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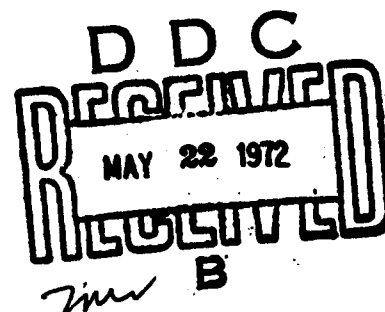
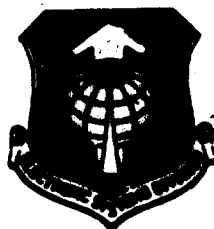
THE AUTOMATED USE OF BIBLIOGRAPHIES  
FOR SOFTWARE MANAGEMENT

J. Fleming

AUGUST 1971

Prepared for

DEPUTY FOR COMMAND AND MANAGEMENT SYSTEMS  
ELECTRONIC SYSTEMS DIVISION  
AIR FORCE SYSTEMS COMMAND  
UNITED STATES AIR FORCE  
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INDEXES						
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SEARCH STRUCTURING						
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## ABSTRACT

The structure of bibliographies in computer-accessible form is described. Its design seeks to use the capability of an existing general-purpose text-processing system to query a file interactively in such a way as to increase the automation available to readers consulting a bibliography. Volume I contains an example of such a bibliography.

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## SECTION I

### INTRODUCTION

Historically, bibliographic entries have been constructed and consulted by the effort of humans, unaided by automation. Technological advances make it possible now, or in the near future, for both the construction and the consultation to be significantly less burdensome to the human.

The construction of an entry can be automated by the selection, with possible reformatting, of facts about a work published by an automated procedure from the medium (as, tapes) produced in order to effect its printing. Alternatively, the facts for an entry could be obtained from the publication itself by optical character reading, followed by the same necessary selection and reformatting.

The consultation of a bibliography can be automated by application of the search capabilities present in general-purpose text-processing systems or, alternatively, by use of systems specifically designed or adapted to bibliographic use.

A significant portion of the documents selected for the present purpose incorporate DOCUMENT CONTROL DATA - R&D, DD Form 1473. This fact and the availability of information required or permitted by it have influenced the information design of the bibliography in certain respects, which will be pointed out when data obtained from the form are described below.

An example of DD 1473 may be found in Appendix A.

The present experiment in partial automation of the processes of construction and consultation of a bibliography reflects a state in between the two polar conditions of manual and automated function described above.

The abstracting of facts about each document and their input to the file have necessarily been performed by the customary human effort, but these facts have been cast in such a form that the possibility of automated consultation of the bibliography has been provided for.



To date, the experimental work undertaken has reached only a partial state of completion. Facts about the works selected for the bibliography have not been consistently indexed because the design has been developing and changing during the time that the indexing was being performed. Works indexed earlier have not been reindexed as the design was altered. Rather the emphasis of the indexing effort up to now has been placed on completeness of the bibliographic file, that is, on entering all the documents selected into the file rather than making revisions so as to obtain a consistent indexing of a lesser number of documents.

The current state of the experimental bibliographic file is reflected in the computer listing of BIBTRANSLATORROUTINES which is found in Appendix A of (1). The development of the bibliography up to this time is described here.

A selection of roughly eighty documents dealing with the problem of moving a software system from one operating environment to another was made by H. A. Bayard, as described in (1).

In view of the availability of the MITRE general-purpose text-processing system with certain text-handling capabilities such as sorting and searching, it was decided to design a format for the bibliographic data which would be compatible with that system. To take advantage of the text-handling capabilities available, the design of the bibliography includes a citation index. The citation feature has so far been only partially implemented in the bibliography. For the same reason, and also because a substantial proportion of the documents have had key words assigned to them by their authors, a key-word feature has been included in the design of the bibliography.

## SECTION II

### STRUCTURE OF DATA

#### INTRODUCTION

Each bibliographic entry, enlarged from the content of a typical entry by the extensions indicated in the introduction, forms an integral unit called an item. Items are recognizable by a first line and a last line, lines IM and V, respectively, which are mandatory for compatibility with the text-processing system.

Each item comprises a number of elements, which are introduced by index labels or tags. Some elements may contain sub-elements. These structural units are described under TEXT FIELD, below.

The bibliographic entry contains a number of units of data which are considered compulsory if they are present in the source; i.e., the data are indexed in the file whenever the given document contains any such data. The motivation for these units lies in the purpose and resulting design of the bibliography rather than responding to any consideration of compatibility with a particular text-processing system. The compulsory units will be pointed out as they are individually described.

Data are input as cards of 80 columns, of which the first 72 contain text, that is, the bibliographic entry itself, and the remaining field of eight columns is reserved for other data, including codes used in editing, sorting, and searching operations. Without reformatting, each card image produces one printed line on the cathode ray tube display at the terminal presently in use. The codes are discussed first.

#### CODE FIELD

Each card is indexed with a numerical line-ending code in column 73. The codes in use are: 0 1 2 3 5. Each of these codes indicates how many of the blanks following the last non-blank character of the card so coded are significant. If that character is final in a data element, the proper code is 5. If it is final in a sub-element, the code is 3. If the character is a colon, the code is 2; if a hyphen it is 0. In all other cases, the code is 1.

Typically, the identification element contains several of these additional facts about a work which can contribute to serving the needs of the user of the bibliography. These facts are treated as sub-elements in the file.

1. A code devised by the late H. P. Luhn (2, p. 231) was adopted for local use in identifying this selection of documents because it is intrinsically more meaningful than a serial accession number. It also permits the ordering of the items in much the same sequence as a typical alphabetically ordered bibliography by a sort operation on only 11 character positions. For a file of moderate size, such as this one, a sort on even as few as six character positions produces a useful result. This capability effects a saving when compared with the amount of running time and program complexity which would be required to sort on the name of the author and the title of the document.

A description of the structure of the Luhn code follows:

- a. The first six characters identify the (senior) author or editor:
  - (1) For a person: characters 1-4 are the first four letters of his name, 5 and 6 are his (first) two initials. The hyphen is used as a filler character. SNOWAB would be used for A. B. Snow, DOE-J- for John Doe.
  - (2) For a corporate or institutional source or the like (where a personal author is not credited): the first character is -; characters 2-6 are alphabetic characters representing the name of the organization. The criteria for the selection of codes were accepted usage and mnemonic value. A valuable guide to usage was found in Ellen T. Crowley and Robert C. Thomas, editors, Acronyms and Initialisms Dictionary, third edition (Detroit, Mich.: Gale Research Company, 1970), Appendix

B contains a list of some shorter versions of corporate names which appear in the experimental bibliographic file in (1).

(3) For the name of the publication in which the paper or article was published (when neither a personal nor a corporate author is credited): the first character is +. +ELECN may be used for Electronic News.

- b. Characters 7 and 8 of the Luhn code are numeric; they represent the final two digits of the year of publication. 70 is used for 1970; -- for an undated document.
- c. Characters 9-11 are alphabetic, representing the initial letters of each of the first three substantive words of the title. CNT is used for "A Cooperative Network of Time-Sharing Computers: Preliminary Study."

2. Identification numbers assigned by other holders of the document follow the Luhn code. The AD number assigned by the Defense Documentation Center forms the first sub-element for those documents to which an AD number has been assigned, since it is a primary identifier in the MITRE library. The MD number, if one has been assigned by the MITRE library, follows the AD number. The remaining sub-elements are any identification numbers found in blocks 9a and 9b of a DD 1473 for the given document or appearing within the document proper, or on a microfiche made from it (where the microform served as the source document). No identification associated with the document has been intentionally omitted from the identification element.

The category code for the first line of the mandatory identification element is IM; if there are continuation lines, they are coded I.

#### Title Data

The title element (tag TITLE:) contains the full title of the document, omitting any initial non-meaningful words, such as articles, or phrases, such as "On the." "A Cooperative Network of Time-Sharing

Computers: Preliminary Study" appears as TITLE: COOPERATIVE NETWORK OF TIME-SHARING COMPUTERS: PRELIMINARY STUDY. The line category code for the compulsory title element is T.

#### Author Data

The compulsory author element (tag AUTH. :) may represent either a personal or a corporate author. In the absence of an author, the name of an editor may appear among the bibliographic facts for the document. In such a case, an editor element (tag EDIT. :) takes the place of an author element. Except for the difference in the tag, editor elements are constructed according to the pattern for author elements.

The names of authors other than the senior author are treated as sub-elements, comprising, together with the name of the senior author, the author element. The names of all personal authors are inverted, not just that of the senior author, so that one author's name will appear in the same arrangement wherever it is found.

The surname of each personal author is followed by the given names or initials shown on the document, without punctuation. AUTH.: ROBERTS L G MCCAFFREY EDWIN MARILL T JONES JOHN B III LT is an example.

A corporate author is treated as the author element only in the absence of a personal author. Corporate authors are often identified by block 1 of DD 1473. Frequently, the title page of the document or block 1 names a sub-unit of the corporate agency, in which event the sub-unit is treated as a sub-element. AUTH.: MASSACHUSETTS INSTITUTE OF TECHNOLOGY LINCOLN LABORATORY is an example.

A personal author is distinguished from a corporate author by the line-category codes, AP and AC, respectively.

#### Facts of Publication

The facts of publication are treated as a series of compulsory elements, each with its index tag.

For an article (whose title appears in the T line of the item) in a periodical: TITLE: is followed by the name of the periodical; VOL.: by two numeric characters indicating the arabic number of the volume containing the article and by the issue number if this is necessary or useful, the two numbers being separated by a period; PP.: introduces the two four-digit inclusive page numbers separated

by a hyphen; DATED: is followed by the date of publication in the format YY.MM.DD with six, four, or only two digits. In the date format scheme, YY indicates the year, MM the month, and DD the day of the month. Numerics are right-justified, with leading zeroes included where required. TITLE: IBM SYSTEMS JOURNAL VOL.: 06.06 PP.: 0267-0302 DATED: 67 is an example.

For a book (no example occurs in the experimental file), PUB.: is followed by the name of the publishing agency, which may include, besides publishing firms, societies, institutions of learning, and the like. PLACE: is followed by the name of the country or state and the name of the city where the book was published. PUB.: MACMILLAN CO. PLACE: NEW YORK NEW YORK DATED: 55 is an example.

