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Volumes I & II

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
L. G. Hanscom Field, Bedford, Massachusetts

Project 572R

Prepared by
THE MITRE CORPORATION
Bedford, Massachusetts

Contract F19(628)-71-C-0002

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FOREWORD

This report presents the results of analyses conducted by The MITRE Corporation, Bedford, Massachusetts under Contract F19(628)-71-C-0002. Dr. John B. Goodenough (ESD/MCDT-1) was the ESD project monitor.

REVIEW AND APPROVAL

This technical report has been reviewed and is approved.

P. L. Veckem

FOR

EDMUND P. GAINES, JR., Colonel, USAF
Director, Systems Design & Development
Deputy for Command & Management Systems

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.

Columns 74 and 75 contain an alphabetic category code. Category codes in use include: AC corporate author; AP personal author; C cites; I identification; IM identification (mandatory first line of each item); K key words; P facts of publication; T title; V mandatory last line of each item (the line is otherwise blank). When one line is inadequate to contain the desired information, the data are continued on the following line, to which the same category code is assigned. As a minor exception, because certain routines in the MITRE text-processing system assume that the first line of an item carries a unique code, IM is a proper code for a first line of the identification element and I is used only for a continuation line. The content to which each of these codes relate is discussed below under TEXT FIELD.

The presence of the line-ending codes and the line category codes permits compacting of the file so as to eliminate nonsignificant blanks. Sometimes such compacting properly results in combining two adjacent lines which are of the same coded category. The same facility would allow conversion of all items from card-image to sequential format, should such conversion be desired in the future.

Card columns 77-80 constitute the field for line numbers of a file. These line numbers are not contained in the internal representation of the file but are supplied during output to the display terminal.

TEXT FIELD

The nature of the individual bibliographic data indexed in the text field of the card is indicated by a preceding index label or tag. (The text field is left-justified.) Brevity in the tags is obtained by the use of standard American English abbreviations from American Heritage Dictionary of the English Language, William Morris, editor (New York: American Heritage Publishing Co., Inc. and Houghton Mifflin Company, 1970). Their status as abbreviations indicates that their mnemonic value has been established and eliminates any need to provide glosses for the tags used in the file. Tags are punctuated by following colons, separated from the index elements they label by two blanks.

Identification Data

For each item, the identification element (tag I.D.:) contains compulsory facts about the document being indexed which may be useful in locating a desired item within the file (see 1 below) or in obtaining a needed document from the author, the agency responsible for its distribution, or a library or other holder of a pertient collection of documents (see 2 below).

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 (I). 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 pysics 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 (5). 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 (4) to the documents indexed in the file of (1). 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.

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Systems

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APPENDIX A

A SAMPLE BIBLIOGRAPHY ON TECHNIQUES FOR SOFTWARE TRANSFER

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.

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. Bayard
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 ANDEDW67MPI BAERJL--LOP 3C
BAERJL68CAE BERGC-62TGA BAKEJJ62NMB BOVEDP68MAC BARNG---IIC 3C
BUSSB-62PVS COFFEG67BPP CHENYC66SPC CLINCT64MFP COOPDC66CPG 3C
CRITAJ65GMM COTTLW65CIF CURTWA63MCS DUDERA64DMD EISNH-62GNA 3C
ESTRG-67MMM ELMASE64AAG ELMASE67EDP 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 KNOWM-67MOI 3C
KEMEJG63FMC KUCKDJ--IIS LAMPBW68SPM LEHMM-66SPP LEVYWA65CMC 3C
MARTDF66AAS MARTDF67EMC MARTDF67MCS MARTDF67MCS MENDMJ66SSR 3C
MARTJJ65DTD MCKEJL62SPJ MALCDG59ATR MARIRB59NMC MCNAR-59SDL 3C
MURTJC66HPI MAYBJO64MTS NIEVJ-64PMI PARKDF66CCU PRITAB6oGGE 3C
PROSRT60ABM RAMACV66AGC RADRJ-67GMP ROTHMA66SIT RUSSEC63AAC 3C
RUSSEC--APA ROY-B-62CCG SAATTL61EQT SCHWES64HPP SENZDN65COA 3C
SCHWES61ASP SCHWJ-66LPC SHEDGS67PNM SMITRD67GAS SCHEAL67ATC 3C
STAUDC67U1P SCHWJI64GPT TONGFM65ABU THORJF67CGP THORJE63POC 3C
TURNR-63AIV VAN RS63MCP 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                    5IM
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:  ALLARW64SE6    CART--62ILT    FELDJA66FSC    GRAHRM64BCT               3C
GREEJ-66MEP    KRIDL-64FAA    MARIT-62CCS    NIEVJ-65ASC    OLSETM65PTP        3C
SHAWCJ61J--    STEETB--FVU    WILDDU67PAD                                      5C
KEY WD.:                                                                       5K
                                                                               5V


