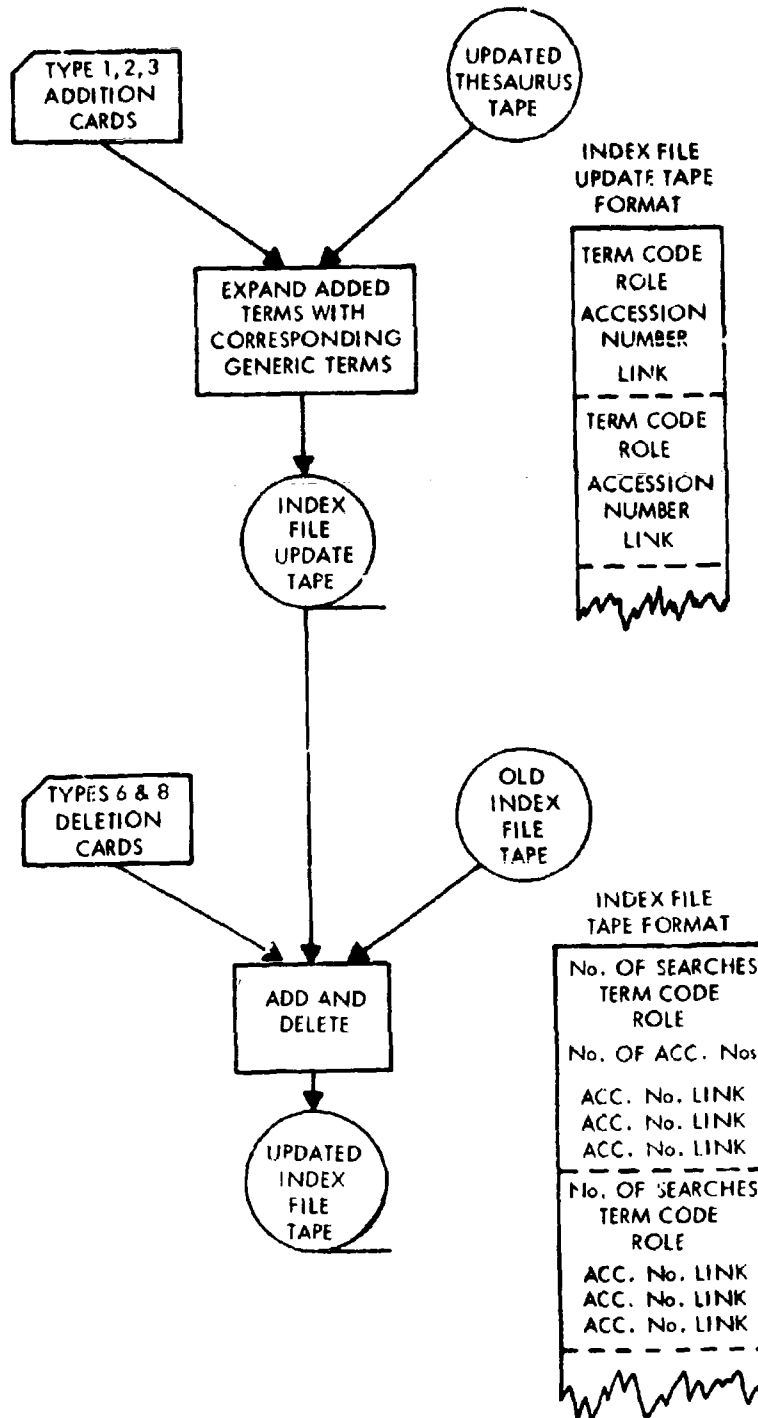


Thesaurus  
Tape Format

No. of Roles	
Role No.	Alphabetic
Role No.	Alphabetic
Role No.	Alphabetic
TERM CODE	
TERM ALPHABETIC	
No. OF HIGHER GENERIC CODES	
LIST OF HIGHER GENERIC CODES	
TERM CODE	
TERM ALPHABETIC	
No. OF HIGHER GENERAL CODES	
LIST OF HIGHER GENERAL CODES	