For a paper or monograph published under the name of one or more personal authors, a corporate agency such as is cited in block 1 of DD 1473 is considered as a kind of "publisher." Its name and geographical location are shown, together with the date, found in block 6. AUTH.: SIGNATRON, INC. PLACE: MASSACHUSETTS LEXINGTON 02173 DATED: 68.06 is an example. The geographical location is shown with the units arranged in order of decreasing size, as here state before city, and with the zone improvement plan (ZIP) code last. Street addresses have been included for possible convenience of readers. In a larger file considerations of space would probably preclude their inclusion.

The tag AUTH.: has been used for publisher-like information because the same agencies (an example from the experimental file is System Development Corporation) may appear in block 1 of DD Form 1473, both in the presence and in the absence of a personal author. The use of the same tag in both instances may simplify the framing of a computer search query seeking a report of work done under the auspices of the agency, whether a personal author is credited or not. These two functions sharing the code AUTH.: are distinguished by their category codes.

For a monograph published without designation of a personal author, the name of the "originating activity (corporate author)" has been omitted from the facts of publication, since it already appears as corporate author in a line coded "AC." Its dual status as author and "publisher" is implicit in the absence from the bibliographic record of a personal author. Accordingly, the repetition of its name in a "P" line is unnecessary. The facts of publication may be limited to "PLACE:" and "DATED:" in such cases.

The line-category code for the elements together comprising the facts of publication is P.

### Citation Data

Most of the publications upon which the bibliographic entries in this file are based contain either a bibliography or a list of references (both are present in at least one document).

For each item the citation element (tag CITES:) contains an alphabetically ordered list of identifiers of documents cited by the document being indexed. The identifier listed is the Luhn code, which is constructed entirely from the information provided in the citing document, even though this information may be incomplete. The document whose own bibliographic entry begins I.D.: MONDLF67VCS contains the citation line CITES: FELDJA64FSC FELDJA66FSC FLOYRW61DLS, which represents the three documents the author Lee F. Mondshein cited in his bibliography or list of references.

For the optional citation element, the line-category code is C.

While the design contemplates that the list of cited documents will be alphabetically ordered, many deviations from that sequence may be found in the file.

The text-processing system at present contains no facility for sorting at the hierarchical depth at which these identifiers are located. Editing capabilities do exist which will permit ordering of these sub-elements by on-line procedures.

### Key Words

For those documents incorporating a DD 1473, the author usually provides a list of key words in block 14.

For the key words element (tag KEY WD:), the individual key words are treated as sub-elements.

The line-category code for the optional key words element is K.

### Last Line

In order to be compatible with the text-processing system, each item must have a uniquely coded last line. In the experimental file, the mandatory item terminator (tag null) contains a null element. An advantage is thus obtained that the text field contains a blank line which serves the human user by visually separating each two adjacent items.

The line-category code for the mandatory terminator line is V.

## GENERAL

The elements of the bibliography are those usual in technical writing in the United States except for the citation and key words elements. Background information regarding the inclusion of both is provided in Section I, INTRODUCTION.

As an interim procedure for elements such as the citation element and the key words element, which are optional elements since some documents lack them, the tag appears in the experimental file with a null element as an indication to the indexer while work on the file is in progress that the element is, in fact, lacking in a given document.

When the file has been completely indexed, these tags will have served their purpose and the line where each appears will be deleted.

The presence of the line-category codes described above makes it possible for the MITRE text-processing system to operate on a properly configured text field. The most pertinent operations are searching and sorting.

A listing of one possible arrangement of the experimental file is found in (1). The last few items are credited to corporate authors, in the absence of a personal author. In other respects, the file shows the same sequence as an alphabetically ordered bibliography.

The uses which have been made of the text-processing system to bring the experimental file to its present state include: use of the editor to correct errors in keypunching by substituting or permuting characters and to correct errors in indexing by inserting lines with tags and elements or with tags and null elements; and use of the sorting capability to order the Luhn codes of the citing papers, and hence the items representing them, in alphabetical sequence.



### SECTION III

#### AUTOMATED USE OF A BIBLIOGRAPHY

With a body of bibliographic information available in such a form as has been described in Section II, a user can repeatedly search that file up to a point where he is satisfied that he has found almost all the references pertinent to his need.

A description of one possible path his efforts might take follows.

He looks at a listing of the bibliographic file (henceforth BIB) and notices that Gardner has an item whose title contains the word "list-processing." He queries the file BIB for all occurrences of LIST\* on T or K lines, so as to learn whether there are other papers in the file which have a similar word in their titles or as one of their key words. A full explanation of how queries are entered and choices made about presentation of the responses to those queries may be found in (3).

Next he looks for the particular list-processor LISP\* in lines of the same categories.

Then he follows up whether Gardner's paper has been cited by any other paper in the file BIB by searching for occurrences of GARD on C lines.

After that he investigates whether colleagues of Gardner might be represented by papers having a bearing on his although not citing his paper. He can explore this possibility by searching for occurrences of both UNIVERSITY OF CALIFORNIA and LOS ANGELES in AC or P.

After any of the searches suggested above, the nature of the response obtained might lead him to follow a different path from that indicated.

## SECTION IV

### POTENTIAL EXTENSIONS OF BIBLIOGRAPHIC TECHNIQUES

An extension of the citation feature represented in the experimental bibliographic file would be to represent the cited documents as items with their own independent entries derived from the list of references contained in the citing document which referred to them (provided they are not already present in the file as citing documents).

For example, say that citing paper a cites papers p and q. The item for a contains an identification line I.D.: A . . . and a citation line CITES: P Q . . . in the present file. If neither p nor q is in the file now, when the extension is implemented, two items will be added: I.D.: P . . . CITED BY: A . . . and I.D.: Q . . . CITED BY: A . . .

An investigation of "the feasibility of analyzing relationships between citing and cited publications into a fairly small number of categories of probable value to physicists . . . through inspection of actual papers and their bibliographies in physics journals" is reported in (4). Four major groups containing 29 categories were identified.

Group One (eight categories) describes the "citing article's . . . relation to science in general," such as description of observed phenomena or hypothesis or theory. Group Two (three categories) described the citing publication's "administration or associative relation to science in general," such as review article or bibliography. Since Groups One and Two deal with the citing article only, they need be listed only once for each citing article.

Group Three (seven categories) describes a "continuity relationship between the cited paper and the citing paper which is independent of the . . . contribution," such as shared authorship or continuation. Group Four (eleven categories) indicates a "disposition relationship" between the citing paper and the cited paper, such as "changed the scope of applicability (plus or minus)" or "questioned (expressed doubt)." The categories of these two groups, since they involve the cited paper as well as the citing paper, may differ for each paper cited by a single citing paper.

A certain amount of adaptation would be necessary in order to apply this scheme, which was elaborated on documentation in the physics discipline, to the topic of software management, as follows:

**Group One Original Intellectual Intent of the Citing Paper**

1. Description (as, of a software implementation)
2. Definition (as, of a software concept)
3. Evaluation (as, of a software design)
4. Recommendation (as, for an application of software)

**Group Two Contribution of Citing Paper other than Original Intellectual Intent**

5. Review article
6. Bibliography
7. Data cumulation

**Group Three Identity of Continuity Relationship of Citing Paper to Cited Paper**

8. One or more authors in common
9. Same text
10. Abstract or condensation
11. Erratum
12. Continuation
13. Precursor
14. Inclusion

**Group Four Disposition of the Intellectual Intent of the Cited Paper in the Citing Paper**

15. Noted only
16. Distinguished
17. Reviewed or compared
18. Applied
19. Improved or modified
20. Replaced
21. Changed the precision (plus or minus)
22. Changed the scope of applicability (plus or minus)
23. Questioned
24. Affirmed
25. Refuted

While there seems to be little doubt that indicators of categories such as are listed above would benefit citation users materially, Lipetz observes that "analysis of actual publications for the purpose of determining relationships according to the scheme described . . . is neither simple nor rapid." A trial application with a voluntarily cooperating group of citation users would be necessary to determine its desirability in a given setting.

Selecting key words from an unrestricted vocabulary has the disadvantage that an author assigning key words to a work he has written (or an editor or indexer doing so in his stead) and an index user who has a current need for such a publication may not share a common understanding of the interpretation and scope of the key words which the author has assigned.

The use of any restricted list of terms (thesaurus) known to both the author and the prospective user has the advantage that key words selected from such a list convey meaning not only because the selected term is present in the list but also because other terms are also present which were not selected. When the reader consults the list of terms and then attempts to match his selection of likely terms against an index of documents, he can profit by the sort of negative information described above, as well as profiting by the positive information.

When the document has been indexed from a free and unrestricted vocabulary of terms, the reader has only the positive information to guide his selection of potentially interesting documents.

Other things being equal, a hierarchically structured thesaurus can express precision of meaning more concisely than a non-hierarchical one. A hierarchical thesaurus suitable for providing key words for documents having such subject matter as the question of moving a software system from one operating environment to another is <sup>(5)</sup>. Its title page states, "This book is a major revision of an earlier title . . . ; this revision was prepared in joint operation with the United States Department of Defense."

An appropriate extension of the work already performed under the present project would be the assignment of key words from <sup>(4)</sup> to the documents indexed in the file of <sup>(1)</sup>. Either indexers or users might assign these key words. An indexer would reflect his total understanding of a document in a single effort.

If the cooperative effort of users were enlisted, a list of descriptors for a document might be gradually built up by soliciting a report of the reader's experience with the document. If he had a

current interest in topics a and b which lead him to consult a certain document, he might report that he found useful information about b but nothing regarding a. Accordingly, key word b can be assigned to the document.

The response of a user who failed to find any useful information in the same document can be of equal value to the response of the more successful user in the construction of the wanted list of key words for the document. If he were interested in topics b and c but reported that he found no useful information in the document, which instead deals with d and e, key words d and e can be assigned. At this point three key words which will be of value to potential users of the document will have been associated with the document.

In time a state can be reached where, for most of the documents in the file, users need not be asked to recommend key words for assignment to documents in the collection which they consult. Their suggestions for deletions of key words will always be of value, of course.

J. Fleming  
J. Fleming  
Intelligence and Information  
Systems

JF:dmk

APPENDIX A  
A SAMPLE BIBLIOGRAPHY ON TECHNIQUES  
FOR SOFTWARE TRANSFER

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## SECTION I

### INTRODUCTION

This bibliography represents a collection of documents pertaining to software transferability; in particular to software transferability as it relates to Air Force Systems problems.

The problem of moving a software system from one operating environment to another has primarily been dealt with in two ways;

1. On the administrative level: by providing similar operating environments, by constraining programmer behavior to increase the possibility of easy transfer of software, etc.
2. By providing automatic and semi-automatic techniques which aid in the translation of software systems which work in one environment to software systems which work in a second.