I.D.:  BARBP-69MFI    AD 693296    MD 60632    PLR003                          5IM
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.:  BENNRK68BBU    AD 681169    MD 57704    SIG-TR-336    AFOSR             1IM
69-0072TR                                                                      5I
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    BROORA63C--    CHEATE64SDC    -DATAP61DIP    FELDJA66FSC      3C
GALLB-67PDA    -IBM----PLS    IRONET61SDC    MCCLRM65TSC    METCHH64PCB      3C
PLASJ-66TSM    RICHM-68BRM    SCHODV64SCW                                      5C
KEY WD.:  COMPUTER LANGUAGES    PROGRAMMING LANGUAGES    COMPILERS            3K
ASSEMBLERS    TRANSLATORS    LANGUAGES    LANGUAGE DEFINITION                 5K
                                                                               5V
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I.D.:  BRANRL67CTJ    WP-8120    NPN 218                                    5IM
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                                   5IM
TITLE:  RDTRAN:  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                5IM
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            3IM
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	BAERJ-68GMC	BAUEFL66SSF	BAUMR-64IA-	BEMERW68SIS	3C
BERGC-62TGA	BINGH-67DEO	BROORA67TPR	BROORA67CFA	BROORA67EC-	3C
BROORA67SPD	BROWWS65OEC	BURKWM65MSS	CALIP-67SPE	CHARBA68UST	3C
CHEATE64AC-	CHEATE64SDC	CLARER67ASS	COHEJ-66NOG	COHEJ-67NAP	3C
COHEJ-67LCW	COOPDC66CPG	COOPDC66ECC	CROCS-66IFI	DAVIM-66RFI	3C
DONOJJ67FSS	ESTRG-67SCC	ESTRG-67MMM	FELDJ-62CSG	FELDJA66FSC	3C
FELDJ-68TWS	FEREEN68SDP	FERGD-66EMP	FERGHE63DSS	FISHDA67PAM	3C
FLOYR-64BCS	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	INGEPZ66SDT	IRONET61SDC	IVERKE64FPL	JOHAP-67NP-	3C
KARPRM60NAG	KARUAD69TAM	KNUTDE68AP-	KNUTDE67CPL	KNUTDE65TLL	3C
KOSTR-69LSC	KUNOS-65PAP	KUNOS-66APA	KUNOS-66PA-	KUNOS-62MSA	3C
LEWIPM68SDT	LIU-CL67DIT	LYNCWC63ABN	MANDRL68TCD	MARIRB59NMC	3C
MARTD-67EMC	MARTD-67MCS	MARTD-67MCS	MARTJJ65DTD	POTAH-69DCD	3C
PRATTW66PBS	PRATTW65SDT	PRESL-68SSE	PROSRT60ABM	RAMACV65DMA	3C
RANDB-64A6I	RESNM-68ISD	REYNJC68ICP	ROGEH-67TRF	ROHLJS68NBF	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
STEVDF68SEC	TIXIV-67RFR	TOSHW-65ST-	TRACM-69PEO	TROURG67CS-	3C
TYRRA-69IM7	UNGESH63GPC	WALTKG66COO	WARSS-61SDG	WEISC-67L1P	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
5V