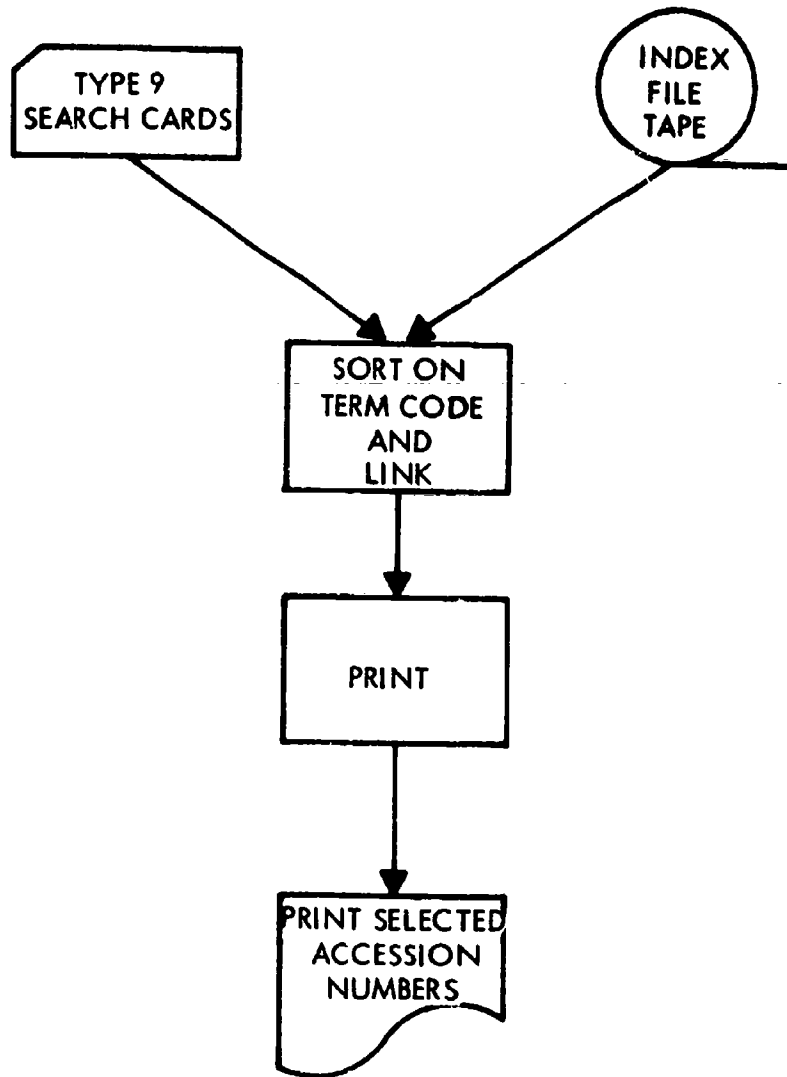
D-3

# RACIC Generic Posting Generation and Update Index File Runs and Index File Tape Formats



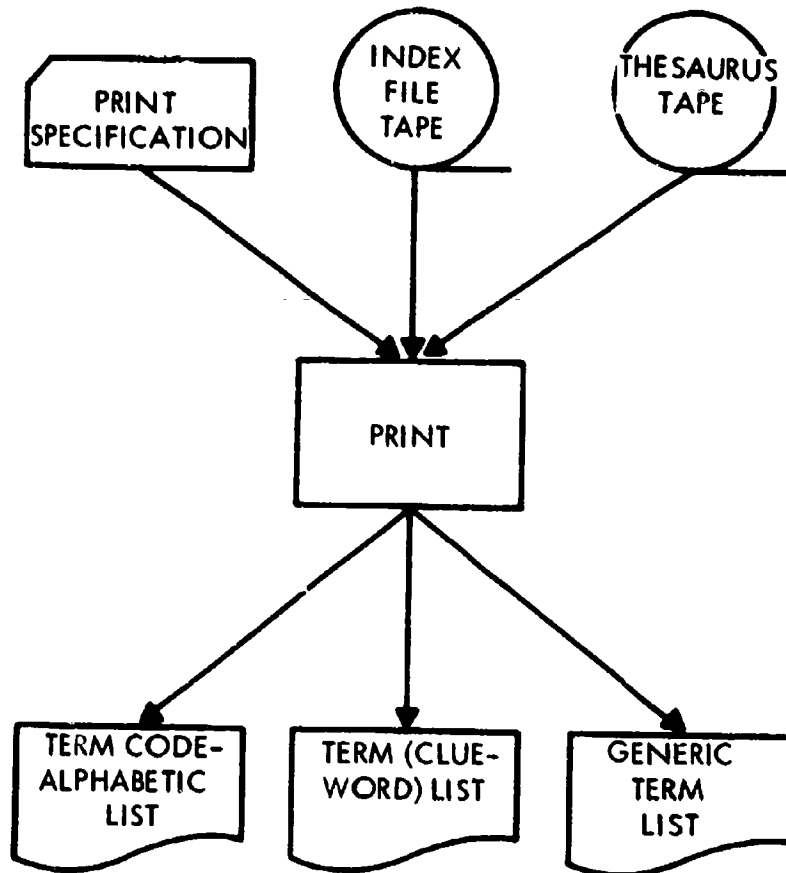
D-4

Search and Retrieval Run



D-5

Print Files Run



DMIC Bibliographic Record

C C C C C R/5710/112963/OFR/68-4/N600/9361 T 052951 C  
C  
T J. A. Ford S S R. W. Hertsbert S S F. D. Lemkey C  
C  
T Analytical and Experimental Investigations of the Fracture C  
T Mechanisms of Controlled Polyphase Alloys C  
C  
T United Aircraft Corp. S S S Final Report, Report  
No. B910068-4 S S C  
T (October 29, 1962-November 29, 1963), November 29, 1963  
S S S C  
T Bureau of Naval Weapons, S S S N600(19)59361 C  
C  
\* T Cm S S S Cr-Cr23-Cr6 S S Cu-Cr System S S fracture S S  
metallographic C  
T S S Al-Al3Ni System S S modulus S S Al-CuAl2 System  
S S electron C  
T fractography S S whisker S S tensile properties S S  
toughness S S C  
T modulus of elasticity B B B

S stands for space, C stands for carriage return,  
T stands for tabulate shift and B stands for backspace.

(\*) The typist would, at this point, turn off the punch mechanism and store the tape pending completion of the extract. At that time the fourth variable field would be added to the tape.



Unclassified

Security Classification

DOCUMENT CONTROL DATA - R&D		
<small>(Security classification of title, body of abstract and indexing annotations must be the same as the document)</small> 1. ORIGINATING AGENCY (Name, address and city) <b>BOOZ ALLEN APPLIED RESEARCH, INC.</b> <b>4733 Bethesda Avenue</b> <b>Bethesda, Maryland 20014</b>		2. SECURITY CLASSIFICATION <b>Unclassified</b>
3. REPORT TITLE <b>Mechanization Study of the DMIC, BDIC, RACIC and REIC Information Centers of the Battelle Memorial Institute, Columbus, Ohio.</b>		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) <b>Final Report of on-site survey</b>		
5. AUTHOR(S) (Last name, first name, initials) <b>G. A. Kershaw, D. Crowder, J. E. Davis, E. G. Loges, E. Merendini, S. M. Thomas</b>		
6. REPORT DATE <b>September, 1966</b>	7A. TOTAL NO. OF PAGES <b>47</b>	7B. NO. OF REFS. <b>4</b>
8A. CONTRACT OR GRANT NO. <b>DSA-7-15489</b>	8B. ORIGINATOR'S REPORT NUMBER <b>914-1-18</b>	
9. OTHER REPORT NUMBERS (Any other numbers that may be assigned this report) <b>AD 640 113</b>		
10. AVAILABILITY LIMITATION NOTICES <b>Distribution of this Document is unlimited</b>		
11. SUPPLEMENTARY NOTES <b>None</b>	12. SPONSORING MILITARY ACTIVITY <b>Defense Supply Agency            Defense Documentation Center            Cameron Station, Virginia</b>	