The articles mentioned here deal with the second approach: what automatic and semi-automatic aids exist for translation of software systems; what techniques and theory exist which, when applied to language and language processor design, simplify the problem of software transferability; and what techniques and theory exist which might be applicable to the design of automatic and semi-automatic transfer aids. Since JOVIAL is the official Air Force command and control language, special emphasis was given to collecting documents concerning systems written in it and concerning the transferability of JOVIAL systems.

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## SECTION II

### SOURCES

The documents were collected as the result of searches of several different sources:

1. Computerized search from the Defense Documentation Center for Scientific and Technical Information at Cameron Station, Alexandria, Virginia, with the following keywords:

SEMANTICS OF PROGRAMMING LANGUAGES  
JOVIAL  
EXTENDIBLE LANGUAGES  
INTERPRETER ROUTINES  
TRANSLATOR ROUTINES  
TRANSLATING and COMPUTERS  
COMPILERS  
SIMULATION ROUTINES and COMPUTERS

2. Manual searches at MITRE of:

Computing Reviews: The Association for Computing Machinery (from January 1965)

Computer and Control Abstracts: The Institute of Electrical and Electronics Engineers Inc. (from January 1969)

Scientific and Technical Aerospace Reports: National Aeronautics and Space Administration (from January 1969)

Government Reports Announcements: U. S. Department of Commerce National Technical Information Service (from January 1969)

While the manual searches were duplicated in part by the computerized search, relevant documents were found by both techniques which were not found by the other method. This was due to the fact that the computerized search had available to it documents from a longer time span, and that the manual searches were not limited to the keywords mentioned above.



### SECTION III

#### STRUCTURE

The bibliography is maintained as a file in SHOEBOX--an on-line interactive text processing system developed at MITRE. As a result, the bibliography can be randomly browsed through or computer searched for specific requests by the SHOEBOX user. The listing of the bibliography in this document is a printing of the SHOEBOX file.

Each line in the file consists of a text portion (the first 72 characters on the line) and a three character code portion. The first character of the code portion, a number, is for SHOEBOX's use and should be ignored. The second and third characters of the code portion of a line identify the kind of information found on the line. In this file the following codes and meanings are used:

'IM'	'I'	identification information; also indicates the first line of an item in the bibliography
'T'		title information
'AP'	'AC'	author information
'P'		publication information
'C'		citation information
'K'		keyword information
'V'		indicates the end of an item in the bibliography

Each item in the bibliography consists of six sections:

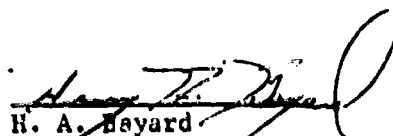
1. Identification section--The identification numbers associated with a document are maintained on the 'IM' and 'I' lines of an item. The identification numbers associated with a document consist of, at minimum, the Luhn code\* of

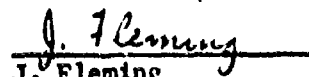
\*Claire K. Schultz, editor, H. P. Luhn: Pioneer of Information Science, Selected Works, New York, Spartan Books, 1968, pp. 230-231.

the document. In addition, if available, the AD number and the MD number (MITRE document number) of the document are given. Finally, if any other identification numbers are attached to the document, they are also present.

2. Title section--The title of the document is found on the 'T' lines of an item.
3. Author section--If there is an individual author, then his name appears on the 'AP' lines of an item. If there is no individual author, then, when available, the corporate author of the document appears on the 'AC' lines of an item.
4. Publication section--Information about publication of the document is found on the 'P' lines of an item. If there is a corporate author which was responsible for publication of the document, the name will only appear in the author section.
5. Citation section--The Luhn code of each document cited by the report is given. This information is found on 'C' lines.
6. Keyword section--Keywords, if any, which were found in the document are listed. The 'K' lines of an item contain the keywords.

A more detailed description of the format of items in the bibliography can be found in Volume II.

  
H. A. Hayward  
Intelligence and Information  
Systems

  
J. Fleming  
Intelligence and Information  
Systems

HAB/JF:dmk

A LISTING OF THE FILE BIBTRANSLATORROUTINES

LISTING OF FILE + BIBTRANSLATORROUTINES DATE 11AUG71

I.D.:	BAERJE68GMC	AD 678753	MD 57971	REPORT NO. 68-46	5IM
TITLE:	GRAPH MODELS OF COMPUTATIONS IN COMPUTER SYSTEMS				5T
AUTH.:	BAER JEAN-LOUP E				5AP
PUB.:	UNIVERSITY OF CALIFORNIA LOS ANGELES DEPARTMENT OF				1P
ENGINEERING	DATED: 68.10	PLACE: CALIFORNIA LOS ANGELES			5P
CITES:	ASCHRA67IM-	AOKIM-63ACA	ANEDW67MPI	BAERJL--LOP	3C
HAERJL68CAE	BERGC-62TGA	BAKEJJ62NMB	BGVEDP68MAC	BARNG---IIC	3C
BUSSB-62PVS	COFFEG67BPP	CHENYC66SPC	CLINCT64MFP	COOPDC66CPG	3C
CRITAJ65GMM	COTTLW65CIF	CURTWA63MCS	DUDERA64DMD	EISNH-62GNA	3C
ESTRG-67MMM	ELMASE64AAG	ELMASE67EOP	ESTRG-63AAC	ESTRG-67SCC	3C
ESTRG-60OCS	FLOYRW67NA-	FULKDR62ECP	GEREWS66HJS	GIFFB-60ASP	3C
GLUCSE65ISD	GOSDJA66EPP	GRAHRL66BCP	HELLJ-61SAM	HELDM-63AB-	3C
HU--TC61PSA	IGNAE-65ABB	JACKJR55CPL	JOHNSM54023	KARPRM60NAG	3C
KELLJE61CPP	KILBMD62RAS	KLEIL-66SPM	KARPRM66PMP	KNOHM-67MOI	3C
KEMEJG63FMC	KUCKDJ--IIS	LAMPBW68SPM	LEHMM+66SPP	LEVYWA65CMC	3C
MARTDF66AAS	MARTDF67EMC	MARTDF67MCS	MARTDF67MCS	MENDMJ66SSR	3C
MARTJJ65DTD	MCKEJL62SPJ	MALCOG59ATR	MARIRB59NMC	MCNAR-59SDL	3C
MURTJC66HPI	MAYBJO64MTS	NIEVJ-64PMI	PAKKDF66CCU	PRITAB60GGE	3C
PROSRT60ABM	RAMACV66AGC	RADRJ-67GMP	ROTHMA66SIT	RUSSEC63AAC	3C
KUSSEC--APA	ROY-8-62CCG	SAATTL61EQT	SCHWES60HPP	SENZDN65COA	3C
SCHWES61ASP	SCHWJ-66LPC	SHEDGS67PNM	SMITRD67GAS	SCHEAL67ATC	3C
STAUDC67UIP	SCHWJI64GPT	TONGFM65ABU	THORJF67CGP	THORJE63PIC	3C
TURNR-63AIV	VANRS63MCP	WARSS-62TBM	WIESJD64SPS		5C
KEY WD.:	DIRECTED GRAPH	MODELS OF COMPUTATIONAL TASKS	A PRIORI		1K
SCHEDULING	COMPUTERS	PARALLEL PROCESSING			5K
					5V

I.D.: BARBP-68ARP AD 679237 PLR-002 INTERIM REPORT 51M  
TITLE: AUTOMATIC REPROGRAMMING WITH THE PILER SYSTEM 5T  
AUTH.: BARBE PENNY 5AP  
AUTH.: PROBE CONSULTANTS, INC. PLACE: ARIZONA PHOENIX 3139 WEST 1P  
CALAVAR ROAD 85023 DATED: 68.11.01 5P

CITES: ALLARM64SE6 CART--62ILT FELDJA66FSC GRAHRM648CT 3C  
GREEJ-66MEP KRIDL-64FAA MARIT-62CCS NIEVJ-65ASC DLSETM65PTP 3C  
SHAWCJ61J-- STEETB--FVU WILDDU67PAD 5C  
KEY WD.: 5K  
5V

I.D.: BARBP-69MFI AD 693296 MD 60632 PLR003 51M  
TITLE: MICRO-FORM FORMATS AND INTERPRETERS IN THE PILER SYSTEM 5T  
AUTH.: BARBE PENNY 5AP  
AUTH.: PROBE CONSULTANTS, INC. PLACE: ARIZONA PHOENIX 3139 WEST 1P  
CALAVAR ROAD 85023 DATED: 69.05.01 5P

CITES: 5C  
5V

I.D.: BENNRK688BU AD 681169 MD 57704 SIG-TR-336 AFOSR 11M  
69-0072TR 5T  
TITLE: BUILD, A BASE FOR UNIFORM LANGUAGE DEFINITION: A USER'S MANUAL 1T  
FOR COMPUTER LANGUAGE DESIGNERS AND SYSTEMS PROGRAMMERS 5T  
AUTH.: BENNETT RICHARD K 5AP  
AUTH.: SIGNATRON, INC. PLACE: MASSACHUSETTS LEXINGTON 02173 5P  
DATED: 68.06 5P

CITES: ABRAPW66L2P ARDEBW61IOM BASTAL62PLT -BELLT--BSD 3C  
BENNRK64SST BROOKA63C-- CHEATE64SDC -DATAP61DIP FELDJA66FSC 3C  
GALLB-67PDA -IBM---PLS IRONET61SDC MCCLRM65TSC METCHH64PCB 3C  
PLASJ-66TSM RICHM-68BRM SCHODV64SCH 5C  
KEY WD.: COMPUTER LANGUAGES PROGRAMMING LANGUAGES COMPILERS 3K  
ASSEMBLERS TRANSLATORS LANGUAGES LANGUAGE DEFINITION 5K  
5V

I.D.: BRANRL67CTJ WP-8120 NPN 218 51M  
 TITLE: COMPARISON OF TWO JOVIAL COMPILERS 5T  
 AUTH.: BRANT R L 5AP  
 AUTH.: MITRE CORPORATION WASHINGTON D.C. OFFICE PLACE: 5P  
 DATED: 67.11.22 5P

CITES: 5C  
 KEY WD.: 5K  
 5V

I.D.: BRAZEL68RPL LA-4020 MD 64104 51M  
 TITLE: ROTHAN: A PROBLEM-ORIENTED LANGUAGE INPUT PROCESSOR 5T  
 AUTH.: BRAZIER EMMETT L JR GRIFFIN JAMES H 5AP  
 AUTH.: UNIVERSITY OF CALIFORNIA LOS ALAMOS SCIENTIFIC LABORATORY 5P  
 PLACE: NEW MEXICO LOS ALAMOS 87544 DATED: 68.11.27 5P