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I.D.:  CHEATE--RMS    AD 683362    MD 58235    FIRST SEMI-ANNUAL TECHNICAL 1IM
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-63SRD                               5C
                                                                         5V


I.D.:  CHEATE68BEE    N70-15399    MD 64052                              5IM
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         1IM
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.:  CHIKGB67OMR    AD 697616    FTD-MT-24-411-68                       5IM
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-67WTG AD 683105 FTD-HT-23-613-66 5IM
TITLE: WELL TRANSLATABLE GRAMMARS AND ALGOL-LIKE LANGUAGES 3T
TRANSLATED FROM RUSSIAN 5T
AUTH.: CULIK K 5AP
TITLE: NAUCHNO-TEKHNICHESKAYA INFORMATSIYA SERIYA 2 INFORMATSIONNYYE 1P
PROTSESSY I SISTEMY VOL.: 03 PP.: 0021-0023 5P

CITES: 5C
5V

I.D.: DELLGT65UMT 5IM
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: BRAUJH63SI7 STEVDF63EF7 MAGNRA64MP- BAKECL63ACM 3C
MYLAWC65CSP MAGNRA65EUM 5C
KEY WD.: 5K
5V

I.D.: DILLR-67RSE MD 64076 TM-3567/000/00 (DRAFT) 5IM
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 COLORADO AVE. DATED: 67.07.07 5P

CITES: +ACM----JA- +ACM----CA- SIEGM---IRB CALIP-67SPE 3C
+CA-------- +IPJ------- +CR-------- +AFIP---CP- +IFIP---CP- 3C
GOSDJA62SCC -IBM----SJ- GINZMG--NTR +CAA------- HILLJR66SBP 3C
JOSLEO66VBC STATN-64MEC IHREFC--CPP IHREFC--UCE TOTAJB67RPP 3C
HAMMC-66CES +ACM----CP- JOSLEO65ABK APPLCT65PMD +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

I.D.: FREDDS65AML 5IM
TITLE: ACROSS MACHINE LINES IN COBOL 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.:  GAINRS65TML                                                    5IM
TITLE:  TRANSLATICN 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
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I.D.:  GILBP-67APT   AD 811145   RADC-TR-66-665, VOLUME II                    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


I.D.:  GILBP-67CGU   AD 658029   MD 50702   RADC-TR-67-456                   5IM
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
IRONET61SCA   NAURP-60RAL                                                    5C
KEY WD.:  PROGRAMMING LANGUAGES   COMPILERS   FORTRAN   JOVIAL               3K
ALGOL                                                                        5K
                                                                             5V