13. ABSTRACT <p>Four of the information centers operated by the Battelle Memorial Institute were included in the library mechanization study. The CDC 3400 computer is used for any mechanization although this was not extensive at the time of the survey. A Flexowriter is used by BDIC to produce a monthly list of documents for security classification downgrading and by REIC to produce a monthly accessions list with abstracts and coordinate index, and a semianual compilation of government-sponsored contracts relative to radiation-effects research. RACIC uses Flexowriter edge-punched cards to produce a security log of secret cards in the file. DMIC uses a Termatrix coordinate index system to store and retrieve references to government-sponsored contracts of interest to the Center. REIC uses a mechanized process to punch EAM cards which are used to produce a listing of clue words and a listing of reports with accession numbers. REIC has also initiated the development of a thesaurus. RACIC has mechanized its listing of clue words and is experimenting with a computer program to produce a clue-word coordinate index from a file of EAM punched cards. All four centers consider that their manually produced and searched files of extracts are preferable to a computerized system. However, they feel that additional mechanization of their printed outputs would be desirable as a time-saving feature wherever it would prove economical.</p>		

DD FORM 1473

Unclassified  
Security Classification

# Information Retrieval Digital Computers Indexes Dictionary Electronic Accounting Machines

FORM A DD FORM 100-1 1-64	FORM B DD FORM 100-2 1-64	FORM C DD FORM 100-3 1-64
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**1. ORIGINATING AGENCY.** Enter the name and address of the agency or institution which prepared the report. If the report is being submitted to the Department of Defense through the agency, enter the name of the agency.

**2. REPORT SECURITY CLASSIFICATION.** Enter the security classification of the report. Indicate whether the report is classified. Marking is to be in accordance with appropriate security regulations.

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**13. REPORT NUMBER.** Enter the report number. It is to be in accordance with the type of report. It is to be in accordance with the type of report. It is to be in accordance with the type of report.

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