CITES: 5C  
 KEY WD.: 5K  
 5V

I.D.: BUDEFC69PPS AD 859371 MD 60492 RADC-TR-69-265 51M  
 TITLE: PROGRAM PRODUCTION SYSTEM SOFTWARE SUPPORT AND JOVIAL COMPILER 1T  
 QUALITY ASSURANCE 5T  
 AUTH.: BUDELMAN FREDERICK C ET AL 5AP  
 AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: NEW YORK ROME 200 1P  
 EAST GARDEN STREET 13440 DATED: 69.08 5P

CITES: 5C  
 KEY WD.: SOFTWARE JOVIAL COMPILER INPUT/OUTPUT QUALITY 1K  
 ASSURANCE 5K  
 5V

I.D.: CALLED69JPD AD 682305 MD 57883 TR-0020 (S9990)-4 31M  
 SAMSO-TR-69 25 5I  
 TITLE: J-3, PL/I AND A DATA BASE 5T  
 AUTH.: CALLENDER E DAVID RHODUS N WAYNE 5AP  
 AUTH.: AEROSPACE CORPORATION PLACE: CALIFORNIA SAN BERNARDINO 5P  
 DATED: 69.02.07 5P

CITES: -AFSCF68SPT -----68CEP -IBM--66DAF -IBM----PPG 3C  
 -IBM----PRM -IBM--68JCL -----68PPS 5C  
 KEY WD.: PL/I JOVIAL J-3 IBM-OS COMPOOL 5K  
 5V

I.D.: CERFVG70MRP AD 708770 REPT. 70-43 UCLA-10P14-90 5IM  
 TITLE: MEASUREMENT OF RECURSIVE PROGRAMS 5T  
 AUTH.: CERF V G 5AP  
 AUTH.: UNIVERSITY OF CALIFORNIA, LOS ANGELES SCHOOL OF ENGINEERING 1P  
 AND APPLIED SCIENCE PLACE: CALIFORNIA LOS ANGELES DATED: 2P  
 70.05 5P

CITES: ADDIJW65TM- AHO-AV68RAP ANON--66MLA APPLCT65PMD 3C  
 ASCHRA69CHM SAERJ-68GMC BAUEFL66SSF BAUMR-64IA- BEMERW68SIS 3C  
 BERGC-62TGA BINGH-67DEO BROORA67TPR BROORA67CFA BROORA67EC- 3C  
 BROORA67SPD BROWNS65DEC BURKWM65MSS CALIP-67SPE CHARBA68UST 3C  
 CHEATE64AC- CHEATE64SDC CLARER67ASS COHEJ-66NOG COHEJ-67NAP 3C  
 COHEJ-67LCH COOPDC66CPG COOPDC66ECC CROCS-66IFI QAVIM-66RFI 3C  
 DONOJJ67FSS ESTRG-67SCC ESTRG-67MMM FELDJ-62CSG FELDJA66FSC 3C  
 FELDJ-68TWS FEREN68SDP FERGD-66EMP FERGHE63DSS FISHDA67PAM 3C  
 FLOYR-64RCS FLOYR-67NA- FOSTJM68SIP FREIIF68DBP GILBR-66SAL 3C  
 GOLDDG66UTD GOODCD63GMA GORNS-66SLM GOSDJA62SCC GOTLCC67AFF 3C  
 GRIFTV65REC GRIFTV68TBA HALPMI64XMM HARAF-65SMI HARTJ-67MRC 3C  
 HARTJ-65CCT HERMDJ64UCE HILLJR68SBP HOLTAW63MAI HOPCJE67NSA 3C  
 HOPKD-68MUE INGPZ66SOT IRQNET61SDC IVERKE64FPL JOHAP-67NP- 3C  
 KARPRM60NAG KARUAD69TAM KNUTDE68AP- KNUTDE67CPL KNUTDE65TLL 3C  
 KOSTR-69LSC KUNOS-65PAP KUNOS-66APA KUNOS-66PA- KUNOS-62MSA 3C  
 LEWIPM68SDT LIU-CL67DIT LYNWC63ABN MANDRL68TCD MARIRB59NMC 3C  
 MARTD-67EMC MARTD-67MCS MARTD-67MCS MARTJJ65DTD POTAH-69DCD 3C  
 PRATTW66PBS PRATTW65SDT PRESL-68SSE PROSRT60ABM RAMACV65DMA 3C  
 RANDB-64A6I RESNM-68SD REYNJC68ICP ROGEH-67TRF ROHLS68NBF 3C  
 ROTAB-61CAI RUBERJ68QMP RUBIM-67MSS RUSSEC69APA ROSES-64CBS 3C  
 SCHODV64MIS SCHODV67SCS SCHNFW64MSD SCHNVB67SCP SCHUFD67HMD 3C  
 -SDS--67FIO -SDS--68BPM SHERPM66FCP STATN-64MEC STEEJB66FLD 3C  
 STEVDF68SFC TIXIV-67RFR TOSHW-65ST- TRACM-69PEO TROURG67CS- 3C  
 TYRZA-69IM7 UNGESH63GPC WALTKG66COO WARSS-61SDG WEISC-67LIP 3C  
 WELCJT65CAU WELCJT66MAC WHITP-64REC WOLMBL65STP YOUNDH67RPC 5C  
 KEY WD.: META COMPILERS PROGRAM PERFORMANCE MEASURES COMPUTER 1K  
 MEASUREMENT METHODS SYNTAX RECOGNIZERS TRANSLATOR WRITING SYSTEMS 3K  
 COMPUTATION MODELS 5K  
 5P

I.D.: CHEATE--RMS AD 683362 MD 58235 FIRST SEMI-ANNUAL TECHNICAL 11M  
 REPORT 5I  
 TITLE: RESEARCH IN MACHINE-INDEPENDENT SOFTWARE PROGRAMMING 5T  
 AUTH.: CHEATHAM T E JR CHRISTENSEN CARLOS 5AP  
 AUTH.: MASSACHUSETTS COMPUTER ASSOCIATES, INC. PLACE: 2P  
 MASSACHUSETTS WAKEFIELD LAKESIDE OFFICE PARK 01680 DATED: XX 5P

CITES: CHEATE63ICP CHEATE64SDC CHEATE66TCC CHEATE66IDF 3C  
 CHEATE66IDF CHEATE68BEE CHRIC-64APL CHRIC-65ESM CHRIC-66IAL 3C  
 CHRIC-67RMN CHRIC-68EMD FLOYRW67NA- HOLTAW68FRI JORRP-68GBE 3C  
 LEONGF64EOS LEONGF66MEM SATTK-62SAO SHAPRM63DCG SHAPRM64GC- 3C  
 SHAPRM68NAO WARSS-61SDG WARSS-63SRU 5C  
 5V

I.D.: CHEATE68BEE N70-15399 MD 64052 51M  
 TITLE: ON THE BASIS FOR ELF--AN EXTENSIBLE LANGUAGE FACILITY 5T  
 AUTH.: CHEATHAM T E JR 5AP  
 AUTH.: MASSACHUSETTS COMPUTER ASSOCIATES, INC. PLACE: 2P  
 MASSACHUSETTS WAKEFIELD LAKESIDE OFFICE PARK 01880 DATED: 68.06. 0P  
 13 5P

CITES: CHEATE66IDF DIJKEW68LE- FISCAE BBL FLOYRV63SAO 3C  
 GARWJV67GL- GARWJV--GPL GALLBA67PDA LEONGF64EOS LANDPJ66N7P 3C  
 PERLAJ67SAS PERLAJ--PC- SHAPRM64GTC SHAPRM63DCG VAN A-68DPA 3C  
 WIRTN-66EGA 5C  
 KEY WD.: 5K  
 5V

I.D.: CHEATE69RMS AD 860066 MD 60729 SECOND SEMI-ANNUAL 11M  
 REPORT 5I  
 TITLE: RESEARCH IN MACHINE-INDEPENDENT SOFTWARE PROGRAMMING 5T  
 AUTH.: CHEATHAM T E JR CHRISTENSEN CARLOS HOLT ANATOL W 5AP  
 AUTH.: MASSACHUSETTS COMPUTER ASSOCIATES, INC. PLACE: 2P  
 MASSACHUSETTS WAKEFIELD LAKESIDE OFFICE PARK 01880 DATED: 69 5P

CITES: HENDD-69DDS JORRP-69FDB JORRP-69FDB JORRP-69FDB 3C  
 LEDEKS69CR- WOLFMS69UVC 5C  
 KEY WD.: 5K  
 5V

I.D.: CHIKGB670MR AD 697616 #TD-MT-24-411-68 51M  
 TITLE: ONE METHOD OF REPRESENTING ALGORITHMS OF MACHINE 1T  
 TRANSLATION 5T  
 AUTH.: CHIKOIDZE G B 5AP  
 TITLE: AN GRUZSSR. SOOBSHCHENIYA DATED: 67 TRANSLATED: 2P  
 68.12.27 VOL.: 48.02 PP.: 0293-0298 5P

CITES: CHIKGB66AMT 5C  
 KEY WD.: MACHINE TRANSLATION ALGORITHMIC LANGUAGE 5K  
 5V



I.D.: CULIK-67WTC AD 683105 FTD-HT-23-613-66 51M  
 TITLE: WELL TRANSLATABLE GRAMMARS AND ALGOL-LIKE LANGUAGES 3T  
 TRANSLATED FROM RUSSIAN 5T  
 AUTH.: CULIK K 5AP  
 TITLE: NAUCHNO-TEKHNICHESKAYA INFORMACSIYA SERIYA 2 INFORMACIONNYE 1P  
 PROTSESSY I SISTEMY VOL.: 03 PP.: 0021-0023 5P

CITES: 5C  
 5V

I.D.: DELLGT65UMT 51M  
 TITLE: USE OF MACROS IN TRANSLATION OF SYMBOLIC ASSEMBLY LANGUAGE OF 1T  
 ONE COMPUTER TO ANOTHER 5T  
 AUTH.: DELLERT GEORGE T JR 5AP  
 TITLE: COMMUNICATIONS OF THE ACM VOL.: 8, NO. 12 PP.: 2P  
 0742-0748 DATED: 65.12 5P