I.D.:  GILBP-67CGU   AD 658029   RADC-TR-67-454                              5IM
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
IRONET61SCA   CANTDG62APB   DIFOAC63SRS   GILBP-66SAL   GILB----APT          3C
GILB----APT   GILB----APT                                                    5C
KEY WD.:  PROGRAMMING LANGUAGES   COMPILERS   FORTRAN   JOVIAL               3K
ALGOL                                                                        5K
                                                                             5V
```

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I.D.:  GINSS-69ALF    AD 702812    MD 61981    AFCRL-69-0326                    5IM
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-69MA-        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                                                   5IM
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    -NAA--67DLN    -USAF-67SCP    -WESCO67CPT        5C
KEY WD.:                                                                        5K
                                                                                5V



I.D.:  GRAHML65ALR                                                              5IM
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    FERGDE--ML-    INGEPZ64PTP    -IBM----RMI               3C
-UNIVA--CCM                                                                     5C
KEY WD.:                                                                        5K
                                                                                5V
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I.D.:  HAHNW-70STC    M70-43                                                    5IM
TITLE:  SOFTWARE TRANSFER COST ESTIMATION TECHNIQUE                             5T
AUTH.:  HAHN 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    ADAMDL67PCC    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    GOSDJA68SC-    GUTTN-68PCP    HALPMI65MII        3C
-ARMY-69HAR    HAUEWC68TCP    HIRSP-69WIB    -ARMY-69IAD    JANNTJ61CPC        3C
JONEMV69CGD    JONEMV65EMD    JONEMV65HEI    KEDEV-68CCE    LABOV-66DEE        3C
LABOV-64ECP    LAPALJ67TRM    MANUB-64SCC    MEALGH--PTS    NELSEA65RIM        3C
PATRRL69IO-    PORTJD67ACE    RAICE-67PAC    RANFAM68ADC    RANFAM68CFP        3C
RATYMV67AFC    RUBERJ68CEP    RUBIJ-66CAS    SANDCW66AWC    TUCKSG65ELS        3C
WEINGF66DEC    WEINGF65RMC    WILLDA67CLM                                       5C
KEY WD.:                                                                       5K
                                                                               5V


I.D.:  HAUEWC68TCP    MD 56988    TM-3676/007/01                               5IM
TITLE:  TRANSFERABILITY OF COMPUTER PROGRAMS AT COMMAND CENTERS                 5T
AUTH.:  HAUEISEN 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
BRUHSW66WMC    BUDDAE66MES    BUDDAE66MES    BUDDAE66MES    BUDDAE67AAS        3C
CHRILS66ITJ    DRUTA-67WAS    ENGLJE67TS4    ERICWJ67ACC    FLEIT-67TAP        3C
FLEIT-67RSE    GAINRS65TML    HAUEWC68RNC    -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-64SPO        3C
WEINGF65RMC                                                                    5C
KEY WD.:                                                                       5K
                                                                               5V
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I.D.:  HILLRH68SET                                                    5IM
TITLE:  SIMULATION, EMULATION, & TRANSLATION                          5T
AUTH.:  HILL RICHARD H                                                5AP
TITLE:  SIMULATION     VOL.:     PP.:  0081-0084     DATED:  68.02    5P

CITES:                                                                5C
KEY WD.:  SOURCE COMPUTER   TARGET COMPUTER   HOST COMPUTER  OBJECT    1K
COMPUTER   SOURCE LANGUAGE   OBJECT LANGUAGE   MACHINE CODE   MACHINE-  0K
LEVEL LANGUAGE   HIGHER-LEVEL LANGUAGE                               5K
                                                                      5V


I.D.:  HOLTAW70ECA   AD 704796   MD 63959   THIRD SEMI-ANNUAL TECHNICAL 1IM
REPORT   PART II (COVERING TASK AREA II)                              5I
TITLE:  EVENTS AND CONDITIONS   AN APPROACH TO THE DESCRIPTION AND     1T
ANALYSIS OF DYNAMIC SYSTEMS                                           5T
AUTH.:  HOLT ANATOL W   COMMONER FREDERIC                             5AP