CITES: BRAUJH63S17 STEVDF63EF7 MAGNRA64MP- BAKECL63ACM 5C  
 MYLAWC65CSP MAGNRA65EUM 5C  
 KEY WD.: 5K  
 5V

I.D.: DILLR-67RSE MD 64076 TM-3567/000/00 (DRAFT) 51M  
 TITLE: RESULTS OF THE SURVEY OF EXISTING AND AVAILABLE TEST AND 1T  
 EVALUATION METHODS FOR NONFUNCTIONAL COMPUTER PROGRAMS 5T  
 AUTH.: DILLER R FLEISHMAR T 5AP  
 AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 1P  
 MONICA 2500 COLOPADO AVE. DATED: 67.07.07 5P

CITES: +ACM---JA- +ACM---CA- SIEGM---IRB CALIP-67SPE 5C  
 +CA----- +IPJ----- +CR----- +AFIP---CP- +IFIP---CP- 3C  
 GOSDJA62SCC -IBM---SJ- GINZMG--NTR +CAA----- HILLJR66SHP 3C  
 JOSLE066VPC STATN-64MEC IHREFC--CPP IHREFC--UCE TOTAJB67RPP 3C  
 HAMMC-66CES +ACM---CP- JOSLE065ABK APPLCT65PMC +DATAM----- 3C  
 OPLEA-64MSC PATRRL64MP- HEADRV64TRS HEADRV64TRS +CJ----- 3C  
 +CB----- -CDPSC62P-- PATRRL--PLS WILLRC--CLS MOORWC----- 3C  
 ABRAPW63QMI DOPPO-62TPU 5C  
 KEY WD.: 5K  
 5V

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I.D.: FREDDS65AML 51M  
 TITLE: ACROSS MACHINE LINES IN COROL 5T  
 AUTH.: FREDERICKS D S WARBURTON C R 5AP  
 TITLE: COMMUNICATIONS OF THE ACM VOL.: 8, NO. 12 PP.: 2P  
 0731-0735 DATED: 65.12 5P

CITES: 5C  
 KEY WD.: 5K  
 5V

I.D.: GAINRS65THL 5IM  
 TITLE: TRANSLATION OF MACHINE LANGUAGE PROGRAMS 5T  
 AUTH.: GAINES R STOCKTON 5AP  
 TITLE: COMMUNICATIONS OF THE ACM VOL.: 8, NO. 12 PP.: 2P  
 0736-0741 DATED: 65.12 5P

CITES: GUNNJH62PPI OPLEA-62ATP GRAHS-65SCC 5C  
 KEY WD.: 5K  
 5V

I.D.: GARDRI68DMC AD 681851 MD 59170 68-65 UCLA-10814-65 5IM  
 TITLE: DEVELOPMENT OF A METACOMPILER CONTAINING LIST-PROCESSING 1T  
 CAPABILITIES 5T  
 AUTH.: GARDNER ROBERT I JR 5AP  
 AUTH.: UNIVERSITY OF CALIFORNIA DEPARTMENT OF ENGINEERING 5P  
 PLACE: CALIFORNIA LOS ANGELES 90024 DATED: 68.12 5P

CITES: 5C  
 KEY WD.: METACOMPILER LIST-PROCESSING SYSTEM DIRECTED GRAPH 1K  
 STRUCTURES LANGUAGE TRANSLATORS COMPILERS 5K  
 5V

I.D.: GILBP-66APT AD 488851 MD 30715 RADC-TR-66-54 5IM  
 TITLE: AUTOMATIC PROGRAMMING TECHNIQUES 5T  
 AUTH.: GILBERT P GUNN D M SCHAGER C L 5AP  
 AUTH.: TELEDYNE SYSTEMS CORP PLACE: CALIFORNIA HAWTHORNE 12525 1P  
 SO. DAPHNE AVE DATED: 66.07 5P

CITES: CHOMN-59CFP GILB--62APT GILB--63APT GILBP---SAL 3C  
 GINSS-62TFL GLENAE60SMC IRONET61SCA NAURP-60RAL 5C  
 KEY WD.: COMPILERS PROGRAMMING LANGUAGE FORTRAN ALGOL JOVIAL 3K  
 AUTOMATIC PROGRAMMING 5K  
 5V

I.D.: GILBP-67APT AD 811144 RADC-TR-66-665, VOLUME I 5IM  
 TITLE: AUTOMATIC PROGRAMMING TECHNIQUES 5T  
 AUTH.: GILBERT PHILIP GUNN DON M SCHAGER CRAIG L TESTERMAN W 5AP  
 AUTH.: TELEDYNE SYSTEMS CO. PLACE: CALIFORNIA HAWTHORNE 12525 1P  
 SOUTH DAPHNE AVE. DATED: 67.01 5P

CITES: 5C  
 KEY WD.: COMPILERS PROGRAMMING LANGUAGES FORTRAN, JOVIAL, ALGOL 3K  
 AUTOMATIC PROGRAMMING 5K  
 5V

1.0 GILBP-67APT AD 811145 RADC-TR-66-665, VOLUME II 51M  
TITLE: AUTOMATIC PROGRAMMING TECHNIQUES 5T  
AUTH.: GILBERT PHILIP GUNN DON M SCHAGER CRAIG L TESTERMAN W 5AP  
AUTH.: TELDYNE SYSTEMS CO. PLACE: CALIFORNIA HAWTHORNE 12525 1P  
SOUTH DAPHNE AVE. DATED: 67.01 5P

CITES:  
KEY WD.: COMPILERS PROGRAMMING LANGUAGES FORTRAN, JOVIAL, ALGOL 5C  
AUTOMATIC PROGRAMMING 3K  
5K  
5V

1.0: GILBP-67CGU AD 658029 MD 50702 RADC-TR-67-456 51M  
TITLE: COMPILER GENERATION USING FORMAL SPECIFICATION OF PROCEDURE- 0T  
ORIENTED AND MACHINE LANGUAGES 5T  
AUTH.: GILBERT PHILIP MCLELLAN WILLIAM G 5AP  
AUTH.: ROME AIR DEVELOPMENT CENTER (EMIRD) PLACE: NEW YORK 1P  
GRIFFISS AIR FORCE BASE 13440 DATED: 67.08 5P

CITES: CANTDG62APB CHOMN-57SS- CHOMN-59CFP DIFOAC63SRS 3C  
GILB-62APT GILB-66APT GILB-66APT GILBP-66SAL GINSS-62TFL 3C  
TRONET61SCA NAURP-60RAL 5C  
KEY WD.: PROGRAMMING LANGUAGES COMPILERS FORTRAN JOVIAL 3K  
ALGOL 5K  
5V

1.0: GILBP-67CGU AD 658029 RADC-TR-67-454 51M  
TITLE: COMPILER GENERATION USING FORMAL SPECIFICATION OF PROCEDURE- 0T  
ORIENTED AND MACHINE LANGUAGES 5T  
AUTH.: GILBERT PHILIP MCLELLAN WILLIAM G 5AP  
AUTH.: ROME AIR DEVELOPMENT CENTER (EMIRD) PLACE: NEW YORK 1P  
GRIFFISS AIR FORCE BASE 13440 DATED: 67.08 5P

CITES: CHOMN-57SS- CHOMN-59CFP GINSS-62TFL NAURP-60RAL 3C  
TRONET61SCA CANTDG62APB DIFOAC63SRS GILBP-66SAL GILB----APT 3C  
GILB----APT GILB----APT 5C  
KEY WD.: PROGRAMMING LANGUAGES COMPILERS FORTRAN JOVIAL 3K  
ALGOL 5K  
5V

I.D.: GINSS-69ALF AD 702812 MO 61981 AFCRL-69-0326 51M  
 TITLE: ALGORITHMIC LANGUAGES FINAL REPORT 5T  
 AUTH.: GINSBURG SEYMOUR 5AP  
 AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 1P  
 MONICA 90406 DATED: 69.07.01. 5P

CITES: CHANWJ69AFD DONEJE67TAS GINSS-67ORL GINSS-67NPL 3C  
 GINSS-67CSC GINSS-67P-- GINSS-67OEE GINSS-68DL- GINSS-68TBA 3C  
 GINSS-68AFL GINSS-68MMT GINSS-68SFL GINSS-69PA- GINSS-69IAU 3C  
 GREIS-67IAO GRIES-67NUP GREIS-68SCG GREIS-68CAO GREIS-69HA- 3C  
 GREIS-69CFA HIBBTN66GCD HIBBTN67ECG MAGEG-68WPA ROSEGF68AFP 3C  
 ROSEGF67CWP ULLIJ-66PAP 5C  
 KEY WD.: AUTOMATA FORMAL LANGUAGES AFL THEORY 5K  
 5V

I.D.: GOSDJ-68AIC MTP-312 51M  
 TITLE: ACHIEVING INTER-ADP CENTER COMPATIBILITY 5T  
 AUTH.: GOSDEN J BRAMSON S FRY J MAHLE S STERNICK H 5AP  
 AUTH.: MITRE CORPORATION WASHINGTON OPERATIONS PLACE: 5P  
 DATED: 68.05 5P

CITES: FRANEW66DMS SABLJ-66RCA +ACM--63A6R -USASI66F-- 3C  
 -USASI66BF- -USASI--CIB -CSC--67GC- -CSC----GS- -CSC----ECT 3C  
 +DATAM67CLM -IBM----PLS -USASI67SCI +ACM--67MTL -AUERC66RCA 3C  
 -AUERC66DM- -AUERC67DSS -NAM--67DLN -USAF-67SCP -WESCO67CPT 5C  
 KEY WD.: 5K  
 5V

I.D.: GRAMML65ALR 51M  
 TITLE: ASSEMBLY LANGUAGE FOR REPROGRAMMING 5T  
 AUTH.: GRAHAM MARVIN LOWELL INGERMAN PETER ZILAHY 5AP  
 TITLE: COMMUNICATIONS OF THE ACM VOL.: 8, NO. 12 PP.: 2P  
 0769-0773 DATED: 65.12 5P

CITES: HALPMI64XMW FEKGE--ML- INGEPZ64PTP -IBM----RMI 3C  
 -UNIVA--CCM 5C  
 KEY WD.: 5K  
 5V

I.D.: MAHNW-70STC M70-43 51M  
 TITLE: SOFTWARE TRANSFER COST ESTIMATION TECHNIQUE 5T  
 AUTH.: MAHN W STONE J JR 5AP  
 AUTH.: MITRE CORPORATION WASHINGTON OPERATIONS PLACE: 5P  
 DATED: 70.07 5P

CITES: -ESD--66AFA -DCA--690CD BRANDH63MSD -ARMY-69CAS 3C  
 -DCA--70WBC DELAWA66PCC FARRL-64FAC KAHNPG69PC- LICHHA69WSE 3C  
 NELSEA67MHE -OASD-68CAU ADAMD167PCC BAKEDM66ECC BARLDA68SOS 3C  
 BEMERW69PT- BRANRL67CAJ BRIGPL69PC- BUDDAE67AAS CARTWJ66PFC 3C  
 DRUMKR66PAD FARIM-66TC- FIFEDW67AEC FLEIT-66CRA FLURWR65NDB 3C  
 FREDDS65AML FRITWB67CCW FRY-JP68UGS GAINRS65TML GALIMP67ERS 3C  
 GILLGW69MCP GOSDJA68AIA GOSOJA68SC- GUTTN-68PCP HALPMI65MII 3C  
 -ARMY-69MAR HAUENC68TCP HIRSP-69WIB -ARMY-69IAD JANNTJ61CPC 3C  
 JONEMV69CGD JONEMV65EMD JONEMV65HEI KEDEV-68CCE LABOV-66DEE 3C  
 LABOV-64ECP LAPALJ67TRM MANUB-64SCC MEALGH--PTS NELSEA65RIM 3C  
 PATPRL69IO- PORTJD67AGE RAICE-67PAC RANFAM68ADC RANFAM68CFP 3C  
 RATYMV67AFC RUBERJ68CEP RUBIJ-66CAS SANDCW66AWC TUCKSG65ELS 3C  
 WEINGF66DEC WEINGF65RMC WILLDA67CLM 5C  
 KEY WD.: 5K  
 5V

I.D.: HAUENC68TCP MD 56988 TM-3676/007/01 51M  
 TITLE: TRANSFERABILITY OF COMPUTER PROGRAMS AT COMMAND CENTERS 5T  
 AUTH.: HAU EISEN W C MATHUR R N ILGER H J LABOLLE V 5AP  
 AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 1P  
 MONICA 2500 COLORADO AVE 90406 DATED: 68.01.16 5P

CITES: BAERRE67RTA BEAUAA67RT4 BENSSG65CPA BORED-67T-- 3C  
 BRUMSW66WMC BUDDAE66MES BUDDAE66MES BUDDAE66MES BUDDAE67AAS 3C  
 CHRILS66ITJ DRUTA-67WAS ENGLJE67TS4 ERICWJ67ACC FLEIT-67TAP 3C  
 FLEIT-67RSE GAINRS65TML HAUENC68RNC -IBM---ISC IRBYLA67RCT 3C  
 KLEIPE64RSB KLINJ-67DPS NEILG-67CMP NEILG-67SDR OLSETM65PTP 3C  
 OPPEDK66M-- -SDC--64DMC SEARLV67SEG SEARLV66SEN SEARLV66SMD 3C  
 SHAWCJ66CPC -USAF-64CMD -USAF---CME -USAF-64DE- -USAF-64MCD 3C  
 -USAF---PTS -USAF-66SEM -USAF---SMP -USAF-65SPM -USAF-64SPD 3C  
 WEINGF65RMC 5C  
 KEY WD.: 5K  
 5V

I.D.: HILLRH68SET  
 TITLE: SIMULATION, EMULATION, & TRANSLATION  
 AUTH.: HILL RICHARD H  
 TITLE: SIMULATION VOL.: PP.: 0081-0084 DATED: 68.02

5IM  
 5T  
 5AP  
 5P

CITES:  
 KEY WD.: SOURCE COMPUTER TARGET COMPUTER HOST COMPUTER OBJECT  
 COMPUTER SOURCE LANGUAGE OBJECT LANGUAGE MACHINE CODE MACHINE-  
 LEVEL LANGUAGE HIGHER-LEVEL LANGUAGE

5C  
 1K  
 0K  
 5K  
 5V

I.D.: HOLTAW70ECA AD 704796 MD 63959 THIRD SEMI-ANNUAL TECHNICAL  
 REPORT PART II (COVERING TASK AREA II)  
 TITLE: EVENTS AND CONDITIONS AN APPROACH TO THE DESCRIPTION AND  
 ANALYSIS OF DYNAMIC SYSTEMS  
 AUTH.: HOLT ANATOL W COMMONER FREDERIC  
 AUTH.: MASSACHUSETTS COMPUTER ASSOCIATES, INC. PLACE:  
 MASSACHUSETTS WAKEFIELD LAKESIDE OFFICE PARK 01880 DATED: 70.  
 04

1IM  
 5I  
 1T  
 5T  
 5AP  
 2P  
 0P  
 5P

CITES: HOLTAW68FRI HOLTAW65MM PATISS69MCD PATISS69MDA  
 PATISS69NMA PATISS69MIC PATISS--CRD PETRCA--CA- SHAPRM69HFS  
 SHAPRM69RA-  
 KEY WD.:

3C  
 3C  
 5C  
 5K  
 5V

I.D.: IRBYLA67RCT MD 64067 TM-WD-488/000/00  
 TITLE: RESULTS OF CONVERSION OF TWO OPERATIONAL PROGRAMS FROM J3 ON  
 THE CDC 1604 TO J5.2 ON THE IBM 360  
 AUTH.: IRBY LELIA A  
 AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: VIRGINIA FALLS  
 CHURCH 22041 DATED: 67.12.18

5IM  
 1T  
 5T  
 5AP  
 1P  
 5P

CITES:  
 KEY WD.:

5C  
 5K  
 5V

I.D.: JORRP-69FDB AD 860063 MD 60718 51M  
TITLE: FORMAL DEFINITION OF BASEL PART 3: INTERPRETER 5T  
AUTH.: JORRAND PHILIPPE 5AP  
AUTH.: MASSACHUSETTS COMPUTER ASSOCIATES, INC. PLACE: 2P  
MASSACHUSETTS WAKEFIELD LAKESIDE OFFICE PARK 01880 DATED: 69. 0P  
02.15 5P

CITES: HAMMM--FDB JORRP---FDB 5C  
KEY WD.: 5K  
5V

I.D.: KINGJC69PV- AD 699248 AFOSR-70-0039TR 51M  
TITLE: PROGRAM VERIFIER 5T  
AUTH.: KING JAMES C 5AP  
AUTH.: CARNEGIE MELLON UNIVERSITY DEPARTMENT OF COMPUTER SCIENCE 5P  
PLACE: PENNSYLVANIA PITTSBURGH 15213 DATED: 69.09 5P

CITES: 5C  
KEY WD.: 5K  
5V

I.D.: KISEBR67SCT AD 684013 FTD-HT-23-506-68 51M  
TITLE: STANDARDIZATION OF COMPUTER TECHNOLOGY FACILITIES TRANSLATED 1T  
FROM RUSSIAN 5T  
AUTH.: KISELEV B R 5AP  
TITLE: STANDARTY I KACHESTVO DATED: 67 VOL.: 10 PP.: 2P  
0028-0031 5P

CITES: 5C  
5V

I.D.: KLEIPE64RSB MD 64066 TM-WD-423/000/00 51M  
TITLE: RESULTS OF A STUDY OF THE BIDIRECTIONAL TRANSFER OF COMPUTER 1T  
PROGRAMS BETWEEN THE IBM 7090 AND THE CDC 1604A 5T  
AUTH.: KLEIN P E 5AP  
AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 1P  
MONICA 2500 CORADO AVE DATED: 64.08.12 5P

CITES: 5C  
KEY WD.: 5K  
5V

I.D.: KNUDE70EFS AD 711329 MEMO AIM-126 REPORT NO. CS 169 51M  
TITLE: EXAMPLES OF FORMAL SEMANTICS 5T  
AUTH.: KNUTH DONALD E 5AP  
AUTH.: STANFORD UNIVERSITY COMPUTER SCIENCE DEPARTMENT ARTIFICIAL 1P  
INTELLIGENCE PROJECT PLACE: CALIFORNIA STANFORD DATED: 2P  
70.07 5P

CITES: 5C  
KEY WD.: LAMBDA EXPRESSIONS SYNTHESIZED ATTRIBUTES INHERITED 1K  
ATTRIBUTES TURINGOL TL/I INFORMATION STRUCTURES 5K  
5V

I.D.: KROHK869DMM AD 697826 MD 62723 AFOSR 69-2993TR 51M  
TITLE: DEVELOPMENT OF A MACHINE-INDEPENDENT, MULTI-LEVEL, RECURSIVE 1T  
MACRO SUBSTITUTION LANGUAGE FOR THE SPECIFICATION OF REAL FILE 1T  
STRUCTURES AND THEIR OPERATIONAL ENVIRONMENTS 5T  
AUTH.: KROHN KENNETH B 5AP  
AUTH.: COMPUTER SYMBOLIC, INC. PLACE: DISTRICT OF COLUMBIA 1P  
WASHINGTON 920 15TH STREET, N.W. 20005 DATED: 69.11.20 5P

CITES: 5C  
KEY WD.: MACHINE LANGUAGE COMPILER RECURSIVE SYSTEMS FILE 1K  
ORGANIZATION COMPUTER SYSTEMS SOFTWARE ASSEMBLY LANGUAGE 3K  
PROGRAMMING 5K  
5V

I.D.: LAMPBW66RMC AD 707366 DOCUMENT NO. R-13 51M  
TITLE: REFERENCE MANUAL: COMPILER PACKAGE 5T  
AUTH.: LAMPSON BUTLER H 5AP  
AUTH.: UNIVERSITY OF CALIFORNIA PLACE: CALIFORNIA BERKELEY 5P  
DATED: 66.03.18 5P

CITES: 5C  
KEY WD.: 5K  
5V



I.D.: OSWAH-67IPT AD 812819 MD 48545 RADC-TR-67-104 5IM  
 TITLE: IMPLEMENTATION OF PROGRAM TRANSLATION 5T  
 AUTH.: OSWALD HENRY DYKAAR R R VOLLERS J OSWALK J KAUFMAN P 1AP  
 5AP  
 AUTH.: CELESTRON ASSOCIATES, INC. PLACE: NEW YORK VALHALLA 4 1P  
 BROADWAY 10595 DATED: 67.03 5P

CITES: 5L  
 KEY WD.: DIGITAL COMPUTER AUTOMATICALLY TRANSLATE MACHINE 1K  
 LANGUAGE COMPUTER PROGRAM 5K  
 5V

I.D.: PAULMC68TDS AD 683 784 MD 59903 SCIENTIFIC REPORT NO. 11M  
 6 5T  
 TITLE: TRANSLATION DESCRIPTION SYSTEM FOR COMPUTER LANGUAGES 5T  
 AUTH.: PAULL MARVIN C 5AP  
 AUTH.: RCA LABORATORIES PLACE: NEW JERSEY PRINCETON 08540 5P  
 DATED: 68.12 5P