AUTH.:  MASSACHUSETTS COMPUTER ASSOCIATES, INC.     PLACE:            2P
MASSACHUSETTS WAKEFIELD LAKESIDE OFFICE PARK 01880     DATED:  70.    0P
04                                                                    5P

CITES:  HOLTAW68FRI   HOLTAW65MMM   PATISS69MCD   PATISS69MDA         3C
PATISS69NMA   PATISS69MIC   PATISS--CRD   PETRCA--CA-   SHAPRM69HFS   3C
SHAPRM69RA-                                                           5C
KEY WD.:                                                              5K
                                                                      5V


I.D.:  IRBYLA67RCT   MD 64067   TM-WD-488/000/00                       5IM
TITLE:  RESULTS OF CONVERSION OF TWO OPERATIONAL PROGRAMS FROM J3 ON   1T
THE CDC 1604 TO J5.2 ON THE IBM 360                                   5T
AUTH.:  IRBY LELIA A                                                  5AP
AUTH.:  SYSTEM DEVELOPMENT CORPORATION     PLACE:  VIRGINIA FALLS     1P
CHURCH 22041     DATED:  67.12.18                                     5P

CITES:                                                                5C
KEY WD.:                                                              5K
                                                                      5V
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I.D.:  JORRP-69FDB    AD 860063    MD 60718                                  5IM
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
08.15                                                                       5P

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



I.D.:  KINGJC69PV-    AD 699248    AFOSR-70-0039TR                          5IM
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                         5IM
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                          5IM
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 COLORADO AVE      DATED:  64.08.12                              5P

CITES:                                                                      5C
KEY WD.:                                                                    5K
                                                                            5V
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I.D.: KNUTDE70EFS AD 711329 MEMO AIM-126 REPORT NO. CS 169 5IM
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.: KROHKB69DMM AD 697826 MD 62723 AFOSR 69-2993TR 5IM
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 5IM
TITLE: REFERENCE MANUAL: COMPILER PACKAGE 5T
AUTH.: LAMPSON BUTLER W 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
J 5AP
AUTH.: CELESTRON ASSOCIATES, INC. PLACE: NEW YORK VALHALLA 4 1P
BROADWAY 10595 DATED: 67.03 5P

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

I.D.: PAULMC68TDS AD 683 784 MD 59903 SCIENTIFIC REPORT NO. 1IM
6 5I
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--SDT 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
MONICA 2500 COLORADO AVE. DATED: 65.09.01 5P

CITES: 5C
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

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I.D.:  PERSMH66GLB    AD 635473    MD 45082    TM-555/005/00                    5IM
TITLE:  GRAMMAR AND LEXICON FOR BASIC JOVIAL                                    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                   5IM
TITLE:  SOME TECHNIQUES FOR DESCRIBING PROGRAMMING LANGUAGES                    5T
AUTH.:  PERSTEIN MILLARD H                                                      5AP
AUTH.:  SYSTEM DEVELOPMENT CORPORATION      PLACE:  CALIFORNIA SANTA            1P
MONICA      PP.:  0001-0028                                                     5P

CITES:  ABRAPW66FSD    BERKEC67CE-    IVERKE64MSS    NAURP-60RAL               3C
PERSMH66CSD    PERSMH66JGL    PERSMH66NSD    SAMMJE61DC6    SHAWCJ63SJ-        3C
-USASI67PUS    -USGP061C1R                                                     5C
                                                                               5V



I.D.:  PLASJE66TSM    AD 637956    MD 44176    CA-6607-1512                     3IM
AFCRL-66-516                                                                    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    FLOYRW63SAO    LIETMP64MSC    LONDRL64CPD    LONSET63EPA        3C
MITCRW66ILN    SHAPR-64GTC    STRAC-65GPM    TAYL--61BBA    WILLH-66ADN        3C
-COMPA66ST-    -COMPA66TI-                                                     5C
                                                                               5V