CITES: AHO-AV--SOT INGEPZ66SOT PAULMC67BDS 5C  
 KEY WD.: LANGUAGE DESCRIPTION LANGUAGE PROCESSING COMPUTER 1K  
 LINGUISTICS TRANSLATION SYSTEMS PROGRAMMING LANGUAGES SYNTAX 3K  
 SEMANTICS CONTEXT-FREE GRAMMARS REPRESENTATIONS 5K  
 5V

I.D.: PERSMH65JMP AD 620611 MD 15434 TM-555/002/03 5IM  
 TITLE: JOVIAL MANUAL, PART 2 JOVIAL (J3) GRAMMAR AND LEXICON 5T  
 AUTH.: PERSTEIN MILLARD H (EARLIER VERSIONS BY C. J. SHAW AND M. H. 1AP  
 PERSTEIN)  
 AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 5P  
 MONICA 2500 COLORADO AVE. DATED: 65.09.01

CITES: 5L  
 5V

I.D.: PERSMH65JMP AD 623861 MD 15434 TM-555/002/04 5IM  
 TITLE: JOVIAL MANUAL, PART 2 JOVIAL (J3) GRAMMAR AND LEXICON 5T  
 AUTH.: PERSTEIN MILLARD H (EARLIER VERSIONS BY C. J. SHAW AND M. H. 1AP  
 PERSTEIN) 5AP  
 AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 1P  
 MONICA 2500 COLORADO AVE. DATED: 65.10.20 5P

CITES: 5C  
 5V

I.D.: PERSMH66GLB AD 635473 MD 45082 TM-555/005/00 51M  
TITLE: GRAMMAR AND LEXICON FOR BASIC JOYIAL 5T  
AUTH.: PERSTEIN M H 5AP  
AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 1P  
MONICA DATED: 66.05.10 5P

CITES: 5C  
5V

I.D.: PERSMH68STD AD 666370 MD 54054 SP-2916/000/01 51M  
TITLE: SOME TECHNIQUES FOR DESCRIBING PROGRAMMING LANGUAGES 5T  
AUTH.: PERSTEIN MILLARD H 5AP  
AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 1P  
MONICA PP.: 0001-002B 5P

CITES: ABRAPW66FSD BERKEC67CE- IVERKE64MSS NAURP-60RAL 3C  
PEKSMH66CSD PERSMH66JGL PERSMH66NSD SAMMJE61DC6 SHAWCJ63SJ- 3C  
-USASI67PUS -USGPD61C1R 5C  
5V

I.D.: PLASJE66TSM AD 637956 MD 44176 CA-6607-1512 31M  
APCRL-06-516 5I  
TITLE: TRANGEN SYSTEM ON THE M460 COMPUTER 5T  
AUTH.: PLASKOW JONATHAN E SCHUMAN STEPHEN A 5AP  
AUTH.: MASSACHUSETTS COMPUTER ASSOCIATES, INC. PLACE: 2P  
MASSACHUSETTS WAKEFIELD LAKESIDE OFFICE PARK 01880 DATED: 2P  
66.07.15 5P

CITES: BEARD-66GPS BUMGLL--ORC CHEATE65NCT CHEATE65TTG 3C  
CHEATE64SC- CHRIC-65ESM EVANA-50A6C EVANA-65SAP FELDJA66FSC 3C  
FLOYRW61DLS FLOYRW63SAD LIETMP64MSC LONORL64CPD LONSET63EPA 3C  
MITCRW66ILN SHAPR-64GYC STRAC-65GPM TAYL--6188A WILLH-66ADN 3C  
-COMPA66ST- -COMPA66TI- 5C  
5V

I.D.: PRESL-68SSE AD 679592 68-51 UCLA-10P14-52 51M  
 TITLE: STRUCTURE, SPECIFICATION, AND EVALUATION OF TRANSLATORS AND 1T  
 TRANSLATOR WRITING SYSTEMS 5T  
 AUTH.: PRESSER LEON 5AP  
 PUB.: UNIVERSITY OF CALIFORNIA LOS ANGELES DEPARTMENT OF 1P  
 ENGINEERING PLACE: CALIFORNIA LOS ANGELES 90024 DATED\* 2P  
 68.10 5P

CITES: BAERJ-68GMC BROOKE-60USB BOVEDP68MAC BROORA60APP 3C  
 BROORA60SPK BROORA61DMA BROORA62GTP BURKWH65UPL CARDAF68POL 3C  
 CERFV-68MP- CHEATE64AC- CHEATE66TCC CHOMN-63FPG -CCCIT65CNN 3C  
 -CCCIT65CNN DAVIRA66CCS DEANAL64SRA ESTRG-67SCC ESTRG-68MDD 3C  
 FELDJA64FSC FELDJA66FSC FELDJ-68TWS FLOYRW61DLS FLOYRW63SAD 3C  
 FLOYRW64BCS GARWJV64GLC GINSS-66MTC GINSS-66DCF GINSS-67SAC 3C  
 GORNS-61SBT GRAHRM64BCT GRANEE66ECO GREEJH63UL- GREISA64FPS 3C  
 HALPMI65MIT HALSMH62MCP HARTPH67HWS HAVEJP63PLS HUNTEC66MS- 3C  
 -IBM--66PLM INGEZ66SI- IRONET61SDC IRONET61SUS ITURR-66TAU 3C  
 KNUTDE65TLL LAWSHW68PIS MANDR-66MDA MANDR-68ICW MARIMA68IFP 3C  
 MARTDF66AAS MCCAJ-62LIP MCCLRM65TSD MCKEWM66ACL METCH-64PCB 3C  
 MORRCW38FETS NORTRS64FSL OPLEA-64MSC OPPEDK66MLS PRESL-67CWS 3C  
 ROSES-64CBS RUSSEC68APA SCHML-63ISM SCHOV-63SDS SCHOV-64MIS 3C  
 SCHNFW64MSD SHAWA-66LNC SHAWCJ66SOE SIBLRA61SS- SQUIBE65RSC 3C  
 SQUIRE66LAP STEETB66FLD TOLLJ-67FE- TURNR-63AIV WARSS-61SDG 3C  
 WIRTN-66EGA ZEMAH-66SPL 5C  
 KEY WD.: TRANSLATORS TRANSLATOR WRITING SYSTEMS TRANSLATOR 1K  
 SPECIFICATION TRANSLATOR EVALUATION TRANSLATOR MEASUREMENT 3K  
 COMPILERS INTERPRETERS META COMPILERS PRECEDENCE GRAMMARS 3K  
 PRECEDENCE LANGUAGES 5K  
 5V

I.D.: RUBERJ68CEP AD 669096 MD 55002 ESD-TR-68-150 LOGICON 11M  
 REPORT NO. CS-6813-R0106 5I  
 TITLE: COMPARATIVE EVALUATION OF PL/I 5T  
 AUTH.: RUBEY RAYMOND J ET AL 5AP  
 AUTH.: LOGICON, INCORPORATED PLACE: CALIFORNIA SAN PEDRO 1P  
 90731 DATED: 68.04 5P

CITES: 5C  
 KEY WD.: PL/I EVALUATION PROGRAMMING LANGUAGE EVALUATION 3K  
 PROGRAMMING LANGUAGE COMPARISON FORTRAN : PL/I COMPARISON JOVIAL : 1K  
 PL/I COMPARISON COBOL : PL/I COMPARISON BENCHMARK COMPUTER 1K  
 PROGRAMS 5K  
 5V

I.D.: RZEPWE69JSS AD 852934 MD 59441 RADC-TR-69-106 51M  
TITLE: JOVIAL SORT AND SEARCH ROUTINES FOR THE DM-1 SYSTEM 5T  
AUTH.: RZEPKA WILLIAM E 5AP  
AUTH.: ROME AIR DEVELOPMENT CENTER (EMIIH) PLACE: NEW YORK 1P  
GRIFFISS AIR FORCE BASE 13440 DATED: 69.05 5P  
CITES: GOTLCC63SC- -SDC--66JTM -UNIVA65RJL 5C  
KEY WD.: PROGRAMMING (COMPUTER) SORTING SEARCHING 5K  
5V

I.D.: SHAPKM69RA- AD 697026 CA-6908-2331 RADC TR-69-313, 11M  
VOL. II 5I  
TITLE: REPRESENTATION OF ALGORITHMS 5T  
AUTH.: SHAPIRO ROBERT M SAINT HARRY 5AP  
AUTH.: APPLIED DATA RESEARCH, INC. CORPORATE RESEARCH CENTER 5P  
PLACE: NEW YORK NEW YORK 450 SEVENTH AVE. 10001 DATED: 69.09 5P  
CITES: 5C  
5V

I.D.: SHAWCJ60JMP MD 15433 TM555 PART 1 51M  
TITLE: JOVIAL MANUAL: PART 1 COMPUTERS, PROGRAMMING LANGUAGES AND 1T  
JOVIAL 5T  
AUTH.: SHAW C J 5AP  
AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 1P  
MONICA 2500 COLORADO AVE. DATED: 60.12.20 5P  
CITES: 5C  
5V

I.D.: SHAWCJ61BJP MD 15435 FM-5477 51M  
TITLE: BASIC JOVIAL PRIMER 5T  
AUTH.: SHAW C J 5AP  
AUTH.: SYSTEM DEVELOPMENT CORPORATION PLACE: CALIFORNIA SANTA 1P  
MONICA 2500 COLORADO AVE. DATED: 61.05.05 5P  
CITES: 5C  
5V

I.D.: SRINCV67FDC AD 662899 SCIENTIFIC REPORT NO. 2 AFCRL-67- 01M  
 0588  
 TITLE: FORMAL DEFINITION OF CDL1, A COMPUTER DESCRIPTION LANGUAGE 5I  
 AUTH.: SRINIVASAN CHITTOOR V 5T  
 AUTH.: RADIO CORPORATION OF AMERICA RCA LABORATORIES PLACE: NEW 5AP  
 JERSEY PRINCETON 08540 DATED: 67.10 1P  
 5P

CITES:  
 KEY WD.: DESIGN AID SYSTEMS COMPUTER DESCRIPTION LANGUAGE 5C  
 DOCUMENTATION SIMULATION AUTOMATIC SYNTHESIS 3K  
 5K  
 5V

I.D.: SRINCV69CCD AD 693555 SCIENTIFIC REPORT NO. 3 AFCRL-69- 01M  
 0522  
 TITLE: CDL1, A COMPUTER DESCRIPTION LANGUAGE 5I  
 AUTH.: SRINIVASAN CHITTOOR V 5T  
 AUTH.: RCA LABORATORIES PLACE: NEW JERSEY PRINCETON 08450 5AP  
 DATED: 69.07 5P  
 5P

CITES.  
 5C  
 5V

I.D.: STANTA67DDF AD 658042 MD 56181 AFOSR 67 264 5IM  
 TITLE: DATA DEFINITION FACILITY FOR PROGRAMMING LANGUAGES 5T  
 AUTH.: STANDISH T A 5AP  
 AUTH.: CARNEGIE INSTITUTE OF TECHNOLOGY DEPARTMENT OF COMPUTER 1P  
 SCIENCE PLACE: PENNSYLVANIA PITTSBURGH 15216 DATED: 2P  
 67.05.18 5P

CITES: ABRAP-66L2- ANDERH66TDS BACKJW59SSP BERGC-62TGA 3C  
 BOBRDG66MLI BOBRDG66NLI BOBRDG--0AS BOHMC-66FDT BONDE-64FEF 3C  
 BROORA67ECC BROORA62GTP BROWNS64ASN CHURA-41CLC O'IMM-64DST 3C  
 EARLJC67MSS ENGLC-65POH EVANAM65SAP FELDJA64FSC FELDJA66FSC 3C  
 FENIPR66OSA FLOYRW61DLS FLOYRW66SCC GALLBA67PDA HOGMCD56HCP 3C  
 HARCAS65PH- HOLTAW65MMM INGEPZ66SOT ITURR-67CMM KLERM-65TDP 3C  
 HOGMCD66PDL KNUTDE65TLL KNUTDE63CDF LANDP J64MEE LEDEJ-65DSC 3C  
 LEDEJ-66SOM LINDRK65ESD MCCAJ-64DND MCCAJ-60RFS MCCAJ-62L1P 3C  
 MDEJ-66ST- NARAR-66SDI NAURP-63RRA NEWEA-64 IPL NEWEA-64PCS 3C  
 PERLAJ66SMT PERLAJ64FL- PEKLAJ66SAS PERLAJ66DFA -IBM--66PLS 3C  
 ROBELG64GCC ROSES-64CBS ROSSDT61GTS SAMMJE62BEC 3C  
 SAMMJE66SFM SCOTAE58APF SHERPH66FCP SKILHM57EEC SLAGJH61HPS 3C  
 STANTA66PLD STRAC-66CWP SUTHWR66CLO -USGPO61CRS VAN RP66FMA 3C  
 VAN RE60IMN WARSS-62TBM WEIZJ-66SLP WELL--63--- 5C  
 5V

I.D.: VESEVM67AAL AD 695921 MD 61072 FID-MT-24-498-68 51M  
 TITLE: ALGORITHMS AND ALGORITHMIC LANGUAGES TRANSLATED FROM 1T  
 RUSSIAN 5T  
 AUTH.: VESELOV V M KOPROV V M 5AP  
 TITLE: OBNINSK FIZIKO-ENERGETICHESKIY INSTITUT DOKLADY DATED: 2P  
 67 TRANSLATED: 69.05.12 INDEXED: 71.03.31 VOL.: 81 5P  
 PP.: 0001-0027 5P

CITES: BACKJWS9SSP BEKU--65AAL KLINSK57IM- MAL'AI65ARF 3C  
 MARKAA5TA- MARKAA5ITA- TURCVFXXMAL TURCVF06MFD ZHOMN-61TMD 5C  
 KEY WD.: COMPUTER LANGUAGE ALGORITHMIC LANGUAGE ALGORITHM 5K  
 5V

I.D.: VESEVM67AAL AD 702909 MD 63960 FID-MT-24-415-69 51M  
 TITLE: ALGORITHMS AND ALGORITHMIC LANGUAGES TRANSLATED FROM 1T  
 RUSSIAN 5T  
 AUTH.: VESELOV V M KOPROV V M 5AP  
 PUB.: FIZIKO-ENERGETICHESKIY INSTITUT DATED: 67 TRANSLATED: 2P  
 69.01.06 INDEXED: 71.04.15 PP.: 0001-0027 5P

CITES: 5C  
 KEY WD.: ALGORITHM ALGORITHMIC LANGUAGE/(U) ALGOL 60 LANGUAGE 3K  
 (U)M20 DIGITAL COMPUTER 5K  
 5V

I.D.: WILSDM65C7C 51M  
 TITLE: CAT: A 7090-3600 COMPUTER-AIDED TRANSLATION 5T  
 AUTH.: WILSON DONALD M MOSS DAVID J 5AP  
 TITLE: COMMUNICATIONS OF THE ACM VOL.: 8, NO. 12 PP.: 2P  
 0777-0781 DATED: 65.12 5P

CITES: MCKENM65PO- 5C  
 KEY WD.: 5K  
 5V

I.D.: -COMPC68JPS AD 835453 MD 55840 118-8, 118-7 (APP. I), 118- 01M  
 1 (APP. II) RADC-TR-68-166, VOL. I (OF 2) 5I  
 TITLE: JOVIAL PROGRAM SUPPORT SYSTEM, VOLUME I--SYSTEM MANUAL 5T  
 AUTH.: COMPUTER COMMAND AND CONTROL COMPANY 5AC  
 PLACE: PENNSYLVANIA PHILADELPHIA WILFORD BUILDING, 33RD & ARCH STREETS 1P  
 19104 DATED: 68.05 5P

CITES: 5C  
 KEY WD.: COMPUTERS PROGRAMMING (COMPUTERS) 5K  
 5V

AD: -COMPC68JPS AD 835270 MD 55479 11B-6 RADC-TR-68-166. 11M  
 VOL. II (OF 2) 5T  
 TITLE: JOVIAL PROGRAM SUPPORT SYSTEM, VOLUME II--SYSTEM USER'S 1T  
 AUTH: 5T  
 AUTH: COMPUTER COMMAND AND CONTROL COMPANY 5AC  
 PLACE: PENNSYLVANIA PHILADELPHIA WILFORD BUILDING, 33RD & ARCH STREETS 1P  
 19104 DATED: 68.05 5P

CITES: 5C  
 KEY WDS: COMPUTERS PROGRAMMING (COMPUTERS) 5X  
 5V

AD: -COMPS70APT AD 702058 FINAL TECHNICAL REPORT PART II 51M  
 TITLE: ADVANCED PROGRAMMING TECHNIQUE FOR A COST-EFFECTIVE HARDWARE- 0T  
 INDEPENDENT REALIZATION OF NAVAL SOFTWARE SYSTEMS 5T  
 AUTH: COMPUTER SYMBOLIC, INC. PLACE: D.C. WASHINGTON MCPHERSON 1P  
 SQUARE OFFICE BUILDING 920 15TH STREET, N.W. 20005 DATED: 2P  
 70.07 5P

CITES: -COMPS--FP- -LOCKM67MXP MAURWV69CMA ORGARJ69BMF 3C  
 VANWJ669SGS 5C  
 KEY WDS: ASSEMBLY SYSTEMS COST-EFFECTIVE SOFTWARE HARDWARE 1K  
 INDEPENDENCE NAVAL SOFTWARE PSEUDO ASSEMBLY LANGUAGES 5K  
 5V

AD: -ESD--70UMC AD 711369 ESD-TR-70-274 51M  
 TITLE: USER'S MANUAL COBOL COMPILER VALIDATION SYSTEM 5T  
 AUTH: ELECTRONIC SYSTEMS DIVISION DIRECTORATE OF SYSTEMS DESIGN & 1P  
 DEVELOPMENT PLACE: MASSACHUSETTS BEDFORD L G HANSCOM FIELD 1P  
 01730 DATED: 70.07 5P

CITES: 5C  
 KEY WDS: COBOL COMPILER VALIDATION 5K  
 5V

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I.D.: -ESD--70UMJ AD 711370 ESD-TR-70-278 51M  
TITLE: USER'S MANUAL JOVIAL COMPILER VALIDATION SYSTEM 5T  
AUTH.: ELECTRONIC SYSTEMS DIVISION DIRECTORATE OF SYSTEMS DESIGN 1AC  
& DEVELOPMENT PLACE: MASSACHUSETTS BEDFORD L G HANSCOM FIELD 1P  
01730 DATED: 70.07 5P

CITES: 5C  
KEY NO.: JOVIAL J-3 (J3) COMPILER VALIDATION 5R  
5V

I.D.: -FOCCP68JPL AD 672933 FOCCPAC TECH NOTE 3 128365 51M  
TITLE: JOVIAL PROCEDURE LIBRARY 5T  
AUTH.: PACIFIC FLEET FLEET OPERATIONS CONTROL CENTER 5AC  
PLACE: CALIFORNIA SAN FRANCISCO DATED: 68.04 5P

CITES: 5C  
5V



APPENDIX B

EXAMPLE OF DOCUMENT CONTROL DATA - R & D,  
DD FORM 1473

APPENDIX C

IDENTIFIERS FOR CORPORATE NAMES

AFSCF	Air Force Satellite Control Facility, Computer Program Integration Contractor
AICE	American Institute of Chemical Engineers
API	American Petroleum Institute
ARMY	U.S. Army
AUERC	Auerbach Corporation
BELLT	Bell Telephone Laboratories, Inc.
CA	Computer Abstracts
CAA	Computers and Automation
CARIT	Carnegie Institute of Technology
CB	Computer Bulletin
CDPSC	Computing and Data Processing Society of Canada
CJ	Computer Journal
CODAS	CODASYL Systems Committee
CR	Computing Reviews
CRPC	Chemical Rubber Publishing Company
CSC	Computer Sciences Corporation
DATAM	Datamation
DATAP	Data Processing Inc.
DCA	Defense Communications Agency

ESD U.S. Air Force, Electronic Systems Division  
FEDEL Federal Electric Corporation  
HARVU Harvard University  
IBM International Business Machines Corporation  
IPJ Information Processing Journal  
NAA North American Aviation, Inc.  
OASD Office of Assistant Secretary of Defense  
(Comptroller)  
PHILC Philco Corporation  
RAND Rand Corporation  
SDC System Development Corporation  
UNILL University of Illinois  
UNIVA UNIVAC  
USAF U.S. Air Force  
USASI U.S. of A. Standards Institute  
USGPO U.S. Government Printing Office  
WESCO Westinghouse Electric Corporation

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