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I.D.: PRESL-68SSE AD 679592 68-51 UCLA-10P14-52 5IM
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 BOOKE-60USB BOVEDP68MAC BROORA60APP 3C
BROORA60SPR 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 FLOYRW63SAO 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 INGEPZ66SI- IRONET61SDC IRONET61SUS ITURR-66TAU 3C
KNUTDE65TLL LAWSHW68PIS MANDR-66MDA MANDR-68ICW MARIMA68IFP 3C
MARTDF66AAS MCCAJ-62L1P MCCLRM65TSD MCKEWM66ACL METCH-64PCB 3C
MORROW38FTS NORTRS64FSL OPLEA-64MSC OPPEDK66MLS PRESL-67CWS 3C
ROSES-64CBS RUSSEC68APA SCHML-63ISM SCHOV-63SDS SCHOV-64MIS 3C
SCHNEW64MSD SHAWA-66LNC SHAWCJ66SOE SIBLRA61SS- SQUIBE65RSC 3C
SQUIBE66LAP 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 1IM
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

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I.D.:  RZEPWE69JSS    AD 852934    MD 59441    RADC-TR-69-106                5IM
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.:  SHAPRM69RA-    AD 697026    CA-6908-2331    RADC TR-69-313,           1IM
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                             5IM
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                                    5IM
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
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I.D.:  SRINCV67FDC   AD 662899   SCIENTIFIC REPORT NO. 2   AFCRL-67-     0IM
0588                                                                    5I
TITLE:  FORMAL DEFINITION OF CDL1, A COMPUTER DESCRIPTION LANGUAGE       5T
AUTH.:  SRINIVASAN CHITOOR V                                            5AP
AUTH.:  RADIO CORPORATION OF AMERICA   RCA LABORATORIES     PLACE:  NEW 1P
JERSEY PRINCETON 08540     DATED:  67.10                                5P

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


I.D.:  SRINCV69CCD   AD 693555   SCIENTIFIC REPORT NO. 3   AFCRL-69-     0IM
0322                                                                    5I
TITLE:  CDL1, A COMPUTER DESCRIPTION LANGUAGE                           5T
AUTH.:  SRINIVASAN CHITOOR V                                            5AP
AUTH.:  RCA LABORATORIES     PLACE:  NEW JERSEY PRINCETON 08450         5P
DATED:  69.07                                                           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
BOBRDG64MLI   BOBRDG64NLI   BOBRDG--QAS   BOHMC-66FDT   BONDE-64FEF     3C
BROORA67ECC   BROORA62GTP   BROWWS64ASN   CHURA-41CLC   D'IMM-64DST     3C
EARLJC67MSS   ENGLC-65POM   EVANAM65SAP   FELDJA64FSC   FELDJA66FSC     3C
FENIRR66OSA   FLOYRW61DLS   FLOYRW66SCC   GALLBA67PDA   HOGMCD56HCP     3C
HOARCA65RH-   HOLTAW65MMM   INGEPZ66SOT   ITURR-67CMM   KLERM-65TDP     3C
KNOWKC66PDL   KNUTDE65TLL   KNUTDE63CDF   LANDPJ64MEE   LEDEJ-65DSC     3C
LEDEJ-66SOM   LINDRK65ESD   MCCAJ-64DND   MCCAJ-60RFS   MCCAJ-62L1P     3C
MOSEJ-66SI-   NARAR-66SDI   NAURP-63RRA   NEWEA-64IPL   NEWEA-64PCS     3C
PERLAJ60SMT   PERLAJ64FL-   PERLAJ66SAS   PERLAJ66DFA   -IBM--66PLS     3C
RHATJT65VDS   ROBELG64GCC   ROSES-64CBS   ROSSDT61GTS   SAMMJE62BEC     3C
SAMMJE66SFM   SCOTAE58APF   SHERPM66FCP   SKILHM57EEC   SLAGJH61HPS     3C
STANTA66PLD   STRAC-66CWP   SUTHWR66CLD   -USGPO61CRS   VAN RP66FMA     3C
VAN ME60IMN   WARSS-62TBM   WEIZJ-66SLP   WELL--63---                   5C
                                                                        5V
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I.D.:  VESEVM67AAL    AD 695921    MD 61072    FTD-MT-24-498-68                5IM
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:  BACKJW59SSP    BEKU--65AAL    KLINSK57IM-    MAL'AI65ARF                 3C
MARKAA54TA-    MARKAA51TA-    TURCVFXXMAL    TURCVF66MFD    ZHOMN-61TMD          5C
KEY WD.:  COMPUTER LANGUAGE    ALGORITHMIC LANGUAGE    ALGORITHM                5K
                                                                                5V


I.D.:  VESEVM67AAL    AD 702909    MD 63960    FTD-MT-24-415-69                5IM
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                                                              5IM
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:  MCKEWM65PO-                                                             5C
KEY WD.:                                                                        5K
                                                                                5V


I.D.:  -COMPC68JPS    AD 835453    MD 55840    118-8, 118-7 (APP. I), 118-     0IM
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
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I.D.: -COMPC68JPS   AD 835270   MD 55479   118-6   RADC-TR-68-166,      1IM
VOL. II (OF 2)                                                          5I
TITLE: JOVIAL PROGRAM SUPPORT SYSTEM, VOLUME II--SYSTEM USER'S          1T
GUIDE                                                                   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


I.D.: -COMPS70APT   AD 702058   FINAL TECHNICAL REPORT PART II          5IM
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
70.02                                                                   5P

CITES: -COMPS--FR-   -LOCKM67MXP   MAURWV69CMA   ORGARJ69BMP           3C
VANOJE69SGS                                                             5C
KEY WD.: ASSEMBLY SYSTEMS   COST-EFFECTIVE SOFTWARE   HARDWARE          1K
INDEPENDENCE   NAVAL SOFTWARE   PSEUDO ASSEMBLY LANGUAGES                5K
                                                                        5V


I.D.: -ESD--70UMC   AD 711369   ESD-TR-70-274                           5IM
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 WD.: COBOL   COMPILER   VALIDATION                                  5K
                                                                        5V
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I.D.: -ESD--70UMJ AD 711370 ESD-TR-70-278 5IM
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 WD.: JOVIAL J-3 (J3) COMPILER VALIDATION 5K
5V

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

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APPENDIX B

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Security Classification

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Rome Air Development Center (EMIRD)
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2b. GROUP
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COMPILER GENERATION USING FORMAL SPECIFICATION OF PROCEDURE-ORIENTED AND MACHINE LANGUAGES

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)
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5. AUTHOR(S) (First name, middle initial, last name)
Philip Gilbert
William G. McLellan

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This document has been approved for public release and sale; its distribution is unlimited.

11. SUPPLEMENTARY NOTES
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12. SPONSORING MILITARY ACTIVITY
Rome Air Development Center (EMIRD)
Griffiss Air Force Base, New York 13440

13. ABSTRACT

A compiler generation system is described which is rigorously based and which allows formal specification both of the source (procedure oriented) languages and of the object (machine oriented) languages. An intermediate or "buffer" language, BASE, is interposed, reducing the required transformation techniques described. The system, so far, includes those elements in BASE necessary to produce ALGOL, FORTRAN, and JOVIAL compilers.

This paper was presented at the 1967 Spring Joint Computer Conference.

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UNCLASSIFIED

Security Classification

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Programming Languages						
Compilers						
FORTRAN						
JOVIAL						
ALGOL						

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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4. Ben-Ami Lipetz, "Improvement of the Selectivity of Citation Indexes to Science Literature Through Inclusion of Citation Relationship Indicators," American Documentation, April 1965, pp. 81-90.

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The MITRE Corporation
P. O. Box 208
Bedford, Massachusetts 01730

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2b. GROUP

3. REPORT TITLE
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4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*

5. AUTHOR(S) *(First name, middle initial, last name)*
Jeanne Fleming

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13. 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. A bibliography on software transferability was compiled for automated access with the MITRE test-processing system, SHOEBOX. Sources and formats are described, followed by the bibliography itself.

DD FORM 1 NOV 65 1473

Security Classification

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
BIBLIOGRAPHIES						
COMPUTER PROGRAMS						
DATA RETRIEVAL						
DATA STORAGE						
INDEXES						
INFORMATION RETRIEVAL						
SEARCH STRUCTURING						
TRANSLATOR ROUTINES						